ALABAMA DEPARTMENT OF FORENSIC SCIENCES
ADMINISTRATIVE CODE

CHAPTER 370-1-1
CHEMICAL TEST FOR INTOXICATION

370-1-1-A Appendix A.

Appendix A

EVIDENTIAL BREATH ALCOHOL TESTING QUALITY CONTROL.

Purpose.

The purpose of this section is to inform the public of the quality control or good laboratory practices that are utilized by the Alabama Department of Forensic Sciences to support Breath Alcohol Testing in the field. The practices described in this section only demonstrate that each Draeger Alcotest 7110 MKIII is capable of performing as expected. The method as described in 370-1-1-.01(4) is the only sequence of steps that isolates alcohol (ethanol) from a subject to accurately determine the amount. Subsequently the quality control built into the method is the only process that verifies a particular Breath Alcohol Test did indeed perform as expected. Since the authority derived from §32-5A-194 Code of Ala. 1975, as amended, is limited to a method to perform a chemical analysis to determine the alcoholic content of a subjects blood the following information pertaining to good laboratory practice **does not constitute a rule.**

(1) Pre-installation Evaluation. Each Draeger Alcotest 7110 MKIII is evaluated by the Alabama Department of Forensic Sciences Technical Director or his designee prior to being placed in operation. The evaluation will demonstrate the ability of each Draeger Alcotest 7110 MKIII to identify and flag specific conditions; as well as, verify the analytical integrity of the instrument.

(a) *Purging Error*. Place the instrument in the "Error Check" mode. Restrict the air flow into the ambient air inlet while the pump is running. This will prompt the instrument to display "Check Sampling Hose" and sound an audible alarm. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(b) *Minimum Volume Not Achieved*. Place the instrument in the "Error Check" mode. At the prompt

"Please Blow", deliver a deficient sample volume. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(c) *Blowing Time Too Short.* Place the instrument in the "Error Check" mode. At the prompt "Please Blow", deliver a sample of sufficient volume and deficient duration. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(d) *Blowing Not Allowed.* Place the instrument in the "Error Check" mode. At any time other than when the instrument indicates "Please Blow" deliver a sample into the instrument. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(e) *Ready To Blow Expired.* Place the instrument in the "Error Check" mode. At the prompt "Please Blow" do not provide a sample. After three (3) minutes has elapsed this error will be triggered by the instrument. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(f) *Ambient Air Check.* Place the instrument in the "Error Check" mode. When the instrument begins to purge itself, direct an ethanol vapor (typically from a 0.020 g/210L dry gas cylinder) near the breath hose inlet, but not directly into the breath hose inlet. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(g) *Interference.* Place the instrument in the "Error Check" mode. Prepare a methanol control by adding 105 microliters of methanol to 500 milliliters of distilled water and dispense into a simulator. At the prompt "Please Blow", deliver a sufficient sample into the instrument. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(h) *Mouth Alcohol.* Place the instrument in the "Error Check" mode. At the prompt "Please Blow" the

evaluator should rinse his or her mouth with a common mouthwash containing ethanol, then deliver a sufficient sample into the instrument. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(i) *Accuracy Check Fail*. Place the instrument in the "Error Check" mode. Connect the 0.020 g/210L dry gas cylinder to the 0.080 g/210L gas port and initiate a test. Record pass if the message "Error Triggered, Test Okay" is printed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(j) *Standard Gas Supply*. Disconnect the dry gas cylinders from the instrument and initiate a test. Record pass if the message "Stnd Gas Supply" is displayed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(k) *Outside +/- Tolerance*. Initiate an administrative test sequence. At the prompt "Please Blow" deliver a sufficient sample. When prompted to deliver the second sample, deliver a sufficient sample which varies in concentration from the first by at least 0.021 g/ 210 L. Record pass if the message "Outside +/- Tol" is displayed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(l) *No Admittance*. The evaluator should attempt to initiate a restricted function without the use of an appropriate key. Record pass if the message "No Admittance" is displayed. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(m) *Linearity Check*. Utilizing manufactured solutions prepare simulators with the following ethanol concentrations: 0.000g/210L, 0.020g/210L (+/- 0.005 g/ 210L), 0.040 g/210L (+/- 0.005 g/210L), 0.080 g/210L (+/- 5%), 0.120 g/210L (+/- 5%), 0.200 g/210L (+/- 5%), and 0.500 g/210L (+/- 5%). Place the instrument in the "Acc-Check" mode. When instructed, connect the appropriate simulator to the instrument. Repeat this procedure three times for each ethanol control. Average the results obtained for each concentration from the three runs. To record pass, the average results must fall within the following parameters: 0.000 g/210L, 0.020 g/210L (+/- 0.005 g/210L), 0.040 g/210L (+/- 0.005 g/ 210L), 0.080 g/210L (+/- 5%), 0.120 g/210L (+/- 5%),

0.200 g/210L (+/- 5%), and 0.500 g/210L (+/- 5%). If the instrument does not pass, initiate the necessary corrective actions to achieve the desired specifications.

(n) *Breath Temperature Check*. Place the instrument in "ABA" mode. Initiate a testing sequence consisting of three breath samples. When instructed to do so deliver three breath samples into the instrument from a precisely controlled water bath apparatus adjusted to a temperature of approximately 34.0°C. Repeat this procedure using a precisely controlled water bath apparatus adjusted to a temperature of approximately 37.0°C. Record pass if the instrument records a temperature within +/- 0.3°C of the actual temperature. If the instrument does not pass initiate the necessary corrective actions to restore the instrument to proper working condition.

(o) *Acetone Interference Check*. Prepare a solution consisting of 500 milliliters of a manufactured 0.080 g/210L solution of ethanol and 950 microliters of Acetone in a simulator. Initiate an administrative test sequence. At the prompt "Please Blow", deliver a sufficient sample into the instrument. Record pass if the message "Interference" is displayed or if the instrument reports a result of 0.080 g/210 L +/- 0.004 g/ 210 L. If the check does not pass initiate the necessary corrective actions to restore the instrument to proper working condition.

(p) *Voltage Range Check*. Verify the Draeger Alcotest 7110 MKIII's performance capability throughout a voltage range of approximately 90-200 volts AC and 12 volts DC.

1. With the instrument connected to a variable AC power supply, adjust the voltage to approximately 90 volts AC. Initiate a standard check sequence consisting of three measurements of a 0.080 g/210L dry gas standard. Record pass if the instrument records an average result between 0.076-0.084 g/210L. If the instrument does not pass, initiate the necessary corrective actions to achieve the desired specification.

2. With the instrument connected to a variable AC power supply, adjust the voltage to approximately 220 volts AC. Initiate a standard check sequence consisting of three measurements of a 0.080 g/210L dry gas standard. Record pass if the instrument records an average result between 0.076-0.084 g/210L. If the instrument does not pass,

initiate the necessary corrective actions to achieve the desired specification.

3. With the instrument connected to a DC power supply, adjust the voltage to approximately 12 volts DC. Initiate a standard check sequence consisting of three measurements of a 0.080 g/210L dry gas standard. Record pass if the instrument records an average result between 0.076-0.084 g/210L. If the instrument does not pass initiate the necessary corrective actions to achieve the desired specification.

(q) *Barometer Check*. Establish communication with the instrument in the diagnostic screen mode. Compare the barometric pressure as indicated by the instrument to the laboratories barometer. Record pass if the difference between the two readings is not greater than 5%. If the instrument does not pass initiate the necessary corrective actions to restore the instrument to proper working condition.

(r) *Standard Deviation Check*. Initiate a standard check sequence consisting of ten measurements of a 0.080% dry gas standard. Record pass if the instrument records the following: an average result between 0.076-0.084 g/210L and a standard deviation of less than 0.0025. If the instrument does not pass initiate the necessary corrective actions to restore the instrument to proper working condition.

(2) Data Download Review. The Test Data collected and stored by each Draeger Alcotest 7110 MKIII in the field is transferred to the Alabama Department of Forensic Sciences. Upon transfer, the data is systematically reviewed to identify instrument problems and to perform trend analyses. This data transfer allows the Alabama Department of Forensic Sciences to review essentially 100% of the Breath Alcohol Tests performed statewide.

(a) *Communication Check*. The Draeger Alcotest 7110 Data Retrieval and Archiving Program produces a Summary of Automatic Data Retrieval. The summary readily identifies those instruments for which communication was not established. For those instruments that automatic communication was unsuccessful, manually establish communication. If communication problems persist investigate the source of the problem and document.

(b) *Message Check*. Open the Message File (50 File) to identify the automatic Instrument Messages and Operator Messages retrieved by the current download. Review the messages to determine the needs of the

instrument, operator, or location (supplies). Document any actions taken.

(c) *Instrument Parameter Check.* Open the Data File (10 File) to identify Instrument Parameter data retrieved by the current download. Isolate the data corresponding to each of the following parameters collected before and after the subject samples for review: *Ambient Air Pressure, 12V DC Power Supply, Battery Voltage, IR Signal, EC Offset, Cuvette Temperature, Breath Hose Temperature, Breath Probe Temperature, Breath Temperature Thermistors, Flow Sensor, Pre-Test Diagnostic Check, and Post-Test Diagnostic Check.* For each parameter identify when if any an instrument recorded a result outside the specified operating range. Investigate the source of any problem and document any corrective action.

(d) *Dry Gas Configuration Check.* Open the Data File (10 File) to identify the Dry Gas Configuration data retrieved by the current download. Isolate the data corresponding to each of the following categories for review: *0.02 Gas Lot Number, 0.02 Gas Expiration Date, 0.08 Gas Lot Number, 0.08 Gas Expiration Date, 0.02 Target Concentration, 0.02 Relative Tolerance, 0.02 Absolute Tolerance, 0.08 Target Concentration, 0.08 Relative Tolerance, and 0.08 Absolute Tolerance.* For each category identify if the instrument contains the correct configuration. Investigate any discrepancy and document any corrective action.

(e) *Error and Accuracy Check.* Open the Data File (10 File) to identify the Error and Accuracy Check data retrieved by the current download. Isolate the data corresponding to each of the following errors or measurements: *Error, Error 2, Error 3, Error 4, 0.02 gas data, and 0.08 gas data.* For each category identify when if any an instrument recorded a result outside the specified operating range. Also review the 0.02 g/210L and 0.08 g/210L gas data to identify low or high trends. Investigate the source of any problem or trend and document any corrective action.

(3) Electronic Inspection. The Electronic Inspection serves primarily as a quality assurance role by being a back-up inspection to the instrument set-up procedures and Data Download Review. The Electronic Inspection also is an opportunity to evaluate instrument performance over an extended time frame.

(a) *Diagnostic Screen Check.* Initiate the Draeger Alcotest 7110 Data Retrieval and Archiving Program. Establish communication with the instrument

through the Diagnostic Screen. Evaluate the following displayed parameters: *Instrument Serial Number, Instrument Location, Firmware Version, Date, Time, Ambient Air Pressure, 12VDC Power Supply, Battery Voltage, IR Signal, EC Offset, Cuvette Temperature, Breath Hose Temperature, Breath Probe Temperature, Breath Temperature 1, Breath Temperature 2, Function Key, and Flow Sensor.* Investigate any discrepancy and document any corrective action.

(b) *Interactive Screen Check*. Initiate the Draeger Alcotest 7110 Data Retrieval and Archiving Program. Establish communication with the instrument through the Interactive Screen. Evaluate the following displayed parameters: *Measuring Units, Calibration Configuration, and Cylinder Pressure Limit.* Investigate any discrepancy and document any corrective action.

(c) *Calibration Check Plot*. Open the Data File (10 File) to identify the Accuracy Check data retrieved by the instrument over the last 6 months. Plot the Accuracy Check data for both the 0.02 and 0.08 g/210L Accuracy Checks. Investigate the source of any problem or trend and document any corrective action.

(4) Annual Re-Evaluation/Pre-Installation Evaluation. Regardless of the performance of an instrument in the field each instrument will be brought back to the Alabama Department of Forensic Sciences laboratory once a year for evaluation. This evaluation will consist of the battery of tests described under (1) Pre-Installation Evaluation.

(a) Intoximeters Intox DMT Dual Sensor

1. Pre-installation Evaluation. Each Intoximeters Intox DMT Dual Sensor is evaluated by the Alabama Department of Forensic Sciences Technical Director or his designee prior to being placed in operation. The evaluation will demonstrate the ability of each Intoximeters Intox DMT Dual Sensor to identify and flag specific conditions; as well as, verify the analytical integrity of the instrument.

(i) *Purging Error*. While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Purging Error. Restrict the air flow into the breath tube while the pump is running. This will prompt the instrument to sound an audible alarm. If the error is triggered, the instrument will record PASS and the message "Successfully induced a purging error" is displayed on the screen. If the error is not triggered initiate the necessary

corrective actions to restore the instrument to proper working condition.

(ii) *Ready to Blow Expired.* While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Ready to Blow Expired. At the prompt "Please Blow", never provide an acceptable sample. If the error is triggered, the instrument will record PASS and the message "Successfully induced a ready to blow expired" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(iii) *Ambient Fail.* While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Ambient Fail. During the initial purge introduce a 0.020 g/210L ethanol dry gas into the breath hose. This process will be required 3 times. If the error is triggered the instrument will record PASS and the message "Successfully induced ambient fail" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(iv) *Acetone Interference.* Prepare a solution consisting of 500 milliliters of a manufactured 0.080 g/210L solution of ethanol and 950 microliters of Acetone in a simulator. Allow the simulator to come to temperature. While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Acetone Interference. When prompted, deliver a sufficient sample into the instrument through the simulator. If the error is triggered the instrument will record PASS and the message "Successfully induced acetone interference" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(v) *Methanol Interference.* Prepare a methanol control by adding 105 microliters of methanol to 500 milliliters of distilled water and dispense into a simulator. Allow the simulator to come to temperature. While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Methanol Interference. When prompted, deliver a

sufficient sample into the instrument through the simulator. If the error is triggered the instrument will record PASS and the message "Successfully induced methanol interference" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(vi) *Invalid Sample*. While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Invalid Sample. The evaluator should rinse his or her mouth with a common mouthwash containing ethanol. When prompted deliver a sufficient sample into the instrument. If the error is triggered the instrument will record PASS and the message "Successfully induced invalid sample" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(vii) *Sample Agreement Error*. While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Sample Agreement Error. When prompted, deliver a sufficient sample. When prompted to deliver the second sample, deliver a sufficient sample which varies in concentration from the first by at least 0.021 g/ 210 L. If the error is triggered the instrument will record PASS and the message "Successfully induced sample agreement error" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(viii) *Standard Out of Range*. While in the "Maintenance Test" mode, the instrument will ask "Trigger following test condition?" Standard Out of Range. Connect an incorrect gas to a gas port and select that port, *ca.* connect a 0.080 g/ 210L gas to the 0.020 g/210L port. If the error is triggered the instrument will record PASS and the message "Successfully induced standard out of range" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(ix) Gas Flow Error. While in the "Maintenance Test" mode, the instrument will ask

"Trigger following test condition?" Gas Flow Error. When the gas standard box appears select a gas port that does not have a gas connected to it. If the error is triggered the instrument will record PASS and the message "Successfully induced gas flow error" is displayed on the screen. If the error is not triggered initiate the necessary corrective actions to restore the instrument to proper working condition.

(x) *Linearity Check*. Utilizing manufactured solutions prepare simulators with the following ethanol concentrations: 0.000g/ 210L, 0.020g/210L (+/- 0.005 g/210L), 0.040 g/ 210L (+/- 0.005 g/210L), 0.080 g/210L (+/- 5%), 0.120 g/210L (+/- 5%), 0.200 g/210L (+/- 5%), and 0.500 g/210L (+/- 5%). Place the instrument in the "Linearity Test" mode. When instructed, connect the appropriate simulator to the instrument. Repeat this procedure three times for each ethanol control. Average the results obtained for each concentration from the three runs. To record pass, the average results must fall within the following parameters: 0.000 g/ 210L, 0.020 g/210L (+/- 0.005 g/210L), 0.040 g/ 210L (+/- 0.005 g/210L), 0.080 g/210L (+/- 5%), 0.120 g/210L (+/- 5%), 0.200 g/210L (+/- 5%), and 0.500 g/210L (+/- 5%). If the instrument does not pass, initiate the necessary corrective actions to achieve the desired specifications.

(xi) *Voltage Range Check*. The Intoximeters Intox DMT Dual Sensor utilizes and external power supply which supplies 12 volts DC to the instrument. Verify the Intoximeters Intox DMT Dual Sensor performance capability throughout a voltage range of approximately 90-200 volts AC.

(I) With the instrument connected to a variable AC power supply, adjust the voltage to approximately 90 volts AC. Initiate a standard check sequence consisting of three measurements of a 0.080 g/210L dry gas standard. Record pass if the instrument records an average result between 0.076-0.084 g/210L. If the instrument does not pass, initiate the necessary corrective actions to achieve the desired specification.

(II) With the instrument connected to a variable AC power supply, adjust the voltage to approximately 220 volts AC. Initiate a standard check sequence consisting

of three measurements of a 0.080 g/210L dry gas standard. Record pass if the instrument records an average result between 0.076-0.084 g/210L. If the instrument does not pass, initiate the necessary corrective actions to achieve the desired specification.

(xii) *Barometer Check*. Place the instrument in "Technician Mode". Compare the barometric pressure as indicated by the instrument to the laboratory's barometer. Record pass if the difference between the two readings is not greater than 5%. If the instrument does not pass initiate the necessary corrective actions to restore the instrument to proper working condition.

(xiii) *Standard Deviation Check*. Initiate a standard check sequence consisting of ten measurements of a 0.080 g/210L dry gas standard. Record pass if the instrument records the following: an average result between 0.076-0.084 g/210L and a standard deviation of less than 0.0025. If the instrument does not pass initiate the necessary corrective actions to restore the instrument to proper working condition.

2. Data Download Review. The Test Data collected and stored by each Intoximeters Intox DMT Dual Sensor in the field is transferred to the Alabama Department of Forensic Sciences. Upon transfer, the data is systematically reviewed to identify instrument problems and to perform trend analyses. This data transfer allows the Alabama Department of Forensic Sciences to review essentially 100% of the Breath Alcohol Tests performed statewide.

(b) *Communication Check*. The Intoximeters Intox DMT Dual Sensor pushes data to the FTP server via a network connection when a test is completed. If data transmission fails there will be a message displayed on the instrument screen. Each instrument should have at least one file a week uploaded to the FTP site. Open the Data Retrieval and Archiving Program and verify that there is at least one file for every instrument. If there is not at least one file per instrument initiate the necessary corrective actions to restore communication with the instrument missing a file.

(c) *Message Check*. Open the Data Retrieval and Archiving Program to identify the automatic Instrument Messages and Operator Messages retrieved by

the current download. Review the messages to determine the needs of the instrument, operator, or location (supplies). Document any actions taken.

(d) *Instrument Parameter Check*. Any instrument parameter that is out of range will trigger a status message. Open the Data Retrieval and Archiving Program perform a search for status messages. Investigate the source of any problem and document any corrective action.

(e) *Dry Gas Configuration Check*. Open the Data Retrieval and Archiving Program. Review the tank change and DUI tests to verify that the *0.02 Manufacturer, 0.02 Gas Lot Number, 0.02 Gas Expiration Date,0.08 Manufacturer, 0.08 Gas Lot Number, 0.08 Gas Expiration Date, 0.150 Manufacturer, 0.150 Gas Lot Number, 0.150 Gas Expiration Date, 0.02 Target Concentration, 0.02 Relative Tolerance, 0.02 Absolute Tolerance, 0.08 Target Concentration, 0.08 Relative Tolerance, 0.08 Absolute Tolerance, 0.150 Target Concentration, 0.150 Relative Tolerance, and 0.150 Absolute Tolerance* is correct. Investigate any discrepancy and document any corrective action.

(f) *Error and Accuracy Check*. Open the Data Retrieval and Archiving Program perform a search for status messages. Also review at the values obtained during the 0.02 g/210L and 0.08 g/210L standard checks. Evaluate these results for trends. Investigate the source of any problem or trend and document any corrective action.

3. *Periodic Self-Test*. The Periodic Self-Test serves as a way to "exercise" the mechanical components of the Intoximeters Intox DMT Dual Sensor. The Intoximeters Intox DMT Dual Sensor will perform a Periodic Self-Test at designated intervals.

(g) *Filter Wheel Test*. The Filter Wheel Test is part of the Periodic Self-Test that activates the filter wheel and verifies that it is working properly. Any failure will be documented in the Periodic Self-Test file. Review this file for any discrepancy and document any corrective action.

(h) *Five Way Test*. The Five Way Test is part of the Periodic Self-Test that activates the five way valve.

(i) *Bleed Valve Test*. The Bleed Valve Test is part of the Periodic Self-Test that activates the bleed valve on the fuel cell.

4. *Periodic Check*. Serves as a mechanism to exercise the fuel cell of the Intoximeters Intox DMT Dual Sensor at locations where the instrument is rarely used. The Intoximeters Intox DMT Dual Sensor will perform the Periodic Check of the 0.080 g/210L standard at designated intervals. The results of the Periodic Test will be stored in the Periodic Test file. Review this file for any discrepancy and document any corrective action.

5. Annual Re-Evaluation/Pre-Installation Evaluation. Regardless of the performance of an instrument in the field each instrument will be brought back to the Alabama Department of Forensic Sciences laboratory once a year for evaluation. This evaluation will consist of the battery of tests described under (1) Pre-Installation Evaluation.

Author: Dale A. Carpenter, Mark A. Pevey, Gregory L. Turner
Statutory Authority: Code of Ala. 1975, §32-5A-194, as amended.
History: New Appendix: Filed July 7, 2003; effective August 11, 2003. **Amended**: Filed May 10, 2018; effective June 24, 2018. **Amended**: Filed May 6, 2019, effective June 20, 2019.

Ed. Note: Appendix is attached to Rule 370-1-1-.01, as per certification filed July 7, 2003; effective August 11, 2003.