Purpose: To detect and enhance latent or patent imprint/impressions using various chemical processes.

Responsibility: Forensic Science Examiners assigned to the Imprints Unit are responsible to follow the guidance of this procedure.

Safety: All proper personal protection equipment will be used as appropriate. Fume hoods should be utilized whenever possible.

Procedure:

Special Note:

All chemical enhancement processing will be coordinated and conducted with the assistance of the Latent Print and/or other Unit(s) of the Laboratory.

Procedure:

1. Review information provided by submitting agency and conduct preliminary examination of items to determine if chemical enhancement processing is necessary.

2. Photograph all items prior to processing. (See IM SOP-4 Photography.)

3. All chemicals and reagents will be stored and kept in appropriate containers. Containers will be properly labeled as to the contents, date of preparation, and expiration date, as applicable. Chemicals and reagents that have expired or have passed their shelf-life will be discarded.

4. The selection of the chemical or reagent is at the discretion of the examiner and may be based on several factors, including the material from which the imprint is made, the color of the substrate, the background reactivity of the substrate and the amount of blood, dirt or other material in the imprint. It is ultimately the responsibility of the examiner to determine the best possible application or sequential applications of various techniques based on previous experience, training and type of evidence being examined.

5. Before a chemical/reagent can be used on any item of evidence, it shall be tested to assure that its shelf-life has not passed and that expected results will be achieved. The substrate shall also be tested for possible background interference. The results of the test(s) shall be recorded in the examiner's notes and in any log book as applicable. Any chemical/reagent that does not produce a positive result of an acceptable strength shall be discarded. A new supply source shall be tested and utilized only if positive results are obtained.

6. Chemicals/reagents and powders utilized by the Latent Prints Unit are approved for use by the Imprints Unit. Whenever possible premixed solutions or premixed kits will be purchased. When

an examiner needs guidance as to the application of development techniques or the preparation of chemicals not purchased as premixed, the "Guidelines for the Application of Powders, Chemicals and Reagents" in LP SOP-04 Appendix 2 should be referenced. If a chemical/reagent will be made at the Laboratory, the examiner should refer to the appropriate "formula" information in LP SOP-04 Appendix 1.

7. Any new reagents or chemicals not listed in this SOP or LP SOP-04 will first be validated after conferring with the Deputy Director of Identification and/or the Quality Manager.

8. In addition to the chemicals and reagents in LP SOP-04, the following reagent is also approved for use by the Imprints Unit.

Potassium Thiocyanate

Iron will react with thiocyanate ions in an acid solution. If iron is present in the residue of an imprint, a positive reaction will produce a reddish-brown color. Iron is found in some soils. The procedure works well for wet residue and muddy impressions. A premixed solution can be used or the potassium thiocyanate can be prepared according to the following formula:

Potassium Thiocyanate:

15 g potassium thiocyanate
120 mL acetone
15 mL distilled water
8.5 mL sulfuric acid (dilute)

To 120 mL of acetone and 15 mL of water add 15 g of potassium thiocyanate. Then add 8.5 mL of dilute sulfuric acid. Make sure that you add the sulfuric acid to the acetone/water mixture. A milky mixture will result, which, on standing, will separate into two layers. When the layers have separated, remove the top layer, which is clear. This is the solution to be sprayed on the impressions. The reagent can be stored for three months in a cool dry place. This reagent is light sensitive and should be stored in a dark bottle.

Procedure of Application

1. Spray the impression with the potassium thiocyanate reagent using a fine spray in light successive coatings until satisfactory development is obtained. Be careful to not over spray, as running of the reagent can occur.

Before application of the reagent on the evidence, a control test will be run to determine if the reagent is performing properly and that the expected results will be achieved. An imprint on paper, or on another surface as applicable, will be made with a soil sample known to

contain iron. The reagent will be applied to this test imprint and the results of the test shall be recorded in the examiner's notes and in any log book as applicable. Any chemical/reagent that does not produce a positive result of an acceptable strength shall be discarded. A new supply source shall be tested and utilized only if positive results are obtained.

9. The evidence and any imprint(s) developed should be photographed after enhancement. (See IM SOP-4 Photography.)

Results:

Dependent on results of chemical enhancement processing.

Sources of Error: N/A

Quality Assurance: N/A

References: See bibliography.