Technical Procedure for Distance Determination

1.0 Purpose – To outline the procedures in determining muzzle-to-target distances.

2.0 Scope – This procedure applies to any evidence submitted to the Firearm and Tool Mark Section which may contain gunshot residues or pellet patterns.

3.0 Definitions

- **Bullet wipe** – The discolored area on the immediate periphery of a hole, caused when soft lead, carbon residue, bullet lubricant and debris from the barrel are wiped off the surface of a bullet.
- **Chromophoric** – Color producing.
- **Distance determination** – The process of determining the distance from the firearm, usually the muzzle, to the target based upon patterns of gunpowder or gunshot residues deposited upon that target. Where multiple projectiles, such as shot, have been fired, the spread of those projectiles is also indicative of distance.
- **Gunshot residues** – The total residues resulting from the discharge of a firearm. It includes both gunpowder and primer residues, plus metallic residues from projectiles, fouling, etc.
- **Maximum distance determination** – A type of distance determination in which the results indicate the closest muzzle-to-target distance at which no gunshot residue is observed.
- **Negative control** – An experiment that is expected to yield a negative result in an effort to test for contamination of test media and/or reagents that may give a false positive.
- **Nitrite** – A chemical component which is a product of combustion of black and smokeless powder.
- **Pellet pattern** – The distribution of shot fired from a shotgun.
- **Positive control** – An experiment that is expected to yield a positive result in an effort to verify proper working condition and reactivity of test media and/or reagents.
- **Specific range distance determination** – A type of distance determination in which the results may be given as a bracketed range, indicating the muzzle of the firearm was farther than a given distance away from the target and closer than a given distance away from the target when the shot was fired.
- **Stellate** – Star shaped. In practical use any hole that has three or more points is usually called stellate. For instance a hole in the form of an “L” or a “T” would be called stellate by most.

4.0 Equipment, Materials, and Reagents

- Stereomicroscope
- Lighted magnifier
- Tape measure
- 15 % acetic acid solution
- Sodium rhodizonate
- Buffer solution (pH 2.8)
- 5 % hydrochloric acid solution
- Distilled Water
- Photographic paper (either desensitized emulsion-based photographic paper or inkjet photographic paper)
- Filter paper (sharkskin)
- Nitrite test swabs
- Lead test swabs, sheet lead, and/or lead bullet
- Twill cloth squares, 9” x 9”
- Cardboard

- Spray nozzle
- Gauze (cheesecloth may be substituted)
- Iron
- Personal protective equipment
- Fume hood

5.0 Procedure

5.1 Distance determinations are firearm and ammunition specific.

5.1.1 In the event that no fired ammunition component(s) is/are identified to the submitted firearm or no evidence firearm is submitted, a visual examination of evidence items may be performed, but no chemical processing shall be performed.

5.2 Gunshot Residue Examination

5.2.1 Item Preparation

5.2.1.1 Prior to examination, ensure that any additional service requests (e.g., Forensic Biology, Trace, Latent, etc.) that shall be completed before analysis by the Firearm and Tool Mark Section have been completed. This may be verified by examining one, or a combination, of the following:

5.2.1.1.1 The status of other case records in Forensic Advantage (FA).

5.2.1.1.2 The chain of custody.

5.2.1.1.3 Markings from other Forensic Scientists on the evidence packaging.

5.2.1.2 Wear personal protective equipment, such as gloves, lab coat, and/or safety glasses, if the item may be contaminated with a biohazardous material (blood or other potentially infectious material).

5.2.1.3 Visually inspect the item for possible trace evidence such as hair, fibers, wood, etc. Note the location on the item where the trace material was found. Carefully remove the material and place in a container suitable for return to the submitting agency or submission to the appropriate Laboratory Section for further examination.

5.2.1.3.1 If the trace material is not to be retained, indicate as such in the case notes.

5.2.1.4 Mark all evidence for identification.

5.2.1.4.1 Mark the evidence away from the area being processed.

5.2.1.4.2 Mark with the item designation number (R number), the Laboratory case number, and the Forensic Scientist's initials.

5.2.2 Visual/Microscopic Examination

5.2.2.1 A separate Gunshot Residue Worksheet shall be filled out in Forensic Advantage (FA) for each item of evidence to be processed. Each worksheet shall contain the item designation number (R number) assigned to the item by the Forensic Scientist.

5.2.2.2 Visual/microscopic examinations of evidence for observable physical characteristics of residues shall be performed in an uncontaminated area with adequate lighting.

5.2.2.3 Examine the evidence for physical effects indicative of or consistent with:

5.2.2.3.1 The discharge of a firearm:

- Vaporous lead (smoke, soot)
- Particulate metals (shavings, solidified droplets)
- Unburned, partially burned, and/or burned gunpowder

5.2.2.3.2 The passage of a bullet:

- A hole in the item
- A visible ring around the perimeter of a hole (possible bullet wipe)

5.2.2.3.3 A contact gunshot:

- Ripping or tearing, especially stellate-shaped tears
- Burning or singeing
- Melted artificial fibers
- Heavy soot and vaporous lead residues

5.2.2.3.4 Possible masking effects:

- Dark background color
- Blood staining
- Intervening object

5.2.2.4 Record the findings of the visual/microscopic examination in the case notes. The notes shall include a written description of the item and the location of any holes in the item. The notes may include a sketch, drawing, or photographs of the item with the holes indicated.

5.2.3 Chemical Testing

5.2.3.1 All chemical tests shall be performed in a properly ventilated fume hood.

5.2.3.2 If multiple chemical examinations are to be performed on an item, they shall be completed in a specific order: Modified Griess followed by Sodium Rhodizonate.

5.2.3.3 The Modified Griess Test

5.2.3.3.1 A chemically specific chromophoric test for nitrite compounds from burned or partially burned gunpowder.

5.2.3.3.2 Prepare enough Griess paper as needed for the examination of the evidence and one extra for the negative control test.

5.2.3.3.2.1 Place Griess paper solution (prepared by the Firearm and Tool Mark Section Safety and Chemical Hygiene Officer or his/her designee) in a non-reactive tray.

5.2.3.3.2.2 Briefly dip precut sheets of desensitized photographic paper into the tray. Submerge each sheet and remove.

5.2.3.3.2.3 Hang sheets to dry and place the remaining Griess paper solution into an uncontaminated and sealed storage container.

5.2.3.3.2.4 Once the Griess paper has dried, perform the following positive and negative control tests.

5.2.3.3.3 Positive Control

5.2.3.3.3.1 Saturate a nitrite test swab in a small amount of 15 % acetic acid solution and dab the corners of the Griess paper.

5.2.3.3.3.2 An orange color appearing at each corner of the Griess paper confirms that the test is reacting properly.

5.2.3.3.4 Negative Control

5.2.3.3.4.1 Place a piece of unused twill cloth on the working side of the extra sheet of Griess paper.

5.2.3.3.4.2 Soak a piece of nitrite-free gauze in 15 % acetic acid solution and wring it out. Place this gauze on the twill cloth as the third layer and apply a hot iron to the gauze. The iron shall be cleaned before use and between evidence items.

5.2.3.3.4.3 No reaction is expected to take place and no visible nitrite reactions are expected to be found on the Griess paper.

5.2.3.3.5 The results of the positive and negative control tests shall be recorded on the Gunshot Residue Worksheet.

5.2.3.3.6 Evidence Examination

5.2.3.3.6.1 Place the evidence item questioned side down on the working side of the Griess paper. Using a pencil or other marking device, index suspected bullet holes.

5.2.3.3.6.2 Soak a piece of nitrite-free gauze in a solution of 15 % acetic acid solution and wring it out. Place the gauze on the questioned item as the third layer. Press the gauze with a hot iron. The iron shall be cleaned before use and between evidence items.

5.2.3.3.6.3 Discard the gauze and separate the questioned item from the Griess paper. Any orange reactions on the Griess paper are the results of a chromophoric reaction chemically specific for the presence of nitrite residues.

5.2.3.3.6.4 Record and fully describe any reactions in the case notes, including the size and density of any pattern found.

5.2.3.3.6.5 For health and safety reasons, discard the used Griess paper and gauze in a biohazard container.

5.2.3.3.6.6 Repeat the above process for all holes in the questioned item and for any other porous questioned items submitted for gunshot residue examination.

5.2.3.3.6.7 If necessary, allow the evidence item to dry prior to performing the next stage of testing.

5.2.3.4 The Reverse Modified Griess Test

5.2.3.4.1 A variation of the Modified Griess Test to be used for non-porous materials through which the acetic acid solution “steam” will not penetrate.

5.2.3.4.2 Prepare Griess paper as described in 5.1.3.3.2.

5.2.3.4.3 Positive Control

5.2.3.4.3.1 Saturate a nitrite test swab in a small amount of 15 % acetic acid solution and dab the corners of the Griess paper.

5.2.3.4.3.2 An orange color appearing at each corner confirms that the test is reacting properly.

5.2.3.4.4 Negative Control

5.2.3.4.4.1 Place a piece of unused twill cloth on the working side of the extra sheet of Griess paper.

5.2.3.4.4.2 Soak a piece of nitrite-free gauze in 15 % acetic acid solution and wring it out. Place this gauze on the twill cloth as the third layer and apply a hot iron to the gauze. The iron shall be cleaned before use and between evidence items.

5.2.3.4.4.3 No reaction is expected to take place and no visible nitrite reactions are expected to be found on the Griess paper.

5.2.3.4.5 The results of the positive and negative control tests shall be recorded on the Gunshot Residue Worksheet.

5.2.3.4.6 Evidence Examination

5.2.3.4.6.1 Wipe the working side of the Griess paper with a piece of gauze saturated with the 15 % acetic acid solution. Lightly apply this solution to the entire surface. Too much acetic acid may cause an indistinct or hazy result due to pigment migration.

5.2.3.4.6.2 Immediately place the Griess paper working side down on the questioned surface. Apply a hot iron to the back of the Griess paper. (Note: Placing filter paper between the iron and the Griess paper may help prevent the Griess paper from sticking to the iron.) The iron shall be cleaned before use and between evidence items.

5.2.3.4.6.3 Separate the questioned item from the Griess paper. Any orange reactions on the photo paper are the results of a chromophoric reaction chemically specific for the presence of nitrite residues.

5.2.3.4.6.4 Record and fully describe any reactions in the case notes, including the size and density of any pattern found.

5.2.3.4.6.5 For health and safety reasons, discard the used Griess paper and gauze in a biohazard container.

5.2.3.4.6.6 Repeat the above process for all holes in the questioned item and for any other non-porous questioned items submitted for gunshot residue examination.

5.2.3.4.6.7 If necessary, allow the evidence item to dry prior to performing the next stage of testing.

5.2.3.5 The Sodium Rhodizonate Test

5.2.3.5.1 A chemically specific chromophoric test for lead.

5.2.3.5.2 Positive Control

5.2.3.5.2.1 Using the specially prepared lead swabs, sheet lead, or a lead bullet, mark the item to be tested well away from any holes to be examined. If the size of the item may result in the contamination of the questioned area by the positive control mark, unused twill cloth may be utilized instead.

5.2.3.5.2.2 Spray the control area of the item with a saturated solution of sodium rhodizonate in distilled water.

5.2.3.5.2.3 Spray the same area with a buffer solution (pH 2.8) consisting of sodium bitartrate and tartaric acid in distilled water. A pink reaction is expected to be seen in the area marked with lead and no reaction is expected to be seen in the areas not marked with lead.

5.2.3.5.2.4 Spray a 5 % solution of hydrochloric acid. This spray changes the pink areas to a blue-violet color in the areas marked with lead and no change is expected to occur in the areas not marked with lead.

5.2.3.5.3 Negative Control

5.2.3.5.3.1 The areas surrounding the test mark produced for the positive control test shall also be subjected to the sodium rhodizonate, buffer, and hydrochloric acid solutions.

5.2.3.5.3.2 No reaction is expected to take place in these surrounding areas.

5.2.3.5.4 The results of the positive and negative control tests shall be recorded on the Gunshot Residue Worksheet.

5.2.3.5.5 Evidence Examination

5.2.3.5.5.1 Spray the questioned area with a saturated solution of sodium rhodizonate in distilled water.

5.2.3.5.5.2 Spray the same area with a buffer solution (pH 2.8) consisting of sodium bitartrate and tartaric acid in

distilled water. Any pink reaction that results may be lead, but this shall be confirmed in the next step.

5.2.3.5.5.3 Spray a 5 % solution of hydrochloric acid. This spray changes the pink areas to a blue-violet color if lead is present, and only if it is present.

5.2.3.5.5.4 Record and fully describe any reactions in the case notes. Positive results would be vaporous lead, particulate lead, bullet wipe or a combination of these lead residues.

5.2.3.6 The Bashinsky Transfer Method of Sodium Rhodizonate Testing

5.2.3.6.1 A variation of the Sodium Rhodizonate Test used to test dark-colored items which may mask the blue-violet coloration of a positive test result.

5.2.3.6.2 Positive Control

5.2.3.6.2.1 Using the specially prepared lead swabs, sheet lead, or a lead bullet, mark the item to be tested well away from any holes to be examined. If the size of the item may result in the contamination of the questioned area by the positive control mark, unused twill cloth may be utilized instead.

5.2.3.6.2.2 Place a piece of filter paper over the test area of the questioned item.

5.2.3.6.2.3 Uniformly dampen the filter paper while it is on the questioned item by spraying with a 15 % acetic acid solution.

5.2.3.6.2.4 Cover the dampened filter paper with several layers of dry filter paper. Apply a hot iron to the filter paper and iron it until the damp paper is dry.

5.2.3.6.2.5 Remove the filter paper which was in direct contact with the test area. Process with sodium rhodizonate, buffer solution, and 5 % hydrochloric acid solution as in the direct application method.

5.2.3.6.2.6 A pink reaction after the buffer solution that changes to a blue-violet color after the application of the hydrochloric acid solution is expected to be seen in areas marked with lead and no reaction is expected to be seen in areas not marked with lead.

5.2.3.6.3 Negative Control

5.2.3.6.3.1 The areas surrounding the test mark produced for the positive control test shall also be subjected to the Sodium Rhodizonate, buffer, and hydrochloric acid solutions.

5.2.3.6.3.2 No reaction is expected to take place in these surrounding areas.

5.2.3.6.4 The results of the positive and negative control tests shall be recorded on the Gunshot Residue Worksheet.

5.2.3.6.5 Evidence Examination

5.2.3.6.5.1 Place a piece of filter paper over the appropriate area of the questioned item. With a pencil or other marking device note the position of any holes on the filter paper.

5.2.3.6.5.2 Uniformly dampen the filter paper while on the questioned item by spraying with a 15 % acetic acid solution and distilled water.

5.2.3.6.5.3 Cover the dampened filter papers with several layers of dry filter paper. Apply a hot iron to the filter paper and iron it until the damp paper is dry.

5.2.3.6.5.4 Remove the filter paper which was in direct contact with the evidence item. Process with sodium rhodizonate, buffer solution, and 5 % hydrochloric acid solution as in the direct application method. Note: All positive reactions are a mirror image of the residue deposits on the questioned item.

5.2.3.6.5.5 Record and fully describe any reactions in the case notes. Positive results include vaporous lead, particulate lead, bullet wipe or a combination of these lead residues.

5.2.3.6.5.6 For health and safety reasons, discard the used filter papers in a biohazard container.

5.2.4 Interpreting the Results of Microscopic and/or Chemical Testing

5.2.4.1 A prime consideration in the interpretation of any type of gunshot residue is that conclusions shall be stated as a result of residues that are found to be present. **The absence of residues is not a basis for expressing a categorical and conclusive statement about a particular situation.**

5.2.4.2 The Contact Shot

5.2.4.2.1 The most basic type of distance determination occurs when a contact shot is found. Based on the presence of very characteristic ripping and tearing of a garment, the burning and singeing of cloth, the melting of artificial fibers and/or the heavy vaporous lead (smoke/soot) deposits around the hole, a contact shot is indicated.

5.2.4.2.2 The Modified Griess Test and the Sodium Rhodizonate Test may yield positive results on contact shots, but the physical characteristics themselves are sufficient to reach the conclusion of a contact shot.

5.2.4.2.3 No suspect firearm testing is necessary to reach this conclusion.

5.2.4.3 Modified Griess Test

5.2.4.3.1 Positive for a pattern of nitrite residues

5.2.4.3.1.1 It is possible to produce similar patterns for a specific range distance determination. See 5.3.5 for the applicable test pattern production.

5.2.4.3.2 Positive for scattered nitrite residues

5.2.4.3.2.1 It is possible to find the maximum distance to which such residues are deposited. See 5.3.6 for the applicable test pattern production.

5.2.4.4 Sodium Rhodizonate Test

5.2.4.4.1 Positive for vaporous lead residues

5.2.4.4.1.1 It is possible to find the maximum distance to which such residues are deposited. See 5.3.6 for test pattern production.

5.2.4.4.2 Positive for lead particulate

5.2.4.4.2.1 Because lead particulate is not a reliably reproducible phenomenon, it is not useful for distance determination. It is, however, consistent with the discharge of a firearm.

5.2.4.4.3 Positive for bullet wipe

5.2.4.4.3.1 A hole with a visible dark ring around its perimeter that is chemically detectable as lead is consistent with the passage of a bullet. No distance determination may be made based on bullet wipe alone.

5.2.4.5 The interpretation of all microscopic examination and chemical testing of gunshot residues shall be included in the Forensic Scientist's case notes.

5.3 Shotgun Pellet Pattern Examination

5.3.1 Item Preparation

5.3.1.1 Prepare and mark the item as described in 5.1.1.

5.3.2 Visual/Microscopic Examination

5.3.2.1 A separate Gunshot Residue Worksheet shall be completed in FA for each item of evidence to be processed. Each worksheet shall contain the item designation number (R- number) assigned to the item by the Forensic Scientist.

5.3.2.2 Visually and microscopically examine the item as described in 5.1.2.

5.3.2.3 The Forensic Scientist shall note the overall size and shape of the pellet pattern.

5.3.2.4 The Forensic Scientist shall also look for finely divided plastic particulate (filler material) during the microscopic examination.

5.3.2.4.1 Filler material may assist in identifying/corroborating the type of ammunition involved and is itself indicative of the discharge of a shotgun.

5.3.3 Chemical Testing

5.3.3.1 Shot patterns may be chemically tested for nitrites and lead at the Forensic Scientist's discretion.

5.3.3.1.1 There is the possibility of a shot pattern concealing a bullet hole and other residues within.

5.3.3.1.2 Attention shall be paid to the possibility of "pellet wipe" and lead randomly deposited by the impact of wadding materials.

5.3.3.1.3 These deposits are normally not useful in distance determinations but can be corroborative.

5.3.4 Interpreting the Results of Microscopic and/or Chemical Testing

5.3.4.1 The main basis for pellet pattern distance determination is simply the size of the shot pattern and the production of similar size patterns.

5.3.4.2 The pattern shall be compared side-by-side with known distance test patterns.

5.3.4.2.1 The Forensic Scientist may visually eliminate "flyers" or holes which deviate from a normal roughly circular pattern.

5.3.4.3 Some pellet patterns will be elongated in shape due to the fact that at the instance of firing there was an angle of some sort involved.

5.3.4.3.1 The narrower dimension of the elongated shot pattern is the significant dimension and the basis of comparison with the diameter of test pellet patterns.

5.3.4.4 A shot pattern is not necessarily the product of a shotgun having been fired. There are numerous handgun loads by various manufacturers that fire shot pellets, especially in the smaller shot sizes.

5.4 Test Pattern Production

5.4.1 Distance determinations are firearm and ammunition specific. Use the suspect firearm and suspect ammunition or ammunition similar to suspect ammunition.

5.4.2 Test Medium

5.4.2.1 White twill cloth squares (approximately 9" X 9") shall be used for bullet test patterns.

5.4.2.1.1 One unused twill cloth square shall be designated as a control and shall be subjected to the same chemical testing as the other test media.

5.4.2.2 Cardboard shall be used for shot pellet patterns.

5.4.2.3 Fabric from the questioned item may be used.

5.4.3 Test firing shall be conducted based on the suspected event that occurred.

5.4.4 Microscopically and/or chemically process the distance test patterns as required, in the same manner that the questioned item was processed.

5.4.5 Specific Range Distance Determinations

5.4.5.1 Fire into the test media at various distances until a pattern is produced at a certain distance that is consistently smaller and/or denser than the pattern found on the questioned item and a pattern is produced at a farther distance that is consistently larger and/or less dense than the pattern found on the questioned item.

5.4.5.2 The Forensic Scientist’s notes shall include the methodology used to produce test patterns and the bracketed results of the testing.

5.4.6 Maximum Distance Determinations

5.4.6.1 Fire into the test media at various distances until a distance is found where residues always occur and until a farther distance is found where no residue is ever found.

5.4.6.2 The Forensic Scientist's notes shall include the methodology used to produce test patterns for maximum distance and the results of the testing.

5.4.7 Upon request, test patterns may be produced to be sent to a medical examiner's office for comparison to wounds or residues found during an autopsy.

5.4.7.1 These test patterns shall be produced in a similar manner, but shall not be chemically processed.

5.4.7.2 Residues on twill cloth test patterns shall be preserved with clear tape before packaging.

5.5 Range of Conclusions

5.5.1 The suggested report wording listed below may be modified at the Forensic Scientist's discretion to reflect more accurately his/her conclusions. Any such modifications to report wording shall be reviewed and approved with the technical review.

5.5.2 Contact Gunshot

- "The area around the hole in the upper left chest area of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues. Residues and physical characteristics consistent with a contact gunshot were found."

5.5.3 Pattern of Nitrite Particulate Residues

- "The area around the hole in the upper left chest area of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues and a pattern of residues was found. Using the K-1 pistol and ammunition like the Q-1 bullet and Q-2 cartridge case, test material was shot at various distances. Patterns similar to the pattern on the upper left chest of the R-1 shirt were produced at distances greater than two (2) feet and less than three (3) feet."

5.5.4 Scattered Nitrite Particulate

- "The area around the hole in the upper left chest of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues, and some scattered gunpowder residue was found. Using the K-1 pistol and ten (10) of the K-2 cartridges, test material was shot at various distances. No gunshot residue was observed on test material shot at distance of six (6) feet or greater."

5.5.5 Vaporous Lead Residue

- "The area around the hole in the upper left chest of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues, and some residue was found. Using the K-1 pistol and ten (10) of the K-2 cartridges, test material was shot at various distances. No gunshot residue was observed on test material shot at distance of six (6) feet or greater."

5.5.6 Scattered Lead Particulate only

- "The area around the hole in the upper left chest area of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues. Residues were found which are consistent with the discharge of a firearm. Insufficient residues were found for which a muzzle-to-target distance determination could be made."

5.5.7 Bullet Wipe only

- "The area around the hole in the upper left chest of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues. Residues were found which are consistent with the passage of a bullet. Insufficient residues were found for which a muzzle-to-target distance determination could be made."

5.5.8 Shot Pellet Pattern

- "The chest area of the R-1 shirt was examined and a shot pattern was found. Using the K-1 shotgun and ammunition like the Q-1 and Q-2 fired shotshells, patterns similar to that on the chest of the R-1 shirt were produced at distances greater than nine (9) feet and less than eighteen (18) feet."

5.5.9 Negative for any Residues

- "The area around the hole in the upper left chest area of the R-1 shirt was microscopically examined and chemically processed for the presence of gunshot residues and no residues were found. Therefore, a muzzle-to-target distance determination is not possible."

5.6 Standards and Controls

5.6.1 For verification procedures for Griess test chemicals, including 15 % acetic acid, and nitrite test swabs, see the positive and negative control protocols in 5.1.3.3.3 and 5.1.3.3.4, respectively.

5.6.2 For verification procedures for Sodium Rhodizonate test chemicals, including Sodium Rhodizonate, Buffer solution, 5 % Hydrochloric acid, and lead sources, see the positive and negative control protocols in 5.1.3.5.2 and 5.1.3.5.3, respectively.

5.7 Calibration – For tape measure calibration information, see the Firearm and Tool Mark Section Technical Procedure for Instrument Calibration and Maintenance.

5.8 Maintenance – For stereomicroscope and tape measure maintenance information, see the Firearm and Tool Mark Section Technical Procedure for Instrument Calibration and Maintenance.

5.9 Sampling – N/A

5.10 Calculations – N/A

5.11 Uncertainty of Measurement – N/A

6.0 Limitations – The distance determination examination is firearm and ammunition specific.

7.0 Safety – Examinations performed in the Firearm and Tool Mark Section are inherently dangerous. These procedures involve hazardous chemicals, firearms, and ammunition. All hazardous procedures shall be performed in compliance with the State Crime Laboratory Safety Manual. If the examination involves a biohazard, the Forensic Scientist shall use personal protective equipment, such as eye protection, a lab coat, and/or gloves, and work within a fume hood, when appropriate.

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9.0 Records

- FA Worksheets: Main, Gunshot Residue, and Disposition/Results

10.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document
02/15/2013	2	Removed Raleigh from the header; 4.0 - added fume hood; added new 5.1 and 5.1.1; 5.2.3.3.2.1 - added “or his/her designee”