

GUIDELINES FOR COLLECTING AND FORWARDING SAMPLES FOR DNA ANALYSIS

3.1 PURPOSE

- 3.1.1: To provide general guidelines for the collection of touch, wearer and body fluid type samples.
- 3.1.2: To provide general guidelines for forwarding samples for DNA analysis.

3.2 RESPONSIBILITY

Forensic Science Examiners from the Division of Scientific Services who have been trained in the discipline of physical evidence examination according to FB SOP-26 (Training Manual and Checklist) and GL-4 (LIMS/Justice Trax).

3.3 SAFETY

Use appropriate measures for the proper handling of biohazardous materials and hazardous chemicals according to GL-2 (Safety Manual).

3.4 PROCEDURE

The Following Should Be Noted:

This information is a general guideline for the collection of evidence for DNA testing. A trained analyst should always use their judgement and experience when examining evidence. The analyst should always take into account the type, condition, and quantity of the evidence being examined.

- A. If you have a reasonable expectation that more sample remains on the item and could be collected in the future, then there is no consumption issue.
- B. If blood is also present, then collect the sample accordingly.
- C. Forward appropriate samples to DNA according to the case scenario and the Forensic Biology results.
- D. The appropriate quantity of samples will be forwarded to DNA according to the following Guidelines. Additional sample may be forwarded at the discretion of the examiner with input from a Unit Lead.

3.4.1: General Instructions for the Collection and Retention of Samples from Evidence

- A. For Collection
 - 1. dH₂O is defined as deionized water, see FB SOP-21 (General Chemical and Reagent QC, section 20.4.1) and DNA SOP-1 (General Guidelines, section 1.1.9).
 - 2. When an area is swabbed with the intention of separating the swabs (i.e. retaining half and sending half for DNA analysis), the swabs must be collected simultaneously.

3. For collecting areas for touch/wearer DNA:
 - a. Remove the appropriate number of swabs from the swab package(s) and retain the package(s).
 - b. Moisten the swab(s) with dH₂O.
 - c. Swab the area by turning the swab(s) to ensure that all sides come in contact with the area.
 - d. Place the swabs back into an appropriately labeled swab package with the moistened swab tip facing outward for drying.
 - e. If possible, air dry the swab(s) over-night in a designated area, separately from high DNA yield samples (i.e. blood). During this time the sample(s) will remain in the custody of the examiner as in compliance with GL-13 (General Evidence Handling). Moist samples may be transferred directly for DNA analysis when necessary.
4. For collecting questioned stains from non-absorbent surfaces:
 - a. Remove the appropriate number of swabs from the swab package(s) and retain the package(s).
 - b. Moisten swab(s) with dH₂O. (0.5% ammonia may be used to moisten the swabs for blood-like stains that are difficult to remove.)
 - c. Swab the stain from the surface. For limited samples, avoid spreading the stain out on the swab by collecting it on the smallest area of the swab as possible.
 - d. Place the swabs back into an appropriately labeled swab package with the moistened swab tip facing outward for drying.
 - e. When possible, air dry the swab(s) over-night in a secure, designated area. Moist samples may be transferred directly for DNA analysis when necessary.
 - f. A stain or debris may be scraped from a non-absorbent surface.
5. For collecting questioned stains from absorbent surfaces:
 - a. Collect swab tip(s) submitted with stains or touch samples.
 - b. Cut the stain from a piece of clothing or other material.

B. For Retention

1. Samples can be retained in a properly labeled sterile plastic tube or paper-fold and then into a properly labeled plastic bag.
2. Heat seal the plastic bag, initial the heat seal and place in freezer storage (further analysis).
3. If the sample was collected on a swab, snap the swab tip off of the stick and place in a properly labeled, sterile plastic tube.

C. Preparing samples for DNA Analysis

1. Remove the swab cotton from the stick or cut the appropriate quantity of stain and place in a properly labeled plastic tube.
2. No more than three swabs are to be placed into one tube for DNA analysis. Place any additional swabs into a separate tube and notify DNA.
3. Place tubes into a properly labeled plastic bag.
4. Heat seal the plastic bag, initial the heat seal and place in freezer storage (DNA sample).

D. Extracted samples (remaining extract and/or extracted substrate will be considered work product, therefore is not considered evidence and is not tracked through LIMS).

1. Retain extract(s) tested for semen from samples collected and store in further analysis freezer storage.
2. Retain extract(s) tested for blood if the sample is limited and store in further analysis freezer storage.
If the sample is not limited then discard extract.
3. Retain the extracts by removing the extracted sample from the basket, placing it into the extract tube and sealing the closed tube with parafilm. Place the extract tubes in a separate plastic bag and retain with the other samples in another plastic bag.

3.4.2: Evidence Previously Examined by the Latent Print Unit

- A. Collect a sample from the designated area, as necessary, using one swab. If there is more than one designated area, it is the discretion of the examiner to collect each area separately using one swab or to collect multiple areas simultaneously using 1 or 2 swabs.

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- B. Each case will be evaluated to determine which of these samples, if necessary, should be forwarded for DNA analysis.
 - a. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - b. Suspect (arrested): Send what you collected to DNA (consumption issue).

3.4.3: Guns

- A. If the gun has been super glued, swab vigorously when collecting the sample to penetrate beneath the super glue layer.
- B. If there is a designated latent print area, please follow the instructions in section 3.4.2 (Evidence Previously Examined by the Latent Print Unit).
- C. Collect samples described below from locations of various firearms according to section 3.4.17 (Examples for the Documentation and Collection of Samples from Various Firearms).
- D. Lesser Crimes (illegal possession/shots fired/weapons charge/found gun)
 - 1. Small gun (hand gun, revolver etc.)
 - a. Collect one sample from the entire gun using two swabs.
No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.*

*Evaluate on a case-by-case basis. If the entire sample is forwarded to DNA and a suspect has been arrested then the consumption issue must be addressed.
 - b. If necessary, collect a sample from the trigger separately using one swab (don't send initially).
 - i. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - ii. Suspect (arrested): Send what you collected to DNA (consumption issue).
 - 2. Large gun (rifle, shotgun etc.)
 - a. Collect one sample from the entire gun using three swabs.
No Suspect/Suspect (no arrest)/Suspect (arrested): Send one-and-a-half swabs to DNA.*

*Evaluate on a case-by-case basis. If the entire sample is forwarded to DNA and a suspect has been arrested then the consumption issue must be addressed.
 - b. If necessary, collect a sample from the trigger separately using one swab (don't send initially).
 - i. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - ii. Suspect (arrested): Send what you collected to DNA (consumption issue).

- E. Serious Crimes (homicides/assaults/shooting with injury/robbery)
1. Small gun (hand gun, revolver etc.): Collect a sample from each area using one or two swabs.
 - a. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - b. Suspect (arrested): Send what you collected to DNA (consumption issue).
 - c. Send the sample(s) from the appropriate area(s) to DNA according to the case scenario.
 2. Large gun (rifle, shotgun etc.): Collect a sample from each area using one or two swabs.
 - a. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - b. Suspect (arrested): Send what you collected to DNA (consumption issue).
 3. Unfired Cartridges are not swabbed unless requested: Collect a sample using one swab. If multiple cartridges are submitted, collect one sample from all cartridges using two swabs.

Note: If there is case information that an individual picked up a fired cartridge casing then swab as above. If there is no information to this effect then do not swab the fired cartridge casing.

 - a. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - b. Suspect (arrested): Send what you collected to DNA (consumption issue).
 4. Magazine: Collect a sample using two swabs.
 - a. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - b. Suspect (arrested): Send what you collected to DNA (consumption issue).

3.4.4: Knives

- A. If the knife has been super glued, swab vigorously when collecting the sample to penetrate beneath the super glue layer.
- B. If there is a designated latent print area, please follow the instructions in section 3.4.2 (Evidence Previously Examined by the Latent Print Unit).
- C. Collect a sample from the handle area using one or two swabs.
 1. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 2. Suspect (arrested): Send what you collected to DNA (consumption issue).
- D. If requested or necessary, collect a sample from the blade area using one or two swabs.
 1. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 2. Suspect (arrested): Send what you collected to DNA (consumption issue).

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- A. Collect samples from each area according to the case scenario using two swabs:
 - 1. One sample from exterior hip and waistband areas.
 - 2. One sample from interior front panel and crotch areas (avoid crotch area if stained).
 - 3. One sample from interior back panel and crotch areas (avoid crotch area if stained).
- B. For each sample collected:
 - 1. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - 2. Suspect (arrested): Send what you collected to DNA (consumption issue).

3.4.6: Wearer

- A. Collar: Collect a sample from the interior collar using two swabs.
 - 1. No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
 - 2. Optional: Collect one sample from both interior sleeve cuffs using two swabs. Don't send to DNA initially but retain.
- B. Hat: Collect a sample from the interior rim using two swabs.
 - 1. No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
 - 2. Optional: Collect a sample from the brim using two swabs. Don't send to DNA initially but retain.
- C. Waistband: Collect a sample from the interior waistband using two swabs.
No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
- D. Other items may be collected for wearer and samples forwarded to DNA at the discretion of the examiner with input from the Forensic Biology Unit Lead(s).

3.4.7: Cigarette Butts/Blunts

- A. Collect approximately $\frac{1}{4}$ " of the unburnt filter end of a cigarette butt and send half to DNA.
- B. Collect approximately $\frac{1}{2}$ " of the unburnt end of a blunt (include any flattened area). Send half to DNA. Remove any tobacco-type material from the interior if possible and return with blunt.

3.4.8: Paper (notes, cards, calendar sheets etc.)

- A. If there is a designated latent print area and it is necessary to collect the area separately, please follow the instructions in section 3.4.2 (Evidence Previously Examined by the Latent Print Unit).
- B. Collect a sample from the remaining paper surfaces, as necessary, using two swabs.
 - 1. No Suspect/Suspect (no arrest): Send two swabs to DNA.
 - 2. Suspect (arrested): Send two swabs to DNA (consumption issue).

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- C. If there is a designated latent print area and it is not necessary to collect the area separately, collect a sample from both the area and remaining paper surfaces together using two swabs.
 - 1. No Suspect/Suspect (no arrest): Send two swabs to DNA.
 - 2. Suspect (arrested): Send two swabs to DNA (consumption issue).
- D. If there are no designated latent print areas, collect a sample from the paper surfaces using two swabs.
 - 1. No Suspect/Suspect (no arrest): Send two swabs to DNA.
 - 2. Suspect (arrested): Send two swabs to DNA (consumption issue).

3.4.9: Envelopes

- A. If there is a designated latent print area and it is necessary to collect the area separately, please follow the instructions in section 3.4.2 (Evidence Previously Examined by the Latent Print Unit).
- B. Using caution to avoid tearing, begin at one corner of the envelope and gently attempt to pry the flap apart from the envelope with forceps.
- C. If the flap does not separate easily, STOP. Proceed to step F.
- D. If the flap separates easily and cleanly, continue until it is completely separated from the envelope.
- E. Collect a sample from the adhesive area of both surfaces using one or two swabs.
 - 1. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - 2. Suspect (arrested): Send what you collected to DNA (consumption issue).
- F. Applying Steam (should be conducted in a hood)
 - 1. Fill a 250ml beaker with approximately 200ml dH₂O and bring to a boil.
Note: Add more dH₂O to the beaker as evaporation occurs.
 - 2. Beginning at one end of the envelope, hold the envelope flap approximately 1" above the steam for approximately 5 minutes. Use caution not to touch the envelope to the beaker.
 - 3. Remove the envelope from the steam. Using forceps, gently and slowly attempt to pry apart the flap in the steamed area, avoid tearing. If the flap begins to separate from the envelope continue to gently pry it apart until the flap becomes stiff as it dries and will no longer separate.

4. Repeat steps b and c above in the next area of the flap until it is completely separated.
Note: Some envelopes may require numerous applications of steam and increased exposure time (up to ~10 minutes at a time to the point of visible dampness, do not allow the envelope to become saturated). Use extra caution to avoid tearing.
 5. Collect a sample from the adhesive area of both surfaces using one or two swabs.
 - a. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - b. Suspect (arrested): Send what you collected to DNA (consumption issue).
 6. If unable to separate the flap from the envelope, collect a cutting along the adhesive area of the flap, measuring approximately 4cm x 1cm in size. This cutting should include both the flap and envelope layers.
No Suspect/Suspect (no arrest)/Suspect (arrested): Send half of the cutting to DNA.
- G. To remove a stamp from an envelope repeat steps B-F.4 above.
1. Collect a sample from the adhesive area of both surfaces using one swab.
 2. If unable to separate the stamp from the envelope, collect the stamp by cutting through the envelope layer. Don't send to DNA initially but retain.
- H. Record the lot # of the dH₂O used to collect the sample(s) and also the dH₂O used for steaming, when necessary, on the appropriate Quality Record worksheet.

3.4.10: Bottles/Cans

- A. If there is a designated latent print area, please follow the instructions in section 3.4.2 (Evidence Previously Examined by the Latent Print Unit).
- B. Collect a sample from the exterior mouth opening and interior cap (if present) using two swabs.
 1. No Suspect: Send what you collected to DNA.
 2. Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
- C. If requested or necessary, collect a sample from the exterior body area of the bottle or can using two swabs.
 1. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 2. Suspect (arrested): Send what you collected to DNA (consumption issue).
- D. If multiple bottles/cans are submitted for one case, then collect samples from only the mouth and cap area of each bottle/cans (individually).

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- A. Heavy bloodstain swab: Send half of the swab to DNA.
- B. Light bloodstain swab:
 - 1. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - 2. Suspect (arrested): Send one swab to DNA (consumption issue).
- C. If the case scenario indicates that a sample collected by the submitting agency was previously treated with a field test, then send the swab directly to DNA without serological testing.

3.4.12: Sexual Assault Cases

- A. If 2+/3+/4+ sperm
 - 1. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - 2. Suspect (arrested): If more than one swab remains, send one swab to DNA.
If one swab remains, send the swab to DNA (consumption issue).
- B. If 1+ sperm/(1) sperm (head portion or intact) or (+) p30
 - 1. No Suspect/Suspect (no arrest): Send up to three swabs to DNA.
 - 2. Suspect (arrested): If more than three swabs remain, send three swabs to DNA.
If three or less swabs remain, send up to three swabs to DNA (consumption issue).

3.4.13: Condoms

- A. If the interior or exterior is positive for AP, collect a sample from the interior and/or exterior (separately) using four swabs. If visible material (strong positive AP) remains on the interior or exterior of the condom then the examiner may collect more than four swabs.
 - 1. If 2+/3+/4+ sperm
 - a. No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
 - 2. If 1+ sperm/(1) sperm (head portion or intact) or (+) p30
 - a. No Suspect/Suspect (no arrest)/Suspect (arrested): Send three swabs to DNA.
 - b. Note: Evaluate test results to determine if there may be a consumption issue.
 - 3. If (-) semen
 - a. No Suspect/Suspect (no arrest): Send three swabs to DNA.
 - b. Suspect (arrested): Send three swabs to DNA (consumption issue).
- B. If the interior or exterior is negative for AP, collect a separate sample from each using two swabs.
 - 1. No Suspect/Suspect (no arrest): Send what you collected to DNA.
 - 2. Suspect (arrested): Send what you collected to DNA (consumption issue).

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3.4.14: Saliva (Amylase)

- A. If (+)/weak (+)/very weak (+) Amylase:
 - 1. No Suspect/Suspect (no arrest): Send all remaining swabs (up to three) to DNA.
 - 2. Suspect (arrested): Send all remaining swabs (up to three) to DNA (consumption issue).
- B. If strong (+) Amylase:
 - 1. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - 2. Suspect (arrested): If more than one swab remains, send one swab to DNA.
If one swab remains, send the swab to DNA (consumption issue)

3.4.15: Fingernail Scrapings/Clippings

- A. Before collecting a sample, visually or microscopically inspect the submission for any tissue-like material, blood-like stains or debris. If a microscopical examination was conducted, record on the appropriate Quality Record Worksheet.
- B. To collect the best sample, swab the tip end of the nail fragment and avoid the nail bed area.
- C. If a microscopical examination is conducted and no Forensic Biology report is generated, then DNA will address in their report.
- D. Fingernail scrapings/clippings may be submitted to the Laboratory as follows: a sample collected from each finger and packaged separately, samples collected from each hand and packaged separately or a sample collected from each finger and packaged together.
 - 1. Fingernail scrapings/clippings packaged separately:
 - Collect a sample using one swab from each scraping/clipping (separately). Include tissue-like material, blood-like stains or debris if present.
 - a. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - b. Suspect (arrested): Send one swab to DNA (consumption issue).
 - 2. Left and right hand samples packaged separately:
 - a. If no tissue-like materials or blood-like stains are present, collect a sample from the entire contents of each package using one swab.
 - i. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - ii. Suspect (arrested): Send one swab to DNA (consumption issue).
 - b. Nail fragments containing tissue-like material and/or blood-like stains should be collected separately from nail fragments without tissue-like material or blood-like stains using one swab for each.
 - i. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - ii. Suspect (arrested): Send one swab to DNA (consumption issue).

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- c. If there is a large quantity of tissue-like material or blood-like stains present, then collect a portion of the material/stains using one swab and retain the remaining contents.
No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
- 3. All fingernail scrapings/clippings packaged together:
 - a. If no tissue-like materials or blood-like stains are present, collect a sample from the entire contents of the package using one swab.
 - i. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - ii. Suspect (arrested): Send one swab to DNA (consumption issue).
 - b. Nail fragments containing tissue-like material and/or blood-like stains should be collected separately from nail fragments without tissue-like material or blood-like stains using one swab for each.
 - i. No Suspect/Suspect (no arrest): Send one swab to DNA.
 - ii. Suspect (arrested): Send one swab to DNA (consumption issue).
 - c. If there is a large quantity of tissue-like material or blood-like stains present, then collect a portion of the material/stains using one swab and retain the remaining contents.
No Suspect/Suspect (no arrest)/Suspect (arrested): Send one swab to DNA.
- 4. For additional information see FB SOP-02 (Sexual Assault Evidence Collection Kit Examination, section 2.6.K).

3.4.16: Smears - Coverslip Removal/Sample Collection

For smear(s) stained with Sperm Hy-Liter, use acetone to remove the nail polish from the cover slip by placing acetone on a swab and rubbing off nail the polish.

- A. Photograph the slide as received.
- B. Conduct a microscopical examination of the smear for cellular material. It is not necessary to search the entire smear.
 - 1. Record the result and microscope(s) used on the appropriate quality record worksheet.
 - 2. If an intact spermatozoa is identified, a second FB analyst will confirm this identification, when necessary, and initial the appropriate quality record worksheet .

- C. Place the slide in the freezer for five (5) to fifteen (15) minutes.
- D. Remove the slide and allow to thaw, preferably at 37°C.
- E. While wearing eye protection, use a clean blade under one (1) edge of the cover slip and gently pry it off the slide. Use caution since the coverslip may break into pieces when removing.
- F. If needed, repeat the freeze-thaw cycle to aid in the removal of the cover slip.
- G. Once the cover slip is removed, use one (1) or two (2) sterile swabs (plastic handles) moistened with dH₂O to collect the smear off of the slide. Additional swabs may be used to collect any remaining smear.
- H. If unable to swab the smear off the slide, the smear can be removed by scraping it from the slide. Use a clean blade and collect the scrapings with sterile swabs moistened with dH₂O.
- I. Photograph the slide after the smear has been collected.

3.4.17: Examples for the Documentation and Collection of Samples from Various Firearms

- A. Photograph the weapon showing both sides of the frame and then photograph from various angles, if necessary, including weapon manufacturer, model number and serial number:



- B. The following photographs are examples of all sides of the weapon to be documented as necessary.



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- C. The following areas are typically swabbed (see photos below):
1. Handguns:
 - a. Trigger
 - b. Grip (aka handle or pistol grip)
 - c. Action mechanisms
 - i. Slide including sights (for pistols)
 - ii. Cylinder loading and latch area including hammer and sights (for revolvers)
 2. Longarms:
 - a. Trigger
 - b. Stock
 - c. Forearm
 - d. Action mechanisms
 - i. Bolt (for semi-automatic rifles)
 - ii. Lever (for lever action rifles)
 - iii. Hammer or magazine spring loader (shotguns)
- D. If there is a Latent Print request for examination:
1. If the gun was processed by Latent Prints prior to Forensic Biology processing, or there was no Latent Print request, then all relevant areas above are to be swabbed.
 2. If Forensic Biology is to process the gun before the Latent Print examination, then only the textured areas of each relevant area are to be swabbed. Small areas including sights, trigger, cylinder loading/latch, hammer, bolt or lever may also be included. On a case-by-case basis, Forensic Biology may request the return of the gun from the Latent Print Unit in order to swab the remaining portions.

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Handgun: Semi-Automatic Pistol

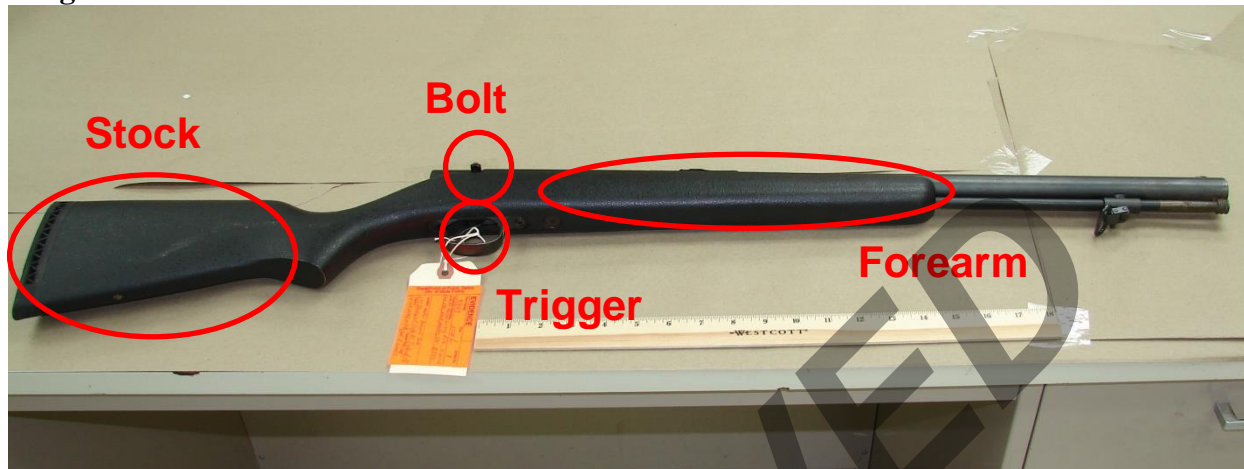


Handgun: Revolver



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Long arm: Semi-Automatic Rifle



Long arm: Lever Action Rifle



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Long arm: Semi-automatic Rifle



Long arm: Shotgun (Pump Action)

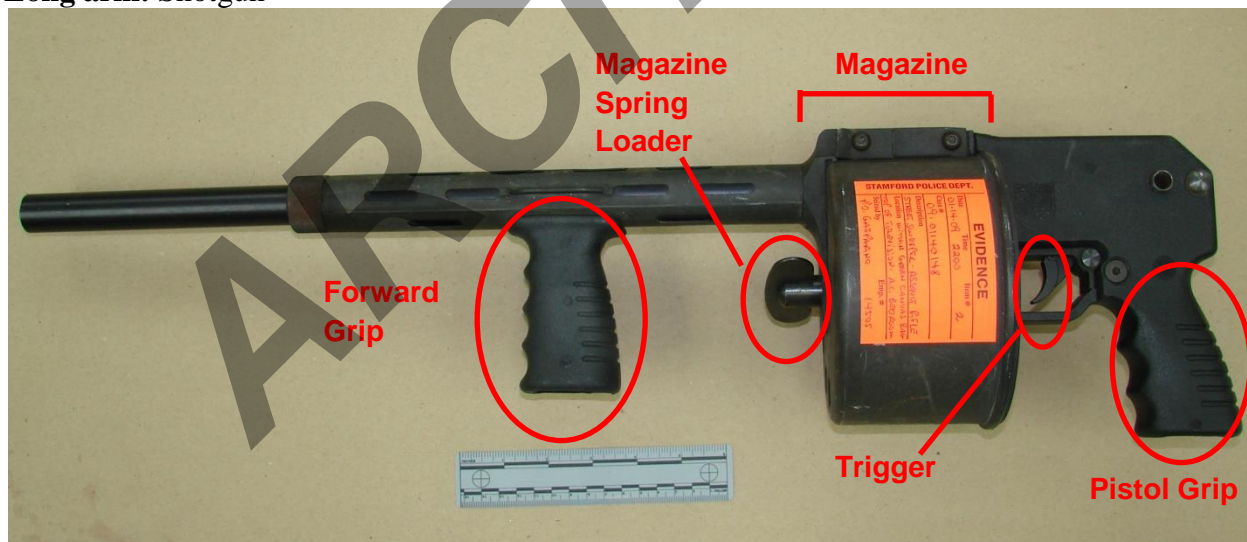


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Long arm: Shotgun



Long arm: Shotgun



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E. Cartridges

1. Only cartridges with the following calibers (.22 cal, .25 cal. and .32 cal) are to be swabbed when there is a Latent Print request for processing. If there is no Latent Print request then all calibers of cartridges can be swabbed.
2. Cartridges are to be photographed from all sides, noting the caliber and manufacturer headstamp.
3. All sides of the cartridges are swabbed as one (1) sample.



4. See examples of Bullets/Projectiles and Cartridge cases/casings below:



Bullets/projectiles

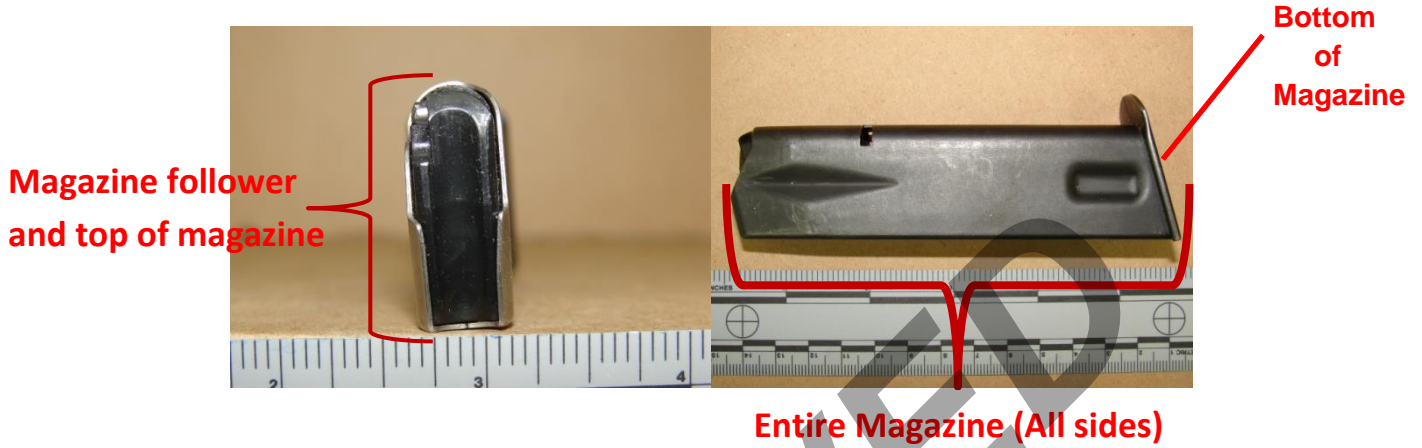


cartridge cases/casings

F. Magazines

1. If the magazine was processed by Latent Prints prior to Forensic Biology processing, or there was no Latent Print request, the entire magazine is to be swabbed.
2. If Forensic Biology is to process the magazine before the Latent Print examination, swab the magazine follower and top of magazine only. If the bottom of the magazine is textured then that may be included as well.
 On a case-by-case basis, Forensic Biology may request the return of the magazine from the Latent Print Unit in order to swab the remaining portions.

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- G. Refer to section 3.3.3 (Guns) for additional information.

3.5 REFERENCES

- A. GL-2 (Safety Manual)
- B. GL-4 (LIMS/Justice Trax)
- C. GL-13 (General Evidence Handling)
- D. DNA SOP-1 General Procedures, Unit 1.1.9