EVIDENCE HANDLING & LABORATORY CAPABILITIES GUIDE

APRIL 2008

P R E F A C E
A N D
A C K N O W L E D G E M E N T

This Evidence Handling and Laboratory Capabilities Guide has been developed as a cooperative effort of the Forensic Training Section and Laboratory Disciplines of the Virginia Department of Forensic Science. This Guide is intended for police use only.

The objective of this Guide is to make practical information concerning how the Forensic Laboratory can assist in criminal investigations, and procedures for the collection, preservation, and submission of physical evidence, available to law enforcement personnel.

While every effort has been made to ensure its accuracy, it is inevitable that with time some changes will occur. It is, therefore, recommended that the user of this Guide keep abreast of those changes.

The Guide is not intended to cover all situations or to supersede agency policies or procedures. The Laboratory intends to make periodic updates and changes to this Guide as new methods are developed.

Should any questions arise, individuals are encouraged to contact the Training Section or appropriate Laboratory Examiner.

It is the hope of the Department that this Guide will promote the maximum use of physical evidence and encourage greater use of the services of the Laboratory.

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GENERAL SUBMISSION OF EVIDENCE

IDENTIFICATION OF PHYSICAL EVIDENCE

Identification of physical evidence generally falls into two classes. Evidence with class characteristics only can only be placed into a category or group. There is a possibility of more than one source of material; therefore, it can never be identified as from a specific source. The value of evidence with class characteristics only, should not be minimized.

Evidence with individual characteristics includes materials that can be identified as from a specific source to a reasonable scientific probability, provided there are sufficient individual identifying (unique) characteristics present.

SUBMISSION OF EVIDENCE

The "REQUEST FOR LABORATORY EXAMINATION" (RFLE) form is designed to permit personnel in the laboratory to serve you in a more efficient and orderly fashion.

This form provides an evidence receipt for the officer and evidence work sheets to remain with the evidence while in the laboratory.

The form should be completed by the investigating officer prior to being hand-carried or mailed to the laboratory with the evidence. With this procedure the person receiving the evidence will be able to process the request much more rapidly.

When executing this form, use either a typewriter or print neatly using a ball point pen. If handwritten, the form should be resting on a hard surface. This will permit the last copies to be legible. **PLEASE PRINT LEGIBLY.** Corrections should be made on all copies.

When submitting multiple items of evidence in a case that includes a primer residue kit for examination, it is recommended that the primer residue kit be submitted on a separate RFLE. Oftentimes, other requested examinations are completed and the submitting agency needs the evidence back for discovery, court or to return an item back to the owner prior to the primer residue examination being completed. Submitting the primer residue kit on a separate RFLE will allow for a more timely return of other evidence submitted in the agency's case.

When mailing evidence and the completed request form to the laboratory please detach the last copy of the form, which is to be retained by you for your records, <u>and mail the **original** and remaining three copies.</u>

In those instances where the officer is hand carrying the evidence to the laboratory, the entire request form (include all copies) should accompany the evidence. Upon accepting the evidence, the examiner or evidence receiving officer will sign the request form and return a copy to the submitting officer to serve as a receipt. Please note the FS number and have it available when you call inquiring about your case.

The request form is a communication device and should be used to clearly communicate the

examinations and comparisons desired. **Remember to have a clear investigative reason for the submission.**

Stamp or note on evidence "biological evidence". Include HIV (AIDS) warning if applicable.

Do not mail WET biological evidence.

Do not mark directly onto an item of evidence with a scribe, pen or other instrument unless specifically prescribed to do so in the sections that follow.

Stapling is not an appropriate method for sealing evidence containers and should NEVER be used with document evidence.

SAMPLE RFLE KEY

A brief explanation of the various sections on the form is presented below. Each explanation is numbered to correspond with the specific section on the accompanying example request form.

1. The full name and title of the investigating officer to whose attention the results of examination are to be directed.

2. Your agency telephone number, including area code. If available, also include your pager #. This makes communication easier.

3. The full name and address of the submitting agency, including zip code.

   PLEASE INCLUDE AN E-MAIL ADDRESS.

4. The case number assigned to this specific investigation by your agency. The inclusion of this number will greatly enhance communications between the laboratory and the submitting agency.

5. Do not write in this block. It is used for the laboratory file number which is assigned at the time the evidence is received.

6. If the submission is a second or subsequent submission in the same investigation and you know our FS file number, please indicate in this space.

7. Full name(s) of the victim(s). If name(s) are unknown it should be listed as "Unknown". Do not use abbreviations or nicknames unless full name is not available.

   List name(s) in this order: LAST, FIRST, MIDDLE.

8. List the date of birth (DOB), race, sex, and any other pertinent descriptive information about the victim. This information may be of value in aiding the examiner during the examination of certain evidence or when communicating with various agencies involved with the particular case.

9. Full name(s) of the suspect(s). If name(s) are unknown, it should be listed as "Unknown".

   List name(s) in this order: LAST, FIRST, MIDDLE.

10. List the date of birth (DOB), race, sex, and any other pertinent descriptive information about the suspect. This information may be of value in aiding the examiner during the examination of certain evidence or when communicating with various agencies involved with the particular case.

11. The date or approximate date that the offense occurred; the type of offense, i.e.: rape, burglary, death investigation, illegal whiskey, etc.

    (Please submit only one incident per request form).

12. The projected date of trial in which results of examination will be needed for litigation. Also please indicate the court level (Circuit, Juvenile or District).

13. Attach additional information as needed such as police reports, accident reports, etc. Indicate the type of examination(s) you wish to have performed on the evidence, i.e.: blood, fingerprints, firearms, etc. For trace evidence specify the specific area needed, e.g.: paint, arson, etc. Indicate if anything must be cross-referenced to another FS Laboratory number.

14. Indicate the jurisdiction where offense occurred, i.e.: Mid-City, VA.

    (Do not use FIPS Code or ORI #).

15. Give a brief but specific statement of what occurred and how.

16. Indicate how the evidence is to be returned to you. If it is to be picked up by you or your representative, please arrange to do so as soon as possible after receiving the examination results. Evidence storage space is extremely limited. Personal pick-up should apply to large or fragile evidence.

    It is advisable to call the laboratory before traveling to pick up evidence.

17. List (itemize) all evidence being submitted. Include descriptive data, i.e.: item number, name, make, model, color, size, serial number, etc. where available. Also after each item, state manner of preservation as well as packaging information when applicable and specific examinations requested. In cases involving a large number of items, the **examinations requested** may be placed on a separate sheet of plain paper with corresponding item number. Don't duplicate item numbers in a single case (i.e., under same case #) particularly important if this is a subsequent submission.

*18. The printed name and title of the individual submitting evidence to the laboratory.

*19. Signature of individual whose name appears in space #18. Also, the date that evidence is being submitted.

**20. Signature of laboratory personnel receiving evidence from submitting officer and date evidence is being received.

- **Do Not Use this space for transfers within your agency**
- **** This space is for Laboratory Use Only.**

EVIDENCE MAILING INSTRUCTIONS

Any items of evidence packaged and mailed to the Department of Forensic Science should bear the appropriate address of the submitting agency.

When using the U. S. Postal Service for transmittal of evidence, it is necessary to maintain the proper chain-of-custody. To maintain reasonable control over evidence transmitted in this manner, it is suggested that the evidence be mailed by certified or registered mail with a return receipt requested. This method of shipment allows the sender to maintain a written record of the various stages of transmittal. Use a street or route number in your return address so that evidence may be returned to you by UPS.

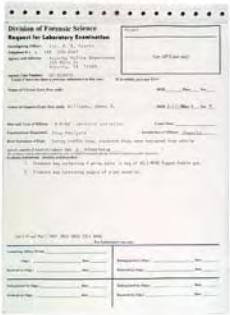
If mailing general correspondence without evidence, law enforcement agencies may use the name of the examiner or section in the address.

Package item(s) of evidence in a sealed, initialed evidence container(s). Complete the Request for Laboratory Examination (RFLE) form. Place the evidence container and the RFLE (original plus 3 copies) in a larger envelope or box for mailing.

REMINDER: <u>Prohibited items include</u>: firearms and ammunition, explosives, flammable liquids, petroleum distillates and caustics.

Evidence Container

R.F.L.E.



Mailing Package

SUBMISSION REMINDERS

- Please specify your agency's name and your agency's/precinct's address where you want the report sent.

- When mailing evidence, please place the Submission Form (RFLE) inside the mailing container but outside of the evidence container (see previous page for instructions). This assures that the evidence security is not compromised during the receiving process.

- Place an agency phone number rather than a home phone number on the submission form. This will allow the analyst to contact you if there is a question. An agency phone number assures that someone is available to at least take a message and contact you. If available, include the e-mail address and a pager # for the primary investigator assigned to the case to ensure quick communication.

- Type or print legibly with a ballpoint pen on your request form. This form is used to relay information which is rendered useless if the analyst can't read it.

- PLEASE USE JURISDICTION NAME to indicate jurisdiction of offense.

  DO NOT USE FIPS CODE or ORI #.

- Indicate the court date and the type of court (ie: District, Circuit, etc.). Do not indicate preliminary or arraignment dates.

- Clearly describe the type of evidence container and the item(s) being submitted.

- Use one item number for each item of evidence submitted under a FS Lab number. If resubmission of the item of evidence is required, reuse the item number originally assigned to the item of evidence. Do not duplicate item numbers that have already been assigned in a previous submission.

- Each item listed as being in the evidence container must have an item number which corresponds with item numbers written on the RFLE. If not, DFS will assign item numbers.

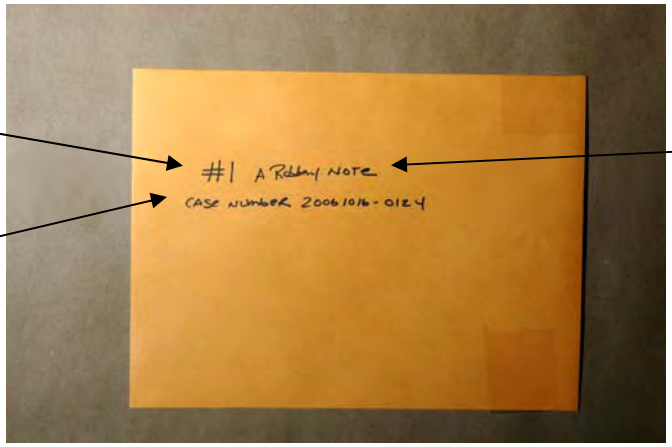
- Latent print cards, which are often carried in by hand, must be properly packaged, sealed and protected.

- Evidence containers must be at least 5x7 inches in size to accommodate the DFS bar code label that is attached to the container for tracking purposes.

- Each evidence container should include the following MINIMUM information, agency case number (if available), the item number and a description of the item.

Item number

Item description



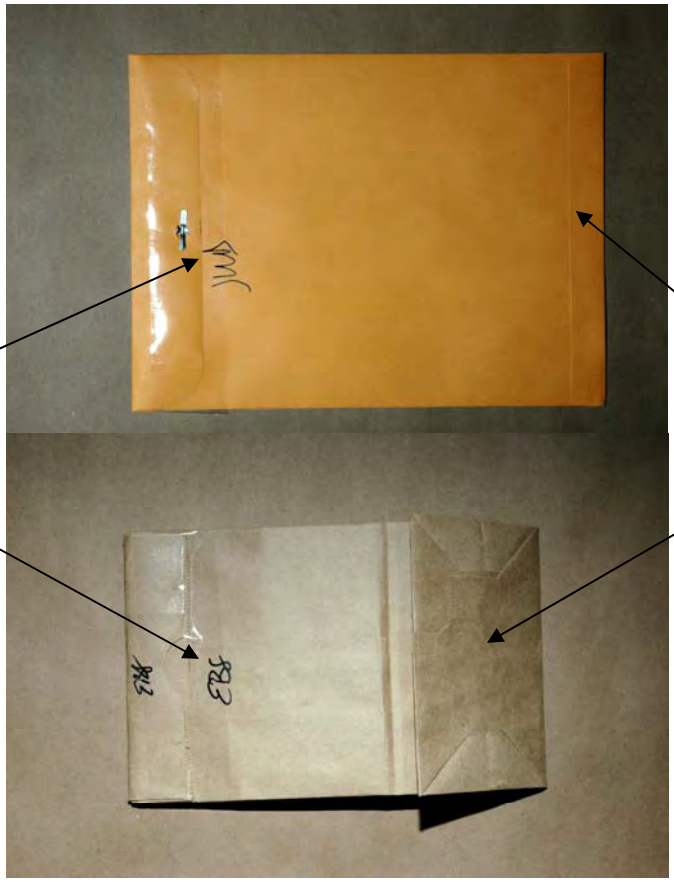
Agency case number

- A secure seal is necessary for chain of custody. However, do not tape excessively. This makes evidence handling in the laboratory difficult.

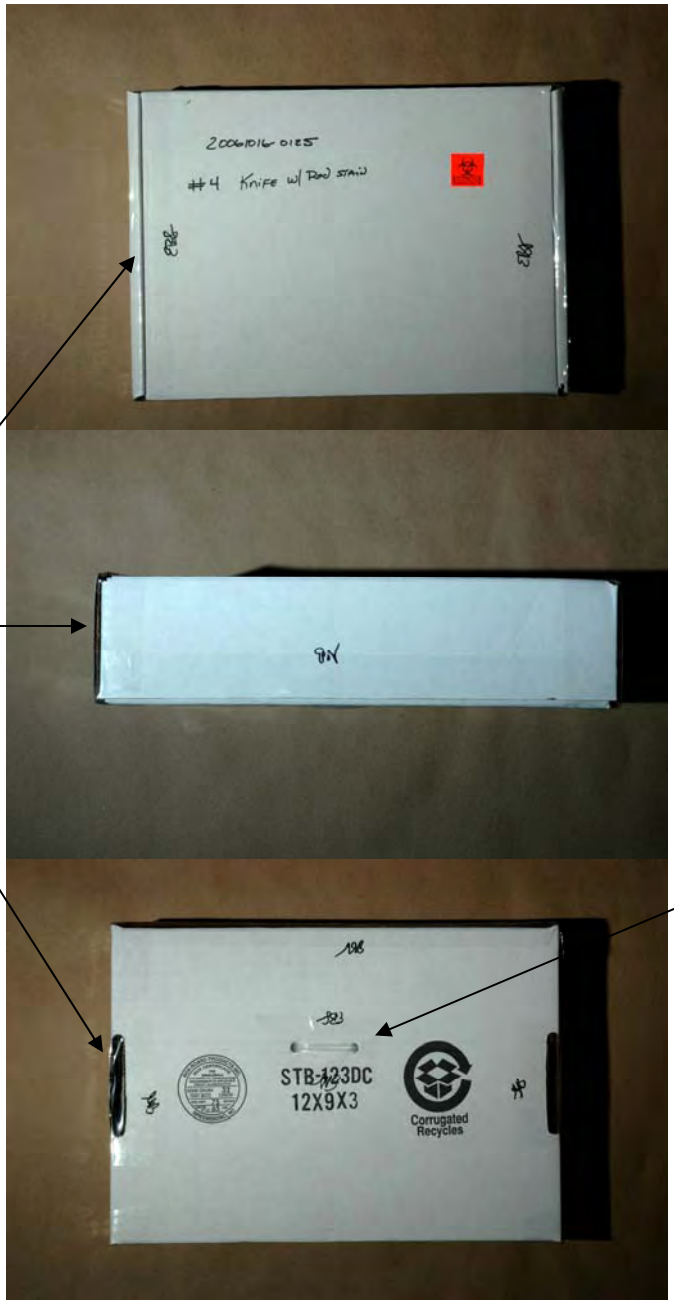
- **Evidence Seals:** An acceptable seal is one that prevents ready escape of the evidence and will be clearly damaged or altered if broken to permit entry. Intact manufacturer seals do not need to be re-sealed with additional tape. <u>Personnel sealing evidence must place their initials or mark on, across or under the seal.</u>

Envelope flap / bag sealed with tape and initialed

<u>Intact</u> manufacturer seals
No tape required



- When submitting evidence in a cardboard box (i.e. gun boxes) and a Trace or Forensic Biology examination is being requested, seal all openings where evidence may readily escape.



Box openings sealed with tape

Zip tie through perforated holes sealed with tape

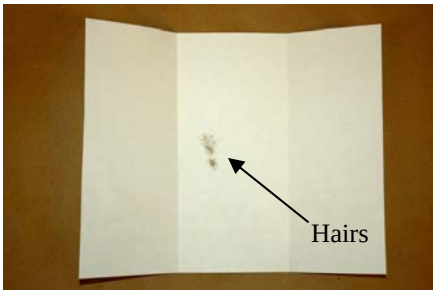
- Have the FS Lab number available when picking up or checking on a case.

- If a case becomes inactive either by refusal to charge, dismissal, or plea agreement, contact DFS. This will allow DFS to prepare the submission to be returned to the agency.

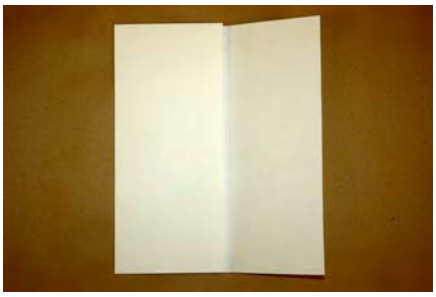
PAPER EVIDENCE FOLD

Properly folded, the paper evidence fold is a leak proof container that may be used for small quantities of any dry substance such as hairs, fibers or powders that may leak from envelopes or paper bags.

Directions



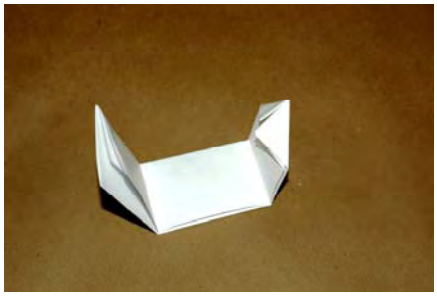
1. Fold a clean, unused sheet of paper into thirds and place evidence in middle section



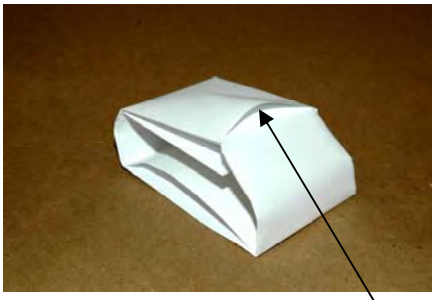
2. Fold one third over middle section

3. Fold the other third over middle section

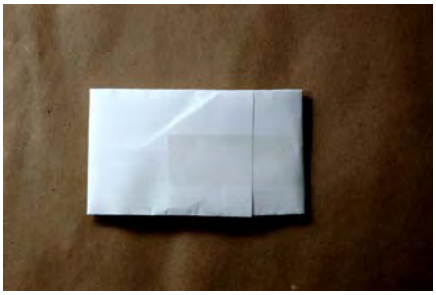
4. Fold in half in the same direction as the thirds were folded. **THIS IS THE CRITICAL STEP IN MAKING THE PACKAGE LEAK PROOF**



5. Fold the ends up, making one into a point for easier insertion into the other



6. Insert the pointed end into the **OUTERMOST** opening of the straight end



7. If it appears the final fold may not stay closed, use **ONE** small piece of tape to secure the closure

- The evidence fold should then be placed into a 5” x 7”, or larger, envelope or paper bag which is labeled and sealed as indicated on page I – 7.
- If more than one evidence fold is to be placed into a larger container, each should be labeled to describe its contents.

Department of Forensic Science

Request for Laboratory Examination

FS Lab # 5

TRAINING FORM ONLY

For DFS use only

1 **Investigating Officer:** Investigator William E. Jones

2 **Telephone #:** (804) 555-2222

E-mail Address: joneswe@midcitypd.org

3 **Agency and Address:** Mid City Police Department
1000 E. Main Street
Mid City, VA 23007

4 **Agency Case Number:** 20020620-1234 **Previous submission** ☐ **Yes** ☒ **No** 6 **Previous FS #:** _____

7 **Names of Victims (Last, first, mid):** JOHNSON, Edward W. (Friendly Loan Company) 8 **DOB** 2/06/42 **Race** W **Sex** M

9 **Names of Suspects (Last, first, mid):** MEAN, Joe B. 10 **DOB** 12/09/60 **Race** W **Sex** M

11 **Date and Type of Offense:** 6/30/02 Burglary 12 **Court Date:** October 3, 2002

13 **Examinations Requested:** Latents, Forensic Biology Toolmarks, Trace Evidence (Glass) 14 **Jurisdiction of Offense:** Mid City, VA

15 **Brief Statement of Fact:** One or more persons entered the Friendly Loan Co. at 1 N. 14th Street. Entry was gained through a glass Window in the rear alley. The safe was forced open by prying the door. A large amount of cash and checks were taken.

16 Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

17 **Evidence Submitted: (Itemize and describe)**

Item #1 - Reddish liquid substance from carpet in office, air dried. (Identify, type, compare with item #24).
Item #2 - One Marlboro cigarette butt. (Check for secretion, compare with item #24: check for fingerprints, compare with item #20).
Item #4 - Metal plate from safe door, processed for prints at the scene. (Examine for toolmarks, compare to item #26).
Item #6 - Two blank checks #989 and #997, Friendly Loan Co. (Check for fingerprints and compare to item #20).
Item #15 - Known glass taken from area of rear door (Compare with any material on items #21 and #25).
Item #20 - Known inked fingerprints and palm prints of Joe B. Mean.
Item #21 - Suspects clothing, (1) brown shirt and (1) gray pants. (Check for trace material/ glass).
Item #24 - Known buccal swabs from Joe B. Mean, air dried.
Item #25 - Known hair combing from Joe B. Mean taken from suspect at time of arrest (Check for trace material/glass).
Item #26 - One 12" screwdriver with yellow plastic handle taken from Joe B. Mean.

For DFS use only

18 Submitting Officer (Print) William E. Jones

19 (Sign.) *William E. Jones* Date 7/01/02 Relinquished by (Sign.) _____ Date _____

20 Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

BLOODSTAIN

Contact Us

If you have any questions concerning the Bloodstain laboratory examination capabilities or evidence handling procedures, please call the Training Section or **Marjorie Harris** at **(804) 786-4707 ext. 2-6938** in the Bloodstain Section at the **Central Laboratory**.

OVERVIEW

Blood is often a common sight at crime scenes, especially those of a violent nature. Looking beyond the benefits of information gained from a forensic biology examination, blood (as it is deposited) creates a pattern and provides a basis for study. Bloodstain study can benefit in several investigative approaches. A reconstruction can be utilized which demonstrates the course of events and possibly a sequence of events. This allows logical determinations for collection sites of blood samples for a biological examination. Bloodstain pattern interpretation may either support innocence or guilt in reference to a suspect or witness statement(s) and may provide vital information used in the interview or interrogation of a witness and/or suspect.

CATEGORIES

Bloodstains fall into major categories:

Passive (Falling/Dripping)

Blood drop created or formed by the force of gravity acting alone. These are characterized by larger, circular stains.

Projected

Blood is being propelled or expelled by a force greater than gravity, such as:

1. Cast-off

   Blood being released or projected off of a blood bearing object in motion, usually on a backswing. Cast-off patterns are characterized by clusters or “in-line” staining.

2. Expirated

   Blood being blown out of a nose, mouth, or wound as a result of air pressure or air flow. Expirated patterns may display similar characteristics of impact spatter but differ in pattern continuity.

Arterial Spurting/Gushing

Blood exiting the body from a breached artery. Arterial patterns are characterized by larger volume stains and may show pressure variations due to the injury.

Impact

Blood being compressed by some force causing it to be broken into smaller droplets. These stains are characterized by various sizes and random distribution.

Contact

Transfer

Blood being transferred from a bloody object or surface to a non-bloody object or surface.

Swipe

Blood being transferred from a bloody object or surface to a non-bloody object or surface with motion.

Wipe

Existing blood being disturbed by an object

The possibilities of characteristics range from a rough object outline to fine detail (such as a bloody fingerprint) and/or “feathering” (which may indicate directionality of motion).

Sometimes bloodstains are found in particular patterns. These patterns may be very important evidence because they allow for the reconstruction of events.

CAPABILITIES AND SERVICES

Bloodstain pattern analysis has successfully been used in the past in Virginia:

(1) to establish the position of a victim when receiving fatal impacts in a beating or shooting.

(2) to corroborate a statement made by a suspect.

(3) to refute a statement made by a suspect resulting in a confession after this knowledge was used in the interrogation.

(4) to establish certain events in order of their occurrence.

(5) to dispute the accuracy of a "self-defense" plea.

(6) to determine events which took place after the actions creating the bloodstains.

In one particular case, bloodstain pattern analysis verified that proper procedure was followed and that the resulting death of a law enforcement officer was not due in effect to his own negligence.

Cases involving this discipline are on the increase and are commonly utilized in the courtroom setting. Information gained by this examination can often be a vital key in the investigation and the prosecution.

COLLECTION GUIDELINES

ITEM - Spatter and/or bloody fingerprints, foot/sock/shoeprints, fabric impressions, etc.

IMPORTANT: A swab of suspected blood from the scene or an item of evidence suspected to be stained with blood from the scene must be submitted for a preliminary test for blood in order for analyses on the above types of evidence to be performed.

METHOD I - Photographic Documentation

(1) Use slow speed film to minimize grain with enlargements.

(2) Use color film. Small spots of blood need to be distinguished from surface contaminants and surface patterns.

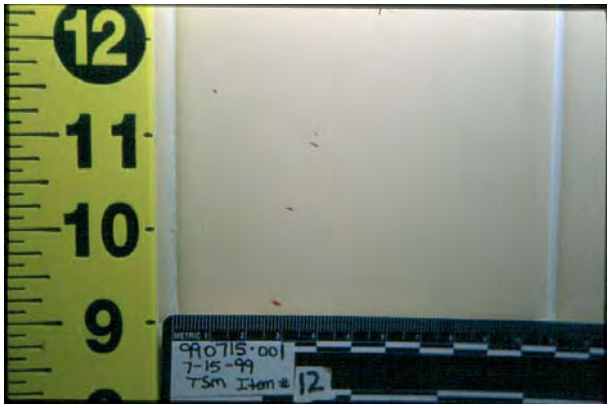
(3) Mount camera on a tripod to help ensure exact focusing and to make sure film plane is parallel to the stained surface.

(4) Mid-range photos should show relation of stained area with floor, corner of room, or other recognizable features.

(5) After mid-range photos without scales, additional mid-range photos are taken with long scales, showing height of stain pattern (primary vertical scale).

(6) An additional scale, perpendicular to the height scale (at a right angle), is added to show horizontal spread of the stain pattern.

(7) Close-ups follow (using a metric scale) to show stain pattern and relative sizes of blood stains.



(8) If additional scales are needed, besides the longer primary horizontal and vertical scales, at least one photo should show the relationship of the small scale to either the primary vertical or horizontal scale.

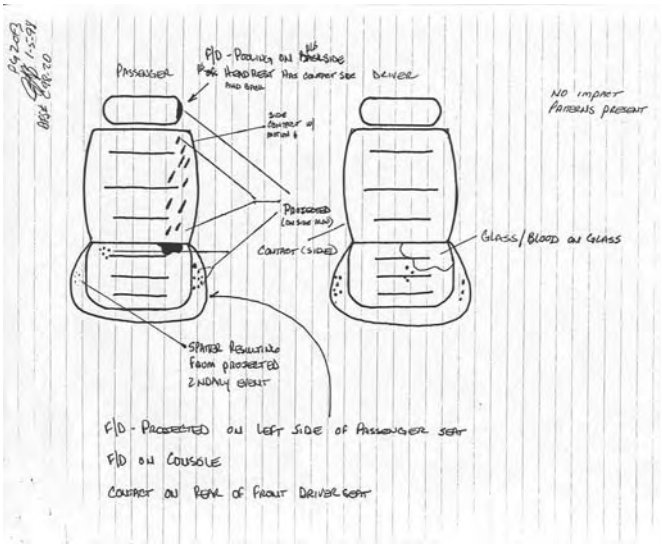
(9) If a wide-angle lens is used to encompass a long stain pattern (e.g. cast-off stain), document its use carefully. Re-photograph the same stain with the 50 mm lens and use the 50 mm lens to overlap the remaining photos.

METHOD II - Sketches

(1) A scale drawing including measurements and placement of bloodstain patterns.

(2) Include a log and description of the category of bloodstain patterns.

(3) Notes are an essential part of the documentation of a scene along with the photographs and sketches.



At the scene, it is important to remember to look-up at the ceiling and high items as well as other objects of furniture in the vicinity. It may be necessary to use cross-lighting with a flashlight on hands and knees when trying to locate extremely tiny crucial bloodstains on a carpet or grain pattern wood floors.

DISCUSSION - The pattern of blood spatter may enable an expert to reconstruct the sequence of events that created the pattern.

A correct analysis of the sequence of events may provide indications of which stain sites are important for collection, being indicative of wounds from the suspect or particular victims.

An accurate interpretation of blood spatter evidence may corroborate the testimony of a witness, victim, or suspect: offering an explanation of the events that caused the staining. In such a case, someone's innocence may be established.

An alibi may be disproved or a different sequence of events may be suggested thereby indicating deception or guilt.

ITEM – Evidence beyond the crime scene

Items displaying valuable bloodstain evidence are often overlooked or not considered credible as to the information that can be obtained. Such items include (but are not limited to) jewelry, belt buckles, eyeglasses, shoes, and clothing worn by the suspect(s) and/or the victim(s).

METHOD - Clothing articles should be air-dried and baffled so that no area of the material comes into contact with another area of material. Hard object items should be secured in a packaging manner which secures the object from movement.

DISCUSSION - Cloth material can easily transfer blood and create new stain patterns when allowed to touch another area of cloth material.

Blood that has dried on nonporous objects allow the possibility of that blood flaking off due to movement or friction against the surface.

Packaging should not increase the number of patterns available for analysis or subtract any potential stains from being visible.

SUBMISSION REMINDERS

SCENE SKETCHES, OVERALL PHOTOGRAPHS, AND AN AUTOPSY REPORT ARE ESSENTIAL ITEMS TO INCLUDE IN THE SUBMISSION FOR BLOODSTAIN ANALYSIS.

A SWAB OF SUSPECTED BLOOD FROM THE SCENE OR AN ITEM OF EVIDENCE SUSPECTED TO BE STAINED WITH BLOOD FROM THE SCENE MUST BE SUBMITTED FOR A PRELIMINARY TEST FOR BLOOD IN ORDER FOR A BLOODSTAIN PATTERN ANALYSIS TO BE PERFORMED.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Investigator Marvin A. Jones

Telephone #: (808) 525-6688

E-mail Address: jonesma@townpd.gov

Agency and Address: Old Town Police Department
123 Washington Drive
Old Town, VA 22222

Agency Case Number: 20060610-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): SMYTH, Bob **DOB** 1/03/70 **Race** W **Sex** M

Names of Suspects (Last, first, mid): SMYTH, Rhonda **DOB** 4/08/63 **Race** W **Sex** F

Date and Type of Offense: 06/10/06 Homicide **Court Date:** Pending

Examinations Requested: Bloodstain Pattern Analysis **Jurisdiction of Offense:** Old Town, VA

Brief Statement of Fact: Victim was found deceased from a gun shot wound to the head. Suspect claims victim committed suicide

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 12. Jeans from Rhonda Smyth

13. Shirt from Rhonda Smyth

14. Shoes from Rhonda Smyth

27. Scene Photographs

32. Autopsy report

33. Scene sketch

page 1 of 1

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Submitting Officer (Print) Ivan M. Small

(Sign.) Ivan M. Small Date 06/13/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

CONTROLLED SUBSTANCES

Contact Us

If you have any questions concerning the Controlled Substances laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Controlled Substances Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**John Przybylski**	**(804) 786-4707 ext. 2-9632**
	Linda Jackson	**(804) 786-4707 ext. 2-9639**
Eastern	**Susan Stanitski**	**(757) 683-8327 x 1416**
Northern	**John Griffin**	**(703) 323-3035**
Western	**Chris Bryant**	**(540) 561-6000**

OVERVIEW

Examiners in the Controlled Substances section test materials for the presence of controlled substances or marijuana. Illegal drugs may be presented in powders, solid material, liquids, or LSD blotter paper, as well as in plants and mushrooms. The section also examines pharmaceutical preparations (tablets, capsules, and injectables).

Drugs are classified both legally and pharmacologically. Legally, drugs are listed in the Code of Virginia in Schedules based on their medical use and potential for abuse and dependency. The "highest" schedule is Schedule I (drugs with no accepted medical use and a high potential for abuse and dependency) and the "lowest" schedule is Schedule VI (drugs that require a prescription but have a very low potential for abuse). The following table lists common drugs along with their pharmacological category and schedule.

Drug	**Pharmacological Category**	**Schedule**
Alprazolam (Xanax)	Depressants	IV
Amphetamine	Stimulants	II
Caffeine (look-a-like)	Stimulants	OTC
Cocaine (forms include salt and base (crack))	Stimulants	II
Codeine	Narcotics	II, III, V
Diazepam (Valium)	Depressants	IV
GHB (gamma-butyrolactone)	Depressants	I
Hashish Oil	Hallucinogens	I
Heroin	Narcotics	I
Hydromorphone (Dilaudid)	Narcotics	II
LSD (Lysergic Acid Diethylamide)	Hallucinogens	I
MDMA (Ecstasy)	Hallucinogens	I
Meperidine (Demerol)	Narcotics	II
Mescaline (usually found in peyote cactus)	Hallucinogens	I
Methadone	Narcotics	II
Methamphetamine	Stimulants	II

Methylphenidate (Ritalin)	Stimulants	II
Morphine	Narcotics	II
Nandrolone	Anabolic Steroids	III
Opium	Narcotics	II
Oxycodone	Narcotics	II
PCP (Phencyclidine)	Hallucinogens	II
Psilocybin (usually found in mushrooms)	Hallucinogens	I
Secobarbital	Depressants	II
Testosterone	Anabolic Steroids	III

In the Commonwealth, marijuana is not listed as a controlled substance or scheduled in the Code of Virginia. Marijuana is defined as "any part of a plant of the genus Cannabis whether growing or not, its seeds or resin; and every compound, manufacture, salt, derivative, mixture, or preparation of such plant, its seeds, or its resin. Marijuana shall not include any oily extract containing one or more cannabinoids unless such extract contains less than 12 percent of tetrahydrocannabinol by weight, nor shall marijuana include the mature stalks of such plant, fiber produced from such stalk, oil or cake made from the seeds of such plant, unless such stalks, fiber, oil or cake is combined with other parts of plants of the genus Cannabis" (Code of Virginia, § 54.1-3401). Marijuana has associated penalties for possession, sale, gift, distribution or possession with intent to sell, give or distribute.

CAPABILITIES AND SERVICES

Analysis

The Controlled Substances section analyzes evidence submitted by law enforcement agencies for the presence or absence of controlled substances and/or marijuana.

In the laboratory, drugs are routinely screened using color tests and thin layer chromatography (TLC) with identification by gas chromatography/mass spectrometry (GC/MS). Additional techniques such as infrared spectrophotometry (FTIR) and gas chromatography with flame ionization detector (GC/FID) may also be used.

Quantitative analyses are not necessary in most situations and are only done at the request of the Commonwealth's Attorney.

The original Certificate of Analysis is prepared and sent directly to the Office of the Commonwealth's Attorney with a copy sent to the investigating officer.

Drug Item Reduction Policy

In 1988, the Drug Analysis Section implemented the Drug Item Reduction Policy (DIRP). The aim of this program was to increase the number of cases worked by having the examiners analyze only the most important items in a case in terms of quantity and schedule. Typically, residue items are not analyzed when accompanied by items containing a weighable quantity of drugs. Exceptions to this are cases where an item with residue is the only item connected to a particular suspect or the item with residue is the probable cause for a search. For these exceptions to be granted, information should be specifically noted by the item in question on the RFLE.

If, during the pretrial process, it becomes apparent that items that were not analyzed are necessary for successful prosecution then, upon resubmission, those items will receive top priority at the laboratory.

Reversals

The Department will assist law enforcement agencies with preparation of materials to be used in drug reversals, buy/bust operations and “show and tell” drugs. In all instances, the requesting agency must assume full responsibility for distribution of these materials.

Training

The Controlled Substances section also provides training for user agencies. This includes anything from training police officers about current drug abuse practices and trends to teaching them how to recognize, collect, properly preserve, and submit various drug evidence and paraphernalia to the Department for analysis. This section also has the unique opportunity to assist attorneys, legislators, and police officers in understanding the scientific meaning of analysis results as they pertain to the Virginia Drug Control Act and the Controlled Substances Act.

Field Test Approval

The Drug Analysis Section is primarily responsible for the regulation and approval of field tests used by police officers for the field detection of drugs in the Commonwealth.

Field tests can be used for two purposes in Virginia as listed in §19.2-188.1. First, §19.2-188.1 (A) allows officers using an approved field test to offer testimony as to the results he/she obtained in any preliminary hearing on many drug related offenses. This statute has been in place since 1991. Additionally, in July 2006, the legislature enacted §19.2-188.1 (B) which allows for the results of Marijuana field test kits to be used in trial of simple possession offenses.

The two separate but related statutes each have associated regulations which describe the testing and approval process. Once tests have been approved, DFS publishes separate lists of these approved tests in the Virginia Register. Care must be taken to make sure that tests used in the field are for the appropriate purpose.

Links to both the regulations and the current list of approved field test kits are available on our website:

Document	Website
Regulations for Drug Field Tests	www.dfs.virginia.gov/kits/approvedFieldTestKitRegulations.pdf §19.2-188.1 (A) – for preliminary hearings only
Approved Drug Field Tests	www.dfs.virginia.gov/kits/approvedFieldTestKits.pdf §19.2-188.1 (A) – for preliminary hearings only
Regulations for Marijuana Field Tests	www.dfs.virginia.gov/kits/approvedMarijuanaFieldTestKitRegulations.pdf §19.2-188.1 (B) – for simple possession of marijuana plant material
Approved Marijuana Field Tests	www.dfs.virginia.gov/kits/approvedMarijuanaFieldTestKits.pdf §19.2-188.1 (B) – for simple possession of marijuana plant material

The Department of Forensic Science is providing approved marijuana field test kits to user agencies free of charge. Agencies are provided access to the online ordering system on our website. Quantities of kits allotted to agencies are based on previous submissions to the laboratory.

Clandestine Laboratories

Law enforcement officials also come to the Drug Analysis Section for assistance in the investigation of clandestine drug manufacturing labs. The section is not equipped to handle clandestine lab raids and the Virginia State Police or Drug Enforcement Administration should be contacted as soon as possible for assistance.

The "Best Practices Protocol for use by law enforcement and emergency response agencies regarding the clean-up of abandoned and deactivated methamphetamine production sites and the retention and handling of the byproducts of methamphetamine production" addresses the entire process of taking down a lab and is located at the following web address:

www.dfs.virginia.gov/services/controlledSubstances/methLabsProtocol.pdf

Key points in this document include:

> Local Law Enforcement ("LLE") entities without Certified Clandestine Lab Response teams and adopted Safety and Health Programs will notify Certified Clandestine Lab Response Personnel (Virginia State Police ("VSP") or Drug Enforcement Agency ("DEA"). To contact VSP personnel, please utilize the appropriate Division number below:
>
> Appomattox (800) 552-0962
>
> Chesapeake (800) 582-8350

Culpeper (800) 572-2260

Fairfax (800) 572-4510

Richmond (800) 552-9965

Salem (800) 542-5959

Wytheville (800) 542-8716

No individual or agency will intentionally enter or authorize entry into a suspected clandestine laboratory without adoption of an entity-specific Standard Operating Procedure ("SOP") that provides for a Safety and Health Program as required by the Virginia Occupational Safety and Health ("VOSH") Program and in compliance with 16 VAC 25-90-1910.120 (HAZWOPER) Standards and/or Safety and Health Program as required by OSHA and Federal Regulation 29 CFR 1910.120 (HAZWOPER) Standards.

Evidence from clandestine laboratories requires special handling and packaging in order to be submitted to the laboratory. An excerpt from this "Best Practices Protocol" relates specifically to evidence submission and packing to the laboratory for analysis. The "Collection and Submission of Meth Labs Materials to DFS" is shown below:

Collection and Submission of Meth Lab Materials to DFS

An Excerpt from Best Practices protocol for use by law enforcement and emergency response agencies regarding the clean-up of abandoned and deactivated methamphetamine production sites and the retention and handling of the byproducts of methamphetamine production

5. Safe packaging of evidentiary samples

• Only Certified Clandestine Lab Response Personnel shall collect samples from clandestine laboratories.

• A representative sample shall be removed from all precursor items, chemicals, and reaction vessels requiring analysis. Bulk items should not be submitted for analysis. Samples of those items shall be collected in a bottle assembly consisting of an approximately 25 mL glass vial with a Teflon-lined cap which is secured in an appropriately sized wide-mouth, high-density polyethylene plastic bottle. The glass vials should be filled no more than 75% to prevent breakage. Each bottle assembly shall be placed in a separate evidence container/bag and sealed. Under no circumstances should any metal containers be used due to the reactivity of many of the materials encountered.

• Liquefied ammonia gas will not be accepted by the Virginia Department of Forensic Science ("DFS").

• Lithium metal or sodium metal will not be accepted unless pre-approved by a Controlled Substances Section Supervisor at the DFS. Where final product is present or where two or more substances other than lithium metal or sodium metal listed in Code § 18.2-248(J) are found, submission of lithium metal or sodium metal will not be approved. If lithium metal or sodium metal must be submitted, a small quantity shall be placed in a bottle assembly consisting of an appropriately sized (at least twice the volume of the metal) glass vial with a Teflon-lined cap which is secured in an appropriately sized wide-mouth, high-density polyethylene plastic bottle. The glass vial containing the lithium metal or sodium metal shall be completely filled with mineral oil to prevent combustion of the metal. The bottle assembly shall be placed in a separate evidence container/bag and sealed.

• Items containing suspected final product (*e.g.*, meth oil, powder or solid material) may be submitted in larger containers. Dry items of suspected final product shall be secured in an inner container/bag and placed in sealed plastic evidence bags. Liquid items of suspected final product shall be secured in a leak-proof container and placed in a five gallon plastic bucket packed with vermiculite and sealed. This bucket will serve as the evidence container upon submission to the laboratory.

• A copy of the evidence log/list and photographs documenting the items recovered at the scene shall be submitted to the laboratory with the evidentiary samples to facilitate substance identification and recognition of hazards. The Request for Laboratory Examination form ("RFLE") should associate the submitted evidentiary samples to the bulk items on the evidence log/list.

6. Transportation of evidentiary samples

• All samples shall be promptly hand-delivered to the nearest DFS laboratory.

• Sample(s) contained within sealed evidence container(s)/bag(s) shall be placed in five gallon plastic bucket(s) packed with vermiculite for transportation purposes. For samples other than lithium metal or sodium metal, more than one sealed evidence container/bag may be placed in each five gallon plastic bucket provided an ample amount of vermiculite is present for spill absorption. When approved for submission, each evidence container/bag containing a sample of lithium metal or sodium metal shall be placed in its own five gallon plastic bucket packed with vermiculite for transportation purposes. Buckets used solely for transportation should not be submitted as evidence containers. The buckets and vermiculite should be retained by the agency after submission and utilized when samples are retrieved by the agency upon completion of analysis.

• Liquid items of suspected final product that are sealed within five gallon plastic buckets may be transported as is.

7. Retention of evidentiary samples by law enforcement agencies after analysis by DFS

- Upon completion of analysis by DFS, collected samples will be returned by hand delivery to the appropriate law enforcement entity for maintenance as evidence.

Evidence from clandestine laboratories not packaged accordingly will not be accepted at the laboratory.

COLLECTION GUIDELINES

ITEM - Powders and plant material

METHOD - Package in evidence envelopes or bags in original containers

ITEM - Tablets and Capsules

METHOD - Package in rigid containers.

DISCUSSION - Rigid containers will ensure that evidence is not crushed or damaged.

ITEM - Prescription bottle with label

METHOD - Submit in original prescription bottle.

ITEM - Fresh, wet or moist plant material

METHOD - Should be air dried and placed in a paper bag. Roots and dirt should be removed before submitting. Please, do not strip leaves, buds, etc. from mature stalk.

DISCUSSION - Wet marijuana supports the growth of a fungus that produces carcinogenic spores that can produce respiratory and other infections. Fresh plant material packaged in plastic decomposes rapidly leading to material which is unsuitable for analysis. The dirt and roots are not necessary and will not be weighed or analyzed. The mature stalk is considered to be marijuana only when mixed with other parts of the plant and should be left intact.

ITEM - Smoking devices

METHOD - When large smoking devices are collected as evidence, remove and submit only that part of the device which contains the drug residue or plant material (i.e. the stem from a “bong”). Also, if it is necessary to submit a “bong”, please remove any water before packaging.

DISCUSSION - Only the portion of the smoking device containing the residue will be analyzed. Water from a smoking device increases time of analysis due to the need for drying the device prior to analysis. Leaking evidence may damage other items, request forms, etc.

ITEM - Residues

METHOD - Items should be packaged securely to avoid cross-contamination or loss of sample. A rigid container is recommended. EXAMPLE: Cover a smoking pipe bowl to secure the plant material.

DISCUSSION - When residue items are submitted with weighable quantities and/or countable dosage units of drugs, only the weighable (countable) item(s) will be analyzed, unless the investigating or submitting officer provides a written, case-specific request for analysis of the residue on the RFLE. (For example, analysis of an item such as a pipe containing residue found in possession of a defendant is necessary to show possession of a weighable quantity of drugs found nearby.) These requests will be considered by the Department in accordance with the procedures set forth in the Department's Controlled Substances Procedures Manual, Section 3.1 et seq., (Drug Item Reduction Program, DIRP.)

ITEM - Clandestine Laboratory samples

METHOD - see “Collection and Submission of Meth Lab Materials to DFS” in preceding section

ITEM - Multiple packages of powder or plant material

METHOD - Items with multiple packages (e.g., 20 plastic bag corners of crack) should be packaged together in one container.

DISCUSSION - Decreases number of containers associated with a case. Also, allows the examiner to address the item collectively on the Certificate of Analysis.

ITEM - Syringes and other sharp materials

METHOD - SYRINGES SHOULD NOT BE SUBMITTED UNLESS ABSOLUTELY NECESSARY. If necessary, package the syringe in a **rigid plastic safety tube.** Please do not uncap the syringe prior to submission. Label the outer container with the following information:

- “Handle with Caution”
- “Contains a Syringe”
- BIOHAZARD

Other sharp or breakable materials, such as glass pipes, mirrors, and razor blades, should be packaged in a rigid container and the outer container labeled with a warning to “Handle with Caution.”

DISCUSSION - Syringes are a health hazard to all. **Syringes will most often be analyzed only in instances where they are the only item in the case as per DIRP.** To protect anyone handling the evidence from the hazards of accidental exposure to biohazard materials, sharps should be packaged in appropriate rigid, plastic safety tubes.

ITEM - Biohazard Materials

METHOD - Any potential hazards to the examiner should be addressed on the request form. This might include noting that an object was removed from a body cavity, items were recovered from a toilet, etc.

ITEM - Cases involving found property in which no suspect is identified

METHOD - These cases and should not be submitted and will not be accepted for drug analysis without a written request citing exigent circumstances.

ITEM - Used field test kits

METHOD - Used field test kits should NEVER be submitted to the laboratory.

DISCUSSION - Most field test kits contain strong acids which can cause burns to the skin with contact. Also, if the acid were to leak out of the kit and come into contact with the submitted evidence, the evidence and its packaging could be destroyed. It is imperative to dispose of all field test kits properly (according to the manufacturers' instructions supplied with the field test) after their use.

ITEM - Cases for federal prosecution

METHOD - Drug Task Force cases designated for federal prosecution should be submitted to the Drug Enforcement Administration (DEA) laboratory while DFS continues to experience a significant backlog of controlled substances cases.

DFS, in consultation with the DEA, has developed the following guidelines for handling drug task force cases:

- Evidence collected by drug task forces should not be submitted to the laboratory until federal and state prosecutors have decided who will prosecute the case
- Cases slated for state prosecution will be accepted by DFS from state or local agencies
- Cases slated for federal prosecution will be accepted by DEA from any federal investigative agency with a federal case number
- Cases that are submitted to DFS that will be adjudicated in federal court will be placed at a lower priority than any Virginia cases and scheduled federal court dates will not elevate this priority
- DFS protocols will be utilized for normal case examinations and may not provide results that can support federal charges or penalties
- Written requests from federal prosecutors will be required for additional analysis on previously completed cases. Such requests will be considered by DFS management.

DISCUSSION - The analytical testing required to support federal prosecutions, which often includes time consuming quantitation and base determination, exceeds the testing performed to

support most state prosecutions. Additionally, testimony in federal cases is frequently required. DFS is tasked by statute (§ 9.1-1109) with providing forensic laboratory services to Virginia law enforcement agencies. This statute allows DFS to provide such services to any federal investigatory agency within available resources. In light of our current caseload and the delayed turnaround time to our state user agencies, DFS does not have the resources available to routinely provide scientific testing to support federal drug prosecutions.

ITEM - Items of low schedule in the presence of items in a higher schedule

DISCUSSION - For submissions containing controlled substances of different schedules, priority will be assigned according to the highest schedule. A written, case-specific request on the RFLE from the investigating or submitting officer to articulate the request for examination is required for the analysis of a lower schedule item.

Example: A case containing packets of heroin (Schedule I) and tablets of sildenafil (Viagra) (Schedule VI) would result in only the packets of heroin being analyzed.

ITEM - Request For Laboratory Examination (RFLE) form

METHOD -

1. The RFLE for drug analysis should include a brief statement of facts about the case including the specific criminal charge(s) relating to the items submitted (Code section and/or charge description). Briefly indicate, with respect to each item submitted, the reason the requested analysis is necessary in order to aid examiners in selecting samples for testing. For example, when multiple items and multiple suspects are involved, RFLE should specify which suspect is charged with which item(s) so all items necessary for prosecution are tested.

2. Please complete the RFLE information for court date with the notation of “hearing” or “trial” and communicate on a regular basis pending trial dates for felony drug cases pending.

3. If possible, give a brief statement as to what type of controlled substance may be present. Please do not indicate the weights of substances on the request form. Finally, be sure to count individual drug units - i.e.: pills, bags, etc. When describing the evidence on the RFLE, specify quantities as an approximate count (i.e., “approximately 97 tablets").

DISCUSSION -

1. DFS utilizes an administrative sampling plan where the number of specimens analyzed within an item will be based on the type of criminal charge.

2. One of the DFS considerations for prioritization of drug cases focuses on pending trial dates.

3. Although scientists at the lab screen for <u>all</u> drugs, not just those that are indicated as possibilities, it can be helpful to have information provided by the defendant as to the sample’s identity. Weights listed on the RFLE may be a cause of confusion when a gross weight is indicated on the request, and a net weight is reported in the Certificate of Analysis. An approximate count on the request form is all that is needed, in order to eliminate the need to contact the investigating officer when a discrepancy arises.

SUBMISSION REMINDERS

When a case becomes inactive, either through refusal to charge, dismissal or plea agreement, it is the responsibility of the primary officer and/or the assigned Commonwealth's Attorney to notify DFS of that status. Analysis will cease, DFS will terminate the case, and submissions will be returned to the submitting agency.

Exclusive possession is the ultimate goal. Therefore, if the substance is located in a common area, consider requesting latent fingerprints AND handle evidence accordingly.

A secure seal is necessary for chain-of-custody. HOWEVER: It is not necessary to tape excessively or "mummify" because this makes evidence handling in the laboratory more difficult.

Items which establish a Probable Cause should be clearly marked and noted as such on the RFLE.

Items that need to be tested separately should be packaged separately.

USE DISCRETION: Submit only necessary items in need of analysis. Eliminate trash and ashes from ashtray submissions. Items that do not need to be tested should not be submitted (e.g., drivers license, cigarette rolling papers).

LSD in liquid form can be absorbed through the skin. It is also light sensitive. Handle with caution and wrap container with paper to block light.

Fentanyl has been found is some suspected heroin submissions. Fentanyl is a highly potent narcotic and great care should be taken to avoid accidental inhalation or ingestion. The normal pharmaceutical dosage is in the microgram range.

Make sure the packaging size is suitable for your evidence. Small objects (such as a "rock" of cocaine) may become lost or crushed in a large bag. Please make sure that the final bag or package is at least 5" x 7". Small items should be packaged in a suitable envelope and THEN placed in a 5" x 7" container. This assures security of the evidence and allows the analyst room to re-package and secure the evidence without breaking your seal.

ALWAYS USE CAUTION WHEN SEARCHING A VEHICLE OR A SUSPECT. USE GLOVES AND WASH HANDS WHEN COMPLETED. USE DENTAL MIRRORS OR MIRRORS WHEN SEARCHING A VEHICLE TO PREVENT STICKS AND CUTS.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Officer I. Will Gettum

Telephone #: (804)555-1212

E-mail Address: will.gettum@anytown.ci.gov

Agency and Address: Anytown Police Department
200 W. Main Street
Anytown, VA 23220

Agency Case Number: 20061018-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): MARLEY, Bob **DOB** 2/06/45 **Race** B **Sex** M
JOPLIN, Janice 1/19/43 W F

Date and Type of Offense: 10/19/06 Poss. of marijuana (§18.2-250.1) - suspect 1 **Court Date:** 12/05/06 (preliminary hearing)
Distribution of cocaine (§18.2-248) - suspect 2, Poss. of Schedule I (§18.2-250)
Examinations Requested: Drug exam **Jurisdiction of Offense:** Anytown

Brief Statement of Fact: During traffic stop, observed item 3 in car. Item 1 found in Marley's pocket. Item 4 found in Joplin's purse. Item 5 found in car.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)
One sealed envelope containing:

ITEM# 1. Approximately 22 plastic bag corners containing off-white chunky material

3. One glass smoking device with residue (PROBABLE CAUSE ITEM)

4. Three bags of green leafy material

5. One plastic vial containing approximately 17 green tablets with a "smiley face" logo

For DFS use only

Submitting Officer (Print) I. Will Gettum

(Sign.) I. Will Gettum Date 10/20/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

DIGITAL EVIDENCE

Contact Us

If you have any questions concerning the Digital Evidence laboratory examination capabilities or evidence handling procedures, please call the Training Section or **Chuck Pruitt** at **(804) 786-4707 ext. 2-6919** in the Digital Evidence Section at the **Central Laboratory**.

OVERVIEW

The Digital Evidence Section is comprised of Audio Analysis, Digital Evidence Recovery (as it applies to audio and image data), Image Analysis, Video Analysis and Photo Processing. Within these areas are several sub disciplines and will be explained under the appropriate section.

DEFINITIONS

Algorithm – A set of rules (program) by which a computer solves problems.

Alternate Light Source (ALS) – Variable wavelength sources of light used for forensic examinations. These devices usually use various barrier filters, in conjunction with certain chemicals, stains, dyes or powders that cause the treated area to fluoresce.

Analog – A signal that simulates sound or vision by electrical analogy e.g. variations in voltage producing corresponding variations in brightness, or vice versa.

Area of Interest (AOI) – The specific area of interest to be clarified on an audio or video recording.

Artifact – Any visible feature of distortion in a recorded image or output image that is not present in the corresponding imaged object or input image. Image artifacts can be introduced inadvertently by hardware or software, or intentionally by an operator. The latter type includes annotation of other direct alteration of an image in order to clarify or call attention to some particular image content. Artifacts introduced by hardware and software generally degrade an image and if severe enough, can impair interpretation.

Aspect Ratio – The relationship between the height and width of a displayed image.

Bit – Short or binary digit – a single number having a value either of zero or one. Eight bits equal one byte.

Brightness – One of three dimensions of color; the other two are hue and saturation. The term used to describe differences in the intensity of light reflected from or transmitted through an image independent of its hue and saturation.

Capture – The process of recording an image.

CCD – Charge coupled device. A solid state imaging device containing numerous light sensitive picture elements (pixels) that produce an electrical output analogous to the amount of light striking each of the elements.

CD-R – A recordable (only once) CD.

CODEC – A device or program used to encode and decode (or compress and decompress) various types of data particularly those that would otherwise use up an inordinate amount of disk space, such as sound and video files. The majority of codec's are of a preparatory nature.

Compression – A digital process that allows data to be stored or transmitted using less than normal number of bits. Video compression refers to techniques that reduce the number of bits required to store transmitted images. Compression can be lossless, lossy or visually lossless.

Deinterlacing – Any technique that converts interlaced scanned video into progressively scanned video. This process requires interpolation or replication to replace missing image lines in individual frames.

Digital – Information or graphical data that has been translated into a discrete numerical value and can, therefore, be manipulated and reproduced without loss of quality.

Digitized – Convert into digital form. Digitization is subdivided into the processes of sampling the analog signal at a moment in time, quantizing the sample (allocating it a numerical value) and coding the number in binary form. A digital image is made up of a grid of points. There is no continuous variation of color or brightness. Each point on the grid has a specific value.

File Format – The overall format in which an image is saved. Choosing the correct format for saving images is important to ensure that the files are compatible with various software packages and other computer platforms. Examples are: TIFF, BMP, JPEG, PICT, etc.

Filter – A software routine which modifies an image by changing the values of certain pixels.

Frame - Video data is transmitted as two interlaced fields which make up a frame.

Gigabyte – A unit of measure of stored data corresponding to one billion bytes of information.

Image Clarification - Any process intended to improve the visual appearance of an image.

Interpolation – A process by which the apparent resolution of an image is increased. In most cases the software mathematically averages adjacent pixel densities and places a pixel of that density between the two.

Lossless Compression – Compression is which no image data is lost and the image is retrieved in its original form.

Lossy Compression – Compression in which image data is lost and cannot be retrieved in its original form.

MD5 Hash – A 128 bit number that uniquely describes the contents of a file. This is the standard hash code utilized in Forensics.

Pixel: Picture Element – The smallest area capable of resolving detail.

Pixilation – Subjective impairment of the image in which the pixels are large enough to become visible individually.

Progressive Scan – (Non-interlaced). Video in which each image frame contains information form every horizontal scan line of the imaging sensor.

Ram: Random access memory – Temporary working memory created when the computer is switched on. The size of images which can be opened depends on the amount of RAM installed in the computer.

Resolution – The ability of a recording system to record and reproduce fine detail. In digital imaging, the resolution of the final images depends upon the resolution of the image capture device.

Rom – Read only memory. A memory unit in which the data is stored permanently.

Signal to Noise Ratio – The relationship between the required electrical signal to unwanted signals caused by interference (usually measured in decibels, dB).

Storage Media – Any object in which an image or data is preserved.

Tiff – Tagged image file format. A standardized image file exchange format. It has been adopted by many manufactures that support high resolution graphics.

CAPABILITIES AND SERVICES

AUDIO ANALYSIS

Audio recordings come from a wide variety of criminal activity. These recordings have been successfully analyzed by the suppression or elimination of background noise and the clarification of the speech patterns and signals. In some instances the background noise can render information that was previously undetected.

VIDEO ANALYSIS

Video recordings, both analog and digital, have been successfully analyzed in an effort to identify suspects as well as to obtain other pertinent information captured during lawful and unlawful activities.

DIGITAL EVIDENCE RECOVERY

The Laboratory can recover data from cell phones, audio, video or image evidence present in a digital form, digital storage media, digital video recorders or computers. Important information such as the operating system, passwords, the format utilized to produce the recording etc. should be included on the R.F.L.E.

IMAGE ANALYSIS

Image Analysis technology can be applied to any evidence that requires a visual examination of either conventional or digital media. This technology has been successfully applied to Questioned Documents, Tool Marks, Bite Marks, a wide variety of Impression Evidence, Photographic Evidence, Latent Print Evidence, Fracture Match cases and Medical Examiner cases; for example tattoos or scars on decomposed bodies and X-Rays. It can also be used in conjunction with the Automated Fingerprint Identification System, and Alternate Light Sources.

Image Comparisons can be performed on any type or any combination of types of media: conventional photography (negatives & prints), digital photography (prints), analog and digital video images. The image results from the above types of media can be utilized in the comparison and identification of individuals, clothing and property captured by any of the above listed formats. When submitting evidence for a comparison it will be necessary to submit all images or recording of the known as well as questioned individuals, clothing and property.

PHOTO PROCESSING

The Photo Processing Unit accepts film and digital media from all Law enforcement agencies within the Commonwealth of Virginia. Images from conventional film will be placed onto digital media if requested. Custom enlargements will be produced upon request. Please provide adequate notice when submitting custom requests.

When submitting photo processing requests please utilize the Photo Processing Request Form and envelope, it is NOT necessary to utilize an R.F.L.E. Please use ONE photo request form per each roll of film or digital media submitted.

COLLECTION GUIDELINES

ITEM – Audio Recordings

METHOD – Submit the ORIGINAL recording with the safety recording tabs removed. A brief description of the dialog, method of recording and speed of the recording should be indicated on the Request for Laboratory Examination form (R.F.L.E.). The evidence should be packaged in a generous rigid container to allow for the results to accompany the original submitted evidence at the conclusion of the analysis. Care must be taken to avoid magnetic sources and extreme temperatures. Attempts to playback the recording should be minimal, as excessive playback will directly affect the results of the analysis.

ITEM – Audio recordings written to digital media or contained within a digital device

METHOD – Render to the safe position. The evidence should be placed in a generous rigid container to allow for the results to accompany the original submitted evidence at the conclusion of the analysis. Care must be taken to avoid magnetic sources and extreme temperatures. Indicate the format utilized to produce the recording on the R.F.L.E.

ITEM – Video recordings

METHOD – Submit the ORIGINAL recording with the safety recording tabs removed or rendered to the safe position. Include a brief description of the area of interest as well as physical description of any individual or object that is pertinent to the analysis. In many video recordings the date and time stamp is easily visible; however, there are many analog recordings that the date and time stamp is encoded. In these recordings the date and time stamp is easily visible during playback on the original recording device; however, during playback on another device the information may not be visible. In cases where the date and time stamp is not recorded, it will be necessary to cue the recording just prior area of interest and to indicate that same on the R.F.L.E. The following analog formats can be analyzed by the Laboratory: S-VHS, VHS, VHS-C, Hi-8 and 8mm.

Analog video recordings should not be reviewed any more than necessary as rewinding and viewing multiple times will directly affect the results of the analysis. CAUTION should be taken as not to expose the recording media to the pause position. This will directly affect the recording and results. It is not advisable to view time lapse recordings in the original recording device without first determining if the device is in an automatic recording mode. If this occurs the recorded information will be recorded over and CAN NOT be recovered.

The evidence should be packaged in a generous rigid container to allow for the results to accompany the original submitted evidence at the conclusion of the analysis. Care must be taken to avoid magnetic sources and extreme temperatures.

ITEM – Cell Phones

METHOD – Turn off and submit with the correct charger. The evidence should be placed in a generous rigid container to allow for the results to accompany the original submitted evidence at the conclusion of the analysis. Care must be taken to avoid magnetic sources and extreme temperatures. Any pass words or access codes should be furnished on the R.F.L.E. along with the service carrier and specific details of what information is desired to be recovered.

DISCUSSION – It is important to know that some specific information is retained on the carrier's server and not contained within the cell phone itself.

ITEM – Digital Video Recorders (DVR)

METHOD – The evidence should be placed in a generous rigid container to allow for the results to accompany the original submitted evidence at the conclusion of the analysis. Care must be taken to avoid magnetic sources and extreme temperatures. The Digital Evidence Section should be notified in an effort to accommodate the submission to allow for the data to be retrieved and the device returned as quickly as possible. Once the data is recovered the recording device can be returned and the analysis can continue. It is important to understand that it is necessary in some instances to have the physical device in order to playback the recording.

ITEM – Computer

METHOD – Image Recovery can be accomplished by the submission of the hard drive or digital storage device. If the device is recovered or in some instances the files are written to another form of digital media, for example a CD-R, DVD, Hard Drive or other media, it is imperative that the system viewer (CODEC) be written as well as the actual files. It should be understood that writing digital files to another form of media may cause further compression to the already compressed files. The evidence should be placed in a generous rigid container to allow for the results to accompany the original submitted evidence at the conclusion of the analysis. Because the unit is sealed in a rigid container, there is NO NEED to seal each individual port with tape. DO NOT use any type of Styrofoam product as packing material and care must be taken to avoid magnetic sources and extreme temperatures. When submitting computer components they should be marked as fragile.

DISCUSSION – Static electricity can cause small pieces of Styrofoam to enter the component. Wadded up paper may be used to protect the evidence in the container.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Ivan C. Good

Telephone #: (804) 555-2211

E-mail Address: goodic@arrestpd.org

Agency and Address: Arrest Police Department
100 Fast Street
Arrest, VA 40000

Agency Case Number: 20070525-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): Gary's Quick Stop **DOB** NA **Race** NA **Sex** NA

Names of Suspects (Last, first, mid): Unknown **DOB** _____ **Race** _____ **Sex** _____

Date and Type of Offense: 05/25/07 Robbery **Court Date:** Pending

Examinations Requested: Video analysis, image comparison **Jurisdiction of Offense:** Arrest, VA

Brief Statement of Fact: Gary's Quick Stop was robbed and suspect was captured on video between 17:25 – 17:27. Suspect appears to be a W/M wearing a white shirt and displaying a hand gun. Compare the known clothing to that being worn in the recording.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. One (1) sealed yellow envelope containing an VHS video cassette

2. One (1) white shirt

page 1 of 1

For DFS use only

Submitting Officer (Print) Ivan C. Good

(Sign.) Ivan C. Good Date 05/26/07 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Ivan C. Good

Telephone #: (804) 555-2211

E-mail Address: goodic@arrestpd.org

Agency and Address: Arrest Police Department
100 Fast Street
Arrest, VA 40000

Agency Case Number: 20070525-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): Unknown **DOB** _____ **Race** _____ **Sex** _____

Date and Type of Offense: 05/25/07 Drug operation **Court Date:** Pending

Examinations Requested: Audio analysis **Jurisdiction of Offense:** Arrest, VA

Brief Statement of Fact: Please clarify voices present on the recording made during an under cover drug buy and eliminate the background noise.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)** ITEM# 1. One (1) sealed yellow envelope containing an audio cassette.

page 1 of 1

For DFS use only

Submitting Officer (Print) Ivan C. Good

(Sign.) Ivan C. Good Date 05/26/07 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Ivan C. Good

Telephone #: (804) 555-2211

E-mail Address: goodic@arrestpd.org

Agency and Address: Arrest Police Department
100 Fast Street
Arrest, VA 40000

Agency Case Number: 20070525-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): SMITH, John **DOB** 3/16/58 **Race** W **Sex** M

Date and Type of Offense: 05/25/07 Possession of child pornography **Court Date:** Pending

Examinations Requested: Image analysis **Jurisdiction of Offense:** Arrest, VA

Brief Statement of Fact: Male suspect's computer seized which is believed to contain child pornography.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)
ITEM# 1. One (1) sealed cardboard box containing one (1) desktop computer.

**Attached: paperwork with suspect's password and copy of search warrant.

page 1 of 1

For DFS use only

Submitting Officer (Print) Ivan C. Good

(Sign.) Ivan C. Good Date 05/26/07 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Ivan C. Good

Telephone #: (804) 555-2211

E-mail Address: goodic@arrestpd.org

Agency and Address: Arrest Police Department
100 Fast Street
Arrest, VA 40000

Agency Case Number: 20070525-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): SMITH, John **DOB** 3/16/58 **Race** W **Sex** M

Date and Type of Offense: 05/25/07 Possession of child pornography **Court Date:** Pending

Examinations Requested: Image analysis **Jurisdiction of Offense:** Arrest, VA

Brief Statement of Fact: Male suspect's cell phone seized which is believed to contain child pornography. Recover all video clips containing child pornography.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. One (1) sealed yellow envelope containing one (1) Verizon "Razor" cell phone.

**Attached paperwork with suspect's access code and copy of search warrant.

For DFS use only

Submitting Officer (Print) Ivan C. Good

(Sign.) Ivan C. Good Date 05/26/07 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

FIREARMS/TOOLMARKS

Contact Us

If you have any questions concerning the Firearms/Toolmarks laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Firearms/Toolmarks Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**Ann Davis**	**(804) 786-4707 ext. 2-6981**
	Jim Pickelman	**(804) 786-4707 ext. 2-9079**
Eastern	**John Ward**	**(757) 683-8327 x 1402**
Northern	**Jay Mason**	**(703) 764-4622**
Western	**Van Roberts**	**(540) 561-6000**

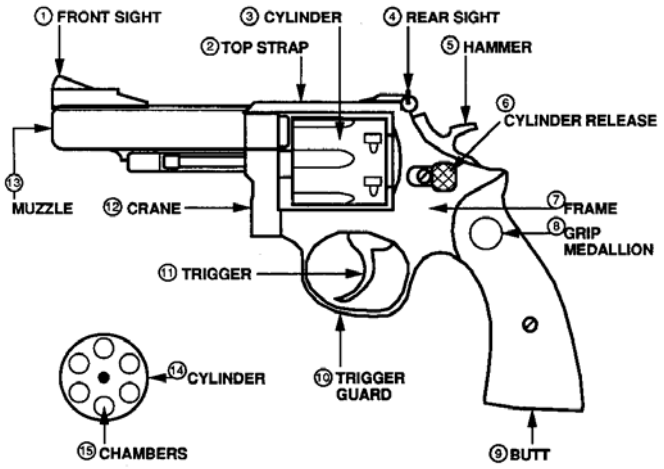
OVERVIEW

The primary concern of the firearms examiner is the examination of firearms and ammunition components in an attempt to associate a particular firearm as having fired particular ammunition components, through microscopic study, to the exclusion of all other firearms.

FIREARMS NOMENCLATURE & DEFINITIONS

HANDGUNS

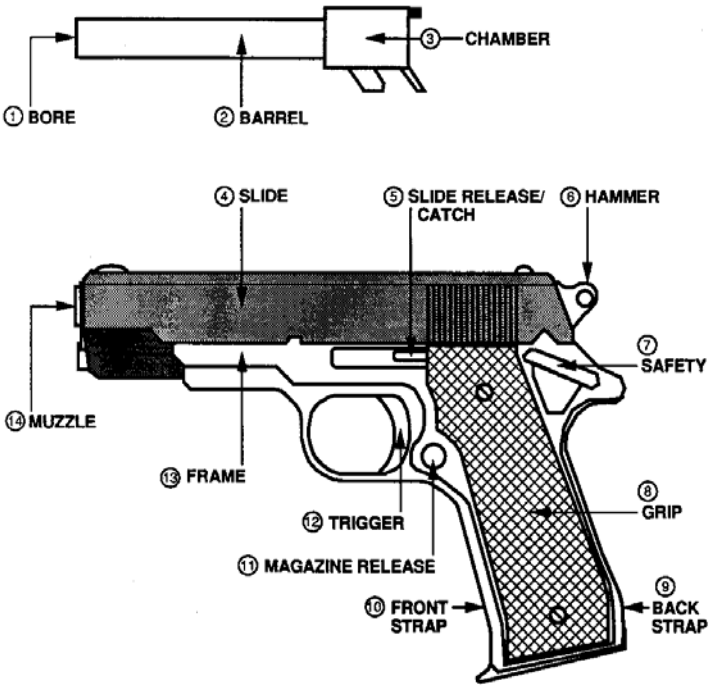
Revolvers A firearm, usually a handgun, with a cylinder having several chambers so arranged as to rotate around an axis and can be discharged successively by the same firing mechanism



Pistol A repeating firearm requiring a separate pull of the trigger for each shot fired, and which uses the energy of discharge to perform a portion of the operating or firing cycle.

Magazine A container for cartridges which has a spring and follower. The magazine serves to provide a new cartridge for loading into the chamber of the firearm during the firing cycle.

Clip A detachable metal frame or box, generally disposable, which contains cartridges and serves to facilitate the loading of an internal magazine. ***Not to be confused with a magazine***.

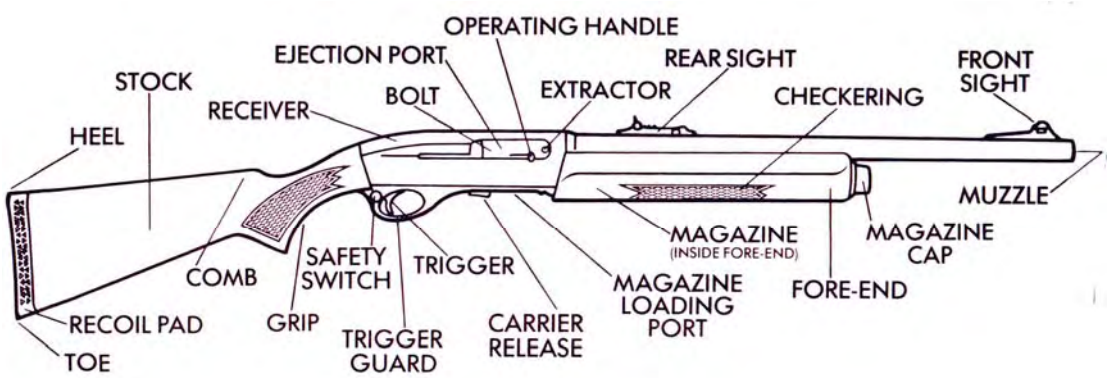


SHOULDER GUNS

Rifle A firearm having rifling in the bore and designed to be fired from the shoulder.

Shotgun Generally, a smooth bore shoulder firearm designed to fire a shotshell containing numerous pellets or sometimes a single projectile (slug). Shotguns can also be equipped with a rifled barrel.

Semiautomatic Rifle or Shotgun Schematic



AMMUNITION COMPONENTS

Bullet A non-spherical projectile designed for use in a rifled barrel.

Cartridge A single unit of ammunition consisting of the cartridge case which contains a primer, propellant, and the bullet or projectiles.

Cartridge Case The metallic container, which is no longer filled with the components that originally, comprised the cartridge.

Shotshell A single unit of ammunition consisting of the shotshell case, which contains a primer, propellant, and one or more projectiles.

Shotshell Case The shotshell container, may be plastic or paper, which is no longer filled with the components that originally comprise a shotshell.

Shotshell Wad The components of a shotshell, which typically separate the powder and projectiles, and are used to adjust the volume of the contents of the shotshell. Wads are made of a variety of material types (e.g., circular cardboard, fiber or felt disks, plastic one-piece or multi-piece shot cup and/or shot columns).

Slug A term applied to a single projectile loaded into shotshells.

Shot Pellets ranging in size, normally loaded in shotshells. (Note: there are several cartridges currently available for handguns that contain pellet loads)

CAPABILITIES AND SERVICES

Mechanical Condition of Firearms

Each firearm that is submitted to the firearm section is examined to determine whether it is in normal mechanical operating condition and it is test fired, when possible. This examination includes the operability of the safety features, physical characteristics of the firearm and trigger pull. In addition, a drop test examination can be conducted to determine whether the firearm will or will not fire without pulling the trigger, when necessary. Also, capability of full automatic fire is determined.

NIBIN (National Integrated Ballistics Information Network)™

NIBIN is a computerized system for acquiring and storing, in a database, the images of cartridge cases and shotshell cases from semiautomatic pistols and semiautomatic, slide-action and bolt action rifles and shotguns. After capturing an image, the system can correlate it for possible associations. A firearms examiner evaluates the correlation and if an association is found, the actual evidence is compared, by an examiner, on a comparison microscope for a final determination. With the utilization of the NIBIN™ system, it is possible to help law enforcement agencies establish links between incidents.

Identification of Firearm Parts

Firearm parts found at a crime scene may be identified as to:

a. The type of firearm from which they originated

b. Whether the part came from an evidence firearm (Fracture Match)

Identification of Brand

Bullets, wad components, cartridge cases and shotshell cases recovered at a scene or from a body may be identified by brand.

Possible Brand and Caliber of Firearm

By determining the class characteristics (caliber, number of lands and grooves, direction of twist and their dimensions, breechface and/or firing pin shapes, other various markings) exhibited on fired ammunition components (bullets, cartridge cases, shotshell cases), the firearm examiner may be able to provide information concerning the brand and type of firearm which the component was fired. This may be particularly useful when no firearm has been recovered.

Bullet Identification to a Particular Firearm

When a rifled firearm is manufactured and through its use, unique microscopic markings (striae) are left on the inner surface of the barrel. When the firearm is fired, these striae are imparted on the bullet. These striae are individual to a particular firearm.

When a firearm is submitted to the laboratory for comparison, the examiner test fires the firearm and uses a comparison microscope to compare the striae of the test fired bullet to those present on the evidence bullet. By this microscopic study of the markings on both bullets, the examiner can determine if the evidence bullet was fired from the submitted firearm. The following conclusions may be reached:

a. The bullet was identified as having been fired from the firearm.

b. The bullet was eliminated as having been fired from the firearm.

c. It is not possible to identify or eliminate the bullet as having been fired from the firearm.

Firearm not Recovered

Bullets and cartridge cases/shotshell cases recovered from the same or different incidents can be compared to determine if they were fired from/in the same firearm.

Bullet in Victim

If medical or legal constraints do not allow for the removal of a bullet, the laboratory may be able to determine the approximate caliber of the bullet using an x-ray technique. This may be helpful when several firearms of different caliber were used.

Bullet Fragments

The firearm examiner may be able to provide the same type of information from a bullet fragment as that of a whole bullet. A bullet fragment can be identified as having been fired from

a particular firearm if sufficient marks are present. The quantity and quality of these marks are determined by microscopic examination. All bullet fragments should be collected and submitted to the laboratory.

Cartridges

If the cartridge has been cycled (loaded, extracted and ejected) through the action of a bolt-action, lever-action, slide-action or autoloading firearm, the markings left by this process may be associated with a particular firearm. In some cases markings left on cartridges may be associated to a particular magazine. If these types of marks are present on cartridges, it may also be possible to associate them to cartridge cases, if no firearm has been recovered.

Cartridge Cases

Generally, there are five surfaces of a firearm that may leave identifiable marks on various areas of a cartridge case: breechface, firing pin, extractor, ejector, chamber. Generally, if a fired cartridge case can only be identified to a particular firearm by the extractor and/or ejector mark(s), this only identifies the cartridge case as having been extracted and/or ejected (i.e., cycled) in a particular firearm.

Identification of Possible Brand of Firearm

By determining the class characteristics (caliber, type of breechface marks and firing pin shape) exhibited on a fired cartridge case, the firearms examiner may be able to provide information concerning the type and brand of firearm which fired the cartridge case(s). This may be particularly useful when no firearm has been recovered.

Shotshells

These may be associated to a firearm in the same manner as cartridges. The gauge may be determined and the brand of the components may be characterized.

Shotshell Cases

These may be identified in the same manner as a fired cartridge case. In addition, the components that may have been commercially loaded into the shotshell may be identified.

Shotshell Components

Recovered wad material and/or projectiles may be identified as to gauge, type, and/or brand of commercial manufacture.

Saboted Ammunition

A sabot is a plastic enclosure around a bullet/projectile that allows a smaller diameter and lighter weight projectile to be fired. The Remington Accelerator™ cartridge and saboted slugs (for shotguns) are two examples of this type of ammunition. When saboted ammunition is used, the microscopic markings from the barrel will be imparted onto the sabot rather than the bullet. This means the bullet/slug cannot be identified with the firearm that fired it, but it may be possible to identify the sabot.

Distance (Proximity) Determination

The approximate distance the muzzle of a firearm was from an object at the time of firing may be determined by examining clothing or other materials for the presence of gunshot residues. Pellet patterns can also be examined for approximate distance. When no firearm is recovered, objects can be examined for the presence of gunshot residues; however, unless it is a contact shot, an approximate distance *cannot be determined* unless a firearm and ammunition components associated with the firearm and the shooting incident are submitted. All ammunition recovered with a firearm should be submitted.

Reconstruction/Trajectory Analysis

The analysis of objects brought to the laboratory can be conducted to aid in the investigation for determination of trajectory and origin of the shots fired, help locate other pertinent evidence, and help determine the position of the victim and/or the shooter.

COLLECTION GUIDELINES

ITEM - Firearms (handgun or shoulder gun)

METHOD - All firearms to be submitted to the laboratory should be made safe. Unload firearms after properly documenting the cylinder in revolvers or the chamber and magazine in pistols, rifles and shotguns on a **FIREARMS DOCUMENTATION WORKSHEET**. A copy of this worksheet can be found on the last page of this section and should accompany all firearms being submitted. Consider recovery of DNA, trace or latent prints. (Do not process in field). Package firearms in a rigid container, seal, mark container and indicate condition of firearm on container as **LOADED** or **UNLOADED**. Firearms submitted for DNA or trace evidence must be sealed with tape over all edges and any openings (such as holes in the box) prior to submission (see example in General Submission of Evidence).

DISCUSSION - Safety is the first consideration; therefore, firearms should be unloaded prior to delivery to the laboratory. If this is not possible, call the firearm examiner prior to submission and make sure the packaging material is marked **LOADED FIREARM.** Packaging material may rub latent prints and destroy evidence; therefore, it is important to package in a manner so the gun contacts the packaging material as little as possible. Documenting the cylinder in a revolver may help determine the sequence of events and aid in scene reconstruction. If latent prints are not a concern, package in a rigid container with proper labeling. It is requested that you not package guns in plastic.

ITEM – Firearms found in water

METHOD – Place the firearm in a container of the same water and immediately submit the item.

DISCUSSION - When a firearm is found in water, leaving the firearm in the same water will slow the rusting process.

ITEM – Bullets, shot pellets, slugs and shotshell wads

METHOD - Recover using rubber tipped forceps or latex examining gloves, so as not to contaminate or add trace or other biological evidence. Place in a plastic zip lock type bag. Package projectiles separately, clearly label and seal properly. It is currently suggested not to mark the item itself. Bullets, etc. collected from doctors in the emergency room should be washed off with water (not disinfectants) prior to submission and air dried before packaging. Body fluids may destroy some microscopic markings.

DISCUSSION - Handling these items with your fingers may add additional trace or biological evidence. Bullets, etc. should be handled as if biohazards are present and in a manner to protect any trace evidence, such as fibers, paint or DNA, that may be present. The chain of custody can be maintained by marking the packaging material and carefully noting your actions.

ITEM - Cartridge, cartridge case, shotshell, shotshell case

METHOD - Recover using rubber tip forceps or gloves so as not to obliterate fingerprints, or damage trace evidence. Cartridges, cartridge cases, shotshells and shotshell cases may be placed in a zip lock bag if fingerprints are not a concern. Properly label and seal the container. If fingerprints are a concern, package in a manner that will immobilize the item and/or reduce the contact with the packaging material. Never mark the head stamp area or other portions of the cartridge, cartridge case, shotshell or shotshell case. In incidents where the use of saboted ammunition is suspected, the investigator should be aware that the sabot may have separated from the projectile (bullet or slug).

DISCUSSION - Handling these evidence items may destroy fingerprint evidence. The marks in the head stamp area and other portions are used in the laboratory comparison and identification process. Ammunition found at the scene or in the suspect's house may be helpful in the comparison process. The sabot bears the identifying marks (the bullet/slug in this instance does not).

ITEM - Clothing for gunpowder/gunshot residues

METHOD - Totally air dry clothing and package in paper so that the clothing is not contaminated. Place clothing item on flat piece of paper. Place a second piece of paper over the item and roll or leave in the flat position. Also place a piece of paper inside article of clothing. Properly label and seal the container. Also, please submit the autopsy report from the OCME, the police report, room size, constraints, witness/suspect statements, and any information that may be pertinent to the investigation.

DISCUSSION - This packaging approach ensures that the area of the clothing bearing the gunshot residue will not come in contact with other areas of the garment. This is also a good procedure for bloody garments). Plastic will cause the biological material on the clothing to deteriorate, even if it is thoroughly air dried.

Toolmarks Overview

Toolmark Identification is a discipline of forensic science which has as its primary concern to determine if a toolmark was produced by a particular tool. Toolmark cases may involve any type of criminal activity, ranging from burglary to homicide. Toolmarks may be encountered on many varied surfaces including wood, metal and even human tissue; therefore, all cases and many surfaces should be considered for potential toolmarks.

The examination of toolmarks involves an attempt to associate a particular toolmark with a particular tool, through microscopic study, to the exclusion of all others. Toolmark examinations also include identification of objects which forcibly contacted each other, were joined together under pressure for a period of time and then removed from contact or were originally a single item before being broken or cut apart.

TOOLMARKS NOMENCLATURE & DEFINITIONS

Tool An object used to gain mechanical advantage; the harder of two objects which when brought into contact with each other, results in the softer one being marked.

Toolmark A mark produced on a softer receiving surface by a harder object.

Cast The reproduction of a toolmark or the surface of a tool using a molding material such as silicone rubber, Mikrosil™, Forensic Sil™, Kerr Permlastic™ or other suitable material.

CAPABILITIES AND SERVICES

Examination of the Toolmark Prior to the Recovery of a Suspect Tool

The laboratory can provide valuable investigative information to the investigating officers through the careful examination of the toolmark. The possible determinations are as follows:

1. Type of tool used (class characteristics)
2. Size of tool used (class characteristics)
3. Unusual features of tool (class and/or individual characteristics)
4. Action employed by tool in its operation
5. Most importantly, examination can determine if the toolmark is of value for identification purposes

Examination of the Suspect Tool with a Toolmark

The tool will be examined for foreign deposits such as paint or metal for comparison against the marked object. This trace evidence may help to associate the tool with the marked surface;

however, the trace evidence in these circumstances usually provides class characteristic evidence.

After the examination for foreign materials, class characteristics are compared to establish consistency. Finally, several test marks are made with the suspect tool, and microscopic comparisons of the test against the questioned toolmark are made.Three possible conclusions may be reached:

1. That the tool produced the toolmark
2. That the tool did not produce the toolmark
3. That there are not sufficient corresponding individual characteristics between the known and the unknown to determine if the tool did or did not produce the mark

COLLECTION GUIDELINES

ITEM - Toolmarks

METHOD - If the object bearing the toolmark is reasonably mobile, bring the entire object to the laboratory. Protect the toolmark area by covering it carefully with paper; however, always consider latent fingerprints, trace evidence, paint, etc. when packaging. If the object is particularly large or is completely immobile, the toolmark area may be cut out (depending on the situation, e.g., security considerations and damage to property) or cast using a suitable casting material. Package the toolmark cast in a rigid container (such as a pill box), properly seal and label. Include mid-range or orientation photographs, sketches and reports.

DO NOT place suspect tool into toolmark as it could destroy markings or transfer trace evidence.

DISCUSSION - The actual toolmark is preferred over a cast of the toolmark; therefore, the microscopic marks need to be protected to provide the best possible results. Placing the tool into the toolmark may destroy microscopic detail and contaminate trace evidence. Submission of photographs, sketches and reports may help the examiner determine the action of the tool.

ITEM - Tools

METHOD - Do not submit a tool for toolmark comparison until it can be associated with a suspect. If fingerprints are possible, package in a manner to immobilize the item and/or to reduce the contact with the packaging material. When marking the tool for identification, be sure not to mark near the working end of the tool.

Package in a manner to protect the working end of the tool (e.g., on a screwdriver place a paper fold over the tip). After the working end has been protected, place in a rigid container.

DISCUSSION - Tool/toolmark cases are very time consuming examinations, and if the examination does not assist in implicating a suspect, time is wasted for examiner and investigator. Always consider fingerprints, which could associate a suspect with the tool. Wrapping the working end of the tool will protect the microscopic characteristics of the tool as well as trace evidence.

ITEM - Drill

METHOD - Consider fingerprints, protect the drill bit, and recover any drill shavings on the tool or in the tool box. Package shavings in a rigid container and cushion with tissue. Seal and label properly.

DISCUSSION - Although microscopic markings on drill bits change with use, drill shavings found on the tool or in the tool box may have been produced during the same time frame as those recovered at the scene. The rigid container will help protect this fragile evidence.

ITEM - Drill Shavings (Scene)

METHOD - Packaging same as drill shavings from the drill

SPECIALIZED TOOLMARK EXAMINATIONS

Fracture Match

Fracture match examinations are conducted to associate items such as broken bolts, automobile ornaments, tips of knives and screwdriver blades with objects from which they were broken.

Collection Guidelines

ITEM - Items to be examined for fracture match (examples: broken tools, glass, vehicle parts, etc.)

METHOD - Package in a manner that will protect the edges of the items to be fracture matched. For example, when submitting glass, wrap and package each piece separately and clearly label and seal. In the request clearly indicate which items should be compared. For fragile items such as paint, a rigid container cushioned with tissue is probably best.

DISCUSSION - The edge will contain the areas to be fracture matched. If these areas are damaged it may prevent any possibility of a successful match.

MISCELLANEOUS PRESSURE OR CONTACT EXAMINATIONS

These examinations may make it possible to associate any two objects that were in contact momentarily or for more extended time

Number Restorations

Serial numbers provide a means of identifying and tracing items of equipment. vehicles, guns and other products using this form of identification. The numbers or letters are stamped into an appropriate metal surface, compressing the molecules beneath the die strike. Serial numbers can be obliterated using several different techniques, such as scraping, grinding, punching or filing. Usually the perpetrator obliterates the number sufficiently only to make the number invisible.

The compressed molecules are often still present under the obliterated area. The obliterated area is first prepared for the restoration process where possible or practical. This usually involves polishing the surface with an abrasive material to remove the grinding marks, gouges, etc. After the surface has been properly prepared, it can be treated in a number of ways that may make the number visible. The type of metal may dictate the most appropriate approach. For many obliterations, an acidic solution is swabbed over the polished surface. The acid reacts at different rates with the compressed molecules under the location of the die strike and the non compressed molecules. Often this procedure enables the examiner to visualize and document the number in an appropriate manner.

Collection Guidelines

ITEM - Obliterated Serial Numbers

METHOD - Protect the area needing restoration. Do not attempt to restore the number in the field.

DISCUSSION - The first attempt to restore the number is the most productive and further attempts will likely destroy the evidence.

OTHER EXAMINATIONS

Fingernail Examinations

Fingernails are possibly overlooked as items of evidence in assault cases or other contact cases where physical exertion may result in a broken fingernail. Although not found as readily at crime scenes as fingerprints and other types of physical evidence, torn, broken or even clipped pieces of fingernails/toenails have proven to be of significant value for identification purposes. In addition to identifying the depositor of a torn nail, these comparisons may also be used to identify missing persons or unknown human remains. Similar to the uniqueness of fingerprints, no two individuals have been found to have identical striation patterns on the underside of their finger or toe nail. These biological toolmarks are individual in nature.

Collection Guidelines

ITEM- Known specimens should be collected for comparison purposes

METHOD – If physical evidence of this type is recovered at a crime scene and a suspect is developed, photographs should initially be taken of the suspect's nails before clipping. Full width clippings of each nail should be placed into separate small plastic zip lock type bags (or other convenient individual containers) and labeled with the individual's name, date of collection and finger identification. Within the laboratory, it has been most convenient to designate fingers accordingly: L1 = left thumb, L2 = left index, etc., R1 = right thumb, R2 = right index, etc.

DISCUSSION - Each clipping should be given a unique item number on the Request for Laboratory Examination (RFLE) form. The questioned nail should be

packaged separately, labeled accordingly, and also given a unique item number.

Speedometer Examinations

During an automobile crash, the speedometer speed indicating needle may impact the faceplate of the speedometer leaving an impact mark or a transfer mark, both which may allow the forensic examiners to determine the approximate speed at the time of collision. If the needle of the speedometer has a fluorescent coating on its underside, some of this material may be transferred to the faceplate. By using specialized lighting, such as lighting in the ultra violet region, the transferred material may be visualized, thus leading to determination of the approximate speed of the vehicle.

Collection Guidelines

ITEM - Speedometers/Tachometers

METHOD - Package in a manner to protect the face of the speedometer. Box in a rigid container.

DISCUSSION – Materials transferred to the faceplate are tangible, and may be easily altered

Vehicle Lamp Examination

While a damaged lamp cannot actually testify, it may provide vital information to the investigator at the scene of an accident. Thus, the physical appearance of the lamp filaments, or the remaining portion of a broken lamp filament, can often be a key factor in attempting to determine prior events.

The examination of lamps and lamp filaments, while not new, is often overlooked as a potential piece of evidence. If, during an investigation, the “on” or “off” condition of a lamp is to be determined, the investigating officer must know the correct procedure to properly and completely collect, identify, and then preserve lamp filament evidence for submission to the forensic laboratory for examination.

The fragile nature of a lamp filament requires that the investigator have a thorough knowledge of collection techniques. On occasion, it may be necessary to remove and submit the lamp fixture rather than remove the individual lamp. This procedure applies if the lamps have been broken or if the lamp base is corroded to the extent that an attempt to remove the lamp could potentially damage the filaments.

The collection of necessary lamps should be complete, according to the area of the vehicle that was damaged by the impact of the accident. If the impacted area was at the front of the vehicle, the headlamps, parking lamps and front side marker lamps should be submitted. Likewise, if the impact damage occurred at the rear of the vehicle, tail lamps, rear side marker lamps and the backup and license plate lamps should be submitted to the laboratory. Thus, the officer who collects lamp filament evidence should be certain to collect those lamps that could have a bearing on the case.

Collection Guidelines

ITEM - Lamps from vehicles involved in an accident or hit and run

METHOD - Once the necessary lamps and/or fixtures have been collected, they must be properly identified and packaged for submission to the laboratory. The information needed particularly for lamp filament cases is as follows:

** item designation

** area of vehicle from which the lamp is removed

** make and year of vehicle

** date of recovery

** agency case number

** the officer's initials

Individual small lamps will obviously be too small to contain the necessary identifying information, whereas this information could be recorded on the rear of most fixtures and intact headlamp glass envelopes. Lamps and exposed filaments can be packaged using single or several paper or styrofoam cups as protective enclosures to cover fragile lamp filaments or portions of broken lamps filaments. The cups should be marked with the necessary information, and when securely taped, they serve to protect this important form of physical evidence. Package in a manner to protect the filament. (Cover filament with materials which will prevent leakage e.g., styrofoam cup). Submit all of the lamps near the damaged area of vehicle. For example, if the front left side of the car is damaged, submit all lamps from the front left side and also submit the undamaged lamps from the front right of the car. Also, submit accident or police report and photographs of damaged areas.

DISCUSSION - The filament is the primary area of examination and must be protected. The undamaged lamps will help the examiner in the comparison process and the police report may help in the reconstruction process. Photographs show proximity. Since the laboratory examiner, in most cases, never observes the scene or the vehicle, he/she should be furnished with adequate information related to the incident and a completed traffic report with a diagram and photographs showing the impact area. In some instances, the laboratory examiner may find it necessary to discuss certain aspects of the case with the investigating officer.

FIREARMS DOCUMENTATION WORKSHEET

(submit completed copy with firearm)

GENERAL INFORMATION

AGENCY:	**CASE NUMBER:**	**ITEM#:**
OFFENSE TYPE:	**OFFENSE DATE:**	**RECOVERY DATE:**
RECOVERY LOCATION:		
RECOVERING OFFICER:	**OFFICER BADGE / CODE # :**	

DESCRIPTION OF FIREARM

FIREARM TYPE:	**MANUFACTURER / BRAND:**
MODEL:	**SERIAL NUMBER:**
CALIBER / GAUGE:	**OTHER IDENTIFYING MARKS:**
BARREL LENGTH:	**CYLINDER / MAGAZINE CAPACITY:**
FINISH:	**SAFETY: Y N**
CYLINDER ROTATION (AS VIEWED FROM REAR): CLOCKWISE COUNTER CLOCKWISE	

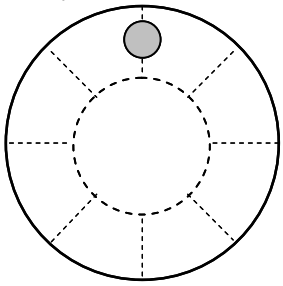
CONDITION OF FIREARM

CHAMBER LOADED: Y N	**CYLINDER / MAGAZINE LOADED: Y N**
SAFETY POSITION: ON OFF UNK	**NO. OF CARTRIDGES LOADED (CYLINDER / MAGAZINE):**
HAMMER POSITION:	**MAGAZINE SEATED IN FIREARM: Y N** (if NO, collect and submit magazine as separate item)

CARTRIDGE / CARTRIDGE CASE POSITION

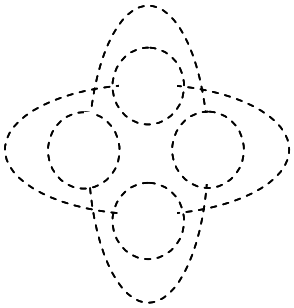
REVOLVER

Index Cylinder IN-LINE with Barrel



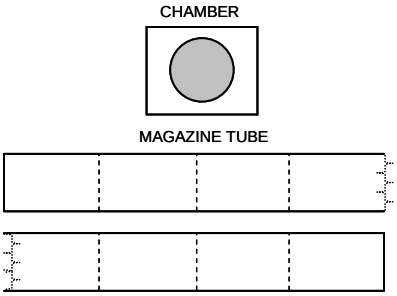
Sketch and Label Cylinder Configuration

DOUBLE BARREL



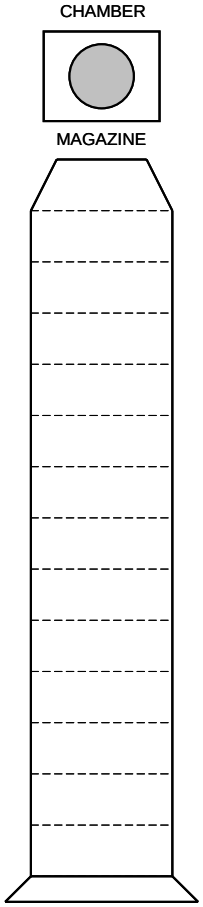
Sketch and Label Configuration

RIFLE / SHOTGUN



Sketch and Label Configuration

PISTOL / RIFLE



POSITION	STATUS	HEADSTAMP	POSITION	STATUS	HEADSTAMP
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

STATUS: F = Fired / **NF** = Not Fired / **MF** = MisFire / **E** = Empty

Other similar Ammunition recovered in this investigation? Y N

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Investigator Ivan M. Small

Telephone #: (808) 525-6688

E-mail Address: smallim@townpd.gov

Agency and Address: Old Town Police Department
123 Washington Drive
Old Town, VA 22222

Agency Case Number: 20060610-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): WASHINGTON, George **DOB** 02/05/50 **Race** W **Sex** M

Names of Suspects (Last, first, mid): JEFFERSON, Thomas **DOB** 11/23/58 **Race** W **Sex** **M**

Date and Type of Offense: 06/10/06 Aggravated Assault **Court Date:** 9/05/06

Examinations Requested: Firearms (restore serial #, NIBIN, Distance Determination **Jurisdiction of Offense:** Old Town, VA

Brief Statement of Fact: The victim was shot several times

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM #'s 1-5. Each a cartridge case: Firearms - compare to item 10.

6. One (1) bullet from scene: Firearms - compare to item 10.

102. One (1) bullet from victim: Firearms - compare to item 10.

18. Shirt from victim: Firearms - distance determination with item 10.

9. Box of cartridges recovered from suspect: Firearms - use for distance tests.

10. One (1) pistol: Firearms - function test, attempt to restore serial #, NIBIN.

For DFS use only

Submitting Officer (Print) Ivan M. Small

(Sign.) Ivan M. Small Date 06/13/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

FORENSIC BIOLOGY

Contact Us

If you have any questions concerning the Forensic Biology laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Forensic Biology Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**Lisa Schiermeier-Wood**	**(804) 786-4707 ext. 2-6034**
Eastern	**David Pomposini**	**(757) 683-8327 x 1404**
Northern	**Karen Ambrozy**	**(703) 764-4600**
Western	**Elizabeth Smith**	**(540) 561-6600**

OVERVIEW

When a biological substance, such as, blood, semen, saliva, or tissue leaves the human body and is left at the scene of a crime, the biological sample will begin to degrade (break down; be destroyed) if not properly collected, packaged, and preserved. In addition, due to the sensitivity of the DNA technology used by the Department of Forensic Science, if proper precautions are not taken while collecting evidentiary samples there is an increased likelihood of introducing contamination from a foreign DNA source unrelated to the crime. It is also possible to transfer unrelated sources of DNA between crime scene samples if the evidence is not packaged correctly.

PROCESSING OF EVIDENCE BY THE FORENSIC BIOLOGY SECTION

The initial examination performed by the Forensic Biology examiner is screening of the evidence to identify the possible presence of a biological substance (i.e., blood or semen). Probative biological evidence will then be analyzed using a DNA technology specifically designed to test minute amounts of biological material at 16 different genetic areas of the DNA. The DNA profile obtained from the evidence is compared to the DNA profile from the known samples (victim, suspect, or elimination samples, such as a husband or boyfriend) to determine if an individual is included or eliminated as a possible source of the biological substance. If no suspect has been identified the foreign DNA profile will be searched against the Virginia DNA Data bank, which contains DNA profiles from convicted offenders and individuals arrested of specific felonies, to aid the law enforcement community to identify a possible perpetrator. The types of cases analyzed by the Forensic Biology Section using DNA analysis include, but are not limited to:

- Homicides (includes attempted homicide, manslaughter, and death investigations)
- Sexual Assaults (includes rape, anal sodomy, oral sodomy, and cunnilingus)
- Criminal Paternity
- Breaking & Entering/Grand Larceny
- Robbery/Car Jacking
- Assault/Maiming
- Malicious Wounding
- Miscellaneous (fraud, felony vandalism, arson, hit & run, illegal deer kills and sales, etc.)

These cases can be placed primarily into two (2) examination categories:

- Blood cases
- Secretion cases (semen, saliva, perspiration, etc.)

DEFINITIONS

BIOLOGICAL SUBSTANCES

Body fluids such as blood, seminal fluid, saliva, or urine or biological material such as tissue (muscle, fetal material, etc.) and feces

DEGRADATION

Partial or complete deterioration of a biological substance by chemical or physical means (i.e., heat, moisture, or bacteria)

DEOXYRIBONUCLEIC ACID (DNA)

The genetic material found in various body tissues (muscle, fetal tissue, skin, etc.) and body fluids (semen, vaginal fluid, blood, saliva, etc.). Because an individual's DNA is the same from cell-to-cell within the body and is different from individual-to-individual, DNA can be used to determine whether a biological substance may have been deposited by a specific individual.

DNA PROFILE

The combined results that are obtained when testing 16 different areas of the DNA

LUMINOL

Luminol is a chemiluminescent compound which reacts with blood and emits light in a dark environment. The working Luminol solution is made up of two components and can be used to visualize trace amounts of blood which can't be seen with natural light.

PHYSICAL EVIDENCE RECOVERY KIT (PERK)

A kit used for the recovery of physical evidence from the body of the sexual assault victim or suspect. The kit is designed to aid the recovery of foreign secretions and trace evidence (i.e., hairs and fibers) from the victim or suspect.

SEMEN

A biological substance secreted by males that consists of a combination of seminal fluid and spermatozoa

SEMINAL FLUID

A biological fluid produced by males in which spermatozoa reside

TOUCH EVIDENCE

"Touch" evidence is evidence resulting from casual contact by an individual with a surface or material. This would including primarily objects touched by an individual's hand(s), such as cigarette lighters, keys, gun grips, triggers, knife handles, steering wheels, etc.

VIRGINIA DNA DATA BANK (also referred to as CODIS)

The Virginia DNA Data Bank is a collection of DNA profiles from convicted offenders and individuals arrested for certain felonies. A buccal swab sample is collected from every person convicted of a felony or arrested for a certain class of felonies. The DNA profiles from these individuals are stored in the Data Bank for comparison purposes. In addition, the DNA Data Bank also contains DNA profiles obtained from evidence samples which may be compared in order to connect the DNA profiles from two or more unrelated cases to a common perpetrator.

WEARER DNA

DNA recovered from an article of clothing believed to have been worn by the individual in question.

CAPABILITIES AND SERVICES

Identification of biological substances and determination of whether the biological substance may have originated from a specific individual through the use of DNA analysis is the primary function of the Department's Forensic Biology Section. The types of biological materials that are routinely analyzed fall into the following two categories:

Serological testing

A. Blood Cases – The screening and testing of the evidence in these types of cases is designed to answer two (2) questions:

1. Is the reddish/brownish stain blood?

   The Forensic Biology Section can determine if blood is indicated in a stain through chemical testing. This testing is an integral part of the examination of a blood case.

   To assist in the location of possible blood in cases where the blood has been cleaned up from a floor or wall and is no longer visible to the naked eye, the Forensic Biology Section can provide a chemical to the investigator known as Luminol, as well as consultation concerning its use. This chemical may be sprayed in the trunk of a car in which no stains are visible, but the car is suspected of transporting a body. If a positive Luminol result is obtained the sample(s) must be collected and submitted to the laboratory for further biological substance determination.

   The BlueStar® Forensic Test Kit may also be used to assist in locating possible trace amounts of blood that are not visible in natural light. Information on purchasing this kit and the instructions for its use are available at www.bluestar-forensic.com.

2 If the stain is blood, is it human?

The Forensic Biology Section can determine if the blood stain is human blood. If the stain is not human and animal origin is not important, no further examinations will be conducted. However, in those cases where the animal origin must be established (illegal deer kills), the Forensic Biology Section maintains the necessary chemicals to determine the animal family.

B. Secretion Cases –These types of cases may include sexual assaults (semen or saliva), breaking and entering (saliva deposited on cigarettes left at the scene), robbery (perspiration or saliva – wearer DNA on the suspect's ski mask left at the scene), and homicide ("touch DNA evidence" on a weapon).

- The first step is to identify the biological substance(s), if possible:

  Identify the presence of sperm (which confirms seminal fluid)

  Identify the presence of seminal fluid (in the absence of sperm)

- The presence of some biological substances can be indicated, but cannot be confirmed:

  Indicate the presence of urine

  Indicate the presence of feces

  Sufficient unique characteristics do not exist with current technologies for the Forensic Biology Section examiner to absolutely confirm the presence of the biological material to the exclusion of all other biological substances.

- Some biological substances are implied:

  Implied presence of saliva on envelope flaps, stamps, cigarette butts or straws

  Implied presence of vaginal fluid on vaginal/cervical swabs

DNA Testing

Once the biological substance has been determined the Forensic Biology Section examiner will attempt to determine if the biological material may have originated from a specific individual. The Forensic Biology Section utilizes a commercially available DNA typing kit known as PowerPlex® 16 BIO, which permits the examiner to test 16 different genetic areas of the DNA simultaneously for comparison to a known sample to determine if an individual (i.e., victim or suspect) could have deposited the biological substance. If the DNA profile obtained from the evidence is consistent with the DNA profile obtained from the known sample, the examiner will perform a statistical calculation to provide weight to the likelihood that the biological substance was deposited by a specific individual.

Virginia DNA Data Bank

If the DNA profile obtained from the evidence does not match the known sample from the suspect or no suspect sample has been submitted for comparison, the DNA profile obtained from the evidence will be searched against the Virginia DNA Data Bank (also known as CODIS) to help identify the possible perpetrator of the crime.

Criminal Paternity/Maternity

The Forensic Biology Section performs DNA analyses in cases involving incest or rape in which the victim of the assault gives birth to a child and the known blood or buccal samples from the victim, suspect and child are submitted to the laboratory for comparison. In addition, DNA analysis can also be performed on fetal tissue obtained as a result of an abortion once the known samples from the victim and suspect are submitted to the laboratory.

COLLECTION GUIDELINES

Biological fluids and body fluid stains are valuable evidence which can be used to either associate a victim or suspect with a crime/crime scene or eliminate them from consideration. The most frequently encountered biological fluids are blood, seminal fluid, and saliva.

NOTE - For the collection of blood for alcohol and/or drug analysis, refer to the instructions in the Toxicology Evidence Section of this manual.

SAFETY PRECAUTIONS

It is imperative when collecting or packaging biological evidence for submission to the laboratory that clean latex gloves, shoe covers, gowns, masks, head covers, and safety glasses, as appropriate, be worn and changed often. All biological materials and fluids must be handled with universal precautions. Body fluids, wet or dry, have been shown to carry diseases, so proper safety precautions must be observed. Dry stains may flake when disturbed or collected, sending minute particles airborne. These may be absorbed through mucus membranes (eyes, nose, mouth, etc.), open cuts, or chapped skin.

ITEM - BIOLOGICAL EVIDENCE

METHOD - All biological evidence should be air-dried prior to submission to the laboratory. When possible, the evidence (once packaged) should be submitted to the laboratory as soon as possible. If the evidence cannot be dried and submitted to the laboratory the same day as packaged, refrigerate the evidence until submission. However, the evidence should not be refrigerated for more than a week.

During the collection, air-drying, or packaging of any body fluid stains, caution should be used to ensure that a stained area from an item of evidence does not come in contact with another stained or unstained area. This applies to outer surfaces and inner surfaces. For example, a shirt should not be

folded or rolled so that bloodstain on the front contaminates any stained or unstained area on the back or inside of the shirt. A barrier, such as paper or cardboard should be placed on the inside of the shirt, as well as under and over the garment to prevent stained areas for coming in contact with each other.

When air drying articles stained with body fluids, place them on or over a piece of clean paper. Any debris which falls from the material onto the paper during the drying process will be collected when the paper is folded with the article prior to packaging, labeling and sealing.

Body fluid evidence can be contaminated by the crime scene officer's own body fluids. The perspiration on the officer's hands may contaminate the cotton swabs used to collect the body fluids. To prevent such contamination protective clothing (i.e., latex gloves, gowns, masks, and head covers) should be worn while collecting the evidence.

To avoid possible sample-to-sample contamination, change latex gloves (and other applicable protective wear) as necessary when collecting evidence.

DISCUSSION - Refrigerating the evidence will retard bacterial growth. However it will not stop the growth which can then lead to degradation of the biological material if the evidence is not dried. The sooner the biological evidence is dried or submitted to the laboratory for drying, the more likely useful information can be obtained from the evidence through DNA analysis.

ITEM - WET (SATURATED) BIOLOGICAL EVIDENCE

METHOD - Package the item of evidence in plastic only if there is a danger of contamination due to saturation of wet items that cannot be air-dried prior to submission to the laboratory. Paper packaging is preferred if saturation is not a problem**.** NOTE: If it is necessary to package an item of evidence in plastic because it is wet, this information needs to be indicated on the RFLE and the evidence submitted to the laboratory the same day as packaging, if possible.

DISCUSSION - Within a short period of time wet evidence stored in plastic, even if refrigerated will promote bacterial growth, which can destroy biological material and potentially preclude the examiner from obtaining DNA results.

ITEM - KNOWN BLOOD/BUCCAL SWAB SAMPLE

METHOD - Known blood samples are taken by a doctor, nurse, or other qualified person and collected in a 7cc lavender top EDTA vacutainer tube. NOTE: Collect blood for alcohol and/or drug analysis separately and according to instructions in the Toxicology Section of this manual.

Known buccal swabs are collected by taking two (2) sterile swabs and swabbing the inner cheek of the mouth. The swabs should be rotated during the collection process to ensure that the swab has been saturated with saliva and buccal cheek cells. Place both swabs together into one new labeled swab box to air dry.

ITEM - WET BODY FLUIDS ON NON-POROUS SURFACES (i.e., glass window, counter top, wood floor, etc.)

METHOD - Absorb the stain onto a sterile cotton swab; saturating one swab before using another. Use the minimum number of swab(s) to collect the stain. Allow the swab(s) to air dry or place the

swab(s) in a new labeled swab box for drying. It is not necessary to collect more than 4 saturated swabs for submission to the laboratory. NOTE: double-tipped swabs and Q-tips should not be used.

DISCUSSION - Collection of wet body fluids in this manner assures that the best evidence is submitted in its most concentrated form. Any time water is added for collection, the chance of diluting the stain or contaminating the evidence is increased.

ITEM - WET BODY FLUIDS ON POROUS SURFACES (i.e., blanket, carpet, untreated wood, etc.)

METHOD - Submit the air-dried item of evidence if possible. For large items (large carpets, upholstered furniture, etc.) it may be necessary to cut out the stained areas or swab the stained area with a sterile swab. If cuttings/swabbings are taken, package the cuttings/swabbing from each area separately.

ITEM - DRIED BODY FLUIDS STAINS [blood/semen] ON NON-POROUS OR POROUS SURFACES

METHOD - Submit the item of evidence or when possible take a swabbing of the evidence and submit the swab(s) to the laboratory. For large items (large carpets, upholstered furniture, etc.) it may be necessary to cut out the stained areas or absorb the stained area onto a slightly moistened sterile cotton swab using one (1) to two (2) drops of distilled water. Saturate one swab with the stain before absorbing onto the next swab. Allow the swab(s) to air dry or place the swab(s) in a new labeled swab box for drying. It is not necessary to collect more than 4 saturated swabs for submission to the laboratory. NOTE: double-tipped swabs and Q-tips should not be used.

DISCUSSION - Avoid scraping crusts due to risk of airborne flakes.

ITEM - DRIED BODY FLUID STAINS [saliva/perspiration] ON NON-POROUS OR POROUS SURFACES (i.e., bottles, cans, triggers or grips of firearms, etc.)

METHOD - Submit the item of evidence or when possible use a single swab to take a swabbing of the evidence and submit the swab to the laboratory. It may be necessary to absorb the stained area onto a slightly moistened sterile cotton swab using one (1) to two (2) drops of distilled water. Allow the swab to air dry or place the swab in a new labeled swab box for drying. NOTE: double-tipped swabs and Q-tips should not be used.

DISCUSSION - Avoid scraping crusts due to risk of airborne flakes.

A single swab is recommended for collection to concentrate the stain and to increase the likelihood of obtaining sufficient biological material to obtain a DNA profile.

By swabbing an item of evidence, such as the mouth of a bottle or an area of the grip of a firearm of no value for latent print examination, the swab(s) can be submitted to the Forensic Biology Section while the actual item of evidence can be submitted for examination to the Latent or Firearms Sections. If uncertain where to collect the swabbing it is best to submit the entire item of evidence to the laboratory for evaluation.

The Forensic Biology Section no longer analyzes control swabs, therefore there is no need to collect or submit a control swab to the laboratory.

ITEM - BODY FLUID EVIDENCE NOT READILY VISIBLE

METHOD I - An Alternate Light Source (ALS) may be used to locate a possible biological substance (i.e., seminal fluid). Once the stain has been located, the stain(s) can be collected and submitted to the laboratory.

Examples of ALS:

- UV light
- Omnichrome
- LumaLite/ CrimeScope

Short wave and long wave ultraviolet light: No filter is needed when using UV light, short wave UV light is emitted at 245 nm and long wave UV light is emitted at 366 nm. NOTE: long term exposure of DNA to UV light can cause degradation.

Omnichrome: fluorescence of body fluids is best at 450 nm; a yellow filter should be used.

LumaLite/CrimeScope: most sensitive of the Alternate Light Sources and can be used in daylight; fluorescence of body fluids is best at 450 nm; an orange filter should be used.

DISCUSSION I - At certain wavelengths of light, body fluids may emit light (fluoresce). This can be demonstrated by holding a UV light source over a particular item of evidence with suspected body fluid staining. For example, seminal stains on automobile seats and floors may not be readily visible to the naked eye but may be enhanced by using an ALS.

Certain chemicals (such as detergents) can mimic body fluid stains under certain lighting conditions.

METHOD II - Luminol or the BlueStar® Forensic Test Kit can be used to visualize traces of blood from a crime scene that has been cleaned up and residual blood still remains that cannot be seen in natural light. The Luminol and BlueStar® reagents are chemiluminescent compounds which react with blood and emit light in a dark environment. Take a swabbing of Luminol or BlueStar® positive areas and submit to the laboratory for possible blood confirmation. If submitting a piece of evidence with a Luminol or BlueStar® -positive stain, circle the area where luminescence was seen.

Luminol and the BlueStar® reagent are sprayed in the dark and the luminescence may be photographed with very sensitive film.

Collect any visible stains

Do not over saturate the stain area, otherwise the Luminol or BlueStar® solution will dilute the possible blood stain.

DISCUSSION II - Luminol and the BlueStar® reagent can react with other substances such as metals and bleach.

ITEM - VICTIM PHYSICAL EVIDENCE RECOVERY KIT (VPERK) – white box

A kit used for the recovery of physical evidence from the body of the sexual assault victim.

Modifications to this kit are made for the collection of evidence from children and male victims.

METHOD - For use within 72 hours of the assault. Medical personnel are urged to follow the instructions supplied with the kit.

DISCUSSION - The kit contains supplies to recover foreign secretions and trace evidence (i.e., hairs and fibers) from the alleged victim. In addition, the kit contains supplies for the collection of known samples from the victim for comparison with the foreign secretions and hairs and fibers recovered which may be from the suspect.

PERKS are available at all regional laboratories for law enforcement officers and hospitals.

The kit should be sealed and initialed by the examining clinician/doctor and initialed by the officer receiving the PERK.

Do not open and air-dry the contents of the PERK

Submit the PERK to the laboratory the same day it is collected. If this is not possible, refrigerate the evidence up to one week before submission to retard bacterial growth and thus degradation process.

The Evidence Transfer Bag should be left open since items inside have been sealed.

ITEM - SEXUAL ASSAULT VICTIM'S UNDERPANTS

METHOD - Submit underpants worn during and/or immediately after the assault if the examining clinician did not include them in the PERK.

DISCUSSION - Specifically ask if the underpants worn by the victim to the hospital are the same ones worn immediately after the assault. If not, it may be necessary to locate and collect them. Package them in paper to facilitate drying. The underpants worn by the victim immediately after the assault will likely collect vaginal drainage, which may include the seminal fluid, saliva, and/or hairs/fibers left by the suspect.

Other victim clothing items may be submitted if the suspect had contact with them. If submitted, describe the clothing on the Request for Laboratory Examination form (i.e., bag containing blue jeans, shirt and sweatshirt).

ITEM - PHYSICAL EVIDENCE FROM SEXUAL ASSAULTS SCENE (i.e., bedding)

METHOD - If the assault occurred on a bed, collect the top surface of bed linen which may hold stains, hairs, and/or fibers. If the assault occurred in a vehicle, collect actual seat fabric cuttings and/or swabs of stains. Collect towels or tissues used by the suspect and/or victim to clean up after the assault; package in paper to promote drying.

Swabs containing wet blood, seminal fluid, saliva, or distilled water used to moisten the swab MUST be:

a) Air-dried or put in a swab box to dry, then submitted as soon as possible to the laboratory.

b) Refrigerated until submitted to the laboratory. The evidence should be submitted to the laboratory within a week to reduce degradation.

c) If the evidence has not been air-dried, this must be indicate this on the RFLE

DISCUSSION - These areas may contain body fluid and/or hairs/fibers of the suspect and/or victim. This becomes especially important if the victim has washed or cleansed himself/herself after the assault.

Crucial evidence (i.e., trace evidence and biological substances) may still be obtained from clothing and bedding that has been washed. Therefore this evidence should still be collected for possible examination/evaluation if other evidence yields no probative information.

Bedding can be submitted in the absence of a PERK. If a PERK has been collect, the bedding should not be submitted to the laboratory until the PERK has been evaluated.

ITEM - SUSPECT PHYSICAL EVIDENCE RECOVERY KIT (SPERK) - blue envelope

A kit to aid the recovery of physical evidence from the body of a sexual assault suspect

METHOD - For use within 24 hours of the offense. Medical personnel are urged to follow the instructions supplied with the kit.

DISCUSSION - The kit contains supplies to recover foreign secretions (as may be found on underpants or pubic area swabs) and trace evidence (i.e., hairs and fibers) from the suspect's body and underpants. Also collect known samples (i.e., buccal swabs and hairs) from the suspect for comparison with foreign secretions and hairs and fibers recovered from the victim.

ITEM - SEXUAL ASSAULT SUSPECT'S CLOTHING

METHOD - Collect the suspect's clothing which was worn during the assault.

Have suspect stand on large clean sheet of paper while disrobing to collect any possible trace evidence (i.e., hairs or fibers).

DISCUSSION - Secretions (i.e., vaginal fluid or saliva associated with fellatio), hairs, fibers, and/or other materials may be found on the suspect's clothing which may associate the suspect with the victim and/or the crime scene.

ITEM - BLOOD AND HAIR SAMPLES KIT/BUCCAL SWABS KIT – orange envelope

NOTE: The Blood and Hair Samples Kits are being phased out and will be replaced exclusively by the Buccal Swabs Kit.

This kit is for the collection of known samples from a victim, suspect, or a third party for elimination purposes. This kit can be used when known blood and/or hair samples are to be collected for comparison purposes and are not collected elsewhere.

METHOD - The instructions supplied with the Blood and Hair Samples Kit or Buccal Swabs Kit should be followed when collecting the appropriate samples.

DISCUSSION - This kit may be used to collect evidence from the following individual under the specified circumstances:

- SUSPECT – when the collection of the samples takes place more than 24 hours after a sexual assault or any individual who may be involved in a particular criminal case.

- VICTIM - when the collection of known samples takes places more than 72 hours after a sexual assault or for cases not involving a sexual assault.

- THIRD PARTY - when an individual (e.g., husband or boyfriend) unrelated to the crime may have contributed biological substances to the evidence.

The sexual assault may not be reported immediately; therefore it is imperative that the time interval since the assault occurred be determine to ensure the correct kit is used for the collection of the samples

The victim and suspect known samples must be collected and submitted to the laboratory for comparison with submitted evidentiary samples

ITEM - ABORTED FETAL TISSUE ASSOCIATED WITH CRIMINAL PATERNITY CASES

METHOD - If the fetus is 10 weeks old or more at the time of the abortion, request the medical doctor performing the procedure to place the entire aborted fetal material into a hard plastic container (i.e., specimen cup).

If the fetus is less than 10 weeks old at the time of the abortion, request the medical doctor to isolate a portion of the fetal tissue from the maternal tissue and place the fetal tissue into a hard plastic container (i.e., specimen cup).

Submit the container to the laboratory the same day. If it is not possible for the aborted fetal tissue/material to be submitted to the laboratory the same day, place the container into a refrigerator and submit to the laboratory the next day.

> **NOTE**: The fetal tissue/material should not be stored in a saline solution or any other type preservative.

DISCUSSION - Within a short period of time fetal tissue/material stored in plastic, even if refrigerated will promote bacterial growth, which can destroy biological material and potentially preclude the examiner from obtaining DNA results.

Tissue (products of conception) collected from an aborted fetus that is 10 to 12 weeks old may contain identifiable body characteristics (i.e., hands and feet) that can easily be isolated by the DNA examiner from the remaining aborted fetal/maternal tissue. If the fetus is less than 10 weeks old, the body characteristics cannot be easily identified by the examiner. Therefore assistance from the medical doctor performing the procedure will be required to isolate the fetal tissue from the maternal tissue prior to submission to the laboratory.

SUBMISSION REMINDERS

General Reminders

Requests for DNA analysis of "touch" evidence will not be accepted without a written request specifying the reason for such testing from the Commonwealth's Attorney. A letter of request from the Commonwealth's Attorney will not be required for the analysis of "touch" evidence in major crimes cases where screening by a DNA examiner as described in paragraph 2 below has occurred. Refer to the following memorandum addressed to all agencies served by the Department of Forensic Science Laboratories dated October 12, 2004.

Prior to submission of a large number of items the examiner/supervisor must be contacted via telephone or through an in-person meeting to identify the most probative evidence for the respective case and evidence submission will be limited to those items. Refer to the following memorandum addressed to all agencies served by the Department of Forensic Science Laboratories dated October 12, 2004.

a. Determination of probative evidence will be decided based on a number of factors including the type of case, the evidence collected, the number of victims and perpetrators, etc.

b. In the event that additional evidence submission is necessary, communication between the assigned examiner and the investigator will occur to facilitate this process and the examination of the subsequent submission in a timely manner.

DNA analysis of evidence associated with simple possession of controlled substances (i.e., cocaine, heroin) and misdemeanor offenses, except any sex-related offenses (such as peeping tom cases), will not be analyzed without a written request from the Commonwealth's Attorney specifying the reason for such testing. Refer to the following memorandum addressed to all Law Enforcement Personnel dated May 14, 2002.

To perform a complete DNA analysis and reach a conclusion, it is imperative that all appropriate known samples (i.e., victim, suspect, elimination samples, such as the husband or boyfriend) are submitted to the laboratory prior to the DNA analysis of the evidence.

Submit only the most probative item(s) of evidence to the laboratory. If necessary, additional items of evidence can be submitted at a later date.

Prior to submitting evidence from a "cold case", please consult with the Forensic Biology Section examiner who performed the original analysis, if possible, or a section supervisor to determine which items of evidence should be resubmitted to the laboratory.

If it is not possible to dry a wet item of evidence prior to submission to the laboratory, please indicate on the Request for Laboratory Examination (RFLE) form that the item of evidence is wet so that immediate attention can be given to this item and the sample(s) can be dried prior to storage.

The Forensic Biology Section no longer analyzes control swabs, therefore there is no need to collect or submit the control swabs to the laboratory.

Physical Evidence Recovery Kit (PERK) Reminder

When preservation of the evidence is required, submit only those items that need to be preserved (i.e., Victim PERK). If both the Victim PERK and clothing have been collected and the clothing is dry, only submit the Victim PERK for preservation. Please specify on the RFLE that the request is for "Preservation Only."

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CRIMINAL JUSTICE SERVICES

OFFICE OF THE DIRECTOR
DIVISION OF FORENSIC SCIENCE
A Nationally Accredited Laboratory

700 NORTH FIFTH STREET
RICHMOND, VIRGINIA 23219
(804) 786-2281 FAX (804) 786-6857

NOTICE OF DFS POLICY CHANGE

To: All Agencies Serviced by Division of Forensic Science Laboratories
From: Paul B. Ferrara, Ph.D., Director
Date: October 12, 2004
RE: DNA Backlogs and Proposed Solutions

Given the overwhelming backlogs facing the Division of Forensic Science's DNA section, we met today with the Board of the Virginia Association of Commonwealth's Attorneys to discuss creative solutions to this crisis. The Board voted unanimously to approve the implementation of the following two policies that are effective immediately:

1. REQUESTS FOR DNA ANALYSIS OF "TOUCH" EVIDENCE WILL NOT BE ACCEPTED WITHOUT WRITTEN REQUEST FOR TESTING FROM THE COMMONWEALTH'S ATTORNEY

No request for DNA analysis shall be accepted or performed on "touch" evidence unless there is a specific written request from the Commonwealth's Attorney for such analysis. A letter request from the Commonwealth's Attorney will not be required for the analysis of touch evidence in major crimes cases where screening by a DNA examiner as described in Item 2 below has occurred.

"Touch" evidence is evidence resulting from limited casual contact by an individual with a surface or material. This would include primarily objects touched by an individual's hand, such as cigarette lighters, keys, door handles, gun grips, triggers, light switches, drawer handles, countertops, gear shift knobs, steering wheels, etc. This does <u>not</u> refer to items of evidence on which blood is observed or other biological fluids would expect to be found (for example, items of clothing, gloves, etc. are not considered "touch" evidence and will be analyzed in an attempt to identify the wearer of these items; additionally, evidence that has allegedly come in contact with a person's mouth such as a bottle, can or cigarette butt is also not deemed "touch" evidence).

2. PRIOR TO INITIAL SUBMISSION OF LARGE MULTI-ITEM (DNA) CASES, CONSULTATION WITH A DNA EXAMINER/SUPERVISOR WILL BE REQUIRED BEFORE EVIDENCE IS ACCEPTED

Large evidence submissions will be reviewed by DNA examiners/supervisors via telephone communication or in-person meetings in order to identify the most probative evidence for the respective case and evidence submission will be limited to those items.

Determination of probative evidence will be decided based on a number of factors including the type of case, the evidence collected, the number of victim(s) and perpetrator(s), etc. In the event that additional evidence submission is necessary, communication between the assigned examiner and the Investigator will occur to facilitate this process and the examination of the subsequent submission in a timely manner.

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NOTICE OF POLICY CHANGE

To: ALL LAW ENFORCEMENT PERSONNEL
From: Paul B. Ferrara, Ph.D., Director of the Department of Forensic Science
Date: May 14, 2002

CERTAIN REQUESTS FOR DNA ANALYSIS WILL NOT BE ACCEPTED WITHOUT WRITTEN REQUEST FOR TESTING FROM THE COMMONWEALTH'S ATTORNEY

Pursuant to discussions with the Board of Directors of the Virginia Association of Commonwealth's Attorneys and Members of the Commonwealth's Attorneys' Services Council, effective immediately, no request for DNA analysis shall be accepted or performed in the following types of cases unless there is a specific written request from the Commonwealth's Attorney for such analysis:

- Misdemeanor offenses (except any sex-related offense)
- Simple possession of controlled substances (i.e., cocaine, heroin)

Any questions about whether an offense falls under this policy should be directed to Michelle Gowdy, Counsel for the Department, at (804) 786-2281.

EXAMPLES OF SUBMISSION SCENARIOS

- The investigator plans to submit to the laboratory a convenience bag containing the Victim Physical Evidence Recovery Kit (VPERK), a sealed white bag containing a shirt, and a sealed bag containing a pair of shorts.

  The RFLE form should list the items as follows:

  Item 1 - VPERK from Jane Doe

  Item 2 - Sealed white bag containing shirt from Jane Doe

  Item 3 - Sealed white bag containing shorts from Jane Doe

- The investigator plans to submit to the laboratory a convenience bag containing the VPERK and a single sealed white bag containing an assortment of clothing. However, the investigator is not sure what items of clothing are inside of the bag.

  The RFLE form should list the items as follows:

  Item 1 - VPERK from Jane Doe

  Item 2 - Sealed white bag containing clothing from Jane Doe

- The investigator receives a VPERK box from a hospital staff member and is told that the clothing is packaged inside the box. The investigator plans to submit the VPERK to the laboratory.

  The RFLE form should list the item as follows:

  Item 1 - VPERK from Jane Doe

- The investigator plans to submit to the laboratory two blood stained swabs collected from the point of entry of a residential breaking and entering. The stains were collected by moistening two cotton swabs with sterile water.

  The RFLE form should list the item as follows:

  Item 1 – two swabs of red stain from entry point (air dried)

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Investigator Ivan M. Small

Telephone #: (808) 525-6688

E-mail Address: smallim@townpd.gov

Agency and Address: Old Town Police Department
123 Washington Drive
Old Town, VA 22222

Agency Case Number: 20060610-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): WASHINGTON, George **DOB** 02/05/50 **Race** W **Sex** M

Names of Suspects (Last, first, mid): JEFFERSON, Thomas **DOB** 11/23/58 **Race** W **Sex** **M**

Date and Type of Offense: 06/10/06 Breaking and Entering **Court Date:** 9/05/06

Examinations Requested: Forensic Biology (Blood ID, databank search if suspect eliminated) Firearms (Toolmark exam) **Jurisdiction of Offense:** Old Town, VA

Brief Statement of Fact: Suspect arrested for breaking into victim's apartment

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ONE SEALED YELLOW ENVELOPE CONTAINING:
ITEM 1: SWAB OF RED STAIN FROM VICTIM'S BROKEN WINDOW (AIR DRIED)
ITEM 2: SWAB OF RED STAIN FROM VICTIM'S BEDROOM FLOOR (AIR DRIED)
ITEM 3: SUSPECT'S KNOWN DNA BUCCAL SWAB (AIR DRIED)

**FORENSIC BIOLOGY: EXAMINE ITEMS 1 & 2 FOR BLOOD/DNA AND COMPARE TO ITEM 3

ONE SEALED BROWN BAG CONTAINING:
ITEM 4: PIECE OF WOOD FROM VICTIM'S WINDOW PANE
ITEM 5: SCREWDRIVER FROM SUSPECT'S POCKET

**FIREARMS: EXAMINE ITEM 4 FOR TOOLMARKS AND COMPARE TO ITEM 5

For DFS use only

Submitting Officer (Print) Ivan M. Small

(Sign.) Ivan M. Small Date 06/13/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Investigator Ivan M. Small

Telephone #: (808) 525-6688

E-mail Address: smallim@townpd.gov

Agency and Address: Old Town Police Department
123 Washington Drive
Old Town, VA 22222

Agency Case Number: 20060610-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): WASHINGTON, George **DOB** 02/05/50 **Race** W **Sex** M

Names of Suspects (Last, first, mid): JEFFERSON, Thomas **DOB** 11/23/58 **Race** W **Sex** **M**

Date and Type of Offense: 06/10/06 Rape **Court Date:** 9/05/06

Examinations Requested: Forensic Biology (Seminal fluid ID, Hair / fiber exam) **Jurisdiction of Offense:** Old Town, VA

Brief Statement of Fact: Victim reported being raped by suspect in her bed after suspect made entry through locked door.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)
ONE SEALED WHITE BOX CONTAINING:
ITEM # 1: Victim PERK (kit # 14583)

ONE SEALED BROWN ENVELOPE CONTAINING:
ITEM #3: Suspect PERK

Forensic Biology: Please make examination on Item #1 for any evidence of sexual assault and compare to Item #3.

For DFS use only

Submitting Officer (Print) Ivan M. Small

(Sign.) Ivan M. Small Date 06/13/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

IMPRESSIONS

Contact Us

If you have any questions concerning the Impressions laboratory examination capabilities or evidence handling procedures, please call the Training Section or an Impressions examiner.

Laboratory	Section Contact	Phone Number
Central	**Robin Young**	**(804) 786-4707 ext. 2-6920**
	Amanda Lane	**(804) 786-4707 ext. 2-2108**
Western	**Andy Johnson**	**(540) 561-6600**
	Robert Stevens	**same as above**
	Kenneth Gill	**same as above**

OVERVIEW

An impression may occur when one object, such as a shoe or tire, impresses or impacts a receiving object and characteristics or features are transferred onto the receiving surface. Just as in other forms of forensic examinations (such as firearms, toolmarks and latents), examiners will strive to find uniqueness in impressions that would cause them to be made from a specific source or origin. In most cases, the five most important aspects between an impression and a source are the correspondence of design type, physical size and shape, general wear, manufacturing characteristics, and individual identifying characteristics.

Impression evidence at the scene can be associated with the item that made it by class characteristics or individual characteristics. With sufficient individual characteristics, a positive identification between the source and the impression can be made. Quick recovery of impression sources such as shoes or tires is important because continuous use will alter or wear away identifying characteristics. New cuts and other identifiers will appear subsequent to the original impression which must be acknowledged in the examination. Also, foreign objects embedded in the surface and recorded in the impression may in time be removed or altered.

CAPABILITIES AND SERVICES

The primary areas that are examined by laboratory personnel are:

- Three-dimensional impressions (footwear or tire impressions in soil, snow, sand, mud, etc.)
- Two-dimensional prints (for example - footwear prints on a vinyl or wooden floor)
- Fabric impression transfers (hit-and-run, natural and man made gloves, etc.)
- General transfers/impressions (such as a bloody knife print on bed sheet, etc.)

What can be determined by the lab?

- Identify the make, design, physical size, wear/manufacturing characteristics, as well as individual characteristics of a specific tire or footwear item.
- If a suspect origin is known, comparisons between the two can be made for corresponding characteristics (wear patterns, cuts, tears, abrasions, etc.)
- Impressions can be used to corroborate or disprove statements, for alibis made by individuals as to their actions or involvement in a particular situation. They may also assist in determining a specific time frame depending on their location and position.
- Determine if impressions made on suspected pedestrian hit-and-run vehicles correspond to victim clothing.
- Determine if a particular item was used to strike, or aid in locating the striking item that was used in an assault.

- Determine if a specific object, such as a bloody glove, an article of clothing, weapon, etc., made a particular impression.

COLLECTION GUIDELINES

ITEM - Three Dimensional Impressions(e.g.: Footwear or Tire Impressions in soil)

METHOD I - Photographic Documentation

Step 1: Take normal overall and mid-range photos.

Step 2: For close-ups, use a slow speed Black and White film with a 35 mm single lens reflex camera (not a "point and shoot"). Digital cameras are not recommended for impression photography.

Step 3: Use the normal focal length on the lens, as opposed to wide angle or telephoto/close up settings.

Step 4: Position the camera on a tripod, with the film plane parallel to the impression and directly over the impression.

Step 5: Position camera to fill the frame with the impression, not cropping any of the impression.

Step 6: After photos without a scale have been made, add a scale alongside the impression containing identification information and take examination quality photographs.

> **Note:** *The 90° or L-shaped scale is best. If this scale is not available, use a scale that runs the length of the impression or is at least 6 inches.*

Step 7: Use low oblique lighting with the flash held approximately three feet from the impression. Exact flash angle is determined by depth of impression. For best results, photograph the impression with the flash at 10°, 30° and 45° angles. Several photos with the flash at different positions around the impression (a minimum of four) need to be made also, since each flash position highlights the impression differently. Only one of the four flash positions may highlight the individual characteristics needed for a positive identification. Make a tent to block out any ambient light (particularly on a bright sunny day) by draping a cloth or material around the legs of the tripod and direct the oblique light from the flash through the open side of the tent. Make sure that the scale is at the same depth as the impression.

Step 8: To ensure you have a proper exposure, bracket the series of photos. For example, if the original series of examination quality photos were taken with an aperture setting of f8, take two more complete series, one at f11 and one at f5.6.

Step 9: With tire impressions, sufficient photos must be taken to ensure the entire circumference has been documented (at least six feet). Overlap photos for continuity of impression. If more than one tire impression is present, each must be separately documented.

DISCUSSION I:

Photography documents evidence detail and allows a 1:1 photo for comparison to be made. The use of the normal lens setting and a parallel film plane eliminate distortion of the image. The use of a tri-pod is necessary for important detail of the impression to be in fine focus.

METHOD II - Basic Casting Technique

Dental Stone casting should be used to collect the actual impression to supplement the photographs that were taken. Class I Dental Stone is stronger, easier to use and more durable than Plaster of Paris.

Step 1: Examine the impression. Loose debris like leaves and twigs may be removed. Be careful not to disturb the impression. Embedded debris must be left untouched. Removing embedded debris is too likely to destroy detail within the impression. Photograph before and after removing debris.

Step 2: Surround the impression with a form or frame. This provides a neater edge, and enables the excess material to add to the thickness of the cast rather than be wasted. It also allows for pouring additional casting material into the frame area to thicken the cast to make it more durable.

Step 3: Impressions in wet sand or loose dirt may need to be “fixed” before casting can begin. The recommendation is to mist with a hairspray product off a baffle to firm the material of the impression. Be careful not to allow drops of hairspray to fall off the baffle into the impression.

Step 4: The ideal method of mixing the casting material and water is to have pre-measured amounts packaged in double-bagged plastic zip-lock bags. Generally, about two to three (2 - 3) pounds of dental stone is sufficient to cover a standard shoe impression. Add six (6) ounces of water ***per pound*** of dental stone, then mix by kneading the bag until a uniform consistency is achieved with no lumps. One way to make sure lumps are eliminated is to place the bag on a flat surface and press sections of the bag until no lumps are felt. The zip-lock bag serves as the storage container, the "mixing bowl", and the pourer.

Step 5: Pouring should begin at the highest point of the impression, inside the frame that has been placed around the impression. The dental stone mixture should be poured onto an intermediate object (spatula, paint stir stick) to soften the impact of the liquid stone onto the impression. The dental stone should be poured at a constant rate while moving the flow gently across the area of the form, allowing the mixture to flow into the entire impression. Be sure there is enough mixture to cover the impression on one pouring. Additional mixture can be added to form a thick and strong cast.

Step 6: Identification data need to be applied. You can etch the required information into the top of the cast as it is hardening, carefully insert a wire loop ID data tag into the soft mixture, or use a permanent marker to write the information on the dried cast.

Step 7: If not using pre-measured bags of the casting material, the mixing bowl method may be used. Add dry casting material to the water until the casting material peaks above the water about an inch. Stir to a uniform consistency described as either pancake batter or melted ice cream. Make sure you have mixed enough casting material to cover the impression. Apply as

above.

Step 8: Once dry, usually 20-30 minutes, the cast may be lifted. Dig around the cast when lifting so pressure is not applied to the cast itself. Attempts to remove soil or debris from the bottom of the cast should be avoided.

Step 9: Package evidence properly. Be sure cast is dry and place in or wrap with newspaper or other paper. Do not package in plastic. Place in rigid container to ensure cast does not break.

Additional considerations for tire impressions

When dealing with tire tracks, it is important to cast the full circumference of the tire. Since a six (6) foot cast is impractical, make four (4) consecutive one and a half (1 ½) feet casts for each tire track found. Label each appropriately so they can be realigned.

With tire tracks, it is often possible to determine which tire of the vehicle made the particular tire track. In a turn the front tires track to the outside of the rear tires. In a back-up/forward maneuver, the front tire angles will be visibly different because they can turn.

With tires, the individual defects that are important may be on the sidewalls. Make sure the full depth of the impression is cast, including the sidewalls.

Additional considerations for Snow Impressions

Photograph the snow impressions as detailed above. Oblique lighting is critical to generate contrast in a white-on-white impression. Use Snow Print Wax or light blue spray paint to highlight the impression and show more details in the photographs.

Dental stone generates some heat when mixed, so applying a protective barrier between the mixture and the snow will produce better casts. Snow Print Wax is recommended for this. Three coats of the fine red wax should be applied prior to casting. When the cast is lifted the individual characteristics will be preserved in the fragile wax.

ITEM - Two Dimensional Impressions

METHOD I - Photography

Documentary photography should always be done, regardless of other collection techniques.

Residue prints that are visible in existing light are photographed in much the same way as three dimensional impressions. The flash angle can be more direct, but this will depend on the surface and the thickness of the impression. Use your flashlight at different angles to determine the best flash angle.

With dust impressions that aren't visible in normal light, use the oblique lighting techniques explained for three dimensional impressions. With dust the best flash angle is almost parallel to the surface that bears the dust impression, since the depth isn't a factor.

When possible, collect the surface the impression is on and turn it in as evidence. Packaging should be a rigid container and should be clearly marked "This end up". This ensures the total integrity of the evidence. Every detail is documented for the Lab, because they have the actual item.

DISCUSSION I - Two dimensional impression photography documents evidence detail prior to attempts to lift or package and allows for 1:1 comparison. Collection of the item that the impression is on is usually preferred because that transfers actual evidence and therefore documents detail for the examiner.

METHOD II - Dust Lifts (Electrostatic Dust Print Lifter)

After a two dimensional impression has been photographed, an attempt to retrieve the impression should be made. The best tool to recover impressions in dust is the Electrostatic Dust Print Lifter (EDPL).

Step 1: A special film which is metalized on one side is placed carefully over the dust print. An electrostatic charge is applied to the film which then attracts and holds the dust particles on its surface. When the film is lifted, the impression will cling to the back surface of the film, making it easily visible. Lit with oblique light, minute details and individual characteristics may be readily identifiable with this tool.

Step 2: Because the dust impression is now on a black surface, high contrast photography can be done to preserve the dust print. Since the dust transfer is not permanent, photography best preserves this evidence.

Step 3: Successful dust lifts using the EDPL can be obtained from wood surfaces, vinyl tile, nylon pile carpeting, indoor/outdoor carpeting, cardboard, cement, metal, and newspaper. Lifts can also be obtained from the skin of deceased victims.

Step 4: Since dust is the medium, the eventual settling of ambient dust will gradually obscure these impressions. Noticeable degradation in the quality of test dust impressions was noticed when left to sit for a week before attempting to lift them with the EDPL.

Step 5: Do not attempt to "fix" the dust lift on the EDPL film but rather package in a rigid container. Do not use plastic containers as the static generated by them can damage the dust lift.

METHOD III - Residue Lifts

Step 1: Using wide fingerprint tape to lift a two-dimensional impression can also be successful. The wider the lifting tape the better. Otherwise, the multiple overlaps necessary to completely cover the impression may themselves obscure details or when lifting the tape the overlaps may separate. Once the tape is lifted, hold it over a light and a dark surface to see which provides better contrast before affixing it to either.

Step 2: Commercial shoeprint lifters are also available. These include gelatin lifters and adhesive lifters.

Step 3: Residue impressions are sometimes visible in natural light and sometimes they are not. A rubber soled or gum soled shoe may not leave a visible mark on a tiled or linoleum floor, even when lit by oblique light. Dusting these surfaces with regular black or magnetic black fingerprint powder has sometimes made these impressions visible. Then they can be photographed and lifted.

Dental Stone Casting

This has recently been found to be successful in recovering some visible residue impressions. The dental stone absorbs the residue material and cleans the surface where applied. The visible residue is then clearly visible in the dental stone, having transferred completely. This includes visible impressions on garage cement floors and road shoulders, any impression where mud or another thick material has been deposited in the form of an impression.

Cast in the same manner prescribed for three dimensional impressions.

ITEM - Bite Mark Impressions

METHOD I - The initial step in documenting this type of evidence is photography.

Step 1: Since the age of the bite mark may be an issue, color film is used to show the stage to which the wound has progressed.

Step 2: Since the color of the wound is critical, a color scale should be included on the roll of film to provide for proper color balancing.

Step 3: Close-ups without and then with a scale are made (making sure the scale is on the same plane as the wound and parallel to the film plane).

Step 4: If the victim is still living, photographs made at different time periods should be made. As the wound ages, its colors will change and the bite mark may be better identified with one color rather than another.

Casting Techniques

Step 1: Using a silicone rubber compound (as is used to take casts of toolmarks), make a cast of the bite mark indentations.

Step 2: If the bite mark is in a hairy location, consider shaving hair from around the site first.

Step 3: Take particular care to accurately reproduce the contour of the bite mark. This may mean making a relatively thick cast or supporting the back of the cast in some way. The Odontologist can best analyze a bite mark if this contour is accurately reproduced.

Step 4: If the victim is deceased, have the medical examiner preserve tissue specimens of bite mark sites.

METHOD II - A suggestion to do powder and tape lifts, just prior to casting, has been made to give an additional resource for the Odontologist to work with.

Step 1: If the bite mark area is in a hairy site, shave the area carefully.

Step 2: Using a camel hair brush and traditional black powder, dust the areas of the dental arches. Make tape lifts of the dusted areas, placing the tape on glossy white cards. On the back of the card all appropriate identification information can be added.

Note: Photography is suggested before, during, and after this process to document the

technique.

This technique will also work with toolmarks found on a body. If tissue has been compressed in vice grips, for example, the teeth of the toolmark may be dusted and lifted with tape. If a Suicide victim manually cocked the hammer of a gun with his/her thumb, the hammer spur impression MAY be noticed on his/her thumb and documented by this technique.

DISCUSSION - Bite marks on the skin of victims can, at times, be positively identified as having been made by a particular suspect when examined by qualified Forensic Odontologists.

Do not powder or cast an open wound of a living person.

SUBMISSION REMINDERS

Prioritize Evidence

Impression evidence should be prioritized for early consideration since it is so easily contaminated. Search for impression evidence at the approach to the scene, at the entry and exit ways, along the path through the scene and escape route, near other impressions and on floors, walls, doors and even the roof. When located it must be protected so that it isn't destroyed by personnel at the scene and/or the elements (snow, rain, wind, heat).

Practice New Techniques

It is important to practice new casting techniques on a test impression before taking them into a crime scene. Make a print or impression under similar conditions but far enough away from the evidence to protect its integrity. Once you have established a procedure that works, you can cast your evidence. This is particularly helpful with impressions in snow.

Use the Correct Method

Moist or damp impressions can not be secured by the EDPL ("dust lifter"). If you can readily see an impression it would probably be suitable for casting or lifting--after photography.

Submissions

Submit the photographs, negatives or original media packaged separately from any casts or lifts. Package known shoes in paper bags.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Investigator Howard Jones

Telephone #: (808) 525-6548

E-mail Address: hjones@oldtownpd.org

Agency and Address: Old Town Police Department
123 Washington Drive
Old Town, VA 22222

Agency Case Number: 20030315-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): JONES, Bob **DOB** 1/03/71 **Race** W **Sex** M

Names of Suspects (Last, first, mid): SMYTHE, Rhonda **DOB** 4/08/63 **Race** B **Sex** F

Date and Type of Offense: 3/15/03 Aggravated Assault **Court Date:** 5/18/03

Examinations Requested: Impressions **Jurisdiction of Offense:** Old Town, VA

Brief Statement of Fact: Victim was beaten by suspect following a verbal argument

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. Dental stone cast

2. Photographs from scene

3. Photographic negatives from scene

4. Known footwear from Ms. Smythe

5. Known footwear from Mr. Jones (elimination)

page 1 of 1

For DFS use only

Submitting Officer (Print) Howard Jones

(Sign.) Howard Jones Date 3/20/03 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

LATENT FINGERPRINTS

Contact Us

If you have any questions concerning the Latent Fingerprints laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Latent Fingerprints Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**Sylvia Buffington-Lester**	**(804) 786-4707 ext. 2-6915**
	Robin Young	**(804) 786-4707 ext. 2-2108**
Eastern	**Lee Kennedy**	**(757) 683-8327 x 1405**
Northern	**Annie Carver-Jones**	**(703) 674-4625**
Western	**Lyle Shaver**	**(540) 561-6600**

DEFINITIONS

LATENT PRINT – These prints may or may not be readily visible and could require some type of processing in order to better develop and detect them.

Each friction ridge found on the fingers, palms, toes and soles has a row of pores that excretes perspiration. Composition of perspiration:

98.5 to 99.5% water (Water evaporates so field processing is best in most cases on non-porous material).

0.5 to 1.5% - chlorides (salts), urea, amino acids etc.

Intermittent contact with other body parts, such as hair and skin may also leave a layer of oils on the ridges. When items are touched, an impression of the friction ridges is left, via the afore-mentioned transfer mediums.

PATENT PRINT – These prints are normally readily visible. When friction ridges come into contact with materials such as soil, blood, ink, oil and paint or are impressed into substances such as putty or wax, impressions of the friction skin are visible before any processes are employed.

KNOWN PRINTS – These are impressions of the friction ridges that have been intentionally recorded via printer's ink or electronic scanning. Recording known prints in a ***Major Case Prints*** (Figure 1) format helps ensure the entire friction ridge surfaces of the fingers and palms are captured. Submission of known prints in a *Major Case Prints* format provides the laboratory with the greatest opportunity to conduct complete latent evidence examinations.

Figure 1 – Forms for Major Case Prints

ALTERNATE LIGHT SOURCE (ALS) – Variable wavelength sources of light used for forensic examinations. These systems usually use various filters, in conjunction with certain chemicals, stains, dyes, or powders that cause latent fingerprints to fluoresce.

A.F.I.S. – Automated Fingerprint Identification System, which is a computer system that searches unknown or known fingerprints against the database of known fingerprints. (In Virginia, the database is

located at the Virginia State Police Headquarters.)

I.A.F.I.S. – Integrated Automated Fingerprint Identification System, which is the computer system that searches unknown and known fingerprints against the database of known fingerprints at the F. B. I.

CAPABILITIES & SERVICES

Developing and recovering latent prints from items of evidence, comparing them to known impressions and/or conducting A.F.I.S. searches are the primary functions of the latent print examiners.

Types of Processes Utilized by the DFS Latent Print Section:

- Visual examination (always done first)
- Amido Black (Protein enhancer for blood prints)
- A.L.S (Inherent luminescence)
- Gentian Violet (Dye stain for sticky side of tape)
- Ninhydrin (Chemical for developing latent prints on porous surfaces, such a paper)
- Physical Developer (Chemical for developing latent prints on wet paper)
- Powders (Preferably black powder which is effective on smooth, non-porous surfaces)
- Small Particle Reagent (Liquid powder solution effective on wet porous evidence)
- Cyanoacrylate (Super glue fuming is appropriate for all types of non-porous surfaces)
- Dye Stains (Ardrox, MBD, and Rhodamine 6 G, RAM, etc. are used to detect prints with an ALS on non-porous evidence after using Cyanoacrylate fuming)

After detecting latent prints located on items of evidence, the prints are photographed (1:1) for comparison purposes, or placed onto lift cards. Often latent prints are enhanced to obtain a better contrast. If the prints of a suspect or victim are known, the latent prints are compared. If no prints are submitted for comparison, an AFIS search of suitable latent prints is conducted. All identifications that are effected are verified by a second examiner. The results of the latent print examinations are reported on a Certificate of Analysis, which is sent to the investigating officer.

Automated Fingerprint Identification System (AFIS)

Latent fingerprints are entered into AFIS for a search of the database. AFIS system searches can be conducted <u>without</u> information regarding a possible suspect. AFIS can save many hours of investigative time.

Note: Presently, the VA AFIS is not configured to search palm prints.

Latent prints submitted to or developed by Forensic Science personnel are evaluated to determine if

they are of sufficient quality for an AFIS search. Latent fingerprints that are not identified through AFIS are added to the unsolved latent database. As new fingerprint cards of arrestees are entered into the system, they are automatically searched against each latent print in the unsolved latent database. Latent fingerprints that are unsuitable for entry into AFIS are manually compared to any submitted fingerprints. It is very important to submit elimination fingerprints.

COLLECTION GUIDELINES

In many instances, latent fingerprints can and should be developed at the crime scene by evidence technicians or crime scene search officers using a multitude of processes on all type of surfaces. Latents developed through traditional powder processing methods should be lifted and submitted to the laboratory. Detailed information concerning the case, date, location and orientation of the latent should be recorded on the back of the lift card (Figure 2).

Date:	**-Sketch of Latent Lift Location-** **(indicate latent lift orientation)**
Case#	
Offense	
Recovery Location (Address):	
Location of Latent Lift #: _____ _____ _____	
Officer: _____ **Badge/Code #:** _____	

(Figure 2)

If latent prints at a crime scene appear to be visible (patent prints), or if the lift process may pose unique challenges, the latents should be photographed.

However, if any item of evidence is to be submitted to the lab for processing, it is best not to attempt any field recovery of latent prints. Certain powders and other processes may interfere with chemical or other tests that could be utilized by the forensic lab personnel.

Photography Protocols -

Latent prints should be photographed with a 35mm SLR camera or a high resolution (1000 ppi or greater) digital SLR camera Cameras must have close-up photography capabilities. Recommended

film speed for 35mm is 100 ISO or slower. For digital images, use the slowest camera ISO setting possible. Digital images should be captured in .tiff file format.

The camera should be held perpendicular (at a right angle) to the latent print so that the film plane and the print are parallel. The photograph should be composed such that the latent print is photographed at a 1:1 ratio. The latent should be first photographed without a scale, then with a scale. Any additional photographs of the latent can be taken with a scale. The scale is important to allow for 1:1 (actual) size reproduction for comparison purposes. The scale should include specific case information, as well as individual latent photo identifiers.

Photographs submitted to the laboratory for examination should be accompanied by the film negatives or a CD containing the latent images files in .tiff format. The original capture media (film negative, digital file) is needed in the event the laboratory must re-print the latent image so that a *one to one* comparison photo can be made.

All evidence that is to be submitted to the lab should be handled and packaged carefully so that no cross contamination or damage to any potential latent prints occurs. More information on these topics can be located in METHOD and DISCUSSION portions of this section.

Many of the processes used by latent print examiners in the laboratory involve the use of alternate light sources that range anywhere from a simple UV black light to a high intensity quartz arc tube. Ardrox and MBD are among the most popular florescent dye stains used with those alternate light sources.

ITEM - NON-POROUS OR NON-ABSORBENT SURFACES (Glass, Metal, Tile, etc. may be processed in the field.)

METHOD – Generally, fingerprint powders should be used. Black powder is preferred because it produces the best ridge reproduction and is easier to compare. For powders to be used, the surface must be dry. Wet items should be allowed to fully air-dry. The use of a hair dryer may produce too much heat causing the moisture in the latent print to evaporate.

*REMINDER: Whenever possible, non-porous items should be processed at the crime scene and the processed latent print(s) lifted, providing no other evidence (hair, fibers, blood, etc.) are present.

DISCUSSION - Unnecessary transportation and handling may damage or even destroy a print(s). In some cases, Cyanoacrylate Ester (commonly referred to as Super Glue Fuming) may be considered. This technique has proven successful in developing latent prints on items such as plastic baggies, firearms, styrofoam, and some types of leather.

CAUTION: If an item is left in the fuming chamber too long, overdevelopment may occur, resulting in print loss. Once again, this process should not be used if you are submitting the items to the lab.

It is recommended that you not attempt to fume items if your agency does not have the capability to perform the latent examinations and comparisons of the developed prints. If you feel cyanoacrylate fuming will yield the best results and your agency does not have a latents examiner, submit the untreated item to the laboratory for processing.

ITEM - POROUS OR ABSORBENT SURFACES (Paper, Untreated Wood, Cardboard, etc.)

METHOD – Generally, a variety of chemical processes are available. The photography of chemically developed latent prints is essential. Prints may fade or even completely disappear from the surface.

EXAMPLES OF CHEMICAL PROCESSES:

Cyanoacrylate Ester, Ninhydrin, Physical Developer, Amido Black.

DRY PAPER ITEMS:

Dry paper items can be collected and placed into plastic check (document) protectors or plastic bags (zip-lock).

WET PAPER ITEMS:

Wet paper items should be air dried and once dry can be packaged as you would dry items.

DISCUSSION:

Identifiable prints have been developed on items that have been exposed to water. Care should be taken when handling these items. Keep to a minimal amount of handling, even when wearing vinyl or cloth gloves. Glove marks have been developed with certain processes.

Powder processing will prevent the application of chemical processes which might have given more favorable results; therefore, avoid processing porous items prior to lab submission.

Safety Considerations: Chemical processing should not be performed in the field. Safety goggles, approved mask and/or respirator, gloves and other safety apparel should be worn. A fuming hood is recommended. As with cyanoacrylate fuming, it is recommended that you not attempt to chemically process items if your agency does not have the capability to perform the latents examinations and comparisons of the developed prints. If you feel chemical processing will yield the best results and your agency does not have a latents examiner, submit the untreated item to the laboratory for processing.

ITEM - PATENT (VISIBLE) PRINTS

METHOD - CLOSE-UP PHOTOGRAPHS SHOULD BE TAKEN PRIOR TO ATTEMPTS TO COLLECT THE PRINTS

IMPORTANT COLLECTION CONSIDERATIONS:

For visible prints on small objects, such as a window pane, collect the entire object. If the item is too large to submit, such as a bloody patent print on a wall, it may be necessary to cut out a section of the wall with the patent print. Be sure to leave a reasonable amount of wall surface material surrounding the patent print. A protective covering may be placed over the print provided that the covering does not come into contact with the print. An example: if the print is on a door, a small paper box can be taped to the door, over the print for protection.

DISCUSSION - Photographs are important because damage to the impression may occur during

attempts to remove the surface containing the print.

Avoid pressing or touching the impression with your finger or any object to see if the substance is dry or tacky. Doing so may result in damage to the print.

ITEM - PRINTS ON SKIN

METHOD - In experimental cases, great results were achieved after exposing the bony extremities of bodies, which were at room temperature, to Cyanoacrylate ester for about 15 to 20 seconds and applying black magnetic powder. Photographs were taken of the developed prints.

Preparation:

1) Body should be about room temperature, so it must not be put in a cooler.

2) Best probable results are on neck, lower arms, wrists, lower legs and ankles, so bodies that have been moved after death and handled in those areas are the best candidates for yielding prints on skin.

3) Do not attempt to recover prints from bodies without prior consent from the medical examiner.

SUBMISSION REMINDERS

A Request for Laboratory Examination form must accompany all requests for AFIS searches.

Indicate all requested forensic examinations on the Request for Laboratory Examination Form.

If it is a re-submission, note the previous Forensic Laboratory number in the appropriate space on the request form.

An Item number may be assigned to each latent lift card, or to a group of lift cards. If the latents are collected under one Item number, it is recommended that each latent lift in the group be given a unique identifying alpha suffix, e.g., Item 4-a, 4-b, 4-c.

Do not process any items that you are planning to submit to the laboratory and do not place tape over items of evidence where you think there may be latent prints.

Recommended digital image file format is .tiff. The laboratory is unable to process digital images in .raw file format. .Raw is a proprietary file format that varies from camera manufacturer to camera manufacturer. Computers must be loaded with the corresponding camera software in order to view images saved in the .raw file format.

Insure that sharp objects such as broken glass or knives are packaged safely and properly labeled: e.g.:

CAUTION - CONTAINS SHARP OBJECT(S) - BROKEN GLASS.

NOTE: Paper bags are not considered to be good packaging materials for sharp or broken objects. Sharp objects can easily puncture the bag and cause injury.

Good quality known prints are important and necessary. Smudged or blurred prints, overlays, too much ink, prints outside the blocks or off-centered, etc., will reduce the chances for an identification to be effected.

If suspects are known, please obtain a set *of Major Case Prints*, or an original set of fingerprint and palm print cards and submit them with the evidence. Submitting agencies can obtain copies of fingerprint cards from Central Criminal Records Exchange (C.C.R.E.). Clear, full size copies of known fingerprints may be submitted in lieu of originals if the originals are not available.

Take elimination fingerprints of the victims, family members, caretakers, etc.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Investigator Ivan M. Small

Telephone #: (808) 525-6688

E-mail Address: smallim@townpd.gov

Agency and Address: Old Town Police Department
123 Washington Drive
Old Town, VA 22222

Agency Case Number: 20060610-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): WASHINGTON, George **DOB** 2/05/50 **Race** W **Sex** M
WASHINGTON, Martha 9/15/45 W F

Names of Suspects (Last, first, mid): JEFFERSON, Thomas **DOB** 11/23/58 **Race** W **Sex** **M**

Date and Type of Offense: 06/10/06 Breaking and Entering **Court Date:** 9/05/06

Examinations Requested: Examine latent lift cards and compare with items 8,9,10. AFIS. **Jurisdiction of Offense:** Old Town, VA

Brief Statement of Fact: Victim's residence had been broken into and several items stolen.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM #'s

1. One (1) empty Budweiser beer can
2. One (1) RCA radio
3. Five (5) latent lift cards labeled A through E
4. Known fingerprints & palm prints of George Washington (victim)
5. Known fingerprints and palm prints of Martha Washington (victim)
6. Known fingerprints and palm prints of Thomas Jefferson (suspect)

For DFS use only

Submitting Officer (Print) Ivan M. Small

(Sign.) Ivan M. Small Date 06/13/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

QUESTIONED DOCUMENTS

Contact Us

If you have any questions concerning the Questioned Documents laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Questioned Documents Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central, Eastern	**Mike Moore**	**(804) 786-4707 ext. 2-6816**
or Northern	**Jack Jamieson**	**(804) 786-4707 ext. 2-9214**
Western	**Gordon Menzies**	**(540) 561-6600**
	Rick Horton	**same as above**
	Tom Dewan	**same as above**

OVERVIEW

A questioned document can be any material substance bearing marks or symbols (not always visible to the naked eye) whose authenticity or origin is under scrutiny. Questioned documents are not always paper products. Questioned marks often appear on objects such as walls, items of clothing, and in one case even on a human skull. The typical Questioned Document submission involves a comparison of a questioned document with known samples. The results of a comparison of this type are largely dependent on the quality and the quantity of the entries in both the questioned and known documents. Equally important is having an adequate amount of directly comparable known material. In handwriting cases, for example, it is necessary to have known samples that duplicate the text and general type of writing from the questioned document (cursive, hand printing, signatures or numerals), and to have known samples adequate in number in order to establish the writer's range of writing habits and variations.

Although the majority of the submissions involves handwriting or hand printing (e.g. checks, credit card receipts, robbery/demand notes, threatening letters, suicide notes) non-handwritten evidence is routinely examined as well. Non-handwritten evidence would include such things as inks, pens and other writings instruments, rubber stamps, typewritten documents, typewriters and typewriter components (e.g. ribbons, elements, print wheels), photocopied documents and photocopiers, counterfeit documents (e.g. currency, checks, receipts, passports, driver's licenses), papers and envelopes, paper products with virtually invisible indented entries, torn and cut paper products, burnt matches, alterations and obliterations to documents, plus others. In short, any document or component related to a document would likely be examined in the Questioned Document Section.

CAPABILITIES AND SERVICES

Handwritten Documents - by comparing a questioned document with known writings the document examiner may be able to identify the writer of that questioned document to the exclusion of any other writer. The examiner may also be able to eliminate the suspect or victim. In some circumstances the examiner may indicate a less than absolute degree of certainty that a particular writer did (or did not) prepare certain entries. Handwritten evidence such as robbery/demand notes should always be submitted even when there are no known suspects or samples. Notes of this type can be compared to file copies of other robbery notes submitted, and many of them are often associated to one particular writer.

On all documents fingerprints may be present and should be considered. The obvious value of fingerprints should not be underestimated, and documents should be handled in a proper manner. (see COLLECTION GUIDELINES – Handle Document Carefully)

Typewriting/Machine Impressions - by comparing the spacing, fonts, and other characteristics, the typewriting may be classified and may be helpful in associating a typewritten document as having been produced by a particular manufacturer or group of manufacturers. In some cases there may be a sufficient number of individual characteristics to allow the examiner to identify a particular typewriter as the one that produced a particular document. Other possible examinations include the examination of a ribbon to determine if it was used to produce a specific document, as well as the examination of correction tapes, typing elements and print wheels.

Examinations and comparisons are also conducted on mechanical impressions and/or perforations associated with such things as check protectors and rubber stamps. In addition, documents produced by computer based

printers, photocopiers, mechanical printing, as well as facsimile copies, can be studied.

Alterations, Obliterations and Erasures - can be examined using various lighting conditions including UV and IR photography and/or video. Under these conditions the original text may be visualized and recoverable. The sites of any erasures (mechanical or chemical) can also be detected.

Charred and Water Soaked Documents - the written text may be enhanced and made visible using special lighting techniques. Special handling is necessary in preserving fragile documents of this nature. (See COLLECTION GUIDELINES – Handle Document Carefully)

Fracture Matches - Document Examiners can study torn edges of paper to determine if two or more pieces of paper were at one time joined. For example, pages torn out of a writing tablet may be matched back to the tablet in question. Other torn edges could include items such as stamps, paper matches and match books. Again fingerprints should be considered.

Other Examinations – Document examiners routinely develop significant investigative leads by recovering indented (virtually invisible) writings from items such as robbery/demand notes and anonymous threatening letters, by differentiating and comparing inks (nondestructively), and by studying paper products for dimensions, weight, color, texture, watermarks, composition, rulings and other important characteristics which could allow for a determination regarding whether all originated from a common source.

COLLECTION GUIDELINES

The investigating officer is often the first person to view and handle the questioned and known documents. Quite often, the work done in the field by the officer is critically important to the successful resolution of the case. This is particularly true with handwriting comparisons, where the investigator collects the questioned document, and interviews both suspects and victims in order to obtain known writing samples.

ITEM - Intact Document (e.g. checks, credit cards, letters, etc.)

> **METHOD I -** Whenever possible, submit the original questioned document rather than a photograph, photocopy or other type of copy. Microfilm copies of DMV records, banking transactions, and treasury checks are often the only documents available. In these instances, they are the "best evidence" and will be examined if submitted to the forensic laboratory. If copies must be submitted please try to submit a first generation copy rather than copies of other copies, or copies of faxed documents.
>
> **DISCUSSION I -** As a general rule, even the best copy available is a somewhat inferior reproduction of the original. For this reason some of the more subtle characteristics of the document may not be susceptible to proper evaluation. The submission of copies also limits the types of comparisons that can be conducted. Some of the examinations that cannot be conducted on copies include ink comparisons, determining the type of writing instrument(s), indented writings, type of paper, plus others. Additionally, when working from a copy it may not be possible to determine whether a signature was traced, letters were overwritten, or material was added or deleted through photocopier manipulation. When an individual (suspect or victim) offers a photocopy as the only evidence available, the investigator should realize that photocopies can be manipulated to produce a completely fraudulent document. In short, originals should be submitted whenever possible, but in

those cases where originals are not possible, copies are acceptable and should be submitted for examination.

METHOD II - Handle questioned documents carefully in order to preserve latent fingerprints. Soft tipped tweezers or gloves should be used as necessary. Once the document has been recovered, it should not be given back to the suspect or any person who may alter the writings or other impressions in some way to prevent their identification or decipherment.

DISCUSSION II - Fingerprints may associate a suspect with the document even if the writing comparison cannot. By handling the document with tweezers, fingerprints will not be destroyed. DO NOT PROCESS FOR FINGERPRINTS PRIOR TO SUBMITTING FOR HANDWRITING COMPARISON because the inks and subsequently the handwriting may be damaged. Also, the chance for the recovery of any indented writing will be lost.

METHOD III - THINGS TO AVOID - DO NOT fold, staple, pin, tamper with, mark or touch unnecessarily, stamp, etc., document evidence.

DISCUSSION III - It is important to maintain and preserve documents in the same condition as received. This allows for the most comprehensive examination possible, and improves the chance for a definitive conclusion.

ITEM - Obtaining Handwriting Exemplars or Standards.

METHOD - The purpose of dictated known writings is to obtain exemplars that are **comparable, representative,** and **adequate** to conduct the requested examinations.

DISCUSSION - Comparability between the questioned and known material is of the utmost importance. If the questioned entry is in the form of disconnected hand printing, then the known material should also be hand printed. If the questioned entry is in the form of cursive handwriting, then the known material should also be handwritten. It is not possible to compare hand printing with handwriting because they are fundamentally different styles, and, as such, there exists no basis for comparison.

Equally important is that the questioned and known material represents the same characters and numerals. This means that the known material must also repeat the text (words, signatures, numerals) from the questioned document.

It is also important that there be an adequate amount of known material in order to allow the examiner to establish the writer’s level of ability and range of writing variation. Twenty to twenty-five exact text exemplars are generally adequate; however, depending on the writer, more specimens may be required. As a general rule too many is always better than not enough.

Suggestions to Follow When Interviewing Suspects and Victims:

Proper preparation for the first interview is important.

1. It may be helpful to obtain non-dictated specimens (preexisting course of business samples) of the person’s writing before the interview. This gives you and the document examiner at the laboratory examples of the person's handwriting or hand printing that was completed prior to the interview. This has distinct advantages if the writer begins to

deliberately distort or disguise his dictated specimens. If course of business samples are not available before the interview, these samples should still be obtained and submitted along with the dictated samples to the Laboratory for examination.

2. Individuals are generally more cooperative on the first interview than on subsequent interviews, so try to get at least 25 samples or more if you feel it's necessary.

3. Non-dictated writings (course of business samples) can be obtained from social, employment, bank, confinement facilities, courts, and other sources. They often include canceled checks, applications, letters, diaries, written requests, telephone and address books, traffic summons, DMV records, etc. A more comprehensive listing of suggested sources for preexisting writings follows at the end of this section.

4. Study the questioned writing prior to the interview. Being familiar with the general form, size, slant, and wording is important. If possible, look for signs of disguise.

5. Gather writing materials for obtaining dictated specimens. They can consist of similar blank forms, and writing instruments, such as ballpoint pens, pencils, felt tip pen, etc. Generally, ballpoint pen shows the most writing line detail, and should be used for obtaining the samples, unless the questioned document was prepared with an uncommon writing instrument such as a chisel point or other wide tip type marker.

6. Decide on an approach that will encourage the writer to be cooperative and to provide specimens voluntarily.

The procedures for obtaining dictated handwriting specimens are as follows:

1. Whenever possible, the investigator should attempt to duplicate the conditions under which the questioned writings were produced. This includes the same type of form, writing instrument, and if known, comparable writing position. To accomplish this it may be necessary to use blank check sample forms, prescription forms, Virginia Uniform Summons forms, etc. If the questioned writing was prepared on a small slip of paper, papers used for the dictated samples should be cut to that size prior to being written on.

2. Do not allow the writer to view, or copy from, the questioned writing directly. That includes the original document or a photocopy.

3. Dictate the full text of the questioned wording and numbers. This can include all the questioned entries on a check, an application form, letter, etc. Ask the person to print where there is hand printing in the questioned material, and to write when there is handwriting.

4. Remove each specimen as it is completed. Number them in the order they were taken. Make sure they are initialed and dated by the suspect.

5. Do not give any instructions on the first few specimens. Let the person write as he or she likes.

6. Then, give instructions that better duplicate the questioned writings, such as writing larger and faster or in a forehand or backhand slant. Make sure the instructions given are noted on the back of the appropriate page(s). Do not, however, instruct the writer on how to spell or

punctuate the known writings.

7. Watch for efforts to disguise. Obvious methods are writing very slowly, or rapidly, or very small or large. Watch for changes in slant.

8. Obtain writing samples from the weak hand. For example, if the person is right handed, instruct him or her to write some samples with the left hand.

9. Whenever possible, supplement the dictated specimens with the non-dictated known writings as previously described. The person could be asked for copies of known writings that are in their possession at the interview.

10. In most cases, it is helpful to the Document Examiner for you to obtain known writings of the victim. These specimens can be obtained from dictation or may consist of numerous samples of course of business writing such as canceled checks. In cases of stolen and forged checks, the suspect may have had access to the victim's signature and may have attempted to copy the victim's signature. Proper evaluation of the potential for any attempt to copy or imitate the writing style of the victim requires the submission of known victim samples.

In summary, when obtaining handwriting samples:

DUPLICATE AS NEARLY AS POSSIBLE THE ORIGINAL CONDITIONS OF THE QUESTIONED WRITING

Making sure the samples are:

- **Comparable** - long hand for comparison to handwriting. Hand printing for comparison to hand printing. Signatures for comparison to signatures. Numerals for comparison to numerals.

- **Representative** - same exact wording

- **Adequate** - enough to obtain the normal range of writing in check cases - 20-25 samples with the full wording of each questioned document (when possible).

Package known items separately from questioned documents.

Suggested Sources of Non-Dictated Writings

The following is a list of possible sources for preexisting known writing which may prove valuable.

Bank Records
Canceled checks
Deposit Slips
Microfilm
Mortgages
Promissory Notes
Safety Deposit Vault Register
Signature Cards
Withdrawal Slips

City Records
Building Department
    Building Permits
City Auditor
    Canceled Checks
City Clerk
    Licenses (e.g. Peddler, Tavern, Special Permits)
    Voter's Registration Lists
Personnel Department
    Civil Service Applications

County Records
County Clerk
    Civil Service Applications
    Claims for Services or Merchandise
    Fishing, Hunting, Marriage Licenses
Purchasing Department
    Bid and Contracts
Register of Deeds
    Deeds
    Birth Certificates
    Public Assistance Applications
    ID Card Applications
Selective Service (Local Board)
    Registrations
Department of Taxation
    State Income Tax Returns
Treasurer
    Canceled Checks

Department Store Records
Applications for Credit
Complaints and Correspondence
Receipts for Merchandise
Signed Sales Checks

Drug Store Records
Register for Exempt Narcotics, Poisons

Employment Records
Applications for Employment
Canceled Payroll Checks
Credit Union
Personnel Jacket, Letters, Memoranda
Receipts for Bonds, Salary, etc.
Withholding Exemption Forms
Work Product (Notes, Ledgers, Sales Checks, etc.)

Federal Records
Civil Service Regional Offices
    Applications (No. 57)
Department of Justice (FBI)
    Fingerprint Cards
Military Records
    Air Force, Army, Coast Guard, Marines, Navy
    (Bases and Stations)
    Record Depots (for Ex-Service Men)
Post Office Department
    Application for P. O. Box
    Registered and Special Delivery Receipts
Social Security Administration
    Applications for Numbers, Benefits
Veterans Administration
    Applications for Benefits, (Veterans & Widows)
U.S. Treasury
    Canceled Payroll Checks

In The Home
Books (Flyleaf Signatures)
Canceled Checks, Notes
Correspondence
Diaries
Insurance Policies
Military Discharge Papers
Notebooks
Passports
Receipts (Rent)
Recipes (Cooking)
Wills

Hospital Records
Admissions, Releases

Hotel and Motel Records
Registrations, Reservations

Insurance Records (Life)
Applications for Insurance

Library Records
Applications for Cards

On the Person
Contents of Wallet (Signed ID Cards of all types)
Letters, Post Cards
Notebooks
Passport

Police and Sheriffs' Department Records
Complaints
Fingerprint Cards
Receipts for Returned Property

Prison Records
Complaints
Requests
Property Receipts
Correspondence located in the cell
Letters or copies of letters sent

Public Utility Records
Applications for Service
- Electricity
- Gas
- Telephone
- Water

Real Estate Records
Property Listing Agreements

Relatives
Letters, Post Cards

School and College Records
Applications for Entrance
Daily Assignments
Registration Cards

State Records
Conservation Files
- Boat, Fishing, Hunting Licenses

Workmen and Unemployment Files
- Unemployment Compensation
- Canceled Checks

Motor Vehicle Files
- Drivers' Files
- Title Files

Personnel Files
Civil Service Applications and Examinations
Corrections Files
- Probation and Parole Reports

Secretary of State
- Application for Notary Public

Taxation Files
- Beverage and Cigarette Tax Applications

State Treasurer
- Canceled Checks

Miscellaneous
Building After-hour Registers
Express Company, Cartage, Movers' Receipts
Rent Receipts to Tenants

ITEM - Charred Documents

METHOD - If the evidence is found in a fireplace or woodstove, the damper must be closed before recovering the charred material. Slide a piece of heavy paper under the charred paper and carefully place on a cushion of tissue paper in a rigid box (cardboard). Be sure to mark the top of the box and indicate this side up. The top should be closed to prevent air currents. If the document is in a movable container, such as an ash tray (consider fingerprints) place the ash tray in a rigid container so that is does not slide and fingerprints are not damaged. If the document is in a larger movable container such as a trash can, either submit the trash can with the charred paper (cover trash can and mark this end up), or if the can has excessive trash in it, carefully attempt to remove the document

by sliding paper under it and proceed as mentioned above (re: fireplace or woodstove). Charred documents are fragile, and for this reason should be hand carried to the nearest laboratory.

DISCUSSION - Charred documents may be successfully examined, but proper handling of this most fragile evidence is very important. The objective is to deliver the evidence to the laboratory in the same condition as it was found.

ITEM - Water-soaked Documents

METHOD - Package evidence so that the moisture content is maintained. Do not attempt to separate any of the layers. Hand-carry to the laboratory as quickly as possible.

DISCUSSION - Water-soaked documents may be successfully separated and deciphered if delivered to the lab expeditiously before any further degradation occurs.

ITEM - Crumpled Documents

METHOD - Do not try to straighten the document - simply place in a rigid container for submission to the laboratory. Again remember the possibility of fingerprints.

DISCUSSION - Excessive handling may damage fingerprint evidence or confuse elements of the handwriting examination.

ITEM - Indented Writing Submission

METHOD - Handle carefully. Do not mark the document or the packaging material with the document already enclosed. Place the document inside a file folder or enclose it between cardboard large enough to cover the document and place in an appropriate size envelope. Label the envelope with instructions not to bend, fold, or stamp the envelope. The document should be packaged securely to limit rubbing and prevent any "surface friction." This can damage the indented writings, limiting the potential for deciphering or recovering them.

DISCUSSION - The cardboard will protect the document from additional indentation. REMEMBER - any type of document could contain indented writings that result in the development of significant investigative leads

ITEM - Obliterated/Eradicated/Altered Documents

METHOD - Handle in the same manner as intact documents.

ITEM - Extended Writings (e.g. lengthy letters, diaries, journals)

METHOD - Submit the entire questioned document using the same procedures and precautions as for intact documents.

For dictated known samples, have the suspect repeat the entirety of the questioned body of writing 7-10 times. In cases involving extremely large bodies of questioned writing choose a representative sample (paragraph or several lines) from each page and have the suspect repeat the writing from each page 7-10 times.

ITEM - Typewriting and Typewriters (and typewriter components)

METHOD - The intact typewritten document should be handled as previously described in the Intact Documents Section. Any suspect typewriters should be submitted along with any extra typing elements or wheels and any known standard specimens. The typewriter should be hand carried to the Laboratory. If the suspect typewriter cannot be submitted to the Laboratory, the Questioned Document Section should be contacted directly for advice on obtaining known samples from it. It is always best to submit the entire typewriter to the lab for a complete examination.

Typewriter ribbons should be submitted with the ribbon still on the machine. As with typing elements and wheels, any extra ribbons should also be submitted for examination. If the machine is not being submitted remove the ribbon cassette from the typewriter and package it in a box of the appropriate size. If the ribbon is loose (not a cassette) secure the ribbon spools so the ribbon will not become unraveled. If the ribbon is of the carbon film type (readable) it SHOULD NOT be used for obtaining any known samples from the suspect typewriter. In that case a fresh ribbon would need to be used for the samples.

ITEM - Check writer and/or Pricing Labeler

METHOD - Same as for Typewriting above.

ITEM - Torn Documents

METHOD - Do not attempt to piece the torn document back together. Instead carefully place all the pieces in an envelope prepared for submission to the laboratory.

DISCUSSION - Excessive handling may destroy important information.

ITEM - Inks/Writing Instruments

METHOD - Handle and submit the questioned document in the same manner as in Intact Documents. Package the writing instrument in an appropriate size box or envelope.

ITEM - Matches/Other Torn Paper

METHOD - Used (meaning partially burnt) and unused matches may be associated or fracture matched back to the matchbook from which they were torn. Package the match in a crush proof container such as a pill box. Package the match book in a separate container that will also protect it from damage. A small box would be ideal. KEEP AWAY FROM EXCESSIVE HEAT AND DO NOT SEND THROUGH THE MAIL. Remember the possibility of a Latent Print examination.

Fragments of torn paper can also be fracture matched back to the sheet from which they were torn. These items are fragile, especially along their torn edges, and should be handled carefully.

ITEM - Paper

METHOD - Paper products (e.g. sheets, envelopes) may be examined for dimensions, weight, color, texture, watermarks, composition, rulings, indentations and other important characteristics in order to determine whether two or more could have originated from the same source.

Safety Measures

Documents that are believed to be contaminated with physiological fluids should only be handled while wearing latex or other suitable gloves. Documents of this type can be found at the scenes of homicides, sexual and other types of assaults, B&Es, or may be found on the person of the suspect when he or she is arrested. If documents are known to be blood-soaked, then safety glasses, gloves, and protective clothing should be worn. Documents of this type should be submitted indicating the BIOHAZARD potential. The laboratory can provide BIOHAZARD stickers for this type of evidence. The documents should be air dried prior to submission to the Laboratory.

Bodily fluids, wet or dry, may carry diseases, so proper safety precautions must be observed. Dry stains may flake when disturbed or collected, sending minute particles airborne. These may be absorbed through mucus membranes (eyes, nose, mouth) or through open cuts or through chapped skin.

Packaging for Transporting to the Laboratory

Questioned and known documents should be packaged separately. It is not necessary to package each questioned item in its own individual envelope or check protector. The questioned checks or other evidence can be packaged in most any kind of envelope or plastic evidence bag as long as it fits without folding. If documents are damp or wet, they should be permitted to air dry first before they are submitted. Wet items should not be sealed in plastic except for immediate transporting to the laboratory.

Evidence packaging should be labeled **prior** to putting the questioned documents in the container. If the questioned documents are put in an envelope and the envelope is marked, then there is a good possibility that indented writings will be imparted on the questioned documents. This should be avoided. Always label the packaging material before placing the document in the envelope.

Evidence containers (e.g. envelopes) should be large enough to hold the document evidence without having to fold it.

The use of plastic ‘document protectors’ is not recommended. These so called ‘document protectors’ often do more harm by lifting off layers of toner (e.g. photocopies, laser printed documents), and even some inks can be adversely affected. If you find that you must use a ‘document protector’ you can remedy this problem by placing an intervening sheet of plain white bond paper between the document and the plastic holder.

Regarding document identification, investigators should accurately describe the document in the field notes and should photograph or photocopy it to record things such as check number, date, payee name, etc., so that the document does not have to be physically marked for identification. The packaging material should be clearly labeled with the date, item description, officer's name, case number, item designation. If a document must be marked (your department policy), then it should be done discretely in an area that is not near the questioned entries. A pencil can be used to mark document evidence. If a latent print is later developed where the identification marking was written, then it can be erased and the latent print can be examined.

Marking the document may hamper later efforts to develop latent fingerprints, and could also interfere with efforts to decipher and recover any indented writing from the document.

Mold formed as a result of sealing wet (or even damp) documents in air-tight containers damages paper fibers and inks, and for this reason should be avoided.

SUBMISSION REMINDERS

Clearly separate known and questioned documents, and indicate such on the laboratory request.

Whenever possible, submit the original questioned and known documents.

The "Handwriting Samples Forms" packets supplied by the DFS are designed for use in check and credit card cases only, and may not be appropriate for other types of cases, such as those involving Virginia Uniform Summonses, Public Assistance documents, anonymous letters, bomb threats, robbery/demand notes, or credit card application forms. It is preferred that forms similar to the questioned one(s) be used whenever possible. This may mean photocopying a blank form like the questioned one 20-25 times, and having the writer provide dictated samples on each copy. You can usually obtain blank forms from the source (e.g. bank, business, law office, DMV).

Generally, each questioned document should be submitted as a separate item of evidence. An exception to this might be appropriate in large volume questioned check cases (e.g. twenty or more) when it is suspected that all were written by the same individual. Also, keep in mind that the rule of thumb is each separate offense requires a separate lab submission.

The known writings of one person may be contained in the same envelope and listed as a single item. Even if they total 10, 15 or even 20 separate specimens, as long as all were written by the same person they may be combined as a single item.

Make sure that the known writings are:

- Comparable - e.g., handwriting for handwritten questioned document
- Representative - same wording
- Verbally dictated
- Removed from sight of writer as each is completed
- Adequate - 20-25 in check cases. Also submit non-dictated samples whenever possible, such as business correspondence, memos, notes, etc

The use of the old style Q1 and K1 designators has been replaced with numerical Item designators that are used in the Laboratory's Automated Information Management (computer) System. If possible, please number the Items you are submitting, and keep those same numbers if those same Items are resubmitted at a later date for additional examinations.

For secondary submissions involving the same case, make sure to reference the original submission using the DFS Lab case number. Also, maintain consistency in your Item designations. For example, if you are submitting additional known writings from a particular individual and the original known writings for that individual were designated as number 5 then this new set of known writings would be

designated with the next available number.

When submitting photocopies or photographs rather than originals, please describe them as such in the “Evidence Submitted” section of the laboratory request form.

Use envelopes that are large enough that you do not have to fold the documents being submitted for examination.

Submit your evidence ASAP. Often times we’ll recommend that additional writings be obtained and submitted for a more comprehensive examination. Submitting early helps to insure that we’ll be able to meet your court suspense.

Protect document evidence by avoiding exposure to moisture, heat, and strong light sources.

Don't handle the documents excessively, and don’t carry them around in your pocket.

Don't write on the questioned document or on packaging material while questioned document is enclosed.

Don't dust or chemically treat for latents prior to document examination.

Don’t use plastic document protectors.

Don’t staple the laboratory request to the evidence container.

If questioned documents represent separate trials, then have separate Laboratory Requests for each case.

When in doubt about any aspect of a Questioned Document case, please call the Forensic Laboratory. The examiners at each Lab are available to go over any case with you prior to submission or during the investigation. Chances are we have seen a case similar to yours and can offer some helpful suggestions.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Brian Ellis

Telephone #: (312) 323-4445

E-mail Address: bellis@metropd.gov

Agency and Address: Metro Police Department
100 Main Street
Metro City, VA 23332

Agency Case Number: 960615-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): ADAMS, George Lee **DOB** 7/09/64 **Race** W **Sex** M

Names of Suspects (Last, first, mid): WASHINGTON, Thomas Lloyd **DOB** 3/23/69 **Race** W **Sex** M

Date and Type of Offense: 06/19/96 Forgery, Larceny **Court Date:** Pending

Examinations Requested: Handwriting analysis, Latents **Jurisdiction of Offense:** Metro City, VA

Brief Statement of Fact: Suspect allegedly stole a check from the victim, then wrote it and cashed it for $250.00

Specify manner of return of evidence: Mail XXX Personal Pick-up _____

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. Check # 123 from the account of George Adams: Questioned Documents - compare to items 2 and 3.
Latents - compare to item 4.

2. Writing samples from Thomas Washington

3. Writing samples from George Adams

4. Known inked fingerprints of Thomas Washington

EXAMPLE OF A SINGLE CHECK FORGERY CASE SUBMITTED FOR HANDWRITING COMPARISON AND FINGERPRINT ANALYSIS

For DFS use only

Submitting Officer (Print) Brian Ellis

(Sign.) Brian Ellis Date 06/21/96 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Investigator Janice W. Smith

Telephone #: (333) 525-6688

E-mail Address: smithjw@mainstreampd.org

Agency and Address: Mainstream Police Department
100 Creek Road
Mainstream, VA 45044

Agency Case Number: 950707-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): STONE, William Lee **DOB** 3/11/55 **Race** W **Sex** M

Names of Suspects (Last, first, mid): REED, Steven David **DOB** 6/10/61 **Race** W **Sex** M

Date and Type of Offense: 7/07/95 Larceny, Forgery **Court Date:** Pending

Examinations Requested: Handwriting analysis **Jurisdiction of Offense:** Mainstream, VA

Brief Statement of Fact: Reed is suspected of stealing 6 checks from Stone, writing all of them and cashing them for over $500.00

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. Check #129: Questioned Documents - compare to items 7 and 8.

2. Check #130: Questioned Documents - compare to items 7 and 8.

3. Check #131: Questioned Documents - compare to items 7 and 8.

4. Check #132: Questioned Documents - compare to items 7 and 8.

5. Check #133: Questioned Documents - compare to items 7 and 8.

6. Check #134: Questioned Documents - compare to items 7 and 8.

7. Writing samples from Steven Reed

8. Writing samples from William Stone

page 1 of 1

EXAMPLE OF A MULTIPLE CHECK CASE SUBMITTED FOR HANDWRITING COMPARISONS

For DFS use only

Submitting Officer (Print) Janice W. Smith

(Sign.) Janice W. Smith Date 7/15/95 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Inspector Harold Callahan

Telephone #: (804) 222-8585

E-mail Address: hcall12@gothampd.org

Agency and Address: Gotham City Police Department
100 Main Street
Gotham City, VA 23319

Agency Case Number: 20020811-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): Gotham City Bank **DOB** NA **Race** NA **Sex** NA

Names of Suspects (Last, first, mid): Unknown **DOB** _____ **Race** _____ **Sex** _____

Date and Type of Offense: 8/11/02 Robbery **Court Date:** Pending

Examinations Requested: Indented writing and an other exam you deem appropriate **Jurisdiction of Offense:** Gotham City, VA

Brief Statement of Fact: An unknown white male handed the bank teller a demand note and left with over $10,000.00.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)** ITEM# 1. Handwritten note on a torn piece of notebook paper: Questioned Documents

page 1 of 1

EXAMPLE OF A FIRST SUBMISSION ON A ROBBERY/DEMAND NOTE CASE WITH AN UNKNOWN SUSPECT

For DFS use only

Submitting Officer (Print) Harold Callahan

(Sign.) Harold Callahan Date 8/11/02 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Inspector Harold Callahan

Telephone #: (804) 222-8585

E-mail Address: hcall12@gothampd.org

Agency and Address: Gotham City Police Department
100 Main Street
Gotham City, VA 23319

Agency Case Number: 20020811-#### **Previous submission** ☒ **Yes** ☐ **No** **Previous FS #:** C02-12345

Names of Victims (Last, first, mid): Gotham City Bank **DOB** NA **Race** NA **Sex** NA

Names of Suspects (Last, first, mid): SMITH, Henry Alan **DOB** 10/11/70 **Race** W **Sex** M

Date and Type of Offense: 8/11/02 Robbery **Court Date:** 9/10/02

Examinations Requested: Handwriting, ink and paper exams **Jurisdiction of Offense:** Gotham City, VA

Brief Statement of Fact: Smith was arrested as a suspect. A notebook and pen were recovered from his vehicle. Known writing samples from the suspect were also obtained.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 2. Known writings (dictated and collected) of Henry Smith: Questioned Documents - please compare to the previously submitted item # 1 note to determine if he wrote it.

3. One notebook, brand name "Meade": Questioned Documents - please determine if item # 1 came from this notebook.

4. One ink pen: Questioned Documents - please determine if this pen was used to write item # 1.

page 1 of 1

EXAMPLE OF A SECOND SUBMISSION ON A ROBBERY/DEMAND NOTE CASE WITH NEW EVIDENCE COLLECTED FROM A SUSPECT

For DFS use only

Submitting Officer (Print) Harold Callahan

(Sign.) Harold Callahan Date 8/15/02 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Detective Adam Smith

Telephone #: (804) 222-3324

E-mail Address: asmith@metropd.gov

Agency and Address: Metro Police Department
100 Main Street
Large City, VA 23333

Agency Case Number: 20030307-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): BRYANT, Mary Alice (infant) **DOB** 12/12/2002 **Race** W **Sex** F
BRYANT, Anne Marie (mother) 8/05/63 W F

Names of Suspects (Last, first, mid): DANIELS, Robert Earl **DOB** 11/15/69 **Race** W **Sex** M

Date and Type of Offense: 3/07/03 Abduction **Court Date:** Pending

Examinations Requested: Handwriting analysis, Latents **Jurisdiction of Offense:** Large City, VA

Brief Statement of Fact: Anne Bryant's infant daughter was abducted from the shopping mall. A handwritten ransom note was left behind.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. A three page handwritten note with an accompanying envelope: Questioned Documents - compare handwriting to items 2 and 3. Latents - compare to items 4 and 5.

2. Writing samples from Robert Daniels

3. Writing samples from Anne Bryant

4. Known inked fingerprints of Robert Daniels

5. Known inked fingerprints of Anne Bryant

EXAMPLE OF A RANSOM NOTE CASE SUBMITTED FOR HANDWRITING COMPARISON & FINGERPRINT ANALYSIS

For DFS use only

Submitting Officer (Print) Adam Smith

(Sign.) Adam Smith Date 3/08/2003 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Detective Ralph W. Weems

Telephone #: (813) 333-2222

E-mail Address: weemsrw@capcitypd.org

Agency and Address: Capitol City Police Department
100 State Street
Capitol City, VA 23111

Agency Case Number: 20060306-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): LANE, Margaret Louise **DOB** 1/11/52 **Race** W **Sex** F

Names of Suspects (Last, first, mid): BROWN, Ronnie Lee **DOB** 8/15/93 **Race** W **Sex** M

Date and Type of Offense: 3/06/06 Larceny **Court Date:** Pending

Examinations Requested: Questioned Documents (ink exams) **Jurisdiction of Offense:** Capitol City, VA

Brief Statement of Fact: Ms. Lane claims she wrote Brown a check for $8.00 as payment for her monthly newspaper delivery, however the check was cashed for $80.00.

Specify manner of return of evidence: Mail XXX Personal Pick-up _____

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. Check # 802: Questioned Documents - please examine the ink on item 1 to see if there is any evidence of an alteration. If possible, please determine how much the check was originally written for.

EXAMPLE OF AN ALTERED DOCUMENT (CHECK) CASE SUBMITTED FOR INK ANALYSIS

For DFS use only

Submitting Officer (Print) Ralph W. Weems

(Sign.) Ralph W. Weems Date 3/10/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

TOXICOLOGY

Contact Us

If you have any questions concerning the Toxicology laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Toxicology Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**Dr. Les Edinboro**	**(804) 786-4707 ext. 2-3275**
	Dr. Julia Pearson	**(804) 786-4707 ext. 2-9472**
Eastern	**Dr. Connie Luckie**	**(757) 683-8327 x 1401**
Northern	**Dr. Carol O'Neal**	**(703) 764-4614**
Western	**Dr. James Kuhlman**	**(540) 561-6600**

OVERVIEW

The toxicology section analyzes blood and other biological samples for the presence of alcohol, drugs and poisons. Types of cases analyzed include DUI/DUID, drug-facilitated sexual assault, death investigations, poisonings and manslaughter cases. In addition, the toxicology section includes an alcoholic beverage laboratory supported by the Virginia Department of Alcoholic Beverage Control.

CAPABILITIES AND SERVICES

Volatile compounds (ethanol, methanol, isopropanol, acetone)

Drugs of abuse

Over the counter and prescription medications

Alcoholic Beverage Content and Class

Miscellaneous (heavy metals, carbon monoxide)

COLLECTION GUIDELINES

ITEM - DUI/DUID Samples (Collected pursuant to implied consent 18.2-266)

METHOD - Use a DUI/DUID kit provided by the Department of Forensic Science. This kit includes two blood vials, two Certificates of Blood Withdrawal, povidone iodine swab to cleanse arm, and evidence seals. Please submit a RFLE with the kit indicating suspected intoxicant (alcohol or specific drugs).

Have a physician, registered professional nurse, graduate laboratory technician or a technician or nurse designated by order of a circuit court use the povidone iodine swab to cleanse the arm and withdraw blood into the two vacutainer tubes provided by the Department of Forensic Science (18.2-268.5).

The vials shall be sealed by the person taking the sample or at his direction. The person who seals the vials shall complete the prenumbered certificate of blood withdrawal forms and attach one form to each vial. The vials shall be placed in a container provided by DFS and the container shall be sealed to prevent tampering with the vials (18.2-268.6). Promptly transport or mail the DUI container to the DFS Richmond Laboratory.

DISCUSSION - Once the analysis is complete, the completed Certificate of Analysis with the certificate of blood withdrawal will be returned to the clerk of the court in which the charge will be heard (not the submitting or arresting officer). Upon completion of the analysis, DFS will preserve the remainder of the blood sample for 90 days after the offense date. DFS will then destroy the remainder of the blood sample if no notice of or court order to transmit the blood sample to an independent laboratory is received (18.2-268.7).

ITEM – Non-implied consent cases (Biological samples collected pursuant to search warrant or means other than implied consent)

Examples of cases include possession of controlled substance, child endangerment, manslaughter, maiming or any other type of non-DUI offense in which the arresting officer is interested in determining whether or not the suspect had consumed alcohol or drugs.

If the suspect had used or ingested drugs recently (<6 hrs), blood samples would provide the most probative evidence. If more than 6 hours has passed since the suspected time of drug use, then both blood and urine samples should be collected from the suspect.

METHOD - The DUI kits provided by DFS can be used to collect blood samples. Alternatively, blood, urine or other biological samples can be collected by medical personnel using blood vials and containers provided by the medical facility. When submitting hospital vials and containers, please make sure they are leak proof prior to submission. Submit an RFLE with the evidence, including the nature of the offense, manner in which evidence was collected (search warrant) and types of examination requested (ethanol or specific drugs).

DISCUSSION - Once the analysis is complete, the evidence and Certificate of Analysis will be returned to the investigating officer.

ITEM - Drug-Facilitated Sexual Assault Cases

In cases alleged drug-facilitated sexual assault, both blood and urine samples should be collected if the alleged drugging occurred within 12 hours of examination. If alleged drugging occurred more than 12 hours prior to examination, collect and submit urine sample only.

METHOD - The small purple top blood tube in the PERK kit does not provide enough sample for a complete toxicological investigation, so additional blood and urine samples are required for the investigation of a drug facilitated sexual assault. When collecting evidence, request the SANE nurse collect 2 blood samples ***and*** a urine sample if the rape occurred less than 12 h prior to examination. If the rape occurred more than 12 h prior to examination, instruct the SANE nurse to collect a urine sample **only**. Keep these samples separate from the PERK and submit them to the laboratory as a separate item with a request for toxicological examination. The investigator or SANE nurse should also fill out the *Questionnaire for Drug-Facilitated Sexual Assault Cases* (located inside the PERK kit).

DISCUSSION - The sooner blood and urine samples are collected after the alleged assault, the greater the chance of detecting drugs that are quickly eliminated from the body.

ITEM - Alcoholic Beverage

Suspected alcoholic beverages may be submitted to the toxicology laboratory to determine alcohol content or beverage class. Determination of alcohol content requires at least one ounce of liquid and determination of beverage class requires at least 3 ounces of liquid.

METHOD - Submit original container whenever possible. If the original container is open or could potentially leak, please transfer at least 1-3 ounces of liquid to a clean glass screw top bottle prior to submission. Unopened beverages labeled with alcohol content will not be analyzed. If evidence contains multiple samples (i.e. unopened 12 pack) submit one item from each brand for analyses. Please indicate what type of testing is required on RFLE.

DISCUSSION - Alcohol evaporates easily so make sure evidence is sealed tightly and refrigerate if possible.

ITEM - Poisoning Cases

Poisoning cases are extremely rare and require specific handling and collection. Please contact the toxicology or trace laboratory for suggestions and instructions on submission of poisoning cases. Items such as empty bottles, partially eaten food, liquid from glasses or other containers, medicinal products, as well as many other possibilities, may be the key piece of evidence in these cases. Depending on the nature and circumstances of the poisoning, evidence may be analyzed by toxicology, trace or drug sections.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Deputy Ronald J. Brown

Telephone #: (804) 730-6110

E-mail Address: rbrown@localsheriff.org

Agency and Address: Local County Sheriff's Office
P.O. Box 119
Local, VA 23007

Agency Case Number: 970719-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): BOURBON, Randy **DOB** 05/25/93 **Race** W **Sex** M

Date and Type of Offense: 7/19/06 Underage Possession of Alcohol **Court Date:** 8/15/06

Examinations Requested: Toxicology (analysis to determine alcohol content of substance) **Jurisdiction of Offense:** Local Co.

Brief Statement of Fact: Responded to a call of a loud party and found alcoholic beverges in a Juvenile's possession.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)**
	ITEM# 1. Clear plastic bag containing one specimen cup containing a pinkish liquid believed to be Wild Berry wine cooler

For DFS use only

Submitting Officer (Print) Ronald J. Brown

(Sign.) Ronald J. Brown Date 07/24/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Deputy Ronald J. Brown

Telephone #: (804) 730-6110

E-mail Address: rbrown@localsheriff.org

Agency and Address: Local County Sheriff's Office
P.O. Box 119
Local, VA 23007

Agency Case Number: 20010719-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): PYLE, Gomer **DOB** 11/20/62 **Race** W **Sex** M

Date and Type of Offense: 07/19/06 DUI **Court Date:** 08/15/06

Examinations Requested: Toxicology (test for Alcohol, Cocaine & Marijuana) **Jurisdiction of Offense:** Local Co.

Brief Statement of Fact: Suspect was arrested for DUI after poor performance on field test.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)** ITEM# 1. One DUI kit containing two vials of suspect's blood

For DFS use only

Submitting Officer (Print) Ronald J. Brown

(Sign.) Ronald J. Brown Date 07/20/01 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Deputy Ronald J. Brown

Telephone #: (804) 730-6110

E-mail Address: rbrown@localsheriff.org

Agency and Address: Local County Sheriff's Office
P.O. Box 119
Local, VA 23007

Agency Case Number: 20010719-####

Previous submission ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): **DOB** _____ **Race** _____ **Sex** _____

Names of Suspects (Last, first, mid): PYLE, Gomer **DOB** 11/20/62 **Race** W **Sex** M

Date and Type of Offense: 7/01/06 Felony DUI, hit and run **Court Date:** 8/15/06

Examinations Requested: Toxicology (test for alcohol and drugs) **Jurisdiction of Offense:** Local Co.

Brief Statement of Fact: Suspect's blood was taken via search warrant. Strong odor of alcohol. Crack cocaine and marijuana found in vehicle.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)** ITEM# 1. One DUI kit containing two vials of suspect's blood

page 1 of 1

For DFS use only

Submitting Officer (Print) Ronald J. Brown

(Sign.) Ronald J. Brown Date 07/20/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

TRACE EVIDENCE

Contact Us

If you have any questions concerning the Trace Evidence laboratory examination capabilities or evidence handling procedures, please call the Training Section or the Trace Evidence Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**Josh Kruger**	**(804) 786-4707 ext. 2-0178**
or Northern	**Eileen Davis**	**(804) 786-4707 ext. 2-7618**
Eastern	**Brenda Christy**	**(757) 683-8327 x 1467**
Western	**Anthony Brown**	**(540) 561-6600**

EXPLOSIVES AND EXPLOSIVE RESIDUES OVERVIEW

Analysis for explosives or explosives residues may include commercial, military or improvised explosive devices. Explosives are generally classified as either low or high.

Low explosives are primarily used as propellants and are designed to generate large volumes of gas. They have a pushing, rather than a shattering effect and must be properly confined and ignited to explode, as in a pipe bomb. Examples of low explosives are black powder, black powder substitutes, smokeless powder, flash powder, match heads and fireworks powder. Low explosives can be ignited with a flame.

High explosives detonate and do not need to be confined to explode. They are designed to shatter and destroy. Examples include initiating explosives such as mercury fulminate and lead azide, commercial explosives such as Tovex, ANFO and dynamite, and military explosives such as TNT, RDX and C-4. Primary high explosives are extremely sensitive to shock, friction, flame and/or heat and are often packaged as blasting caps. Primary high explosives are **HAZARDOUS**. Secondary high explosives are relatively insensitive to shock, friction, flame and/or heat. They must be initiated with a shock wave, often produced by a primary high explosive.

Improvised Explosive Devices (IEDs) can be constructed with a variety of common filler materials such as black powder, black powder substitutes, powder from fireworks, match heads and chlorate/sugar mixtures. Containers most frequently encountered are threaded metal or PVC pipe nipples with end caps; however, the function and design possibilities are virtually unlimited. Nails or other sharp metal objects may be added as shrapnel.

Bottle bombs are constructed by confining expanding gases in a capped plastic bottle such as a soda or water bottle.

Acid or base bottle bombs are made by adding a mixture of an acid and aluminum foil to a capped bottle. The acids are typically battery acid or toilet bowl cleaners, such as “The Works”. Alternately, a base such as sodium hydroxide, found in Red Devil Lye or Drano, may be mixed with aluminum foil and water.

Chemical reaction bottle bombs can be made with granular pool chlorine (such as HTH), sugar, and water. A soda containing sugar may be substituted for the water.

Physical reaction bottle bombs are made using carbon dioxide (CO_2) or liquid nitrogen. (LN_2). These bombs leave no chemical residue; however, there will be physical indications that the bottle has exploded.

CAPABILITIES AND SERVICES

Identification of Improvised Explosive Device (IED) components and construction to include measurements, initiating mechanism, analysis of explosive fillers and residues, labeling, markings and intended function.

Identification of unconsumed low explosive powder

Identification of high explosives

Analysis of bottle bombs

COLLECTION GUIDELINES

ITEM - Intact, live explosive devices

METHOD - USE EXTREME CAUTION. The lab will not accept live explosive devices.

DISCUSSION - Either qualified individuals in your agency or an agency that will assist such as the Virginia State Police or the Bureau of Alcohol, Tobacco, Firearms & Explosives must render the device safe prior to laboratory submission. State on the RFLE how the device was rendered safe.

ITEM - Post-blast or render-safe evidence

METHOD – Place fragments with sharp, jagged edges or suspected volatile materials in clean, unused, lined, metal paint cans. Look for materials with porous surfaces near the seat of the blast that may have explosive residues embedded in them. Also, collect comparison samples of porous materials consistent with that found in the suspected explosive-containing samples (e.g. wood, soil, carpet, etc.). If the sample for explosive residues analysis is concrete then the comparison sample would consist of concrete that contains no suspected explosive residues. It is recognized that it is not always possible to obtain comparison samples. Place the porous materials in a clean, unused, lined, metal paint can. Look for wires, clocks, timers, batteries, fuses and wrappers. This type of evidence may be placed in a plastic bag unless there is also a request for latents; if so, use a cardboard box, securing the evidence to eliminate friction within the container.

DISCUSSION - Materials should be packaged in a manner so as not to cause further damage. Volatile materials will evaporate unless placed in an air-tight container. Comparison samples of porous materials assist the lab in determining what interferences may be present from the substrate material itself.

ITEM - Unconsumed low explosives

METHOD - Place whole powder in a film canister, no greater than ½ full, or another container hat will protect it from heat, shock, friction or sparks. Do not place black powder, black powder ubstitutes, smokeless powder or flash powder in regular plastic bags.

DISCUSSION - Static electricity from regular plastic bags may cause ignition of the low explosive powders.

ITEM - Undetonated Secondary High Explosives

METHOD - Collect a small sample and package in a glass vial, plastic bag or clean, unused, lined metal paint can. If suspected nitroglycerin-based dynamite, package in a clean, unused, lined metal paint can. Include information from the package or wrapper on the RFLE.

DISCUSSION - Only a small portion of the entire material is necessary for analysis. For example, a one inch piece from a two pound block of C4 military explosives. These types of secondary high explosives are insensitive to heat and friction.

ITEM – Pyrotechnic safety fuse or detonation cord

METHOD - Collect no more than approx. a 6 inch piece of fuse or cord, wrap in paper and place in a plastic bag. If a fracture match exam is requested, protect the ends of the fuse or cord and submit the known fuse or cord for comparison.

DISCUSSION – Only a small portion of the entire material is necessary for analysis. The exposed ends tend to leak powder and therefore, wrapping in paper contains the powder.

ITEM - Bottle Bombs

METHOD - Remove any liquid and package separately in plastic. If possible, separate out any foil and package in plastic. Package bottle separately in plastic. **DO NOT USE METAL.** Glass containers may be used instead of plastic; however, the lid must have no metal.

DISCUSSION - These materials continue to react when exposed to metal so metal should never be used in packaging.

ITEM – Fireworks

METHOD – Do not submit intact, commercial fireworks unless absolutely necessary. Call the lab prior to doing so. Do submit fireworks that are part of an IED, have been modified or may have been the source of the filler in an IED. Submit these fireworks as a part of the IED or place them in a clean, unused, lined metal paint can.

DISCUSSION - The Code of Virginia §27-95 distinguishes between legal and illegal fireworks based upon their function not their chemical composition. Setting off the fireworks while filming their action is typically sufficient for prosecution. Analysis of fireworks may be important if the firework or its powder is part of a device.

SUBMISSION REMINDERS

NEVER submit live devices or intact blasting caps. Any intact device must be rendered safe by qualified personnel prior to submission.

Merely removing a fuse from a pipe bomb DOES NOT render it safe.

Preferred packaging for sharp metal objects or volatile material is a clean, unused, lined metal paint can.

Preferred packaging for bottle bombs is plastic. These devices may contain a strong acid or strong base and should be handled with **EXTREME CAUTION.**

Provide as much information related to the incident on the RFLE as possible: What was the target? Can witnesses describe smoke, sound and flash?

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Captain Samuel Dooright

Telephone #: (808) 786-4787

E-mail Address: Sam.Dooright@Bomb.blast

Agency and Address: Bureau of Bomb Blast
350 Skyhigh Blvd.
Cratersville, VA 33380

Agency Case Number: 20060713-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): Grandma's Country Store **DOB** NA **Race** NA **Sex** NA

Names of Suspects (Last, first, mid): MITE, Diana **DOB** 5/10/69 **Race** W **Sex** F

Date and Type of Offense: 7-13-06 Bombing **Court Date:** 09/20/06

Examinations Requested: Trace (Explosives), Latents **Jurisdiction of Offense:** Cratersville, VA

Brief Statement of Fact: A building was leveled to the ground by an explosion which occurred due to a bomb planted at the rear door. Store owner and suspect had argument over food bill earlier in the day.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1.Bomb fragments from scene. (ID explosives, possible fingerprints)

2. Soil from seat of blast. (ID explosives)

3. Sample of soil from area adjacent to seat of blast. Comparison sample for Item #2.

4. Unknown material (suspect explosive) not consumed at seat of blast. (ID explosive)

5. Unknown material (suspect explosive) obtained from suspect's vehicle (ID explosive and compare to Items 1, 2 &4).

6. Known fingerprints of suspect (compare to Item #1).

For DFS use only

Submitting Officer (Print) Samuel Dooright

(Sign.) *Samuel Dooright* Date 7-15-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

FIRE DEBRIS OVERVIEW

Fires often involve the use of an ignitable liquid used as an accelerant which is a material used to spread and increase the rate and intensity of burning. Fire debris and other associated evidence is examined for the presence of ignitable liquids. The ignitable liquids identified are often petroleum products such as gasoline, kerosene, or charcoal starter fluids. They may also be nonpetroleum-based ignitable liquids such as alcohols, acetone, or turpentine. The results of laboratory examinations serve to assist the investigator to ultimately determine whether a fire was caused by arson or by other incidental means.

CAPABILITIES AND SERVICES

Identification of ignitable liquids from whole liquid samples and fire debris.

COLLECTION GUIDELINES

ITEM – Suspected Ignitable Liquids such as gasoline, kerosene, charcoal starter fluids, alcohols, etc.

METHOD – Place no more than 1 ounce of liquid directly into a small, clean, unused, lined metal paint can. Alternatively, a glass jar may be used as long as the cap/cap lining is inert (yes – Teflon, polyethylene, foil; no – paper, cardboard, wax, rubber) and the glass jar is protected from breakage by placing it into a can which has been filled with packing material to cushion the glass jar. A polyethylene plastic bottle with a polyethylene cap would also be appropriate.

Do not submit a ***fuel container*** which contains liquid. The liquid must be removed from the container and only 1-2 tsps. submitted as noted above. Unless there is a request for latent fingerprints on the container, there is no need to submit the entire container.

Empty fuel containers must either have their caps attached securely or must have the container openings closed over and sealed shut. Multiple layers of plastic secured over the openings with tape are suitable for this purpose.

DISCUSSION – The laboratory only needs a small amount of liquid for analysis. Larger quantities of liquid are unnecessary and create a potential for contamination. Fuel containers with liquid often leak or spill. Glass jars with inappropriate lids or plastic bottles other than polyethylene are not appropriate as the ignitable liquid can dissolve these materials leading to contamination or loss of the evidence sample. Not all plastics are appropriate as lids or containers.

ITEM – Molotov Cocktails

METHOD – Remove liquid from container and package 1-2 tsps. directly into a small, clean, unused, lined, metal paint can. Alternatively, a glass jar as described above may be used. Remove the wick and package in a separate clean, unused, lined, metal paint can. After air drying, package the container so as to avoid the loss of possible latent fingerprints. If liquid is removed from the Molotov cocktail, the wick and container will generally not be examined for ignitable liquids.

If the container is broken, no liquid is present and there is a wick: Package the wick in a clean, unused, lined, metal paint can. Package the remains of the container in a separate clean, unused, lined, metal paint can.

If the container is broken, no liquid is present and there is no wick: Package remains in a clean, unused, lined, metal paint can.

ITEM – Fire Debris Samples

METHOD - Collect porous materials from the area at the interface between heavily charred areas and areas of marginal burn near the point(s) of origin. Package in clean, unused, lined, metal paint cans. Fill the can no more than 3/4 full with debris.

DISCUSSION - Paint cans protect ignitable liquids from evaporation and contamination and when filled only 3/4 full provide a means for efficient extraction in the lab.

ITEM – Comparison Samples

METHOD - Collect comparison samples which contain unburned materials consistent with that found in the fire debris sample, e.g. wood, carpet, tile, etc. Avoid collecting comparison samples from areas where accelerants may have been poured, splashed, tracked, etc. If the fire debris sample is charred carpet and foam padding then the comparison sample would consist of carpet and foam padding from an area that is believed to contain no ignitable liquid. It is recognized that it is not always possible to obtain a comparison sample due to the extensive damage caused by a fire.

Package in clean, unused, lined, metal paint cans. Fill the can no more than 3/4 full with the comparison sample.

DISCUSSION - Comparison samples assist the lab in determining what interferences may be present from the substrate material itself.

ITEM – Evidence Too Big For A Paint Can

METHOD - Cut the evidence to fit into one or more clean, unused, lined, metal paint cans. Fill each can no more than ¾ full. Indicate on the RFLE that these items can be combined.

If the evidence absolutely cannot fit into one or more clean, unused, lined, metal paint cans, then wrap the evidence multiple times (3-4) in heavy plastic. Submit this evidence ASAP – same day or next day. Call the lab before submission to inform them that evidence packaged in this manner is on its way.

ITEM – Suspected Ignition Sources such as candles, matches, fusees, or fireworks.

METHOD - A clean, unused, lined metal paint can is appropriate for any of these materials.

ITEM – Hazardous Materials or “Dumping” Samples

METHOD – If sample is liquid, follow the guidelines for Suspected Ignitable Liquids. For non-liquids, package the material in a clean, unused, lined, metal paint can. Fill the can no more than ¾ full with material.

DISCUSSION – The only samples accepted will be those that require only the identification of an ignitable liquid. For instance, the Trace Evidence Section does not conduct flash point examinations or the analysis of PCB's in oil. These types of analyses will be referred to the Division of Consolidated Laboratory Services. Please call the Trace Evidence Section with questions regarding these types of samples.

SUBMISSION REMINDERS

NEVER air dry evidence for fire debris analysis. This type of evidence is **VOLATILE**; it evaporates. The sooner the evidence is placed in an airtight metal paint can the better the chance of recovery of ignitable liquid residues.

Preferred packaging for evidence is clean, unused, lined, metal paint cans. Make sure the lids are on tight.

Fill cans no more than ¾ full of fire debris.

When submitting liquids, put no more than one ounce in a paint can or glass jar. If using a glass jar, the lid must be appropriate and the jar must be protected from breakage.

When submitting liquids from a labeled container, photocopy the labeling (front and back) and include with the RFLE.

If collecting a liquid using an absorbent material (e.g. cotton swabs, cotton balls, gauze), a control of the absorbent material must be submitted. Package the control absorbent material in a separate clean, unused, lined, metal paint can. "Haz-Mat" absorbent material must not be used and will not be analyzed. It is also not advisable to use newspaper, feminine hygiene products, paper towels or toilet tissue as these materials may contain petroleum products or other materials that may interfere with the analysis.

Indicate on the RFLE if separate containers of fire debris from the same location may be combined.

Indicate on the RFLE if there is a suspected ignitable liquid that has been used. This is particularly important in the cases of fuel oil #2, kerosene, and diesel fuel.

If ignitable liquids that evaporate quickly (e.g. alcohol, acetone, starter fluids, brush cleaners, etc.) are suspected, indicate this on the RFLE.

If chemical incendiaries are suspected, indicate this on the RFLE.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Investigator Willie E. Ketchum

Telephone #: (804) 786-0000

E-mail Address: WEK@Richlake.Fire

Agency and Address: Richlake Bureau of Fire
P. O. Box 2000
Richlake, VA 20001

Agency Case Number: 20061006-#### **Previous submission** ☐ **Yes** ☐ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): BOW, John **DOB** 9-25-56 **Race** W **Sex** M

Names of Suspects (Last, first, mid): Unknown **DOB** _____ **Race** _____ **Sex** _____

Date and Type of Offense: 10-6-06 Suspected Arson **Court Date:** Pending

Examinations Requested: Trace-Ignitable Liquids **Jurisdiction of Offense:** Richlake, VA

Brief Statement of Fact: Fire occurred at approximately 10:00 p.m., business completely burned. Witness states heavy billowing smoke and red intense flame.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1.Wood debris taken from northeast corner of living room

2. Wood debris taken from southwest corner of living room

3. Carpet and foam padding from living room couch

4. Comparison sample of carpet and foam padding for Item 3

5. Liquid recovered from fuel container found outside on front porch. Container was labeled gasoline.

page 1 of 1

For DFS use only

Submitting Officer (Print) Will E. Ketchum

(Sign.) Will E. Ketchum Date 10-9-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

FRACTURE MATCH EXAMINATIONS OVERVIEW

Fracture matches involve physically fitting items of evidence back together. A positive fracture match is a conclusive result that means that the fractured materials were at one time a portion of a single unit.

The Trace Evidence Section typically conducts fracture matches on the types of evidence that would normally be examined by the Section if a fracture match could not be effected. This would include, but not be limited to, plastic, glass and other vehicular parts, paint, tapes, glass, fabric, ropes and cordage. This way, the same Section that attempts the fracture match would conduct the physical and chemical analysis of the materials if the fracture match is not made.

CAPABILITIES AND SERVICES

Determination as to whether or not one or more items were at one time a portion of a single unit.

COLLECTION GUIDELINES

ITEM – Fractured (broken) items

METHOD – Protect the broken items from further damage. Package in plastic or paper bags or boxes and cushion with tissue. Cardboard "sandwiches" may also assist in protecting from further breakage. If the item is particularly fragile, placing the item in a box cushioned with tissue is preferred.

DISCUSSION – AVOID attempting the fracture match in the field. If a fracture match attempt is successful, expect a telephone call or e-mail asking if any remaining examinations are necessary. Oftentimes the conclusive nature of the fracture match precludes the need for further testing.

SUBMISSION REMINDERS

Protect evidence from further damage.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Will I. Catchem

Telephone #: (808) 555-6677

E-mail Address: Will.Catchem@lcso.org

Agency and Address: Landover Co. Sheriff's Office
P. O. Box 444
Landover, VA 23456

Agency Case Number: 20061208-#### **Previous submission** ☐ **Yes** ☐ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): JONES, John A. **DOB** 11/20/60 **Race** W **Sex** M

Names of Suspects (Last, first, mid): DIDIT, James A. **DOB** 08/18/47 **Race** W **Sex** M

Date and Type of Offense: 12-8-06 Hit and Run **Court Date:** 2/15/07

Examinations Requested: Trace – Paint and Fracture Match **Jurisdiction of Offense:** Landover, VA

Brief Statement of Fact: A vehicle ran into the victim's vehicle while parked in front of his home. The described vehicle matched that of Mr. Didit's whose vehicle bears damage to the right front fender.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. Known paint from left rear quarter panel of victim's vehicle – 1998 dark green Ford Taurus

2. Foreign paint recovered from left rear quarter panel of victim's vehicle

3. Known paint from right front fender of suspect's vehicle – 2006 red Buick LeSabre

4. Foreign paint recovered from right front fender of suspect's vehicle

5. Plastic fragments recovered from scene

6. Turn signal assembly removed from suspect's vehicle

For DFS use only

Submitting Officer (Print) Will I. Ketchum

(Sign.) Will I. Ketchum Date 12-20-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

GENERAL CHEMICAL OVERVIEW

Trace Evidence examiners conduct analysis on a wide variety of materials including, but not limited to, those involving:

Acids and bases (alkalies)	Inhalants
Automotive fluids	Inks
Bank dyes	Lubricating oils/greases
Bleach	Metal compositions
Condom lubricants	Paint balls
Cosmetics	Pepper spray and tear gas
Crayons and other waxes	Plastics and rubbers
Drug excipients	Sugar or salt
Dyes and pigments	Tapes
Fire extinguisher materials	Tar and asphalt
Glues and adhesives	Materials we have never encountered

The examinations conducted may provide an identification of a questioned sample or may include comparison of a questioned sample to a known sample to determine if the questioned may have originated from the known. The investigator must provide as much information about the questioned sample as possible including the location from which the substance was recovered, the original condition of the substance, the use/application method (e.g., brushed, poured, sprayed) and the properties of the substance (e.g., odor, burns/irritates, greasy/oily texture). The investigator also needs to document any injuries incurred by a victim, if the material was ingested and what effect this had on the victim and what type of medical treatment the victim received.

CAPABILITIES AND SERVICES

Identification of specific chemicals (e.g., capsaicin, sugar/salt) or chemical types (e.g., acids/bases, greases)

Comparison of questioned materials to known sources

COLLECTION GUIDELINES

ITEM - Acids (such as battery acid and muriatic acid) or Bases (alkalies/caustics such as lye and some household cleaners like Drano or Red Devil Lye)

METHOD - Household products may be submitted in their original containers if the container is not leaking and is no larger than one pint. If sampling is necessary, carefully pour no more than one ounce of the material into a plastic bottle or small glass jar making sure that the lid contains no metal. The container can then be packaged in a non-metal container with packing material to keep the bottle or jar secure.

DISCUSSION - Use extreme caution when handling acids or bases. Be careful to package acids or bases correctly using proper plastic containers (e.g., polyethylene, polypropylene, Haz/Mat collection containers) and no metal.

ITEM - Pepper spray/tear gas

METHOD - The spray canister can be placed in a plastic bag, unless there is a request for latents; if so, use a cardboard box, securing the evidence to eliminate friction within the container. Any clothing which needs to be analyzed for the presence of pepper spray needs to be wrapped in paper and placed in a paper bag. Clothing being analyzed for tear gas (CS or CN) needs to be packaged in a clean, unused, lined metal paint can. Gauze squares moistened with isopropyl alcohol (rubbing alcohol) can be used to collect pepper spray/tear gas residues from skin. Also, submit a control gauze square.

DISCUSSION - Package the questioned evidence in a separate container from the known **(**source) container, e.g. pepper spray or tear gas canisters.

ITEM - Inhalants (e.g., glue sniffing huffing)

METHOD - Place the questioned sample in a clean, unused, lined metal paint can. Submit any known containers/sources for use as comparison samples. The original containers can be packaged in a plastic or paper bag.

DISCUSSION – Inhalants are volatile materials which will evaporate readily upon exposure to air. Placing this evidence in an airtight container: a clean, unused, lined metal paint can, as soon as possible is very important.

ITEM - Adhesive tapes

METHOD - <u>If tape is on roll</u> and a fracture match exam is desired, the end of the tape MUST be protected. Package the tape in a plastic bag or plastic container, unless there is a request for latents; if so, use a cardboard box, securing the evidence to eliminate friction within the container.

<u>If tape is loose or wadded.</u> Do not mark, warp or distort the tape evidence. If the tape must be cut to remove it from a victim, deceased or living, ensure that the cut ends are marked accordingly. If the tape is generally flat and has exposed adhesive surfaces, press the adhesive side of the tape onto a heavy grade plastic bag or plastic sheet (i.e. acetate). Place this evidence in an envelope or paper bag. Wads of tape may be placed in a clean, unused, lined paint can for submission.

DISCUSSION – Generally, a fracture match will always be attempted. If a fracture match is not possible then, comparison of the physical and chemical properties of the known and questioned tapes will be conducted. It is important to handle the tape as little as possible and to ensure that the tape does not come in contact with paper surfaces which will contaminate the tape with paper fibers.

ITEM - Unknown powders/liquids/solids

METHOD - If the powder is dry, collect in a paper evidence fold for submission. If the powder is damp or moist and no volatiles are suspected, allow the powder to dry and then package in a paper evidence fold. Plastic containers (pillboxes) or small glass vials are also acceptable for packaging powders. If volatiles are suspected, package in a clean, unused, lined metal paint can. If a known source is present, also submit a sample of the known source for comparison purposes.

For liquids, package the liquid in a plastic or glass container. Submit comparison samples of known liquids as available.

If the powder is sugar/ salt in a gas tank - Collect any crystals which may be present near the fill spout opening and place in a paper evidence fold. If the gas tank has been removed as a part of the investigation, solids or aqueous liquid which may be present in the bottom of the tank should be collected in a glass jar or plastic container and submitted. The fuel or oil filter may also be collected for testing as needed. Many solids such as sugar or salt are not soluble in gasoline but are soluble in water. Pistons from engines that have seized may also be submitted packaged in plastic.

DISCUSSION – Any unknown material may be very HAZARDOUS and should be handled with extreme caution. If the material is suspected of containing a biological or chemical agent, then it will be submitted to DCLS for this testing prior to submission to DFS for identification.

ITEM - Bank dye packs or articles suspected of containing bank dye

METHOD – Place expended bank dye packs in a plastic bag which is then packaged in a separate container such as a paper bag. Wrap clothing or other articles suspected of containing bank dye in paper and then place in a paper.

ITEM – Hazardous Materials or "Dumping" Samples

METHOD – See same under Fire Debris.

SUBMISSION REMINDERS

As not every type of physical evidence which may be collected from a scene can be addressed, assess the evidence to be submitted and use common sense when packaging. Protect all evidence from loss, contamination or deleterious change. Refrigerate materials that may degrade prior to laboratory analysis. Place materials that are volatile (evaporate readily) in clean, unused, lined metal paint cans. If the material could possibly be an acid or a base, do not package it in metal or allow it come into contact with any metal. Collection of evidence with cotton-tipped applicators is not recommended. Do not hesitate to call the lab to discuss your particular evidence and circumstances.

Assume that any unknown material is hazardous and make personal safety the highest priority. General chemical materials may be CAUSTIC, TOXIC OR POISONOUS and MUST be handled with EXTREME CARE.

Avoid metal containers for collecting unknown substances (especially acids/bases) since these containers may be destroyed by the unknown chemical. Be careful if packaging unknown chemicals in plastic containers as some chemicals can react with and dissolve the plastic. Glass jars can also be used

as packaging containers. Collection of evidence using swabs is not recommended. Potential volatiles need to be packaged in air-tight containers like paint cans. Ensure that the containers are leak proof.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Sergeant Arthur Green

Telephone #: (804) 786-0000

E-mail Address: agreen@richlake.bop

Agency and Address: Richlake Bureau of Police
P. O. Box 2020
Richlake, VA 09087

Agency Case Number: 20061010-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): DOE, John **DOB** 11/10/56 **Race** W **Sex** M

Names of Suspects (Last, first, mid): JONES, Chris **DOB** 12/05/65 **Race** W **Sex** M

Date and Type of Offense: 10-10-06 Assault **Court Date:** Pending

Examinations Requested: Trace – General Chemical **Jurisdiction of Offense:** Richlake, VA

Brief Statement of Fact: Mr. Doe was showering at work when he noticed his shampoo smelled terrible and it made his scalp burn. Investigation revealed that one of his co-workers was bragging about tampering with his shampoo by mixing hair remover with the shampoo. See if the shampoo has hair remover in it.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)**
	ITEM# 1. Partially used bottle of victim's Pantene Pro V Volumizing shampoo
	2. Purchased bottle of Pantene Pro V Volumizing shampoo for comparison purposes
	3. Purchased bottle of Nair Sweet Smelling Hair Remover (allegedly added to shampoo)

page 1 of 1

For DFS use only

Submitting Officer (Print) Arthur Green

(Sign.) Arthur Green Date 10-12-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

GLASS EXAMINATION OVERVIEW

Glass evidence is a very valuable tool to the criminal investigator because glass is present in nearly every building and is frequently broken to gain entry. When a glass source is broken in the commission of a crime, glass particles may be transferred to the perpetrator and taken from the scene. While the comparison of questioned glass particles to a known broken glass source(s) is the most common request for forensic glass examination, other examinations involving glass evidence may be conducted. These include: identification of a material as glass, direction-of-impact determination, sequence of impact determination and the determination of point(s) of impact from either a projectile or a blow to the glass.

If large enough, the physical properties (e.g. color, thickness, tint, etc.) of a questioned glass are compared with the known glass. Refractive index may be determined on the known and questioned glass samples, and can be measured on particles that are not visible with the naked eye. When questioned glass particles are found to have properties consistent with the known glass source, an association is made and conclusions are drawn based upon the obtained results.

CAPABILITIES AND SERVICES

Identification of material as glass

Comparison of questioned glass particles to known glass samples

Fracture matches of glass

Direction of impact determinations

Sequence of impact determinations

Point of impact determinations

Fiberglass comparison

COLLECTION GUIDELINES

ITEM - Known Glass Samples

METHOD - Collect samples of ALL broken glass sources at the scene, including samples from all panes of a multipaned window. Collect broken glass from the window frame whenever possible. Laminated glass, such as that used in automobile windshields, consists of two window panes separated by a thin layer of plastic. If the pane was penetrated, submit a sample of the laminated glass that has all layers of the laminate. Package each broken known glass source separately and package all knowns in a separate container(s) from any questioned items. Place broken glass sources in leak-proof containers such as film canisters or plastic bags. Do not use paper or glass containers.

Known fiberglass samples with a sample size equivalent to about that of two cotton balls should be packaged in either a plastic bag or a properly folded paper evidence fold which has been placed into an envelope for submission.

ITEM - Questioned Items

METHOD - All questioned items should be packaged separately from broken glass sources. Collect suspect's outer clothing and shoes as soon as possible after the offense. Package the shoes separately from the suspect's clothing. Have the suspect disrobe over a piece of new, clean butcher paper. Wrap the clothing in the same paper and place into paper bags. The shoes should be wrapped separately in paper and then placed into a paper bag. Package clothing and shoes with enough room to allow for the evidence to be removed from the container without excessive contact with the outer container. Indicate on the RFLE from which suspect the clothing and shoes were removed.

Hair combings may be obtained by using a new, clean, comb and combing the hair over a piece of new, clean butcher paper. The paper then can become a paper evidence fold with the comb and any debris secured inside and submitted as a separate item.

Collect and submit any questioned items, such as tools or a baseball bat, by wrapping in paper and placing in a paper bag or securing in a cardboard box.

DISCUSSION - Having the suspect disrobe over paper will help to retain any glass particles that may fall from the clothing during this process. Do not use tape for recovering glass particles, for reserving glass particles or for binding items together that are to be searched for glass particles.

ITEM - Fracture Match Evidence

METHOD - If a glass fragment transfer from the scene has occurred and might be large enough or a fracture match, submit the entire source of broken glass remaining at the scene. For hit-and run evidence, submit all available pieces of headlight and other lamp glass.

DISCUSSION- Physical fitting provides the only conclusive association between glass samples.

ITEM - Point of Impact/Direction of Impact/ Sequence of Impact Determinations

METHOD - The broken glass source must be non-tempered. All of the larger pieces should be submitted, including those from the floor, the ground and those remaining in the frame. The remaining pieces of glass still in the frame must be marked by the investigator to indicate inside/outside orientation. Label the glass where it was removed from the frame (e.g. top, bottom). Tape may be used for securing large glass fragments together in a frame. Package in a manner that prevents the glass from further breakage. Securing the glass in a heavy cardboard "sandwich" or placing the glass in a box with packing material may accomplish this goal.

DISCUSSION – These types of analyses cannot be performed on tempered glass. They also cannot be conducted from photographs. The broken pane must be reconstructed; therefore, it is important to recover as many larger- sized glass fragments as possible.

SUBMISSION REMINDERS

DO NOT use tape or any other adhesives to collect glass.

Submit samples from all broken glass sources at the scene.

Package known glass sources separately from questioned glass sources.

In scenes where glass was broken and clothing recovered from the suspect, submit the clothing even if glass particles are not readily visible on the clothing or the shoes. Glass particles often are only visible when using a microscope.

Submit the suspect's outer clothing (e.g. jacket, shirt, pants, hats, gloves, etc.) in addition to the shoes. Glass located on suspect's clothing is more significant than glass found embedded in or on shoes.

Package shoes separately from the suspect's clothing.

Indicate on the RFLE from which suspect the clothing and/or shoes were removed.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #

TRAINING FORM ONLY

For DFS use only

Investigating Officer: Officer Alice N. Wonderland

Telephone #: (804) 700-1234

E-mail Address: WEK@Richlake.Fire

Agency and Address: Lookingglass SO
1234 Main Street
Richmond, VA 12345

Agency Case Number: 20060615-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): HATTER, Mad **DOB** 7/04/72 **Race** W **Sex** M

Names of Suspects (Last, first, mid): HEARTS, Queenie O. **DOB** 09/13/75 **Race** W **Sex** F

Date and Type of Offense: 06-15-06 Break and Enter **Court Date:** Pending

Examinations Requested: Trace – Glass **Jurisdiction of Offense:** _____

Compare any foreign glass recovered from suspect's clothing with known glass from Mr. Hatter's broken window.

Brief Statement of Fact: Suspect broke into residence through picture window in order to vandalize residence.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 2. Suspect's pants and shirt

3. Suspect's jacket

4. Combings from suspect's hair

5. Known glass sample taken from frame of victim's picture window

page 1 of 1

For DFS use only

Submitting Officer (Print) Alice N. Wonderland

(Sign.) *Alice N. Wonderland* Date 06/16/06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

HAIR & FIBERS OVERVIEW

When two objects come into contact, materials such as hairs and fibers may be transferred. Hairs will be assessed to determine if they are animal or human. Human hairs will be assessed to determine if it is appropriate to refer them to the Forensic Biology Section for nuclear DNA testing. For fibers, the color and generic class (e.g. nylon, polyester, acrylic) may be identified and known sources requested for comparison. If known and questioned fibers have been submitted, a comparison of physical, chemical and optical properties may be made between them and a conclusion rendered based upon the obtained results.

In the course of an investigation, the officer/investigator may consider the following as particular areas that could be areas of deposition and/or sources of hairs and fibers: victim and/or suspect clothing and person, window and/or doors, other points-of-entry/exit (roof), carpeting/floors, furniture, vehicle upholstery, vehicle floor mats, damaged areas on vehicles (grilles, windshields, etc.), undercarriage of a vehicle.

CAPABILITIES AND SERVICES

Differentiate hairs from fibers.

Differentiate human hairs from animal hairs.

Determination of suitability for nuclear DNA PCR-based typing.

Fracture match of rope/cordage or clothing/fabrics.

Identification of fiber generic class (e.g. nylon, polyester, cotton, silk, wool).

Comparison of questioned fibers to known fiber samples.

COLLECTION GUIDELINES

ITEM – Individual Hairs and/or Fibers

METHOD – Remove the individual hairs and/or fibers with forceps or gloved fingers. Place the hairs and/or fibers into a properly folded paper evidence fold, into a glassine envelope or onto the adhesive edge of a Post-It type note. If the hairs and/or fibers are very small, the use of a Post-it-type note is preferred. Place the evidence fold, glassine envelope or Post-it-type note into an envelope for submission.

DISCUSSION – Post-It type notes use a low tack adhesive. Tapes with high tack adhesives make recovery of hairs and/or fibers difficult at best and may result in damage or distortion to the hair and/or fiber evidence as it is lifted from the tape. High tack adhesive adheres to the hairs and/or fibers upon removal and may interfere with testing. Do not use high tack tapes for recovery. Examples of high tack tapes are: duct tape, latent fingerprint lift tape, first aid tape, regular adhesive tape, lint rollers, masking tape, strapping tape, packing tape and so on. Do not collect or package hairs and/or fibers in a manner that crushes or bends them.

ITEM – Clothing

METHOD – When collecting the clothing an individual is wearing, have the person remove one article of clothing at a time while standing on pieces of new, clean butcher paper. The paper can then become a paper evidence fold to retain whatever debris may have fallen off during disrobing as well as that particular clothing item. Each clothing item should be packaged separately. Individual hairs and fibers that may have been recovered from a clothing item also being submitted for examination should be packaged in the manner described above and included with the clothing item from which they were recovered and submitted as one item. For example, standing on a new, clean piece of butcher paper, the blue jeans are removed, folded up in the piece of butcher paper and then placed into a paper bag for submission. A new, clean piece of butcher paper is used to stand on for the removal of the jacket, the jacket wrapped in the paper and placed into a paper bag. The jacket also previously had several apparent hairs and/or fibers individually recovered which were placed into a paper evidence fold. The paper evidence fold was placed into an envelope and the envelope was included in the paper bag with the jacket for submission as one item.

If a subject's clothing has already been bagged together or has been removed and placed in one pile, do not separate the clothing items for individual submission. Collect all clothing items together as one item, wrap in paper and place in a paper bag for submission.

ITEM – Items too large for submission

METHOD – It is always suggested that an item be submitted for the lab to conduct hair and/or fiber recovery to include collection of known fiber samples. However, it is recognized that this may not be possible in all instances. Items that are too large (or too difficult) for submission may include area rugs, vehicle seats, sofas, chairs and so on. These items may be taped with low tack tape such as that found on Post-it-type notes. A low tack tape with a clear/colorless backing and a clear/colorless adhesive is ideal. Alternatively, painter's masking tape may be used to recover hairs and/or fibers. Use successive strips of tape until the strip of tape begins to lose its stickiness. Place the strips of tape with the recovered hairs and fibers onto a clear/colorless plastic sheet (like a page protector) or onto a plastic bag. Place the plastic sheet or plastic bag containing the strips of tape into an envelope for submission.

ITEM – Collection of Known Samples

METHOD – For head hair samples, use clean scissors to cut **a minimum of twenty-five (25)** full-length head hairs as close to the skin as possible. Take cuttings from the following scalp locations: center, front, back, left side and right side. Cut hairs of different colors as appropriate (collect bleached or gray hairs as well as dark hairs). For pubic hair samples, use clean scissors to cut **a minimum of twenty-five (25)** full length pubic hairs as close to the skin as possible. Cut hairs of different colors as appropriate (collect light or gray hairs as well as dark hairs). Place the head or pubic hair samples in a glassine envelope or a properly folded paper evidence fold. Place the glassine envelope or paper fold in an envelope for submission.

For fabrics, submit the entire item when possible wrapping in paper and placing in a paper bag. Otherwise, submit a representative sample of the known by cutting out a section that will include all colors and types of fibers in the known. Either place in a properly folded paper evidence fold and place in an envelope for submission or wrap in paper and place in an envelope or paper bag for submission.

ITEM – Rope, Twine, and Cordage

METHOD – Package in plastic bags, paper bags or envelopes. Be sure to label ends you may have cut. While the Department of Forensic Science does not conduct examination of knots, this type of evidence should be preserved for possible future analysis. Do not disturb knots. Maintain tension on the knot so it does not unravel.

DISCUSSION – Fracture matches of ends will be attempted first. If a fracture match is not made, a physical and chemical comparison of the material will be conducted.

SUBMISSION REMINDERS

NEVER use a high tack (strong) adhesive to collect hairs and fibers.

If possible, submit the entire item for the laboratory to perform the hair and/or fiber recovery.

Indicate the ends that have been cut by investigators, EMTs or MEO staff in rope, twine, or cordage.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Corporal Tadd E. Pole

Telephone #: (808) 786-4706 or 4705

E-mail Address: tadd.pole@DCI.virginia.forensic

Agency and Address: Division of Criminal Investigation
P. O. Box 8765
Forensic, VA 23219

Agency Case Number: 20060318-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): MUFFET, L., Missie **DOB** 3/13/87 **Race** W **Sex** F

Names of Suspects (Last, first, mid): SPIDER, B., Widow **DOB** 04/15/82 **Race** W **Sex** M

Date and Type of Offense: 3-18-06 Assault **Court Date:** Pending

Examinations Requested: Trace – Hairs and Fibers; check clothing items for foreign hairs and fibers and compare to known clothing items; check hairs, Item 17, for DNA suitability. **Jurisdiction of Offense:** Forensic, VA

Brief Statement of Fact: Mr. Spider allegedly assaulted Miss Muffet by wrestling her to the ground. A struggle ensued whereby Miss Muffet hit Mr. Spider with her pocketbook, broke free and ran away.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 15. Red sweater and blue skirt from victim

16. Green shirt and khaki pants from suspect

17. Clump of apparent hairs recovered from zipper of victim's pocketbook

For DFS use only

Submitting Officer (Print) Tadd E. Pole

(Sign.) Tadd E. Pole Date 03-19-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

PAINT ANALYSIS OVERVIEW

Painted surfaces are encountered frequently at crime scenes in the form of vehicles, architectural structures, tools, bicycles, boats and many other items. When two objects come in contact with one another and at least one of these objects is painted, a transfer of the paint may occur. This transferred paint can be compared back to a known sample from near the point of damage to tie these two objects together. Painted surfaces tend to be repainted over time providing a characteristic history of layer structure.

Large paint fragments may be physically fitted or fracture matched back to a surface providing an identification of the fragments as having come from that specific source. The color, texture, type, layer sequence and chemical composition of known and questioned paints are compared and a conclusion rendered. Additionally, in cases with no suspect vehicle and questioned paint available, it may be possible to at least provide an investigative lead as to the color and metallic/nonmetallic type of paint present. If the questioned paint is suitable, then the PDQ (Paint Data Query) database may be searched and vehicular information provided as to the possible makes, models and year range that used the questioned paint.

CAPABILITIES AND SERVICES

Identification of material as paint.

Comparison of questioned paint particles to known paint samples.

Fracture matches of paint fragments.

Determination of color/make/model/year ranges from recovered vehicular paint.

COLLECTION GUIDELINES

ITEM – Known or questioned paint samples

METHOD – If practical, submit the painted item in its entirety or remove a portion of the item for submission; thus allowing the lab to perform the questioned paint recovery. Wrap these samples in paper and, if small enough, place the paper wrapped item in a paper bag for submission.

Otherwise, use a previously unused scalpel blade or razor blade to cut or chip paint from the item. Cut all the way to the substrate (wood, metal, plastic, etc.) with the goal of keeping all layers intact. Do not scrape or shave the paint. The combined size of all particles in a known sample should approximately cover an area the size of the surface of a nickel. Collect all transferred/questioned paint. The size of the transfer will dictate how large this sample will be.

Collect known samples from an undamaged portion of each area/panel/surface that is damaged or from where paint transfer may have occurred. Package each area sampled in a separate properly folded paper evidence fold placed into another container such as an envelope for submission.

Paint particles may be packaged in a properly folded paper evidence fold or another leak proof container such as a film canister or pillbox which is then placed into another container such as an envelope for submission.

Large paint particles such as those from the scene should be packaged in a way to prevent breakage such as in a small box. When a possible source of the large paint particles is located, collect the entire area including the substrate for a fracture match exam.

Whole automotive bumpers, tailgates, bicycles and other large items may be submitted as long as the damaged area is protected by sealing over/around it with paper.

DISCUSSION - It is not uncommon for adjacent automotive panels or the door and doorjamb of a building to be painted differently. Some variation in paint may also be found within a single panel or small area. Therefore, it is important to collect the known samples as close to the damaged area(s) as possible.

ITEM – Paint smears on automobile panels and other surfaces

METHOD – Care should be taken to preserve a paint smear in as close to the original condition as possible. Submit the painted surface in its entirety or remove a portion of the item for submission; thus preserving the smear for recovery by lab personnel. If a saw is used to remove a portion of a surface, ensure that no trace evidence transfer is lost by placing paper under the surface being cut. If the surface is metal, avoid cutting too close to the transfer area as heat will be produced and conducted along the metal possibly altering the transfer paint. Cut several inches away from the area of interest. Wrap these samples in paper and, if small enough, place the paper wrapped item in a paper bag for submission.

If it is not practical to submit the item containing the smear, then use a previously unused scalpel blade or razor blade to cut or chip paint from the item. Cut all the way to the substrate (wood, metal, plastic, etc.) with the goal of keeping all layers intact. Do not scrape or shave the paint. Paint particles containing smears may be packaged in a properly folded paper evidence fold or another leak proof container such as a film canister or pillbox.

DISCUSSION – Paint smears are typically fragile. If possible, it is generally best to allow the examiner to collect the smear directly from the object. This allows the examiner to microscopically examine the smear in its entirety and most easily identify the portions of the smear most suitable for analysis. Plastic or rubber objects can be easily cut to collect large portions containing the smear.

ITEM – Tools containing possible paint transfer

METHOD – Protect the area with suspected transfer by wrapping the area in paper also taking care to ensure the tool does not break or punch through the paper. If practical, place the tool with the paper protected area into a paper bag for submission.

DISCUSSION – Paint transfer to tools is often small and may only be detected using a microscope; therefore, the area of suspected transfer must be protected from loss or further damage.

ITEM – Clothing from a pedestrian hit and run victim or sheet used to wrap/transport victim.

METHOD – Air dry bloody or wet items prior to submission in controlled conditions on/over clean butcher paper. Wrap items in clean butcher paper which is then placed in a paper bag for submission.

DISCUSSION – The victim's clothing can be an excellent source of trace evidence and therefore, care must be taken to avoid loss of microscopic trace evidence from the clothing. The clothing will be visually and microscopically examined and then scraped to collect debris in order to recover trace materials including paint. Recovered paint can be compared to known samples from a suspect vehicle. If the suspect vehicle is not known, it may be possible to provide color, make, model and year ranges of potential suspect vehicles.

The laboratory will prioritize hit and run fatality cases with no suspect vehicle to attempt to provide investigative information as quickly as possible. Call the lab to alert personnel to these cases.

ITEM – Spray paint or other paint used to vandalize

METHOD – Collect the entire can of suspected paint. If the can of paint is not already protected from drying out, replace the lid on the can or transfer a small amount of the liquid paint to a glass jar or glass vial.

Collect questioned paint samples from the location of the vandalism for comparison by following the method described above for known or questioned paint samples.

ITEM – Paint Balls

METHOD – If already dry, submit the item containing the paint ball "paint" by wrapping in paper and placing in a paper bag. If still wet, swab the area containing the paint ball "paint" with cotton swabs which are then placed in plastic bags. Place intact or expended paint balls in plastic bags.

DISCUSSION - Paint balls are not technically paint. They are made out of food-grade water soluble materials. Expended paint balls or paint ball "paint" can still be compared to known paint balls.

SUBMISSION REMINDERS

DO NOT use tape when collecting paint.

Include on the RFLE the color, make, model and year for all vehicles from which paint is collected.

A properly folded paper evidence fold is the best container for packaging paint evidence.

Collect paint which contains all layers by cutting all the way to the substrate (wood, metal, cement). Do not shave or scrape paint from a surface.

For known samples, collect enough intact paint particles that will cover approximately the surface area of a nickel.

Collect a known sample of paint directly adjacent to the suspected transferred paint.

Do not submit the scalpel blade or razor blade used to collect the paint sample.

If two painted objects come in contact with one another always be alert to the potential of an interchange of paint and collect samples from both sources.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Detective Will I. Catchem

Telephone #: (808) 555-6677

E-mail Address: Will.Catchem@lcso.org

Agency and Address: Landover Co. Sheriff's Office
P. O. Box 444
Landover, VA 23456

Agency Case Number: 20061208-#### **Previous submission** ☐ **Yes** ☐ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): JONES, John A. **DOB** 11/20/60 **Race** W **Sex** M

Names of Suspects (Last, first, mid): DIDIT, James A. **DOB** 08/18/47 **Race** W **Sex** M

Date and Type of Offense: 12-8-06 Hit and Run **Court Date:** 2/15/07

Examinations Requested: Trace – Paint and Fracture Match **Jurisdiction of Offense:** Landover, VA

Brief Statement of Fact: A vehicle ran into the victim's vehicle while parked in front of his home. The described vehicle matched that of Mr. Didit's whose vehicle bears damage to the right front fender.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only

Evidence Submitted: (Itemize and describe)

ITEM# 1. Known paint from left rear quarter panel of victim's vehicle – 1998 dark green Ford Taurus

2. Foreign paint recovered from left rear quarter panel of victim's vehicle

3. Known paint from right front fender of suspect's vehicle – 2006 red Buick LeSabre

4. Foreign paint recovered from right front fender of suspect's vehicle

5. Plastic fragments recovered from scene

6. Turn signal assembly removed from suspect's vehicle

page 1 of 1

For DFS use only

Submitting Officer (Print) Will I. Ketchum

(Sign.) Will I. Ketcham Date 12-20-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

PRIMER RESIDUE OVERVIEW

Primer residue is formed by the ignition of a chemical in the primer when a firearm is discharged. This results in the formation of microscopic particles which are blown out of various openings in the weapon as the weapon is discharged. These particles are spherical or molten in appearance and typically contain the elements: lead, barium and antimony. Particles of this nature are highly specific to primer residue. Particles containing two of the three elements listed above are indicative of primer residue. Indicative particles are less specific to, but commonly found in, primer residue.

Primer residue can be deposited on the hands by circumstances such as: firing a weapon, handling a weapon, being in the proximity to the discharge of a weapon or coming into contact with an object that has primer residue on it. The examination itself cannot determine the relative likelihood of these listed circumstances.

The absence of primer residue on the hands is consistent with an individual not having fired a weapon. A negative result could also occur from circumstances such as: washing the hands, wiping the hands, wearing gloves, sweating profusely, environmental factors including wind and rain, bloody hands, excessive debris on the sample, greater than 4 to 6 hours passing between firing and sampling, or the weapon not producing primer residue on the hands when discharged.

CAPABILITIES AND SERVICES

Ability to determine the presence of particles highly specific to or indicative of primer residue on the hands or other surfaces.

COLLECTION GUIDELINES

ITEM – Primer Residue from the hands

METHOD - Follow the specific instructions included in the primer residue (GSR) kit provided by the Department of Forensic Science. Always sample the hands of a suspect as soon as possible. Collect primer residue samples at the scene whenever possible. If collection at the scene is not possible then bag the hands of the suspect with Tyvek® or paper bags before transporting in a police vehicle.

Secure paper bags around the wrists of the suspect with rubber bands; secure Tyvek® bags around the wrists of the suspect with the attached drawstring of the bag. Always clean **your** hands before collection of samples. Grip the suspect's hand by the wrist and avoid touching the surface to be sampled. If sampling from a dead body avoid wet or bloody areas. Always wear barrier gloves. Always photograph the hands and document any high velocity blood spatter patterns if present before sampling for primer residue.

DISCUSSION – Primer residue particles are continually lost from the hands due to normal activity. The optimal window of opportunity for sampling the hands of a **living** individual lasts for up to 4 to 6 hours after the shooting event. The Department of Forensic Science will **no longer routinely analyze primer residue samples collected from the hands of a living individual in excess of 8 hours after the shooting event.** If exigent circumstances exist (individual was asleep or unconscious) indicate that on the Analysis Information Form contained in the collection kit provided by the Department of Forensic Science.

ITEM – Primer Residue from clothing

METHOD – Only samples collected from clothing that is similar to skin (leather, vinyl) will be analyzed.

DISCUSSION – Analysis of primer residue particles collected from clothing can be problematic for a number of reasons. There is no way to determine how long primer residue particles may remain on clothing. Studies have shown that clothing may retain primer residue particles even after washing. Fibers collected on the sampling device can cause problems during analysis. For these reasons, only samples collected from nonfibrous clothing will be analyzed for primer residue.

ITEM – Primer Residue from vehicles

METHOD – If a vehicle is suspected to have been used in a "drive by" shooting, samples can be collected to determine the presence of primer residue. Collection should be done from leather, vinyl or plastic surfaces. Avoid sampling fabric surfaces. If the weapon was discharged inside a vehicle a good place to sample would be areas where small amounts of settled dust can be seen. Examples would include the top of the dashboard or steering column. Areas exposed to the wind from an open window are less likely to retain primer residue particles.

DISCUSSION – Use a single Primer Residue kit to sample the areas of interest. Simply strike out "right hand" or "left hand" and write in the area currently being sampled. It is not necessary to submit multiple kits from a single vehicle since it is not possible to determine the position where the shooter was firing from by primer residue analysis.

SUBMISSION REMINDERS

Fill out the Primer Residue Analysis Information Form as completely as possible and make a copy for your records. This information is used at the laboratory to maintain a database on primer residue cases and helps identify problematic ammunitions and weapons.

When submitting multiple items of evidence in a case that includes a primer residue kit for examination, it is recommended that the primer residue kit be submitted on a separate RFLE. Oftentimes, other requested examinations are completed and the submitting agency needs the evidence back for discovery,

court or to return an item back to the owner prior to the primer residue examination being completed. Submitting the primer residue kit on a separate RFLE will allow for a more timely return of other evidence submitted in the agency's case.

An examination for primer residue should not be confused with a firing distance test. The distance from the muzzle of a weapon to the victim **cannot** be determined by testing for primer residue particles on the hands of the victim. Therefore, analyzing samples from the hands of homicide victims shot at close range is typically not probative.

Department of Forensic Science

Request for Laboratory Examination

FS Lab #
TRAINING FORM ONLY
For DFS use only

Investigating Officer: Sergeant. Theodore Cleaver

Telephone #: (808) 788-2167

E-mail Address: t.cleaver@BoI.gov

Agency and Address: Bureau of Investigations
200 Wiretap Road
Watergate, VA 22232

Agency Case Number: 951110-#### **Previous submission** ☐ **Yes** ☒ **No** **Previous FS #:** _____

Names of Victims (Last, first, mid): DOORNALE, Deaddas A. **DOB** 3/12/67 **Race** W **Sex** F

Names of Suspects (Last, first, mid): SHOOTEM, Wille **DOB** 1/09/66 **Race** W **Sex** M

Date and Type of Offense: 11-10-95 Homicide **Court Date:** Pending

Examinations Requested: Trace – Primer Residue **Jurisdiction of Offense:** Watergate, VA

Brief Statement of Fact: Domestic fight at 2:00 a.m. at Kelly's Bar, Mr. Shootem allegedly pulled gun and fired three times at Ms. Doornale. Mr. Shootem was arrested three blocks away at 2:20 a.m. Alledged witness may have been involved. Primer residue kits submitted from suspect and witness.

Specify manner of return of evidence: Mail _____ Personal Pick-up XXX

This evidence is being submitted in connection with a criminal investigation and has not been examined by another laboratory.

For DFS Use Only	**Evidence Submitted: (Itemize and describe)**
	ITEM# 1.One Primer Residue Kit from Willie Shootem
	6. One Primer Residue Kit from I. Saw Everything

page 1 of 1

For DFS use only

Submitting Officer (Print) Theodore Cleaver

(Sign.) *Theodore Cleaver* Date 11-13-06 Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____

Relinquished by (Sign.) _____ Date _____ Relinquished by (Sign.) _____ Date _____

Received by (Sign.) _____ Date _____ Received by (Sign.) _____ Date _____