IN THE DISTRICT COURT OF THE STATE OF WASHINGTON
IN AND FOR WHATCOM COUNTY

THE STATE OF WASHINGTON, Plaintiff, vs. RUSSELL H. GALBRAITH, Defendant.	No. C 732306 Findings of Fact, Conclusions of Law, and Order Re: Defendant's Motion to Suppress Breath Test Result Due to the "Uncertainty" of its measurement

This matter came before the court upon Defendant's motions to suppress the results of his breath alcohol test in this matter pursuant to CrRLJ 3.6, and ER 104(a), 403, 702 and 703. Defendant is represented by Mr. Jonathan Rands and Mr. Ted Vosk, while the State of Washington is represented by the Whatcom County Prosecuting Attorney, by and through its Deputy Prosecuting Attorneys Messrs. Nathan Deen and Evan Jones. Hearings upon the motions were held on June 2nd and 24th, and July 21, 2010. Testimony was received from Mr. Jason Sklerov, Washington State Toxicology Laboratory and Dr. Ashley Emery, Ph.D., and argument of counsel was heard. The exhibits admitted into evidence and considered by the court are set out fully in the Clerk's list.

Based on the testimony, agreements of counsel and the evidence received, the court makes the following findings of fact:

FINDINGS OF FACT

1. In this matter the State alleges that at 0205 hours on or about April 18, 2009, the Defendant was operating a motor vehicle northbound on Interstate 5 in Whatcom County while under the influence or affected by alcohol in violation of RCW 46.61.502 (both prongs of the statute are implicated in the present case). After his arrest, the Defendant provided two samples of his breath for analysis by a BAC Datamaster. The breath samples were given at 0244 and 0246 hours and were found by the instrument to contain 0.318 and 0.329 grams of alcohol per 210 liters of his breath respectively. See Complaint filed herein and Exhibit 5.

2. For the purposes of the motion before the court, the following facts are assumed to be true:

   a) The BAC Datamaster used in this matter is an instrument approved by the State Toxicologist.

   b) The analysis of the Defendant's breath was performed according to the methods approved by the State Toxicologist.

   c) The testing officer who performed the test held a valid permit and was authorized to perform such test by the State Toxicologist.

   d) The Defendant did not vomit or have anything to eat, drink, or smoke for at least fifteen minutes prior to administration of the test.

   e) The Defendant did not have any foreign substances, not to include dental work, fixed or removable, in his mouth at the beginning of the fifteen-minute observation period.

   f) Prior to the start of the test, the temperature of the liquid simulator solution utilized as an external standard, as measured by a thermometer approved of by the State Toxicologist was thirty-four degrees centigrade plus or minus 0.3 degrees centigrade.

   g) The internal standard test resulted in the message "verified."

   h) The two breath samples agree to within plus or minus ten percent of their mean to as determined by the method approved by the State Toxicologist.

   i) The result of the test of the liquid simulator solution external standard or dry gas external standard result did lie between .072 to .088 inclusive.

   j) And, all blank tests gave results of .000.

3. Dr. Emery holds a Ph.D. in Engineering from the University of California at Berkeley (1961) and is a professor of engineering at the University of Washington. His qualifications to testify as an expert witness are further shown in Exhibit 10.

4. Mr. Sklerov holds a B.S. in Chemistry from George Washington University (1992), is a member of the Society of Forensic Toxicologists, and is currently the Quality Assurance Manager of the Washington State Patrol Toxicology Laboratory Division in Seattle, Washington (herein after "WSP Laboratory" or "WSP Lab."). Among his other duties, Mr. Sklerov oversees the laboratory's accreditation and compliance with quality management systems. His qualifications to testify as an expert witness are further shown in Exhibit 7.

5. Both witnesses testimony included references to “ISO” standards. The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies (ISO member bodies). The work of the ISO is carried out by technical committees organized under the ISO which function primarily to prepare international standards. Exhibit # 15

6. Similarly to the ISO, the International Electrotechnical Commission (IEC) is a worldwide technical standards body which addresses all matters of concerning electrotechnical standardization. The two bodies work together in developing international standards for the purpose of measurement. Exhibits #14 and 15,

7. In 1999 the ISO and IEC jointly produced suggested international standards to be utilized by testing and calibration laboratories, to include a standard referenced as ISO/IEC 17025, “General requirements for the competence of testing and calibration laboratories.” Ex 14, pg v. Those standards were revised in 2005 published as a second edition, and are referenced as ISO/IEC 17025:2005(E), *see* Exhibit #14. The ISO/IEC recommend that accreditation bodies that recognize the competence of testing and calibration laboratories use this international standard as the basis for their accreditation programs. Exhibit #14 page *vi*.

8. Both witnesses testimony included references to “ASCLD” certification standards and procedures. In the 1970s, FBI Director Clarence Kelley and FBI Laboratory Director Briggs White organized a group of crime laboratory directors that became known as the American Society of Crime Laboratory Directors (or ASCLD). ASCLD’s Committee on Laboratory Evaluation and Standards focused on developing quality assurance standards, and in 1981 the ASCLD/Laboratory Accreditation Board (ASCLD/LAB) was formed. Exhibit #12 page 197-98

9. In 2003, the ASCLD/LAB approved the implementation of an ISO/IEC 17025 program, and ASCLD/LAB began offering accreditations in April 2004. Accreditations for forensic science laboratories are now conducted using the *General requirements for the competence of testing and calibration laboratories 17025 ISO/IEC (2005)*, and the same requirements under which private and public laboratories are accredited. Exhibit #12 page 198

10. From the technical standards produced by the ISO/IEC (see also, Exhibit #12 referenced below) it appears these bodies recognize there are a variety of purposes to which their standards may be applied. There appears to be three basic objectives sought to be addressed in the creation of technical standards: one, for the establishment of measurement units themselves (e.g., yards verses meters to measure length); second, the application of measurement standards in course of manufacturing and science, and third, for legal purposes such as trade, commerce, taxation, and criminal law, including the forensic sciences.

11. The tolerance for uncertainty in measurement appears to vary according to the objective or goal of the measurement. There is little tolerance for uncertainty in devising a unit of

measurement or generating and certifying a standard references for that unit from which other instruments can be calibrated. On the other hand, much tolerance has existed in the forensic sciences, *see, e.g*., Exhibit #12.

12. However, in reference to its proposed technical standards the ISO states:

> "[K]nowledge of the uncertainty associated with measurement results is essential to the interpretation of the results. Without quantitative assessments of uncertainty, it is impossible to decide whether observed differences between results reflect more than experimental variability, whether test items comply with specifications, or whether laws based upon limits have been broken. Without information on uncertainty, there is a risk of misinterpretation of results. Incorrect decisions taken on such a basis may result in unnecessary expenditure in industry, incorrect prosecution in law, or adverse health or social consequences." Exhibit #15 page *v*.

13. Both witnesses were examined with regard to the findings and conclusions published by a committee of the National Academy of Sciences which was formed under the name of the "Forensic Science Committee." The National Academy of Sciences established the Forensic Science Committee in 2006 to implement the United States Senate's request, in broad terms, to investigate and report on the state of and practices of country's crime labs. The committee published its results entitled "Strengthening Forensic Science in the United States," *See* Exhibit # 12.[1]

14. According to the Forensic Science Committee's report, accreditation of crime labs is viewed as just one aspect of an organization's quality assurance program. An accredited laboratory has in place a management system that defines the various processes by which it operates on a daily basis, monitors that activity, and responds to deviations from the acceptable practices using a routine and thoughtful method. This cannot be a self-assessing program. Oversight must come from outside the participating laboratory to ensure that standards are not self-serving and superficial and to remove the option of taking shortcuts when other demands compete with quality assurance. In addition, accreditation serves as a mechanism to strengthen professional community ties, transmit best practices, and expose laboratory employees directly to the perspectives and expectations of other leaders in the profession. Exhibit #14 page 195 Accreditation cannot guarantee high quality – that is, it cannot guard against those who intentionally disobey or ignore requirements. However, over time it can reduce the likelihood that violations will occur. Exhibit #14 page 197.

15. According to the Forensic Science Committee, ASCLD/LAB's international program has accredited 60 laboratories as of April 2008, in addition to 337 laboratories accredited under the organization's original Legacy program. Additionally, the committee reports that only a few jurisdictions require their forensic laboratories to be accredited.

[1] The National Academy of Sciences was established by an Act of Congress in 1863 to investigate, examine, experiment, and report upon any subject of science or art whenever called upon to do so by any department of the government, including Congress.

According to a 2005 census of 351 publicly funded crime laboratories, more than 78 percent have been accredited by the ASCLD/LAB, and another 3 percent have been accredited by other organizations such as the ISO. Exhibit #14 at 199-200.

16. The Washington State Toxicology Laboratory's breath testing program has been accredited by the ASCLD/LAB. The accreditation goes only to the calibration of the breath testing instruments and the creation of the external simulator solutions used in the testing procedure.

17. ASCLD/LAB has not set requirements or standards for calculating uncertainty information on individual breath alcohol tests. The ASCLD/LAB does not require uncertainty calculations or information to be given with respect to individual breath alcohol tests in order for the crime laboratory to be accredited by ASCLD/LAB. Testimony revealed that ASCLD/LAB has taken the stance that research needs to be conducted on the subject of uncertainty in breath testing and the development of such standards should be devised by the forensic community.

18. According the Forensic Science Committee:

> "Scientific data and processes are subject to a variety of sources of error. For example, laboratory results . . . are subject to measurement error. A key task for the scientific investigator designing and conducting a scientific study, as well as for the analyst applying a scientific method to conduct a particular analysis, is to identify as many sources of error as possible, to control or to eliminate as many as possible, and to estimate the magnitude of remaining errors so that the conclusions drawn from the study are valid. Numerical data reported in a scientific paper include not just a single value (point estimate) but also a range of plausible values (e.g., a confidence interval, or interval of uncertainty)." Exhibit #12 page 116.

19. In its report, the Forensic Science Committee adds:

> " Consider, for example, a case in which an instrument (e.g., a breathalyzer such as Intoxilyzer) is used to measure the blood-alcohol level of an individual three times, and the three measurements are 0.08 percent, 0.09 percent, and 0.10 percent. The variability in the measurements may arise from the internal components of the instrument, the different times and ways in which the measurements were taken, or a variety of other factors. These measured results need to be reported, along with a confidence interval that has a high probability of containing the true blood-alcohol level (e.g., the mean plus or minus two standard deviations). For this illustration, the average is 0.09 percent and the standard deviation is 0.01 percent; therefore, a two-standard-deviation confidence interval (0.07 percent, 0.11 percent) has a high probability of containing the person's true blood-alcohol level. (Statistical models dictate the methods for generating such intervals in other circumstances so that they have a high probability of containing the true result.)" Exhibit #12 at 117

20. The Forensic Science Committee goes on to state: “Few forensic science methods have developed adequate measures of the accuracy of inferences made by forensic scientists. All results for every forensic science method should indicate the uncertainty in the measurements that are made, and studies must be conducted that enable the estimation of those values.” Exhibit #12 at 184.

21. The Forensic Science Committee concluded:

> “ Research needs to be done to. . . address the questions that arise in the specific context of forensics. [And a] complete research agenda should include studies to establish the strengths and limitations of each procedure, sources of bias and variation, quantification of uncertainties created by these sources, measures for performance, procedural steps in the process of analyzing the forensic evidence, and methods for continual monitoring and improving the steps in that process.” Exhibit #12 at 188.

22. Research is being conducted by the WSP Crime Laboratory in an effort to determine the level of uncertainty surrounding breath alcohol measurement by the BAC Datamaster, but that effort is not yet complete. According to Mr. Sklerov, there is no single uncertainty measurement calculation yet adopted by those few forensic scientists working in the field of breath alcohol measurement.

23. Defendant’s expert witness, Dr. Emery testified consistently that no scientific interpretation, decision, or credible conclusion can be made about a measurement unless its uncertainty interval or data is made known. More specifically, according to Dr. Emery, the result of a breath alcohol test cannot be interpreted or understood for scientific purposes absent an indication of the uncertainty of the measurement associated with it.

24. The State’s witness, Mr. Sklerov concedes that measurement uncertainty exists in the measurement of breath alcohol content with the BAC Datamaster instrument.

25. Mr. Sklerov explained that there are multiple sources of uncertainty in measurement. Among the sources of potential error are those inherent in the instrument itself, the materials used, the abilities of the operator to operate the instrument correctly, and the biological variations presented by the person being tested. This last source of error appears to account for a significant portion of the uncertainty potential.

26. With regard to sources of uncertainty in breath alcohol testing, in one of Mr. Gullberg’s papers Gullberg adds the following facts: “The principal components contributing to uncertainty include: (1) biological/sampling, (2) analytical and (3) traceability. . . . Generally, the biological/sampling component contributes most to combined uncertainty.” Exhibit # 25 at page 563.

27. With regard to the case at hand, Dr. Fiona J. Couper of the Washington State Patrol Toxicology Laboratory reports in a letter dated April 8, 2010, that the 99% confidence interval for Defendant's breath test results in this case would be defined by a breath alcohol concentration range of 0.2934 to 0.3507 g/210L. Dr. Couper did not, in the letter, explain the methodology used to arrive at this statistical conclusion. Exhibit #4.

28. There are a variety of suggested ways to measure the uncertainty of a breath alcohol test measurement. The methodologies proposed were referred to as "uncertainty budgets." The term "budget" refers to what variables or information might be considered necessary to arrive at a scientifically acceptable means to derive the uncertainty information, for example, what biological information should be included such as the temperature of the subject's breath, age or gender. *See, e.g.*, Exhibit #15 at page 4, section 3.13.

29. In an article published in the Newsletter of the International Association for Chemical Testing, Dr. A. W. Jones, Ph.D., D.Sc., proposes that a simple methodology for determining the uncertainty of a breath alcohol test could be based purely upon a statistical analysis of the standard deviations from the mean of large population of tested intoxicated drivers. *See* Exhibit #24.

30. However, in the same article Dr. Jones proposes a method to calculate uncertainty but notes as follows:

> "No analytical method is perfect and both pre-analytical (sampling and sample preparation) and analytical factors contribute to the overall uncertainty. The method of calculating uncertainty described here has only considered the contribution from random variations and assumes therefore that systematic error or bias is negligible and can be ignored. If systematic error does exist this must be added or subtracted from the mean result of alcohol analysis before the uncertainty calculations are made." Exhibit #24 page 10.

31. In his newsletter article, Dr. Jones further notes:

> "When the first alcohol *per se* drunk-driving law was introduced in Sweden in 1941 the legal limit was 0.08 g/100mL and the Supreme Court mandated that the laboratory charged with the task of analyzing the blood samples should allow for uncertainty or error in the analytical procedures. The forensic chemistry government laboratory therefore from the very beginning always made a deduction from the mean result of analysis. Originally, the amount deducted was 0.014 g/100mL and whatever BAC remained, if above the legal limit, was used for making a prosecution." Exhibit #24.

32. Dr. Jones also notes in the same article that some jurisdictions, namely the United Kingdom and Canada, which obtain multiple breath samples from subjects simply base the prosecutorial decision and proof solely upon the lower of the samples given. Exhibit #24.

33. According to the State's witness Mr. Sklerov, Dr. Jones' uncertainty calculation methodology is but one of many being considered by those engaged in the area of forensic breath testing for alcohol concentrations. Mr. Sklerov pointed out that his laboratory is researching the subject currently and has not yet devised an acceptable and meaningful statistical model or uncertainty budget.

34. Mr. Sklerov acknowledged that an employee of his laboratory, Rod G. Gullberg, M.S., has been researching the subject of uncertainty of breath testing with the BAC Datamaster and has proposed methodologies for making an uncertainty calculation. Mr. Sklerov agrees that Mr. Gullberg is recognized internationally as a expert in the field of testing for breath alcohol content. The methodologies proposed by Mr. Gullberg vary in accordance with what factors or variables one includes in the uncertainty budget for that methodology. Examples of Gullberg's proposals are reflected in Exhibits #25 and #26. His ongoing research incorporates differing variables to include in his proposed uncertainty budgets to determine the impact of varying sources of error. Changes in the methodology or budget impact the resulting uncertainty information or calculation.

35. Mr. Gullberg's uncertainty budgets or methodologies have not yet been peer reviewed, nor generally accepted by his peers.

36. In a paper entitled "Professional and Ethical Considerations in Forensic Breath Alcohol Testing Programs," Exhibit #27, Mr. Gullberg notes professional and ethical practice can be accomplished, in part, by acknowledging analytical uncertainties associated with measurement.

37. In the same paper, Exhibit #27, Mr. Gullberg offers additional guidance. He writes:

> "Drunk-driving convictions, determined primarily from breath alcohol results within a *per se* statutory context, have serious financial and personal consequences. Professional and ethical responsibility, therefore, compels the highest level of quality control for the analytical procedure. Moreover, forensic quality control requires a total program perspective, including elements other than simply measurement protocol. With significant false-positive consequences, protocols and methodologies must be employed that minimize this risk."

38. Mr. Gullberg adds, in Exhibit #27, that further peer reviewed research is needed to advance the science of breath alcohol testing, and he additionally writes:

> "Like all scientific disciplines, sound and careful research is critical for advancing knowledge in forensic breath alcohol analysis. Only research performed with professional and ethical integrity, however, provides significant contribution. . . . Ethical research begins with a careful and thorough design that maximizes the informative value while minimizing the necessary resources. An important element of careful research also includes the retention of all data and the willingness to provide it on request where no confidential restrictions or pending litigation exists. . . . Research should not be avoided simply because

> results may be requested by the defense. Where relevant and tractable research questions exist, they should be pursued in the most scientifically objective and professional manner possible given the constraints of resources and organizational policy. Experimental work should be carefully designed with prospectively specified end-points, statistical analysis, sample sizes, stopping rules, decision criteria and alpha error allocation. . . . The research should also specify whether the design is a randomized controlled trial or an observational study because of important differences in causal inference. Finally, completed research, whether published or not, should be available through routine legal discovery when requested."

39. There are very few crime laboratories within the United States that are researching or attempting to calculate the uncertainties associated with breath alcohol testing instruments.

40. Mr. Sklerov knew of only one other crime laboratory in the United States which is also studying how best to analyze and report uncertainty data in individual breath alcohol tests.

41. The issue of what information should be used in calculating and reporting the uncertainty associated with a measurement of blood alcohol is likewise unsettled. In James Garriott's text entitled "Garriott's Medicolegal Aspects of Alcohol," Exhibit #6, the issue of uncertainty in the area of blood alcohol testing and a lack of consensus is described as follows by Dr. Graham R. Jones Ph.D. (who is a member and head of the American Board of Forensic Toxicologists, which is an accrediting organization):

> "Increasingly, 'uncertainty of measurement' is required to be estimated and recorded. Uncertainty of Measurement is defined by ISO/IEC ('Guide to the Expression of Uncertainty in Measurement' – often referred to as the 'the GUM') and further interpreted by NIST (Technical Note 1297 'Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results'). It is recognized that any scientific measurement has some error associated with it. Most measurements have multiple sources of potential error that may affect the precision and accuracy of an analytical determination.
>
> The issue is complicated because there is no clear, practical consensus in the forensic sciences as to what uncertainty should include, how it should be calculated and how (or if) it should be reported. Estimation of uncertainty may be based on calibrator performance, control performance, the results of replicate determinations, or a combination. For example, in blood alcohol analysis it will include such factors as pipetting (and any weighing) errors in addition to other analytical inaccuracies (e.g., random variations in instrument performance, integration errors, etc.).
>
> The requirement to calculate and report the uncertainty value for any given analytical result is still a matter of some debate. Some authorities state that reporting uncertainty is a matter for the 'client' to decide. Some require that the uncertainty be calculated, but only if the 'client' requires it. Regardless, in the forensic world, who is the 'client'? Is it the police force or medical examiner/coroner that collected and

submitted the sample? Is it the local legal jurisdiction or judiciary? Or is the donor/accused that provided the sample? ” Exhibit #6.

42. Mr. Gullberg’s research which was admitted into evidence revealed the four principal components that contribute to breath alcohol measurement uncertainty are: 1) biological and sampling, 2) instrumental, 3) traceability, and 4) the water/air partition coefficient for the control standards. He found the biological/sampling component was the greatest error component, contributing 73%, while instrumental, traceability, and the water/air partition coefficient contributed 10%, 13% and 4% respectively. According to Mr. Gullberg’s paper, the sources of variation of the biological/sampling component itself includes, among other things, pre-exhalation breathing pattern, breath temperature, flow rate, forced vital capacity, exhalation time, and alveolar breath fraction. Mr. Gullberg notes that knowing the relative contributions of each component toward the uncertainty of the measurement can assist in evaluating the performance of the total testing procedure and its fitness-for-purpose. Exhibit #25.

43. In the same article, Exhibit #25, Gullberg opines:

> “Establishing fitness-for-purpose is necessary before analytical results can be relied on for important legal decisions. This is particularly true in the forensic measurement of breath alcohol concentration, employed by most jurisdictions throughout North America and Europe, in drunk-driving litigation to determine compliance with regulatory limits. . . . The prosecution in such cases relies significantly on the analytical results. Given the serious penalties associated with conviction, the entire analytical system must be demonstrated fit-for-purpose. . . . Clearly, given a 0.08 g/210L limit, the court should be informed if the uncertainty in [a] case [could take the measurement below that limit]. Once the acceptable uncertainty and fitness-for-purpose is established, the court can appropriately weigh the evidence and make an informed decision. . . .
> . . . The legal admission of forensic breath-test results is rarely accompanied by an estimation of its uncertainty. This results, in part, from final decision-makers failing to appreciate its relevance. Defense attorneys, prosecutors, judges and lay juries often lack scientific training and naively accept measurement results as certain. . . .
> . . . Although some forensic scientists may find the notion of “error” unsettling, it is a reality of measurement that must be appreciated. However, it need not imply a ‘blunder’ or a ‘mistake.’ Only when measurement “error” is acknowledged and properly estimated can the system be improved and analytical goals achieved. . . .
> . . . [Gullberg concludes] [c]omputing expanded uncertainties and subsequent confidence intervals for quantitative forensic evidence provides the court with relevant information for determining appropriate evidentiary weight. Employing these straightforward methods should enhance the credibility and quality assurance of forensic breath-test programs.”

44. As mentioned in Finding of Fact # 17, accreditation by ASCLD/LAB for the purposes of the alcohol breath testing program is limited to the methodology for calibrating the

instruments and creating the external simulator solutions. In performing those functions ASCLD/LAB requires the laboratory to report the uncertainty information associated with those tasks in order to be accredited. The ASCLD/LAB accreditation does not address how individual tests are performed, nor do it require uncertainty information to be calculated on the individual test level.

45. Mr. Sklerov is unaware of any forensic accreditation program or organization that does accreditation on the individual testing level or even proposes how uncertainty should be calculated on the individual testing level.

46. Mr. Sklerov is aware of only two other laboratories in the United States that hold an ASCLD/LAB accreditation for its alcohol breath testing program, and they are the State of Virginia and the Ventura County California Sheriff's Office. Neither of those laboratories report uncertainty data on the individual breath test level.

47. Mr. Sklerov is unaware of any crime laboratory in the United States that is currently reporting uncertainty information on the individual breath test level.

48. No single method for computing the uncertainty associated with an individual breath alcohol test has been accepted by crime laboratories in the United States. This is due, in large part, to a lack of research findings and consensus in the forensic community about what components or variables should be included in the calculation (also described in the testimony as a lack of consensus as to what factors should be included in the uncertainty budget).

49. Some suggested methods for calculating uncertainty range from the very basic, for example, the Swedish solution of simply reducing all results by a particular sum, to the rather complex system described by Mr. Gullberg in his work, *see* Exhibit #25.

50. Regardless of the varying suggestions on how to calculate uncertainty, Mr. Sklerov testified that the WSP Lab. has been performing such calculations since February 2010 on tests which fall outside particular numeric ranges. Based upon its current uncertain budget, the laboratory has concluded that if a test result is higher than 0.21 g/210L, or if it is between 0.12 to 0.149 g/210L, then an uncertainty measurement will not be calculated because the result is unlikely to have an impact upon the issue of regulatory/statutory compliance. As explained, under its current calculation method, any uncertainty found in a result above 0.21 g/210L could not bring the test result down below a 0.15 g/210L level. Similarly, any uncertainty found in a test between 0.12 and 0.149 g/210L could not result in reduction of the subject's measurement below the 0.08 g/210L *per se* limit.

51. To arrive at these ranges in Finding of Fact #50, Mr. Sklerov explained that the WSP Lab. first considered the tolerance of the instrument's measurement accuracy or bias as found during the instrument's calibration. For bias a maximum 5% tolerance is assumed. The first calculation undertaken is to average the subject's two breath test results. That average was then adjusted downward by the maximum assumed instrument bias of 5%. The laboratory then further adjusted the average result downward based upon its

uncertainty calculation. After the result is adjusted for uncertainty (as the laboratory defined it) the result was then further reduced by an additional "buffer" of 20%. With the addition of the 20% buffer, a maximum downward average result is achieved which incorporates instrument bias, uncertainty, and the additional buffer. However, the particulars of the uncertainty calculation were not detailed. [2] The confidence interval (*i.e.*, uncertainty) utilized in this calculation is the 99% confidence interval. Mr. Sklerov characterized this method for calculating uncertainty as a "scientifically valid" one.

52. If, as in the view of the WSP Lab, measurement uncertainties would not affect the evidentiary value of breath test results within the ranges of either: (1) 0.21 and above, or (2) between 0.12 and 0.149 g/210L (*see* Finding of Fact #50), then apparently uncertainty would in fact impact the evidentiary value of breath test measurements which are not inside those ranges. Those would be the tests that are necessarily suspect under WSP Lab's perspective. Given the Laboratory's current uncertainty calculation (including its current budget), a test result of 0.08 to 0.119 would be suspect for the purposes of the *per se* limit, and those results of 0.15 through 0.209 would also be suspect for the purposes of the 0.15 sentencing enhancement threshold. Obviously, if the uncertainty calculation methodology changes, for example, by changing the variables or values of the variables to be included in it (*i.e.*, the budget), then different ranges for the significant evidentiary impact of uncertainty would likely occur.

53. In the case at hand, Defendant's breath test resulted measurements of 0.318 and 0.329 g/210L. The uncertainty calculation performed by the Toxicology Laboratory by Dr. Couper offered a 99% confidence interval for his results as falling within a breath alcohol concentration range of 0.2934 to 0.3507 g/210L. Although the court is uncertain (no pun intended) about what uncertainty budget was used in arriving at this uncertainty range, it appears that the affects of measurement uncertainty would have no significant impact upon the question of whether the Defendant's breath was at or over either the *per se* limit of 0.08 or the enhanced sentencing threshold of 0.15 g/210L.

54. By way of description of the WSP Lab's current uncertainty calculation, Mr. Sklerov stated, "we average the two breath test results, we then correct for bias, and then we calculate based upon that corrected value." Hearing testimony on June 2nd at approximately 3:31 pm.

55. Although the WSP Lab's uncertainty calculation (and its budget) were not fully disclosed (*see* Finding of Fact #51), more was learned about it. The lab's uncertainty budget includes a mathematical equation to account for biological differences which is based upon a data base developed from 40 to 60,000 breath tests of drivers. The equation represents the variances found between the pairs of breath samples taken in each test within that sample population. Mr. Sklerov said this data has been put together in graphs describing the uncertainty or standard deviations of them plotted as the "y" axis against the average of the two values of the paired breath test results on the "x" axis. From the plot of these tens of thousands of results, the Lab developed an equation to reflect the

[2] Since the hearing in this case, the crime laboratory has changed its policy and will perform an uncertainty calculation in any case in which a defendant asks for one. Still the actual methodology is unknown to this court.

relationship found. The Lab found that at higher breath alcohol concentrations the variations became wider. When the test results got into the 0.30 range or even a 0.25 g/210L the contribution of uncertainty that came from the biological components tended to be broader than they were at the lower 0.08 or 0.10 g/210L levels. Sklerov attributed this difference to the fact they had fewer numbers of the higher test results in the database so there was a greater variance observed amongst the data. As a result, the higher degree of uncertainty observed was thought to be due to the comparably small sample size of the high BAC test scores.

56. Mr. Sklerov provided further testimony on the subject of developing an uncertainty budget. He suggests that one must first examine the testing system as a whole in an effort to identify all sources of the system that have some component of uncertainty so that an uncertainty budget can be developed from those sources of error. The development of the items to include in the budget allow for some personal or subjective selection based on the researcher's experience and perspective in terms of what items or components which may be included in the uncertainty budget. He noted the standards suggested, for example, the GUM, require a fairly rigorous look at the sources of error to be performed and an application of as many as sources as possible should be made. He mentioned there are rules out there for gauging whether or not something needs to be included based upon its contribution to uncertainty. He believed that the GUM and other guidelines suggest that a source of error that contributes less than one fifth or less than one third towards uncertainty can be ignored. However, he said there are no definitive guidelines that suggest a threshold level of contribution a component might have in the realm of alcohol breath testing before it can be ignored as a budget item. He relates the budget details all those components selected for inclusion in the examination and the measurement system is then evaluated utilizing and quantifying every one of those components. It this that process which gives you a value of uncertainty. When it comes time to report, you expand that uncertainty quantity by multiplying by two or three standard deviations in order to find the range of uncertainty.

57. Mr. Sklerov further stated there are two types of uncertainty: Type A and Type B. He described Type A as coming from the testing equipment and once one has generated sufficient information (statistical data) on those influences, uncertainty corrections can be applied to them. The Type B uncertainty was described as being anything else that doesn't apply to the Type A factors. As mentioned above, he stated that one of the things GUM provides for in the examination is experience or judgment of the scientist (or researcher), so the scientist can apply his or her own judgment as what should be included and what value is to be assigned to it and how you are going to use it for the purposes of determining Type B uncertainty.

58. There is no consensus as to what components or variables to include in the uncertainty calculation budget. The more things you put into the budget the greater the range of uncertainty will become.

59. There is no consensus in the forensic community dealing with uncertainty on the breath testing level. According to Mr. Sklerov, there are only a few labs nationwide that are

dealing with uncertainty with regard to the calibration of instruments, and he knew of no research or publication from other labs dealing with calculating uncertainty on the breath test level.

60. The State concedes in argument that BAC Datamaster test results are offered in trial as scientific evidence.

61. Breath alcohol tests are offered as scientific evidence at trial, so they are received as such by fact finder(s). As result, determinative weight can be placed upon the value reported for an individual's breath alcohol concentration.

62. Placing determinative weight upon the results of an individual breath test can occur with regard to either the *per se* or the appreciably affected prongs of RCW 46.61.502 or RCW 46.61.504.

63. All instruments used to make measurements can be expected to have some degree of bias associated with them.

64. Bias is also known as systematic error or systematic bias.

65. The instrument bias (systematic error) associated with a measuring instrument manifests itself in the values its reports, which can cause those values to be artificially elevated or depressed with respect to the true value of the thing being measured.

66. There are well accepted methods for determining and correcting for instrument bias (systematic error) of measurement results employed throughout the general scientific community.

67. Because the failure to correct for instrument bias (systematic error) leads to the reporting of false values for a thing being measured and because bias is easily determined and corrected for, it is assumed throughout the scientific community that for those measurements conducted in accordance to "GUM" and NIST measurement guidelines/standards that all results have been corrected for bias (systematic error) before being reported. *See*, Exhibit #17, BIPM, *Evaluation of measurement data — Guide to the expression of uncertainty in measurement (GUM)*, § 3.2.4 (2008); Exhibit #16, NIST, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST TN 1297 § 5.2 (1994).

68. Datamasters (or BAC Datamaster) are like any other measuring instrument in that each is expected to have some degree of bias (systematic error) associated with it.

69. The instrument bias (systematic error) associated with each Datamaster manifests itself in the values its reports for an individual's breath alcohol concentration so that all values reported by a Datamaster for an individual's breath alcohol concentration are expected to be accompanied by some degree of bias (systematic error).

70. The bias (systematic error) associated with measurements of breath alcohol concentration by a Datamaster causes the values reported to be artificially elevated or depressed with respect to the true value of an individual's breath alcohol concentration.

71. Because all breath test results performed by a Datamaster are accompanied by bias (systematic error), even where the values reported are in excess of a 0.08 or 0.15, the true breath alcohol concentration represented by these results may in fact be below these limits.

72. If systematic error does exist this must be added or subtracted from the mean result of alcohol analysis before an uncertainty calculation is made. Exhibit # 24, Jones, *Dealing with Uncertainty in Chemical Measurements*, 14(1) NEWSL. OF THE INT. ASSOC. FOR CHEM. TEST. 6, 10 (2003).

73. The Washington State Toxicology Lab determines the bias (systematic error) associated with every Datamaster at the time of each Datamaster's annual QAP.

74. Despite knowing the bias (systematic error) associated with each Datamaster, the WSP Lab does not correct individual breath test results for this bias (systematic error).

75. Because the WSP Lab does not correct breath test results for the known bias (systematic error), even where the values reported are in excess of a 0.08 or 0.15, the true breath alcohol concentration represented by these results may in fact be below these limits.

76. Once the bias of a result has been corrected for, its uncertainty can be determined.

77. No measuring device or process is infinitely precise.

78. Because no measuring device or process is infinitely precise, no matter how good the instrument or methodology, we can never know the actual value of the thing being measured.

79. Instead, every value obtained from a measurement represents a range of values, all of which can actually and reasonably be attributed to the true value of the thing being measured with a given level of confidence (probability).

80. The range of values associated with a measurement result and the level of confidence associated with that range are known as the measurement uncertainty.

81. According to Dr. Emery, because every measurement result actually represents a range of values, no measurement result is complete or can be interpreted for scientific purposes unless it is accompanied by an estimate of its uncertainty.

82. However, uncertainty itself does not necessarily imply a measurement is invalid. In its guide for the evaluation and expression of uncertainty in quantitative chemical analysis the EURACHEM/CITAC Working Group offers the following advice: "Uncertainty of

measurement does not imply doubt about the validity of a measurement; on the contrary, knowledge of the uncertainty implies increased confidence in the validity of a measurement result." Exhibit # 21 at pg 4 (note, the composition of the working group is outlined on the unnumbered reverse side of the cover sheet of that document).

83. There are standard methods ("bottom up," "top down," "total error," etc.) recognized throughout the scientific community for estimating the uncertainty of a measurement. Each method is simply a different tool for trying to determine the same thing;

84. A common way of reporting the uncertainty of a result is as a confidence interval expressed by $R = y \pm x$ *(95%)*. This value is interpreted as meaning that the true value of the thing being measured lies in the range from $y - x$ to $y + x$ with a probability of 95%.

85. The measurement of breath alcohol concentration, like any other measurement, can be accompanied by measurement uncertainty.

86. Any value obtained from a breath test represents a range of values, all of which can actually and reasonably be attributed to the true value of an individual's breath alcohol concentration with a given level of confidence (probability).

87. The uncertainty associated with the measurement of breath alcohol concentration may be small or large depending on the instrument used and the effect of the other variables, such as the biological attributes of the person being tested.

88. Because the uncertainty associated with the measurement of breath alcohol concentration will vary between instruments, identical test results from two different instruments will likely represent a different range of values.

89. Because every breath test result actually represents a range of values, a breath test result is more completely understood if it is accompanied by an estimate of its uncertainty.

90. Even where the alcohol breath concentration reported by a Datamaster is in excess of a 0.08or 0.15 g/210L of breath, uncertainty information may reveal that the values which can reasonably be attributed to the true value of an individual's breath alcohol concentration, based on such result may in fact be less or greater than a 0.08 or 0.15 g/210L of breath.

91. It is impossible to determine whether, or how likely it is that, the result of a breath alcohol test represents values less than or in excess of 0.08, 0.15 g/210L of breath absent an indication of the uncertainty associated with the test result.

92. The uncertainty associated with the measurement of breath alcohol concentration can be reported in one of two ways:

a) As a range of values (confidence interval) representing those concentrations that could actually and reasonably be attributed to an individual's breath alcohol concentration with a given level of confidence (this is the most common method); or

b) As a value adjusted down for uncertainty (by one half the confidence interval) yielding a value above which those concentrations that could actually and reasonably be attributed to an individual's breath alcohol concentration will be expected to lie with a given level of confidence (this method is applied by some forensic practitioners to give the full benefit of the doubt to the accused).

93. The Washington State Breath Test program has acknowledged the role played by uncertainty in the interpretation of breath test results for at least a decade.

a) In the year 2000, the Forensic Science Review, a peer reviewed journal, published a paper by Rod Gullberg wherein he wrote:

> "All analytical results, regardless of context, protocol or instrumentation, possess uncertainty…all measurement results are approximations. This is acceptable…so long as the limits of uncertainty are known and acceptable." Exhibit #26, Gullberg, *Methodology and Quality Assurance in Forensic Breath Alcohol Analysis*, 12 For. Sci. Rev. 49, page 50 (2000). "All analytical results, including breath alcohol analysis, have uncertainty." Exhibit #26, Gullberg, *Methodology and Quality Assurance in Forensic Breath Alcohol Analysis*, 12 For. Sci. Rev. 49, page 60 (2000).

b) When training breath technicians the WSP Breath Test Program instructors have instructed their students since 2000 that:

i. "A breath alcohol result cannot be adequately interpreted for forensic purposes without some understanding or estimate of its uncertainty."

ii. "The results on a valid (under the WAC standards) breath test document should not be interpreted and presented as if there were no uncertainty present."

94. Rod Gullberg is recognized as a leader in the field of uncertainty analysis with respect to breath testing. Exhibit #24, Jones, Ph.D, *Dealing with Uncertainty in Chemical Measurements*, 14(1) Newsletter of the International Association for Chemical Testing, pg 7 (2003). He has been published in peer reviewed journals and treatises, taught toxicologists and breath test professionals from around the country at the prestigious Borkenstein School, and has developed the methodology currently employed by the WSP Laboratory in determining the uncertainty of breath test results. Exhibit # 23, Gullberg, *Statistical Applications in Forensic Toxicology*, Medical-Legal Aspects of Alcohol, p. 457 (James Garriott ed., 5th ed. 2009); Exhibit # 25, Gullberg, *Estimating the Measurement Uncertainty in Forensic Breath Alcohol Analysis*, 11 ACCRED. QUAL. ASSUR. 562 (2006); Exhibit #27, Gullberg, *Professional and Ethical Considerations in Forensic Breath Alcohol Testing Programs* 5(1) J. ALC. TEST. ALLIANCE 22 (2006);

Exhibit #26, Gullberg, *Methodology and Quality Assurance in Forensic Breath Alcohol Analysis*, 12 For. Sci. Rev. 49, 60 (2000).

95. The issue of uncertainty in measurement and/or chemical analysis has been recognized for years. From the evidence introduced from the international organizations charged with the task of providing uniform guidance on the subject to scientists and regulators we know from the evidence the issue has been widely recognized by scientist and regulators as early as 1994. Exhibit #16, NIST, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST TN 1297 § 5.2 (1994). We also learned that uncertainty in the area of breath alcohol measurement was of concern to scientists and legislators in Sweden as early as 1941. Exhibit #24. As to knowledge of the issue in Washington State, the many works of Mr. Gullberg, who then and now works with the WSP Lab, show he was voicing concerns about uncertainty in breath testing as early as 2000. Exhibit #26. Gullberg's concerns were additionally voiced in training seminars to the State Patrol testing officers as early as 2000 as well. Finding of Fact #93.

96. The testimony and exhibits received reveal that, although the specific details going into any laboratory's determination of the uncertainty of breath alcohol analysis would be expected to vary because no two laboratories are absolutely identical, certain basic principles and methods appear accepted by a broad array of scientists and statisticians and they may be applicable to the WSP Laboratory's analysis of breath for alcohol concentration. *See, e.g.*, Exhibit #23, Gullberg, *Statistical Applications in Forensic Toxicology*, Medical-Legal Aspects of Alcohol, p. 457 (James Garriott ed., 5th ed. 2009); Exhibit # 25, Gullberg, *Estimating the Measurement Uncertainty in Forensic Breath Alcohol Analysis*, 11 ACCRED. QUAL. ASSUR. 562 (2006); Exhibit # 16, NIST *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results,* NIST TN 1297 (1994); Exhibit # 21, EURACHEM, *Quantifying Uncertainty in Analytical Measurement* CG-4, (2000), and Exhibit # 17, BIPM, *Evaluation of measurement data — Guide to the expression of uncertainty in measurement (GUM)* (2008).

97. According to the testimony of both Dr. Emery and Mr. Sklerov, the method developed by Rod Gullberg and utilized by the WSP Laboratory for determining the uncertainty of breath test measurements employs the methodology of the "GUM." Exhibit #17, BIPM, *Evaluation of measurement data — Guide to the expression of uncertainty in measurement (GUM)* (2008). It is described as being a scientifically valid method for determining the uncertainty of breath test results. Exhibit #23, Gullberg, *Statistical Applications in Forensic Toxicology*, Medical-Legal Aspects of Alcohol, p. 457 (James Garriott ed., 5th ed. 2009); Exhibit # 25, Gullberg, *Estimating the Measurement Uncertainty in Forensic Breath Alcohol Analysis*, 11 ACCRED. QUAL. ASSUR. 562 (2006).

98. Despite the fact that the Washington State Toxicology Lab has a potentially scientifically valid method for determining some of the uncertainty associated with its breath test results, it has chosen not to determine or report the uncertainty as a matter of practice due to a lack of sufficient resources and a lack of consensus amongst forensic scientists on the appropriate components to include in the calculation's budget. The Toxicologist and WSP Lab have also not yet determined to their satisfaction that the currently employed

mythology is adequately fit for its purpose. Additional study and research has been deemed necessary before adoption of a particular uncertainty calculation (including its budget) can be made and implemented.

99. In spite of a lack of associated uncertainty data, the results of the BAC Datamaster breath alcohol test is nevertheless a quantitative measurement of the test subject's breath alcohol content expressed in terms of grams of alcohol per 210 liters of breath.

100. When the WSP Lab does determine the uncertainty of a result, it uses an existing Microsoft Excel spreadsheet computer software program that both corrects the result for bias and then calculates the uncertainty. The calculation includes averaging the results of the subject's two breath samples and feeding that result into the software program by hand. The current methodology to correct for bias and to determine uncertainty can be done in about 15 minutes.

101. Much of the information required to determine instrument bias and the uncertainty of an individual breath test is obtained during the certification of simulator solutions and the QAP of each individual Datamaster. The WSP Lab is already required to obtain this information under its current accreditation requirements.

102. It is unrealistic to expect that a typical defendant, attorney, or judge will have the expertise to perform the calculations necessary to correct a result for bias and determine its uncertainty, so if the WSP Lab does not do so, those accused will likely need to retain an expert witness to do so at additional expense to the defense.

103. The failure to correct breath test results for bias may be the difference between a finding of guilt or innocence at trial.

104. The failure to report the uncertainty of breath test results may be the difference between a finding of guilt or innocence at trial.

105. The failure to correct breath test results for bias may influence whether one accused of DUI to plead innocent or guilty.

106. The failure to report the uncertainty of breath test results may influence whether a person accused of DUI pleads innocent or guilty.

Based upon the above findings, the court makes the following conclusions of law:

CONCLUSIONS OF LAW

Defendant moves to exclude the result of his breath alcohol test from evidence based upon three theories. First he asks for suppression due to a lack of compliance with the statutory foundational elements necessary for admission. Second, he argues ER 702 precludes admission without uncertainty information because the evidence would be misleading or not helpful to the trier of fact. Third, he asserts that absent the uncertainty data surrounding the measurement the test result has so little probative value it would unfairly prejudice him and thus be excludable under ER 403. Each argument will be addressed in turn.

Motion to Suppress due to lack of statutory foundational requirements.

Defendant moves, based on RCW 46.61.506(3) and CrRLJ 3.6, to suppress the results of his breath test because the State has declined to ". . . provide the requisite foundational requirements in the form of uncertainty measurements and calculations regarding the reliability of the breath test evidence." While Defendant's request for relief may be supported by the facts, it is not by the law. The court concludes as follows:

1. The undisputed facts clearly establish that any quantitative measurement involves a component of error or uncertainty. Scientists and statisticians acknowledge measurement error and they have devised means to express the uncertainty surrounding quantitative measurements. The record herein includes many examples of various equations developed to express uncertainty in terms, among others, of a confidence coefficient to be associated with a particular measurement or test result.

2. The evidence also made it clear that for the purposes of scientific interpretation, measurements cannot be helpful or meaningful without an expression of the uncertainty associated with the measurement. Dr. Emery consistently testified, one cannot make a scientifically informed judgment about a measurement's true value or interpret it for scientific purposes unless one also knows about the uncertainty associated with the measurement.

3. However, in the matter before the court, the question is whether a measurement can be helpful, meaningful, and worthy of interpretation to a trier of fact for the purposes of the application of a law, not for scientific inquiry.

4. In his paper on uncertainty, Dr. Jones notes the needs of the end user can dictate the need for uncertainty data by opining:

   > ". . . The requirement to calculate and report the uncertainty value for any given analytical result is still a matter of some debate. Some authorities state that reporting uncertainty is a matter for the 'client' to decide. Some require that the uncertainty be calculated, but only if the 'client' requires it. . ." Finding of Fact # 41 (Quoting from Exhibit #6).

5. The "client" in this instance is the Washington State Legislature. The legislature has defined the crime of DUI, see RCW46.61.502 and 504, and it has defined how the commission of that crime can be proven, see RCW 46.61.506.

6. Although, due to measurement errors, an accused may not, within a particular degree of statistical certainty, in fact have had a 0.08 or a 0.15 g/210L breath alcohol content (BAC), the law as crafted by the legislature does not demand a particular quantitative

level of certainty be met before that BAC result can be admissible as evidence. A duty to measure or report a BAC measurement to any specific quantitative level of certainty is not required under RCW 46.61.506.

7. The crime of DUI is a *mala prohibita* offense. It is not unlawful to drive a motor vehicle after consuming some amount of alcohol. Driving or being in physical control of a motor vehicle after consumption only becomes unlawful when the driver's ability to operate the vehicle is appreciably affected, RCW 46.61.502(1)(b) or 46.61.504(1)(b), or if the person's breath or blood alcohol concentration is at a 0.08 g/210L or higher within two hours of the driving, RCW 46.61.502(1)(a) or 46.61.504(1)(a). The quantitative standard of 0.08 grams per 210 L of breath is the *per se* prong or alternative of the crime. The legislature has the authority to define this *mala prohibita* crime of DUI as it chosen to do so, and it chose not to require a quantitative statement of the potential uncertainty surrounding a breath test result under the *per se* prong of the statute.

8. As already noted, the issue of measurement error and uncertainty have been recognized for a considerable period of time. It was clearly known at the time our state legislature enacted our existing DUI laws, including the recent amendments to RCW 46.61.506. In spite of that fact, the legislature chose to adopt an evidentiary standard to define the quantitative *per se* threshold without reference to, or incorporation of, any uncertainty statement or requirement.[3] RCW 46.61.506; *see also*, Conclusion of Law #23 which is incorporated herein by this reference.

9. Defendant cites as his authority for suppression RCW 46.61.506(3). In that particular subsection, the legislature simply delegates to the state toxicologist the authority to develop and approve satisfactory methods and techniques to conduct the breath analysis necessary to fulfill the needs of sections 502 and 504 of chapter 46.61 RCW. Such delegation is permissible. *E.g., State v. Ford*, 110 Wn.2d 827, 755 P.2d 806(1988). That legislative command was met through the adoption of chapter 448-16 WAC by which the state toxicologist set out those approved methods and procedures for breath testing. Neither RCW 46.61.506 nor chapter 448-16 WAC set out any requirement for the State to produce the uncertainty data demanded by Defendant in this case. With respect to the alcohol breath testing program, the Court in *Ford* cautions that courts must be mindful that it is not their function to substitute their judgment for that of the legislature or the state toxicologist. Defendant's motion to suppress based on RCW 46.61.506(3) must be denied, as it is simply not statutorily required.

<u>Motion to suppress as results are inadmissible under ER 702</u>

With regard to Defendant's argument that ER 702 precludes admission without uncertainty information because the evidence would be misleading or not helpful to the trier of fact the court concludes as follows:

[3] It was not argued that the legislature's requirement under RCW 46.61.506(4)(a)(vi) concerning the subject's breath samples being within 10% of their mean constituted an uncertainty measure.

10. Under ER 702 scientific opinion (being a quantitative measurement in this case) is admissible only if it is helpful and meaningful to the trier of fact. Defendant asserts that without a concomitant uncertainty statement, the results of his BAC test cannot be helpful or meaningful to the trier of fact, and therefore, should be held inadmissible under Rule 702.

11. In a criminal case an expert's opinion based upon a scientific theory or method (*e.g.*, a breath test result) should not be introduced as evidence if that theory or method has not been generally accepted within the relevant scientific community. *Frye v. United States*, 293 Fed. 1013 (D.C.Cir. 1923). The *Frye* standard is still applicable in Washington. *State v. Copeland*, 130 Wn.2d 244, 922 P.2d 1304 (1996); *see also, State v. Cauthron*, 120 Wn.2d 879, 846 P.2d 502 (1993).

12. The operative principles and function of the BAC Datamaster instrument have already been scrutinized under the *Frye* standard. The instrument does not introduce or rely upon any new or unusual theory or method. It employs a well established scientific principle to quantify breath alcohol content. *State v. Ford*, 110 Wn.2d 827, 755 P.2d 806(1988); *State v. Straka*, 116 Wn.2d 859, 810 P.2d 888 (1991). Once the foundational elements set forth in RCW 46.61.506 are met, a breath test result is admissible, and any flaws go to its weight not its admissibility. *City of Fircrest v. Jensen*, 158 Wn.2d 384, 143 P.3d 776 (2006). The rule of *stare decisis* tells us, absent a clear showing that a decision is wrong and harmful, once a scientific theory or principle has been accepted or approved for admission as substantive evidence by an appellate court, it is unnecessary to relitigate the issue. *See, e.g., State v. Berlin*, 133 Wn.2d 541, 947 P.2d 700 (1997). There has been no showing these prior decisions are wrong. The function of the instrument and its output need not be relitigated. While the defense proved that a complete understanding of a breath test result is impossible without a statement of its concomitant uncertainty data, *see* Findings of Fact 71, 75, 78, 89, 90 and 91, the defense failed to prove the result obtained in this case was subject to such uncertainty that the result obtained here would not be helpful or meaningful to the trier of fact, *see* Finding of Fact # 53, and Conclusion of Law # 24. In spite of the fact the uncertainty surrounding the result is unknown (or unstated), precedent tells us the result is nevertheless admissible. Moreover, uncertainty information does not imply or prove the result itself is invalid. Finding of Fact # 82.

13. We also know that in the context of applying Rule 702 an expert's opinion cannot exceed the limits of the underlying science or art, accepted or not. If the opinion is based upon a scientific theory or method, then the theory or method should be one generally accepted within the relevant scientific community. This principle applies equally to the theory of uncertainty as it does to the measuring instrument itself.

14. Given the evidence produced, the general theory of uncertainty is well known and generally accepted within the scientific community. The mathematics underlying the issue is also well known and generally accepted. However, the testimony showed that there is not a generally accepted methodology within the relevant scientific community for calculating the uncertainty associated with the testing of breath alcohol content. More specifically, the testimony revealed that there is no agreement or consensus on what

variables should be included in the budget for such uncertainty calculations. The evidence presented also showed there is not a generally accepted method for calculating the uncertainty associated with the measurement of breath alcohol content amongst those scientists engaged in that work.[4] Although Mr. Sklerov labeled the toxicology laboratory's current method as a scientifically valid one, his testimony and the exhibits admitted show there are a variety of approaches to the problem, none of which appear to have been generally accepted amongst those working in the field of alcohol breath testing.[5]

15. By its motion, the defense asks this court to require the State to introduce uncertainty evidence based upon a calculation budget that has not yet passed scrutiny under the *Frye* standard before the breath test of the accused can be admitted into evidence. This is contrary to the requirements of *Frye*, and as discussed above, is not required by the Washington legislature. Since the BAC instrument and its procedural protocols have already been accepted, *see, e.g., City of Seattle v. Allison*, 148 Wn.2d 75, 59 P.3d 85 (2002), it makes little sense to reject a breath test result under ER 702 due to a lack of uncertainty information that is based upon a budget of variables and values which have not yet been *Frye* tested.

16. Denying Defendant's motion to exclude under ER 702 does not necessarily prejudice an accused in the presentation of his or her defense because it does not necessarily preclude an accused from introducing evidence surrounding the uncertainty of BAC Datamaster instrument's measurements. Such evidence has clearly been made admissible by virtue of legislative decree under RCW 46.61.506(4)(c). It may also be admissible under ER 703. ER 703 allows for the introduction of an expert's opinion even though it may be based upon facts which themselves are not admissible in evidence, at least so long as it is reasonable for the expert to rely upon those underlying facts (an untested uncertainty budget for example). While no particular uncertainty budget has yet passed the *Frye* standard for admission as substantive evidence, an opinion about the accuracy of breath test based upon a proposed uncertainty budget may nonetheless be admissible under ER 703. *Group Health v. Dept. of Revenue*, 106 Wn.2d 391, 722 P.2d 787 (1986).[6] The opportunity to produce uncertainty evidence is afforded defense, by statute and perhaps evidence rule.[7]

17. Furthermore, in the present case, if the uncertainty calculation based on the budget deemed "scientifically valid" by Mr. Sklerov was found acceptable under *Frye*, or as the basis of an opinion proposed under ER 703, the error potential would clearly be of no

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[4] *State v. Russell*, 125 Wn.2d 24, 40, 882 P.2d 747 (1994)(*citing State v. Cauthron*, 120 Wn.2d 879, 887, 846 P.2d 502 (1993); *People v. Young*, 425 Mich. 470, 481, 391 N.W. 2d 270(1986) (concluding the ideal community would be those scientists with direct empirical experience with the procedure in question).

[5] Given the evidence and argument, the court cannot conclude that the requirement of RCW 46.61.506(4)(a)(vi) constitutes an uncertainty measurement for the purposes of the relief sought herein.

[6] Additionally, "well founded statistics" can be used to establish facts that will be useful to the trier of fact. *State v. Russell*, 125 Wn.2d 24, 70, 882 P.2d 747 (1999)(*citing State v. Briggs*, 55Wn.App. 44, 62-63, 776 P.2d 1347(1989)).

[7] The fact that this may shift the burdens of production and proof to the defense is of no consequence. It is permissible to do so in this context. *City of Fircrest v. Jensen*, 158 Wn.2d 384, 143 P.3d 776 (2006).

quantitative consequence under the *per se* prong of the DUI statute. The uncertainty information proffered by Mr. Sklerov was based upon a calculation performed by the State Toxicologist, and that calculation resulted in a potential breath alcohol content range for the Defendant of 0.2934 to 0.3507 g/210L. Given the circumstances, the impact of the proffered error is of such little numeric consequence relative to the DUI *per se* threshold, that even with its consideration, the test result in this case remains meaningful and helpful to the trier of fact which favors admission verses exclusion under ER 702. *State v. Copeland*, 130 Wn.2d 244, 270, 922 P.2d 1304 (1996)(laboratory error is a matter of weight and not admissibility under *Frye*). Essentially, the potential for error is not so serious that the results should be excluded as being unhelpful to the trier of fact in the case at hand. It should be admitted and any arguments surrounding the result's uncertainty would go to the weight to be given the evidence. *State v. Kalakosky*, 121 Wn.2d 525, 541, 852 P.2d 1064 (1993)(When the challenge to admissibility is to the errors in a given test, the determination of whether expert testimony is admissible is within the discretion of the trial court); *see also*, *State v. Cauthron*, 120 Wn.2d 879, 889, 846 P.2d 502 (1993)(If the particular technique is sufficiently accepted in the scientific community at large, any remaining concerns about the possibility of error or mistakes being made in the case at hand can be argued to the fact finder.).

<u>Motion to suppress because results are inadmissible under ER 403</u>

Finally, Defendant asserts that absent the uncertainty data his test result has so little probative value it would unfairly prejudice him, and thus, be excludable under ER 403. As to this motion, the court draws the following conclusions:

18. The results of a breath alcohol test are undeniably highly relevant in any DUI prosecution under either prong of the statute. In fact, RCW 46.61.506(1) makes it statutorily worthy of consideration even in cases below the 0.08 threshold. Defendant does not argue otherwise. The results of Defendant's breath test is assumed relevant for purposes of ER 401 and 402. Instead, Defendant argues under ER 403, given the potential for uncertainty in the measurement of his breath, that the result is so misleading that its probative value is outweighed by the prejudice caused to him by that measurement uncertainty. A balancing test is used to determine the outcome of that analysis. ER 403; *State v. Giedd*, 43 Wn.App. 787, 790, 719 P.2d 946 (Div. I, 1986). The burden of showing prejudice is on the party seeking to exclude the evidence, and there is a presumption favoring admissibility under Rule 403. *Carson v. Fine*, 123 Wn.2d 206, 867 P.2d 610 (1994).

19. The fact that breath alcohol measurement may be subject to error or uncertainty is not a new concept or argument under Washington common law. The margin of error argument was raised, for example, in *State v. Keller*, 36 Wn.App. 110, 674 P.2d 412 (1983), in which Keller's breath alcohol content was measured by the Breathalyzer (a precursor to the BAC Datamaster) and found to be at a 0.10 percent level. Keller was convicted under the then existing 0.10 percent breath alcohol statutory standard of RCW 46.61.502(1). At Keller's trial the evidence showed the instrument was subject to a "margin of error of

0.01 percent." *Keller* at 111. Keller argued that since his reading could have been as low as 0.09 percent the State's testing evidence was insufficient to prove a violation of the statute. The Court of Appeals disagreed with Keller holding the test result was not conclusive proof of guilt relieving the State of its burden of proof. Instead, the Court of Appeals noted the State still had to prove the test result was correct and the defense may still attack the accuracy of the test result. In reaching that conclusion, the Court of Appeals, citing *State v. Franco*, 96 Wn.2d 816, 639 P.2d 1320 (1982), noted the margin of error in the testing procedure should be considered by the trier of fact in deciding whether the test performed sustains a finding of guilt beyond a reasonable doubt. The court went on to state the "weight to be given the Breathalyzer reading is left to the trier of fact, as is the weight to be accorded other evidence in the case." *Keller* at 113. This holding suggests evidence of measurement uncertainty should be heard and weighed by the trier of fact instead of acting as a basis for suppressing the otherwise relevant evidence entirely due to its claimed prejudicial effect upon the accused.

20. The language of RCW 46.61.506 demands the same result. First, even if a breath test result may be below the 0.08 per se threshold, that lower result is nonetheless still admissible on the question of determining whether the driver was under the influence of intoxicating liquor. RCW 46.61.506(1) and (2). Additionally, under RCW 46.61.506(4)(c) an accused is specifically permitted to challenge the reliability and accuracy of the test performed, and a challenge to the reliability or accuracy of the breath test "shall not preclude the admissibility of the test." "Instead, [the legislature declares] such challenges may be considered by the trier of fact in determining what weight to be given to the test result." *Id.* In the statutory framework of RCW 46.61.506 the legislature has already declared the balance in such evidentiary challenges must go to the weight of the evidence, not its admissibility. These statutory provisions were predicated upon the Legislature's perceived authority to adopt evidentiary rules under *State v. Long*, 113 Wn.2d 266, 778 P.2d 1027 (1989); *State v. Sears*, 4 Wn.2d 200, 215, 103 P.2d 337 (1940); *State v. Pavelich*, 153 Wash. 379, 279 P. 1102 (1929), and its expressed intent to curtail the incident of the crime defined.[8] Denying the motion to suppress under ER 403 fosters the legislature's intent and mandate underlying RCW 46.61.506.

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[8] The legislative intent in adopting its current standards surrounding the use and admissibility of breath alcohol test was stated as follows:

"The legislature finds that previous attempts to curtail the incidence of driving while intoxicated have been inadequate. The legislature further finds that property loss, injury, and death caused by drinking drivers continue at unacceptable levels. This act is intended to convey the seriousness with which the legislature views this problem. To that end the legislature seeks to ensure swift and certain consequences for those who drink and drive.

To accomplish this goal, the legislature adopts standards governing the admissibility of tests of a person's blood or breath. These standards will provide a degree of uniformity that is currently lacking, and will reduce the delays caused by challenges to various breath test instrument components and maintenance procedures. Such challenges, while allowed, will no longer go to admissibility of test results. Instead, such challenges are to be considered by the finder of fact in deciding what weight to place upon an admitted blood or breath test result.

The legislature's authority to adopt standards governing the admissibility of evidence involving alcohol is well established by the Washington Supreme Court. See generally *State v. Long*, 113 Wn.2d 266, 778 P.2d 1027 (1989); *State v. Sears*, 4 Wn.2d 200, 215, 103 P.2d 337 (1940) (the legislature has the power to enact laws which create

21. Defendant's argument is also reminiscent of the one made in *City of Seattle v. Allison*, 148 Wn.2d 75, 59 P.3d 85 (2002). In *Allison* it was argued that inaccuracies in the thermometers used to determine the temperature of simulator solutions made it impossible to know the actual temperature of those solutions. Without that missing information, Allison argued it was impossible to establish the necessary foundation for the admission of a breath test result. Citing *State v. Ford*, 110 Wn.2d 827, 755 P.2d 806 (1988) and *State v. Straka*, 116 Wn.2d 859, 810 P.2d 888 (1991), the *Allison* court observed the legislature not only had the power to establish the foundational elements necessary for the "general admissibility" of a breath alcohol test for the purposes of the DUI statutes, but it also had the authority to delegate the task of determining the methodology, procedures and instrumentation to be used to the State Toxicologist. The court concluded that once compliance with the administrative rules established by the toxicologist for the administration of a breath test are shown, then that test result is valid and rendered admissible. To the court in *Allison*, those threshold requirements were seen as a 'sufficient assurance of accuracy and reliability to allow for the general admissibility of test results.' *Allison* at 80 (*quoting Straka*, 116 Wn.2d at 870). Once those threshold requirements are met, challenges to the accuracy and reliability go to the weight of the evidence not its admissibility.

22. The reasoning in *Allison* tells us that even if the adopted testing procedure incorporates a margin of error in a component measurement, since the procedure was established under the authority of the legislature, and so long as it fulfills the basic foundational requirements set for admissibility by common law (*i.e., State v. Baker*, 56 Wn.2d 846, 355 P.2d 806 (1960)), then the test result should be admitted. Once the test result is admitted, it is for the accused to attack its accuracy and reliability. *Allison, supra*. This approach was revisited in *City of Fircrest v. Jensen*, 158 Wn.2d 384, 143 P.3d 776 (2006), and in upholding the 2004 amendments to RCW 46.61.506, the court noted "[t]he legislature has made clear its intention to make BAC test results fully admissible once the State has met its prima facie burden [, and] [n]o reason exists to not follow this intent."[9] *Id.* at 399.

23. When the statutes and procedures at issue in *Allison* were adopted by the legislature, the fact that there is uncertainty associated with breath alcohol testing was undoubtedly well known to all. Uncertainty issues brought forth in the present motion to exclude were likewise known when the legislature made its more recent revisions to RCW 46.61.506 in 2004 and to the State Toxicologist when she made her administrative rule changes in response to those statutory amendments. *See* Finding of Fact # 95. The 2004 statutory changes were the subject of review by the court in *Fircrest*. One must assume that if the legislature had been concerned that known measurement errors would affect breath alcohol test results, it would have addressed the issue in crafting its definition of the *per*

rules of evidence); *State v. Pavelich*, 153 Wash. 379, 279 P. 1102 (1929) ('rules of evidence are substantive law')." Laws 2004 chapter 68 § 1.

[9] The court in *Fircrest* also stated this result "does not alter the burden of the State in DUI cases, it is merely codifying it. The appellant has not shown an impermissible or unconstitutional shifting of the evidentiary burden." Id. at 400.

se prong of the DUI statutes. The same assumption would hold true for the State Toxicologist in the promulgation of the administrative rules for the breath testing program. Neither the legislature nor the State Toxicologist chose to incorporate the uncertainty measurement as described herein into the testing procedure adopted nor did they mandate a calculation be made of it. The legislature was apparently willing to accept the fact that the numeric limit they set for the *per se* prong of the DUI statutes was subject to some margin of error. In defining this *mala prohibita* crime, the legislature impliedly accepted the fact that some accused may be convicted of the crime when their actual breath alcohol content was in fact actually lower than the 0.08 threshold or the 0.15 threshold for enhanced penalties. The accuracy range of the instrument and its measurements were apparently acceptable to the legislature for the purposes of defining the crime and its punishment. The known boundaries of the instrument's accuracy dictate this conclusion. The potential prejudice which may stem from the inaccuracies in the testing instrument were not deemed sufficient to the legislature to exclude a test result from consideration by the jury. RCW 46.61.506(4). After all, due process requires that the burden of proving all the elements of a crime beyond a reasonable doubt remains upon the State/Plaintiff.[10]

24. In the instant case the Defendant's breath test results were 0.318 and 0.329 grams of alcohol per 210 liters of his breath. According to the State Toxicologist there is a 99% probability that Defendant's actual breath alcohol concentration would lay within a range of 0.2934 to 0.3507 g/210L. The probability that Defendant would be wrongly convicted under the *per se* prong of the DUI statute, or improperly sentenced, is so remote that the potential prejudice reflected in measurement error clearly does not outweigh the probative value of the test result. Defendant's breath test result is clearly meaningful and useful to the trier of fact in this case. The balancing test of ER 403 weighs in favor of admission of the evidence, not exclusion of it.

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[10] Due process requires the State to bear the burden of persuasion beyond a reasonable doubt as to every essential element of a crime. *State v. Hanna*, 123 Wn.2d 704, 710, 871 P.2d 135 (1994). Due process also prohibits a trial judge from inviting the jury to find one or more elements of the crime irrationally or arbitrarily, and it bars the judge from submitting the case to the jury (and thereby inviting the jury to find each element of the crime) when the evidence is such that no rational trier of fact could find each element of the crime beyond a reasonable doubt. *State v. Delmarter,* 68 Wn.App. 770 at 776-77, 845 P.2d 1340 (Div. 2, 1993)(*citing Jackson v. Virginia,* 443 U.S. at 319, 99 S.Ct. at 2789 (1979), *and overruled on other grounds by State v. Brunson*, 128 Wn.2d 98, 905 P.2d 346 (1995)); *State v. Green*, 94 Wn.2d 216, 616 P.2d 628 (1980)(*also citing Jackson v. Virginia*, 443 U.S 307, 99 S.Ct. 2781, 61 L.Ed.2d 560 (1979)). Unfortunately, without some evidence on the issue of uncertainty, it would be difficult for a trial court to fulfill its obligation to ensure due process is achieved in some DUI breath test cases. *See* Finding of Fact #102.

ORDER

Given the above findings and conclusions, it is hereby ordered that the Defendant's motions to suppress are denied.

ENTERED this 13th day of October, 2010.

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David M. Grant, Judge