2016 Annual Toxicology Report

Department of Justice
Forensic Science Division
Toxicology Section

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Special thanks to Annalisa Martin (Division Administrative Officer), Gavin Lawson, and Michelle Duffus for helping compile statistics used in report.

Introduction

The mission of the Forensic Science Division Toxicology laboratory is to provide the state of Montana forensically defensible results in the quickest timeframe possible. The laboratory provides drug and alcohol testing for the following types of cases:

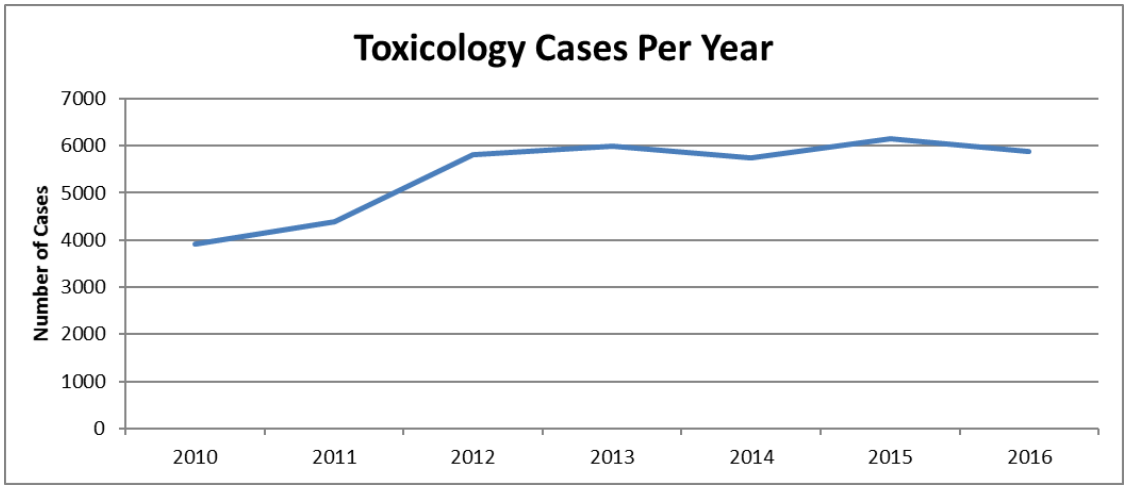
1. Driving under the Influence Cases (DUI or DUID)
2. Postmortem cases: Assisting the medical examiner/coroner system in the determination of cause/manner of death.
3. Urinalysis testing for Department of Corrections probation/parole system
4. Sexual assault cases
5. Drug Endangered Children cases (DEC).

The laboratory continues to follow guidelines needed to sustain ASCLD/LAB accreditation. The laboratory communicates with medical examiners, coroners, law enforcement officials, attorneys, and the general community in matters pertaining to chain-of-custody, pharmacology, and toxicological related matters. The Toxicologists testify in the court system whenever requested.

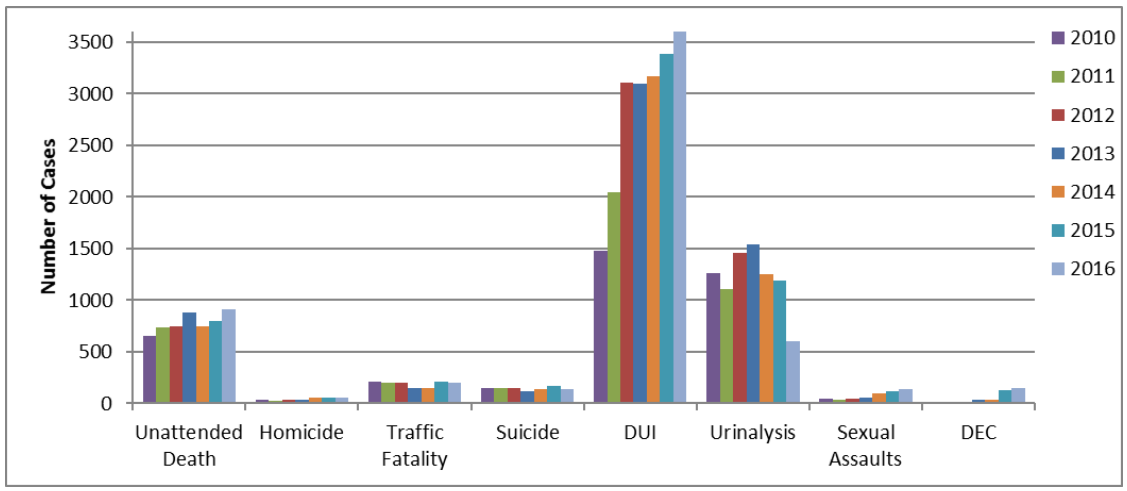
This report contains graphs and figures that can be used to track our results by the many agencies we work in partnership with throughout the state. This is not an exhaustive list of drugs detected and confirmed by this laboratory, just the most frequently found drugs. The cases in this report are sorted into groups as they were submitted to us, not necessarily as the final cause/manner of death as concluded by the medical examiner or coroner. In addition, a drug found in a postmortem case does not necessarily mean that it contributed to the cause/manner of death.

Total Testing Per Year

2010-2016 Total Toxicology Cases



2010-2016 Toxicology Results per Case Type



2016 TURN-AROUND TIME SUMMARY

A standard metric within the toxicology field is determining the percentage of cases done within a given timeframe. The current goal at this laboratory is to complete 95% of the postmortem cases within 75 days, DUI drug cases within 75 days, DUI ethanol-only cases within 30 days, and urinalysis cases within 60 days. The results of every laboratory depend on the efficiency of the program in general and resources available to the laboratory.

Type of Case	Median	% of cases within desired range
Postmortem	43 Days	93% cases completed by 75 days
DUI Drugs	53 Days	95% cases completed by 75 days
DUI Ethanol	22 Days	82% cases completed by 30 days
Urinalysis	47 Days	86% cases completed by 60 days

Driving Under the Influence (Alcohol and/or Drugs) Summary

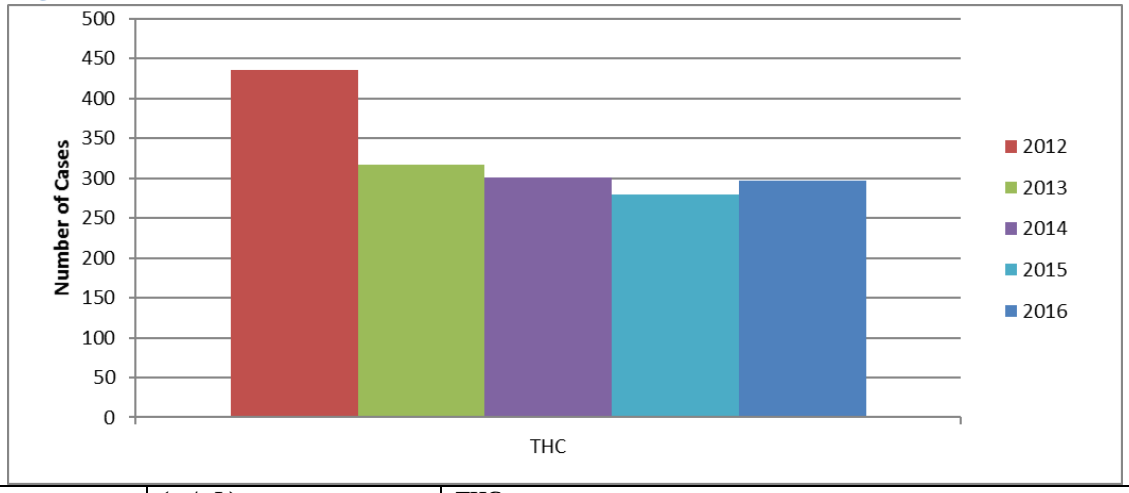
In 2013, a laboratory policy was instituted where drugs were only tested in DUI cases *if* requested and the blood alcohol was less than 0.1 g/100mL. Case reports are then released with a note stating that no drug testing was performed. Contact information is provided if a client requests drug testing to be performed on that case. This policy was necessary to cope with the increased workloads and to reduce delays in the completion of reports for the majority of DUI cases. Any case involving a drug recognition expert (DRE) is exempt from this policy.

DUI- Alcohol

Ethanol Concentration

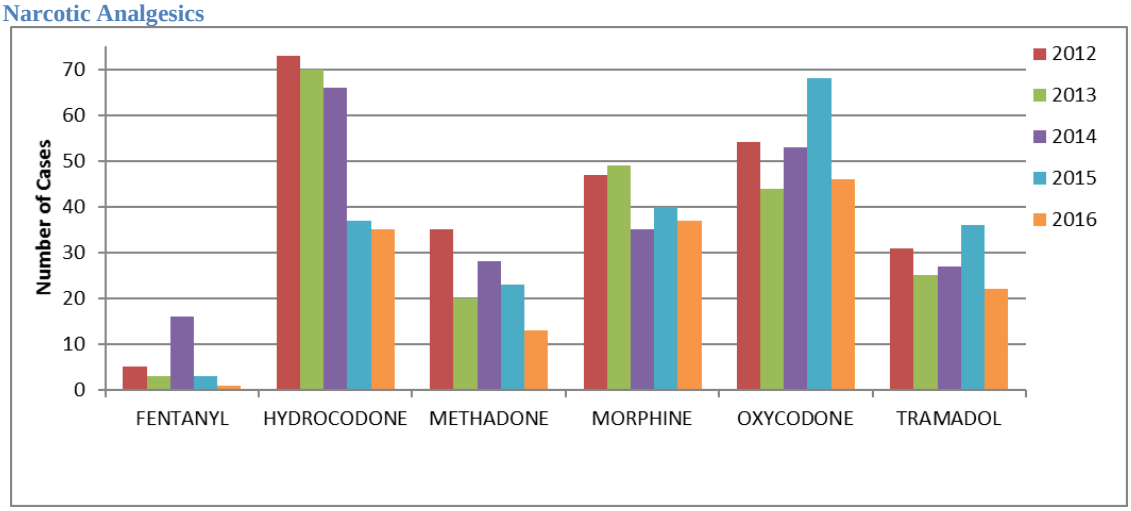
Cases with Alcohol Only Detected (DUI)	Total	Mean	Range
2011	832	0.19	0.08-0.46
2012	1653	0.19	0.08-0.39
2013	1854	0.19	0.08-0.43
2014	2195	0.19	0.08-0.46
2015	2277	0.19	0.08-0.46
2016	2427	0.20	0.028-0.51
Cases with Drugs and Alcohol Detected (DUID)	**Total**	**Mean**	**Range**
2011	496	0.14	0.02-0.46
2012	676	0.14	0.02-0.44
2013	414	0.13	0.02-0.47
2014	259	0.078	0.02-0.40
2015	260	0.077	0.02-0.30
2016	281	0.080	0.02-0.45

DUI- THC



Year	(ng/mL)	THC
2012	Mean	6
	Range	1-49
2013	Mean	8
	Range	1-48
2014	Mean	11
	Range	1.3-100
2015	Mean	9
	Range	3-49
2016	Mean	10
	Range	3-82

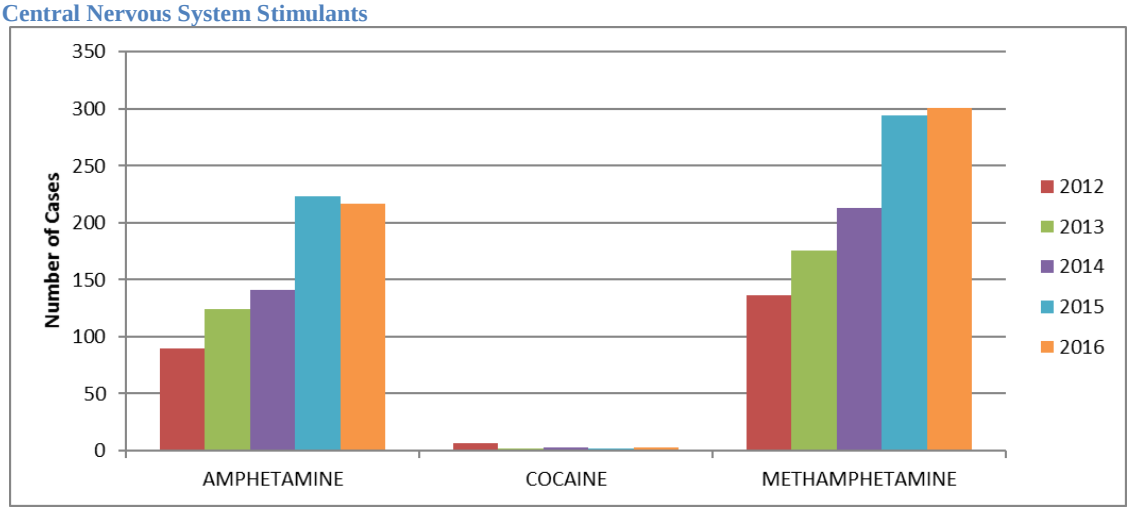
DUI- Narcotic Analgesics



Year	mg/L	FENTANYL*	HYDROCODONE	METHADONE	MORPHINE	OXYCODONE	TRAMADOL
2012	Mean	4.3	0.07	0.23	0.06	0.09	1.1
	Range	4-5	0.02-0.6	0.02-0.92	0.02-0.19	0.02-0.41	0.02-10
2013	Mean	2.2	0.57	0.19	0.05	0.10	0.67
	Range	2.2	0.02-22	0.04-0.79	0.02-0.14	0.02-0.51	0.03-3.4
2014	Mean	2.7	0.07	0.27	0.05	0.1	0.69
	Range	0.69-9.5	0.03-0.2	0.03-0.64	0.02-0.15	0.02-0.29	0.02-3.3
2015	Mean	3	0.07	0.24	0.06	0.11	0.45
	Range	0.62-6.3	0.02-0.25	0.03-0.92	0.02-0.33	0.02-0.44	0.03-3.1
2016	Mean	1.9	0.056	0.26	0.05	0.11	0.4
	Range	N/A	0.02-0.18	0.02-0.91	0.02-0.15	0.02-0.61	0.03-2

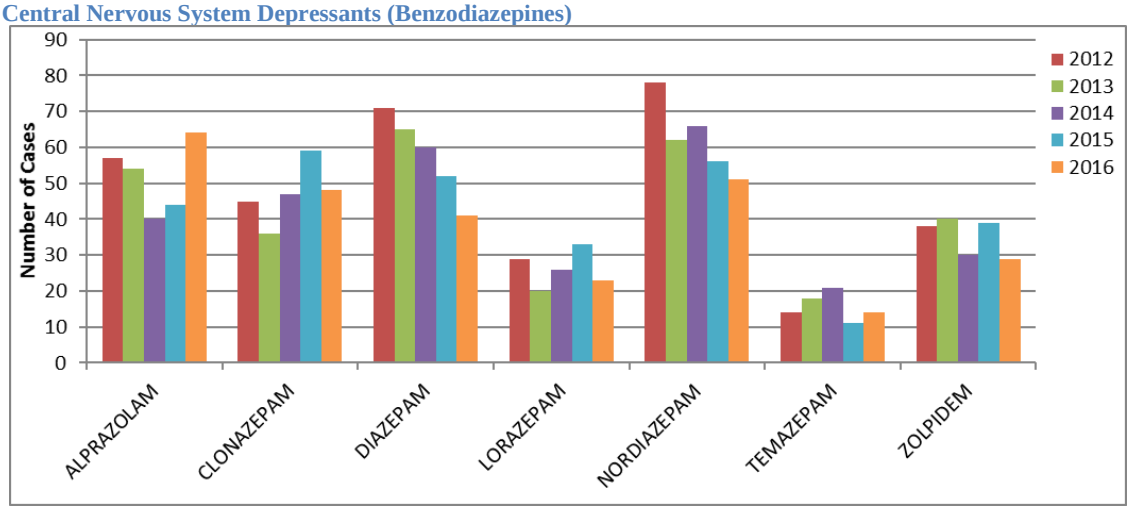
*All concentrations are in mg/L except Fentanyl which is in ng/mL

DUI- Central Nervous System Stimulants



Year	mg/L	AMPHETAMINE	COCAINE	METHAMPHETAMINE
2012	Mean	0.09	0.03	0.30
	Range	0.02-1.0	<0.02-0.03	0.02-4.3
2013	Mean	0.07	0.03	0.26
	Range	0.02-0.28	<0.02-0.04	0.02-2
2014	Mean	0.07	N/A	0.33
	Range	0.02-0.8	N/A	0.02-1.9
2015	Mean	0.07	N/A	0.36
	Range	0.02-0.44	N/A	0.02-2.6
2016	Mean	0.06	N/A	0.34
	Range	0.02-0.44	N/A	0.02-1.8

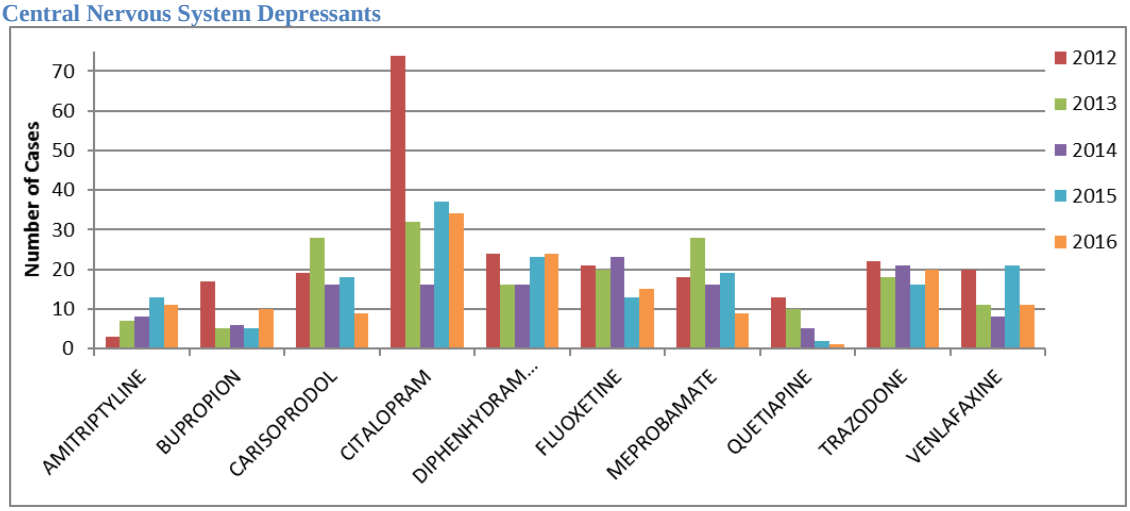
DUI- Central Nervous System Depressants (Benzodiazepines)



Year	mg/L	ALPRAZOLAM	CLONAZEPAM	DIAZEPAM	LORAZEPAM *	NORDIAZEPAM	TEMAZEPAM	ZOLPIDEM
2012	Mean	0.10	0.07	0.29	58	0.30	0.16	0.40
	Range	0.02-0.26	0.02-0.20	0.02-1.6	5-159	0.02-2.3	0.02-1.1	0.02-3.5
2013	Mean	0.13	0.05	0.54	68	0.40	0.36	0.21
	Range	0.02-0.88	0.02-0.14	0.02-4.6	6-194	0.02-1.7	0.03-0.93	0.02-0.69
2014	Mean	0.093	0.05	0.28	83	0.29	0.25	0.29
	Range	0.02-0.6	0.02-0.19	0.02-1.2	17-210	0.02-2.2	0.02-1.7	0.03-1.3
2015	Mean	0.08	0.05	0.18	65	0.32	0.19	0.31
	Range	0.02-0.3	0.02-0.09	0.02-0.75	7-229	0.02-1.3	0.02-0.61	0.04-1.7
2016	Mean	0.11	0.04	0.37	67	0.32	0.32	0.35
	Range	0.02-0.68	0.02-0.11	0.02-1.5	10-390	0.03-1.6	0.02-2	0.07-1.3

*All concentrations are in mg/L except Lorazepam which is in ng/mL

DUI- Central Nervous System Depressants

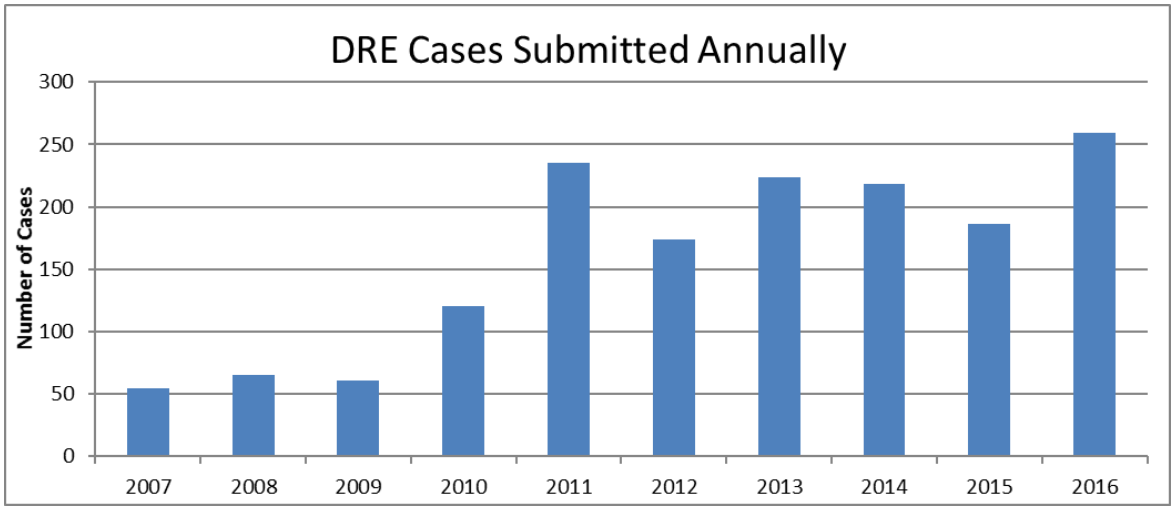


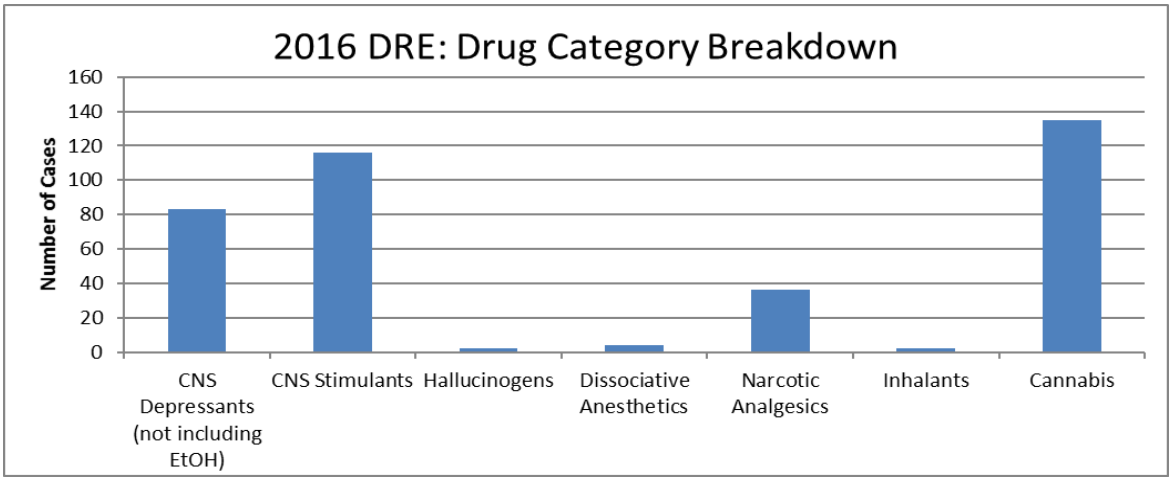
Year	mg/L	AMITRIPTYLENE	BUPROPRION	CARISOPRODOL	CITALOPRAM	DIPHENHYDRAMINE
2012	Mean	0.11	0.04	5.4	0.13	0.23
	Range	0.07-0.14	0.02-0.08	2.0-10	0.02-0.48	0.03-1.1
2013	Mean	0.14	0.03	6.4	0.13	0.54
	Range	0.07-0.21	0.03-0.04	2.5-13	0.04-0.46	0.53-2.2
2014	Mean	0.06	0.031	5.1	0.098	0.37
	Range	0.021-0.12	0.022-0.047	2.0-15	0.04-0.21	0.02-2.7
2015	Mean	0.05	N/A	6.5	0.03	0.11
	Range	0.02-0.10	N/A	2.4-13	0.02-0.05	0.02-0.77
2016	Mean	0.12	N/A	5.7	N/A	0.21
	Range	0.03-0.36	N/A	2.1-12	N/A	0.02-1

Year	mg/L	FLUOXETINE	MEPROBAMATE	QUETIAPINE	TRAZODONE	VENLAFAXINE
2012	Mean	0.29	15	0.37	0.51	0.14
	Range	0.03-1.2	3-26	0.02-1.2	0.06-1.2	0.03-0.49
2013	Mean	0.19	11	0.36	0.56	0.38
	Range	0.07-0.43	2-28	0.04-1.1	0.12-1.6	0.05-1.4
2014	Mean	0.36	13	0.22	0.57	0.44
	Range	0.91-1.8	2.4-52	0.04-0.85	0.06-1.4	0.06-2
2015	Mean	0.25	12	N/A	0.3	N/A
	Range	0.12-0.38	2.3-31	N/A	0.09-0.53	N/A
2016	Mean	N/A	16	N/A	0.81	0.8
	Range	N/A	3-49	N/A	0.07-1.8	0.12-2

DRE (Drug Recognition Expert) Summary

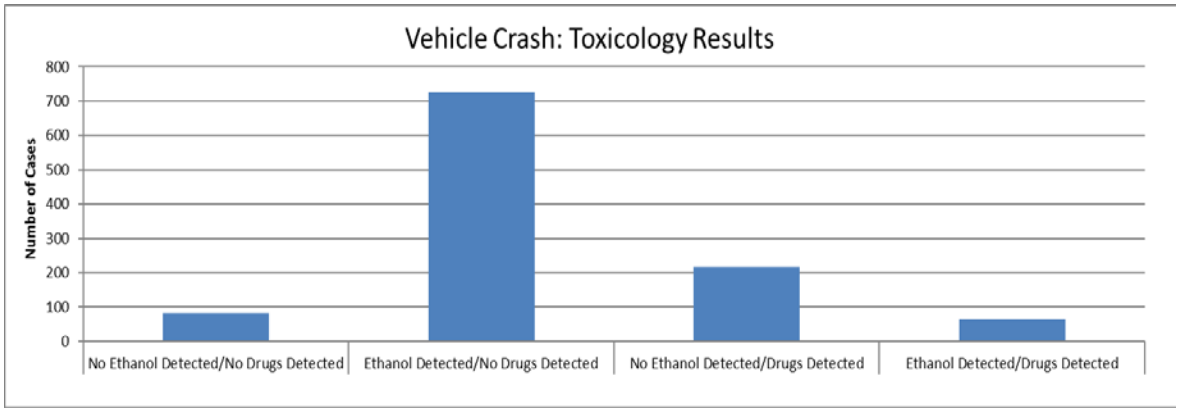
Drug testing is performed on all DRE submitted cases. In 2016 there were 259 DRE cases submitted. Some cases may be positive for multiple drugs.

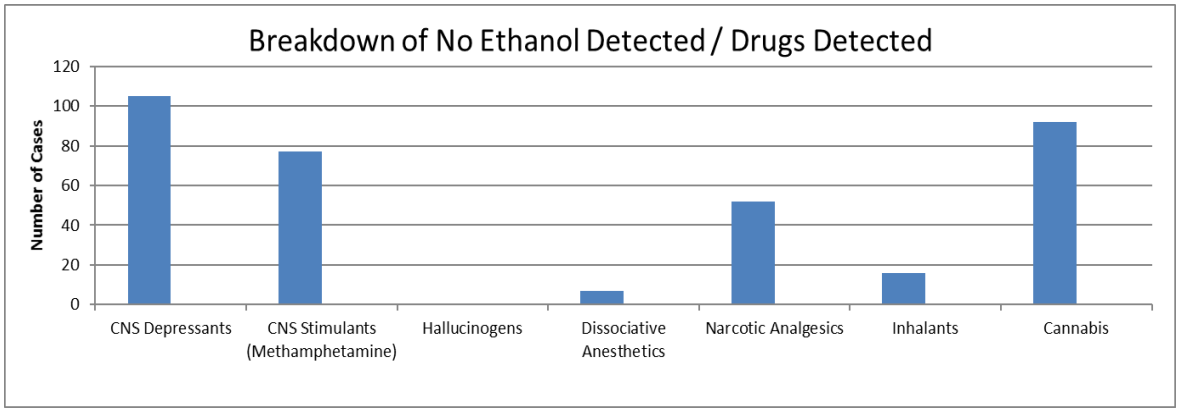


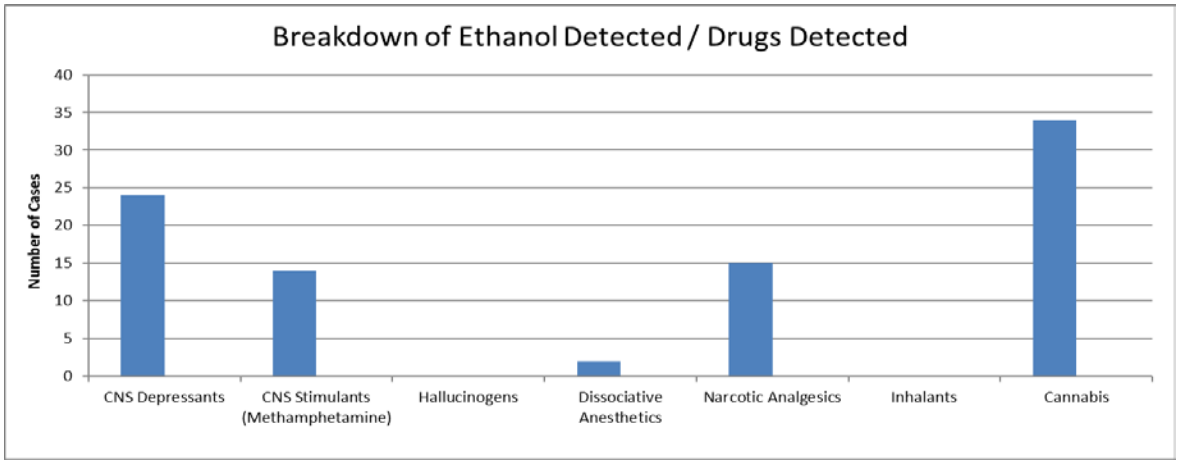


Crash/DUI Summary

The laboratory received 1090 crash cases. The mean ethanol concentration was 0.191 g/100mL. The mean THC concentration was 7.0 ng/mL. Some cases may be positive for multiple drugs. Ethanol not included in CNS Depressant drug group below.

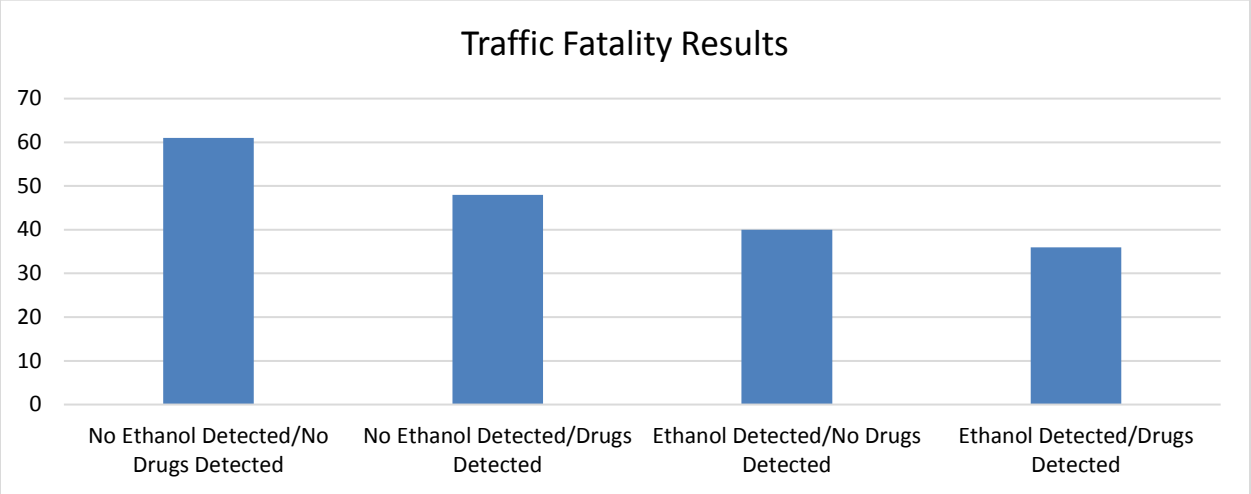


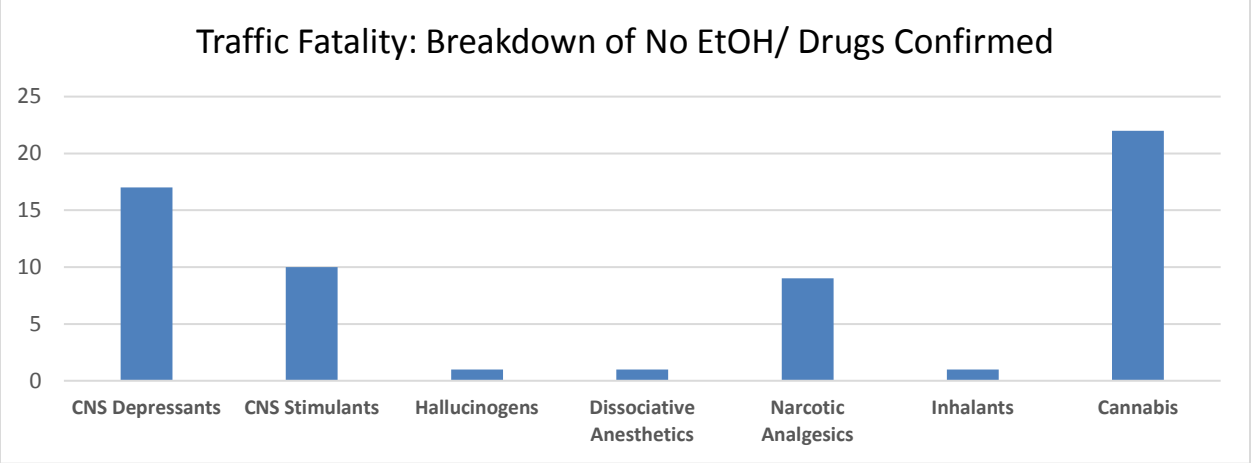


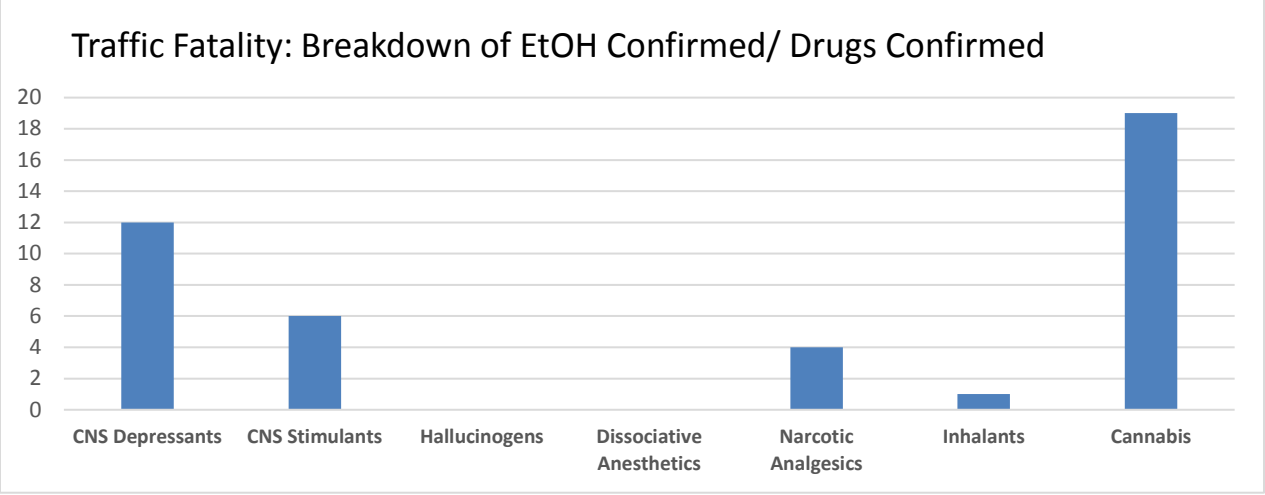


TRAFFIC FATALITIES SUMMARY

The laboratory received 194 traffic fatality cases and performed toxicology testing on 186 cases. There is no distinction between a driver and a passenger in the following data. The mean ethanol concentration was 0.211 g/100mL for both the EtOH Confirmed/No Drug cases and the EtOH Confirmed/ Drug confirmed cases. The mean THC concentration in the No EtOH /Drugs confirmed cases was 24 ng/mL. The mean THC concentration in the EtOH Confirmed/ Drug confirmed cases was 12 ng/mL. Some cases may be positive for multiple drugs. Ethanol not included in CNS Depressant drug group below.







POSTMORTEM TOXICOLOGY SUMMARY

Medical Examiners performed 599 autopsies in death investigation cases. The toxicology section would have performed testing on most those cases. It was determined that 152 of those cases had toxicology results of significance. Below is a breakdown of the "Cause and Manner of Death" and corresponding drug results. The data below does not include deaths where the coroner did not have an autopsy performed.

Toxicology Related Case Breakdown by Manner of Death (Autopsied cases only)

		Ethanol		THC		Methamphetamine		Fentanyl	
Manner of Death	**Number of cases**	**Detected (# of cases)**	**Conc. (g/dL)**	**Detected (# of cases)**	**Conc. (ng/mL)**	**Detected (# of cases)**	**Conc. (mg/L)**	**Detected (# of cases)**	**Conc. (ng/mL)**
Homicide	3	1	0.246	0	None Present	0	None Present	0	None Present
Suicide	9	4	0.105	0	None Present	2	1.4	0	None Present
Natural	23	8	0.192	3	Less than 3	2	0.16	1	No Quant
Accident	92	19	0.152	5	12	29	1.72	12	15.58
Undetermined	26	5	0.157	2	13	2	7.95	0	None Present

Toxicology Related Case Breakdown by Cause of Death (Autopsied cases only)

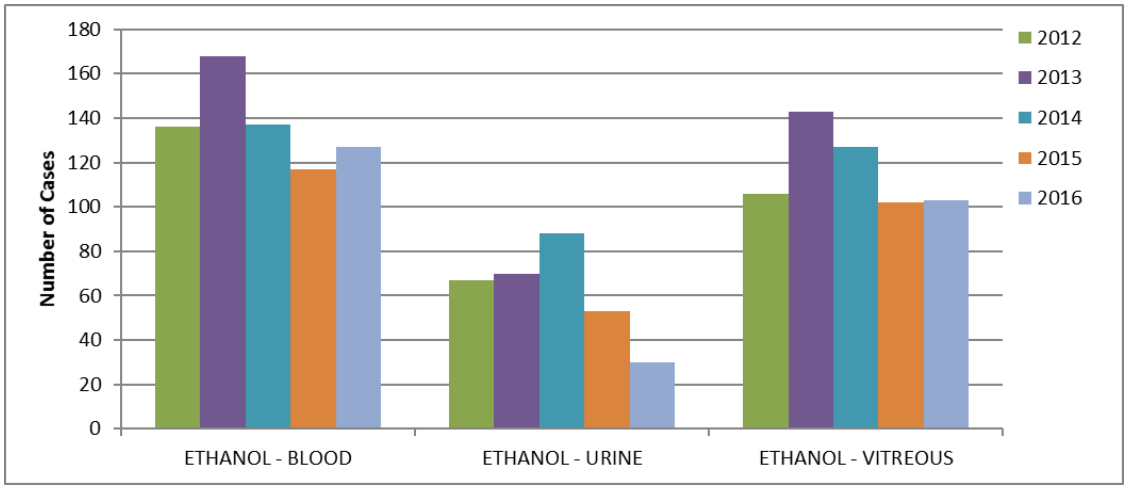
Cause of Death (some cases fall into multiple categories)	**# of cases**	**Ethanol Conc. (g/dL)**	**Meth Conc. (mg/L)**	**THC Conc. (ng/mL)**
Ethanol Related (with or without drugs)	37	0.178	0.12	Less than 3
Ethanol Only	23	0.196	0.16	Less than 3
Drug(s) in combination with EtOH	15	0.167	0.08	3.5
Multiple Drugs w/o EtOH	36	0.098	0.88	11
Methamphetamine Related	24	0.033	2.4	33
Methadone Related (Mean: 0.33 mg/L)	8	0.137	0.45	None Detected
Fentanyl related (Mean: 17 ng/mL)	9	0.261	Detected Only (1 case)	3.5
Oxycodone Related (Mean: 0.30 mg/L) Hydrocodone Related (Mean: 0.46 mg/L)	8	0.116	3.9	6.2
Heroin	4	0.051	0.02	None Detected
Carbon Monoxide/smoke inhalation (Mean: >47.4% CoHb)	18	0.224	1.1	None Detected
1,1 Difluoroethane	6	None Detected	None Detected	None Detected
Undetermined	15	0.026	3200 ng/g	1300 ng/g
Miscellaneous 1. Clozapine Intoxication 2. Isopropanol Intoxication 3. Lorazepam/Diphenhydramine Intoxication 4. Trazodone Intoxication	4	None Detected	None Detected	None Detected

Unattended Death Toxicology Results

A routine postmortem toxicology testing panel consists of the analysis of major alcohols (ethanol, methanol, acetone, and isopropanol), illicit drugs, and prescription medications. Case history and requests from the submitting agency decides the final testing panel of each case. All positive drug results have been screened and confirmed by different scientific methods. All significant drug results were quantitated unless directed otherwise.
The following disclaimers apply:

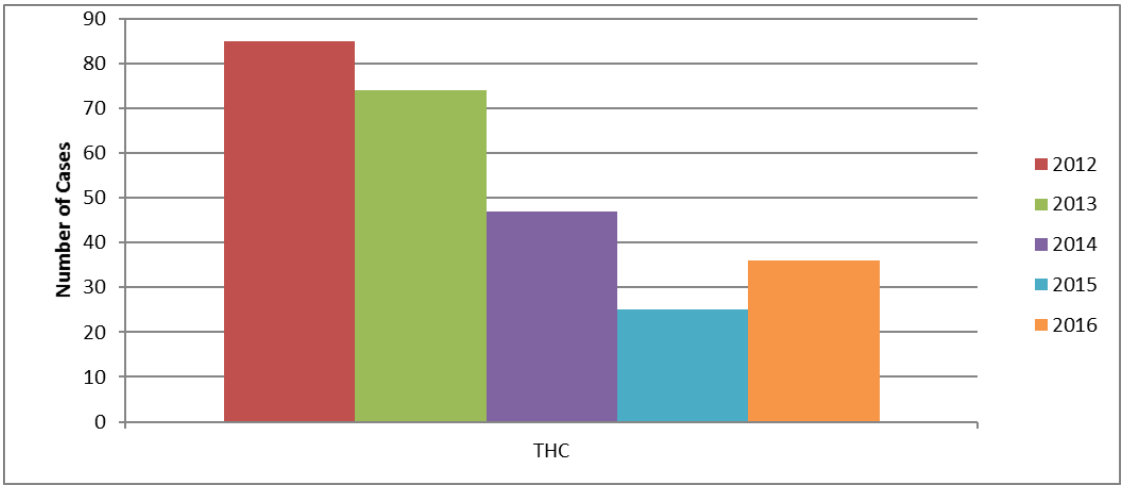
1. The data found in the following tables are only results from the various unattended death cases in our lab and should not be used in any type of postmortem drug interpretation.
2. The ethanol and drugs found in the following postmortem cases do not necessarily mean they were attributed to the cause or manner of death.
3. The cases in the graphs below are sorted into groups as they were submitted to us, not necessarily as the final cause/manner of death as concluded by the medical examiner or coroner.

Unattended Death- Ethanol



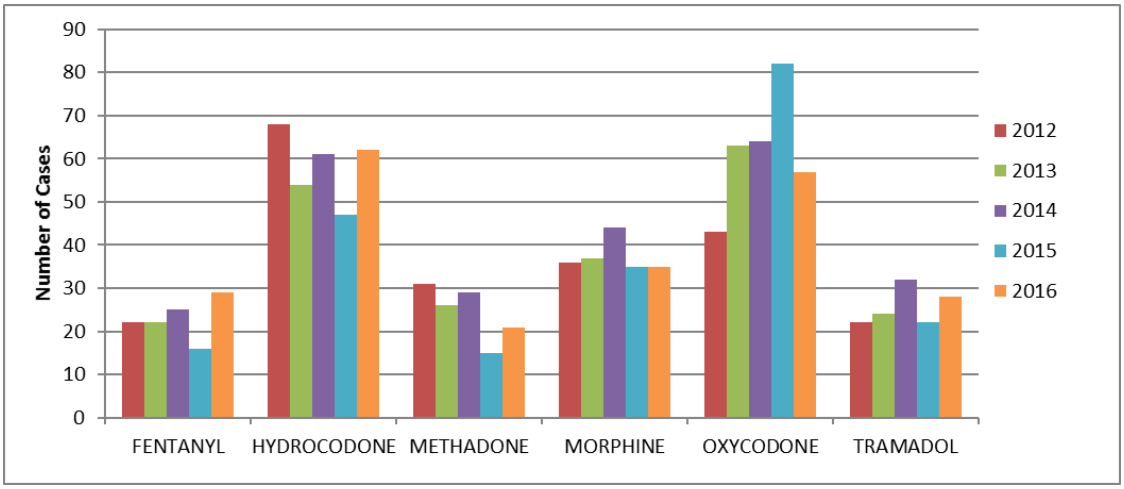
Year	g/100mL	ETHANOL-BLOOD	ETHANOL-URINE	ETHANOL-VITREOUS
2012	Mean	0.14	0.23	0.19
	Range	0.02-0.41	0.02-0.49	0.02-0.54
2013	Mean	0.17	0.22	0.20
	Range	0.02-0.50	.02-0.55	0.03-0.53
2014	Mean	0.17	0.24	0.20
	Range	0.02-0.45	0.02-0.50	0.02-0.50
2015	Mean	0.18	0.22	0.27
	Range	0.02-0.66	0.02-0.74	0.02-0.60
2016	Mean	0.18	0.24	0.20
	Range	0.02-0.59	0.03-0.44	0.02-0.60

Unattended Death- THC



Year	ng/mL	THC
2012	Mean	7.2
	Range	1-39
2013	Mean	8.6
	Range	1-70
2014	Mean	10.9
	Range	1.1-62
2015	Mean	10.7
	Range	1.5-69
2016	Mean	11
	Range	3.1-35

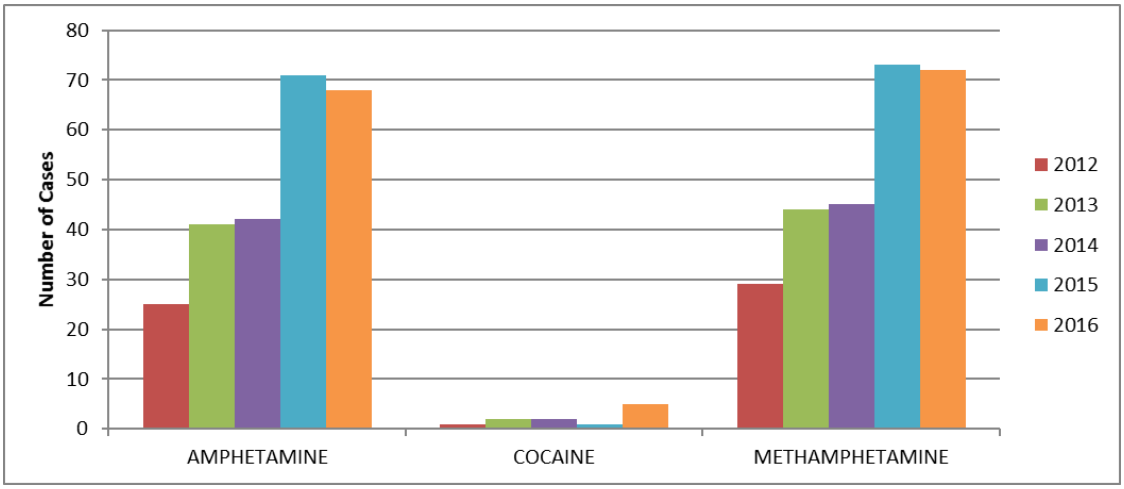
Unattended Death- Narcotic Analgesics



Year	ng/mL	FENTANYL*	HYDROCODONE	METHADONE	MORPHINE	OXYCODONE	TRAMADOL
2012	Mean	18	0.15	0.56	0.25	0.47	1.1
	Range	3-35	0.02-0.82	0.11-1.9	0.25-2.7	0.02-2.6	0.04-5.4
2013	Mean	15	0.21	0.45	0.25	0.31	2.7
	Range	4-29	0.03-1.0	0.02-1.1	0.02-2.5	0.03-1.9	0.04-24
2014	Mean	12	0.17	0.40	0.28	0.28	2.1
	Range	1.2-48	0.02-2.2	0.07-1.2	0.02-3.6	0.02-2.2	0.1-13
2015	Mean	16	0.13	0.52	0.31	0.3	0.92
	Range	1-80	0.03-0.61	0.09-1.5	0.03-2	0.02-1.4	0.14-2.9
2016	Mean	12	0.10	0.38	0.19	0.39	5.4
	Range	1-39	0.02-0.80	0.05-1.3	0.03-0.61	0.02-2.0	0.07-75

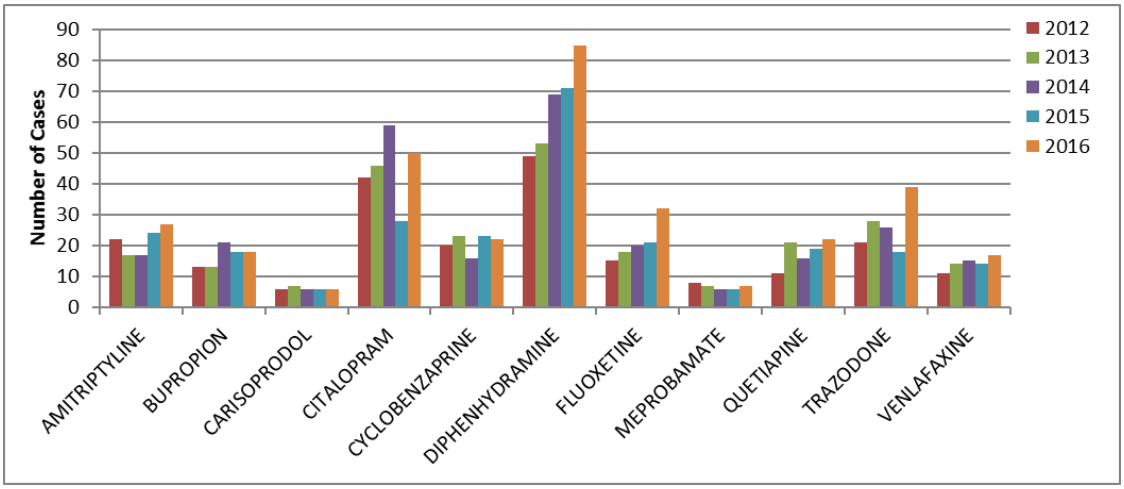
*All concentrations are in mg/L except Fentanyl which is in ng/mL

Unattended Death- Central Nervous System Stimulants



Year	mg/L	AMPHETAMINE	COCAINE	METHAMPHETAMINE
2012	Mean	0.18	N/A	0.56
	Range	0.02-1.2	N/A	0.12-1.9
2013	Mean	0.16	N/A	0.91
	Range	0.02-1.2	N/A	0.14-10.7
2014	Mean	0.15	N/A	1.8
	Range	0.02-1.2	N/A	0.04-17
2015	Mean	0.19	N/A	2.7
	Range	0.02-1.6	N/A	0.02-38
2016	Mean	0.10	N/A	1.2
	Range	0.02-0.48	N/A	0.02-11

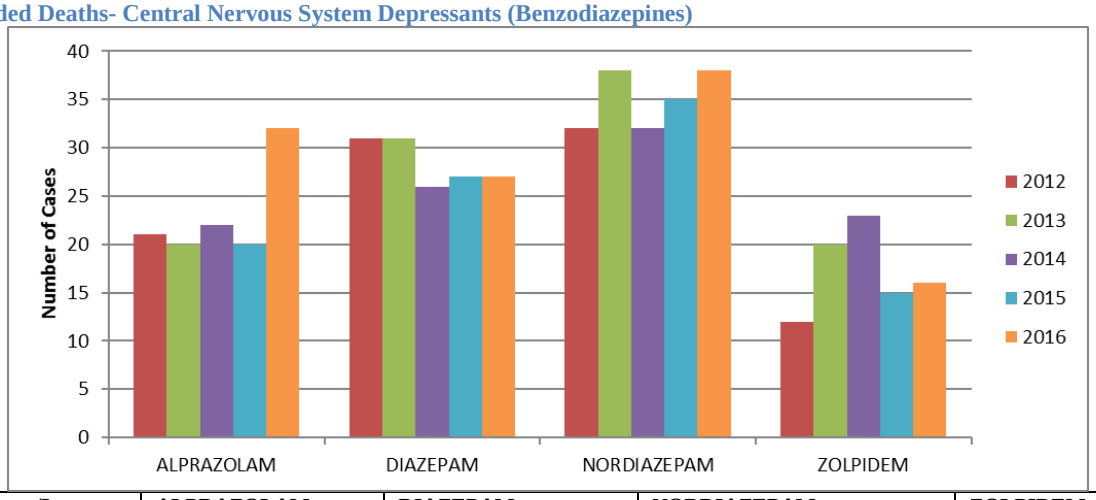
Unattended Deaths- Central Nervous System Depressants



Year	mg/L	AMITRIPTYLENE	BUPROPRION	CARISOPRODOL	CITALOPRAM	CYCLOBENZAPRINE
2012	Mean	0.46	0.21	0.76	0.59	0.11
	Range	0.08-1.9	0.08-0.41	0.3-1.4	0.06-2.9	0.05-0.3
2013	Mean	0.64	1.3	7.9	0.49	0.13
	Range	0.03-2.3	0.03-9.4	0.3-35	0.05-2.1	0.03-0.67
2014	Mean	0.51	0.44	3	1.4	0.12
	Range	0.04-2	0.05-1.5	1-6.6	0.03-20	0.06-0.26
2015	Mean	1.1	1.9	2.5	0.71	0.19
	Range	0.03-8.2	0.02-16	2-3	0.07-2.3	0.02-0.63
2016	Mean	0.55	0.55	5.5	0.43	0.2
	Range	0.06-1.5	0.04-3.0	0.5-15	0.06-1.5	0.03-0.97

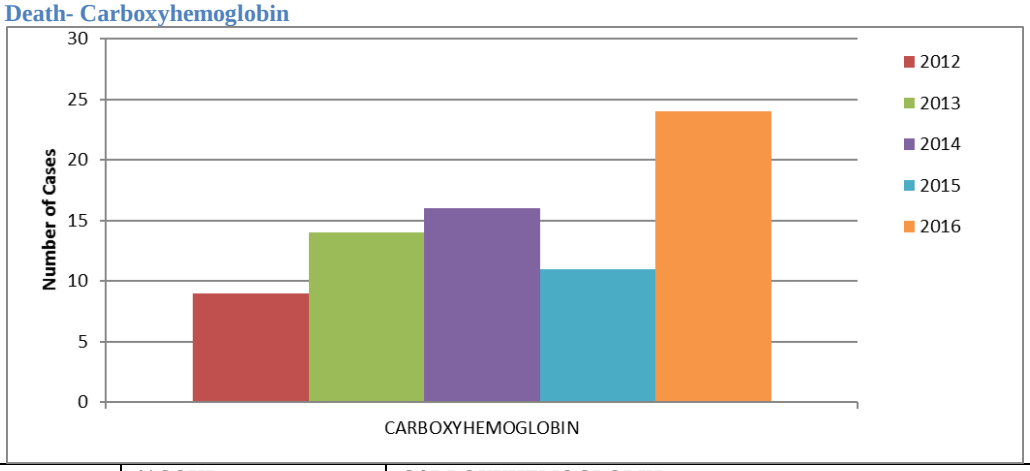
Year	mg/L	DIPHENHYDRAMINE	FLUOXETINE	MEPROBAMATE	QUETIAPINE	TRAZODONE	VENLAFAXINE
2012	Mean	1.7	0.87	3.3	0.91	0.94	0.65
	Range	0.07-19	0.23-1.8	1.7-6.7	0.21-2.8	0.06-2.1	0.1-1.3
2013	Mean	1.3	0.95	9.8	2.3	0.96	1.3
	Range	0.04-24	0.3-3.8	2.4-31.0	0.13-11	0.07-9.7	0.1-5.6
2014	Mean	0.54	0.63	9.2	1.7	0.52	0.85
	Range	0.03-6	0.03-2.1	4-23	0.1-8.8	0.04-2.6	0.08-4.1
2015	Mean	0.62	0.68	8.5	2.1	1.3	2.9
	Range	0.02-6.4	0.08-1.7	1.8-18	0.23-9.5	0.04-8.1	0.45-17
2016	Mean	0.60	1.4	15	1.2	2.2	3.8
	Range	0.03-4.7	0.15-6.5	0.2-50	0.06-5.4	0.07-33	0.06-27

Unattended Deaths- Central Nervous System Depressants (Benzodiazepines)



Year	mg/L	ALPRAZOLAM	DIAZEPAM	NORDIAZEPAM	ZOLPIDEM
2012	Mean	0.07	0.18	0.19	0.15
	Range	0.02-0.17	0.02-0.75	0.02-0.84	0.03-0.57
2013	Mean	0.08	0.13	0.19	0.15
	Range	0.02-0.40	0.02-0.34	0.03-0.52	0.04-0.57
2014	Mean	0.04	0.18	0.21	0.1
	Range	0.016-0.08	0.02-0.61	0.02-0.96	0.02-0.38
2015	Mean	0.093	0.13	0.21	0.07
	Range	0.02-0.47	0.02-0.32	0.02-1.3	0.02-0.13
2016	Mean	0.20	0.17	0.16	0.12
	Range	0.02-0.98	0.02-0.91	0.02-0.51	0.04-0.33

Unattended Death- Carboxyhemoglobin



Year	%COHB	CARBOXYHEMOGLOBIN
2012	Mean	39%
	Range	0.3-79%
2013	Mean	34%
	Range	0.2-70% (4 cases were greater than upper limit of detection of 75%)
2014	Mean	43%
	Range	1.2-75% (4 cases were greater than upper limit of detection of 75%)
2015	Mean	35%
	Range	1.1-74% (4 cases were greater than upper limit of detection of 75%)
2016	Mean	39%
	Range	0.0-77% (4 cases were greater than upper limit of detection of 75%)

Emerging Drug Trends

Mitragynine (Kratom): This is an alkaloid herbal drug that is extracted from the leaves of plants commonly found in southeast Asia. It is marketed as a dietary supplement due to its stimulant effects (when used in low doses) but it can have significant sedative and euphoric effects (when used in higher doses). It is currently legal in the United States and can be purchased easily at local businesses in Montana.

Case Type	Number of Cases
Unattended Death	4
DUID	2
Urinalysis	1

Designer Opiates

U-47700 is a synthetic opioid agonist that was developed by a pharmaceutical company in the early 1970's. It has been demonstrated to have a 7-8 fold increase in potency over morphine in mice but was never studied in humans. It seems to be used as an alternative to morphine or heroin. It began to appear in late 2015 and into 2016. There have been reports of overdoses in at least 11 states including Montana. There were two accidental overdoses last year.

Cases 1:
U-47700 (503 ng/mL)
Ethanol-blood (0.236 GM/100mL)

Case 2:
U-47700 (395 ng/mL)
Ethanol-blood (0.134 GM/100mL)

Furanyl Fentanyl is an analog that is similar to pharmaceutical fentanyl but has never been tested on humans. Over 125 fatalities in at least 24 states have been connected to this drug. Montana had one documented accidental overdose last year (3.8 ng/mL).

Etizolam: A designer benzodiazepine that is not approved for use in the United States (can be purchased over the internet). It can produce euphoria, drowsiness, sedation, depression, and slurred speech when used at higher concentrations. There were two DUI cases in 2016.

Methamphetamine: A central nervous system stimulant, whose use has steadily increased over the last few years in the state of Montana. In 2011, the lab received 73 methamphetamine positive DUI cases. In 2016, that number jumped to 301. During that time-frame the mean concentration rose from 0.163 mg/L to 0.342 mg/L (110% increase). Similarly, there has been a dramatic increase in unattended death postmortem cases. In 2011, the lab received 20 methamphetamine postmortem cases. In 2016, that number jumped to 72. During that time-frame the mean concentration rose from 0.343 mg/L to as high as 2.7 mg/L in 2015 (687% increase). The mean concentration dropped in 2016 to 1.2 mg/L. The percentage of positive urine methamphetamine cases from the Department of Corrections have also increased from

10% in 2009 up to 51% in 2016. These are three different subsets of the population that have all shown a significant increase in methamphetamine use, in addition to large increases in concentration.

6-Monoacetylmorphine: A metabolite of heroin that is found in low levels in the blood and urine. In 2016, the lab detected this compound (blood or urine) in 6 unattended death cases (morphine was found in every case). This was a decrease from 2015 where it 6-MAM was detected in 10 unattended death cases (morphine was found in every case) and in 1 homicide. It was also found in 3 probation/parole urinalysis cases in 2016.

Synthetic Cannabinoids (SC): The designer synthetic cannabinoid drugs are intended to mimic the effects of natural cannabinoids. The laboratory currently does not have the capability to perform SC testing so any requests are sent to outside reference laboratories. In 2016, there were 27 requests. Two of those cases came back positive (7.4% positive rate). Like the rest of the forensic community, Montana has seen the evolution of SCs over the years. Between July 2014 and July 2015, the Montana State Crime Lab sent 23 cases to AIT Laboratories for suspected SC use, 15 (65%) of which were positive. AB-PINACA and AB-CHMINACA accounted for 88% of those positive results. Between August 2015 and August 2016, 34 cases were sent out and only 4 (11.7%) were positive for MDMB-FUBINACA, PB-22, AB-CHMINACA (2 cases), and MAB-CHMINACA. This decrease in positive results after July 2015 may be an example of new compounds replacing the older versions and the testing panels not catching up.

Synthetic Cannabinoid Found	Number of Positives
AB-Chminaca	2

1,1-Difluoroethane: The compound is found in “canned air” and regularly used for huffing. In 2016 the laboratory confirmed the compound in 8 unattended death and 14 DUID cases. In 2015, DFE was confirmed in 2 unattended death and 12 DUID cases.

Buprenorphine: Synthetic opiate used for pain management and the treatment of opiate addiction.

Case Type	Number of Cases	Mean (ng/mL)	Range (ng/mL)
Unattended Death	5	4.4	0.7-11
DUID	16	2	0.69-5.7
Traffic Fatality	1	2.2	2.2

Gabapentin: Treats seizures, pain, anxiety in addition to other uses.

Case Type	Number of Cases	Mean (mg/L)	Range (mg/L)
Unattended Death	16	23	2.3-66
DUID	2	11	8.2-14
Traffic Fatality	1	20	20

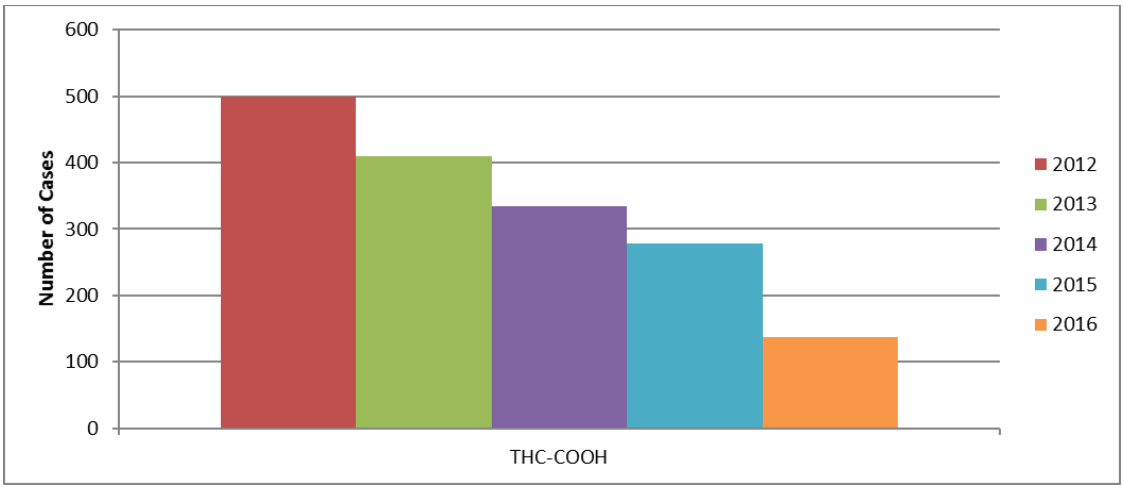
URINALYSIS SUMMARY

Our policy is to confirm the drugs that the submitting agency requested on the submission form based on their screening results. The following list contains the drugs regularly tested for in Urinalysis cases. This is not a complete list but the majority of drugs probation/parole agencies are interested in are included. There can be overlap between the Immunoassay and the Basic Drug Screen depending on the drug. This list will only include some of that overlap. The detection of all drugs is concentration dependent. There is no quantitation on urine specimens.

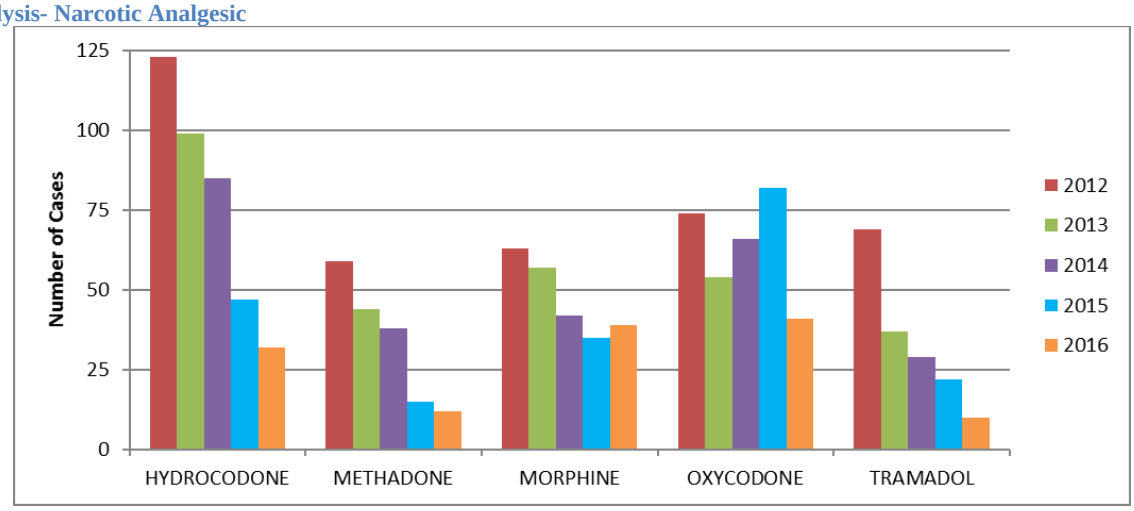
There was a large decrease in submitted cases from 2015 (1192) to 2016 (597). Of the 597 urine specimens that were submitted for analysis, 3 (0.5%) were reported out as no drugs detected. This is a major difference from 2015 when 246 (20.6%) were reported out as no drugs detected.

1. Immunoassay Screen (Further testing needed for confirmation)
    a. Cocaine/Metabolites
    b. Benzodiazepines
    c. Barbiturates
    d. Opiates (Morphine)
    e. Oxycodone
    f. THC/Metabolites
    g. Amphetamine
    h. Methamphetamine
2. Full Scan Basic Drug Screen (GC/MS or LC/MS)
    a. Opiate related drugs: Methadone/ Tramadol/ Hydrocodone/ Fentanyl/ Oxycodone
    b. Cocaine
    c. Benzodiazepines
    d. Amphetamine
    e. Methamphetamine
    f. Anti-depressants
3. Ethanol
4. THC-COOH Confirmation (Inactive metabolite of THC)

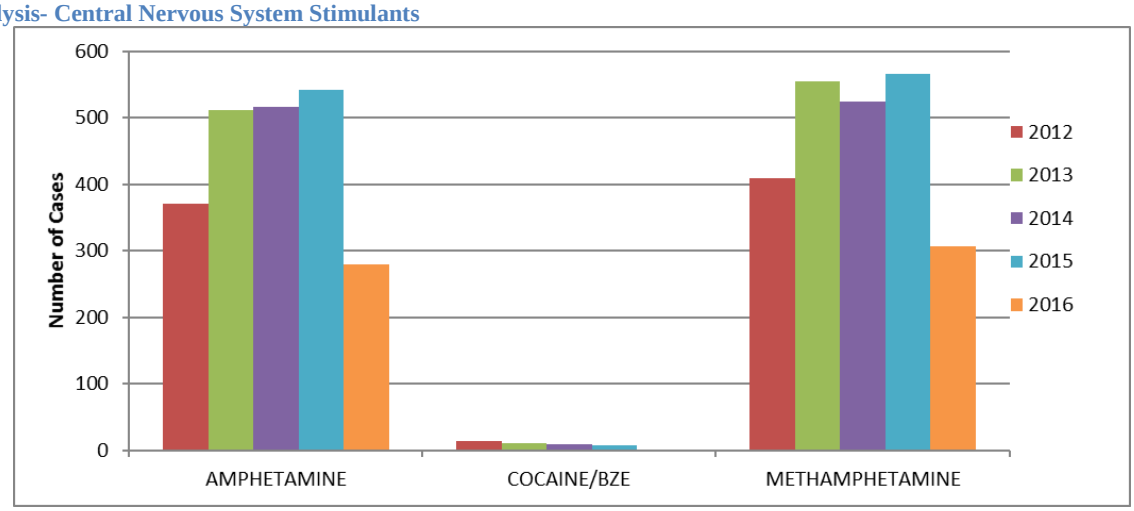
Urinalysis- THC-COOH



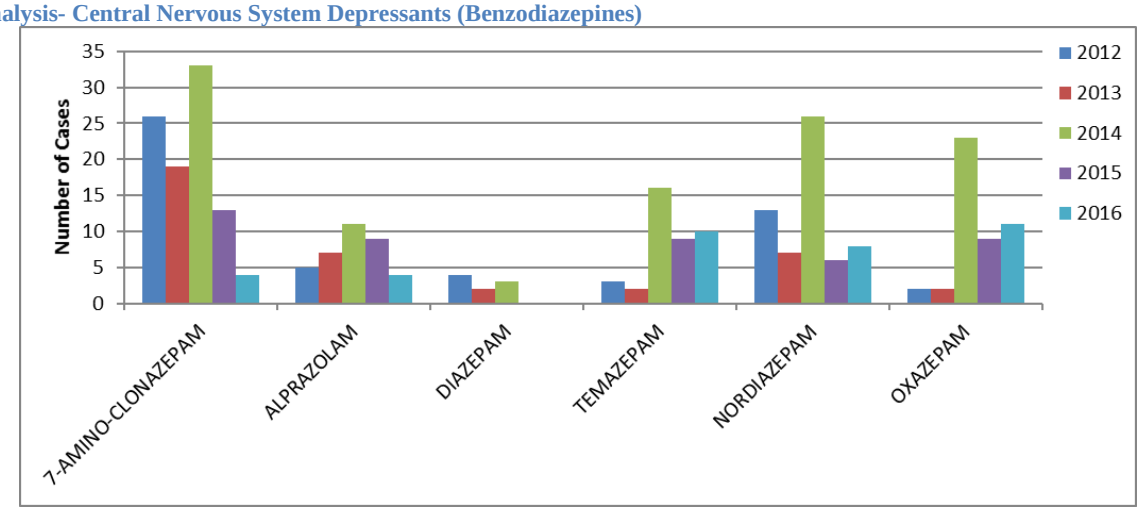
Urinalysis- Narcotic Analgesic



Urinalysis- Central Nervous System Stimulants



Urinalysis- Central Nervous System Depressants (Benzodiazepines)



DRUG ENDANGERED CHILDREN (DEC) SUMMARY

DEC cases are submitted from multiple agencies throughout the state. The specimens that are routinely submitted are urine and/or hair. The laboratory performs drug testing on all urine specimens in-house while all hair specimens are tested in an external reference lab. In 2016, there were 138 hair specimens sent out for testing (up from 125 in 2015 and 23 in 2014). The results were no drugs detected in 62 of those cases while 2 did not have enough quantity to test. 26 cases were positive for multiple drugs.

Drug Type	Total Positives	Mean Concentration (pg/mg)	Range
Methamphetamine	47	2523	204- >10,000
THC	47	290	5.1-1988
Hydrocodone	1	2996	---
Oxycodone	1	747	---
Morphine/6-MAM	2	317	256-379
Methadone	1	326	---
Cocaine	1	2108	---

BREATH ALCOHOL SUMMARY

The Breath Alcohol section was created in the late 1980's by Phil Lively, who implemented the state wide use of the Intoxilyzer infrared breath analysis instrument. The section now oversees nearly 100 instruments in the field and has almost 2000 certified officers throughout the state. In a typical year those officers run approximately 20,000 breath tests. This number includes DUI and all other forms of use within the state. More accurate state and local testing statistics aren't available with the current instrumentation and software, but could be attained by acquiring a newer version of the instrument and its accompanying software. The laboratory is currently working to acquire this updated model due to the age of its current instrumentation.

The section has three main duties that are performed on a regular basis. The first duty includes the maintenance, repair, and calibration of all breath analysis instruments. These instruments are supplied to law enforcement agencies around the state comprising of local, county, state and federal locations. Montana Administrative Rules require all instruments to be returned to the laboratory at least once a year for this process. The annual certification returns the instruments to above factory standards using the most modern forensic techniques available.

The second duty of the Breath Alcohol section involves the training and recertification of all law enforcement officers. As part of the Montana Law Enforcement Academy, all officers are required to pass a comprehensive 40-hour course in DUI detection, arrest and processing. Officers are from all types of law enforcement agencies, including local, county, state and federal. This course includes basic alcohol pharmacodynamics and pharmacokinetics, breath analysis instrument infrared theory and operation; in combination with Standardized Field Sobriety Testing (SFST). All students are exposed to live alcohol dosed individuals for 'real world' hands-on training and must pass a written and practical test. This course typically has nearly 50 students and is run at least 5 times a year. After achieving this level of certification, all officers are also required to perform a recertification each year in order to maintain their DUI certification status.

The final duty involves the education of breath alcohol testing to various groups throughout the state. The breath alcohol section is involved with training prosecutors, defense attorneys, and judges in this field. In addition, the section testifies in court, for both prosecution and defense, roughly 50 times per year in all jurisdictions (city, justice, district and federal courts) across Montana.