

GUIDELINES FOR SUBMISSION OF SAMPLES FOR DNA ANALYSIS AT THE ICMP

FOR FURTHER ASSISTANCE WITH SAMPLES SUBMISSION FOR EXAMINATION AND DNA ANALYSIS AT THE ICMP, PLEASE CONTACT:

**ICMP Project/Contact Liaison Person (As Indicated On The Agreement/Contract Of Work)
OR**

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Distribution:

General

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ICMP.FSD.DNA.511.1.doc

I. Background

1. The International Commission on Missing Persons (ICMP) assists governments and other authorities in locating and identifying missing persons resulting from armed conflicts, hostilities and natural disasters. Technical assistance provided by the ICMP ranges from the recovery and examination of human remains through to the identification of the remains using a DNA-led identification system.
2. The DNA Laboratories and Identification Coordination Division (ICD) of the ICMP have been accredited under ISO/IEC17025 guidelines since 2007. This accreditation recognizes the high quality of work produced by the ICMP in the field of missing persons identification using DNA analysis.
3. An important component in the quality assurance of this work is the need to correctly label, package and transport samples to the ICMP. The success of any sample analysis is greatly dependent upon the ability to ensure sample integrity and continuity upon sample receipt at the ICMP. Furthermore, the achievement of any identification project relies upon the availability of sufficient sample specific information through legible labelling and supporting documentation. This further ensures that results can be correctly interpreted in the context of the situation.

II. Scope

4. Postmortem samples and reference DNA samples are routinely submitted to the ICMP for DNA analysis as part of the identification process. This document outlines the guidelines for sample labelling and submission to the ICMP. These guidelines are based upon best practice forensic principles to ensure that meaningful results and interpretations can be made to the highest quality.
5. The guidelines outlined in this document are applicable to all ICMP missing person identification projects. Deviations specific to certain identification projects may be found within the agreement or contract for that project. The ICMP project or contact liaison person working on such project will be able to advise upon any project specific sample submission requirements.

III. Quality Assurance and Sample Acceptance

6. Forensic identification utilizing DNA testing requires unambiguous sample designation, and a definitive link between submitted samples and the human remains they represent. Therefore it is necessary that the guidance in this document be followed. Adherence to these guidelines facilitates the analysis process, enables the samples to be processed promptly and ensures that results can be interpreted correctly. Failure to follow these guidelines may result in a delay in sample processing, as missing information will need to be established through communication with each sample submitter.
7. Failure to adequately transport, label, and transfer samples may result in the ICMP refusing to accept samples for examination and/or DNA testing, if such a failure has the potential to affect the reliability of the testing and/or identification process. Submitters of samples are encouraged to liaise with ICMP ahead of time to ensure an appropriate labelling and submission scheme. Regular submitters of samples from the former Yugoslavia are expected to conform to the sample labelling convention listed below under section VIII.

IV. References to Related Documentation

8. Where practical, the following ICMP documentation may be available for submitters to use when submitting samples to the ICMP to ensure compliance with the guidelines outlined:
 - *Request for DNA Analysis Chain of Custody Form – ICMP.FSD.98.doc;*

- *Secure Transfer of Items Form – ICMP.FSD.95.doc;*
- *ICMP Pre-printed Envelopes for Packaging Postmortem Samples Collected for DNA Analysis;*
- *ICMP Antemortem Data Questionnaire with Reference Donor Information – ICMP.FSD.18.doc.*

9. Enquiries on the availability and applicability of these documents to specific identification projects should be made with the contacts indicated on the front page of this document.

V. Reference DNA Samples Submission

10. A reference sample is a biological sample of DNA (usually in the form of a bloodstain card or buccal swab) collected from family members with missing relatives. DNA profiles obtained from reference samples are used to establish genetic relationships with those obtained from unidentified human remains, thereby enabling identifications to be made.
11. Irrespective of the involvement of ICMP trained personnel for the collection of reference DNA samples, all samples submitted for use as known DNA references should be uniquely labelled as to the identity of the person providing the reference and his/her relationship to any and all missing persons for whom the sample was provided. This should be labelled in a clear and legible manner.
12. Specifically, each reference sample should be accompanied by the following information:
- Full name, sex and date of birth of person providing reference sample;
 - Full name, sex and date of birth (if known) of the missing person(s) for whom the sample(s) are provided;
 - Unambiguous information indicating the biological and/or spousal relationship of the reference donor to the missing person(s) and to other donors of the same missing person;
 - Evidence of signed informed consent by the donor for the provision of the reference sample;
 - Where relevant, completed the consent section indicating whether or not the donor is willing for the information to be used in any criminal justice proceedings, or shared with other identification authorities.

Note: If the reference sample is *only* labelled with a unique sample code (such as a barcode), sufficient documentation needs to be provided to the ICMP to demonstrate the link between the unique sample identifier and the corresponding information indicated above.

13. This information may be provided to the ICMP using the *ICMP Antemortem Data Questionnaire with Reference Donor Information (ICMP.FSD.18.doc)* or other agreed documentation.
14. Each reference sample should be individually packed to minimise the chances of cross-sample contamination. The immediate packaging of each sample should also be labelled with the corresponding unique sample identifier. All packaging should be tape-sealed, signed and dated by the individual that performed the packing to ensure the integrity of the samples.
15. All samples and any accompanying documentation should be secured inside a tape-sealed and signed container for delivery to the ICMP (e.g. tape-sealed and signed cardboard box or envelop). All openings and potential openings (e.g. underside of a box) of the container should be secured to protect the integrity of the samples (e.g. tape-sealed).

VI. Postmortem Samples Submission

16. Regardless of the involvement of ICMP trained personnel for the recovery and collection of postmortem samples, all samples which are subsequently taken for submission to the ICMP for DNA analysis, should be identified or labelled with a unique sample identifier (such as an item number or a barcode). This should be labelled in a clear and legible manner, either attached to the sample itself or on its immediate packaging. Additional information on the use of sample codes for samples submitted from the former Yugoslavia can be found in Section VIII of this document.
17. Furthermore, each sample should be accompanied by the following information:
 - Name and signature of the individual who authorized the taking of the sample;
 - Date of sample collection;
 - Name(s) and signature(s) of the individual(s) who took and, or packed the sample (if these are different);
 - Name of the forensic expert or individual authorized to receive the report of results (this will ensure that results are promptly reported to the relevant individual);
 - Type of bone sample e.g. femur;
 - The recovery location of the sample (if this is unknown then it should indicate as such).
18. Postmortem samples intended for submission to the ICMP for DNA analysis should be individually packed to minimise the chances of cross-sample contamination. All packaging should be tape-sealed, signed and dated by the individual who performed the packing to protect the integrity of the samples.
19. The ICMP pre-printed sample envelopes and the *Request for DNA Analysis Chain of Custody Form (ICMP.FSD.98.doc)* may be available for use in packing bone samples for submission to the ICMP for DNA analysis. The completion of all the fields indicated on these documents will ensure compliance to the guidelines indicated above, resulting in the prompt processing of samples upon receipt at the ICMP.
20. All samples and any accompanying documentation should be secured inside a tape-sealed and signed container for delivery to the ICMP (e.g. tape-sealed and signed cardboard box). All openings and potential openings (e.g. underside of a box) of the container should be secured to protect the integrity of the samples (e.g. tape-sealed).

Note: If the bone sample is *only* labelled with a unique sample code (such as a barcode), sufficient documentation needs to be provided to the ICMP to demonstrate the link between the unique sample identifier and the corresponding information indicated above (i.e. demonstrate linkage between the barcode and the sample specific information).

VII. Delivery of Samples via a Commercial Shipping Company

21. Where a commercial shipping agency is used to deliver samples to the ICMP, the submitter should ensure that the package containing all samples and accompanying documentation is suitably packed to withstand the journey. The submitter should also maintain a copy of the tracking number and shipment record for their own records in order to track the delivery of the samples.
22. For deliveries outside of the country where ICMP facilities are based, the submitter should ensure that the ICMP contact liaison is informed of any upcoming deliveries. The ICMP may be able to facilitate the delivery of samples into the country by ensuring that specific customs declarations and requirements are met by the submitter.

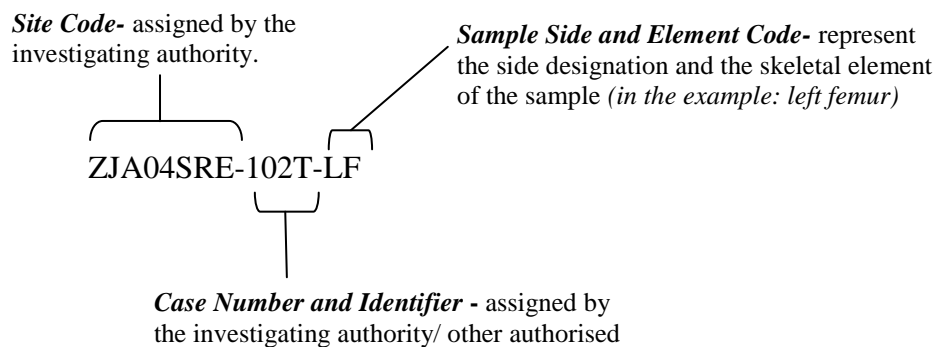
VIII. Additional Information for Postmortem Sample Labelling

8.1. Sample Codes

23. Sample codes are used for the unique identification of a sample. Every sample designated for DNA testing must be assigned a unique sample code to eliminate the chances of sample mix up. This code may also be used for sample tracking purposes within various departments to ensure continuity for quality assurance purposes.
24. The selection in the type of sample codes employed may differ according to organizational or departmental needs. Regardless of the type and format of sample codes used, sufficient documentation should be in place to ensure that the origin of the sample can be traced using the unique sample code.
25. In general, sample codes may be a combination of alphanumeric characters written (or printed) out in full or encoded as a barcode. The following recommendations apply when assigning sample codes:
 - Where the sample code is handwritten, it should be neatly written using CAPITAL letters;
 - A zero must have a diagonal slash through it (e.g. Ø), to distinguish this number from the letter 'O';
 - The number seven must have a dash through it (e.g. 7), to distinguish this number from the number '1';
 - The sample code should not have blank spaces;
 - A slash (e.g. /) should be written clearly to avoid confusion with the number '1'.

8.2. Determination of a Sample Code (ICMP Example)

26. For samples taken by ICMP staff, and for submitters of cases from the former Yugoslavia, the sample code should consist of the site code, case number, identifier, sample side and skeletal element code.
27. The following example shows the sequence and appropriate characters for separation:



28. Table 1 represent the elements with a side designation and the abbreviated element code. For skeletal elements which are not listed, an indicative code should be devised and a notation made indicating the sampled element on the relevant submission form.

Skeletal/Dental Element	Sample Side	Element Code
Maxillary Tooth		MXT or Specific Tooth Code (T##)
Mandibular Tooth		MNT or Specific Tooth Code (T##)
Occipital Bone		OC
Parietal Bone	L or R	PR
Petrous Portion of Temporal Bone	L or R	PT
Mandibular Body	L or R	MN
Clavicle	L or R	CL
Rib	L or R	RB
Cervical Vertebral Spinous Process		CV
Thoracic Vertebral Spinous Process		TV
Lumbar Vertebral Spinous Process		LV
Humerus	L or R	H
Ulna	L or R	U
Radius	L or R	R
Innominate	L or R	P
Femur	L or R	F
Tibia	L or R	T
Fibula	L or R	FB
Metatarsal	L or R	MT

Table 1:
Skeletal Elements with Side Designation and Abbreviated Element Code

Element Number:

The element number is used to distinguish between the same elements in a commingled assemblage. Some cases may have several duplicate elements, each of which will be sampled.

For example:

THAI/Ø86BP-LF ←
THAI/Ø86BP-LF2 ← *In this example, two left femora are distinguished as shown*

8.3. Additional Components of a Sample Code (ICMP Example)

i) Determination of a Sample Code for a Second Sample from the Same Bone

29. If the first DNA sample produced an unsuccessful DNA result and another sample is selected from the same skeletal element, the identifier **-2** is added to the sample code.

For example:
THAI/199BP-RT → THAI/199BP-RT-2 *In this example: denotes a second sample taken from the right tibia*

ii) Determination of a Sample Code for a Second Sample from the Same Body Part, but Different Bone

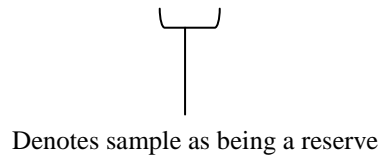
30. Follow the same procedure as for a new sample.

iii) Samples Submitted as a Reserve

31. For cases where more than one specimen are submitted separately and it is **NOT** required that all of the specimens be processed for DNA testing, a final designator is required to indicate that the additional specimen(s) are reserves.
32. Reserve specimens will be retained indefinitely by ICMP and processed only if the first, most desirable sample fails to yield a DNA profile. Accordingly, *samples should be listed as reserves only in cases where there is NO possibility that they originate from different individuals.*
33. An example of the narrow circumstances where this is justified would be taking femur and tooth samples from the same fully articulated body from a single burial. For reserve samples, the identifier **-RES** is added to the sample code.

For example:

THAI/234BP-LT-RES



Denotes sample as being a reserve

Version Number	Date of Issue	Date of Implementation	Prepared By	Approved By	Signed
1	11-Oct-2011	11-Oct-2011	Kitty Lai	Thomas Parsons	