Evaluation of
Breath Alcohol Testing Instruments
to Replace the Intoxilyzer 5000

September 2012

GBI Crime Laboratory

GEORGIA BREATH TESTING INSTRUMENT EVALUATION

EXECUTIVE SUMMARY

Background

Pursuant to O.C.G.A. § 40-6-392 the Georgia Bureau of Investigation is responsible for approving the methods used for evidential breath alcohol testing in the state of Georgia. Since 1995, the sole approved instrument in the state of Georgia for analysis of alcohol in breath has been the Intoxilyzer 5000 manufactured by CMI, Inc. Although a reliable breath testing device, the technology used in the Georgia Model Intoxilyzer 5000 may not be able to meet future requirements for Georgia's breath testing program. Significantly, some of its original components are no longer produced by the manufacturer, leading to uncertainty as to the availability of replacement parts for the Georgia Model Intoxilyzer 5000. Additionally, the design of the Georgia Model Intoxilyzer 5000 is unable to meet the evolving demands for digital information from the legal community is significantly limited. Due to these concerns, the Division of Forensic Sciences (DOFS) embarked upon a year-long evaluation process of available breath alcohol testing instruments and will modify GBI Rule 92-3 to allow for a gradual transition for all law enforcement agencies from the Georgia Model Intoxilyzer 5000 to a Georgia Model Intoxilyzer 9000 by the end of calendar year 2015.

Evaluation Process

In 2011 the GBI DOFS undertook a study to identify which evidential breathing instruments currently on the market could most likely meet the future needs of Georgia's breath alcohol testing program. The GBI Crime Lab ultimately selected three evidential breath testing instruments from three different vendors for further evaluation as potential replacements for the Intoxilyzer 5000. One instrument from each vendor was leased for the purposes of the evaluation. A detailed evaluation plan was developed which considered laboratory measures of instrument performance and reviewed each instrument's capabilities and reputation in the scientific community. Evaluation of the instruments was conducted by the Division of Forensic Sciences and each instrument was scored according to predefined, objective criteria.

Evaluated Instruments

Intoxilyzer 9000 (series 9400) SN 90-000107 manufactured by CMI Owensboro, KY.

Evidenzer 240 Mobile (EVI-013) SN 90-0406 manufactured by Nanopuls Uppsala Sweden.

Datamaster DMT Series (GF) SN 300115 manufactured by National Patent Analytical Systems (NPAS) Mansfield, OH.

In the course of evaluating the instruments as a possible successor to the Georgia model Intoxilyzer 5000, approximately 2000 known samples were analyzed under numerous laboratory conditions. In laboratory testing, the Intoxilyzer 9000 and the Evidenzer 240 Mobile performed very well. Both instruments exhibited excellent accuracy, precision, linear range and stability, RFI immunity, mouth alcohol detection, and sampling parameters. The Intoxilyzer 9000 demonstrated superior performance over the Evidenzer 240 Mobile in the area of instrument

specificity or the ability of the instrument to distinguish ethyl alcohol from other compounds. Both instruments exhibited more than adequate specificity to ensure accurate and reliable testing. Though it produced excellent results when working properly, the Datamaster DMT-GF ultimately lagged significantly behind the Intoxilyzer 9000 and Evidenzer 240 Mobile in most laboratory measures due to problems with its fuel cell stability.

Category	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Administrative Review	328	263	234
Laboratory Evaluation	283	266	145
Final Score	611	529	379

The top two scoring instruments in the administrative evaluation were the Intoxilyzer 9000 and the Evidenzer 240 Mobile. The Intoxilyzer 9000 evaluation showed clear advantages over the Evidenzer 240 Mobile in both cost analysis and customer references. The Intoxilyzer 9000 was the highest rated instrument by existing customers. This included personnel from other states and Georgia law enforcement personnel selected from the Georgia State Patrol and the Governor's Office of Highway Safety Traffic Enforcement Networks.

Ultimately the Intoxilyzer 9000 attained the highest score in both the laboratory and administrative evaluations. It was also unanimously selected as the highest rated instrument by Georgia law enforcement evaluators.

Summary

Based on the laboratory testing and administrative review conducted by the Division of Forensic Sciences, the Intoxilyzer 9000 has been selected to be the eventual successor to the Georgia Model Intoxilyzer 5000. The Intoxilyzer 9000 will accurately and reliably measure subjects' breath alcohol concentration when properly operated and maintained. GBI Rule 92-3 will be amended to allow for a gradual transition from the Georgia Model Intoxilyzer 5000 to a Georgia Model Intoxilyzer 9000 by the end of calendar year 2015.

GEORGIA BREATH TESTING INSTRUMENT EVALUATION

Administrative review

The administrative review phase of the instrument evaluation was designed to evaluate each instrument's design and specifications as well as the reputation of the instrument and manufacturer in the scientific community. It consisted of 7 major evaluation categories and 75 total elements including a review of each instrument's specifications, a review of the literature regarding the instrument and manufacturer, an evaluation of customer evaluations and references, an evaluation of the instrument manufacturer, a review of legal opinions on the instrument and/or instrument manufacturer, an evaluation of potential modifications to the testing process, and a cost benefit analysis for each instrument.

Evaluated Instruments

Intoxilyzer 9000 (series 9400) SN 90-000107 manufactured by CMI Owensboro, KY.
Evidenzer 240 Mobile (EVI-013) SN 90-0406 manufactured by Nanopuls Uppsala Sweden.
Datamaster DMT Series (GF) SN 300115 manufactured by National Patent Analytical Systems (NPAS) Mansfield, OH.

Overall the Intoxilyzer 9000 scored approximately 25% higher on the objective scoring measures used in the administrative review than the next highest rated instrument. The Intoxilyzer 9000 was unanimously selected as the highest rated instrument when evaluated by law enforcement personnel.

The Evidenzer 240 Mobile was the second highest scoring instrument but fell short of the Intoxilyzer 9000 in three major areas. 1) The instrument was generally not preferred by law enforcement personnel and received much lower ratings than the Intoxilyzer 9000. 2) The estimated cost for the Evidenzer 240 Mobile is significantly higher than the other two instruments evaluated. 3) Several individuals expressed concerns over working with a manufacturer based outside of the US.

The Datamaster DMT-GF seemed to be somewhat more popular than the Evidenzer 240 Mobile with law enforcement personnel and has a larger U.S. presence; however, it lacked some of the desired specifications for optimizing the breath testing process. While the use of dual technology is a potential advantage of the DMT-GF, the stability and performance of the fuel cell is also its largest concern at this time.

For further information collected during the Administrative Review please refer to Appendix 1.

Administrative Review Score Summary

Category	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Specifications	204	197	157
Literature Review	10	9	7
Customer References	46	30	37
Company Review	20	9	10
Case Law Review	0	0	0
Process Review	25	15	0
Cost/ Benefit Evaluation	23	3	23
Totals	**328**	**263**	**234**

Instrument comparison overview

Feature	Intoxilyzer 9000	240 Mobile	DMT -GF
Appearance			
Detection system	4 filter IR, measuring C-O vibration in the 9 micron region. Specific detector, no filter wheel necessary	5 filter IR, measuring C-H vibration in the 3 micron region. Utilizes chopper/filter wheel. Can also optionally be equipped to measure the subject's breath temperature.	3 filter IR measuring C-H vibration in the 3 micron region. Utilizes a chopper/filter but is also equipped with a fuel/ electrochemical cell that also quantifies the alcohol concentration.
User interface	Full color 8.4" touch screen LCD, running Windows CE.	240x320 resolution built in display, no touch screen option. Interface runs on Windows CE platform.	800 x 480, 7" touch screen running Windows CE
Operating temperatures	32° – 104°F	32° -104°F	65° -78°F
Instrument dimensions	19"L x 14"W x 6.5-9.5"H (adjustable); 10 lb weight, 12 lb with dry gas compartment.	17.7" L x 6.9" W x 9.1" H with control unit; 21.4 lb	20" L X 15"W X 5" H; 24 lb

Feature	Intoxilyzer 9000	240 Mobile	DMT -GF
Calibration points	The instrument utilizes an optional multipoint calibration routine with quadratic curve fitting.	Optional multipoint calibration. Typical calibration utilizes two points, a zero and an ethanol solution.	The instrument utilizes single-point ethanol calibration.
Stated accuracy and precision	Accuracy: +/-3% or +/- 0.003 g/210L, whichever is greater. Precision: a std dev of 0.003 g/210L or less.	Accuracy: expected to be less than or equal to 0.0013 g/210L at concentrations 0.000-0.084 g/210L and less than or equal to 0.28% at concentrations greater than 0.084 g/210L. Precision: expected to be less than or equal to 0.0007 g/210L at concentration 0.000-0.084 g/210L and less than 1.8% at concentrations greater than 0.084 g/210L.	Accuracy: +/- .002g/210 L at 0 .100 g/210 L BrAC Precision: a %CV of less than 1.1% at 0.08 g/210L.
Estimated cost	Approximately $7000 for base model plus up to $850 in additional options (printer/dry gas delivery system). Mouth pieces approximately $0.25 each. *other options are available and may add to the final cost if utilized.	Approx. $8500 for base model plus up to $1100 in additional options (dry gas delivery system/ breath temp monitor). Mouth pieces approximately $0.55 each. *other options are available and may add to the final cost if utilized.	Approx. $6500 with printer. Mouth pieces approximately $0.26 each. *other options are available and may add to the final cost if utilized.

Specifications

The instrument specifications category of the administrative evaluation was designed to evaluate the functional design of each instrument. The specifications evaluation was worth a total of 237 possible points and consisted of an evaluation of each instrument's: detection system, diagnostic criteria, operating criteria, optional equipment, performance criteria, sampling criteria, and software capabilities. Information regarding each instrument's specifications was obtained through vendor supplied literature and responses to questionnaires prepared by the Division of Forensic Sciences.

Points Awarded	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Detection System	110	95	78
Diagnostic Criteria	14	19	15
Operating Criteria	13	10	1
Optional Equipment	6	6	6
Performance Criteria	28	28	24
Sampling Criteria	7	13	7
Software Capabilities	26	26	26
Total	**204**	**197**	**157**

Detection System Evaluation

Each instrument's detection system was evaluated for functional and design elements that were deemed to be potentially beneficial to optimal operation and integration into Georgia's breath testing program. Each instrument's detection system was evaluated for 8 elements worth a total of 130 possible points including: dual detection technique capability, the use of a filter wheel, the identity and number of detecting infrared wavelengths, the data sampling rate, the design of the infrared path, the resolution o the infrared detector, and the theoretical selectivity of the infrared system when compared against a database of infrared spectra.

Detection System Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Dual Detection System	The detection system was evaluated to determine if it utilized two analytical techniques to identify and quantify alcohol concentration.	0	0	10
Filter/Chopper Wheel	The infrared detection system was evaluated to determine whether it utilizes a filter/chopper wheel. Because filter wheel motors increase both "noise" and maintenance costs, systems without filter wheels are preferred.	10	2	2
Identity of IR Wavelengths	The identity of each infrared wavelength measured by the instrument was evaluated to ensure selectivity for alcohol to the exclusion of other common volatile compounds or mixtures of compounds. Measurements in the 8-9 micron region are preferred.	20	8	6
IR Data Sampling Rate	The resolution of the detection system was evaluated by review of the stated data sampling rate. Higher data sampling rates are preferred.	5	5	0
IR Path	The infrared detection system was evaluated to determine whether it utilizes a linear or folded/reflected IR path. Because reflected IR paths increase the likelihood of misalignment and optical bench maintenance concerns, systems with linear path length are preferred.	5	5	0

Detection System Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
IR Selectivity Test	The stated specifications of the IR detection system were evaluated for selectivity against an internal database of digitized infrared spectra downloaded from NIST. A ratio for each of the detection system's ethanol measuring IR wavelengths was calculated for each compound and compared to calculated ratios for ethanol.	30	30	20
Number of IR Wavelengths	The instrument was evaluated to determine if the number of infrared wavelengths measured is sufficient to ensure selectivity for alcohol to the exclusion of other common volatile compounds or mixtures of compounds.	40	40	30
Resolution of the IR Detector	The resolution of the infrared detection system at each infrared wavelength measured was evaluated by review of the stated infrared channel/filter width.	0	5	10
Total		100	95	78

Diagnostic Criteria

Each instrument's diagnostic criteria and capabilities were evaluated to determine whether it possessed all of the necessary diagnostic elements to ensure accurate and reliable testing and whether it possess any additional diagnostic capabilities deemed beneficial to the breath testing program in Georgia. The diagnostic criteria evaluation consisted of the evaluation of 10 elements worth a total of 19 possible points. The diagnostic elements evaluated include an evaluation of the instrument's: ambient air test capability, breath tube temperature monitoring, dry gas standard check compatibility, method of internal standard analysis, ability to perform remote diagnostics, ability to monitor sample chamber temperature, ability to perform self diagnostics, compatibility with wet bath simulators, the ability to utilize heated wet bath simulator connectors, and the ability to perform wet bath vapor re-circulation.

Diagnostic Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Ambient Air Evaluation	The instrument's ability to perform an air blank and purge the sample chamber of ethanol was evaluated. Instruments must be able to flag the presence of ethanol in the sample chamber if it present above a specified threshold after the air blank. Hydrochemical cleaning is preferred due to its ability to yield a "true zero".	1	4	1
Breath Tube Temperature Monitor	The instrument's ability to heat and measure the breath tube temperature was evaluated. Heated breath tubes are preferred because the reduce breath sample condensation.	4	4	4
Dry Gas Compatibility	The instrument's ability to perform calibration checks utilizing dry gas samples was evaluated. Dry gas compatibility is a critical function.	Pass	Pass	Pass
Internal Standard	The instrument's ability to perform an internal standard check as part of its diagnostic routine was evaluated. Both electronic internal checks and optical filter checks are preferred.	1	3	2
Self Diagnostics	The instrument's ability to perform an internal check of its operating parameters to ensure prior to sample analysis was evaluated.	Pass	Pass	Pass

Diagnostic Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Remote Diagnostics	The ability to initiate and review an instrument diagnostic routine from a remote location was evaluated. Two way communications for the purposes of instrument diagnostics is preferred.	3	3	3
Sample Chamber Temperature	The instrument’s ability to heat and measure the sample chamber temperature was evaluated. A heated sample chamber is critical to instrument stability.	2	2	2
Wet Bath Compatibility	The instrument's ability to perform calibration checks utilizing wet bath samples was evaluated. Wet bath compatibility is a critical function.	Pass	Pass	Pass
Wet Bath Heated Connections	The instrument's ability to heat wet bath simulator connections was evaluated. Heated connections are preferred to minimize condensation.	1	1	1
Wet Bath Recirculation	The instrument's ability to perform calibration checks utilizing wet bath vapor recirculation was evaluated. Wet bath recirculation is preferred for calibration solution longevity.	2	2	2
Total		**14**	**19**	**15**

Operating Criteria

The Operating Criteria subcategory of the Administrative Evaluation was designed to evaluate the environmental conditions under which the instrument can reliably be operated and stored. The Operating Criteria evaluation consisted of two elements worth a total of 13 possible points. The two elements evaluated under the Operating Criteria Evaluation were the instrument's operating temperature range and storage temperature range.

Operating Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Operating Temperature Range	The recommended operating temperature range was evaluated for robustness. A wide range of operating temperature is preferred.	7	7	1
Storage Temperature Range	The recommended storage temperature range was evaluated for robustness. A wide range of storage temperatures is preferred.	6	3	0
Total		**13**	**10**	**1**

Optional Equipment

The Optional Equipment subcategory of the Administrative Evaluation was designed to evaluate the compatibility of each instrument with optional external equipment and software deemed potentially beneficial to the Georgia's breath testing program. The Optional Equipment evaluation consisted of three elements worth a total of 6 possible points. The three elements evaluated under the Optional Equipment Evaluation were compatibility with barcode readers, the availability of instrument compatible database software, and instrument compatibility with internal and external printers.

Optional Equipment Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Barcode Readers	The instrument's ability to utilize a barcode reader to import subject or operator information during a breath test was evaluated.	2	2	2
Database Software	The availability of manufacturer supplied database software for remote instrument communication and data handling was evaluated.	2	2	2
Printer Compatibility	The instrument's ability to utilize both an internal and external printer was evaluated.	2	2	2
Total		**6**	**6**	**6**

Performance Criteria

The Performance Criteria subcategory of the Administrative Evaluation was designed to evaluate the stated performance of each instrument with respect to calibration, linear range, accuracy, and precision. The Performance Criteria evaluation consisted of four elements worth a total of 28 possible points. The four elements evaluated under the Performance Criteria Evaluation were expected accuracy, the number of points used during calibration, linear range, and expected precision.

Performance Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Accuracy	The manufacturer's stated accuracy was evaluated.	10	10	10
Calibration Points	The instruments were evaluated for the ability to perform a multipoint calibration. Multipoint calibration is preferred because it allows for the evaluation of regression statistics associated with measurement uncertainty.	4	4	0
Linear Range	Instruments were evaluated according to the manufacturer's stated limit of detection to ensure they are able to quantify alcohol concentrations at relevant levels.	4	4	4
Precision	The manufacturer's stated precision was evaluated.	10	10	10
Total		**28**	**28**	**24**

Sampling Criteria

The Sampling Criteria subcategory of the Administrative Evaluation was designed to evaluate each instrument's ability to monitor sample delivery characteristics and ensure that a sufficient sample is received. The Sampling Criteria evaluation consisted of seven elements worth a total of 13 possible points. The seven elements evaluated under the Sampling Criteria Evaluation were the instrument's ability to: measure breath temperature, measure breath volume and flow rate, heat the mouth piece, detect level slope, identify mouth alcohol profiles, detect reverse flow, and detect radio frequency interference.

Sampling Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Breath Temperature	The instrument's ability to measure the subject's breath temperature was evaluated.	0	4	0
Breath Volume and Flow Rate	The instrument's ability to measure the total breath volume delivered and flow rate was evaluated. The ability to measure breath flow and volume is a critical function.	Pass	Pass	Pass
Heated Mouth Piece	The instrument's ability to heat the mouth piece surfaces during testing was evaluated. Heated mouth pieces are preferred because they reduce breath sample condensation.	0	2	0
Level Slope	The instrument's ability to evaluate changes in the slope of the BrAC curve during the exhalation profile to ensure level slope was evaluated. Level slope is critical for the obtaining of breath samples with sufficient equilibration with alveoli and airway surfaces. The ability to measure level slope is a critical function.	Pass	Pass	Pass
Mouth Alcohol Rejection	The instrument's ability to flag significant drops in the BrAC during the exhalation profile as potential mouth alcohol or invalid samples was evaluated. The ability to flag BrAC drops is a critical function.	Pass	Pass	Pass
Reverse Flow	The instrument's ability to detect or prevent reverse flow or suck back through the breathline was evaluated.	2	2	2

Sampling Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
RFI Detection	The instrument's ability to identify the presence of radio frequency interference during the test was evaluated.	5	5	5
Total		**7**	**13**	**7**

Software Capabilities

The Software Capabilities subcategory of the Administrative Evaluation was designed to evaluate each instrument's ability to utilize customized testing and reporting formats as well as its data access and retention capabilities. The Software Capabilities evaluation consisted of eleven elements worth a total of 28 possible points. The eleven elements evaluated under the Software Capabilities Evaluation were operator information, question sequence, remote data retrieval, report format, restricted access levels, software updates, source code policy, test sequence, test storage capacity, test storage elements, and USB data retrieval.

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Operator Information	The instrument's ability to evaluate the status of instrument operators was evaluated.	3	3	3
Question Sequence	The ability of the software to be customized with respect to the subject or test information collected during the breath test routine was evaluated.	Pass	Pass	Pass
Remote Data Retrieval	The ability to initiate and download stored test information from a remote location was evaluated.	8	8	8
Report Format	The ability of the software to be customized with regard to the report format of the breath test results was evaluated.	Pass	Pass	Pass
Restricted Access Levels	The instrument's ability to utilize restricted access levels was evaluated.	2	2	2
Software Update	The ability of the instrument's operational software to be updated in the field was evaluated.	3	3	3
Source Code Policy	The availability of the instrument's source code for review was evaluated.	Pass	P/F*	Pass
Test Sequence	The ability of the software to be customized with regard to the order and elements of the breath test routine was evaluated.	Pass	Pass	Pass
Test Storage Capacity	The ability of the instrument to store breath test results was evaluated.	4	4	6

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Test Storage Elements	The ability of the instrument to store all of the information associated with breath test results was evaluated.	4	4	4
USB Data Retrieval	The ability to download stored test information to a USB key was evaluated.	2	2	0
Total		**26**	**26**	**26**

* The rating of P/F for the Evidenzer 240 Mobile is due to an unclear response from the vendor Nanopuls regarding access to the software code for the instrument.

Literature Review

The Literature Review category of the Administrative Evaluation consisted of a literature search for articles related to each evaluated instrument. This review was conducted to look for any scientific studies or articles utilizing or referencing the instrument in question. When information regarding the specific instrument was unavailable, literature regarding the type or testing methodology of the instrument based on its specifications was evaluated. Each study was evaluated by the GBI as positive, neutral, or negative with respect to the evaluated instrument. The Literature Review was worth a total of 25 possible points and consisted of a review of articles specifically referencing the evaluated instruments, articles involving other instrument produced by the same manufacturer, and specific articles involving technologies unique to the instruments being evaluated. Manufacturers were given the opportunity to submit articles for this evaluation. Each study was evaluated by GBI personnel as positive, neutral, or negative with respect to the instrument.

Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Instrument Articles	A search of the scientific literature for any peer reviewed scientific study involving the specific instrument tested was conducted.	0	6	1
Manufacturer Articles	A search of the scientific literature for any peer reviewed scientific article published since January 1, 2000 involving any instrument manufactured by the instrument manufacturer was conducted.	9	0	4
Technology Articles	A search of the scientific literature for any peer reviewed scientific study involving technological elements unique to the instrument tested was conducted.	1	3	2
Total		**10**	**9**	**7**

Customer References

The Customer References category of the Administrative Evaluation consisted of an evaluation of feedback regarding each evaluated instrument from both existing users around the world and potential users in the Georgia breath testing community. The Customer Reference evaluation consisted of two subcategories and was worth a total of 49 possible points. The Customer References evaluation consisted of a review of Existing Customer Questionnaires and a Law Enforcement Evaluation.

Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Existing Customer Questionnaire	Customers were asked to supply information regarding their experience with the instrument/ manufacturer including: how long they have used the instrument, number of instruments in use, how the instrument is being utilized, questions regarding legal challenges to the instrument, advantages and disadvantages of the instrument and estimated cost of operation.	22	17	21
Law Enforcement Evaluation	A group of law enforcement officers experienced in the use of evidential breath testing devices were selected to evaluate each instrument. Each manufacturer was allowed to submit documentation or brochures to be reviewed by the evaluators prior to the evaluation process.	24	13	16
Total		**46**	**30**	**37**

Company Review

The Company Review category of the Administrative Evaluation consisted of an evaluation to determine each manufacturer's ability to meet the needs of the Georgia breath testing program. Information was obtained through questionnaires provided to the manufacturers and a review of the provided literature. The Company Review evaluation consisted of eight elements and was worth a total of 30 possible points. The Company Review evaluation consisted of a review of relevant manufacturer accreditations, relevant instrument approvals, information dissemination policies, instrument repair capacity, prevalence of the manufacturer in the breath testing community, the manufacturer's production capacity, the manufacturer's training policies, and the terms of the instrument warranty.

Company Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Accreditations	The manufacturers' accreditations were evaluated. ISO accreditations are preferred.	5	2	2
Approvals	Each instrument's approvals were evaluated. Both OIML compliance and NHTSA/DOT approval is preferred.	0	5	0
Information Dissemination Policies	Manufacturers were evaluated for their willingness to provide access to instruments and training to any interested party.	Pass	Pass	Pass
Instrument Repair	Manufacturers were evaluated for their ability to calibrate and repair instruments. Manufacturers meeting the ISO 17025 calibration lab standard are preferred.	10	No U.S. facility at evaluation	Pass
Prevalence	Each instrument manufacturer was evaluated for prevalence in the evidential breath testing market.	5	0	3
Production Capacity	Manufacturers were evaluated for their capacity to meet the instrument replacement schedule set forth by GBI.	Pass	Pass	Pass
Training Policies	Manufacturers were evaluated for their willingness to train law enforcement personnel in instrument operation.	Pass	Pass	Pass
Warranty	The manufacturers' instrument warranties were evaluated.	0	2	5
Total		**20**	**9**	**10**

Case Law Review

The Case Law Review category of the Administrative Evaluation consisted of an evaluation to determine if adverse case law or rulings regarding the instrument or manufacturer exists in the legal community. The Case Law Review evaluation consisted of one subcategory worth a total of 0 possible points, only negative points were awarded for this category. The Case Law Review consisted only of a Legal Review conducted using web tools such as Lexis or general web searches. Primary emphasis was placed on appellate and Supreme Court rulings in the various states where the evaluated instruments or other instruments from the same manufacturer are used.

Case Law Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Legal Review	Each instrument was evaluated to determine if adverse case law or rulings regarding the instrument or manufacturer exists in the legal community. Sources for this information may include Lexis, customer interviews, defense attorney organizations, prosecuting bodies such as PAC or internet news searches. The manufacturer was given the opportunity to respond to any adverse information used in this evaluation and present mitigating or contrary rulings.	0	0	0
Total		**0**	**0**	**0**

Process Review

The Process Review category of the Administrative Evaluation consisted of an evaluation to determine how each instrument's unique features and options can be utilized in Georgia to improve overall efficiency and quality control and reduce cost and maintenance. The Process Review evaluation consisted of one subcategory worth a total of 25 possible points, The Process Review consisted of a review of process modification options unique to each instrument. Manufacturers were allowed to submit documentation or literature highlighting any unique features of the instrument that may benefit GBI-DOFS.

Process Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Process Modification Options	Each instrument was evaluated by GBI to determine how its unique features and options can be utilized to improve efficiency and quality control and reduce cost and maintenance.	25	15	0
Total		**25**	**15**	**0**

Cost/Benefit Review

The Cost/Benefit Review category of the Administrative Evaluation consisted of an evaluation of the base cost of each instrument along with the cost of optional configurations and consumables used in everyday operation. The Cost/Benefit Review consisted of one subcategory worth a total of 30 possible points consisting of four elements. The Cost/Benefit Review consisted only of a cost analysis for each instrument.

Cost/Benefit Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Cost Analysis		23	0	23
Total		**23**	**0**	**23**

Cost Analysis

The Cost Analysis subcategory of the Cost/Benefit Review consisted of an evaluation of the various aspect of the each instrument's cost. The Cost Analysis consisted of four elements worth a total of 30 points. The Cost Analysis consisted only of an analysis of each instrument's base cost, the cost of consumables, the cost of implementation, and the cost of optional equipment.

Cost Analysis Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Base Cost	The cost of each model instrument supplied was evaluated.	10	0	15
Consumables	The cost of consumables for each model instrument supplied was evaluated.	5	0	3
Implementation Cost	Each instrument was evaluated to determine if any other any unique additional costs exist to implement the instrument in the desired configuration.	3	0	5
Options	The cost of the optional equipment for each instrument was evaluated. A breakout of the cost of each of the instrument options was evaluated for cost/benefit.	5	3	0
Total		**23**	**3**	**23**

Laboratory Evaluation

The laboratory evaluation phase of the instrument evaluation was designed to test each instrument's performance under a variety of laboratory and field conditions. It consisted of 7 major testing categories and 24 total subcategories including accuracy and precision testing across the instrument's linear dynamic range, testing under various environmental conditions, testing of the instrument's specificity/selectivity for ethanol to the exclusion of other volatile organic compounds, testing the effectiveness of the mouth alcohol detection systems, testing of the sampling systems, testing of the instrument's RFI immunity and detection systems, and testing of the instrument's stability.

Both the Evidenzer 240 Mobile and the Intoxilyzer 9000 performed very well in laboratory evaluations. Accuracy, precision, linear range and stability were excellent with respect to both instruments. In addition RFI immunity and detection, mouth alcohol detection, and sampling parameter evaluation showed comparably good performance between the Intoxilyzer 9000 and the Evidenzer 240 Mobile. The one area where the Intoxilyzer 9000 showed clearly superior performance over the Evidenzer 240 Mobile was in the area of instrument specificity. Both instruments exhibited more than adequate specificity to ensure accurate and reliable testing.

Though the Datamaster DMT-GF performed well when operating properly, it suffered from numerous error messages throughout the course of laboratory testing, which ultimately affected its overall score. These error messages were primarily attributable to disagreements between the readings from the fuel cell and infrared detector. Thus the Datamaster DMT-GF lagged significantly behind the Intoxilyzer 9000 and Evidenzer 240 Mobile in most laboratory evaluation categories.

For further information collected during the Laboratory Evaluation please refer to Appendix 2.

Laboratory Evaluation Score Summary

Category	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Linear Dynamic Range	40	48	24
Environmental Conditions Test	14	14	4
Specificity Test	129	84	77
Mouth Alcohol Test	20	45	10
Sampling Parameter Evaluation	40	30	10
RFI Detection Evaluation	15	15	15
Instrument Stability Evaluation	25	30	5
Totals	**283**	**266**	**145**

Linear Dynamic Range

The linear dynamic range category of the laboratory evaluation was designed to test the accuracy and precision of the breath testing instrument at various concentrations. It was comprised of three subcategories worth a total of 53 possible points. The sub categories are: Limit of Detection, Dynamic Range Calibration Check, Dynamic Range Sample Mode.

Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Limit of Detection (LOD)	LOD was determined by analysis of ethanol standards: 0.000 to 0.013 g/210L incremented by 0.001 until an analytical result was displayed (sample test mode).	0	0	0
Dynamic Range Calibration Check	Linear Dynamic Range was determined by the analysis of ethanol standards with concentrations between 0.010 and 0.600 g/210L. Each sample was analyzed in the cal check mode 20 times and evaluated for RSD and accuracy. The levels tested included 0.02, 0.05, 0.08, 0.10, 0.2, 0.3, 0.4, 0.6 g/210L.	22	24	21
Dynamic Range Sample Mode	Linear Dynamic Range was evaluated in the sample test mode by the analysis of ethanol standards with concentrations between 0.010 and 0.600 g/210L. Each sample was analyzed in the sample test mode 10 times and evaluated for RSD and accuracy. The levels tested included 0.02, 0.05, 0.08, 0.10, 0.2, 0.3, 0.4, and 0.6 g/210L. During each test, the temperature and the relative humidity shall not vary by more than 5° C and 10% respectively. Pressure should be 1013+/-40hPa.	18	24	3
Total		**40**	**48**	**24**

Environmental Conditions Test

Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Temperature Influence	Environmental temperature influence on alcohol analysis was evaluated by the determination of accuracy and reproducibility at three ambient temperatures within the analyzer's operating range. A single ethanol standard was selected and analyzed 20 times using the analyzer's sample analysis and/or calibration check mode. These temperatures included a room temperature test (68°-78° F), a low temperature test (35°-50° F) and a high temperature test (80°-95° F). Final selection of temperatures depended on the manufacturer's stated operating range. Humidity was maintained at 50% +/- 30%.	4	4	2
Environmental Humidity Influence	Environmental humidity influence on alcohol analysis was evaluated by the determination of accuracy and reproducibility at different ambient humidity levels within the analyzer's operating range. A single ethanol standard was selected and analyzed 20 times using the analyzer's sample analysis and/or calibration check mode. Humidity during analysis was measured using a hygrometer. Temperature was maintained between 64° F and 82° F. The number of humidity levels chosen depended on logistical considerations of GBI-DOFS.	4	4	2
Sample Humidity Influence	Sample humidity influence on alcohol analysis was evaluated by the comparison of accuracy and reproducibility for both a dry gas standard and a wet bath standard. A single ethanol standard level was selected and analyzed 20 times using the analyzer's calibration check mode.	6	6	0
Total		**14**	**14**	**4**

Specificity Tests

The specificity test category of the laboratory evaluation was designed to test the specificity/ selectivity of each breath testing instrument when exposed to various volatile organic compounds (VOCs). It was comprised of four subcategories worth a total of 137 possible points. The sub categories are: VOC Influence, VOC with Ethanol Influence, Binary Mixture Influence, and Ambient Fail Test.

Specificity Test Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
VOC Influence	Volatile organic compound influence on alcohol analysis was evaluated by the analysis of prepared wet bath standards in the sample delivery mode. The maximum level of contribution to the ethanol concentration was determined by then increasing of the volatile standard concentration in increments of approximately 0.01 g/dL. The maximum level of contribution was considered to be the level reached immediately before an interferent is indicated by the analyzer. Compounds that show no response above the maximum relevant concentration were considered to be unable to affect the analyzer reading. Compounds that were analyzed for specificity include: acetone, acetaldehyde, methanol, 2-propanol, toluene, ethyl acetate, 2-butanone, 2-butanol, 1-propanol, acetonitrile, methylene chloride, and 2-methyl propanol.	72	67	72
VOC with Ethanol Influence	Specificity for ethanol mixtures was evaluated for at least three mixtures of compounds at or near their LOD with a 0.08 g/210L ethanol solution. Binary solutions were analyzed at least 5 times and evaluated for accuracy and precision.	10	-10	5
Binary Mixture Influence	Specificity for binary volatile mixtures was evaluated using the volatile organic influence procedure for at least five mixtures of two of more compounds. Compounds and levels used for the binary mixtures were based on predicted responses from the NIST IR evaluation and fuel cell specificity literature.	22	12	0

Specificity Test Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Ambient Fail Test	Ambient fail test was performed to determine if the analyzer can successfully identify the environmental presence of ethanol and other volatile organic compounds during its air blank or purging routine. A sample of concentrated ethanol solution was introduced into the analyzer during the purging or air blank routine. An ethanol standard was immediately analyzed in the sample analysis mode. This process was repeated five times and the results were evaluated for accuracy and precision. This process was repeated for one or more volatile organic compounds.	25	15	0
Total		**129**	**84**	**77**

Mouth Alcohol Tests

The mouth alcohol test category of the laboratory evaluation was designed to test the effectiveness of the breath testing instrument's mouth alcohol detection systems. It was comprised of three subcategories worth a total of 50 possible points.

Mouth Alcohol Test Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Mouth Alcohol LOD	Mouth alcohol limit of detection was evaluated using an ethanol containing mouthwash or breath spray. After administration of ethanol to the oral cavity, a breath sample was provided at regular intervals as close together as the instrument allowed until the alcohol was completely dissipated. The process was repeated until a total 5 administrations have been made. The mouth alcohol limit of detection was determined by looking at the analyzer's response and the breath alcohol curve characteristics.	10	15	0
Mouth Alcohol Detection in Drinking Subjects	Mouth alcohol detection in drinking subjects was evaluated using a controlled dosing experiment. Dose subjects were required to consume a small amount of an alcohol containing beverage and provide a breath sample at an interval determined by the evaluator. Estimated BrAC was compared to the mouth alcohol results to evaluate the effectiveness of the instrument in identifying mouth alcohol. This test was performed on a minimum of 5 drinking subjects with two separate administrations of mouth alcohol.	10	25	0
Mouth Alcohol Detection with Foreign Objects	A mouth alcohol detection test with foreign objects was performed using non-dosed subjects in a laboratory setting. In this test the mouth alcohol limit of detection test was performed while a variety of foreign objects such as gum or bread remain in the mouth. This test was performed on a minimum of two foreign objects. This test does not need to be performed more than once for each object tested.	0	5	10
Total		**20**	**40**	**10**

Sampling Parameter Tests

The sampling parameter test category of the laboratory evaluation was designed to test the effect of various characteristics of sample delivery on the instrument's accuracy and precision. It is comprised of three subcategories worth a total of 65 possible points.

Sampling Parameter Test Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Sample Volume Effect	The effect of sample volume was evaluated by delivering a blank air sample at approximately 20L/min. Sample delivery times were varied to deliver different sample volumes to the analyzer. Delivery times evaluated were 2, 3, 4, 5, 6, 10, 15, and 20 sec. These steps were repeated using an ethanol standard and a wet bath simulator. An ethanol standard was analyzed ten consecutive times at 5 and 15 sec. The results were evaluated for accuracy and precision.	20	20	10
Sample Flow Rate Effect	The effect of sample flow rate was evaluated using a blank air sample delivered at 20L/min and 10 L/min. An ethanol standard was analyzed ten consecutive times at 10 sec at both the 20L/min and 10L/min flow rate. The results were evaluated for accuracy and precision.	10	10	0
Sample Volume Effect in Drinking Subjects	The effect of sample volume in live drinking subjects was evaluated by requiring dosed subjects to provide a sample meeting the minimum requirements for an acceptable sample, immediately followed by a maximum exhalation. The procedure was performed for at least five dosed subjects. The instrument results were evaluated to determine the volume and flow effects on analyzer results.	10	0	0
Total		**40**	**30**	**10**

Radio Frequency Interference Detection Tests

The Radio Frequency Interference (RFI) test category of the laboratory evaluation was designed to test the instruments' immunity to RFI and their ability to indicate the presence of various frequencies of RF above a specified threshold. It was comprised of four subcategories worth a total of 28 possible points. The response of the analyzer at each distance and field strength was evaluated to determine the effectiveness of the RF immunity and RFI detector.

RFI Detection Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
30-300 MHz test	The analyzer was evaluated for RF immunity and detection at radio frequencies in the range of 30-300 MHz using a police radio. The radio's RF field strength was measured. The position of the radio was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths.	5	5	5
800-1000 MHz test	The analyzer was evaluated for RF immunity and detection at radio frequencies in the range of 800-1000 MHz using a cell or cordless phone. The phone's field strength was measured. The position of the phone was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths.	4	4	4
1800-2000 MHz test	The analyzer was evaluated for RF immunity and detection at radio frequencies in the range of 1800-2000 MHz using a cell or cordless phone. The phone's field strength was measured. The position of the phone was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths.	3	3	3

RFI Detection Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
2200-2500 MHz test	The analyzer was evaluated for RF immunity and detection at radio frequencies in the range of 2200-2500 MHz using a wireless router. The router's field strength was measured. The position of the device was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths.	3	3	3
Total		**15**	**15**	**15**

Instrument Stability Evaluation

The Instrument Stability Evaluation category of the laboratory evaluation was designed to test the instruments' ability to produce accurate and reproducible results over an extended period of time. It is comprised of four subcategories worth a total of 45 possible points.

Instrument Stability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Zero Test	The analyzer was evaluated for stability using a blank air sample provided by an air pump at 20L/min. An alcohol free air sample was evaluated 20 times to ensure that a negative result was returned. The instrument was re-evaluated using the same procedure at a period at least four hours later.	5	0	5
Four Hour Stability Test	The analyzer was evaluated for stability using a wet bath alcohol standard at 0.08 g/210L. The standard was evaluated 20 times and the results were statistically evaluated for mean accuracy and %CV. The instrument was re-evaluated using the same procedure at least four hours later.	10	10	0
Two Month Stability Test	The analyzer was evaluated for stability using a wet bath alcohol standard at 0.08 g/210L. The standard was evaluated 20 times and the results were statistically evaluated for mean accuracy and %CV. The instrument was re-evaluated using the same procedure two months later.	10	10	0
Memory Test	The analyzer was evaluated for memory using a wet bath alcohol standard at 0.40 g/210L followed by a wet bath alcohol standard at 0.02 g/210L. The standard pair was evaluated 10 times and the results were statistically evaluated for mean accuracy and %CV. The data was compared to data collected in the linear dynamic range test to determine if any statistical memory effect existed.	0	10	0
Total		**25**	**30**	**5**

Evaluation Summary

In the course of evaluating instruments as a possible successor to the Georgia model Intoxilyzer 5000, approximately 2000 known samples were analyzed under numerous laboratory conditions and the three candidate instruments underwent an administrative evaluation. Ultimately the Intoxilyzer 9000 yielded the highest score in both the laboratory and administrative evaluations. Based on the extensive laboratory testing and administrative review conducted by the Division of Forensic Sciences the Intoxilyzer 9000 is the best available evidential breath testing instrument to be the eventual successor to the Georgia Model Intoxilyzer 5000. The Intoxilyzer 9000 will accurately and reliably measure subjects' breath alcohol concentration when properly operated and maintained.

APPENDIX 1

Scoring criteria utilized and instrument specific observations/comments collected during the Administrative Review portion of the intoxilyzer evaluation.

Detection Systems

Detection System Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Dual Detection System	The detection system was evaluated to determine if it utilized two analytical techniques to identify and quantify alcohol concentration. Instruments that had a standard 2 detection system were awarded a score of 10 while instruments that employed an optional two detection system were awarded a score of 4. All other instruments were awarded a score of 0.	Infrared only, no optional fuel cell available	Infrared detection only.	The instrument utilizes both a standard fuel cell and an infrared detector to quantify ethanol.
Filter/Chopper Wheel	The infrared detection system was evaluated to determine whether it utilizes a filter/chopper wheel. Because filter wheel motors increase both "noise" and maintenance costs, systems without filter wheels are preferred. Instruments employing detection systems with no filter wheel were awarded a score of 10. Thermoelectrically cooled detectors utilizing a chopper wheel were awarded a score of 2. All other systems were awarded a score of 0.	Utilizes a pulsed IR source and quad-detector eliminating the need for a mechanical chopper	A PbSe cooled fast IR detector with filter wheel.	The instrument utilizes a cooled PbSe detector with a filter wheel.
Identity of IR Wavelengths	The identity of each infrared wavelength measured by the instrument was evaluated to ensure selectivity for alcohol to the exclusion of other common volatile compounds or mixtures of compounds. Measurements in the 8-9 micron region are preferred. 2 points were awarded for each ethanol-measuring wavelength in the 3 micron C-H stretch region and 5 points were awarded for each ethanol-measuring wavelength in the 8 to 9 micron C-O stretch region. A maximum of 20 points were awarded for this evaluation.	Four total wavelengths in the 8 and 9 micron region of the infrared spectrum.	3.52, 3.47, 3.41, 3.37 uM EtOH, 3.80 reference, 2.585, 2.73 uM - water and CO2	Three infrared wavelengths are utilized in the identification and quantification of ethanol: 3.445, 3.373, and 3.501 um.

Detection System Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
IR Data Sampling Rate	The resolution of the detection system was evaluated by review of the stated data sampling rate. Higher data sampling rates are preferred. Each evaluated instrument was ranked according to its stated data sampling rate. The instrument with the greatest sampling rate was awarded a score of 5 while the second and third place instruments were awarded a score of 3 and 0 respectively.	IR source is pulsed at 10 Hz. After processing measurements are produced at a rate of 20 Hz.	Each channel delivers a data value 10 times per second to the control unit. Each is a mean value of 16 measurements.	A measurement of alcohol concentration is taken 4 times per second.
IR Path	The infrared detection system was evaluated to determine whether it utilizes a linear or folded/reflected IR path. Because reflected IR paths increase the likelihood of misalignment and optical bench maintenance concerns, systems with linear path length are preferred. Instruments employing detection systems with a linear path length were awarded a score of 5. All other instruments were awarded a score of 0.	A linear, non-reflected path length.	Linear 10" length with a 2.9 cubic inch internal volume.	A 28 cc volume sample chamber with a 65 cm folded optical path length.
Infrared Selectivity	The stated specifications of the IR detection system were evaluated for selectivity against a database of digitized infrared spectra downloaded from NIST. A ratio for each of the detection system's ethanol measuring IR wavelengths was calculated for each compound and compared to calculated ratios for ethanol. A maximum score of 30 points were awarded on this evaluation. 10 points were deducted from the maximum score for each compound that does not exhibit the desired selectivity. A compound was deemed to exhibit the desired selectivity when at least one if the ratio examined differs by more than 20% from the calculated ratio for ethanol.	IR comparison test shows the desired selectivity for all evaluated compounds.	IR comparison test shows the desired selectivity for all evaluated compounds.	IR comparison test shows the desired selectivity for all evaluated compounds except toluene.

Detection System Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Number of IR Wavelengths	The instruments were evaluated to determine if the number of infrared wavelengths measured is sufficient to ensure selectivity for alcohol to the exclusion of other common volatile compounds or mixtures of compounds. 10 points were awarded for each wavelength of infrared light measured in the identification of ethanol. Instruments measuring less than 3 wavelengths of infrared light were excluded from consideration. A maximum of 40 points were awarded for this evaluation.	Four total wavelengths in the 8 and 9 micron region of the infrared spectrum	Four measuring wavelengths at 3.52, 3.47, 3.41, 3.37 uM with a 3.80 uM reference. Filters at 2.585 and 2.73 uM for measuring water and CO2.	Three infrared wavelengths are used to identify and quantify ethanol in breath: 3.445, 3.373, and 3.501 um.
IR Detector Resolution	The resolution of the infrared detection system at each infrared wavelength measured was evaluated by review of the stated infrared channel/filter width. Each evaluated instrument was ranked according to its stated IR resolution. The instrument with the greatest resolution was awarded a score of 10 while the second and third place instruments were awarded a score of 5 and 0 respectively.	Narrowband IR, undisclosed resolution. Given lowest score due to undisclosed resolution.	Narrowband, 1-1.5% of filter value or approximately 30-50nm.	+/- 10nm.

Diagnostic Capability

Diagnostic Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Ambient Air Evaluation	The instrument's ability to perform an air blank and purge the sample chamber of ethanol was evaluated. Instruments must be able to flag the presence of ethanol in the sample chamber if it is present above a specified threshold after the air blank. Hydrochemical cleaning is preferred due to its ability to yield a "true zero". Instruments capable of performing an air blank and initiating a flag or warning when ethanol levels exceed a set threshold were awarded 1 point. Instruments capable of performing hydrochemical cleaning of the instrument air were awarded a score of 3. All other instruments were disqualified from consideration. A maximum of 4 points was possible.	The instrument is capable of producing ambient fail warning if a zero reference cannot be obtained.	The instrument is capable of producing ambient fail warning when residual alcohol cannot be cleared from the sample chamber. The instrument possesses true zero capability through use of a cleaning loop with molecular sieve.	The instrument is capable of producing ambient fail warning if a zero reference cannot be obtained. The instrument will indicate "filter will not zero" or if on first blind purge the milliamp signal is not within tolerance, "ambient fail" is displayed.
Breath tube temperature monitor	The instrument's ability to heat and measure the breath tube temperature was evaluated. Heated breath tubes are preferred because they reduce breath sample condensation. Instruments capable of measuring the breath tube temperature were awarded a score of 4. All other instruments were awarded a score of 0.	The instrument maintains, monitors, and displays the breath hose temperature and prevents testing if the breath hose temperature falls outside prescribed limits.	The instrument maintains and monitors breath tube temperature.	The instrument maintains and monitors breath tube temperature.
Dry Gas Compatibility	The instrument's ability to perform calibration checks utilizing dry gas samples was evaluated. Dry gas compatibility is a critical function. Instruments incapable of performing dry gas calibration checks with automatic correction for barometric pressure were disqualified from consideration.	Dry gas compatible. A lockable case holds one 67L ethanol dry gas standard. A second dry gas standard can be attached independently from the first. The instrument employs automatic barometric pressure compensation for dry gas analysis.	A dry gas kit containing one or two separately controlled 34L cylinders capable of 75 tests each can be attached to the instrument. Dry gas checks utilize atmospheric barometric pressure compensation.	The instrument is capable of utilizing dry gas calibration checks with automatic barometric pressure compensation. Gas tank pressure is monitored with pressure transducer. The DMT-GF measures the atmospheric pressure and then makes a correction to the target gas concentration.

Diagnostic Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Internal Standard	The instrument's ability to perform an internal standard check as part of its diagnostic routine was evaluated. Both electronic internal checks and optical filter checks are preferred. Instruments were awarded 2 points for the capability of performing an optical filter check and 1 point for the capability of performing an electronic internal standard check. A maximum of 3 points was possible.	The internal standards check utilizes a mechanism by which the IR source's radiated power is reduced to match the equivalent reduction IR energy due to ethanol. The internal standard check verifies the instrument's optics and electronics used in the analysis of ethanol.	Internal standard analysis utilizes dual verification. 1)The Slope Filter automatically puts "filter" into the IR-beam, in front of the detector, and simulates a gas mixture in the measuring chamber, giving specified IR absorption different from each filter in the filter wheel. 2) Electronic ISTD verifies that the relative attenuation at each one of the filter wavelengths is the same as it was at the time for calibration.	The instrument utilizes a calibration check with an internal quartz standard before each test. Deviation of more than 4% from calibration results in error. No electronic internal standard verification is utilized by the DMT-GF.
Remote Diagnostics	The ability to initiate and review an instrument diagnostic routine from a remote location was evaluated. Two way communications for the purposes of instrument diagnostics is preferred. Instruments capable of two way communication and remote initiation of diagnostics were awarded 3 points. Instruments only capable of one way information download for review were awarded 1 point. Instruments incapable of any form of remote communication were disqualified from consideration.	Two way data transfer possible via 10/100 Ethernet RJ45, analog modem 33.6 RJ11, USB 2.0, or RS232.	Client Server based. Networking is implemented by means of the ICMP, IGMP, UDP/TCP/IPv4 protocol suit. If required the software can implement a secure two way communication in order for a central server to access the instruments.	The instrument is capable of data transfer via high-speed modem or Ethernet. The DMT-GF possesses an RJ45 Ethernet port and RJ11 modem port for a 56K modem. The instrument is capable of remote communications for troubleshooting, voltage adjustments, and software updates.

Diagnostic Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Sample Chamber Temperature	The instrument's ability to heat and measure the sample chamber temperature were evaluated. A heated sample chamber is critical for instrument stability. Instruments capable of reporting the sample chamber temperature were awarded a score of 2. All other instruments were awarded a score of 0. Instruments incapable of heating the sample chamber were disqualified from consideration.	The sample chamber is heated and the temperature is monitored and displayed. Testing is prevented if the temperature falls outside the prescribed limits.	The sample chamber temperature is measured at several points and controlled to keep the entire sample chamber temperature at approximately 43.5° C. The temperature inside the instrument is kept at a constant temperature of 49° C which helps ensure stable performance of the instrument filters. The temperature is monitored and can be displayed or printed.	The instrument's sample cell temperature is monitored and displayed. Cell temperature is maintained between 44°-52°C.
Self Diagnostics	The instrument's ability to perform an internal check of its operating parameters to ensure the instrument is operating properly prior to sample analysis was evaluated. This was a pass/fail criterion. Instruments incapable of performing any self diagnostic check prior to sample analysis were disqualified from consideration.	Self diagnostic capable.	Capable of performing self diagnostic routines before, during, and after sample analysis. In addition, monitoring of signal response of the 3.8 uM filter checks the overall status of the measurement unit.	Self diagnostic capable.
Wet Bath Compatibility	The instrument's ability to perform calibration checks utilizing wet bath samples was evaluated. Wet bath calibration capability is a critical function. This was a pass/fail criterion. Instruments incapable of performing wet bath calibration checks were disqualified from consideration.	Calibration using wet bath recirculation capable.	Wet bath calibration check capable with optional calibration interface unit.	Calibration using wet bath recirculation capable.

Diagnostic Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Heated Wet Bath Connections	The instrument's ability to heat wet bath simulator connections was evaluated. Heated connections are preferred to minimize condensation. Instruments capable of utilizing heated wet bath connections were awarded 1 point. All other instruments were awarded a score of 0.	The instrument does not utilize heated wet bath connectors. The instrument can accommodate the use of heated hoses if required by the customer.	The instrument does not utilize actively heated wet bath connectors; however, the manufacturer can supply a metal connector that is passively heated by the simulator housing and the measurement unit.	The instrument utilizes heated wet bath connectors.
Wet Bath Recirculation	The instrument's ability to perform calibration checks utilizing wet bath vapor recirculation was evaluated. Wet bath recirculation is preferred for calibration solution longevity. Instruments were awarded 2 points for the capability of performing wet bath recirculation. All other instruments were awarded a score of 0.	Wet bath recirculation capable, with optional communication with digital simulators. The height of the calibration ports is adjustable.	The instrument is designed for recirculation, but the feature is not presently used by any customers.	The instrument is wet bath recirculation capable.

Operating Criteria

Operating Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Operating Temperature Range	The recommended operating temperature range was evaluated for robustness. A wide range of operating temperature is preferred. 1 point was awarded for each 10 degree Fahrenheit span in the operating range. No fractional points were awarded. All instruments must be capable of operating between 68°-78°F. Failure to operate in this temperature range will result in disqualification from consideration.	The recommended operating temperature range is 0° to 40°C (32°-104°F) at 10% to 100% relative humidity, non-condensing.	0°-40°C (32°-104°F)	65°-78°F. The DMT-GF's operational temperature range exceeds DOT specifications
Storage Temperature Range	The recommended storage temperature range was evaluated for robustness. A wide range of storage temperatures is preferred. 1 point was awarded for each 20 degree Fahrenheit span in the storage temperature range. No fractional points were awarded. All instruments must be capable of being stored between 32°-104°F. Failure to allow storage in this temperature range will result in disqualification from consideration.	The recommended storage temperature range is -10°C to 60°C (14°-140°F)	0°-40°C (32°-104°F)	65°-78°F

Optional Equipment

Optional Equipment Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Barcode Readers	The instrument's ability to utilize a barcode reader to import subject or operator information during a breath test was evaluated. Instruments capable of utilizing a barcode reader to import driver's license or operator information during a test were awarded a score of 2.	The instrument can be configured to utilize a hand held barcode scanner to import information such as operator cards, driver's licenses, or calibration standard information.	The instrument is capable of utilizing a barcode reader.	The instrument is capable of utilizing barcode reader to import information.
Database Software	The availability of manufacturer supplied database software for remote instrument communication and data handling was evaluated. Instruments with database software for instrument communication and data handling available from the manufacturer were awarded a score of 2. All other instruments were awarded a score of 0.	Optional database software for instrument communication and data handling is available from the manufacturer.	The manufacturer can offer a central result database with process controls, based on relational database (MySQL) and for which the data is visualized using the tool Qlikview. The instrument can be configured to automatically upload data to the database when connected to a network.	Database software for instrument communication and data handling is available from the manufacturer. NPAS can customize the DMT and create customized client databases. Connectivity via secure DMT Host can be established via FTP, FSTP, or VPN.
Printer Compatibility	The instrument's ability to utilize both an internal and external printer was evaluated. Instruments capable of utilizing both external and internal printers were awarded a score of 2. Instruments utilizing only an internal printer were awarded a score of 1. All other instruments were awarded a score of 0.	The instrument is capable of utilizing both external and internal printers. An internal thermal printer is optional.	The instrument is capable of utilizing both external and internal printers.	The instrument is equipped with an external printer, but NPAS offers an optional internal thermal printer. Internal printer option is not conducive to printing the breath profile with the subject results.

Performance Criteria

Performance Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Accuracy	The manufacturer's stated accuracy was evaluated. A stated accuracy of less than or equal to 3% at a concentration of 0.08 to 0.10 g/210L was awarded a score of 10. A stated accuracy within 3% to 5% was awarded a score of 5 and an accuracy of greater than 5% was awarded a score of 0.	- +/-3% or +/- 0.003 g/210L, whichever is greater.	Instrument accuracy is expected to be less than or equal to 0.0013 g/210L at concentrations 0.000 to 0.084 g/210L and less; less than or equal to 0.28% at concentrations greater than 0.084 g/210L.	+/- .002g/210 L at 0.100 g/210 L BrAC
Calibration Points	The instrument was evaluated for the ability to perform a multipoint calibration. Multipoint calibration is preferred because it allows for the evaluation of regression statistics associated with measurement uncertainty. Instruments employing calibration using three or more points were awarded a score of 4. All other instruments were awarded a score of 0.	The instrument utilizes an optional multipoint calibration routine with quadratic curve fitting.	Optional multipoint calibration. Typical calibration utilizes two points, a zero and an ethanol solution.	The instrument utilizes only single-point ethanol calibration.
Linear Range	Instruments were evaluated according to the manufacturer's stated limit of detection to ensure they are able to quantify alcohol concentrations at relevant levels. A maximum score of 4 was awarded on this evaluation. 2 points were deducted if the upper limit of the linear range was less than 0.40 g/210L. Another 2 points were deducted if the lower limit of the linear range was greater than 0.005 g/210L.	0.000 to 0.650 g/210L.	-0.021 to 0.84 g/210L. Third party tests show linear range up to 0.420 g/210L.	0.000 to 0.600 g/210L, results greater than 0.83g/210L will give a detector overflow error.

Performance Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Precision	The manufacturer's stated precision was evaluated. A stated precision of 3% or less was awarded a score of 10, a precision between 3% and 5% was awarded a score of 3 and a precision of greater than 5% was awarded a score of 0.	A standard deviation of 0.003 g/210L or less.	Instrument precision is expected to be less than or equal to 0.0007 g/210L at concentrations 0.000 to 0.084 g/210L and less; less than 1.8% at concentrations greater than 0.084 g/210L.	A %CV of less than 1.1% at 0.08 g/210L.

Sampling Criteria

Sampling Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Breath Temperature	The instrument's ability to measure the subject's breath temperature was evaluated. Instruments capable of measuring breath temperature were awarded a score of 4. All other instruments were awarded a score of 0.	The instrument is incapable of measuring the subject's breath temperature.	The instrument can be equipped with an optional breath temperature monitor accurate to within better than +/-0.3C, typically better than +/-0.1C.	The instrument is incapable of measuring breath temperature.
Breath Volume and Flow Rate	The instrument's ability to measure the total breath volume delivered and flow rate was evaluated. The ability to measure breath flow and volume is a critical function. This was a pass/fail criterion. Instruments incapable of measuring breath volume and breath flow were disqualified from consideration.	The instrument is capable of measuring breath volume and breath flow accurately to within +/-10% of the stated value or the standard used to calibrate it.	The instrument is capable of measuring breath volume and breath flow. Minimum allowed volume is typically 1.5L but is user configurable.	The instrument is capable of measuring breath volume and breath flow.
Heated Mouth Piece	The instrument's ability to heat the mouth piece surfaces during testing was evaluated. Heated mouth pieces are preferred because they reduce breath sample condensation. Instruments capable of heating the mouth piece during breath sampling were awarded a score of 2. All other instruments were awarded a score of 0.	The instrument is not capable of heating the mouth piece during breath sampling; however, it does possess a heated compartment where mouth pieces can be stored before testing.	Mouthpiece design allows for heating during sample delivery, patent pending.	The instrument is not capable of heating the mouth piece during breath sampling.
Level Slope	The instrument's ability to evaluate changes in the slope of the BrAC curve during the exhalation profile to ensure level slope was evaluated. Level slope is critical for the obtaining of breath samples with sufficient equilibration with alveoli and airway surfaces. The ability to measure level slope is a critical function. This was a pass/fail criterion. Instruments incapable of identifying level slope within set criteria failed this criterion and were disqualified from further consideration.	The instrument is capable of identifying level slope within set criteria.	The instrument is capable of identifying level slope within set criteria.	The instrument evaluates the breath profile for level slope and produces a real time graphical representation of both alcohol rise and breath flow. Both positive change and no change are considered positive slope.

Sampling Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Mouth Alcohol Rejection	The instrument's ability to flag significant drops in the BrAC during the exhalation profile as potential mouth alcohol or invalid samples was evaluated. The ability to flag BrAC drops is a critical function. This was a pass/fail criterion. Instruments incapable of identifying drops in the peak alcohol concentration during the exhalation profile failed this criterion and were disqualified from further consideration.	The instrument utilizes a configurable mouth alcohol algorithm that measures drop from peak BrAC.	The instrument monitors mouth alcohol using the following factors: 1) Waviness between profile knee and end: Drop greater than 0.0002 g/210L + 5 % of end value. 2) Rise between profile knee and end: Rise less than 5 % or Rise greater than 35 %. 3) Sample Result difference: Abs Diff greater than 0.0012 g/210L + 12 % of EBT avg. These limits are configurable.	The instrument utilizes slope monitoring to detect mouth alcohol. Mouth alcohol is indicated if: 1) 3 consecutive comparisons of 2 point averages give a trend greater than 0.001 in the negative direction. 2) Any final result greater than or equal to 0.06 is less than 95% of any previous high reading. 3) Any final result greater than 0.003 and less than 0.06 is lower than a previous high reading by at least 0.003 g/210L.
Reverse Flow	The instrument's ability to detect or prevent reverse flow or suck back through the breathline was evaluated. Instruments capable of detecting or preventing reverse sample flow were awarded a score of 2. All other instruments were awarded a score of 0.	The instrument possesses a non-return valve that prevents suck back.	Both the instrument and the mouth piece contain non-return valves to prevent reverse flow.	The instrument is equipped with a mass flow sensor that can detect reverse flow. In addition, the instrument is equipped with check valves that prevent reverse flow.

Sampling Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
RFI Detection	The instrument's ability to identify the presence of radio frequency interference during the test was evaluated. Instruments capable of identifying the presence of radio frequency interference above a threshold set by the manufacturer were awarded a score of 5. All other instruments were awarded a score of 0.	The instrument is equipped with an RFI sensor and RFI antenna. The RFI sensor sensitivity is adjustable using a potentiometer.	The instrument is designed for RF immunity: 1. The instrument is built to be immune to RF disturbances and fulfills EN/IEC 61326-1:2006; 2. Monitoring of the 3.8 uM reference filter; 3. The instrument has an optional RF detection system that detects RFI and if the levels are above a certain threshold, the test is aborted.	The instrument possesses RFI shielding and external RFI detection. In addition the instrument has been subjected to third party RFI testing.

Software Capabilities

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Operator Information	The instrument's ability to evaluate the status of instrument operators was evaluated. Instruments capable of utilizing a remote operator database to evaluate operator status were awarded a score of 3.	The instrument utilizes an on-board SQL Server database to store operator access information. This database, which can be remotely administered, provides the instrument's software with the ability to evaluate an operator's status and/or permissions to run tests or other operations and can restrict the operator's access.	The software can be updated to synchronize user credentials frequently when network access is available in order to have the local operator database up to date.	The instrument is capable of remote monitoring and control to allow for remote update of user lists. The DMT allows management of the fleet of instruments via high-speed modem or Ethernet including remote download of results. NPAS can provide a link between the instrument and the client's network. NPAS has provided secure remote solutions utilizing FTP, FSTP, and VPN type applications.
Question Sequence	The ability of the software to be customized with respect to the subject or test information collected during the breath test routine was evaluated. This was a pass/fail criterion. Instruments incapable of customization with regard to collection of subject and test information at the request of GBI-DOFS failed this criterion and were disqualified from further consideration.	The instrument's software is customizable. Selection of instrument operating and user interface parameters are configurable.	The instrument software can be custom configured by the manufacturer to meet the needs of the client.	DMT Software is customized to meet the needs of the jurisdiction and customer. Custom forms, screens, logos and views are possible.

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Remote Data Retrieval	The ability to initiate and download stored test information from a remote location was evaluated. Instruments capable of remote download of test information were awarded a score of 8. All other instruments were awarded a score of 0.	The instrument is capable of remote communication and data download through vendor supplied software.	Data can be downloaded to a USB memory or to an external database using the LAN communication port on control unit. The software can be updated so that central server software can connect and initiate a secure data transfer to the central storage database.	The DMT allows management of the fleet of instruments via high-speed modem or Ethernet including remote download of results. NPAS can provide a link between the instrument and the client's network. NPAS has provided secure remote solutions utilizing FTP, FSTP, and VPN type applications.
Report Format	The ability of the software to be customized with regard to the report format of the breath test results was evaluated. This was a pass/fail criterion. Instruments incapable of customization with regard to the report format of the breath test results at the request of GBI-DOFS failed this criterion and were disqualified from further consideration.	The report format of the breath test results is configurable by CMI technical personnel per customer requirements.	The instrument software can be custom configured by the manufacturer to meet the needs of the client.	DMT Software is customized to meet the needs of the jurisdiction and customer. Custom forms, screens, logos and views are possible.
Restricted Access Levels	The instrument's ability to utilized restricted access levels was evaluated. Instruments capable of utilizing at least three different restricted access levels to instrument function were awarded a score of 2.	Selection of instrument operating and user interface parameters are configurable including the use of at least three restricted user access levels.	The instrument software has 4 configurable access levels.	The instrument software contains at least three customizable security levels.

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Software Update	The ability of the instrument's operational software to be updated in the field was evaluated. Instruments capable of having their software updated using a remote data connection were awarded 2 points. Instruments capable of having their software updated using a USB port were awarded 1 point. Instruments incapable of having their software updated in the field were disqualified from evaluation. A maximum of 3 points was possible.	The instrument's software can be updated through remote connection or USB interface.	The application software can be upgraded by means of a centralized distribution management server or by using a USB interface.	The instrument's flash memory can be updated through remote connection or USB interface.
Source Code Policy	The availability of the instrument's source code for review was evaluated. Controlled viewing of the instrument's "source code" in electronic form must be available to experts if ordered by the Georgia court provided a Non-Disclosure Agreement and Protective Order acceptable to the manufacturer are in place. This shall not apply to any third party software such as Windows CE. This was a pass/fail criterion.	A protective order and non-disclosure agreement is required for third party viewing of the instrument software. Viewing of the source code must be done at CMI.	*See Nanopuls response at end of Software Capabilities table.	A protective order and non-disclosure agreement is required for viewing of the instrument's source code.
Test Sequence	The ability of the software to be customized with regard to the order and elements of the breath test routine was evaluated. This was a pass/fail criterion.	The order and elements of the breath test sequence are configurable per customer requirements. This can be configured by CMI technical personnel or optionally by the customer.	The instrument software can be custom configured by the manufacturer to meet the need of the client.	DMT Software is customized to meet the needs of the jurisdiction and customer. Custom forms, screens, logos and views are possible.

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Test Storage Capacity	The ability of the instrument to store breath test results was evaluated. Instruments as received for evaluation were ranked according to their stated memory capacity with the instrument having the largest standard storage capacity receiving a score of 4 and the remaining instruments receiving a score of 2 and 0 respectively. Instruments with built in memory expansion capability such as the ability to accommodate an SD card were awarded an additional 2 points.	The instrument's memory capacity is 512 MB and the instrument is equipped with an SD memory expansion slot which will allow for expansion of the instrument's memory up to 32GB.	The instrument is equipped with a memory capacity of 2GB or approximately 10,000 data sets. The memory is of the type industrial grade compact flash. Instruments can be configured with a larger capacity memory card if it is necessary to store more than 10,000 data sets.	The instrument is equipped with a 2GB card that is expandable.
Test Storage Elements	The ability of the instrument to store all of the information associated with breath test results was evaluated. Notwithstanding data storage limitations, instruments capable of storing the pressure or flow and BrAC curves with the test information were awarded 4 points. Instruments incapable of retaining breath test results and general subject test information would have been disqualified from consideration.	The instrument can be configured to store pressure/flow rate curves as well as BrAC curves with the test information. This information can be printed and transmitted with the test information to a PC via supplied software.	The instrument will store subject information as specified by the client. Packages of data are delivered from the measurement unit at the rate of ten samples per second. This data can be stored in the control unit or PC. Each data package includes internal instrument temperatures, chopper frequency, cooler current, internal voltages and raw readings from the detector for spectroscopic channels. This data is then used to generate the complete "exhalation profile" with BrAC curves for each spectroscopic channel and flow or pressure curves.	The instrument is capable of storing graphical representations of both alcohol rise and breath flow with the breath test information.

Software Capability Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
USB data retrieval	The ability to download stored test information to a USB key was evaluated. Instruments capable of downloading test information to a USB key were awarded a score of 2. All other instruments were awarded a score of 0.	The instrument is capable of downloading test information to a USB key.	The instrument is capable of downloading test information to a USB key.	The manufacturer does not indicate that the instrument is capable of downloading test information to a USB key.

*"A State may upon reasonable request have access to the measurement unit specific source code (excluding Microsoft CE operating system and control unit software), together with information that permits manual verification of instrument results, for evidentiary use in connection with the prosecution of DWI court proceedings. In each case, such access shall be subject to an appropriate nondisclosure/ non reproduction agreement or protective order, and solely for use in the court procedure. All source code will be provided in printed format only. In all cases, release and access were limited to safeguard trade secret information from being published, distributed and / or disseminated."

Literature Review

Literature Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Instrument Articles	A search of the scientific literature for any peer reviewed scientific study involving the specific instrument tested was conducted. Each study was evaluated by the GBI as positive, neutral, or negative with respect to the evaluated instrument. Instrument manufacturers were given the opportunity to submit articles for review. Articles evaluated to be positive were awarded a score of 1, articles deemed to be neutral were awarded no score, and articles deemed to be negative were awarded a score of -5. A maximum score of 10 was possible for this evaluation. Issues deemed to be negative by DOFS may be subject to further investigation and may have resulted in disqualification from consideration.	Due to the fact the Intoxilyzer 9000 was only introduced to the US market in late 2011, no peer reviewed scientific articles referencing the Intoxilyzer 9000 existed at the time of the Literature Review in May of 2012.	Six (6) articles rated as positive identified. See citations 1-6 below	One (1) article rated as positive identified. See citation #7 below.
Manufacturer Articles	A search of the scientific literature for any peer reviewed scientific article published since January 1, 2000 involving any instrument manufactured by the instrument manufacturer was conducted. Each study was evaluated by the GBI as positive, neutral, or negative with respect to the evaluated instrument. Instrument manufacturers were given the opportunity to submit articles for review. Articles evaluated to be positive were awarded a score of 1, articles deemed to be neutral were awarded no score, and articles deemed to be negative were awarded a score of -5. A maximum score of 10 was possible for this evaluation. Issues deemed to be negative by DOFS may be subject to further investigation and may have resulted in disqualification from consideration.	Nine (9) articles rated as positive identified. See citations 8-16 below. Two (2) articles rated as neutral. See citations 17-18 below.	A search for manufacturer articles related to Nanopuls revealed no additional articles not identified in the Instrument Article section	Four (4) articles rated as positive identified. See citations 19-22 below. One (1) article rated as neutral. See citation 23 below.

Literature Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Technology Articles	A search of the scientific literature for any peer reviewed scientific study involving technological elements unique to the instrument tested was conducted. Each study was evaluated by the GBI as positive, neutral, or negative with respect to the evaluated instrument. Instrument manufacturers were given the opportunity to submit articles for review. Articles evaluated to be positive were awarded a score of 1, articles deemed to be neutral were awarded no score, and articles deemed to be negative were awarded a score of -1. A maximum score of 5 was possible for this evaluation. Issues deemed to be negative by DOFS may be subject to further investigation and may have resulted in disqualification from consideration.	One (1) article rated as positive identified. See citation 24 below.	Three (3) articles rated as positive identified. See citations 25-27 below.	Two (2) articles rated as positive identified. See citations 28-29 below.

Citations and Comments:

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2. Jones, Alan Wayne. "Determination of ethanol in breath for legal purposes using a five filter infrared analyzer: studies on response to volatile interfering substances." Journal of Breath Research. Issue 2, 2008. An evaluation of the prevalence of volatile organic compounds in breath and the response of the Evidenzer.
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7. Turner, Greg. "Preliminary Results from a Dual Detector Evidential Breath Alcohol Testing Instrument Manufactured by National Patent Analytical Systems." IACT Meeting 2010. Overview of Alabama's evaluation of the DMT. Article shows good accuracy and precision numbers for a DMT-GF prototype.
8. Cowan JM, Burris JM, Hughes JR, Cunningham MP. "The relationship of normal body temperature, end-expired breath temperature, and BAC/BrAC ratio in 98 physically fit human test subjects." J Anal Toxicol. 2010 Jun; 34(5):238-42. A blood/ breath alcohol correlation study that examines the impact of breath and body temperature on breath alcohol test results using the Intoxilyzer 5000.
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11. Jones AW, Andersson L. "Comparison of ethanol concentrations in venous blood and end-expired breath during a controlled

drinking study." Forensic Sci Int. 2003 Mar 12; 132(1):18-25. This study compares breath samples obtained from drinking subjects and tested on an Intoxilyzer 5000 with near simultaneous venous blood samples.

12. Stowell AR, Gainsford AR, Gullberg RG. "New Zealand's breath and blood alcohol testing programs: further data analysis and forensic implications." Forensic Sci Int. 2008 Jul 4; 178(2-3):83-92. Epub 2008 Mar 26., This study is a large scale evaluation of the correlation of blood results and breath results obtained from the same subject. Breath tests were performed on the Intoxilyzer 5000.
13. Gainsford AR, Fernando DM, Lea RA, Stowell AR. "A large-scale study of the relationship between blood and breath alcohol concentrations in New Zealand drinking drivers." J Forensic Sci. 2006 Jan; 51(1):173-8., This study is a large scale evaluation of the correlation of blood results and breath results obtained from the same subject. Breath tests were performed on the Intoxilyzer 5000.
14. Dubowski KM, Goodson EE, Sample M Jr. "Storage stability of simulator ethanol solutions for vapor-alcohol control tests in breath-alcohol analysis." J Anal Toxicol. 2002 Oct; 26(7):406-10., This study looks at the long term stability of ethanol simulator solutions as tested on an Intoxilyzer 5000.
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28. "EMC Test Report for a Infrared Breath Alcohol Measuring Instrument/Datamaster DMT." F Squared Laboratories. Nov 2, 2006. This test report shows the RF immunity of the Datamaster DMT.
29. Turner, Greg. "Preliminary Results from a Dual Detector Evidential Breath Alcohol Testing Instrument Manufactured by National Patent Analytical Systems." IACT Meeting 2010. Overview of Alabama's evaluation of the DMT. Article shows good accuracy and precision numbers for a DMT-GF prototype.

Customer References

Existing customer questionnaire

Each instrument manufacturer was required to submit a list of five potential customers currently using the evaluated instrument as references. The GBI selected three customers from the list to complete an instrument questionnaire. If the current instrument model was not being used then the customers using other similar instruments from the manufacturer were selected. Customers were asked to supply information regarding their experience with the instrument/ manufacturer including: how long they have used the instrument, number of instruments in use, how the instrument is being utilized, questions regarding legal challenges to the instrument, advantages and disadvantages of the instrument and estimated cost of operation. Customer feedback deemed to be sufficiently negative by DOFS was investigated and was subject to a deduction at the discretion of DOFS. Manufacturers failing to provide at least three potential customer references would have been disqualified from evaluation. Scores from the surveyed customers were averaged. One half the average customer rating for each survey question were the points awarded for this evaluation. Final points were rounded to the nearest whole number.

Please complete the survey below based on your experience with the instrument:
1. Please rate the instrument for ease of use on a scale of 1 to 6 with 6 being extremely easy to use and 1 being extremely difficult to operate.
2. Please rate your overall satisfaction with the performance of the instrument on a scale of 1 to 6 with 6 indicating that you are extremely satisfied and 1 indicating that you are completely dissatisfied with the instrument's performance.
3. Please rate the instrument's overall accuracy and precision on a scale of 1 to 6 with 6 indicating that the instrument consistently delivers a very high degree of accuracy and 1 indicating that the instrument cannot be relied upon to produce accurate or reproducible results.
4. Please rate the suitability of the instrument for mobile use on a scale of 1 to 6 with 6 indicating that the instrument is extremely well suited to use in mobile environments and 1 indicating that the instrument can only be reliably used in a climate controlled, stationary environment.
5. Please rate the instrument's cost of operation on a scale of 1 to 6 with 6 indicating that the instrument is extremely efficient and cost effective and 1 indicating that the instrument is very expensive to operate. When considering cost of operation please consider factors such as instrument cost, cost of consumables, implementation costs, and cost and frequency of repairs and maintenance.

6. Please rate the instrument's robustness on a scale of 1 to 6 with 6 indicating that the instrument is very robust and rarely needs repair and 1 indicating that the instrument is frequently out of service.
7. Please rate the specificity/selectivity of the instrument on a scale of 1 to 6 with 6 indicating that the instrument is completely specific for ethanol and 1 indicating that there is a high likelihood that the instrument could misidentify other compounds as ethyl alcohol.
8. Please rate your satisfaction with the responsiveness of the instrument's manufacturer on a scale of 1 to 6 with 6 indicating that the manufacturer is very responsive and provides great customer service and 1 indicating that you are completely dissatisfied with the customer service provided by the manufacturer.

Survey Information:

The survey was conducted using Survey Monkey. Respondents were selected from a list supplied by the manufacturer. Respondents were emailed a link to the survey on 5/17/12 and asked to respond by 6/1/12. In addition to rating the instrument, respondents were asked to provide demographic information regarding their use of the instrument and to comment on the unique advantages and disadvantages of the instrumentation.

Instrument	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Intoxilyzer 9000	6	5.5	5.5	5	6	4.5	5	5.5
Evidenzer 240 Mobile	5	4	6	1*	3	4	6	5
Datamaster DMT	6	5	5	4.3	4.3	5.5	5.3	5.7

Numbers reflect average response value for each question for each instrument.

*The 240 Mobile was awarded the lowest response for Q4, because it was not addressed by any of the respondents.

Composite Average Survey Results:

Dates: May 17, 2012 to June 1, 2012

Six responses were evaluated. Only 7 of 9 selected participants responded to the survey. One response for the Intoxilyzer 8000 only was not used because it was not applicable to the evaluation. One response was identified as a duplicate of an existing response and was omitted from consideration, thus only 6 total unique responses were obtained.

Respondent Summary

Intoxilyzer 9000	
Advantages	**Disadvantages**
Measurements at 9 microns/ Interferent detection	Lack of sensitivity to compounds other than ethanol
Multiple point calibration	Potential lack of durability in case and breath tube design
Total data management /information download	Lack of field data
High Windows CE software version	
Operator Card / Driver's License Swipe	

Evidenzer 240 Mobile	
Advantages	**Disadvantages**
Low breath alcohol limits (10ug/100ml=0.02g/210L)	
Very comprehensive supporting documentation from test labs	

Datamaster DMT GF	
Advantages	**Disadvantages**
Remote instrument access/operation	Fuel cell durability
Analysis of the sample using two independent technologies	Difficulties with the fuel cell
National Patent customer service	

Law Enforcement Evaluation

Two groups of law enforcement officers experienced in the use of evidential breath testing devices were selected to evaluate each

instrument. Each manufacturer was allowed to submit documentation or brochures to be reviewed by the evaluators prior to the evaluation process. Each evaluator was asked to rate the prospective instrument with respect to given criteria. The rating of the evaluators was averaged for scoring purposes. The average of the evaluators' ratings was the points awarded for this evaluation.

Based on your interaction with each instrument and the information provided to you:
1. Please rate each of the following instruments for their ease of use on a scale of 1 to 5 with 5 being extremely easy to use and 1 being extremely difficult to operate.
2. Please rate each of the following instruments for their functional design on a scale of 1 to 5 with 5 indicating that the instrument is extremely practical and well suited to breath alcohol testing and 1 indicating that the instrument suffers from serious potential problems in its design.
3. Please rate each of the following instruments for your overall satisfaction with the equipped features on a scale of 1 to 5 with 5 indicating that the instrument has all of the features necessary to make breath testing as efficient as possible and 1 indicating that the instrument lacks some important elements needed to ensure an efficient breath testing process.
4. Please rate each of the following instruments for your recommendation to adopt on a scale of 1 to 10 with 10 indicating that you highly recommend that we adopt the instrument and 1 indicating that you strongly recommend that we do not adopt the instrument. A score of 5 should be used if you have no opinion as to whether the instrument should be adopted.

Composite Average Survey Results:

Dates: April 18, 2012 and April 25, 2012

A total of 30 respondents selected from the Georgia State Patrol and/or GOHS Traffic Enforcement Networks participated in this survey. One prosecuting attorney from the Prosecuting Attorney's Council also participated in the survey.

Law Enforcement Evaluation												
	Intoxilyzer 9000				240 Mobile				DMT-GF			
Questionnaire #	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
42501	5	4	5	8	3	3	4	4	4	3	4	6
42502	4	5	5	8	1	2	2	3	4	5	5	8

Law Enforcement Evaluation												
	Intoxilyzer 9000				240 Mobile				DMT-GF			
Questionnaire #	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
42503	5	5	5	8	3	2	2	2	5	3	3	6
42504	5	5	4	10	3	4	5	8	4	5	5	8
42505	5	5	5	10	3	5	3	1	5	5	5	9
42506	5	5	5	10	2	3	3	6	3	3	3	4
42507	5	5	5	10	2	3	4	1	4	3	2	1
42508	5	5	5	10	2	1	5	1	3	3	5	1
42509	5	4	5	10	3	3	3	5	5	5	5	9
42510	5	5	5	9	4	3	3	7	4	4	4	7
42511	5	5	5	10	3	3	3	2	3	2	2	2
42512	5	5	5	10	2	3	2	1	3	3	2	1
42513	5	5	5	10	4	3	1	1	3	2	2	1
42514	4	4	4	9	3	3	3	7	4	4	4	8
42515	5	5	5	10	4	5	4	8	4	5	4	6
41801	5	5	5	9	3	3	3	5	3	4	3	6
41802	5	4	5	10	3	4	4	5	4	3	5	5
41803	5	5	5	10	3	3	2	5	4	3	3	8
41804	5	4	4	9	1	2	2	2	2	2	3	3
41805	5	5	5	10	2	2	3	1	3	3	2	1
41806	4	4	5	9	3	4	3	5	4	4	4	6

Law Enforcement Evaluation												
	Intoxilyzer 9000				240 Mobile				DMT-GF			
Questionnaire #	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
41807	5	5	5	10	2	4	4	5	3	3	3	6
41808	5	4	5	9	2	3	4	6	4	4	5	8
41809	5	5	5	10	4	4	4	6	3	2	3	3
41810	4	4	4	10	3	2	4	2	3	3	4	2
41811	5	5	5	10	2	3	4	5	3	4	4	6
41812	5	5	5	10	3	3	4	5	4	4	4	6
41813	5	5	5	10	1	2	1	1	3	4	4	7
41814	5	5	4	10	2	3	3	4	5	3	4	7
41815	5	4	5	10	2	3	4	1	4	2	4	9
41816	5	5	4	10	4	3	3	7	3	2	3	2

Company Review

Company Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Accreditations	The manufacturers' accreditations were evaluated. ISO accreditations are preferred. 5 points were awarded if the manufacturer is ISO accredited or registered. 2 points were awarded if the company conforms to some other accreditation standard deemed relevant by the GBI.	ASCLD/LAB International / ISO 17025 Forensic Science Calibration Laboratory	ISO 9001-2008 registration was pending. Nanopuls is in the process of receiving ISO 9001-2008 registration. Expected completion is after summer of 2012. Since the registration was not complete, 2 points were awarded.	US government MIL STD –790
Approvals	Each instrument's approvals were evaluated. Both OIML compliance and NHTSA/DOT approval are preferred. 5 points were awarded if the instrument was approved under OIML at the time of selection. NHTSA approval of the instrument prior to purchase is a mandatory criterion.	National Highway Traffic Safety Administration (NHTSA). According to CMI, the instrument has been approved by NHTSA as of July 2012. The instrument is expected to be added to the conforming products list for evidential breath testing devices before the end of 2012.	National Highway Traffic Safety Administration (NHTSA) OIML R126 Edition 1998 (E)	National Highway Traffic Safety Administration (NHTSA)

Company Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Information Dissemination Policy	Manufacturers were evaluated for their willingness to provide access to instruments and training to any interested party. Manufacturers must provide written policies, where they exist, regarding who is eligible to purchase instruments and receive training. Manufacturers must make access to instruments and training available to all governmental entities responsible for law enforcement in the state of Georgia. These entities include police departments, sheriff's offices, Georgia State Patrol, Georgia Bureau of Investigation, Georgia DNR, District Attorneys, Solicitors, the Office of the Public Defender, and military police. This was a pass/fail criterion. Manufacturers not meeting these criteria would have been disqualified from consideration.	By direction/request of the state of Georgia, CMI will consider making training available to attorneys and/or other non-law enforcement personnel. CMI does not have a written policy regarding who is able to purchase instruments and/or receive training.	All governmental entities responsible for testing will be given conditional or limited access to instruments and training. Nanopuls is very restrictive regarding customers outside law enforcement. The Evidenzer has been made available for the scientific community and as a reference instrument for private companies evaluating breath analyzing techniques.	NPAS does not have a written policy as it relates to the defense community and information on the DMT. It is standard practice to follow the direction of the state agency responsible for breath testing. NPAS is more than willing to work with attorneys and other non-law enforcement personnel. This includes: limited training and limited access to instruments as well. Should a DMT be sold to private sources, with your approval, the instrument would not include state specific software.
Instrument Repair	Manufacturers were evaluated for their ability to calibrate and repair instruments. Manufacturers meeting the ISO 17025 calibration lab standard are preferred. The manufacturer must have the capability to calibrate and repair instruments at a rate of at least 10 instruments per month at a facility in the US by the time of instrument selection. Manufacturers not meeting this requirement would have been disqualified from consideration. Facilities meeting the ISO 17025 calibration laboratory standard were awarded 10 points.	CMI is easily capable of repairing ten instruments per month. The CMI Calibration Laboratory (CCL) is accredited through the American Society of Crime Laboratory Directors–Laboratory Accreditation Board (ASCLD/LAB) to ISO 17025:2005 and ASCLD/LAB-International.	Nanopuls is in the process of selecting a U.S. partner to perform instrument calibration and repairs. No U.S. facility at time of evaluation.	NPAS “service group” had the ability to process in excess of 50 instruments per month. NPAS is pursuing 17025 accreditation but does not currently possess it.

Company Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Prevalence	Each instrument manufacturer were evaluated for prevalence in the evidential breath testing market. Each manufacturer were ranked according to the number of states in the US or countries where an evidential breath testing device made by the manufacturer is in use. The manufacturer with the most states and countries were awarded a score of 5 while the other two manufacturers were awarded scores of 3 and 0 respective to their ranking.	Intoxilyzer 5000 Total Users = 30: see list below this Company Review Table Intoxilyzer 8000 Total Users=37: see list below this Company Review Table. Intoxilyzer 6000 Total Users=4: Cyprus, Gibraltar, United Kingdom, Thailand	Total Users=7: Sweden, Iceland, Ireland, Finland, Denmark, Norway, USA (QuinetQ Foster-Miller Lab)	Total Users=14: Alaska, Alabama, Michigan, Minnesota, Missouri, New York, Pennsylvania, South Carolina, Vermont, California, Quebec, Netherlands, Australia, China
Production Capacity	Manufacturers were evaluated for their capacity to meet the instrument replacement schedule set forth by GBI. The manufacturer must have the capacity to supply instruments at the rate of at least 250 per year at the time the instrument is selected. This was a pass/fail criterion. Manufacturers not meeting this criterion would have been disqualified from consideration.	CMI's manufacturing capacity is easily capable of supplying 250 Intoxilyzer 9000s per year.	Nanopuls can provide ten instruments per week.	NPAS can produce 25-30 instruments per week.

Company Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Training Policies	Manufacturers were evaluated for their willingness to train law enforcement personnel in instrument operation. The manufacturer must make a training course available to select law enforcement personnel on the theory, engineering, calibration, operation, and maintenance of the instrument. With the exception of information deemed to be proprietary intellectual property or trade secrets by the manufacturer, the manufacturer must be willing to make available information regarding the instrument to GBI upon request. This information includes instrument operation and service manuals, information regarding the instrument's technical specifications, functional schematics of the instrument's measurement system, sample flow, and control system, and materials used in operator training. This was a pass/fail criterion. Manufacturers not meeting this criterion would have been disqualified from consideration.	See CMI training policy below the Company Review Table	Nanopuls has training courses that cover everything mentioned and will provide all information necessary to fully understand the process of evidential breath testing and the functionality of our instrument.	NPAS will provide training classes to GBI select personnel on theory, basic operation, calibration, troubleshooting, and maintenance. The information provided during training were detailed and include schematics, flow diagrams, any/all details on operation as well as source code information as required.
Warranty	The manufacturers' instrument warranties were evaluated. Manufacturers must provide written warranty policy for the evaluated instrument. Warranties provided to DOFS were for scope and coverage period. The instrument deemed to have the best warranty by DOFS with regard to scope and coverage period were awarded a score of 5. The instrument with the second best warranty as determined by DOFS was awarded a score of 2. Instruments having a warranty period of less than one year were disqualified from consideration.	See CMI warranty conditions below the Company Review Table	See Nanopuls warranty conditions below the Company Review Table	NPAS has a five year warranty on the DMT family of products. Consumable items such as breath hoses, fuel cell, etc. are not included in the five year warranty.

Intoxilyzer 5000 users: Nebraska, Connecticut, New Hampshire, Colorado, Nevada, Delaware, New York, Georgia, Oklahoma, Hawaii, Pennsylvania, Idaho, Illinois, Rhode Island, Kentucky, South Dakota, Louisiana, Texas, Maine, US Capitol Police, Minnesota, Canada, Cayman Islands, Iceland, Jamaica, Mexico, New Zealand, Norway, Puerto Rico, Virgin Islands

Intoxilyzer 8000 users: Arizona, North Dakota, Ohio, Florida, Oklahoma, Hawaii, Oregon, California, Pennsylvania, Mississippi, South Dakota, Kansas, Utah, Illinois, Montana, New Mexico, New York, Ascension Island, Australia, Botswana, Caribbean Islands, Canada,

Cyprus, Guyana, Italy, Jamaica, Malaysia, Malta, Mauritius, Mexico, Portugal, Russia, Singapore, Slovenia, St. Helena, South Africa, Zimbabwe

CMI Training Policy: CMI provides training to both law enforcement and lab personnel for federal, state and local breath testing programs. Topics covered in the training class include, but not limited to, theory of operation, engineering and design considerations, instrument calibration and calibration adjustment, operation by both users and supervisors, and instrument maintenance. Intellectual Property and trade secrets withstanding, CMI will make available all manuals available for the instrument, all necessary technical specifications, functional schematics of the instrument's measurement system, sample flow and control systems and any materials used in operator training. CMI will go a step further by allowing portions of the instrument to be included in the state's training and will review the state's final training materials if requested.

CMI Warranty: CMI Inc. warrants that each new product were free from defects in material and workmanship, under normal use and service, for a period of one year from the date of invoice to the initial purchaser. CMI's obligation is limited to repairing or replacing, as CMI may elect, any part or parts of such product, which CMI determines to be defective in material or workmanship. Warranty repairs were performed at the factory or at a factory authorized service center. The product, or part of the product, considered to be covered by the conditions of this warranty shall be returned, freight prepaid, in its original shipping container or similar protective container, to the factory, only after receipt of a Returned Material Authorization number from CMI. The repaired or replacement part or product were returned from CMI or the authorized service center, freight prepaid. Warranty coverage extends only to the original purchaser and does not include abuse, misuse, cables, switches or use of the product for other than its intended purpose. This warranty also does not apply if the product is adversely affected by attaching any feature or device to it, or is in any way tampered with or modified, without expressed written permission from CMI, Inc.

Nanopuls Warranty Nanopuls AB warrants that this product were free from defects in material and workmanship, and under normal use and service, for a period of two years from the date of delivery to the first user-purchaser. Nanopuls AB obligation during the warranty period is limited to repairing or replacing, as Nanopuls may elect, any part or parts of such product which Nanopuls examination discloses to be defective in material or workmanship. Warranty repairs were performed only at authorized factory service centers, however, Nanopuls reserves the right to authorize other repair centers to perform warranty repairs/exchanges. Such authorization must be granted in advance and in writing.

Any part or parts considered to be covered by the condition of this warranty shall be returned, freight prepaid, to an authorized factory service center. If the returned product is covered by this warranty, Nanopuls will pay the shipping charges to return the product to the customer. Repaired components are warranted for a period of 90 days from the date of repair, and that warranty is subject to the same limitations as this warranty. Components not repaired or replaced do not receive an extended 90 day warranty. Warranty coverage extends only to the original purchaser and does not cover replacement of parts that are, by their nature, expendable. This warranty is void if the product is adversely affected by attaching any feature or device to it not approved in writing by Nanopuls AB. There are no other warranties expressed or implied including but not limited to, any implied warranties of merchantability or fitness for a particular purpose. In no event shall Nanopuls AB be liable for any loss of profit or any indirect or consequential damages arising out of any such defect in material or workmanship.

Process Review

Case Law Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Legal Review	Each instrument was evaluated to determine if adverse case law or rulings regarding the instrument or manufacturer exists in the legal community. Sources for this information included Lexis, customer interviews, defense attorney organizations, prosecuting attorney organizations and/or internet news searches. A score of -5 would have been awarded for each ruling deemed to be credible and significantly adverse to the instrument's or manufacturer's standing in the legal community as determined by GBI.	**Instrument:** Due to the fact that the Intoxilyzer 9000 is not currently in use in any U.S. jurisdiction, no relevant case law exists. **Manufacturer:** Due to their widespread use, many state appellate and supreme court rulings involve CMI manufactured instruments. The most contentious cases seem to involve issues involving production of the instrument source code in Arizona, Florida, and Minnesota (see Minnesota v Underdahl). CMI's 2007 position statement to provide limited access to the source code under protective court order and non-disclosure agreement sufficiently addresses concerns raised in these cases. Alleged issues regarding the CMI Intoxilyzer 8000's failure to correctly measure sample volume in Florida are unclear. In addition, a few cases in Ohio were identified where the reliability of the Intoxilyzer 8000 remained in question in the courts. These cases appear to persist because of the state's failure to lay proper foundation for their reliability (Gerome v	**Instrument:** Due to the fact that the Evidenzer is not currently in use in any U.S. jurisdiction, no relevant case law exists. Other countries have successfully used the Evidenzer. **Manufacturer:** Though no US cases involving Nanopuls have been identified, countries such as Ireland and Sweden continue to use the Evidenzer. The only potential issue identified involves the manufacturer's failure to include Sweden's automatic deduction for uncertainty in the software for one of the updates it provided to police in 2008. No cases deemed to be significantly adverse to Nanopuls were identified.	**Instrument:** Due to the fact that the DMT-GF is not currently in use in any U.S. jurisdiction, no relevant case law exists. Other states have successfully used the DMT model of the Datamaster. **Manufacturer:** Though there are cases involving challenges to the Datamaster line of products, no cases deemed to be significantly adverse to NPAS were identified.

Case Law Review Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
		Ohio, Ohio v Davis). Though there were cases involving challenges to the CMI line of products, no cases deemed to be significantly adverse to CMI were identified.		

Process Modification Options

Each instrument was evaluated to determine how its unique features and options can be utilized to improve efficiency, improve quality control, reduce costs, and reduce maintenance. Manufacturers were allowed to submit documentation or literature highlighting any unique features of the instrument. Each instrument was ranked according to the ability of the instrument to improve the overall breath testing process. The instrument deemed to have the greatest potential for process improvement by GBI DOFS was awarded a score of 25 while the second and third ranked instruments were awarded scores of 15 and 0 respectively. Factors considered in ranking the instruments were documented.

Intoxilyzer 9000	
Feature	**Value Added**
The Intoxilyzer 9000 utilizes pulsed infrared source eliminating the chopper motor thus improving reliability and reducing maintenance of the analytical system.	High
The Intoxilyzer 9000 utilizes Windows Embedded CE 6.0 allowing for maximum hardware and software configurability and support.	Moderate
The Intoxilyzer 9000 utilizes a SQL database to store operator access information. This database, which can be remotely administered, provides the instrument's software the ability to evaluate an operator's status and/or permissions to run tests or other operations and can restrict that operator's access to the instrument appropriately thereby enhancing overall test integrity.	High
The Intoxilyzer 9000 utilizes increased instrument monitoring including but not limited to the breath hose. The intoxilyzer 9000 maintains, monitors, and displays the breath hose temperature. Furthermore, the software is configured to prevent testing if the breath hose temperature falls outside of prescribed limits.	Not Unique
The Intoxilyzer 9000 utilizes increased memory storage. Data storage can include but is not limited to subject test records, breath curves, calibration check records, quarterly inspection records, etc. In the case of the quarterly inspection records, these can be uploaded via COBRA V5 or downloaded to a thumb drive, minimizing/eliminating the time spent scanning documents by a Georgia State Patrol (Implied Consent) Trooper.	High
The Intoxilyzer 9000 utilizes an optional barcode reader and/or magnetic card reader to read operator cards and/or drivers' licenses minimizing operator error during data entry as well as minimizing the time required to enter the data.	Low

Intoxilyzer 9000	
Feature	**Value Added**
The Intoxilyzer 9000 utilizes form generation software which could be used to create a uniform breath test affidavit, quarterly inspection report, etc. This software feature working with a specific test protocol can aid the officer by populating all the fields of the breath test affidavit minimizing time spent on paperwork. Similarly, this software can aid the Georgia State Patrol (Implied Consent) Trooper during a quarterly inspection by printing the results onto a defined form, thus eliminating the use of multiple printer cards.	Moderate
The Intoxilyzer 9000 utilizes four infrared wavelengths in the 8-9 micron region to analyze ethanol, giving the instrument a high degree of selectivity/specificity.	High
CMI provides ISO 17025 accredited calibration service.	High
The Intoxilyzer 9000 utilizes a 7” LCD 800x480 color graphics display which can be used to further assist operators during the testing process to minimize operational errors.	Moderate

Evidenzer 240 Mobile	
Feature	**Value Added**
The Evidenzer uses an accurate dual reference system before and after every test for instrument verification.	Moderate
The Evidenzer uses a hydrochemical filter to obtain a true zero reference before every subject sample.	Moderate
The Evidenzer examines both exhaled air and ambient air for interference.	Moderate
All printouts from the Evidenzer have a unique checksum that can be used to verify the integrity of the printed results.	Moderate
The Evidenzer has very low backpressure or resistance to breath flow making it easier for a subject to provide a sufficient sample.	Moderate
The Evidenzer can retain the entire BrAC and pressure curve.	High
The Evidenzer can monitor and record the subject’s breath temperature.	Low
The availability of the Profiler lite for the Evidenzer makes it possible to easily test the effectiveness of sample acceptance criteria and mouth alcohol profiles.	Low

Evidenzer 240 Mobile	
Feature	**Value Added**
The Evidenzer utilizes a color 240x320 resolution built in display employing a Windows CE platform.	Moderate

Datamaster DMT GF	
Feature	**Value Added**
The DMT-GF allows for the use of true dual test technology to indentify and quantify alcohol in breath.	Moderate
The DMT-GF allows for remote connectivity through the use of VPN, FTP, or SFTP.	High
The DMT-GF has customizable test sequence and report formats.	Moderate
The DMT-GF has expandable software that can grow with future needs.	Moderate
The DMT-GF produces a real time breath alcohol concentration display shown the breath profile of each subject	High
The use of lead selenide detectors in the DMT-GF allows for faster real time evaluation of the breath alcohol concentration during the exhalation profile.	Moderate
The DMT-GF prints the breath profile with each report, which can be used to expose uncooperative subjects.	Already addressed

Results were based on vendor questionnaire responses. All costs are approximate and contingent upon the volume ordered. Prices are not binding and are subject to change.

Cost/Benefit Review

Cost/Benefit Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Base Model	The cost of each model instrument supplied was evaluated. Each instrument was ranked according to cost. The instrument with the lowest cost was awarded a score of 15 while the second and third ranked instruments with respect to cost were awarded scores of 10 and 0 respectively. Configurations of the instruments considered in ranking the instruments were documented.	Base Model Package: $7000: Includes (2D Bar Code Reader Ready, Signature Pad Ready, and Dry Gas Ready) Integrated Magnetic Card Reader, Integrated On Screen Keyboard, Mouthpieces (100), Standard, One Year Warranty	Base Model Package: $8500 Includes Evidenzer Mobile System EVI-013 measurement and EVI-011 control unit.	Base Model Package: $6500: Includes DMT-FG base IR instrument , dry gas compartment, fuel cell, and printer
Consumables	The cost of consumables for each model instrument supplied was evaluated. Each instrument was ranked according to consumable cost. The instrument with the lowest cost was awarded a score of 5 while the second and third ranked instruments were awarded scores of 3 and 0 respectively. Consumables considered in ranking the instruments were documented. Scores were based primarily on mouthpiece costs as other consumables varied depending on configured options.	Mouth Pieces (100/box): $25.00 Other Consumables Dry gas(67L): $148 Internal Printer paper: $3.00/roll	Mouth Pieces (ea): $0.55 Other Consumables Internal Printer paper: $1.50/roll	Mouth Pieces (ea): $0.26 Other Consumables Dry gas(108L): $117

Cost/Benefit Criteria Evaluated	Summary	Intoxilyzer 9000	Evidenzer 240 Mobile	Datamaster DMT-GF
Implementation Cost	Each instrument was evaluated to determine if any other any unique additional costs exist to implement the instrument in the desired configuration. Each instrument was ranked according to estimated implementation cost. The instrument with the lowest cost was awarded a score of 5 while the second and third ranked instruments were awarded scores of 3 and 0 respectively. Implementation costs considered in ranking the instruments were documented.	Would require the purchase of a gas delivery system with each instrument. Database software has upfront cost of ~$8,500, but no per instrument license fee.	Would require the purchase of a calibration interface and dry gas kit for each instrument. Use of vendor database management would cost approx. $49 per instrument per year.	Customized database creation cost is approximately $5000. No other unique costs are associated with this model
Options	The cost of the optional equipment for each instrument was evaluated. A breakout of the cost of each of the instrument options was evaluated for cost/benefit. Each instrument was ranked according to value of the optional equipment as determined by GBI. The instrument deemed to have the most valuable options was awarded a score of 5 while the second and third instruments were awarded scores of 3 and 0 respectively.	2D barcode reader (USB) $290 Gas delivery system: $425 Height adjusting pedestal: $195 Integrated printer: $410 USB printer: $349 ISO 17025 calibration: $299 Cobra v5: $8500 Annual Cobra Support: $1250 1 Year extended warranty: $125 Case: $349	Dry gas kit (2x34L): $650 Database Management system: $49 per instrument/year Plus $1500 per user Bar code reader: $200 Temperature measurement option: $450 Breath profiler lite: $4900 Carry case: $250-$300	Database creation: $5000 Internal card reader: $480 External barcode reader: $490 Dry Gas delivery: standard on DMT-GF

LABORATORY EVALUATION– APPENDIX 2

Abbreviations used in this appendix:

Avg = Average

BrAC = Breath Alcohol Content

Conc. = Concentration

g = grams

dL = deciliter

INT =- Interferent

L = liter

MA = Mouth Alcohol

NA or N/A = Not Applicable

Std. Dev. = Standard Deviation

%CV = % Coefficient of Variation

Linear Dynamic Range

Linear Dynamic Range Criteria Evaluated	Summary	Test Method	Scoring	Test Information
Limit of Detection (LOD)	The breath alcohol analyzer should be capable of measuring all mass concentrations in the range 0.00 g/210L to at least 0.40 g/210L. The breath alcohol analyzer may indicate 0.000 g/210L for mass concentrations equal to or smaller than 0.005 g/210L.	LOD was determined by analysis of ethanol standards: 0.000 to 0.013 g/210L incremented by 0.001 until an analytical result was displayed (sample test mode).	Instruments exhibiting an LOD of 0.005 g/210L or less were awarded 5 points.	Date: Feb. 14, 2012 Ethanol standard solutions prepared using: **Stock:** Acros Organic Ethyl Alcohol 99.5+%, lot number B0521933. **Flask:** 500 mL Class A volumetric #E **Pipette**: T-203 **Simulator:** Guth 34C G3360 verified at 33.907 C **Thermometer**: 72576029
Calibration Check	The breath alcohol analyzer should be capable of measuring all mass concentrations in the range 0.00 g/210L to at least 0.40 g/210L. The maximum permissible errors, positive or negative, are +/- 0.004 g/210L or +/- 5 % of the true value of mass concentration, whichever is greater, for all mass concentrations over the measuring range.	Linear Dynamic Range was determined by the analysis of ethanol standards with concentrations between 0.010 and 0.600 g/210L. Each sample was analyzed in the cal check mode 20 times and evaluated for RSD and accuracy. The levels tested included 0.02, 0.05, 0.08, 0.10, 0.2, 0.3, 0.4, and 0.6 g/210L.	Instruments were awarded 1 point for each level tested that exhibited a %CV of less than 5.0% and an additional 2 points for each level where the %CV is 3.0% or less as tested by GBI-DOFS. Each level with a mean concentration that was not within 5.0% or 0.004 g/210L, whichever is greater, of the target value was not awarded any points regardless of the %CV.	**Date**: Feb. 10, 2012 988.5 hPa, 28.2% RH, 20.6°C Ethanol standard solutions prepared using: **Stock:** Acros Organic Ethyl Alcohol 99.5+% lot number B0521933. **Flask:** 500 mL Class A volumetric #E **Thermometers**: 72576029, 11564016 *Unable to complete 0.60 level due to repetitive blank error.

Linear Dynamic Range Criteria Evaluated	Summary	Test Method	Scoring	Test Information
Test Mode	The breath alcohol analyzer should be capable of measuring all mass concentrations in the range 0.00 g/210L to at least 0.40 g/210L. The maximum permissible errors, positive or negative, are +/- 0.004 g/210L or +/- 5 % of the true value of mass concentration, whichever is greater, for all mass concentrations over the measuring range.	Linear Dynamic Range will be evaluated in the sample test mode by the analysis of ethanol standards with concentrations between 0.010 and 0.600 g/210L. Each sample was analyzed in the sample test mode 10 times and evaluated for RSD and accuracy. The levels tested included 0.02, 0.05, 0.08, 0.10, 0.2, 0.3, 0.4, and 0.6 g/210L.	Instruments were awarded 1 point for each level tested that exhibits a %CV of less than 5.0% and were awarded an additional 2 points for each level where the %CV was 3.0% or less as tested by GBI-DOFS. Each level with a mean concentration that was not within 7.0% or 0.006 g/210L, whichever is greater, of the target value was not awarded any points regardless of the %CV.	Dates: Mar 9, 2012, Mar 15, 2012, Mar 20, 2012 Ethanol standard solutions prepared using: **Stock:** Acros Organic Ethyl Alcohol 99.5+% lot number B0521933. **Flask:** 500 mL Class A volumetric #E **Thermometers**: 72576029, 11564016 During each test, the temperature and the relative humidity did not vary by more than 5°C and 10% respectively. Barometric Pressure was 1013+/- 40hPa. Ambient conditions: **Date**: **3/9/12** 993.6 hPa, 58.0% RH 20.4°C **Date**: **3/15/12** 995.2 hPa, 58.2% RH 21.6°C **Date**: **3/20/12** 991.7 hPa, 59.0% RH 20.9°C

Limit of Detection Results				
Sample Number	**Vapor Concentration (g/210L)**	**Intoxilyzer 9000**	**Evidenzer 240 Mobile**	**DMT-GF**
1	0.001	0.000	0.000	0.000
2	0.002	0.000	0.000	0.000
3	0.003	0.000	0.000	0.000
4	0.004	0.000	0.000	0.000
5	0.005	0.000	0.000	0.000
6	0.006	0.000	0.000	0.000
7	0.007	0.000	0.000	INT
8	0.008	0.000	0.000	0.003
9	0.009	0.000	0.008	0.004
10	0.010	0.000		
11	0.011	0.000		
12	0.012	0.000		
13	0.013	0.010		

Calibration Check Results

Solution Number	Vapor Conc. (g/210L)	Intoxilyzer 9000					Evidenzer 240 Mobile					DMT-GF				
		Simulator	Temp	Mean	Std. Dev	%CV	Simulator	Temp	Mean	Std. Dev	%CV	Simulator	Temp	Mean	Std. Dev	%CV
1	0.020078	PS1196	33.901	0.0193	0.0008	4.15%	PS1196	33.901	0.0200	0.000403	2.02%	PS1196	33.901	0.0201	0.000394	1.97%
2	0.049997	G10635	33.993	0.0497	0.0007	1.41%	G10635	33.993	0.0517	0.000305	0.59%	PS1196	33.903	0.0517	0.000733	1.42%
3	0.079987	G10635	33.976	0.0807	0.0013	1.61%	G3360	33.970	0.0824	0.000355	0.43%	PS1196	33.915	0.0807	0.0013	1.61%
4	0.100072	G10635	34.008	0.1010	0.0017	1.68%	G3360	33.946	0.1034	0.000488	0.47%	PS1196	33.903	0.1045	0.000826	0.79%
5	0.200053	G10635	33.935	0.1995	0.0014	0.70%	G3360	33.936	0.1993	0.001847	0.93%	PS1196	33.914	0.2041	0.001317	0.65%
6	0.300034	G10635	33.915	0.2955	0.002	0.68%	G3360	33.972	0.3004	0.001213	0.40%	PS1196	33.911	0.3102	0.002042	0.66%
7	0.400028	G10635	33.902	0.3959	0.0024	0.61%	G3360	33.902	0.4018	0.002104	0.52%	PS1196	33.918	0.4108	0.001989	0.48%
8	0.59999	G10635	33.984	0.5850	0.0028	0.48%	G3360	34.022	0.5935	0.001225	0.21%	PS1196	33.911	N/A	N/A	N/A

Test Mode Samples						
Solution Number	**Stock Added (uL)**	**Liquid Concentration (g/dL)**	**Vapor Concentration (g/210L)**	**Pipette**	**Simulator**	**Simulator Temp °C**
1	155.3	0.024	0.020079	T-48	G3360	34.049
2	387.2	0.061	0.050075	T-10	G3360	34.069
3	618.5	0.098	0.079987	T-10	G10635	33.939
4	773.8	0.122	0.100072	T-10	G3360	33.962
5	1546.9	0.244	0.200053	T-10	G10635	33.959
6	2320	0.366	0.300034	T170	G3360	33.981
7	3095	0.488	0.400261	T-170/T-48	G10635	33.965
8	4640	0.732	0.600068	T-170	G10635	33.908

Test Mode Results[1]										
		Intoxilyzer 9000[2]			Evidenzer 240 Mobile			DMT-GF[3]		
Solution Number	Vapor Conc.	Average	Standard Deviation	%CV	Average	Standard Deviation	%CV	Average	Standard Deviation	%CV
1	0.0201	0.0142	0.00123	8.66%	0.0189	0.00057	3.00%	INT	INT	INT
2	0.0501	0.0449	0.00110	2.45%	0.0475	0.00071	1.49%	INT	INT	INT
3	0.0800	0.0753	0.00048	0.64%	0.0770	0.00125	1.62%	INT	INT	INT
4	0.1001	0.0982	0.00114	1.16%	0.0979	0.00099	1.02%	INT	INT	INT
5	0.2001	0.1983	0.00095	0.48%	0.1941	0.00129	0.66%	0.1811	0.00300	1.66%
6	0.3000	0.2944	0.00337	1.15%	0.2887	0.00231	0.80%	0.2801	0.00160	0.57%
7	0.4003	0.3823	0.00333	0.87%	0.3831	0.00559	1.46%	INT	INT	INT
8	0.6001	MA[2]	N/A	N/A	0.5711	0.00711	1.24%	A. Fail*	A. Fail	A. Fail

1. Technical Note: A theoretical decline of approximately 1.5% in the solution alcohol concentration is predicted over ten 2L samples and a decline of 3.1% is expected over twenty 2L samples. This was factored into the scoring criteria acceptable limits.
2. Intoxilyzer 9000 yielded mouth alcohol warnings when tested with the 0.60 g/210L solution.
3. DMT-GF yielded interference warning for 5 out of 8 solutions and an ambient fail warning when tested with the 0.60 g/210L solution.

Environmental Conditions

Environmental Conditions Criteria Evaluated	Summary	Test Method	Scoring	Test Information
Temperature Influence	The breath alcohol analyzer should be capable of accurately measuring breath alcohol concentration within a specified range of environmental temperatures.	Environmental temperature influence on alcohol analysis was evaluated by the determination of accuracy and reproducibility at three ambient temperatures within the analyzer's operating range. A single ethanol standard was selected and analyzed 20 times using the analyzer's sample analysis and/or calibration check mode. These temperatures included a room temperature test (68° - 78°F), a low temperature test (35° - 50°F) and a high temperature test (80° - 95°F). Final selection of temperatures depended on the manufacturer's stated operating range. Humidity was maintained at 50%+/-30%.	Instruments were awarded 1 point for each temperature tested where the measured alcohol concentration exhibits a %CV of less than 5.0% and an additional 1 point for each temperature where the %CV is 3.0% or less as tested by GBI-DOFS. Each temperature with a mean concentration that was not within 5.0% of the target value was not awarded any points regardless of the %CV. Instruments exhibiting a %CV of greater than 10% would have been disqualified from consideration.	**Date: March 6, 2012** Ambient Conditions: 1005 hPa, 18.4% RH, 20.8°C / 69.4°F **Date: March 6, 2012** Ambient Conditions: 1003 hPa, 75.8% RH, 5°C / 41°F **Date: April 3, 2012** Ambient Conditions: 984.4 hPa, 36.8% RH, 31°C / 87.8°F **All Dates:** Thermometers: 72576029, 11564016 Ethanol standard: Guth 0.08 g/210L, lot #11200

Environmental Conditions Criteria Evaluated	Summary	Test Method	Scoring	Test Information
Environmental Humidity Influence	The breath alcohol analyzer should be capable of accurately measuring breath alcohol concentration within a specified range of environmental humidity.	Environmental humidity influence on alcohol analysis was evaluated by the determination of accuracy and reproducibility at different ambient humidity levels within the analyzer's operating range. A single ethanol standard was selected and analyzed 20 times using the analyzer's sample analysis and/or calibration check mode. Humidity during analysis was measured using a hygrometer. Temperature was maintained between 64°F and 82°F. The number of humidity levels chosen depended on logistical considerations of GBI-DOFS.	Instruments were awarded 1 point for each humidity level tested where the measured alcohol concentration exhibited a %CV of less than 5.0% and an additional 1 point for each humidity level where the %CV was 3.0% or less as tested by GBI-DOFS. Each humidity level for which the mean concentration was not within 5.0% of the target value was not awarded any points regardless of the %CV. Instruments exhibiting a %CV of greater than 10% would have been disqualified from consideration.	**Date: March 6, 2012** Ambient Conditions: 1005 hPa, 18.4% RH, 20.8°C 69.4°F Date: April 3, 2012 Ambient Conditions: 984.2 hPa, 58.7% RH, 20.9°C 69.6°F All Dates: Thermometers: 72576029, 11564016 Ethanol standard: Guth 0.08 g/210L, lot #11200

Environmental Conditions Criteria Evaluated	Summary	Test Method	Scoring	Test Information
Sample Humidity Influence	The accuracy of the alcohol analyzer should not be affected by the sample humidity.	Sample humidity influence on alcohol analysis was evaluated by the comparison of accuracy and reproducibility for both a dry gas standard and a wet bath standard. A single ethanol standard level was selected and analyzed 20 times using the analyzer's calibration check mode.	Instruments were awarded 3 points if the average measured dry gas value and the average measured wet bath value were within 5% of their mean and both exhibit %CVs of less than 5.0%. If the average measured dry gas value and the average measured wet bath value were within 3% of their mean and both exhibit %CVs of less than 3.0% as tested by GBI-DOFS the instrument was awarded an additional 3 points. If either the average dry gas value or wet bath value was not within 5.0% of the target value no points were awarded regardless of the %CV. Instruments exhibiting a %CV of greater than 10% would have been disqualified from consideration.	**Date: April 3, 2012** Ambient Conditions: 984.2 hPa, 58.7% RH, 20.9°C Thermometers: 72576029, 11564016 Date: April 11, 2012 Ambient Conditions: 989.3 hPa, 18.8% RH, 21.7C Thermometer: 11564016

Temperature Influence Results							
Instrument	**Date**	**Ambient Temp °C**	**Simulator**	**Instrument Temp °C**	**Mean**	**Std. Dev.**	**% CV**
Intoxilyzer 9000	**March 6, 2012**	**20.8**	G10635	33.913	0.0778	0.0012	1.54%
Evidenzer 240 Mobile			G3360	33.934	0.0790	0.001566	1.98%
DMT-GF			PS1196	33.976	0.0812	0.00041	0.51%
Intoxilyzer 9000	**March 6, 2012**	**5**	G10635	33.934	INT[1]	INT[1]	INT[1]
Evidenzer 240 Mobile			G3360	34.003	0.0630[3]	0.000441	0.70%
DMT-GF			N/A[2]	N/A	N/A	N/A	N/A
Intoxilyzer 9000	**April 3, 2012**	**31**	G3360	34.065	0.0814	0.001	1.23%
Evidenzer 240 Mobile			G3360	34.065	0.0810	0.0003	0.37%
DMT-GF[4]			N/A	N/A	N/A	N/A	N/A

1. INT - all samples on the Intoxilyzer 9000 yielded an interferent warning.
2. N/A – Ambient Temperature was outside the stated operating range for the DMT-GF.
3. Cold simulator housing and tubing caused excessive condensation in simulator resulting in lower than expected alcohol concentration.
4. 0.08 solution yielded interference warning on DMT-GF, no test done.

Environmental Humidity Influence Results							
Instrument	**Date**	**Ambient Humidity**	**Simulator**	**Instrument Temp °C**	**Mean**	**Std. Dev.**	**% CV**
Intoxilyzer 9000	**March 6, 2012**	**18.4%**	G10635	33.913	0.0778	0.0012	1.54%
Evidenzer 240 Mobile			G3360	33.934	0.0790	0.001566	1.98%
DMT-GF			PS1196	33.976	0.0812	0.00041	0.51%
Intoxilyzer 9000	**April 3, 2012**	**58.7%**	G10635	34.036 C	0.0784	0.0011	1.40%
Evidenzer 240 Mobile			G10635	34.036 C	0.0810	0.000269	0.33%
DMT-GF[1]					NA	NA	NA

1. 0.08 g/210L ethanol solution yielded interference warning on DMT-GF, no test done.

Sample Humidity Influence Results							
Instrument	**Date**	**Test Sample**	**Simulator**	**Instrument Temp °C**	**Mean**	**Std. Dev.**	**% CV**
Intoxilyzer 9000	**April 3, 2012**	**Guth 0.08 g/210L, lot# #11200**	G10635	34.036 C	0.0784	0.0011	1.40%
Evidenzer 240 Mobile			G10635	34.036 C	0.0810	0.000269	0.33%
DMT-GF[1]					N/A	N/A	NA
Intoxilyzer 9000	**April 11, 2012**	**ILMO 0.08 g/210L gas lot# 02612080A1**			0.0797	0.0006	0.75%
Evidenzer 240 Mobile					0.0820	0.000347	0.42%
DMT-GF[1]					N/A	N/A	N/A

1. 0.08 g/210L ethanol standard yielded interference warning on DMT-GF, no test done.

Specificity Tests

Specificity Test Criteria Evaluated	Summary	Test Method	Scoring
Volatile Organic Compound (VOC) Influence	The instrument should not measure more than + 0.02 g/210L or + 5 % of the true value of mass concentration of an ethanol standard, whichever is greater, in the presence of volatile organic compounds (VOCs).	Volatile organic compound influence on alcohol analysis was evaluated by the analysis of prepared wet bath standards in the sample delivery mode. The maximum level of contribution to the ethanol concentration was determined by increasing the volatile standard concentration in increments of approximately 0.01 g/dL. The maximum level of contribution was considered to be the level reached immediately before an interferent is indicated by the analyzer. Compounds that showed no response above the maximum relevant concentration were considered to be unable to affect the analyzer reading. Compounds that were analyzed for specificity included: acetone, acetaldehyde, methanol, 2-propanol, toluene, ethyl acetate, 2-butanone, 2-butanol, 1-propanol, acetonitrile, methylene chloride, and 2-methyl propanol.	Each instrument was awarded 6 points for each compound it is able to flag as an interferent or that is deemed unaffected at the maximum analyzed concentration. 1 point was deducted for each compound that produces a measured alcohol concentration of more than 0.010 g/210L but no more than 0.020 g/210L. 5 points were deducted for each compound that produced a measured alcohol concentration of more than 0.020 g/210L but no more than 0.030 g/210L. 20 points were deducted for each compound that produced a measured alcohol concentration of more than 0.03 g/210L. If the instrument produced a measured alcohol concentration of more than 0.060 g/210L for any evaluated compound it would have been disqualified from consideration.
VOC with Ethanol Influence	The instrument should not measure more than + 0.02 g/210L or + 5% of the true value of mass concentration of an ethanol standard, whichever is greater, in the presence of volatile organic compounds (VOCs).	Specificity for ethanol mixtures was evaluated for at least three mixtures of compounds at or near their LOD with a 0.08 g/210L ethanol solution. Binary solutions were analyzed at least 5 times and evaluated for accuracy and precision.	Each instrument was awarded 5 points if it was able to produce a measured alcohol concentration. 1 point was deducted for each mixture that produced a measured average alcohol concentration of more than 7% greater than the target value but less than 10%. 5 points were deducted for each mixture that produced a measured average alcohol concentration of more than 10% but no more than 20% greater than target. 20 points were deducted for each mixture that produced a measured alcohol concentration of more than 20% higher than target. If the instrument produced a measured alcohol concentration of more than 0.060 g/210L above the target ethanol value for any evaluated mixture it would have been disqualified from consideration.

Specificity Test Criteria Evaluated	Summary	Test Method	Scoring
Binary Mixture Influence	The instrument should not measure more than 0.02 g/210L in the presence of binary mixtures of volatile organic compounds.	Specificity for binary volatile mixtures were evaluated using the volatile organic influence procedure for at least five mixtures of two of more compounds. Compounds and levels used for the binary mixtures were based on predicted responses from the NIST IR evaluation and fuel cell specificity literature if applicable.	Each instrument were awarded 5 points for each mixture it was able to flag as an interferent at the maximum analyzed concentration. 1 point was deducted for each mixture that produced a measured alcohol concentration of more than 0.010 g/210L but less than 0.020 g/210L. 3 points were deducted for each mixture that produced a measured alcohol concentration of more than 0.020 g/210L but less than 0.030 g/210L. 10 points were deducted for each mixture that produced a measured alcohol concentration of more than 0.030 g/210L. If the instrument produced a measured alcohol concentration of more than 0.060 g/210L for any evaluated mixture it would have been disqualified from consideration.
Ambient Fail Test	The instrument should not measure more than + 0.004 g/210L or + 5 % of the true value of mass concentration of an ethanol standard, whichever is greater, in the presence of hydrocarbons in the ambient air.	Ambient fail test was performed to determine if the analyzer can successfully identify the environmental presence of ethanol and other volatile organic compounds during its air blank or purging routine. A sample of concentrated ethanol solution was introduced into the analyzer during the purging or air blank routine. An ethanol standard was immediately analyzed in the sample analysis mode. This process was repeated five times and the results were evaluated for accuracy and precision. This process was repeated for one or more volatile organic compounds.	10 points were awarded if the instrument was able to produce an "ambient fail" or equivalent warning for the concentrated vapor for both compounds. 15 points were awarded if the average of the accuracy check was within 5% of target and the precision exhibits a %CV of 5% or less after exposure to both ambient ethanol and other volatile organic compounds. Instruments exhibiting a %CV of greater than 10% or a standard deviation of greater than 0.008 g/210L, whichever is greater, would have been disqualified from consideration.

Volatile Organic Compound Influence Results								
Solution #	**Date**	**Test Sample**	**Volume Added (uL)**	**Liquid Conc. (g/dL)**	**Vapor Conc. (g/210L)**	**Intoxilyzer 9000**	**Evidenzer 240 Mobile**	**DMT-GF**
1	**Feb 22, 2012**	**Toluene[1,2]**	57.8	0.0100	8.0733	0.000	INT	Invalid
2			115.6	0.0182	0.0149	MA		Invalid
1	**Feb 22, 2012**	**2-Methyl-1-Propanol[3]**	62.3	0.0100	NA	INT	MA	INT
2			124.6	0.0200	NA		INT	
1	**Feb 22, 2012**	**Acetaldehyde[4]**	63.7	0.0100	0.1109	0.000	INT	INT
2			127.4	0.0200	0.2217	0.000		
3			191.1	0.0300	0.3326	0.000		
4			254.8	0.0400	0.4435	0.000		
5			318.5	0.0500	0.5544	0.000		
6			382.2	0.0600	0.6652	INT		
1	**Feb 7, 2012**	**1-Propanol[5]**	62.2	0.0100	0.0131	0.000	0.011	INT
2			124.4	0.0200	0.0261	0.010	MA	
3			186.6	0.0300	0.0392	INT	0.027	
4			248.8	0.0400	0.0523		INT	
1	**Feb 22, 2012**	**2-Butanol[6]**	61.9	0.0100	0.0152	0.000	0.008	INT
2			123.8	0.0200	0.0303	0.000	INT	INT
3			185.7	0.0300	0.0455	0.000	INT	
4			247.6	0.0400	0.0606	0.000		
5			309.5	0.0500	0.0758	INT		
1	**Feb 22, 2012**	Ethyl Acetate[7]	61.9	0.0112	0.3391	INT	INT	INT
1	**Feb 29, 2012**	**2-Propanol[8]**	63.7	0.0100	0.0131	0.000	0.000	INT
2			127.4	0.0200	0.0261	0.000	INT	
3			191.1	0.0300	0.0392	0.000		

Volatile Organic Compound Influence Results								
Solution #	**Date**	**Test Sample**	**Volume Added (uL)**	**Liquid Conc. (g/dL)**	**Vapor Conc. (g/210L)**	**Intoxilyzer 9000**	**Evidenzer 240 Mobile**	**DMT-GF**
4			254.8	0.0400	0.0523	0.000		
5			318.5	0.0500	0.0653	INT		
1			63.2	0.0100	0.0062	0.000	0.000	0.000
2	**Feb 22, 2012**		126.4	0.0200	0.0124	INT	INT	0.006
3		**Methanol[9]**	189.6	0.0300	0.0185			INT
1			63.7	0.0100	0.1109	0.000	INT	INT
2			127.4	0.0200	0.2217	0.000		
3			191.1	0.0300	0.3326	0.000		
4			254.8	0.0400	0.4435	0.000		
5	**Feb 22, 2012**		318.5	0.0500	0.5544	0.000		
6		**2-Butanone/MEK[10]**	382.2	0.0600	0.6652	INT		
1			63.6	0.0100	0.0231	0.000	0.000	0.000
2			127.2	0.0200	0.0461	0.000	0.000	0.000
3			190.8	0.0300	0.0692	0.000	0.000	0.000
4			254.4	0.0400	0.0923	0.000	0.000	0.000
5			381.6	0.0600	0.1384	0.000	0.000	0.000
6			508.8	0.0800	0.1845	0.000	0.000	0.000
7	**Feb 7, 2012**	**Acetonitrile[11]**	636	0.1000	0.2307	UNAF[12]	UNAF[12]	INT
1			37.7	0.0100	3.3932	0.000	0.000	0.000
2			75.4	0.0200	6.7864	0.000	0.000	0.000
3			113.1	0.0300	10.1795	0.000	0.000	0.000
4			150.8	0.0400	13.5727	0.000	INT	0.000
5			216.2	0.0573	19.4590	0.000		0.000
6	**Feb 22, 2012**		281.6	0.0746	25.3454	0.000		0.000
7		**Methylene Chloride[13]**	347	0.0920	31.2317	UNAF[12]		UNAF[12]
1	**Jan 19,**	**Acetone[14]**	63.2	0.0100	0.0428	0.000	0.000	INT

Volatile Organic Compound Influence Results								
Solution #	**Date**	**Test Sample**	**Volume Added (uL)**	**Liquid Conc. (g/dL)**	**Vapor Conc. (g/210L)**	**Intoxilyzer 9000**	**Evidenzer 240 Mobile**	**DMT-GF**
2	**2012**		126.4	0.0200	0.0855	0.000	INT	
3			189.6	0.0300	0.1283	0.000		
4			252.8	0.0400	0.1711	0.000		
5			379.2	0.0600	0.2566	0.000		
6			505.6	0.0800	0.3422	0.000		
7			632	0.1000	0.4277	INT		

1. Toluene was virtually immiscible in water. Immiscibility caused rapid dissipation that mimicked mouth alcohol profile. Points were awarded for samples that were flagged as mouth alcohol (MA).
2. Toluene stock solution: Acros Organic lot A0250823; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
3. 2-Methyl-1-Propanol stock solution: Acros Organic lot B0735904; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
4. Acetaldehyde stock solution: Acros Organic lot A0310073; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
5. 1-Propanol stock solution: Omnisolv lot 46112; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
6. 2-Butanol stock solution: Acros Organic lot B00K5008; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
7. Ethyl Acetate stock solution: Fisher lot 75085; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
8. 2-Propanol stock solution: Fisher lot 092247; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
9. Methanol stock solution: Fisher lot 011700; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
10. 2-Butanone (MEK) stock solution: Acros Organic lot A0305268; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
11. Acetonitrile stock solution: Fisher lot 093316; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
12. UNAF indicates that the instrument was unaffected at the highest tested VOC concentration.
13. Methylene chloride stock solution: Fisher lot 107287; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364
14. Acetone stock solution: Fisher lot 113751; Thermometers: 72576029, 11564016; Pipette: T-48; Flask: 500 mL class A #E; Simulator: G3364

VOC with Ethanol Solutions						
Solution #	**VOC**	**Volume Added (uL)**	**Liquid Conc. (g/dL)**	**Vapor Conc. (g/210L)**	**Pipette**	**Simulator Temp**
1	**Ethanol**	See note 1	0.0976	0.080	N/A	34.033
	Acetaldehyde	12.74	0.0020	0.0222	T-203	
2	**Ethanol**	See note 1	0.0976	0.080	N/A	34.033
	Acetaldehyde	31.8	0.0050	0.0554	T-48	
3	**Ethanol**	620	0.0978	0.0802	T-170	33.937
	1-Propanol	186.6	0.0300	0.0392	T-54	
4	**Ethanol**	620	0.0978	0.0801	T-170	33.937
	2-Butanol	61.8	0.0100	0.0151	T-54	

1. A stock Guth 0.08 g/210L ethanol standard solution, lot 11200, was used to prepare the acetaldehyde mixtures.

VOC with Ethanol Results									
Acetaldehyde/Ethanol Mixture[2]									
Solution	**Intoxilyzer 9000**			**Evidenzer 240 Mobile**			**DMT GF**		
1	0.074			MA[1]			0.075		
1	0.074						0.075		
1	0.075						0.076		
1	0.075						0.076		
1	0.075						0.076		
2				INT			INT		
	Average	**Std. Dev**	**% CV**	**Average**	**Std. Dev**	**% CV**	**Average**	**Std. Dev**	**% CV**
	0.075	0.000548	0.73%	0.078	0.000378	0.48%	0.076	0.000548	0.72%
1-Propanol/Ethanol Mixture[4]									
3	0.092			0.102			N/A[3]		
3	0.095			0.104					
3	0.094			0.104					
3	0.094			0.104					
3	0.093			0.104					
	Average	**Std. Dev**	**% CV**	**Average**	**Std. Dev**	**% CV**	**Average**	**Std. Dev**	**% CV**
	0.094	0.001140	1.22%	0.104	0.000894	0.86%	N/A	N/A	N/A
2-Butanol/Ethanol Mixture[5]									
4	0.078			0.089			N/A[3]		
4	0.081			0.088					
4	0.081			0.088					
4	0.080			0.088					
4	0.080			0.089					
	Average	**Std. Dev**	**% CV**	**Average**	**Std. Dev**	**% CV**	**Average**	**Std. Dev**	**% CV**
	0.080	0.001225	1.53%	0.0884	0.000548	0.62%	N/A	N/A	N/A

1. Delivery through breathline yielded mouth alcohol warning. Test done through gas verification mode.
2. Date: February 23, 2012; Flask: 500 mL class A #E; Ethanol standard solution: Guth 0.08 g/210L lot 11200; Simulator: G3360; Acetaldehyde stock solution: Acros Organic lot A0310073; Thermometers: 72576029, 11564016
3. 0.08 g/210L standard solution alone yielded interference warning on DMT-GF.
4. Date: April 3, 2012; Flask: 500 mL class A #E; Ethanol solution: Decon Labs lot 2701G; Simulator: G3360; 1-Propanol stock solution: OmniSolv lot 46112; Thermometers: 72576029, 11564016
5. Date: April 3, 2012; Flask: 500 mL class A #E; Ethanol solution: Decon Labs lot 2701G; Simulator: G3360; 2-Butanol stock solution: Acros Organic lot B00K5008; Thermometers: 72576029, 11564016

Binary Mixture Solutions					
Solution #	**VOC**	**Volume Added (uL)**	**Liquid Conc. (g/dL)**	**Vapor Conc. (g/210L)**	**Pipette**
1	**Acetone**	63.2	0.0100	0.0428	T-48
	Ethyl Acetate	55.4	0.0100	0.3035	
2	**Acetone**	63.2	0.0100	0.0427	
	2-Propanol	63.7	0.0100	0.0130	
3	**Acetone**	63.2	0.0100	0.0427	
	2-Propanol	127.4	0.0200	0.0261	
4	**Acetone**	63.2	0.0100	0.0427	
	2-Propanol	191.1	0.0100	0.0392	
5	**Acetone**	63.2	0.0100	0.0427	
	2-Propanol	254.8	0.0400	0.0522	
6	**Acetone**	63.2	0.0100	0.0427	
	2-Propanol	382.2	0.0600	0.0784	
7	**Methanol**	63.2	0.0100	0.0062	
	Isobutanol (2-methyl-1-propanol)	62.2	0.0100	UNK	
8	**Methanol**	63.2	0.0100	0.0062	
	Isobutanol	124.4	0.0200	UNK	
9	**2-Butanone (MEK)**	62.1	0.0100	0.0667	
	Methanol	63.2	0.0100	0.0062	
10	**2-Butanone (MEK)**	62.1	0.0100	0.0667	
	Methanol	126.4	0.0200	0.0124	
11	**1-Propanol**	186.6	0.0300	0.0392	
	2-Butanol	123.8	0.0200	0.0303	
12	**1-Propanol**	186.6	0.0300	0.0392	
	2-Butanol	247.6	0.0400	0.0606	

Binary Mixture Influence Results				
Solution #	**Intoxilyzer 9000**	**Evidenzer 240 Mobile**	**DMT GF**	**Test Information**
#1 - Acetone + Ethyl Acetate	MA	INT	N/A[1]	See Note 2
	MA			
	MA			
	MA			
	INT			
#2 – Acetone + 2-Propanol	0.000	INT	N/A[1]	See Note 3
#3 – Acetone + 2-Propanol	0.000			
#4 – Acetone + 2-Propanol	0.000			
#5 – Acetone + 2-Propanol	0.000			
#6 – Acetone + 2-Propanol	INT			
#7 – Methanol + Isobutanol	INT	0.023	N/A[1]	See Note 4
#8 – Methanol + Isobutanol		INT		
#9 – 2-Butanone + Methanol	0.000	INT	N/A[1]	See Note 5
#10 – 2-Butanone + Methanol	INT			
#11 – 1-Propanol + 2-Butanol	0.026	0.052	N/A[1]	See Note 6
#12 – 1-Propanol + 2-Butanol	INT	INT		

1. The DMT-GF chronically gave an interference warning when exposed to 0.08 g/210L ethanol solution Guth #11200. Test not performed.
2. Date: April 4, 2012; Flask: 500 mL class A #E;; Simulator: G3364; Acetone Stock Solution: Fisher lot 804017;Ethyl Acetate Stock Solution: Fisher lot 75085; Thermometers: 72576029, 11564016
3. Date: April 4, 2012; Flask: 500 mL class A #E;; Simulator: G3364; Acetone Stock Solution: Fisher lot 804017;Ethyl 2-Propanol Stock Solution: Fisher lot 93368; Thermometers: 72576029, 11564016
4. Date: April 4, 2012; Flask: 500 mL class A #E;; Simulator: G3364; Methanol Stock Solution: Fisher lot 11700; Isobutanol Stock Solution: Acros Organic lot B0735904; Thermometers: 72576029, 11564016
5. Date: April 4, 2012; Flask: 500 mL class A #E;; Simulator: G3364; 2-Butanone (MEK) Stock Solution: Acros Organic lot A0305268; Methanol Stock Solution: Fisher lot 11700;Thermometers: 72576029, 11564016
6. Date: April 4, 2012; Flask: 500 mL class A #E;; Simulator: G3364; 1-Propanol Stock Solution: Ominsolv lot 46112; 2-Butanol Stock Solution: Acros Organic lot B00K5008;Thermometers: 72576029, 11564016

Ambient Fail Test Samples						
Sample #	**Compound**	**Volume Added (uL)**	**Liquid Conc. (g/dL)**	**Vapor Conc. (g/210L)**	**Pipette**	**Simulator Temp**
Ambient 1	Ethanol	conc vapor[1]	N/A	N/A	N/A	N/A
Solution 1	Ethanol	1160	0.1830	0.1500	T-170	33.993
Ambient 2	Ethyl Acetate	conc vapor[2]	N/A	N/A	N/A	N/A

1. Vapor from a concentrated ethanol solution was introduced into the instrument.
2. Vapor from a concentrated ethyl acetate solution was introduced into the instrument.

Ambient Fail Test Results						
	Intoxilyzer 9000		**Evidenzer 240 Mobile**		**DMT GF[1]**	
	Ambient 1-Ethanol	#1 – Ethanol Solution	Ambient 1-Ethanol	#1 – Ethanol Solution	Ambient 1-Ethanol	#1 – Ethanol Solution
	A. Fail[2]	0.151	NR[3]	0.150	A. Fail	INT
	A. Fail	0.148	NR	0.150	N/A	N/A
	A. Fail	0.149	NR	0.147	N/A	N/A
	A. Fail	0.149	NR	0.147	N/A	N/A
See Note 4	A. Fail	0.150	NR	0.150	N/A	N/A
Average		0.149		0.149		N/A
Std. Dev.		0.001		0.002		N/A
% CV		0.76%		1.02%		N/A
	Ambient 2 – Ethyl Acetate	#1 – Ethanol Solution	Ambient 2 – Ethyl Acetate	#1 – Ethanol Solution	Ambient 2 – Ethyl Acetate	#1 – Ethanol Solution
	A. Fail[2]	0.147	NR[3]	0.146	N/A	N/A
	A. Fail	0.150	NR	0.146	N/A	N/A
	A. Fail	0.147	NR	0.147	N/A	N/A
	A. Fail	0.148	NR	0.145	N/A	N/A
See Note 5	A. Fail	0.147	NR	0.146	N/A	N/A
Average		0.148		0.146		N/A
Std. Dev.		0.001		0.001		N/A
% CV		0.88%		0.48%		N/A

1. The DMT-GF gave an interference warning when exposed to 0.15 g/210L ethanol solution #1.
2. A. Fail denotes an Ambient Fail warning was given.
3. NR denotes no ambient fail response was obtained.
4. Date: April 10, 2012; Flask: 500 mL class A #E;; Simulator: G10635; Ethanol Solution for concentrated vapor: Acros Organic lot B0521933; Ethanol Stock Solution: Decon Labs lot 2701G; Thermometers: 72576029, 11564016
5. Date: April 10, 2012; Flask: 500 mL class A #E;; Simulator: G10635; Ethyl Acetate solution used for concentrated vapor: Fisher lot 75085; Ethanol Stock Solution: Decon Labs lot 2701G;Thermometers: 72576029, 11564016

Mouth Alcohol Tests

Mouth Alcohol Test Criteria Evaluated	Summary	Test Method	Scoring
Limit of Detection (LOD)	The breath alcohol analyzer should be equipped with a function which automatically detects the profile of samples affected by the presence of alcohol in the upper respiratory tract.	Mouth alcohol limit of detection was evaluated using an ethanol containing mouthwash or breath spray. After administration of ethanol to the oral cavity, a breath sample was provided at regular intervals as close together as the instrument allowed until the alcohol was completely dissipated. The process was repeated until a total 5 administrations were made. The mouth alcohol limit of detection was determined by examining the analyzer's response and the breath alcohol curve characteristics.	The mouth alcohol LOD was determined as the greatest reported mouth alcohol concentration where no indication of mouth alcohol was given by the instrument. Instruments were ranked according to their mouth alcohol LOD. The instrument with the lowest mouth alcohol LOD was awarded a score of 15, with the second and third lowest LODs receiving scores of 10 and 0 respectively. Any instrument that exhibited a mouth alcohol LOD of 0.010 g/210L or less would have been awarded the maximum score.
Detection in Drinking Subjects	The breath alcohol analyzer should be equipped with a function which automatically detects the profile of samples affected by the presence of alcohol in the upper respiratory tracts.	Mouth alcohol detection in drinking subjects was evaluated using a controlled dosing experiment. Dose subjects were required to consume a small amount of an alcohol containing beverage and provide a breath sample at an interval determined by the evaluator. Estimated BrAC was compared to the mouth alcohol results to evaluate the effectiveness of the instrument in identifying mouth alcohol. This test was performed on a minimum of 5 drinking subjects with two separate administrations of mouth alcohol.	Mouth alcohol detection was considered effective if the mouth alcohol result was within 10% or 0.01g/210L of the estimated BrAC or if the instrument "flagged" the sample. Instruments were ranked according to the percentage of effective mouth alcohol detections. The instrument with the greatest percentage of mouth alcohol detections was awarded a score of 25, with the second and third highest detection rates receiving scores of 10 and 0 respectively. Any instrument that produced at least 95% effective mouth alcohol detections would have been awarded the maximum score.
Detection with Foreign Objects	The breath alcohol analyzer should be equipped with a function which automatically detects the profile of samples affected by the presence of alcohol in the upper respiratory tracts.	A mouth alcohol detection test with foreign objects was performed using non-dosed subjects in a laboratory setting. In this test the mouth alcohol limit of detection test was performed while a variety of foreign objects such as gum or bread remained in the mouth. This test was performed on a minimum of two foreign objects. This test did not need to be performed more than once for each object tested.	The mouth alcohol LOD was determined as the greatest reported mouth alcohol concentration where no indication of mouth alcohol was given by the instrument. Instruments were ranked according to their mouth alcohol LOD. The instrument with the lowest mouth alcohol LOD was awarded a score of 10, with the second and third lowest LODs receiving scores of 5 and 0 respectively. Any instrument that exhibited a mouth alcohol LOD of 0.010 g/210L or less would have been awarded the maximum score.

Intoxilyzer 9000 Mouth Alcohol Limit of Detection Results[1]															
	Test #1			Test #2			Test #3			Test #4			Test #5		
Sample	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result
1	0	1.00	MA	1	1.1	MA	1.5	1	MA	0.5	1.30	MA	0.25	1.4	MA
2	2	0.89	MA	3	1	MA	4	1.7	MA	2.5	2.30	MA	2.25	1.3	MA
3	4	1.23	MA	5	1	MA	6.5	3.1	0.012	4.5	2.70	MA	4.25	1.3	MA
4	6	2.35	MA	7	3	0.020	8.5	3.1	0.000	6.5	3.20	0.014	6.25	3.6	0.019
5	8	4.00	0.010	9		0.000				8.5		0.000	5.25	3	0.010
6	10	3.00	0.000										10.25		0.000

1. Date: February 27, 2012; Ethanol Source: Binaca Fast Blast Cool mint spray, 3 squirts.; Time elapsed since exposure measured with timing device; Thermometers: 72576029, 11564016

Evidenzer 240 Mobile Mouth Alcohol Limit of Detection Results[2]															
	Test #1			Test #2			Test #3			Test #4			Test #5		
Sample	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result
1	0.5	3.00	MA	0.25	1.7	MA	0	2.5	MA	1	2.10	MA	1.5	3.3	MA
2	2.5	3.00	MA	2.25	1.6	MA	2	4.3	MA	3	2.60	MA	3.5	2	MA
3	4.5	3.00	0.016	4.25	1.6	MA	4	4.5	MA	5	2.60	MA	5.5	3.2	MA
4	7.5	1.70	0.007	6.25	1.7	MA	6	4.3	MA	7	2.20	MA	7.5	3.3	0.010
5	9.5	3.20	0.000	8.25	1.7	0.014	8	4	0.012	9	2.60	0.007	9.5	1.6	0.010
6				10.25	1.8	0.000	10	4.8	0.008	11	4.00	0.000			
7							12	4.8	0.000						

2. Date: February 27, 2012; Ethanol Source: Binaca Fast Blast Cool mint spray, 3 squirts, 1st test, 2 squirts).; Time elapsed since exposure measured with timing device; Thermometers: 72576029, 11564016

DMT-GF Mouth Alcohol Limit of Detection Results[3, 4]																
	Test #1			Test #2			Test #3			Test #4			Test #5			
Sample	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	Time Elapsed (min)	Volume Delivered (L)	Result	
1	0		overflow	0.5		MA	1	1	MA	1.5		MA	0.25		Blank Error	
2	2.5		MA	5		MA	5.5	1.7	MA	4.5		MA	2.75		Blank Error	
3	5.5		MA	7.5		0.004	12	3.1	0.000	11		0.000	5.5		Blank Error	
4	5.83		MA	11.5		0.000							9		Blank Error	
5	12															

3. Date: February 27, 2012; Ethanol Source: Binaca Fast Blast Cool mint spray, 3 squirts; Time elapsed since exposure measured with timing device; Thermometers: 72576029, 11564016
4. The DMT-GF was awarded the lowest score due to failure of test #5.

Subject	Mouth Alcohol Detection in Drinking Subjects Results													
	Intoxilyzer 9000[1]					Evidenzer 240 Mobile[2]					DMT-GF[3]			
	Test #1		Test #2			Test #1		Test #2			Test #1		Test #2	
	Time Elapsed (min)	Result	Time Elapsed (min)	Result	Estimated BrAC (g/210L)	Time Elapsed (min)	Result	Time Elapsed (min)	Result	Estimated BrAC (g/210L)	Time Elapsed (min)	Result	Time Elapsed (min)	Result
1	2	**MA**	4	**MA**	0.105	2	**MA**	4.5	**MA**	0.123				
2	3.5	**MA**	5	**0.073**	0.080	4.5	**0.105**	6.5	**0.102**	0.096				
3	3	0.163	5	0.103	0.077	3.5	**MA**	5	**MA**	0.084				
4	1	**MA**	2.5	**MA**	0.049	7	**0.07**	9	**0.056**	0.066				
5	1.5	0.189	3.5	0.112	0.093	3.5	**MA**	5	**MA**	0.100				
6	2.5	0.132	4	**0.116**	0.116									
7	1	**MA**	3	MA	0.069									

1. 64% mouth alcohol detections.
2. 100% mouth alcohol detections
3. Dosed subject test for DMT-GF was cancelled due to chronic Interference warning.
4. Time is time elapsed since last drink, measured with timing device.
5. Mouth alcohol (MA) created by consumption of alcoholic beverage.
6. Estimated BrAC at time of mouth alcohol test was calculated using modified Widmark formula.
7. Results in bold indicate effective flag.
8. Dates: February 15, 2012; February 21, 2012; March 14, 2012; and April 4, 2012; Ethanol Source: Alcoholic beverage; Time elapsed since exposure measured with timing device; Thermometers: 72576029, 11564016

Sample	Mouth Alcohol Detection with Foreign Objects Results[1]								
	Dentyne Ice Arctic Chill - 1 piece					Publix yellow sheet cake ~1 inch cube			
	Time Elapsed (min)	Intoxilyzer 9000	Evidenzer 240 Mobile	DMT-GF		Time Elapsed (min)	Intoxilyzer 9000	Evidenzer 240 Mobile	DMT-GF
1	Baseline	0.000	0.000	0.000		Baseline	0.000	0.000	0.000
2	0	MA	MA	MA		0	MA	MA	MA
3	2	0.049	MA			2	MA	MA	
4	3			MA		3			MA
5	4	0.020	MA			4	0.032	MA	
6	6	0.000	0.000	MA		6	0.013	MA	MA
7	9			0.000		8	0.000	MA	
8						9			0.003
9						10		MA	
10						12		0.015	0.000
11						14		0.000	

1. Date: March 6, 2012; Ethanol Source: Binaca Fast Blast Cool mint spray, 3 squirts; Time elapsed since exposure measured with timing device; Thermometers: 72576029, 11564016

Sampling Parameters

Sampling Parameter Criteria Evaluated	Summary	Test Method	Scoring
Sample Volume Effect	The breath alcohol analyzer should indicate whether the conditions of exhalation (e.g., continuity and flow) complied with the conditions specified by the manufacturer in order to ensure a representative measurement. These conditions, specified by the manufacturer, shall comply with the following values: exhaled volume: greater than or equal to a value between 1.1L and 1.5L, pressure: greater than or equal to 10 hPa, or Flow rate: greater than or equal to a value between 0.10 L/s and 0.15 L/s.	The effect of sample volume was evaluated by delivering a blank air sample at approximately 20L/min. Sample delivery times were varied to deliver different sample volumes to the analyzer. Delivery times evaluated were 2, 3, 4, 5, 6, 10, 15, and 20 seconds. These steps were repeated using an ethanol standard and a wet bath simulator. In addition, at 5 and 15 seconds an ethanol standard was analyzed ten consecutive times and evaluated for accuracy and precision.	Instruments that exhibited an average measured breath volume within +/- 25% of the predicted value were awarded 10 points. Instruments that showed a %CV of 5% or less at both the 5 second and 15 second standard check were awarded an additional 10 points.
Sample Flow Rate Effect	The breath alcohol analyzer should indicate whether the conditions of exhalation (e.g., continuity and flow) complied with the conditions specified by the manufacturer in order to ensure a representative measurement. These conditions, specified by the manufacturer, shall comply with the following values: exhaled volume: greater than or equal to a value between 1.1L and 1.5L, pressure: greater than or equal to 10 hPa, or Flow rate: greater than or equal to a value between 0.10 L/s and 0.15 L/s.	The effect of sample flow rate was evaluated using a blank air sample delivered at 20L/min and 10 L/min. The ethanol standard was analyzed ten consecutive times at ten seconds at both the 20L/min and 10L/min flow rate and evaluated for accuracy and precision.	Instruments yielding an average measured volume within +/-25% of the predicted value at both the 20L/min and 10L/min flow rate were awarded 10 points. Instruments that showed a %CV of 5% or less at both the 10L/min and 20L/min standard check were awarded an additional 10 points. If the instrument is incapable of receiving a sample at the 10L/min flow rate during the ethanol standard test it was not be counted against their score. Only printed BrACs were used in the determination of %CV.

Sampling Parameter Criteria Evaluated	Summary	Test Method	Scoring
Sample Volume Effect with Drinking Subjects	The breath alcohol analyzer should indicate whether the conditions of exhalation (e.g., continuity and flow) complied with the conditions specified by the manufacturer in order to ensure a representative measurement. These conditions, specified by the manufacturer, shall comply with the following values: exhaled volume: greater than or equal to a value between 1.1L and 1.5L, pressure: greater than or equal to 10 hPa, or Flow rate: greater than or equal to a value between 0.10 L/s and 0.15 L/s.	The effect of sample volume in live drinking subjects was evaluated by requiring dosed subjects to provide a sample meeting the minimum requirements for an acceptable sample immediately followed by a maximum exhalation. The procedure was performed for at least five dosed subjects. The instrument results and breath alcohol profile were evaluated to determine the volume and flow effects on analyzer results.	The mean of consecutive breath samples was calculated. Sample volume effect was deemed insignificant when duplicate sample results are within 7% or +/- 0.004 g/210L of their mean. Instruments showing insignificant sample volume effect in at least 95% of subjects would have been awarded the maximum score of 25, while instruments showing insignificant sample volume effect in at least 67% of subjects were awarded a score of 10. All other instruments were awarded a score of 0.

Sample Volume Effect Solutions

Solution. Number	Stock Added uL	Liquid Conc.	Vapor Conc (g/210L)	Simulator	Temp C
1	775	0.1223	0.1002	G10635	33.933
2	775	0.1223	0.1002	G10635	33.933
3	775	0.1223	0.1002	G3360	33.959

Date: March 30, 2012; Flask: 500 mL class A #E; Ethanol Stock Solution: Acros Organic lot B0521933; Conditions: 985.8 hPa, 55.6% RH, 21.8°C; Pipette: T-170; Thermometers: 72576029, 11564016

Sample Volume Effect Results							
Solution 1 - 0.10 g/210L- 20L/min, 5 sec				**Solution 2 & 3- 0.10 g/210L- 20L/min, 15 sec**			
Sample Number	**Intoxilyzer 9000**	**Evidenzer 240 mobile**	**DMT-GF**	**Sample Number**	**Intoxilyzer 9000**	**Evidenzer 240 mobile**	**DMT-GF[1]**
1	0.097	0.098	INT	1	0.099	0.101	INT
2	0.097	0.099		2	0.097	0.102	
3	0.095	0.099		3	0.097	0.101	
4	0.096	0.098		4	0.096	0.098	
5	0.097	0.098		5	0.095	0.097	
6	0.096	0.099		6	0.094	0.097	
7	0.096	0.097		7	0.099	0.098	
8	0.096	0.097		8	0.098	0.095	
9	0.096	0.097		9	0.098	0.095	
10	0.094	0.098		10	0.098	0.096	
Average	0.096	0.098	N/A		0.0971	0.098	N/A
Standard Deviation	0.000943	0.000816	N/A		0.001663	0.002539	N/A
%CV	0.98%	0.83%	N/A		1.71%	2.59%	N/A

1. The DMT-GF gave an interference warning when exposed to 0.10 g/210L ethanol solution.

Volume Acceptance Test and Comparison Results[1]											
			Intoxilyzer 9000			Evidenzer 240 mobile			DMT-GF		
Sample Number	Flow Rate	Pump	Volume (L)	Time (min)	Predicted Volume	Volume (L)	Time (min)	Predicted Volume	Volume (L)	Time (min)	Predicted Volume
1	20L/min	DP-1258	0.86	2.2	0.73	0.9	2.6	0.9	NA[2]	2	0.67
2	20L/min	DP-1258	1.44	3.7	1.23	1.4	3.8	1.3	NA[2]	3	1.00
3	20L/min	DP-1258	1.61	4.2	1.40	1.7	4.7	1.6	1.73	4	1.33
4	20L/min	DP-1258	2.24	5.7	1.90	2.0	5.5	1.8	1.95	5	1.67
5	20L/min	DP-1258	2.51	6.4	2.13	2.3	6.6	2.2	2.41	6	2.00
6	20L/min	DP-1258	3.99	10.4	3.47	3.7	10.3	3.4	3.92	10	3.33
7	20L/min	DP-1258	5.98	15.7	5.23	5.5	15.3	5.1	5.84	15	5.00
8	20L/min	DP-1258	7.55	20.2	6.73	7.6	20.8	6.9	7.70	20	6.67
Average Accuracy			114.66%			108.19%			117.75%		

1. Date: March 30, 2012; Flask: 500 mL class A #E; Ethanol Stock Solution: Acros Organic lot B0521933; Conditions: 985.8 hPa, 55.6% RH, 21.8 C; Pipette: T-170; Thermometers: 72576029, 11564016.
2. Volume delivered was below the instrument's accepted minimum volume

Sample Flow Rate Effect Solutions					
Solution. Number	**Stock Added uL**	**Liquid Conc.**	**Vapor Conc (g/210L)**	**Simulator**	**Temp C**
1	775	0.1223	0.1002	G3360	34.051
2	775	0.1223	0.1002	G10635	34.064

Sample Flow Rate Results[1]						
	Solution 1 0.10 g/210L- 20L/min, 10 sec			**Solution 2 0.10 g/210L- 10L/min, 10 sec**		
Sample Number	**Intoxilyzer 9000**	**Evidenzer 240 mobile**	**DMT-GF**	**Intoxilyzer 9000**	**Evidenzer 240 mobile[2]**	**DMT-GF**
1	0.095	0.098	INT	0.095		INT
2	0.095	0.098		0.096		
3	0.097	0.098		0.096		
4	0.097	0.097		0.095		
5	0.096	0.096		0.097		
6	0.095	0.096		0.095		
7	0.095	0.096		0.096		
8	0.093	0.094		0.095		
9	0.096	0.095		0.094		
10	0.092	0.094		0.096		
Average	0.0951	0.0962	N/A	0.0955	NA	NA
Std. Dev.	0.001595	0.0015492	N/A	0.00085	NA	NA
%CV	1.68%	1.61%	N/A	0.89%	NA	NA

1. Date: March 29, 2012; Flask: 500 mL class A #E; Ethanol Stock Solution: Acros Organic lot B0521933; Conditions: 987.2 hPa, 54.7% RH, 21.7°C; Pipette: T-170; Thermometers: 72576029, 11564016.
2. The Evidenzer 240 Mobile would not accept a sample at 10L/min due to its configuration

Flow Acceptance Test and Comparison Results											
			Intoxilyzer 9000			Evidenzer 240 mobile			DMT-GF		
Sample Number	Flow Rate	Pump	Volume (L)	Time (min)	Predicted Volume	Volume (L)	Time (min)	Predicted Volume	Volume (L)	Time (min)	Predicted Volume
1	20L/min	DP-1056	**4.00**	**10.4**	**3.47**	**3.8**	**10.4**	**3.5**	**4.03**	**10**	**3.33**
2	20L/min	DP-1258	**3.95**	**10.4**	**3.47**	**3.6**	**10.4**	**3.5**	**3.89**	**10**	**3.33**
3	10L/min	DP-1056	2.60	10.7	1.78	NA[1]	0.1	NA	2.54	10	1.67
4	10L/min	DP-1258	2.52	10.4	1.73	NA[1]	0.1	NA	2.32	10	1.67

1. Volume delivered was below the instrument's accepted minimum volume
2. Results in bold meet the criteria stated in the scoring criteria.

Sample Volume Effect with Drinking Subjects Results[1,2]										
	Intoxilyzer 9000					Evidenzer 240 Mobile				
Subject	Time (min)	Minimum	Maximum	Mean	% Difference from Mean	Time (min)	Minimum	Maximum	Mean	% Difference from Mean
1	15	0.063	0.073	0.068	7.35%	16	0.081	0.087	**0.084**	**3.57%**
2	30	0.042	0.045	**0.0435**	**3.45%**	19	0.048	0.057	0.0525	8.57%
3	32	0.056	0.064	**0.06**	**6.67%**	24	0.07	0.076	**0.073**	**4.11%**
4	15	0.099	0.103	**0.101**	**1.98%**	27	0.041	0.043	**0.042**	**2.38%**
5	30	0.049	0.057	**0.053**	**7.55%**	32	0.051	0.063	0.057	10.53%
6	19	0.022	0.024	**0.023**	**4.35%**					
7	22	0.085	0.09	**0.0875**	**2.86%**					

1. Dates: February 15, 2012; February 21, 2012; March 14, 2012; and April 4, 2012; Ethanol Source: Alcoholic beverage; Time elapsed since exposure measured with timing device; Thermometers: 72576029, 11564016
2. Drinking subject test for DMT-GF cancelled due to chronic Interference warning.
3. Time (min) is time elapsed since last drink, measured with timing device.
4. Minimum: minimum acceptable exhalation, subject asked to stop blowing when volume was between 1.1-1.5L.
5. Maximum: subjects asked to give a maximum exhalation when providing breath sample.
6. Results in bold pass the listed scoring criteria.

Radio Frequency Interference (RFI) Detection Tests

RFI Detection Tests Criteria Evaluated	Summary	Test Method	Scoring
30-300 MHz	In the presence of a disturbance, the breath alcohol analyzer should display no significant fault. The significant fault is equal to a maximum permissible error of 0.01 g/210L for the following disturbances: radiated or conducted radio frequency and electromagnetic fields.	The analyzer was evaluated for RFI immunity and detection at radio frequencies in the range of 30-300 MHz using a police radio. The radio's power output was used to determine the approximate field strength at various distances. The position of the radio was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths. The response of the analyzer at each distance and field strength was evaluated to determine the effectiveness of the RF immunity and RFI detector.	Instruments were deemed to show RF immunity if signal strengths of less than 10V/m have no effect on instrument operation. Instruments showing RF immunity were awarded 5 points. Instruments were deemed to show RF detection if the presence of RF field strengths at any tested level is "flagged" by the instrument. Instruments showing RF detection were awarded an additional 5 points. Any instrument producing an elevated BrAC in the presence of RF without being "flagged" by the instrument would have been disqualified from consideration.
800-1000 MHz	In the presence of a disturbance, the breath alcohol analyzer should display no significant fault. The significant fault is equal to a maximum permissible error of 0.01 g/210L for the following disturbances: radiated or conducted radio frequency and electromagnetic fields.	The analyzer was evaluated for RFI immunity and detection at radio frequencies in the range of 800-1000 MHz using a cell or cordless phone. The phone's power output was used to determine the approximate field strength at various distances. The position of the phone was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths. The response of the analyzer at each distance and field strength was evaluated to determine the effectiveness of the RF immunity and RFI detector.	Instruments were deemed to show RF immunity if signal strengths of less than 10V/m have no effect on instrument operation. Instruments showing RF immunity were awarded 4 points. Instruments were deemed to show RF detection if the presence of RF field strengths at any tested level greater than 10 V/m was "flagged" by the instrument. Instruments showing RF detection were awarded 4 points. Any instrument producing an elevated BrAC in the presence of RF without being "flagged" by the instrument would have been disqualified from consideration.

RFI Detection Tests Criteria Evaluated	Summary	Test Method	Scoring
1800-2000 MHz	In the presence of a disturbance, the breath alcohol analyzer should display no significant fault. The significant fault is equal to a maximum permissible error of 0.01 g/210L for the following disturbances: radiated or conducted radio frequency and electromagnetic fields.	The analyzer was evaluated for RFI immunity and detection at radio frequencies in the range of 1800-2000 MHz using a cell or cordless phone. The phone's power output was used to determine the approximate field strength at various distances. The position of the phone was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths. The response of the analyzer at each distance and field strength was evaluated to determine the effectiveness of the RF immunity and RFI detector.	Instruments were deemed to show RF immunity if signal strengths of less than 10V/m have no effect on instrument operation. Instruments showing RF immunity were awarded 3 points. Instruments were deemed to show RF detection if the presence of RF field strengths at any tested level greater than 10 V/m was "flagged" by the instrument. Instruments showing RF detection were awarded 2 points. Any instrument producing an elevated BrAC in the presence of RF without being "flagged" by the instrument would have been disqualified from consideration.
2200-2500 MHz	In the presence of a disturbance, the breath alcohol analyzer should display no significant fault. The significant fault is equal to a maximum permissible error of 0.01 g/210L for the following disturbances: radiated or conducted radio frequency and electromagnetic fields.	The analyzer was evaluated for RFI immunity and detection at radio frequencies in the range of 2200-2500 MHz using wireless router. The device's power output was used to determine the approximate field strength at various distances. The position of the device was varied with respect to the analyzer while attempting to perform a breath test to simulate varying RF field strengths. The response of the analyzer at each distance and field strength was evaluated to determine the effectiveness of the RF immunity and RFI detector.	Instruments were deemed to show RF immunity if signal strengths of less than 10V/m have no effect on instrument operation. Instruments showing RF immunity were awarded 3 points. Instruments were deemed to show RF detection if the presence of RF field strengths at any tested level greater than 10 V/m was "flagged" by the instrument. Instruments showing RF detection were awarded 2 points. Any instrument producing an elevated BrAC in the presence of RF without being "flagged" by the instrument would have been disqualified from consideration.

Radio Frequency (RF) Devices Used for Testing							
Frequency Range	**RF Source**	**Serial No.**	**Primary Frequency**	**Avg Field Stength (mV/m)**	**Measurement distance**	**Measurement Device**	**Serial No.**
30-300 MHz	Vertex Std. VX-18V	#5H 0033327	154.80 MHz	163.4	12"	Spectran HF 6065	#33657
800 – 1000 MHz	ATT Atrix II	MB865	843.5 MHz	469.7	1"	Spectran HF 6065	#33657
800 – 1000 MHz	ATT Atrix II	MB865	1852.5 MHz	892.4	1”	Spectran HF 6065	#33657
1800 – 2000 MHz	Sprint HTC	PH44100	1867.5 MHz	200.1	1"	Spectran HF 6065	#33657
2200 – 2500 MHz	Linksys Router Model WRK54G	CGT00D516671	2474 MHz	866.7	6”	Spectran HF 6065	#33657

RF Interference Test Results						
Date Tested	**Frequency Range**	**Distance**	**Measured Field Strength V/m**	**Intoxilyzer 9000**	**Evidenzer 240 Mobile**	**DMT-GF**
March 21, 2012	30 – 300 MHz[1]	12”	0.1634	RFI	0.000	0.000
March 21, 2012	30 – 300 MHz	1”	3.00[2]	RFI	0.000	0.000
May 24, 2012	800 – 1000 MHz[3]	1”	0.47/0.89[4]	0.000	0.000	0.000
April 11, 2012	1800 – 2000 MHz[3]	1”	0.2	0.000	0.000	0.000
June 12, 2012	2200 – 2500 MHz[3]	6”	0.87	0.000	0.000	0.000

1. RF source did not produce field strength greater than 10V/m.
2. Points awarded to instruments showing immunity at 3V/m.
3. RF source did not produce field strength greater than 10V/m. No points for 10V/m flag test were awarded.
4. RF source emitted two frequencies simultaneously.

Instrument Stability Tests

RFI Detection Tests Criteria Evaluated	Summary	Test Method	Scoring
Zero Test	The drift from 0.00 g/210L should be less than 0.002 g/210L in 4 hours.	The analyzer was evaluated for stability using a blank air sample provided by an air pump at 20L/min. An alcohol free air sample was evaluated 20 times to ensure that a negative result is returned. The instrument was re-evaluated using the same procedure at a period at least four hours later.	Instruments showing any positive alcohol concentration during this evaluation were awarded no points. All other instruments were awarded a score of 5. Instruments producing any readings greater than 0.01 g/210L during this test would have been disqualified from consideration.
4 Hour Stability Test	The drift at 0.08 g/210L should be less than 0.004 g/210L in 4 hours under normal conditions**.**	The analyzer was evaluated for stability using a simulator alcohol standard or dry gas standard at 0.08 g/210L. The standard was evaluated 20 times and the results were statistically evaluated for mean accuracy and %CV. The instrument was re-evaluated using the same procedure at a period at least four hours later.	Instruments showing a %CV of 3% or less and a mean within 3% of target or better for both the initial and 4 hour evaluation were awarded the maximum score of 10. Instruments showing a %CV of 5% or less and a mean within 5% of target for both the initial and 4 hour evaluation was awarded a score of 5. Instruments exhibiting a %CV of greater than 10% or a mean BrAC that was not within 10% of the target value would have been disqualified from consideration.
Two Month Stability Test	The drift at 0.08 g/210 L should be less than 0.004 g/210L in two months under normal conditions.	The analyzer was evaluated for stability using a simulator alcohol standard or dry gas standard at 0.08 g/210L. The standard was evaluated 20 times and the results were statistically evaluated for mean accuracy and %CV. The instrument was re-evaluated using the same procedure at a period at least two months later.	Instruments showing a %CV of 3% or less and a mean within 3% of target or better for both the initial and two month evaluation were awarded the maximum score of 10. Instruments showing a %CV of 5% or less and a mean within 5% of target for both the initial and two month evaluation were awarded a score of 5. Instruments exhibiting a %CV of greater than 10% or a mean BrAC that was not within 10% of the target value would have been disqualified from consideration.

RFI Detection Tests Criteria Evaluated	Summary	Test Method	Scoring
Memory Test	The memory effect should be less than 0.002 g/210L. The error in the result obtained with a standard having a mass concentration which is more than 0.02 g/210L less than that of another standard previously injected should be less than or equal to 5% for the lower mass concentration or 0.004 g/210L whichever is greater.	The analyzer was evaluated for memory using a simulator alcohol standard at 0.40 g/210L followed by a simulator alcohol standard at 0.02 g/210L. The standard pairs were evaluated 10 times and the results were statistically evaluated for mean accuracy and %CV. The data was compared to data collected in the linear dynamic range test to determine if any statistical memory effect existed.	Instruments showing a %CV of 3% or less and a mean within 5% of target or better for both alcohol levels would have been awarded the maximum score of 20. Instruments showing a %CV of 5% or less and a mean within 10% of target for both alcohol levels were awarded a score of 10. All other instruments were awarded a score of 0.

Zero Test Results[1]					
		Test 1		Test 2	
Instrument	Simulator	Average	Std Dev	Average	Std Dev
Intoxilyzer 9000	G10635	0.000	0.0000	0.000	0.0000
Evidenzer 240 Mobile	G3360	0.0008[2]	0.0003	0.00	0.000
DMT-GF	PS1196	0.000	0.0000	0.000	0.0000

1. All simulators filled with deionized water. Tests conducted on March 12, 2012 and May 29, 2012.
2. Below instrument's reported testing LOD and would be considered negative in testing mode.

4 Hour Stability Test Results[1]									
				Baseline Test			4 hour Test		
Instrument	Guth 0.08 g/210L Solution lot#	Simulator	Temp°C	Mean	Std dev	%CV	Mean	Std dev	%CV
Intoxilyzer 9000	11200	G10635	33.913	0.0778	0.0012	1.54%	0.0800	0.0008	1.00%
Evidenzer 240 Mobile	11200	G3360	33.934	0.0790	0.001566	1.98%	0.0820	0.000816	1.00%
DMT-GF	11200	PS1196	33.976	0.0812	0.00041	0.51%	INT	INT	INT

1. Date: March 12, 2012; Conditions: 1005 hPa, 18.4% RH, 20.8°C; Thermometers: 72576029, 11564016

2 Month Stability Test Results											
		Baseline Test[1]					2 Month Test[2]				
Instrument	Guth 0.08 g/210L Solution lot#	Simulator	Temp°C	Mean	Std dev	%CV	Simulator	Temp°C	Mean	Std dev	%CV
Intoxilyzer 9000	11200	PS1196	33.906	0.0800	0.0007	0.88%	G10635	34.036	0.0784	0.0011	1.40%
Evidenzer 240 Mobile	11200	PS1196	33.906	0.0800	0.000402	0.50%	G10635	34.036	0.0810	0.000269	0.33%
DMT-GF[3]	11200	PS1196	33.922	0.0808	0.000523	0.65%			N/A	N/A	N/A

1. Date February 3, 2012 and February 7, 2012; Conditions: 998.6 hPa, 29.2% RH, 20.7°C; Thermometers: 72576029, 11564016
2. Date: April 3, 2012; Conditions: 984.2 hPa, 58.7% RH, 20.9°C; Thermometers: 72576029, 11564016
3. DMT-GF showed Interference warning on initial solution check April 3, 2012. Stability check not done due to interference warning.

Memory Test Solutions						
Solution. Number	**Stock Added uL**	**Liquid Conc.**	**Vapor Conc (g/210L)**	**Pipette**	**Stock lot#**	**Flask (500mL)**
1	155.26	0.0245	0.020	T-48	B0521933	E
2	3095	0.4884	0.400	T-170	B0521933	E

Memory Test Results[1]											
Solution. Number	**Simulator**	**Temp °C**	**Intoxilyzer 9000**			**Evidenzer 240 Mobile**			**DMT-GF[2]**		
			Mean	**Std dev**	**%CV**	**Mean**	**Std dev**	**%CV**	**Mean**	**Std dev**	**%CV**
1	G3360	34.049	0.0142	0.0012	8.66%	0.0189	0.0006	3.00%	NA	NA	N/A
2	G10635	33.965	0.3823	0.0033	0.87%	0.3831	0.0056	1.46%	NA	NA	N/A

1. Date March 12, 2012; Conditions: 1005 hPa, 18.4% RH, 20.8°C; Thermometers: 72576029, 11564016
2. Unable to complete DMT-GF test due to chronic failure messages: INT, ambient fail, blank error.