

Traffic Safety Standard

Providing relevant information to Montana's prosecutors, law enforcement and judges

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Montana's Traffic Safety Resource Prosecutor (TSRP) position is funded by the Montana Department of Transportation as part of a comprehensive effort to reduce the number and severity of traffic crashes, injuries, and fatalities on Montana highways.

Crime Lab Improves Toxicology Reports in DUI Cases

By Scott Larson (slarson@mt.gov) Toxicology Supervisor, Montana Forensic Science Division

Accreditation Prompts the Changes

The Montana Department of Justice's Forensic Science Division has been accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) since 2005. This is a rigorous process that continually pushes the division to improve upon current policies. Over the last couple of years there has been a movement by ASCLD/LAB for all forensic science entities to provide measurement uncertainty values for all quantitative amounts. For the toxicology laboratory that means calculating the measurement of uncertainty for all compounds that we produce a quantitative value for. This has been a large undertaking, but the policy was put in place on December 31, 2013.

What is Measurement of Uncertainty?

"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 the measurement result."¹

Mathematically it is recognized that no measurement is exactly known. Anytime a measurement is taken, the value depends on many different variables. This would include the measuring system, the procedure, the person performing the measurement, etc. Therefore, the measurement uncertainty is the variability associated with any quantitative measurement result based on the total process. Additionally, no measurement is fully interpretable within a given context until the full process generating the result is understood.

A common misconception is that measurement of uncertainty somehow equals an error rate. An error rate suggests that you know the true value that is being measured. The error rate would then be a simple calculation from the measured value to the theoretical value. When we are testing a DUI sample for ethanol there is no known value. That is why we need to take into account every component of our testing to determine our combined uncertainty.

How does Measurement of Uncertainty affect the Toxicology Results?

The primary goal of the toxicology laboratory is to produce accurate testing in a timely manner. Adding measurement uncertainty to our results will give our clients a better understanding of each test we perform. Every assay that we produce a value for will have an uncertainty of measurement calculated for it. This calculation will allow a range to be assigned for each result. For drugs that have a State of Montana per se law (ethanol and parent THC), the test result followed by the uncertainty of

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measurement will be printed on the report. For all other drugs, the uncertainty of measurement calculation can be obtained from the toxicology laboratory with a request.

An example of this on a report would be as follows: Ethanol: 0.119 ± 0.009 gm/100mL

The interpretation of this result would be that the true value of ethanol in this case could range from 0.110 gm/100mL to 0.128 gm/100mL. This uncertainty of the concentration is expressed as an extended uncertainty at a coverage probability of 95.45% using a coverage factor of $k=2$. Based on the statistical analysis of our method we are 95.45% sure that the result would fall into that range.

Most people realize that there are always variables and unknowns when measurements are calculated. We are now tracking these to provide a better overall product. Please contact the laboratory if you have any questions.

References

ASCLD/LAB Policy on Measurement Uncertainty (AL-PD-3060 Ver. 1.1)

1. Eurachem/CITAC Guide: Quantifying Uncertainty in Analytical Measurement, Third edition.

TSRP Questions

Erin: Has the procedure or equipment you use in testing blood for DUI cases changed as a result of the certification?

Scott: No. There have been no changes. There has always been variability in all testing. Now we are documenting the confidence in the overall procedure.

Erin: Can we trust and use the test results in court prior to January 1, 2014?

Scott: Yes, because no procedural changes have been made. We are now just doing the statistical analysis to go along with the testing.

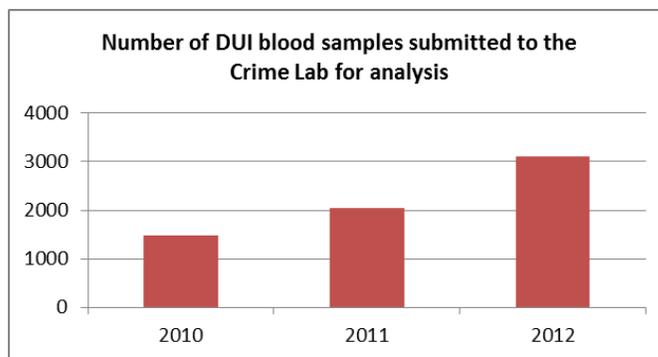
Erin: This sounds a lot like margin of error. Is it?

Scott: It is similar but uncertainty of measurement tracks not only the sampling error but the variability of the entire testing process.

Crime Lab Sees Rise in DUI Samples In Recent Years

In 2010, the laboratory received 1481 DUI blood samples for analysis. In 2011, this increased 38% to 2048. In 2012, this increased another 51% to 3102. In just two years the laboratory was testing over double the number of DUI samples. It also saw an increase in the number of blood samples submitted in 2013 for DUI cases.

In addition to alcohol, many of these cases contain an assortment of drugs. Statewide there has been an increasing focus on the abuse of both pharmaceuticals and drugs of abuse. Driving while impaired on these drugs continues to be a serious traffic safety issue. Over 30% of all DUI cases contained drugs. Of the drug positive cases, 35% contain multiple drugs.



Between the large increase in DUI cases and the amount of drugs found in these cases the laboratory does not have the instrumentation or personnel necessary to keep up with testing. Due to these increases, the laboratory has had to implement a testing policy to only perform drug testing on any DUI that has a blood alcohol level less than 0.1g/dL or if there is a specific request from the arresting officer or prosecutor.

Currently the laboratory only has one gas chromatography/ mass spectrometry instrument (GC/MS) to perform drug screening on DUI cases and one liquid chromatography/ mass spectrometry instrument (LC/MS) to perform quantitative work. The Crime Lab only has two toxicologists that works full-time on DUI cases (alcohol and drugs) and two who work part-time (they have other duties in laboratory) so there can be a delay in performing testing because of the case volume or lack of available instrumentation.



Dr. Karl Citek Comes to Montana

Dr. Karl Citek, Professor at Pacific University College of Optometry is pictured here with Rich Batterman, President of the Montana County Attorneys Association and Carter and Fallon County Attorney. Dr. Citek braved sub-zero temperatures to speak at the Association's winter conference in December. He spent three hours detailing the effect of drugs on human eyes and safe driving. The discussion included time spent explaining the significance of the Horizontal Gaze Nystagmus test, that officers use when conducting standardized field sobriety tests.



Recent Traffic Safety Case Highlights

Court decisions affecting enforcement on our roads:

State v. Garding, 2013 MT 355. The District Court did not abuse its discretion when it allowed the State to call a previously undisclosed rebuttal witness regarding fabric impressions in a DUI crash case during the case-in-chief. The witness testified briefly, and the court gave Defendant “ample time to interview [the witness] and indicated a willingness to grant more time if necessary.”

State v. Calvert, 2013 MT 374. Nevada's 1996 DUI statute, which includes a traditional “under the influence” provision, a greater than 0.10 per se provision, and a 0.10 within 2 hours of driving provision, is sufficiently similar to Montana's 1995 DUI statutes to consider them prior offenses in Montana under Montana Code Annotated Section 61-8-734. The fact that Nevada allowed for a conviction when the level was measured up to two hours after the driving (Nevada) as opposed to while driving (Montana) “was not significant for purposes of §61-8-734(1)(a). . . .”

For the complete text of the opinions, go to <http://searchcourts.mt.gov/>.

Past issues of the Traffic Safety Standard are online at:
www.mdt.mt.gov/tsrp/newsletters.shtml

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Training Dates

Course Title	Date	Location	Registration Information
Advanced Roadside Impaired Driving Enforcement (ARIDE) More Information	February 10-11	Billings	To register, contact Kurt Sager at ksager@mt.gov or 406-422-9251
DRE School For Prosecutors (Prosecuting the DUI)	February 25-27	Great Falls	Email barb@inmantraining.com
Prosecuting the DUI Course Description and Registration	April 1-3	Fort Harrison (Helena)	Email barb@inmantraining.com no cost
Conducting Compliance Check Operations	Ongoing	Free - Online course	course details
Environmental Strategies	Ongoing	Free - Online course	course details
Party Prevention and Controlled Party Dispersal	Ongoing	Free - Online course	course details
Techniques for Managing Special Events	Ongoing	Free - Online course	course details
Source Investigations	Ongoing	Free - Online course	Coming soon

For information about more trainings and conferences, please go to <http://www.mdt.mt.gov/tsrp/> and click on "Education and Training Opportunities"

MDT attempts to provide accommodations for any known disability that may interfere with a person participating in any service, program, or activity of the Department. Alternative accessible formats of this information will be provided upon request. For further information call (406) 444-3423, TTY (800) 335-7592, or the Montana Relay at 711.