2023 HAMILTON COUNTY CRIME LABORATORY ANNUAL REPORT

Brian Scowden-Crime Lab Director

Profile of the Organization

The Hamilton County Coroner's Crime Laboratory (HCCL) is located in Blue Ash, Ohio and occupies a three-story building that was built in 2021. The mission of the crime laboratory is to provide reliable, accurate, timely, and impartial forensic services to the local and regional criminal justice community. The crime laboratory has an additional responsibility to assist forensic pathologists with determining cause and manner of death.

The Hamilton County Coroner's Crime Laboratory provides services in Drug Chemistry, Firearms/Toolmarks, Forensic Biology, Toxicology, and Trace Evidence. The crime laboratory currently has a staff of 29 analysts who process 8000-10000 cases a year. Most of the casework completed by the laboratory originates from Hamilton County law enforcement agencies. However, the laboratory performs analysis on evidence submitted by agencies outside the county for a fee. The evidence accepted is for investigations, not only at the local and state level, but the federal level as well. The analysts, as part of their analysis, provide expert testimony when required. On occasion, the staff at the laboratory provide training and give presentations to law enforcement, universities, and high schools.

Quality (Accreditation and Certification)

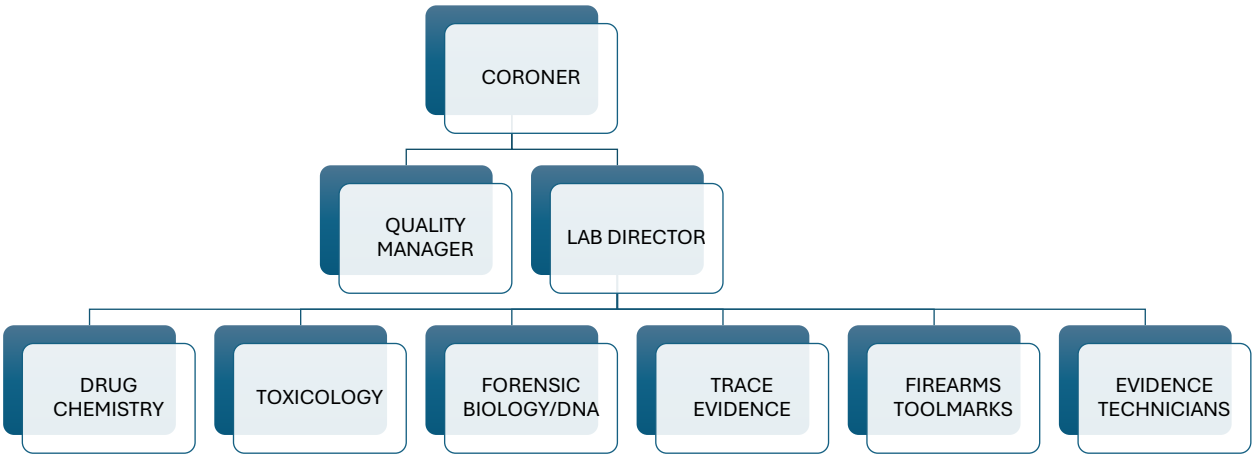
The Hamilton County Coroner's Crime Laboratory is committed to meeting the needs of our customers by providing accurate, impartial scientific examinations and related services. An effective quality management system assures the laboratory meets these commitments. The primary objectives of this quality system include but are not limited to:

a. Providing effective forensic services to the law enforcement community commensurate with available personnel and equipment.
b. Complying with the highest national standards for scientific competence and professional responsibility.
c. Maintaining a healthy, safe, and pleasant working environment for all employees.

To help the laboratory meet those objectives, HCCL is currently accredited by ANAB (ANSI National Accreditation Board) to ISO/IEC 17025 standards for testing, calibration, and forensic laboratories.

To maintain accreditation, HCCL undergoes a full site assessment every four years with annual assessment activities to evaluate and confirm ongoing conformance. The laboratory successfully completed a full site assessment in March of 2023.

Laboratory Organizational Chart



Evidence Management

Staffing:

The laboratory has two full-time evidence technicians.

Duties:

The evidence technicians accept all evidence submitted to the laboratory. They are responsible for logging case information and evidence items into the laboratory's management information system at the time of receipt. They are responsible for organizing storage of evidence so it can be retrieved when needed and the release of evidence as necessary. They deliver evidence for testing to each section's vestibule and pick up evidence from the vestibule when analysis has been completed.

Drug Chemistry Section

Staffing:

The Drug Chemistry Unit is currently staffed by five full-time analysts, one part-time analyst, and one analyst in training.

Duties:

The Drug Chemists identify controlled substances, non-controlled substances of abuse, and diluent materials in seized evidence samples. They perform analysis on solid dosage type items including powders, solid material, liquids, tablets, and vegetation. They also perform analysis on residues from digital scales, syringes, packaging materials, and smoking devices. The Drug Chemists also perform open container analysis for ethyl alcohol content.

2023 Statistics:

Drugs and Marihuana:

The section completed analysis on **6516 cases** with **71322 items** analyzed.

Open Container:

The section completed analysis on **270 cases** with **294 items** analyzed.

Average Turnaround time:

16.33 days

Figure 1: Top eight items identified in 2023. The counts include paraphernalia.

Figure 2: Comparison of Licit vs Illicit pharmaceutical preparations in 2023. Licit tablets are those tablets that contained the compound the tablet markings indicated. Illicit tablets are those tablets that contained a different compound than the tablet markings indicated and/or those tablets clandestinely manufactured (i.e. methamphetamine).

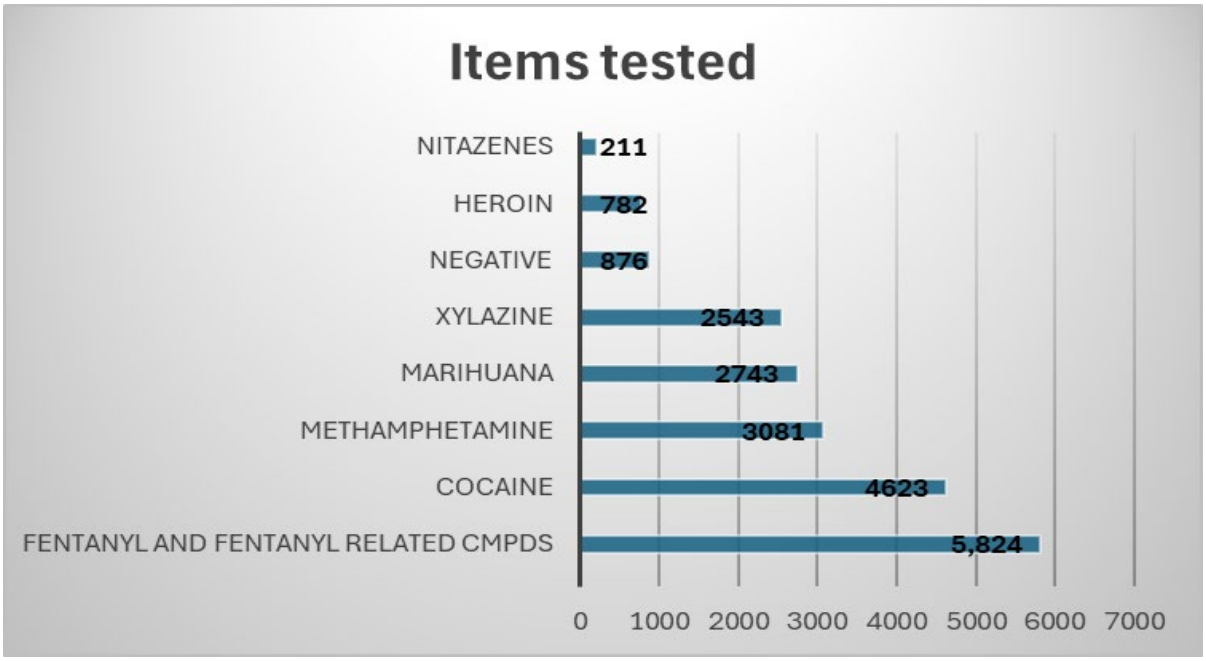


Figure 1

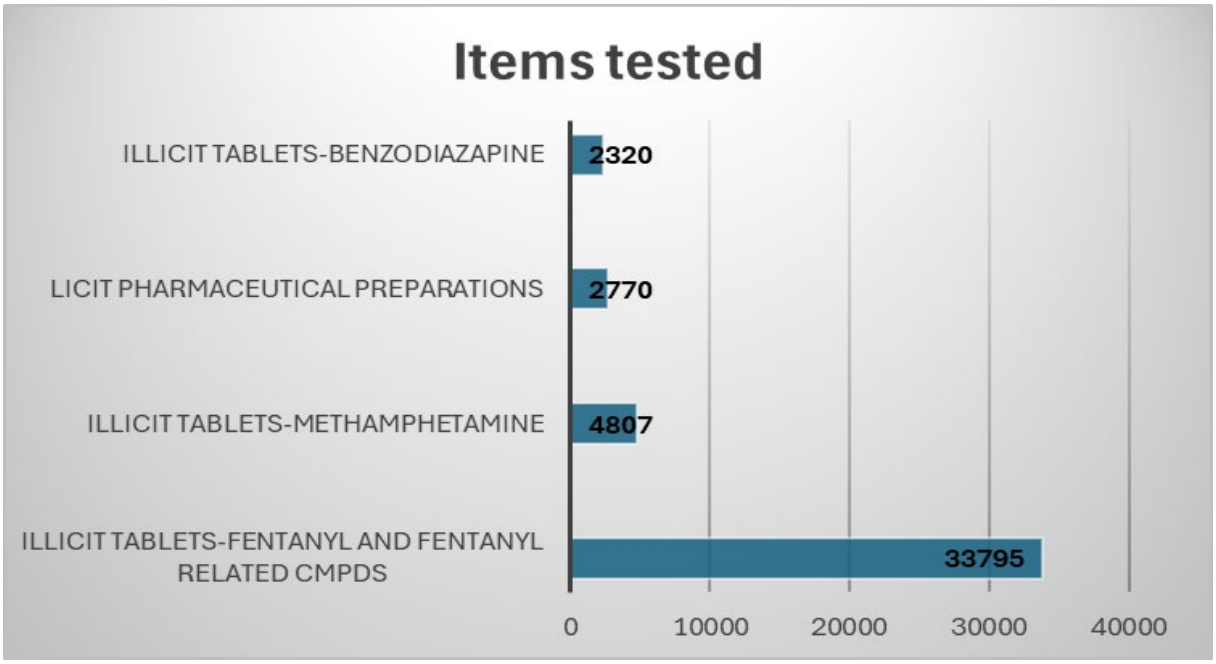


Figure 2

Toxicology

Staffing:

The Toxicology unit is currently staffed by seven full-time analysts. There are five toxicologists, one toxicology associate, and one toxicology assistant.

Duties:

The staff of the Toxicology unit analyze:

1. postmortem biological specimens for volatiles, drugs, and other toxic substances affecting the manner and cause of death.

2. biological specimens for ethyl alcohol and/or other drugs from driver's involved in suspected OVI offenses.

3. biological specimens from victims of suspected drug facilitated crimes and from suspects and/or victims of other criminal cases.

Stats for 2023:

The Toxicology unit completed **2115 cases** in 2023. The average turnaround time for coroner cases for 2023 was **36.1 days**.

Figure 1 is a chart of 2023 cases submitted, and cases completed and signed in 2023. OVI=operating a vehicle impaired. DFC=drug facilitated crime. Totals in the completed and signed category include cases that were submitted in 2022.

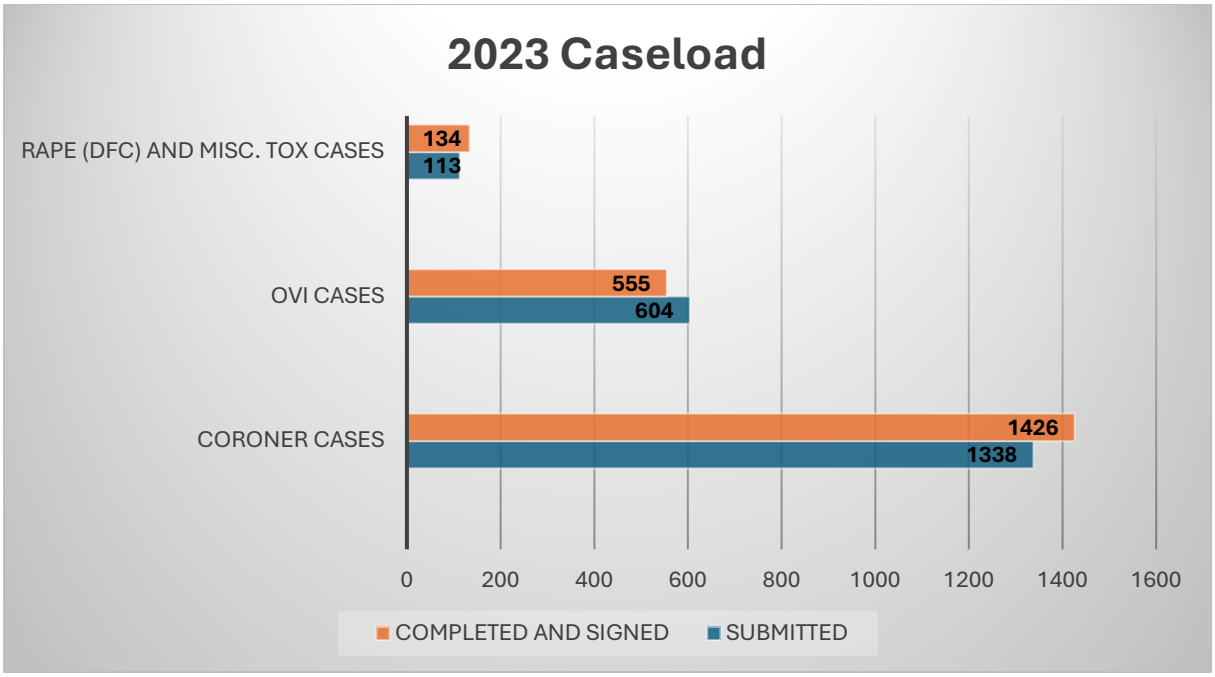

2023 Caseload
RAPE (DFC) AND MISC. TOX CASES
134
113
OVI CASES
555
604
CORONER CASES
1426
1338
0
200
400
600
800
1000
1200
1400
1600
COMPLETED AND SIGNED
SUBMITTED

Figure 1

Forensic Biology/DNA

Staffing:

The Forensic Biology section is currently staffed by six full-time analysts and one analyst in training.

Duties:

The Forensic Biology/DNA Section uses technology and scientific processes to detect, collect, and interpret results from blood, semen, saliva, or urine. They use appropriate chemical and microscopic testing for determination of the type and origin of the biological material present.

Forensic DNA analysis is a multi-step process which involves extraction, quantitation, amplification, separation by capillary electrophoresis, and interpretation. The generated DNA forensic profiles are then compared to known specimens from victims or suspects or searched within the Combined DNA Index System (CODIS) database of crime scene samples and previous offenders and arrestees.

Stats for 2023:

The section **received 1440 cases in 2023**. This was an **11.03 % increase from 2022.**

The section **completed 1505 cases in 2023**. This was a **14.10 % increase from 2022.**

The cases completed in 2023 represented **24,507 examinations** performed on **7317 items**. This was an 11.82% and 2.24% increase respectively from 2022.

Figure 1 is a chart of the 397 CODIS hits for 2023. An Offender is an individual who was previously convicted and was required to provide a DNA sample for inclusion in the CODIS database. An arrestee is an individual who has been arrested and was required to provide a DNA sample for inclusion in the CODIS database. A forensic hit is when two or more forensic samples submitted by casework laboratories match one another. A hit occurs when a DNA profile

developed from crime scene by a casework laboratory matches to a DNA profile at the Local, State, or National sites. CODIS matches may occur at any of the three levels of the CODIS system:

1. The Local CODIS site (Hamilton County) houses profiles from crime scene samples. This is also referred to as a casework laboratory.

2. The State CODIS site houses profiles from all the crime scene samples in Ohio, as well as persons convicted of crimes in Ohio, and arrestee profiles from persons arrested in Ohio.

3. The National CODIS site houses profiles from all the crime scene samples in the United States, as well as profiles from persons convicted of crimes and persons arrested in the United States.

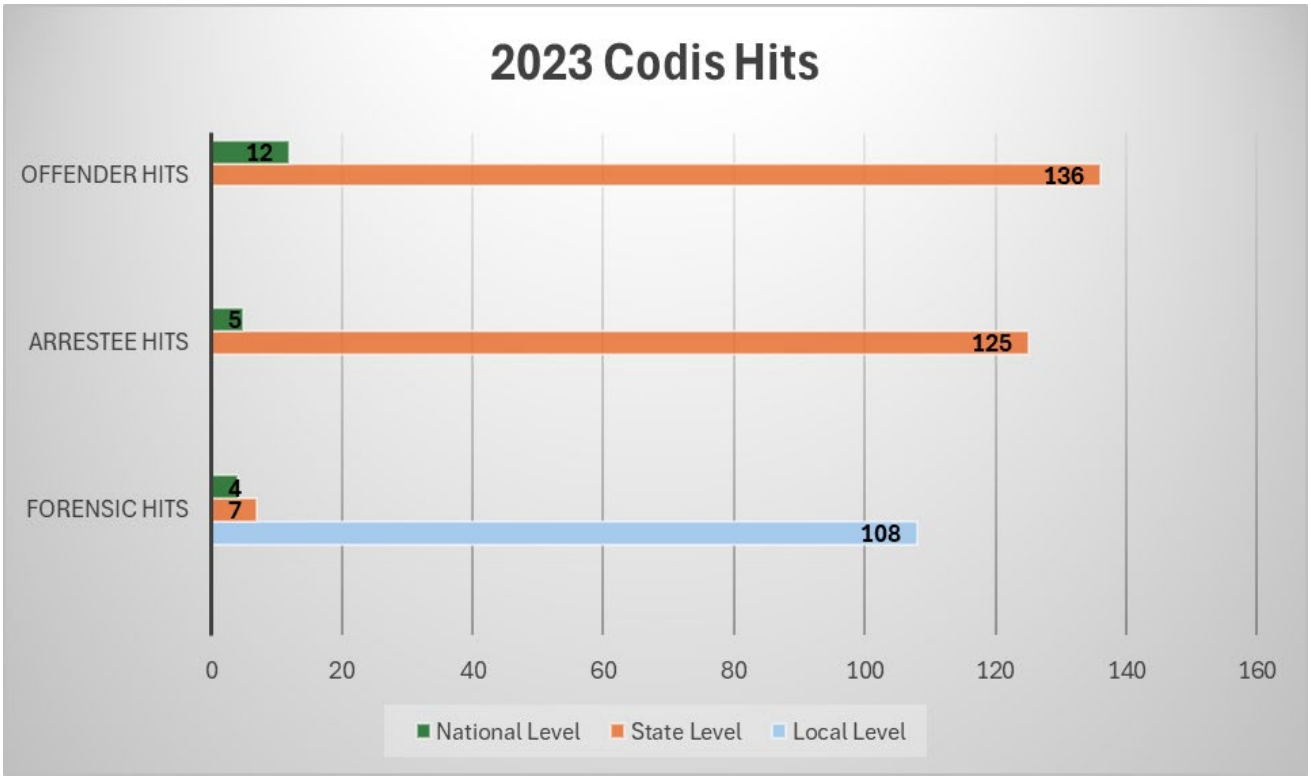


Figure 1

Trace Evidence

Staffing:

The Trace Evidence Section is currently staffed by two full-time analysts, one of which is currently still training in some sub-disciplines.

Duties:

Trace evidence is the minute transfer of materials based on Locard's Exchange principal theory. Trace evidence may provide a link between the suspect and victim, a victim and a scene, or the suspect and a scene.

The Trace Evidence Section examines an array of evidence including footwear and tire impressions, paint, glass, tape, hair, dye packs, chemical irritants, explosives, fibers, gunshot residue (GSR), ignitable liquids analysis and fracture matches.

Stats for 2023:

The Trace Evidence Section accepted **154 cases** in 2023. The section completed work on **149 cases** in 2023.

Figure 1-Types of Cases worked in 2023.

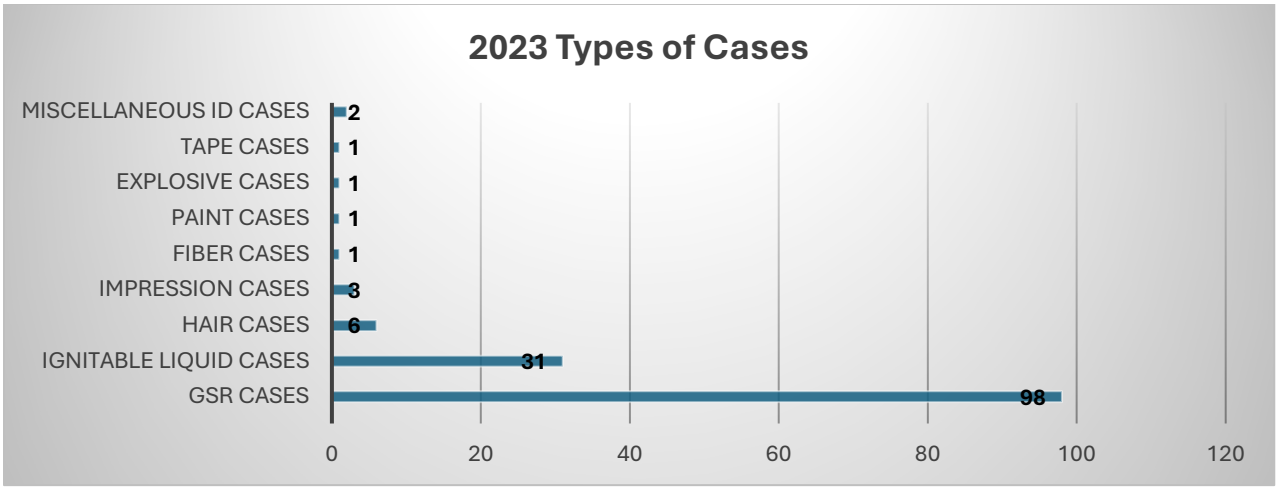


Figure 1

Firearms and Toolmarks

Staffing:

The Firearms and Toolmarks Section is currently staffed by two full-time analysts, one part-time analyst, and three analysts in training.

Duties:

The Firearms and Toolmarks Section conducts a wide variety of examinations. Using valid scientific procedures, they conduct safety and function testing on firearms, determine general rifling characteristics, perform serial number restoration, compare ammunition components to determine if they were fired in a specific firearm, and determine if a specific tool made a certain toolmark.

Stats for 2023:

The Firearms and Toolmarks Section accepted **188 cases** in 2023. They worked **241 cases** in 2023. At the end of 2022 the section had a backlog of **369 cases**. At the end of 2023 the section had a backlog of **295 cases**.

Figure 1-Types of analysis performed on the work completed in 2023.

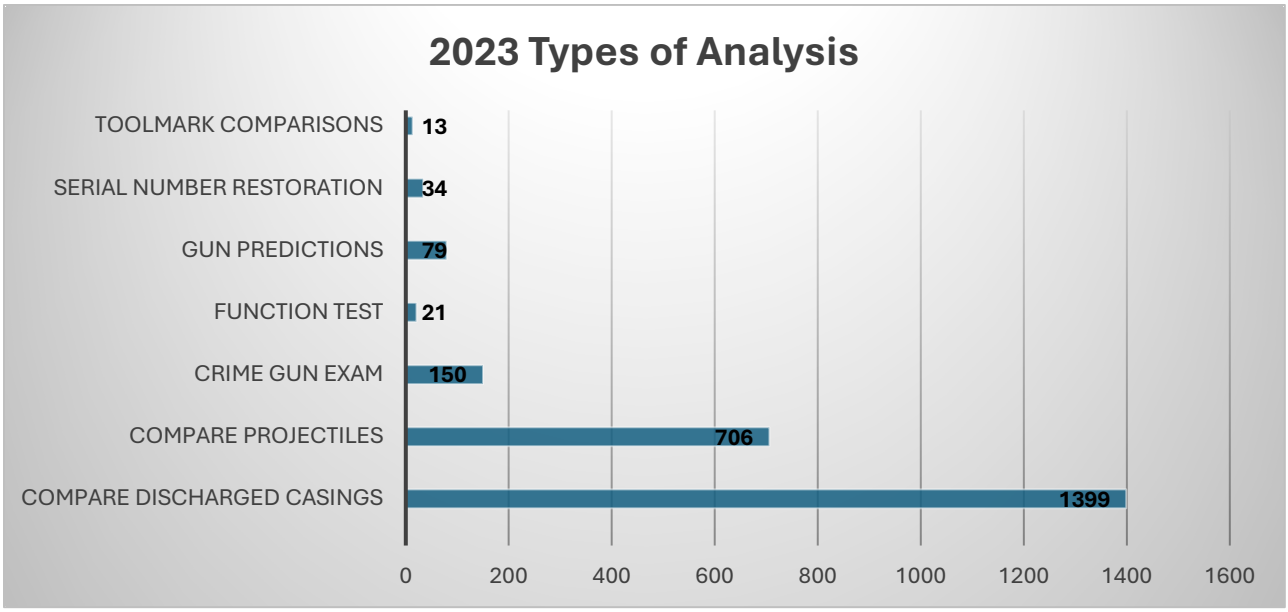


Figure 1

Projections/Goals for the Laboratory in 2024:

The laboratory's management and professional staff will continue to focus on an environment of continuous improvement -through training opportunities, collaboration and communication, new technology, and supporting the health and wellness of our staff. Below are some of the 2024 goals/projections for the laboratory sections.

General Laboratory:

The laboratory is implementing a new FIMS (Forensic Management Information System) in 2024. This system should be more efficient in accepting evidence. It will also notify agencies when casework is finished and allow customer access to lab reports.

Drug Chemistry:

The section will continue to strive to keep the turnaround time for cases to around 14-21 days. The section hopes to finish the training of the new analyst in the first half of 2024. The section will be purchasing and validating/verifying two new instruments: a Gas Chromatograph/Mass Spectrometer for controlled substance case work and a new headspace sampler for open container analysis. The section will be working toward validating their liquid chromatography/ tandem mass spectrometer (LC/MS/MS) in order to expand services offered. This instrument will allow the laboratory to differentiate between psilocybin and psilocyn, as well as perform purity testing of methamphetamine for federal court.

Toxicology:

The section is committed to reducing their average turnaround time for completing and signing out coroner cases to under 25-30 days. They will also continue to develop and validate more in-house methods and procedures to reduce the number of send-outs. The toxicology associate will be promoted to a toxicologist which will give them one more analyst to sign analytical reports.

Forensic Biology:

The analyst in training will be fully trained and authorized to perform analysis on casework in 2024. This will help them as they continue to reduce their backlog numbers.

Trace Evidence:

The section will look to complete an analyst's training in two sub-disciplines. They will complete the verification of their new Fourier Transform Infrared (FTIR) Microscope. They will also work toward the validation of microspectrophotmetor (MSP)-a new technology in their section.

In April the section will be hosting a tape workshop at the laboratory.

Firearms and Toolmarks:

The Firearms and Toolmarks Section will continue to strive to reduce the backlog. The section is hoping to complete the training for all three analysts in training in 2024. The goal is to be able to work cases as they are submitted to the laboratory.