17 August 2017

Ms. Margaret A. Farrand
Federal Public Defender - Central District of CA
321 East 2nd Street
Los Angeles, CA 90012-4202

RE: MT14-0304 – Clinton Young

Dear Ms. Farrand,

As requested, we have completed additional analyses of the gloves received by our laboratory with respect to the above referenced case. This report describes our analytical methods, documents our results, and discusses the conclusions we have drawn from them.

Samples

A package containing two samples was received at our laboratory on 13 June 2017. The package contained two samples:

- Questioned Gloves (Labeled "Two Brown Gloves, Cass #1 lease" DPS 010124479, 01-09968) Figure 1-3.
- Control Gloves (Labeled "Left & Right Control Gloves" CR27181) Figure 4-6.[1]

Tasks

- Sample four areas on each glove to determine if gunshot residue (GSR) is present and, if present, the relative amounts.
- If possible, provide an opinion on the possible source(s) of the detected GSR particles.

Analytical Approach

Initial Examination and Documentation

Images of the front and back surfaces of each glove are shown in Figures 2-3 (questioned) and Figures 5-6 (control). The control gloves are relatively similar in construction to the questioned gloves; both consisting of bulky, dark colored gloves with a red lining.

[1] It is our understanding that the control gloves were obtained by purchasing a similar pair of gloves, which was then worn during a test fire at the location where the questioned gloves were found. A video of the test fire was provided for review.

Sampling

Samples were obtained by cutting squares of approximately 1 cm^2 from the same four sampling locations on each glove. The specific sampling locations were denoted A, B, C and D as illustrated in Figure 7. Each fabric swatch was suspended in a plastic centrifuge tube and sonicated for 15 minutes in ethanol. The fabric swatch was removed from the ethanol solution and the remaining solution was spun down to the bottom of the tube in a centrifuge. The mass of loose fibers was removed from each tube using a clean glass rod. The solution was again sonicated for five minutes at which time the solution was filtered through a 0.2 µm polycarbonate membrane filter. Four filters were prepared from each glove. An ethanol blank was processed under the same conditions as the samples. A portion of each resulting filter was mounted on an adhesive carbon stub. A conductive carbon coating of ~7 nm was applied to each sample. In total, five samples from each glove were prepared (Sample locations A, B, C, D, and blank).

Each sample was analyzed using an automated GSR routine in a field emission scanning electron microscope (FESEM) using energy dispersive x-ray spectroscopy (SEM/EDS) that was setup to analyze the same sized area from each sample. In this way, a comparison of the relative amounts of GSR collected from each location on each glove could be compared. With each set of samples, a positive control (ENFSI 2015 synthetic GSR standard) and negative control (blank) were also analyzed.

Results

The automated GSR particle analysis results were evaluated for the presence of tricomponent, bicomponent, and monocomponent particles.[2] The results from the samples are summarized in Table 1. Note that the totals listed in Table 1 are not the total for the glove, but for the approximately 4 cm^2 area of fabric that was analyzed. This represents less than 1% (0.75%) of the overall surface area of one glove (Figure 8). Therefore, the total number of GSR particles on each evidence glove could be 10 times or even as much as 100 times greater than the sum of the particles presented in Table 1.

[2] A tricomponent particle contains three elements: Lead (Pb), Antimony (Sb) and Barium (Ba). A bicomponent particle consists of a combination of any two of these elements. A monocomponent particles consists of any one of these elements. As noted in Table 1, barium was not counted due to the high level of barium sulfate particles on the glove samples.

Table 1. Summary of GSR particle analysis results.

Evidence Gloves										
Left						Right				
Location	Tri	Bi	Mono*	Total Particles#		Location	Tri	Bi	Mono	Total Particles
A	2	1	10	8973		A	0	0	1	428
B	1	1	3	3500		B	0	0	0	274
C	16	9	33	8693		C	3	0	6	1152
D	1	1	21	12933		D	0	0	5	6028
Blank	0	0	0	30		Blank	0	0	0	0

Control Gloves										
Left						Right				
Location	Tri	Bi	Mono	Total Particles		Location	Tri	Bi	Mono	Total Particles
A	0	0	0	7		A	0	0	0	10
B	0	0	0	27		B	0	0	0	10
C	0	0	0	29		C	0	0	0	24
D	0	0	0	10		D	0	0	0	11
Blank	0	0	0	13		Blank	0	0	0	4

*Mono includes lead and antimony rich particles. Barium rich particles are not included in the mono count due to the barium sulfate in the local environment
#Total particles include all particle types that were classified by the automated analysis software. A list of the particle classes is provided in appendix A.

Discussion and Conclusions

Two major, published, reviews on the evaluation of GSR evidence each arrive at the same conclusion: GSR interpretation is best conducted on a case-by-case basis (Romolo and Margo, 2001; Dalby et al., 2010).[3]

Control Gloves. No GSR-related particles (tri-, bi-, or mono-component) were detected on either of the control gloves. A video of the test firing was reviewed as part of the preparation of this report. The video shows that the wind was blowing into the shooter's face, from right to left when facing the target. A wind sock visible in the video was fully extended. While we don't know the make and model of the wind sock, it is reported that a fully extended "sock" can indicate wind speeds in excess of 15 mph. Historical wind data from the area on the day of the test fire indicates an average speed of 12.5 mph, a peak speed of 66 mph, and a maximum sustained speed of 55 mph. In comparison, historical weather records for the day of the shooting indicates an average wind speed of 5.8 mph, a peak speed of 20 mph, and a maximum sustained speed of 15 mph.[4] The reported wind direction those two days differed by over 90°. The stronger wind on the test firing day and directional differences could account for the absence of detectable GSR on the areas of the control gloves that were analyzed. Based upon the lack of GSR data on the test fire gloves and differences in environmental conditions from the day of the

[3]Romolo, F.S. and Margot, P. (2010) Identification of Gunshot Residue: A critical review. Forensic Science International, 119, 195-211.
Dalby, O., Butler, D., and Birkett, J.W. (2010) Analysis of gunshot residue and associated materials: a review, Journal of Forensic Science, 55(4) 924-943.

[4] Weather data is taken from historical weather data collected at Midland Airport for 26 November 2001 and 12 June 2017. This data was provided to Microtrace by defense counsel and is provided in Appendix B.

shooting, the control gloves are of little probative value in addressing the question of interest in this matter.

Questioned Gloves. The results from the analyses presented above and the prior analyses conducted by Microtrace (report of 21 July 2015) show that tricomponent GSR particles are present on both the back and front of both the left and right questioned gloves. Based on discussions with defense counsel, it is my understanding that the gloves recovered in this case were purchased after Mr. Douglas was shot and that the gloves were left at the pump jack site in Midland following the shooting of Mr. Petrey. The focus of the present analysis is to determine if constraints can be placed upon the point (or points) within this period during which GSR particles were deposited on the gloves.

We begin by reviewing the assumptions under which this interpretation of data is based. The following statements represent my present understanding of the relevant events, in sequence, between the purchase of the gloves and their receipt at our laboratory.[5] Each of these events, alone or in combination, is discussed as a possible explanation for the presence and distribution of the GSR detected on the gloves.

1. Mr. Douglas was shot two times in the head while he was sitting in the driver's seat of his Pontiac.

    - The gloves had not yet been purchased, so this event could not have directly resulted in the deposition of GSR on the gloves.

2. A pair of gloves (questioned gloves) was purchased by Mr. Page at a gas station.

    - The possibility exists that the purchased gloves contained pre-existing GSR. This, however, is regarded as unlikely a) because the gloves were new and b) GSR was not detected on the control gloves, which were purchased from the same location.

3. The gloves were in the possession of Mr. Page in the front passenger seat.

    - Since a firearm had been recently discharged in the Pontiac, it is possible that GSR from the environment of the Pontiac could have been transferred to the gloves. The literature suggests that airborne GSR has generally settled within 10 minutes after the discharge of a firearm (Fojtasek and Kmjec, 2004)[6]. Beyond this time, any GSR transfer would require direct contact with a surface on which GSR particles had settled. While this possibility cannot be ruled out, it seems unlikely that the presence of gloves in this area of the vehicle would be sufficient to account for the number and distribution of particles that were observed.

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[5] This sequence is based upon the 2017-06-08 order grating additional testing, a photo of the gloves at the scene, and discussions with defense counsel.

[6] Fojtasek, L. and Kmjec, T. (2004) Time periods of GSR particles deposition after discharge-final results. Forensic Science International, 153, 132-135.

4. The gloves were worn by Mr. Page to remove Mr. Douglas' body from the vehicle by grabbing Mr. Douglas under the arms.

    - Based upon the description provided, Mr. Page lifted Mr. Douglas under the arms. It is unlikely that significant amounts of GSR would have collected under the arms of Mr. Douglas; however, depending on the specific amount and location of physical contact, it is possible that GSR could have been transferred to the gloves when Mr. Douglas was lifted from the vehicle. Thus, while possible, it seems unlikely that this mode of transfer would account for the number and distribution of particles that were observed.

5. Mr. Douglas was shot again (one time) at the creek by Mr. Ray.

    - GSR was produced by this event; the type of ammunition and caliber of the weapon can have an impact on the amount and composition of GSR particles that were produced). As previously noted, both with the control gloves (above) and in the literature, GSR generated in an outdoor environment is more widely dispersed (relative to an indoor surface); and therefore, its concentration on a given surface (*e.g.*, a glove) would be lower relative to what might be deposited in an indoor environment. Ultimately, the direct transfer of any significant number of particles from this firearm discharge to the gloves would require proximity of the gloves to the firearm (which is unknown). Any other transfer of particles from this event, would require a second order (or higher) transfer (*i.e.*, gun to person to glove) and as such, the number of particles and their distribution would be limited to direct physical contact. So, while this event cannot be ruled out as a contributing factor to the population of GSR particles detected on the glove, there is no direct mechanism in the provided descriptions that accounts for the number and distribution of the tricomponent particles observed on the questioned gloves.

6. The gloves were tossed onto the back seat of the vehicle and later moved to the back floorboard. The gloves were not worn while riding in the car.

    - Same answer as point 3 above.

7. The gloves were brought into the stolen pickup truck but were not worn while riding in the car-jacked pickup truck.

    - While the pick-up truck represents an unknown environment, there is no reason to expect that it would contain high levels of GSR.

8. Samuel Petrey was shot and killed at a pump jack site. Whether Mr. Page was wearing the gloves at the time Mr. Petrey was killed is in question.

    - Despite the fact that the control gloves showed no capture of GSR particles under the conditions of the test fire, the discharge of a firearm nonetheless offers the possibility

of transferring large numbers of GSR particles to the glove.

9. The gloves were found on the ground at the pump jack site with the right glove stuffed into the left glove. A partial box of ammunition, a loose round, and a knife were found in the box.

    - Neither unfired ammunition nor a loose round would be expected to have enough surficial GSR particles on them to account for the population and distribution observed on the glove.

10. The gloves were packaged together in an evidence envelope.

    - While this action may alter the spatial distribution of GSR particles on the gloves, this would not add additional GSR particles to the overall population.

As noted above, there are several events along this sequence during which GSR particles could have been transferred to the gloves. Two scenarios hold the potential for primary transfer, while the rest require secondary or higher order transfers. While secondary and higher order transfers under controlled circumstances could be responsible for the transfer of GSR particles, such transfers typically involve lower numbers of particles that have become localized in a specific area of contact. The quantity and distribution of GSR particles in the areas sampled on the glove, both in this and our prior analysis, suggest that this is a less likely possibility. This leaves us with two scenarios in which GSR could have been directly transferred: 1) During the weapons discharge at the creek and during the weapons discharge at the oil field. In the former event, it is known that Mr. Page was not the shooter. 2) In the latter scenario, Mr. Page is hypothesized to have been wearing the gloves while discharging two rounds from the firearm. This latter event would have created a plume that could have contained enough particles to account for the quantities detected on the gloves.

Given the scenarios discussed above, the discharge of a weapon by a shooter wearing the questioned gloves is the most likely scenario based upon the results of the GSR analyses reported here.

I, Christopher S. Palenik, Ph.D., Microtrace LLC, declare under penalty of perjury under the laws of Texas and the laws of the United States of America that the foregoing is true and correct. Executed this 21st day of August, 2017, in Elgin, Illinois.

Christopher S. Palenik, Ph.D.

Appendix A – List of Particle Classes Used in the Automated Analysis Software

Characteristic	
	Sb Ba Pb
	Sb Ba Pb Sn
Consistent Sb Ba Pb	
	Ba Si Ca
	Ba Sb
	Pb Sb
	Ba Al
	Pb Ba
	Pb
	Sb
	Ba
Lead-Free/Non-Toxic	
	Ti Zn Gd
	Cu Sn Ga
Consistent Lead-Free/Non-Toxic	
	Ti Zn Cu
	Ti Zn Sn
	Sr
	Ti Zn
	Cu Zn
Environmental	
	Ni
	Sn
	Au
	Lighter Flint
	Fe
	Cu
	Zn
	S

Appendix B – Historical Weather Data

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 2862 ft, Lat: 31.9475° N Lon: -102.2086° W
Station: **MIDLAND INTERNATIONAL AIRPORT, TX US 23023**

Local Climatological Data
Daily Summary
November 2001
Generated on 08/03/2017

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	87*	58s	72s	13.0s				0s	7s	0705	1759		0.00			26.93		10.3	*		20	180
02	84	59	72	13.4				0	7	0706	1758		0.00	0.0	0	27.05		7.6	15	220	14	220
03	76	54	66	7.8				0	1	0707	1757	FG BR HZ	0.00	0.0	0	27.24		7.3	17	140	14	110
04	75	50	62	4.2				3	0	0708	1757		0.00	0.0	0	27.32		4.7	20	120	17	120
05	75	50	62	4.7				3	0	0709	1756	FG BR	0.00	0.0	0	27.24		8.2	20	150	16	160
06	74	51	62	5.1				3	0	0710	1755		0.00	0.0	0	27.18		11.1	28	160	23	170
07	80	53	66	9.6				0	1	0710	1754		0.00	0.0	0	27.14		9.6	23	250	20	250
08	62	44	53	-3.0				12	0	0711	1754	DU	0.00	0.0	0	27.29		13.5	35	030	30	020
09	57	40	48	-7.6				17	0	0712	1753	RA	0.02	0.0	0	27.40		4.9	16	030	14	020
10	67	42	54	-1.1				11	0	0713	1752		T	0.0	0	27.25		4.2	15	200	12	200
11	70	53	62	7.3				3	0	0714	1752	RA FG BR HZ	0.03	0.0	0	27.17		8.8	23	160	14	150
12	76	45	62	7.6				3	0	0715	1751	FG BR HZ	0.00s	0.0	0	27.13		9.2	20	160	17	160
13	72	56	64	10.2				1	0	0716	1750	FG BR HZ	0.00s			27.05		16.6	30	160	26	160
14	63	48	56	2.6				9	0	0716	1750	TS RA FG BR	0.22	0.0	0	26.94		10.5	28	170	23	210
15	59	46	52	-0.9				13	0	0717	1749	RA FG BR	0.39	0.0	0	27.01		5.5	17	050	15	050
16	58	42	50	-2.5				15	0	0718	1749	FG BR	0.01			27.16		2.2	12	110	9	110
17	64	49	56	3.9				9	0	0719	1748	RA FG BR	0.15	0.0	0	27.20		6.2	20	180	17	180
18	73	50	62	10.3				3	0	0720	1748	FG BR	0.00s	0.0	0	27.12		9.5	22	200	18	200
19	59	38	48	-3.3				17	0	0721	1747	FG BR	T	0.0	0	27.32		13.4	36	030	30	030
20	55	31	43	-7.9				22	0	0722	1747	FG BR	0.00s	0.0	0	27.23		6.1	16	210	13	190
21	66	37	52	1.5				13	0	0723	1747		0.00s	0.0	0	26.92		9.6	22	250	18	250
22	76	42	59	8.9				6	0	0724	1746		0.00s	0.0	0	26.73		11.5	29	260	23	260
23	72	50	61	11.3				4	0	0724	1746	RA	T	0.0	0	26.82		16.0	45	250	37	250
24	64	38	51	1.7				14	0	0725	1746		0.00s	0.0	0	26.90		9.5	29	320	23	320
25	71	42	56	7.0				9	0	0726	1745		0.00s			26.86		14.1	*		26	180
26	58	41	50	1.4				15	0	0727	1745		0.00s	0.0	0	26.90		5.8	20	010	15	360
27	46	25	36	-12.3				29	0	0728	1745	SN FG BR	0.20	2.0	0	27.00		17.6	31	060	26	050
28	25	16	20	-28.0				45	0	0729	1745	SN FG BR BLSN	0.47	6.0	8	27.13		14.8	32	020	29	030
29	36	11*	24	-23.7				41	0	0730	1745		0.00s	0.0	2	26.98		8.9	20	240	17	250
30	60	31	46	-1.4				19	0	0730	1744		0.00s			26.97		7.9	*		17	240
	65.6	43.0	54.3							Monthly Averages | Totals			0.97s			27.08	30.13	9.4				
	-1.1	3.6	1.4							Departure from Normal (1981-2010)			0.28s									

Degree Days

	Monthly		Season-to-date	
	Total	Departure	Total	Departure
Heating	339	-31	400	
Cooling	16	9	2621	

Number of days with...

Temperature				Precipitation		Snow	Weather	
Max		Min						
>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
0	1s	5	0	9s	3s	2		

Date of 5-sec to 3-sec wind equipment change	Sea Level Pressure			Greatest...		
		Date	Time	24-Hr...		Snow Depth
N/A	Maximum 30.52			Precip	Snowfall	
	Minimum 29.39	23	1326	0.52s		
				Date		
				14-14		

Station Augmentation
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

Palenik-180

Microtrace LLC

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 2862 ft, Lat: 31.9475° N Lon: -102.2086° W
Station: **MIDLAND INTERNATIONAL AIRPORT, TX US 23023**

Local Climatological Data
Daily Summary
June 2017

Generated on 08/03/2017

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	85	64	74	-3.8				0	9	0544	1950	TS RA BR	0.08	0.0	0	27.01		9.2	32	140	26	140
02	89	66	78	-0.1				0	13	0543	1950	TS RA	0.01	0.0	0	26.98		10.2	36	010	29	020
03	85	62*	74	-4.3				0	9	0543	1951	TS RA BR	0.30	0.0	0	27.01		8.5	33	300	26	300
04	89	63	76	-2.5				0	11	0543	1951		0.00	0.0	0	26.96		8.0	22	330	17	350
05	92	64	78	-0.7				0	13	0543	1952		0.00	0.0	0	26.95		9.3	25	020	20	020
06	92	66	79	0.0				0	14	0543	1952		0.00	0.0	0	27.06		7.3	18	060	13	090
07	93	68	80	0.8				0	15	0543	1953		0.00	0.0	0	27.06		6.2	19	100	16	100
08	91	71	81	1.6				0	16	0542	1953		0.00	0.0	0	26.99		9.3	21	230	16	220
09	98	71	84	4.5				0	19	0542	1954		0.00	0.0	0	26.88		9.5	36	360	30	350
10	101	74	88	8.3				0	23	0542	1954		0.00	0.0	0	26.85		17.1	30	170	25	160
11	102	73	88	8.1				0	23	0542	1955		0.00	0.0	0	26.90		16.7	35	170	28	170
12	103	67s	85s	4.9s				0s	20s	0542	1955	TS RA DU	0.52	0.0	0	26.91		12.5	66s	250s	55s	250s
13	100	71	86	5.8				0	21	0542	1955	TS	0.00	0.0	0	26.89		16.7	37	170	26	160
14	101	74	88	7.6				0	23	0542	1956	TS RA	0.56	0.0	0	26.93		14.1	53	220	45	220
15	103	76	90	9.5				0	25	0542	1956	TS RA	0.04	0.0	0	26.94		15.2	32	140	26	160
16	109	76	92	11.3				0	27	0543	1957		0.00	0.0	0	26.66		13.8	35	140	28	140
17	111*	75	93	12.2				0	28	0543	1957		0.00	0.0	0	26.76		10.7	30	160	23	150
18	100	77	88	7.1				0	23	0543	1957	HZ	0.00	0.0	0	26.86		14.2	35	020	29	020
19	93	74	84	2.9				0	19	0543	1957		0.01	0.0	0	27.05		10.7	27	090	23	080
20	99	75	87	5.8				0	22	0543	1958		0.00	0.0	0	27.07		8.4	22	100	17	100
21	101	75	88	6.7				0	23	0543	1958		0.00	0.0	0	26.93		9.3	24	120	20	130
22	103	73	88	6.6				0	23	0544	1958	TS RA	0.04	0.0	0	26.83		8.3	27	360	22	010
23	108	75	92	10.5				0	27	0544	1958	TS RA HZ	T	0.0	0	26.94		15.3	60	070	46	060
24	91	69	80	-1.6				0	15	0544	1958		0.00	0.0	0	27.16		15.7	36	080	28	080
25	92	71	82	0.4				0	17	0544	1958		0.00	0.0	0	27.20		14.2	30	120	25	120
26	81	63	72	-9.7				0	7	0545	1959	TS RA FG BR	1.47	0.0	0	27.16		11.1	40	020	31	020
27	91	68	80	-1.8				0	15	0545	1959		0.00	0.0	0	27.04		8.0	20	150	17	130
28	97	71	84	2.2				0	19	0545	1959		0.00	0.0	0	26.93		15.3	26	160	21	160
29	107	74	90	8.1				0	25	0546	1959		0.00	0.0	0	26.88		10.7	24	170	21	180
30	106	79	92	10.1				0	27	0546	1959	HZ	0.00	0.0	0	26.92		13.9	38	180	33	180
	97.1	70.6	84.0							Monthly Averages | Totals			3.05s			26.96	29.79	11.6				
	3.7	3.5	3.7							Departure from Normal (1981-2010)			1.25s									

Degree Days

	Monthly		Season-to-date	
	Total	Departure	Total	Departure
Heating	0	0	1712	
Cooling	569	108	1112	

Number of days with...

Temperature				Precipitation		Snow	Weather	
Max		Min						
>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
25	0	0	0	9	4	0		

Date of 5-sec to 3-sec wind equipment change

N/A

Sea Level Pressure

		Date	Time
Maximum	30.12	26	0533
Minimum	29.49	17	1850

Greatest...

24-Hr...		Snow Depth
Precip	Snowfall	
1.47		
Date		
26-26		

Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

Palenik-178

Microtrace LLC

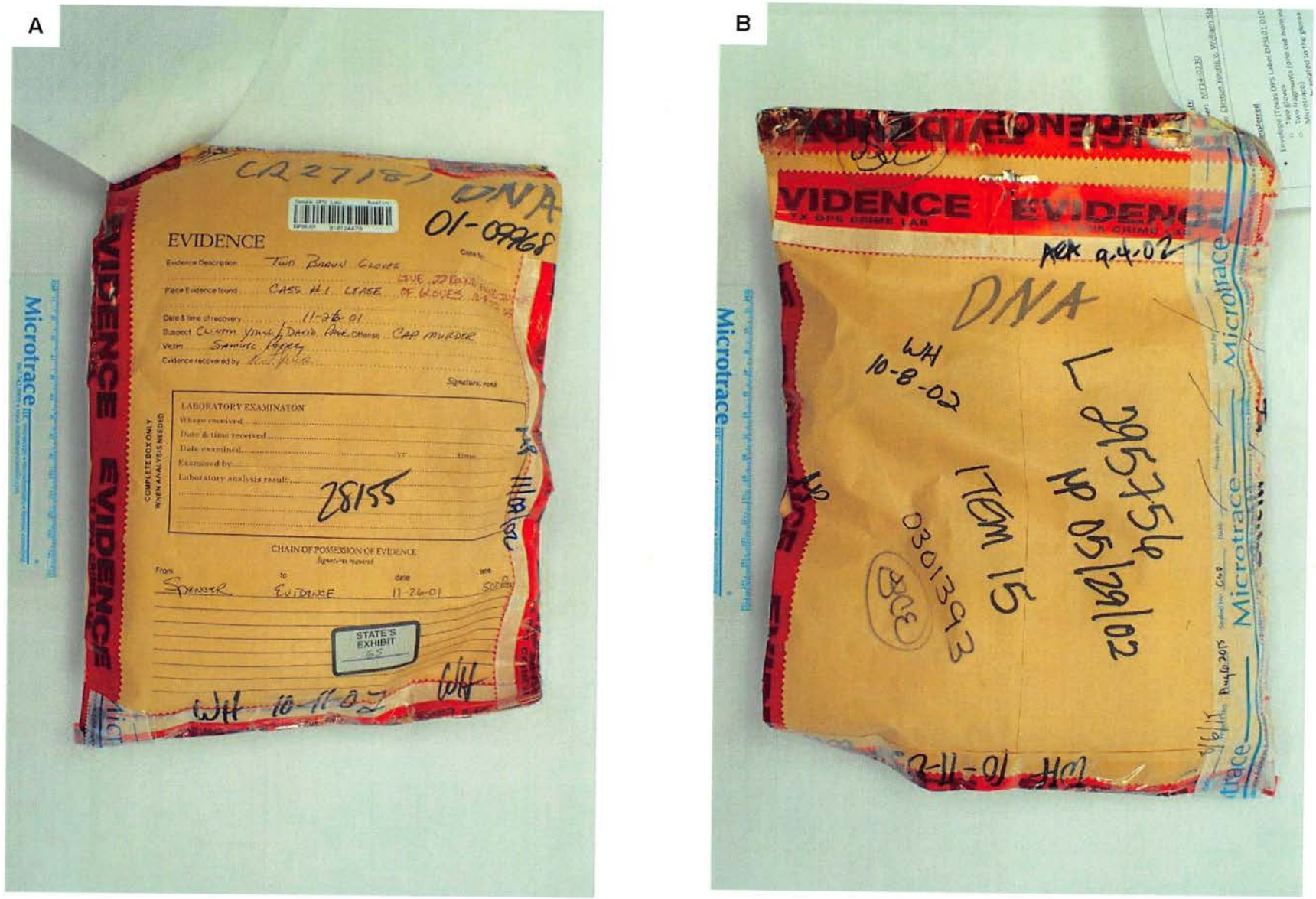


Figure 1. Evidence package shown from both sides, as received. Labeled "Two Brown Gloves, Cass #1 lease" DPS 010124479, 01-09968.

Figure 2. Left questioned glove shown (a) palm up and (b) palm down (before sampling)..

Figure 3. Right questioned glove shown (a) palm up and (b) palm down (before sampling).

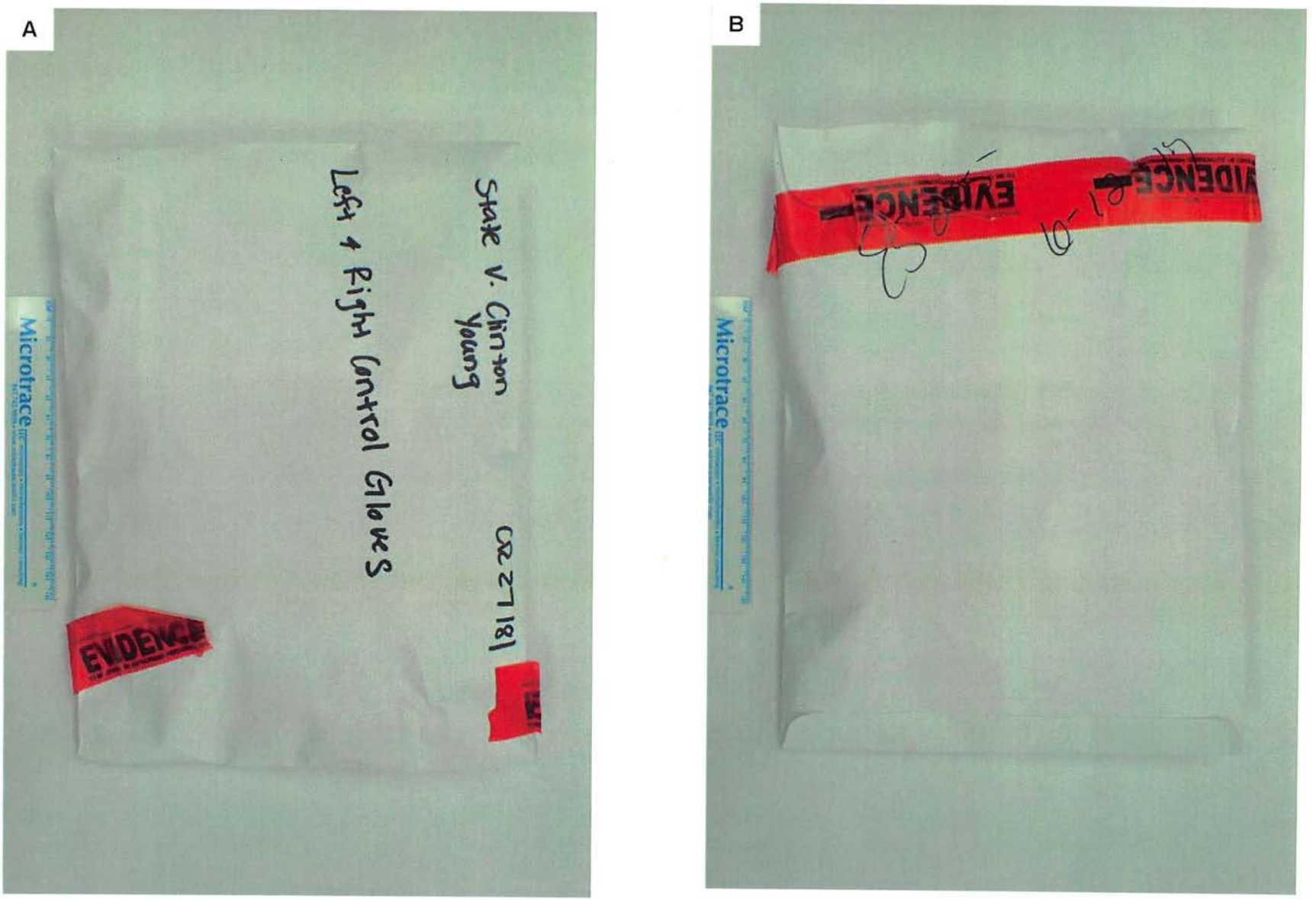
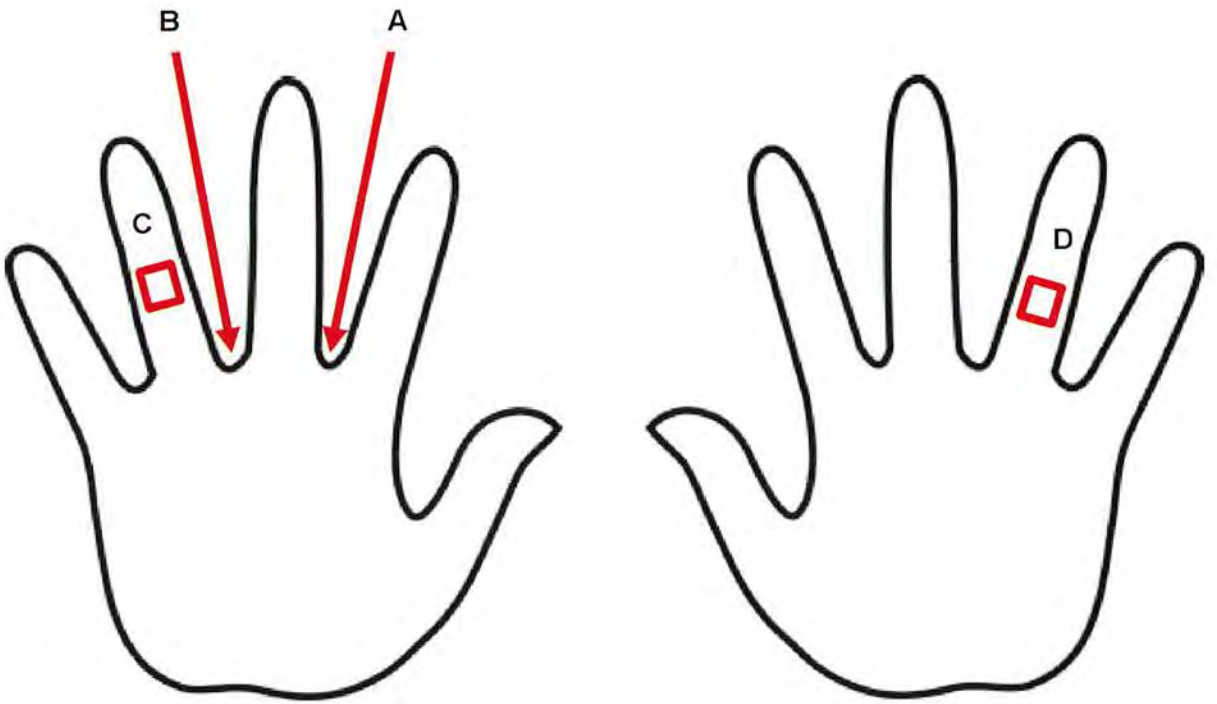


Figure 4. Evidence package shown from both sides, as received. Labeled "Left & Right Control Gloves" CR27181.

Figure 5. Left control glove shown (a) palm up and (b) palm down (before sampling).

Figure 6. Right control glove shown (a) palm up and (b) palm down (before sampling).



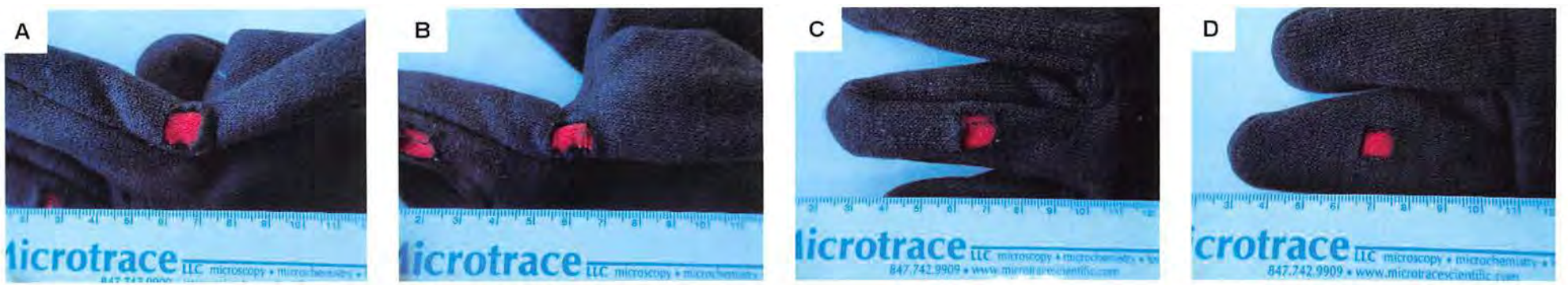


Figure 7. Upper: Schematic diagram showing the four sampling locations from each glove. Lower: Images of sampling locations A, B, C and D from the left control glove. The left control glove is shown above as an example; however, analogous locations were sampled on the other glove.

	Area	Mean	Major	Minor	Angle	Feret	%Area	FeretX	FeretY	FeretAngle	MinFeret	Length
1	267.246	39.026	22.902	14.857	178.704	23.033	0	2.048	5.785	153.748	14.892	0
2	0.128	177.282	0.000	0.000	-90.000	14.974	0	25.904	1.382	90.000	0.000	14.974

Figure 8. Measurement of left evidence glove to determine its area. Upper measurement shows the area of one side of the glove (outlined yellow) is approximately 267 cm^2. The lower measurement shows that the length of the scalebar is approximately 15 cm. Thus the minimum total area of the glove is ~534 cm^2. The actual area would be larger and would take into account the non-flat portions of the glove.

INDIVIDUAL ACKNOWLEDGMENT

State/Commonwealth of Illinois
County of Kane } ss.

On this the 21st day of August, 2017, before me,
Day Month Year

Joshua L. Peterson, the undersigned Notary Public,
Name of Notary Public

personally appeared Christopher Palenik,
Name(s) of Signer(s)

☐ personally known to me – **OR** –

☒ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same for the purposes therein stated.

WITNESS my hand and official seal.

JOSHUA L PETERSON
Official Seal
Notary Public – State of Illinois
My Commission Expires Jan 31, 2021

Place Notary Seal/Stamp Above

Signature of Notary Public

Any Other Required Information
(Printed Name of Notary, Expiration Date, etc.)

OPTIONAL

Not required by law, this information can be useful to those relying on the document and prevent fraud.

Description of Any Attached Document

Title or Type of Document: Scientific Report

Document Date: 08/17/17 Number of Pages: 17

Signer(s) Other Than Named Above: _____

RIGHT THUMBPRINT OF SIGNER #1	RIGHT THUMBPRINT OF SIGNER #2
Top of thumb here	Top of thumb here