

Chemistry

Forensic Biology

Physical Evidence

Toxicology

Forensic Training

Quality Assurance

Research

# DIVISION OF TECHNICAL SERVICES UPDATE

Alka B. Lohmann, Director of Technical Services  
Presented to the Scientific Advisory Committee  
April 11, 2023





## CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

**Virginia Department of Forensic Science  
Crime Laboratory System**

Fulfills the requirements of

**ISO/IEC 17025:2017**

ANAB Forensic Testing & Calibration AR 3125:2019

FBI Quality Assurance Standards for Forensic DNA Testing Laboratories:2020

FBI Quality Assurance Standards for DNA Databasing Laboratories:2020

In the field of

**Forensic Testing & Calibration**

This certificate is valid only when accompanied by a current scope of accreditation document.  
The current scopes of accreditation can be verified at [www.anab.org](http://www.anab.org).

  
Pamela L. Sale, Vice President, Forensics

Expiry Date: 30 September 2026

Certificate Numbers:

FT-0051

FT-0052

FT-0053

FT-0054

FC-0004



# Accreditation

- Internal Audits conducted Feb. 21 – March 23
- Surveillance Conformance Checklist submitted March 31
- Surveillance Document Review – May 2023
- Certificates and Scopes are available on the DFS website: <https://www.dfs.virginia.gov/about-dfs/accreditation/accreditation-documentation/>
- Current cycle expires September 30, 2026

# Forensic Training

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- 108<sup>th</sup> FSA Session graduated March 31, 2023
- First full session for the two newly hired Forensic Trainer Seniors
  
- Laboratory Capabilities and Updates April 18
- 109<sup>th</sup> FSA Session begins April 24





# Grant Update – Chemistry Research

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- Paradigm Shift in Forensic Toxicology Screening: The Development and Validation of Two Automated Sample Preparation Techniques for the Comprehensive Screening of Biological Matrices Using High Resolution Mass Spectrometry
  - Final reports submitted March 2023
- Expanded Quantitative Cannabinoid Testing in Biological Specimens to Combat the Ever-Changing Cannabis Landscape
  - End date December 2023 (1 year extension approved)
  - Validation of method

# Grant Applications – Chemistry Research

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- Quantitative evaluation of psilocybin metabolites in biological matrices using liquid chromatography tandem mass spectrometry
  - Optimization of sample preparation
  - Stability evaluation including long-term storage and extraction
- Evaluation of alternative mobile phase gases for the headspace analysis of blood ethanol concentrations
  - Conversion of helium to hydrogen or nitrogen mobile phase
  - Re-evaluation and optimization of sample preparation and analysis conditions (e.g., dilution ratio, vial size, equilibration temperature/time)



# Chemistry Research Update

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- Staffing
  - 2- Full-time Forensic Laboratory Specialists (FLSs) VI
  - 1- Full-time FLS III (CDC Opioid Project – August 2023) started March 10
- Vacant
  - 1- Full-time FLS VI (CDC Opioid Project – August 2023)

# Grant Continuation – Chemistry Research

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## Overdose Data to Action in States (OD2A-S) Funding with OCME

- Supports the Toxicology Section and Chemistry Research Section
  - Employs at least 2 Laboratory Specialists
  - Purchased the Automated Liquid Handling Systems
- Opportunity for five more years of continued funding (~\$375,000/year)
- Employ two FLS VI and one FLS III in Chemistry Research Section to develop/validate new methodology
- Use funds to purchase instrumentation/supplies to explore new methodology



# DFS Representatives on OSAC

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Digital Evidence Subcommittee – Jesse Lindmar

Forensic Toxicology Subcommittee – Rebecca Wagner, Ph.D.

- Subcommittee Vice Chair

Human Forensic Biology Subcommittee – Susan Greenspoon, Ph.D.

Ignitable Liquids, Explosives, & Gunshot Residue Subcommittee – Brenda Christy

- Subcommittee Chair

Ignitable Liquids, Explosives, & Gunshot Residue Subcommittee - Mary Keehan

Video/Imaging Technology and Analysis Subcommittee – Patricia Mullaney

- Subcommittee Executive Secretary



# Chemistry Program Update

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Robyn Weimer

Chemistry Program Manager



# Trainee Update

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## **Trace Evidence, Central Laboratory:**

- One (1) trainee in Primer Residue, expected completion June 2023
- One (1) trainee in Tape, expected completion Q2 2023
- One (1) trainee in Hair, expected completion Q2 2023

## **Controlled Substances:**

- No trainees currently, with one position in recruit



# Training – Trace Evidence

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## Statewide Section Meeting in Richmond – March 2023

- Physical fit – research, verifications, and report wording
- Bias awareness
- Quality assurance topics, including proficiency testing
- OSAC update
- Toured the conservation laboratory at the Virginia Museum of Fine Arts – instrumentation and small particle handling, preservation methods, retention of documentation, etc.



# Grant – Trace Evidence

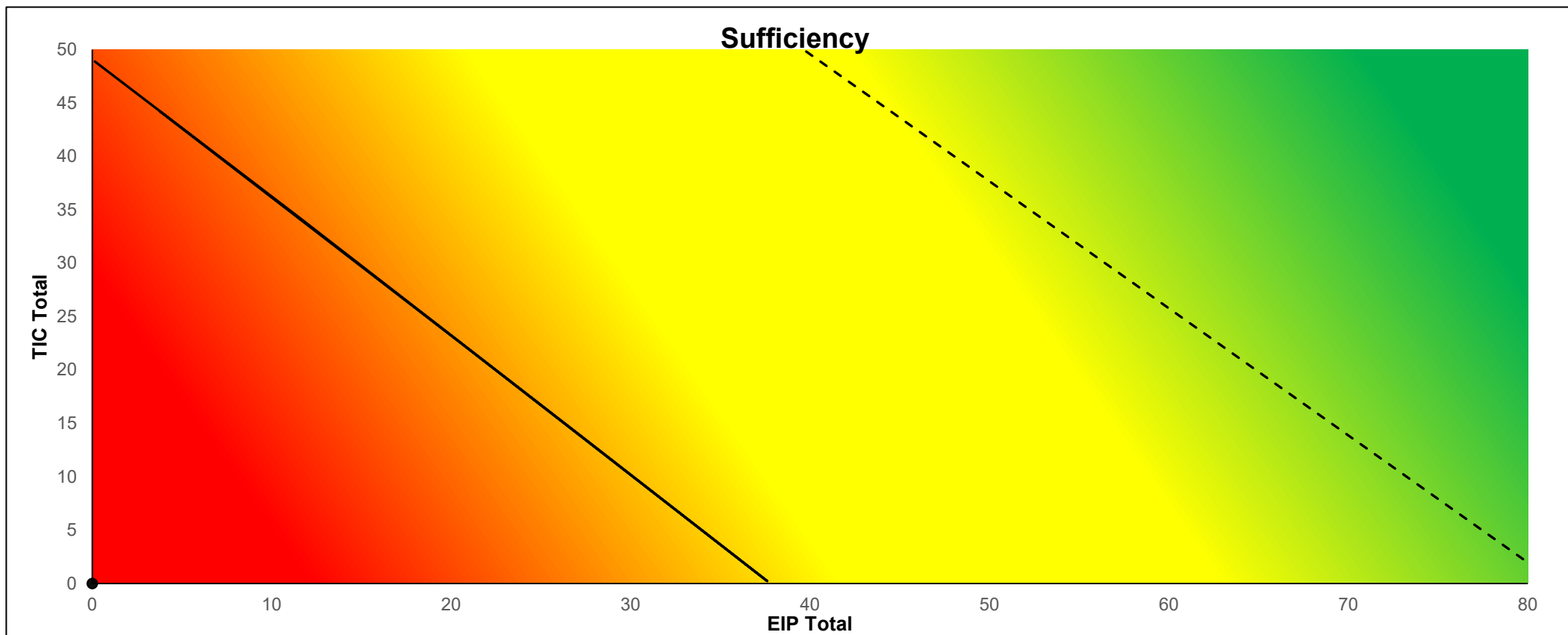
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## *Fire Debris Interpretation Using Quantitative Measures Of Chromatographic Features in Medium Range Ignitable Liquids and the Use of Graphical Display to Demonstrate Data Sufficiency*

- Continuation of NIJ Grant Award 2018-DU-BX-0174 which proposed a statistically supported, standardized interpretation method for gasoline.
- Expansion for medium petroleum products (MPPs), which are the most identified ignitable liquids in fire debris samples following gasoline.



# Incorporation of Gasoline Workflow





# Training – Controlled Substances

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January 2023: Current Trends in Seized Drug Analysis  
(free) Online Symposium

- Provided 8-15 hours of training

Statewide Section Meeting – October 2023

- Will include a tour of a hemp processor facility

# Board of Pharmacy Expedited Scheduling

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DFS recommended five (5) compounds in July 2022. These compounds became scheduled on February 1, 2023.

DFS recommended five (5) compounds in October 2022. These compounds will be scheduled effective April 12, 2023.

# Board of Pharmacy Expedited Scheduling

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DFS recommended five (5) compounds in January 2023. The compounds were considered at the Board's March 30<sup>th</sup> meeting and are pending final approval.

## **Synthetic Opioid:**

- para-fluoro valeryl fentanyl
- para-fluoroacetyl fentanyl

## **Hallucinogenic Properties:**

- 3-fluoro Phencyclidine
- 2-fluoro-2-oxo PCE

## **Stimulant:**

- 3-chlorophenmetrazine





# Legislative Session 2023

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- Final amendments to be considered at Reconvened Session 4/12/23
- “Tetrahydrocannabinol” definition:

*"Tetrahydrocannabinol" means any naturally occurring or synthetic tetrahydrocannabinol, including its salts, isomers, and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible within the specific chemical designation and any preparation, mixture, or substance containing, or mixed or infused with, any detectable amount of tetrahydrocannabinol. For the purposes of this definition, isomer means the optical, position, and geometric isomers.*

- “Industrial hemp” and “industrial hemp extract” definitions refer to the “concentration of *tetrahydrocannabinol*”; Definition of “Marijuana” specifically excludes both.



# Legislative Session 2023

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- “Hemp product” and “industrial hemp extract” definitions have total tetrahydrocannabinol limits:

**49** "Hemp product" means a product, including any raw materials from industrial hemp that are used for  
**50** or added to a food or beverage product, that (i) contains industrial hemp and has completed all stages of  
**51** processing needed for the product and (ii) when offered for retail sale (a) contains a total  
**52** tetrahydrocannabinol concentration of no greater than 0.3 percent and (b) contains either no more than  
**53** two milligrams of total tetrahydrocannabinol per package or an amount of cannabidiol that is no less  
**54** than 25 times greater than the amount of total tetrahydrocannabinol per package.



# Cannabis Update

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## Semi-Quantitative Method Expansion

- Semi-quant method for plant material & cannabis extracts ( $\Delta 9$ -THC) since December 2020
- Expansion includes other tetrahydrocannabinols:  $\Delta 8$ -THC,  $\Delta 10$ -THC, and  $\Delta 6a,10a$ -THC, ... *cis*- $\Delta 9$ -THC and  $\Delta 7$ -THC to follow
- Administrative threshold will remain at 1%
- Not applicable to edibles or residues
- Subcommittee reviewed validation documentation
- Pending legislation, effective July 1, 2023



# Cannabis Edibles Update

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- Need semi/quant. method for edibles
- Request For Proposal (RFP) for outsourcing of cases in process
- Development of an internal method dependent on caseload
- Proposed amendment to the 2022-2024 biennial budget included provision for one (1) laboratory specialist position to enable agency analysis of THC edibles



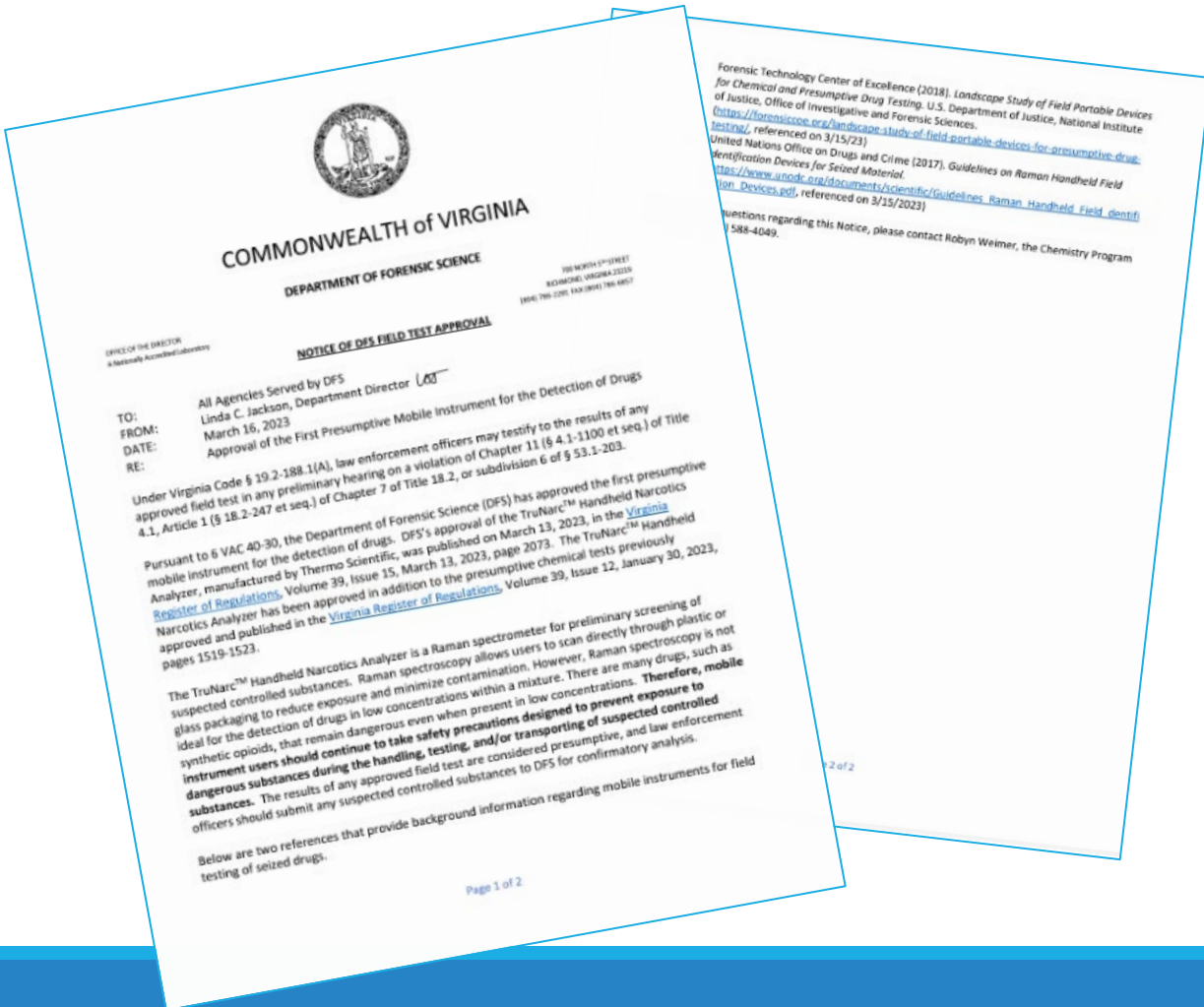
# Field Test Regulation Update

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## 6 VAC 40-30 Regulations for the Approval of Field Tests for Detection of Drugs

- Reevaluated previously approved presumptive chemical field tests, if requested by manufacturer, and new requests.
- Published updated list on January 30<sup>th</sup> in *Virginia Register of Regulations*, Vol 39 (Issue 12), pages 1519 – 1523.
- During that reevaluation process, DFS received the first presumptive mobile instrument evaluation request.

# First Approved Presumptive Mobile Instrument for Detection of Drugs



- Published on March 13<sup>th</sup>, in *Virginia Register of Regulations* Vol 39 (Issue 15), page 2073.
- Customer notice issued along with safety concerns and references for additional information.

# Forensic Biology Program Update

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Brad C. Jenkins

Forensic Biology Program Manager



# Forensic Biology Examiner Staffing

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- Central – 1 position in recruit, 1 Biologist starting training
- DTS - 1 examiner in training Mito, 1 in recruit DB
- Eastern – casework fully staffed
- Northern – 1 position in recruit, 1 starts 4/25
- Western - 1 position in recruit





# Staff Internal Training Projects

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- STRmix: 9 starting final competency
- True Allele - Training 2 examiners
- Y-STR - Data Bank 2 examiners completed



# Validation Update

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- **STRmix and True Allele validation**
- **New Real Time PCR instruments**
- **New DNA quantitation kit**
- **New Thermal cyclers**
- New Y-STR Kit evaluation
- Additional Casework Direct studies



# Direct Amplification

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## Reference samples

- Deployment stage (electronic worksheet completed)
- Regional Laboratory performance checks
- Staff training and competency
- Validation and performance checks for your review next meeting



# Outsourced Sexual Assault Kit Testing

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## SAKI Grant with Virginia Office of the Attorney General

- Pre CODIS kits prior to 1997 and terminated kits 1997-2016
- Approximately 600
- DLI in Florida
- Ownership reviews and CODIS uploads continue



# Forensic Biology Legislation:

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## *Strangulation Kits*

- Design and purchase kits for statewide distribution July 1, 2025
- Estimating 2000 kits needed year 1
- Kits submitted for DNA low (just an estimate)

# Physical Evidence Program Update

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Sabrina S. Cillessen

Physical Evidence Program Manager

# Latent Prints & Impressions Staffing

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## In training:

- 1 in Central for Impressions
- 1 in Western for Impressions

# Latent Prints & Impressions Continuing Education

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The Section Meeting will be held at the International Association for Identification (IAI) August 2023 Educational Conference in Maryland.





# Latent Prints

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- The Virginia State Police is upgrading the Automated Fingerprint Identification System (AFIS) which requires the Department to purchase workstations and enter into a contract with the vendor, NEC.
- It is anticipated the system will “go-live” in June.
- The following agencies have opted out of purchasing workstations and will no longer have latent print searching capabilities:
  - Fairfax PD
  - Arlington PD
  - Portsmouth PD
  - Henrico PD
  - Chesterfield PD
  - Alexandria PD

# Firearms & Toolmarks Staffing

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## In recruit:

- 2 in Central
- 3 in Eastern
- 1 in Western
- 1 in Northern

## In training:

- 1 in Eastern

# Firearms & Toolmarks Continuing Education

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- Three day section meeting in Manassas
  - ATF - James Barlow Chief, FEO Development Branch Firearms and Ammunition Technology Division
    - Machinegun conversion devices for Glock-variant pistols and Ars, Privately Made Firearm (PMF)/Machinegun Conversion Device (MCD) presentations. This will include hands-on in the range.
  - Robert Cole – Team One Network Springfield XD/ XDM Armorer Course
    - This course provides a complete and detailed answers to specific questions concerning the weapons mechanical functioning, operational procedure, field stripping and armorer detailed stripping, inspection(s), troubleshooting, and corrective actions/maintenance.
  - Omar Felix, United Metropolitan Forensic Crime Laboratory Firearms Examiner
    - Glock manufacturing - a brief history of the company, the evolution of the different generations of pistols, and the manufacturing process Glock uses (and used) to make its various pistols.



# Firearms & Toolmarks

## National Integrated Ballistic Information Network (NIBIN)

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### Comparison of 1<sup>st</sup> quarter results

2023

- 1 hit confirmed
- 326 potential NIBIN associations
  - Western = 48
  - Northern = 13
  - Eastern = 172
  - Central = 93

2022

- 9 hits confirmed
- 422 potential NIBIN associations
  - Western = 20
  - Northern = 22
  - Eastern = 259
  - Central = 121

# Firearms & Toolmarks NIBIN

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## Local agencies with NIBIN

- Chesapeake
- Fairfax
- Newport News/Hampton (entry & correlation)
- Norfolk
- Richmond
- Virginia Beach

# Digital & Multimedia Evidence Staffing Update

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In recruit:

- 2 in Central



# Digital & Multimedia Evidence Training

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- Virginia Cybercrime Initiative (VCI) CIIFER Conference; Williamsburg, VA
  - Commonwealth's Attorneys' Services Council (CASC)
  - Jesse Lindmar presented “Cellebrite 101 for Prosecutors From Device Acquisition to Reporting”



# Digital & Multimedia Evidence

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- Increase in vehicle forensic examination
- Investigators are submitting the vehicle “computer”
- Requires a "chip-off" acquisition
  - Vehicle systems are constantly collecting performance metrics, monitoring sensor data, scanning external environmental conditions, processing telemetry data, and communicating with other vehicles and infrastructure



# Toxicology Program Update

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James W. Hutchings, Ph.D.

Toxicology Program Manager



# Toxicology

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## Methodology - update

- Nitazenes – in development on the QTOF
- Cannabinoid Quantitation and Confirmation by Supported Liquid Extraction Using LCMSMS
  - Currently in validation
  - Aiming for completion in late Spring 2023
- Alternative blood sources



# Staffing

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## Vacancies

- Toxicology
  - C: No vacancies
  - W: 1 Forensic Toxicologist (FT)
  - E: 1 Forensic Laboratory Specialist (FLS)
  - N: 3 FLS, 1 FT
- Breath Alcohol
  - No vacancies

## Trainees

- Toxicology
  - Central – 1 FT
  - Western – 3 Forensic Scientist (FS) (2 starting soon), 1 FLS
  - Eastern – 1 FT, 2 FS
  - Northern – 1 FT
- Breath Alcohol
  - 2 FS



# Grants

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## Applied for DMV Highway Safety Office Grants

- Breath Alcohol
  - To continue to offer licensing training and to retain one Forensic Scientist
  - Maintain mobile access and electronic processes
- Toxicology
  - Retain two FLS II (part time)
  - Retain/hire six FLS II/III



# Toxicology Statistics

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- Cases submitted by examination type

	2021	2022
OCME	5484	5139
DUID	2838	2583
DUI	2139	2327
Tox-Other	705	753

\*Outsourcing of OCME cases in E and W.



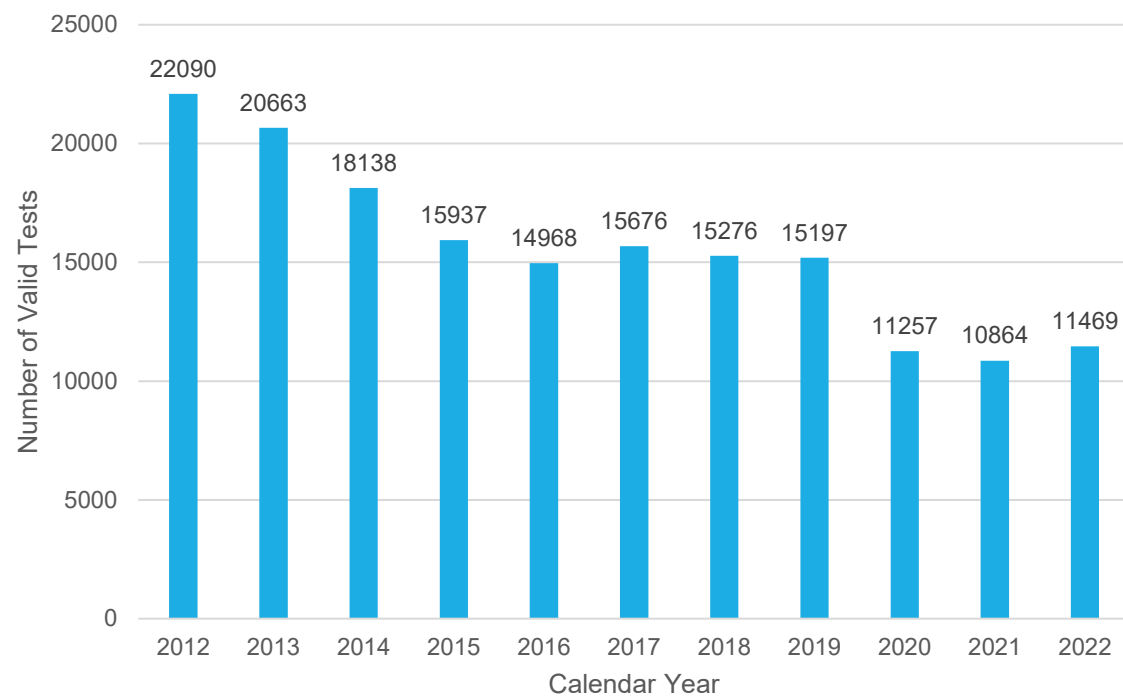
# Toxicology – Items of Note

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- DUI/DUID Testing Policy - January 1, 2023
- All DUI/DUID samples are screened for cannabinoid metabolites and alcohol
- Additional drug screening performed on samples with BAC < 0.100%



# Breath Alcohol Statistics





# Breath Alcohol Updates

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- New Breath Alcohol Instrument
  - Developing Invitation for Bid/Request for Proposal for new instrumentation
  - Desires
    - High Speed Communication
    - Laser Printer





# Legislation

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- Budget Bill (Pending)
  - Screening of deidentified cases for full drug panel if only blood alcohol and cannabis was screened
  - Addition of equipment and one FLS to Chemistry Research Section
- SB1398 - Data Sharing Regarding Impaired Driving
  - DFS will be required to share data on drug impaired driving cases for each annual cycle
  - Provide to DMV (one of many agencies) who will produce a report for the General Assembly



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Thank you!