



DNA HIGH VOLUME SERVICE (HVS) GUIDE

SUBMITTING EVIDENCE

The CFS HVS conducts high throughput DNA analysis in support of the identification of perpetrator(s) in the investigation of Break and Enters and Secondary DNA Designated Offences.

CONSULTATION PRIOR TO SUBMISSION IS NOT REQUIRED*. For best service, please fill out a submission request using the online submission portal at <https://www.cfsgov.ca/>. A case synopsis writing guide is linked to the case synopsis section of the submission request form. Please refer to it to ensure the relevant information is included in the case synopsis. Doing so will expedite approval by reducing the need for follow-up questions.

Always choose the highest level offence for your case, and select the appropriate service. If you are submitting blood or urine from a suspected impaired driver for drugs/alcohol testing, please choose this under “what are you interested in?” instead of DNA analysis.

* Please contact the High Volume Service Advisor at the earliest possible stage of projects that will involve multiple agencies and/or numerous submissions of evidence over time, so that a strategy for examination that considers the Project in its entirety may be developed.

For other enquiries, you may contact the High Volume Scientific Advisor by email CFS.biology.highvolume@ontario.ca or by telephone 647-329-1601.

ACCEPTANCE CRITERIA

Submissions to the Biology section, including the HVS, must meet the National DNA Databank Criteria as per the DNA Identification Act (1998):

The crime scene index shall contain DNA profiles derived from bodily substances found:

- a) at any place where a designated offence was committed;
- b) on or within the body of the victim of a designated offence;
- c) on anything worn or carried by the victim at the time when a designated offence was committed;
- or
- d) on or within the body of any person or thing or at any place associated with the commission of a designated offence.

QUALIFYING OFFENCES

The following primary or secondary designated offences (as per Section 487.04 of the Criminal Code of Canada) are accepted into the CFS DNA HVS:

Primary Designated Offences

- 348(1)(d) Breaking and entering a dwelling house

ALL Listed and Generic Secondary Designated Offences, EXCEPT

- 98.1 Robbery to steal firearm
- 266 Assault
- 270 Assaulting a peace officer
- 280/281/282/283 Abduction offences
- All traffic offences involving direct impact of a person by a vehicle resulting in injury or death
- Any offences with a “cause death” element

All other primary designated offences and the secondary designated offences listed above are accepted in the Biology Violent Crime Service.

NOTE: We cannot legally upload DNA profiles to the NDDDB unless the evidence is submitted under a DNA designated offence due to restrictions in the DNA Identification Act. Evidence from non-designated offences will not be accepted for DNA testing without the concurrent submission of a reference sample from the suspect/accused/POI.

PLEASE REFER TO THE NATIONAL DNA DATABANK WEBSITE FOR THE COMPLETE LIST OF DESIGNATED OFFENCES ([See list of offences](#)).

NUMBER OF ITEMS ACCEPTED

- Without information indicating multiple perpetrators, **up to 3 items** may be submitted per case up front. Follow-up submissions (up to a maximum of 5 items per case) may be considered pending the results of the initial submission.
- With information indicating multiple perpetrators, **up to 5 items** may be submitted per case up front.
- The item limit is 5 items per case. Exceptions must be approved by a HVS Advisor.
- For best use of CFS resources, please focus submissions on the least number of items to identify the perpetrator(s). Consider which item is most relevant to address the allegation and which items are the best sources of DNA (those that contain a body fluid) when choosing items to submit. For example, if a perpetrator leaves a backpack behind at the scene and it contains a used water bottle, please only submit the swab of the water bottle and not an additional swab of the backpack. It is reasonable to expect the source will be the same, and a swab of water bottle has a good success rate of generating a DNA profile, while a swab of backpack does not.

ITEMS ACCEPTED

Three types of items are routinely accepted by the HVS:

1. Swab (**Do not submit entire items!**)
2. Cigarette butt
3. Cut-out from envelope flap

Items should not undergo presumptive body fluid testing by the submitting agency. Fingerprinting of any item, prior to DNA analysis, is not recommended; however, swabs of items may be eligible for acceptance following fingerprint treatment in the following scenarios:

- Handled items where the target area for fingerprinting coincides with the target area for DNA analysis (e.g., handles of knives & firearms)
- Items with fingerprints that have been deposited in suspected bodily fluids (e.g., blood or saliva) that require enhancement using fingerprinting chemicals

Submitters must adhere to the following criteria prior to submitting swabs of such items:

- Fingerprint brushes sold as “DNA-free” must be used and must not have been previously applied to another item.
- Fingerprint powders must be non-magnetic, non-fluorescent, and single use.
- Swabs of items that have been rinsed or sprayed as part of the visualization process are acceptable; swabs of items dipped into a solution will not be accepted.
- For items treated with cyanoacrylate, a single item should have been placed in the glue chamber at a time. The chamber should have been decontaminated between the processing of items from different scenes.
- Fingerprints should be recorded through imaging alone. Tape lifts should not be performed as they may remove DNA.
- If UV light sources are used for visualization, wavelengths greater than 255nm should be utilized.

ITEMS NOT ACCEPTED

Items not accepted include, but are not limited to, swabs of:

- door handles
- ammunition/cartridge cases
- magazines
- steering wheels & gear shifts
- items at the scene that may have been touched by the perpetrator

STANDARD ITEM TYPES

1. Cigarette Butt (CB)

- This is the only item that should be submitted whole to the HVS
- Must have been smoked



Note: Plastic cigarillo tip, electronic cigarette/vape mouthpiece or smoked cigar must be swabbed and submitted as SAS (see below).

2. Cut-out from Envelope Flap (ENV)

- Envelope must not be self-sealing variety
- Cut-out an approximately 2cm x 2cm section from the flap of the envelope using either a disposable blade or scissors that have been decontaminated with a ~1% bleach solution and rinsed with water between items.



NOTE: Do not submit the whole item for sampling as the HVS does not return untested material. Since most postage stamps are self-adhesive, they are not accepted for DNA analysis.

3. Swab

Swabs of a variety of item types may be submitted **but the item must have been brought to the scene and left behind by the perpetrator.**

- Process each item using only one swab.
- Unless possible blood or saliva on an item is still wet, all swabs should be slightly moistened with sterile water prior to use. When swabbing a large, absorbent surface such as a fabric glove, the swab should be thoroughly wetted.
- The wet swabs should be dried prior to packaging to prevent mold.
- Ensure that you swab the entire area of interest thoroughly using sufficient pressure. Rotate the swab to use the entire swab head. Click [here](#) for training videos that demonstrate swabbing technique.
- Do not submit control swabs. **Submitting more than one swab in a package will result in the item being returned untested.**

SWAB TYPES

Possible contact with blood

- Swab of possible blood (BLS)
- Swab of syringe (SYR)

Possible contact with saliva

- Swab of drink container or drinking implement (DCS)
- Swab of partially eaten food or eating utensil (FDS)
- Swab of possible saliva (SAS)

Possible contact with blood or saliva

- Swab of airbag (ABS)

Handled Items

- Swab of tool (TLS)
- Swab of weapon (WPS)
- Swab of other handled item (HDS)

Worn/Personal Items

- Swab of headwear (HWS)
- Swab of glove (GVS)
- Swab of personal effect (PES)
- Swab of other worn item (WRS)

Other

- Other (OTH)

Swab of possible blood (BLS)

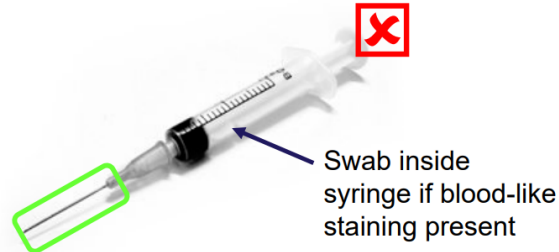
- Suspected blood swabs are only carried forward to DNA analysis if they test positive for blood.
- Testing for blood is the only body fluid identification regularly performed by the HVS. In rare cases, testing for other body fluids may be relevant to the specific allegations. An exception to the standard process must be requested prior to submission.
- You must have established investigative information that more than one perpetrator was bleeding to submit more than one blood swab.
- Do not oversaturate the swab with blood; doing so can inhibit our ability to obtain a DNA profile.



- DO NOT TEST suspected bloodstains or swabs with presumptive tests such as Hematsix® or enhancement chemicals such as Luminol, BlueStar®, or LMG. These can inhibit our ability to obtain a DNA profile.

Swab of syringe (SYR)

Swab the entire needle. Include on the same swab a sample of suspected bloodstaining inside the syringe, if present.



Swab of drink container / drinking implement (DCS)

Swab the entire inner and outer mouth area of a drink container and include the inside cap if applicable. Both ends of a straw should be swabbed with the same swab if unknown which end was used.



Swab of partially eaten food / eating utensil (FDS)

Swab the entire bitten surface of a partially eaten food item. Food items should be kept frozen for preservation and to prevent mold. Swab the entire area of a utensil that would be put in the mouth. This category does not include a swab of knife generally only handled with normal use.

**Swab of possible saliva (SAS)**

This category includes all other items that may have come into contact with saliva and/or nasal secretions. Swab the area in contact with the mouth. If the item is not amenable to swabbing, such as a used Kleenex tissue, a 1cm x 1cm cut-out from staining may be submitted.

**Swab of airbag (ABS)**

A swab of each deployed front airbag may be submitted. Use one swab per airbag and swab as much of the front as possible to maximize the amount of DNA collected and to ensure the correct area of impact is sampled.

If there is any visible blood-like staining, swab the staining separately. This swab should also be coded ABS and is preferable to submit initially as blood is a rich source of DNA.

**Notes:**

- The primary objective of the DNA analysis of airbags is to aid in the identification of individuals present in the vehicle at the time of airbag deployment.
- In most circumstances, DNA profiles from airbags do not, on their own, confirm the position of occupants within a vehicle at the time of a crash (i.e. to determine whether someone was either the driver or a passenger) as body fluids can travel throughout the vehicle during the collision.
- Swabs of side curtain airbags will not be accepted unless there is visible blood-like staining.

Swab of tool (TLS)

Target defined handle grips for swabbing, where applicable. Otherwise target the areas of expected contact. If you plan to fingerprint the item, it is advisable to sample for DNA first, otherwise you must adhere to the criteria outlined in the [“ITEMS ACCEPTED”](#) section. Consider that textured areas and areas of most frequent contact are likely to contain the most DNA, and more DNA will likely be collected with a greater surface area swabbed.



Swab of weapon (WPS)

Generally, swabs of firearms are accepted for associative DNA testing unless the firearm has been seized directly from an individual. A swab of a firearm is limited to a swab of the grip/slide (or stock/forestock of a long arm). You must swab for DNA prior to test firing. The HVS does not accept swabs of a magazine nor ammunition. In cases of weapon possession, only a swab of the weapon should be submitted; the HVS does not accept other item types for DNA testing in lieu of the weapon in these cases.



Swab of other handled item (HDS)

This category includes swabs of handled items other than tools and weapons. Swab the areas of most frequent contact using one swab (e.g. swab the handle and outer cap of a gas can). Consider that increasing the surface area swabbed to maximize the amount of DNA collected will increase the likelihood of generating a DNA profile (e.g. it is recommended to swab the entire surface of a lighter as opposed to just the wheel and button).



Swab of headwear (HWS)

Where applicable, focus swabbing the **inside** surface nose/mouth area, but include as much area as possible that would make the most contact with skin.



Swab of glove (GVS)

Swab the entire **inside** surface of one glove. The inside surface of a disposable glove can be determined by the roll of material inward at the cuff. Only submit a swab of one glove of a pair in the initial submission.



Swab of personal effect (PES)

This category includes items that are considered worn or used by a single person. Swab the area that would make the most contact with skin.



Swab of other worn item (WRS)

This category includes swabs of worn items other than gloves, headwear and personal effects. Swab the area with most rubbing contact with the skin. Staining or fraying of material associated with wear may be useful indicators.



Other DNA swab (OTH)

- These requests will immediately trigger the involvement of a scientific advisor in the online acceptance process. Please provide rationale for requesting an item that falls outside of our standard list of items.

- If this is an item that may contain semen (e.g. swab of ejaculate in indecent act offence) please indicate whether identification of the body fluid is necessary or if it is sufficient to generate a DNA profile only. These items must be submitted under OTH for review, as different processing may be required.



PACKAGING

- Items should be air-dried prior to submission.
- **Package only one item per container (failure to do so will generally result in the return of the items untested).**
- Each item must be individually listed and described.
- Package into paper bags, breathable plastic bags, swab boxes/tubes or envelopes. Minimal packaging is preferable.
- Properly attach a numbered seal to each individual item.

REFERENCE (COMPARISON) SAMPLES

Samples from known individuals, collected with consent, by warrant or discarded, may be submitted at any point. Reference samples should not be submitted if the evidence has already been tested and has failed to yield any DNA profile(s) suitable for comparison.

- **Please ensure you choose the “add reference sample from person” button and not the “add evidence” button on the online submission form.**
- **REFERENCE SAMPLES FROM COMPLAINANTS SHOULD BE SUBMITTED IF THEY HAVE HANDLED / CONTACTED EVIDENCE SAMPLES TO ENSURE DNA PROFILES ATTRIBUTABLE TO COMPLAINANTS ARE NOT UPLOADED TO THE DNA DATABANK.**
- Please list in the case synopsis any other cases and items to which a comparison is requested and authorized, if outside of the current case. If none are listed in the case synopsis, comparisons will be confined to results generated in the case for which the comparison sample is submitted (even if the submission includes cross referenced cases).

REPORTING

- The HVS issues a one-page letter per item with DNA results. This is different than a full biology report that is issued in a Violent Crime Service case.
- The HVS interprets DNA profiles from a single individual and simple mixtures of DNA.
- The HVS does not routinely interpret complex mixtures (complicated DNA profiles where the major contributor is more difficult to determine). You may request an exception by contacting the HVS Advisor if your case meets the exception criteria (linked in the automated HVS email response).
- The HVS does not interpret minor contributions of DNA in a mixture.
- **If you are missing a copy of the letter, please contact your DNA coordinator.**
- The online submission portal provides estimated wait times for reports.
- Expedited testing is not offered by the HVS.

LIMITATIONS OF DNA

- A DNA profile is not necessarily from the last person to handle or wear an item.
- A DNA profile generated is not necessarily from the most frequent user or wearer of an item.
- An individual can handle or wear an item and not deposit sufficient DNA for detection.
- It is possible for someone who has not had direct contact with an item to have their DNA deposited through an indirect means of transfer.
- DNA depositions cannot be dated.

HVS DOES NOT RETURN ITEMS AFTER TESTING

The following are routinely **discarded** after testing:

- Reminders of cigarette butts, envelope flaps, and swab sticks.
- Any possible blood swabs that test negative for blood.
- Control swabs submitted in the same packaging as a possible blood swab.
- Reference samples (including any remaining DNA) submitted concurrently with HVS evidence samples that fail to generate a DNA profile suitable for comparison (in these instances, the results of the reference sample testing will be retained in the case record but not interpreted/reported).
- Original packaging.
- Extracted DNA is **retained for 5 years** from the date of its submission, after which it is destroyed.

Packaging and/or any remaining item may be retained when:

- Packaging is found to be compromised in a manner that affects the integrity of the sample.
- Potential for contamination is noted.