

**From:** P. Allan Kosecki, Blood Alcohol Technical Leader

**To:** Melinda Raines, Quality Manager

**Date:** 07/31/17

**Subject:** Switching from Nitrogen Generator to Nitrogen Tank

**Background:**

The Agilent headspace gas chromatograph uses nitrogen to pressurize the headspace vials and as a make-up gas for the flame ionization detectors (FID). The instrument also uses air as one of the gases burned in the FIDs. When the instrument was installed the source of nitrogen and air was the PEAK nitrogen generator model NM20ZA-230v serial number J06-06-09. The third gas used by the instrument was hydrogen supplied by Parker-Domnick Hunter hydrogen generator model 60HMD serial number 13HMD0166.

**System updates:**

On July 12, 2017, PEAK installed a new nitrogen generator that only delivers nitrogen to the gas chromatograph. This unit is model NG3000A-110-US serial number 770003556. Following installation of the nitrogen generator, I installed Domnick Hunter zero air generator model UHP-10ZA serial number 09Z0025 and added an indicating filter in the line from the existing hydrogen generator. Following these changes, the gas chromatograph appeared to not be getting hydrogen. Since Full Spectrum was due to perform a preventative maintenance (PM) service, no further investigation was done until Full Spectrum could be onsite. Full Spectrum determined that the in-line filter on the hydrogen generator was not fully seated on the manifold. After reseating the filter, the gas chromatograph was restarted.

It was noted that the FID readings were around 40 picoamps. Prior to these changes, the baseline reading was about 20 picoamps. Full Spectrum decided to do part of the PM service to see if the maintenance would lower the FID signal. Full Spectrum cleaned the FID jets; however, the FID signal remained high. The nitrogen generator was disconnected from the instrument and allowed to purge by pumping out nitrogen into the room for three days. The generator was reconnected and the signal was still high.

I turned off the nitrogen flow to the FIDs and the signal dropped to about 3 picoamps indicating that the high signal level was attributable to the nitrogen supply. I ordered a tank of nitrogen to confirm that the high signal was caused by the nitrogen generator.

I installed a nitrogen tank to the gas chromatograph and the FID signal was about 4 picoamps. Until the nitrogen generator can be repaired or replaced the instrument will be connected to a nitrogen tank.

On July 26, 2017, Will Adrian completed a quality assurance run on the instrument to confirm that the instrument was operating correctly with the new gas sources. See Appendix 1 for the run data. The data from the run confirm that instrument is operating correctly.

# APPENDIX ONE

# SCOTTSDALE POLICE DEPARTMENT CRIME LABORATORY BLOOD ALCOHOL FACE SHEET

ANALYSIS DATE 7/26/2017 SEQUENCE NAME PCwISTD072617

**EQUIPMENT**

Pipettor  Hamilton ML600EH7497  Hamilton ML600GJ10749  
 Gas Chromatograph  Agilent US14173023

**INSTRUMENT CALIBRATION**

Vial 1 0.02 calibrator Lot FN03241604 Coefficient of determination ( $r^2$ )  
 Vial 2 0.10 calibrator Lot FN06181501 0.99999  
 Vial 3 0.20 calibrator Lot FN07201502  
 Vial 4 0.40 calibrator Lot FN11191402

**CALIBRATION VERIFICATION AND RESOLUTION TEST**

Vial	Sample	Expected result	Measured result	Manufacturer/lot
5	Blank	Not detected	Not detected	SPD lab 041717
6	Volatiles mixture	6 compounds	6 compounds	SPD lab 020917WLA
7	Aqueous control	0.400 g/dL	0.404 g/dL	Lipomed 08012015-C
8	Aqueous control	0.040 g/dL	0.040 g/dL	Lipomed 09022015-A
9	Blood control	0.200 g/dL	0.202 g/dL	ACQ 407041529/3
10	Aqueous control	0.080 g/dL	0.080 g/dL	Lipomed 28082014-B
13	Aqueous control	0.150 g/dL	0.151 g/dL	Lipomed 09022015-C
14	Aqueous control	0.400 g/dL	0.407 g/dL	Lipomed 08012015-C
15	Aqueous control	0.040 g/dL	0.040 g/dL	Lipomed 09022015-A
16	Blood control	0.200 g/dL	0.205 g/dL	ACQ 407041529/3
17	Blank	Not detected	Not detected	SPD lab 041717

**SUBJECT SAMPLES**

Subjects in the sequence 0 Subjects requiring reanalysis 0

**ADDITIONAL NOTES:** Performance check with internal standard validation included.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Run valid  WAB1570 10/2/17 Run valid  KOSECKI 10/17/17  
 Run invalid  Analyst Run invalid  Technical Reviewer



# Scottsdale Police Department Crime Laboratory Sequence Quality Assurance Summary

WA

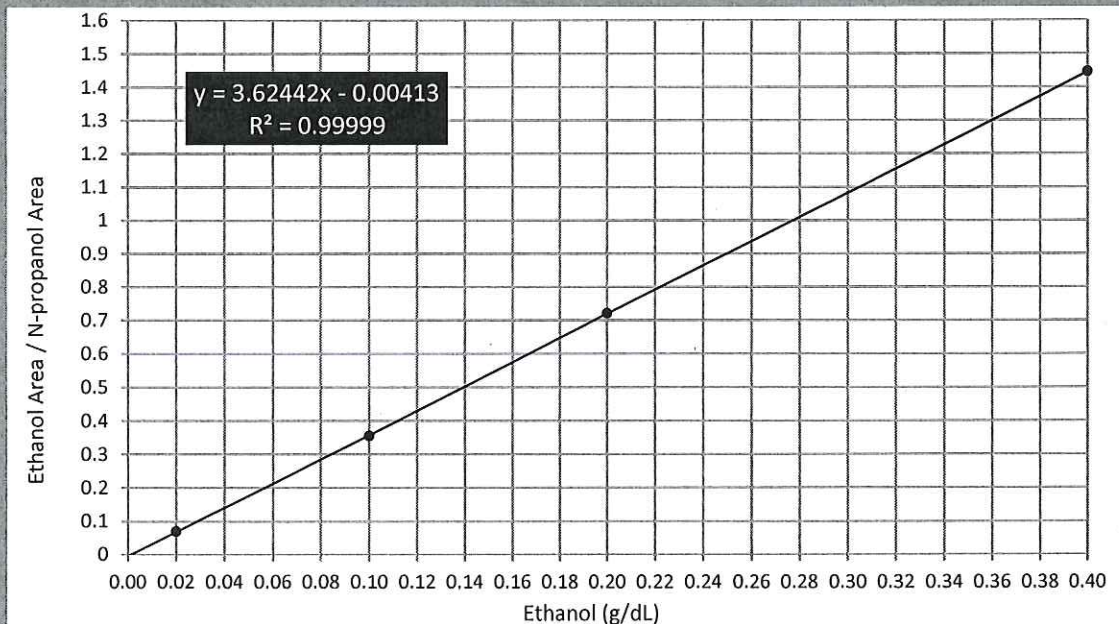
SEQUENCE NAME: PCwISTD072617

ANALYST: Adrian

Sample Name	Vial	Measured Value (g/dL)	Expected Value (g/dL)	Percent Difference	Absolute Difference (g/dL)
blank 041717	5	negative	negative	-	-
0.400 Lipomed 08012015-C	7	0.404	0.400	1.00	0.004
0.040 Lipomed 09022015-A	8	0.040	0.040	0.00	0.000
0.200 ACQ 407041529/3	9	0.202	0.200	1.00	0.002
0.080 Lipomed 28082014-B	10	0.080	0.080	0.00	0.000
0.150 Lipomed 09022015-C	13	0.151	0.150	0.67	0.001
0.400 Lipomed 08012015-C	14	0.407	0.400	1.75	0.007
0.040 Lipomed 09022015-A	15	0.040	0.040	0.00	0.000
0.200 ACQ 407041529/3	16	0.205	0.200	2.50	0.005
blank 041717	17	negative	negative	-	-

Calibrator	Ethanol Area	N-propanol Area	Ratio
0.020	12.461	178.874	0.070
0.100	63.546	178.452	0.356
0.200	128.560	178.156	0.722
0.400	258.645	178.906	1.446

### Calibration Line



WA

SEQUENCE TABLE:

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Location       : 1
Sample Information :
Sample Name    : 0.02 Cerilliant FNO3241604
Lims ID       :                WA 10/16/17
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Line           : 2
Location       : 2
Sample Information :
Sample Name    : 0.1 Cerilliant FNO6181501
Lims ID       :                WA 10/16/17
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=====
Line           : 3
Location       : 3
Sample Information :
Sample Name    : 0.2 Cerilliant FNO7201502
Lims ID       :                WA 10/16/17
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```

=====
Line           : 4
Location       : 4
Sample Information :
Sample Name    : 0.4 Cerilliant FN11191402
Lims ID       :                WA 10/16/17
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Line           : 5
Location       : 5
Sample Information :
Sample Name    : blank 041717
Lims ID       :                WA 10/16/17
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Line           : 6
Location       : 6
Sample Information :
Sample Name    : mix 020917 WLA
Lims ID       :                WA 10/16/17
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=====
Line           : 7
Location       : 7
Sample Information :
Sample Name    : 0.4 Lipomed 08012015-C
Lims ID       :                WA 10/16/17
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WA

Line : 8  
Location : 8  
Sample Information :  
Sample Name : 0.04 Lipomed 09022015-A  
Lims ID : WA 10/16/17

Line : 9  
Location : 9  
Sample Information :  
Sample Name : ~~blood~~ 0.20 ACQ 407041529/3  
Lims ID : WA 10/16/17

Line : 10  
Location : 10  
Sample Information :  
Sample Name : 0.08 Lipomed 28082014-B  
Lims ID : WA 10/16/17

Line : 11  
Location : 11  
Sample Information :  
Sample Name : lot 062217  
Lims ID :

Line : 12  
Location : 12  
Sample Information :  
Sample Name : lot 062217  
Lims ID :

Line : 13  
Location : 13  
Sample Information :  
Sample Name : 0.15 Lipomed 09022015-C  
Lims ID : WA 10/18/17

Line : 14  
Location : 14  
Sample Information :  
Sample Name : 0.4 Lipomed 08012015-C  
Lims ID : WA 10/16/17

Line : 15  
Location : 15  
Sample Information :  
Sample Name : 0.04 Lipomed 09022015-A  
Lims ID : WA 10/16/17

WA

Lims ID :

=====

Line : 16  
 Location : 16  
 Sample Information :  
 Sample Name : ~~blood~~ 0.20 ACQ 407041529/3  
 Lims ID : WA 10/16/17

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Line : 17  
 Location : 17  
 Sample Information :  
 Sample Name : blank 041717  
 Lims ID : WA 10/16/17

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Sequence Summary Parameters:

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Print Method(s):	No
Print Analysis reports:	No
Print Statistics for Calib. runs:	No
Print Statistics for Sample runs:	No
Summary style:	Sample Summary



WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.02 <i>Certificant PN 03241604</i>	Item number:	
Injection date:	7/26/2017 2:47:45 PM <i>WA 10/10/17</i>	Vial:	1
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
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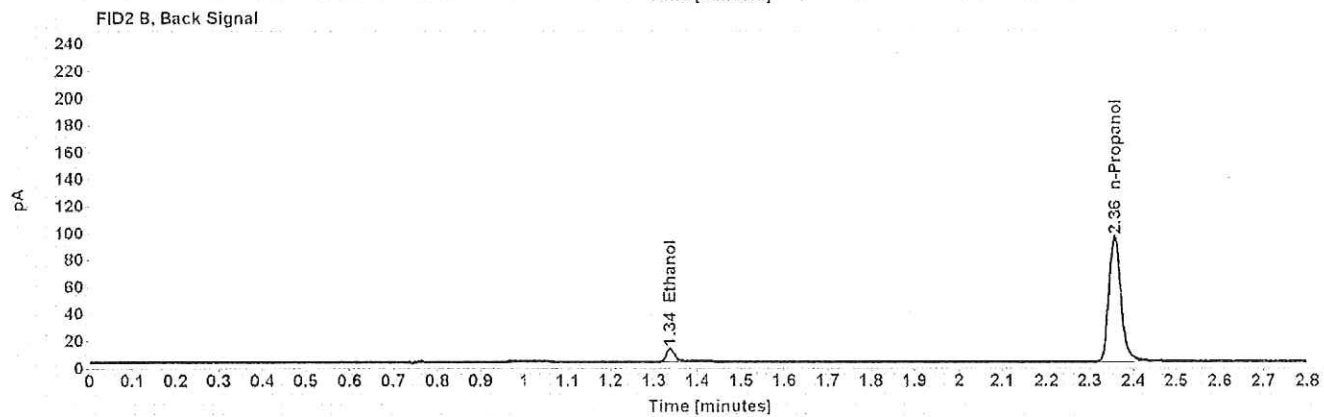
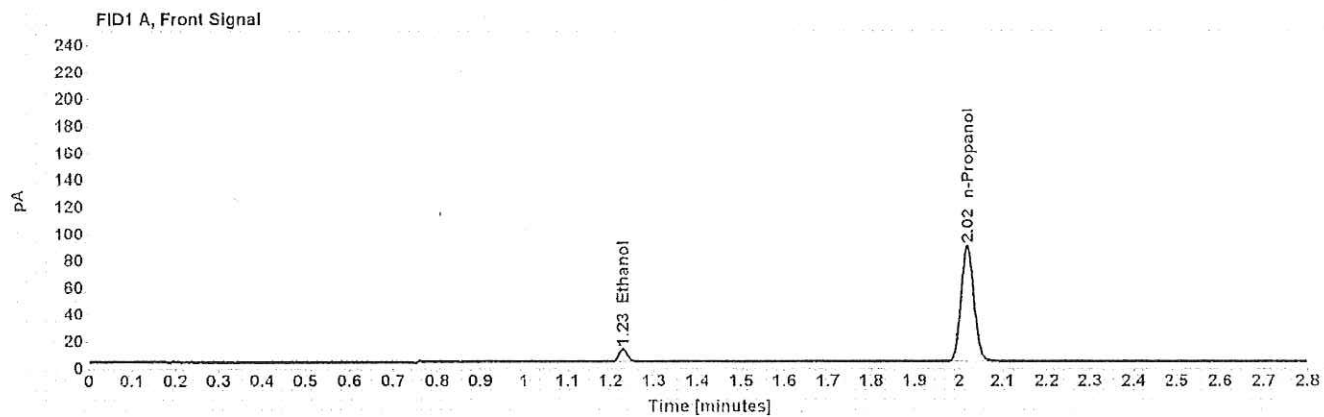


Table 1: FID 1 A (column DB-ALC1)

Compound	Time (min)	Peak Area
Ethanol	1.228	12.461
n-Propanol	2.019	178.874

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.337	12.547
n-Propanol	2.357	179.695



WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.1 <i>Certificant FNO6181501</i>	Item number:	
Injection date:	7/26/2017 2:51:45 PM <i>WA 10/16/17</i>	Vial:	2
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
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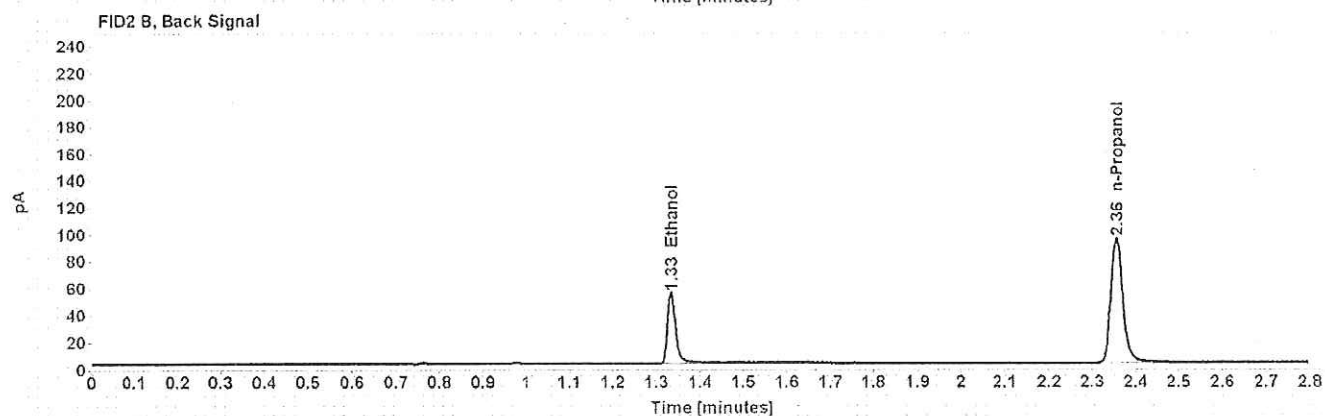
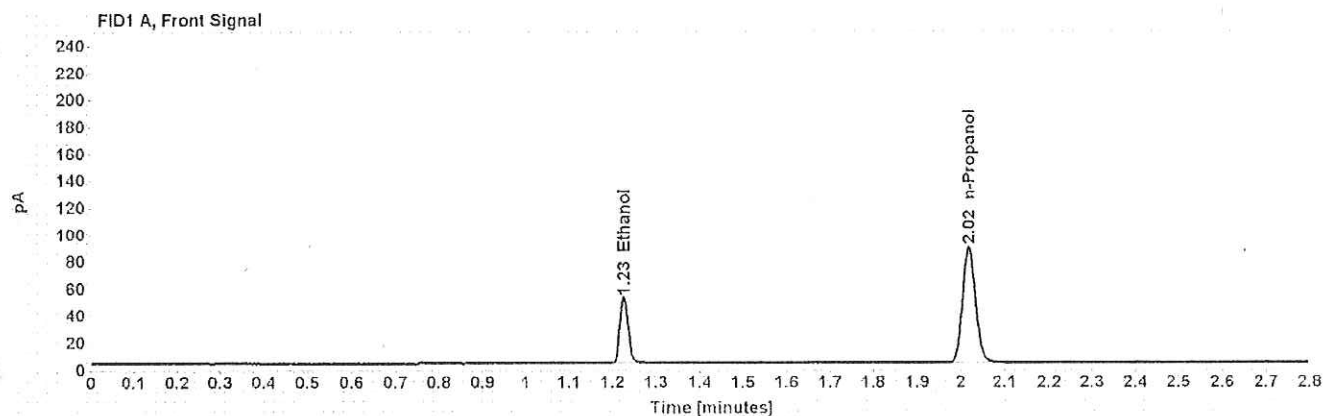


Table 1: FID 1 A (column DB-ALC1)

Compound	Time (min)	Peak Area
Ethanol	1.226	63.546
n-Propanol	2.018	178.452

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.333	66.383
n-Propanol	2.356	180.868

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.2 <i>Cerilliant FNO7201502</i>	Item number:	
Injection date:	7/26/2017 2:55:45 PM <i>AK 10/16/17</i>	Vial:	3
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\003F0301.D		

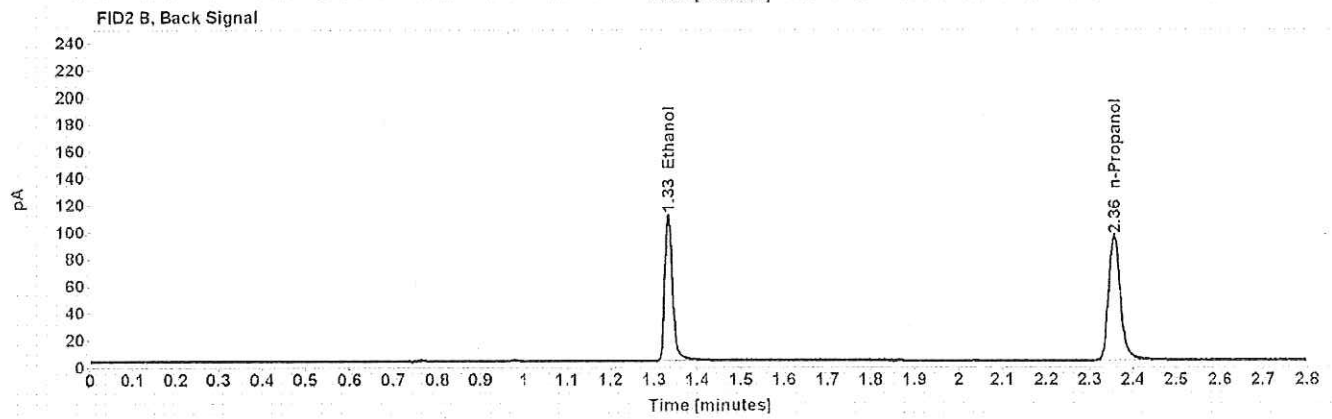
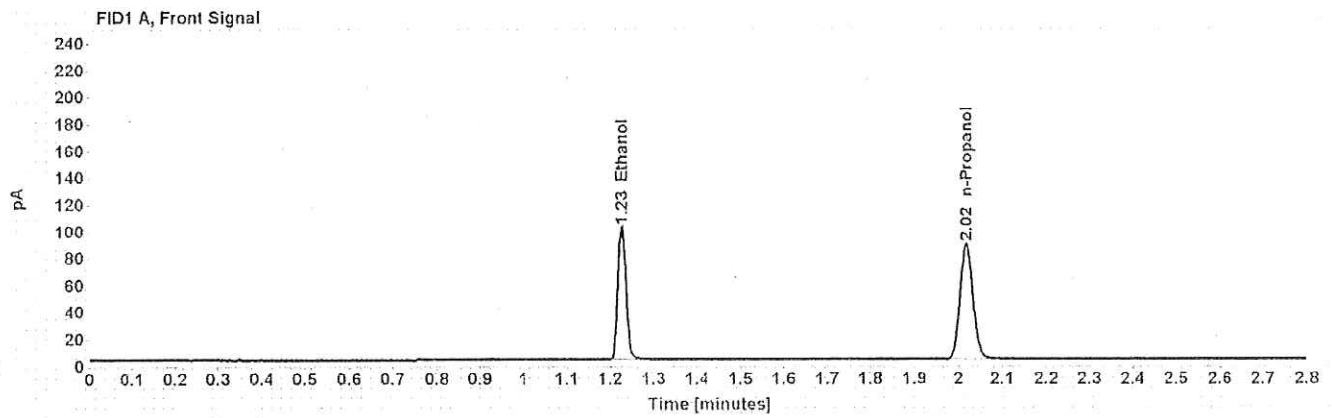


Table 1: FID 1 A (column DB-ALC1)

Compound	Time (min)	Peak Area
Ethanol	1.226	128.560
n-Propanol	2.018	178.156

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.333	134.059
n-Propanol	2.356	180.559

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.4 <i>Cerilliant FN11491402</i>	Item number:	
Injection date:	7/26/2017 2:59:45 PM <i>WA 10/16/17</i>	Vial:	4
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\004F0401.D		

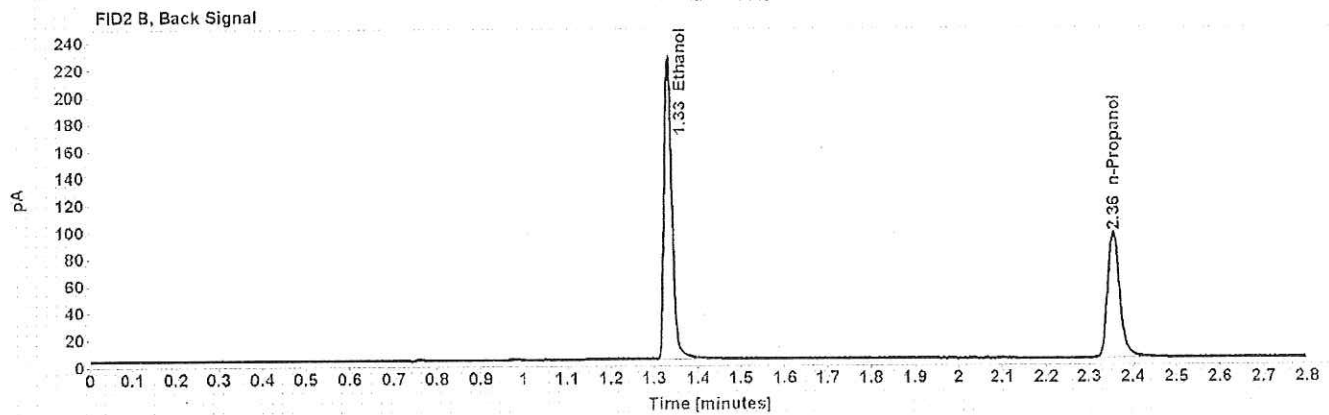
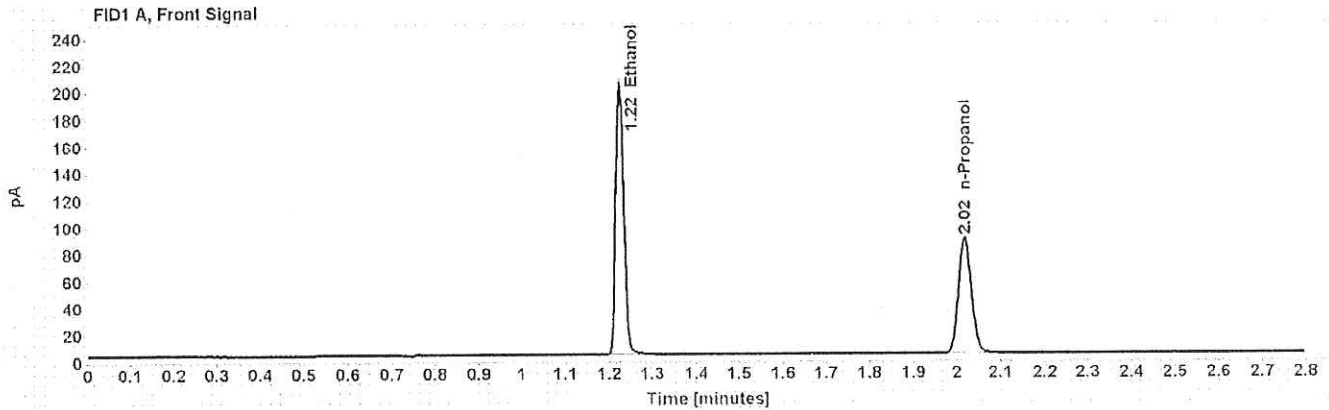


Table 1: FID 1 A (column DB-ALC1)

Compound	Time (min)	Peak Area
Ethanol	1.225	258.645
n-Propanol	2.018	178.906

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.331	271.811
n-Propanol	2.355	182.181

# Scottsdale Police Department Crime Lab Volatiles Analysis

WA

<b>Sample:</b> blank 04177 WA 10/16/17 <b>Injection date:</b> 7/26/2017 3:03:45 PM <b>Method:</b> ethanol quant.M <b>Instrument:</b> US14173023 CN14160045 <b>Data file:</b> C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\005F0501.D	<b>Item number:</b> <b>Vial:</b> 5 <b>Sequence:</b> PC w ISTD 072617 <b>Analyst:</b> Adrian
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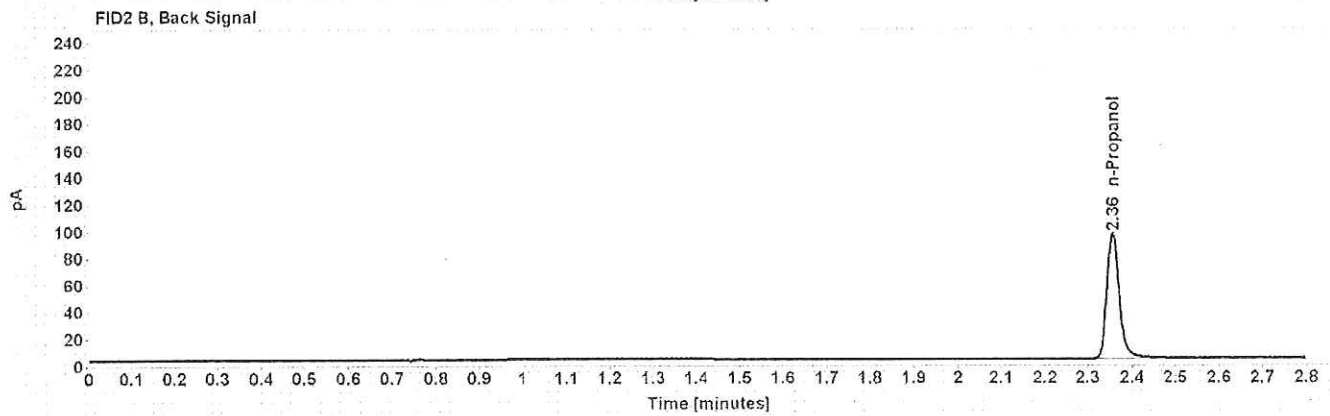
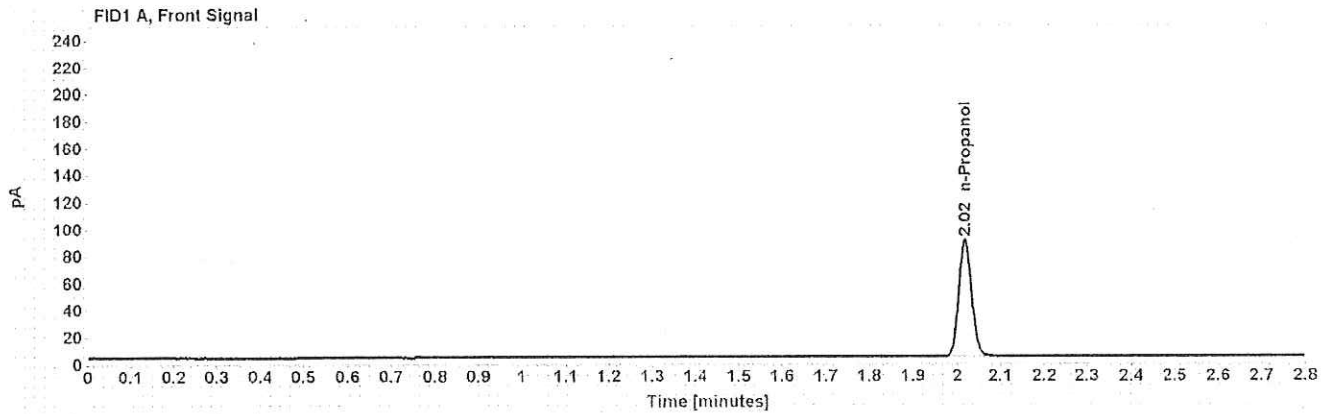


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
n-Propanol	-----	2.018	179.514

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
n-Propanol	2.356	182.349



# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample: mix 020917 WLA WA 10/16/17	Item number:
Injection date: 7/26/2017 3:07:46 PM	Vial: 6
Method: ethanol quant.M	Sequence: PC w ISTD 072617
Instrument: US14173023 CN14160045	Analyst: Adrian
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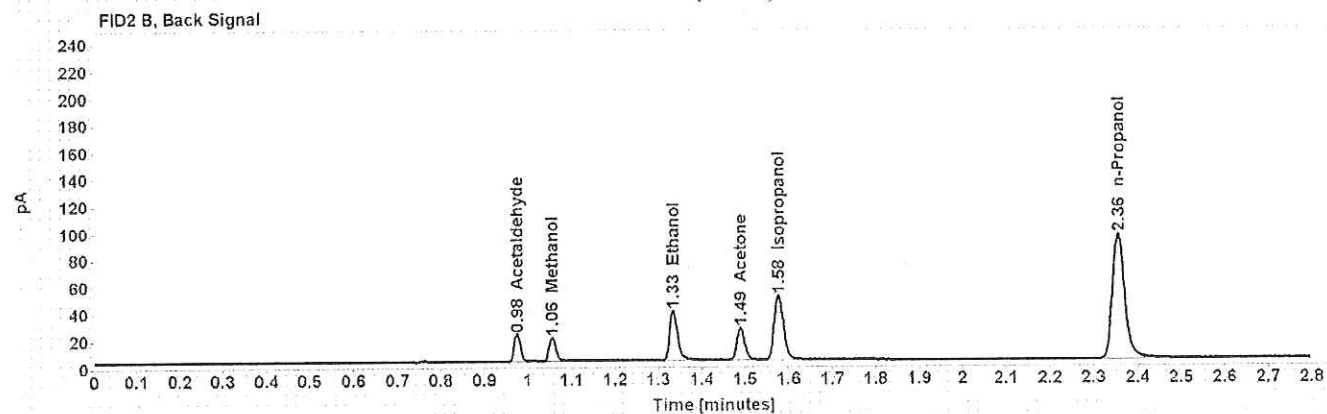
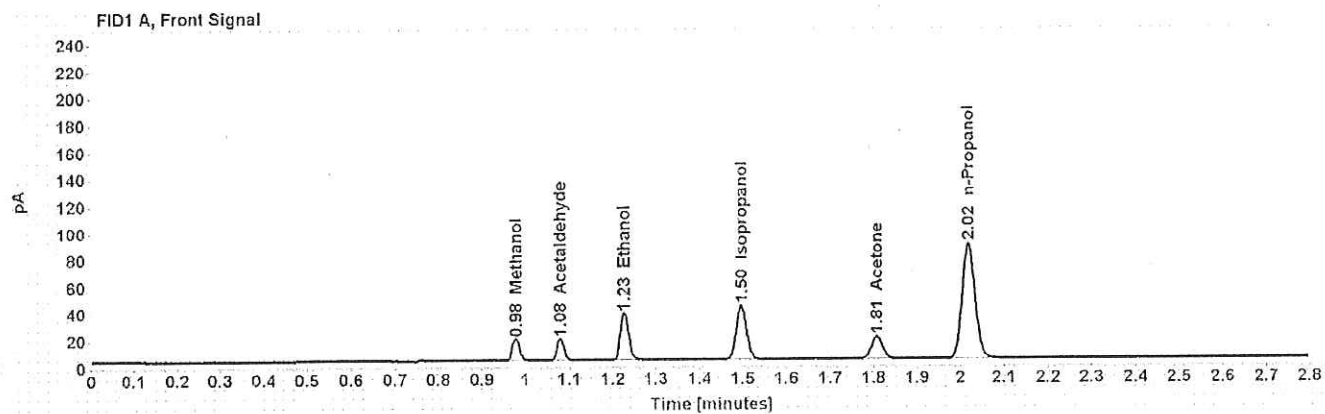


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
Methanol	-----	0.978	18.355
Acetaldehyde	-----	1.079	18.221
>Ethanol	0.0721	1.227	45.734
Isopropanol	-----	1.496	66.871
Acetone	-----	1.807	30.298
n-Propanol	-----	2.018	177.752

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Acetaldehyde	0.976	19.410
Methanol	1.055	18.730
Ethanol	1.334	46.556
Acetone	1.489	30.386
Isopropanol	1.577	69.936
n-Propanol	2.356	181.174

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.4 <i>Lipmed 08012015-C</i>	Item number:	
Injection date:	7/26/2017 3:12:00 PM <i>WA 10/16/17</i>	Vial:	7
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\007F0701.D		

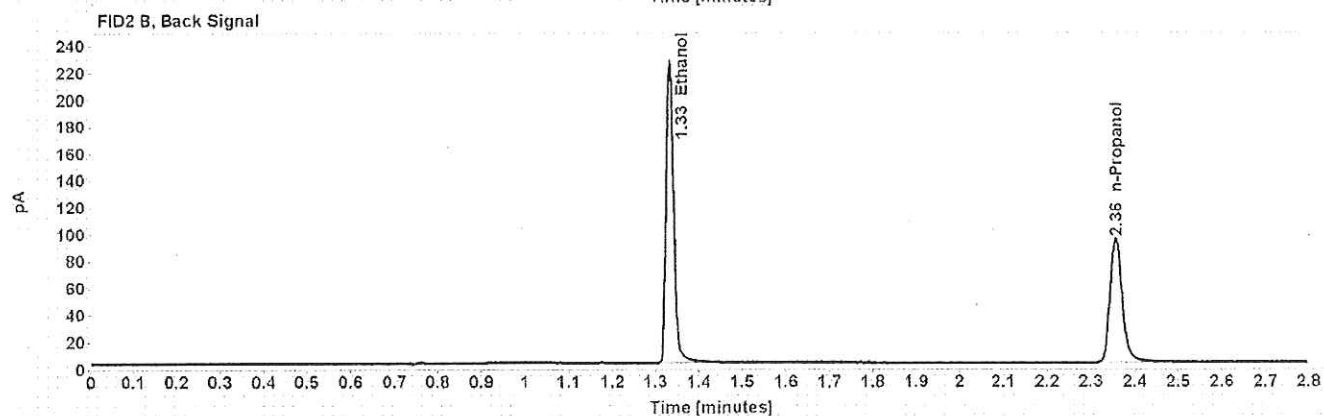
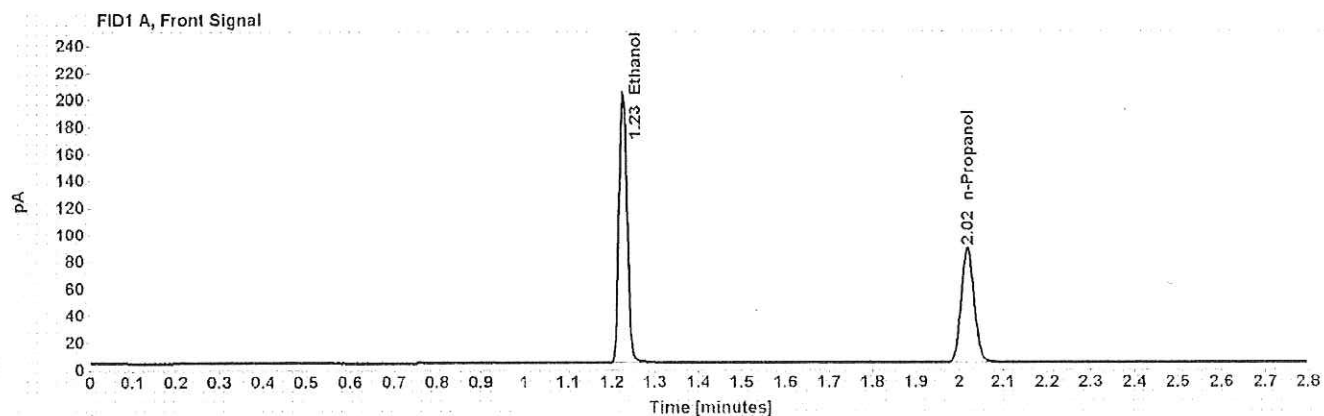


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.4048	1.226	258.282
n-Propanol	-----	2.018	176.522

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.332	270.355
n-Propanol	2.356	180.004

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.04 Lipomed 09022015-A	Item number:	
Injection date:	7/26/2017 3:16:01 PM WA 10/16/17	Vial:	8
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
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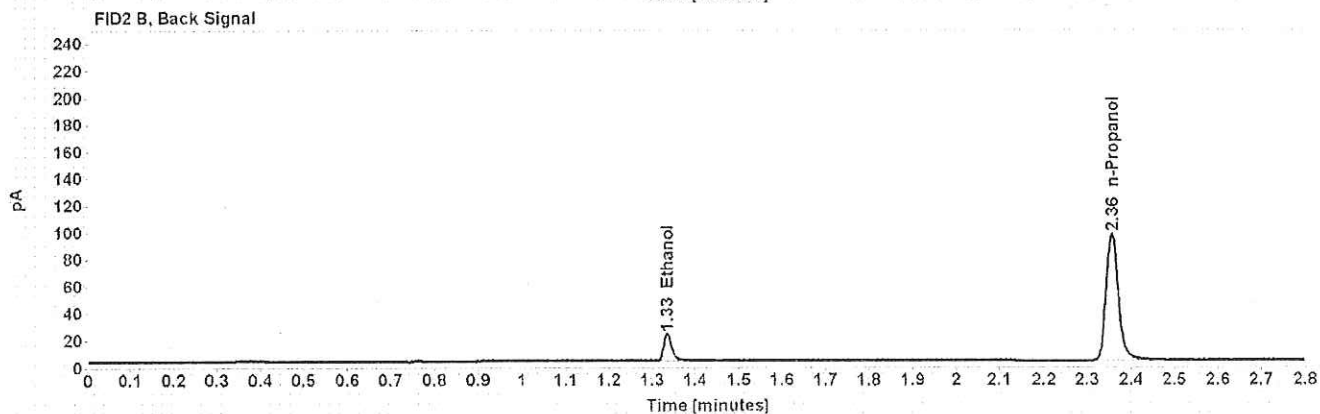
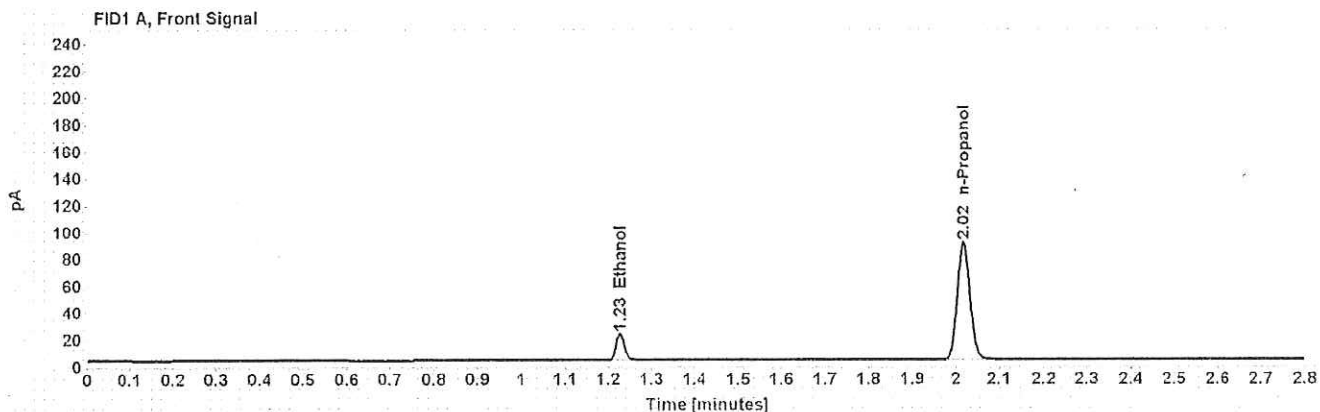


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.0402	1.227	25.564
n-Propanol	-----	2.018	180.671

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.335	25.743
n-Propanol	2.356	183.714

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	<del>blood</del> 0.20 ACQ 407041529/3	Item number:	
Injection date:	7/26/2017 3:20:00 PM WA 10/16/17	Vial:	9
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
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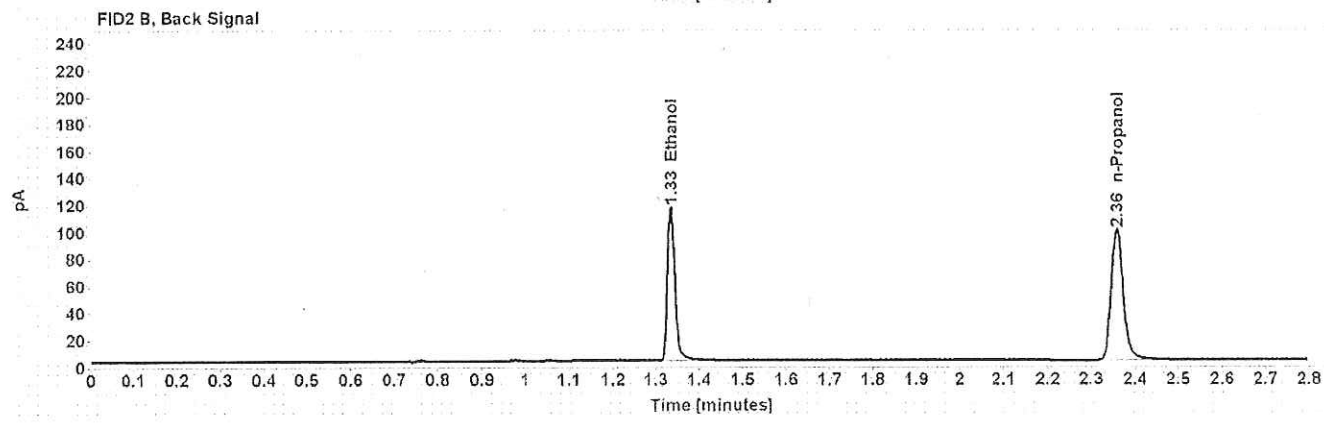
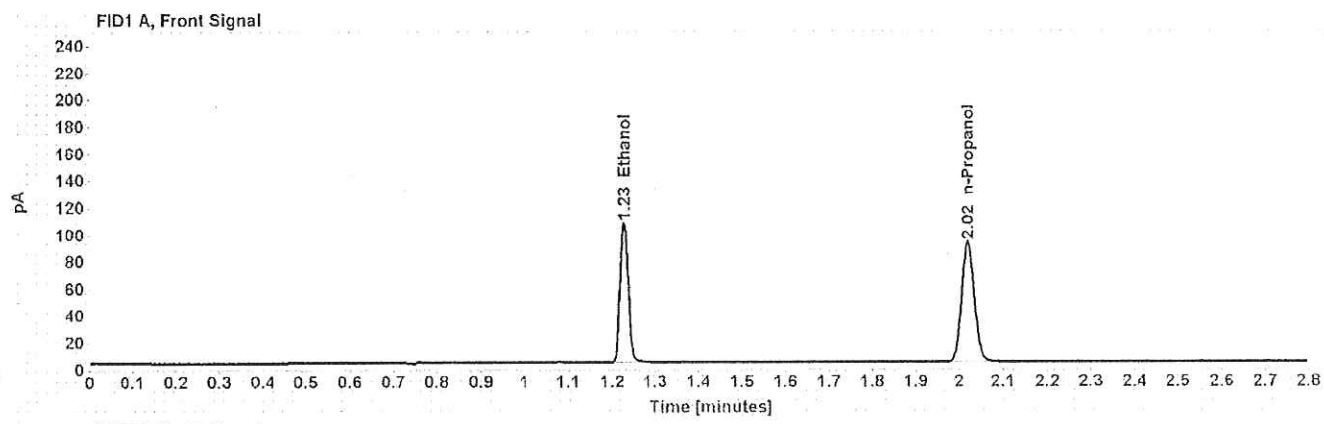


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.2024	1.227	134.873
n-Propanol	-----	2.019	184.921

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.334	140.043
n-Propanol	2.358	188.821



WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.08 <i>Lipomex 28082014-B</i>	Item number:	
Injection date:	7/26/2017 3:24:00 PM <i>10/16/17 WA</i>	Vial:	10
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
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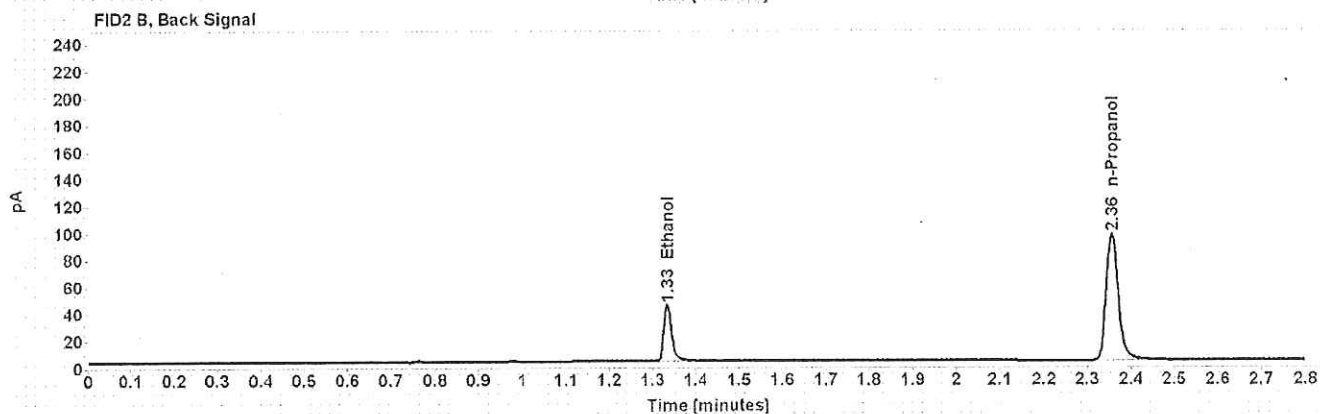
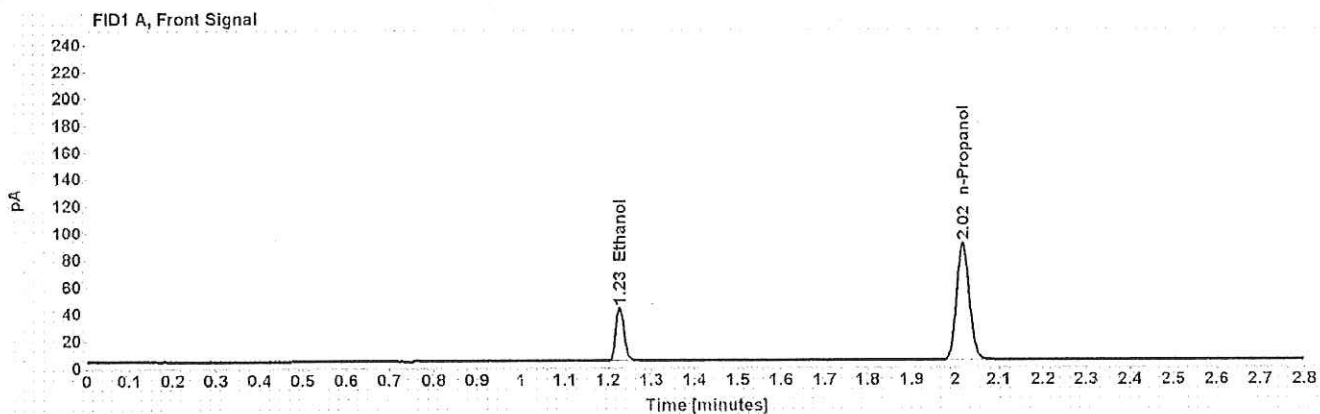


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.0802	1.227	51.585
n-Propanol	-----	2.018	179.946

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.334	52.625
n-Propanol	2.356	183.225

WFA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	lot 062217	Item number:	
Injection date:	7/26/2017 3:28:01 PM	Vial:	11
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
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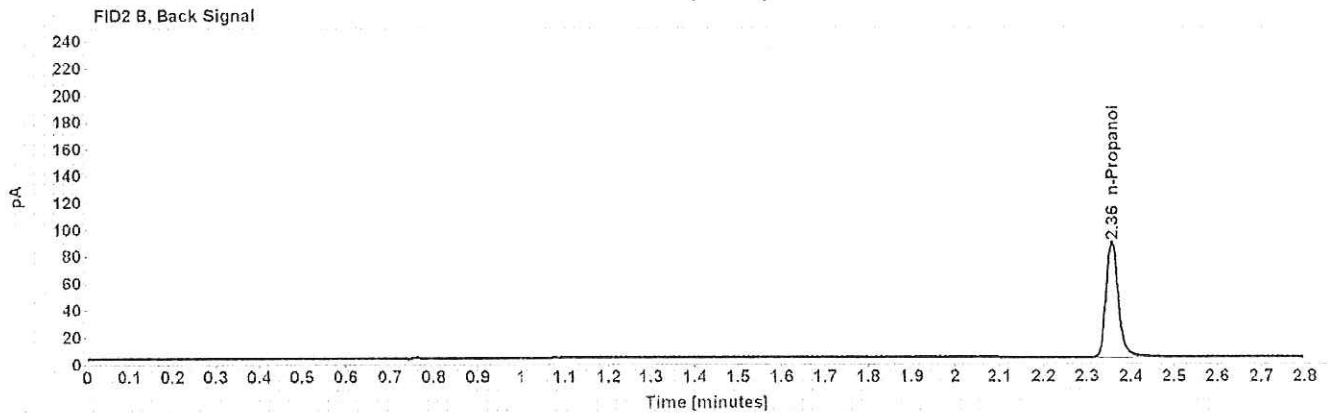
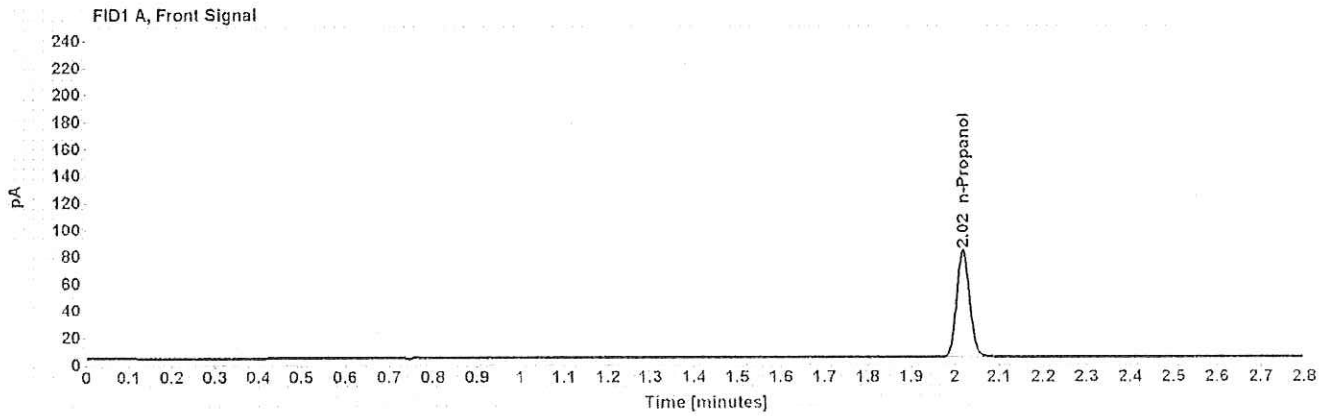


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
n-Propanol	-----	2.018	164.382

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
n-Propanol	2.356	167.217

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	lot 062217	Item number:	
Injection date:	7/26/2017 3:32:00 PM	Vial:	12
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
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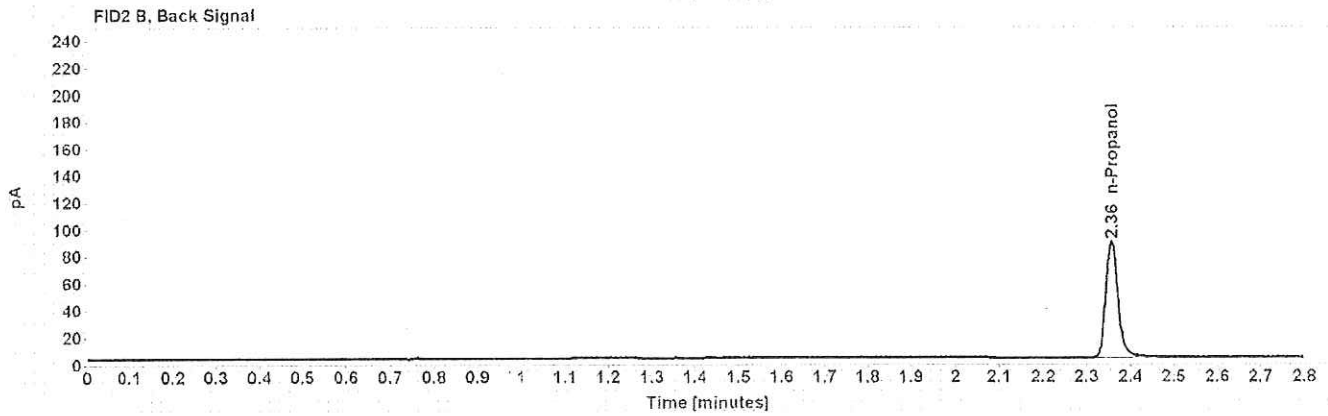
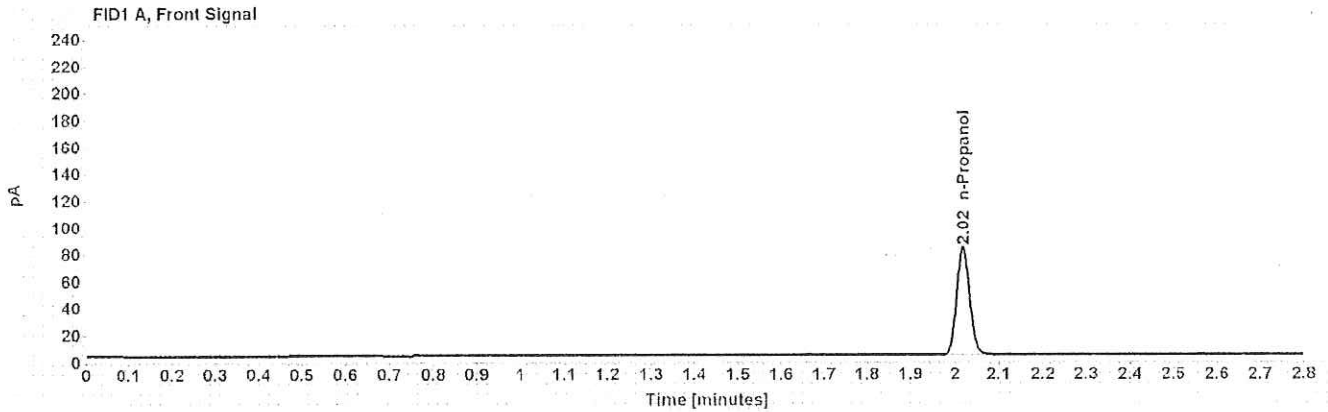


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
n-Propanol	-----	2.018	166.021

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
n-Propanol	2.356	168.584

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.15 <i>Lipmed 09022015-C</i>	Item number:	
Injection date:	7/26/2017 3:36:15 PM <i>WA 10/16/17</i>	Vial:	13
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\013F1301.D		

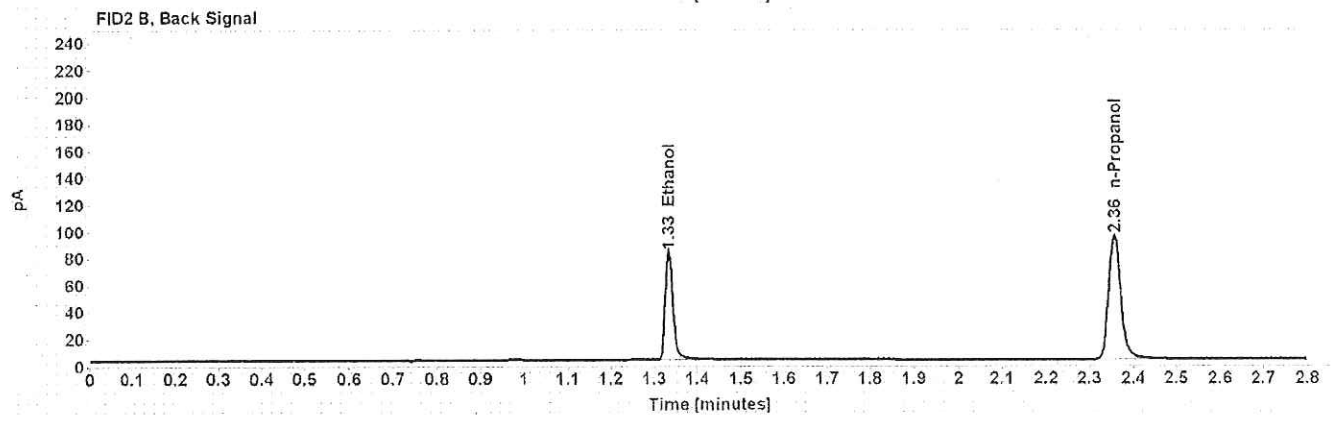
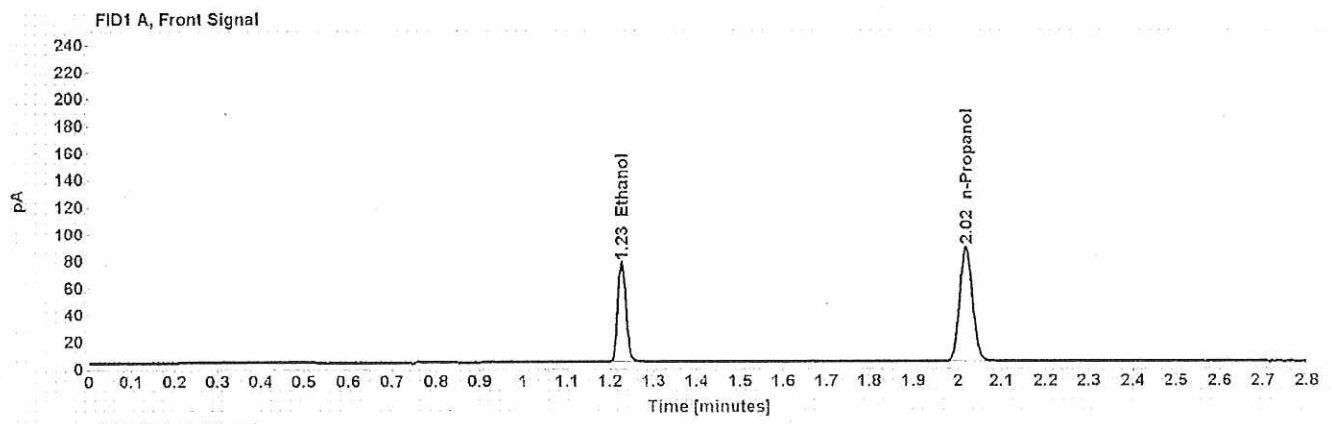


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.1518	1.226	96.210
n-Propanol	-----	2.018	176.216

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.333	99.429
n-Propanol	2.356	180.002



WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	0.4 <i>Lipomed 08012015-C</i>	Item number:	
Injection date:	7/26/2017 3:40:15 PM <i>WA 10/16/17</i>	Vial:	14
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\014F1401.D		

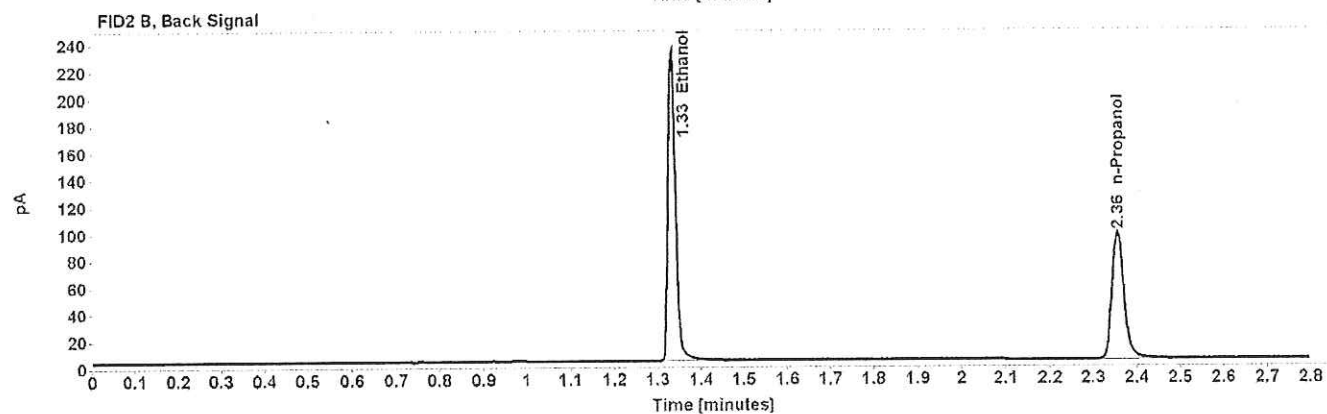
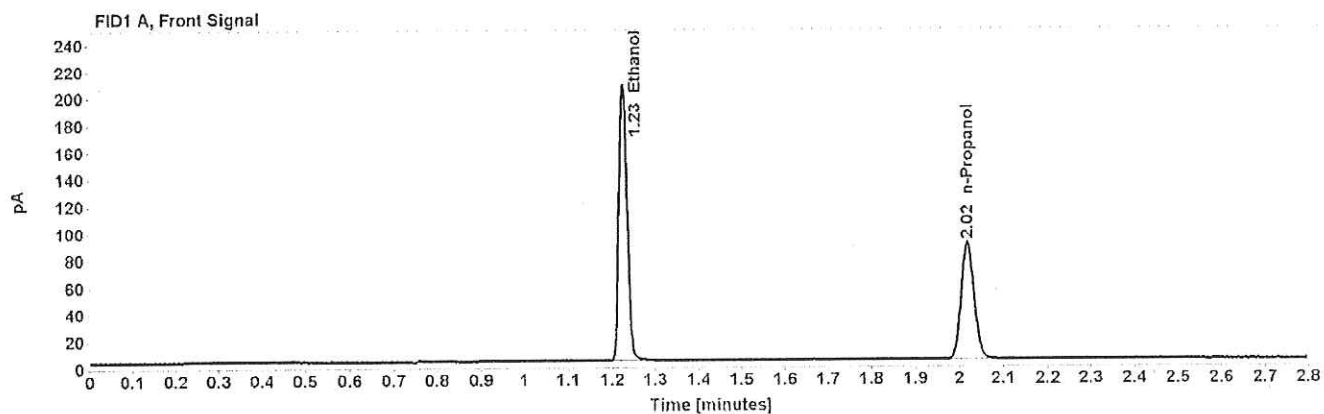


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.4075	1.226	265.363
n-Propanol	-----	2.018	180.190

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.333	278.117
n-Propanol	2.356	183.983

# Scottsdale Police Department Crime Lab Volatiles Analysis

WA

Sample:	0.04 <i>Lipomed 09022015-A</i>	Item number:	
Injection date:	7/26/2017 3:44:15 PM <i>WA 10/16/17</i>	Vial:	15
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\015F1501.D		

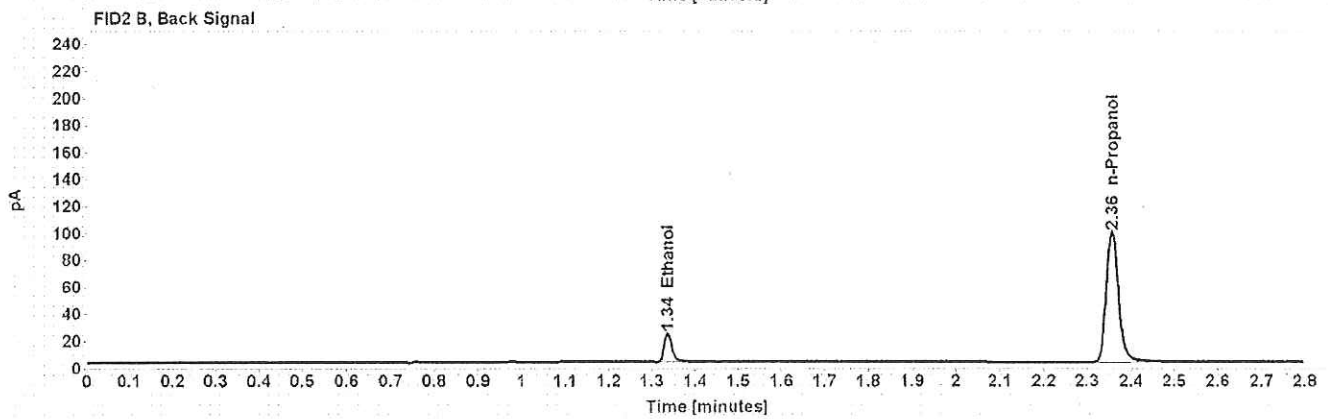
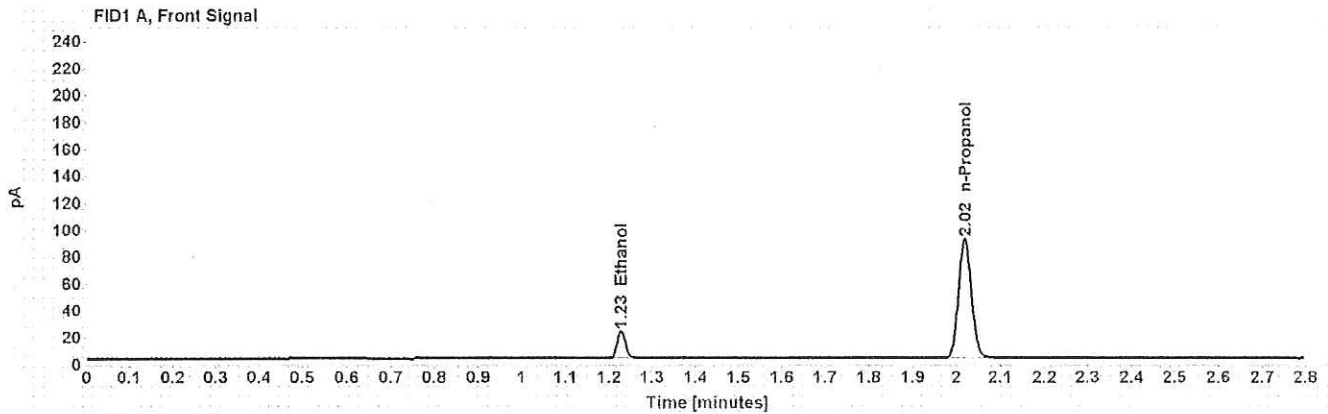


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.0407	1.228	26.355
n-Propanol	-----	2.019	183.975

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.336	26.496
n-Propanol	2.357	187.123

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

<b>Sample:</b> <del>blood</del> 0.20 ACQ 407044529/3 <b>Injection date:</b> 7/26/2017 3:48:16 PM <b>Method:</b> ethanol quant.M <b>Instrument:</b> US14173023 CN14160045 <b>Data file:</b> C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\016F1601.D	<b>Item number:</b> <b>Vial:</b> 16 <b>Sequence:</b> PC w ISTD 072617 <b>Analyst:</b> Adrian WA 10/16/17
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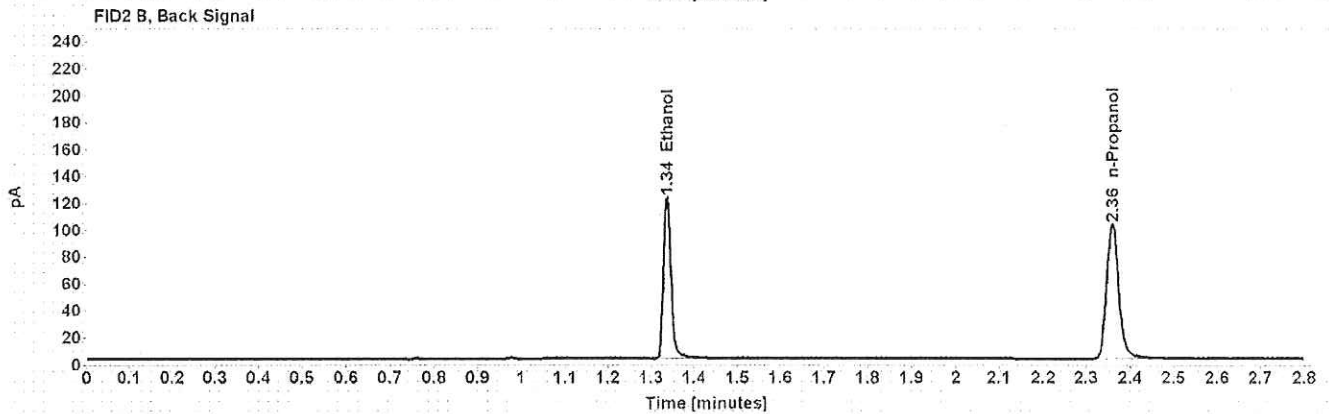
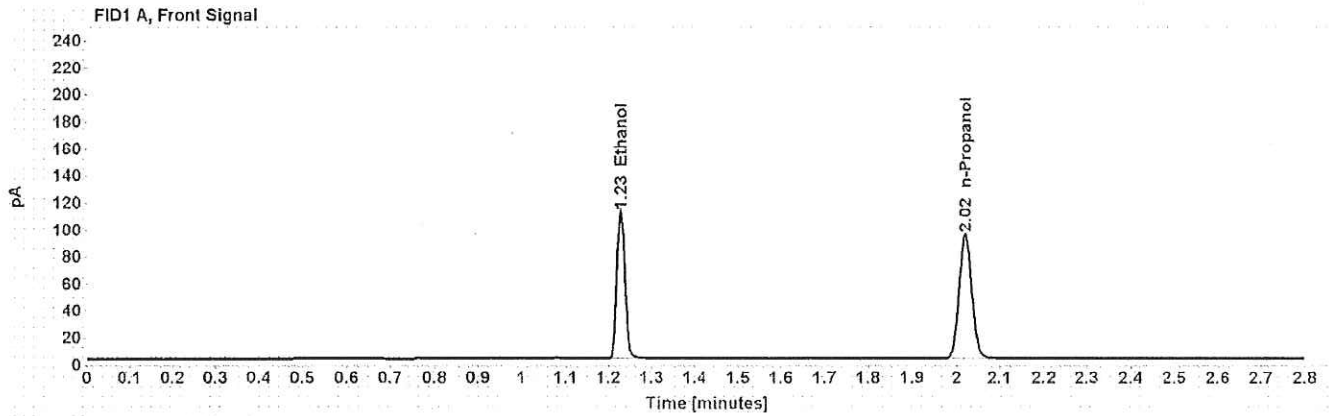


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
>Ethanol	0.2054	1.228	141.191
n-Propanol	-----	2.021	190.737

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
Ethanol	1.336	146.858
n-Propanol	2.359	194.374

WA

# Scottsdale Police Department Crime Lab Volatiles Analysis

Sample:	blank 041717 WA 10/16/17	Item number:	
Injection date:	7/26/2017 3:52:15 PM	Vial:	17
Method:	ethanol quant.M	Sequence:	PC w ISTD 072617
Instrument:	US14173023 CN14160045	Analyst:	Adrian
Data file:	C:\Chem32\1\Data\rsdtest3\PC w ISTD 072617\017F1701.D		

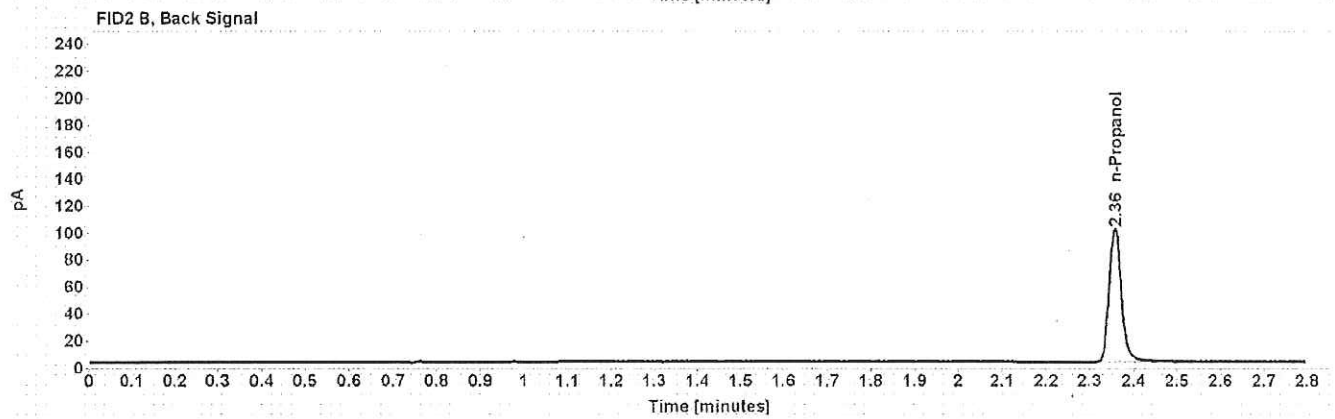
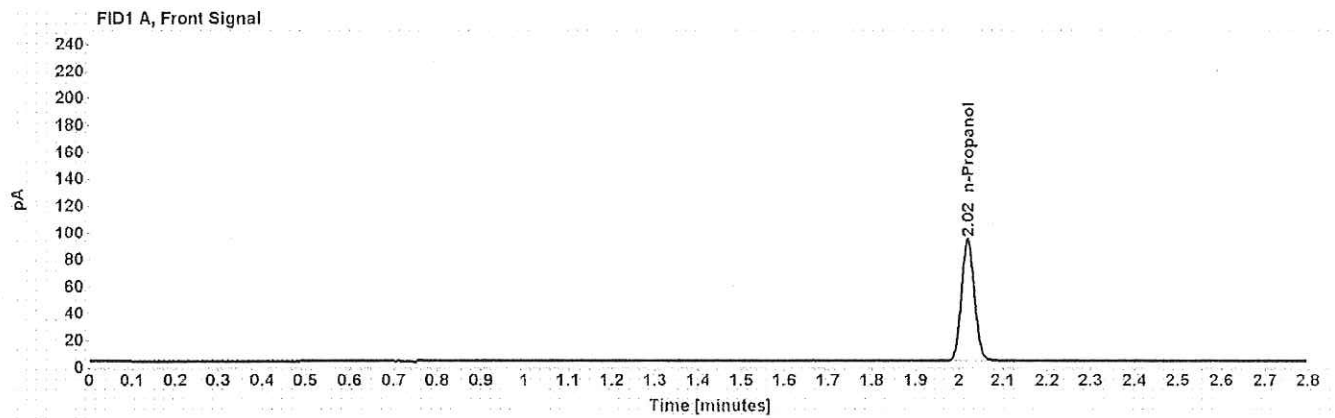


Table 1: FID 1 A (column DB-ALC1)

Compound	Amount (g/100mL)	Time (min)	Peak Area
n-Propanol	-----	2.019	187.497

Table 2: FID 2 B (column DB-ALC2)

Compound	Time (min)	Peak Area
n-Propanol	2.357	192.169