Montana Department of Justice
Forensic Science Division
Annual Report - 2022

Contents

The mission of the Montana Forensic Science Division is to use operationally efficient and financially responsible practices as the laboratory provides accurate, objective, and timely forensic analyses to the criminal justice community in order to maximize value to the citizens of Montana.

Executive Summary

The Forensic Science Division made some internal modifications in 2022. Due to increasing staff in the Toxicology section and the need for additional office and lab space we embarked on an internal renovation of spaces to accommodate the additional staff. The Breath Alcohol Section was renovated to assist with the increased staff and Latent Print Section was split into two areas to allow space for the Breath Alcohol Section. After the completion of this renovation both lab facilities (Missoula and Billings) are at max capacity. The Division has been working with State of Montana Architecture and Engineering (A&E) to work through the steps to determine future possibilities. During the 2023 Legislature A&E will be asking for funding to conduct a feasibility study.

We continue to see dramatic increases in the submission of fentanyl related cases during 2022. You will see the statistics related to these increases throughout the report. We continue to take precaution when analyzing specimens and there have been no fentanyl related exposures for any lab personnel.

The supply chain issues have either resolved themselves or we have been proactive with stocking supplies so that there is no impact on casework. This leads me to recognize two people that without them the lab would not be able to operate as smoothly as it does. Dana Clark is that pleasant voice that you might hear when you call the lab's main phone number, or she is usually the first person that you encounter when you enter the Missoula Lab. She always shows compassion to families that may have lost a loved one looking for answers and helps new law enforcement with proper lab procedures. Her favorite part of the job is helping direct people to the proper building in the complex that houses the Driver's License Exam Station. The second person is Annalisa Martin who is the Division's Administrative Officer. She is the person that keeps the lab running on all cylinders and never misses a beat or runs out of gas. She keeps track of all things financially, coordinates everything building related, has great insight when planning long term and is a great sounding board. Her favorite part of the job is being able to tell people about good coffee!

Travis Spinder, Administrator

Photos showing the transformation of Breath Alcohol to additional Toxicology space.

Forensic Science Division

The Forensic Science Division (FSD), better known as the State Crime Lab, is one of eight Divisions within the Department of Justice. It was established in Montana Code in 1977.

The Division has facilities in both Missoula and Billings. The Missoula facility has the following disciplines: medical examiners, biology, toxicology, chemical analysis, latent prints, firearms/toolmarks, quality assurance, and evidence sections. The Billings facility has the following disciplines: medical examiners, chemical analysis, and evidence sections.

FSD voluntarily participates in Project FORESIGHT which is a business-guided self-evaluation of forensic science laboratories across the globe. For the 3rd year in a row FSD was awarded the FORESIGHT Maximus Award by the American Society of Crime Laboratory Directors (ASCLD). This award is presented to laboratories operating at 90% or better of peak efficiency. This award is in recognition of all the hard work that the entire staff at the Forensic Science Division does for the citizens of Montana.

https://business.wvu.edu/research-outreach/forensic-business-studies/foresight

Staff

The Lab continues to recruit a variety of scientists and staff with a broad range of skill sets to contribute to our mission. We have thirty-eight scientists, four medical examiners, and eleven administrative/support staff.

Accreditation

Accreditation is the process by which organizations throughout the world demonstrate an applicable quality management system and properly perform testing activities, calibrations, or examinations according to the accrediting body requirements. The accrediting body determines the recertification or verification cycle to ensure demonstration of compliance with the accreditation requirements, the organization's policies and procedures, and other implemented requirements.

The Laboratory was originally accredited under the American Society Crime Laboratory Director's/Laboratory Accreditation Board's (ASCLD/LAB) Legacy program in 2005. In 2010, we attained a higher level of accreditation to ISO/IEC 17025 standards for testing laboratories, which are the current standards for forensic labs, as well as ASCLD/LAB-*International* Supplemental Requirements. In 2017, the Breath Alcohol Section was accredited to ISO/IEC 17025:2005 standards for calibration laboratories. In 2019, the laboratory continued accreditation with the ANSI National Accreditation Board (ANAB) through compliance with AR 3125 and ISO/IEC 17025:2017 requirements; these accreditation requirements are applicable to both facilities. ANAB provides laboratory accreditation to ISO/IEC 17025 and a variety of standards for many industry-specific programs. In 2023 the lab will welcome ANAB assessors to our facilities as we undergo the four-year on-site assessment part of the accreditation process.

The Medical Examiner Office (MEO) is accredited with the National Association of Medical Examiners (NAME).   NAME accreditation is an endorsement indicating that the office provides
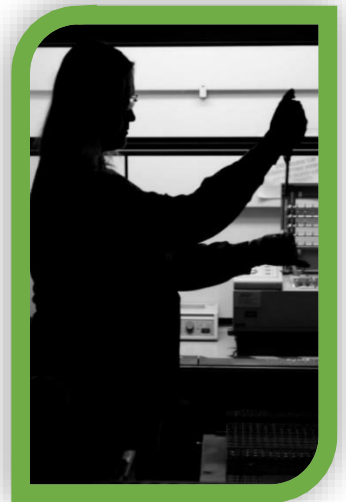
an adequate environment for a medical examiner in which to practice and provides reasonable assurances that the office well serves its jurisdiction.

Outreach

Our interactions with a broad cross-section of legislators, citizens, citizen groups, and criminal justice agencies and organizations across Montana continue to be a focus of our Division. We provide educational presentations across the state when needed. Historically lab representatives attended conferences or met with boards for the Montana Sheriffs and Peace Officers Association, the Montana Association of Chiefs of Police, the Montana County Attorneys Association, the Montana Coroners Association, and the Attorney General's Law Enforcement Advisory Committee. When requested the Division holds open house events for legislators and the public and provides regular tours for the public. Our staff routinely spends over 300 hours training law enforcement, prosecutors, defense attorneys, judges, and the public in matters tied to the forensic sciences.

National Matters

The Organization of Scientific Area Committees (OSAC) for Forensic Science works to strengthen the nation's use of forensic science by facilitating the development of technically sound forensic science standards and by promoting the adoption of those standards by the forensic science community. These standards are written documents that define minimum requirements, best practices, standard protocols, and other guidance to help ensure that the results of forensic analysis are reliable and reproducible. The Lab is proud to have personnel that have served on national committees critical to the advancement of technological standardization of forensic sciences.

Forensic Science Laboratory Advisory Board

The Forensic Science Laboratory Advisory Board was established in 1996 by Attorney General Joe Mazurek and has met nearly every year since. The Board serves as an advisory council and as an independent body to investigate complaints of negligence or misconduct. It also serves as a communication link between the Lab and its stakeholders. Board members include representatives from:

- Montana Attorney General
- District Judge Representative
- Montana Coroners Association Representative
- Non-Law Enforcement Coroner
- Office of the Public Defender Representative
- DOJ's Division of Criminal Investigation Administrator
- Montana Sheriff and Peace Officers Association Representative Montana Association of Chiefs of Police Representative
- Montana Department of Correction Representative
- Montana County Attorney's Association Representative

We are grateful for the time and dedication of these members; their input helps improve the Crime Lab and its services.

Grant Funding

FSD takes advantage of federal grant funding whenever possible. In 2022, the following grants were received, totaling over $1.1 million. Without this financial assistance, many of these projects would not have happened.

1. **BJA "Paul Coverdell Forensic Science Improvement" Grant**
   o $264,558: Training/instrumentation/equipment/supplies/coroner education
2. **BJA "DNA Capacity Enhancement and Backlog Reduction" Grant**
   o $530,063: Funding for personnel/training/supplies/DNA lab case management improvements
3. **NIJ "National Forensic Science Center" Grant**
   o $99,534: Coroner Liaison position, scholarships for hosting medical students to promote interest in forensic pathology as a career choice, and the development of national forensic training for law enforcement, attorneys, and judges.
4. **Centers for Disease Control "Overdose Data to Action (OD2A): Increasing Surveillance and Prevention to Reduce Opioid Misuse in Montana" Grant** *(awarded through the Montana Department of Public Health and Human Services)*
   o $232,000: drug-related autopsy reimbursement for counties/enhanced toxicology testing in complex postmortem cases/instrument parts and maintenance

Caseloads

As with many forensic labs nationwide, FSD has seen a steady influx in cases over the last decade. The total number of cases submitted in 2022 was 8911. Cases can be further divided into requests for testing within specific sections. One case may generate multiple requests for services throughout the Lab or within a section. For example, a single handgun may involve test requests for the presence of latent prints, DNA, firearms analyses and in some instances other case(s) for the MEO. Cases can contain anywhere from one to more than one hundred items of evidence. Section specific workloads are covered below.

Annual Forensic Science Division Cases
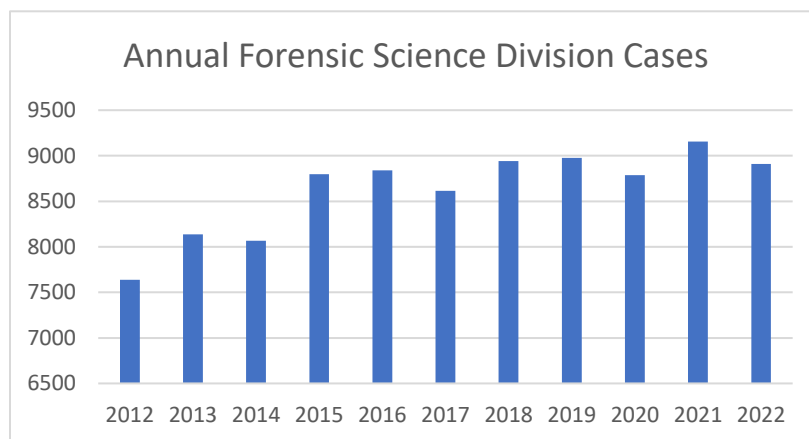
State Medical Examiner's Office

In 2022 the Montana Medical Examiner's Office employed three forensic pathologists, two autopsy assistants, and two part-time autopsy assistants. The vacant Medical Examiner position in Billings was actively being recruited during 2022 and a candidate was selected with an agreed start date of late summer of 2023 was agreed. Administrative support was provided by the Forensic Science Division. Two pathologists work at the State crime laboratory in Missoula to serve the needs of coroners in western Montana. Two pathologists work at the State morgue facility in Billings to serve the needs of coroners in Eastern Montana.

The Medical Examiner's Office has focused on improving casework information and statistics. The Office releases an annual report, which summarizes annual case results based on manner of death, age of the decedent, deaths involving firearms, deaths attributable to alcohol or drugs, natural deaths, and report turn-around time performance. **The full report is available on the Montana Department of Justice's website under the Medical Examiner's Office or Forensic Science Division tab.**

https://dojmt.gov/wp-content/uploads/2022-MT-Medical-Examiner-Annual-Report.pdf

In 2022, 834 postmortem examinations were performed: 475 in Missoula and 359 in Billings. This represents a 2 case decrease over the previous year. Our pathologists responded to a limited number of scene investigations and recoveries. They also testified in court and gave educational presentations at the annual Montana Coroner Advanced and Basic Coroner trainings. In addition, consultations with coroners, law enforcement, county attorneys, organ and tissue procurement agencies, and funeral directors were common. The new Coroner Liaison position (Kayla Wallace) has proven to be a great addition supporting the Medical Examiner's Office and coroners. Kayla has traveled the state introducing herself and offering training and assistance to all Coroners.

Staff

Dr. Willy Kemp	Chief Medical Examiner, Billings
Vacant	Deputy Medical Examiner, Billings
Dr. Aldo Fusaro	Deputy Medical Examiner, Missoula
Dr. Sunil Prashar	Deputy Medical Examiner, Missoula
Heather Krell	Autopsy Technician, Missoula
Kristy Burkhart	Part Time Autopsy Technician, Missoula
Kendra O'Neal	Autopsy Technician, Billings
Tonya Shaffer	Part Time Autopsy Technician, Billings

Successes

1. Partner in the National Center on Forensics grant through NIJ along with George Mason University, the American Society of Clinical Pathologists, and the National Association of Attorney Generals, which includes a Coroner Liaison position and training for medical and pathology students

Challenges

1. Statewide utilization of death case management system by county coroners
2. Recruitment of 4th pathologist for fill pending vacancy created by retirement

Fentanyl Related Deaths
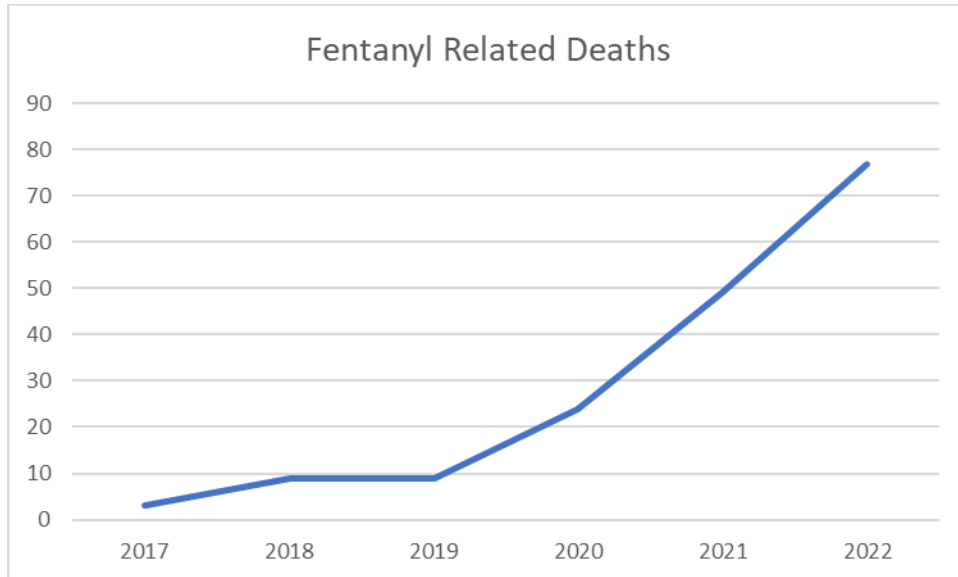
The State has seen an approximate 2,500% increase in fentanyl related deaths since 2017 (2017 - 3 cases vs 2022 – 77 cases).

Toxicology Section

The Toxicology Section performs drug and alcohol testing in Driving Under the Influence cases (DUI or DUID), postmortem cases (assisting the medical examiner/coroner system in the determination of cause/manner of death), urinalysis testing (Department of Corrections probation/parole system and drug endangered children cases), and sexual assault cases. This section also oversees the breath alcohol calibration program, including maintaining and certifying the breath testing instruments used to detect the presence of alcohol in DUI cases. Section staff also provide over 300 hours of training per year to law enforcement, judges, prosecutors, and defense attorneys.

This report contains graphs/figures used to track the results on cases submitted by many agencies throughout Montana. This is not an exhaustive list of drugs detected and confirmed by the Lab; simply the most frequently confirmed drugs.

Staff

Beth Smalley, M.S., Toxicology and Breath Alcohol Supervisor	April Sheets, D.F.S., Forensic Toxicologist
Scott Schlueter, Forensic Toxicologist Diplomate-ABFT-FT	Gavin Lawson, Forensic Toxicologist
Michelle Evans, Forensic Toxicologist Diplomate-ABFT-FT	Elizabeth Holom, M.S., Forensic Toxicologist
Eric Miller, Forensic Toxicologist Diplomate-ABFT-FT	Ben Vetter, Breath Alcohol Program Lead
Crystal Everett, Forensic Toxicologist	Justin Lyndes, Forensic Toxicologist and Breath Alcohol Scientist
Andrew Wade, M.S., Forensic Toxicologist	Jamie Soderling, Forensic Toxicologist
Scott Larson, M.S., Forensic Toxicologist Diplomate-ABFT-FT	Danielle Klemenko, M.S., Toxicology Technician

Successes

1. Validation of five new methods, including updates to current methods or new instrumentation.
2. Renovations of the Toxicology and Breath Alcohol spaces to accommodate more personnel.
3. Bringing on two toxicologists in early 2023 has created assistance to current staff members given increased case complexity and high caseload per toxicologist when compared to the national average.

Challenges

1. Continual influx of novel substances, making toxicological detection difficult.
2. Increase in cannabis positivity rate for DUI cases (46% increase in positive THC/metabolite DUI cases from 2019-2022).
3. Increased travel for in-person testimony means more analyst time spent out of the lab, even for trials that proceed in absentia (defendant not present).

2013-2022 Toxicology Results per Case Type
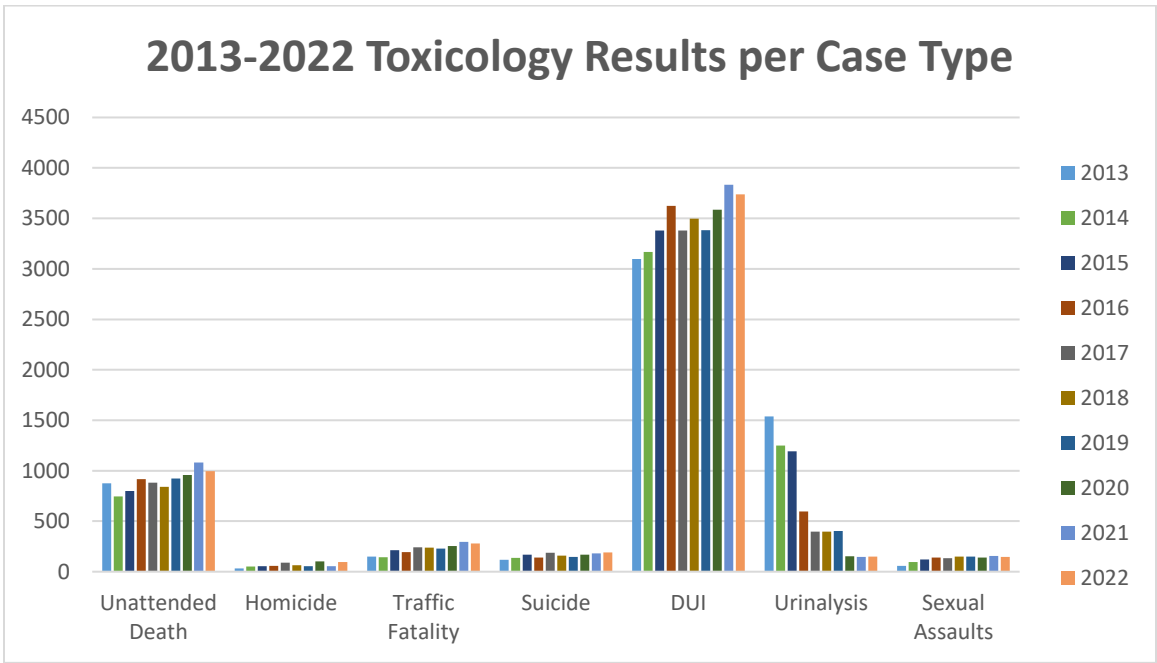
2022 Performance Summary

This chart reflects the average number of days it takes to complete 90% of cases. Also included is the average number of cases per toxicologist for both Montana and national average.

90% of cases completed in this timeframe.

Type of Case	90% of cases completed in this timeframe	*2022 Cases per Montana Toxicologist	*Cases per Toxicologist National Average
Postmortem	63 days	515	169
DUI Drugs	57 days	452	185
DUI Ethanol	21 days	884	605

*Numbers are based on **"Project FORESIGHT Annual Report, 2021-2022,"** from the Forensic Science Initiative, College of Business & Economics, West Virginia University

Drugs of Interest: It is important to recognize that a drugs present in a postmortem death does not necessarily mean that it was part of the cause of death. That determination is done by the Medical Examiners and coroners as part of the death certificate.

Methamphetamine: In 2022, methamphetamine intoxication was listed by the medical examiner as the cause of death in 21 cases and in 42 mixed drug intoxications. It was also found in 26% of all drug driving under the influence cases receiving full drug screens.

Case Type	2022 Cases	2021 Cases	2020 Cases	2019 Cases	2018 Cases
Postmortem (Blood results only)	229 cases Mean: 2.07 mg/L Range: 0.02- 92 mg/L	212 cases Mean: 0.95 mg/L Range: 0.02- 11 mg/L	191 cases Mean: 1.57 mg/L Range: 0.02*-23 mg/L	149 cases Mean: 1.04 mg/L Range: 0.02*-9.9 mg/L	103 cases Mean: 1.54 mg/L Range: 0.02*-54 mg/L
DUID	408 cases Mean: 0.39 mg/L Range: 0.02-2.4 mg/L	500 cases Mean: 0.38 mg/L Range: 0.02-3.9 mg/L	408 cases Mean: 0.35 mg/L Range: 0.02-3.8 mg/L	302 cases Mean: 0.39 mg/L Range: 0.02-3.0 mg/L	319 cases Mean: 0.35 mg/L Range: 0.02-3.3 mg/L

Fentanyl: While still prescribed and used in hospital settings, fentanyl has flooded the illicit markets. Fentanyl is a synthetic opiate narcotic analgesic and is 40-50 times more potent than heroin. There was a 112% increase in postmortem fentanyl positive cases from 2021 to 2022 (295% increase).

Case Type	2022 Cases	2021 Cases	2020 Cases	2019 Cases	2018 Cases
Postmortem (Blood results only)	180 cases Mean: 14.33 ng/mL Range: 0.5- 800 ng/mL	87 cases Mean: 12.09 ng/mL Range: 0.5- 117 ng/mL	41 cases Mean: 9.35 ng/mL Range: 0.6*-48 ng/mL	22 cases Mean: 10.97 ng/mL Range: 2.9*-31 ng/mL	15 cases Mean: 13 ng/mL Range: 0.83*-29 ng/mL
DUID	95 cases	57 cases	12 cases	8 cases	1 case

2022 Toxicology PostMortem Fentanyl Cases
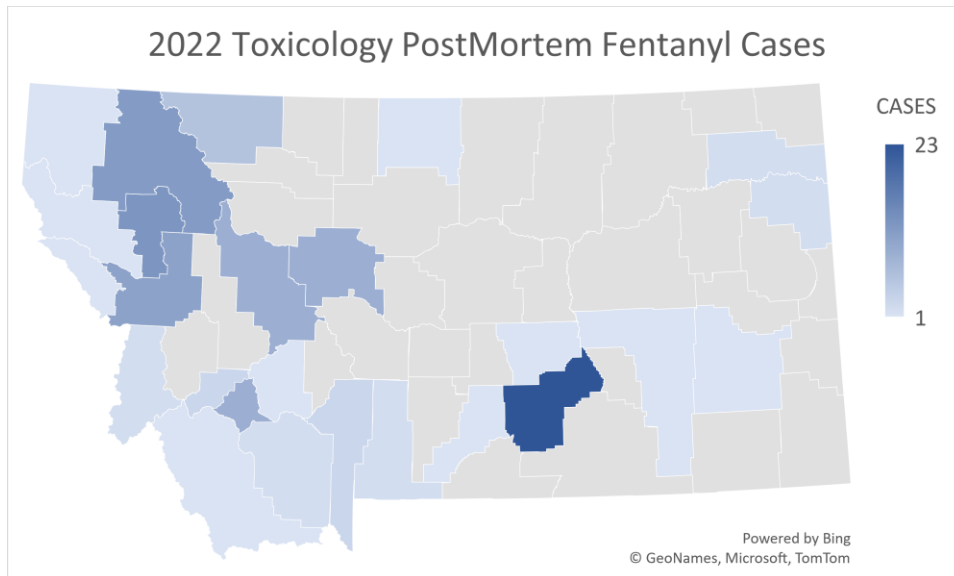
Tetrahydrocannibinol/THC (Marijuana): Before and after the passage of the voter approved initiative to legalize use of marijuana, DUI cases testing positive for cannabis, or its metabolites, have continued to increase (46% increase in cases in positivity from 2019-2022). In 53 cases the presence of delta-8 THC or delta-8 THC-COOH was confirmed.

Case Type	2022 Cases	2021 Cases	2020 Cases	2019 Cases	2018 Cases
DUID	726 cases Mean: 10.03 ng/mL Range:1-144 ng/mL	621 cases Mean: 10.11 ng/mL Range:1-172 ng/mL	530 cases Mean: 9.99 ng/mL Range:1-197 ng/mL	464 cases Mean: 9.4 ng/mL Range:1-75 ng/mL	454 cases Mean: 8.6 ng/mL Range:1-160 ng/mL

Summary of Alcohol and Drug Prevalence in Drivers *(including fatal crashes)*

*In 2013, a laboratory policy was implemented, determining drug testing in DUI cases only *if requested* and the blood alcohol was less than 0.100 g/100mL. Case reports are released with a note stating that no drug testing was performed, and customers may request testing by contacting the section. This policy continues to be necessary to manage increased workloads and to reduce reporting delays for DUI cases. Cases involving a drug recognition expert (DRE) or a fatal crash are exempt from this policy.
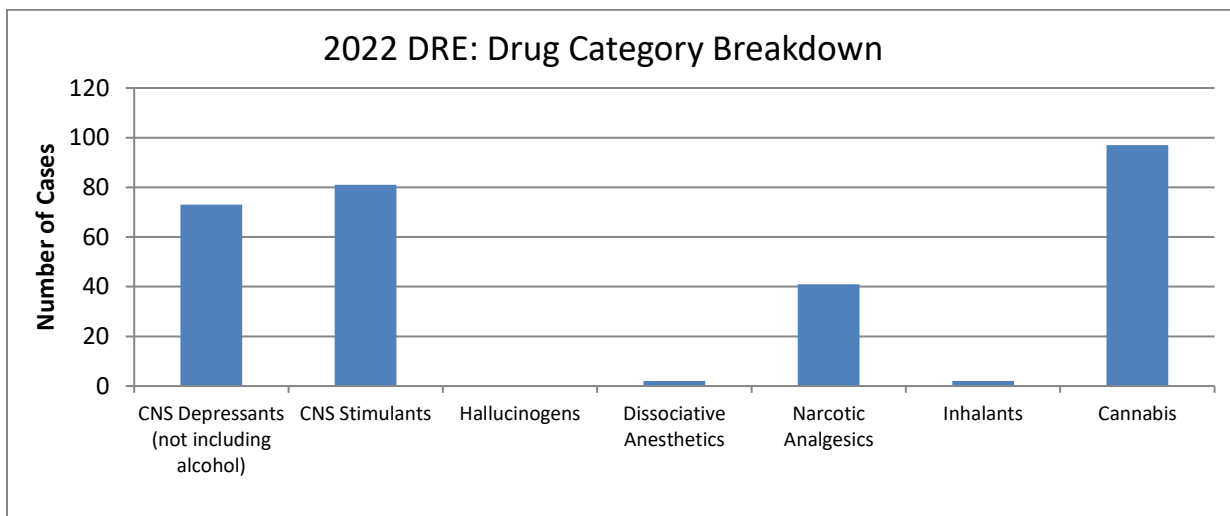
To request quarterly updates of this summary, email michelle.evans@mt.gov.

Alcohol and Drug Prevalence in Driver Blood Samples *(includes fatal crashes)*	
Blood Samples Submitted	3998
Blood Samples tested for drugs other than alcohol (drug)*	1635
Blood Samples Positive for Alcohol	72%
Blood Samples Positive for Drug(s) other than Alcohol*	33%
Alcohol Detected Only*	63%
Alcohol + Drug(s)*	10%
Drug(s) Detected Only*	23%
No Drug(s) or Alcohol Detected	4%
BAC Greater than 0.100%	62%
BAC 0.020% - 0.100%	10%
Average BAC	0.181, Range: 0.010-0.522 g/100mL
Most detected Drugs* -percentages based on total submitted (all) and samples tested for drugs (drug)- 1. Cannabinoids** – 20% (all), 49% (drug) a. THC – 16% (all), 40% (drug) (Avg = 10.0 ng/mL, Range: 1.0–144 ng/mL) 2. Methamphetamine – 11% (all), 26% (drug) (Avg = 0.393 mg/L, Range: 0.020-2.4 mg/L) 3. Fentanyl – 2% (all), 6% (drug) (Avg = 5.2 ng/mL, Range: 0.5-27.7 ng/mL) 4. Diphenhydramine – 2% (all), 5% (drug) (Avg = 0.138 mg/L, Range: 0.022-1.40 mg/L) 5. Gabapentin – 1% (all), 5% (drug) (Avg = 7.5 mg/L, Range: 0.6-74.0 mg/L)	

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6. Citalopram/Escitalopram – 2% (all), 4% (drug) We do not currently quantitate this drug
7. Lorazepam – 1% (all), 3% (drug) (Avg = 39.1 ng/mL, Range: 2.0-46.0 ng/mL)
8. Alprazolam – 1% (all), 3% (drug) (Avg = 0.122 mg/L, Range: 0.026-0.640 mg/L)
9. Benzoylecgonine – 1% (all), 2% (drug) (Avg = 0.738 mg/L, Range: 0.020-5.9 mg/L)
10. Clonazepam – 1% (all), 2% (drug) (Avg = 0.042 mg/L, Range: 0.022-0.110 mg/L)

**This includes any positive from delta 8 or 9 -THC, THC-COOH, or 11-OH-THC with each case only counted once
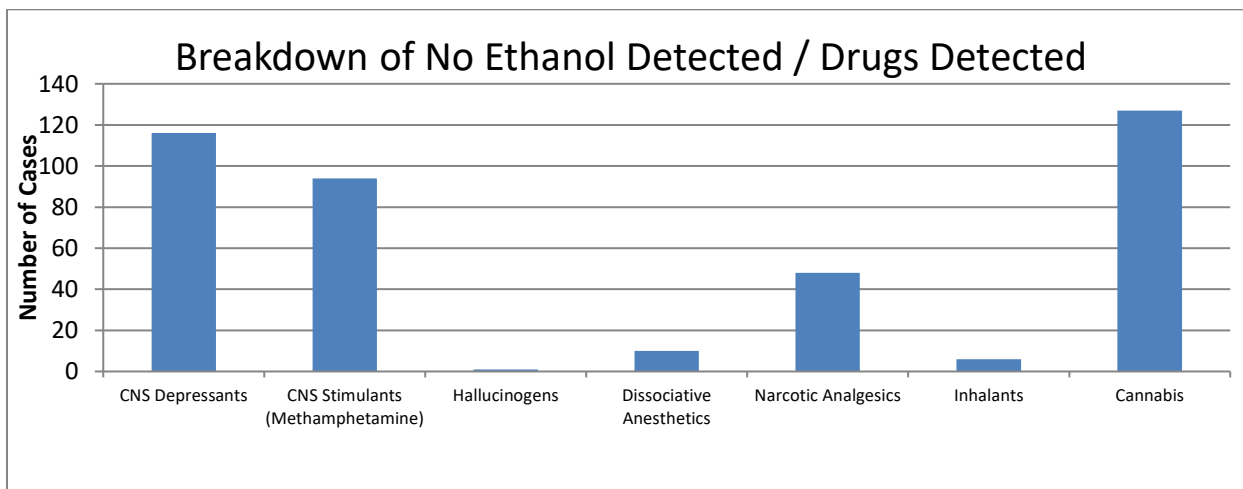
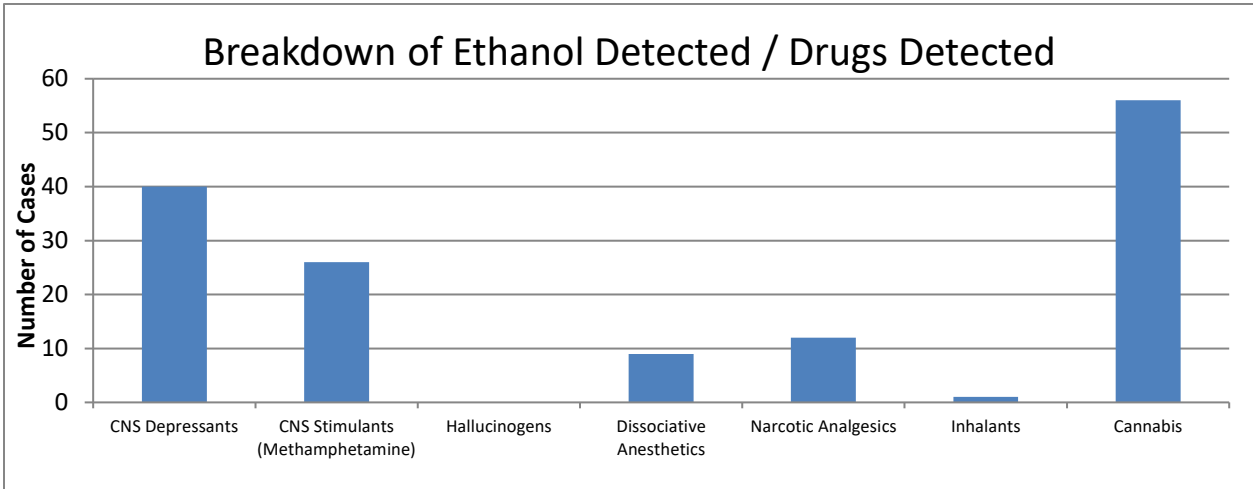## DRE (Drug Recognition Expert) Summary

Drug testing is performed on all DRE submitted cases. In 2022, 187 DRE cases were submitted. Some cases may be positive for multiple drugs.

2022 DRE: Drug Category Breakdown

Number of Cases

- CNS Depressants (not including alcohol): ~73
- CNS Stimulants: ~81
- Hallucinogens: 0
- Dissociative Anesthetics: ~2
- Narcotic Analgesics: ~41
- Inhalants: ~2
- Cannabis: ~97

Crash/DUI Summary

The Laboratory received 1,163 vehicle crash cases in 2022. The mean ethanol concentration was 0.183 g/100mL. The mean THC concentration was 7.6 ng/mL. Drug testing was performed on 430 of these cases. Some cases may be positive for multiple drugs. Ethanol is not included in the CNS depressant drug group.
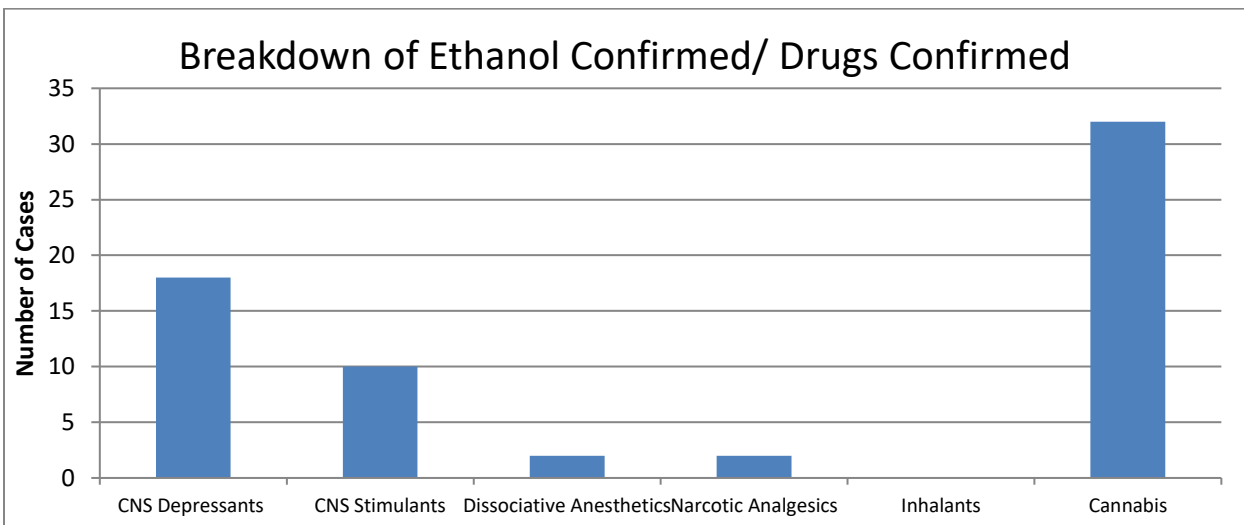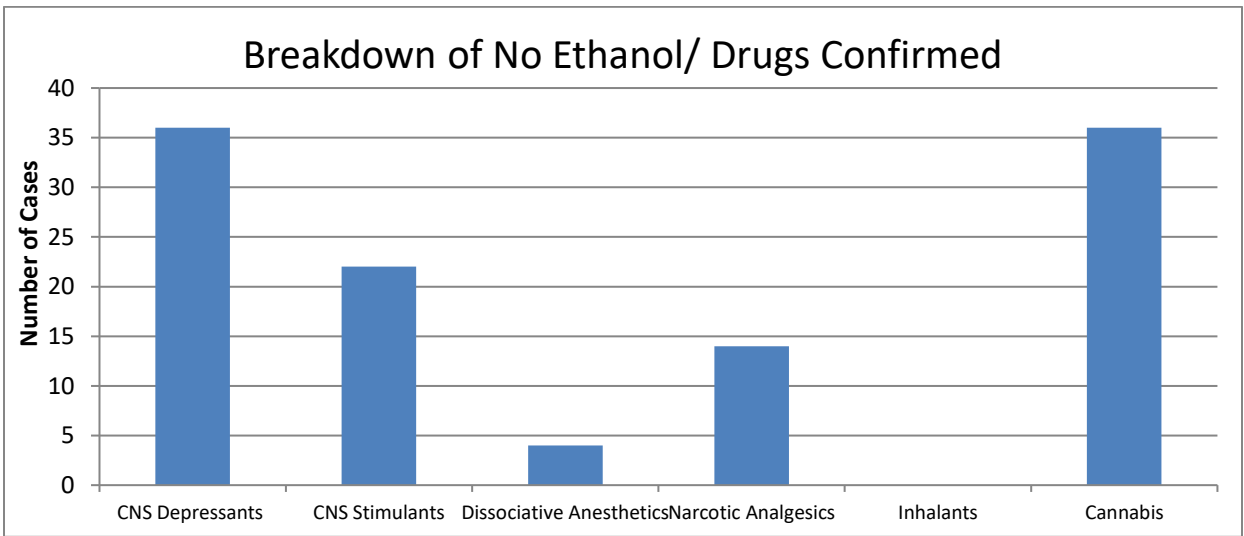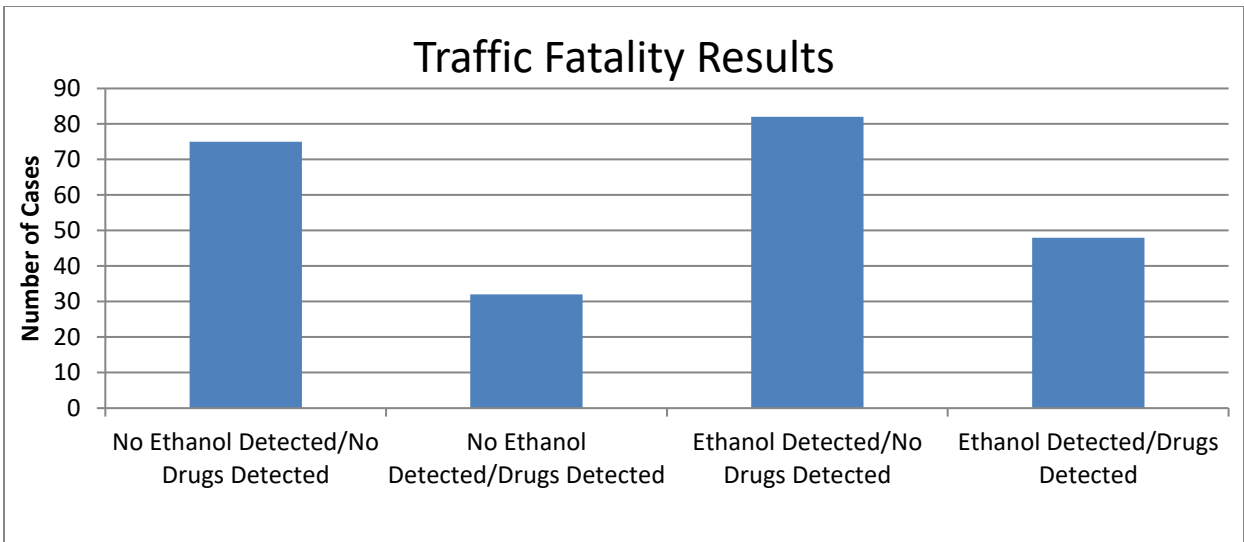
Breakdown of No Ethanol Detected / Drugs Detected

Number of Cases

- CNS Depressants: ~116
- CNS Stimulants (Methamphetamine): ~94
- Hallucinogens: ~1
- Dissociative Anesthetics: ~10
- Narcotic Analgesics: ~48
- Inhalants: ~6
- Cannabis: ~127

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Breakdown of Ethanol Detected / Drugs Detected

The combination of THC and alcohol poses a significant increase in the risk for impairment, even at low levels. Because these are the state's two most prevalent drugs, we will continue to monitor trends involving the combination. Drug testing is not routinely administered for cases with a BAC above 0.100 g/100mL (traffic fatalities are excluded from this policy). This chart includes cases positive for THC only (not cases only positive for metabolites of THC).

	Ethanol + THC ONLY (NO other drugs)		ALL Ethanol + THC (COULD include other drugs)	
2019	112	% Increase	173	% Increase
2020	121	8%	194	12%
2021	131	8%	210	8%
2022	137	5%	232	10%

** Numbers have been updated from previous years to include ethanol data from Intoxilyzer breath instruments.

Traffic Fatalities Summary

The Laboratory received 247 traffic fatality cases and performed toxicology testing on 237 cases. There is no distinction between a driver and a passenger in the following data. The mean ethanol concentration was 0.181 g/100mL in cases when it was detected. When it was detected, the mean THC concentration was 11 ng/mL. Some cases may be positive for multiple drugs. Ethanol is not included in the CNS depressant drug group below.

Traffic Fatality Results

Breakdown of No Ethanol/ Drugs Confirmed

## Breakdown of Ethanol Confirmed/ Drugs Confirmed

Breath Alcohol Summary

The Intox 9000 went live on July 1, 2022. Prior to implementation, regional training on the new instruments for all senior operators was completed.   Our two breath alcohol analysts worked to certify all the Intox 9000's for the 2022 rollout.   The new instruments provide the ability to capture multiple subject sample results from a single breath sample. It will result in multiple efficiencies to the Section, including data collection and the annual certification process. The section also went to electronic storage of all calibration documents.

The Section has three main duties it performs regularly. The first is the maintenance, repair, and calibration of all breath analysis instruments. These instruments are given to local, county, state, and federal law enforcement agencies statewide. Montana Administrative Rules require the return of all instruments to the Laboratory at least once a year for annual certification, which 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 their Montana Law Enforcement Academy requirements, all officers must pass a comprehensive 40-hour course in DUI detection, arrest, and processing. Officers from all types of law enforcement agencies, including local, county, state, and federal attend these courses. The course includes basic alcohol pharmacodynamics and pharmacokinetics, breath analysis instrument infrared theory and operation, and 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 over 50 students and is offered at least five times each year. After achieving this level of certification, all officers must get recertified annually to maintain their Breath Test Specialist certification status.

The Section's third responsibility is to teach various groups across the state about breath alcohol testing, including prosecutors, defense attorneys, and judges. Additionally, Section personnel testify in court, for both the prosecution and the defense, in city, justice, district, and federal courts across Montana.
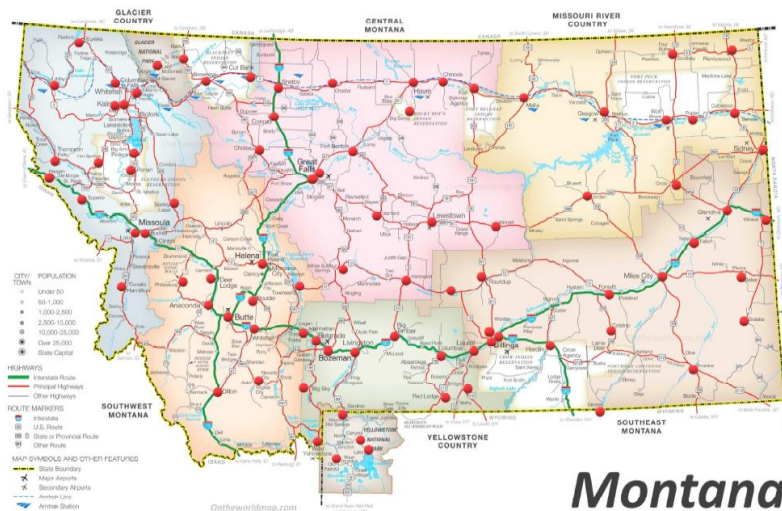
Chemical Analysis Section

The Chemistry/Trace Unit analyzes controlled substances, suspected clandestine laboratory evidence, and gunshot residue casework. Forensic chemists analyze samples seized in cases involving dangerous drugs and clandestine labs, including the identification of previously unseen analogues now flooding the recreational drug market. The increase in fentanyl/fentanyl analogues and designer benzodiazepine cases have increased case complexity. Submissions to this section have more than doubled in the last 10 years.

Staff

|	
Misty Icard Chemistry Supervisor – Billings ABC Board Certified	**Bahne Klietz** Forensic Chemist – Missoula ABC Board Certified
Josh Williams Forensic Chemist – Billings ABC Board Certified	**Amber Trochta M.S.** Forensic Chemist – Missoula
Brook Knapp M.S. Forensic Chemist – Billings ABC Board Certified	**Travis Doria** Forensic Chemist – Missoula ABC Board Certified
Tanna Brown Forensic Chemist – Missoula ABC Board Certified	**Alyssa Stulz** Forensic Chemist – Missoula ABC Board Certified

Successes

1. Maintained a turnaround time of less than 60 days
2. Began cross-training for two analysts in clan lab analysis
3. Continued to simplify and streamline section policies
4. Completed training for a new analyst
5. Submitted proposed changes of the MCA 50-32 to legislature to be more inclusive of fentanyl related substances, substituted benzodiazepines, and clear up THC wording

Challenges

1. Maintaining current turn-around times in the midst of staff members cross-training in subdisciplines and staff members on leave
2. 487% increase in fentanyl related submissions in 2022
3. Continually see new substances that are sometimes not easily identifiable with our current instrumentation/methods.
4. 313% increase in submissions where the result was reported under the analogue law. These cases require a significant amount of research and occasionally require in-depth group discussions.
5. In person testimony required instead of allowing video testimony which equates to more time out of the lab

Casework Summary

Chemistry Casework Backlog 2022
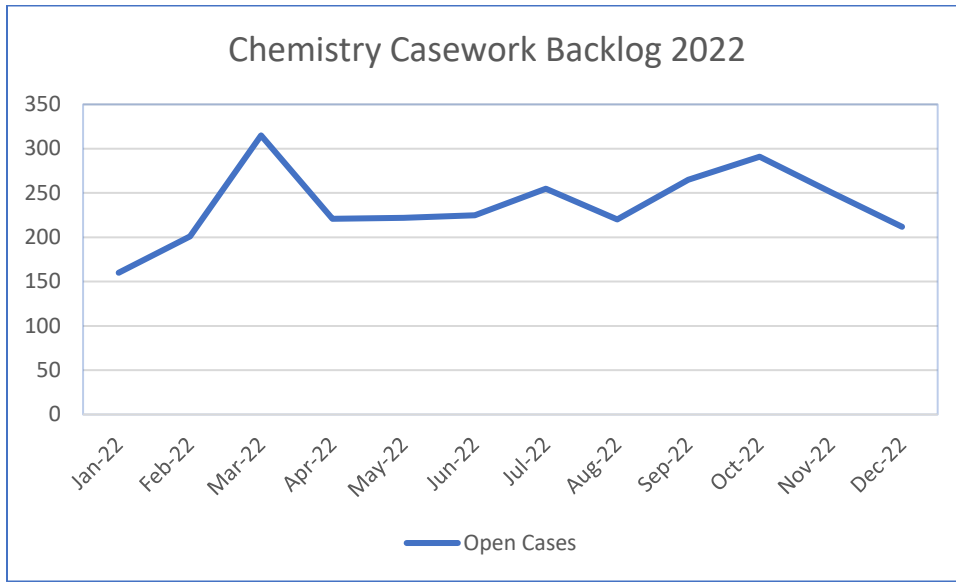
Year	Number of Cases Submitted Missoula/Billings/Outsourced	Samples Analyzed	Beginning Year Backlog (Cases)	Turnaround Time for Year (Days)
2013	1348	1819	627	162
2014	1482	1854	1240	224
2015	2221	2772	1051	120
2016	2024/565	3392	560	67
2017	2047/911	3947	366	31
2018	1434/1323/2	3721	370	175
2019	1096/1239/264	3132	1528	195
2020	1114/754/826	3578	1747	141
2021	2084/862	4087	332	24
2022	2138/754	4223	199	22

Forensic Chemist Travis Doria analyzes controlled substances in the Chemical Analysis Section.

Released May 2023: Version 1

The Chemistry Section has seen a drastic increase in the prevalence of fentanyl found in samples submitted for testing. There has been an approximate 400% increase over the past year and an approximate **7500%** increase since 2019. The lab continues to take precautions to ensure the safety of our staff by making sure that there are additional staff present during testing or support staff is notified to monitor the chemistry staff by way of security cameras installed in the section. To date there have been no exposure incidents from fentanyl by staff.
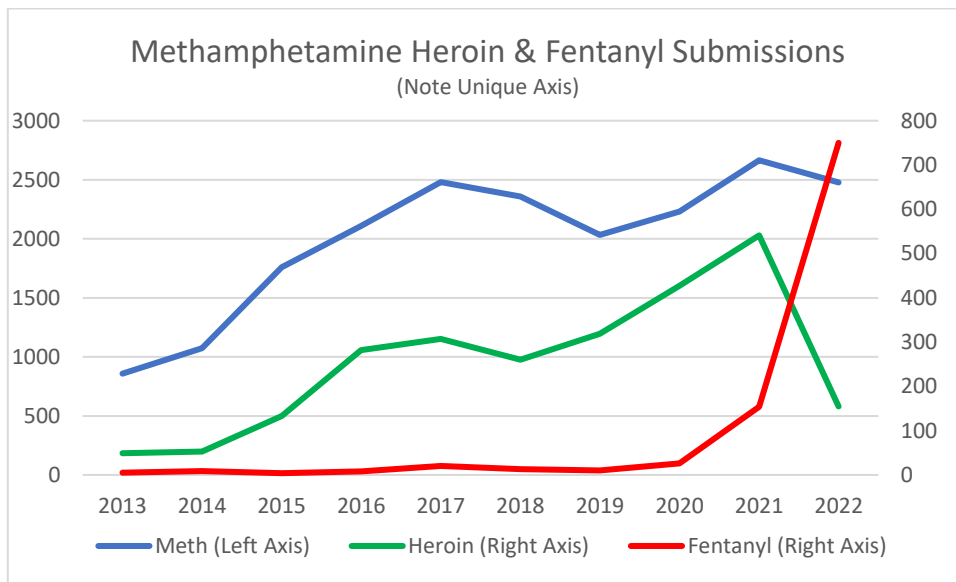
Methamphetamine and Heroin submission decreased in 2022. Methamphetamine submissions saw a slight (~10%) decrease and Heroin decreased to a level that was last seen in 2013.
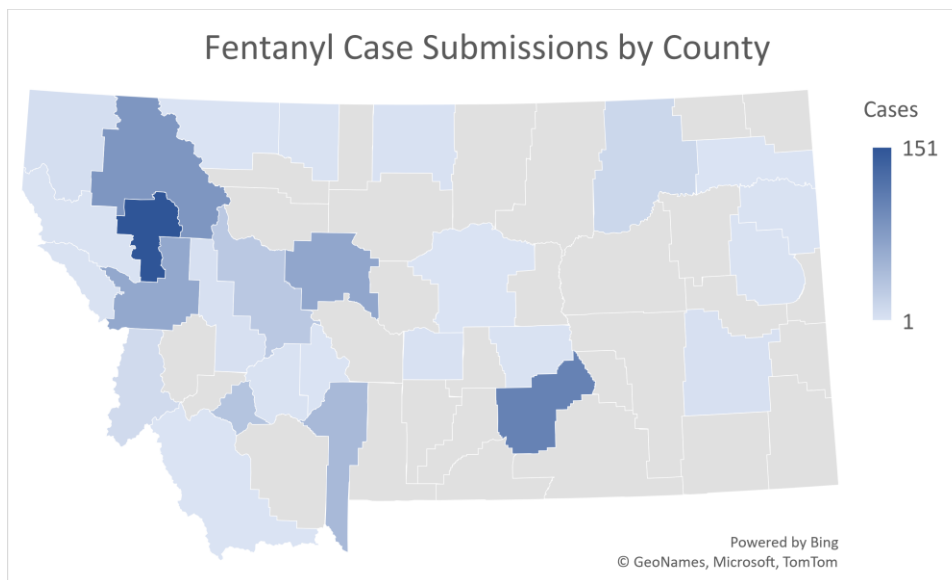
Latent Print Evidence Section

The Latent Print Evidence Section analyzes evidence for the presence of latent fingerprints. Staff then compare them to known prints when possible. The Lab utilizes both a regional and federal Automated Fingerprint Identification System (AFIS), databases for the search and registration of unidentified latent impressions and the retrieval of known fingerprints.

Staff

Kaitlin Delphy	Stephanie Shappee
Supervisor Latent Prints/Firearms/Evidence	Forensic Scientist
IAI Board Certified	IAI Board Certified

Successes

1. The Section has continued to keep up with casework while seeing a 37% increase in cases submitted.
2. Transitioned to fully electronic case records.
3. Completed the validation of all newly procured equipment from the previous year.

Challenges

1. Construction projects in the laboratory space resulted in a period where space was not accessible or suitable for certain types of analysis.
2. Restructuring/staffing considerations within the laboratory resulted in the need for additional coverage in the Evidence section by an LP staff member for a short period of time.

Casework

The latent print section is continuing to keep up with casework following successful outsourcing efforts, with small ebbs and flows that are in part attributed to the unique challenges faced by a small section. Future efforts are focused on outreach to user agencies, procurement of improved imaging technology to replace aging equipment, and reductions in turnaround time. Both improved searching algorithms within our AFIS technology and the efforts of various "Cold Case" units anticipated to have a continued impact on the number of Supplemental Analysis requests.

Year	2022	2021	2020	2019
Total cases submitted	248	181	240	164
Total cases completed	232	230 No outsourcing	188 184 cases completed in-house 4 cases outsourced	323 152 cases completed in-house 171 cases outsourced
Median TAT (days)	32	24	68 (in house cases)	45 (in house cases)
90% of cases worked (days)	104	108	*307 (95%) (Due to clearing out historic cases)	*1,043 (95%) (Due to clearing out historic cases)

*2019 and 2020 stats were based on a 95% calculation for days worked
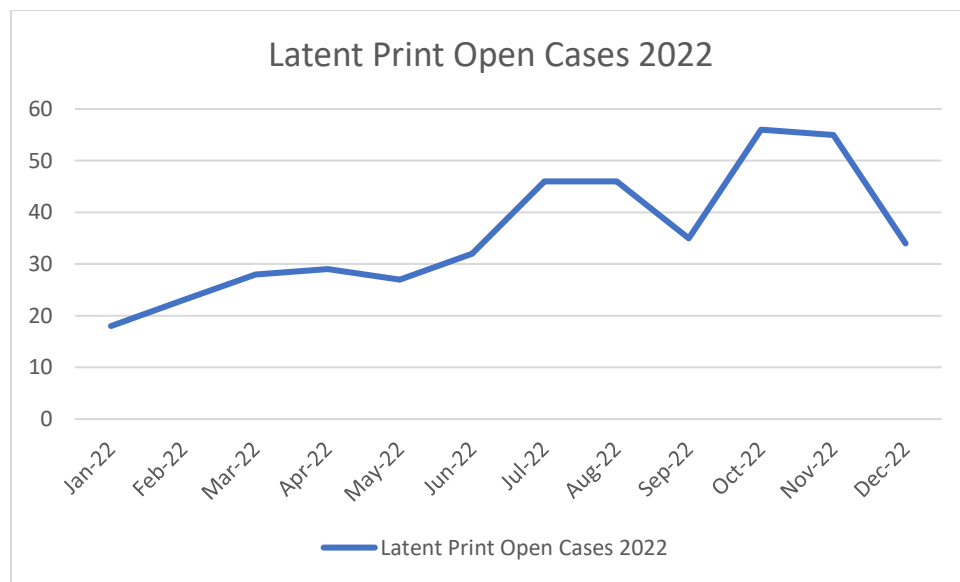
Biology Section

The Biology Section provides quality, accurate, and timely analysis of evidence for the presence of biological fluids and further characterization of those samples using state of the art DNA technologies. In addition, the Missoula laboratory administers the FBI CODIS program and processes all convicted offender database samples for the State. Lastly, the section staff testify at trials regarding analysis conclusions.

Joe Pasternak, Biology Bureau Chief and DNA Technical Leader
Megan Ashton, State CODIS Administrator
Jamie Bray, DNA Analyst
Andrew Bishop, DNA Analyst
Jen Revis-Siegfried, DNA Analyst (part-time)
Steven Antonich, DNA Analyst (in training)
Haley Fallang, DNA Analyst (in training)
Lacey Van Grinsven, Serologist/Y Screening
Rachel Beddall, Serologist/Databasing
Kate Kulgavyy, Serologist/Y Screening
Kendra Henning, DNA Databasing Analyst
Vacant – DNA Analyst (Filling Summer 2023)

Successes

1. **58%** reduction in backlogged DNA cases amidst staffing challenges
2. Implementation of Y-STR DNA analysis testing in April 2022
3. Filled DNA analyst vacancy in April 2022 – training to be completed summer 2023
4. Maintained low turn-around times for Y-screening and Serology caseloads
5. CODIS DNA Database analyst cross-training completed
6. Successful Internal DNA FBI Quality Assurance Standards annual assessment

Challenges

1. One analyst planned departure for March 2023
2. DNA Extraction robotics support discontinued – validation in progress for replacement technology
3. Additional workload from new SAKI focused grant project

2023 Planning

1. Training of newly hired DNA Analyst – summer 2023
2. Completion of robotics validation for DNA pre-amplification processing
3. Implementation of STRmix probabilistic genotyping software for mixtures and statistics
4. Further implementation of paperless processes
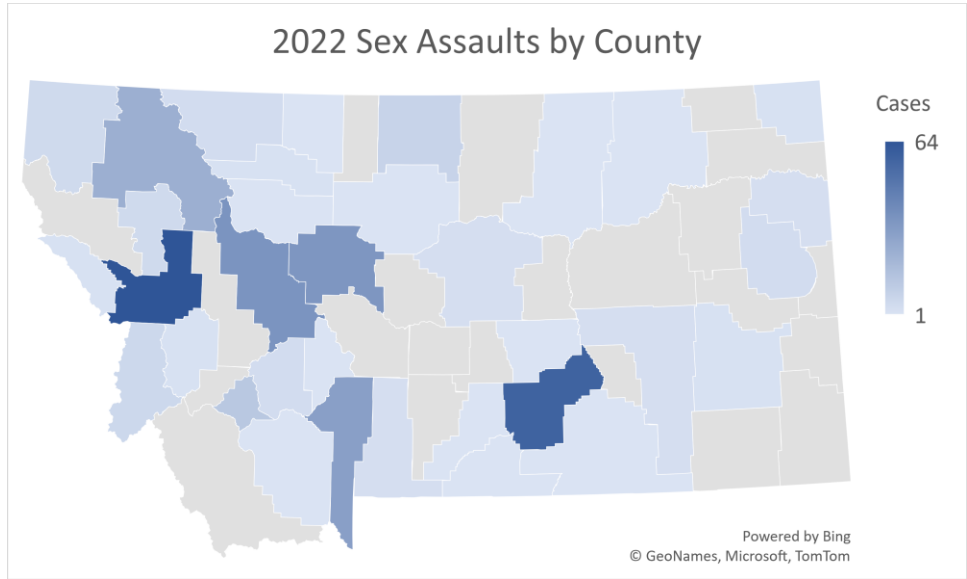
Annual Case Submission

The DNA analysis process continues to be performed using a team approach. By using this approach, the section can be more efficient process as compared to analysts processing individualized case batches. These improvements have resulted in a 58% reduction in cases awaiting DNA analysis equating to a decrease in time to delivery of results to requesting agencies.
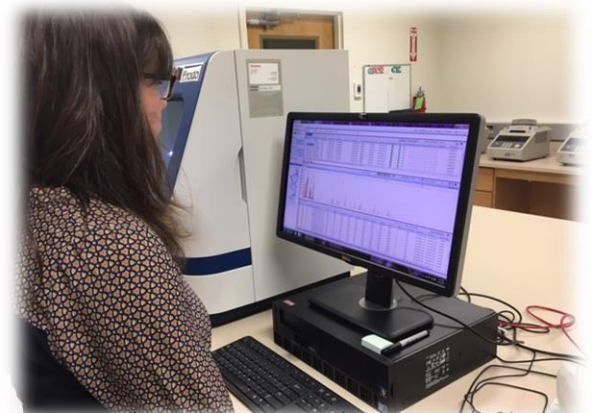

DNA Analyst Jamie Bray works on DNA profile data at the State Crime Lab.

New Cases Submission by Offense
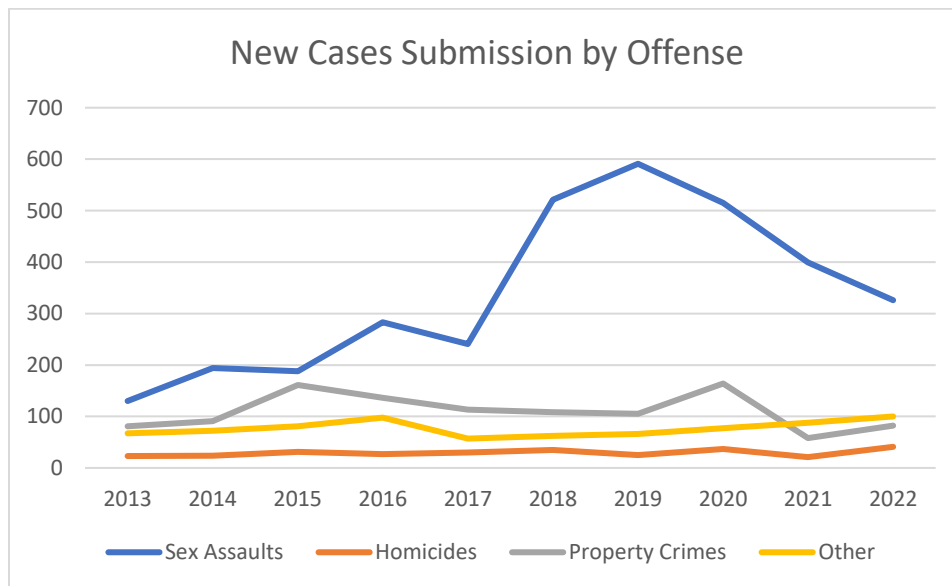
Following an increase in sexual assault submissions from 2016 through 2018 resulting from the Sexual Assault Kit Initiative and passing of State Bill 52, sexual assault submissions have leveled off moving into 2023. Below is a map showing the sexual assault submissions by county.

2022 Sex Assaults by County

Most case submissions consist of multiple items or samples requiring analysis. This chart represents the volume of items and samples worked by type each year.

Items/Samples Analyzed by Type per Year
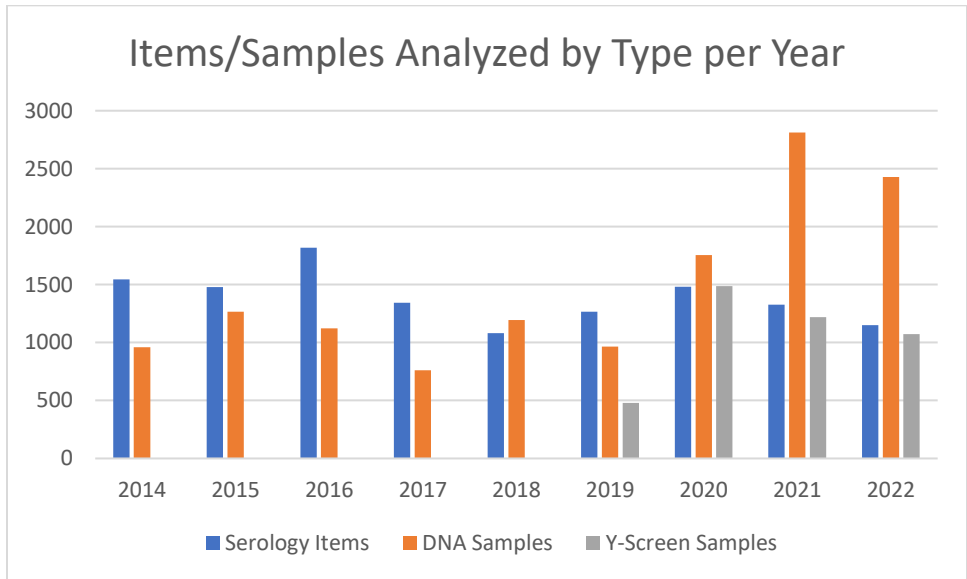
Processing of DNA samples has decreased over the past year but still has increased 38% as compared to 2020. This directly correlates with the decrease in backlogged DNA cases. Serology items and Y screening have continued to decrease as the initial effects of SB52 level off. Y screening of sexual assault kits was initiated in mid-2019.

DNA Backlogged Cases
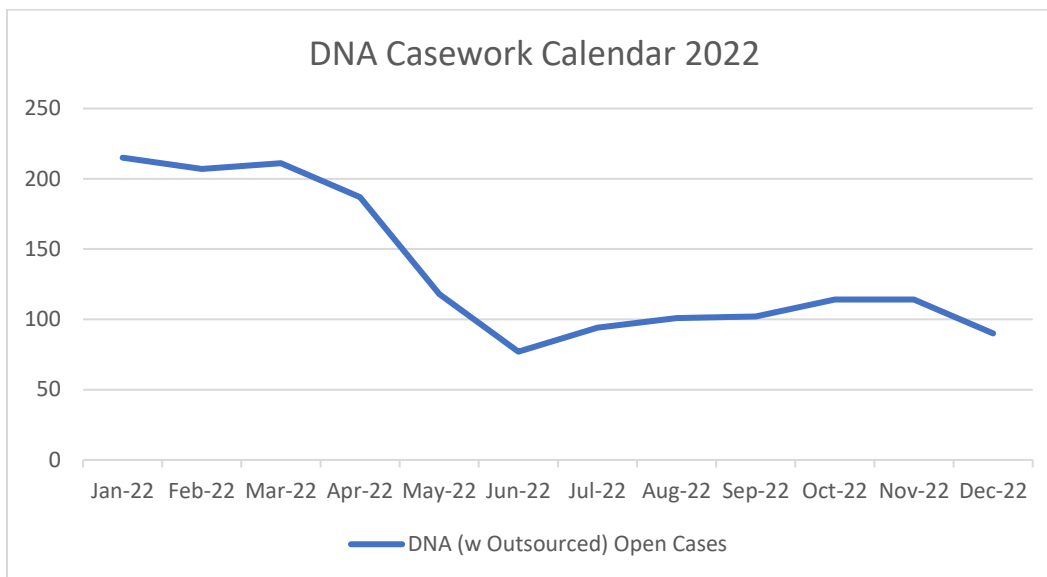
The number of outstanding DNA requests has continued to decline over the course of 2022.

Turnaround Times
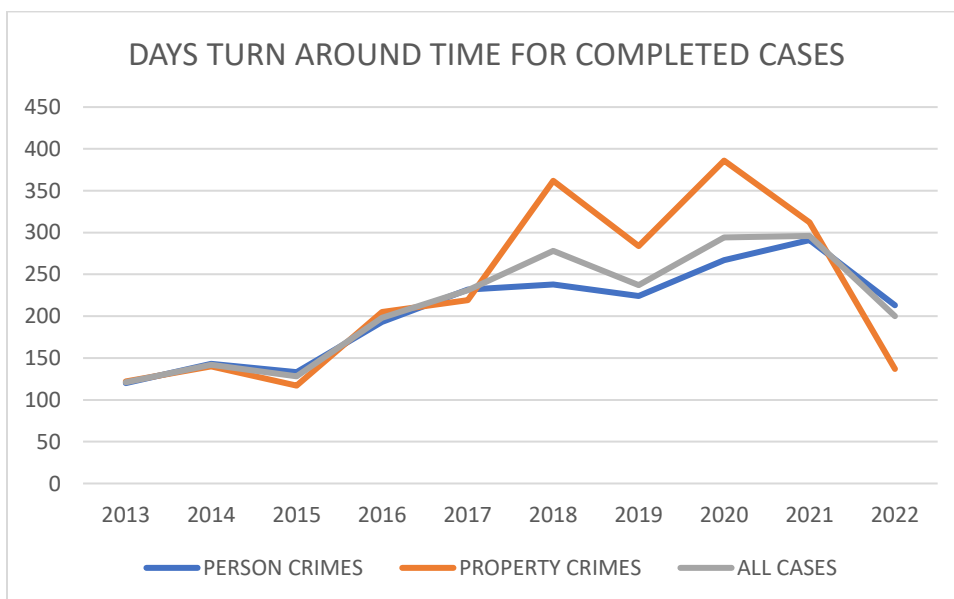
As Biology case are completed, the turn-around times posted reflect the total time the lab has had the request for Biology analysis. Over the course of the next year, the turn-around times are expected to decrease more sharply as the total number of open cases is reduced and the completion time decrease further.

CODIS

The CODIS database allows forensic laboratories throughout the nation the ability to compare DNA profiles from one case to another and to known convicted offenders from each state. Annual Forensic Unknown profile entries continue to increase with a correlation of CODIS HITS. Each HIT is an investigative lead. Upon completion of DNA databasing cross-training, the CODIS lab now has a full time DNA Databasing analyst to process the stream of Montana convicted offender samples that come into the lab monthly.

CODIS Totals – Casework and SAKI

	2022	**2021**	**2020**	**2019**	**2018**	**2017**
Casework Forensic Unknowns	**216**	**243**	189	71	124	105
SAKI Only Forensic Unknowns	N/A	N/A	15	237	129	N/A
Total Profiles Entered	**216**	**243**	204	308	253	105
CODIS HITS	**111**	**92**	86	140	138	31

Firearm/Toolmark Section

The Firearm/Toolmark Section examines firearms and ammunition from crime scene evidence. In addition, its staff examines toolmarks by request. They can determine whether a bullet was fired from a particular gun, and whether a particular tool was used at a crime scene. Within a certain range, they can estimate the distance between a gunshot victim and the gun.

Staff

Lynette Lançon	Doug Lançon
Forensic Scientist	Forensic Scientist
AFTE Certified	

Successes

1. Two full-time analysts doing casework after a year of transitions.

Challenges

1. Steady increase in firearms related cases submitted to the lab.
2. More outreach needed based on submissions and requests.

2023 Planning

1. Retrofit of aging Bullet Recovery Water Tank
2. Purchase and validation of Virtual Comparison Microscope (VCM)
3. Publish Journal article interesting case
4. Consider other potential research topics

Casework

Year	2022	2021	2020	2019	2018	2017
Total cases worked	137 (905 items of evidence worked)	88 (970 items of evidence worked)	90 (2112 items of evidence worked)	65 (597 items of evidence worked)	89 (1,212 items of evidence worked)	87 (978 items of evidence worked)
Median TAT (Days in Firearms section)	40	33	46	25	21	21
90% of cases worked (Days in Firearms section)	76*	83*	91*	64*	77 95%	156 95%

*Years 2022, 2021, 2022 and 2019 were changed from previous reports to reflect a 90% Turn Around Time

Quality Assurance

The Quality Assurance Section maintains the Forensic Science Division's accreditation and continually improves its management system. The quality assurance manager is responsible for ensuring the management system as it relates to quality and safety is implemented and followed at all times. This includes ensuring compliance with ANAB and NAME accreditation requirements [ISO/IEC 17025 and AR 3125] and the Forensic Science Division policies.

Staff

Stacey Wilson Quality Assurance Manager

Successes

1. Y-STR analysis ANAB scope extension achieved in 2022.
2. Medical Examiner's Office NAME accreditation two-year verification completed in December 2022.
3. Website updates providing additional information for law enforcement agencies, attorneys, forensics providers: policies and procedures, discovery and records requests, evidence collection information.
4. Continuation of integrating quality assurance/quality control processes within Qualtrax [more efficient and mostly paperless].

Challenges

1. ANAB laboratory testing and calibration activities re-assessment, May 2023.

Evidence Section

The Evidence Section ensures evidence is accurately and efficiently transferred to maintain the integrity of all evidence submitted and to protect it from loss and cross contamination.

Staff

Jazmin Ortega
Evidence Technician - Missoula
Samantha Hoyt
Evidence Technician - Missoula
Marina Contreraz
Evidence Technician - Billings

Casework

In 2022, the evidence technicians processed 8911 cases. Most of them have multiple pieces of evidence, some totaling over one hundred individual items. It is an essential and often overlooked role within the Division to document, log, and track the tens of thousands of unique pieces of evidence submitted each year.

Successes

1. Provided three evidence training presentations at MLEA.
2. Digitizing old submission forms for easier accessibility

Challenges

1. Increase in fentanyl cases cause increased risk of evidence technicians as they perform the intake of evidence into the lab