



Firearms Examination Test No. 15-526 Summary Report

This test was sent to 426 participants. Each sample set consisted of three known expended cartridge cases (Item 1) test-fired from a suspect weapon and four questioned expended cartridge cases (Items 2-5). Participants were requested to examine these items and report their findings. Data were returned from 398 participants (93% response rate) and are compiled into the following tables:

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This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample set contained five items: Item 1 consisted of three cartridge cases fired in the suspect's firearm. Items 2, 3, 4 and 5 each consisted of one cartridge case recovered from the scene. Federal® American Eagle® 40 S&W 180 grain full metal jacket (FMJ) Centerfire ammunition was used for all five items. Participants were requested to determine which, if any, of the recovered questioned cartridge cases (Items 2-5) were fired from the same firearm as the known cartridge cases.

The cartridge cases in Items 1 and 3 were fired in a Ruger P94DC Auto handgun (Serial number 341-04450). Items 4 and 5 were fired in a Ruger P91DC Auto handgun (Serial number 340-01813). Item 2 was fired in a Smith & Wesson SW40VE Auto handgun (Serial number RBN0084).

ITEMS 1 and 3 (IDENTIFICATION): Multiple magazines were loaded with ammunition totaling 120 rounds in preparation for shooting with the Ruger P94DC handgun. After the ammunition was expended, the cartridge cases were collected and packaged together as a batch in zip top bags. This process was repeated until the required number was produced. Out of each batch, the necessary number of cartridge cases were selected and inscribed with a "1" (three cartridge cases) and a "3" (one cartridge case), then sealed into their respective jewel boxes and kept together as an association batch.

ITEM 2 (ELIMINATION): Multiple magazines were loaded with ammunition totaling 100 rounds in preparation for shooting with the Smith & Wesson SW40VE handgun. After the ammunition was expended, the cartridge cases were collected and packaged together as a batch in zip top bags. This process was repeated until the required number was produced. Out of each batch, the necessary number of cartridge cases were selected and inscribed with a "2" (one cartridge case), then sealed into an Item 2 jewel box.

ITEMS 4 and 5 (ELIMINATION): Multiple magazines were loaded with ammunition totaling 120 rounds in preparation for shooting with the Ruger P91DC handgun. After the ammunition was expended, the cartridge cases were collected and packaged together as a batch in zip top bags. This process was repeated until the required number was produced. Out of each batch, the necessary number of cartridge cases were selected and inscribed with a "4" or "5" (one cartridge case each), then sealed into their respective jewel boxes and kept together as an elimination batch.

SAMPLE SET ASSEMBLY: For each sample set, Items 4 and 5 of the same elimination batch, Item 2, along with Items 1 and 3 of the same association batch were placed in a sample pack box. This process was repeated until all of the sample sets were prepared. Once verification was completed, the sample packs were sealed with evidence tape and initialed "CTS."

VERIFICATION: During test production, 10% of the cartridge cases from each batch were selected and intercompared to confirm that markings were consistent within each batch. Laboratories that conducted the predistribution examination of the completed sample sets reported the expected identifications and eliminations.

Summary Comments

This test was designed to allow participants to assess their proficiency in a comparison of expended cartridge cases. Participants were provided with four questioned expended Federal® American Eagle® 40 S&W 180 grain full metal jacket (FMJ) Centerfire ammunition cartridge cases (Items 2-5) which they were requested to compare with three known expended cartridge cases (Item 1) of the same manufacturer fired in the suspect's weapon, a Ruger P94DC Auto handgun (serial number 341-04450). For each sample set, the Item 3 cartridge case was fired in the same firearm as the Item 1 known cartridge cases. Items 4 and 5 cartridge cases were fired in a different firearm from that which discharged the known expended cartridge cases (Item 1). The Item 2 cartridge case was fired in a different firearm from the one that discharged the known expended cartridge cases (Item 1) and the firearm that discharged the Items 4 and 5 cartridge cases. (Refer to Manufacturer's Information for preparation details.)

In Table 1 Response Summary, 396 of 398 (99%) responding participants identified Item 3 and either eliminated or reported "Inconclusive" for Items 2, 4, and 5 as having been fired from the same firearm as the Item 1 test-fired cartridge cases. [Many labs will not, as a matter of policy, eliminate without access to the firearm or when class characteristics match.] One participant identified Items 3, 4 and 5 as having been fired from the same firearm as the Item 1 test-fired cartridge cases and one participant identified Item 2 as having been fired from the same firearm as the Item 1 test-fired cartridge cases.

The majority of participants reported that Items 4 and 5 had been fired in a second, unknown firearm and that Item 2 was fired in a third, unknown firearm.

Examination Results

Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
24UQX8	No	Yes	No	No	3CKP4X	No	Yes	Inc	Inc
2ADHYE	No	Yes	No	No	3FJ84J	No	Yes	No	No
2B4NBY	No	Yes	No	No	3FX6ZX	No	Yes	No	No
2CM293	No	Yes	No	No	3HVJ7V	No	Yes	No	No
2DJBGY	No	Yes	No	No	3JUQUL	No	Yes	No	No
2E6R3L	Inc	Yes	Inc	Inc	3KYGF3	No	Yes	No	No
2FNACC	No	Yes	No	No	3L7YCD	No	Yes	No	No
2JND7K	No	Yes	Inc	Inc	3LC33X	No	Yes	No	No
2JP4GA	No	Yes	No	No	3LT6VC	No	Yes	No	No
2LPVAN	No	Yes	No	No	3LU379	No	Yes	No	No
2RJHXZ	No	Yes	No	No	3M46WD	No	Yes	No	No
2WDEK7	No	Yes	No	No	3MJGG4	No	Yes	No	No
2XRJH4	No	Yes	No	No	3NR7LH	No	Yes	No	No
2YM6AA	No	Yes	No	No	3RX2HX	No	Yes	No	No
33TR48	No	Yes	No	No	3XDGG4	No	Yes	Inc	Inc
3843W2	No	Yes	No	No	49DX9B	No	Yes	No	No
38KCRM	No	Yes	No	No	4GE7TX	No	Yes	No	No
38TLYL	No	Yes	No	No	4L4M8G	No	Yes	No	No
3AYW7H	No	Yes	No	No	4MBFPJ	No	Yes	No	No
3B8Y2U	No	Yes	No	No	4PG7AZ	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
4ZLEU3	No	Yes	No	No	7EWR97	No	Yes	No	No
628WEG	No	Yes	No	No	7HYF4V	No	Yes	No	No
62VNLZ	No	Yes	No	No	7KXJGJ	No	Yes	No	No
63LGZZ	No	Yes	No	No	7KYFRF	No	Yes	No	No
66PCLN	No	Yes	No	No	7MTDTL	No	Yes	No	No
66XMXT	No	Yes	No	No	7RJEJ9	No	Yes	No	No
6CHKPL	No	Yes	No	No	7TQZMF	No	Yes	No	No
6DMWUB	No	Yes	No	No	7XT3C9	No	Yes	No	No
6EE6UE	No	Yes	No	No	7Z2BJ8	No	Yes	Inc	Inc
6EHWJZ	No	Yes	No	No	7ZTCXY	No	Yes	No	No
6FCGB7	No	Yes	No	No	82GW8G	No	Yes	No	No
6GGXRJ	No	Yes	Inc	Inc	82ZKPB	No	Yes	No	No
6HCJJN	No	Yes	No	No	8EL2E9	No	Yes	No	No
6MM3TX	No	Yes	Inc	Inc	8GKLGZ	No	Yes	No	No
6R43XX	No	Yes	No	No	8KFUUH	No	Yes	No	No
6RDX73	No	Yes	No	No	8LLG2V	No	Yes	No	No
6RTGQZ	No	Yes	No	No	8QFH4A	No	Yes	No	No
6V82RU	Inc	Yes	Inc	Inc	8U9TH2	No	Yes	No	No
764ZJ9	No	Yes	No	No	8VFGLF	No	Yes	No	No
77YJKA	No	Yes	No	No	8W6TGE	No	Yes	No	No
78ALBF	No	Yes	No	No	8W6V7J	No	Yes	No	No
7D3FE9	No	Yes	No	No	8XLDKG	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
8YF22Q	No	Yes	No	No	AR4LTM	No	Yes	No	No
94KRQJ	No	Yes	No	No	AUWRKU	No	Yes	Inc	Inc
9AB4LF	No	Yes	No	No	AWGAPC	No	Yes	No	No
9JWAJJ	No	Yes	No	No	AXGTRX	No	Yes	No	No
9KGECA	No	Yes	No	No	AZFPXZ	No	Yes	No	No
9QYLBB	No	Yes	No	No	B64PQL	No	Yes	No	No
9RALAQ	No	Yes	No	No	B8JEAJ	No	Yes	No	No
9TTQ98	No	Yes	No	No	B9QBJA	No	Yes	No	No
9XJ6U9	No	Yes	No	No	BJZZ27	No	Yes	No	No
9YZ2JM	No	Yes	No	No	BK8GUA	No	Yes	No	No
A46FM4	No	Yes	No	No	BLD7NV	No	Yes	No	No
A6X9F2	No	Yes	No	No	BPEFBB	No	Yes	No	No
A7AHEA	No	Yes	No	No	BPFGR3	No	Yes	No	No
AA7B4Y	No	Yes	No	No	BQHDWX	No	Yes	No	No
AAVU6H	No	Yes	No	No	BTGDL4	No	Yes	No	No
AHKFD3	No	Yes	No	No	BTMV38	No	Yes	No	No
AHRMJ4	No	Yes	No	No	BUB7CG	No	Yes	No	No
AJKH37	No	Yes	No	No	CA84FV	No	Yes	No	No
AMBKR9	No	Yes	No	No	CDEBDV	No	Yes	No	No
AN6ATG	No	Yes	No	No	CEGBQ8	No	Yes	No	No
AN8A6W	No	Yes	No	No	CER37C	No	Yes	No	No
ANB3XA	No	Yes	No	No	CFQLH6	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
CHJ8J9	No	Yes	No	No	DQNR2V	No	Yes	No	No
CJ2ZX6	No	Yes	No	No	DVQECR	No	Yes	No	No
CLFWYU	No	Yes	No	No	DY3K8Y	No	Yes	No	No
CLZMUZ	No	Yes	No	No	E8UHDY	No	Yes	No	No
CRNBN7	No	Yes	No	No	E9JPVA	No	Yes	No	No
CXN9U7	No	Yes	No	No	EB48FP	No	Yes	No	No
D2FU3K	No	Yes	No	No	EBMJDR	No	Yes	No	No
D2L42C	No	Yes	No	No	ECLM73	No	Yes	No	No
D47ZLV	No	Yes	No	No	EEPFD4	No	Yes	No	No
D7KVKZ	No	Yes	No	No	EH7CDZ	No	Yes	No	No
D96E9K	No	Yes	No	No	EL9LW9	No	Yes	No	No
DAGHC3	No	Yes	No	No	EPAM4W	No	Yes	No	No
DALWMH	No	Yes	No	No	ERC2AJ	No	Yes	No	No
DDK9K4	No	Yes	No	No	EXZCFR	No	Yes	No	No
DDLVT	No	Yes	No	No	EZPN96	No	Yes	No	No
DDUWKB	No	Yes	No	No	F2UXUG	No	Yes	No	No
DF6PL6	No	Yes	No	No	F3CKGV	No	Yes	No	No
DGCBTH	No	Yes	No	No	F84UK3	No	Yes	No	No
DHW776	No	Yes	No	No	F8FX43	No	Yes	No	No
DM94JJ	No	Yes	No	No	FBX927	No	Yes	No	No
DNUHRA	No	Yes	No	No	FDMGB8	No	Yes	No	No
DP7JBN	No	Yes	No	No	FLK8UX	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
FMAHMB	No	Yes	No	No	GYNJWT	No	Yes	No	No
FPG376	No	Yes	No	No	GZZ3YC	No	Yes	No	No
FPZN6M	No	Yes	No	No	HBG7L2	No	Yes	No	No
FQJU46	No	Yes	No	No	HJPAD3	No	Yes	No	No
FT4FF9	No	Yes	No	No	HLCUEZ	No	Yes	No	No
FUXPK2	No	Yes	No	No	HLHQXG	No	Yes	No	No
FY6PM2	No	Yes	No	No	HMNLD9	No	Yes	No	No
FYMA2R	No	Yes	No	No	HNZ2RZ	No	Yes	No	No
FZYK3H	No	Yes	No	No	HPHVKM	No	Yes	No	No
FZZAD8	No	Yes	No	No	HYH33A	No	Yes	No	No
G34WBQ	No	Yes	No	No	HZBVW8	No	Yes	No	No
G78NPU	No	Yes	No	No	J278NJ	No	Yes	No	No
GBM2QG	No	Yes	No	No	J3FENR	No	Yes	No	No
GCB3G8	No	Yes	No	No	J62RWH	No	Yes	No	No
GDTG6Z	No	Yes	No	No	J696ZX	No	Yes	No	No
GKAXT4	No	Yes	No	No	JEV23Y	No	Yes	No	No
GNLJ64	No	Yes	Inc	Inc	JHWA79	No	Yes	No	No
GPHHFF	No	Yes	No	No	JLAJZ9	No	Yes	No	No
GTJMB9	No	Yes	No	No	JZ6ZP7	No	Yes	No	No
GUMXP6	No	Yes	No	No	K26NDG	No	Yes	No	No
GXW8EM	No	Yes	No	No	K8U96N	No	Yes	No	No
GXX6NJ	No	Yes	No	No	KDC964	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
KDWFNX	No	Yes	No	No	LQE2AK	No	Yes	No	No
KFYVXQ	No	Yes	No	No	LQY9QU	No	Yes	No	No
KHH8CM	No	Yes	No	No	LTB2RN	No	Yes	No	No
KJCR4T	No	Yes	No	No	LVMK9D	No	Yes	No	No
KJZTB6	No	Yes	No	No	LWNLU4	No	Yes	No	No
KN9EWG	No	Yes	No	No	LXQHGK	No	Yes	No	No
KRT9V3	No	Yes	Inc	Inc	M3KPJU	No	Yes	No	No
KUUCMP	No	Yes	No	No	M6EXXV	No	Yes	No	No
KWUVRV	No	Yes	No	No	M8HG8P	No	Yes	No	No
KZLGKY	No	Yes	No	No	M99JCL	No	Yes	No	No
L4FX9D	No	Yes	Inc	Inc	MAAKVP	No	Yes	No	No
L4XCPH	No	Yes	No	No	MFBU64	No	Yes	No	No
L6AJYJ	No	Yes	No	No	MJEN6U	No	Yes	No	No
L7VMQN	No	Yes	No	No	MKLCBT	No	Yes	No	No
LCA6QJ	No	Yes	No	No	MKZXKV	No	Yes	No	No
LDWTQK	No	Yes	No	No	MN62KN	No	Yes	No	No
LFBGZK	No	Yes	No	No	MTFMEW	No	Yes	No	No
LG6P2U	No	Yes	No	No	MTMZHQ	No	Yes	No	No
LH7Z2W	No	Yes	No	No	MX8TVK	No	Yes	No	No
LHYHT8	No	Yes	No	No	MZLKNT	No	Yes	No	No
LJF3V9	No	Yes	No	No	N3G2PG	No	Yes	No	No
LMQRXY	No	Yes	No	No	N4F2DR	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
N8U6QX	No	Yes	No	No	PYWC3U	Inc	Yes	No	No
NCWA2N	No	Yes	No	No	Q2UAQF	No	Yes	No	No
NFUVTQ	No	Yes	No	No	Q79FCA	No	Yes	No	No
NGMNLP	No	Yes	No	No	Q7UT38	No	Yes	Inc	Inc
NGMQCT	No	Yes	Yes	Yes	Q9M9MV	No	Yes	No	No
NLJFTZ	No	Yes	No	No	Q9NXXJ	No	Yes	No	No
NLYWMT	No	Yes	No	No	QCDACW	No	Yes	No	No
NMKCH4	No	Yes	No	No	QD9YD6	No	Yes	Inc	Inc
NQ43BT	No	Yes	No	No	QDDPYL	No	Yes	No	No
NTUD2L	No	Yes	No	No	QGEQ24	No	Yes	No	No
NWB67G	No	Yes	No	No	QJDGAK	No	Yes	No	No
P8ATLW	No	Yes	No	No	QKFR9R	No	Yes	Inc	Inc
P9FFVV	No	Yes	No	No	QLMQZW	No	Yes	Inc	Inc
P9RBX9	No	Yes	No	No	QU3V8E	No	Yes	No	No
PENWCW	No	Yes	No	No	R3NEKF	No	Yes	No	No
PHUMVN	No	Yes	No	No	R72RAL	No	Yes	No	No
PKKUEZ	No	Yes	No	No	R7QQP9	No	Yes	No	No
PL76ZT	No	Yes	No	No	R8PG49	No	Yes	No	No
PNUEAU	No	Yes	No	No	R9YA89	No	Yes	No	No
PNVCKP	No	Yes	No	No	RAPZ3V	No	Yes	No	No
PPPXCX	No	Yes	No	No	RE7VXQ	No	Yes	No	No
PU9JFU	No	Yes	No	No	REPGUM	Yes	Inc	Inc	Inc

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
REVX69	No	Yes	No	No	TXW98A	No	Yes	No	No
RG8DYA	No	Yes	No	No	TY3MXW	No	Yes	No	No
RHF MPL	No	Yes	No	No	U2VZXL	No	Yes	Inc	Inc
RJWETU	No	Yes	No	No	U9TR7F	No	Yes	No	No
RKPMUT	No	Yes	No	No	UCPH7Y	No	Yes	No	No
RLZGQR	No	Yes	No	No	UD7C9U	No	Yes	No	No
RN7YNN	No	Yes	No	No	UKF34A	Inc	Yes	Inc	Inc
RNUULB	No	Yes	No	No	UY6ZDV	No	Yes	No	No
RRNCBW	No	Yes	No	No	VABPRT	No	Yes	No	No
RTQFFY	No	Yes	No	No	VFGKCT	No	Yes	No	No
RVB6ZC	No	Yes	No	No	VJ2KDU	No	Yes	No	No
RW6TFL	No	Yes	No	No	VN3XUJ	No	Yes	No	No
T2DTUP	No	Yes	No	No	VRWD2N	No	Yes	No	No
T4UMFX	No	Yes	No	No	VWVAMR	No	Yes	No	No
T7KVL T	No	Yes	No	No	VWW8XM	No	Yes	No	No
TCYVGQ	No	Yes	No	No	VXYE7N	No	Yes	No	No
THMER9	No	Yes	No	No	VYD9HH	No	Yes	No	No
TNCVDJ	No	Yes	No	No	VZ8RRW	No	Yes	No	No
TPY7TK	No	Yes	No	No	W8ZUG9	No	Yes	No	No
TR9N39	No	Yes	No	No	W9GF2N	No	Yes	No	No
TRNGLY	No	Yes	No	No	W9KEQH	No	Yes	No	No
TTN4DN	No	Yes	No	No	WJFEPN	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
WLCXAU	No	Yes	No	No	Y7Z7XF	No	Yes	No	No
WWCL8H	No	Yes	Inc	Inc	YCEA3F	No	Yes	No	No
WX7E2F	No	Yes	No	No	YKLE3U	No	Yes	No	No
X7PHBM	No	Yes	No	No	YMBM9N	No	Yes	Inc	Inc
X8YRFM	No	Yes	No	No	YP477Y	Inc	Yes	Inc	Inc
XB984C	No	Yes	No	No	YQBZR8	No	Yes	No	No
XBZXT8	No	Yes	No	No	YR4PCN	No	Yes	Inc	Inc
XE6UVF	No	Yes	No	No	YRRFHL	No	Yes	No	No
XGVDFD	No	Yes	No	No	YUGPRM	No	Yes	No	No
XK6ZYQ	No	Yes	No	No	YVJJNF	No	Yes	No	No
XNA2CZ	No	Yes	No	No	YXR36F	No	Yes	No	No
XQP3XF	No	Yes	No	No	Z3XH2Q	No	Yes	No	No
XUHF3C	No	Yes	No	No	Z4T27D	No	Yes	No	No
XVVR6M	No	Yes	No	No	ZAFXLN	No	Yes	No	No
XWHZVJ	No	Yes	Inc	Inc	ZC9NXU	No	Yes	No	No
XWVYJ2	No	Yes	No	No	ZD2AF7	No	Yes	No	No
XXZKVF	No	Yes	No	No	ZDECBY	No	Yes	No	No
XY8BMC	No	Yes	No	No	ZEAWZJ	No	Yes	No	No
XZFN4E	No	Yes	No	No	ZFT3XF	No	Yes	No	No
XZWX2L	No	Yes	No	No	ZGDPW3	No	Yes	No	No
Y2UZF8	No	Yes	No	No	ZK2Y74	No	Yes	Inc	Inc
Y3ZV7M	No	Yes	No	No	ZNCEBL	No	Yes	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
ZNYH7G	No	Yes	No	No					
ZR4EBA	No	Yes	No	No					
ZT23D7	No	Yes	No	No					
ZTH4DM	No	Yes	No	No					
ZWFMDZ	No	Yes	No	No					
ZY2TKJ	No	Yes	No	No					

Response Summary					Participants: 398				
<i>Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?</i>									
		<u>Item 2</u>	<u>Item 3</u>	<u>Item 4</u>	<u>Item 5</u>				
Responses	Yes	1 (0.3%)	397 (99.7%)	1 (0.3%)	1 (0.3%)				
	No	392 (98.5%)	0 (0.0%)	372 (93.5%)	372 (93.5%)				
	Inc	5 (1.3%)	1 (0.3%)	25 (6.3%)	25 (6.3%)				

Conclusions

TABLE 2

WebCode	Conclusions
24UQX8	The fired cartridge case in Exhibit #2 was not fired in Exhibit #1. The fired cartridge case in Exhibit #3 was fired in Exhibit #1. The fired cartridge cases in Exhibits #4 and #5 were fired in the same firearm. The fired cartridge cases in Exhibits #4 and #5 were not fired in Exhibit #1. The fired cartridge case in Exhibit #2 was not fired in the same firearm as the fired cartridge cases in Exhibits #4 and #5.
2ADHYE	Casing N (Item 3) was fired in the same firearm as the Item 1 test fired casings indicated as being fired in the .40 S&W Ruger P94DC pistol. Casing O (Item 4) and casing P (Item 5) were fired in a second .40S&W pistol. Suspect weapons include .40S&W Ruger pistols; however, any suspect weapon should be submitted for analysis. Casing M (Item 2) was fired in a third .40S&W pistol. Suspect weapons include .40S&W Smith and Wesson Sigma pistols; however, any suspect weapon should be submitted for analysis.
2B4NBY	Item 3 was identified as having been fired in Item 1 based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 4 and 5 were identified as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 4 and 5 were eliminated as having been fired in Item 1 due to disagreement of individual characteristics. Item 2 was eliminated as having been fired in Item 1 or in the same unknown firearm as Items 4 and 5 due to disagreement of discernible class characteristics. Item 1 is test fires reportedly from a Ruger P94DC model 40 S&W pistol, serial number unknown. Items 2, 4, and the test fires from Item 1 were imaged into the Integrated Ballistics Identification System (IBIS)/Brass TRAX database. A review of the correlation results did not indicate any high confidence candidates from these searches. Any future identification made from these entries will be supplemented.
2CM293	The evidence in items 1, 2, 3, 4, and 5 was analyzed by physical and microscopic examination. The three (3) fired 40 caliber cartridge cases in item 2, 4, and 5 were determined not to have been fired in the weapon which fired the three (3) reference 40 caliber cartridge cases in item 1. The fired 40 caliber cartridge case in item 3 was determined to have been fired in the weapon which fired the three (3) reference 40 caliber cartridge cases in item 1. The fired 40 caliber cartridge case in item 2 was determined to have been fired in a different weapon than the two (2) fired 40 caliber cartridge cases in items 4 and 5. The two (2) fired 40 caliber cartridge cases in items 4 and 5 were fired in one weapon. Further analysis of the three (3) fired 40 caliber cartridge cases in items 2, 4, and 5 is pending submission of additional weapons for comparison.
2DJBGY	An examination showed the following, a) The fired cartridge cases Item 1 and Item 3 had been fired in the same pistol, b) The fired cartridge case Item 2 had been fired in a second pistol, and c) The fired cartridge cases Items 4 and 5 had both been fired in a third pistol.
2E6R3L	Upon microscopic examination and comparison with test shots from a .40 S&W caliber, Ruger, P94DC model, semiautomatic pistol (items 1A, 1B, and 1C) the following results were obtained: Item 3 was identified as having been fired by the recovered Ruger pistol (group 1). Item 2 exhibited similar class characteristics and could not be eliminated as having been fired by the recovered Ruger pistol, but lacked sufficient matching individual characteristics for identification (inconclusive result) (group 2). Items 4 and 5 exhibited the same class characteristics and could not be eliminated as having been fired by the submitted Ruger pistol, but lacked sufficient agreement of individual characteristics for identification (inconclusive result). Items 4 and 5 were identified as having been fired by the same unknown firearm (group 3). Differences in individual characteristics would suggest different firearms fired the

TABLE 2

WebCode	Conclusions
	fired cartridge cases from each of the three groups.
2FNACC	The recovered cartridge cases named item 2, 4 and 5, was not discharged from Rugger[sic] P94DC Pistol. Elimination. The recovered cartridge case named item 3, was discharged from Ruger P94DC Pistol. Identification.
2JND7K	Items 1 (A through C) and 2 through 5 are 40 S&W cartridge cases. It was determined through microscopic examination that there are sufficient individual markings present to identify Items 1 (A through C) and 3 as having been fired in the same firearm and Items 4 and 5 as having been fired in the same firearm. Items 1 (A through C) and 3 can neither be identified nor eliminated as having been fired in the same firearm as Items 4 and 5. The inability to effect an identification is not sufficient grounds to eliminate them from each other. Based on class characteristics Item 2 can be eliminated as having been fired in the same firearm used to fire Items 1 (A through C), 3, 4 and 5. Items 1 (A through C) and 2 through 5 lack the characteristics necessary to identify the brand or model of firearm that may have fired them. In the event a suspect firearm or firearms are recovered it would be necessary to submit it along with items 1 (A through C) and 2 through 5 for comparative analysis. All conclusions were reached using microscopic and/or macroscopic examination. This report reflects the test results, conclusions, interpretations and/or the findings of the analysts and technical reviewers below as indicated by their signatures below.
2JP4GA	a. Item #3 was fired in the same firearm that fired Item #1. b. Item #2 was fired in a second firearm. It was not fired in the same firearm(s) as Items #1, #3, #4 or #5. c. Items #4 and #5 were fired in a third firearm. They were not fired in the same firearm(s) as Items #1, #2 or #3.
2LPVAN	The following findings reflect the professional opinion of the examiner authoring this report. Examination of Item# 3 revealed one (1) fired 40 caliber cartridge case. Further examination of Item# 3 with the test fired cartridge cases reportedly from the Ruger semi-automatic pistol (Item #1) revealed Item #3 was fired in the Ruger semi-automatic pistol. Examination of Items# 4 & 5 revealed two (2) fired 40 caliber cartridge cases. Further examination of Items# 4 & 5 revealed they were fired in the same firearm. Examination of Item# 2 revealed one (1) 40 fired caliber cartridge case. Further examination of Item# 2 revealed it was not fired in the reported Ruger semi-automatic pistol (Item #1) or the same firearm as Items# 4 & 5.
2RJHXZ	The fired 40 S&W cartridge case, item #3, was microscopically compared with test cartridge cases previously fired in a Ruger pistol, item #1. These comparisons revealed matching individual breech face characteristics, confirming the fired 40 S&W cartridge case was fired in the Ruger pistol. The three (3) fired 40 S&W cartridge cases, items #2, #4, and #5, were microscopically compared with test cartridge cases previously fired in a Ruger pistol, item #1. These comparisons revealed different class and individual characteristics indicating the three (3) fired 40 S&W cartridge cases are excluded as having been fired in the Ruger pistol. The three (3) fired 40 S&W cartridge cases, items #2, #4, and #5, were microscopically compared with each other. These comparisons revealed different class and individual characteristics indicating the fired 40 S&W cartridge case, item #2, is excluded as having been fired in the same firearm as the two (2) fired 40 S&W cartridge cases, items #4 and #5. The two (2) fired 40 S&W cartridge cases, items #4 and #5, were microscopically compared with each other. These comparisons revealed matching individual breech face characteristics, confirming the two (2) fired 40 S&W cartridge cases were fired in the same firearm.
2WDEK7	Exhibit #2 was not fired in the same firearm as Exhibits #1, #3, #4 or #5. Exhibit #2 is suitable for microscopic comparison. Exhibits #1 and #3 were fired in the same firearm. Exhibits #1 and #3 were not fired in the same firearm as Exhibits #4 and #5. Exhibits #4

TABLE 2

WebCode	Conclusions
	and #5 were fired in the same firearm.
2XRJH4	After microscopic comparison, it was determined that Item #3 was fired in the Ruger P94DC based on agreement of class characteristics and sufficient agreement of individual characteristics of the breechface marks and firing pin aperture shear marks. After microscopic comparison, it was determined that Items #4 and 5 were fired in the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics of the breechface marks and firing pin impression. After microscopic comparison, it was determined that Item #2 was not from the same firearm as Items #1, 3, 4, or 5 based on differences in individual characteristics, firing pin impression and breechface marks.
2YM6AA	A microscopic examination and comparison of the above evidence revealed the following: Cartridge Casings (1-Test Fires) and (3) were fired from the SAME gun based on sufficient agreement of class and individual characteristics of the Firing Pin and Breechface Impressions. Cartridge Casings (4) and (5) were fired from a SECOND gun based on sufficient agreement of class and individual characteristics of the Firing Pin and Breechface Impressions. Cartridge Casing (2) was fired from a THIRD and DIFFERENT gun then[sic] Cartridge Casings (1, 3, 4, and 5) based on sufficient disagreement of individual characteristics.
33TR48	A microscopic comparison was conducted between cartridge case #1, Item 001 & 002, 003, 004 & 005. The examination determined that item 003 was fired in the same firearm as item 001 due to matching firing pin & breech face impressions. The examinations determined that items 002, 004 & 005 were not fired in the same firearm as item 001 due to a noticeable difference in firing pin & breech face impressions.
3843W2	The fired cartridge cases in Submission 1 were microscopically compared to the fired cartridge case in Submission 3 and found to have sufficient individual characteristics to conclude an identification. Therefore, Submission 1 was fired in the same firearm as Submission 3. The fired cartridge cases in Submission 1 were microscopically compared to the fired cartridge cases in Submissions 2, 4, and 5 and found to have different characteristics. Therefore, the cartridge cases in Submission 1 were fired from a different firearm than the cartridge cases in Submissions 2, 4, and 5.
38KCRM	It was determined that the cartridge case in Item 3 was fired in the same firearm as the cartridge cases in Item 1. It was determined that the cartridge cases in Items 2, 4 and 5 were not fired in the same firearm as the cartridge[sic] cases in Item 1.
38TLYL	The fired cartridge cases marked 651TC1 and 117651/15 B were fired from the same firearm. The fired cartridge cases marked 117651/15 C and D was fired in the same firearm. The fired cartridge case marked 117651/15 A is negative to all.
3AYW7H	Test Fired casings from a Ruger P94DC pistol were submitted for comparison purposes against expended casing recovered from a retail store shooting case with the following conclusion: K-KNOWN; Q-QUESTIONED Item 1(K-1) Test fired casings. Item 2(Q-1) The expended 40 cal. casing was not fired from firearm K-1. Item 3(Q-2) The expended 40 cal. casing was fired from firearm K-1. Item 4(Q-3) The expended 40 cal. casing was not fired from firearm K-1. Item 5(Q-4) The expended 40 cal. casing was not fired from firearm K-1. From this examination it appears that two (02) other firearms may have been used at the scene. Items 2 was fired from a different firearm, while items 4 & 5 were fired from a different firearm as well. Items 4 & 5 were fired from the same pistol but not K1, as reported above. A comparison of items 2, 4, & 5 are possible if other firearms are submitted.
3B8Y2U	There are sufficient individual markings present to identify item 3 (cartridge case) as having been fired in item 1 (pistol). Based on class characteristic differences, items 2, 4, and 5

TABLE 2

WebCode	Conclusions
	(cartridge cases) can be eliminated as having been fired in item 1 (pistol). There are sufficient individual markings present to identify items 4 and 5 (cartridge cases) as having been fired in the same firearm. They lack the features necessary to determine the brand of firearm that may have fired them. Based on class characteristic differences, item 2 (cartridge case) can be eliminated as having been fired in the same firearm as items 4 and 5 (cartridge cases).
3CKP4X	I microscopically compared the spent cartridge case submitted for examination (Item 2) to the test fired cartridge cases (Item 1) produced from the Ruger P94DC handgun, comparing both class and individual characteristics. From this examination I observed that there were differences in the class characteristics between Items 1 and 2. Accordingly, I formed the opinion that Item 2 had not been discharged from that firearm. I microscopically compared the spent cartridge case submitted for examination (Item 3) to the test fired cartridge cases (Item 1) produced from the Ruger P94DC handgun, comparing both class and individual characteristics. From this examination I observed that there was agreement of all discernible class characteristics, and because there was sufficient agreement of the observed individual characteristics I formed the opinion that Item 3 had been discharged from that firearm. I microscopically compared the spent cartridge case submitted for examination (Item 4) to the test fired cartridge cases (Item 1) produced from the Ruger P94DC handgun, comparing both class and individual characteristics. From this examination I observed that there was agreement of all discernible class characteristics. However, because there was insufficient agreement of the observed individual characteristics I formed the opinion that Item 4 could have been discharged from that firearm, but that I could neither identify it to, nor eliminate it from, having been discharged from that firearm.
3FJ84J	Exhibits 117771/15 1A, B, C and 3 were positive to each other fired in the first firearm. Exhibits 117771/15 4 and 5 were positive to each other fired in the second firearm. Exhibit 117771/15 2 was negative to exhibits 117771/15 1A, B, C, 3, 4 and 5 fired in the third firearm.
3FX6ZX	Item 3 was fired in the same firearm as Item 1 (identification). This conclusion was verified by Firearms Examiner [name]. Item 2 was not fired in the same firearm as Item 1 (elimination). This conclusion was verified by Firearms Examiner [name]. Item 2 could have been fired in a 40 S&W firearm of the following manufacture: [list provided]. Items 4 and 5 were fired in the same firearm (identification). This conclusion was verified by Firearms Examiner [name]. Items 4 and 5 were not fired in the same firearm as Item 1 (elimination). This conclusion was verified by Firearms Examiner [name]. Items 4 and 5 were not fired in the same firearm as Item 2 (elimination). This conclusion was verified by Firearms Examiner [name]. Items 4 and 5 could have been fired in a 40 S&W firearm of the following manufacture: [list provided]. Manufacturers lists are investigative tools and are not intended to be all-inclusive. Any suspect firearms should be submitted for comparison. For additional clarification regarding conclusion statements, please go to [internet link provided].
3HVJ7V	Microscopic examination and comparison of the evidence cartridge case (item # 3) with the three supplied test cartridge cases (items # 1) reveals sufficient evidence to conclude that the cartridge case (item # 3) was fired in the same firearm that produced the tests (item # 1). Microscopic examination and comparison of the three evidence cartridge cases (items # 2, 4 and 5) with the three supplied test cartridge cases (items # 1) reveals sufficient evidence to conclude that these three cartridge cases (items # 2, 4 and 5) were not fired in the same firearm that produced the tests (item # 1).
3JUQUL	Items 1, 2, 3, 4, and 5 were each examined microscopically. Item 1, three Federal brand caliber 40 S&W cartridge cases, was identified as having been fired in the same firearm. Item 3, a Federal brand caliber 40 S&W cartridge case, was identified as having been fired in the

TABLE 2

WebCode	Conclusions
	<p>same firearm represented by Item 1. Items 4 & 5, each a Federal brand caliber 40 S&W cartridge case, were identified as having been fired in one (1) firearm. These cartridge cases exhibit marks that may be suitable for identification with the firearm in which they were fired. Item 2 is a Federal brand caliber 40 S&W cartridge case which exhibits marks suitable for identification with the firearm in which it was fired. Due to differences in class characteristics, Item 2 was not fired in the same firearms represented by Items 1, 4 and 5. Due to differences in individual characteristics, Items 4 and 5 were not fired in the same firearm as represented by Item 1.</p>
3KYGF3	<p>Item #3 was discharged from Item #1 based on sufficient agreement of class & individual characteristics of breechface marks. Item #s 4 and 5 were not fired from Item #1 based on differences of individual marks (breechface, firing pin, firing pin aperture shear marks). However, they were fired from the same firearm based on sufficient agreement of firing pin aperture shear marks. Item #2 was not fired from Item #1, or from the same firearm as Item #s 4 & 5, based on differences of individual marks (breechface, firing pin, firing pin aperture shear marks).</p>
3L7YCD	<p>Item #3 was fired in the firearm that fired Item #1. Items #4 and #5 were fired in the same firearm. Items #4 and #5 were not fired in the firearm that fired Item #1. Item #2 was not fired in the firearm that fired Item #1 or the firearm that fired Items #4 and #5.</p>
3LC33X	<p>I made an examination of the three test fired cartridge cases using a comparison microscope. This type of examination allows two objects to be viewed simultaneously so that microscopic marks left behind on the breechface of cartridge cases during discharge can be compared and assessed. This was done to determine which marks on the test fired cartridge cases replicates. I then performed a similar comparison between these test fired cartridge cases and the question fired cartridge cases, Item 2 to Item 5. As a result of this examination I formed the following opinion: Item 3 was discharged by the same firearm that discharged the test fired cartridge cases, Item 1. Item 4 and Item 5 were discharged by a second firearm not being any of the firearms Item 1, 2 and 3 were discharged by. Item 2 was discharged by a third firearm, not being any of the firearms Items 1, 3, 4 and 5 were discharged by.</p>
3LT6VC	<p>The cartridge case N° 3 was fired from the suspect's weapon. The cartridge case N° 4 and 5 were fired from the same weapon and different to the suspect's weapon. The cartridge case N° 2 was fired from the weapon different to the suspect's weapon and the weapon who's fired cartridges cases N° 4 and 5.</p>
3LU379	<p>Cartridge Case (3) and Test Fires (1,1,1) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Cartridge Case (3) and Test Fires (1,1,1) are identified as having been discharged from the same firearm. Cartridge Cases 4 and 5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Cartridge Cases 4 and 5 are identified as having been discharged from a second firearm. Cartridge Case (2) was microscopically examined and compared to Cartridge Cases (3-5) and Test Fires (1, 1, 1). Based on the observed disagreement of individual characteristics, Cartridge Case (2) was determined to have been discharged from a Third Firearm.</p>
3M46WD	<p>1. Cartridge cases marked Item 1 and Item 3 were fired in the first firearm. 2. Cartridge cases marked Item 4 and Item 5 were fired in second firearm. 3. Cartridge case marked Item 2 was fired in another firearm third firearm.</p>
3MJGG4	<p>Expended cartridge casing #3 recovered from the main entrance of the scene was identified as having been fired from the submitted Ruger P94DC recovered from the suspect (based</p>

TABLE 2

WebCode	Conclusions
	upon the exhibited correspondence in the breechface markings). The remaining expended cartridge casings (#'s 2, 4 and 5) recovered from the main entrance, near the dressing room and near the cash register of the scene, respectively, were excluded as having been fired from the submitted Ruger P94DC recovered from the suspect, based upon differences in both class characteristic and individualistic markings. However, it should be noted that expended cartridge casings (#'s 4 and 5) were fired from the same unidentified caliber .40 S&W semi-automatic pistol (based upon the correspondence in both breech and firing pin drag markings).
3NR7LH	The four 40 S&W caliber cartridge cases recovered from the scene, Items 2 ->5 were examined and found to have been fired by three firearms. I compared the test fired cartridge cases, Item 1, from the Ruger pistol to the cartridge case Item 3 and the same class of firearm produced marks and sufficient corresponding individual microscopic marks were found. The Ruger pistol, Item 1, fired the cartridge case Item 3. Items 4 and 5 had the same class of firearm produced marks and sufficient individual marks to conclude they were fired in a single firearm, but eliminated from having been fired by the Ruger pistol (Item 1). Item 2 had different class marks than any of the other items 1, 3-5 and was fired by a different firearm.
3RX2HX	Item 3 was fired by the same gun that fired the Item 1 cartridge cases. Items 4 and 5 were fired by one gun. These cartridge cases were not fired by the same gun that fired Items 1 and 3, nor were they fired by the gun that fired Item 2. Item 2 was not fired by the same gun that fired Items 1 and 3, nor was it fired by the gun that fired Items 4 and 5.
3XDGQ4	The Item 2 cartridge case was not fired in the same firearm as the Item 1 cartridge cases or the same unknown firearm as the Item 4 and 5 cartridge cases. The Item 3 cartridge case was fired in the firearm that fired the Item 1 cartridge cases. The item 4 and 5 cartridge cases were both fired in the same unknown firearm. They could neither be identified nor eliminated as having been fired in the firearm that fired the Item 1 cartridge cases. This is due to agreement of all discernible class characteristics but insufficient agreement or disagreement of the discernible individual characteristics.
49DX9B	Exhibit #3 was fired in Exhibit #1. Exhibits #4 and #5 were fired in the same firearm. Exhibits #4 and #5 were not fired in Exhibit #1. Exhibit #2 was not fired in Exhibit #1 or the same firearm as Exhibits #4 and #5.
4GE7TX	I conducted a comparative microscopic examination between the three fired cartridge cases in Item 1 and the four fired cartridge cases; one of each in Items 2, 3, 4 and 5. This examination revealed that three different firearms had been used to discharge these items: (a) The fired cartridge case (Item 3) had been discharged in the same firearm that had discharged Item 1. (b) The three fired cartridge cases (Items 2, 4 and 5) were not discharged in the same firearm that had discharged Item 1. Furthermore, two separate firearms were used to discharge Items 2, 4 and 5. Item 2 was discharged in one firearm; a different firearm had discharged both Items 4 and 5.
4L4M8G	3. On 2015-05-22 during the performance of my official duties I received a sealed evidence bag with number PA4002449454 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed box marked "Test No. 15-526: Firearms Examination", containing the following: 3.1.1 One (1) box marked "Test No. 15-526: Item 1", containing the following exhibits: 3.1.1.1 Three (3) .40 Smith & Wesson calibre fired cartridge cases marked by me "1A", "1B" and "1C" individually. 3.1.2 One (1) box marked "Test No. 15-526: Item 2", containing the following exhibit: 3.1.2.1 One (1) .40 Smith & Wesson calibre fired cartridge case marked by me "2". 3.1.3 One (1) box marked "Test No. 15-526: Item 3", containing the following exhibit: 3.1.3.1 One (1) .40 Smith & Wesson calibre fired

TABLE 2

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	<p>cartridge case marked by me "3". 3.1.4 One (1) box marked "Test No. 15-526: Item 4", containing the following exhibit: 3.1.4.1 One (1) .40 Smith & Wesson calibre fired cartridge case marked by me "4". 3.1.5 One (1) box marked "Test No. 15-526: Item 5", containing the following exhibit: 3.1.5.1 One (1) .40 Smith & Wesson calibre fired cartridge case marked by me "5". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of fired cartridge cases. 4.2 Microscopic individualization of fired cartridge cases. 5. I examined the fired cartridge cases mentioned in paragraphs 3.1.1.1, 3.1.2.1, 3.1.3.1, 3.1.4.1 and 3.1.5.1 and compared the individual and class characteristics markings on them by using a comparison microscope and found: 5.1 The cartridge cases mentioned in paragraphs 3.1.1.1 and 3.1.3.1 were fired in the same firearm. 5.2 The cartridge case mentioned in paragraph 3.1.2.1 was fired in a second firearm. 5.3 The cartridge case mentioned in paragraph 3.1.4.1 was fired in a third firearm. 5.4 The cartridge case mentioned in paragraph 3.1.5.1 was fired in a fourth firearm.</p>
4MBFPJ	<p>Item 3 was microscopically identified as having been fired in the same firearm as the test fires of Item 1. Items 2, 4 and 5 were microscopically eliminated as having been fired in the firearm as the test fires of Item 1. Items 4 and 5 were microscopically identified as having been fired in the same unknown firearm; a suspect firearm/test fires were not submitted.</p>
4PG7AZ	<p>The Items 2 through 5 40 S&W caliber cartridge cases were microscopically compared to the Item 1 test fired cartridge cases from the recovered firearm. Based on these comparisons, the following conclusions were made. Based on class and individual characteristic differences, the Items 2, 4, and 5 cartridge cases were eliminated as having been fired by the pistol that fired the Item 1 test fired cartridge cases. Based on the agreement of individual characteristics, the Item 3 cartridge case was identified as having been fired by the pistol that fired the Item 1 test fired cartridge cases. Based on the agreement of individual characteristics, the Items 4 and 5 cartridge cases were identified as having been fired by the same unknown firearm. Based on class and individual characteristic differences, the Item 2 cartridge case was eliminated as having been fired by the same unknown firearm that fired the Items 4 and 5 cartridge cases. In summary, three firearms are represented by the submitted evidence.</p>
4ZLEU3	<p>Item #3 was identified as fired in the same firearm as Item #1. Items #4 and #5 were identified as fired in the same unknown firearm. Item #2 was not fired in the same firearm as Items #1 and #3 or Items #4 and #5. Items #4 and #5 were not fired in the same firearm as Items #1 and #3. Item #2 is suitable for further microscopic comparisons.</p>
628WEG	<p>Item #2: The cartridge case was compared to the test-fired exemplar, Item #1, obtained from the recovered Ruger pistol. Differences in class characteristics were observed to conclude that the cartridge case was not fired within the pistol. Item #3: The cartridge case was compared to the test-fired exemplar, Item #1, obtained from the recovered Ruger pistol. Sufficient corresponding individual firing pin aperture sheer[sic] marks were observed to conclude that the cartridge case was fired within the pistol. Item #4: The cartridge case was compared to the test-fired exemplar, Item #1, obtained from the recovered Ruger pistol. Differences of individual characteristics were observed to conclude that the cartridge case was not fired within the pistol. Item #5: The cartridge case was compared to the test-fired exemplar, Item #1, obtained from the recovered Ruger pistol. Differences of individual characteristics were observed to conclude that the cartridge case was not fired within the pistol.</p>
62VNLZ	<p>The four (4) 40 S&W fired cartridge cases, item #2 – item #5, were microscopically compared with each other and the three (3) 40 S&W cartridge cases reported as having been previously test fired by the Ruger pistol, item #1. These comparisons revealed the following: 1. Item #1 and item #2, different individual breech face characteristics, indicating that the one (1) 40 S&W fired cartridge case, item #2, is excluded as having been fired by the Ruger</p>

TABLE 2

WebCode	Conclusions
	pistol, item #1. 2. Item #1 and item #3, matching individual breech face characteristics, confirming that the one (1) 40 S&W fired cartridge case, item #3, was fired by the Ruger pistol, item #1. 3. Item #1 and item #4, different individual breech face characteristics, indicating that the one (1) 40 S&W fired cartridge case, item #4, is excluded as having been fired by the Ruger pistol, item #1. 4. Item #2 and item #4, different class firing pin shape characteristics, indicating that the two (2) 40 S&W fired cartridge cases, items #2 and #4, are excluded as having been fired by the same firearm. 5. Item #4 and item #5, matching individual breech face characteristics, confirming that the two (2) 40 S&W fired cartridge cases, items #4 and #5, were fired by the same firearm.
63LGZZ	Item #1 and Item #3 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #1 and #3 are identified as having been fired in the same firearm. Item #4 and Item #5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #4 and #5 are identified as having been fired in the same firearm. Items #1, #2, and #4 were microscopically examined and compared. Based on the observed disagreement of individual characteristics, Items #1, #2, and #4 are eliminated as having been fired in the same firearm.
66PCLN	Items 1 and 3 were fired in the same firearm (Ruger P94DC pistol). Item 2 was fired in a second firearm. Items 4 and 5 were fired in a third firearm.
66XMXT	The location of firing pin impression mark of item 1 is biased, but mark of item 2, 4, 5 are on the center of the detonator surface. The overall shape of firing pin mark of all the items are similar except item 2, but the striation on the head surface were different.
6CHKPL	Three weapons were used on the scene of crime. Item 3 is from suspect's pistol. Item 2 is from another pistol. Items 4 and 5 are from another pistol.
6DMWUB	Item 3(N) was fired in the .40 S&W Ruger P94DC (Item 1). Item 4(O) and Item 5(P) were fired in a second .40 S&W firearm. Suspect weapons include .40 S&W Ruger pistols; however, any suspect weapon should be submitted to the laboratory for analysis. Item 2(M) was fired in a third .40 S&W firearm. Suspect weapons include .40 S&W Smith and Wesson Sigma series pistols; however, any suspect weapon should be submitted to the laboratory for analysis.
6EE6UE	Exhibits 1A through 1C consist of three (3) caliber .40 S&W fired cartridge cases, Federal brand. These cartridge cases were reportedly test fired using the suspect's Ruger, model P94DC firearm. Exhibits 2 through 5 consist of four (4) caliber .40 S&W fired cartridge cases, Federal brand. A microscopic examination was conducted between the Exhibit 1A, 1B and 1C test fired cartridge cases and the Exhibit 2, 3, 4 and 5 fired cartridge cases. There is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify Exhibit 3 as having been fired in the same firearm as the Exhibit 1 test fired cartridge cases. However, due to a difference in class and individual characteristics, Exhibits 2, 4 and 5 were eliminated as having been fired in the same firearm as the Exhibit 1 test fired cartridge cases. There is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify Exhibits 4 and 5 as having been fired in the same firearm. However, due to a difference in class and individual characteristics, Exhibit 2 was eliminated as having been fired in the same firearm as the Exhibit 4 and 5 fired cartridge cases.
6EHWJZ	After microscopic examination, it was determined that item #3 was fired from the submitted Ruger P94DC weapon. This is based on sufficient agreement of class and individual characteristics found within the breech face and firing pin impressions. Items #2, #4, #5, are

TABLE 2

WebCode	Conclusions
	excluded as being fired from the submitted weapon. Items #4 and #5 were fired from the same unrecovered semi-automatic weapon capable of firing .40 caliber ammunition. This is based on sufficient agreement of class and individual characteristics found within the breech face and firing pin impressions.
6FCGB7	Test Fires, (1) and Cartridge Casing, (3), were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Test Fires, (1) and Cartridge Casing, (3) are identified as having been discharged from the SAME firearm. Cartridge Casing, (4) and Cartridge Casing, (5), were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Cartridge Casing, (4) and Cartridge Casing, (5) are identified as having been discharged from the SAME firearm. Cartridge Casing, (2) was microscopically examined and compared to Test Fires (1), and Cartridge Casings (3, 4, 5). Based on the observed disagreement of individual characteristics, Cartridge Casing, (2) was determined to have been fired from a THIRD gun.
6GGXRJ	The cartridge case in submission 2 was not fired in the gun that produced the test fired cartridge cases in submission 1. The cartridge case in submission 3 was fired in the gun that produced the test fired cartridge cases in submission 1. The cartridge cases in submissions 4 and 5 bear class characteristics consistent with the gun that produced the test fired cartridge cases in submission 1. However, no significant similarities in individual characteristics were observed.
6HCJJN	The three fired cartridge cases submitted as item 1 were fired in the same firearm, which was reportedly a Ruger model P94DC .40 S&W caliber semiautomatic pistol. Item 3 was fired in the same firearm as the cartridge cases submitted for item 1. Items 4 and 5 were fired in the same firearm. They were not fired in the same firearm as items 1, 2 or 3. Item 2 was not fired in the same firearm as items 1 or 3-5.
6MM3TX	Item 3 (fired cartridge case) is identified as having been fired in the same firearm as item 1 (submitted test shots). Items 4 and 5 (fired cartridge cases) are identified as having been fired in the same firearm. Items 4 and 5 (fired cartridge cases) are not identified or eliminated (inconclusive) as having been fired in the same firearm as item 1 (submitted test shots). The individual characteristics present do not display agreement and suggest that they were fired in a different firearm. Item 2 (fired cartridge case) is eliminated as having been fired in the same firearm as item 1 (submitted test shots) and items 4 and 5 (fired cartridge cases). There are differences in class characteristics (D-shape firing pin impression vs. hemispherical firing pin impression). Items 1, 2, and 4 were submitted for entry into the National Integrated Ballistic Information Network (NIBIN) database. The submitting agency will be notified if an association is made in the NIBIN database.
6R43XX	Opinions and Interpretations: Item #2 (one Federal .40 S&W fired cartridge case) was examined and microscopically compared on 05/19/2015. The class characteristics of Item #2 (one Federal .40 S&W fired cartridge case) are consistent with Smith & Wesson pistols in .40 caliber; however, this listing is not all inclusive. The firearm that Item #2 (fired cartridge case) was fired in was not submitted. Item #3 (one Federal .40 S&W fired cartridge case) was examined and microscopically compared on 05/19/2015. The Item #3 (one Federal .40 S&W fired cartridge case) was positively identified as having been fired in Item #1 (Ruger pistol). Items #4 and #5 (two Federal .40 S&W fired cartridge cases) were examined and microscopically compared on 05/19/2015. Items #4 and #5 (two Federal .40 S&W fired cartridge cases) were positively identified as having been fired in the same firearm. The class characteristics of Items #4 and #5 (two Federal .40 S&W fired cartridge cases) are consistent with Ruger pistols in .40 caliber; however, this listing is not all inclusive. The firearm that Items

TABLE 2

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	#4 and #5 (two Federal .40 S&W fired cartridge cases) was fired in was not submitted.
6RDX73	The Item 2 cartridge case was not fired in the Item 1 pistol or the same unknown firearm that fired the Item 4 and 5 cartridge cases. The Item 3 cartridge case was identified as having been fired in the Item 1 pistol. The Item 4 & 5 cartridge cases were identified as having been fired in the same unknown firearm. They were not fired in the Item 1 pistol.
6RTGQZ	MICROSCOPIC COMPARISON OF EVIDENCE CALIBER .40 S&W CARTRIDGE CASES ITEM 2 THROUGH ITEM 5, WITH ITEM 1 (TEST FIRED CARTRIDGE CASES FROM RUGER P94DC), REVEALS THE FOLLOWING: EVIDENCE CARTRIDGE CASE ITEM 3 WAS FIRED WITH ITEM 1. EVIDENCE CARTRIDGE CASES ITEM 4 AND ITEM 5 WERE FIRED WITH THE SAME UNKNOWN FIREARM (FIREARM 2). THEY WERE NOT FIRED WITH ITEM 1 DUE TO A DIFFERENCE IN BREECH FACE AND FIRING PIN IMPRESSIONS. EVIDENCE CARTRIDGE CASE ITEM 2 WAS FIRED WITH A DIFFERENT UNKNOWN FIREARM (FIREARM 3. ITEM 2 WAS NOT FIRED WITH ITEM 1, OR THE SAME UNKNOWN FIREARM AS ITEM 4 AND ITEM 5, DUE TO DIFFERENCES IN BREECH FACE AND FIRING PIN IMPRESSIONS.
6V82RU	A comparison of Items 2 through 5 to the casings from Item 1 was performed. This comparison revealed that Items 2, 4 and 5 all bear similar class characteristics to the casings from Item 1, but did not have sufficient corresponding individual microscopic marks to allow an identification with each other. Therefore, no conclusion could be reached as to whether or not they were fired from the same firearm. However, based on macroscopic and microscopic characteristics it was determined that Items 1 and 3 were fired in the same firearm.
764ZJ9	[No Conclusions Reported.]
77YJKA	A test fired cartridge case (Exhibit 1) was microscopically compared to the submitted fired cartridge cases (Exhibit 2 thru 5). Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibit 3 was fired in the same firearm as Exhibit 1. Based on a difference in class characteristics, Exhibits 2, 4 and 5 were not fired in the same firearm as Exhibit 1. The fired cartridge case (Exhibit 4) was microscopically compared to the fired cartridge case in Exhibit 5. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibit 4 was fired in the same firearm as Exhibit 5. Based on a difference in class characteristics, Exhibit 2 was not fired in the same firearm as Exhibits 4 and 5.
78ALBF	The cartridge cases Exhibits 1 and 3 were identified as having been fired in a single firearm. The cartridge case Exhibit 2 was fired in a second firearm. It bears breech face and firing pin impression characteristics typical of Smith & Wesson Sigma series pistols. However, any suspect firearm should be submitted to this laboratory. The cartridge cases Exhibits 4 and 5 were identified as having been fired in a single (third) firearm.
7D3FE9	Item 3 (fired .40 S&W cartridge case) was fired from the same firearm as Item 1 (known cartridge cases fired in the Ruger pistol). Item 2 (fired .40 S&W cartridge case) was not fired from the same firearm as Item 1, and it was also not fired from the firearm that fired Items 4 and 5. Items 4 and 5 (fired .40 S&W cartridge cases) were not fired from the same firearm as Item 1; however, Items 4 and 5 were fired from the same firearm.
7EWR97	The Items 2-5 cartridge cases were compared to the Items 1A-1C test fired cartridge cases. The Item 3 cartridge case was determined to have been fired from the same firearm as the Item 1 test fired cartridge cases. The Items 2, 4 and 5 cartridge cases had different class characteristics and could not have been fired from the same firearm as the Item 1 test fired cartridge cases. Intracomparison of the Items 2, 4 and 5 cartridge cases was performed. The Items 4 and 5 cartridge cases were fired from the same firearm. The Item 2 cartridge case

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	had different class characteristics and could not have been fired from the same firearm as the Items 4 and 5 cartridge cases.
7HYF4V	Microscopic comparison of Item #1 with Item #2 revealed different firing pin styles. This finding confirms Items #1 and 2 were fired from different firearms. Microscopic comparison of Item #1 with Item #3 revealed matching breech face marks and firing pin impressions confirming they were fired from the same firearm (Ruger .40 S&W caliber semi-automatic pistol, model P94DC). Microscopic comparisons between Items #4 and 5 revealed matching breech face marks and firing pin impressions confirming they were fired from the same firearm. Microscopic comparisons of Item #1 with Items #4 and 5 revealed different individual detail. This finding confirms that Items #4 and 5 were not fired from the same firearm as Items #1 and 3. Microscopic comparisons of Item #2 with Items #4 and 5 revealed different firing pin styles confirming Item #2 was not fired from the same firearm as Items 4 and 5.
7KXJGJ	Cartridge case Analysis: Methodology - Comparison Microscopy. Item 3, the cartridge case, was fired in the same firearm as Item 1, the cartridge cases identified to have been discharged from the suspect's weapon, based upon corresponding class and individual microscopic characteristics. Item 2, the cartridge case, was not fired in the same firearm as Item 1, the cartridge cases identified to have been discharged from the suspect's weapon, based upon different class and individual microscopic characteristics. Items 4 and 5, the cartridge cases, were not fired in the same firearm as Item 1, the cartridge cases identified to have been discharged from the suspect's weapon, based upon different individual microscopic characteristics.
7KYFRF	The second expended cartridge case recovered from the main entrance (Item 3) was fired in the suspect's P94DC pistol. The first expended cartridge case recovered from the main entrance (Item 2) was fired in a second firearm. The expended cartridge case recovered near the dressing room (Item 4) and the expended cartridge case recovered near the cash register (Item 5) were both fired in a third firearm.
7MTDTL	On examination and comparison I found: i) the characteristic fine striations and markings on the base of the cartridge case (Item 3) to correlate with the characteristic fine striations and markings on the base of the three expended cartridge cases (Item 1). Hence I am of the opinion that Item 3 was fired with the same firearm as the known expended cartridge cases (Item 1). ii) the characteristic fine striations and markings on the base of the cartridge cases (Item 2, Item 4 and Item 5) do not correlate with the characteristic fine striations and markings on the base of the three expended cartridge cases (Item 1). Hence I am of the opinion that Item 2, Item 4 and Item 5 were not fired with the same firearm as the known expended cartridge cases (Item 1).
7RJEJ9	The Exhibit 3 cartridge case was fired in the Exhibit 1 pistol. The Exhibit 2, 4 and 5 cartridge cases were not fired in the Exhibit 1 pistol. The Exhibit 4 and 5 cartridge cases were fired in the same firearm. The Exhibit 2 cartridge case was not fired in the same firearm as the Exhibit 4 and 5 cartridge cases.
7TQZMF	Cartridge case Item 3 was fired in the same Ruger P94DC as test fires Item 1, based on microscopic comparison and agreement of discernible class characteristics and sufficient matching individual detail. Cartridge case Items 4 & 5 were both fired in the same unknown firearm, based on microscopic comparison and agreement of discernible class characteristics and sufficient matching individual detail. Cartridge case Item 2 was not fired in the Ruger P94DC (Items 1 & 3) or in the same unknown firearm as Items 4 & 5, based on microscopic comparison and significant disagreement of class characteristics.

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7XT3C9	The four expended cartridge cases (items 2, 3, 4 and 5) were compared one to the others to determine common origin, and were compared with the cartridge cases (item 1). One cartridge case (item 3) was fired by the suspect's firearm item 1. The cartridge cases items 4 and 5 were fired from a second firearm, and cartridge case Item 2 was fired from a third firearm.
7Z2BJ8	Items 1 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of Federal ammunition. The Item 1 and 3 cartridge cases were identified as having been fired in the same firearm. The Item 4 and 5 cartridge cases were identified as having been fired in the same firearm. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 1 and 3 cartridge cases were fired in the same firearm as the Item 4 and 5 cartridge cases. The Item 2 cartridge case was excluded as having been fired in the same firearm(s) in which the Item 1, 3, 4, and 5 cartridge cases were fired.
7ZTCXY	Microscopic comparisons of the test fired cartridge cases of Item #1 with the evidence fired cartridge cases of Items 2, 3, 4 and 5 resulted in the following conclusions: The fired cartridge cases of Items 2, 4, and 5 can be eliminated as having been fired in the same firearm as the test-fired cartridge cases of Item #1. The fired cartridge case of Item #3 was microscopically identified as having been fired in the same firearm as the test-fired cartridge cases of Item #1. The fired cartridge cases of Items 4 and 5 were microscopically identified as having been fired in the same unknown firearm. The fired cartridge of Item #2 was fired in a second unknown firearm.
82GW8G	The fired cartridge cases in item 1(a-c) and item 3 were all fired in the same firearm. The fired cartridge cases in items 2, 4, and 5 were all excluded as having been fired in the same firearm that the fired cartridge cases in items 1(a-c) and 3 were fired in. The fired cartridge cases in items 4 and 5 were fired in the same firearm. The fired cartridge case in item 2 was excluded as having been fired in the same firearm that the fired cartridge cases in items 4 and 5 were fired in.
82ZKPB	Exhibits #1 and #3 were fired in the same firearm. Exhibits #4 and #5 were fired in the same firearm. Exhibits #1 and #3 were not fired in the same firearm as Exhibits #4 and #5. Exhibit #2 was not fired in the same firearm as Exhibits #1 and #3 or Exhibits #4 and #5.
8EL2E9	[No Conclusions Reported.]
8GKCLKZ	Item 1, 3: These cartridge cases were fired in the same firearm. Item 2: The cartridge case was not fired in the same firearms as the Items 1 and 3, or 4 and 5 cartridge cases. Item 4, 5: These cartridge cases were fired in the same unknown firearm. They were not fired in the same firearms as the Items 1 and 3, or 2 cartridge cases.
8KFUUH	Cartridge Case Analysis: Methodology - Comparison Microscopy. Item 3, the cartridge case, was fired in Item 1, the Ruger pistol, based upon corresponding class and individual microscopic characteristics. Items 4 and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Item 2, the cartridge case, was not fired in Item 1, the Ruger pistol, based upon different class and individual microscopic characteristics. Items 4 and 5, the cartridge cases, were not fired in Item 1, the Ruger pistol, based upon different individual microscopic characteristics. Item 2, the cartridge case, was not fired in the same firearm as Items 4 and 5, the cartridge cases.
8LLG2V	The Item 1 tests were verified as having been fired in the same firearm. The Item 2, Item 3, Item 4, and Item 5 cartridge cases were compared to the Item 1 tests. The Item 2 cartridge case was determined to have not been fired in the same firearm as Item 1. Markings present

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WebCode	Conclusions
	<p>on this cartridge case were typical of those produced by Smith & Wesson Sigma series pistols. The Item 3 cartridge case was determined to have been fired in the same firearm as Item 1. The Item 4 and Item 5 cartridge cases were determined to have not been fired in the same firearm as Item 1. They were however determined to have been fired in the same firearm. Markings present on these cartridge cases were typical of those produced by Ruger pistols, among others.</p>
8QFH4A	<p>Exhibits 1, 2, 3, 4 and 5 were microscopically compared to each other. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibits 1 and 3 were fired in the same firearm. Based on a disagreement of class characteristics, Exhibits 2, 4 and 5 were not fired in the same firearm as Exhibits 1 and 3. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibits 4 and 5 were fired in the same firearm. Based on a disagreement of class characteristics, Exhibits 4 and 5 were not fired in the same firearm as Exhibit 2.</p>
8U9TH2	<p>The Item 2 cartridge case was not fired in the same firearm as the Item 1 and Item 3 cartridge cases nor was it fired in the same unknown firearm as Items 4 and 5. The Item 3 cartridge case was fired in the same firearm as the Item 1 cartridge cases. The Item 4 and 5 cartridge cases were fired in the same unknown firearm; however, they were not fired in the same firearm as the Item 1 and 3 cartridge cases nor in the same unknown firearm as Item 2.</p>
8VGLF	<p>Items 2, 4, and 5 were not fired in the Ruger P94DC pistol. Item 3 was fired in the Ruger P94DC pistol.</p>
8W6TGE	<p>The cartridge cases Items 1 and 3 were identified as having been fired in a single firearm. The cartridge case Item 2 was fired in a second firearm. The cartridge cases Items 4 and 5 were identified as having been fired in a third firearm.</p>
8W6V7J	<p>The cartridge case in Submission 3 was fired in the gun that fired the cartridge cases in Submission 1. The cartridge cases in Submissions 2, 4 and 5 were not fired in the gun that fired the cartridge cases in Submission 1.</p>
8XLDKG	<p>I examined the fired cartridge cases marked Item 1 to Item 5 and compared the individual and class characteristics markings on them using a comparison microscope and found: 1. The cartridge cases marked Item 1 and Item 3 were fired in one and the same firearm. 2. The cartridge cases marked Item 4 and Item 5 were fired in one and same firearm. 3. Item 1 and Item 3 were fired in a different firearm as Item 4 and Item 5. 4. The cartridge case marked Item 2 was fired in a different firearm as Item 1, 3, 4 and 5.</p>
8YF22Q	<p>Items 1 (test fired cartridge cases) and 3 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, Item 3 was identified as having been fired in the same firearm that fired Item 1 (Ruger P94DC). Items 1 (test fired cartridge cases), 2, and 5 were microscopically examined and compared. Based on observed disagreement of class and individual characteristics, Items 2 and 5 were eliminated as having been fired in the same firearm or the firearm that fired Item 1 (Ruger P94DC). Items 4 and 5 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, the cartridge cases were identified as having been fired in the same firearm.</p>
94KRQJ	<p>Item #3 was fired by the Ruger Model Pistol - Item #1 - Firearm #1. Item #2 was not fired by the Ruger Model Pistol - Item #1 and was fired by a second (2nd) firearm - Firearm #2. Items #4 and #5 were not fired by the Ruger Model Pistol - Item #1 and were fired by one (1) third (3rd) firearm - Firearm #3.</p>
9AB4LF	<p>Item 3 was fired in the Item 1 pistol. Items 4 and 5 were both fired in the same firearm, but</p>

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	are eliminated as having been fired in the Item 1 pistol. Item 2 is eliminated as having been fired in the Item 1 pistol, and is eliminated as having been fired in the same firearm that fired Items 4 and 5.
9JWAJJ	Item #3 was fired in the firearm that fired the Item #1 test fires (40 caliber, Ruger P94DC pistol). Item #4 and Item #5 were fired in a second firearm. Item #2 was fired in a third firearm.
9KGECA	1) The cartridge case marked 110874/15 3.1 was fired in the same firearm as the test cartridge cases marked 110874/15 1.1-1.3. 2) The cartridge cases marked 110874/15 4.1 and 5.1 respectively were fired in one firearm a second firearm. 3) The cartridge cases marked 110874/15 4.1 and 5.1 respectively were not fired in the same firearm as the cartridge cases marked 110874/15 1.1-1.3 and 3.1. 4) The cartridge case marked 110874/15 2.1 was not fired in the same firearms as the cartridge cases marked 110874/15 1.1-1.3, 3.1-5.1 respectively but in a third firearm.
9QYLBB	Exhibit 1 (A through C) consists of three (3) cartridge cases, Federal brand, reportedly fired in a Ruger, .40 S&W caliber, model P94DC pistol, that contain microscopic marks of value for comparison. Exhibits 2 through 5 consist of four (4) fired .40 S&W caliber cartridge cases, Federal brand, that contain microscopic marks of value for comparison. Exhibits 2 through 5 were microscopically compared to Exhibit 1 (A through C), with the following results noted below: it was determined there is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify Exhibit 3 as having been fired in the same firearm that fired Exhibit 1 (A through C). Due to differences in both class and individual characteristics, Exhibit 2 was eliminated as having been fired in the same firearm(s) that fired Exhibits 1 (A through C), and Exhibits 3, 4 and 5. It was determined there is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify Exhibits 4 and 5 as having been fired in the same firearm. However, due to differences in both class and individual characteristics, Exhibits 4 and 5 were eliminated as having been fired in the firearm that fired Exhibits 1 (A through C) and 3.
9RALAQ	Microscopic examination and comparison of the Federal 40 S&W cartridge case (Item 3) revealed that it was fired from the recovered Ruger P94DC semi automatic pistol that discharged the three test-fired Federal 40 S&W cartridge cases (Item 1). Microscopic examination and comparison of the Federal 40 S&W cartridge cases (Items 2, 4 & 5) revealed that they were not fired from the recovered Ruger P94DC semi-automatic pistol that discharged the three test-fired Federal 40 S&W cartridge cases (Item 1). Microscopic examination and comparison revealed that the Federal 40 S&W cartridge cases (Items 4 & 5) were fired in the same unknown firearm. Microscopic examination and comparison of the Federal 40 S&W cartridge case (Item 2) revealed that it was not fired in the same firearm that discharged the Federal 40 S&W cartridge cases (Items 4 & 5).
9TTQ98	Cartridge case comparison indicated that: a. the cartridge case marked "Item 3" was fired from the same firearm that fired the three cartridge cases in the exhibit marked "Item 1". b. the three cartridge cases marked "Item 2", "Item 4" and "Item 5" were not fired from the firearm that fired the three cartridge cases in the exhibit marked "Item 1".
9XJ6U9	The four fired questioned cartridge cases, Items 2, 3, 4, and 5, were examined and determined to be brass .40 S&W cartridge cases marketed by Federal with nickel-plated primers. The fired questioned cartridge cases were microscopically compared to the submitted test-fired cartridge cases (Item 1) from the .40 caliber Ruger P94DC pistol. Item 3 was determined to have been fired in the Ruger pistol based on sufficient microscopic agreement of individual characteristics in the firing pin aperture shear marks. The remaining questioned

TABLE 2

WebCode	Conclusions
	<p>cartridge cases were eliminated as having been fired in the Ruger pistol based on class characteristic differences in the breechface and firing pin and impressions. Representative digital images were taken. Items 4 and 5 were determined to have been fired in the same unknown firearm based on sufficient microscopic agreement of individual characteristics in the firing pin aperture shear marks. Item 2 was not fired in either of the same firearms as Items 3, 4, or 5 based on a difference in the class characteristics of the breechface marks and firing pin impressions. Representative digital images were taken.</p>
9YZ2JM	<p>1. The three (3) cartridge cases described in item 1 and the cartridge case described in item 3, are .40 S&W caliber and were fired by the same firearm. 2. The cartridge case described in item 2, is .40 S&W caliber and was fired by a firearm. 3. The cartridge case described in item 2, was not fired by the firearm that fired the cartridge cases described in items 1 and 3. 4. The cartridge case described in item 2, was not fired by the firearm that fired the cartridge cases described in items 4 and 5. 5. The cartridge case described in item 4 and the cartridge case described in item 5, are .40 S&W caliber and were fired by the same firearm.</p>
A46FM4	<p>Item 1. consisted of three [3] spent .40"S&W calibre cartridge cases which had been discharged in the suspect weapon (known). Items 2 - 5 each consisted of one spent .40" S&W calibre cartridge cases recovered from the scene (questioned). The three spent cartridge cases (known) from the suspects weapon were compared microscopically and were matched in terms of gross and individual characteristics. The four spent cases recovered from the scene (questioned) were compared microscopically to the known controls. Item 3 was positively identified as being fired in the suspect weapon. Items 4 and 5 did not match the controls and were not fired in the suspect weapon. These items were matched to each other and were identified as being fired in a second firearm. Item 2 did not match the controls or items 4 and 5 and was identified as being fired in a third firearm. In my opinion, four shots had been discharged at the scene. One shot was fired from the suspect weapon, two shots were fired from a second weapon and a fourth single shot was fired from a third weapon. All three weapons were identified as .40" S&W calibre self loading pistols.</p>
A6X9F2	<p>1. Microscopic examination of Exhibit 3 revealed it was fired in the same firearm as the test fires in Exhibit 1. 2. Microscopic examination of Exhibits 4 and 5 revealed they were fired in the same firearm; however they were not fired in the same firearm as the test fires in Exhibit 1. 3. Microscopic examination of Exhibit 2 revealed it was not fired in the same firearm as the test fires in Exhibit 1 or the firearm that fired Exhibits 4 and 5.</p>
A7AHEA	<p>The cartridge case Item 2 was not fired in the same firearm as the cartridge case Item 1A (test). The cartridge case Item 2 was not fired in the same firearm as the cartridge case Item 5. The cartridge case Item 3 was fired in the same firearm as the cartridge case Item 1A (test). The cartridge cases, Items 4 and 5, were fired in the same firearm. The cartridge case Item 5 was not fired in the same firearm as the cartridge case Item 1A (test).</p>
AA7B4Y	<p>The cartridge cases in Items 2, 3, 4 and 5 were microscopically examined with the test fired cartridge cases from Item 1. Based on these microscopic examinations it was determined that: A) Item 3 was fired in Item 1. B) Due to differences in class characteristics Item 2 had not been fired in Item 1. C) Items 4 and 5 bear no individual characteristics to link them as having been fired in Item 1. Items 4 and 5 were fired in the same firearm.</p>
AAVU6H	<p>By means of cartridge case, microscopic and microscopic comparison examination, it was determined that: 1. The cartridge cases described in items 1 and 3, are .40 S&W caliber and were fired by the same firearm (suspect's weapon). 2. The cartridge case described in item 2, is .40 S&W caliber and was fired by a firearm. It was not fired by the firearm (suspect's weapon) used to fire the cartridge cases described in items 1 and 3. 3. The cartridge case</p>

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WebCode	Conclusions
	described in item 2, was not fired by the firearm (suspect's weapon) used to fire the cartridge cases described in items 4 and 5. 4. The cartridge cases described in items 4 and 5, are .40 S&W caliber and were fired by the same firearm. They were not fired by the firearm (suspect's weapon) used to fire the cartridge cases described in items 1 and 3.
AHKFD3	As a result of microscopic examination and comparison it was established that: 1. Expended cartridge case Item 3, was fired in the suspect's weapon Item 1. 2. Expended cartridge cases Items 4 and 5 were fired in the another firearm, different suspect's weapon Item 1. 3. Expended cartridge case Item 2 was fired using another firearm different suspect's weapon Item 1 and different weapon fired items 4 and 5.
AHRMJ4	Items 1 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of Federal. Item 1 and Item 3 were identified as having been fired in the same firearm. Item 4 and Item 5 were identified as having been fired in the same firearm. Due to a difference in class characteristics (firing pin), Item 4 and Item 5 were not fired in the same firearm as Item 1 and Item 3. Due to a difference in class characteristics (firing pin) the Item 2 cartridge case was not fired in the same firearm as the Item 1 and Item 3 cartridge cases or the Item 4 and Item 5 cartridge cases.
AJKH37	Exhibit from item 1 and item 3 were fired in the first firearm marked: 110784/15A1, A2, A3 and A5. Firing pin marks. Exhibit from item 2 was fired in the second firearm marked: 110784/15A4. Exhibit from item 4 and 5 were fired in the third firearm marked: 110784/15A6-A7. Firing pin marks.
AMBKR9	Based on the agreement of class characteristics and sufficient agreement of individual characteristics, it was determined that the cartridge case designated as Item 3 was fired from the same firearm as the known fired cartridge cases designated as Item 1. Although there was agreement of discernible class characteristics, there was sufficient disagreement of individual characteristics to eliminate the cartridge cases designated as items 4 and 5 as having been fired from the same firearm that fired the cartridge cases designated as Item 1. There was disagreement of discernible class characteristics to eliminate the cartridge case designated as Item 2 as having been fired from the same firearm that fired the cartridge cases designated as Item 1.
AN6ATG	Discharged cartridge case Item 3 was fired in the same firearm as test fired Item 1. Discharged cartridge cases Items 4 & 5 were fired in a second firearm. Discharged cartridge case Item 2 was fired in a third firearm.
AN8A6W	Items 1 through 5. The Item 1 test fired cartridge cases and the Item 2, 3, 4, and 5 cartridge cases were examined and microscopically compared to each other with the following results: Item 1 and 3 were identified as having been fired in the same firearm. Items 2, 4, and 5 were eliminated from having been fired in the same firearm as Items 1 and 3 based on differences in individual characteristics. Items 4 and 5 were identified as having been fired in the same unknown firearm.
ANB3XA	From the microcomparison made of the ballistic elements from item #1, it was found that its ballistic print marks (trigger mark, ejection, extraction and closing plate) match with the ballistic print marks that were found in item #3; So said cartridge casings were shot from the very same firearm. That is not the case of the ballistic print marks that were found in the ballistic element marked as item #2, since this one was shot from a different firearm. Finally, with regard to the ballistic elements marked as item #4 and #5, these were shot from the same firearm other than the firearm above cited.
AR4LTM	The Item 3 cartridge case was identified, within the limits of practical certainty*, as having

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	<p>been fired in the same firearm as the Item 1 test fired cartridge cases. The Item 4 cartridge case was identified, within the limits of practical certainty*, as having been fired in the same firearm as the Item 5 cartridge case. Items 2, 4, and 5 were not fired in the same firearm as the Item 1 test fired cartridge cases. LIMITATIONS: *Practical Certainty: Since it is not possible to collect and examine samples of all firearms, it is not possible to make an identification with absolute certainty. However all scientific research and testing to date and the continuous inability to disprove the principles of toolmark analysis have demonstrated that firearms produce unique, identifiable characteristics which allow examiners to reliably make identifications. Firearms/Toolmark Identification is an empirical science that relies on objective observations and a subjective interpretation of microscopic marks of value.</p>
AUWRKU	<p>Item #3 (fired cartridge case) is identified with test shots obtained from the Ruger P94DC (Item #1). Items #4 and #5 (fired cartridge cases) are identified as having been fired in the same firearm. Items #4 and #5 are not identified or eliminated with test shots obtained from the Ruger P94DC due to the lack of sufficient matching individual characteristics (inconclusive); however, differences observed suggest they were fired from a different firearm. Item #2 (fired cartridge case) is eliminated with test shots obtained from the Ruger P94DC and as having been fired from the same firearm as items #4 and #5 based on differences in class characteristics ("D" shape firing pin vs. circular firing pin impression).</p>
AWGAPC	<p>The cartridge cases Items 1 through 5 were compared with each other. The cartridge cases Items 1 and 3 were fired in the same firearm. The cartridge case Item 2 was fired in a second firearm. The cartridge cases Items 4 and 5 were fired in a third firearm.</p>
AXGTRX	<p>Item 2 was not fired in the same firearm as the Item 1 tests. Item 2 was not fired in the same unknown firearm as Item 4 and Item 5. Item 3 was fired in the same firearm as the Item 1 tests. Item 4 and Item 5 were fired in the same unknown firearm. Item 4 and Item 5 were not fired in the same firearm as the Item 1 tests.</p>
AZFPXZ	<p>Item 1 (three 40 S&W caliber cartridge cases said to be fired in a Ruger Model P94DC pistol) and Item 3 (one 40 S&W caliber cartridge case) were fired in the same firearm. Items 2, 4 and 5 (three 40 S&W caliber cartridge cases) were fired in a different firearm than Item 1. Items 4 and 5 were fired by the same firearm. Item 2 was fired in a different firearm than Items 4 and 5.</p>
B64PQL	<p>01-01-AA: Three fired .40 S&W caliber cartridge cases submitted as knowns (Item 1). The three fired cartridge cases were identified as having been fired in the same firearm. 01-02-AA: One fired .40 S&W caliber cartridge case (Item 2). The fired cartridge case was eliminated as having been fired in the same firearm as the three other fired cartridge cases (1-03-AA - 1-05-AA) and in the same firearm as the three cartridge cases submitted as knowns (1-01-AA) due to differences in class characteristics. 01-03-AA: One fired .40 S&W caliber cartridge case (Item 3). The fired cartridge case was identified as having been fired in the same firearm as the three fired cartridge cases submitted as knowns (1-01-AA) due to consistent and repeatable marks. 01-04-AA: One fired .40 S&W caliber cartridge case (Item 4). The fired cartridge case was identified as having been fired in the same firearm as one of the other fired cartridge cases (1-05-AA) due to consistent and repeatable marks. The fired cartridge case was eliminated as having been fired in the same firearm as the three cartridge cases submitted as knowns (1-01-AA) due to differences in class characteristics. 01-05-AA: One fired .40 S&W caliber cartridge case (Item 5). The fired cartridge case was identified as having been fired in the same firearm as one of the other fired cartridge cases (1-04-AA) due to consistent and repeatable marks. The fired cartridge case was eliminated as having been fired in the same firearm as the three cartridge cases submitted as knowns (1-01-AA) due to differences in class characteristics.</p>

TABLE 2

WebCode	Conclusions
B8JEA	The fired cartridge cases in Exhibits #1 and #3 were fired in the same firearm. The fired cartridge cases in Exhibits #4 and #5 were fired in the same firearm. Exhibits #1 and #3 were not fired in the same firearm as Exhibits #4 and #5. Exhibit #2 was not fired in the same firearm as Exhibits #1, #3, #4, or #5.
B9QBJA	1. Exhibits 2, 3, 4 and 5 (Four fired cartridge cases) were visually examined and microscopically compared to Exhibit 1 (Test cartridge cases fired in a suspect firearm) and to each other. 2. Exhibit 3 was fired in the same firearm as the Exhibit 1 tests. 3. Exhibits 4 and 5 were fired in the same firearm but not the same firearm as Exhibits 1 and 3. 4. Exhibit 2 was not fired in the same firearm as Exhibits 1 and 3 or the same firearm as Exhibits 4 and 5.
BJZZ27	At least .40 S&W firearms used on crime scene Ruger P94DC shot item 3 only Item 4 and 5 shot from the same firearm. [sic]
BK8GUA	3. On 2015-05-21 during the performance of my official duties I received a sealed evidence bag with number PA4002449563 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 Seven (7) .40 Smith & Wesson calibre fired cartridge cases marked by me 4DCTC1A, 4DCTC1B, 4DCTC1C, "104309/15" each and "2" to "5" respectively. 4. The intention and scope of this forensic examination comprise the following: 4.1 The examination and identification of fired cartridge cases. 4.2 Microscopic individualization of a fired cartridge cases. 5. I examined the fired cartridge cases mentioned in paragraph 3.1 and compared the individual and class characteristics markings on them using a comparison microscope and found: 5.1 The cartridge cases mentioned in paragraph 3.1 marked 4DCTC1A, 4DCTC1B, 4DCTC1C and "104309/15 3" were fired in the same firearm (1st firearm). 5.2 The cartridge cases mentioned in paragraph 3.1 marked "104309/15 4" and 104309/15 5" were fired in the same firearm (2nd firearm). 5.3 The cartridge case mentioned in paragraph 3.1 marked "104309/15 2" was fired in a third 3rd firearm.
BLD7NV	After our examination of the found items, we state that item 3 was fired in the questioned weapon. Items 4 and 5 can, after our opinion, be pooled together as being fired in the same firearm, but not the questioned (item 1) one. In Addition we conclude that item 2 must have been fired in another firearm. We state that three firearms had been used to produce items 1 to 5, whereas item 3 must have been fired in the questioned firearm (item 1).
BPEFBB	The fired Federal 40 S&W cartridge case (item 3) was identified as having been fired in the suspect's firearm. The other three fired Federal 40 S&W cartridge cases (items 2, 4, and 5) were eliminated as having been fired in the suspect's firearm. Two of the fired Federal 40 S&W cartridge cases (items 4 and 5) were identified as having been fired in the same firearm.
BPFGR3	Item 3 was found upon microscopic comparison to have been discharged in the same firearm as Item 1. Items 2, 4 and 5 were not discharged in the same firearm as Item 1. Items 4 and 5 were found upon microscopic comparison to have been discharged in the same firearm.
BQHDWX	Test fires (Items 1, 1 and 1) and cartridge case (Item 3) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, test fires (Items 1, 1 and 1) and cartridge case (Item 3) are identified as having been discharged in the firearm identified above. Cartridge case (Item 4) and cartridge case (Item 5) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, cartridge case (Item 4) and cartridge case (Item 5) are identified as having been discharged in a second firearm. Cartridge case (Item 2) was microscopically examined and compared to test fires (Items 1, 1 and 1) and cartridge cases

TABLE 2

WebCode	Conclusions
	(Items 3, 4 and 5). Based on the observed disagreement of individual characteristics, cartridge case (Item 2) is eliminated as having been discharged in the same firearm as test fires (Items 1, 1 and 1) and cartridge case (Items 3, 4 and 5). Cartridge case (Item 2) was discharged in a third firearm.
BTGDL4	CASING N (ITEM 3) WAS FIRED IN THE SAME WEAPON AS TEST 1 (ITEM 1), THE IMPOUNDED .40 S&W RUGER PISTOL, MODEL P94DC. CASINGS O (ITEM 4) AND P (ITEM 5) WERE FIRED IN A SECOND .40 S&W WEAPON. THE SPECIFIC BRAND OF THE SUSPECT WEAPON IS UNKNOWN AT THIS TIME; HOWEVER, ANY SUSPECT WEAPON SHOULD BE SUBMITTED TO THIS LABORATORY FOR ANALYSIS. CASING M (ITEM 2) WAS FIRED IN A THIRD .40 S&W WEAPON. THE SPECIFIC BRAND OF THE SUSPECT WEAPON IS UNKNOWN AT THIS TIME; HOWEVER, ANY SUSPECT WEAPON SHOULD BE SUBMITTED TO THIS LABORATORY FOR ANALYSIS.
BTMV38	The firearm laboratory of the [Laboratory] in [Country] performed the investigations of the items (sent by CTS) and came to the following result: The forensic material consists of a total of 7 cartridge cases (.40 S&W). Item 1: Three cartridge cases fired with the suspect's handgun (known). Item 2-5: Four cartridge cases recovered from the crime scene (questioned). The three recovered cartridge cases item 2, 4 and 5 show matching coarse traces, they are caliber-identical. They don't show any matching detailed traces compared to item 1. The fired cartridge case item 3 shows concurrent traces to the expended cartridge cases fired with the suspect's weapon (item 1). Furthermore the investigations have shown that item 4 and item 5 were fired with the same weapon, but not with the suspect's weapon. In summary, the carried out investigations have shown, that the cartridge case item 3 was fired with the suspect's weapon (item 1).
BUB7CG	Items 1 and 3 (discharged cartridge cases) were fired in the same firearm (known). Item 4 and 5 (discharged cartridge cases) were fired in a 2nd firearm. Item 2 (discharged cartridge case) was fired in a 3rd firearm.
CA84FV	The known cartridge cases Item 1 and the questioned cartridge case Item 3 have matching individual characteristics, so it is undoubtedly proved, that the cartridge case Item 3 and the cartridge cases Item 1 were discharged from the same firearm (first firearm). The known cartridge cases Item 1 and the questioned cartridge cases Item 2, 4 and 5 have different individual characteristics, so it is undoubtedly proved, that the cartridge cases Item 2, 4 and 5 were not discharged from the same firearm as the cartridge cases Item 1 and the cartridge case Item 3. The questioned cartridge cases Item 4 and 5 have with each other matching individual characteristics, so it is undoubtedly proved, that these cartridge cases were discharged from the same firearm (second firearm). The questioned cartridge cases Item 2 was discharged from a third firearm.
CDEBDV	Examinations showed Item 3 was discharged within the same firearm as Item 1. Examinations showed Items 2, 4 and 5 were not discharged within the same firearm as Item 1. Examinations showed Items 4 and 5 were discharged within the same unknown firearm. Examinations showed Item 2 was not discharged within the same unknown firearm as Items 4 and 5. Examinations showed Item 2 was discharged within a second unknown firearm.
CEGBQ8	Exhibit 3 was fired from the Exhibit 1 firearm. Exhibit 2 was not fired from the same firearm(s) that fired Exhibit 1, 3, 4, or 5. Exhibits 4 & 5 were fired from the same firearm; however, they were not fired from the same firearms that fired Exhibits 2 or 3.
CER37C	The cartridge cases (items 1.1 and 1.3) were identified as having been fired in the same firearm. The cartridge cases (items 1.4 and 1.5) were identified as having been fired in a second firearm. The cartridge case (item 1.2) was fired in a third firearm.

TABLE 2

WebCode	Conclusions
CFQLH6	Examinations showed Item 3 was discharged within the same firearm as Item 1. Examinations showed Item 4 was discharged within the same firearm as Item 5. Examinations showed Item 2 was not discharged within the same firearm as Item 3 and Item 1 due to differences in class and individual characteristics. Examinations showed Item 2 was not discharged within the same firearm as Item 4 and Item 5 due to differences in class and individual characteristics. Examinations showed Item 3 and Item 1 were not discharged within the same firearm as Item 4 and Item 5 due to differences in individual characteristics.
CHJ8J9	In my opinion a microscopical comparison has shown that there is sufficient agreement of class & individual characteristic markings to conclusively determine that item 3 was discharged in the recovered firearm, item 1. In my opinion a microscopical comparison has shown that there is agreement of class characteristic markings but significant disagreement of individual markings to conclusively determine that items 2, 4 & 5 were not fired from the recovered weapon, item 1. In my opinion there is sufficient agreement of class & individual characteristic markings to determine that items 4 & 5 were discharged from the same gun. Item 2 = Gun 1. Item 3 = Gun 2. Item 4 & 5 = Gun 3.
CJ2ZX6	[No Conclusions Reported.]
CLFWYU	Exhibit #3 was fired in Exhibit #1. Exhibit #4 and Exhibit #5 were fired in the same firearm. Exhibits #2, #4, and #5 were not fired in Exhibit #1. Exhibit #2 was not fired in the same firearm as Exhibit #4 and Exhibit #5.
CLZMUZ	Item 2, item 4 and item 5 were not fired in the suspect's firearm. Item 3 bears marks consistent with having been fired in the suspect's firearm. Item 4 and item 5 bear marks consistent with having been fired in the same firearm, firearm unknown.
CRNBN7	Items 1 are fired by the same firearm than the Item 3. Item 4 are fired by the same firearm than the Item 5. Item 2 are fired by another different firearm. 3 different firearms. [sic]
CXN9U7	Exhibit 1 is three (3) .40 S&W caliber Federal brand fired cartridge cases reportedly fired in the Ruger, Model P94DC pistol. Exhibits 2, 3, 4 and 5 are .40 S&W caliber Federal brand fired cartridge cases. The tests in Exhibit 1 were compared with the fired cartridge cases in Exhibit 2, 3, 4 and 5 using a comparison microscope with the following results: The fired cartridge case in Exhibit 3 was identified as having been fired in Exhibit 1. The fired cartridge cases in Exhibits 2, 4 and 5 were eliminated as being fired in Exhibit 1. Exhibits 4 and 5 were identified to being fired in the same firearm, a second firearm. Exhibit 2 was eliminated as being fired in the firearm that fired Exhibits 4 and 5. Exhibit 2 was fired in a third firearm.
D2FU3K	The Items 1 - 5 Federal 40 S&W cartridge cases were examined microscopically and identified as having been fired in three different firearms. Item 3 was identified as having been fired in the firearm represented by Item 1. Items 4 and 5 were identified as having been fired in a second firearm. Item 2 exhibits different firing pin class characteristics from Items 1, 3, 4, and 5 and therefore was fired in a third firearm.
D2L42C	Item 1 fired cartridge cases were identified as having been fired in the same firearm. Item 3 was identified as having been fired in the same firearm as Item 1. Items 4 and 5 were identified as having been fired in the same firearm. Items 4 and 5 were excluded as having been fired in the same firearm as Items 1 and 3. Item 2 was excluded as having been fired in the same firearm as Items 1 and 3. Item 2 was excluded as having been fired in the same firearm as Items 4 and 5.
D47ZLV	Item 3 was discharged within the same firearm as Item 1. Items 2, 4, and 5 were not discharged within the same firearm as Item 1. Items 4 and 5 were discharged within the same

TABLE 2

WebCode	Conclusions
	unknown firearm.
D7KVKZ	The expended cartridge case.40 related in the 3rd item was fired with the firearm brand Ruger P94DC.40 related in the respective report, according to the transferred characteristics on its base (see attached images). [No images included]
D96E9K	Items 1, 2, 3, 4, and 5 were examined and analyzed using microscopy. The Item 3 Federal caliber 40 Smith & Wesson cartridge case was identified as having been fired in the firearm represented by the Item 1 Federal caliber 40 Smith & Wesson cartridge cases. The Item 4 and 5 Federal caliber 40 Smith & Wesson cartridge cases were identified as having been fired in the same firearm. The Item 4 and 5 cartridge cases were eliminated as having been fired in the firearm represented by the Item 1 cartridge cases due to sufficient differences in individual characteristics. The Item 2 Federal caliber 40 Smith & Wesson cartridge case was eliminated as having been fired in the same firearm as the Item 4 and 5 cartridge cases and the firearm represented by the Item 1 cartridge cases due to differences in class characteristics. Firearms that produce general class characteristics like those present on Item 2 include Smith & Wesson brand pistols chambered to fire caliber 40 Smith & Wesson cartridges. This is not all-encompassing; it is possible a firearm produced these characteristics and is not listed due to the content of the database searched.
DAGHC3	ITEM 3 = ITEM 1 (IDENTIFICATION). ITEM 2 different ITEM 1 (EXCLUSION), fired through a second pistol. ITEM 4 = ITEM 5, but different from ITEM 1 (EXCLUSION).
DALWMH	Based on agreement of discernible class characteristics and sufficient matching individual detail, the fired 40 Smith & Wesson caliber cartridge cases from Items 1 and 3 were identified as having been fired in the same firearm. Based on agreement of discernible class characteristics and sufficient matching individual detail, the fired 40 Smith & Wesson caliber cartridge cases, Items 4 and 5, were identified as having been fired in the same firearm. Based on significant disagreement of individual characteristics, the fired cartridge cases, Items 4 and 5, could not have been fired in the same firearm as the fired cartridge cases from Items 1 and 3. Based on significant disagreement of class characteristics, the fired 40 Smith & Wesson caliber cartridge case, Item 2, could not have been fired from the same firearm as the fired cartridge cases from Items 1 and 3 or from the same firearm as the fired cartridge cases, Items 4 and 5.
DDK9K4	Exhibit cartridge case marked 110955/15 A3 is positive to test cartridge cases marked 110955/15 T1 to T3. Breechface. Exhibit cartridge cases marked 110955/15 A4 and A5 are positive to each other. Firing pin. Exhibit cartridge case marked 110955/15 A2 is negative to the above.
DDLVT	Comments: MICROSCOPIC COMPARISON EXAMINATION OF ITEMS #'S 2-5 CARTRIDGE CASES Q1- THROUGH Q4 WITH ITEM #1 TEST FIRED CARTRIDGE CASES FROM K1 RUGER PISTOL HAS REVEALED: ITEM #3 Q2 WAS FIRED WITH K1 RUGER PISTOL. ITEMS #'S 4 AND 5 Q3 AND Q4 WERE FIRED WITH THE SAME UNKNOWN FIREARM. DUE TO DIFFERENCES IN BREECHFACE MARKINGS AND FIRING PIN IMPRESSIONS, ITEMS #'S 4 AND 5 WERE NOT FIRED WITH K1 RUGER PISTOL. DUE TO DIFFERENCES IN BREECHFACE MARKINGS AND FIRING PIN IMPRESSIONS, ITEM #2 Q1 WAS NOT FIRED WITH K1 RUGER PISTOL, OR THE SAME UNKNOWN FIREARM AS ITEMS #'S 4 AND 5 Q3 AND Q4.
DDUWKB	Item 2 was not fired in the same firearms as Items 1 and 3 or Items 4 and 5. Item 3 was identified as having been fired in the same firearm as the three cartridge cases contained in Item 1. Items 4 and 5 were identified as having been fired in the same firearm. Items 4 and 5 were not fired in the same firearm as Items 1 and 3.

TABLE 2

WebCode	Conclusions
DF6PL6	Item 3 was fired in the Item 1 Ruger pistol. Item 4 and Item 5 were not fired in the Item 1 Ruger pistol. Item 4 and Item 5 were fired in the same unknown firearm. Item 2 was not fired in the Item 1 Ruger pistol or the same unknown firearm as Item 4 and Item 5.
DGCBTH	One 40 S&W cartridge case (item 3) was fired in the Ruger pistol represented by the test fired cartridge cases (item 1). The remaining 40 S&W cartridge cases (items 2, 4, and 5) were eliminated from having been fired in the Ruger pistol represented by the test fired cartridge cases (item 1) due to class characteristic differences. Two 40 S&W cartridge cases (items 4 and 5) were identified as having been fired in a single unknown firearm, and they were eliminated as having been fired in the same unknown firearm as the other 40 S&W cartridge case (item 2) due to class characteristic differences.
DHW776	ITEM 3: One (1) Cartridge Cal:40S&W, has been matched with there (3) cartridges cal. 40S&W of ITEM 1. ITEM 4 and 5: have been matched with each other, but not from ITEM 1. ITEM 2: has been fired from one weapon same cal:40S&W, but from ITEM 1 or with it. [sic]
DM94JJ	After microscopic comparison, it was determined that Item #3 was fired from the same firearm, the Ruger P94DC 40 caliber pistol, as the known discharged cartridge cases Item #1. The identification was based on sufficient agreement of class and individual characteristics of the breech face marks, the firing pin marks, and the aperture shear marks. After microscopic comparison, it was determined that Items# 4 and 5 were fired from the same firearm based on sufficient agreement of class and individual characteristics of the breech face marks, the firing pin marks, and the aperture shear marks. Items# 4 and 5 were not fired from the same firearm, the Ruger P94DC 40 caliber pistol, as the known discharged cartridge cases Item #1. The elimination was based on differences of individual characteristics - different firing pin marks and no agreement of breech face marks. After microscopic comparison, it was determined that Item #2 was not fired from the same firearm as Items# 1 and 3, or the same firearm as Items# 4 and 5. The elimination was based on differences of individual characteristics - different firing pin marks and no agreement of breech face marks. There were (3) different firearms used in this incident.
DNUHRA	The test fired cartridge cases (Item #1) have been compared microscopically w/ Items 2-5. Based on all discernable class characteristics and sufficient agreement of individual characteristics, Item #3 has been identified as being fired in the same firearm as the tests. Due to differences in class characteristics Item #2 was not fired in the same firearm as Item #1 or Items 4 & 5. Items #4 & 5 have been compared microscopically[sic] with each other. Based on all discernable class characteristics and sufficient agreement of individual characteristics, they have been identified as being fired in the same firearm. They were not fired in the same firearm of the tests.
DP7JBN	The Item 2 cartridge case was not fired in the Item 1 pistol due to a difference in class characteristics. Characteristics present on this cartridge cases[sic] are typical of those produced by Smith & Wesson Sigma series semi-automatic pistols. The Item 3 cartridge case was fired in the Item 1 pistol. The Item 4 and Item 5 cartridge cases were not fired in the Item 1 pistol due to a difference in class characteristics; however, these cartridge cases were fired in the same firearm. The make and model could not be determined.
DQNR2V	Items 1 & 3: The Item 3 cartridge case was identified as having been fired in the same firearm that fired the Item 1 cartridge cases. Item 2: The cartridge case was not fired in the same firearm that fired the Items 1 and 3 cartridge cases nor was it fired in the same unknown firearm as the Item 4 and Item 5 cartridge cases. The cartridge case displays class characteristics typical of some firearms by Smith & Wesson (Sigma and SD series). Items 4 & 5: The cartridge cases were identified as having been fired in the same unknown firearm.

TABLE 2

WebCode	Conclusions
	They were not fired in the same firearm that fired the Items 1 and 3 cartridge cases nor were they fired in the same unknown firearm as the Item 2 cartridge case.
DVQEER	Item 2 - The cartridge case was microscopically compared to the Item 1, 3, 4, and 5 cartridge cases. The cartridge case was eliminated as having been discharged by the same firearm as the Item 1, 3, 4, and 5 cartridge cases based on differences in class characteristics observed during the microscopic comparison. Item 3 - The cartridge case was microscopically compared to the Item 1 cartridge cases. The cartridge cases matched each other and were discharged by the same firearm. The identification was based on the agreement of individual characteristics observed during the microscopic comparison. Item 4 & 5 - The cartridge cases matched each other and were discharged from the same firearm. The identification was based on the agreement of individual characteristics observed during a microscopic comparison. The cartridge cases were also microscopically compared to the Item 1 cartridge cases. The cartridge cases were eliminated as having been discharged by the same firearm based on differences in individual characteristics observed during the microscopic comparison.
DY3K8Y	The cartridge case identified with item 3, were discharged from the suspicious fire gun, pistol brand caliber.40, Ruger P94DC.
E8UHDX	As a result of microscopic comparisons it was established that: 1. Expanded cartridge case item 3 was fired in the suspect's weapon item 1. 2. Expanded cartridge case item 2 was fired using another firearm, different from that of suspect 's and different from the firearm that expended items 4 and 5. 3. Expanded[sic] cartridges[sic] cases items 4 and 5, were fired by the same firearm, different from that of the suspect 's.
E9JPVA	The cartridge cases marked Item 1 and Item 3 were fired in the same firearm. The cartridge cases marked Item 4 and Item 5 were fired in a second firearm. The cartridge case marked Item 2 was fired in a third firearm.
EB48FP	Items #2 through #5 (questioned cartridge cases) were examined and microscopically compared to tests from Item #1 (suspect's Ruger pistol) on 05/14/2015. Item #2 (first cartridge case by the main entrance) was eliminated as having been fired in Item #1 (suspect's Ruger pistol). Item #3 (second cartridge case by main entrance) was positively identified as having been fired in Item #1 (suspect's Ruger pistol). Items #4 and #5 (cartridge cases by dressing room and cash register) were positively identified as having been fired in the same firearm; however, Item #1 (suspect's Ruger pistol) was eliminated as having fired Items #4 and #5. Item #2 (first cartridge case by the main entrance) was also eliminated as having been fired in the same firearm as Item #4 and #5 (cartridge cases by dressing room and cash register).
EBMJDR	Item #3 was fired in the same firearm as the cartridge cases in Item #1. Item #2, Item #4 and Item #5 were not fired in the same firearm as the cartridge cases in Item #1. Item #4 and Item #5 were fired in the same firearm. Item #2 was not fired in the same firearm as Item #4 and Item #5.
ECLM73	X3 .40 S&W calibre test fired cartridge cases marked 110820/15 (1)A, (1)B and (1)C and fired cartridge case marked 110820/15(3) were fired in the first firearm, match with breechface and firing pin. X2 .40 S&W calibre fired cartridge case marked 110820/15(4) and 110820/15(5) were fired in the second firearm, match with firing pin and chamber marks. X1 .40 S&W calibre fired cartridge case marked 110820/15(2) was fired in the third firearm.
EEPDF4	The below listed spent cartridge case was microscopically examined and compared with test cartridge cases fired by the Ruger model P94DC, 40 caliber pistol, PR# [Removed for

TABLE 2

WebCode	Conclusions
	<p>Anonymity], Lab Evidence #001-A1. Numerous corresponding individual characteristics were observed. Therefore, it is my opinion that the below listed item was fired by this firearm: Lab Evidence # 001-A3, Property # [Removed for Anonymity], Item # 3, Item Description: Spent 40S&W cartridge case. The below listed spent cartridge cases were microscopically examined and compared with test cartridge cases fired by the Ruger model P94DC, 40 caliber pistol, PR# [Removed for Anonymity], Lab Evidence #001-A1. It is my opinion that these items were not fired by this firearm. The spent cartridge cases were further microscopically compared with each other. Numerous corresponding individual characteristics were observed. Therefore, it is my opinion that the below listed spent cartridge cases were fired by the same firearm: Lab Evidence # 001-A4, Property # [Removed for Anonymity], Item # 4, Item Description: Spent 40S&W cartridge case; Lab Evidence # 001-A5, Property # [Removed for Anonymity], Item # 5, Item Description: Spent 40S&W cartridge case. The below listed spent cartridge case was microscopically examined and compared with test cartridge cases fired by the Ruger model P94DC, 40 caliber pistol, PR# [Removed for Anonymity], Lab Evidence #001-A1. It is my opinion that this item was not fired by this firearm. This spent cartridge case was further microscopically compared to the 2 spent 40S&W cartridge cases, Lab Evidence #001-A4 & 001-A5. It is my opinion that this item was not fired by the same firearm as these 2 spent cartridge cases: Lab Evidence # 001-A2, Property # [Removed for Anonymity], Item # 2, Item Description: Spent 40S&W cartridge case.</p>
EH7CDZ	<p>Cartridge case 001-3 (Item 3) was fired in the .40 S&W Ruger P94DC pistol (Item 1). Cartridge cases 001-4 (Item 4) and 001-5 (Item 5) were fired in a second .40 S&W pistol, possibly a Ruger. Cartridge case 001-2 (Item 2) was fired in a third .40 S&W pistol, possibly a Smith & Wesson Sigma series pistol.</p>
EL9LW9	<p>1. Exhibit marked as 3 is positive to test marked as 1. 2. Exhibits marked as 4-5 are positive to each other but negative to test marked as 1. 3. Exhibit marked as 2 is negative to exhibits marked as 4-5 and to the test marked as 1.</p>
EPAM4W	<p>The Exhibit #2, #3, #4, and #5 fired cartridge cases were microscopically compared to each other and to the Exhibit #1A, #1B, #1C test fires. Exhibit #3 was fired in the same firearm as Exhibits #1A, #1B, #1C. Exhibit #2 was fired in a second unknown firearm. Exhibits #4 and #5 were fired in a third unknown firearm.</p>
ERC2AJ	<p>Items 1 through 5 were examined and analyzed using microscopy. The Item 1 and 3 cartridge cases were identified as having been fired in the same firearm. The Item 4 and 5 cartridge cases were identified as having been fired in the same firearm. The Item 4 and 5 cartridge cases were eliminated as having been fired in the same firearm as the Item 1 and 3 cartridge cases due to sufficient differences in individual characteristics. Firearms that produce general class characteristics like those present on the Item 4 and 5 cartridge cases include Ruger pistols chambered to fire caliber 40 S&W cartridges. It is possible a firearm produced these class characteristics and is not listed due to the content of the database searched. The Item 2 cartridge case was eliminated as having been fired in the same firearm as the Item 1, 3, 4 and 5 cartridge cases due to a difference in class characteristics. Firearms that produce general class characteristics like those present on the Item 2 cartridge case include some Smith & Wesson pistols chambered to fire caliber 40 S&W cartridges. It is possible a firearm produced these class characteristics and is not listed due to the content of the database searched. Supporting examination documentation is maintained in the case file.</p>
EXZCFR	<p>Item #3 was fired in the firearm that fired the known cartridge cases in Item #1. Items #4 and #5 were fired in the same firearm. Items #4 and #5 were not fired in the firearm that fired the known cartridge cases in Item #1. Item #2 was not fired in the same firearm as Items #4 and #5 or in the firearm that fired the known cartridge cases in Item #1.</p>

TABLE 2

WebCode	Conclusions
EZPN96	Item 2 was eliminated as having been fired in Item 1 due to disagreement of discernible individual characteristics. Item 3 was identified as having been fired in Item 1 based on agreement of the combination of individual characteristics and all discernible class characteristics. Item 4 and Item 5 were eliminated as having been fired in Item 1 due to disagreement of discernible individual characteristics. However, Item 4 and Item 5 were fired in the same firearm based on agreement of the combination of individual characteristics and all discernible class characteristics.
F2UXUG	I compared the marks on the cartridge cases from the various locations in the retail store with the cartridge cases fired from the suspect's pistol. I found a correspondence of the firing pin impression shape and size and an excellent correspondence of microscopic detail in the firing pin impressions between the second fired cartridge case recovered from the main entrance (item 3) and the cartridge cases fired from the suspect's pistol (item 1). In my opinion the fired cartridge case (item 3) was fired in the suspect's pistol. I did not find any correspondence of features between the remaining cartridge cases from the retail store (items 2, 4 and 5) and the cartridge cases fired from the suspect's pistol (item 1). In my opinion, the fired cartridge cases, items 2, 4 and 5 were not fired in the suspect's pistol.
F3CKGV	1. The cartridge case 40 S&W labeled as item 3, recovered from the main entrance at the scene, was fired by the fire arm Ruger P94DC. 40mm, Pistol seized from the suspect. 2. The cartridge case 40 S&W labeled as item 2, recovered from the main entrance at the scene, was not fired by the fire arm Ruger P94DC. 40mm, Pistol seized from the suspect. 3. The two cartridge cases 40 S&W, labeled as item 4 and item 5, recovered from the floor near the dressing room and from the floor near the cash register were not fired by the firearm Ruger P94DC. 40mm, Pistol seized from the suspect. But these two cartridge cases 40 S&W- item 4 and item 5, were fired by a same firearm, pistol 40 S&W.
F84UK3	Items 1 and 3 were identified as two (2) fired .40 S&W caliber cartridge cases, Federal brand, that were identified as having been fired in the same firearm. Items 4 and 5 were identified as two (2) fired .40 S&W caliber cartridge cases, Federal brand, that were identified as having been fired in the same firearm. Item 2 is one (1) fired .40 S&W caliber cartridge case that was eliminated as been fired in the same F/A of either group.
F8FX43	The submitted cartridge cases were microscopically compared with the following results: The Exhibit 3 cartridge case and the test fired cartridge cases of Exhibit 1 were identified as having been fired in the same firearm. The Exhibit 4 cartridge case and the Exhibit 5 cartridge case were identified as having been fired in the same firearm, but in a different firearm than the one that fired Exhibit 3 and the test fired cartridge cases of Exhibit 1. The Exhibit 2 cartridge case was not fired in the firearm that fired Exhibit 3 and test fired cartridge cases of Exhibit 1, or the firearm that fired fired[sic] Exhibit 4 and Exhibit 5.
FBX927	One cartridge case from main entrance (Item 3) was fired in the same firearm as the cartridge cases from the suspect's firearm (Item 1). The two cartridge cases from the floor (items 4 and 5) were fired in the same firearm; however, they were not fired in the same firearm as the cartridge cases from the suspect's firearm (Item 1). One cartridge case from the main entrance (Item 2) was not fired in the same firearm as the cartridge cases from the suspect's firearm (Item 1), nor was Item 2 fired in the same firearm as the cartridge cases from the floor (items 4 and 5).
FDMGB8	Cartridge Case Analysis: Methodology - Comparison Microscopy. Item 3, the cartridge case, was fired in the same firearm as Item 1, the cartridge cases, based upon corresponding class and individual microscopic characteristics. Items 2, 4, and 5, the cartridge cases, were not fired in the same firearm as Item 1, the cartridge cases, based upon different class and/or

TABLE 2

WebCode	Conclusions
	individual microscopic characteristics. Item 2, the cartridge case, was not fired in the same firearm as Items 4 and 5, the cartridge cases, based upon different class and/or individual microscopic characteristics. Items 4 and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. A reference from this group will be entered into NIBIN.
FLK8UX	Microscopic comparison of the Sub #001-3 evidence cartridge case with the Sub #001-1 test fires revealed agreement of class characteristics and sufficient agreement of individual characteristics, confirming that this cartridge case was fired in the same firearm as the Sub #001-1 test fires at some point in time prior to this examination. Microscopic comparison of the Sub #001-2, Sub #001-4, and Sub #001-5 evidence cartridge cases with the Sub #001-1 test fires revealed corresponding class characteristics but significant disagreement of individual characteristics. These cartridge cases were eliminated as having been fired in the same firearm as the Sub #001-1 test fires. Microscopic comparison of the Sub #001-4 and Sub #001-5 evidence cartridge cases revealed agreement of class characteristics and sufficient agreement of individual characteristics, confirming that these cartridge cases were fired in the same firearm at some point in time prior to this examination. Microscopic comparison of the Sub #001-4 and Sub #001-5 evidence cartridge cases with the Sub #001-2 evidence cartridge case revealed corresponding class characteristics but significant disagreement of individual characteristics. These cartridge cases were eliminated as having been fired in the same firearm as the Sub #001-2 cartridge case. The cartridge cases in this investigation were fired in three different firearms: 1) the suspect Ruger P94DC (Sub #001-1 test fires and Sub #001-3); 2) an unknown second firearm (Sub #001-2); and 3) an unknown third firearm (Sub#001-4 and Sub #001-5).
FMAHMB	The item 3 discharged cartridge case was fired in the same firearm that produced the item 1 test fires (Ruger P94DC, 40 caliber). The items 4 and 5 discharged cartridge cases were fired in a second firearm. The item 2 discharged cartridge case was fired in a third firearm.
FPG376	Evidence item 1.3 was microscopically compared to test fired cartridge cases from evidence item 1.1, with the following results. The expended cartridge case contained in item 1.3 was positively fired in the same firearm that produced test fires 1.1(A, B and C). Evidence items 1.2, 1.4 and 1.5 were microscopically compared to test fired cartridge cases from evidence item 1.1, with the following results. The expended cartridge cases contained in items 1.2, 1.4 and 1.5 were positively NOT fired in the same firearm that produced the test fires 1.1(A, B and C). Evidence items 1.2, 1.4 and 1.5 were microscopically compared to each other with the following results. The expended cartridge cases contained in items 1.4 and 1.5 were both positively fired in the same firearm. Evidence item 1.2 was fired in a different firearm.
FPZN6M	Item 3 was identified as having been fired in the same firearm as the Item 1 test fires. Items 4 and 5 were identified as having been fired in the same unknown firearm. Items 4 and 5 were eliminated as having been fired in the same firearm as the Item 1 test fires - based on individual characteristics. Item 2 was eliminated as having been fired in the same firearm as the Item 1 test fires and same unknown firearm as Items 4 and 5 - based on class characteristics.
FQJU46	Exhibit #3 was fired in the same firearm that fired Exhibits #1A, #1B, and #1C. Exhibit #2 was fired in a second unknown firearm. Exhibit #4 and #5 were fired in a third unknown firearm.
FT4FF9	[No Conclusions Reported.]
FUXPK2	On examination and comparison, I found: 1) The characteristic marks on the second expended cartridge case recovered from the main entrance (Item 3) to match those on the

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WebCode	Conclusions
	<p>three expended cartridge cases discharged from the suspect's weapon (Item 1). 2) The characteristic marks on first expended cartridge case recovered from the main entrance (Item 2), one expended cartridge case recovered from the floor near the dressing room (Item 4) and one expended cartridge case recovered from the floor near the cash register (Item 5) are dissimilar to the three expended cartridge cases discharged from the suspect's weapon (Item 1). Hence, I am of the opinion that the second expended cartridge case recovered from the main entrance (Item 3) was fired by the Ruger P94DC .40 pistol.</p>
FY6PM2	<p>The Item 3 cartridge case was indentified[sic] as having been fired by the same firearm as the Item 1 "tests" (listed as being a Ruger P94DC pistol). The Item 4 and Item 5 cartridge cases were not fired by the same firearm as Items 1 and 3, but were identified as having been fired in the same (unknown) firearm. The Item 2 cartridge case was fired in a second unknown firearm.</p>
FYMA2R	<p>Fired cartridge case FCC2 (Item #3) was fired in P1 (Item #1). Fired cartridge cases FCC3 (Item #4) and FCC4 (Item #5) were fired in the same firearm, not P1. Fired cartridge case FCC1 (Item #2) was not fired in P1 or the same firearm as the FCC3 group.</p>
FZYK3H	<p>Three of the cartridge cases (1A, 1B, 1C) were reported to have been fired in a 40 Smith & Wesson caliber Ruger model P94DC semiautomatic pistol. Four of the cartridge cases (1A, 1B, 1C, 3) were fired in the same firearm. Two of the cartridge cases (4, 5) were fired in the same firearm; however, they were not fired in the same firearm as items 1A, 1B, 1C, and 3. One of the cartridge cases (2) was not fired in the same firearm as either items 1A, 1B, 1C, and 3 or items 4 and 5.</p>
FZZAD8	<p>Item 1A was microscopically compared to Items 3 through 5. There was sufficient agreement of unique characteristics in the firing pin aperture shear, breech face marks, and firing pin impressions to conclude that Item 3 was fired in the same firearm as Item 1A. There was insufficient agreement in the individual characteristics to conclude that Items 4 and 5 were fired in the same firearm as Item 1A. Item 1A was microscopically compared to Item 2. Items 1A and 2 did not share the same class characteristic of firing pin impression shapes. Items 1A and 2 were not fired in the same gun. Items 4 and 5 were microscopically compared to one another and sufficient amount of agreement of unique characteristics in the firing pin aperture shear, breech face marks, and firing pin impressions was observed to conclude they were fired in the same gun. Item 2 was microscopically compared to Item 5. Items 2 and 5 did not share the same class characteristic of firing pin impression shapes. Items 2 and 5 were not fired in the same gun. I was able to establish identification among Items 4 and 5, and seperately[sic] among Items 1A-1C and 3 which suggests that there were two seperate[sic] guns that fired these two groups. In addition, Item 2's different firing pin impression shape suggests a third gun was involved in this case.</p>
G34WBQ	<p>A microscopic comparison was conducted with the following results: FCC-3 (Item #3) was fired in pistol, P-1 (Item #1). FCC-4 (Item #4) and FCC-5 (Item #5) were fired in the same firearm - not submitted. FCC-2 (Item #2) was not fired in pistol, P-1 (Item #1) or from the same firearm as FCC-4 and FCC-5 (Items #4 and #5) due to a difference in individual characteristics.</p>
G78NPU	<p>Microscopic Comparison made between test shots from the recovered Weapon (Item #1) and the four recovered discharged .40S&W Caliber Cartridge Casings with the following results: Item #2 - Negative. Item #3 - Positive. Item #4 - Negative. Item #5 - Negative. Item #3 was discharged from the submitted Weapon.</p>
GBM2QG	<p>The item 3 fired cartridge case was fired in the same firearm as the item 1 fired cartridge cases. The items 2, 4 and 5 fired cartridge cases were not fired in the same firearm as the</p>

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WebCode	Conclusions
	item 1 fired cartridge cases. The items 4 and 5 were fired in the same firearm but not the same as the item 2 fired cartridge case.
GCB3G8	Item #2 was not fired in the firearm that fired Item #1. Item #3 was fired in the same firearm that fired Item #1. Items #4 and #5 were fired in the same firearm, which is not the same firearm that fired Items #1 (test dccc), #2, or #3.
GDTG6Z	The fired cartridge case in Item 3 was fired in/from the same firearm as the cartridges cases from the known firearm in Item 1. The fired cartridge cases in Items 2, 4, and 5 were not fired in/from the same firearm as the cartridges[sic] cases from the known firearm in Item 1. The fired cartridge cases in Items 2, 4, and 5 were not fired in/from the same firearm.
GKAXT4	Items 2-5 each comprise a fired, 0.40" S&W calibre cartridge case. A microscopical comparison of firing marks between items 2-5 & the test fired cartridge cases submitted (item 1) has shown there is sufficient agreement of class and individual characteristic markings (based on firing pin, breech face & outer breech face) to conclusively determine that the cartridge case, item 3, was fired in the recovered Ruger pistol (in relation to item 1). In relation to items 4 & 5, there is sufficient agreement of class and individual characteristic markings (based on firing pin, breech face & outer breech face) to conclusively determine that the cartridge cases, items 4 & 5, were fired in the same firearm. However, due to a disagreement in class & individual characteristic markings, the cartridge cases, items 4 & 5, were not fired in the recovered Ruger pistol (in relation to item 1). Furthermore, a microscopical comparison of firing marks between items 1, 3, 4 & 5 and item 2 has shown there is significant disagreement of class and individual characteristic markings (based on firing pin, breech face & outer breech face) to conclusively determine that the cartridge case, item 2, was not fired in either of the pistols highlighted above. Overall, 3 different guns involved.
GNLJ64	The submission 001-03 cartridge case and the submission 001-01 test fires were identified as having been fired in the same firearm. The submission 001-04 and 001-05 cartridge cases were identified as having been fired in the same unknown firearm. The submission 001-02 cartridge case was eliminated as having been fired in the same firearm that fired the cartridge cases in submission 001-01, 001-04, and 001-05 due to differences in characteristics. The submission 001-04 and 001-05 cartridge cases were inconclusive to the submission 001-01 test fires due to a lack of corresponding individual characteristics.
GPHHFF	Based on agreement of discernible class characteristics and sufficient matching individual detail, the fired 40 Smith & Wesson caliber cartridge cases from Items 1 and 3 were identified as having been fired in the same firearm. Based on agreement of discernible class characteristics and sufficient matching individual detail, the fired 40 Smith & Wesson caliber cartridge cases from Items 4 and 5 were identified as having been fired in the same firearm. Based on significant disagreement of individual characteristics, the fired cartridge cases, Items 4 and 5, could not have been fired in the same firearm as the fired cartridge cases from Items 1 and 3. Based on significant disagreement of class characteristics, the fired 40 Smith & Wesson caliber cartridge case, Item 2, could not have been fired from the same firearm as the fired cartridge cases from Items 1 and 3 or from the same firearm as the fired cartridge cases, Items 4 and 5.
GTJMB9	Item #3 was fired in submitted firearm (Item #1). Item #2 was not fired in submitted firearm (Item #1). Items #4 & #5 were both fired in the same firearm, however were not fired in submitted firearm (Item #1) or the same firearm as Item #2.
GUMXP6	Item #2: The cartridge case was compared to the test-fired exemplars, Item #1, obtained from the Ruger, model P94DC pistol. Differences in class and individual characteristics were

TABLE 2

WebCode	Conclusions
GXW8EM	<p>observed to conclude that the cartridge case was not fired within the pistol. Item #3: The cartridge case was compared to the test-fired exemplars, Item #1, obtained from the Ruger, model P94DC pistol. Sufficient corresponding individual firing pin and firing pin aperture signatures were observed to conclude that the cartridge case was fired within the pistol. Item #4: The cartridge case was compared to the test-fired exemplars, Item #1, obtained from the Ruger, model P94DC pistol. Differences in class and individual characteristics were observed to conclude that the cartridge case was not fired within the pistol. Item #5: The cartridge case was compared to the test-fired exemplars, Item #1, obtained from the Ruger, model P94DC pistol. Differences in class and individual[sic] characteristics were observed to conclude that the cartridge case was not fired within the pistol.</p> <p>The evidence in items 1 through 5 (CTS #1 through 5) was analyzed by physical and microscopic examination. The fired 40 caliber cartridge case in item 3 (CTS #3) was determined to have been fired in the same weapon as the three (3) reference fired 40 caliber cartridge cases in item 1 (CTS #1). The three (3) fired 40 caliber cartridge cases in items 2, 4, and 5 (CTS #2, 4, and 5) were determined not to have been fired in the same weapon as the three (3) reference fired 40 caliber cartridge cases in item 1 (CTS #1). The two (2) fired 40 caliber cartridge cases in items 4 and 5 (CTS #4 and 5) were fired in one weapon and the fired 40 caliber cartridge case in item #2 (CTS #2) was fired in a different weapon the[sic] the two (2) fired 40 caliber cartridge cases in items 4 and 5 (CTS #4 and 5).</p>
GXX6NJ	<p>Items Q2 - Q5 were microscopically examined, inter-compared, and compared to the test fires, Item 1, from the known firearm, a Ruger P94DC .40 caliber pistol. Item Q3 was identified as being fired from the same firearm as the test fires. Items Q4 and Q5 were identified as being fired from the same firearm, but a different firearm than Item Q3 and the test fires from the known firearm. Item Q2 was eliminated as being fired from the same firearm as the submitted test fires, Q3, Q4, or Q5.</p>
GYNJWT	<p>Exhibit #2 was not fired in the firearm that fired Exhibits #1A, #1B and #1C; nor was it fired in the same firearms that fired Exhibits #3, #4 and #5. It displays physical characteristics consistent with cartridge cases fired in some Smith & Wesson Sigma series pistols. Exhibit #3 was fired in the same firearm that fired Exhibits #1A, #1B and #1C. Exhibits #4 and #5 were fired in the same firearm. They were not fired in the firearms that fired Exhibits #1A, #1B, #1C, #2 and #3. Exhibits #1A, #1B, #1C, #2, #3, #4 and #5 were not imaged into the NIBIN database.</p>
GZZ3YC	<ol style="list-style-type: none"> The cartridge cases marked E-1 to E-3, as described in item 1, is caliber .40 S&W and were fired by the same firearm that fired the cartridge case marked E-5, described in item 3. The cartridge cases marked E-4, described in item 2, is caliber .40 S&W and was fired by a firearm; it was not fired by the firearm used to fired[sic] the cartridge cases marked E-1 to E-3, described in item 1, the cartridge case marked E-5, described in item 3, the cartridge case marked E-6, described in item 4 and the cartridge case marked E-7, described in item 5. The cartridge case marked E-6, described in item 4, is caliber .40 S&W and was fired by the same firearm that fired the cartridge case marked E-7, described in item 5.
HBG7L2	<p>I microscopically examined item 1, the three test-fired cartridge cases, and found the marks to be reproducible and sufficient for identification. I microscopically compared item 1 to item 2 and found a class difference in the shape of the firing pin impression. I concluded item 2 had not been fired in the recovered firearm. I microscopically compared item 1 to item 3 and found all class characteristics to agree. I also found sufficient agreement for identification in the individual characteristics, including firing pin aperture shear marks. I concluded that item 3 was fired in the recovered firearm. I microscopically compared item 1 to items 4 and 5. I found some disagreement in the class characteristics and sufficient disagreement in the</p>

TABLE 2

WebCode	Conclusions
	individual characteristics, including firing pin aperture shear marks and firing pin impression marks. I concluded that items 4 and 5 were not fired in the recovered firearm. I microscopically compared items 4 and 5. I found all class characteristics to agree. I also found sufficient agreement for identification in the individual characteristics, including firing pin aperture shear marks and firing pin impression marks. I concluded that items 4 and 5 had been fired in the same unknown firearm.
HJPAD3	1. pistol ruger model p94dc caliber .40 serial number ????? fired cc that inscribed item#3. 2. pistol ruger model p94dc caliber .40 serial number ????? did not fired cc's that inscribed item#2, item#4 and item#5.
HLCUEZ	Exhibit 1 consists of three (3) caliber .40 S&W cartridge cases marketed by Federal, which were reportedly test fired from the suspect's firearm. Exhibits 1A through 1C were examined and microscopically compared. There is an agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify them as having been fired in the same firearm. Exhibits 2 through 5 consist of four (4) caliber .40 S&W fired cartridge cases, marketed by Federal. These Exhibits were examined and microscopically compared to the Exhibit 1 test fired cartridge cases. Based on a difference in class and individual characteristics, Exhibits 2, 4 and 5 were eliminated as having been fired in the same firearm as the Exhibit 1 test fired cartridge cases. Exhibit 3 has an agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify it as having been fired in the same firearm as the Exhibit 1 test fires. Exhibits 4 and 5 were microscopically compared and there is an agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify them as having been fired in the same firearm. Exhibit 2 was microscopically compared to Exhibits 4 and 5 and due to a difference in class characteristics, it was eliminated as having been fired in the same firearm as the Exhibits 4 and 5 cartridge cases.
HLHQXG	Examination showed that the fired cartridge cases Items 1 and Item 3 had been fired in the same pistol. Examination also showed that the fired cartridge cases Items 4 & 5 had both been fired in the same pistol, but not the pistol that had fired the fired cartridge cases Items 1 & 3 or the pistol that had fired the fired cartridge case Item 2. Examination showed that the fired cartridge case Item 2 had been fired in a pistol but not the pistol that had fired the fired cartridge cases Items 1 & 3 or the pistol that had fired the fired cartridge cases Items 4 & 5.
HMNLD9	The fired cartridge cases, items 1 and 3, were identified as having been fired in the same firearm. The fired cartridge cases, items 4 and 5, were identified as having been fired in a second firearm. The fired cartridge case, item 2, was identified as a[sic] having been fired in a third firearm.
HNZ2RZ	The reference fired cartridge cases from the Ruger pistol, specimen #1, were compared to the .40 S&W caliber fired cartridge cases, specimens #2 through #5. It was determined that specimens #2 through #5 were fired in three different weapons due to differences in the markings from the breech faces. Further examination revealed the following: Specimen #3 was fired in the Ruger pistol, specimen #1. Specimen #2 was fired in a second weapon. Specimens #4 and #5 were fired in a third weapon.
HPHVKM	MICROSCOPIC COMPARISON EXAMINATION OF EVIDENCE .40 S&W CARTRIDGE CASES ITEM 2 THROUGH ITEM 5 WITH ITEM 1 FROM RUGER P94DC PISTOL REVEALED THE FOLLOWING: ITEM 3 AND ITEM 1 WERE FIRED WITH THE RUGER P94DC PISTOL(FIREARM 1). ITEM 2 WAS FIRED WITH A DIFFERENT FIREARM THAN ITEM 1 TEST FIRES FROM RUGER P94DC PISTOL DUE TO THE DIFFERENT INDIVIDUAL MARKINGS ON THE BREECHFACE AND FIRING PIN IMPRESSIONS (FIREARM 2). ITEM 4 AND ITEM 5 WERE

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WebCode	Conclusions
	<p>FIRED WITH THE SAME UNKNOWN FIREARM (FIREARM 3); DIFFERENT FROM RUGER P94DC PISTOL (FIREARM 1) AND THE FIREARM THAT FIRED ITEM 2 (FIREARM 2) DUE TO THE DIFFERENT INDIVIDUAL MICROSCOPIC MARKINGS ON THE BREECHFACE AND FIRING PIN IMPRESSIONS.</p>
HYH33A	<p>It is the opinion of the examiner that Laboratory Items 001.B (Item 2), 001.D (Item 4), and 001.E (Item 5) expended Federal 40 S&W cartridge case recovered from the scene are eliminated as being fired by the firearm recovered from the suspect (001.A; Item 1 three expended Federal 40 S&W cartridge cases). The items are eliminated as to sharing a common source, because there is significant disagreement between class and/or individualizing characteristics. It is the opinion of the examiner that Laboratory Item 001.B (Item 2) expended Federal 40 S&W cartridge case recovered from the main entrance is eliminated as being fired by the same firearm as Laboratory Items 001.D (Item 4) and 001.E (Item 5) expended Federal 40 S&W cartridge cases recovered from the floor near the dressing room and floor near the cash register. The items are eliminated as to sharing a common source, because there is significant disagreement between class and individualizing characteristics. It is the opinion of the examiner that Laboratory Item 001.C (Item 3) expended Federal 40 S&W cartridge case recovered from the main entrance is identified as being fired by the firearm recovered from the suspect (001.A; Item 1 three expended Federal 40 S&W cartridge cases). For the purposes of this report, the term identification means that there is agreement between a combination of individualizing characteristics as well as all discernible class characteristics. The extent of this agreement exceeds any agreement of characteristics that may be made by different tools, and is consistent with characteristics that were made by the same tool. It is the opinion of the examiner that Laboratory Item 001.D (Item 4) expended Federal 40 S&W cartridge case recovered from the floor near the dressing room is identified as being fired by the same firearm as Laboratory Item 001.E (Item 5) expended Federal 40 S&W cartridge case recovered from the floor near the cash register. For the purposes of this report, the term identification means that there is agreement between a combination of individualizing characteristics as well as all discernible class characteristics. The extent of this agreement exceeds any agreement of characteristics that may be made by different tools, and is consistent with characteristics that were made by the same tool.</p>
HZBVW8	<p>Item 3 was identified as having been fired in the same firearm as Item 1 based on the agreement of individual and class characteristics. Item 2 was eliminated as having been fired in the same firearm as Item 1 based on differences in class characteristics. The class characteristics of Item 2 indicate that it could have been fired in a Smith & Wesson Sigma series brand of 40 S&W semi-automatic pistol. Items 4 and 5 were eliminated as having been fired in the same firearm as Item 1 based on differences in individual characteristics. Items 4 and 5 were identified as having been fired in the same unknown firearm based on the agreement of individual and class characteristics.</p>
J278NJ	<p>The four (4) fired 40 S&W cartridge cases, items 2 – 5, were microscopically compared to the cartridge cases reported as having been previously test fired in a Ruger pistol, item 1. These comparisons revealed the following conclusions: The one (1) fired 40 S&W cartridge case, item 3, had matching individual breechface characteristics, confirming that item 3 was fired from the same firearm as item 1. The one (1) fired 40 S&W cartridge case, item 2, had dissimilar class characteristics (firing pin shape), excluding item 2 as having been fired in the same firearm as item 1. The two (2) fired 40 S&W cartridge cases, items 4 and 5, had some dissimilar class characteristics (firing pin impression) and dissimilar individual breechface and firing pin characteristics, excluding items 4 and 5 as having been fired in the same firearm as item 1. The three (3) fired 40 S&W cartridge cases, items 2, 4, and 5, were microscopically compared to each other. These comparisons revealed the following conclusions: The two (2)</p>

TABLE 2

WebCode	Conclusions
	fired 40 S&W cartridge cases, items 4 and 5, had matching individual breechface and firing pin characteristics, confirming that items 4 and 5 were fired in the same firearm. The one (1) fired 40 S&W cartridge case, item 2, had dissimilar class characteristics (firing pin shape) when compared to items 4 and 5, excluding item 2 as having been fired in the same firearm as item 2[sic].
J3FENR	Cartridge casings (3) and TESTFIRES (1, 1, and 1) were fired from the same gun based on sufficient agreement of class and individual characteristics of the firing pin and breechface impressions. Cartridge casings (4) and (5) were fired from a second gun based on sufficient agreement of class and individual characteristics of the firing pin and breechface impressions. Cartridge casing (2) was fired from a third gun based on sufficient disagreement of individual characteristics.
J62RWH	Item 2 was eliminated as having been fired in Item 1 due to disagreement of discernible class characteristics. Item 3 was identified as having been fired in Item 1 based on agreement of the combination of individual char. and all discernible class char. Items 4 & 5 were identified as having been fired in the same unknown firearm based on agreement of the combination of individual char. and all discernible class char. Items 4 & 5 were eliminated from Item 1 - differences in individual. Items 4 & 5 were eliminated from same unknow[sic] firearm that fired Item 2 - differences in class.
J696ZX	2.1 The test fired cartridge cases marked 4DCTC1A, 4DCTC1B, 4DCTC1C and 110745/15A3 were fired in the same firearm. 2.2 The fired cartridge cases marked 110745/15A4 and 110745/15A5 were fired in the second firearm. 2.3 The fired cartridge case marked 110745/15A2 was fired in the third firearm.
JEV23Y	1-) Four expended cartridge cases recovered at the crime scene are fired with three different firearms. 2-) The questioned cartridge case "Item 3" was fired with suspect's weapon. (Ruger P94DC). 3-) The questioned cartridge cases "Item 2, Item 4 and Item 5" were fired with two different firearms.(Item 4 and Item 5 were fired with the same firearm).
JHWA79	1. The cartridge cases described in the Items 1 and 3, are .40 S&W caliber and were fired by the same firearm (suspect's weapon). 2. The cartridge case described in the Item 2, is .40 S&W caliber and was fired by a firearm; it was not fired by the firearm used to fire the cartridge cases described in the Items 1 and 3. 3. The cartridge case described in the Item 2, was not fired by the firearm used to fire the cartridge cases described in the Items 4 and 5. 4. The cartridge cases described in the Items 4 and 5, are .40 S&W caliber and were fired by the same firearm.
JLAJZ9	After a microscopic comparison, one cartridge case from the scene (Item 3) was identified as having been fired from the suspect's Ruger P94DC pistol. Items 2, 4, and 5 were eliminated as having been fired in the suspect's pistol. Items 4 and 5 were identified as having been fired from the same firearm.
JZ6ZP7	The cartridge case in Item 3 was fired in the same gun that fired the cartridge cases in Item 1. The cartridge cases in Items 2, 4 & 5 were not fired in the gun that fired the cartridge cases in Item 1.
K26NDG	Item 3 had been discharged in the same firearm as item 1 (the test discharged cases from the seized Ruger pistol).
K8U96N	Test Fires (1.1, 1.2, 1.3) To Cartridge Casing (Item 3) were fired from one gun based on sufficient agreement of class and individual characteristics of the breechface and firing pin impressions. Cartridge Casings (4,5) were fired from a Second firearm based on sufficient agreement of class and individual characteristics of the breechface and firing pin impressions.

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WebCode	Conclusions
	Cartridge Casing (Item 2) to Test Fires (1.1, 1.2, 1.3) and cartridge casings (4,5) were fired from a third gun based on sufficient disagreement of individual characteristics.
KDC964	One of the test fired cartridge cases from Item 1 was microscopically examined and compared with Items 2-5. Item 3 was identified as having been fired in the seized Ruger pistol based on the agreement of their class characteristics and sufficient agreement of their individual characteristics. Item 2 was eliminated as having been fired in the seized Ruger pistol based on the disagreement of their class characteristics and individual characteristics. Items 4 and 5 exhibit class characteristics similar to those of the test fired cartridge cases but were eliminated as having been fired in the seized Ruger pistol based on the disagreement of their individual characteristics. Items 4 and 5 were microscopically compared. Based on the agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 4 and 5 were identified as having been fired in the same firearm. Item 2 and Item 4 were microscopically examined and compared. Item 2 was eliminated as having been fired in the same firearm as Items 4 and 5 based on the disagreement of their class characteristics and individual characteristics.
KDWFNX	Item #3 was fired from the same firearm as Item #1. Item #2, Item #4, and Item #5 were not fired from the same firearms as Item #1. Item #4 and Item #5 were fired from the same firearm. Item #2 was not fired from the same firearm as Item #4 and Item #5.
KFVXQ	Item 1 consists of three fired Federal brand 40 Smith & Wesson cartridge cases stated to have been fired by a Ruger brand Model P94DC 40 S&W pistol. Items 2, 3, 4 and 5 consist of four fired Federal brand 40 S&W cartridge cases. They were microscopically compared to Item 1 and to each other. Item 3 was identified as having been fired by the same firearm that fired the cartridge cases from Item 1. Items 4 and 5 were identified as having been fired by the same firearm. They can be eliminated as having been fired by the same firearm that fired the cartridge cases from Item 1. Item 2 can be eliminated as having been fired by the same firearm that fired Items 1, 3, 4 and 5.
KHH8CM	Comparative microscopic examination of the cartridge cases in Item 1 in conjunction with the cartridge cases in Items 2, 3, 4, and 5 revealed that: A) The cartridge case in Item 3 had been fired in the same firearm as Item 1. B) The cartridge case in Item 2 bears no marks to link it as having been fired in the same firearm as the cartridge cases in Items 1, 3, 4 and 5. C) The cartridge cases in Items 4 and 5 had been fired in the same unknown firearm.
KJCR4T	The evidence and test fired cartridge cases were examined and microscopically inter-compared with the following results: The cartridge case (Item 3) was identified as having been fired by the same firearm that fired the test cartridge cases (Item 1). The cartridge cases (Item 4 & 5) were identified as having been fired by a single, second firearm. The cartridge case (item 2) was eliminated from having been fired by the firearm which fired Items 1 & 3 and also from having been fired by the firearm which fired Items 4 & 5 and is representative of a third firearm.
KJZTB6	Upon microscopic comparison, Items 1 and 3 were identified as having been fired from the same firearm. Upon microscopic comparison, Items 4 and 5 were identified as having been fired from the same firearm, though from a different firearm as Items 1 and 3. Upon microscopic comparison, Item 2 was eliminated as having been fired from the same firearm as Items 1 and 3 or Items 4 and 5 due to differences in class characteristics.
KN9EWG	The Item 1 cartridge cases were compared to each other, confirming that they were fired in the same firearm. The Item 2, Item 3, Item 4 and Item 5 cartridge cases were compared to the Item 1 cartridge cases. The Item 3 cartridge case was determined to have been fired in the same firearm as the Item 1 cartridge cases. The Item 2 cartridge case was not fired in the

TABLE 2

WebCode	Conclusions
	<p>same firearm as the Item 1 cartridge cases. Markings present on this cartridge case were typical of those produced by Smith & Wesson Sigma series semi-automatic pistols. The Item 4 and Item 5 cartridge cases were not fired in the same firearm as the Item 1 cartridge cases. They were, however, fired in the same firearm. Marking present on these cartridge cases are typical of those produced by Ruger semi-automatic pistols among others.</p>
KRT9V3	<p>Based on class characteristics, Item 002 was eliminated as having been fired in the same firearm as Item 001. Item 003 was identified as having been fired in the same firearm as Item 001. Item 004 and Item 005 were identified as having been fired in the same firearm. Microscopic comparisons of the individual characteristics on Item 004 and Item 005 did not reveal sufficient information to identify or eliminate them as having been fired in the same firearm as Item 001; however, differences exist which may be indicative of another firearm having fired Item 004 and Item 005.</p>
KUUCMP	<p>A microscopic comparison was conducted between cartridge case #1, Item 001 and 002, 003, 004 and 005. The examinations determined that Item 003 was fired in the same firearm as Item 001 due to matching firing pin and breech face impressions. The examinations determined that Items 002, 004 and 005 were not fired in the same firearm as Item 001 due to a noticeable difference in firing pin and breech face impressions.</p>
KWUVRV	<p>The cartridge case "Item 3" has been fired in the suspect handgun. The three cartridge cases "Item 2" "Item 4" and "Item 5" have not been fired in this weapon.</p>
KZLGKY	<p>Using the Bayesian approach in casework we view our findings under two hypotheses, namely: H1: The questioned cartridge case is fired by the submitted firearm. H2: The questioned cartridge case is fired by another firearm of the same caliber and with the same class characteristics as the submitted firearm. The likelihood of the findings under the two hypotheses is estimated. The likelihood ratio is expressed on a verbal scale: Approximately equally probable (LR = 1-2), Slightly more probable (LR = 2-10), More probable (LR = 10-100), Much more probable (LR = 100-10,000), Very much more probable (LR = 10,000-1,000,000), Extremely more probable (LR = >1,000,000). Item 2: The class characteristics in Item 2 differ from those in Item 1. Due to this difference the cartridge case (Item 2) cannot be fired by the same firearm as the test fired cartridge cases (Item 1). Item 3: The findings are extremely more probable when H1 is true than when H2 is true. Item 4: The findings are extremely more probable when H2 is true than when H1 is true. Item 5: The findings are extremely more probable when H2 is true than when H1 is true.</p>
L4FX9D	<p>The test fired cartridge cases in Item #1 were microscopically examined in conjunction with the cartridge cases in Items #2-5. Based on these comparative examinations, it was determined that: A. Item #2 was not fired in the same firearm as the test cartridge cases in Item #1 or the cartridge cases in Items #3-5. Characteristics present on this cartridge case are common to cartridge cases that have been fired in Smith & Wesson brand firearms. B. Item #3 was fired in the same firearm as the test cartridge cases in Item #1. C. Items #4 and 5 were fired in the same firearm as each other. D. Items #4 and 5 have similar class characteristics as the test cartridge cases in Item #1 and the cartridge case in Item #3; however, no corresponding individual characteristics were observed.</p>
L4XCPH	<p>Items 2, 3, 4 and 5 were microscopically examined and compared to the test fired cartridge cases, Item 1. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 3 is identified as having been fired in the same firearm as Item 1. Based on the observed disagreement of some class characteristics and patterns of individual characteristics, Items 2, 4 and 5 are eliminated as having been fired in the same firearm as Item 1. Item 4 and Item 5 were microscopically examined and</p>

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	<p>compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 4 and 5 are identified as having been fired in the same firearm. Item 2 was microscopically examined and compared with Items 4 and 5. Based on the observed disagreement of individual characteristics, Item 2 is eliminated as having been fired in the same firearm as Items 4 and 5.</p>
L6AJYJ	<p>Items #1, #1A, #1B and Item #3 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #1, #1A, #1B and #3 are identified as having been fired in the same firearm. Item #4 and Item #5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #4 and #5 are identified as having been fired in the same firearm. Items #1, #2 and Item #5 were microscopically examined and compared. Based on the observed disagreement of individual characteristics, Items #1, #2 and #5 are eliminated as having been fired in the same firearm.</p>
L7VMQN	<p>The cartridge cases identified above as items 2-5 were microscopically compared to one another and to the test-fired cartridge cases contained in item 1. The results are as follows: Item 3 was identified as having been fired in the same firearm that generated the test-fired cartridge cases contained in item 1 (the Ruger pistol). Items 2, 4, and 5 were not fired in the same firearm that generated the test-fired cartridge cases contained in item 1 (the Ruger pistol). Items 4 and 5 were identified as having been fired in a second unknown firearm. - Item 2 was fired in a third unknown[sic] firearm.</p>
LCA6QJ	<p>Examinations showed Item 3 was discharged within the same firearm as Item 1. Examinations showed Item 2 was not discharged within the same firearm as Item 1. Examinations showed Items 4 and 5 were not discharged within the same firearm as Item 1. Examinations showed Items 4 and 5 were discharged within the same unknown firearm. Examinations showed Items 4 and 5 were not discharged within the same unknown firearm as Item 2.</p>
LDWTQK	<p>For laboratory documentation purposes the three 40 S&W cartridge casings (item 001) was subitemed into items 001.01 through 001.03. The 40 S&W cartridge casing (item 003) was identified as having been fired in the same firearm as the 40 S&W cartridge casing (item 001.01). Agreement of the characteristics is sufficient to determine that the two casings were fired in the same firearm. The 40 S&W cartridge casing (item 002) was excluded as having been fired in the same firearm as the 40 S&W cartridge casing (item 001.01). Differences were found in characteristics sufficient to eliminate the casings as having been fired in the same firearm. Firearms known to possess similar cycle of fire characteristics as those observed on the cartridge casing (item 002) include, but are not limited to, some models of pistols manufactured by the following: Smith & Wesson. The two 40 S&W cartridge casings (items 004 & 005) were excluded as having been fired in the same firearm as the 40 S&W cartridge casing (item 001.01). Differences were found in characteristics sufficient to eliminate the casings as having been fired in the same firearm. The two 40 S&W cartridge casings (items 004 & 005) were identified as having been fired in the same firearm. Agreement of the characteristics is sufficient to determine that the two casings were fired in the same firearm.</p>
LFBGZK	<p>The fired cartridge case (Item 3) and the test fired cartridge case (Item 1B) from the Ruger pistol (Item 1) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, the case (Item 3) is identified as having been fired in the Ruger pistol (Item 1). The fired cartridge case (Item 4) and the fired cartridge case (Item 5) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, the cases are identified as having been</p>

TABLE 2

WebCode	Conclusions
	fired in the same firearm. The fired cartridge case (Item 2), the test fired cartridge case (Items 1B) and the fired cartridge cases (Items 3, 4 & 5) were microscopically examined and compared. Based on the observed disagreement of their class characteristics, the case (Item 2) is eliminated as having been fired in the Ruger pistol (Item 1) and the firearms in which the cases (items 3, 4 & 5) were fired. The characteristics exhibited by the test fired cartridge cases from the pistol (Item 1) and the fired cartridge cases (Item 2, 3, 4, & 5) indicate the involvement of at least three different firearms.
LG6P2U	Item 3 was fired in the submitted .40 S&W Ruger pistol, model P94DC. Items 4 and 5 were fired in a second .40 S&W firearm. Suspect weapons include .40 S&W Ruger pistols; however, any suspect weapon should be submitted to the laboratory for analysis. Item 2 was fired in a third .40 S&W firearm. Suspect weapons include .40 S&W Smith & Wesson Sigma Series pistols; however, any suspect weapon should be submitted to the laboratory for analysis.
LH7Z2W	The test cartridge cases in Item 1 were microscopically examined in conjunction with Items 2, 3, 4, and 5 fired cartridge cases. Based on these comparative examinations it was determined that: 1. Items 1 (test cartridge cases) and 3 were fired in the same firearm. 2. Items 4 and 5 were fired in the same unknown firearm. Items 4 and 5 bear no markings to link them as having been fired in the same firearm as Item 1 and 3. 3. Item 2 bears no markings to link it as having been fired in the same firearm as Items 1 and 3, or Items 4 and 5.
LHYHT8	Item #1 (test fires from the Ruger pistol) and Item #3 were fired in the same firearm. Item #4 and Item #5 were fired in a second firearm. Item #2 was fired in a third firearm.
LJF3V9	Examined the four specimens marked #2 through #5. They are .40 S&W caliber discharged shells, headstamped: FC. Compared the three test shells marked #1 through #1B against the shell marked #3 with positive results. The shell marked #3 was discharged in the same firearm that discharged the three test shells marked #1 through #1B. Compared the two shells marked #4 and #5 against each other with positive results. The two shells marked #4 and #5 were discharged in the same firearm. Compared the three test shells marked #1 through #1B against the three shells marked #2, #4 and #5 with negative results. The three shells marked #2, #4 and #5 were not discharged in the same firearm that discharged the three test shells marked #1 through #1B. Compared the shell marked #2 against the two shells marked #4 and #5 with negative results. The shell marked #2 and the two shells marked #4 and #5 were not discharged in the same firearm.
LMQRXY	1. Exhibits 2, 3, 4, and 5 (four Federal brand 40S&W cartridge cases) were visually examined and microscopically compared to Exhibit 1 (three test-fired cartridge cases from Ruger pistol). Microscopic comparison disclosed the following: a. Exhibit 3 was fired in the same firearm as Exhibit 1. b. Exhibits 2, 4, and 5 were not fired in the same firearm as Exhibit 1. 2. Microscopic comparison disclosed that Exhibits 4 and 5 were fired in the same firearm. 3. Microscopic comparison disclosed that Exhibit 2 was not fired in the same firearm as Exhibits 4 and 5.
LQE2AK	The Item 1 and 3 cartridge cases matched each other and were discharged by the same firearm. The identifications were based on the agreement of individual characteristics observed during the microscopic comparison. The Item 2 cartridge case was eliminated as having been discharged by either of the firearms that discharged the Item 1, 3, 4, & 5 cartridge case based on differences in class characteristics observed during the microscopic comparison. (See Rpt for Item 4 & 5 wording) [No report attached].
LQY9QU	Identification: Based on the comparison of breech face and/or firing pin markings of the fired cartridge case C-1C (Item 1) with the fired cartridge case C-3 (Item 3), the fired cartridge

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	<p>case C-3 (Item 3) was identified as having been fired in the same firearm as the fired cartridge cases in Item 1. Identification: Based on the comparison of breech face and/or firing pin markings of the fired cartridge case C-4 (Item 4) with the fired cartridge case C-5 (Item 5), the fired cartridge cases C-4 (Item 4) and C-5 (Item 5) were identified as having been fired in the same firearm. Elimination: Based on differences in class and/or individual characteristics, the fired cartridge cases C-4 (Item 4) and C-5 (Item 5) were eliminated as having been fired in the same firearm as the fired cartridge cases in Item 1. Elimination: Based on differences in class and/or individual characteristics, the fired cartridge case C-2 (Item 2) was eliminated as having been fired in the same firearm as the fired cartridge cases in Item 1. Elimination: Based on differences in class and/or individual characteristics, the fired cartridge case C-2 (Item 2) was eliminated as having been fired in the same firearm as the fired cartridge cases C-4 (Item 4) and C-5 (Item 5).</p>
LTB2RN	<p>1 & 3: The Exhibit 3 cartridge case was identified as having been fired in the same firearm as the Exhibit 1 cartridge cases. 2: The Exhibit 2 cartridge case was not fired in the same firearm as the Exhibit 1, 3, 4 or 5 cartridge cases. The cartridge case displays class characteristics typical of firearms manufactured by Smith & Wesson (Sigma & SD series pistols). 4 & 5: The Exhibit 4 & 5 cartridge cases were identified as having been fired in the same unknown firearm; however, not the same unknown firearm that fired the Exhibit 2 cartridge case or the firearm that fired the Exhibit 1 and 3 cartridge cases.</p>
LVMK9D	<p>Microscopic examination and comparison of the cartridge cases in Items 1, 2, 3, 4, and 5 revealed that: A. The cartridge case in Item 3 had been fired in the same firearm as the test fired cartridge cases in Item 1. B. The cartridge cases in Items 4 and 5 had been fired in the same firearm as one another. These cartridge cases bear the same size, shape, and contour firing pin impressions as the cartridge cases in Items 1 and 3. However, insufficient similar individual characteristics were found to link the cartridge cases in Items 4 and 5 as having been fired in the same firearm as the cartridge cases in Items 1 and 3. C. The cartridge case in Item 2 bears different class characteristics than the cartridge cases in Items 1, 3, 4, and 5 and had, therefore, been fired in an unknown firearm. The class characteristics present on the cartridge case in Item 2 are common to some Smith & Wesson Sigma series pistols.</p>
LWNLU4	<p>2.1 The cartridge cases marked 117763/15 1A-1C and 117763/15 '3' were fired in one firearm (first firearm). 2.2 The cartridge cases marked 117763/15 '4' and '5' were fired in one firearm (second firearm). 2.3 The cartridge cases marked 117763/15 '2' was fired in one firearm (third firearm).</p>
LXQHGK	<p>Examinations showed Item 3 was discharged within the same firearm as Item 1. Examinations showed Items 2, 4, and 5 were not discharged within the same firearm as Item 1. Examinations showed Items 4 and 5 were discharged within the same unknown firearm. Examinations showed Item 2 was not discharged within the same unknown firearm as Items 4 and 5. Item 2 was discharged within a second unknown firearm.</p>
M3KPJU	<p>Casing N (Item 3) was fired in the submitted .40 S&W Ruger pistol, model P94DC (Item 1). Casings O (Item 4) and P (Item 5) were fired in a second .40 S&W firearm. The specific brand of the suspect weapon is unknown at this time; however, any suspect weapon should be submitted for examination. Casing M (Item 2) was fired in a thrid[sic] .40 S&W firearm. Suspect weapons include .40 S&W Smith & Wesson Sigma Series pistols; however, any suspect weapon should be submited[sic] for examination.</p>
M6EXXV	<p>Items #1 through #5 consist of seven (7) caliber .40 S&W cartridge cases, Federal brand. Items #1, #1.1, #1.2 and #3 were identified as having been fired in the same firearm, however, Items #1, #1.1, #1.2 and #3 were not fired in the same firearm as Items #2, #4</p>

TABLE 2

WebCode	Conclusions
	and #5. Items #4 and #5 were identified as having been fired in the same second firearm, however, Items #4 and #5 were not fired in the same firearm as Item #2. Item #2 was not fired in the same firearm as Items #1, #1.1, #1.2 and #3 or in the same firearm as Items #4 and #5.
M8HG8P	The four expended cartridge cases (Items 2, 3, 4, and 5) were compared one to the others to determine common origin and as a result of microscopic comparisons it was established that: The cartridge case (Item 3) was fired by the suspect's firearm item 1. The three cartridge cases (Items 2, 4, and 5) were not fired by the suspect's firearm item 1. The cartridge cases items 4, and 5, were fired from using a second firearm. The cartridge case item 2, was fired by using a third firearm.
M99JCL	The fired cartridge cases in Items 2, 3, 4 and 5 were microscopically examined in conjunction with the test fired cartridge cases in Item 1. Based on these comparative examinations, it was determined that: A. The cartridge case in Item 3 had been fired in the same firearm as the test cartridge cases in Item 1. B. The cartridge cases in Items 4 and 5 had been fired in the same firearm as one another. There were no similar individual characteristics to link the cartridge cases in Items 4 and 5 as having been fired in the same firearm as Items 1 and 3. C. Item 2 bears different class characteristics than Items 1, 3, 4 and 5. Therefore, Item 2 was fired in a different firearm than Items 1, 3, 4 and 5.
MAAKVP	Vanilla .40 caliber S & W Flag FEDERAL.40 S & W, corresponding to Item 3 and marked with the same recovered at the scene where the shooting retail store occurred number was is impacted by gun pistol, brand RUGER, P94DC model, caliber .40 S & W, seized the suspect. [sic]
MFBU64	I2 was not discharged from the same firearm that discharged I1. I3 was discharged from the same firearm that discharged I1. I4 and I5 were not discharged from the same firearm that discharged I1. I4 and I5 were discharged from the same firearm but not the firearm that discharged I1.
MJEN6U	Items 1 and 3 were microscopically identified as being fired by the same firearm. Items 4 and 5 were microscopically identified as being fired by the same firearm, but not the same firearm that fired Items 1, 2, or 3. Item 2 was not fired by the same firearm that fired Items 1, 3, 4, or 5.
MKLCBT	Comparison microscope examinations were conducted and the findings of this examiner are as follows: 1. Item 3 was fired in the submitted .40 S&W Ruger pistol, model P94DC. 2. Items 4 and 5 were fired in a second .40 S&W pistol. The specific brand of the suspect weapon is unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis. 3. Item 2 was fired in a third .40 S&W pistol. Suspect weapons include .40 S&W Smith & Wesson Sigma series pistols; however, any suspect weapon should be submitted to the laboratory for analysis.
MKZXKV	Exhibit 1-3 was fired in the Ruger pistol represented by Exhibit 1-1A (Item 1). Exhibit 1-2 was not fired in the Ruger pistol represented by Exhibit 1-1A (Item 1) nor Exhibit 1-4. Exhibit 1-4 was fired in the same firearm as Exhibit 1-5; however, it was not fired in the Ruger pistol represented by Exhibit 1-1A (Item 1).
MN62KN	For the examination of items 1, 2, 3, 4 & 5. I used a comparison microscope and report the following: The cartridge case on item No 3 was positively identified as being a match to the expended cartridge cases of item No 1 and therefore, report that item 1 and 3 were discharged in the same firearm. The cartridge cases on items 4 and 5 match, this means that they were fired from the same firearm. They both match on microscopy characters, shape and

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WebCode	Conclusions
	metric aspect. Although they do not match with cartridge case on item No.1 (they have been discharged with different firearm that[sic] item 1). The cartridge case on item No 2 does not match with the cartridge on item No 1.
MTFMEW	Item 1 and Item 3 were fired in the same gun. Items 2, 4 and 5 were not fired in the same gun that fired Items 1 and 3. Item 4 and item 5 were fired in the same gun.
MTMZHQ	The five expended cartridge cases (Items 1, 2, 3, 4 and 5) were compared one to the others to determine common origin. The cartridge cases Items 2, 4 and 5, were not fired by the suspect's firearm (Item 1). The cartridge cases Items 4 and 5 were fired from in the other firearms. The cartridge case Item 3, was fired using the suspect's weapon (Item 1). The cartridge case Item 2, was fired from the second firearm different suspect's firearm (Item 1) and different weapon fired Items 4 and 5.
MX8TVK	Examinations showed that the discharged cartridge case listed in Item 3 was discharged within the same firearm that was used to discharge the test fired cartridge cases listed in Item 1. Examinations showed that the discharged cartridge cases listed in Item 2, Item 4, and Item 5 were not discharged within the same firearm that was used to discharge the test fire cartridge cases listed in Item 1. Examinations showed that the discharged cartridge cases listed in Item 4 and Item 5 were discharged within the same unknown firearm. Examinations showed that the discharged cartridge cases listed in Item 2 was not discharged within the same unknown firearm that was used to discharge Item 4 and Item 5.
MZLKNT	Item 3 was microscopically examined and identified as having been fired in the same firearm as Item 1 based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 4 and 5 were microscopically examined and identified as having been fired in the same firearm based on agreement of the combination of individual characteristics and all discernible class characteristics; however were eliminated from Item 1 due to difference in individual characteristics. Item 2 was eliminated as having been fired in the same firearm as Item 1 and as Items 4 and 5 due to a difference in class characteristics.
N3G2PG	Items #1 through #5: The four (4) submitted questioned expended casings (Items #2, 3, 4, & 5) were originally components of Federal Brand .40 S&W caliber cartridges. Microscopic examination and comparison of the three (3) known expended casings (Item #1) and the four (4) questioned expended casings (Items #2, 3, 4, & 5) revealed the following: Item #3 displayed a sufficient quantity of individual characteristics to conclude that it had been fired in the Ruger P94DC pistol reported to have fired Item #1. Items #2, 4, & 5 displayed sufficient disagreement of individual characteristics to conclude that they had not been fired in the Ruger P94DC pistol reported to have fired Item #1. Item #2 had been fired in a second unknown weapon. Items #4 & #5 displayed a sufficient quantity of individual characteristics to conclude that they had been fired in the same weapon; a third unknown weapon.
N4F2DR	The Item 3 cartridge case is identified, with practical certainty, as having been fired in the same firearm that fired the Item 1 cartridge cases. The firearm that fired the Item 1 cartridge cases is eliminated as having fired the Item 2, 4 and 5 cartridge cases. The Item 4 and the Item 5 cartridge cases are identified, with practical certainty, as having been fired in the same unknown firearm. The Item 2 cartridge case is eliminated as having been fired in the same unknown firearm that fired the Item 4 and the Item 5 cartridge cases.
N8U6QX	Cartridge cases recovered from the scene (items 2 through 5) were fired in three different firearms. Comparison results of the items 2 through 5 cartridge cases to cartridge cases test fired in the suspect's firearm (item 1), and comparison of the items 2 through 5 cartridge cases to each other, are described below. Based on significant correspondence of

TABLE 2

WebCode	Conclusions
	firearm-related class and individualizing characteristics, the item 3 cartridge case was fired in the same firearm used to generate the item 1 cartridge cases. Based on significant differences in individualizing detail, the item 2, item 4, and item 5 cartridge cases were not fired in the same firearm used to generate the item 1 cartridge cases. Based on significant correspondence of firearm-related class and individualizing characteristics, the item 4 and item 5 cartridge cases were fired in the same firearm. Based on significant differences in individualizing detail, the item 2 cartridge case was not fired in the same firearm used to fire item 4 and item 5.
NCWA2N	Exhibit #2 was not fired in the Exhibit #1 pistol. Exhibit #3 was fired in the Exhibit #1 pistol. Exhibits #4 and #5 were fired in the same firearm; however, they were not fired in the Exhibit #1 pistol or in the same firearm that fired Exhibit #2. Any suspect firearm(s) should be submitted along with the resubmission of Exhibits #2, #4, and #5 for comparison purposes.
NFUVTQ	Items 1 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of Federal. Item 1 and Item 3 were identified as having been fired in the same firearm. Item 4 and Item 5 were identified as having been fired in the same firearm. Due to a difference in class characteristics (firing pin), Item 4 and Item 5 were not fired in the same firearm as Item 1 and Item 3. Due to a difference in class characteristics (firing pin) the Item 2 cartridge case was not fired in the same firearm as the Item 1 and Item 3 cartridge cases or the Item 4 and Item 5 cartridge cases.
NGMNLP	The Ruger pistol, specimen 1, was test fired using material from the laboratory collection. The reference fired cartridge cases obtained, were compared to the .40 S&W caliber fired cartridge cases, specimens 2 through 5. It was determined that specimen 3 was fired by specimen 1. Further examination revealed the following: Specimen 2 was fired by a second weapon, not by specimen 1. Specimens 4 and 5 were fired by a third weapon, not by specimen 1, and by a different weapon than specimen 2.
NGMQCT	Cartridge cases marked 110717/15A2, A3 and A4 were fired in the firearm. Firing pin and breechface. Cartridge case marked 110717/15A1 was not fired in the firearm.
NLJFTZ	The cartridge cases mentioned in Item-1 and Item-3 were fired in the same firearm. The cartridge cases mentioned in Item-4 and Item-5 were fired in the same firearm. The cartridge cases mentioned in Item-1, Item-2 and Item-4 were not fired in the same firearm.
NLYWMT	Compared the two shells marked 4 and 5 against each other with positive results. Compared test shells against the three shells marked 2, 4, 5 with negative results. Compared test shells against the shell marked 3 with positive results.
NMKCH4	Item 3 was fired in the same firearm as the Item 1 test fires. Item 2 was fired in a second firearm. Items 4, 5 were fired in a third firearm.
NQ43BT	Comparison microscope examinations were conducted on the evidence listed above. The findings of this examiner are the following: 1. Exhibit 3 was fired from the same firearm as Exhibit 1, test fires labeled as being fired from a .40 S&W caliber Ruger model P94DC pistol. 2. Exhibits 4 and 5 were fired from a second .40 S&W caliber firearm. The following is an investigative lead only and not intended to exclude all other makes of firearms. Based on class characteristics of the submitted evidence, the possible firearms are .40 S&W caliber pistols manufactured for Ruger and Taurus. 3. Exhibit 2 was fired from a different firearm than Exhibit 3 and Exhibits 4 and 5. The following is an investigative lead only and not intended to exclude all other makes of firearms. Based on class characteristics of the submitted evidence, the possible firearms are .40 S&W caliber pistols manufactured for Smith & Wesson.
NTUD2L	Item 1 - Three (3) .40 S&W caliber fired cartridge cases bearing the Federal headstamp

TABLE 2

WebCode	Conclusions
	<p>(samples from Ruger pistol) (1). Item 2 - One (1) fired cartridge case (2). Item 3 - One (1) fired cartridge case (3). Item 4 - One (1) fired cartridge case (4). Item 5 - One (1) fired cartridge case (5). The submitted specimens marked Items 2, 3, 4, and 5 were examined and identified as fired .40 S&W caliber cartridge cases bearing the Federal headstamp. Items 2 through 5 were microscopically intercompared and compared to Item 1 sample cartridge cases. As a result of microscopic examination, it was concluded that Item 3 was identified as having been fired in the same firearm that fired Item 1. Item 4 was identified as having been fired in the same firearm that fired Item 5. Items 1 and 3 were eliminated as having been fired in the same firearm that fired Items 4 and 5 based on differences in individual characteristics. Item 2 was eliminated as having been fired in the same firearm that fired Items 1 and 3 and Items 4 and 5 due to differences in individual characteristics. Item 1, Item 2, and Item 4 will be entered into the National Integrated Ballistic Information Network (NIBIN). You will be notified if these images are later associated with another case(s).</p>
NWB67G	<p>The fired cartridge case of item #3 was microscopically identified as having been fired in the same firearm as the test-fired cartridge cases of items #1 (A-C). The fired cartridge cases of items #4 and #5 were eliminated as having been fired in the firearm that fired items #1 (A-C). These cartridge cases were microscopically identified as having been fired in the same unknown 40 S&W caliber firearm. The fired cartridge case of item #2 was eliminated as having been fired in the firearm that fired items #1(A-C) and from the unknown firearm that fired items #4 and #5. It was found to have been fired in a second unknown 40 S&W caliber firearm.</p>
P8ATLW	<p>The cartridge cases Exhibits 1 and 3 were identified as having been fired in a single firearm. The cartridge cases Exhibits 4 and 5 were identified as having been fired in a second firearm. The cartridge case Exhibit 2 was not fired in the same firearms as Exhibits 1, 3, 4, or 5. It bears class characteristics consistent with some Smith & Wesson Sigma series pistols. However, any suspect firearm should be considered for submission to this laboratory.</p>
P9FFVW	<p>The one (1) fired .40 S&W cartridge case (Item 3) was identified as having been fired in the same firearm as the test cartridge cases (Item 1). The three (3) fired .40 S&W cartridge cases (Items 2, 4 & 5) were not fired in the same firearm as the test cartridge cases (Item 1). The two (2) fired .40 S&W cartridge cases (Items 4 & 5) were identified as having been fired in the same firearm.</p>
P9RBX9	<p>The fired cartridge case (Item 3) was identified as having been fired in the firearm (Item 1). The fired cartridge cases (Items 4 & 5) were identified as having been fired in the same firearm. The fired cartridge cases (Items 2, 4, 5) exhibit different class/individual characteristics and could not have been fired in the firearm (Item 1).</p>
PENWCW	<p>Item 2 was fired from an unknown pistol. Item 3 was fired by the suspect's pistol, which produced item 1. Items 4 & 5 were both fired from a third, unknown pistol.</p>
PHUMVN	<p>As a result of microscopic comparisons it was established that: A - The cartridge case Item 3 was fired in the suspect's weapon Item 1. B - The cartridge cases Items 4 and 5 were fired from a second firearm. C - The cartridge case Item 2 was fired from a third firearm, different from that of suspect's and different from the firearm that expended items 4 and 5.</p>
PKKUEZ	<p>The cartridge cases marked 110694/15 1a, 1b, 1c & 3 were fired in the first firearm. The cartridge cases marked 110694/15 2 was fired in the second firearm. The cartridge cases marked 110694/15 4 & 5 were fired in the third firearm.</p>
PL76ZT	<p>1. Comparison microscope examinations were conducted on the evidence listed above. The findings are the following: a. Exhibits 2, 3, 4, and 5 are .40 S&W fired cartridge cases</p>

TABLE 2

WebCode	Conclusions
	<p>manufactured for Federal Cartridge Corporation. b. Exhibit 3 was fired in the same firearm as the Exhibit 1 test fires. c. Exhibits 4 and 5 were fired in the same firearm; however they were eliminated from being fired in the same firearm as the Exhibit 1 test fires based on class characteristics. d. Exhibit 2 was eliminated from being fired in the same firearm as the Exhibit 1 test fires and also eliminated from being fired in the same firearm as Exhibits 4 and 5. Both eliminations are based on class characteristics.</p>
PNUEAU	<p>It is the opinion of the examiner that Laboratory Item 001.B (Item 2) one spent Federal 40 S&W cartridge case is eliminated as being fired from the same firearm as Laboratory Item 001.A (Item 1) three spent Federal 40 S&W cartridge cases discharged from suspect's firearm, Ruger P94DC .40 pistol. The items are eliminated as to sharing a common source, because there is significant disagreement of discernible class characteristics and(or) individual characteristics. It is the opinion of the examiner that Laboratory Item 001.C (Item 3) one spent Federal 40 S&W cartridge case is identified as being fired from the same firearm as Laboratory Item 001.A (Item 1) three spent Federal 40 S&W cartridge cases discharged from suspect's firearm, Ruger P94DC .40 pistol. For the purposes of this report, the term identification means that there is agreement of a combination of individual characteristics and all discernible class characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same tool. It is the opinion of the examiner that Laboratory Item 001.D (Item 4) one spent Federal 40 S&W cartridge case is eliminated as being fired from the same firearm as Laboratory Item 001.A (Item 1) three spent Federal 40 S&W cartridge cases discharged from suspect's firearm, Ruger P94DC .40 pistol. The items are eliminated as to sharing a common source, because there is significant disagreement of discernible class characteristics and(or) individual characteristics. It is the opinion of the examiner that Laboratory Item 001.E (Item 5) one spent Federal 40 S&W cartridge case is eliminated as being fired from the same firearm as Laboratory Item 001.A (Item 1) three spent Federal 40 S&W cartridge cases discharged from suspect's firearm, Ruger P94DC .40 pistol. The items are eliminated as to sharing a common source, because there is significant disagreement of discernible class characteristics and(or) individual characteristics. It is the opinion of the examiner that Laboratory Item 001.D (Item 4) one spent Federal 40 S&W cartridge case is eliminated as being fired by the same firearm as Laboratory Item 001.B (Item 2) one spent Federal 40 S&W cartridge case. The items are eliminated as to sharing a common source, because there is significant disagreement of discernible class characteristics and(or) individual characteristics. It is the opinion of the examiner that Laboratory Item 001.E (Item 5) one spent Federal 40 S&W cartridge case is eliminated as being fired by the same firearm as Laboratory Item 001.B (Item 2) one spent Federal 40 S&W cartridge case. The items are eliminated as to sharing a common source, because there is significant disagreement of discernible class characteristics and(or) individual characteristics. In the opinion of the examiner, it is inconclusive whether Laboratory Item 001.E (Item 5) one spent Federal 40 S&W cartridge case was fired from the same firearm as Laboratory Item 001.D (Item 4) one spent Federal 40 S&W cartridge case. The inconclusive finding resulted from agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to absence, insufficiency, or lack of reproducibility.</p>
PNVCKP	<p>The Exhibit #3 cartridge case was fired in the same firearm as the Exhibit #1 cartridge cases. The Exhibit #4 and #5 cartridge cases were fired in the same firearm as each other; however, they were not fired in the same firearm as the Exhibit #1 and #3 cartridge cases. The Exhibit #2 cartridge case was not fired in the same firearm as the Exhibit #1 and #3 cartridge cases, nor was it fired in the same firearm as the Exhibit #4 and #5 cartridge cases.</p>
PPPXCV	<p>While comparing Item 001-01A to 001-03 I observed agreement of all discernable class</p>

TABLE 2

WebCode	Conclusions
	<p>characteristics and sufficient agreement of individual characteristics to conclude Item 001-03 was discharged from the same firearm that discharged Item 001-01A. While comparing Item 001-01A to Items 001-02, 001-04, and 001-05 I observed differences in class characteristics, and therefore conclude that Items 001-02, 001-04, and 001-05 were not discharged from the same firearm that discharged Item 001-01A.</p>
PU9JFU	<p>Items #1A, #1B, #1C, and #3 were fired in the same firearm. Items #4 and #5 were fired in the same firearm. Items #4 and #5 were not fired in the same firearm as items #1A, #1B, #1C, and #3. Item #2 was not fired in the firearm that fired items #1A, #1B, #1C, and #3 nor the firearm that fired items #4 and #5.</p>
PYWC3U	<p>The test fired cartridge cases in items 001-1A, 001-1B, and 001-1C, were microscopically examined in conjunction with the cartridge cases in items 001- 2, 001-3, 001-4, and 001-5. Based on these comparative examinations, the following was determined: The cartridge case in item 001-2 bears similar class characteristics (firing pin shape, breechface marks) as the test fired cartridge cases from items 001- 1A, 001-1B, and 001-1C. However there is nothing to indicate that the cartridge case in item 001-2 was fired in the same firearm as the test fired cartridge cases in items 001-1A, 001-1B, and 001-1C. Based on observed class and individual characteristics, the cartridge case in item 001-3 had been fired in the same firearm as the test fired cartridge cases in items 001-1A, 001-1B, and 001-1C. Due to differences in class and individual characteristics, the cartridge cases in items 001-4 and 001-5 were excluded as having been fired in the same firearm as the test fired cartridge cases in items 001-1A, 001-1B, and 001-1C. The cartridge cases in items 001-4 and 001-5, were microscopically examined in conjunction with the cartridge case in item 001-2. Due to differences in class and individual characteristics, the cartridge cases in items 001-4 and 001-5 were excluded as having been fired in the same firearm as the cartridge case in item 001-2. The cartridge case in item 001-4 was microscopically examined in conjunction with the cartridge case in item 001-5. Based on these comparative examinations and observed class and individual characteristics, it was determined that the cartridge case in item 001-4 had been fired in the same firearm as the cartridge case in item 001-5.</p>
Q2UAQF	<p>Item #3 was fired in Item #1. Item #2 was not fired from Item #1 due difference individual characteristics.[sic] Firearm not submitted. Item #4 and Item #5 were fired in the same firearm. Item #4 and Item #5 were not fired from Item #1 due to differences in individual characteristics. Item #2 was not fired from the same firearm as Item 4 and Item 5 due to differences in individual characteristics. No other firearms submitted.</p>
Q79FCA	<p>Item 2 was eliminated as having been fired in Item 1 due to disagreement of discernible class characteristics. Item 2 was also eliminated as having been fired in the same unknown firearm that fired Items 4 and 5 due to disagreement of discernible class characteristics. Item 3 was identified as have been fired in Item 1 base[sic] on the agreement of the combination of individual characteristics and all discernible class characteristics. Items 4 and 5 were identified as having been fired in the same unknown firearm based on the agreement of the combination of individual characteristics and all discernible class characteristics.</p>
Q7UT38	<p>The one (1) fired cartridge case, item F1-3, was identified as having been fired in the Ruger pistol, item F1-1. The one (1) fired cartridge case, item F1-2, was eliminated as having been fired in the Ruger pistol, item F1-1, based on a difference in class characteristics (firing pin shape). The two (2) fired cartridge cases, items F1-4 and F1-5, were consistent in all observable class characteristics (caliber, hemispherical firing pin) as the Ruger pistol, item F1-1. While there is some disagreement of microscopic markings, the markings present are insufficient for an elimination. The results are inconclusive. The two (2) fired cartridge cases, items F1-4 and F1-5, were identified as having been fired in the same firearm. The one (1)</p>

TABLE 2

WebCode	Conclusions
	fired cartridge case, item F1-2, was eliminated as having been fired in the same firearm as items F1-4 and F1-5, based on a difference in class characteristics (firing pin shape).
Q9M9MV	3. On 2015-05-11 during the performance of my official duties I received a sealed evidence bag with number PA4002449541 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 Three (3) .40 Smith & Wesson calibre test fired cartridge cases marked by me "102146/15" each and "1A", "1B" and "1C" respectively. 3.2 Four (4) .40 Smith & Wesson calibre fired cartridge cases marked by me "102146/15" each and "2", "3", "4" and "5" respectively. 4. The intention and scope of this forensic examination comprise of the following: 4.1 The examination and identification of fired cartridge cases. 4.2 Microscopic individualization of fired cartridge cases. 5. I examined the fired cartridge cases mentioned in paragraphs 3.1 and 3.2 and compared the individual and class characteristics markings transferred to them by firearm components during the firing process using a comparison microscope and found that the cartridge cases mentioned were fired in different firearms as follows: 5.1 The cartridge cases mentioned in paragraphs 3.1 and 3.2 marked "102146/15" each and "1A", "1B", "1C" and "3" were fired in the first (1st) firearm. 5.2 The cartridge cases mentioned in paragraph 3.2 marked "102146/15 4" and "102146/15 5" were fired in a second (2nd) firearm. 5.3 The cartridge case mentioned in paragraph 3.2 marked "102146/15 2" was fired in a third (3rd) firearm.
Q9NXXJ	The Item 1A, Item 1B, Item 1C, and Item 3 cartridge cases were fired in the same firearm. The Item 2 cartridge case was fired in a second firearm. The Item 4 and Item 5 cartridge cases were fired in a third firearm.
QCDACW	Cartridge Case Analysis: Methodology - Comparison Microscopy. Item 3, the cartridge case, was fired in Item 1, the Ruger pistol, based upon corresponding class and individual microscopic characteristics. Items 4 and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual characteristics. A reference from this group will be entered into NIBIN. Items 4 and 5, the cartridge cases, were not fired in Item 1, the Ruger pistol, based upon different individual microscopic characteristics. Item 2, the cartridge case, was not fired in Item 1, the Ruger pistol, based upon different class and individual microscopic characteristics. Item 2, the cartridge case, was not fired in the same firearm as Items 4 and 5, the cartridge cases, based upon different class and individual microscopic characteristics. Item 2, the cartridge case, will be entered into NIBIN.
QD9YD6	Item 2 was eliminated as having been fired in the same firearm as Items 1, 3, 4 or 5. Item 3 was identified as having been fired in the same firearm as Item 1. Item 3 cannot be identified or eliminated as having been fired in the same firearm as Item 4 or Item 5 due to insufficient reproducible individual characteristics. Item 4 and Item 5 cannot be identified or eliminated as having been fired in the same firearm as Item 1 due to insufficient reproducible individual characteristics. Item 4 was identified as having been fired in the same firearm as Item 5. Item 3 cannot be identified or eliminated as having been fired in the same firearm as Item 4 or Item 5 due to insufficient reproducible individual characteristics. Item 4 and Item 5 cannot be identified or eliminated as having been fired in the same firearm as Item 1 due to insufficient reproducible individual characteristics.
QDDPYL	The Item 3 cartridge case was identified as having been fired in the same firearm that fired the Item 1 cartridge cases. The Item 2 cartridge case was not fired in the same firearm that fired the Item 1 cartridge cases or in the same unknown firearm that fired the Item 4 and 5 cartridge cases. The cartridge case displays class characteristics consistent with some pistols manufactured by Smith & Wesson (Sigma and SD series). The Item 4 and 5 cartridge cases were identified as having been fired in the same unknown firearm. They were not fired in the same firearm that fired the Item 1 cartridge cases.

TABLE 2

WebCode	Conclusions
QGEQ24	Item 3 was identified as having been fired in the Item 1 pistol. Items 4 and 5 were identified as having been fired in the same unknown firearm (Unknown firearm #1). Item 2 was eliminated as having been fired in the Item 1 pistol and the unknown firearm #1 pistol based upon differences in class characteristics (unknown firearm #2).
QJDGAK	Sufficient agreements of class and individual characteristics confirmed the Item 3 cartridge case had been fired in the same firearm as the Item 1 cartridge cases. Differences of individual characteristics confirmed the Items 2, 4 and 5 cartridge cases had not been fired in the same firearm as the Item 1 cartridge cases. Sufficient agreements of class and individual characteristics confirmed the Items 4 and 5 cartridge cases had been fired in the same firearm.
QKFR9R	Item 3 was fired in the same firearm as Item 1 based on matching class and individual characteristics, including breech face impression marks and aperture shearing. Item 2 was not fired in the same firearm as Item 1, Item 3, Item 4 and Item 5 based on significant disagreement of individual characteristics including firing pin impression, breech face impression marks and aperture shearing. Item 4 and Item 5 were unable to be identified or eliminated from Item 1 and Item 3 based on matching class, but insufficient amount of individual characteristics in a pattern. Item 4 and Item 5 were fired in the same firearm based on matching class and individual characteristics, including aperture shearing, firing pin impression and chamber marks.
QLMQZW	Items 1 and 3 were identified as having been fired in the same firearm. Items 4 and 5 were identified as having been fired in the same firearm. Items 1 and 3 could not be identified as having been fired in the same firearm as Items 4 and 5 due to insufficient agreement or disagreement in individual characteristics. Item 2 was excluded as having been fired in the same firearm(s) as Items 1 and 3-5 based on differences in class characteristics.
QU3V8E	[No Conclusions Reported.]
R3NEKF	Microscopic comparison was conducted with the following results: FCC-2 (Item #3) was fired in P-1 (Item #1). FCC-3 & FCC-4 (Items 4 & 5) were fired in the same firearm, not P-1. FCC-1 (Item #2) was not fired in the same firearm as FCC-2 or FCC's 3 & 4.
R72RAL	[No Conclusions Reported.]
R7QQP9	Item 3 was fired in the same firearm as Item 1 (identification). This conclusion was verified by Firearms Examiner [Name]. Items 4 and 5 were fired in the same firearm (identification). This conclusion was verified by Firearms Examiner [Name]. Items 4 and 5 were not fired in the same firearm as Items 1 and 3. (elimination). This conclusion was verified by Firearms Examiner [Name]. Item 2 was not fired in the same firearm as Items 1 and 3 or Items 4 and 5 (elimination). This conclusion was verified by Firearms Examiner [Name].
R8PG49	I conducted a microscopic examination of Items 1 - 5 using a comparison microscope. When compared to the test cartridge cases of Item 1, Exhibit Items 2, 4 & 5 were eliminated as being a match. Exhibit Items 4 & 5 were identified as matching each other and were discharged in the same, unknown firearm different to that which produced the test fired cartridge cases of Item 1. Exhibit Item 2 did not match any other cartridge case submitted in relation to this case and was discharged in an as yet unknown firearm. Exhibit Item 3 was positively identified as being a match to the test cartridge cases of Test Item 1. There is agreement of all class characteristics and sufficient agreement of individual characteristics. In my opinion Exhibit Item 3 was discharged in the same firearm that discharged and produced Test Item 1. Three separate[sic] firearms of the same calibre have been used to produce the submitted items of which only one has been recovered and submitted for examination at this

TABLE 2

WebCode	Conclusions
	stage.
R9YA89	Items 2, 4 and 5 - Elimination - significant disagreement of discernible individual characteristics. Item 3, Identification - agreement of class and individual characteristics.
RAPZ3V	The cartridge case reportedly fired in the suspect's firearms was microscopically compared to the submitted fired cartridge cases reportedly from the crime scene. The following is a summary of the results of the comparisons: Item 2 - significant differences in the firing pin impression shapes and the breech face striae to conclude they were not fired in the same gun. Item 3 - sufficient agreement in the unique characteristics in the striae around the primer flow-back and in the firing pin impressions to conclude they were fired in the same gun. Item 4 - significant differences in the characteristics in the firing pin impressions and extractor marks to conclude they were not fired in the same gun. Item 5 - significant differences in the characteristics in the firing pin impressions and extractor marks to conclude they were not fired in the same gun. Items 4 and 5 were microscopically compared and there was sufficient agreement in the unique characteristics in the striae around the primer flow-back, chamber marks, and in the firing pin impressions to conclude they were fired in the same gun. The results of the microscopic exam indicates there were three different guns used.
RE7VXQ	The cartridge cases recovered at the scene were fired by three different firearms. Item 3 was fired in the same firearm used to fire the bullets in item 1. Items 4 and 5 were fired in the same firearm, but not in the one used to fire the bullets in item 1. Item 2 was fired in a different firearm from those used to fire item 1 and items 4 and 5.
REPGUM	Items 1 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of Federal. The Item 2 cartridge case was identified as having been fired in the same firearm as the Item 1 cartridge cases. The Item 4 cartridge case was identified as having been fired in the same firearm as the Item 5 cartridge case. Nothing was found to indicate that the Item 2 cartridge case was fired in the same firearm as the Item 1 and Item 3 cartridge cases. Nothing was found to indicate that the Item 2 cartridge case was fired in the same firearm as the Item 4 and Item 5 cartridge cases. Nothing was found to indicate that the Item 1 and Item 3 cartridge cases were fired in the same firearm as the Item 4 and Item 5 cartridge cases.
REVX69	Item 3 was fired in the same firearm as Item 1. Items 2, 4, and 5 were not fired in the same firearm as Item 1. Items 4 and 5 were fired in the same firearm but not in the same firearm as Item 2.
RG8DYA	Item 3 was fired in the same firearm as Item 1. This[sic] Items 4 and 5 were fired in the same firearm. Item 2 was not fired in the same firearm as Items 1 and 3. Item 2 was not fired in the same firearm as Items 4 and 5.
RHF MPL	The submitted cartridge cases were examined and microscopically inter- compared. Based on these comparative examinations, the cartridge cases were identified as having been fired by three different firearms grouped as follows: Items 1 and 3 were identified as having been fired by a single firearm. Items 4 and 5 were identified as having been fired by a second firearm. Item 2 had been fired by a third firearm.
RJWETU	The Items 1 through 5 cartridge cases were all compared together. Item 3 was identified with a practical certainty as being fired in the same firearm as the Item 1 tests. Items 4 and 5 were identified with a practical certainty as being fired in a second (unidentified) firearm. Item 2 was fired in a third (unidentified) firearm.
RKPMUT	Items 2, 3, 4, and 5 are four 40 S&W caliber cartridge cases. I compared these items and determined three firearms were used: Item 2 has a different class of marks to Items 3, 4 and 5. Item 2 was fired in a different firearm from Items 3, 4 and 5. Item 3 has significant

TABLE 2

WebCode	Conclusions
	differences of individual marks from Items 4 and 5. Item 3 was fired in a different firearm from Items 4 and 5. Items 4 and 5 have sufficient agreement of individual microscopic marks for identification. Items 4 and 5 were fired in the same firearm. The test fired cartridge cases (Item 1) were compared to Items 2, 3, 4 and 5. Item 3 and the test fired cartridge cases have sufficient corresponding individual microscopic marks for identification. Item 3 was fired in the same firearm and[sic] Item 1.
RLZGQR	1) Exhibits 1 (Three .40 cartridge cases), 2 (One .40 cartridge case), 3 (One .40 cartridge case), 4 (One .40 cartridge case), and 5 (One .40 cartridge case) were visually examined and microscopically compared to each other. a) The Exhibit 3 cartridge case was fired in the same firearm as the Exhibit 1 cartridge cases. b) The Exhibits 2, 4, and 5 cartridge cases were not fired in the same firearm as the Exhibit 1 cartridge cases. c) The Exhibits 4 and 5 cartridge cases were fired in the same firearm. d) The Exhibits 4 and 5 cartridge cases were not fired in the same firearm as the Exhibit 2 cartridge case.
RN7YNN	Microscopic comparisons were conducted between the Exhibit 1 test fires and Exhibits 2 through 5 with the following results: Based on differences of class characteristics, Exhibit 2, 4 and 5 were not fired in the same firearm as the Exhibit 1 test fires. Based on agreement of class characteristics and sufficient agreement of individual characteristics, Exhibit 3 was fired in the same firearm as the Exhibit 1 test fires. Additional microscopic comparisons were conducted between Exhibits 2 through 5 with the following results: Based on a difference in class characteristics, Exhibit 2 was not fired in the same firearm as Exhibits 3, 4, or 5. Based on a difference in class characteristics, Exhibit 3 was not fired in the same firearm as Exhibits 2, 4, or 5. Based on agreement of class characteristics and sufficient agreement of individual characteristics, Exhibit 4 was fired in the same firearm as the Exhibit 5.
RNUULB	Microscopic comparisons of Item #3 with the test fired cartridge cases from Item #1 revealed matching breech face shear marks and firing pin impressions. This finding confirms that Item #3 was fired from the same firearm as the cartridge cases from Item #1. Microscopic comparisons of Item #4 with Item #5 revealed matching breech face shear marks and firing pin impressions. This finding confirms that Items #4 and 5 were both fired from the same firearm. Microscopic comparisons of Items #2, 4 and 5 with the test fired cartridge cases from Item #1 revealed different class characteristics (breech face style). This finding confirms that Items #2, 4 and 5 were not fired from the same firearm as the cartridge cases from Item #1.
RRNCBW	Item 3 was microscopically compared to Item 1 with POSITIVE RESULTS. Item 3 was fired in the same firearm as Item 1. Items 4 and 5 were microscopically compared to one another with POSITIVE RESULTS. Items 4 and 5 were fired in the same firearm. Item 2 was ELIMINATED as having been fired in the same firearm as either Item 1 or Items 4 and 5 based on class characteristic differences. Items 4 and 5 were microscopically compared to Item 1 with NEGATIVE RESULTS. Based on differences in individual characteristics, Items 4 and 5 were not fired in the same firearm as Item 1.
RTQFFY	Item 3 was discharged from the same firearm used to discharge the known cartridge cases, Item 1. Item 2 was discharged from a second firearm. Items 4 and 5 were both discharged from the same firearm, that is, a third firearm. Three (3) different firearms were used to discharge Items 1 to 5.
RVB6ZC	Item #3 - was fired from the 40 S&W cal Ruger Pistol (Item #1) based on the agreement of class characteristics and sufficient corresponding individual characteristics. Items #4 & #5 - were both fired from the same firearm (different than Item #3) based on the agreement of class characteristics and sufficient corresponding individual characteristics. Item #2 - was fired

TABLE 2

WebCode	Conclusions
	from another firearm (different than Items #3, #4, #5).
RW6TFL	The questioned expended cartridge cases (item 3) were discharged from the same firearms as the known expended cartridge cases (item 1), collected with the suspects firearm Ruger P94DC.40.
T2DTUP	Item 3 was discharged in the same firearm as Item 1 (test fires). Items 2, 4, and 5, were not discharged in the firearm that discharged Item 1 (test fires). Items 4 and 5 were discharged from the same firearm. Based on the four submitted evidence cartridge cases, three different 40 Smith & Wesson caliber firearms are involved.
T4UMFX	Item 3 was identified as having been fired by the same firearm that produced the test fired cartridge cases received with item 1 based on the sufficient agreement of class and individual characteristics. Items 2, 4, and 5 were eliminated as having been fired by the same firearm that produced the test fired cartridge cases received with item 1 based on the sufficient disagreement of class and individual characteristics. Items 4 and 5 were identified as having been fired by the same firearm based on the sufficient agreement of class and individual characteristics.
T7KVL	All submitted cartridge cases were compared microscopically. #3 was fired in same firearm as the test cartridge cases, Item #1. #2, 4, 5 all eliminated from being fired in the firearm that discharged #1, #3. #4 & #5 have agreement in all class and sufficient agreement in individual characteristics for identification. They were fired in same firearm. #2 has disagreement in individual characteristics w/ #1 - #5. It is eliminated from being fired in the firearm that discharged #1/#3 and #4/#5.
TCYVGQ	The Exhibit #3 cartridge case was fired in the same firearm as the Exhibit #1A - #1C cartridge cases. The Exhibit #2 cartridge case was fired in an unknown firearm. It displays class characteristics consistent with cartridge cases fired in Smith & Wesson (SW/SD model variants) pistols. The Exhibit #4 and #5 cartridge cases were fired in a second unknown firearm. Exhibits #1A - #1C, #2, #3, #4, and #5 do not meet requirements for imaging per NIBIN criteria.
THMER9	1. Item 2 is eliminated from having been fired in the exhibit Ruger P94DC 40 Smith & Wesson calibre pistol. 2. Item 3 is identified as having been fired in the exhibit Ruger P94DC 40 Smith & Wesson calibre pistol. 3. Item 4 is eliminated from having been fired in the exhibit Ruger P94DC 40 Smith & Wesson calibre pistol. 4. Item 5 is eliminated from having been fired in the exhibit Ruger P94DC 40 Smith & Wesson calibre pistol.
TNCVDJ	Item #2 was not fired in the same firearm as Items #1 and #3. It was not fired in the same firearm as Items #4 and #5. Item #3 was fired in the same firearm as Item #1. Items #4 and #5 were fired in the same firearm. They were not fired in the same firearm as Items #1 and #3.
TPY7TK	Item 3, the second cartridge case recovered from the main entrance, was fired in the Ruger P94DC .40 pistol recovered from the suspect. Item 4, the cartridge case recovered from the floor near the dressing room; and item 5, the case recovered from the floor near the cash register, were not fired in the Ruger P94DC .40 pistol recovered from the suspect. Items 4 and 5 were fired in the same firearm; however it was a different firearm than the suspect's Ruger P94DC. Item 2 was not fired in the suspect's pistol nor the firearm used to fire items 4 and 5.
TR9N39	Items #2 – 5 were examined and each found to contain one Federal brand .40 S&W caliber fired cartridge case. Microscopic comparisons of Item #3 with one of the cartridge cases from Item #1 revealed matching breech face marks and firing pin impressions. This finding confirms that Item #3 was fired from the same firearm as the cartridge cases from Item #1.

TABLE 2

WebCode	Conclusions
	<p>Microscopic inter-comparisons of Items #4 and 5 revealed matching breech face marks and firing pin impressions. This finding confirms that Items #4 and 5 were fired from the same firearm. Microscopic comparisons of Items #4 and 5 with the test fired cartridge cases from Item #1 revealed different class characteristics (firing pin style). This finding confirms that Items #4 and 5 were not fired from the same firearm as the cartridge cases from Item #1. Microscopic comparisons of Item #2 with the test fired cartridge cases from Item #1 revealed different class characteristics (firing pin shape). This finding confirms that Item #2 was not fired from the same firearm as the cartridge cases from Item #1. Microscopic inter-comparisons of Item #2 with Items #4 and 5 revealed different class characteristics (firing pin shape). This finding confirms that Item #2 was not fired from the same firearm as Items #4 and 5.</p>
TRNGLY	<p>Item #3 was fired in the same firearm as the Item #1 cartridge cases. Item #2 was fired in a second firearm. Items #4 & 5 were both fired in a third firearm.</p>
TTN4DN	<p>Items 002, 003, 004, and 005, 40 S&W cartridge cases, were microscopically compared to each other and the test fired cartridge cases in Item 001. It was determined that Item 003 was fired in the same firearm as the Item 001 cartridge cases. Items 002, 004, and 005 were not fired in the same firearm as the Item 001 cartridge cases. Items 004 and 005 were identified as having been fired in the same firearm; but different from the test fired firearm in this case. Item 002 was eliminated as having been fired in the same firearm as Item 004 and Item 005. Items 002, 004, and 005 can be identified to a particular firearm, should one be submitted for comparison. Findings concurred with by [Analyst].</p>
TXW98A	<p>Based on sufficient agreement of individual characteristics within the firing pin aperture shear marks and breech face marks, Item 3 was identified as being fired in the same firearm as Items 1A, 1B, and 1C. Based on significant disagreement of individual characteristics within the firing pin aperture shear marks and breech face marks, Item 2 was eliminated as being fired in the same firearm as Items 1A, 1B, and 1C. Item 2 was fired in a second firearm. Based on significant disagreement of individual characteristics within the firing pin aperture shear marks and breech face marks, Items 4 and 5 were eliminated as being fired in the same firearm as Items 1A, 1B, and 1C. Items 4 and 5 were fired in a third firearm.</p>
TY3MXW	<p>After a microscopic comparison, Item 3 was identified as having been fired in the Ruger P94DC pistol. Items 2, 4, and 5 were eliminated as having been fired in the suspect's firearm, the Ruger P94DC pistol. Items 4 and 5 were identified as having been fired in the same firearm.</p>
U2VZXL	<p>Comparative examinations of Item 1 (three cartridge cases known to have been discharged from the suspect's weapon) against Item 2 (a cartridge case recovered from the main entrance) showed the presence of different class characteristics. This means that Items 1 and 2 were not fired in the same firearm. Comparative examinations of Item 1 (three cartridge cases known to have been discharged from the suspect's weapon) against Item 3 (a cartridge case recovered from the main entrance) showed the presence of matching features. This means that Items 1 and 3 were fired in the same firearm. It could not be determined if the same firearm fired Item 1, Item 4 (a cartridge case recovered near the dressing room) or Item 5 (a cartridge case recovered near the cash register). The comparative examinations showed disagreement of individual characteristics, but insufficient for an elimination. The comparative examinations were inconclusive. Comparative examinations of Item 4 against Item 5 showed the presence of matching features. This indicates that Items 4 and 5 were fired in the same firearm.</p>
U9TR7F	<p>Item 3 was identified as having been fired in the same firearm as Item 1. Item 2 was not fired</p>

TABLE 2

WebCode	Conclusions
	in the same firearm as Item 1 or in the same unknown firearm as Items 4 and 5. Item 2 displays class characteristics typical of some firearms manufactured by Smith & Wesson (Sigma and SD series). Items 4 and 5 were identified as having been fired in the same unknown firearm, however; not in the same firearm as Item 1 or the same unknown firearm as Item 2.
UCPH7Y	Submitted test fired cartridge cases as Item #1, were designated E-1, E-2, E-3 microscopic comparisons of the fired cartridge as Item #1, generated from the recovered Ruger P94DC .40 pistol, were microscopically compared against the four recovered fired cartridge cases in Item #2 to #5. 1. Item #1 and Item #3, were identified as having been fired by the same firearm. 2. Item #4 and Item #5, was identified as having been fired by the same firearm. 3. Item #2, was identified as being fired by a firearm; Item #2, was eliminated as having been fired by the same firearm in Item #1, #3, #4 and #5.
UD7C9U	1. Cartridge case marked item 3 was positive with cartridge cases marked item[sic] 1 - breech face marks and firing pin marks correspond. 2. Cartridge cases marked item 4 and item 5 were fired in the same firearm - breechface marks and firing pin correspond (2nd firearm). 3. Cartridge case marked item 2 was fired in the third firearm.
UKF34A	Item 3 (fired cartridge case) is identified to Items T1 through T3 (test shots taken from a .40 S&W caliber Ruger model P94DC pistol). Items 4 and 5 (fired cartridge cases) are identified as having been fired in the same firearm. They are inconclusive as being fired from the same firearm as Items T1 through T3 (test shots taken from a .40 S&W caliber Ruger model P94DC pistol). Item 2 (fired cartridge case) is inconclusive as having been fired from the same firearm as Items T1 through T3 (test shots taken from a .40 S&W caliber Ruger model P94DC pistol) and 4 and 5 (fired cartridge cases) due to the lack of sufficient individual matching characteristics.
UY6ZDV	Cartridge cases marked item 3 was positive with cartridge cases marked item 1 - firing pin marks and breechface marks correspond. Cartridge cases marked item 4 and item 5 were fired in the same firearm - firing pin and breechface marks correspond (2nd firearm). Cartridge case marked item 2 was fired in the third firearm.
VABPRT	Item 2 was not associated with any of the other submitted cartridge cases. Item 2 was neither fired in the suspect firearm (the pistol used to produce the Item 1 known cartridge cases and Item 3) nor the unknown firearm used to produce Items 4 and 5. Item 3 was identified as having been fired in the suspect firearm (the pistol used to produce the Item 1 known cartridge cases). Items 4 and 5 were not fired in the suspect firearm (the pistol used to produce the Item 1 known cartridge cases). However, Items 4 and 5 were identified as having been fired in the same unknown firearm.
VFGKCT	Item 3 was identified as having been discharged in the same firearm that generated the markings on Item 1. Item 2 was eliminated as having been discharged in the same firearm that generated the markings on Item 1. Item 2 was discharged in an unknown firearm. Items 4 and 5 were eliminated as having been discharged in the same firearm that generated the markings on Item 1. Items 4 and 5 were discharged in a second unknown firearm.
VJ2KDU	Item 3 was identified as having been fired from the same firearm that fired Item 1 based on sufficient agreement of class and individual characteristics. Items 2, 4 and 5 were all eliminated as having been fired from the same firearm as the firearm that fired Item 1 based on disagreement of class and individual characteristics. Items 4 and 5 were identified as having been fired from the same unknown firearm based on sufficient agreement of class and individual characteristics. Additionally, Item 2 was eliminated as having been fired from the same firearm as Items 4 and 5 based on disagreement of class and individual characteristics.

TABLE 2

WebCode	Conclusions
VN3XUJ	The Item 1-3 cartridge case was positively identified as having been discharged in the same firearm as the Item 1-1 cartridge cases. The Item 1-4 and 1-5 cartridge cases were positively identified as having been discharged in the same firearm. These two cartridge cases were determined to have been fired in a different firearm than the one that discharged the Item 1-1 cartridge cases. The Item 1-2 cartridge case was determined to have been fired in a different firearm than the firearms that discharged the Item 1-1, 1-3, 1-4 and 1-5 cartridge cases.
VRWD2N	Item 1 - three (3) test cartridge cases received from CTS, caliber .40 S&W Ruger, model P94DC. Items 2 through 5 - four (4) fired cartridge cases. The submitted specimens marked as Items 2 through 5 were examined and identified as four (4) fired caliber .40 S&W cartridge cases bearing the Federal headstamp. Items 2 through 5 were microscopically compared to Item 1 test cartridge cases. As a result of microscopic examination it was concluded that Item 3 was identified as having been fired in the same firearm as Item 1. Items 4 and 5 were identified as having been fired in a second firearm not Item 1. Item 2 was not fired in the same firearm as Items 1, 3, 4 or 5.
VWVAMR	3. On 2015-06-04 during the performance of my official duties I received a sealed evidence bag with number PA4002449453 from Case Administration of the Ballistics Section, containing: 3.1 Three (3) .40 Smith & Wesson calibre fired cartridge cases marked 1TC1, 1TC2 and 1TC3. 3.2 Four (4) .40 Smith & Wesson calibre fired cartridge cases marked "114672/15" each and "2", "3", "4" and "5" respectively. 4. The intention and scope of this forensic examination comprise the following: 4.1 The examination and identification of fired cartridge cases. 4.2 Microscopic individualization of fired cartridge cases. 5. I examined the fired cartridge cases mentioned in paragraphs 3.1 and 3.2 and compared the individual and class characteristics markings on them using a comparison microscope and found: 5.1 The cartridge case mentioned in paragraph 3.2 marked "114672/15 3" was fired in the same firearm as the cartridge cases mentioned in paragraph 3.1 (1st firearm). 5.2 The cartridge cases mentioned in paragraph 3.2 marked "114672/15" each and "4" and "5" respectively were fired in the same firearm (2nd firearm). 5.3 The cartridge case mentioned in paragraph 3.2 marked "114672/15 2" was not fired in the same firearm as the cartridge cases mentioned in paragraphs 5.1 and 5.2 (3rd firearm).
VWW8XM	The reproducible, individual, firearm-produced markings on the test-fired cartridge cases, Items 1A, 1B and 1C, were compared with individual, firearm-produced markings on questioned cartridge cases #2, 3, 4 and 5 with the following results: 1) Cartridge case #2 does not match either the test-fired cartridge cases or any of the other questioned cartridge cases; 2) Cartridge case #3 was fired in the same firearm as the test-fired cartridge cases based on the presence of sufficient agreement in the firing pin aperture shear marks; and 3) Cartridge cases #4 and #5 were both fired in the same firearm based on the presence of sufficient agreement in the firing pin impressions but do not match either the test-fired cartridge cases or the other questioned cartridge cases. In summary, three different firearms were used to fire the four cartridge cases reported to have been recovered at the crime scene. Representative photomicrographs were taken of the comparisons made in this case. These digital images will be stored on the laboratory's digital image server. The identification of firearm-produced toolmarks is made to the practical, not absolute, exclusion of all other firearms. This is because it is not possible to examine all firearms in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two firearm-produced toolmarks means that the likelihood another firearm could have made the questioned mark is so remote as to be considered a practical impossibility.
VXYE7N	Item #2 is suitable for further microscopic comparisons. Item #2 was not fired in Item #1, the firearm or from the same firearm as Items #4 and #5. Item #3 was fired in Item #1, the

TABLE 2

WebCode	Conclusions
	firearm. Items #4 and #5 were fired in the same firearm. Items #4 and #5 were not fired in Item #1, the firearm or the same firearm as Item #2.
YD9HH	The three, Item 1, 40 S&W caliber test fired cartridge casings were identified as having been fired in the same pistol based on sufficient agreement of individual characteristics. Item 3, a fired, 40 S&W caliber cartridge casing collected from "main entrance" was identified as having been fired in the same pistol as the Item 1 test fires based on sufficient agreement of individual characteristics. All other fired, 40 S&W caliber cartridge casings collected (Item 2, Item 4, Item 5) were excluded from having been fired in the same pistol as the Item 1 test fires based on disagreement of class and individual characteristics. Item 4 and Item 5, two fired 40 S&W caliber cartridge casings, were identified as having been fired in the same, as yet unknown firearm based on sufficient agreement of individual characteristics. Item 2, a fired, 40 S&W caliber cartridge casing, was excluded from having been fired in the same firearm as Items 1, 3, 4, and 5, based on disagreement of class and individual characteristics. Item 2 was fired in an additional, as yet unknown firearm.
VZ8RW	Per the case agent, the cartridge cases in Item 1 were test-fired in a Ruger P94DC handgun. Only the test-fired cartridge cases and not the handgun were submitted for examination. One of the test-fired cartridge cases from Item 1 was microscopically compared to the fired cartridge cases in Items 2 through 5. There are three firearms represented in Items 2 through 5. Items 2, 4, and 5 were eliminated as having been fired in the Ruger pistol. Item 2: The fired cartridge case, Item 2, was fired in an unknown firearm, but not the Ruger pistol. Based on class characteristics, the cartridge case was possibly fired in a Smith & Wesson firearm. Item 3: The fired cartridge case, Item 3, was identified as having been fired in the Ruger pistol. Items 4 and 5: The fired cartridge cases, Items 4 and 5, were identified as having been fired in a second unknown firearm, but not the Ruger pistol.
W8ZUG9	Before examination the expended cartridge cases recovered after a shooting in a retail store were marked T1 (Item 2), T2 (Item 3), T3 (Item 4) and T4 (Item 5). The cartridge cases test fired from the suspect's handgun were marked V1, V2 and V3. These cartridge cases were compared using a Leica FSC comparison Microscope. The cartridge cases bear appropriate marks that make them suitable for comparative analysis. Identification of the firearm used, based on these marks, appears to be possible. Because of clear differences in the observed class and individual characteristics, the chance that T1, T3 and T4 were fired from the suspect's weapon is considered virtually nonexistent. Based on the observed similarities in the individual characteristics of T2 compared to V1, V2 and V3 it is concluded that the cartridge case T2 was fired from the suspect's firearm.
W9GF2N	The cartridge cases Exhibit 1 and the cartridge case Exhibit 3 were identified as having been fired in a single firearm. The cartridge case Exhibit 2 was not fired in the same firearm as the cartridge cases Exhibit 1 and the cartridge case Exhibit 3. Also, it was not fired in the same firearm as the cartridge cases Exhibits 4 and 5. The cartridge case Exhibit 2 bears class characteristics consistent with 40 S&W caliber firearms by Smith & Wesson (some Sigma series). The cartridge cases Exhibits 4 and 5 were identified as having been fired in a single firearm. They were not fired in the same firearm as Exhibits 1 and 3.
W9KEQH	Item 3 was discharged in a Ruger P94DC .40 pistol. Item 2, Item 4 and Item 5 were not fired in the suspect's pistol. Item 2 was discharged in the another unknown firearm. Item 4 and Item 5 were discharged in the same unknown firearm.
WJFEPN	Item #3 was fired in Item #1. Item #1 did not fire Items #2, #4, and #5. Item #2 was not fired in the same firearm as Items #4 and #5. Item #4 and Item #5 were fired in the same firearm.

TABLE 2

WebCode	Conclusions
WLCXAU	I examined the fired cartridge cases marked "Item 1" to "Item 5" and compared the individual and class characteristics markings on them using a comparison microscope and found: 1. The cartridge cases marked "Item 1" and "Item 3" were fired in the same firearm. 2. The cartridge cases marked "Item 4" and "Item 5" were fired in one firearm but in a different firearm as those mentioned in paragraph 1. 3. The cartridge case marked "Item 2" was fired in a different firearm as those mentioned in paragraphs 1 and 2 respectively.
WWCL8H	Item 1 through Item 5 are .40 S&W caliber cartridge cases that bear the headstamp of Federal ammunition. The Item 1 and Item 3 cartridge cases were identified as having been fired in the same firearm. The Item 4 and Item 5 cartridge cases were identified as having been fired from the same firearm. The Item 2 cartridge case was excluded as having been fired in the same firearm(s) as the Item 1 and Item 3 through Item 5 cartridge cases. Nothing was found to indicate that the Item 4 and Item 5 cartridge cases were fired in the same firearm as the Item 1 and Item 3 cartridge cases.
WX7E2F	Items #1.1-1.3 are three 40 S&W caliber cartridge cases with the headstamp markings of "Federal 40 S&W". These cartridge cases were submitted as "known" test fires of the "suspect weapon" to be examined and microscopically compared to Items #2-5 cartridge cases. Items #2-5 are 40 S&W caliber cartridge cases with the headstamp markings of "Federal 40 S&W". Item #2 cartridge case was eliminated as having been fired (not fired) from the same firearm as Items #1.1-1.3 cartridge cases ("from suspect weapon"). Item #3 cartridge case was identified as having been fired from the same firearm as Items #1.1-1.3 cartridge cases ("from suspect weapon"). Item #4 and Item #5 cartridge cases were identified as having been fired from the same unknown firearm; however, they were eliminated as having been fired (not fired) from the same firearm as Items #1.1-1.3 cartridge cases ("from suspect weapon").
X7PHBM	Item #1 is a Ruger, caliber .40 S&W semi-automatic pistol, model P90DC, serial number unknown. This firearm was found to be in normal operating condition. Item #3 is a caliber .40 S&W cartridge case, Federal Cartridge brand, which was identified as having been fired in the Item #1 pistol. Items #4 and #5 are two (2) caliber .40 S&W cartridge cases, Federal Cartridge brand, which were identified as having been fired in the same second firearm. Item #2 is a fired caliber .40 S&W cartridge case, Federal Cartridge brand, which was not fired in the same firearm as Items #3, #4 and #5 or in the Item #1 firearm.
X8YRFM	The cartridge cases Exhibits 1 and 3 were identified as having been fired in a single firearm. The cartridge case Exhibit 2 was not fired in the same firearm as the cartridge cases Exhibits 1 and 3 or the cartridge cases Exhibits 4 and 5. The cartridge cases Exhibits 4 and 5 were identified as having been fired in a single firearm. They were not fired in the same firearm as the cartridge cases Exhibit 1 and 3.
XB984C	Cartridge cases (3, 1, 1, 1) were all fired from the SAME firearm based on sufficient agreement of class and individual characteristics of the firing pin and breechface impressions. Cartridge cases (4, 5) were all fired from a SECOND firearm based on sufficient agreement of class and individual characteristics of the firing pin and breechface impressions. Cartridge case (2) was fired from a THIRD firearm based on sufficient disagreement of individual characteristics[sic].
XBZXT8	1. Examinations showed that the discharged cartridge case listed in Item 3 was discharged within the same firearm that was used to discharge the test fired cartridge cases listed in Item 1. 2. Examinations showed that the discharged cartridge cases listed in Item 2, Item 4, and Item 5 were not discharged within the same firearm that was used to discharge the test fired cartridge cases listed in Item 1. 3. Examinations showed that the discharged cartridge cases listed in Item 4 and Item 5 were discharged within the same unknown firearm. 4.

TABLE 2

WebCode	Conclusions
	Examinations showed that the discharged cartridge case listed in Item 2 was not discharged within the same unknown firearm that was used to discharge Item 4 and Item 5.
XE6UVF	The Item 1 cartridge cases were used to microscopically compare to Items 2-5. The Item 2 cartridge case was not fired in the same firearm as Items 1 and 3 nor the same firearm as Items 4 and 5. The Item 2 cartridge case displays class characteristics consistent with some firearms manufactured by Smith & Wesson (Sigma and SD series). The Item 3 cartridge case was identified as having been fired in the same firearm as the Item 1A cartridge case. It was not fired in the same firearm as Item 2 nor the same firearm as Items 4 and 5. The Items 4 and 5 cartridge cases were identified as having been fired in the same unknown firearm. They were not fired in the same firearm as Items 1 and 3 nor the same firearm as Item 2. Items 1-5 represent three different firearms. Items 2, 4 and 5 should be resubmitted along with any suspect firearms.
XGVDFD	In my opinion, fire matching detail seen between item 1 and item 3. Therefore, in my opinion item 3 had been fired in the recovered Ruger P94DC pistol. Item 2, 4 and 5 had not been fired by the recovered pistol.
XK6ZYQ	The questioned cartridges Item 2, 3, 4 and 5 and the known cartridges were observed, analysed and compared macroscopically to each other. No difference was observed with the Items 2, 3, 4, 5 and the test-fired cartridges Items 1 regarding the class characteristics. Based on the detailed and acquired features, questioned items have been compared to each other and form three groups with potential firearms origins: For the questioned cartridges Items 4 and 5, they share sufficient agreement at the level of detailed and acquired characteristics to support the proposition of a common origin; and they show significant differentiation with the items 2 and 3 (based on firing pin marks, shear marks; extractor marks, breech marks) to support the proposition of a different origin. Items 2 and 3 show significant differentiation (based on firing pin marks, shear marks; extractor marks, breech marks) to consider the proposition of a different origin. For the known items 1, fired by the seized Ruger P94DC .40 pistol, there is a high level of reproducibility with well-marked striations and impressions for the breech, firing pin and shear marks. The extractor's marks are also of interest despite a lower level of reproducibility. If the seized weapon Ruger P94DC .40 pistol has fired one of the questioned items, a high level of agreement should be expected for the specified features. Significant discordances have been observed with the items 2, 4 and 5 compared to the reference material. The forensic observations made on the cartridges 2, 4 and 5 provide very strong support that the questioned items have been discharged by another firearm than the suspected weapon. There is a large level of agreement between the item 3 and the test-fired cartridges Items 1. Then, the forensic observations made on the cartridge 3 provide very strong support that the questioned item 3 has been discharged from the same firearm as the known expended cartridge cases, rather than the proposition that the item 3 was fired by another unknown weapon.
XNA2CZ	A MICROSCOPIC EXAMINATION WAS PERFORMED ON THE CARTRIDGE CASES SUBMITTED. AS A RESULT OF THIS EXAMINATION THE FOLLOWING WAS CONCLUDED: FROM THE FIRING MARKS PRESENT, CONSISTING OF BREECH FACE MARKS, FIRING PIN IMPRESSION AND EJECTOR MARK , WE ARE OF THE OPINION THAT CARTRIDGE (3) HAD BEEN FIRED FROM THE SAME WEAPON AS CARTRIDGES (1). THE RUGER P94DC PISTOL RECOVERED. CARTRIDGES 4 AND 5 HAD BEEN FIRED FROM THE SAME SECOND WEAPON, IE NOT THE WEAPON RECOVERED. CARTRIDGE 2 HAD BEEN FIRED IN A THIRD WEAPON. IN CONCLUSION, THREE WEAPONS HAD BEEN UTILISED DURING THIS INCIDENT; THE TEST FIRED CARTRIDGES (1) MATCHED THE CARTRIDGE (3) RECOVERED FROM THE SCENE. CARTRIDGES 4 AND 5 WERE FIRED IN A SECOND WEAPON AND

TABLE 2

WebCode	Conclusions
	CARTRIDGE 2 WAS FIRED IN A THIRD WEAPON.
XQP3XF	Item #1 - Three .40 S&W caliber discharged shells, headstamped: Federal, test fired in the .40 S&W caliber Ruger semiautomatic pistol, model P94DC. Examined the four specimens marked #2 thru #5. They are .40 S&W caliber discharged shells headstamped: Federal. Compared the three shells marked #1 against the shell marked #3 with positive results (Identification). The two shells marked #4 and #5 were discharged in the same firearm. Compared the three shells marked #1 against the three shells marked #2, #4 and #5 with negative results (Elimination). The three shells marked #2, #4 and #5 were not discharged in the Ruger pistol.
XUHF3C	Exhibits #1a, #1b, #1c, and #3 were fired in the same unknown firearm. Exhibit #2 was fired in a second unknown firearm. This exhibit displays class characteristics similar to those displayed on cartridge cases fired in Smith & Wesson (SW/SD variants) firearms. Exhibits #4 and #5 were fired in a third unknown firearm.
XVVR6M	Exhibit #3 was fired in the same firearm that fired the Exhibit #1A-#1C tests. Exhibits #4 and #5 were fired in a second firearm. Exhibit #2 was fired in a third firearm.
XWHZVJ	The submission 003 cartridge casing was identified as having been fired from the submission 001 firearm, based on the correspondence of individual characteristics. The submission 004 and 005 cartridge casings were identified as having been fired from the same firearm based on the correspondence of individual characteristics. The submission 004 and 005 cartridge casings could neither be identified nor excluded from having been fired from the submission 001 firearm, however differences in individual characteristics indicate a different firearm was used. The submission 002 cartridge casing was eliminated from having been fired from the firearm(s) that fired submissions 001, 004 and 005, based on differences in firing pin characteristics.
XWVYJ2	The cartridge cases in Items #1, #2, #3, #4, and #5 were microscopically examined in conjunction with one another. Based on these comparative examinations and observed class and individual characteristics, it was determined that: A. The cartridge cases in Items #1 and #3 had all been fired in the same firearm. B. The cartridge cases in Items #4 and #5 had both been fired in an unknown firearm. C. The cartridge case in Item #2 had been fired in a second unknown firearm.
XXZKVF	The Item 3 fired cartridge case has been identified as having been fired in the same firearm as fired the Item 1 fired cartridge cases. The Item 4 and Item 5 fired cartridge cases have been identified as having been fired in the same firearm and were not fired in the firearm which fired the Item 1 and Item 3 fired cartridge cases. The Item 2 fired cartridge case was fired in a different firearm than fired the Item 1 and Item 3 fired cartridge cases and the firearm which fired the Item 4 and Item 5 fired cartridge cases.
XY8BMC	Results of comparison examination: TF - Item 1 *(Ruger P94DC, .40 pistol) was compared to EV Items 2-5 with the following results: Item 3 revealed the presence of matching features with Item 1*. This means Item 3 is consistent with having been fired in Item 1*. Item-2 can be eliminated as having been fired in Item 1*. Items 4 and 5 revealed the presence of matching features to each other - indicating they were both fired in the same firearm, however, can be eliminated as having been fired in Item 1*. Results were verified by [Name].
XZFN4E	The cartridge cases submitted Items 1-5 were examined and microscopically compared. Items 1A-C & 3 were discharged in the same firearm. Item 2 was not discharged in the same firearm that discharged any of the other submitted cartridge cases. Items 4 & 5 were discharged in the same firearm, but not the same firearm that discharged Items 1A-C & 3.

TABLE 2

WebCode	Conclusions
	Items 2 & 5 will be submitted for inclusion in the open file (IBIS). You will be notified by the Crime Laboratory of any future association(s).
XZWX2L	Item 001-03 was fired from the Ruger P94DC pistol. Items 001-02, 001-04, and 001-05 were not fired from the Ruger P94DC pistol.
Y2UZF8	The cartridge case in Exhibit #2 was not fired in the firearm in Exhibit #1. The cartridge case in Exhibit #2 was not fired in the same firearm as the cartridge cases in Exhibit #4 and Exhibit #5. The cartridge case in Exhibit #3 was fired in the firearm in Exhibit #1. The cartridge cases in Exhibit #4 and Exhibit #5 were fired in the same unknown firearm. The cartridge cases in Exhibit #4 and Exhibit #5 were not fired in the firearm in Exhibit #1.
Y3ZV7M	Exhibit #3 was fired by the same firearm as Exhibit #1 (cartridge cases listed as test shots fired by: Ruger P94DC, 40S&W). Exhibits #2, #4 and #5 were eliminated as being fired by the same firearm as Exhibit #1. Exhibit #4 and Exhibit #5 were fired by the same unknown firearm. Exhibit #2 was fired by a different firearm than Exhibits #4 and #5.
Y7Z7XF	[No Conclusions Reported.]
YCEA3F	Item #3 was fired in the firearm used to produce Item #1 (test shots/knowns). Items #4 and #5 were fired in the same firearm. - Items #2, #4, and #5 were not fired in the firearm used to produce Item #1 (test shots/knowns) and Item #3. Item #2 was not fired in the same firearm as Items #4 and #5.
YKLE3U	The following conclusions were made based on microscopic comparisons between Items 1a, 2, 3, 4, and 5: Item 3 was fired in the same Ruger pistol as Item 1a. Items 4 and 5 were fired in the same unknown firearm, but not the Ruger pistol. Item 2 was fired in neither the Ruger pistol nor the same unknown firearm as Item 5. Collectively, the four fired cartridge cases (Items 2, 3, 4, and 5) were fired in two unknown firearms and one known firearm.
YMBM9N	The fired cartridge cases, Items 1-1, 1-2, 1-3, and 3 are identified as having been fired in the same firearm. The fired cartridge cases, Items 4 and 5 are identified as having been fired in the same firearm. The fired cartridge case, Item 2 is eliminated as having been fired in the same firearm as Items 1-1, 1-2, 1-3, 3, 4, and 5. There are differences in class characteristics observed with the Firing Pin Impression. The fired cartridge cases, Items 4 and 5 are not identified or eliminated as having been fired in the same firearm as Items 1-1, 1-2, 1-3, and 3. The individual characteristics present do not display sufficient agreement (Inconclusive).
YP477Y	One of the cartridge cases from the main entrance (Item 3) was determined to have been fired in the suspect's weapon (Item 1). The other cartridge cases (Items 2, 4, 5) were compared to the test fired cartridge cases (Item 1) but results were inconclusive. Additionally, Items 4 & 5 were compared to each other and it was determined that they were fired in the same gun.
YQBZR8	1. Item 3 was discharged within the same firearm as Item 1. 2. Items 4 and 5 were discharged within the same unknown firearm. Items 4 and 5 were not discharged within the same firearm as Item 1. Items 4 and 5 were not discharged within the same unknown firearm as Item 2. 3. Item 2 was discharged within a second unknown firearm. Item 2 was not discharged within the same firearm as Item 1. Item 2 was not discharged within the same unknown firearm as Items 4 and 5.
YR4PCN	Based on a difference in class characteristics (Firing pin shape) Item 2 is eliminated as having been fired in the same firearm as Items 1A, 1B, 1C, 3, 4, and 5. Item 3 and Items 1A, 1B, 1C (test shots of suspect firearm) are identified as having been fired in the same firearm. Items 4 and 5 are identified as having been fired in the same firearm. They can be neither identified

TABLE 2

WebCode	Conclusions
	nor eliminated as having been fired in the same firearm as Items 1A, 1B, 1C, and 3 due to a lack of matching individual characteristics (Inconclusive). Differences in identifiable individual characteristics suggest these two groups were fired in different firearms.
YRRFHL	Only item 3 expended cartridge case were fired from the firearm(A) which was used to fire item 1 expended cartridge cases. Item 2, 4, 5 expended cartridge cases were not fired from that pistol. Besides, item 4, 5 expended cartridge cases were fired from the same firearm(B) which was different from that used to fire item 1 expended cartridge cases. Item 2 expended cartridge case were fired from the other firearm(C) which was different form[sic] item 4, 5.
YUGPRM	3. On 2015-05-12 during the performance of my official duties I received a sealed evidence bag with number PA4002449540 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 Seven (7) .40 Smith & Wesson calibre fired cartridge cases, marked by me "102155/15" each and "-1A", "-1B", "-1C" and "-2" to "-5" individually. 4. The intention and scope of this forensic examination comprise of the following: 4.1 The examination and identification of fired cartridge cases. 4.2 Microscopic individualization of fired cartridge cases. 5. I examined the fired cartridge cases mentioned in paragraphs 3.1 and compared the individual and class characteristics markings on them using a comparison microscope and found: 5.1 The cartridge cases mentioned in paragraph 3.1 marked "102155/15" each and "-1A", "-1B", "-1C" and "3" individually were fired in a first (1st) firearm. 5.2 The cartridge case mentioned in paragraph 3.1 marked "102155/15-2" was fired in a second (2nd) firearm. 5.3 The cartridge cases mentioned in paragraph 3.1 marked "102155/15-4" and "102155/15-5" were fired in a third (3rd) firearm.
YVJNF	[No Conclusions Reported.]
YXR36F	The cartridge case marked as item 3 provided with the test 15-526 "Firearms examination" was fired from the same firearm as the known expanded[sic] cartridge cases item 1. The expended cartridges marked as item 2, 4 and 5 provided with the above mentioned test, were not discharged from the same firearm as the known expended cartridge cases.
Z3XH2Q	Item 3 was identified as having been fired from the same firearm as Item 1. Items 2, 4, and 5 were not fired from the same firearm as Item 1. Item 2 was not fired from the same firearm as Items 4 and 5. Items 4 and 5 were identified as having been fired from the same unknown firearm. Item 2 was fired from an additional unknown firearm.
Z4T27D	1. Submission 001-1 and Submission 001-3 were fired in the same Ruger P94DC, .40 caliber pistol. 2. Submission 001-2, Submission 001-4 and Submission 001-5 were eliminated as having been fired in the same firearm as Submission 001-1 due to a difference in class and individual characteristics. 3. Submission 001-4 and Submission 001-5 were fired in the same firearm. Possible suspect weapons are unknown at this time; however, any possible suspect weapon should be submitted to the laboratory for analysis. 4. Submission 001-2 was eliminated as having been fired in the same firearm as Submission 001-4 and Submission 001-5 based on a difference in class characteristics. Possible suspect firearms include Smith & Wesson Sigma series; however, any possible suspect weapon should be submitted to the laboratory for analysis.
ZAFXLN	The four .40 S&W caliber cartridge cases (items 2-5) were microscopically compared to the test fired cartridge cases from the Ruger, model P94DC, .40 S&W caliber pistol (item 1). Based on sufficient corresponding individual markings observed, the .40 S&W caliber cartridge case in item 3 was identified as having been fired in the Ruger pistol (item 1). Because of differences observed in class characteristics, the .40 S&W caliber cartridge cases in items 2, 4, and 5 could not have been fired in the Ruger pistol (item 1).

TABLE 2

WebCode	Conclusions
ZC9NXU	The submitted fired cartridge case, Item 3 was fired in the same firearm as the submitted test fires, Item 1 reported to be from a Ruger P94 DC pistol. The submitted fired cartridge case, Item 2 was not fired in the same firearm as the submitted test fires, Item 1 reported to be from a Ruger P94 DC pistol. The submitted fired cartridge cases, Item 4 and 5 were all fired in the same unknown firearm and were eliminated as having been fired in the same firearm as Item 1, reported to be a Ruger P94 DC pistol.
ZD2AF7	The Item 1-5 cartridge cases were examined and microscopically compared to each other with the following results: Items 1 and 3 were identified as having been fired in the same firearm. Items 4 and 5 were identified as having been fired in a second firearm. Item 2 was eliminated from having been fired in the same firearm as either Items 1 and 3 or 4 and 5 based on differences in class characteristics. Item 2 was fired in a third firearm.
ZDECBY	Items 1, 2, 3, 4 and 5 were microscopically examined in conjunction with each other. Based on these comparative examinations, it was determined that: A. The cartridge cases in Item 1 and the cartridge case in Item 3 had been fired in the same known firearm. B. The cartridge case in Item 2 had been fired in a different firearm than Items 1, 3, 4 or 5. C. The cartridge case in Item 4 and the cartridge case in Item 5 had been fired in a second unknown firearm.
ZEAWZJ	Microscopic comparisons were conducted between Exhibits 1 through 5 with the following results: Based on agreement of all discernible class characteristics and sufficient correspondence of individual characteristics, Exhibits 1A, 1B, 1C, and 3 were identified as having been fired in the same firearm. Based on agreement of all discernible class characteristics and sufficient correspondence of individual characteristics, Exhibits 4 and 5 were identified as having been fired in the same firearm. Exhibits 4 and 5 were eliminated as having been fired in the same firearm as Exhibits 1 and 3 based on differences in class and individual characteristics. Based on differences in class and individual characteristics, Exhibit 2 was eliminated as having been fired in both the same firearm as Exhibits 1 and 3 and the same firearm as Exhibits 4 and 5.
ZFT3XF	Microscopic examination and comparison of the cartridge cases (Items 1, 2, 3, 4 and 5) reveals sufficient evidence to conclude that the cartridge cases Items 2, 4 and 5, were not fired in the suspect's weapon Item 1 (pistol Ruger P94DC .40). The cartridge case Item 3 was fired by the suspect's firearm Item 1. The three expended cartridge cases Items 2, 4, and 5 were compared one the others to determine common origin. The two cartridge cases Items 4 and 5 were fired by the same firearm, different from that of the suspect's (item 1). The cartridge case Item 2 was fired from the second firearm different from that of the suspect's (Item 1) and different from the firearm that expended Items 4 and 5.
ZGDPW3	The Item 2 cartridge case was not fired in the same firearm as the Item 1 cartridge cases, or in the same firearm as Items 3, 4 and 5. Item 3 was fired in the same firearm as the Item 1 cartridge cases. Items 4 and 5 were fired in the same firearm, but not the same firearm as Items 1 and 3.
ZK2Y74	The item #2 cartridge case was not fired in the same firearm as the item #1 cartridge cases, nor was it fired in the same firearm as any of the other submitted cartridges cases. The item #3 cartridge case was fired in the same firearm as the item #1 cartridge cases. The item #4 & #5 cartridge cases were fired in the same unknown firearm. They could not be eliminated as having been fired in the same firearm as items #1 or #3. This is due to a lack of sufficient disagreement of class and or individual characteristics.
ZNCEBL	Item 2 was eliminated as having been fired in the same firearm as Item 1. Item 3 was identified as having been fired in the same firearm as Item 1. Items 4 and 5 were identified as having been fired in the same unknown firearm and eliminated as having been fired in the

TABLE 2

WebCode	Conclusions
	same firearm as Item 1.
ZNYH7G	Exhibits 1 through 5 are fired .40 S&W caliber centerfire cartridge cases marketed by Federal, which were fired from an autoloading type firearm(s) that left marks of value for comparison. Microscopic comparison identified the Exhibit 1 cartridge cases and Exhibit 3 as having been fired in the same firearm. Additionally, Exhibits 4 and 5 were identified as having been fired in the same firearm, which was not the firearm that fired Exhibits 1 and 3. Exhibit 2 was excluded as having been from the firearms that fired Exhibits 1 and 3, and Exhibits 4 and 5 based on differences in class and/or extreme differences in individual characteristics.
ZR4EBA	Cartridge casing (3) and Test Fires (1) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Cartridge casing (3) and Test Fires (1) are identified as having been fired from the SAME (above listed) firearm. Cartridge casings (4,5) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Cartridge casings (4,5) are identified as having been fired from a SECOND gun. Cartridge casing (2) was microscopically examined and compared to Cartridge casings (3-5) and Test Fires (1). Based on the observed disagreement of individual characteristics, Cartridge casing (2) was determined to have been fired in a THIRD gun.
ZT23D7	Sufficient agreements of class and individual characteristics confirmed the item 3 expended cartridge case was fired in the same firearm as the item 1 test standards. Disagreements of class and individual characteristics confirmed the item 2, 4, and 5 expended cartridge cases were not fired in the same firearm as the item 1 test standards.
ZTH4DM	I compared four .40 S&W calibre fired cartridge cases marked 117792/15 (2) (3) (4) (5)* Questioned items to three .40 S&W calibre fired cartridge cases marked 117792/15 T1-T3* Known and found: 2.1 Questioned cartridge case marked 117792/15 (3) is positive to tests marked 117792/15 T1-T3. 2.2 Questioned cartridge case marked 117792/15 (4) (5) are positive to each other but negative to tests marked 117792/15 T1-T3. 2.3 Questioned cartridge case marked 117792/15 (2) is negative to cartridge case marked 117792/15 (3) (4) (5) and to tests marked 117792/15 T1-T3.
ZWFMDZ	1. Cartridge case (Item3) was discharged from the same firearm as cartridge cases (Item1). 2. Cartridge cases (Item4.5) were discharged from the same firearm but different from cartridge cases(Item1.3). 3. Cartridge case (Item2) was not discharged from the same firearm as cartridge cases (Item1.3 and 4.5).
ZY2TKJ	Item 2 was microscopically compared to Items 1A, 1B, and 1C using a comparison microscope. Differences in class and individual characteristics sufficient for elimination were observed. Item 2 was not fired in the Ruger pistol. Item 3 was microscopically compared to Item 1B using a comparison microscope. Corresponding class characteristics and corresponding individual characteristics sufficient for identification were observed. Item 3 was fired in the Ruger pistol. Item 4 was microscopically compared to Items 1A, 1B, and 1C using a comparison microscope. Although class characteristics corresponded, differences in individual characteristics sufficient for elimination were observed. Item 4 was not fired in the Ruger pistol. Item 5 was microscopically compared to Items 1A, 1B, and 1C using a comparison microscope. Although class characteristics corresponded, differences in individual characteristics sufficient for elimination were observed. Item 5 was not fired in the Ruger pistol.

Additional Comments

TABLE 3

WebCode	Additional Comments
24UQX8	The wording for my conclusions assumes that Exhibit #1 is the known firearm.
2E6R3L	Laboratory policy allows for elimination only on differences in class characteristics.
2JND7K	Items 4 and 5 had several areas that did not agree with the Item 1 known or the Item 3, however there were a few areas in which there was some slight agreement. Due to there being some agreement and some disagreement my conclusion was conservative and I concluded that the items 4 and 5 are inconclusive to Items 1 (A through C) and 3.
2JP4GA	Item #2 displays class characteristics consistent with those seen on cartridge cases fired in some of the SD and Sigma series pistols manufactured by Smith & Wesson, among possible others.
3CKP4X	Comments for Item 5 are identical to those for Item 4- there was some agreement (between the unknown and the known cartridge cases) of observed individual characteristics but this was insufficient for either ID or elimination.
3HVJ7V	Microscopic examination and comparison of the the[sic] evidence fired cartridge cases (items # 4 and 5) reveals sufficient evidence to conclude that they were fired in the same firearm. This is not the same firearm which produced the test fired cartridge cases (item # 1). Microscopic examination and comparison of the the[sic] evidence fired cartridge case (item # 2) reveals sufficient evidence to conclude that it was not fired in the same firearm as produced the tests (item # 1), and it was not fired in the same pistol which fired the two evidence cartridge cases (item # 4 and 5).
3KYGF3	The four submitted unknown casings (Item #s 2, 3, 4, 5) were fired from three different firearms.
3LT6VC	Were used three (3) firearms at the scene.
3RX2HX	A slight bulge was noted on the Item 2 cartridge case. This deformity may have been caused by an unsupported or oversized chamber, or by having been fired in a caliber other than 40 S&W.
3XDGQ4	The Items 4 and 5 cartridge cases could neither be identified nor eliminated as having been fired in the firearm that fired the Item 1 cartridge cases. This is due to agreement of all discernible class characteristics but insufficient agreement or disagreement of the discernible individual characteristics.
4GE7TX	Straightforward test.
66XMXT	Item 4 and item 5 may be shot from same pistol.
6GGXRJ	The cartridge cases in submissions 4 and 5 were fired in the same gun. However, the cartridge cases in submissions 4 and 5 could not be identified as having been fired in the same gun as the cartridge cases in submission 1.
6MM3TX	It's the policy of the [State] State Police Forensic Science Division to eliminate for differences in class characteristics only. Items 4 and 5 exhibited agreement of class characteristics and disagreement of individual characteristics to item 1 (submitted test shots).
6R43XX	In summary: Item #3 (one Federal .40 S&W fired cartridge case) was fired in the submitted Item #1 (Ruger pistol). Items #4 & #5 (two Federal .40 S&W fired cartridge cases) were fired in a second firearm, more likely than not a Ruger pistol. Item #2 (one Federal .40 S&W fired cartridge case) was fired from a third firarm, more likely than not a Smith & Wesson pistol.

TABLE 3

WebCode	Additional Comments
7D3FE9	Scribing item numbers on the exterior of a cartridge case is not the best way to mark an item for identification since it may obscure chamber marks or other marks used for comparison. It would be great if other means of marking the evidence items could be considered. Eliminations and IDs are made under the following assumptions - (1) the cartridge cases at the scene were left at or near the same time during the same incident and/or (2) subclass influence was considered and eliminated prior to the submission of the evidence. If these assumptions could not be made, my conclusions may have been different.
7KXJGJ	Items 4 and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 4 and 5, the cartridge cases, were not fired in the same firearm as Item 2, the cartridge case, based upon different class and individual microscopic characteristics. NIBIN: Item 1, a cartridge case identified to have been discharged from the suspect's weapon, will be entered into NIBIN. Item 2, the cartridge case, will be entered into NIBIN. Item 4, the cartridge case, will be entered into NIBIN. The results of NIBIN entries and searches will be the subject of a separate report.
7MTDTL	The characteristic fine striations and markings on the base of the cartridge cases (Item 2, Item 4 and Item 5) do not correlate with each other. Hence I am of the opinion that Item 2, Item 4 and Item 5 were not fired with the same firearm.
7Z2BJ8	[Participant included an association scale that could not be replicated within the report].
8U9TH2	Item 2 displays class characteristics typical of some firearms by Smith & Wesson (Sigma series, SD series).
8W6V7J	The cartridge cases in Submissions 4 and 5 were fired from the same gun.
9TTQ98	The cartridge cases marked "Item 4" and "Item 5" were found to be in agreement of class characteristics and there was sufficient agreement of individual characteristics within their breech face marks and firing pin impressions.
9XJ6U9	Strength of associations made in the identification of firearm-produced toolmarks: The identifications of the cartridge cases in this case to the same known or unknown firearm are made to the practical, not absolute, exclusion of all other firearms. This is because it is not possible to examine all firearms in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two firearm-produced toolmarks means that the likelihood another firearm could have made the questioned mark is so remote as to be considered a practical impossibility.
9YZ2JM	This result is based in the microscopic examination, cartridge case examination and microscopic examination.
AAVU6H	The cartridge cases described in items 2, 4 and 5, were not fired by the suspect's weapon.
AHRMJ4	[Participant included an association scale that could not be replicated within the report].
AJKH37	The cartridge cases have similar marks on the breech face but different firing pin marks.
AMBKR9	Item 2 fired from a different unknown firearm. Items 4 and 5 fired from a third, different, unknown firearm.
ANB3XA	Besides we found individual features that match the ballistic elements that were found in the item #1 with the ballistic elements that were found in the item #3.
AUWRKU	Items #4 and #5 were not eliminated as having been fired from item #1 because different class characteristics were not observed. Some differences were observed in the breech face marks (striations and impressions), the firing pin orientation and in the circular pattern within the firing pin impressions; therefore, the involvement of a different firearm was suggested.

TABLE 3

WebCode	Additional Comments
	[State] State Police Forensic Science Division policy only allows eliminations based on differences in class characteristics. Instruments: Stereo Macroscope: Leica, DMC, serial #5597232, Comparison Macroscope: Leica, DMC, serial #226727
AXGTRX	Item 2 displays class characteristics typical of some firearms manufactured by Smith & Wesson (Sigma and SD series). Items 2, 4 and 5 should be resubmitted along with any suspect firearms.
D7KVKZ	The other 2 expended cartridges related in the items number 4 and 5 come from the same origin, but different to the one obtained by the firearm related in the last reported conclusion.
DY3K8Y	The cartridge cases .40 caliber questioned, identified with items 4 and 5 were discharged from a single firearm type pistol, different from the suspicious weapon.
EPAM4W	Exhibit #2 displays class characteristics similar to firearms by Smith & Wesson (Sigma/SD variants), among others.
ERC2AJ	Item 1 : Three (3) Federal, caliber 40 S&W cartridge cases (known sample from Ruger, model P94DC, caliber 40 S&W pistol) Item 2: One (1) Federal, caliber 40 S&W cartridge case. Item 3: One (1) Federal, caliber 40 S&W cartridge case. Item 4: One (1) Federal, caliber 40 S&W cartridge case. Item 5: One (1) Federal, caliber 40 S&W cartridge case.
F3CKGV	From the above it can be inferred that there are two additional firearms 40 S&W, pistol related to the same event, but different from the one firearm Ruger P94DC.40 mm pistol seized from the suspect; a. One of the additional firearms referred above is a firearm, pistol. 40 mm that fired item 2. b. The other additional firearm referred above is firearm, pistol.40mm that fired item 4 and item 5
FDMGB8	NIBIN: A reference from Item 1 would be entered in NIBIN. Item 2 would be entered into NIBIN. Item 4 (as the reference) would be entered into NIBIN. The results of NIBIN entry and searches will be the subject of a separate report.
FQJU46	The submitted exhibit(s) will be transferred to the Evidence Section for return to your agency. Questions regarding this report should be addressed to: [Analyst].
FUXPK2	The characteristic marks on first expended cartridge case recovered from the main entrance (Item 2), one expended cartridge case recovered from the floor near the dressing room (Item 4) and one expended cartridge case recovered from the floor near the cash register (Item 5) not to match each other. Hence, I am of opinion that (Item 2, Item 4 and Item 5) were not fired by the same firearms.
FY6PM2	All identifications were based on microscopic comparison and the correspondence of individual characteristics.
G78NPU	Items #4 & #5 were microscopically compared to each other with POSITIVE results. Both Items #4 & #5 were discharged from the same (second) Weapon. Item #2 was discharged from a (third) Weapon.
GCB3G8	The elimination of Item #2 to tests (Item #1) was made cumulatively based on differences in the firing pin size and shape as well as breechface marks. The identification of Item #3 to tests (Item #1) was made using sheared primer orifice crater striae. The elimination of Items #4 and #5 to tests (Item #1) was made cumulatively based on differences in the breechface, firing pin concentric circle style, and extractor marks. The cross-identification of Items #4 and #5 was made using sheared primer orifice crater striae.
GNLJ64	Items #4 and #5 were inconclusive to Item #1 due to a lack of corresponding individual characteristics.

TABLE 3

WebCode	Additional Comments
HBG7L2	Strength of associations made in the identification of firearm-produced toolmarks: The identification of cartridge cases with a firearm is made to the practical, not absolute, exclusion of all other firearms. This is because it is not possible to examine all firearms in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two firearm-produced toolmarks means that the likelihood another firearm could have made the questioned mark is so remote as to be considered a practical impossibility.
HJPAD3	cc's that inscribed item#4 and item#5 were fired in the same firearm but different from the suspect pistol and different from the pistol that fired cc that inscribed item#2.
JZ6ZP7	The cartridge cases in Items 4 and 5 were fired in the same gun.
K26NDG	Items 4 and 5 had been fired in the same firearm, this being a different firearm to the seized Ruger pistol. Item 2 had been fired in a different, third firearm.
KDWFNX	Item #2 was fired from firearm (not Ruger) possible Smith & Wesson pistol. Item #4 and Item #5 were fired from another Ruger pistol not from the suspect's weapon.
KRT9V3	Current laboratory policy allows eliminations based on individual characteristics. However, due to the similarity of the class characteristics, minimal matching striae and not having the firearm available for analysis of the breechface and firing pin, an inconclusive finding was rendered.
KZLGKY	Similarities have been found between the markings in Item 4 and Item 5. This resulted in the following conclusion: Item 4 and 5: The findings are extremely more probable when H1 is true than when H2 is true. Where H1: The questioned cartridge cases are fired by one firearm. H2: The questioned cartridge cases are fired by two firearms of the same caliber and with the same class characteristics. The translation from a Bayesian conclusion to a categorical conclusion is not straightforward because differences in the overall approach of the evidential strength of traces. To translate our Bayesian conclusion to a yes/no/inconclusive conclusion a leap of faith has been made. For this test, conclusion are matched as follows: 'findings extremely more probable under H1 than H2' = Yes; findings extremely more probable under H2 than H1' = No.
L4FX9D	Excluded Item #2 based on FP shape. Item # 3 ID'd on FP aperture shear. Items #4 and 5 ID'd to each other on FP aperture shear. Items #4 and 5 have different FP aperture shear marks and different impressed FP marks than tests from Item #1 but general class characteristics are similar.
LHYHT8	Normally we would receive the firearm as evidence, so this report wording differs from what would typically be written.
LQE2AK	Three different 40 S&W caliber firearms.
M8HG8P	The exercise was practical for the application to the comparative studies of cartridge cases that realizes the ballistics group of [City] in [Country]; activity that is very frequent in this laboratory by material evidence submitted for analysis of criminal cases which use one or more firearms.
MAAKVP	The two (2) vanilla caliber .40 S & W, FEDERAL brand.40 S & W, belonging to the Items four (4) and five (5) marked with the same numbers found at the scene place where it happened the shooting retail store, were percutidas by the same firearm in the same caliber, different gun seized from the suspect. Vanilla.40 caliber S & W flag FEDERAL .40 S & W, corresponding to Item 2 and marked with equal recovered at the scene number where it happened the shooting retail store, was percussive a firearm in the same caliber, different

TABLE 3

WebCode	Additional Comments
	firearm confiscated the suspect, and that the two vanilla percutio of Items 4 and 5. In this case involved three (3) firearms.
MKZXKV	Potential subclass with Item 1 and Item 3; however, no impact to identification given ID was made on FPAS.
MTMZHQ	Two firearms of the same caliber but different from one another and different suspect's weapon, were used in the commission of the facts.
NFUVTQ	[Participant included an association scale that could not be replicated within the report].
NLYWMT	Items[sic] 4, 5 were fired in the same gun. Two guns of the same caliber but different from one another and different suspects weapon were used.
PL76ZT	A total of three different firearms were used.
PU9JFU	Items #1B, #2, and #4 are suitable for entry into the NIBIN Database.
Q79FCA	Items 4 and 5 were also eliminated as having been fired in Item 1 due to disagreement of discernible individual characteristics.
Q7UT38	Laboratory policy does not allow for eliminations based on individual characteristics.
QLMQZW	Items 4 and 5 could not be identified or excluded as having been fired in the same firearm as Item 1 due to insufficient agreement or disagreement in individual characteristics.
R9YA89	Items 4 and 5 - 1 x gun. Item 2 - 1 x gun. Item 1+3 - 1 x gun. 3 guns used at scene.
REPGUM	Laboratory SOPs requires a definitive class difference for exclusions. However, if impressed individual marks are present in both items being compared and show no similarity, the phrase "nothing found to indicate" can be used. While technically a form of "no conclusion," this phrase is meant to indicate to the contributor that the type of similarity that is expected when two cartridge cases are fired in the same firearm was not present.
THMER9	1. Item 4 and item 5 were identified as having been fired in the same firearm that has not as yet been received for test firing.
TNCVDJ	Item #2 displays class characteristics (fp shape) similar to Smith & Wesson Sigma/SD or VE variants.
TPY7TK	The questioned cartridge cases recovered at the retail store, items 2, 3, 4, and 5, were compared to the test fired cartridge cases, item 1. There was sufficient agreement of class and individual characteristics present on the firing pin impressions and firing pin aperture shear to conclude that item 3 was fired in the suspect's firearm. Observed differences in class and individual characteristics showed that items 2, 4 and 5 were not fired in the suspect's firearm. Items 4 and 5 were compared to each other. There was sufficient agreement of class and individual characteristics present on the firing pin impressions and firing pin aperture shear to conclude that the items were fired in the same firearm, however a different one than the suspect's.
TRNGLY	Enough Rugers!
U2VZXL	Per laboratory policy, "The discipline recognizes that an elimination of a firearm by other than class characteristics is possible but that such an elimination is an exceptional situation". Comparative examinations of Item 1 against Items 4 and 5 showed disagreement of individual features but not to a level that could be considered to be exceptional. Without access to the firearm that was used to fire Item 1, the results of these examinations were reported conservatively as inconclusive.
UCPH7Y	Cartridge cases in Item #1, are test fired from Ruger P94DC .40 pistol. Cartridge cases Item

TABLE 3

WebCode	Additional Comments
	#4 and #5, were fired by second firearm. Cartridge case Item #2, was fired by a third firearm.
UKF34A	Per [State] State Police Forensic Science Division Policies we only eliminated on class characteristics not individual characteristics.
UY6ZDV	Three different firearms were used.
VWW8XM	No comment on this test. But, I have a general recommendation. My recommendation is that you start using high quality polymer replicas for all of your firearm evidence proficiency tests. In this way, your tests could be designed to mimic the full range of difficulty encountered in real forensic firearms evidence. By providing only actual fired bullets and cartridge cases, you cannot send out border line comparison samples; you are limited to only sending out samples that are relatively easy to identify. The end result of this limitation is that the false positive error rates that you report do not reflect the actual error rates in day-to-day forensic case work.
VYD9HH	Identifications are made to a practical certainty, not to the absolute exclusion of all other possible sources (firearms/tools). This is based upon the fact that it is not possible to examine all firearms or tools in the world, a prerequisite for absolute certainty. Whether statistically or verbally stated, the principle of absolute versus practical certainty is common in forensic science disciplines. The conclusion that sufficient agreement exists between two tool marks, the basis for an identification, means that the likelihood another tool could have made the questioned tool mark is so remote as to be considered a practical impossibility.
W8ZUG9	Based on the observed similarities in the individual characteristics of T3 and T4 compared to each other it appears likely that they were fired from the same, but not the suspect's weapon.
WWCL8H	[Participant included an association scale that could not be replicated within the report].
XGVDFD	IMO Item 4 and 5 had fire matching detail. IMO items fired in the same gun. Item 2 did not match to either 4 and 5. This indicates 3 pistols used in this incident.
XWHZVJ	For inconclusive results, see comments above.
XZFN4E	Item 2 exhibits characteristics associated with newer Smith & Wesson Sigma Series pistols.
Y3ZV7M	There are a total of 3 different firearms involved.
YMBM9N	Items 4 and 5 display the same class characteristics as Items 1 and 3, however, they lacked the agreement in the individual characteristics for an identification. [State] State Police Procedure does not allow for an elimination based on individual characteristics alone.
YP477Y	Although Items 2, 4, 5 were most likely not fired in the suspect's weapon, results were marked inconclusive to account for possible damage to the gun (either intentional or unintentional) that could change the microscopic characteristics transferred to the cartridge cases.
YR4PCN	Per laboratory policy, elimination conclusions must exhibit differences in class characteristics. Differences solely in individual characteristics is not a sufficient reason for an elimination conclusion. Thus, items 4 and 5 were inconclusive to test shots of the suspect firearm (1A, 1B, 1C).
ZAFXLN	The three .40 S&W caliber cartridge cases (items 2, 4, and 5) were microscopically compared to one another. Based on sufficient corresponding individual markings observed, items 4 and 5 were identified as having been fired in the same firearm. Because of differences observed in class characteristics, the .40 S&W caliber cartridge case in item 2 could not have been fired from the same firearm as items 4 and 5.
ZDECBY	The class characteristics present on Item 2 are consistent with those produced by some Smith & Wesson pistols.

TABLE 3

WebCode	Additional Comments
ZFT3XF	Two guns of the same caliber but different from one another and different suspect's weapon, were used in the commission of the facts.
ZK2Y74	It is my belief that items #4 & 5 can be eliminated to items #s 1 & 3. Our unit require a second examiners concurrence for an identification or elimination.

Appendix

Collaborative Testing Services - Forensic Testing Program **Test No. 15-526: Firearms Examination**

DATA MUST BE RECEIVED BY June 22, 2015 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB and ANAB. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB and/or ANAB. (Accreditation Release section on the last page must be completed and submitted.)
- This participant's data is NOT intended for submission to ASCLD/LAB or ANAB.

Online Data Entry

Visit www.cts-portal.com to enter your proficiency test results online. If you have any questions please do not hesitate to contact CTS.

Scenario:

Police are investigating a shooting in a retail store. Investigators recovered four expended cartridge cases at the scene - two from the main entrance, one from the floor near the dressing room and one from the floor near the cash register. A suspect was apprehended later that day and police seized a Ruger P94DC .40 pistol from his possession. Three rounds of Federal® American Eagle® .40 ammunition (which were consistent with the cartridge cases found at the scene) were fired with the suspect firearm and the cartridge cases collected. Investigators are asking you to compare the recovered cartridge cases from the scene with those test fired from the suspect's weapon and report your findings.

Each Item is in a labeled jewel box, it is suggested that when the items are removed from their labeled boxes, they be marked according to your laboratory procedure. However, in case the items are separated from their boxes before labeling has occurred, each item has been inscribed with its item number.

Items Submitted (Sample Pack F1):

- Item 1: Three expended cartridge cases discharged from the suspect's weapon (known).
- Item 2: First expended cartridge case recovered from the main entrance (questioned).
- Item 3: Second expended cartridge case recovered from the main entrance (questioned).
- Item 4: One expended cartridge case recovered from the floor near the dressing room (questioned).
- Item 5: One expended cartridge case recovered from the floor near the cash register (questioned).

1.) Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?

Item 2	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 3	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 4	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 5	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>

*Should an item(s) be marked "Inconclusive", please document the reason in the Additional Comments section of this data sheet.

Please return all pages of this data sheet.

Page 1 of 3

Participant Code:

WebCode:

2.) What would be the wording of the Conclusions in your report?

3.) Additional Comments

<p>Return Instructions: Data must be received via online data entry, fax (please include a cover sheet), or mail by <i>June 22, 2015</i> to be included in the report.</p>	<p>Participant Code: ONLINE DATA ENTRY: www.cts-portal.com FAX: +1-571-434-1937 or Toll-Free: 1-866-FAX-2CTS (329-2287)</p>
<p>QUESTIONS? TEL: +1-571-434-1925 (8 am - 4:30 pm EST) EMAIL: forensics@cts-interlab.com www.ctsforensics.com</p>	<p>MAIL: Collaborative Testing Services, Inc. P.O. Box 650820 Sterling, VA 20165-0820 USA</p>

Please return all pages of this data sheet.

Participant Code:

WebCode:

Collaborative Testing Services ~ Forensic Testing Program

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

WebCode:

for Test No. **15-526: Firearms Examination**

This release page must be completed and received by **June 22, 2015** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

ASCLD/LAB RELEASE

If your lab has been accredited by ASCLD/LAB and you are submitting this data as part of their external proficiency test requirements, have the laboratory's designated individual complete the following.

The information below must be completed in its entirety for the results to be submitted to ASCLD/LAB.

ASCLD/LAB Legacy Certificate No. _____ ASCLD/LAB International Certificate No. _____

Signature _____ Date _____

Laboratory Name _____

Location (City/State) _____

ANAB RELEASE

If your laboratory maintains its accreditation through ANAB, please complete the following form in its entirety to have your results forwarded.

ANAB Certificate No. _____

Signature and Title _____ Date _____

Laboratory Name _____

Location (City/State) _____

Accreditation Release

Return Instructions

Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.

*Questions? Contact us 8 am-4:30 pm EST
Telephone: +1-571-434-1925
email: forensics@cts-interlab.com*

Please return all pages of this data sheet.

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