SEM ANALYSIS of GUNSHOT RESIDUE SAMPLES

DCI Forensic Laboratory
Case Number 05-346

SABOW, James Emery

RJ Lee Group Project Number FRH602036

SDFL #05-346

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INTRODUCTION

Eight (8) gloves and two (2) shells were received from Frans Maritz of DCI Forensic Laboratory for GSR (gunshot residue) analysis. Particle extraction samples were collected from the gloves at RJ Lee Group using permanently-tacky adhesive stubs. The samples were identified as follows:

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Client's Sample ID	RJ Lee Group Sample No.
Case Number 05-346: SABOW, James Emery	
1.01 Sample #12 Glove-Control	1009082
1.02 Sample #13 Glove-Control	1009083
1.03 Sample #15 Glove-R Hand Normal Position	1009084
1.04 Sample #16 Test Sample Glove-R Hand Normal Position	1009085
1.05 Sample #18 Glove-R Hand Thumb	1009086
1.06 Sample #19 Test Sample Glove-R Hand Thumb	1009087
1.07 Sample #20 Glove-R Hand with Index Finger	1009088
1.08 Sample #22 Test Sample Glove-R Hand Index Finger	1009089
5 Tow (2) 12 GA Winchester Shells	1009090

The particle extraction samples were carbon coated and then placed directly into the PSEM (PERSONAL SEM®) for analysis.

SEM ANALYSIS

The samples were initially examined using manual microscopy to set run parameters and sample analysis area. They were then analyzed using an automated scanning electron microscope (PERSONAL SEM®) equipped with a full gunshot residue analysis package, including automated stage, backscattered electron (BSE) detector, energy dispersive x-ray spectrometer (EDS) and automated GSR analysis software.

When lead (Pb), antimony (Sb), and barium (Ba), combine or fuse into a single particle, it is defined as being unique to GSR, barring elemental tags from other sources. Any particles with a combination of two of these elements (Pb, Sb and Ba) with high-temperature features or morphology are classified as consistent with GSR. Particles confirmed as being unique to or consistent with GSR could have resulted from the discharge of a firearm, being in close proximity to a discharging firearm of from contact with a surface contaminated with GSR.

The SEM analysis, on a particle-by-particle basis, retains the individual feature characteristics and can relate the presence of lead (Pb), antimony (Sb) and barium (Ba) to a single particle. When the instrument detects particles with the presence of Pb, Sb and Ba, it flags the particles as potential GSR and stores images, composition and coordinate data for relocation and confirmation by manual microscopy after the automated analysis is completed. A summary run sheet is printed with stored images and spectral data for relocation and confirmation applications. Summary sheets and images of flagged potential GSR particles from the automated analyses are found in the appendix of this report. Flagged particles were relocated for compositional confirmation.

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ANALYTICAL RESULTS

A list of confirmed particles detected during the analysis is as follows:

Sample ID	RJ Lee Group Sample No.	TIFF Image No.	Composition	Number of Particles	Figure No.
1.01 Sample #12 Glove-Control	1009082		Total Unique Particles – 0 Total Consistent-With Particles – 0 Total Single Component Particles – 2		
1.02 Sample #13 Glove-Control	1009083		Total Unique Particles – 0 Total Consistent-With Particles – 0 Total Single Component Particles – 3		
1.03 Sample #15 Glove-R Hand Normal Position	1009084	9084001	Pb-Sb-Ba	Unique to GSR	1
		9084002	Pb-Sb-Ba	Unique to GSR	1
		9084003	Pb-Sb-Ba	Unique to GSR	1
		9084004	Pb-Sb-Ba	Unique to GSR	1
		9084005	Pb-Sb-Ba	Unique to GSR	2
		9084007	Pb-Sb-Ba	Unique to GSR	2
			Total Unique Particles – 6 Total Consistent-With Particles – 4 Total Single Component Particles – 10		
1.04 Sample #16 Test Sample Glove-R Hand Normal Position	1009085	9085001	Pb-Sb-Ba	Unique to GSR	3
		9085002	Pb-Sb-Ba	Unique to GSR	3
		9085003	Pb-Sb-Ba	Unique to GSR	3
		9085004	Pb-Sb-Ba	Unique to GSR	3
		9085005	Pb-Sb-Ba	Unique to GSR	4
		9085006	Pb-Sb-Ba	Unique to GSR	4
		9085007	Pb-Sb-Ba	Unique to GSR	4
		9085008	Pb-Sb-Ba	Unique to GSR	4
			Total Unique Particles – 8 Total Consistent-With Particles – 3 Total Single Component Particles – 8		
1.05 Sample #18 Glove-R Hand Thumb	1009086	9086001	Pb-Sb-Ba	Unique to GSR	5
		9086002	Pb-Sb-Ba	Unique to GSR	5
			Total Unique Particles – 2 Total Consistent-With Particles – 0 Total Single Component Particles – 11		

Sample ID	RJ Lee Group Sample No	FIFF Image No.	Composition	Number of Particles	Figure No.
1.06 Sample #19 Test Sample Glove-R Hand Thumb	1009087	9087001	Pb-Sb-Ba	Unique to GSR	6
			Total Unique Particles – 1 Total Consistent-With Particles – 2 Total Single Component Particles – 5		
1.07 Sample #20 Glove-R Hand with Index Finger	1009088		Total Unique Particles – 0 Total Consistent-With Particles – 2 Total Single Component Particles – 2		
1.08 Sample #22 Test Sample Glove-R Hand Index Finger	1009089		Total Unique Particles – 0 Total Consistent-With Particles – 0 Total Single Component Particles – 1		

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CONCLUSIONS

1.01 Sample #12 Glove-Control
There were no particles classified as being unique-to or consistent-with GSR found. Only single-component particles were found.

1.02 Sample #13 Glove-Control
There were no particles classified as being unique-to or consistent-with GSR found. Only single-component particles were found.

1.03 Sample #15 Glove-R Hand Normal Position
Particles confirmed as being unique-to and consistent-with GSR were found.

1.04 Sample #16 Test Sample Glove-R Hand Normal Position
Particles confirmed as being unique-to and consistent-with GSR were found.

1.05 Sample #18 Glove-R Hand Thumb
Particles confirmed as being unique to GSR were found.

1.06 Sample #19 Test Sample Glove-R Hand Thumb
Particles confirmed as being unique-to and consistent-with GSR were found.

1.07 Sample #20 Glove R-Hand With Index Finger
Particles confirmed as being consistent with GSR were found.

1.08 Sample #22 Test Sample Glove-R Hand Index Finger
There were no particles classified as being unique-to or consistent-with GSR found. Only single-component particles were found; therefore, the results of the analysis of these samples must be deemed inconclusive.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. The submitted items are being returned to your office and are enclosed.

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