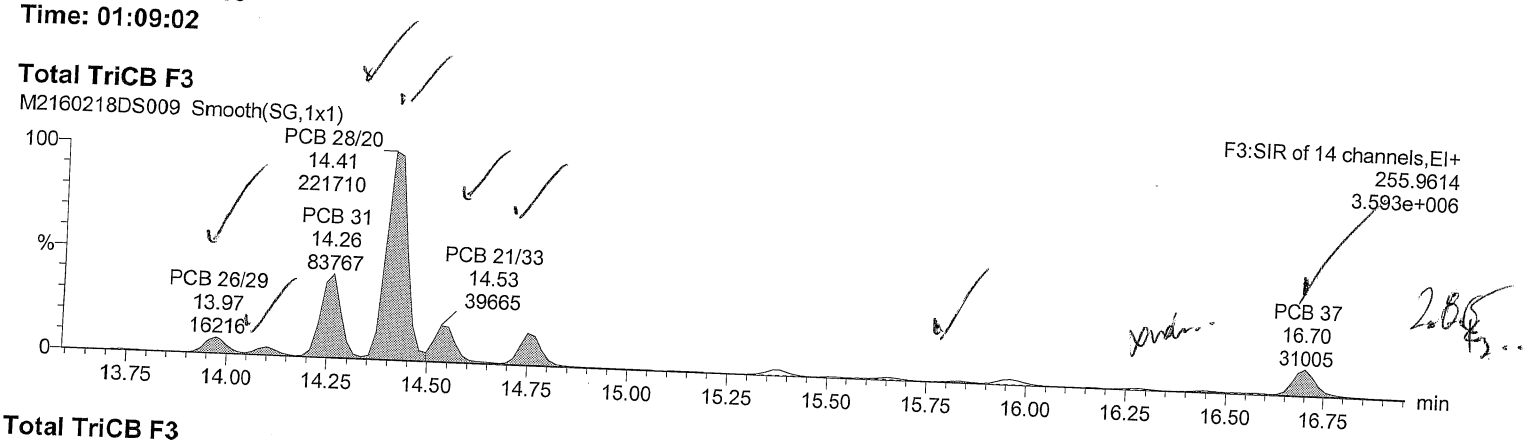
Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

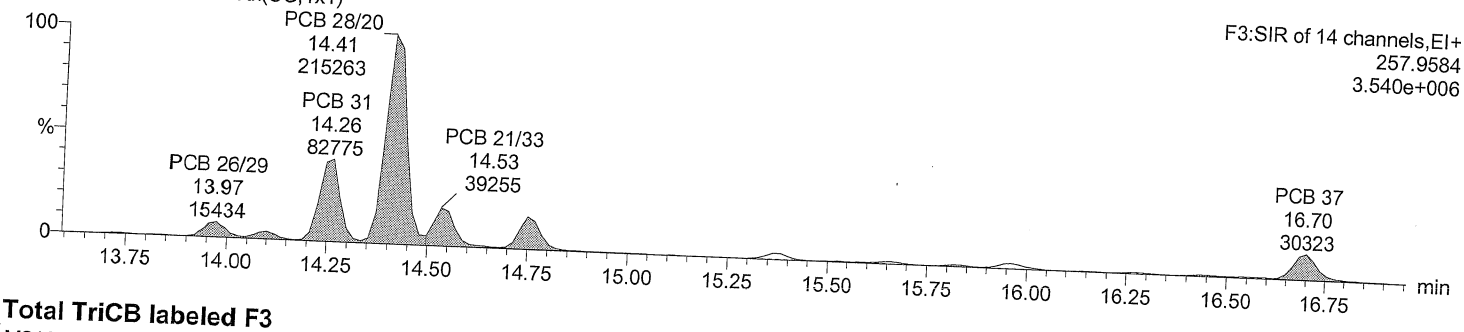
Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

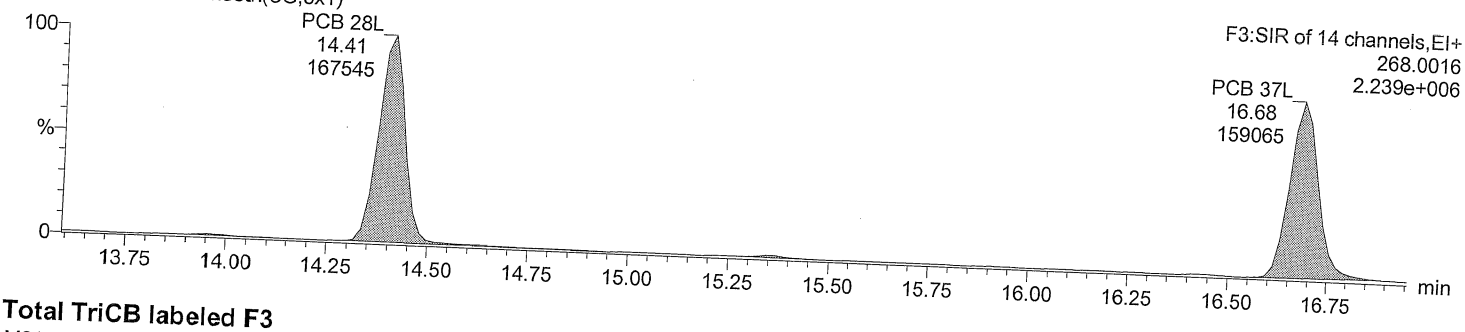
Total TriCB F3
M2160218DS009 Smooth(SG,1x1)



Total TriCB F3
M2160218DS009 Smooth(SG,1x1)



Total TriCB labeled F3
M2160218DS009 Smooth(SG,3x1)



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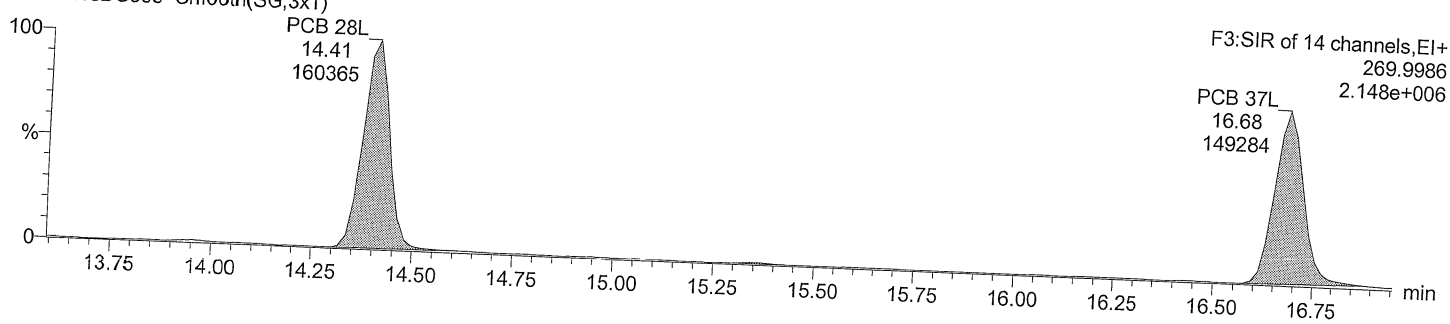

AutoSpec - Ultima 3

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Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
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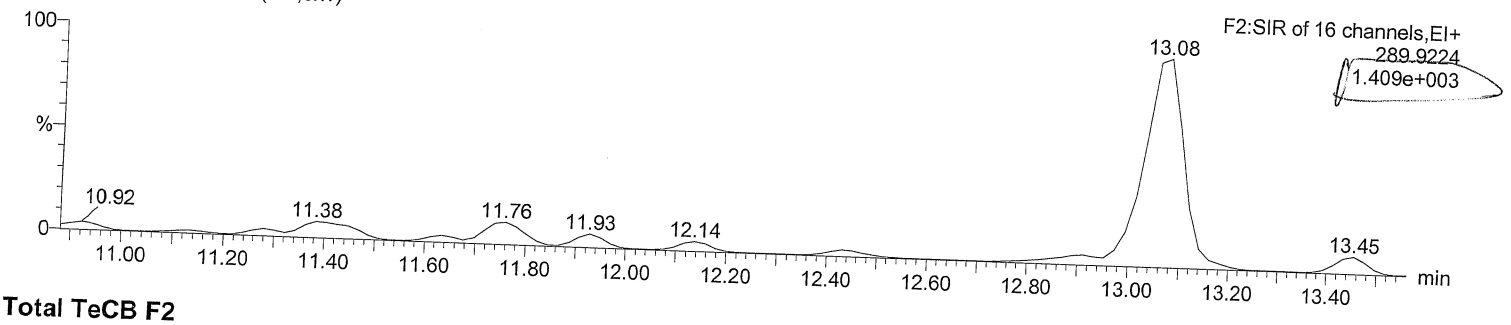
ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total TeCB F2
M2160218DS009 Smooth(SG,3x1)



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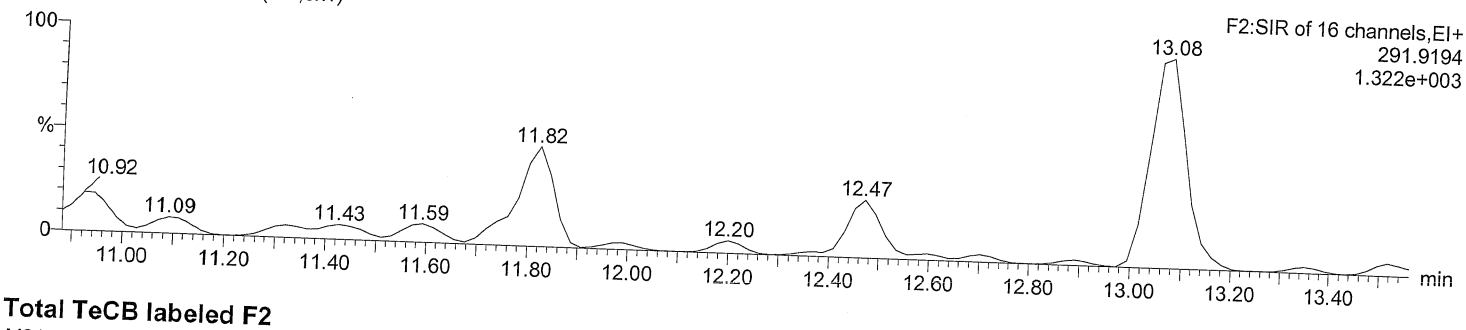

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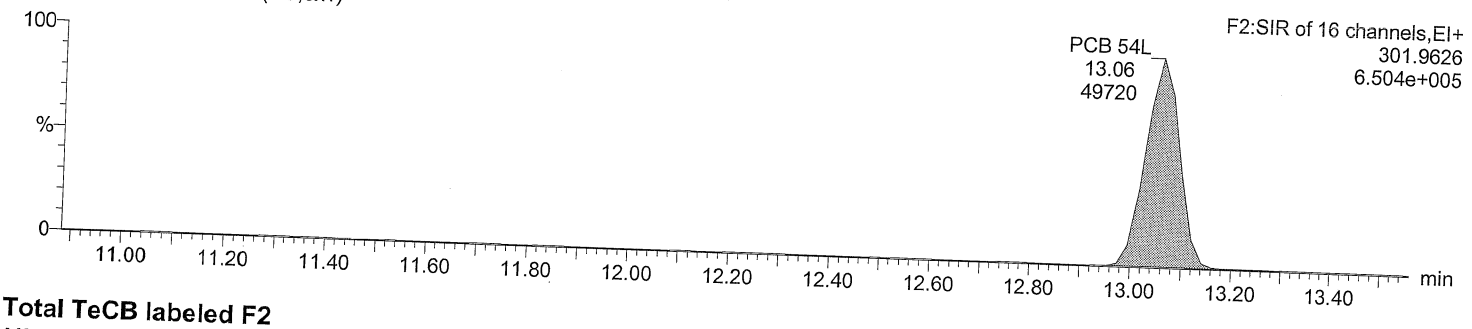

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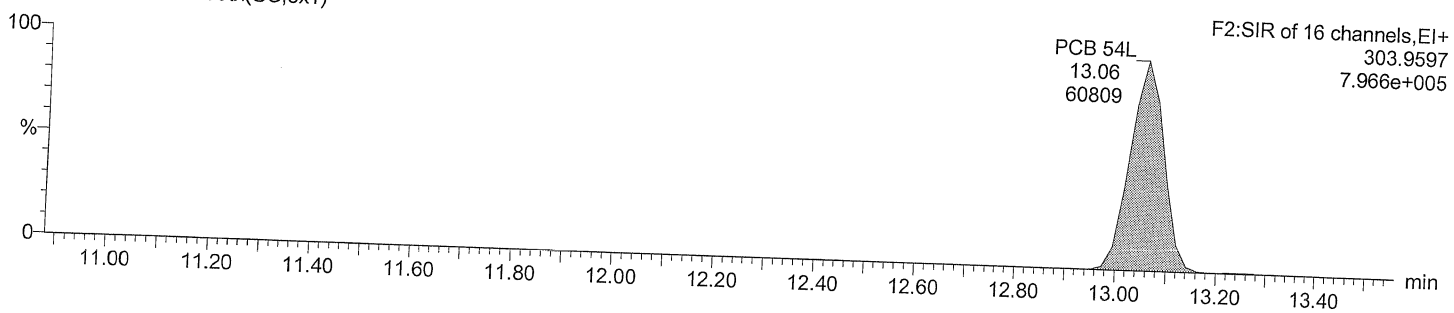

AutoSpec - Ultima 3

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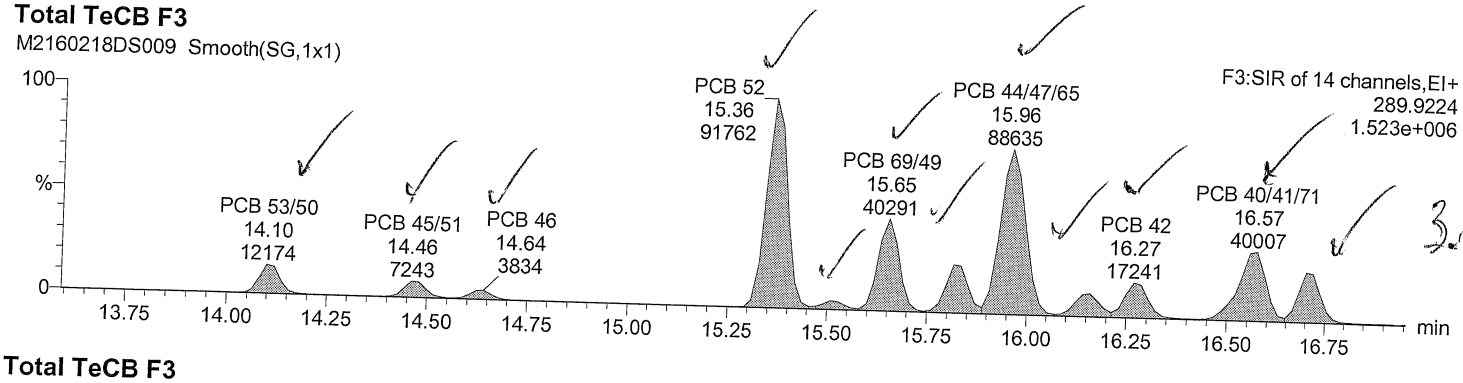
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total TeCB F3
M2160218DS009 Smooth(SG,1x1)



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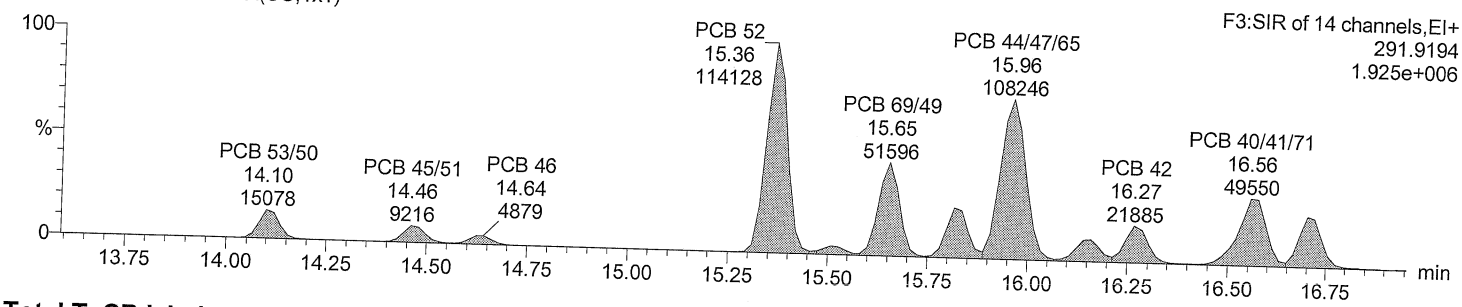

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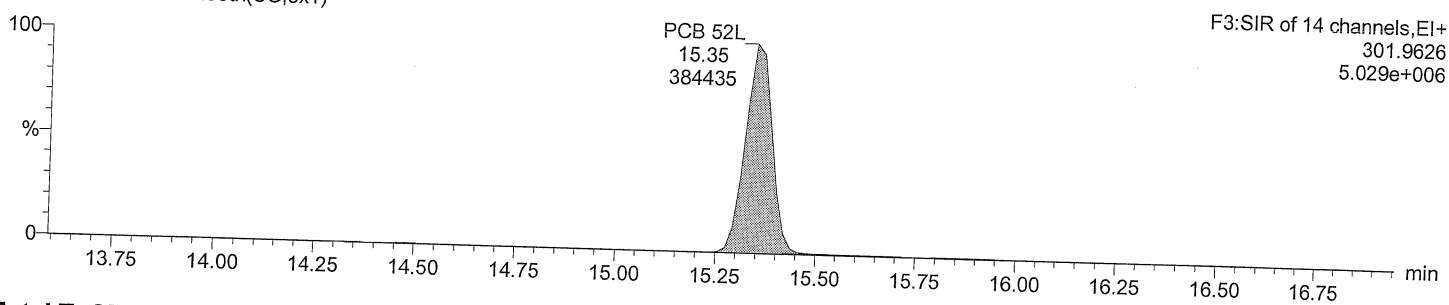

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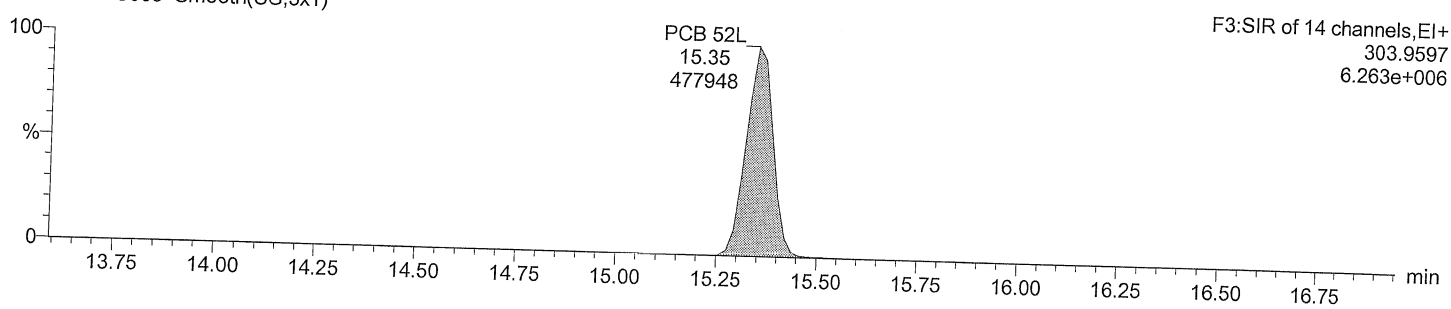

AutoSpec - Ultima 3

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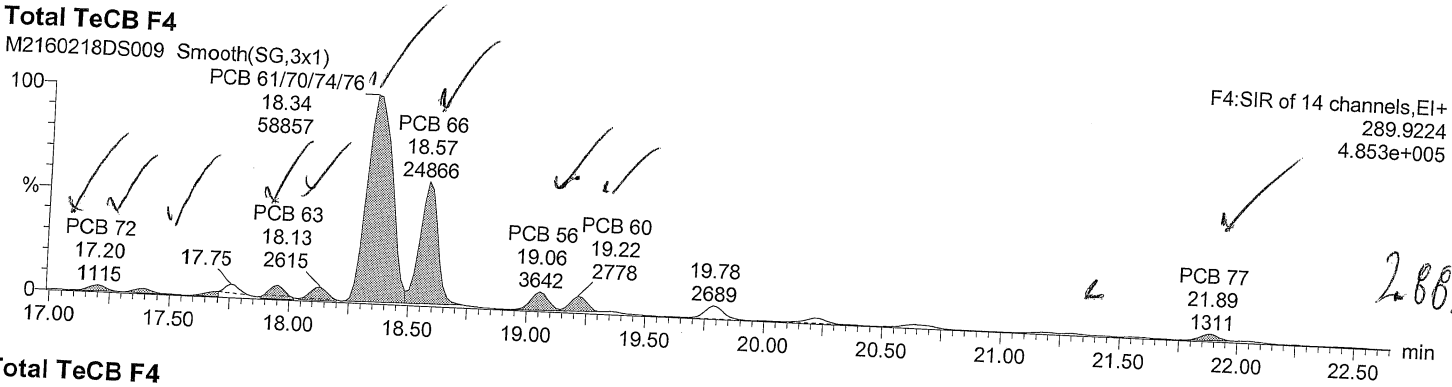
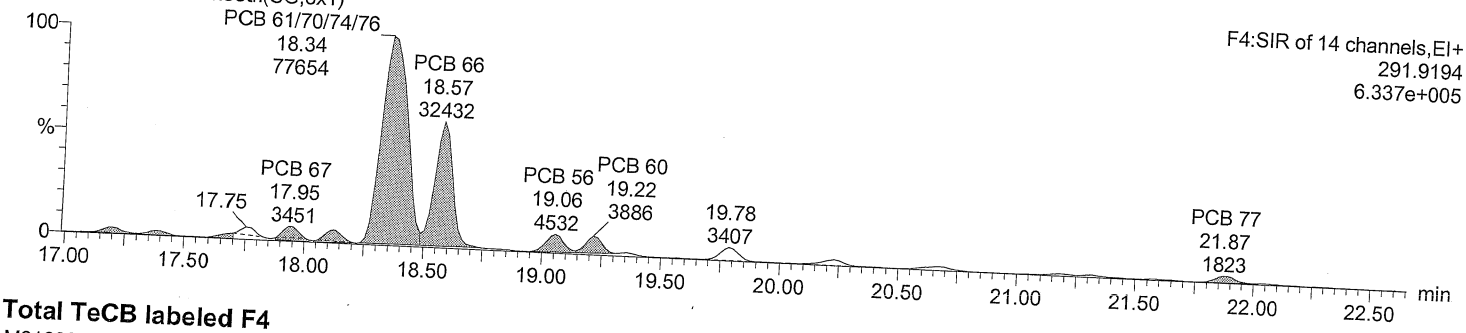
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total TeCB F4
M2160218DS009 Smooth(SG,3x1)



Total TeCB F4
M2160218DS009 Smooth(SG,3x1)



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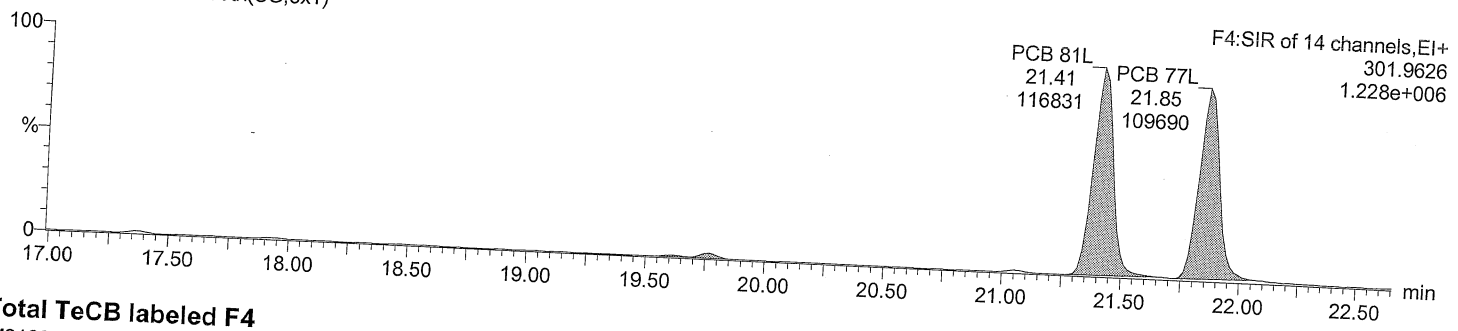

Total TeCB labeled F4
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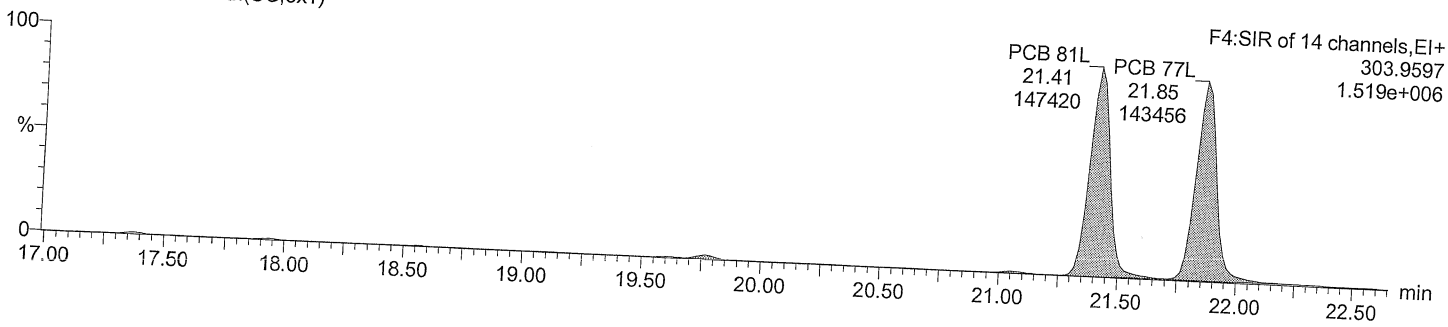

AutoSpec - Ultima 3

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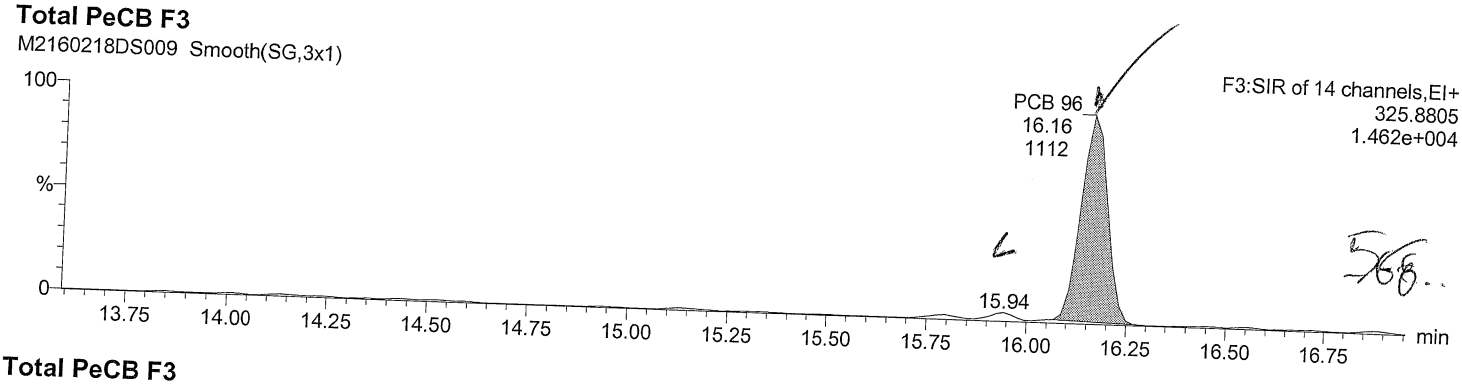
Time: 01:09:02

Total PeCB F3
M2160218DS009 Smooth(SG,3x1)



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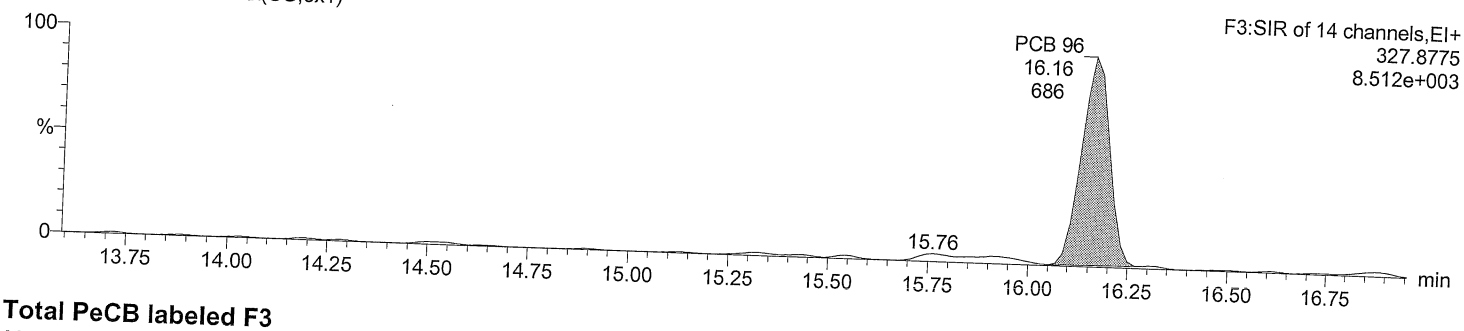

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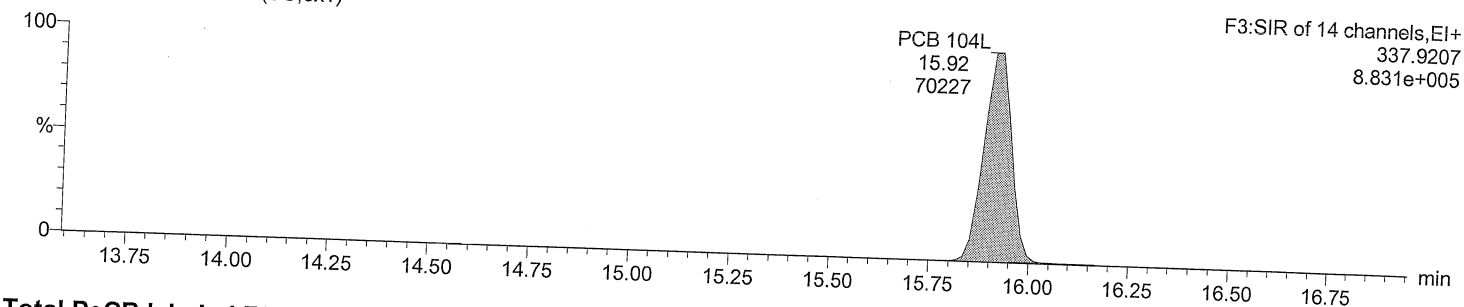

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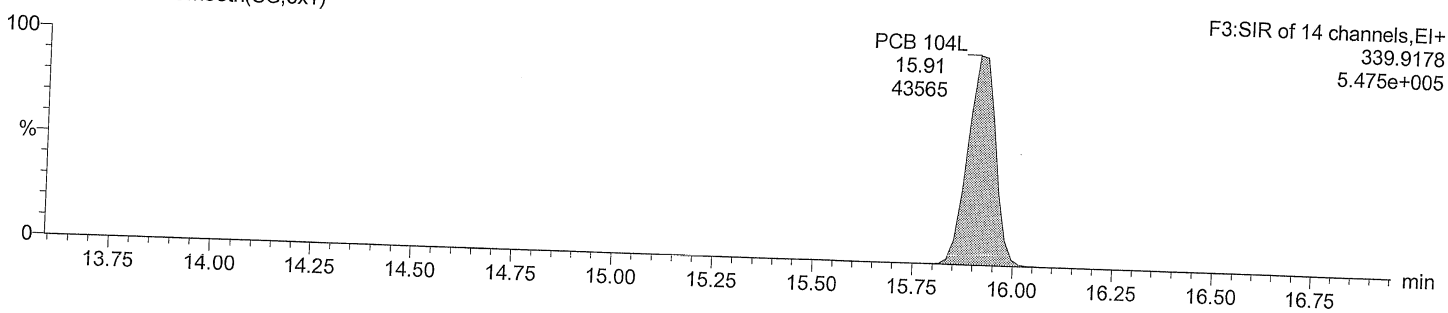

AutoSpec - Ultima 3

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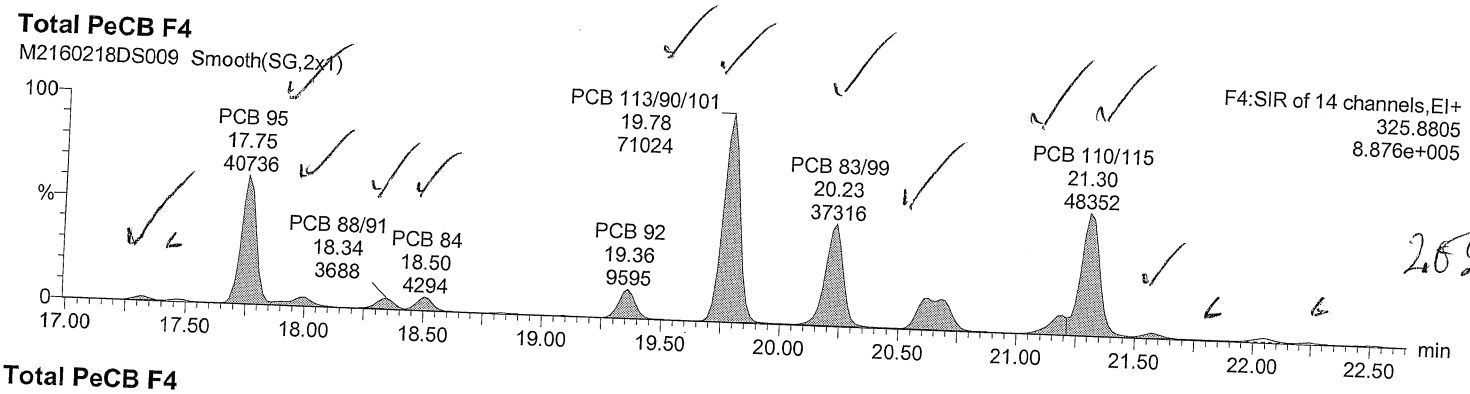
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total PeCB F4
M2160218DS009 Smooth(SG,2x1)



Total PeCB F4
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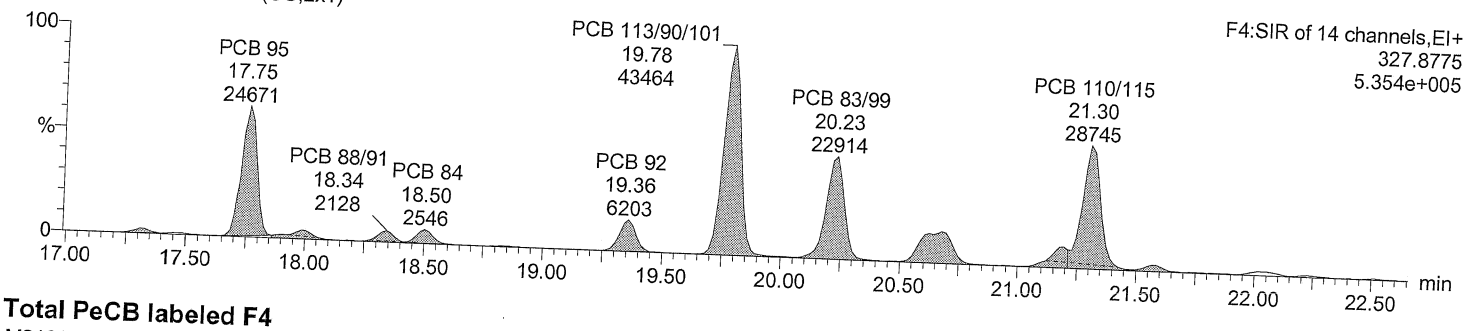

Total PeCB labeled F4
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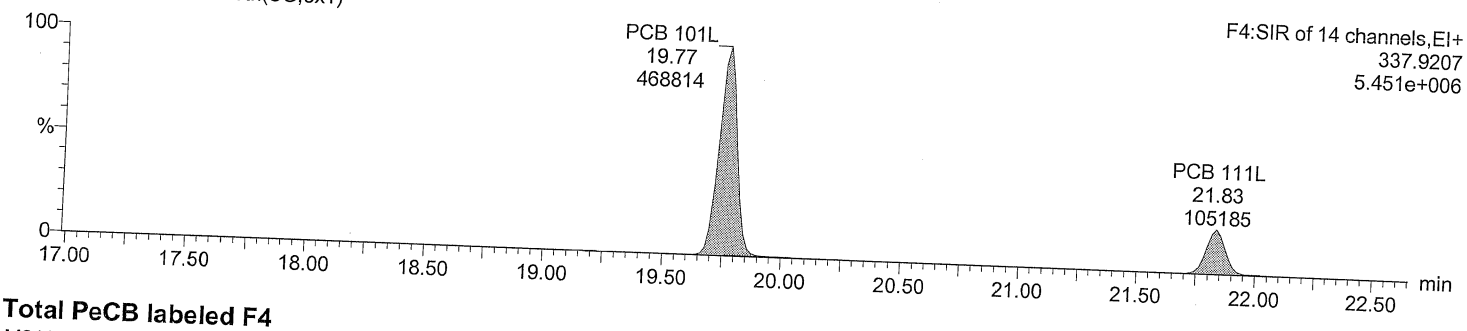

Total PeCB labeled F4
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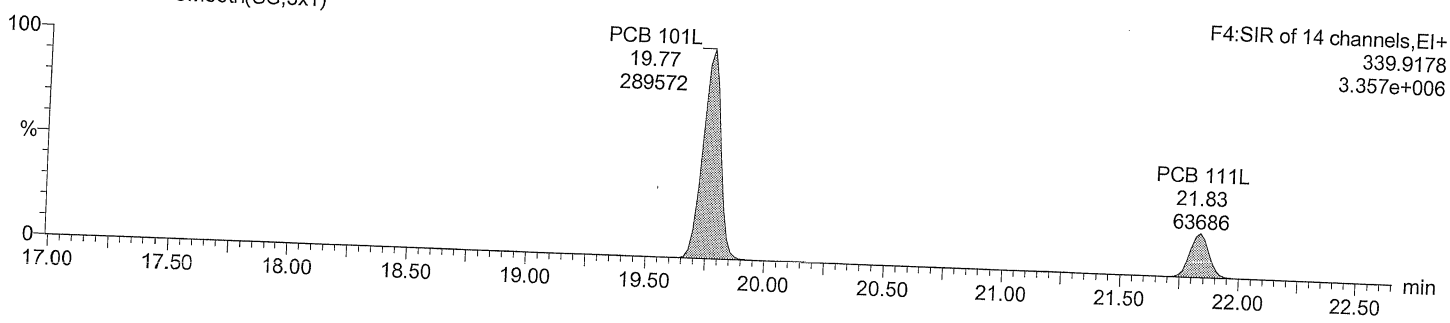

AutoSpec - Ultima 3

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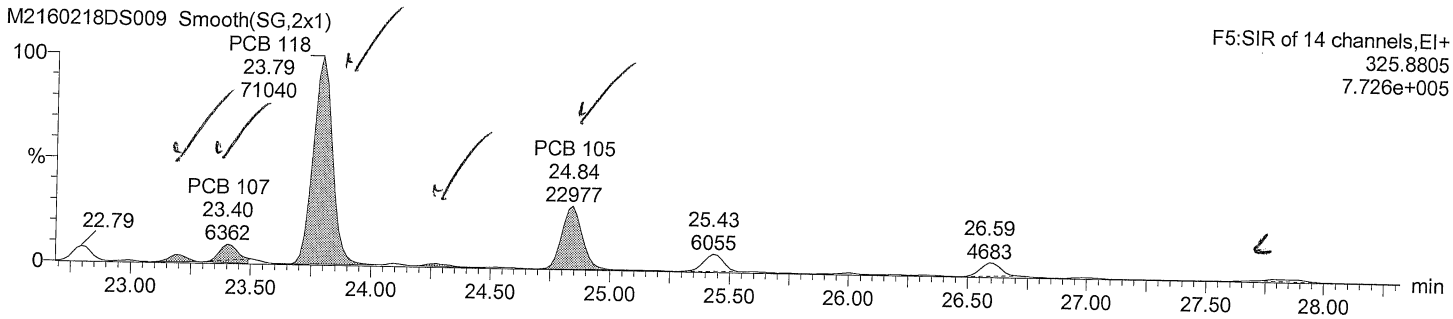
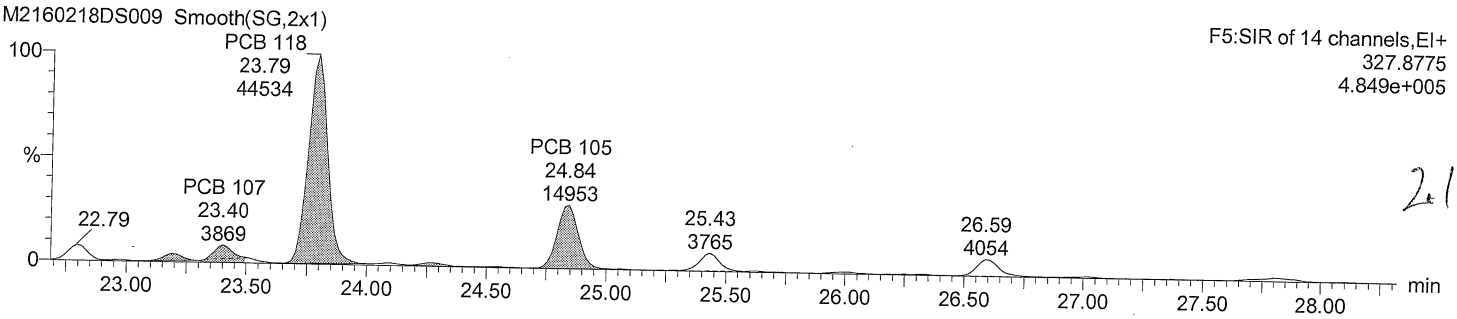
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total PeCB F5



Total PeCB F5



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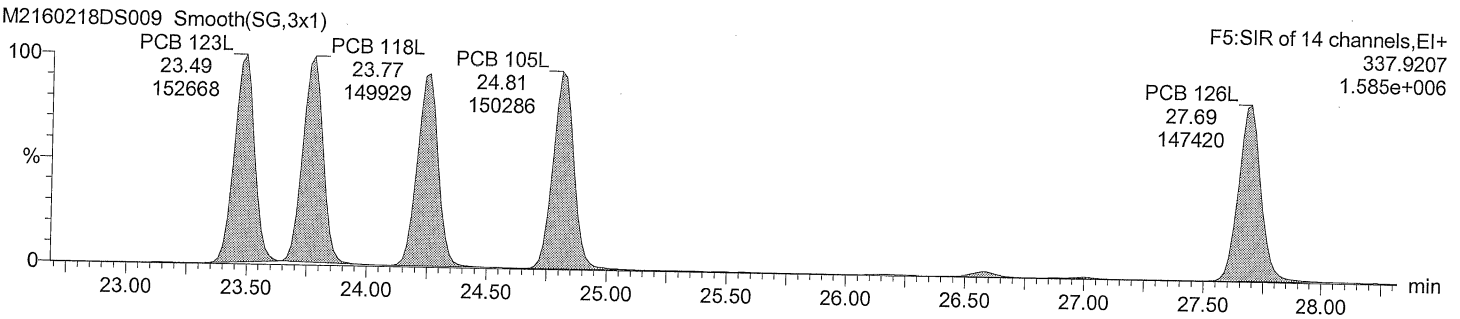
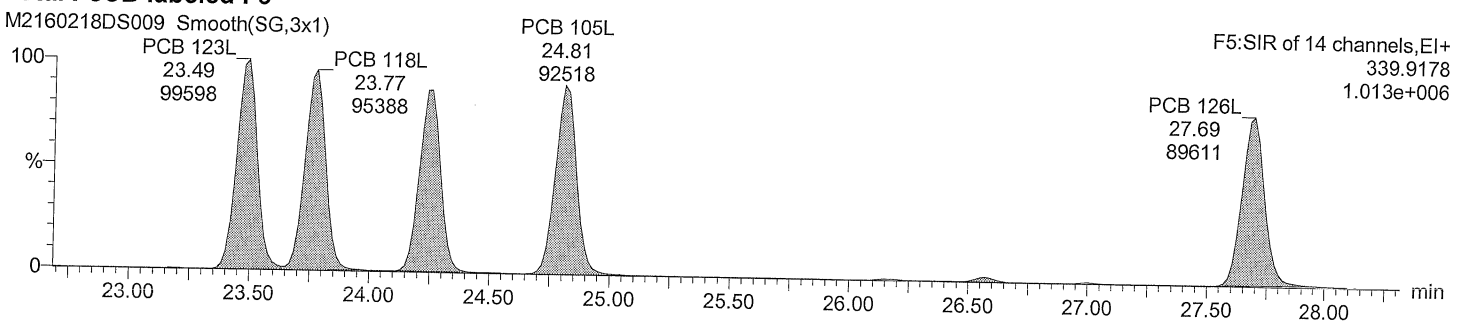
Total PeCB labeled F5



Total PeCB labeled F5



AutoSpec - Ultima 3

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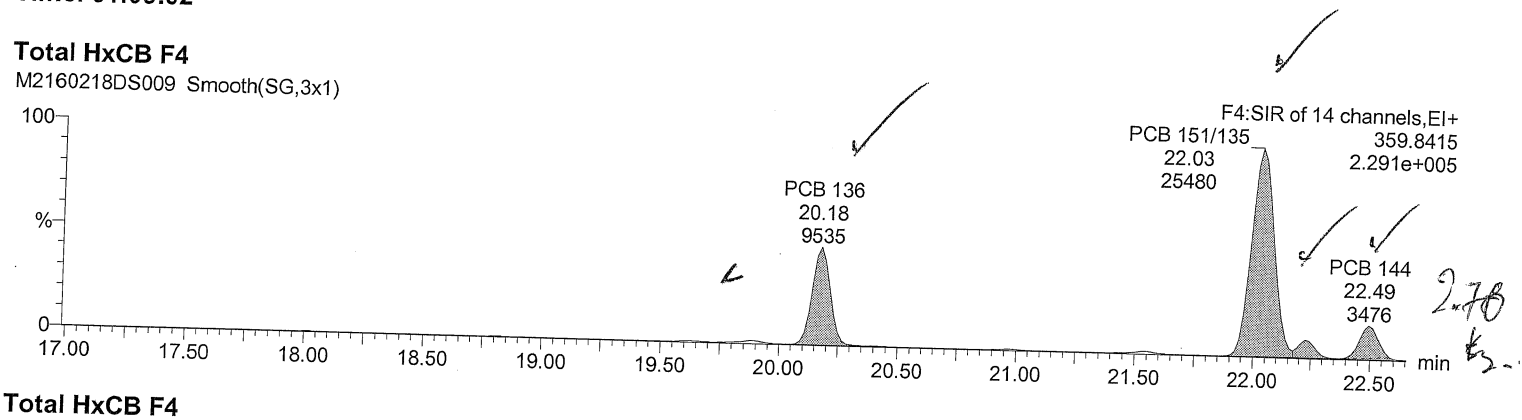
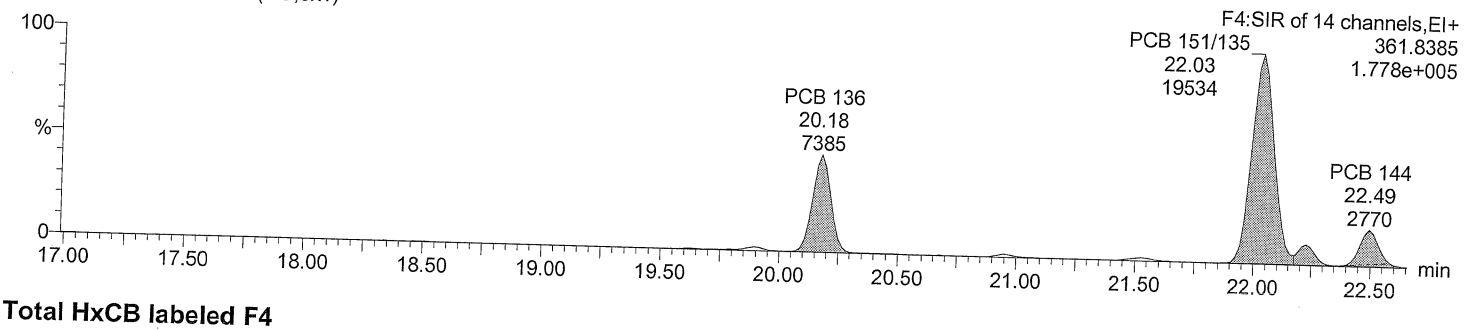
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total HxCB F4
M2160218DS009 Smooth(SG,3x1)



Total HxCB F4
M2160218DS009 Smooth(SG,3x1)



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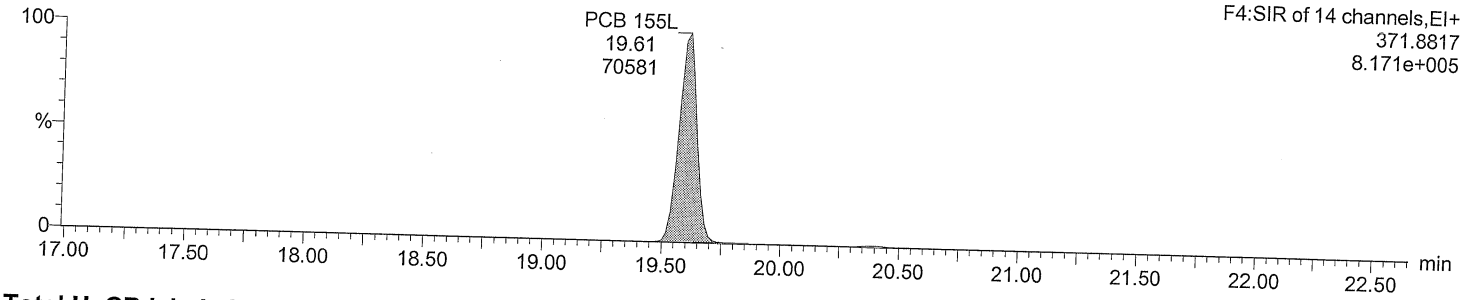

Total HxCB labeled F4
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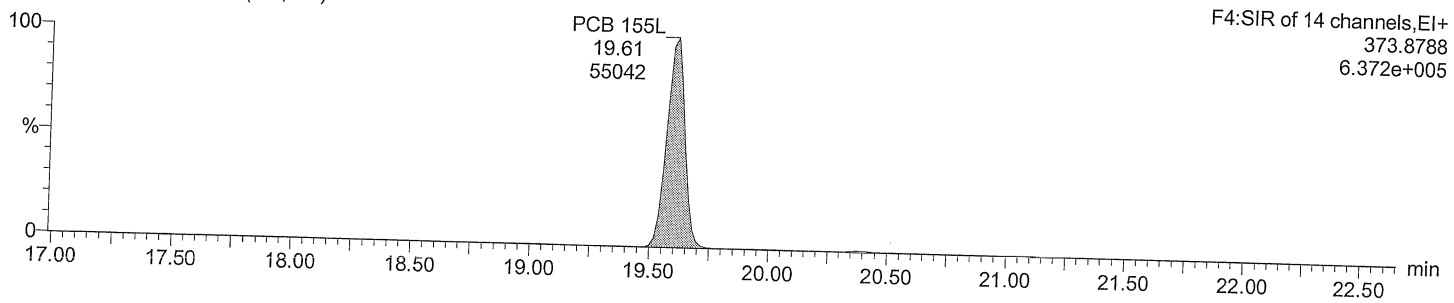

AutoSpec - Ultima 3

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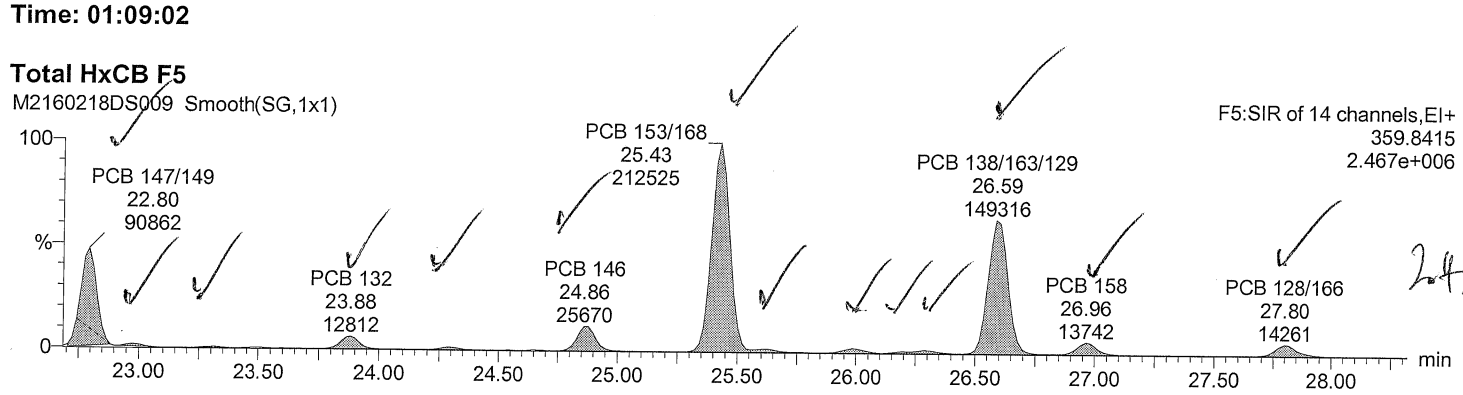
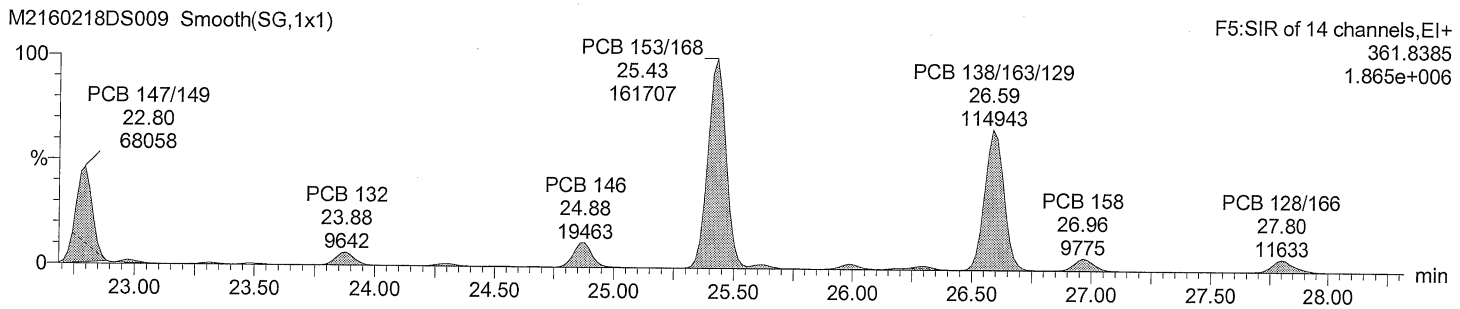
Total HxCB F5



Total HxCB F5



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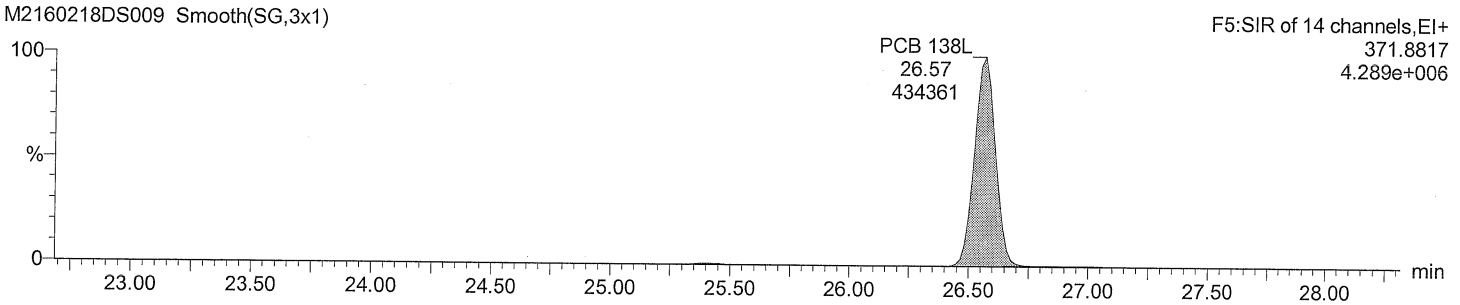

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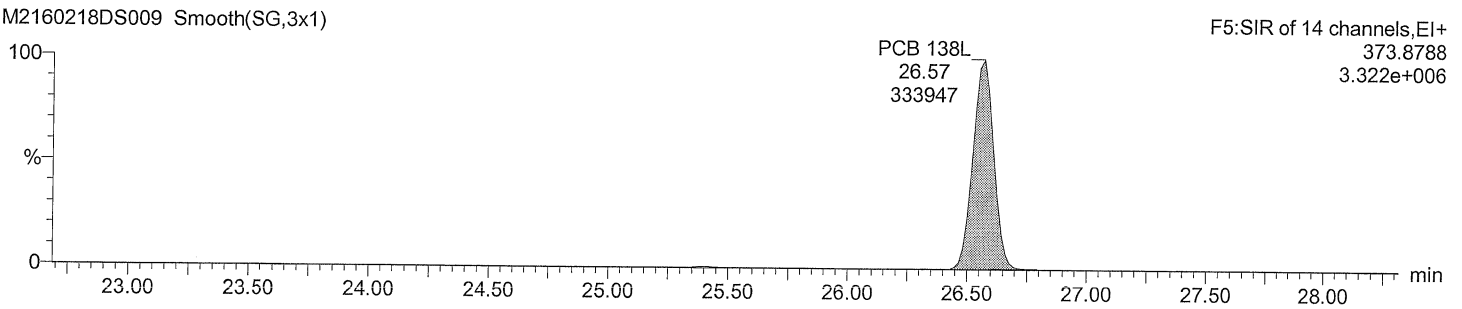

AutoSpec - Ultima 3

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Description: BRP510-01R
Vial: 9
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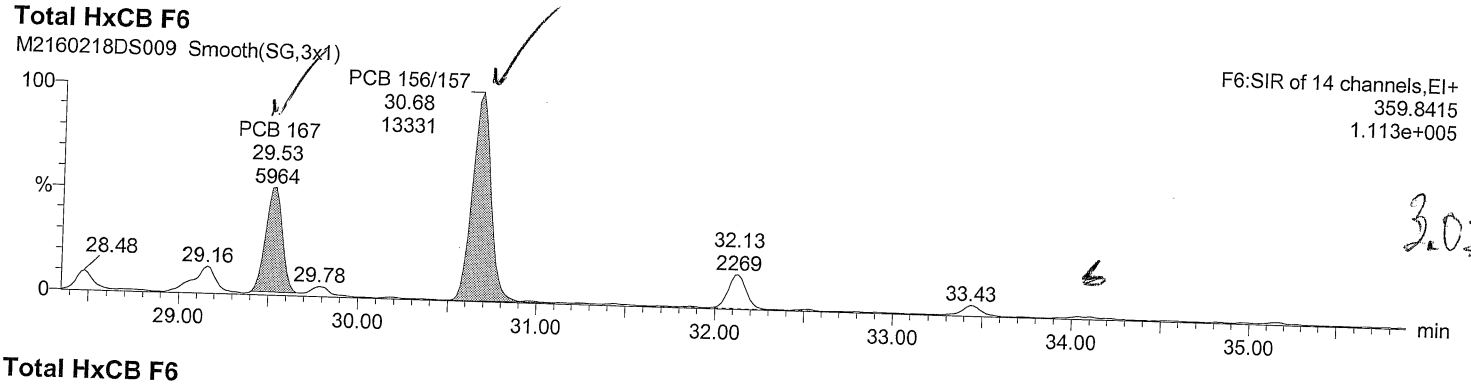
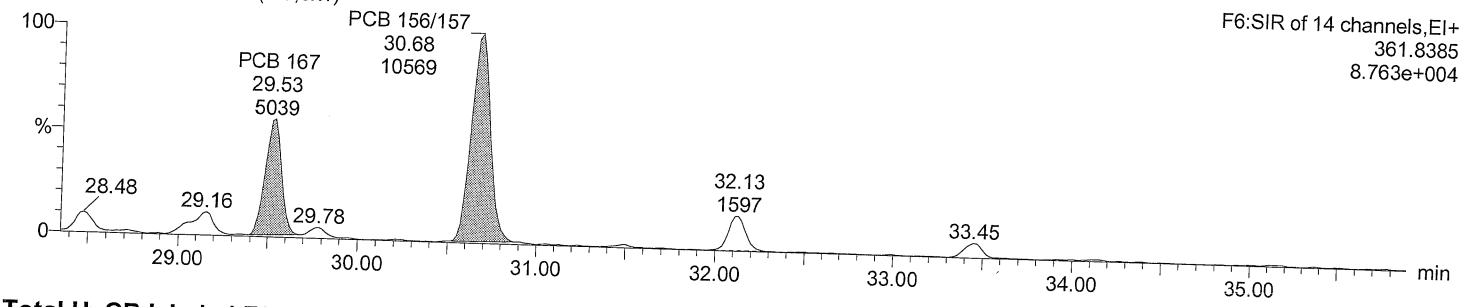
Total HxCB F6
M2160218DS009 Smooth(SG,3x1)

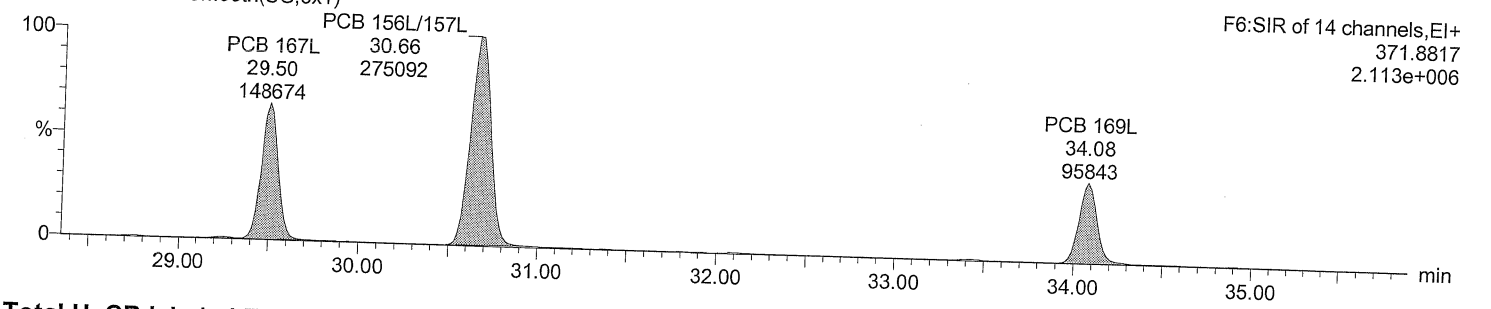


3.03

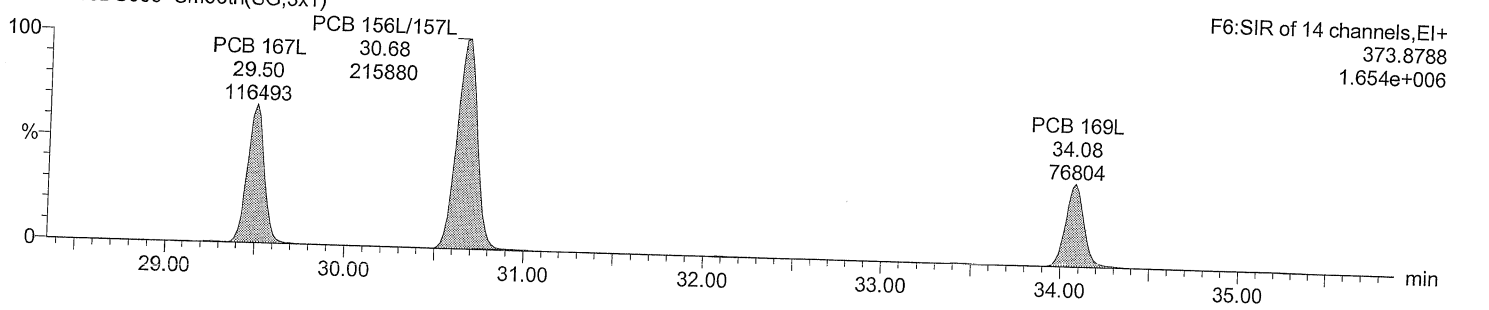
Total HxCB F6
M2160218DS009 Smooth(SG,3x1)



Total HxCB labeled F6
M2160218DS009 Smooth(SG,3x1)



Total HxCB labeled F6
M2160218DS009 Smooth(SG,3x1)



AutoSpec - Ultima 3

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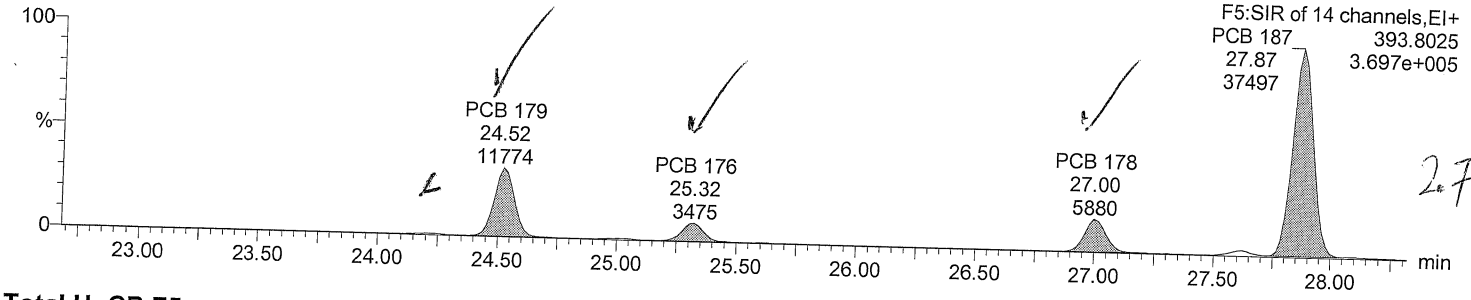
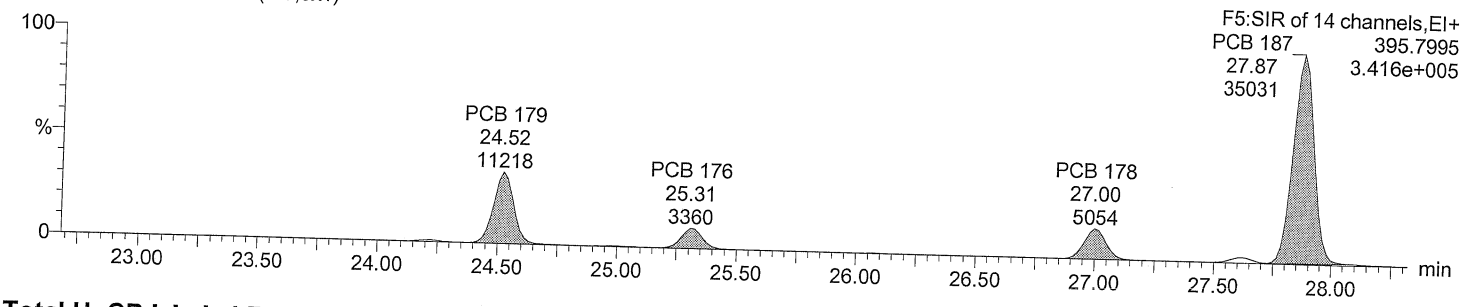
Total HpCB F5
M2160218DS009 Smooth(SG,3x1)



Total HpCB F5
M2160218DS009 Smooth(SG,3x1)



Total HpCB labeled F5
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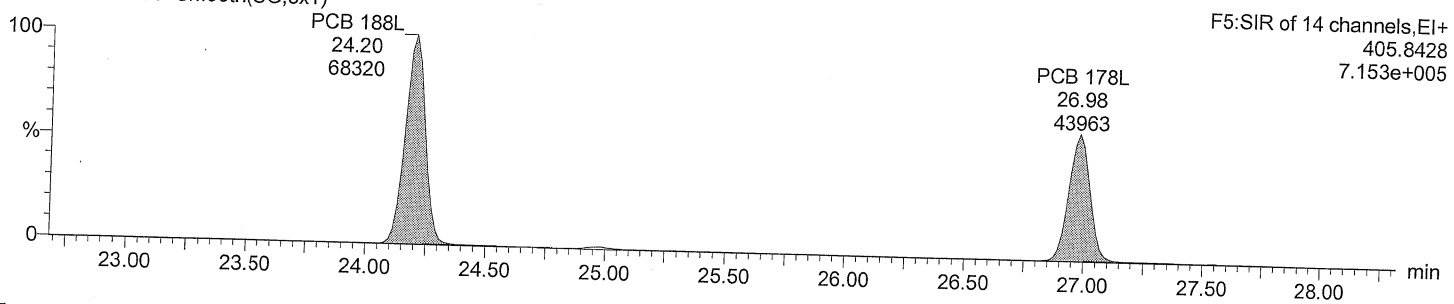
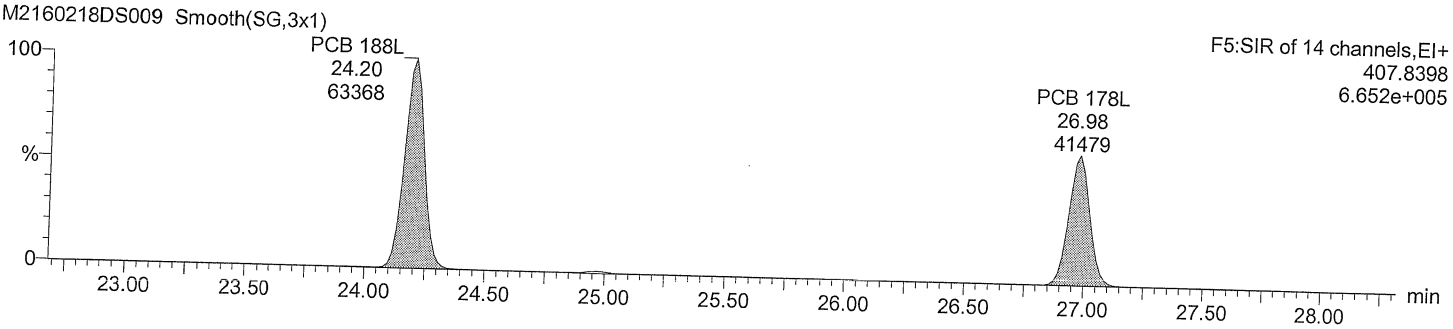


Total HpCB labeled F5
M2160218DS009 Smooth(SG,3x1)



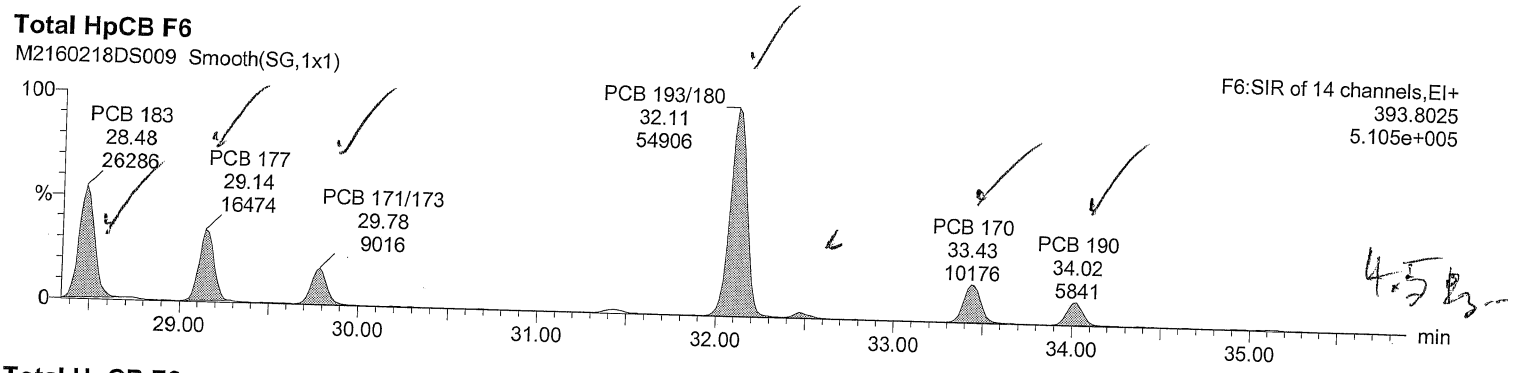
AutoSpec - Ultima 3

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

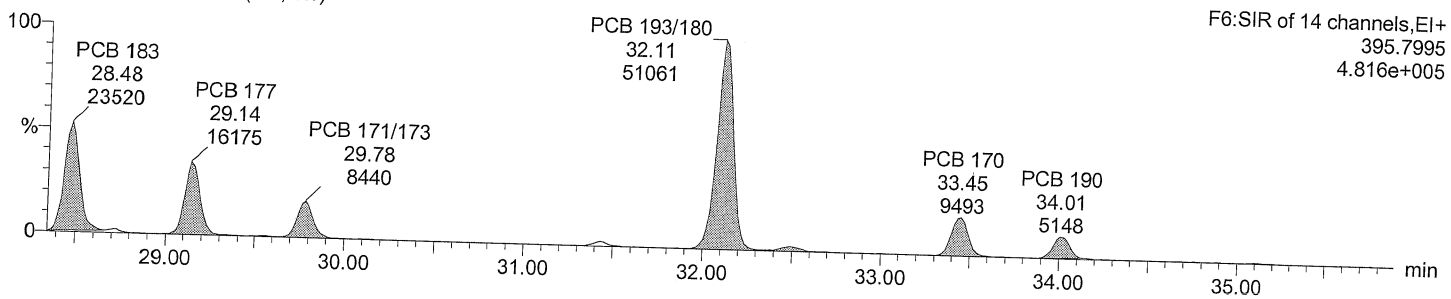
Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

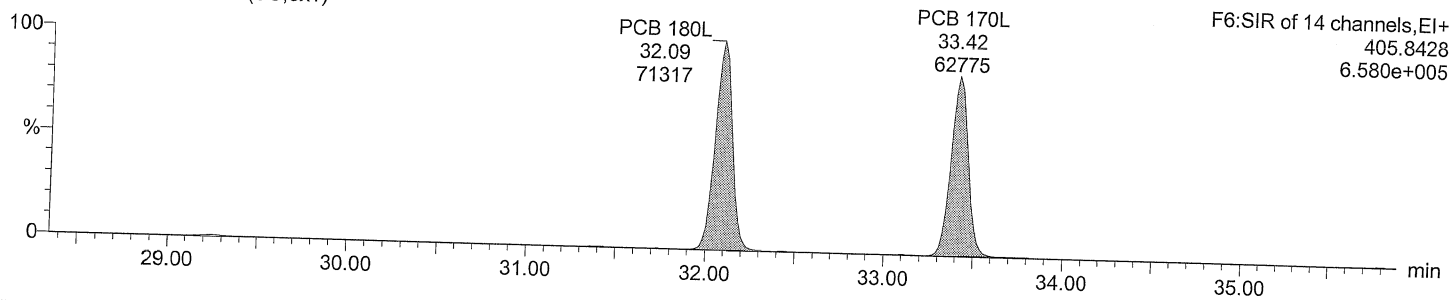
Total HpCB F6
M2160218DS009 Smooth(SG,1x1)



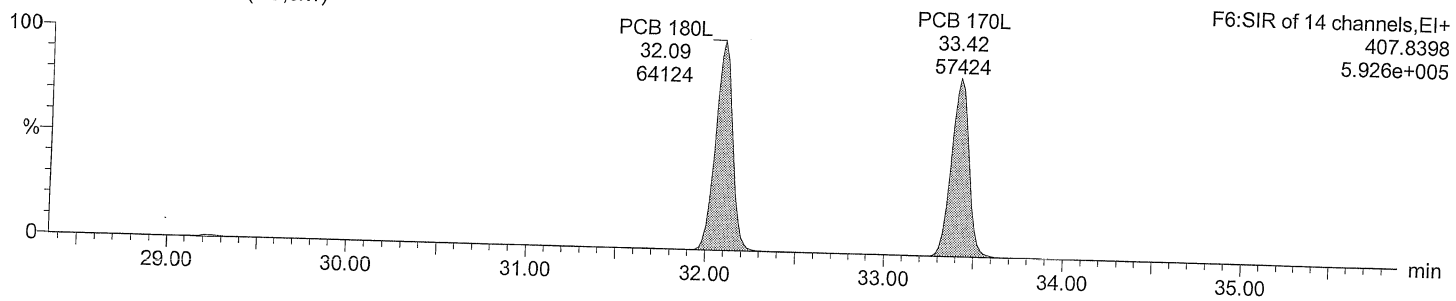
Total HpCB F6
M2160218DS009 Smooth(SG,1x1)



Total HpCB labeled F6
M2160218DS009 Smooth(SG,3x1)



Total HpCB labeled F6
M2160218DS009 Smooth(SG,3x1)



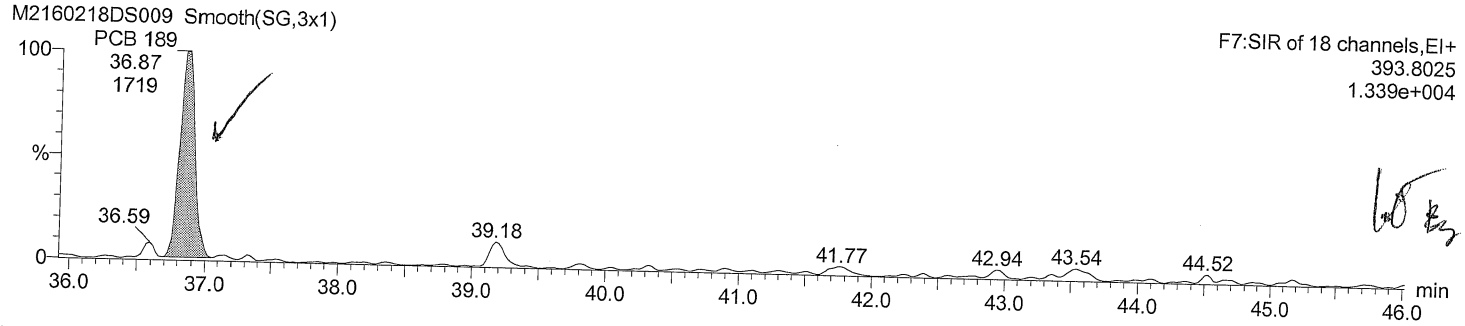
AutoSpec - Ultima 3

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

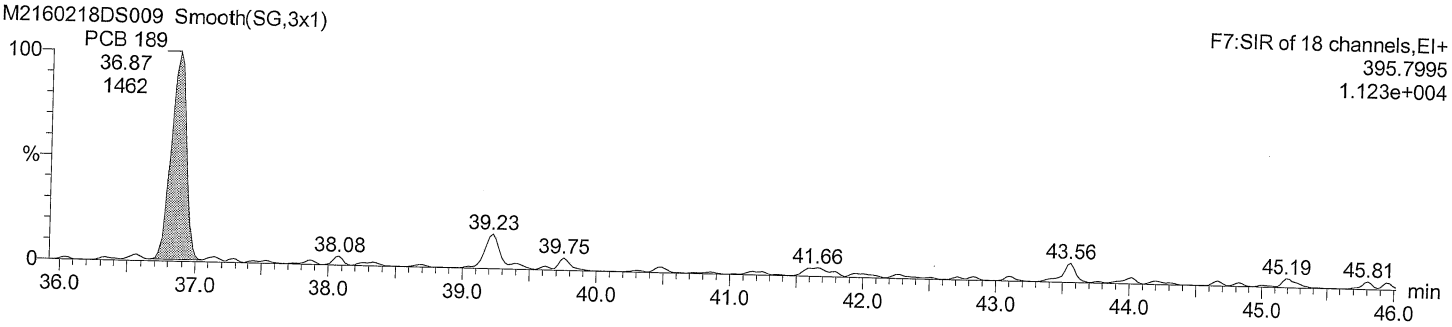
Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total HpCB F7



Total HpCB F7



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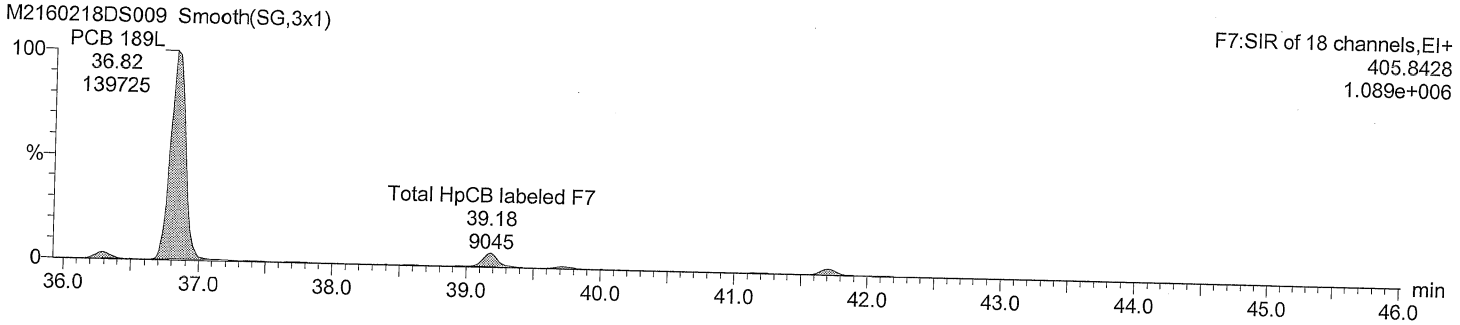

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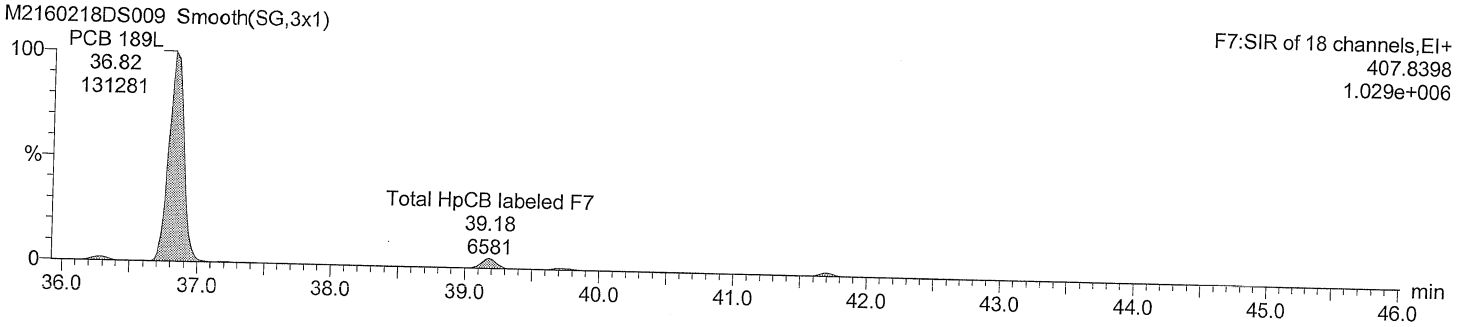


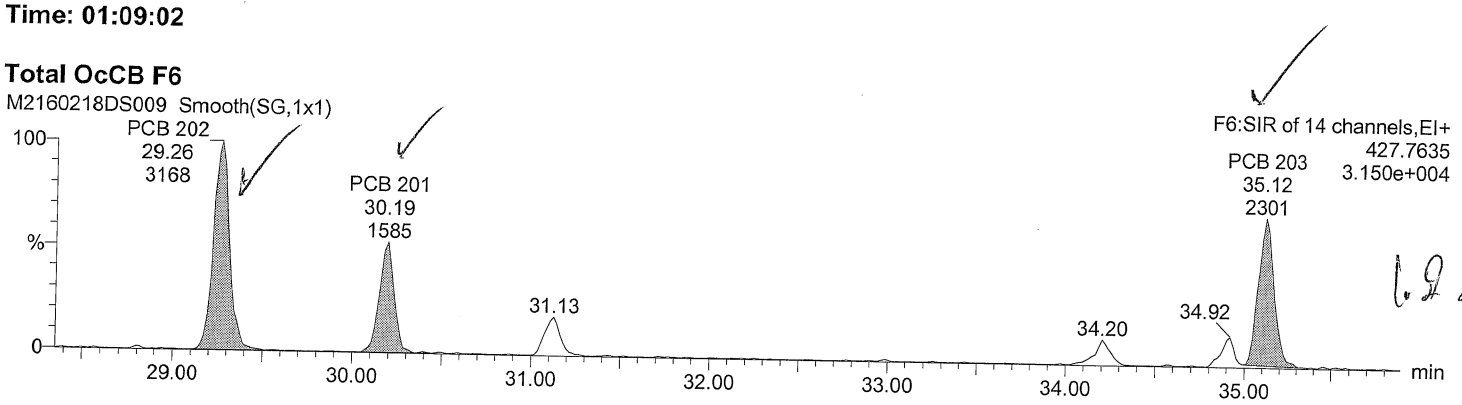
AutoSpec - Ultima 3

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

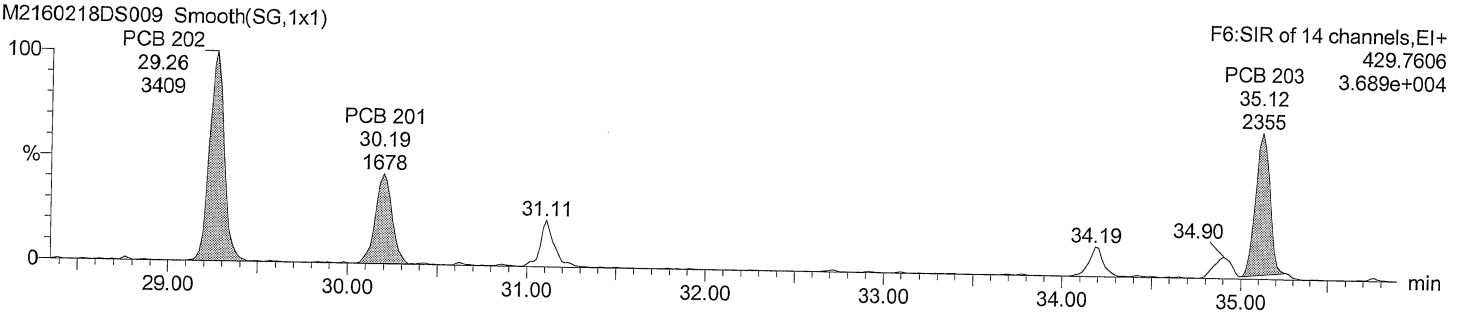
Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total OcCB F6



Total OcCB F6



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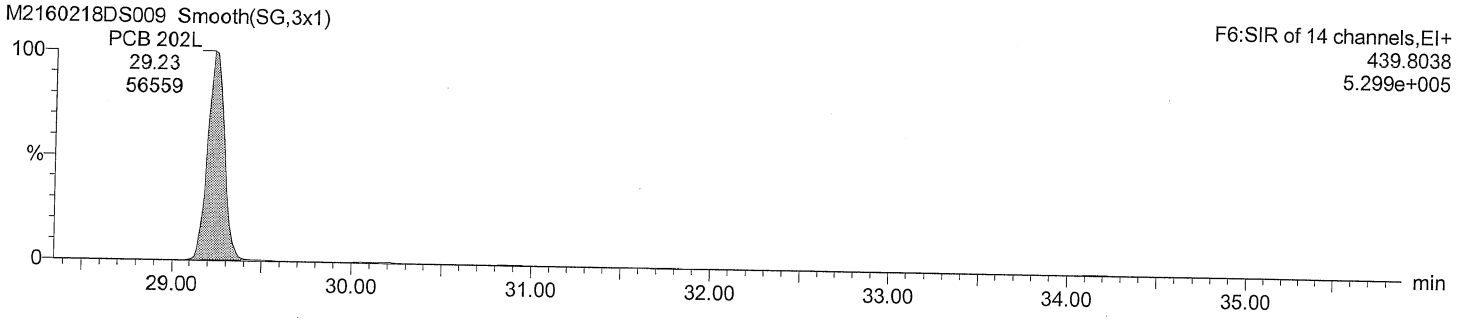

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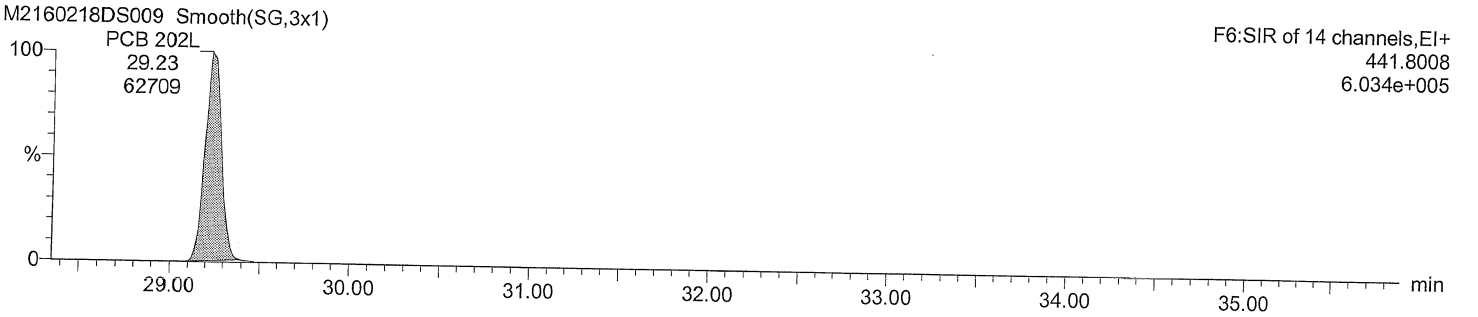


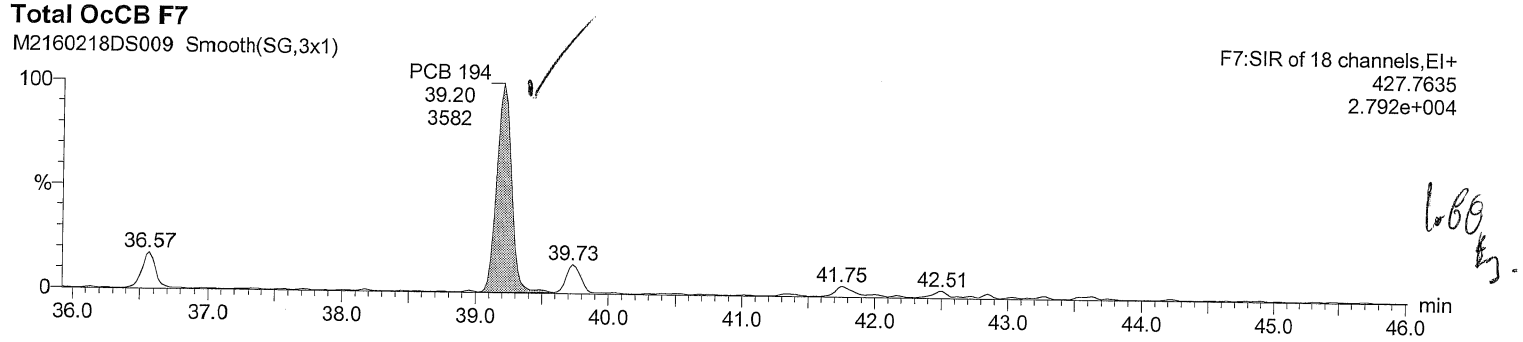
AutoSpec - Ultima 3

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total OcCB F7



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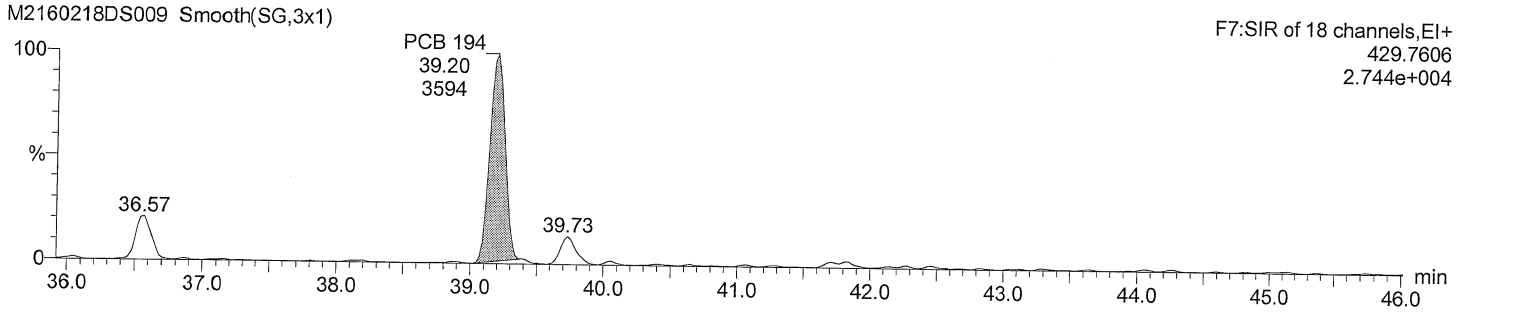

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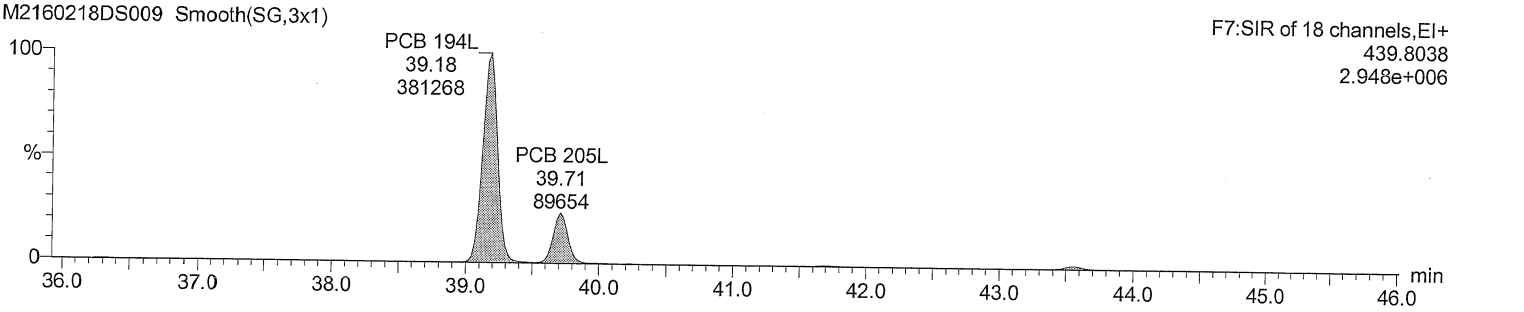

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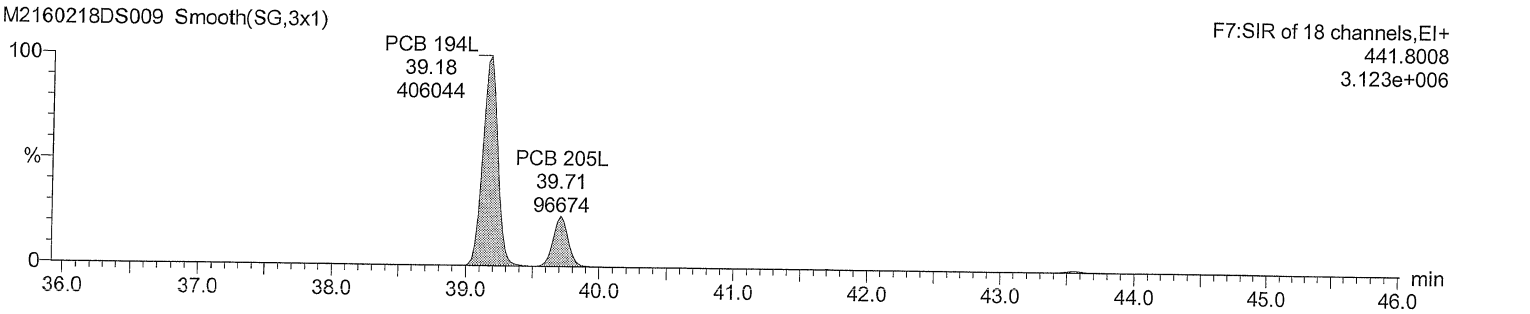


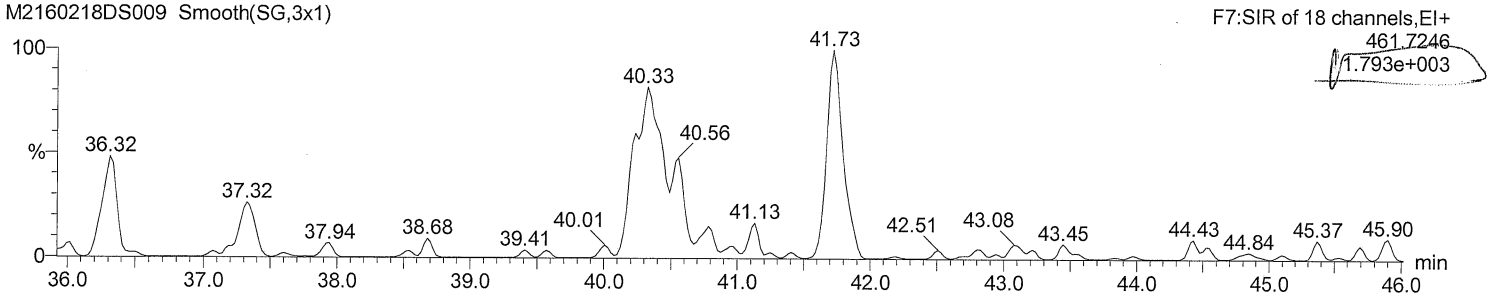
AutoSpec - Ultima 3

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total NoCB F7



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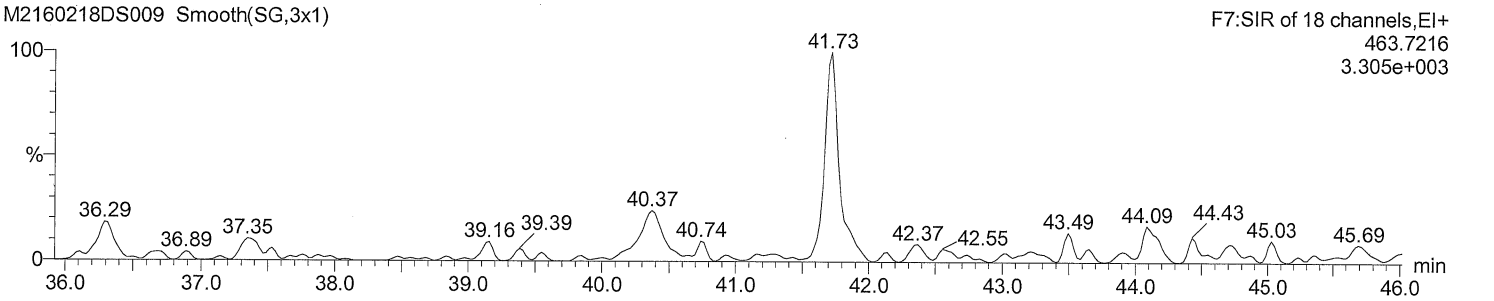

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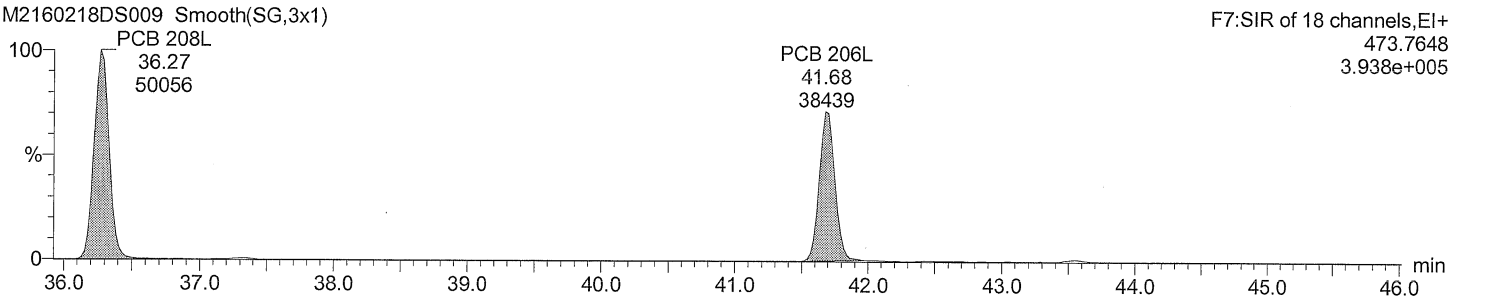

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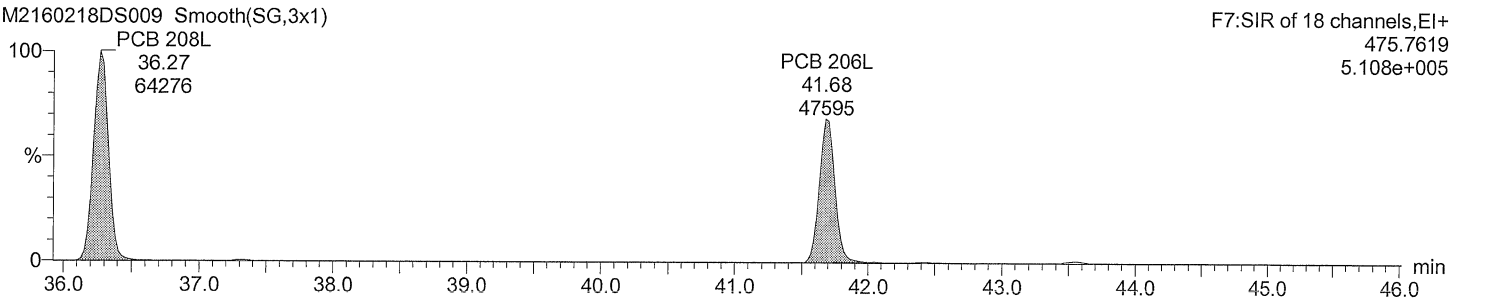

AutoSpec - Ultima 3

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
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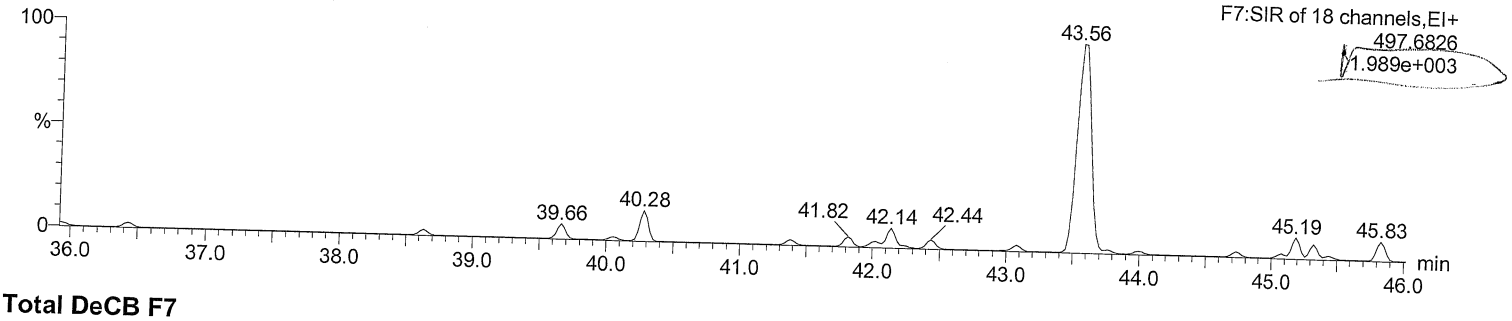
ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

Total DeCB F7
M2160218DS009 Smooth(SG,3x1)



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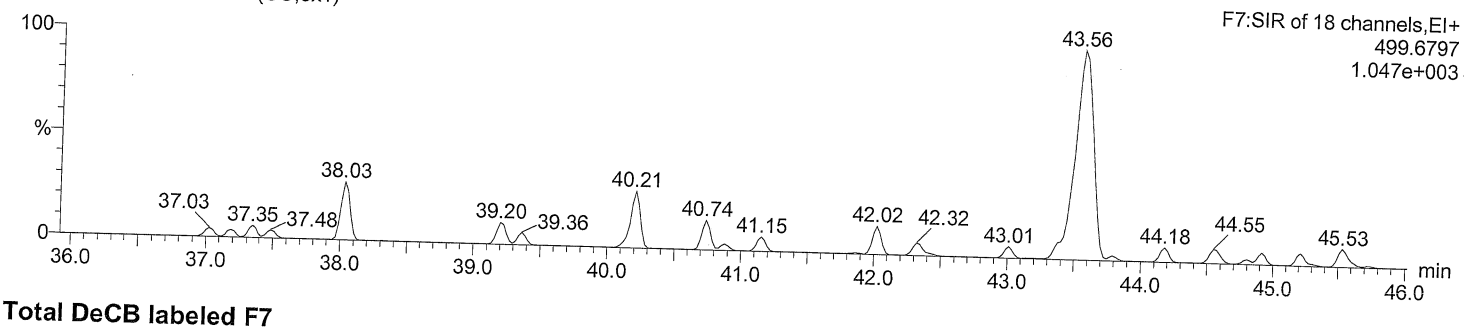

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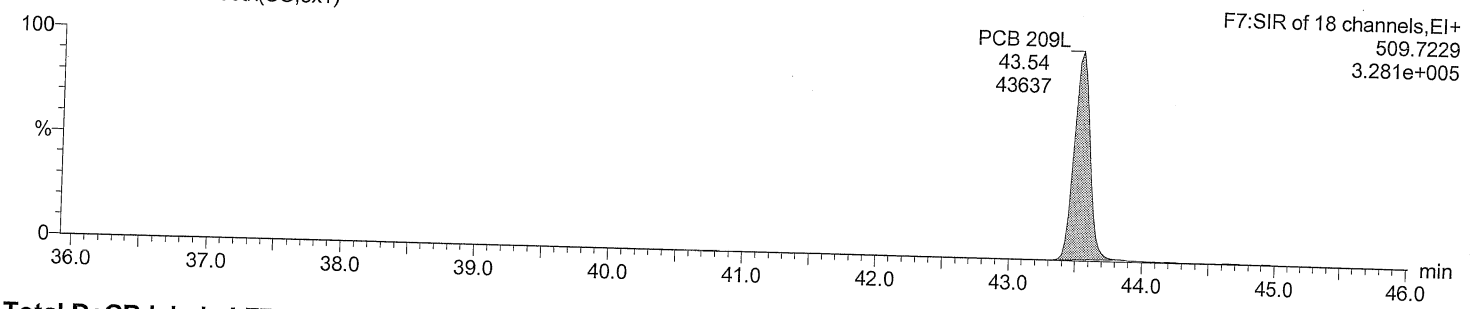

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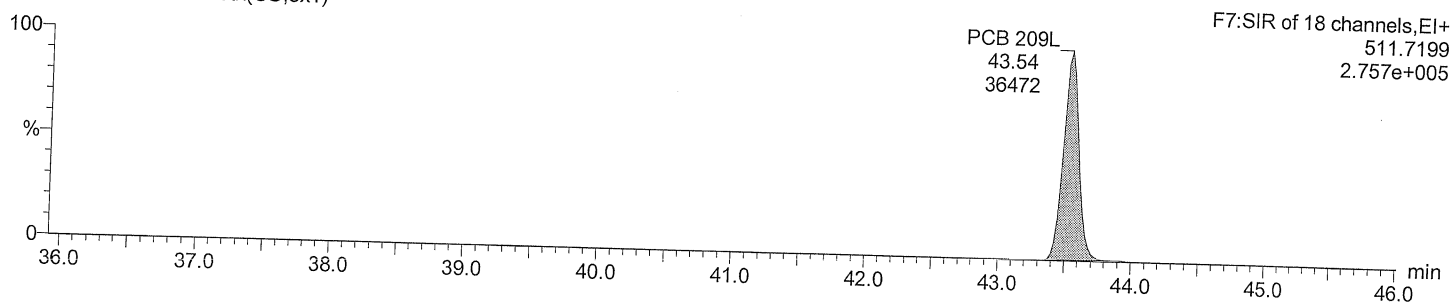


AutoSpec - Ultima 3

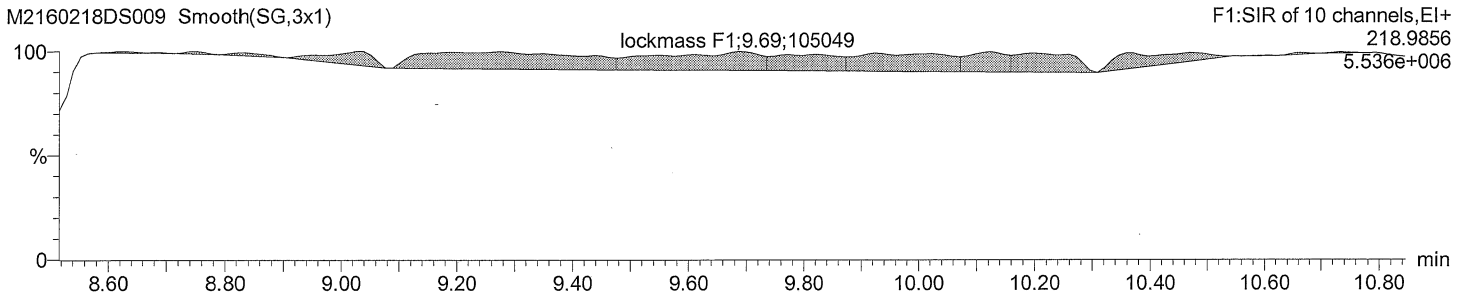
Acquired Date

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

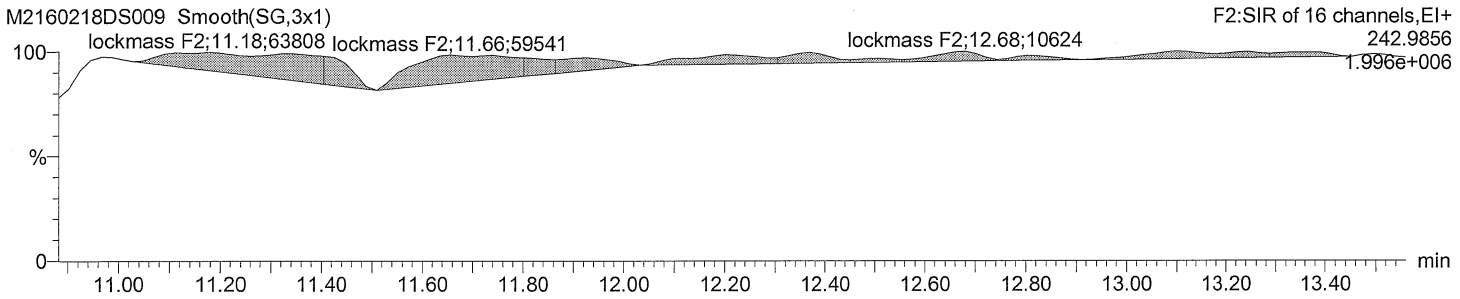
Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

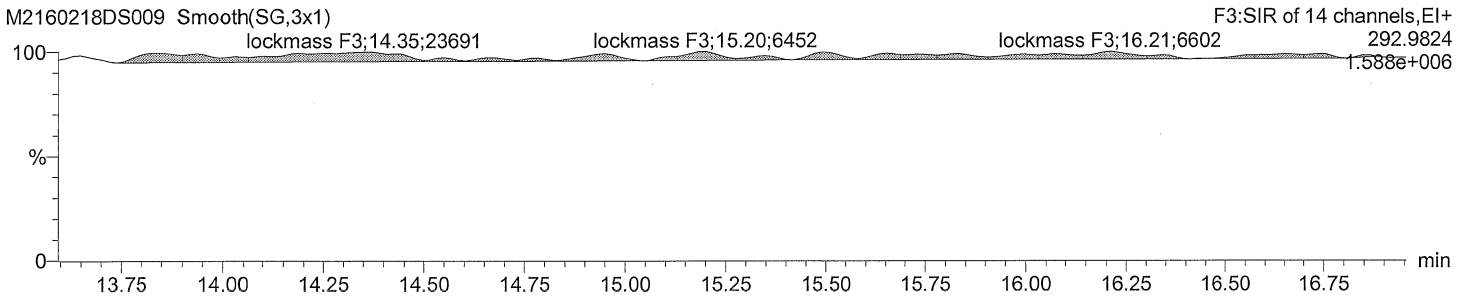
lockmass F1



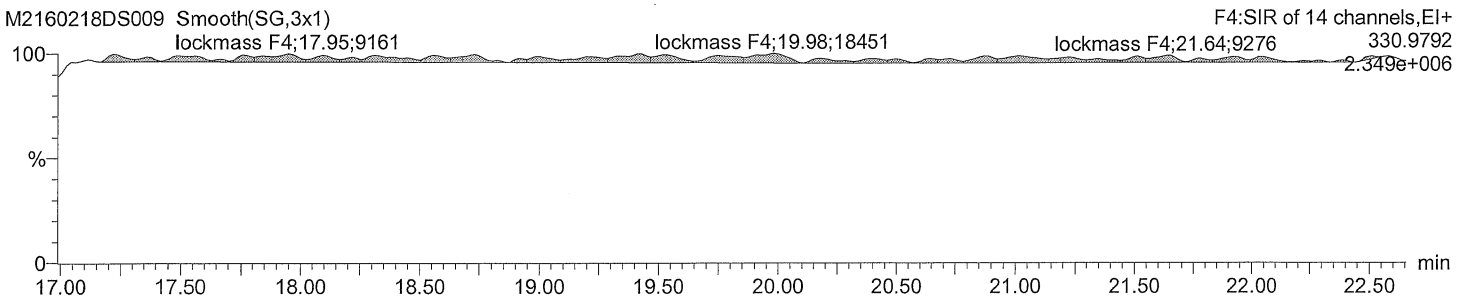
lockmass F2



lockmass F3



lockmass F4



AutoSpec - Ultima 3

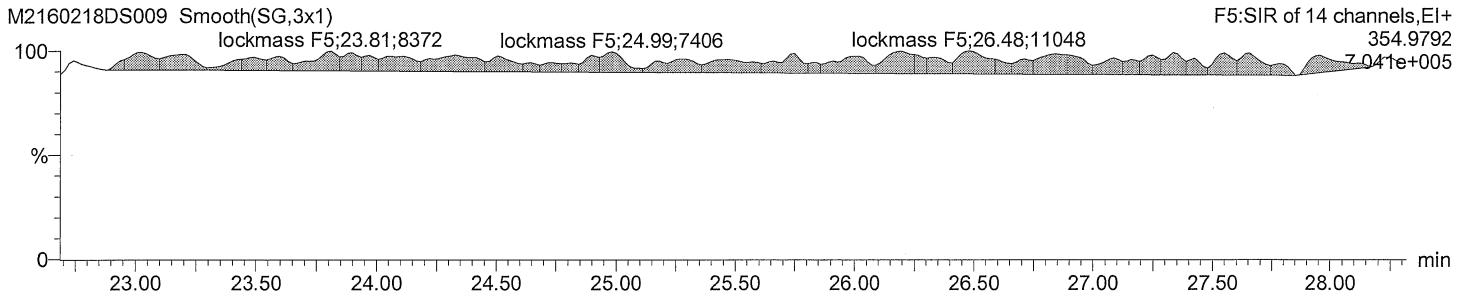
Acquired Date

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

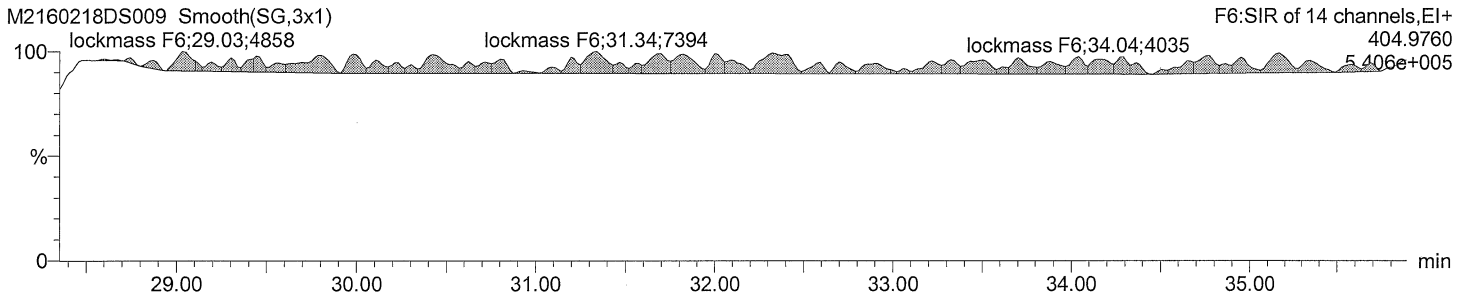
Last Altered: February 20, 2016 01:21:44 PM Eastern Standard Time
Printed: February 20, 2016 01:24:13 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R
Vial: 9
Date: 18-FEB-2016
Time: 01:09:02

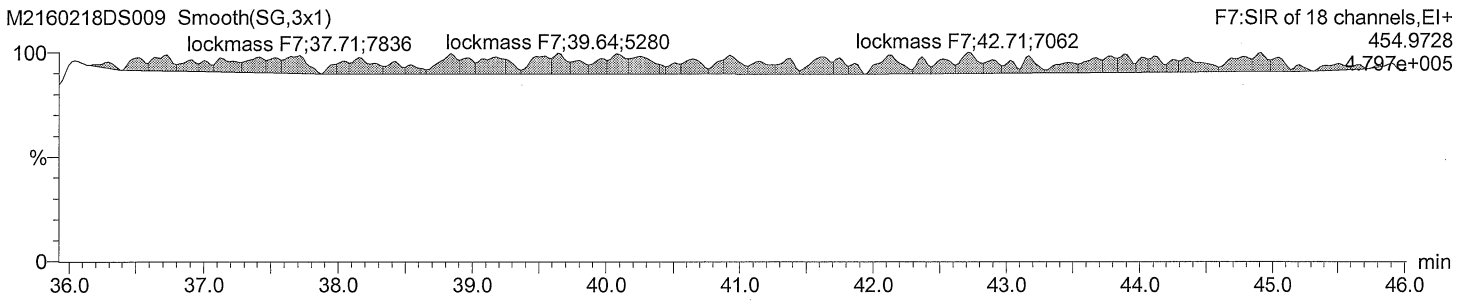
lockmass F5



lockmass F6



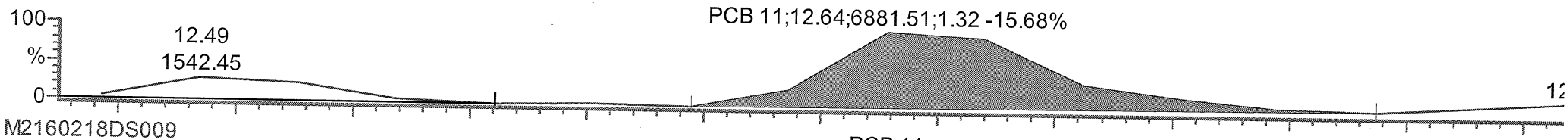
lockmass F7



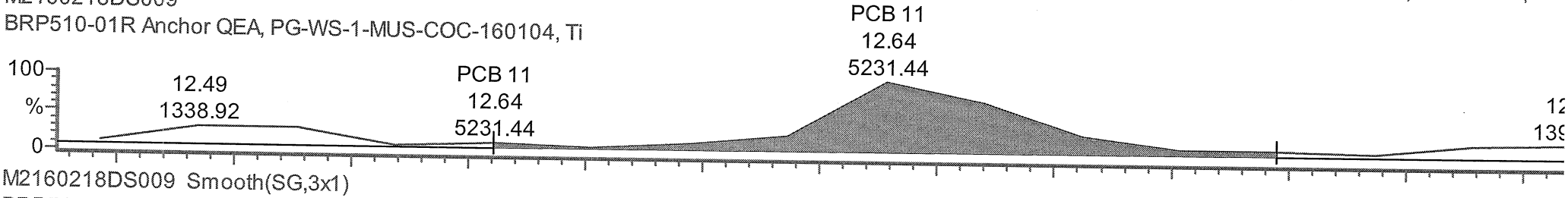
AutoSpec - Ultima 3

Before
15.02.20
RA ...

M2160218DS009
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

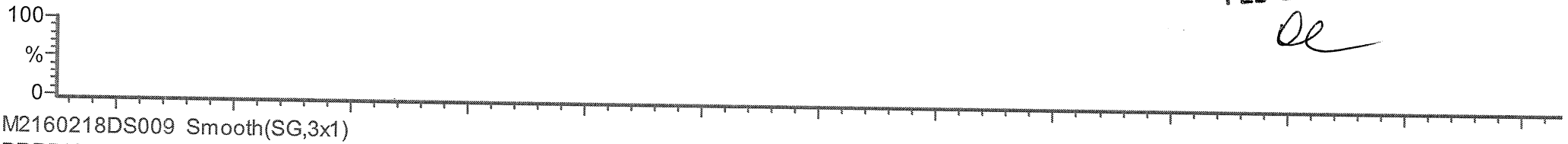


M2160218DS009
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

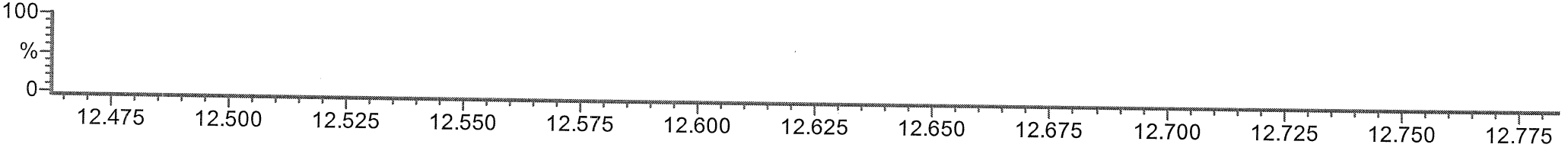


M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

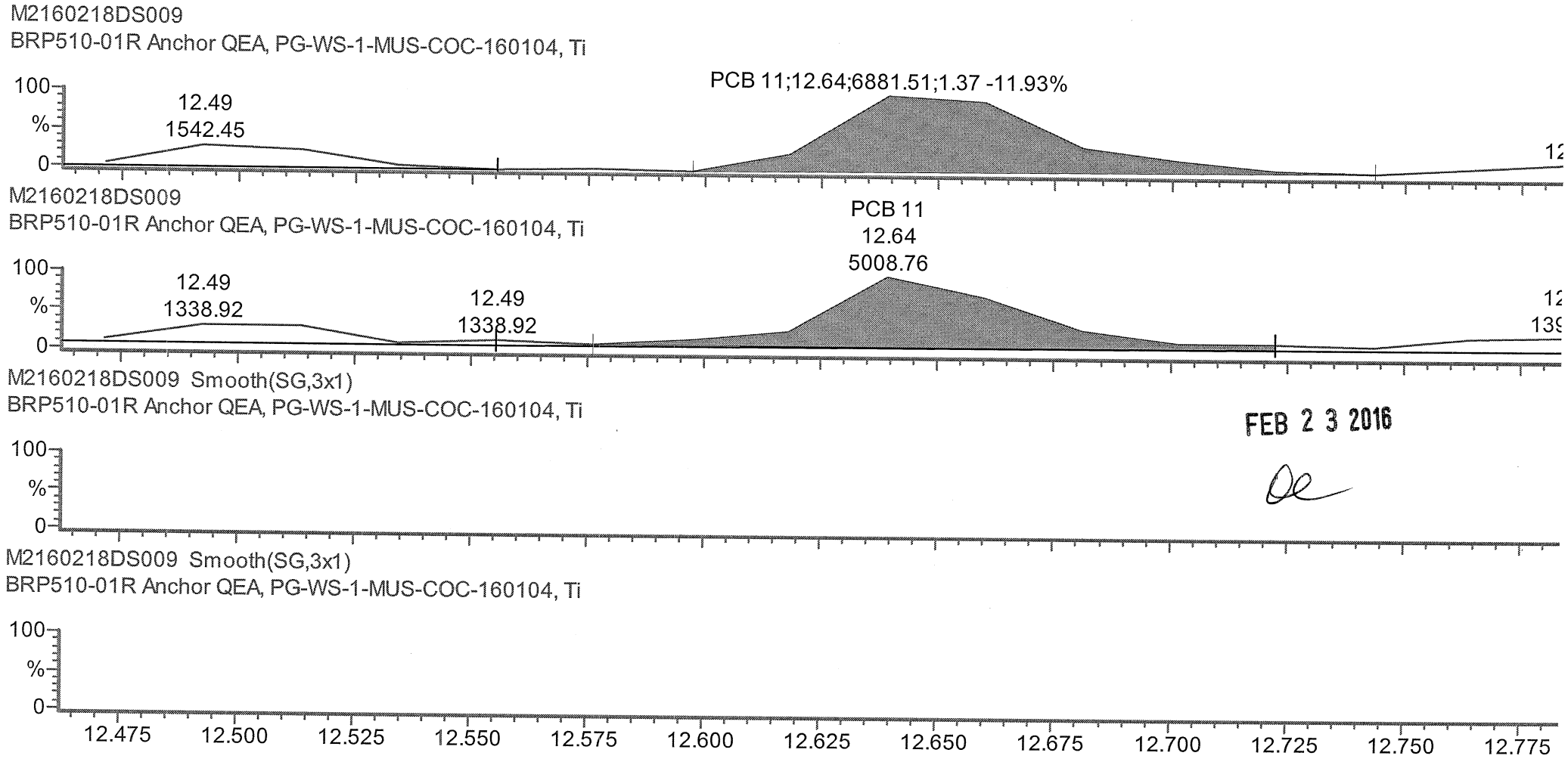
FEB 2 3 2016
OE



M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



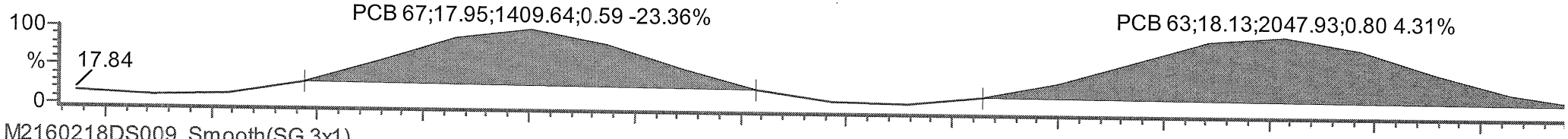
M3 16/02/20 : AH



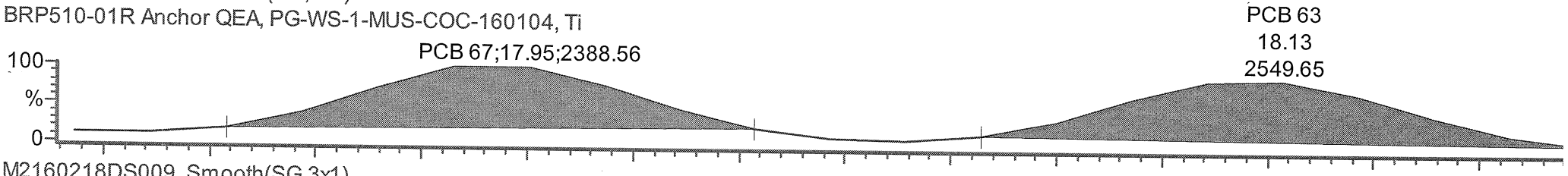
FEB 2 3 2016

Before
15.02.20
AH

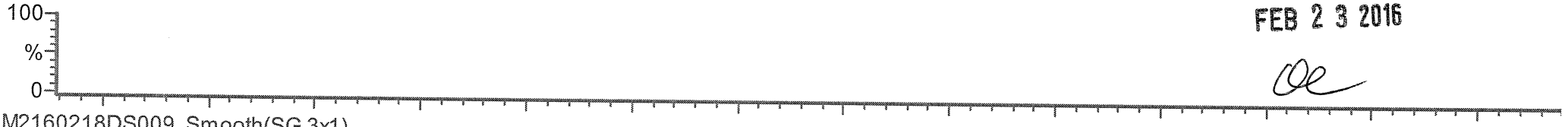
M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

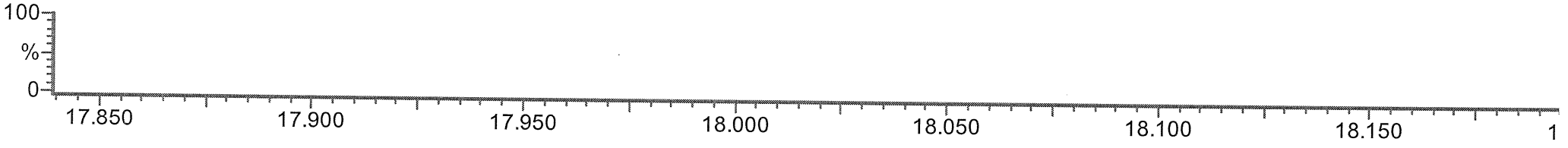


M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

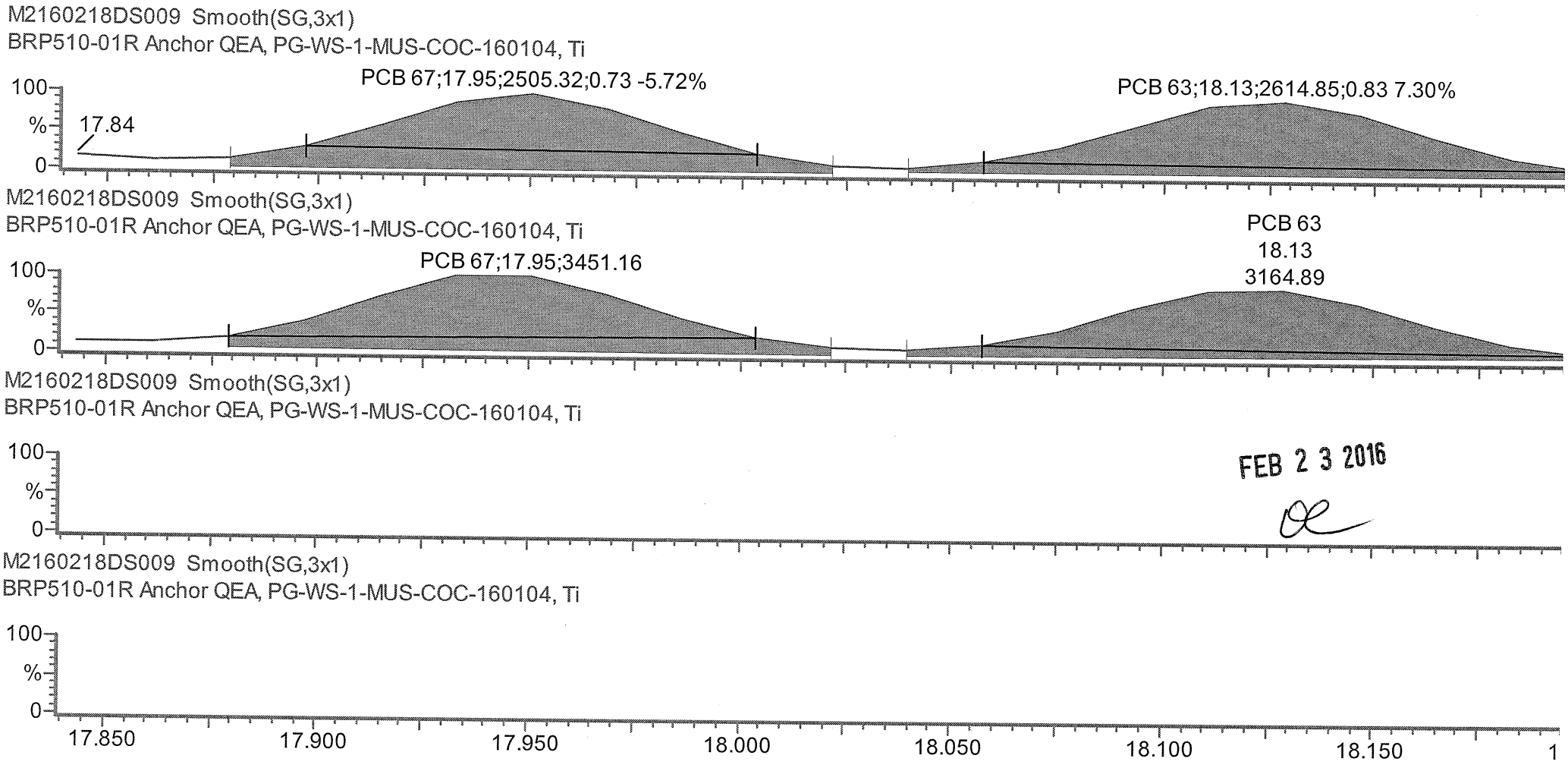


FEB 2 3 2016

M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



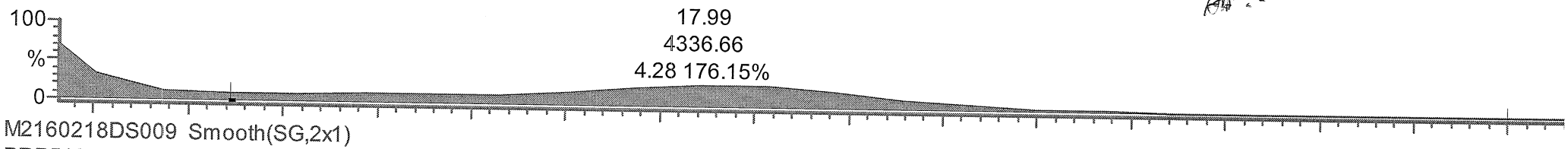
M3 **16/02/20 : AH**



FEB 2 3 2016

Before
15.02.20

M2160218DS009 Smooth(SG,2x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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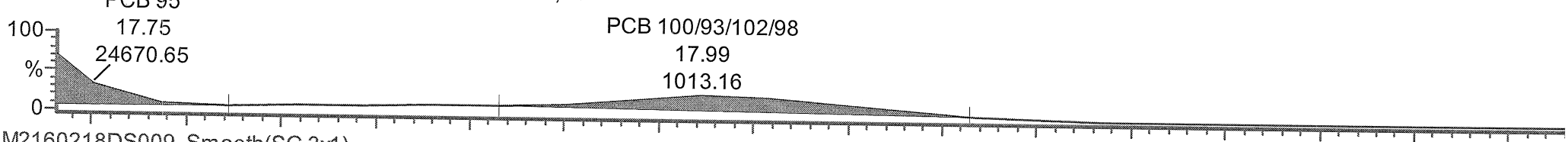
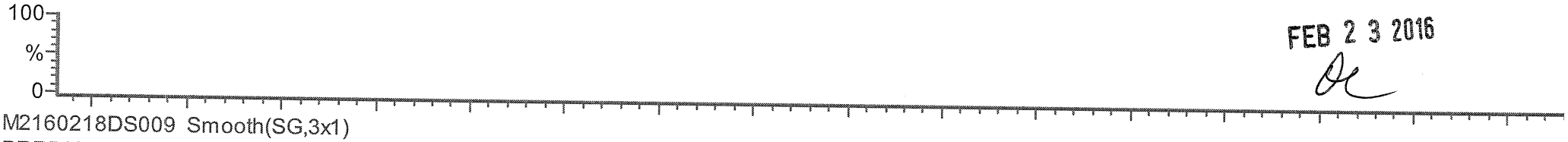
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

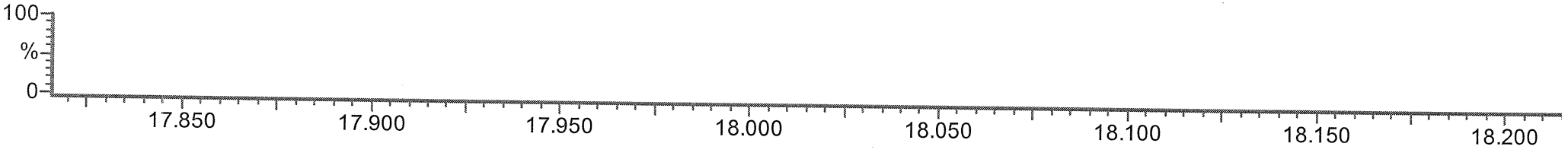


M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



FEB 2 3 2016

M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



M3 **16/02/20 : AH**

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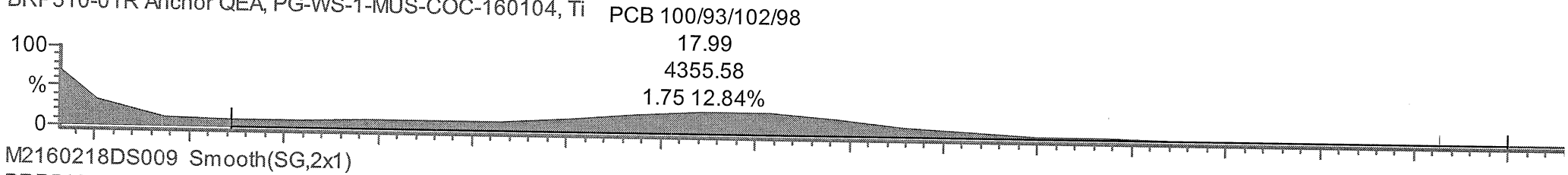

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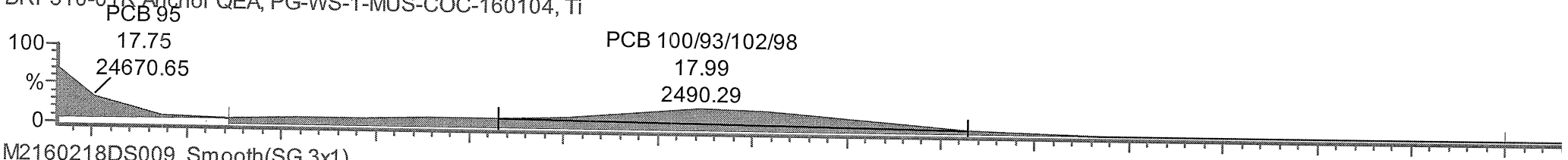
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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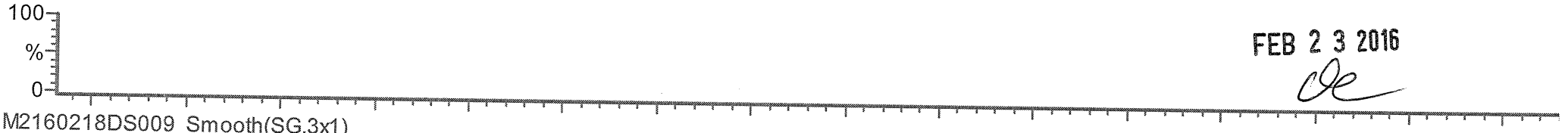
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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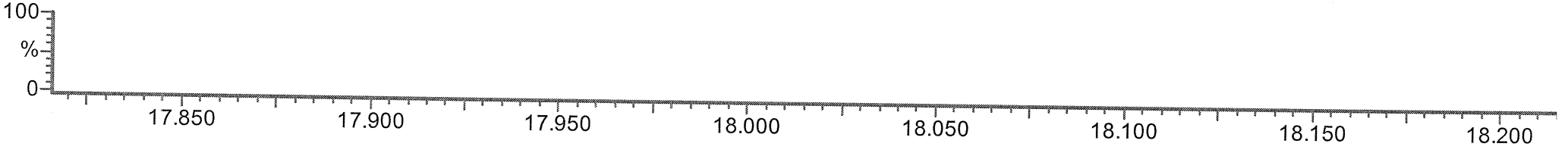
M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



Beken
15.02.20

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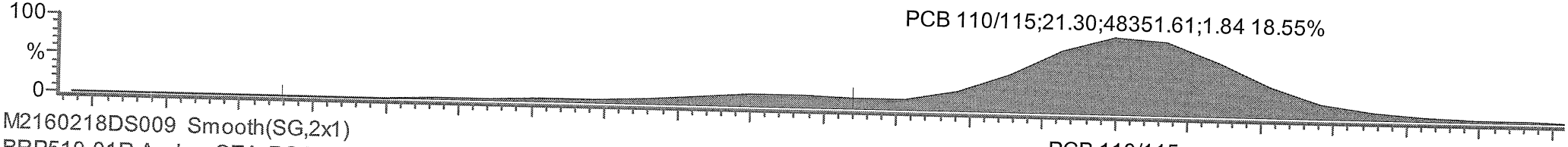
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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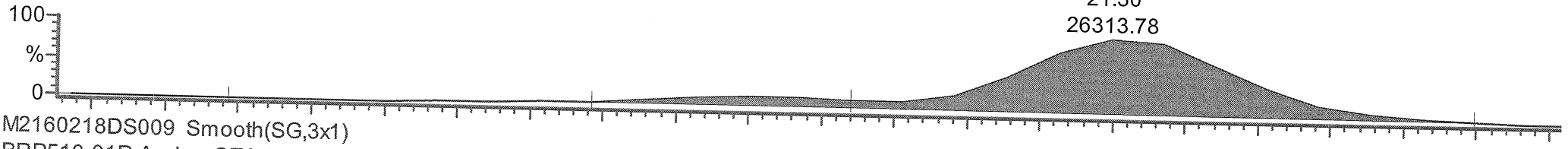
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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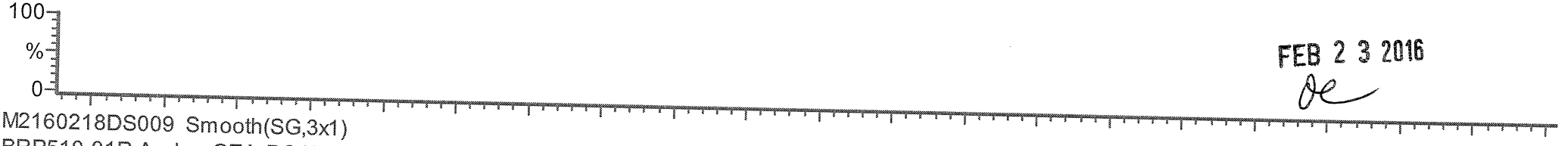
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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M2160218DS009 Smooth(SG,3x1)
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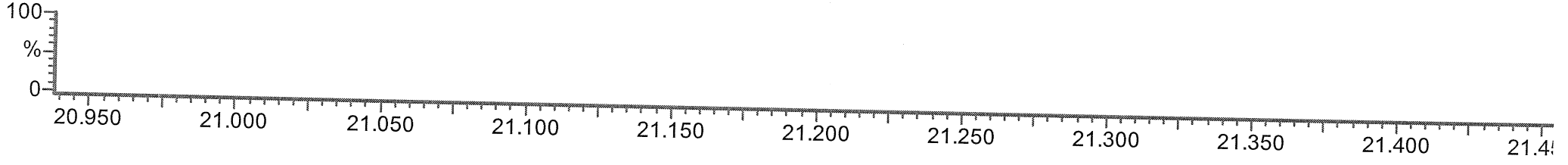
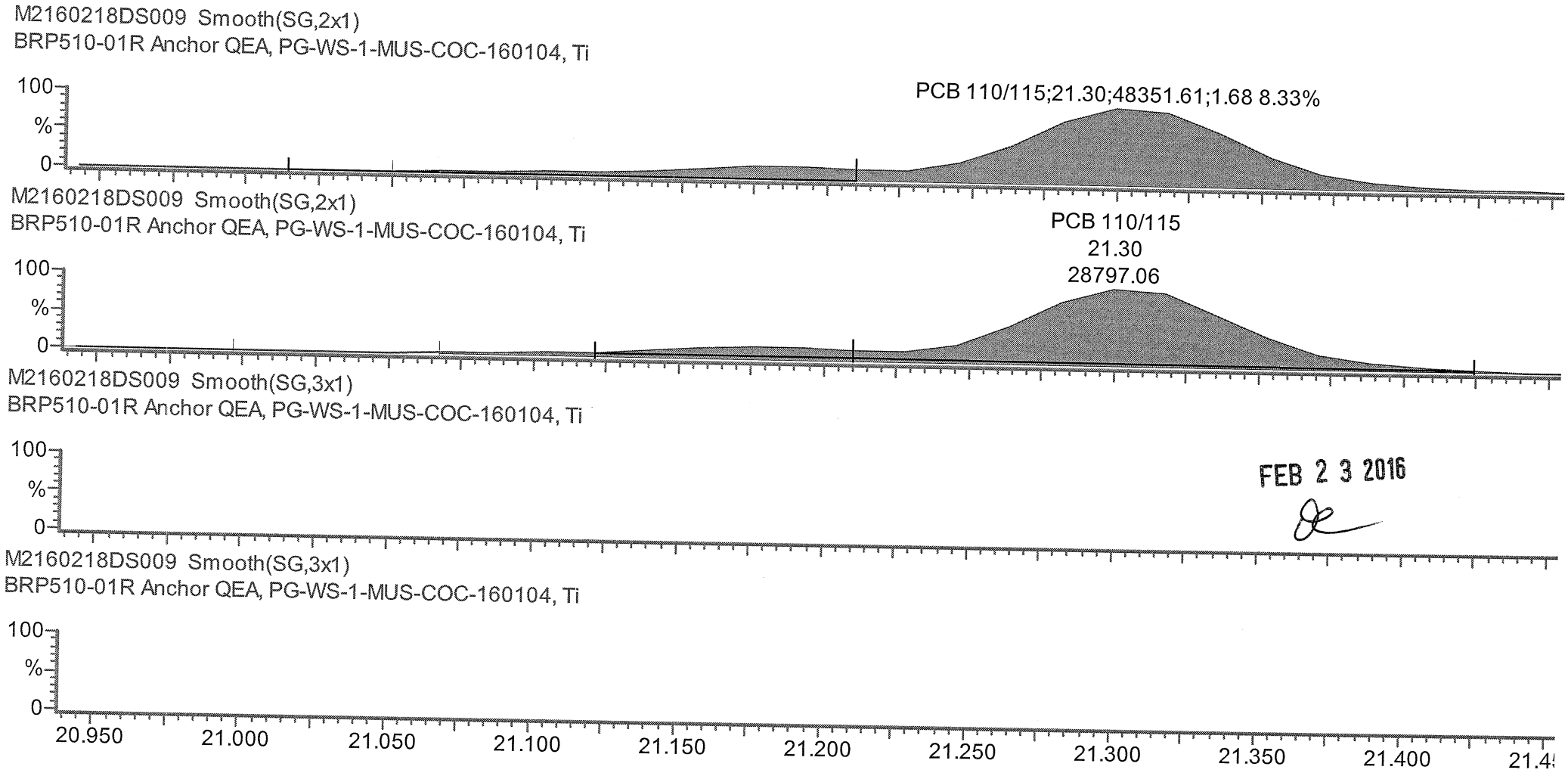


M3 **16/02/20 : AH**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BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
100
%
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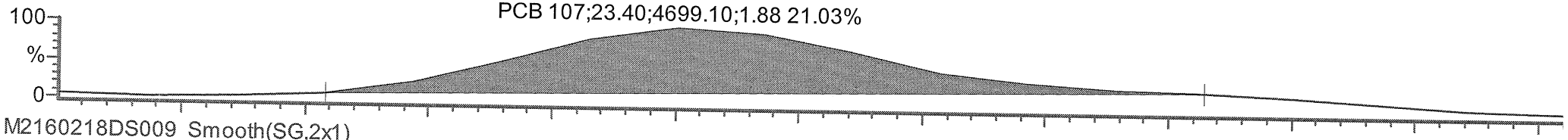
PCB 110/115;21.30;48351.61;1.68 8.33%
M2160218DS009 Smooth(SG,2x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
PCB 110/115
21.30
28797.06
M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
FEB 2 3 2016
M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
20.950
21.000
21.050
21.100
21.150
21.200
21.250
21.300
21.350
21.400

Before
15.02.20
AH -

M2160218DS009 Smooth(SG,2x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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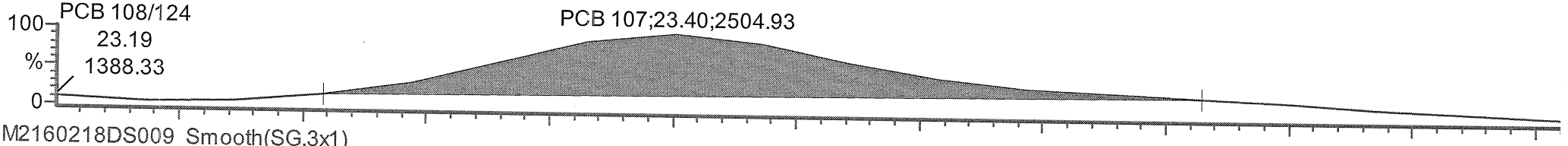
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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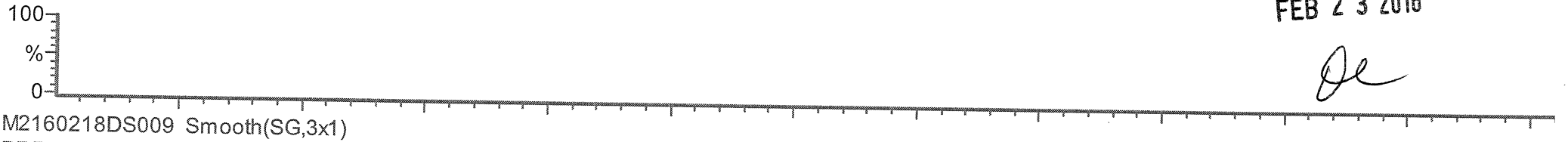
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



FEB 2 3 2016

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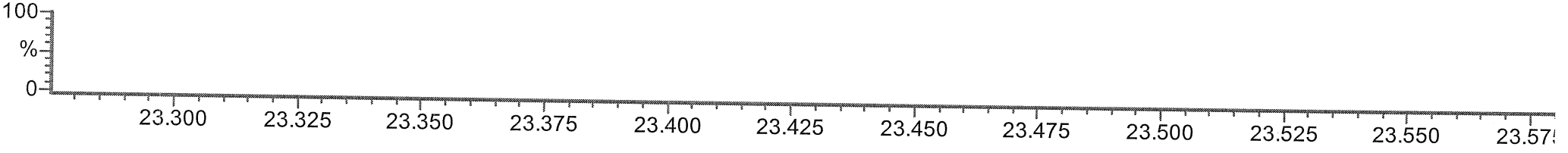
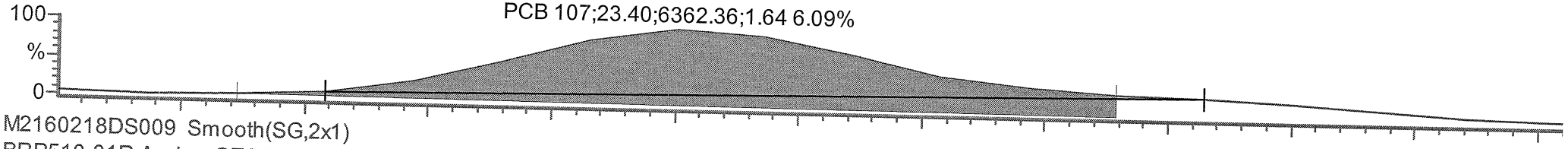
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



M3 **16/02/20 : AH**

M2160218DS009 Smooth(SG,2x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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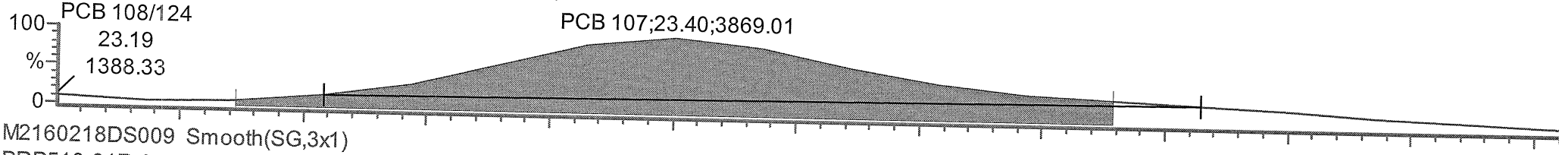
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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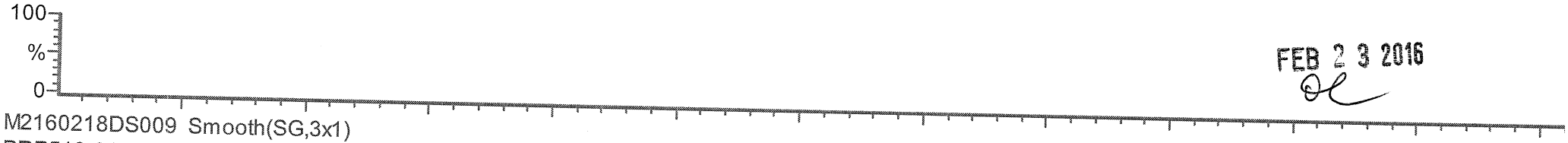
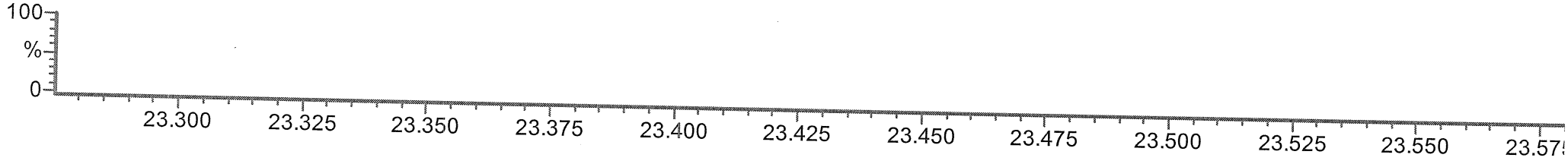
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



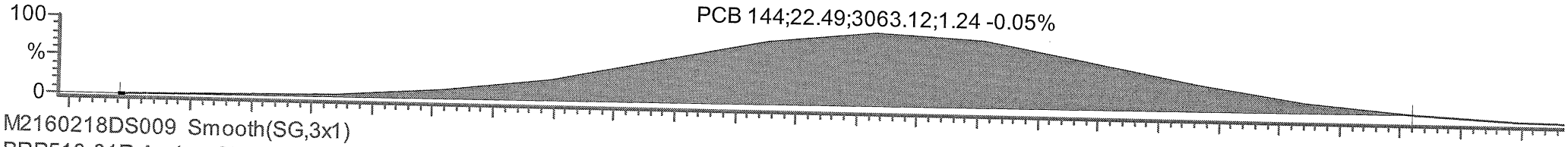
FEB 2 3 2016

M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



Before
15.02.20
AM -

M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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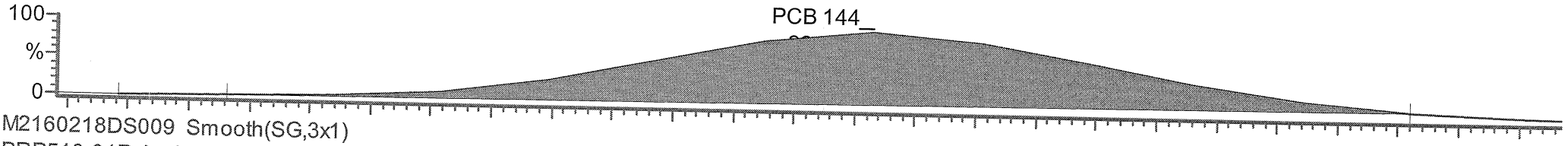
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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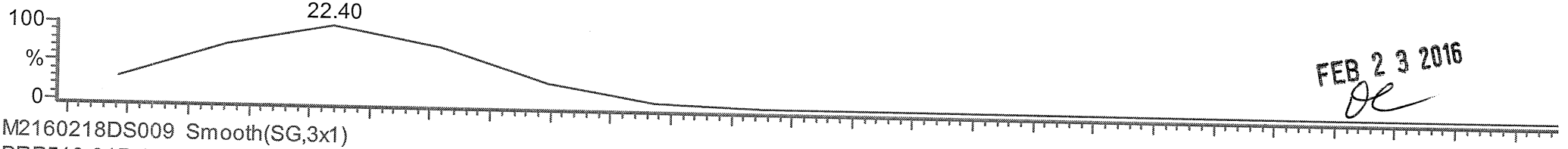
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



FEB 23 2016

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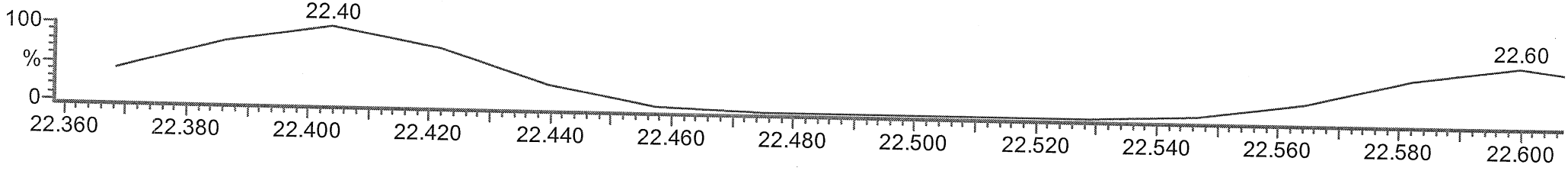
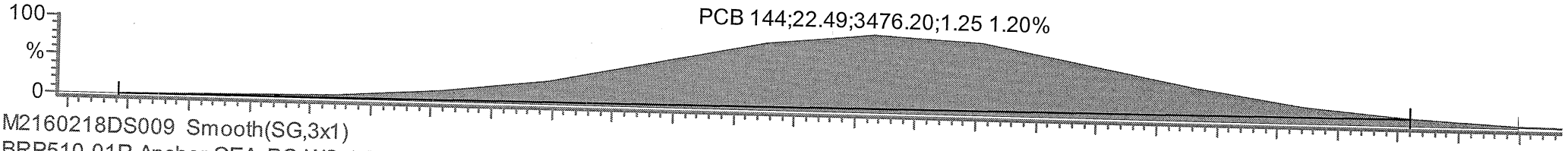
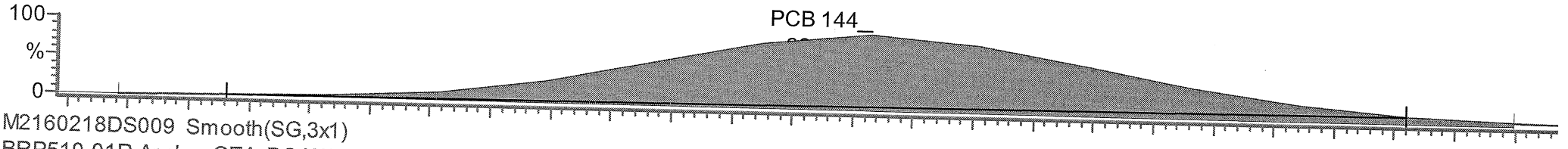


M3 **16/02/20 : AH**

M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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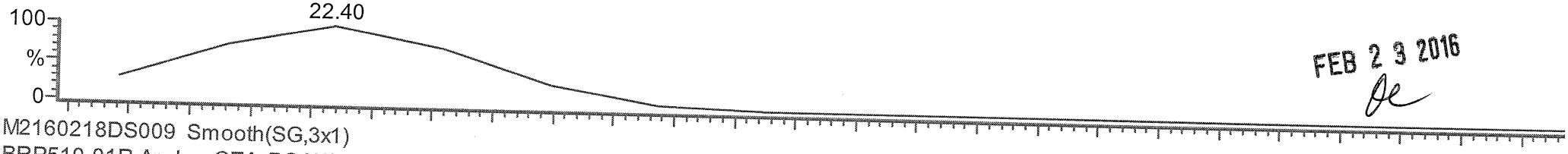
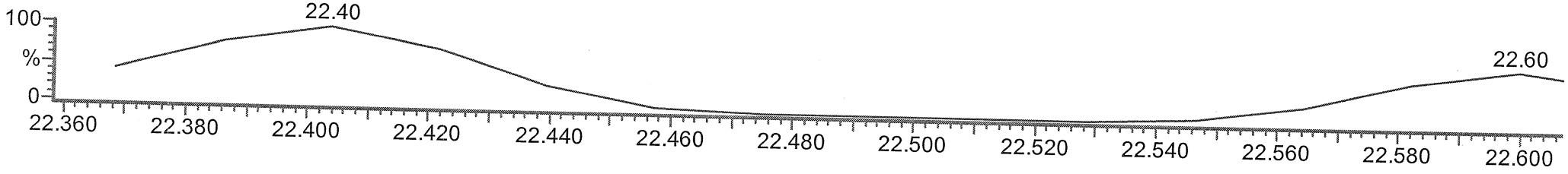
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

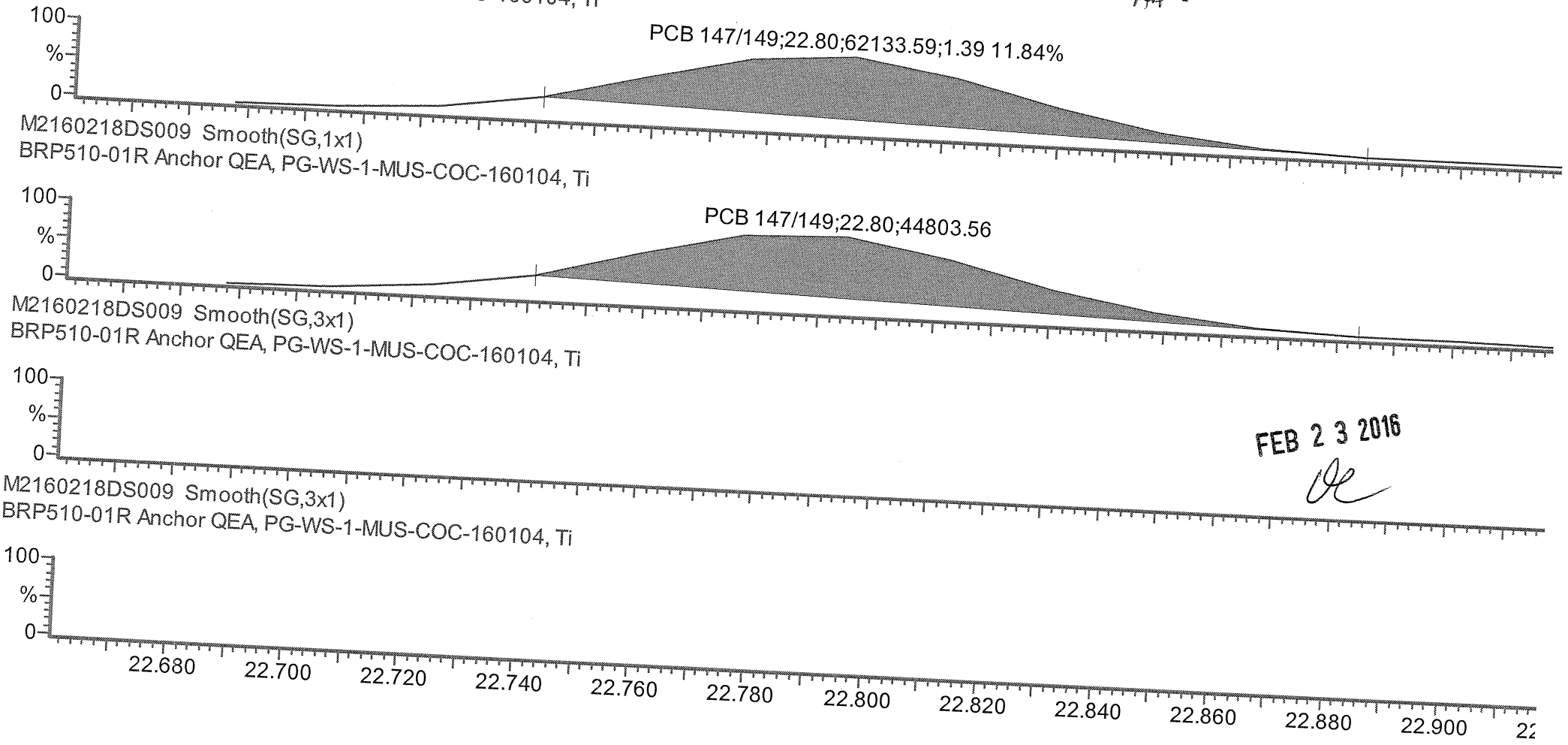


FEB 2 3 2016

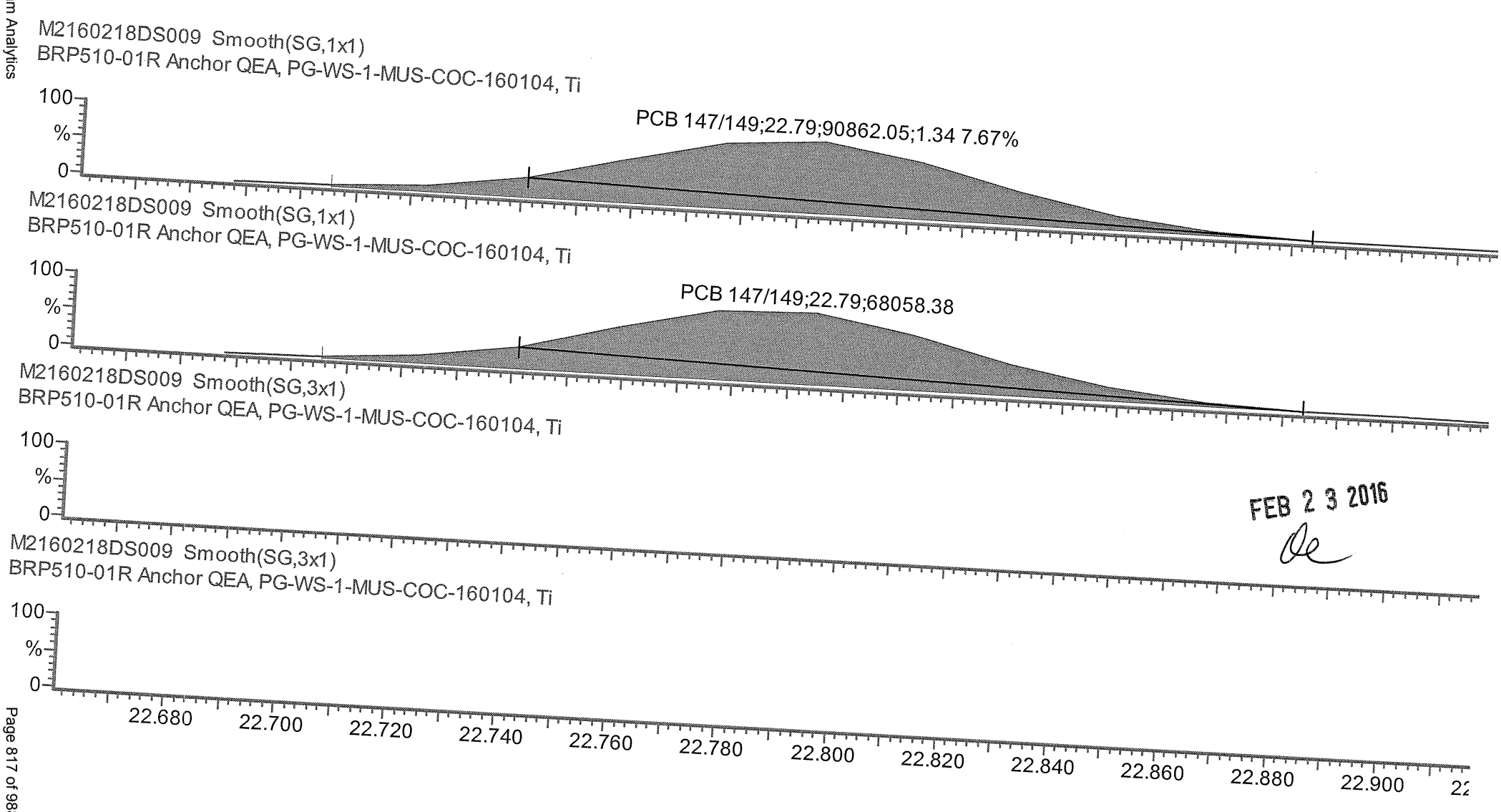
M2160218DS009 Smooth(SG,3x1)
BRP510-01R Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



Before
16.02.20

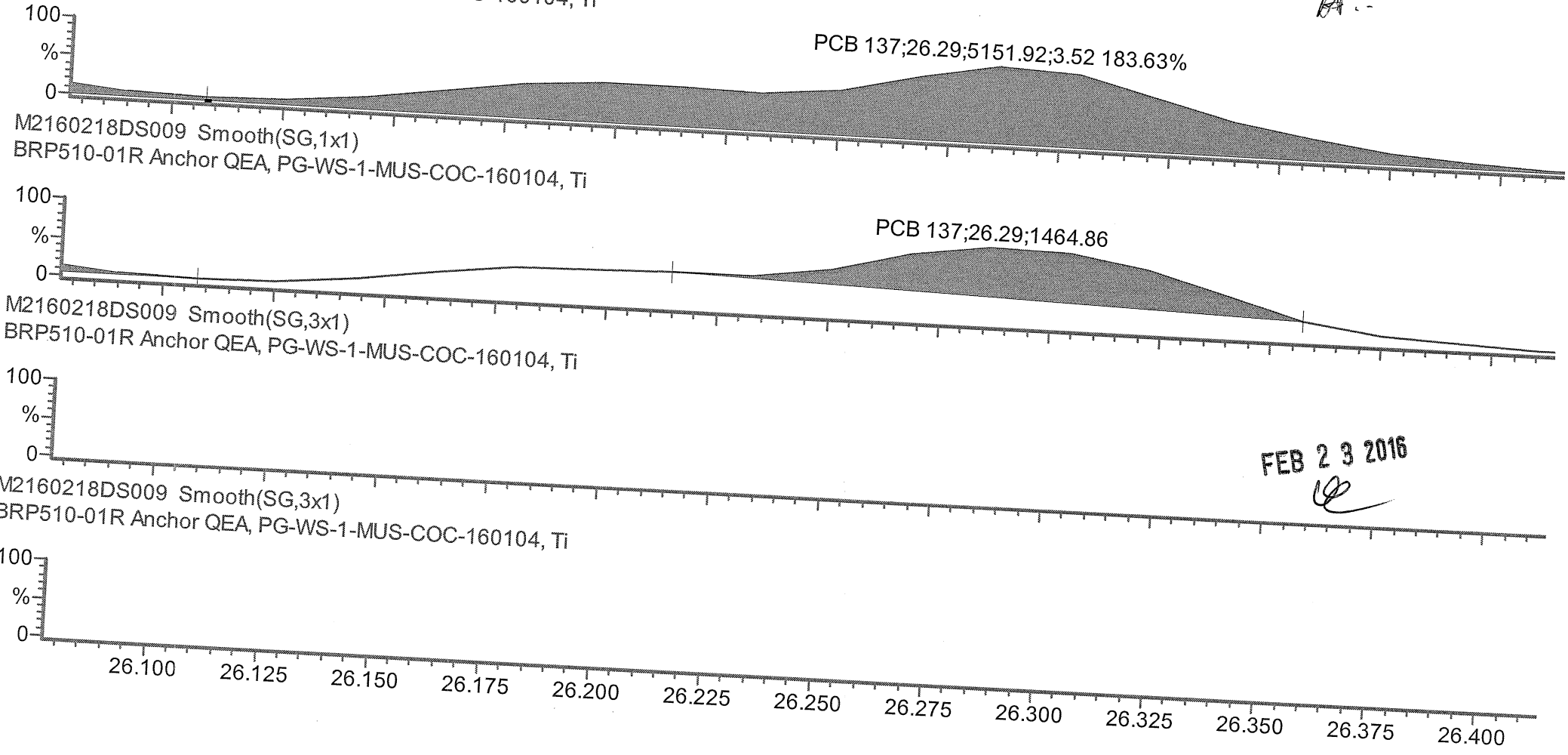


FEB 2 3 2016



FEB 2 3 2016

Before
16.02.10



FEB 2 3 2016

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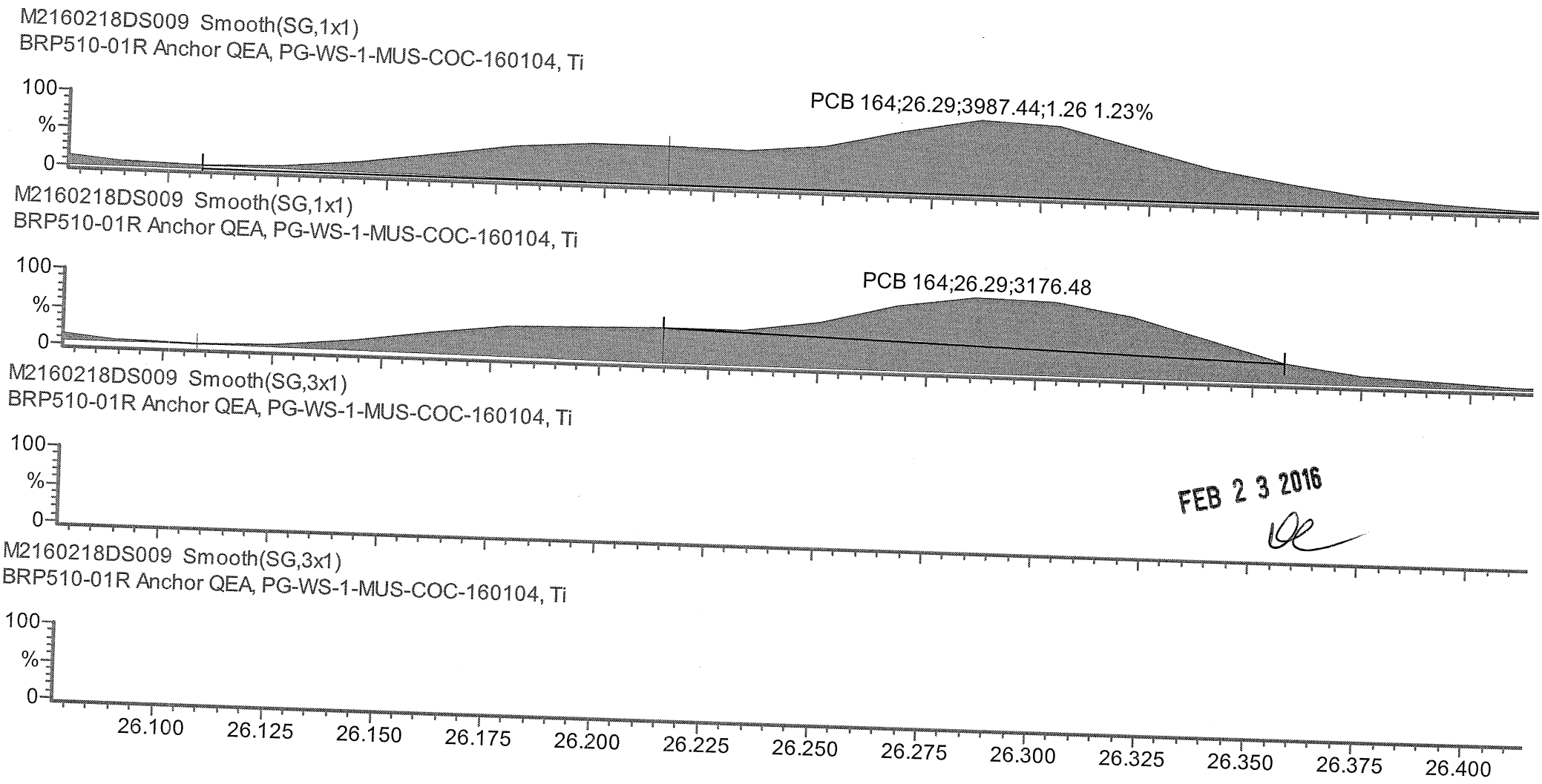

FEB 2 3 2016

Filename M2160218DS010
Acquired 18/02/2016 1:59 Call File M2160218D_209

Sample ID BRP510-01R:D1
Comments
Instrument File Ultima 3
Sample Size 10.173 Dil Fac 1.00

	Name		mass	RT	Area	ratio	Tot Area	ng	Code	Isomers	DL	S/N	Mod	rrf	Rec
1	PCB 1		188	NotFnd	*	*	*	-0.00063			-0.00063	*	no	1.082	-
		MoCB	190	8.98	*	no						*			
2	PCB 2		188	NotFnd	*	*	*	-0.00057			-0.00057	*	no	1.2	-
		MoCB	190	10.10	*	no						*			
3	PCB 3		188	NotFnd	*	*	*	-0.00063			-0.00063	*	no	1.079	-
		MoCB	190	10.19	*	no						*			
4	**PCB 4**		**222**	**10.30**	**1208**	**1.68**	**1925**	**0.003436**			-0.00204	38	yes	0.954	-
		DiCB	224	10.30	717	yes						3			
5	PCB 10		222	NotFnd	*	*	*	-0.00158			-0.00158	*	no	1.229	-
		DiCB	224	10.37	*	no						*			
6	PCB 9		222	NotFnd	*	*	*	-0.00219			-0.00219	*	no	1.311	-
		DiCB	224	11.18	*	no						*			
7	PCB 7		222	NotFnd	*	*	*	-0.00246			-0.00246	*	no	1.165	-
		DiCB	224	11.26	*	no						*			
8	**PCB 6**		**222**	**11.36**	**2399**	**1.49**	**4011**	**0.002575**			-0.00217	37	no	1.319	-
		DiCB	224	11.34	1612	yes						3			
9	PCB 5		222	NotFnd	*	*	*	-0.00292			-0.00292	*	no	0.983	-
		DiCB	224	11.50	*	no						*			
10	**PCB 8**		**222**	**11.55**	**9248**	**1.47**	**15542**	**0.009037**			-0.00197	141	no	1.456	-
		DiCB	224	11.55	6294	yes						10			
11	PCB 14		222	NotFnd	*	*	*	-0.00215			-0.00215	*	no	1.332	-
		DiCB	224	12.26	*	no						*			
12	**PCB 11**		**222**	**12.64**	**7118**	**1.36**	**12351**	**0.00814**			-0.00223	73	no	1.285	-
		DiCB	224	12.66	5233	yes						6			
13	PCB 13/12		222	NotFnd	*	*	*	-0.00237			-0.00237	*	no	1.21	-
		DiCB	224	12.82	*	no						*			
14	**PCB 15**		**222**	**12.95**	**25592**	**1.59**	**41721**	**0.027007**			-0.00329	261	no	0.871	-
		DiCB	224	12.96	16129	yes						19			
15	**PCB 19**		**256**	**11.68**	**1560**	**0.93**	**3239**	**0.005257**			-0.00257	10	no	0.899	-
		TriCB	258	11.70	1678	yes						13			
16	**PCB 30/18**		**256**	**12.49**	**23070**	**1.06**	**44861**	**0.04289**			-0.00284	152	no	0.813	-
		TriCB	258	12.48	21791	yes						152			
17	**PCB 17**		**256**	**12.68**	**4166**	**0.99**	**8357**	**0.009516**			-0.00338	27	no	0.683	-
		TriCB	258	12.69	4191	yes						28			
18	**PCB 27**		**256**	**12.79**	**4665**	**1.07**	**9029**	**0.007007**			-0.0023	27	no	1.002	-
		TriCB	258	12.79	4364	yes						25			
19	PCB 24		256	NotFnd	*	*	*	-0.0027			-0.0027	*	no	0.855	-
		TriCB	258	12.87	*	no						*			
20	**PCB 16**		**256**	**12.91**	**7937**	**1.05**	**15520**	**0.024108**			-0.00461	41	no	0.501	-
		TriCB	258	12.90	7583	yes						37			
21	**PCB 32**		**256**	**13.14**	**7581**	**1.04**	**14877**	**0.010585**			-0.00211	46	no	1.093	-
		TriCB	258	13.14	7296	yes						47			
22	PCB 34		256	NotFnd	*	*	*	-0.00086			-0.00086	*	no	1.235	-
		TriCB	258	13.74	*	no						*			
23	PCB 23		256	NotFnd	*	*	*	-0.00103			-0.00103	*	no	1.033	-
		TriCB	258	13.83	*	no						*			
24	**PCB 26/29**		**256**	**13.97**	**19325**	**1.04**	**37890**	**0.024129**			-0.00087	98	no	1.221	-
		TriCB	258	13.99	18565	yes						96			
25	**PCB 25**		**256**	**14.10**	**9549**	**1.09**	**18344**	**0.010692**			-0.0008	47	no	1.334	-
		TriCB	258	14.10	8795	yes						45			
26	**PCB 31**		**256**	**14.26**	**102856**	**1.03**	**203142**	**0.118311**			-0.0008	516	no	1.335	-
		TriCB	258	14.27	100286	yes						505			
27	**PCB 28/20**		**256**	**14.41**	**266289**	**1.04**	**521393**	**0.340584**			-0.0009	1278	no	1.191	-
		TriCB	258	14.43	255104	yes						1323			
28	**PCB 21/33**		**256**	**14.53**	**47456**	**0.95**	**97131**	**0.060178**			-0.00085	216	no	1.255	-
		TriCB	258	14.53	49675	yes						225			
29	**PCB 22**		**256**	**14.75**	**41209**	**1**	**82634**	**0.057022**			-0.00095	196	no	1.127	-
		TriCB	258	14.77	41425	yes						203			
30	PCB 36		256	NotFnd	*	*	*	-0.00068			-0.00068	*	no	1.57	-
		TriCB	258	15.60	*	no						*			
31	**PCB 39**		**256**	**15.84**	**1645**	**0.92**	**3428**	**0.002019**			-0.00081	8	no	1.32	-
		TriCB	258	15.83	1783	yes						9			
32	PCB 38		256	NotFnd	*	*	*	-0.00074			-0.00074	*	no	1.438	-
		TriCB	258	16.18	*	no						*			
33	**PCB 35**		**256**	**16.45**	**2215**	**1.07**	**4287**	**0.002088**			-0.00067	8	no	1.597	-
		TriCB	258	16.45	2072	yes						9			
34	**PCB 37**		**256**	**16.70**	**37828**	**1.07**	**73136**	**0.042822**			-0.00118	160	no	0.906	-
		TriCB	258	16.70	35308	yes						152			
35	PCB 54		290	NotFnd	*	*	*	-0.00142			-0.00142	*	no	0.911	-
		TCB	292	13.08	*	no						*			
36	**PCB 53/50**		**290**	**14.10**	**15069**	**0.82**	**33510**	**0.040064**			-0.00282	58	no	0.654	-
		TCB	292	14.12	18441	yes						56			
37	**PCB 45/51**		**290**	**14.46**	**8765**	**0.79**	**19863**	**0.024552**			-0.00292	31	no	0.633	-
		TCB	292	14.49	11098	yes						31			
38	**PCB 46**		**290**	**14.64**	**4562**	**0.8**	**10285**	**0.014531**			-0.00333	17	no	0.554	-
		TCB	292	14.64	5723	yes						16			
39	**PCB 52**		**290**	**15.36**	**111120**	**0.81**	**248582**	**0.233146**			-0.00221	418	no	0.834	-
		TCB	292	15.38	137462	yes						405			
40	PCB 73		290	NotFnd	*	*	*	-0.00227			-0.00227	*	no	0.813	-
		TCB	292	15.46	*	no						*			
41	**PCB 43**		**290**	**15.53**	**4812**	**0.75**	**11217**	**0.01699**			-0.00358	17	no	0.516	-
		TCB	292	15.53	6405	yes						16			
42	**PCB 69/49**		**290**	**15.65**	**48058**	**0.79**	**108704**	**0.099901**			-0.00217	181	no	0.851	-
		TCB	292	15.64	60646	yes						178			

43 PCB 48	**290**	**15.84**	**27259**	**0.77**	**62770**	**0.072932**		-0.00274	98	no	0.673	-
	TCB 292	15.84	35511	yes					95			
44 PCB 44/47/65	**290**	**15.96**	**105163**	**0.8**	**237054**	**0.236792**		-0.00236	325	no	0.783	-
	TCB 292	15.98	131891	yes					311			
45 PCB 59/62/75	**290**	**16.16**	**13707**	**0.79**	**31028**	**0.02388**		-0.00182	44	no	1.017	-
	TCB 292	16.17	17321	yes					42			
46 PCB 42	**290**	**16.27**	**21371**	**0.79**	**48281**	**0.055418**		-0.00271	72	no	0.682	-
	TCB 292	16.30	26910	yes					71			
47 PCB 40/41/71	**290**	**16.58**	**48044**	**0.78**	**109897**	**0.118822**		-0.00255	139	no	0.724	-
	TCB 292	16.58	61853	yes					138			
48 PCB 64	**290**	**16.72**	**30557**	**0.81**	**68358**	**0.058009**		-0.002	103	no	0.922	-
	TCB 292	16.71	37801	yes					98			
49 PCB 72	**290**	**17.20**	**1577**	**0.82**	**3495**	**0.002096**		-0.00071	9	no	1.304	-
	TCB 292	17.19	1918	yes					8			
50 PCB 68	**290**	**17.40**	**1203**	**0.82**	**2667**	**0.00171**		-0.00076	6	no	1.22	-
	TCB 292	17.40	1464	yes					6			
51 PCB 57	**290**	**17.70**	**674**	**0.72**	**1611**	**0.001032**		-0.00076	5	yes	1.221	-
	TCB 292	17.68	938	yes					6			
52 PCB 58	290	NotFnd	*	*	*	-0.0009		-0.0009	*	no	1.035	-
	TCB 292	17.83	*	no					*			
53 PCB 67	**290**	**17.95**	**3032**	**0.77**	**6988**	**0.00406**		-0.00069	16	yes	1.347	-
	TCB 292	17.94	3955	yes					17			
54 PCB 63	**290**	**18.13**	**2843**	**0.76**	**6581**	**0.00411**		-0.00074	16	yes	1.253	-
	TCB 292	18.13	3738	yes					16			
55 PCB 61/70/74/76	**290**	**18.34**	**68571**	**0.76**	**158729**	**0.112007**		-0.00084	253	no	1.109	-
	TCB 292	18.35	90158	yes					254			
56 PCB 66	**290**	**18.57**	**30751**	**0.79**	**69804**	**0.043987**		-0.00075	160	no	1.241	-
	TCB 292	18.58	39053	yes					155			
57 PCB 55	290	NotFnd	*	*	*	-0.00093		-0.00093	*	no	0.998	-
	TCB 292	18.71	*	no					*			
58 PCB 56	**290**	**19.06**	**4233**	**0.79**	**9616**	**0.007558**		-0.00093	24	no	0.995	-
	TCB 292	19.05	5384	yes					22			
59 PCB 60	**290**	**19.22**	**3385**	**0.76**	**7816**	**0.006191**		-0.00094	19	no	0.988	-
	TCB 292	19.22	4430	yes					20			
60 PCB 80	290	NotFnd	*	*	*	-0.00076		-0.00076	*	no	1.224	-
	TCB 292	19.48	*	no					*			
61 PCB 79	**290**	**20.62**	**705**	**0.74**	**1652**	**0.000884**		-0.00063	4	yes	1.462	-
	TCB 292	20.61	947	yes					5			
62 PCB 78	290	NotFnd	*	*	*	-0.00072		-0.00072	*	no	1.287	-
	TCB 292	21.06	*	no					*			
63 PCB 81	290	NotFnd	*	*	*	-0.0009		-0.0009	*	no	1.027	-
	TCB 292	21.43	*	no					*			
64 PCB 77	**290**	**21.87**	**1535**	**0.79**	**3471**	**0.002137**		-0.00086	8	no	1.077	-
	TCB 292	21.87	1936	yes					7			
65 PCB 104	326	NotFnd	*	*	*	-0.00021		-0.00021	*	no	1.094	-
	PeCB 328	15.94	*	no					*			
66 PCB 96	326	16.16	-1035.4	1.55	-1703.4	-0.00147	PCB 96 NDR	-0.00026	33	xL	0.874	-
	PeCB 328	16.16	-668	OK					26			
67 PCB 103	**326**	**17.31**	**1444**	**1.67**	**2306**	**0.002348**		-0.00062	13	no	0.739	-
	PeCB 328	17.33	862	yes					12			
68 PCB 94	326	NotFnd	*	*	*	-0.00085		-0.00085	*	no	0.54	-
	PeCB 328	17.47	*	no					*			
69 PCB 95	**326**	**17.75**	**48679**	**1.66**	**77977**	**0.085931**		-0.00067	426	no	0.683	-
	PeCB 328	17.77	29298	yes					408			
70 PCB 100/93/102/98	**326**	**18.00**	**4637**	**1.59**	**7547**	**0.009172**		-0.00074	24	no	0.619	-
	PeCB 328	17.93	2910	yes					24			
71 PCB 88/91	**326**	**18.34**	**4320**	**1.65**	**6934**	**0.008346**		-0.00073	37	yes	0.625	-
	PeCB 328	18.31	2614	yes					33			
72 PCB 84	**326**	**18.50**	**5268**	**1.65**	**8456**	**0.011911**		-0.00086	44	no	0.534	-
	PeCB 328	18.50	3187	yes					39			
73 PCB 89	326	NotFnd	*	*	*	-0.00079		-0.00079	*	no	0.582	-
	PeCB 328	18.84	*	no					*			
74 PCB 121	326	NotFnd	*	*	*	-0.0006		-0.0006	*	no	0.761	-
	PeCB 328	19.08	*	no					*			
75 PCB 92	**326**	**19.36**	**11253**	**1.5**	**18747**	**0.023593**		-0.00077	90	no	0.598	-
	PeCB 328	19.35	7494	yes					95			
76 PCB 113/90/101	**326**	**19.79**	**84618**	**1.66**	**135537**	**0.143553**		-0.00065	681	no	0.71	-
	PeCB 328	19.76	50918	yes					644			
77 PCB 83/99	**326**	**20.23**	**43946**	**1.65**	**70615**	**0.085249**		-0.00074	329	no	0.623	-
	PeCB 328	20.23	26669	yes					308			
78 PCB 112	326	NotFnd	*	*	*	-0.00056		-0.00056	*	no	0.819	-
	PeCB 328	20.34	*	no					*			
79 PCB 109/119/86/97/125/	**326**	**20.68**	**25148**	**1.67**	**40201**	**0.041637**		-0.00063	103	no	0.726	-
	PeCB 328	20.62	15053	yes					103			
80 PCB 117/116/85	**326**	**21.19**	**10349**	**1.69**	**16485**	**0.015589**		-0.00058	72	no	0.796	-
	PeCB 328	21.23	6136	yes					66			
81 PCB 110/115	**326**	**21.30**	**54663**	**1.65**	**87816**	**0.088127**		-0.00061	400	no	0.75	-
	PeCB 328	21.32	33153	yes					377			
82 PCB 82	**326**	**21.58**	**2307**	**1.56**	**3784**	**0.005043**		-0.00081	16	no	0.564	-
	PeCB 328	21.59	1476	yes					17			
83 PCB 111	326	NotFnd	*	*	*	-0.00057		-0.00057	*	no	0.809	-
	PeCB 328	21.85	*	no					*			
84 PCB 120	326	NotFnd	*	*	*	-0.00048		-0.00048	*	no	0.951	-
	PeCB 328	22.25	*	no					*			
85 PCB 108/124	**326**	**23.20**	**2558**	**1.52**	**4236**	**0.002839**		-0.00096	9	yes	1.122	-
	PeCB 328	23.21	1677	yes					8			
86 PCB 107	**326**	**23.40**	**6726**	**1.58**	**10977**	**0.007198**		-0.00093	21	yes	1.147	-
	PeCB 328	23.40	4251	yes					19			
87 PCB 123	326	NotFnd	*	*	*	-0.0012		-0.0012	*	no	0.894	-
	PeCB 328	23.51	*	no					*			
88 PCB 106	326	NotFnd	*	*	*	-0.00088		-0.00088	*	no	1.218	-
	PeCB 328	23.63	*	no					*			
89 PCB 118	**326**	**23.79**	**82808**	**1.59**	**134987**	**0.091663**		-0.00109	248	no	0.981	-
	PeCB 328	23.80	52180	yes					241			

90 PCB 122	326	NotFnd	*	*	*	-0.00099	-0.00099	*	no	1.079	-	
	PeCB 328	24.08	*	no				*				
91 PCB 114	**326**	**24.27**	**1278**	**1.53**	**2112**	**0.001474**	-0.00106	4	yes	1.01	-	
	PeCB 328	24.28	834	yes				4				
92 PCB 105	**326**	**24.84**	**27084**	**1.59**	**44156**	**0.030596**	-0.0011	77	no	0.977	-	
	PeCB 328	24.85	17072	yes				75				
93 PCB 127	326	NotFnd	*	*	*	-0.00087	-0.00087	*	no	1.23	-	
	PeCB 328	26.20	*	no				*				
94 PCB 126	326	NotFnd	*	*	*	-0.0011	-0.0011	*	no	0.977	-	
	PeCB 328	27.72	*	no				*				
95 PCB 155	360	NotFnd	*	*	*	-0.00151	-0.00151	*	no	0.997	-	
	HxCB 362	19.63	*	no				*				
96 PCB 152	360	NotFnd	*	*	*	-0.00186	-0.00186	*	no	0.813	-	
	HxCB 362	19.78	*	no				*				
97 PCB 150	360	NotFnd	*	*	*	-0.00232	-0.00232	*	no	0.65	-	
	HxCB 362	19.88	*	no				*				
98 PCB 136	**360**	**20.18**	**10688**	**1.22**	**19485**	**0.020979**	-0.00198	40	no	0.761	-	
	HxCB 362	20.18	8798	yes				40				
99 PCB 145	360	NotFnd	*	*	*	-0.00228	-0.00228	*	no	0.662	-	
	HxCB 362	20.41	*	no				*				
100 PCB 148	360	NotFnd	*	*	*	-0.00274	-0.00274	*	no	0.551	-	
	HxCB 362	21.55	*	no				*				
101 PCB 151/135	**360**	**22.03**	**30075**	**1.28**	**53479**	**0.084427**	-0.00291	88	no	0.519	-	
	HxCB 362	22.04	23405	yes				85				
102 PCB 154	**360**	**22.23**	**2105**	**1.27**	**3767**	**0.004996**	-0.00244	7	no	0.618	-	
	HxCB 362	22.22	1662	yes				8				
103 PCB 144	**360**	**22.49**	**4117**	**1.31**	**7252**	**0.01057**	-0.00269	14	yes	0.562	-	
	HxCB 362	22.51	3135	yes				14				
104 PCB 147/149	**360**	**22.80**	**107086**	**1.31**	**188804**	**0.233631**	-0.00127	660	yes	0.662	-	
	HxCB 362	22.80	81718	yes				616				
105 PCB 134/143	**360**	**22.97**	**2604**	**1.3**	**4599**	**0.006433**	-0.00144	20	no	0.586	-	
	HxCB 362	23.06	1995	yes				18				
106 PCB 139/140	**360**	**23.29**	**1317**	**1.28**	**2343**	**0.002825**	-0.00124	7	no	0.68	-	
	HxCB 362	23.31	1026	yes				7				
107 PCB 131	360	NotFnd	*	*	*	-0.00157	-0.00157	*	no	0.537	-	
	HxCB 362	23.49	*	no				*				
108 PCB 142	360	NotFnd	*	*	*	-0.00135	-0.00135	*	no	0.626	-	
	HxCB 362	23.65	*	no				*				
109 PCB 132	**360**	**23.88**	**14794**	**1.22**	**26971**	**0.039446**	-0.0015	81	no	0.561	-	
	HxCB 362	23.88	12177	yes				86				
110 PCB 133	**360**	**24.29**	**2657**	**1.35**	**4623**	**0.005768**	-0.00128	15	no	0.657	-	
	HxCB 362	24.31	1966	yes				15				
111 PCB 165	360	NotFnd	*	*	*	-0.0011	-0.0011	*	no	0.765	-	
	HxCB 362	24.66	*	no				*				
112 PCB 146	**360**	**24.88**	**29589**	**1.25**	**53240**	**0.061918**	-0.0012	169	no	0.705	-	
	HxCB 362	24.87	23651	yes				164				
113 PCB 161	360	NotFnd	*	*	*	-0.00087	-0.00087	*	no	0.97	-	
	HxCB 362	25.01	*	no				*				
114 PCB 153/168	**360**	**25.43**	**251274**	**1.31**	**442721**	**0.425881**	-0.00099	1432	no	0.852	-	
	HxCB 362	25.46	191447	yes				1342				
115 PCB 141	**360**	**25.61**	**5202**	**1.27**	**9287**	**0.011173**	-0.00124	29	no	0.681	-	
	HxCB 362	25.60	4085	yes				26				
116 PCB 130	**360**	**26.00**	**5393**	**1.23**	**9775**	**0.012988**	-0.00137	29	no	0.617	-	
	HxCB 362	25.99	4382	yes				27				
117 PCB 137	**360**	**26.23**	**1622**	**1.25**	**2916**	**0.003936**	-0.00139	10	yes	0.607	-	
	HxCB 362	26.19	1294	yes				12				
118 PCB 164	**360**	**26.29**	**4460**	**1.27**	**7968**	**0.007154**	-0.00092	24	yes	0.913	-	
	HxCB 362	26.28	3508	yes				21				
119 PCB 138/163/129	**360**	**26.59**	**175425**	**1.3**	**310417**	**0.361162**	-0.0012	945	no	0.705	-	
	HxCB 362	26.61	134992	yes				894				
120 PCB 160	360	NotFnd	*	*	*	-0.00102	-0.00102	*	no	0.822	-	
	HxCB 362	26.78	*	no				*				
121 PCB 158	**360**	**26.96**	**15360**	**1.23**	**27849**	**0.022729**	-0.00084	77	no	1.004	-	
	HxCB 362	26.96	12489	yes				79				
122 PCB 128/166	**360**	**27.80**	**16645**	**1.27**	**29781**	**0.031546**	-0.00109	73	no	0.774	-	
	HxCB 362	27.79	13136	yes				72				
123 PCB 159	360	NotFnd	*	*	*	-0.00119	-0.00119	*	no	1.179	-	
	HxCB 362	28.76	*	no				*				
124 PCB 162	360	29.05	332	1.18	615	-0.00127	-0.00127	*	yes	1.101	-	
	HxCB 362	29.06	283	no				*				
125 PCB 167	**360**	**29.51**	**6749**	**1.12**	**12802**	**0.008454**	-0.00148	19	no	0.946	-	
	HxCB 362	29.53	6053	yes				21				
126 PCB 156/157	**360**	**30.68**	**14739**	**1.19**	**27156**	**0.018083**	-0.00137	35	no	1.017	-	
	HxCB 362	30.71	12416	yes				35				
127 PCB 169	360	NotFnd	*	*	*	-0.00146	-0.00146	*	no	0.954	-	
	HxCB 362	34.11	*	no				*				
128 PCB 188	394	NotFnd	*	*	*	-0.00114	-0.00114	*	no	1.012	-	
	HpCB 396	24.23	*	no				*				
129 PCB 179	**394**	**24.52**	**13808**	**1.1**	**26399**	**0.025684**	-0.0011	69	no	1.047	-	
	HpCB 396	24.52	12591	yes				68				
130 PCB 184	394	NotFnd	*	*	*	-0.0012	-0.0012	*	no	0.961	-	
	HpCB 396	25.00	*	no				*				
131 PCB 176	**394**	**25.33**	**4288**	**1.17**	**7937**	**0.007873**	-0.00113	21	no	1.027	-	
	HpCB 396	25.32	3649	yes				19				
132 PCB 186	394	NotFnd	*	*	*	-0.00129	-0.00129	*	no	0.899	-	
	HpCB 396	25.75	*	no				*				
133 PCB 178	**394**	**27.00**	**6399**	**0.99**	**12866**	**0.018153**	-0.0016	30	no	0.722	-	
	HpCB 396	27.01	6468	yes				33				
134 PCB 175	**394**	**27.60**	**1116**	**1.07**	**2161**	**0.002926**	-0.00154	5	no	0.753	-	
	HpCB 396	27.62	1045	yes				5				
135 PCB 187	**394**	**27.87**	**44121**	**1.04**	**86563**	**0.121953**	-0.0016	211	no	0.723	-	
	HpCB 396	27.88	42442	yes				213				
136 PCB 182	394	NotFnd	*	*	*	-0.00155	-0.00155	*	no	0.747	-	
	HpCB 396	28.10	*	no				*				

137 PCB 183	**394**	**28.48**	**30437**	**1.08**	**58539**	**0.051356**			-0.00114	138	yes	1.162	-
	HpCB 396	28.50	28102	yes						132			
138 PCB 185	394	NotFnd	*	*	*	-0.00155			-0.00155	*	no	0.851	-
	HpCB 396	28.56	*	no						*			
139 PCB 174	394	NotFnd	*	*	*	-0.00136			-0.00136	*	no	0.97	-
	HpCB 396	28.72	*	no						*			
140 PCB 177	**394**	**29.16**	**19923**	**1.06**	**38715**	**0.041838**			-0.0014	85	no	0.943	-
	HpCB 396	29.14	18792	yes						82			
141 PCB 181	394	NotFnd	*	*	*	-0.00148			-0.00148	*	no	0.892	-
	HpCB 396	29.56	*	no						*			
142 PCB 171/173	**394**	**29.78**	**10851**	**1.11**	**20599**	**0.022136**			-0.0014	47	no	0.948	-
	HpCB 396	29.78	9748	yes						48			
143 PCB 172	**394**	**31.43**	**1224**	**1.07**	**2371**	**0.002544**			-0.00139	6	no	0.95	-
	HpCB 396	31.42	1147	yes						6			
144 PCB 192	394	NotFnd	*	*	*	-0.00122			-0.00122	*	no	1.085	-
	HpCB 396	31.74	*	no						*			
145 PCB 193/180	**394**	**32.13**	**65034**	**1.08**	**125244**	**0.111374**			-0.00096	259	no	1.383	-
	HpCB 396	32.06	60210	yes						253			
146 PCB 191	**394**	**32.50**	**1498**	**0.95**	**3076**	**0.002318**			-0.00098	6	no	1.352	-
	HpCB 396	32.48	1578	yes						6			
147 PCB 170	**394**	**33.45**	**11990**	**1.12**	**22734**	**0.024957**			-0.00104	47	no	1.271	-
	HpCB 396	33.45	10744	yes						45			
148 PCB 190	**394**	**34.01**	**6854**	**1.02**	**13597**	**0.010304**			-0.00098	28	yes	1.345	-
	HpCB 396	34.02	6743	yes						28			
149 PCB 189	**394**	**36.87**	**2159**	**1.15**	**4038**	**0.002708**			-0.00043	14	no	0.944	-
	HpCB 396	36.88	1880	yes						16			
150 PCB 202	**428**	**29.26**	**3690**	**1**	**7365**	**0.010135**			-0.00188	16	no	0.988	-
	OcCB 430	29.28	3675	yes						15			
151 PCB 201	**428**	**30.19**	**1720**	**0.81**	**3854**	**0.004192**			-0.00186	8	no	0.997	-
	OcCB 430	30.18	2134	yes						8			
152 PCB 204	428	NotFnd	*	*	*	-0.00193			-0.00193	*	no	0.962	-
	OcCB 430	30.89	*	no						*			
153 PCB 197	428	31.13	718	0.97	1458	-0.00212			-0.00212	*	yes	0.876	-
	OcCB 430	31.12	740	no						*			
154 PCB 200	428	31.23	20	0.85	44	-0.00185			-0.00185	*	yes	1.006	-
	OcCB 430	31.24	24	no						*			
155 PCB 198/199	428	NotFnd	*	*	*	-0.00284			-0.00284	*	no	0.654	-
	OcCB 430	34.19	*	no						*			
156 PCB 196	428	NotFnd	*	*	*	-0.00276			-0.00276	*	no	0.674	-
	OcCB 430	34.92	*	no						*			
157 PCB 203	**428**	**35.12**	**2653**	**0.9**	**5588**	**0.009196**			-0.00282	11	no	0.659	-
	OcCB 430	35.12	2935	yes						10			
158 PCB 195	428	NotFnd	*	*	*	-0.00156			-0.00156	*	no	1.005	-
	OcCB 430	36.59	*	no						*			
159 PCB 194	428	39.20	-3785.17	0.89	-8038.17	-0.00798	PCB 194 NDR		-0.00143	15	xL	1.091	-
	OcCB 430	39.22	-4253	OK						12			
160 PCB 205	428	NotFnd	*	*	*	-0.00143			-0.00143	*	no	1.091	-
	OcCB 430	39.77	*	no						*			
161 PCB 208	462	NotFnd	*	*	*	-0.00159			-0.00159	*	no	1.023	-
	NoCB 464	36.31	*	no						*			
162 PCB 207	462	NotFnd	*	*	*	-0.00123			-0.00123	*	no	1.32	-
	NoCB 464	37.32	*	no						*			
163 PCB 206	462	NotFnd	*	*	*	-0.00158			-0.00158	*	no	1.027	-
	NoCB 464	41.70	*	no						*			
164 PCB 209	498	NotFnd	*	*	*	-0.00263			-0.00263	*	no	1.04	-
	DCB 500	43.54	*	no						*			
165 PCB 1L	**200**	**8.98**	**218884**	**3.48**	**281700**	**0.18552**			0.001	3644	no	0.824	94
	202	8.97	62816	yes						340			
166 PCB 3L	**200**	**10.17**	**193011**	**3.51**	**248075**	**0.157899**			0.001	3178	no	0.852	80
	202	10.16	55064	yes						298			
167 PCB 4L	**234**	**10.28**	**71778**	**1.64**	**115490**	**0.115468**			0	3835	no	0.543	59
	236	10.28	43712	yes						3962			
168 PCB 15L	**234**	**12.93**	**215276**	**1.61**	**348881**	**0.17618**			0	2432	no	1.074	90
	236	12.91	133605	yes						1721			
169 PCB 19L	**268**	**11.68**	**69652**	**1.07**	**134780**	**0.126456**			0.001	639	no	0.578	64
	270	11.66	65128	yes						554			
170 PCB 37L	**268**	**16.68**	**190813**	**1.06**	**370823**	**0.218493**			0.001	472	no	1.987	111
	270	16.67	180010	yes						820			
171 PCB 54L	**302**	**13.06**	**61324**	**0.79**	**139086**	**0.125491**			0	1102	no	1.297	64
	304	13.06	77763	yes						1632			
172 PCB 81L	**302**	**21.41**	**141639**	**0.8**	**318376**	**0.214434**			0	806	no	1.738	109
	304	21.39	176737	yes						2435			
173 PCB 77L	**302**	**21.85**	**133594**	**0.82**	**296453**	**0.206909**			0	732	no	1.677	105
	304	21.82	162859	yes						2199			
174 PCB 104L	**338**	**15.93**	**87016**	**1.63**	**140304**	**0.163548**			0	6357	no	1.156	83
	340	15.93	53287	yes						2470			
175 PCB 123L	**338**	**23.49**	**187960**	**1.65**	**301886**	**0.210076**			0	2058	no	1.936	107
	340	23.50	113927	yes						2392			
176 PCB 118L	**338**	**23.77**	**180587**	**1.58**	**294988**	**0.208513**			0	1963	no	1.906	106
	340	23.76	114401	yes						2379			
177 PCB 114L	**338**	**24.26**	**172893**	**1.63**	**278877**	**0.21191**			0	1848	no	1.773	108
	340	24.25	105984	yes						2219			
178 PCB 105L	**338**	**24.83**	**178712**	**1.6**	**290562**	**0.214783**			0	1853	no	1.822	109
	340	24.81	111850	yes						2235			
179 PCB 126L	**338**	**27.69**	**169689**	**1.56**	**278696**	**0.21633**			0	1646	no	1.735	110
	340	27.67	109007	yes						1999			
180 PCB 155L	**372**	**19.61**	**86996**	**1.27**	**155356**	**0.145963**			0	5503	no	1.404	74
	374	19.61	68360	yes						4541			
181 PCB 167L	**372**	**29.50**	**175506**	**1.26**	**314773**	**0.196734**			0	3353	no	2.11	100
	374	29.50	139267	yes						1118			
182 PCB 156L/157L	**372**	**30.68**	**330468**	**1.32**	**580569**	**0.398548**			0	5060	no	1.921	101
	374	30.69	250101	yes						1610			
183 PCB 169L	**372**	**34.08**	**110716**	**1.26**	**198893**	**0.139044**			0	1922	no	1.886	71
	374	34.06	88176	yes						641			

184	**PCB 188L**	**406**	**24.20**	**82726**	**1.07**	**160216**	**0.158924**		0	4021	no	1.329	81
		408	24.21	77490	yes					4125			
185	**PCB 180L**	**406**	**32.09**	**83331**	**1.09**	**159914**	**0.157328**		0	1847	no	1.349	80
		408	32.09	76583	yes					2829			
186	**PCB 170L**	**406**	**33.42**	**72808**	**1.07**	**140906**	**0.158413**		0	1586	no	1.18	81
		408	33.42	68098	yes					2529			
187	**PCB 189L**	**406**	**36.84**	**161506**	**1.08**	**310655**	**0.191056**		0	2869	no	2.157	97
		408	36.83	149149	yes					2509			
188	**PCB 202L**	**440**	**29.25**	**68727**	**0.9**	**144671**	**0.135224**		0	5076	no	1.419	69
		442	29.27	75944	yes					2271			
189	**PCB 205L**	**440**	**39.73**	**104769**	**0.93**	**218057**	**0.188929**		0	2574	no	1.531	96
		442	39.73	113288	yes					1887			
190	**PCB 208L**	**474**	**36.27**	**59602**	**0.8**	**134172**	**0.156231**		0	3439	no	1.139	79
		476	36.28	74570	yes					2036			
191	**PCB 206L**	**474**	**41.70**	**44392**	**0.8**	**100030**	**0.174728**		0	2491	no	0.76	89
		476	41.73	55637	yes					1451			
192	**PCB 209L**	**510**	**43.54**	**51297**	**1.2**	**93999**	**0.17218**		0	2223	no	0.724	88
		512	43.53	42702	yes					1746			
193	**PCB 28L**	**268**	**14.41**	**218829**	**1.04**	**429481**	**0.24651**		0.001	617	no	2.039	113
	PCB Cleanup Standard	270	14.41	210652	yes					1076			
194	**PCB 111L**	**338**	**21.83**	**133113**	**1.65**	**213940**	**0.214588**		0	5031	no	1.343	98
	PCB Cleanup Standard	340	21.84	80827	yes					2598			
195	**PCB 178L**	**406**	**26.98**	**57098**	**1.08**	**110194**	**0.198259**		0	2585	no	0.733	91
	PCB Cleanup Standard	408	26.97	53096	yes					2658			
196	PCB 31L	268	NotFnd	*	*	*			0.001		no	1.934	
	PCB Audit Standard	270	14.24	*	no								
197	PCB 95L	338	NotFnd	*	*	*			0		no	0.946	
	PCB Audit Standard	340	17.73	*	no								
198	PCB 153L	372	NotFnd	*	*	*			0		no	1.225	
	PCB Audit Standard	374	25.40	*	no								
199	**PCB 9L**	**234**	**11.18**	**1240308**	**1.61**	**2013045**	**10.15711**		-	15569	no	-	-
	PCB Recovery Standard	236	11.19	772738	yes					11069			
200	**PCB 52L**	**302**	**15.35**	**417980**	**0.81**	**933049**	**7.276455**		-	4908	no	-	-
	PCB Recovery Standard	304	15.36	515068	yes					10618			
201	**PCB 101L**	**338**	**19.77**	**502581**	**1.63**	**810721**	**7.265971**		-	20096	no	-	-
	PCB Recovery Standard	340	19.76	308140	yes					10454			
202	**PCB 138L**	**372**	**26.57**	**471215**	**1.32**	**828212**	**7.573036**		-	11121	no	-	-
	PCB Recovery Standard	374	26.56	356997	yes					14586			
203	**PCB 194L**	**440**	**39.18**	**395957**	**0.93**	**823163**	**7.494846**		-	10166	no	-	-
	PCB Recovery Standard	442	39.17	427206	yes					7317			

Chlorobiphenyls	-0.00063	0	-0.00063
Dichlorobiphenyls	0.050195	5	-0.00329
Trichlorobiphenyls	0.757208	15	-0.00461
Tetrachlorobiphenyls	1.180809	23	-0.00358
Pentachlorobiphenyls	0.654269	17	-0.0012
Hexachlorobiphenyls	1.374099	20	-0.00291
Heptachlorobiphenyls	0.446124	14	-0.0016
Octachlorobiphenyls	0.023523	3	-0.00284
Nonachlorobiphenyls	-0.00159	0	-0.00159
Decachlorobiphenyl	-0.00263	0	-0.00263
PCB (total)	4.486227		

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Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

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ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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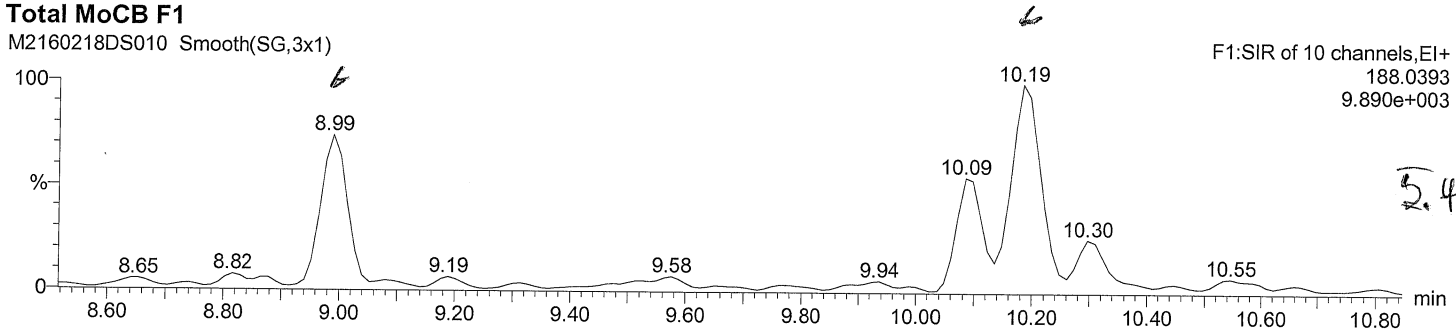

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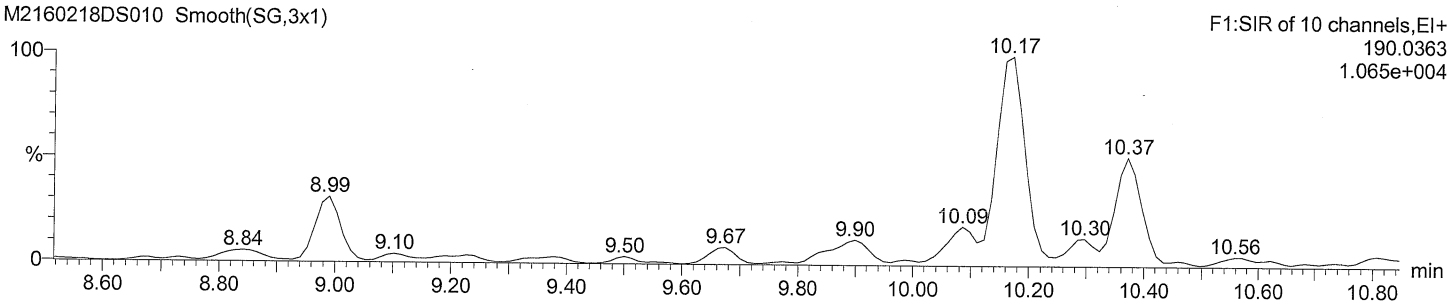

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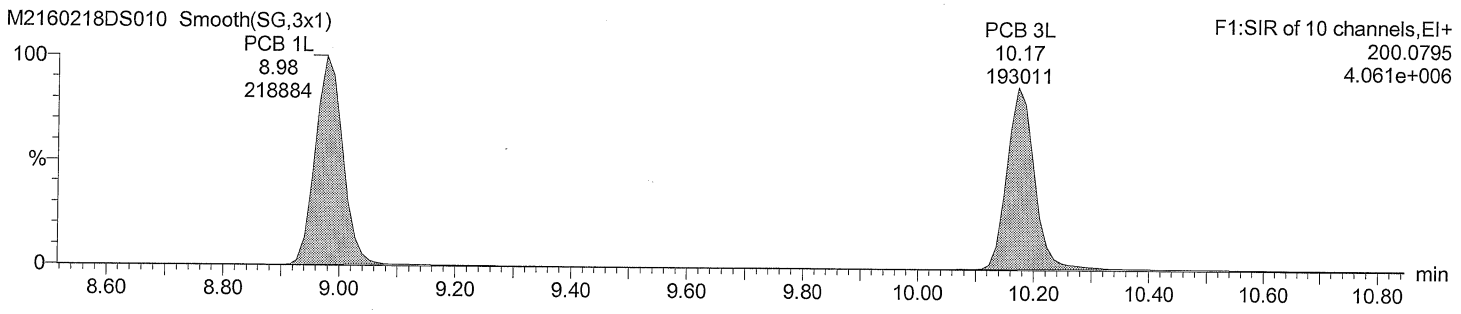

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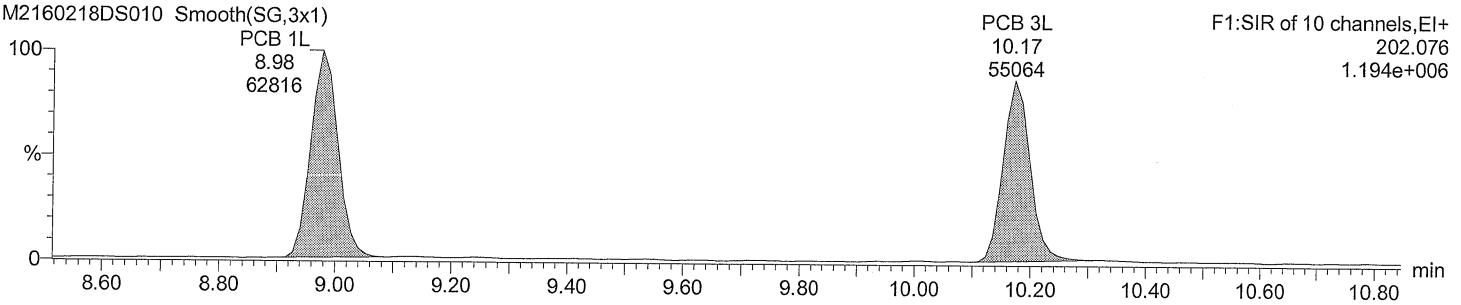

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Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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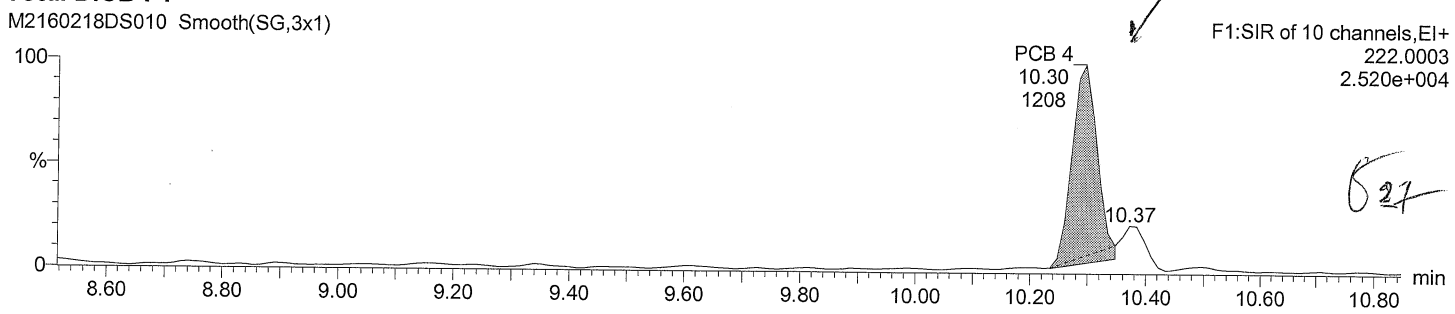

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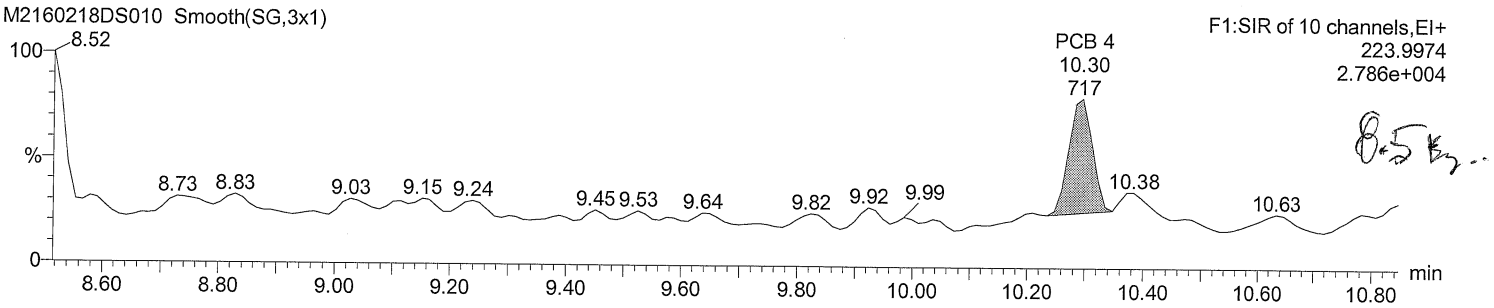

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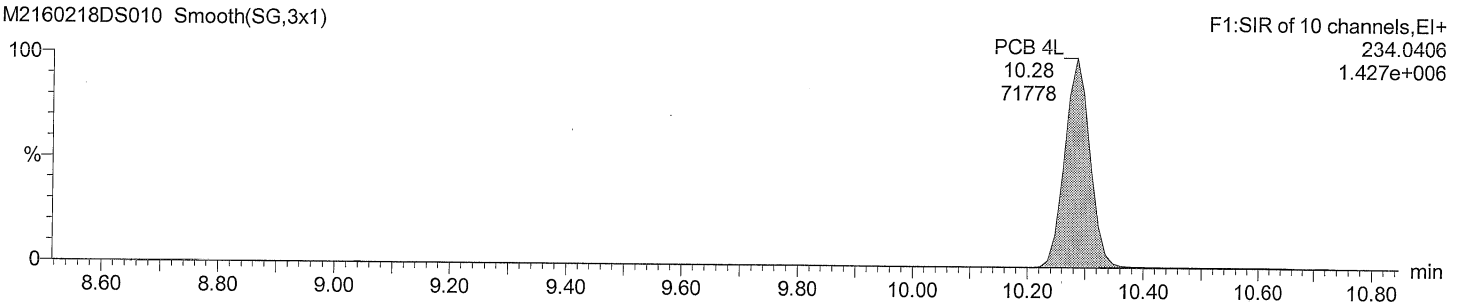

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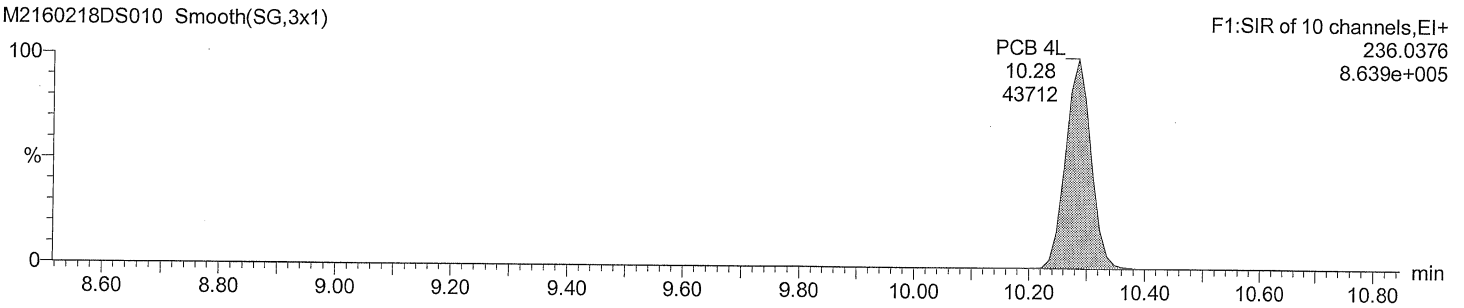

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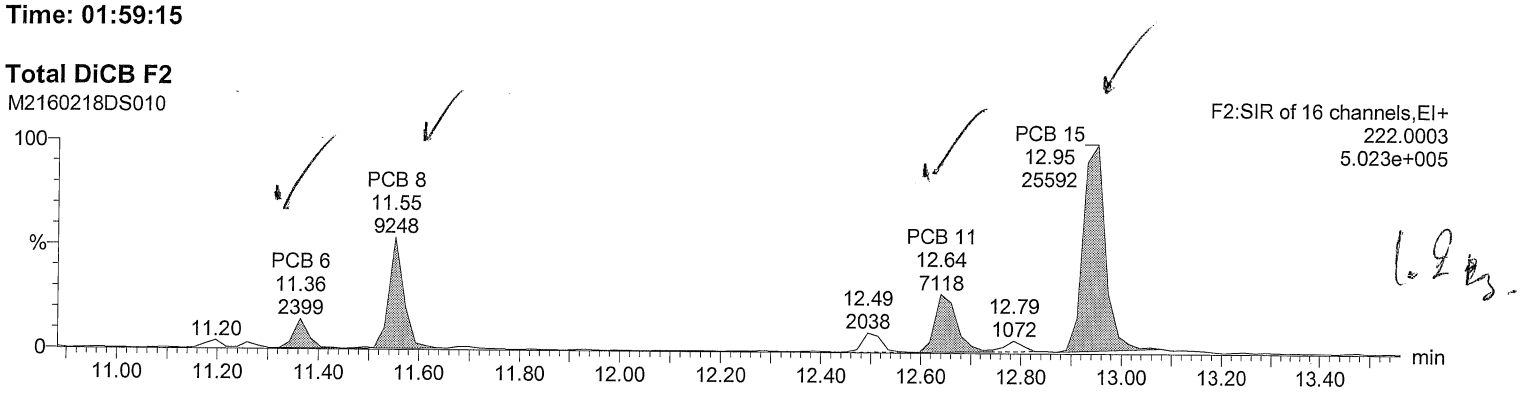
ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

Total DiCB F2
M2160218DS010



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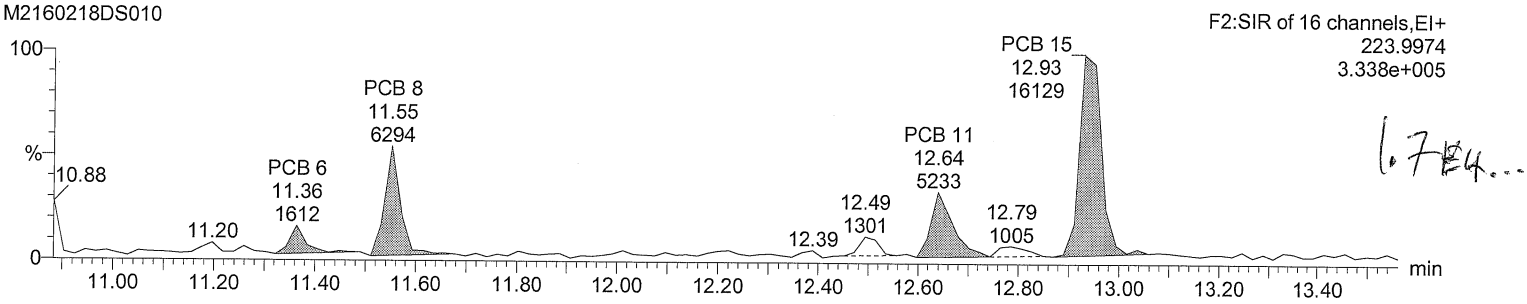

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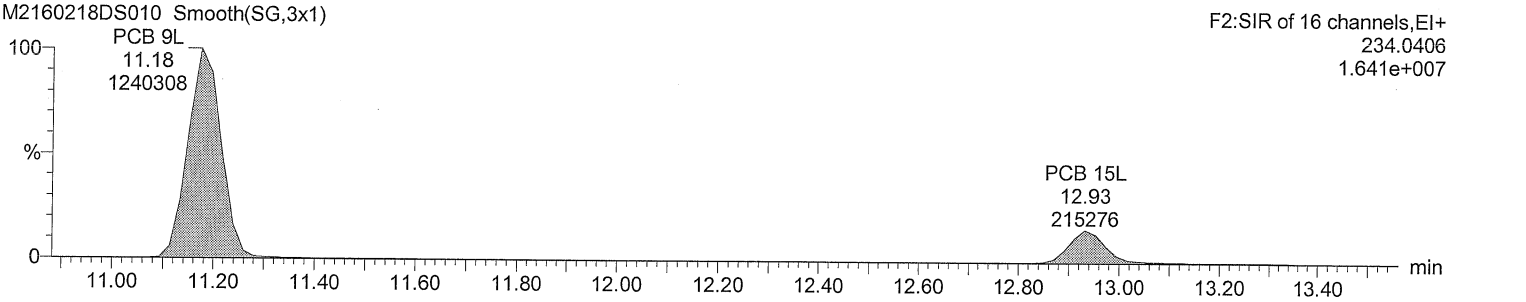

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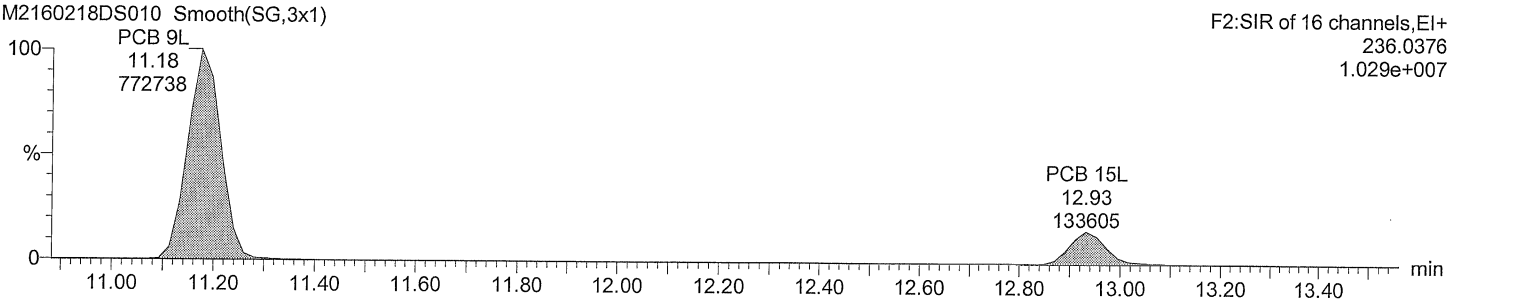

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ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
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Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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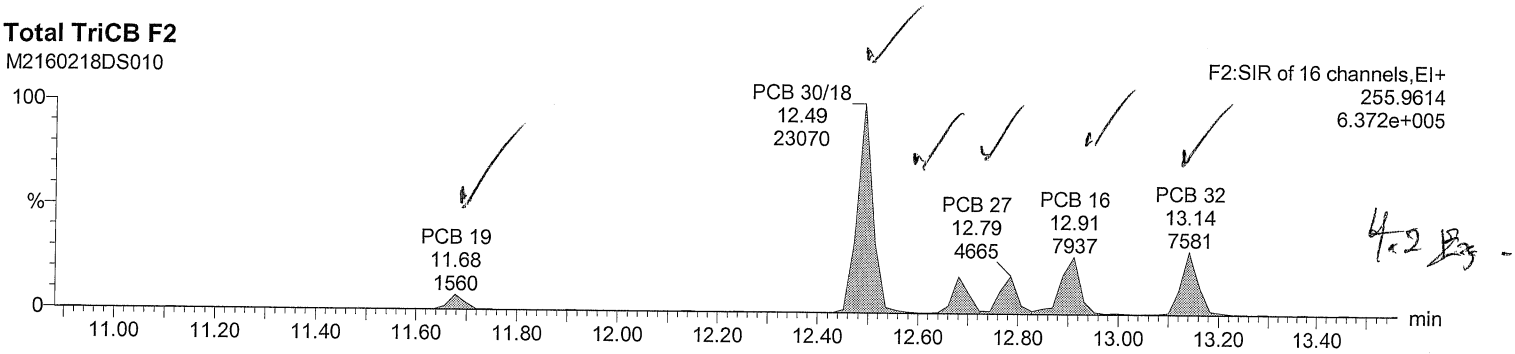

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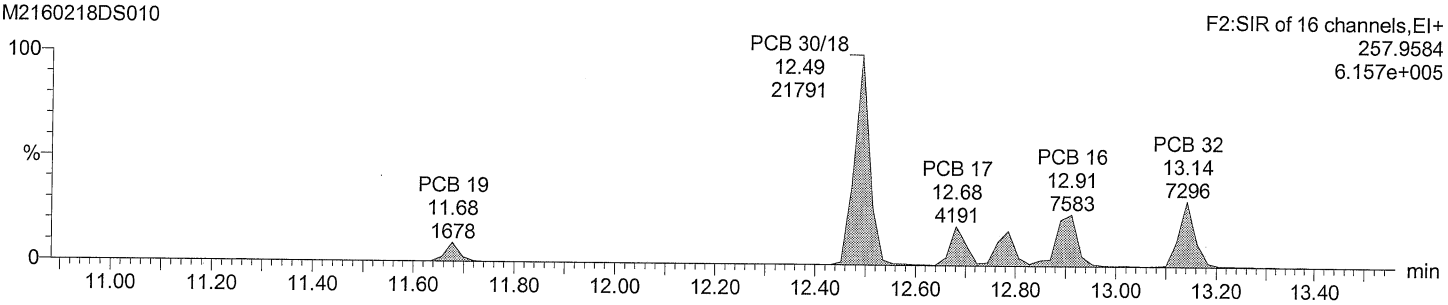

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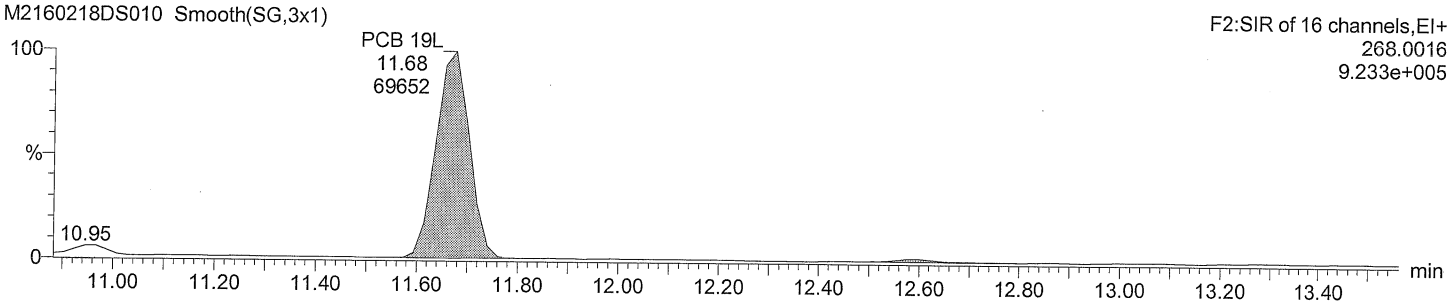

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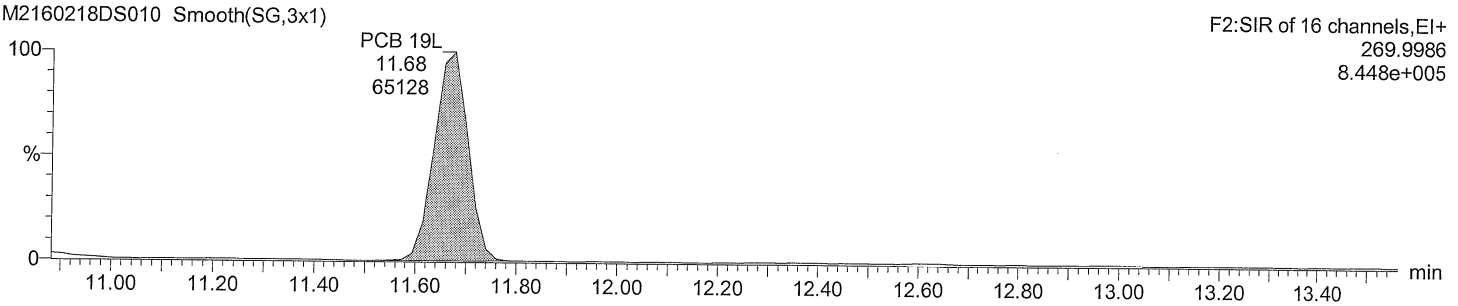

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Last Altered: February 20, 2016 02:09:39 PM Eastern Standard Time
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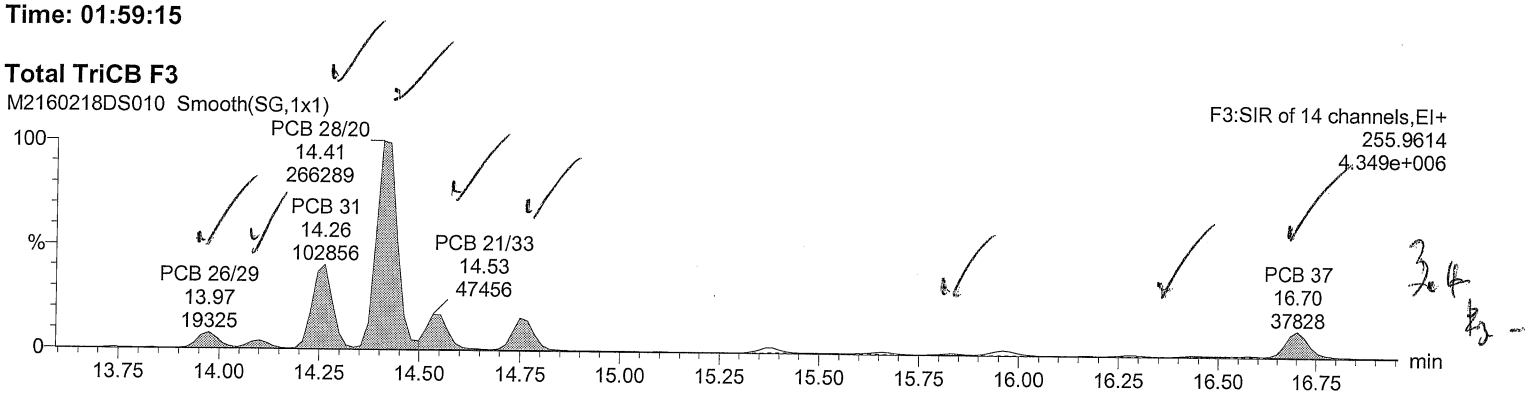
ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

Total TriCB F3



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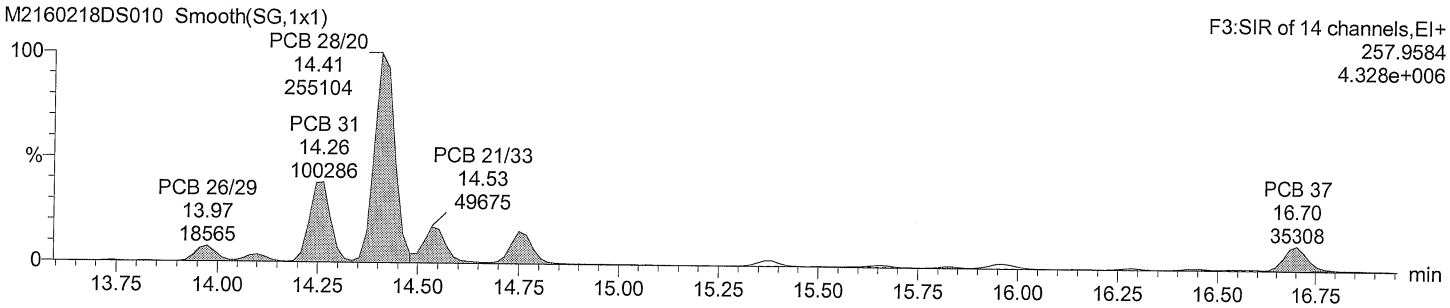

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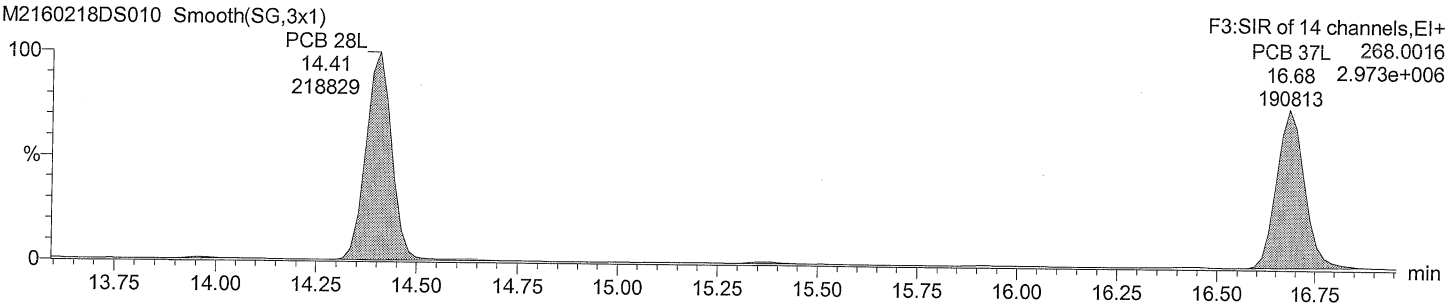

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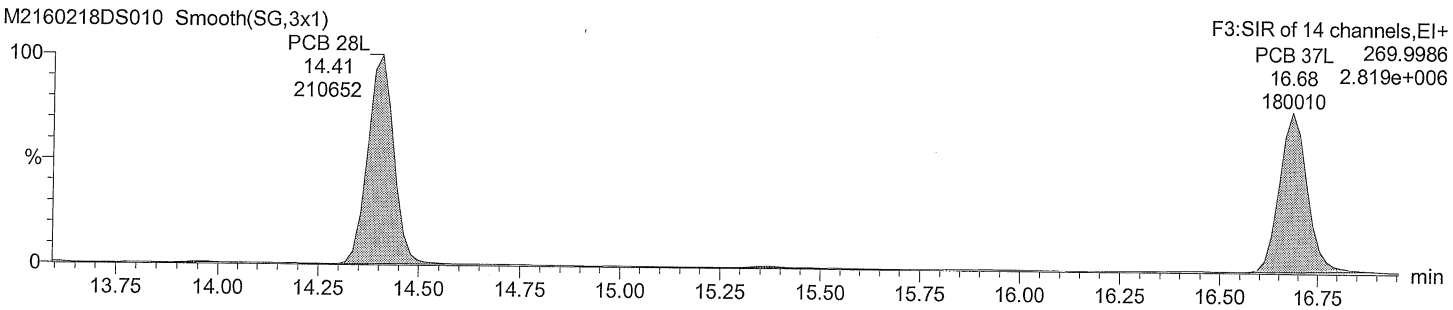

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Description: BRP510-01R:D1
Vial: 10
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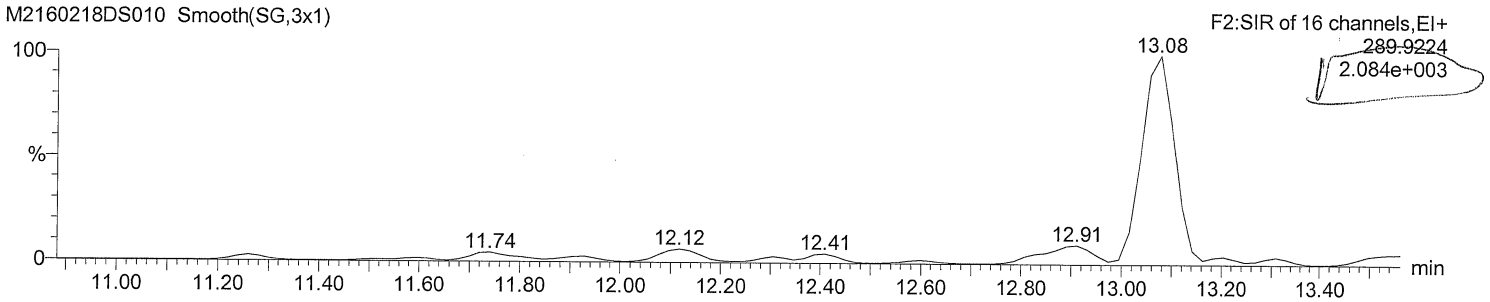
Total TeCB F2



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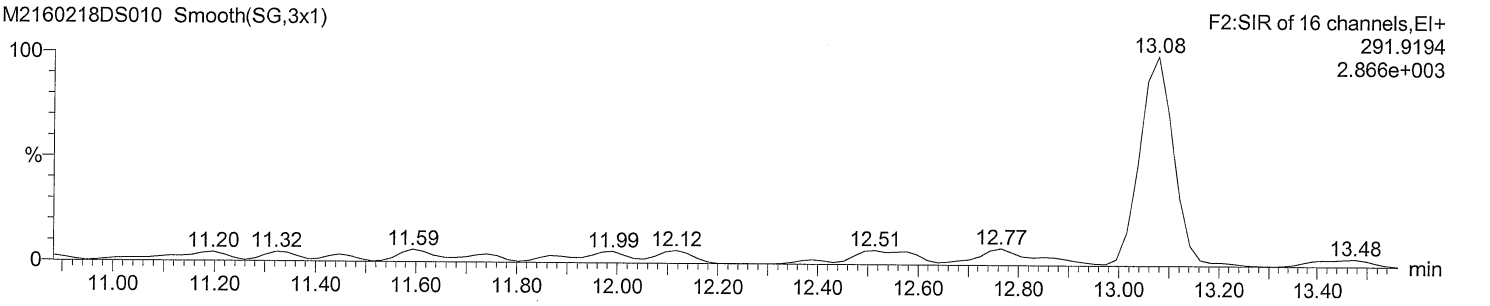

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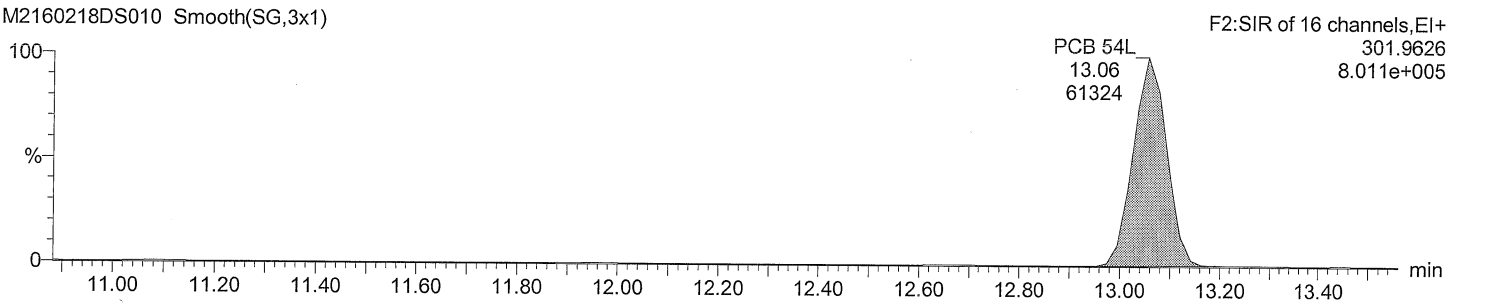

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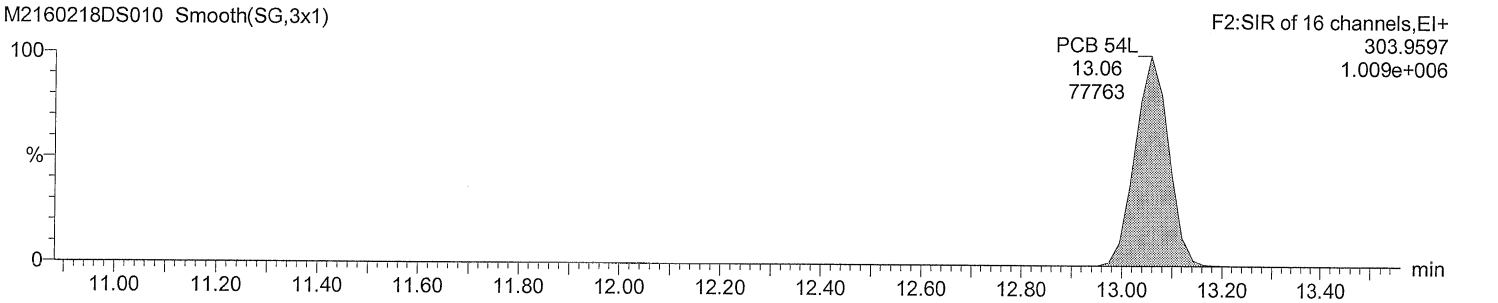

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 02:09:39 PM Eastern Standard Time
Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

Total TeCB F3
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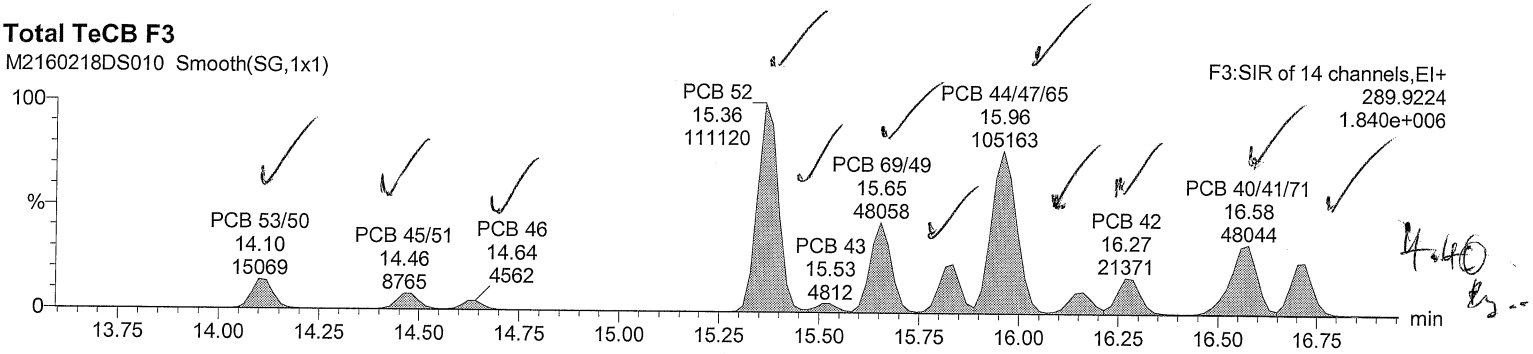

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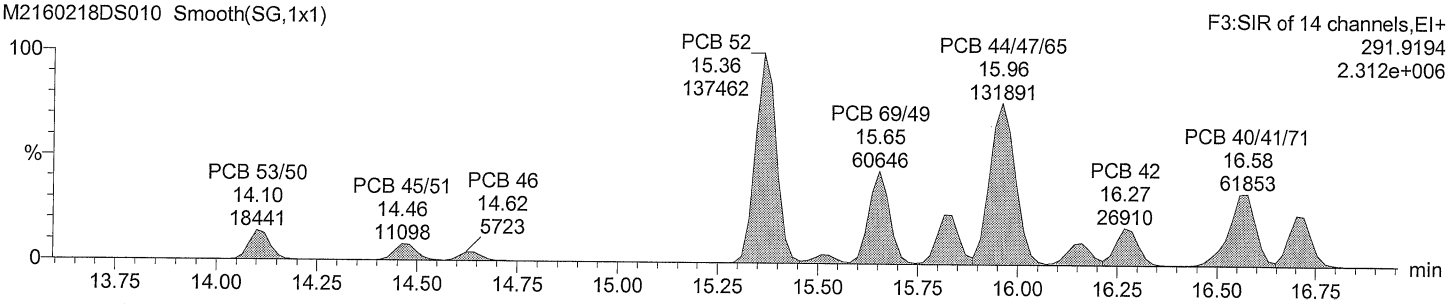

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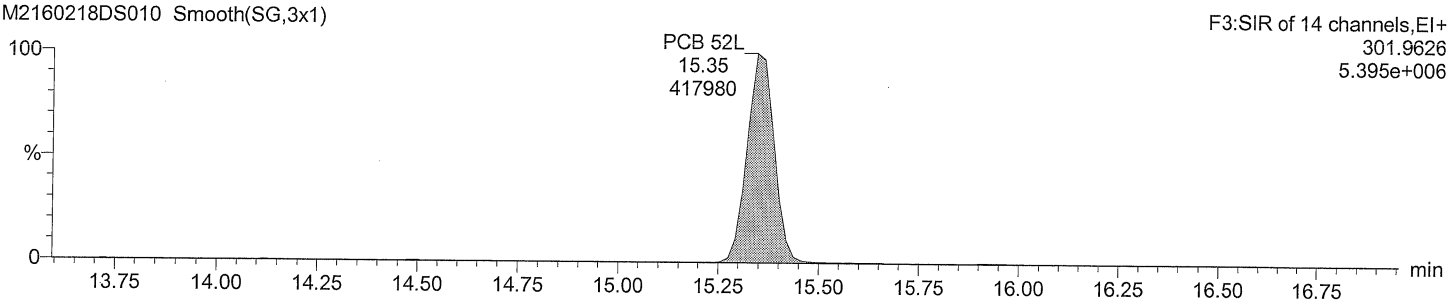

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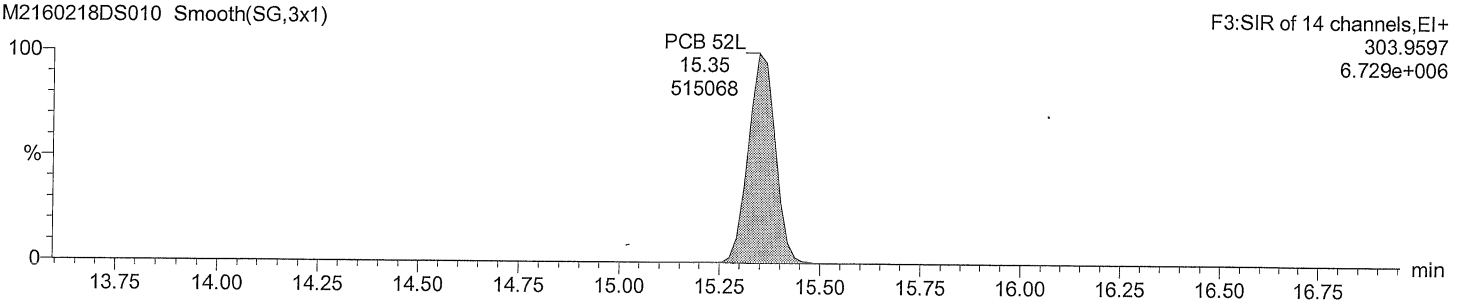

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Date: 18-FEB-2016
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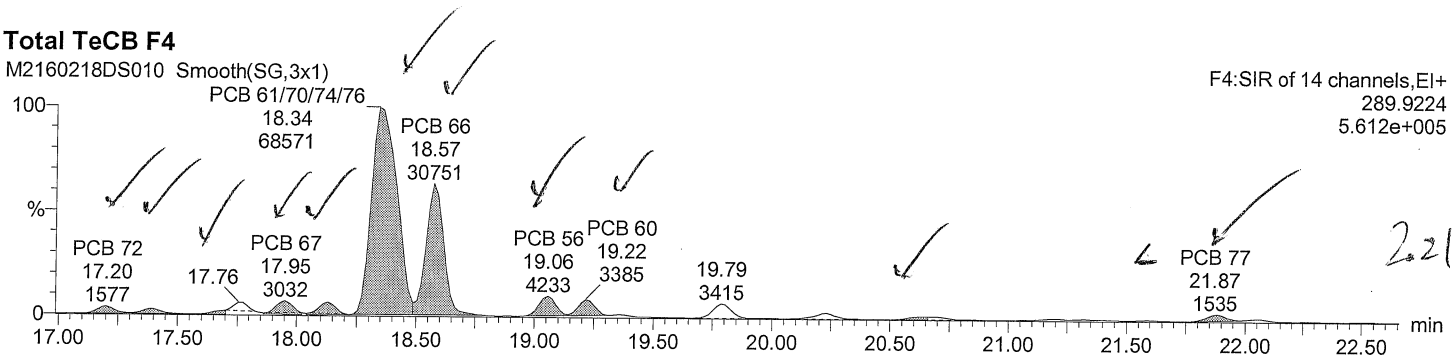

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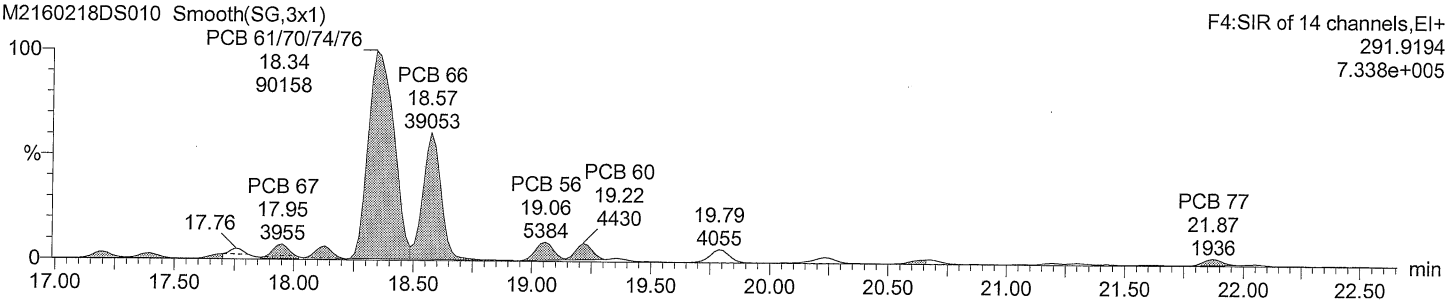

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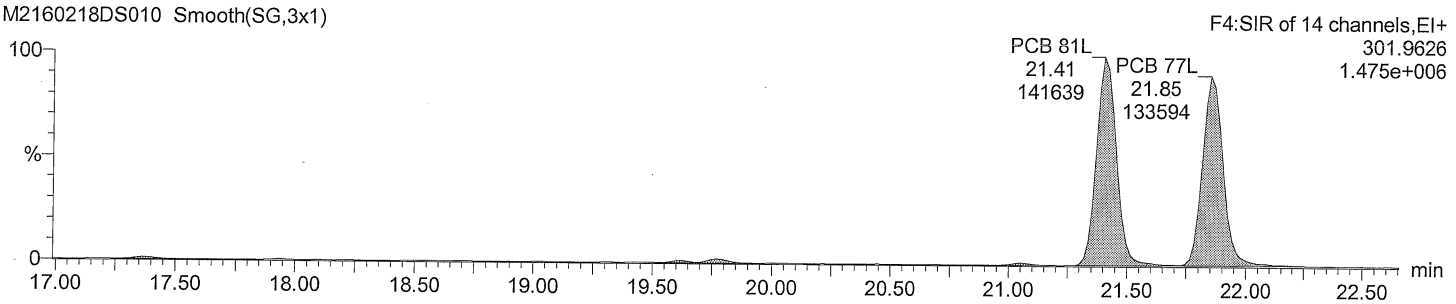

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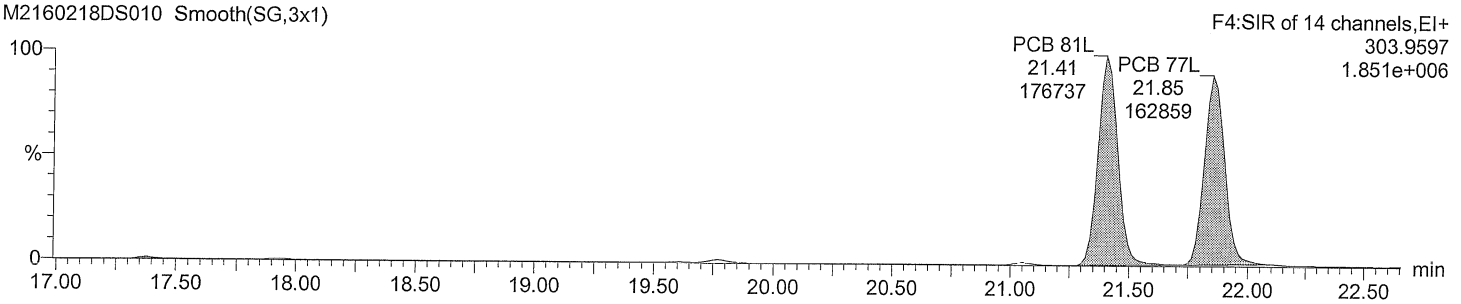

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Total PeCB F3
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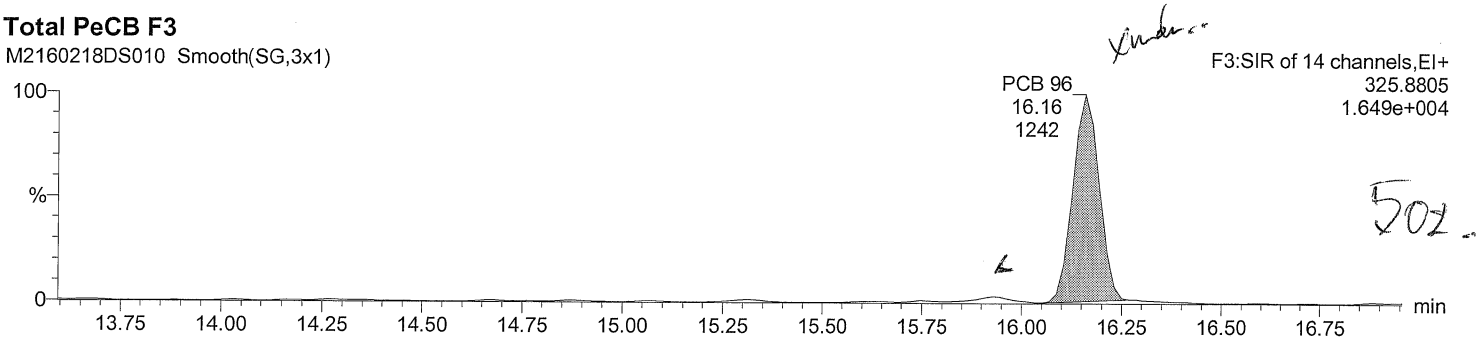

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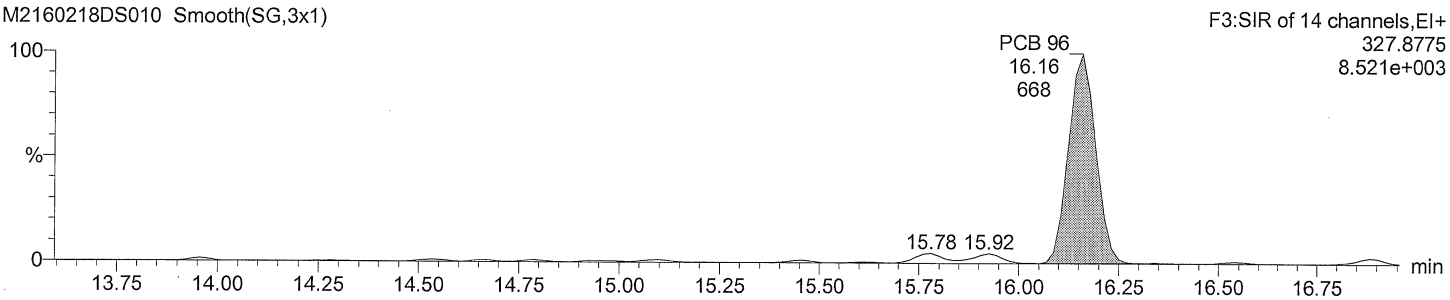

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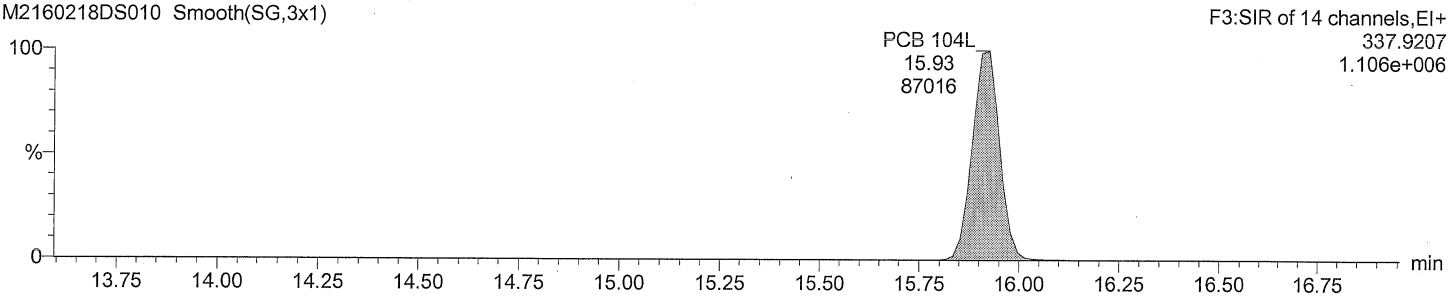

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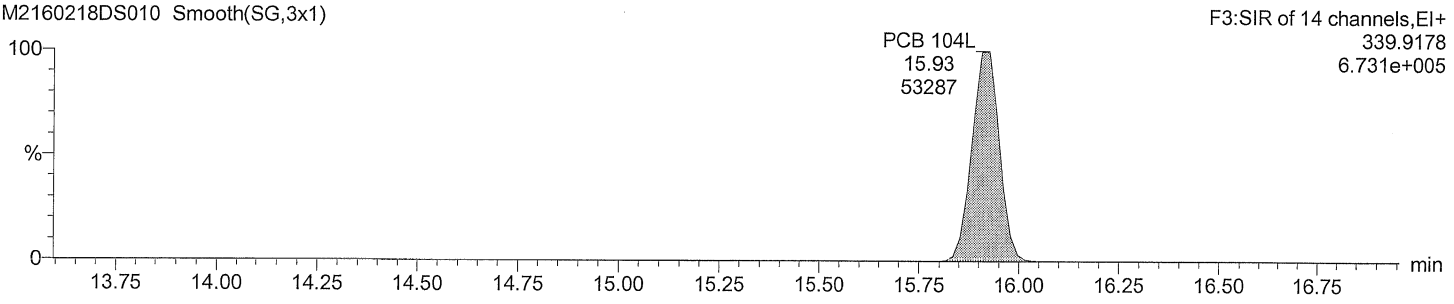

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Time: 01:59:15

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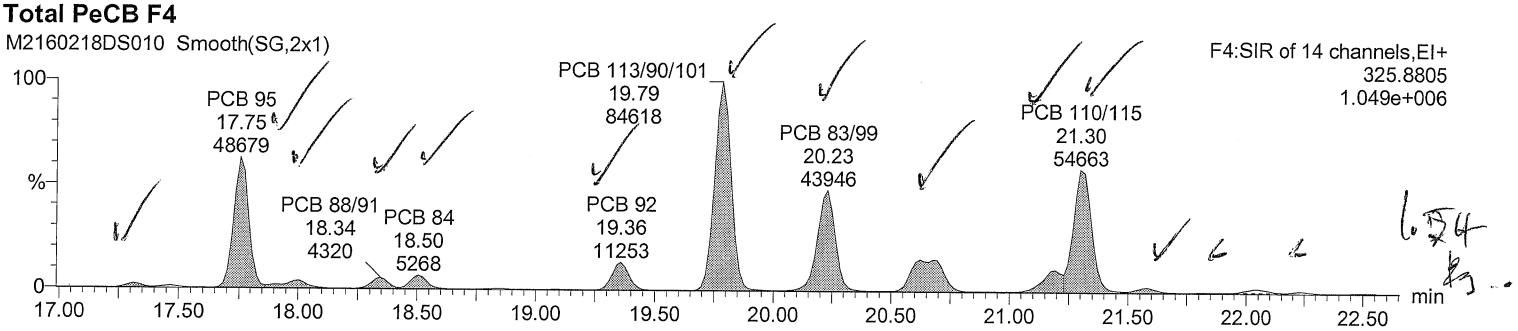

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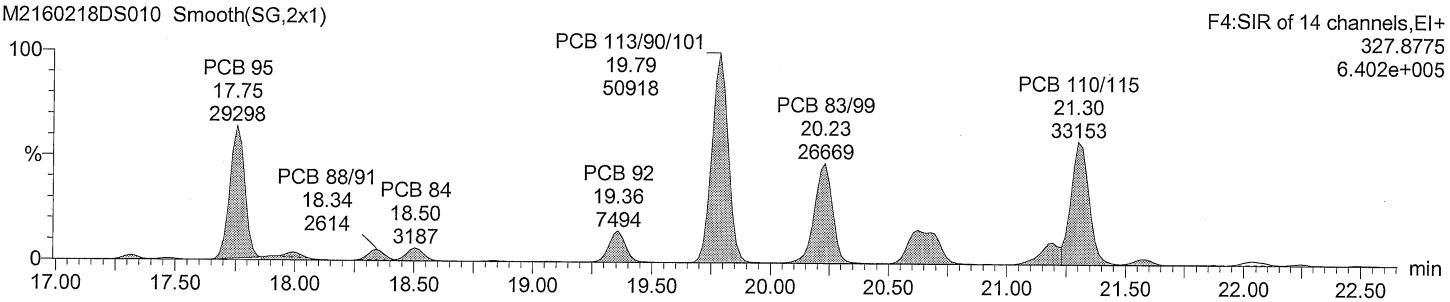

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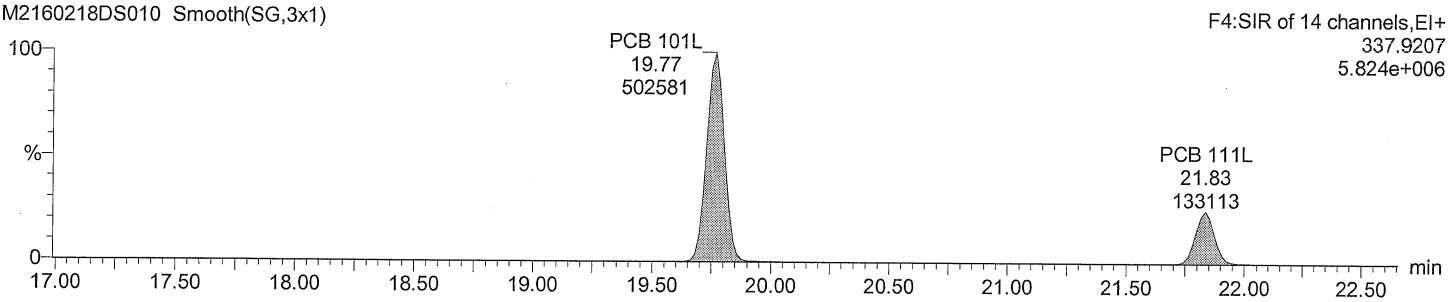

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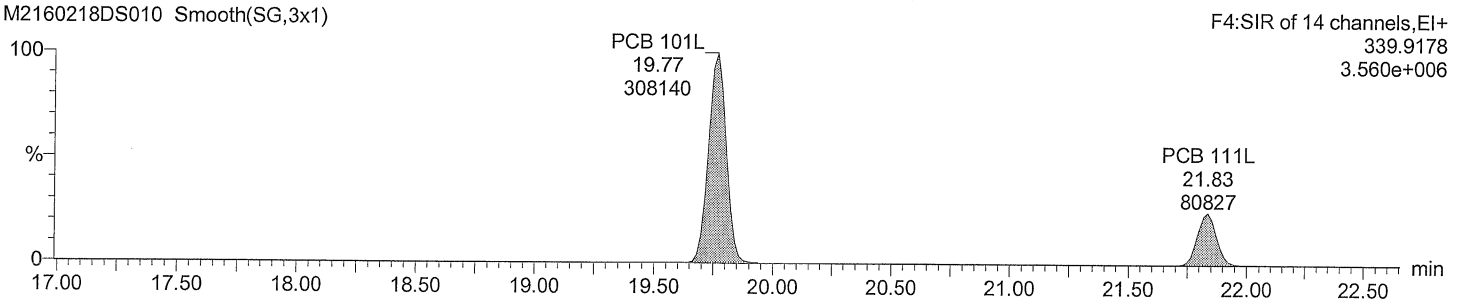

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Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

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Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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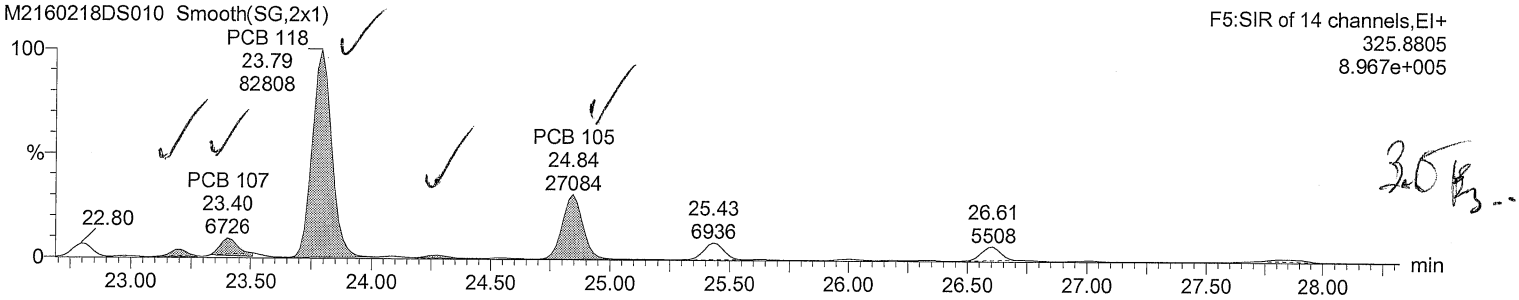

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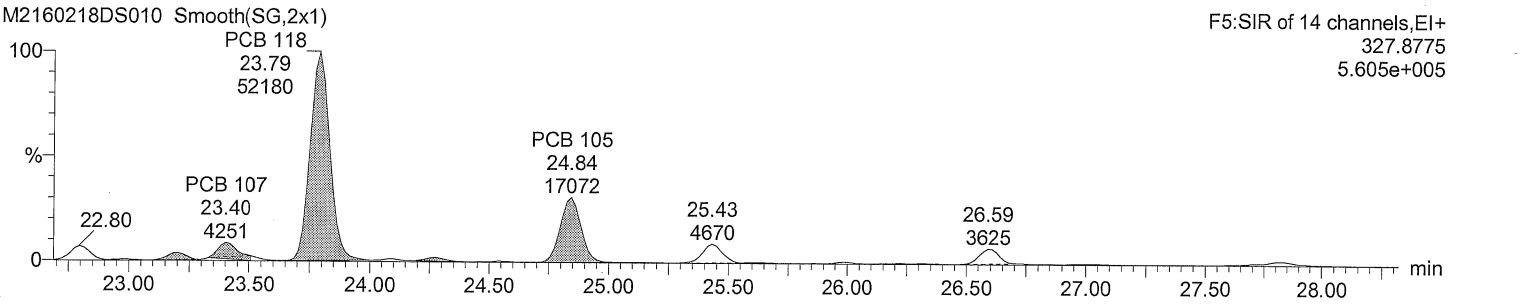

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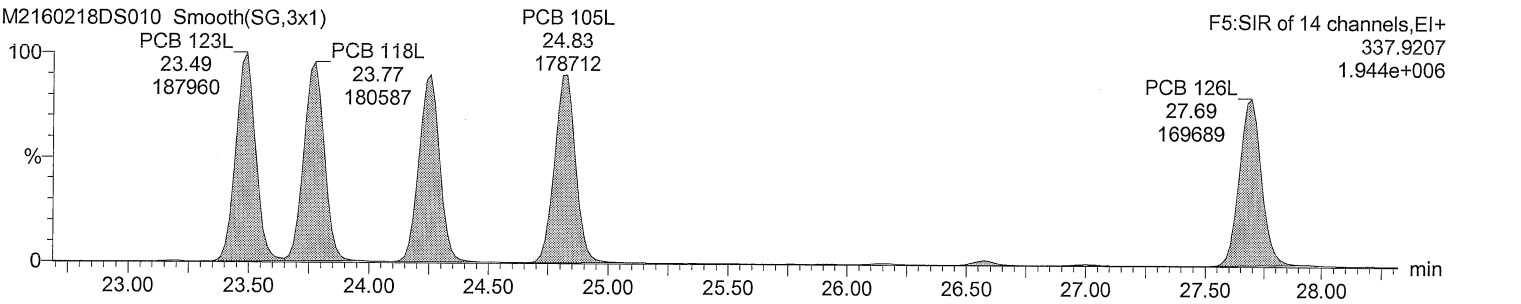

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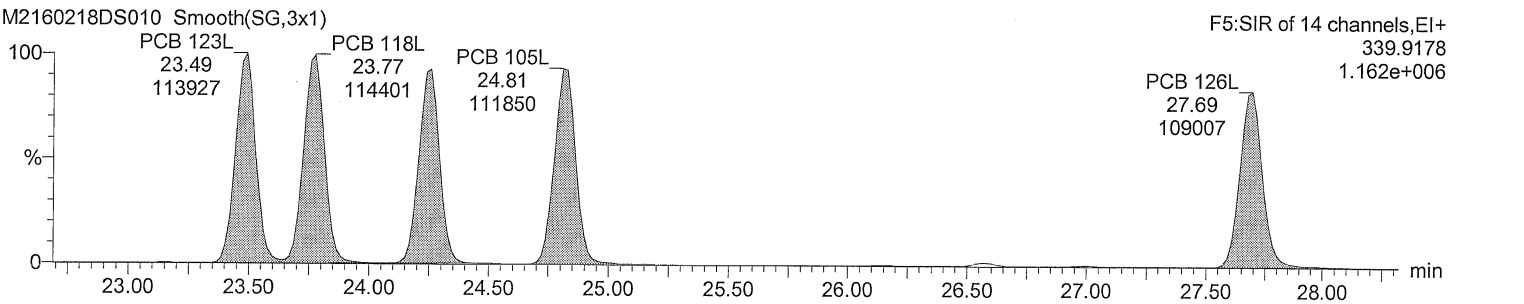

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Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

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Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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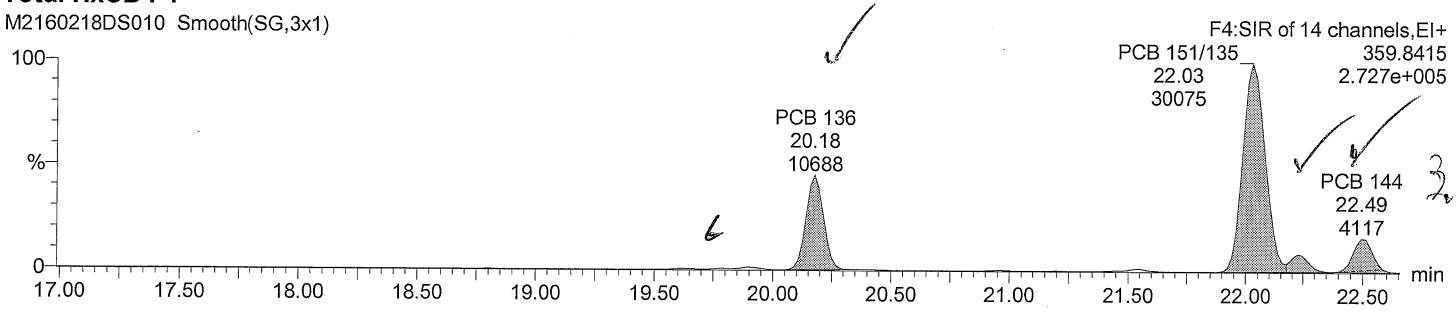

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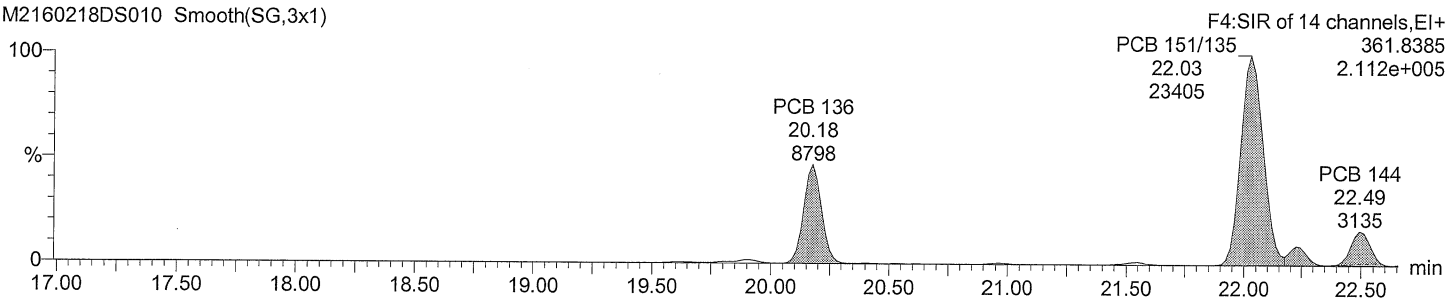

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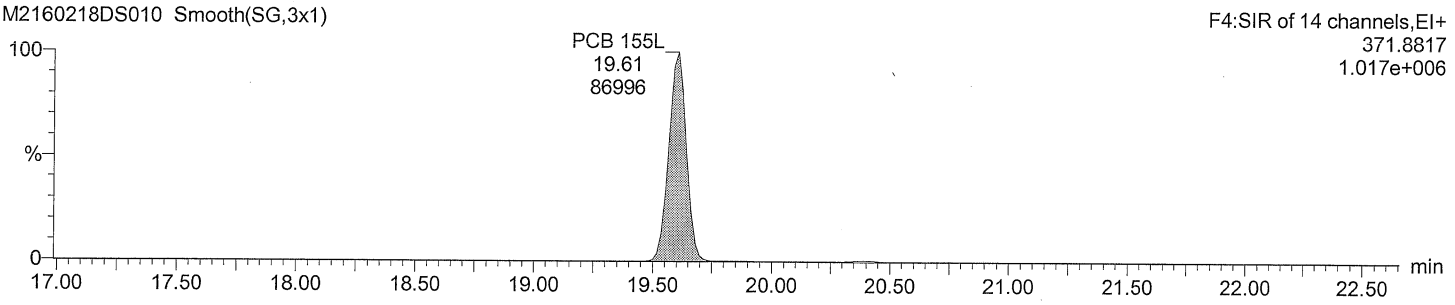

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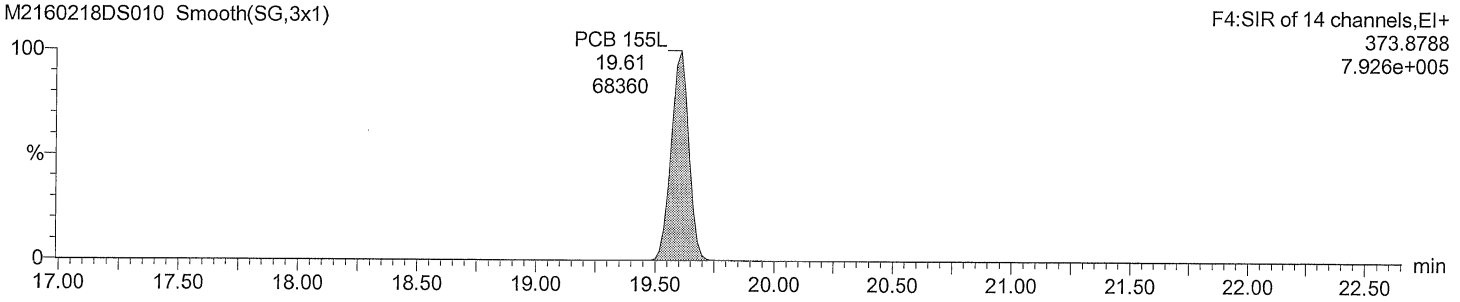

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Last Altered: February 20, 2016 02:09:39 PM Eastern Standard Time
Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

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Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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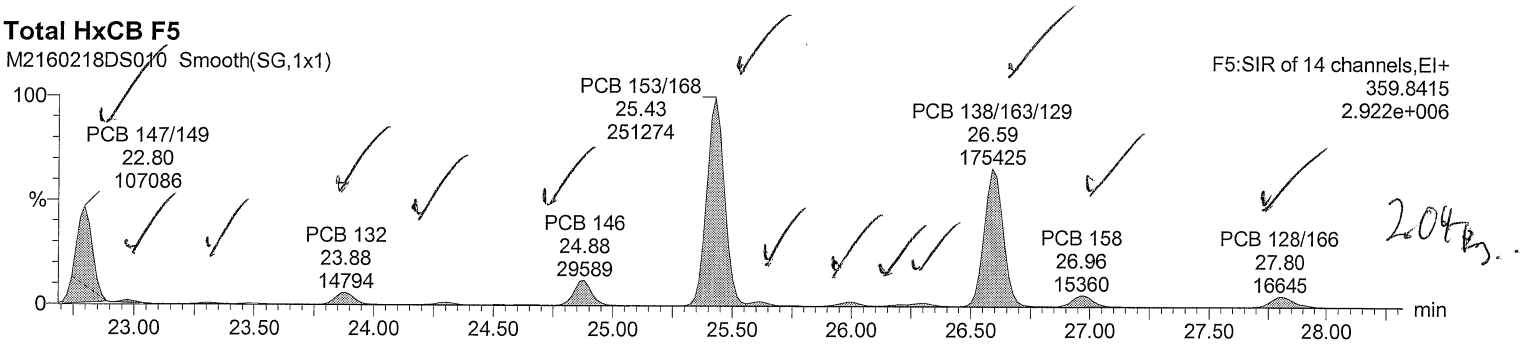

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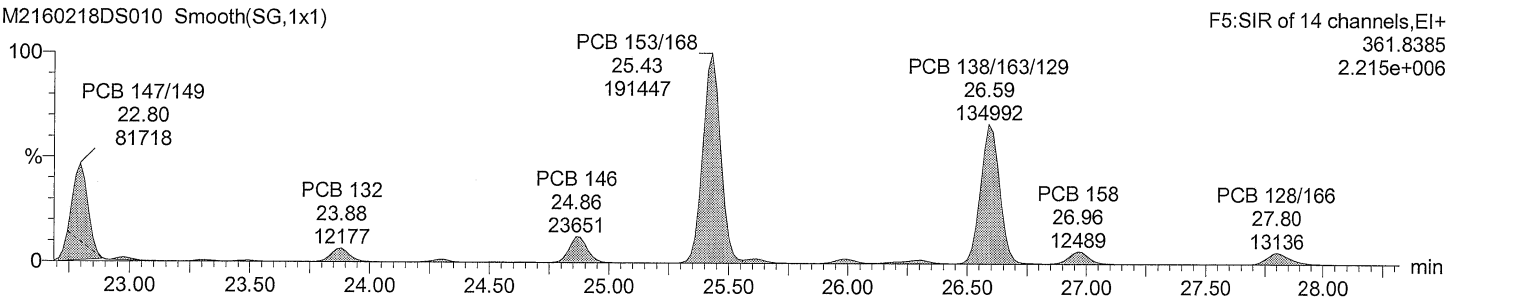

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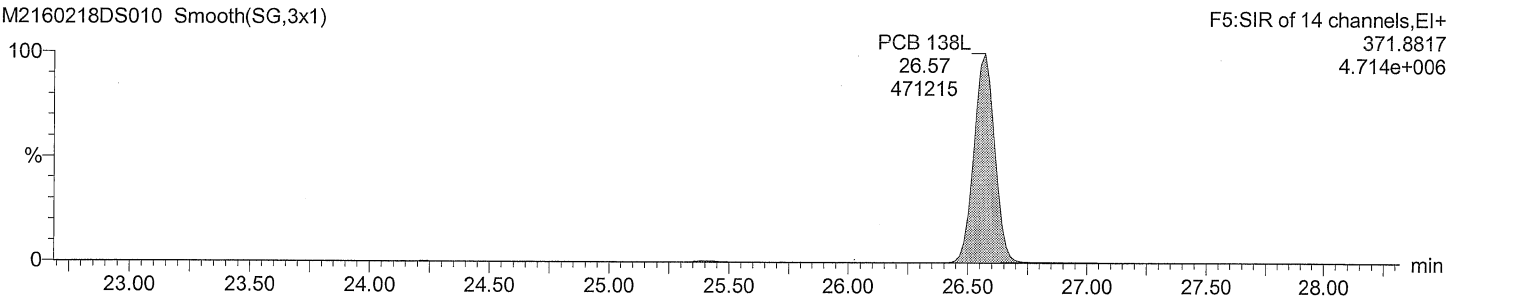

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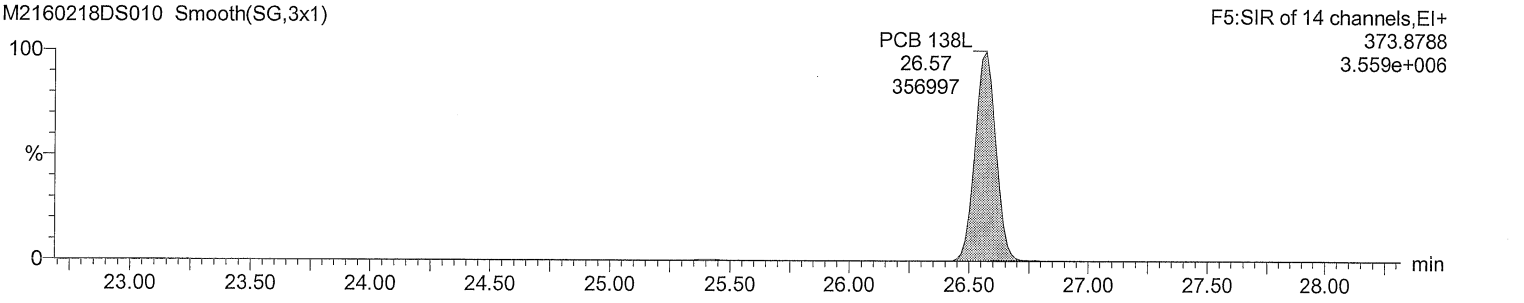

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Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

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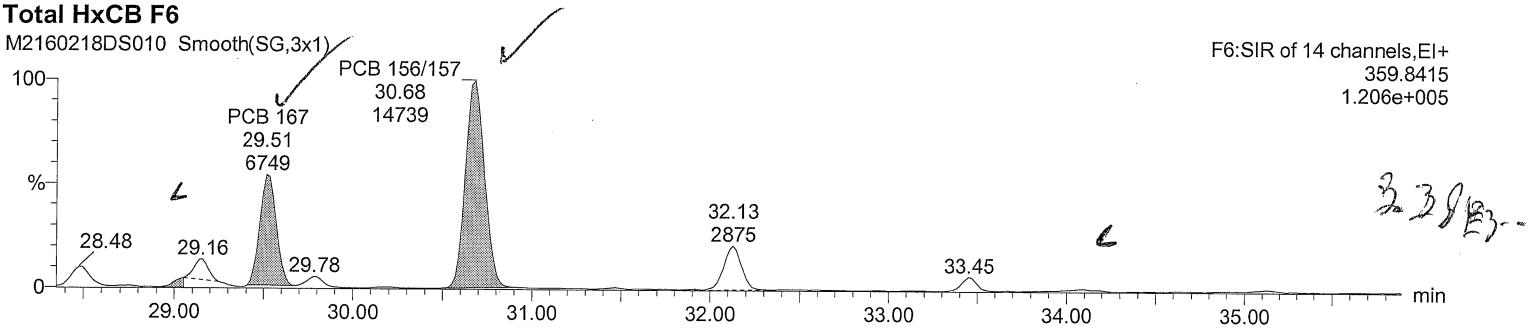
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

Total HxCB F6



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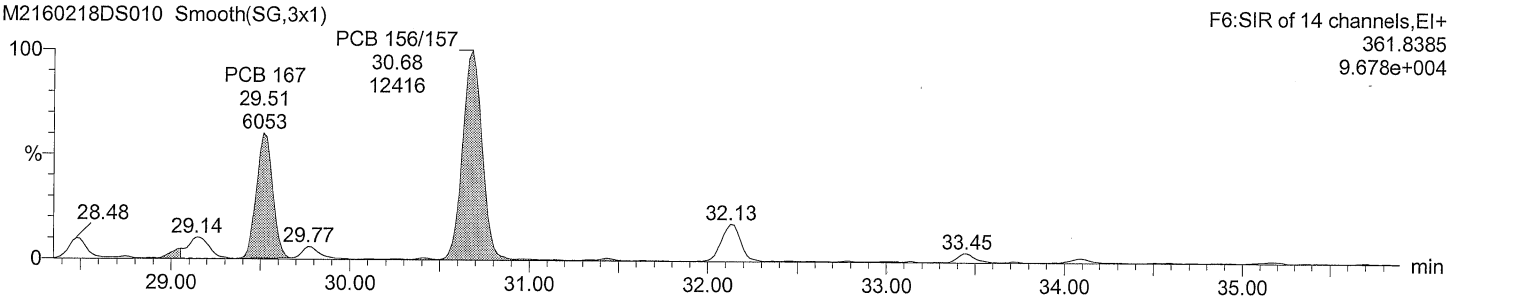

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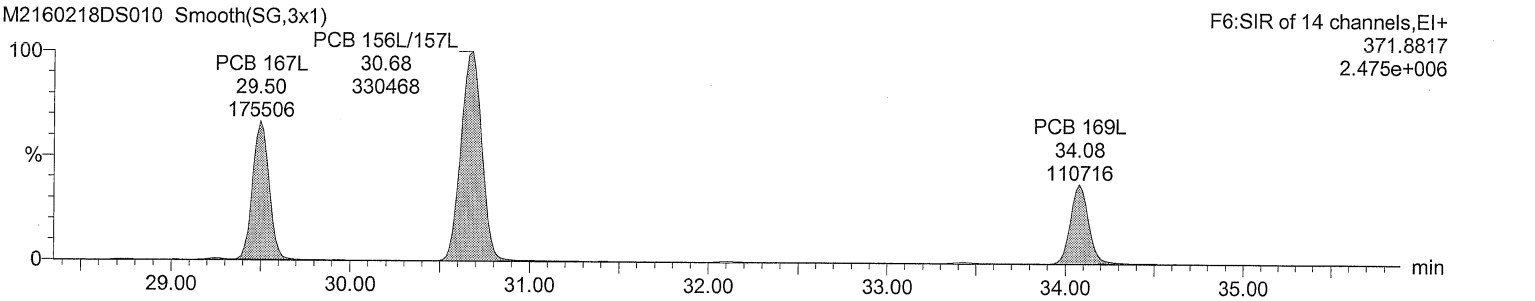

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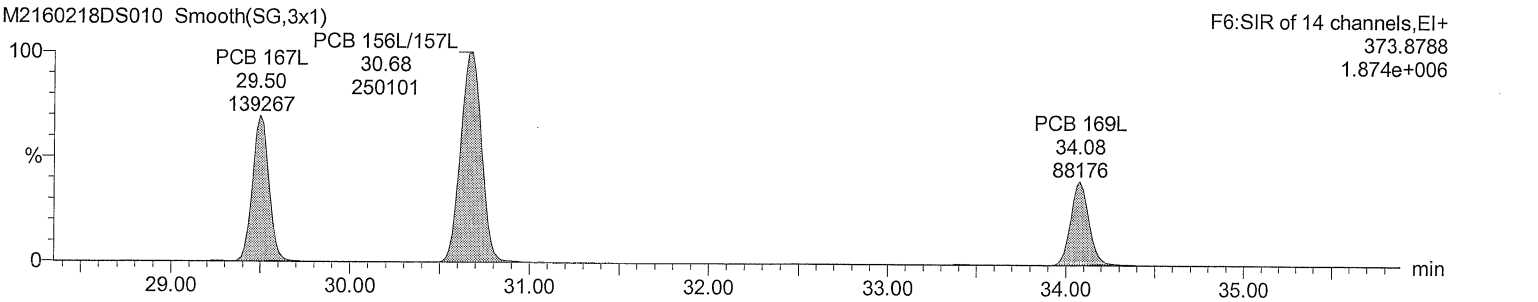

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Time: 01:59:15

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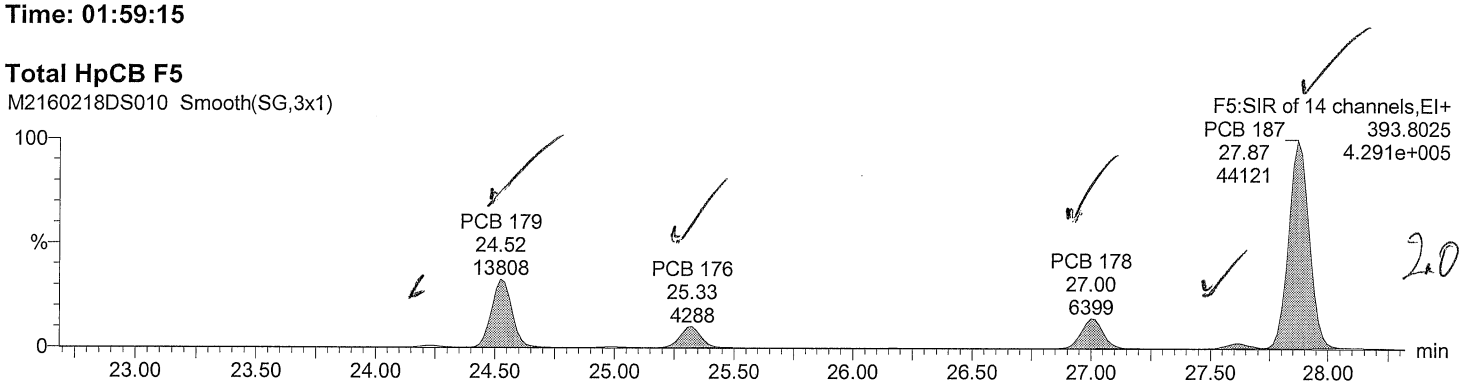

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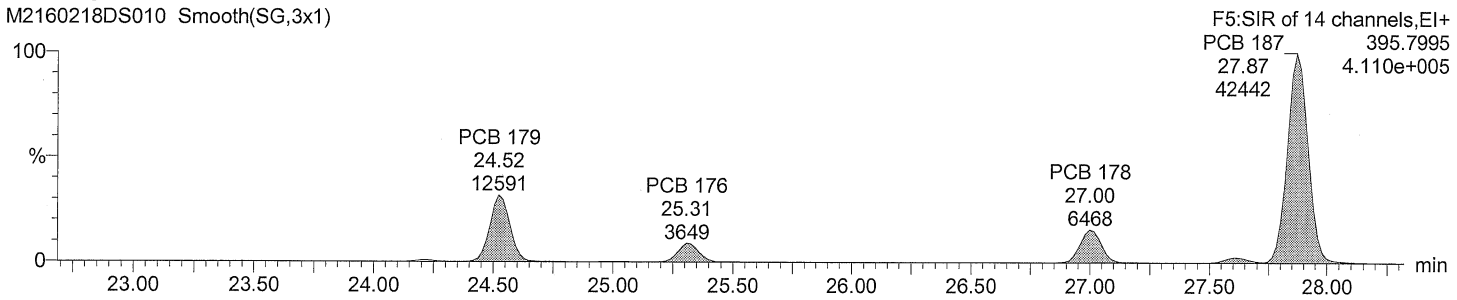

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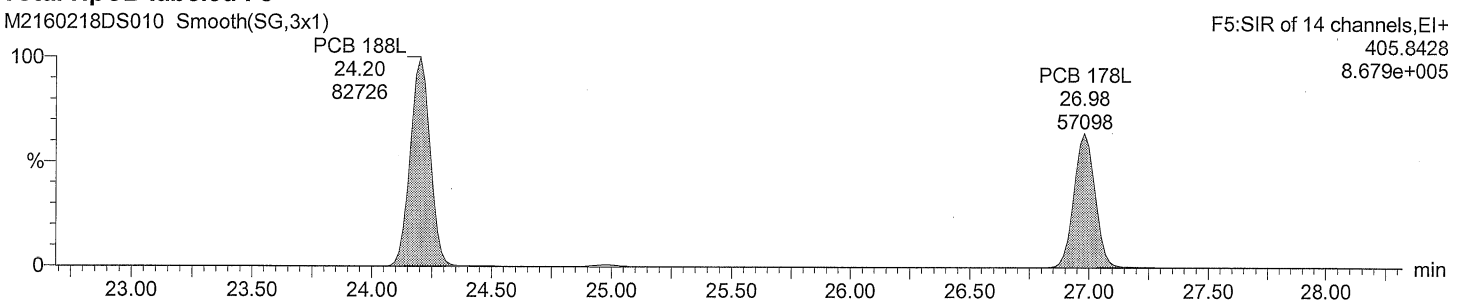

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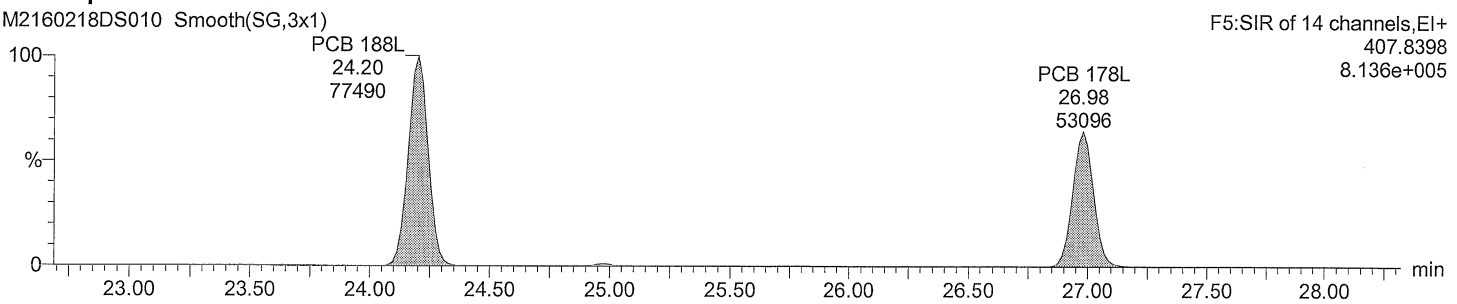

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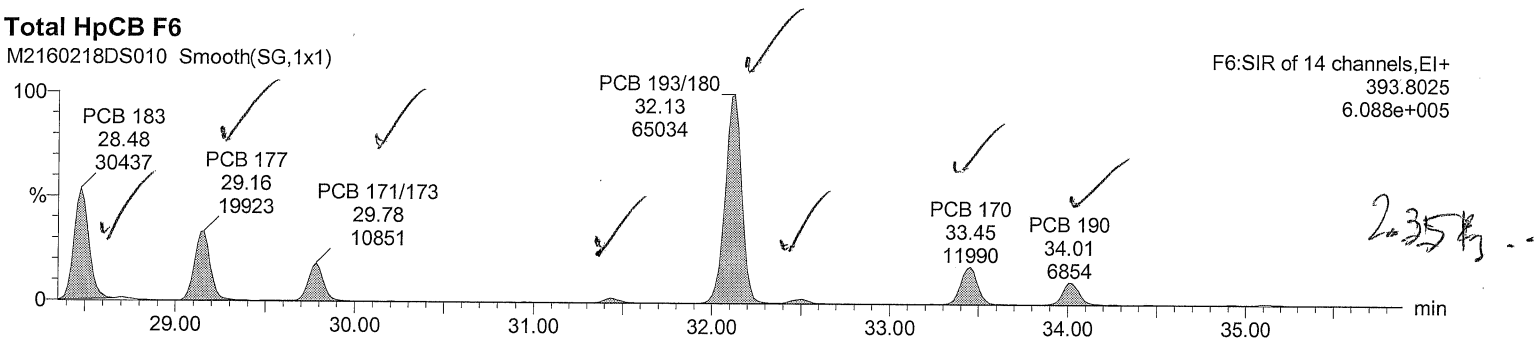

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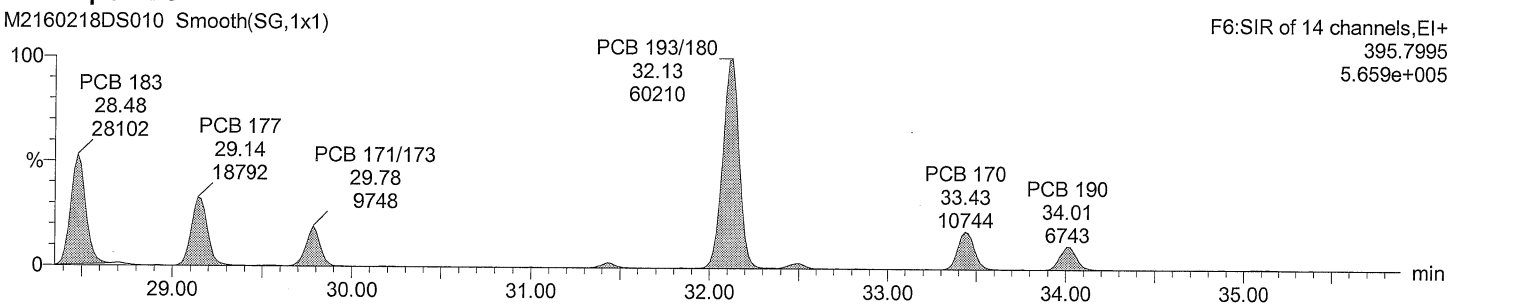

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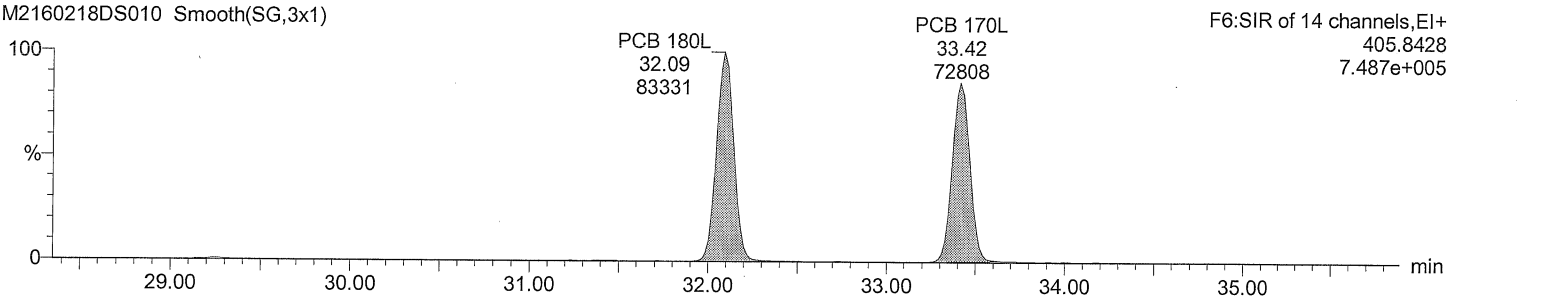

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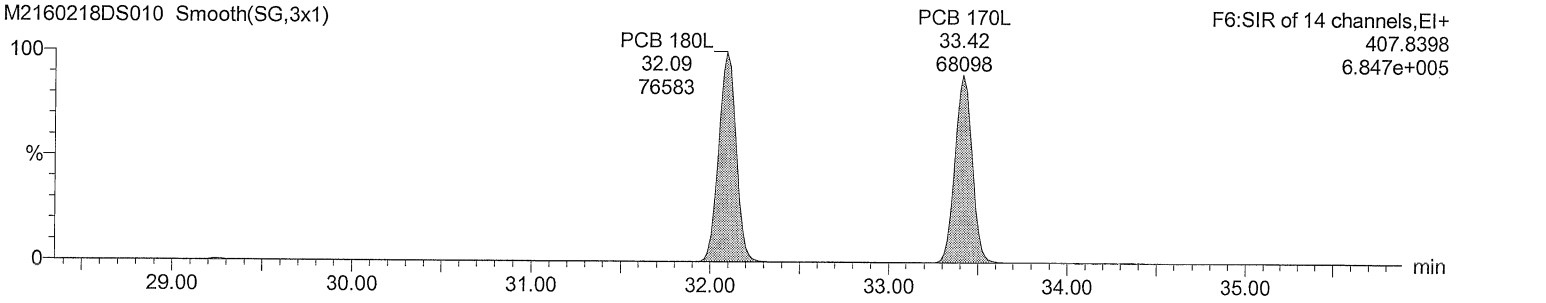

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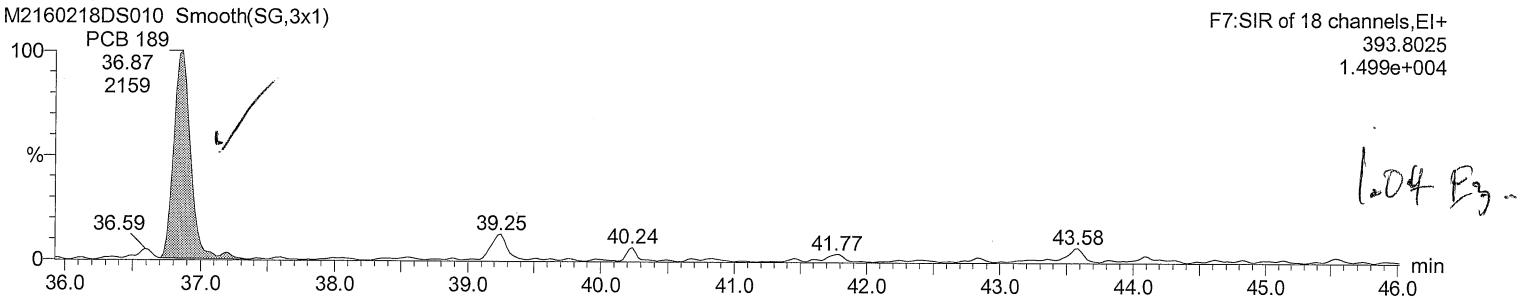

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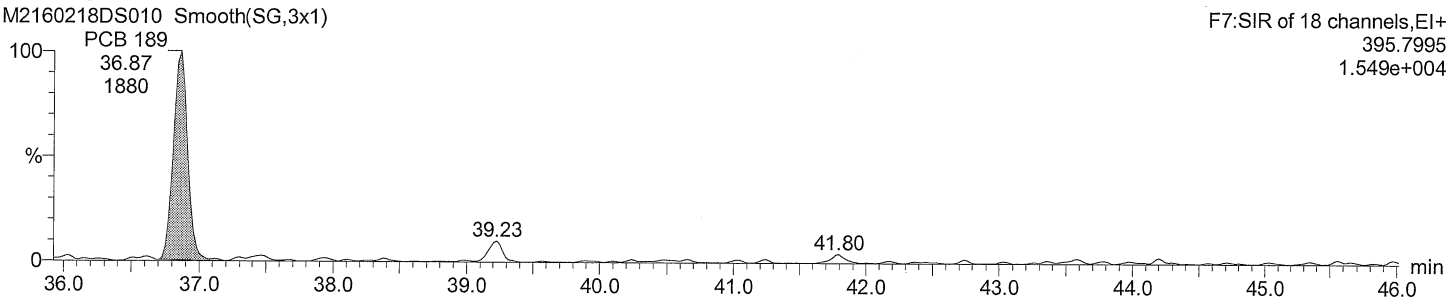

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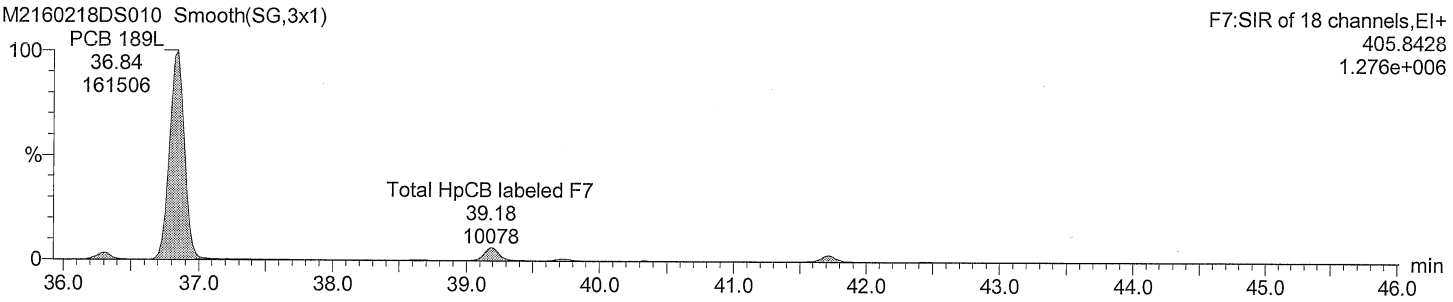

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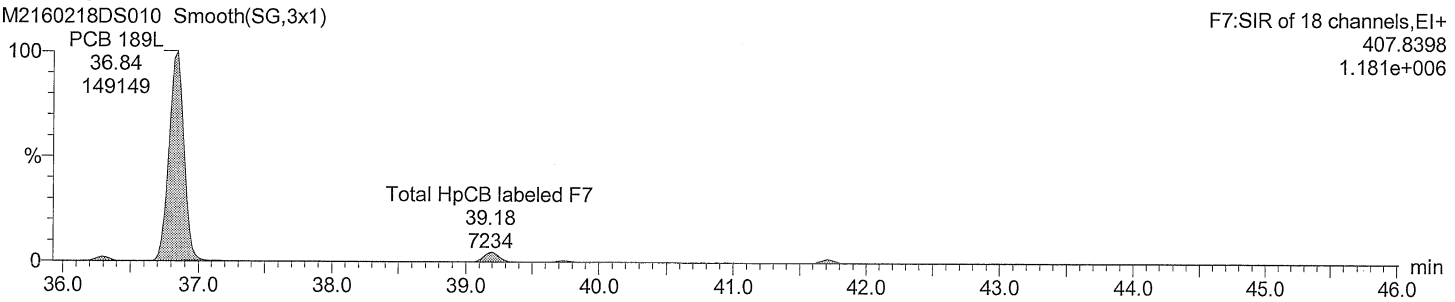

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Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 02:09:39 PM Eastern Standard Time
Printed: February 20, 2016 02:11:48 PM Eastern Standard Time

ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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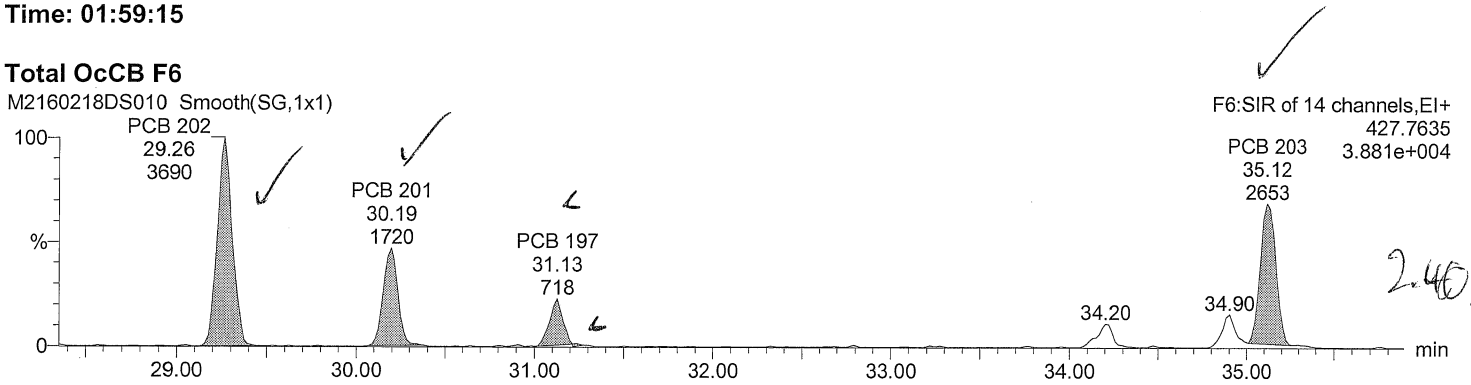

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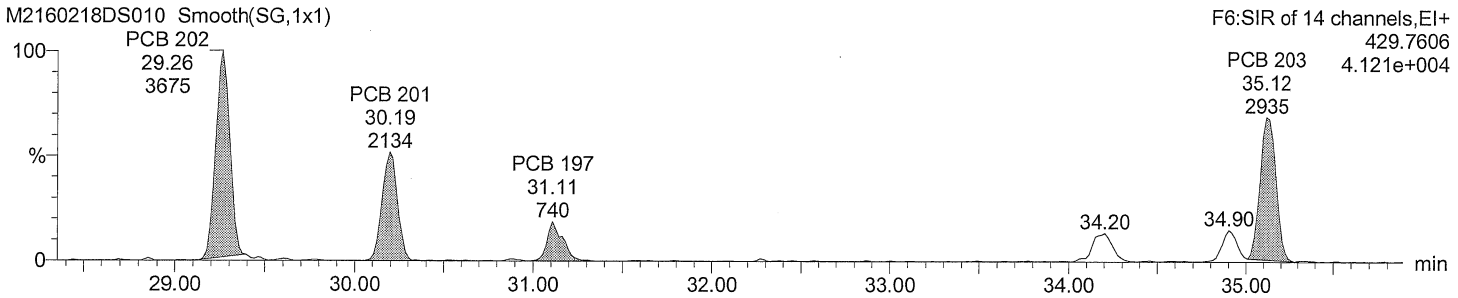

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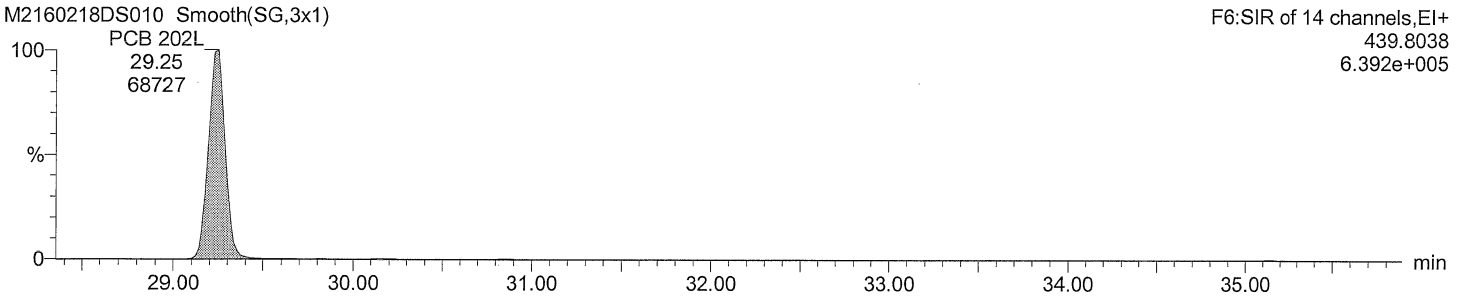

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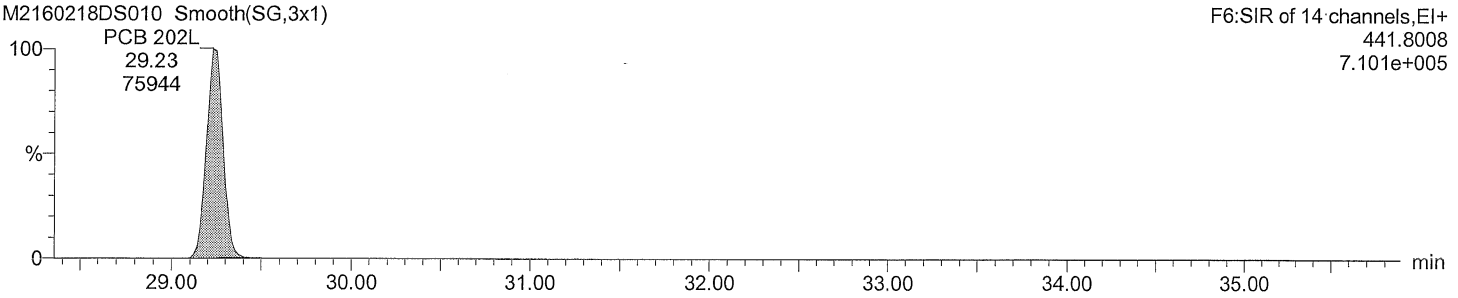

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ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

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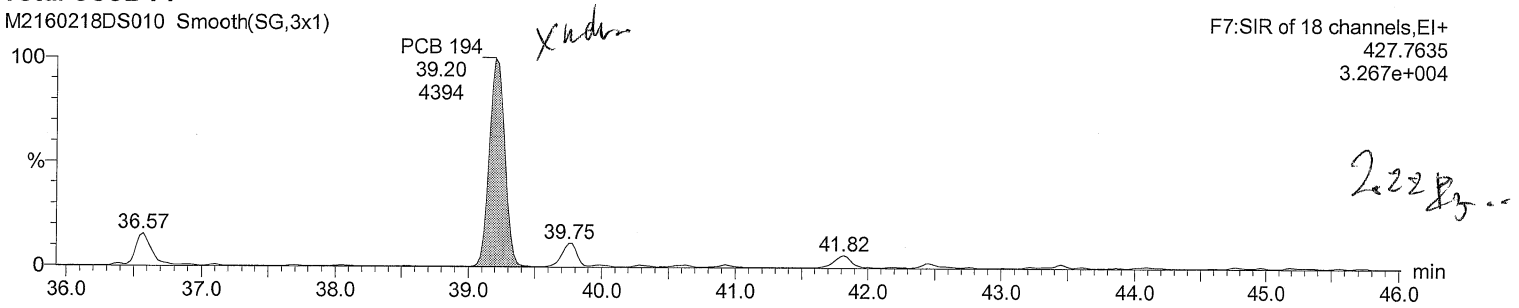

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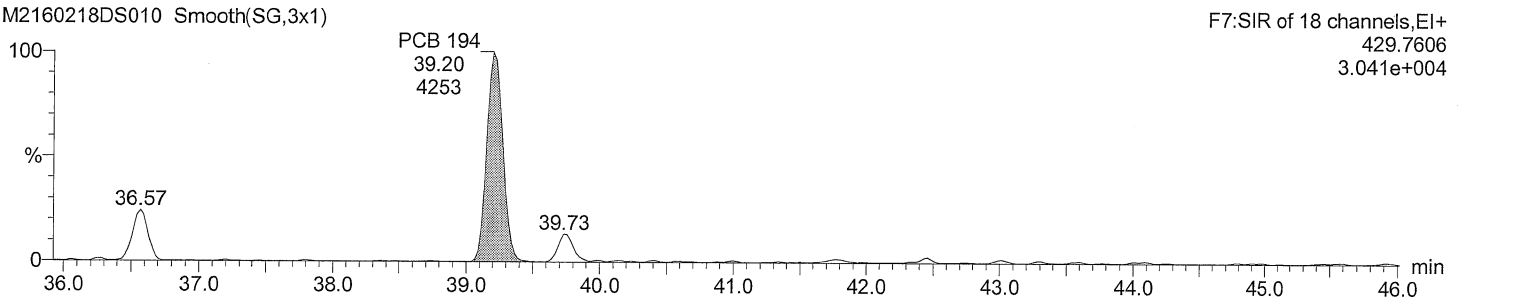

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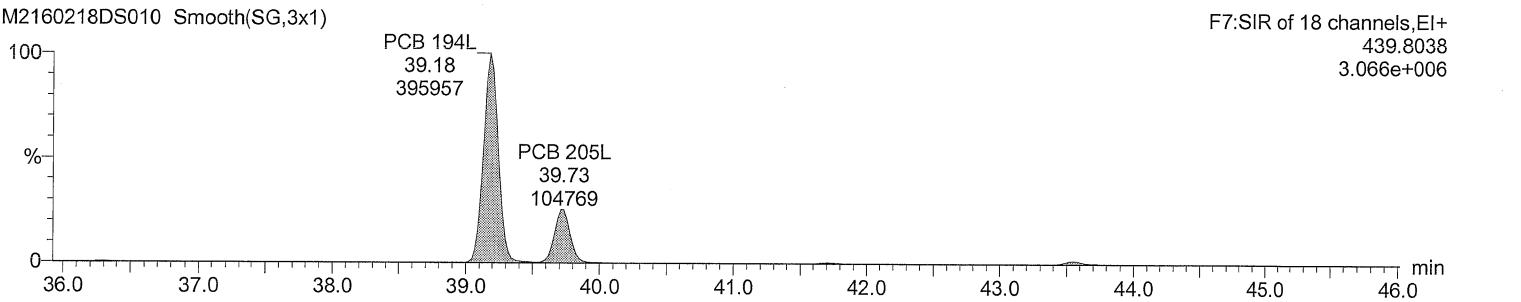

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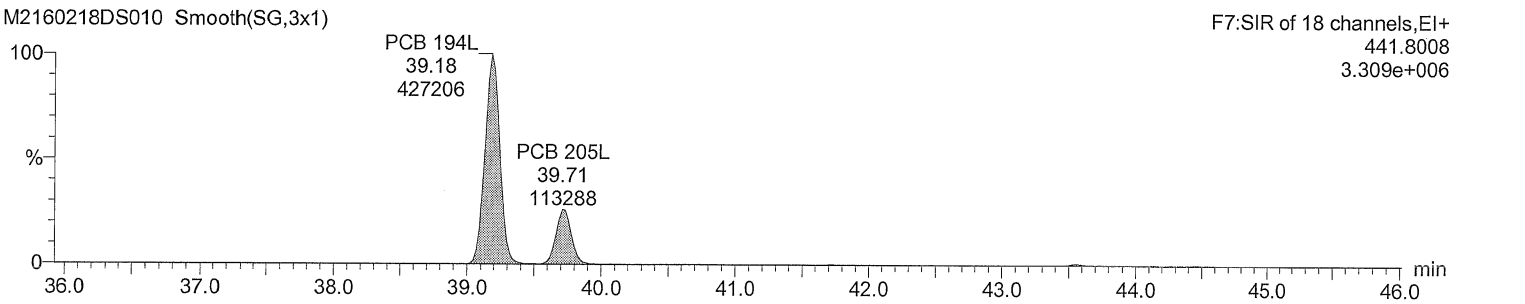

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ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
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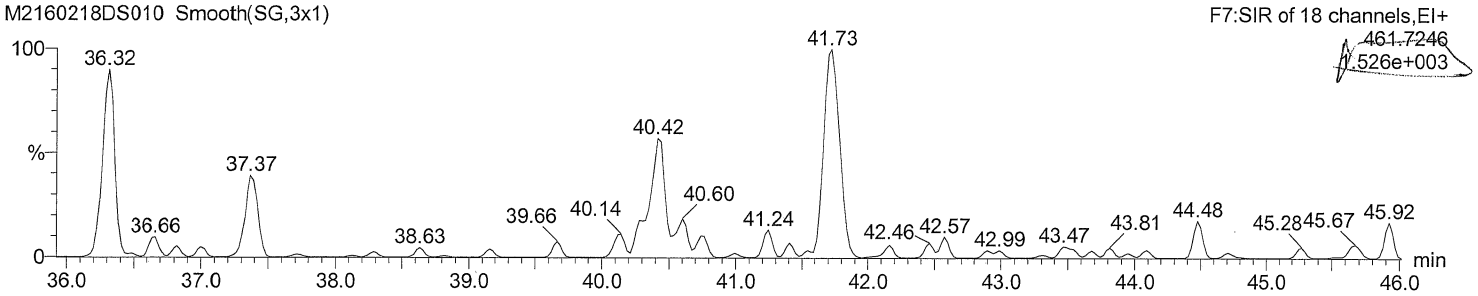

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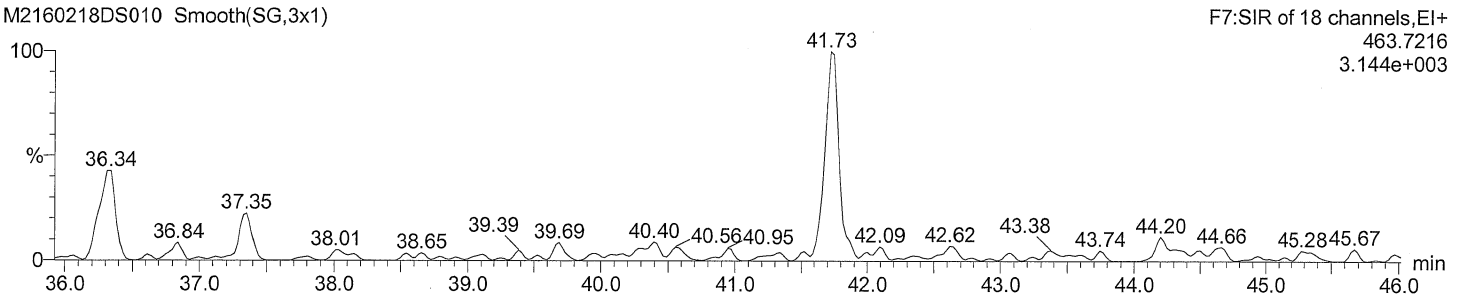

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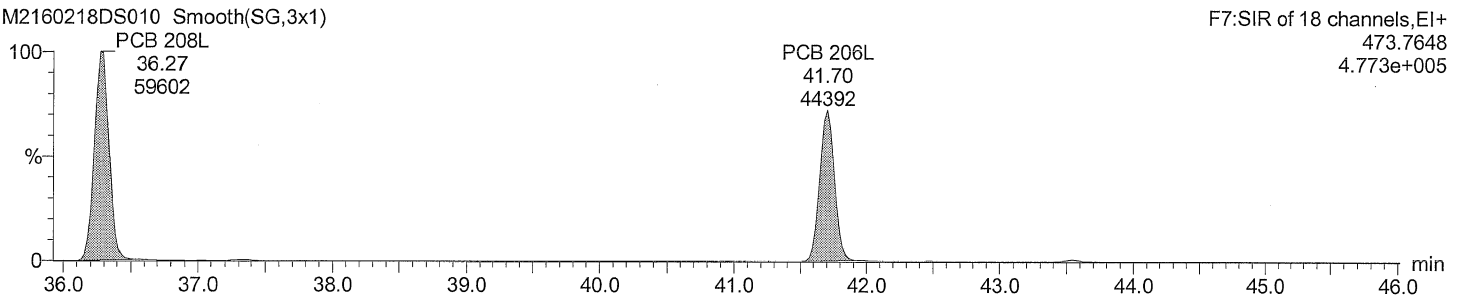

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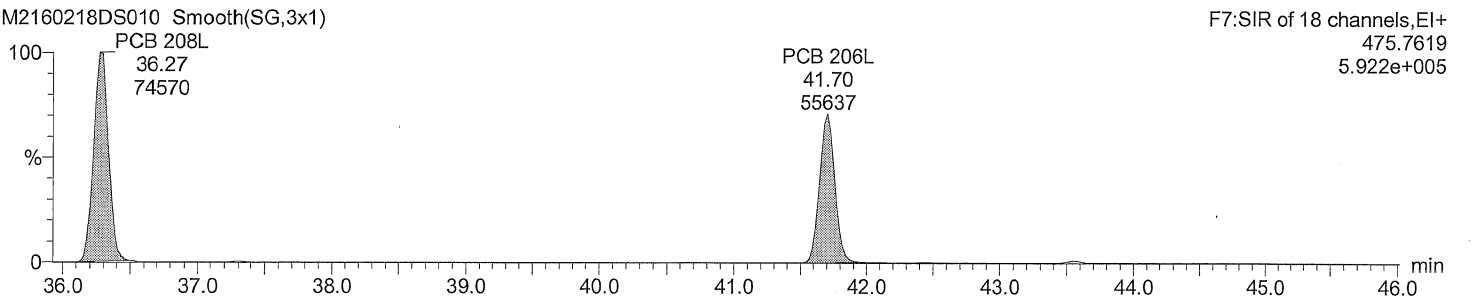

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Last Altered: February 20, 2016 02:09:39 PM Eastern Standard Time
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Description: BRP510-01R:D1
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Date: 18-FEB-2016
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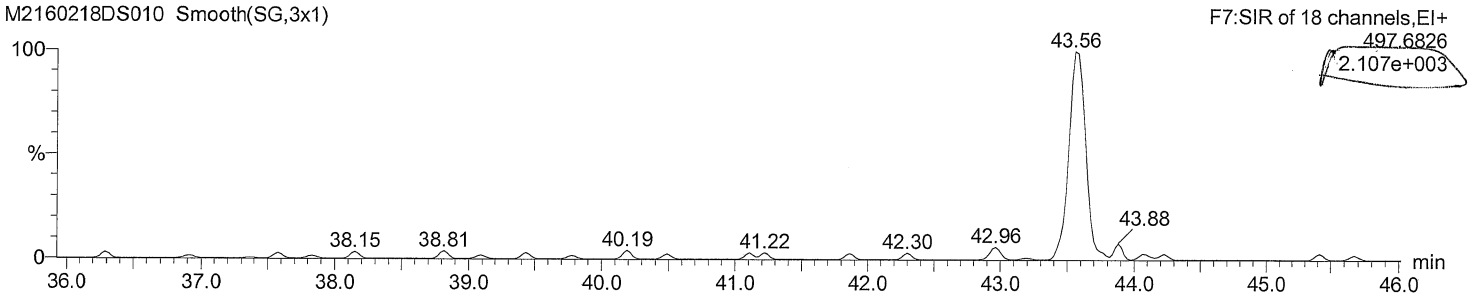

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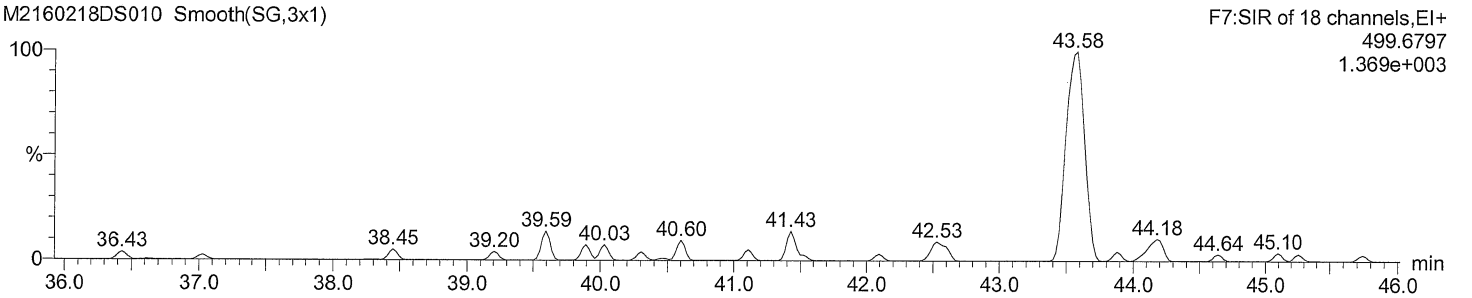

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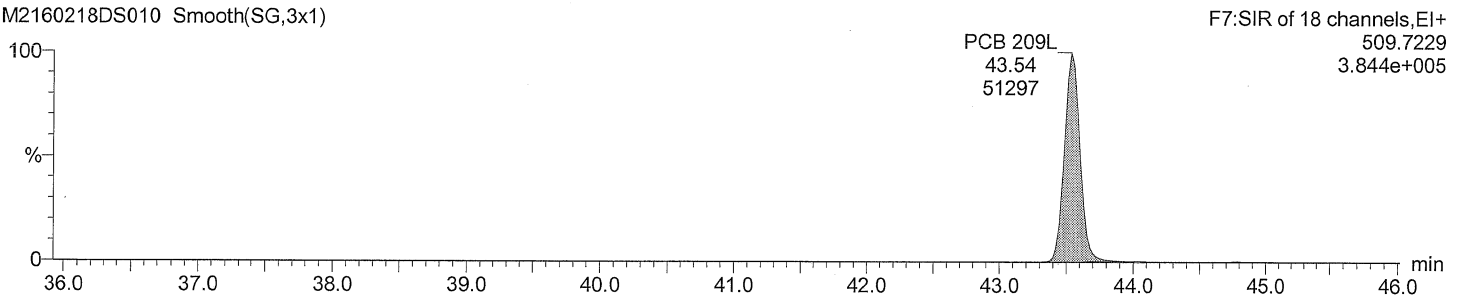

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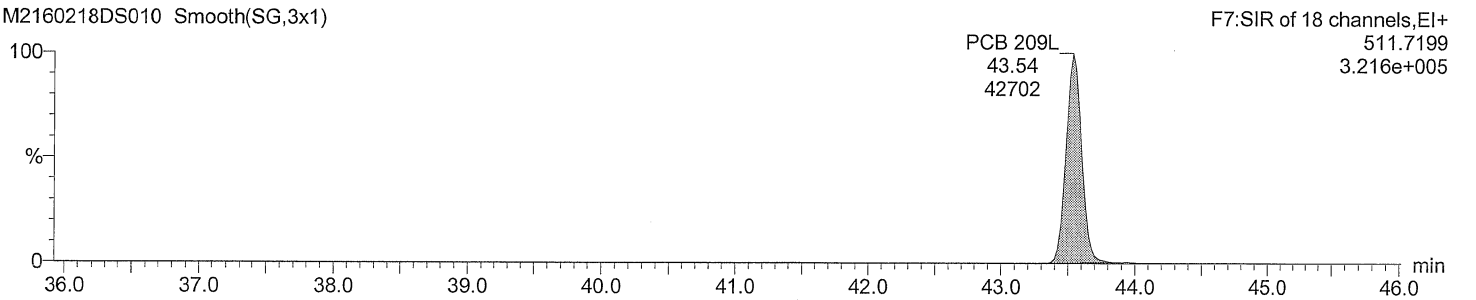

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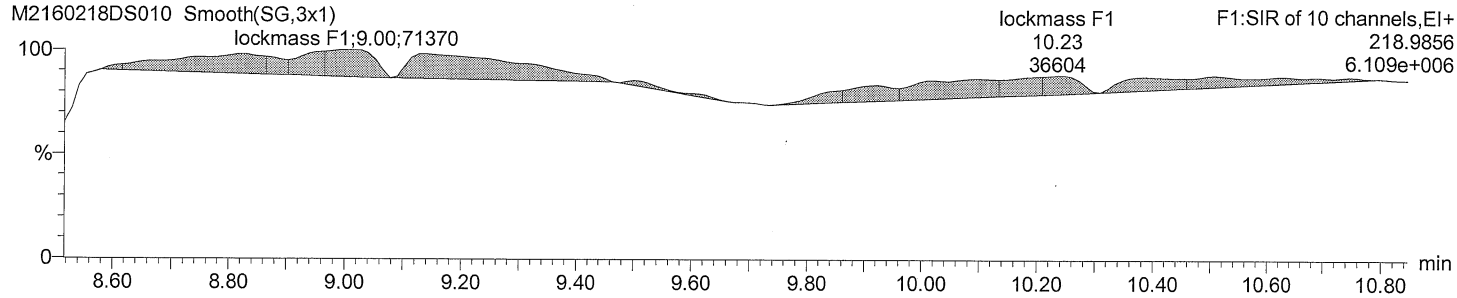
ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

lockmass F1



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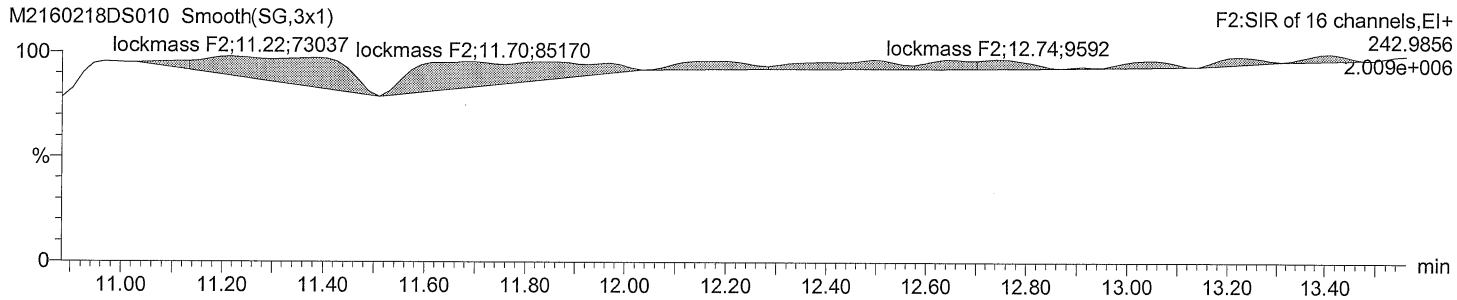

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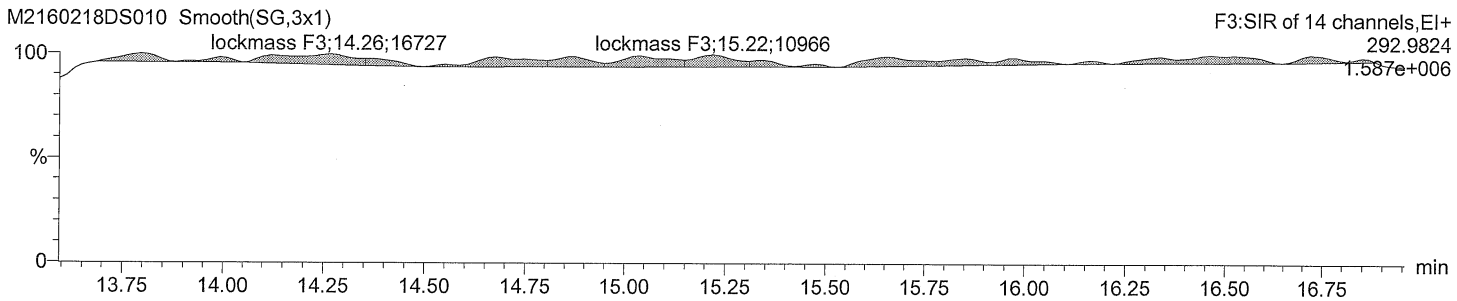

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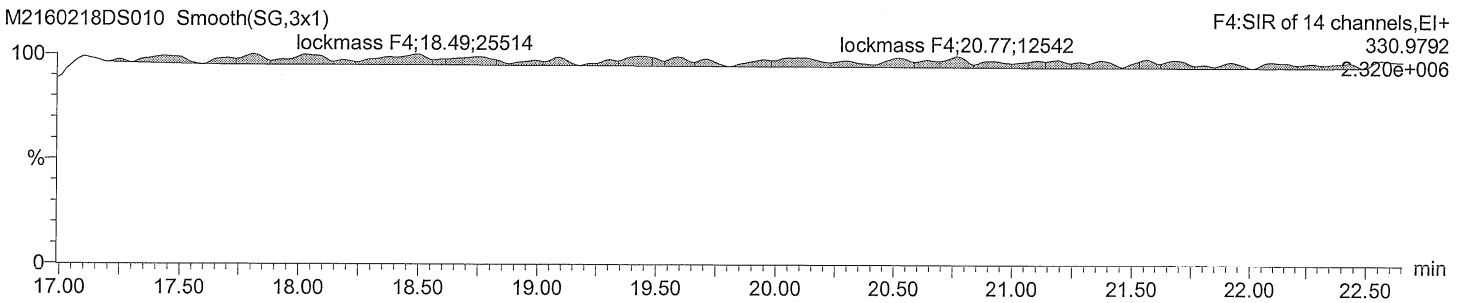

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Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 02:09:39 PM Eastern Standard Time
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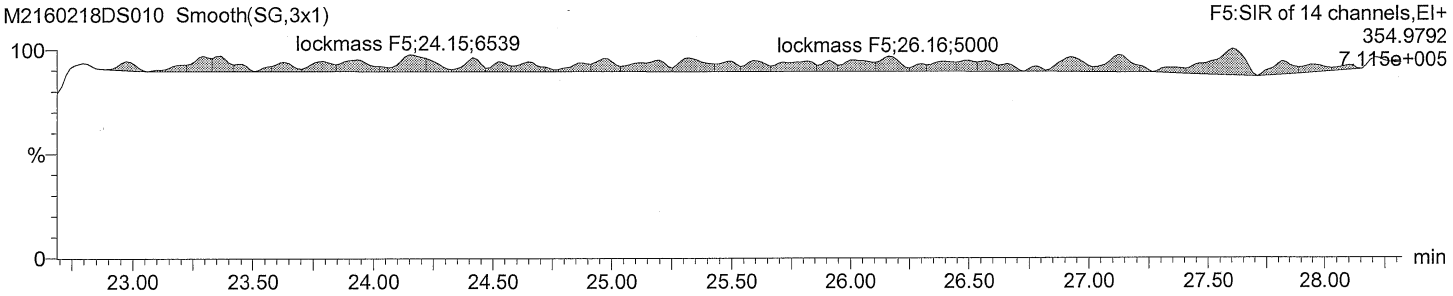
ID: Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
Description: BRP510-01R:D1
Vial: 10
Date: 18-FEB-2016
Time: 01:59:15

lockmass F5



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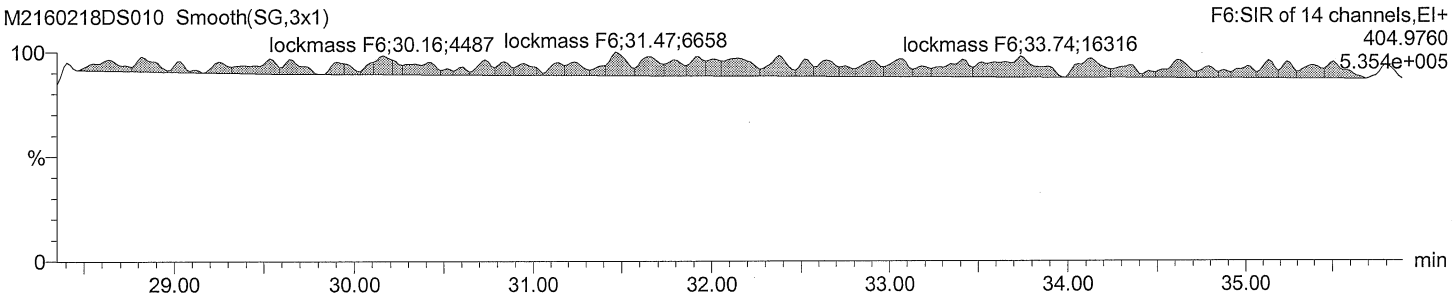

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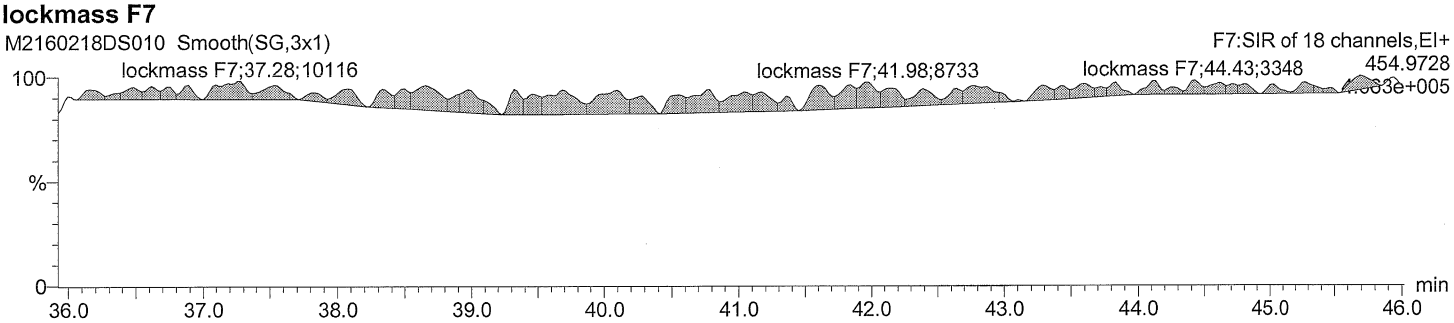
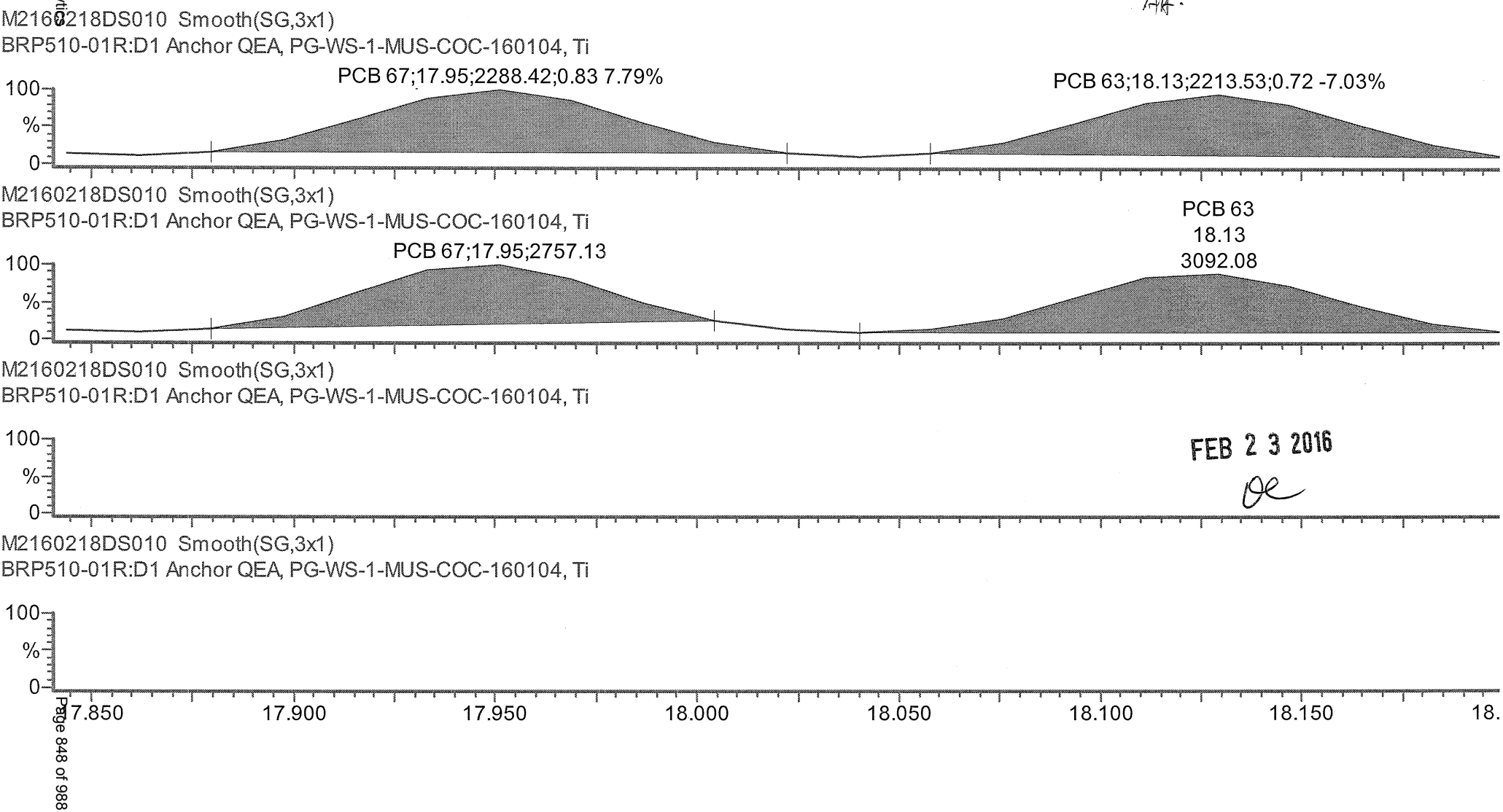


Maxxam Analytics

Below
15.02.20
AH.

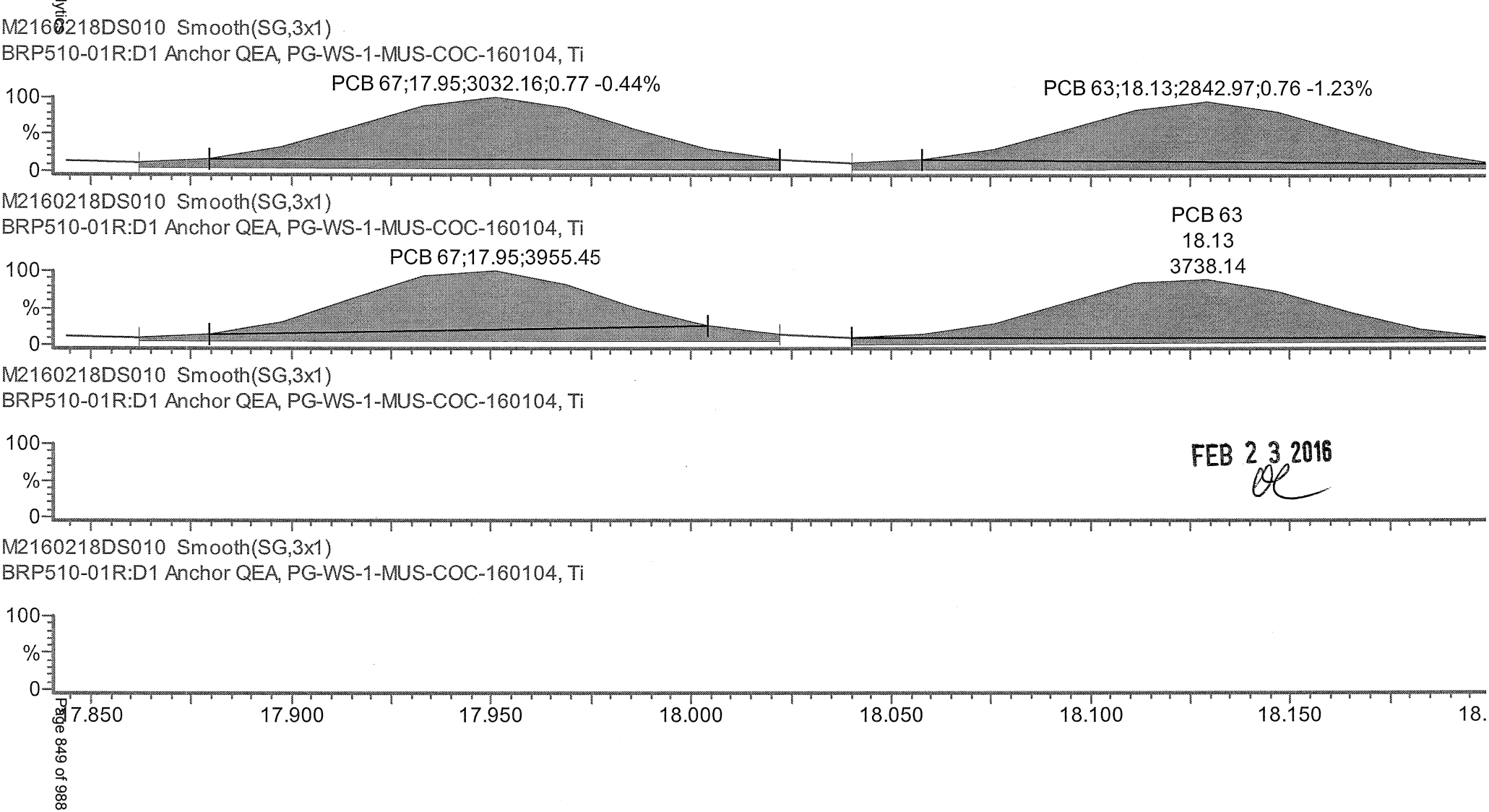


FEB 2 3 2016

Page 848 of 988

Maxxam Analytics

M3 16/02/20 : AH



FEB 2 3 2016

Maxxam Analytics

Before
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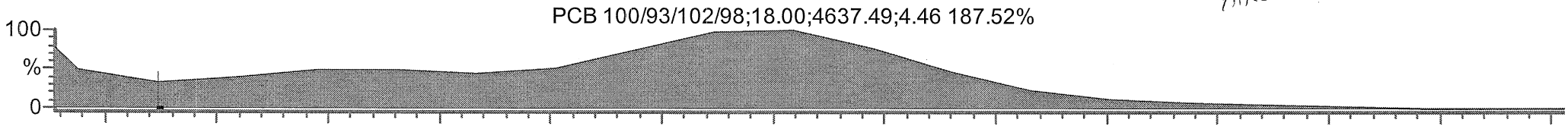

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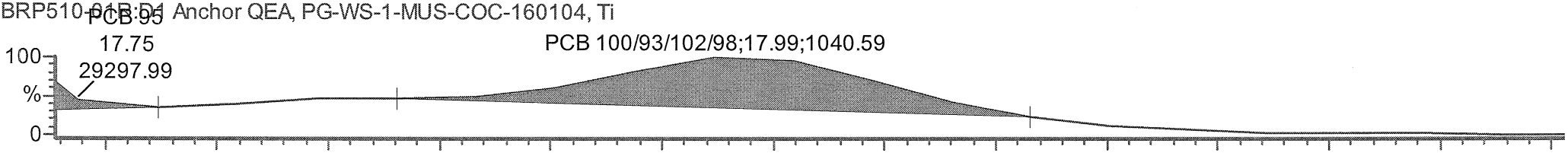

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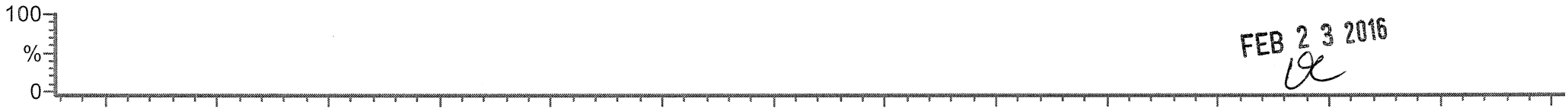

FEB 2 3 2016
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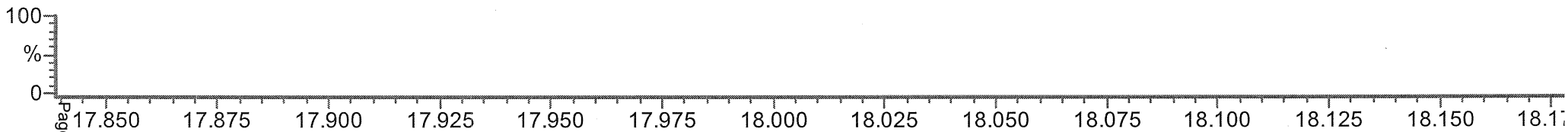

Maxxam Analytics

M3 16/02/20 : AH

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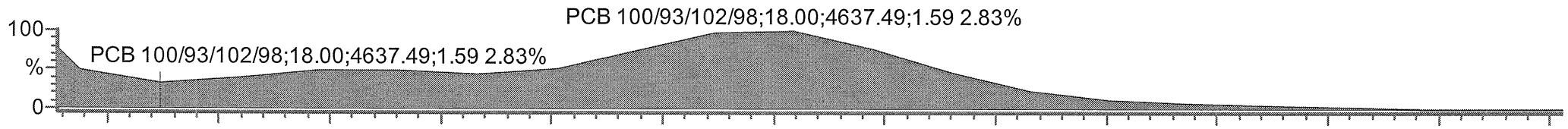

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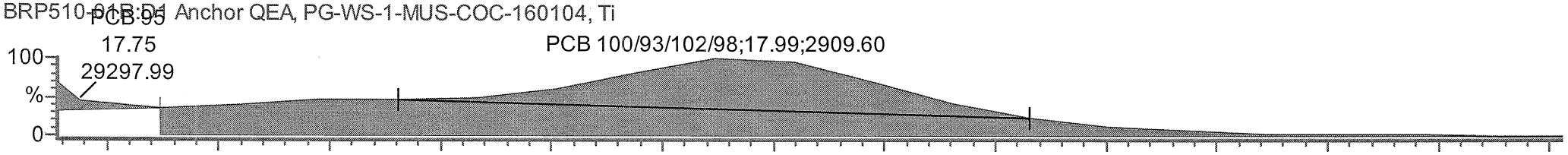

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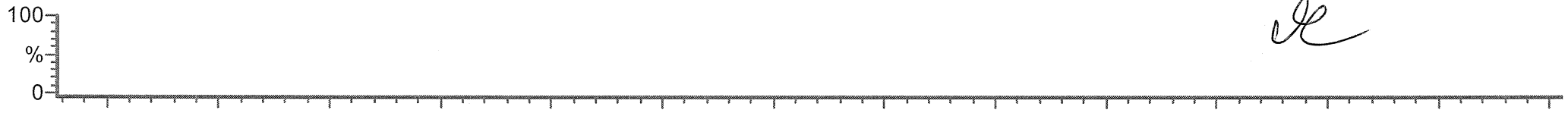

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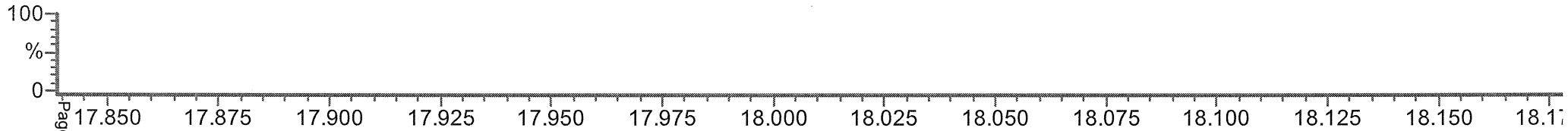

Maxxam Analytics

Before
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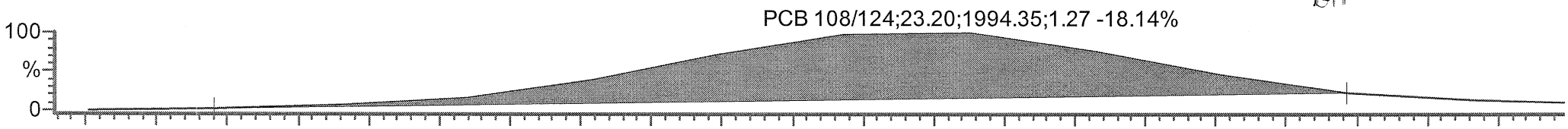

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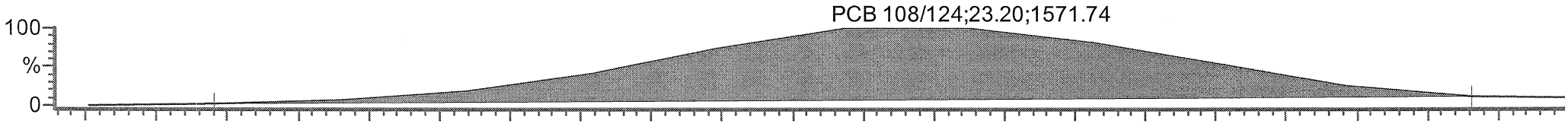

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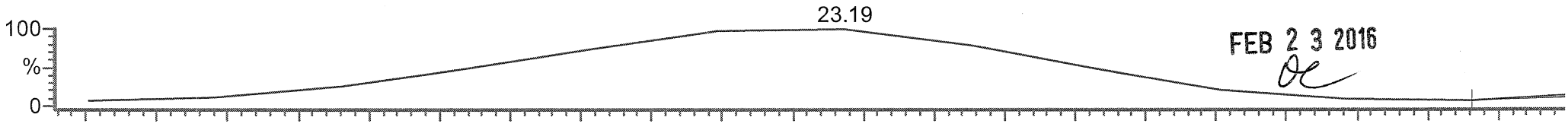

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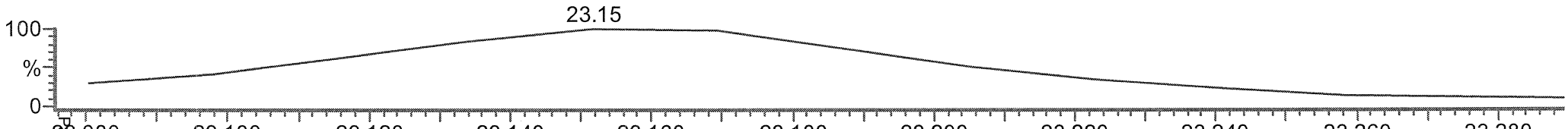

M3 16/02/20 : AH

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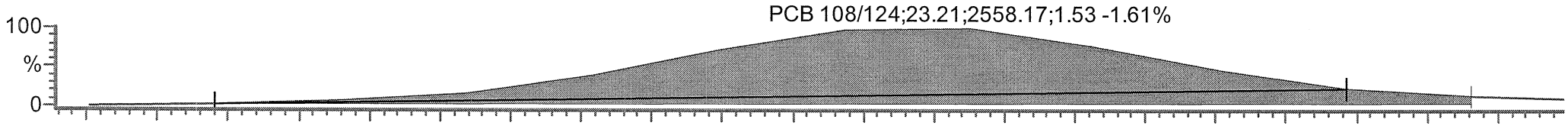

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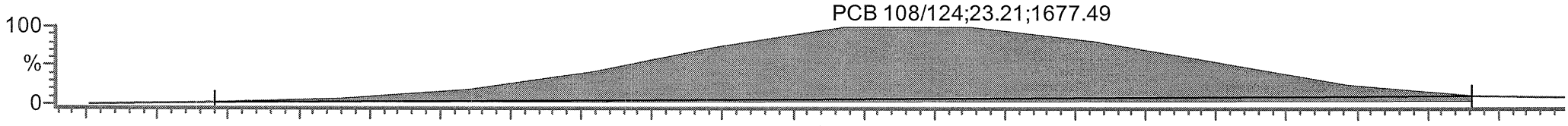

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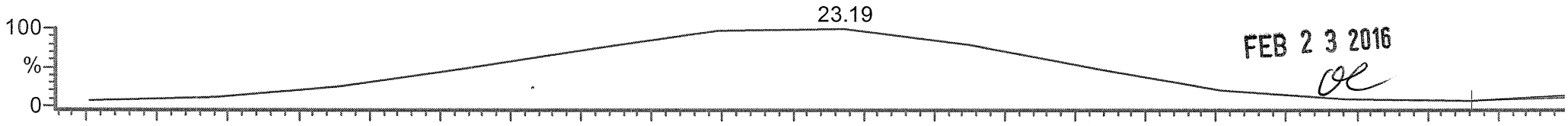

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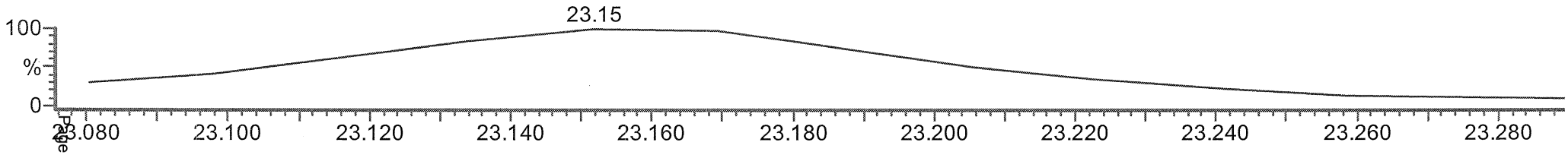

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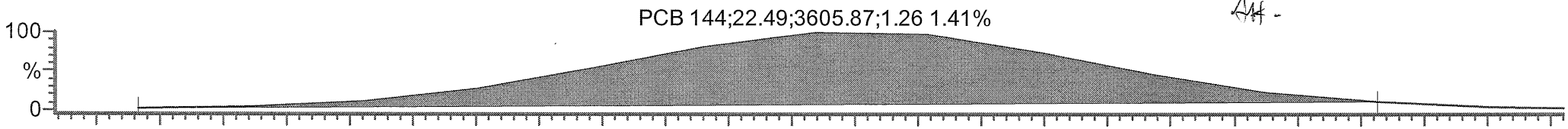

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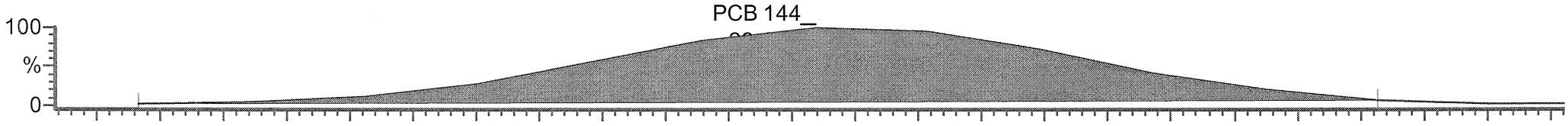

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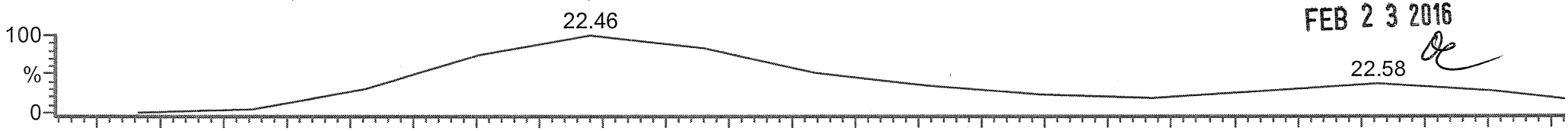
FEB 2 3 2016



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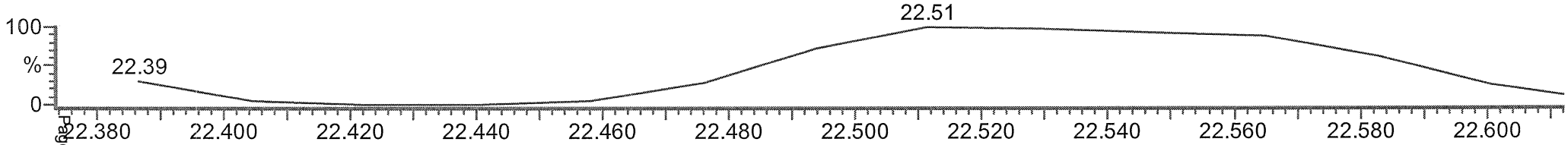
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



Maxxam Analytics

M3 16/02/20 : AH

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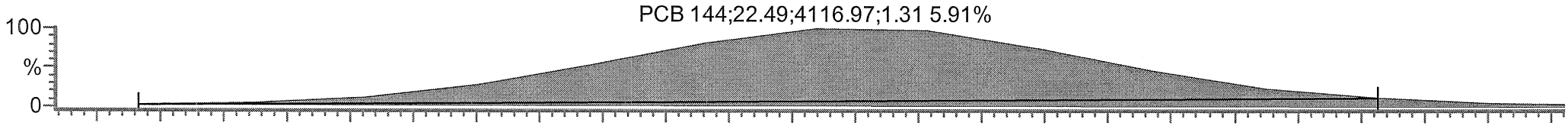
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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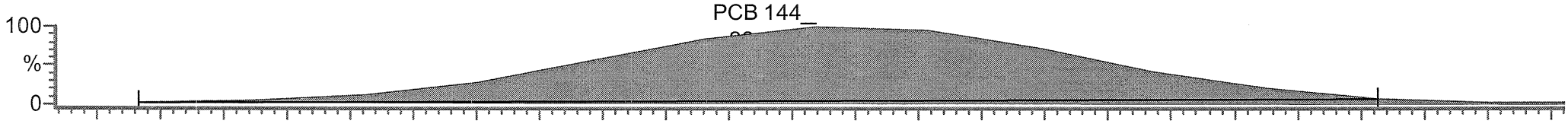
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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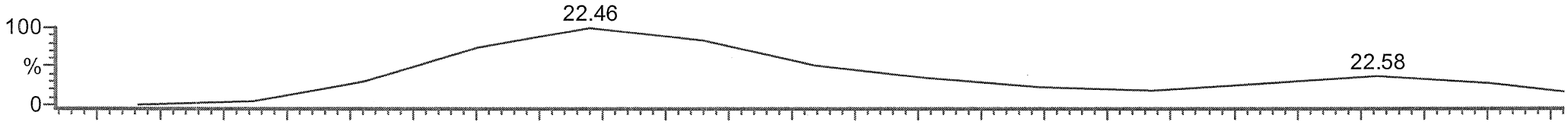
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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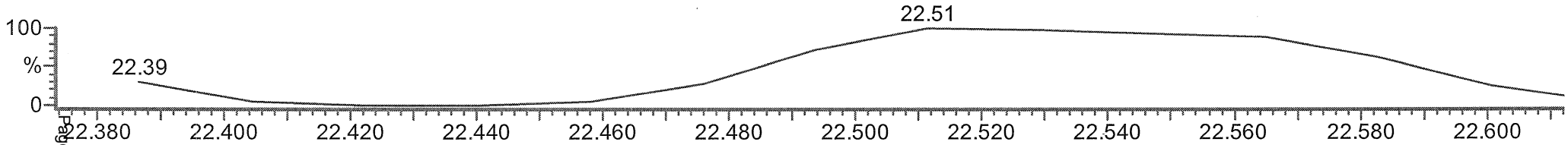
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



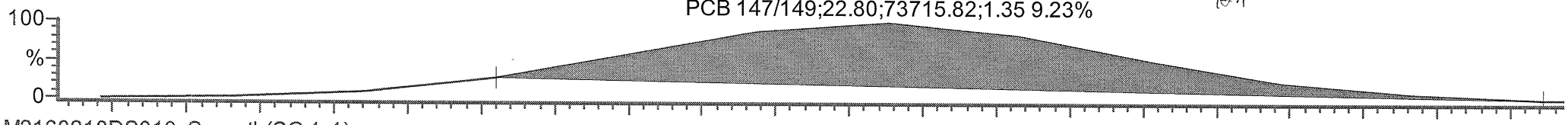
FEB 2 3 2016

Maxxam Analytics

Before
10.02 - 20
DA -

M2160218DS010 Smooth(SG,1x1)
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti

PCB 147/149;22.80;73715.82;1.35 9.23%



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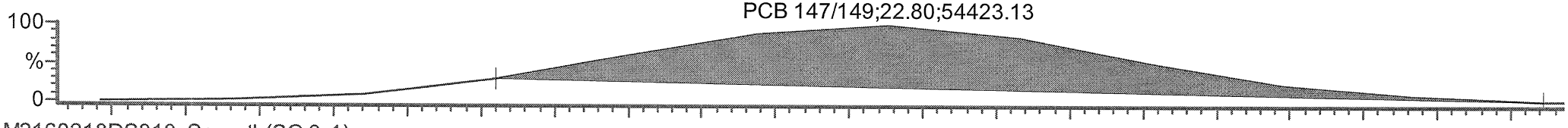
PCB 147/149;22.80;54423.13



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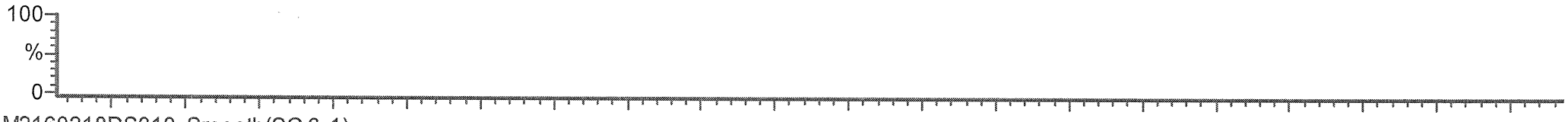

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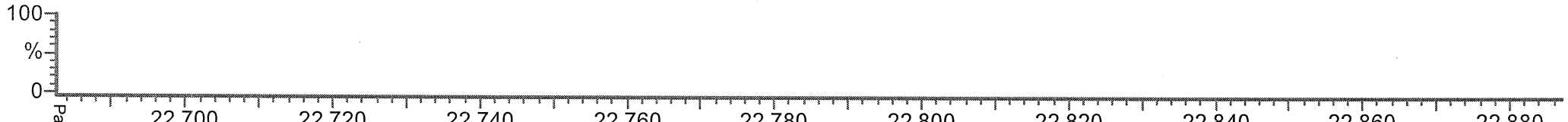

FEB 2 3 2016

M3 16/02/20 : AH

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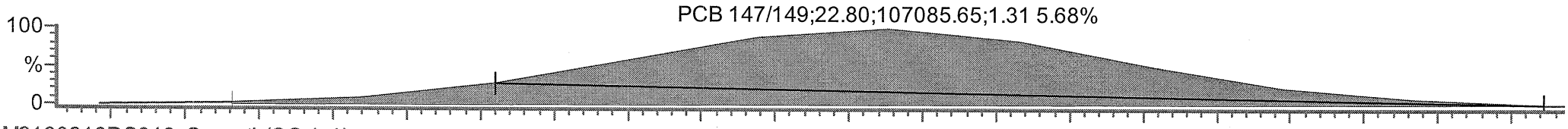

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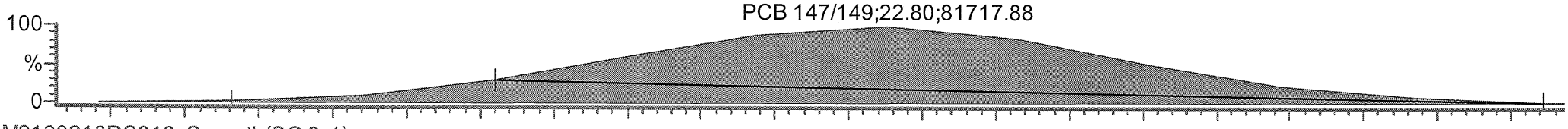
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti



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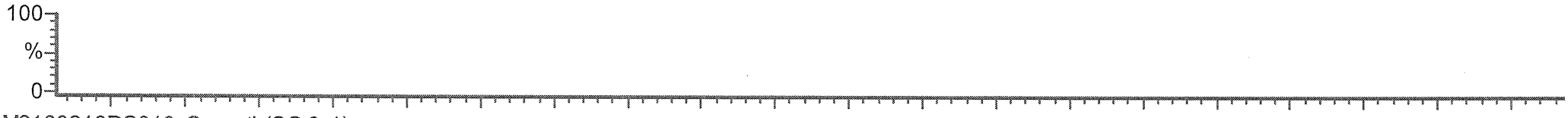

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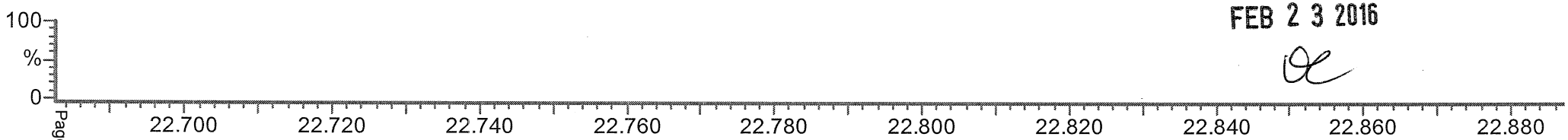
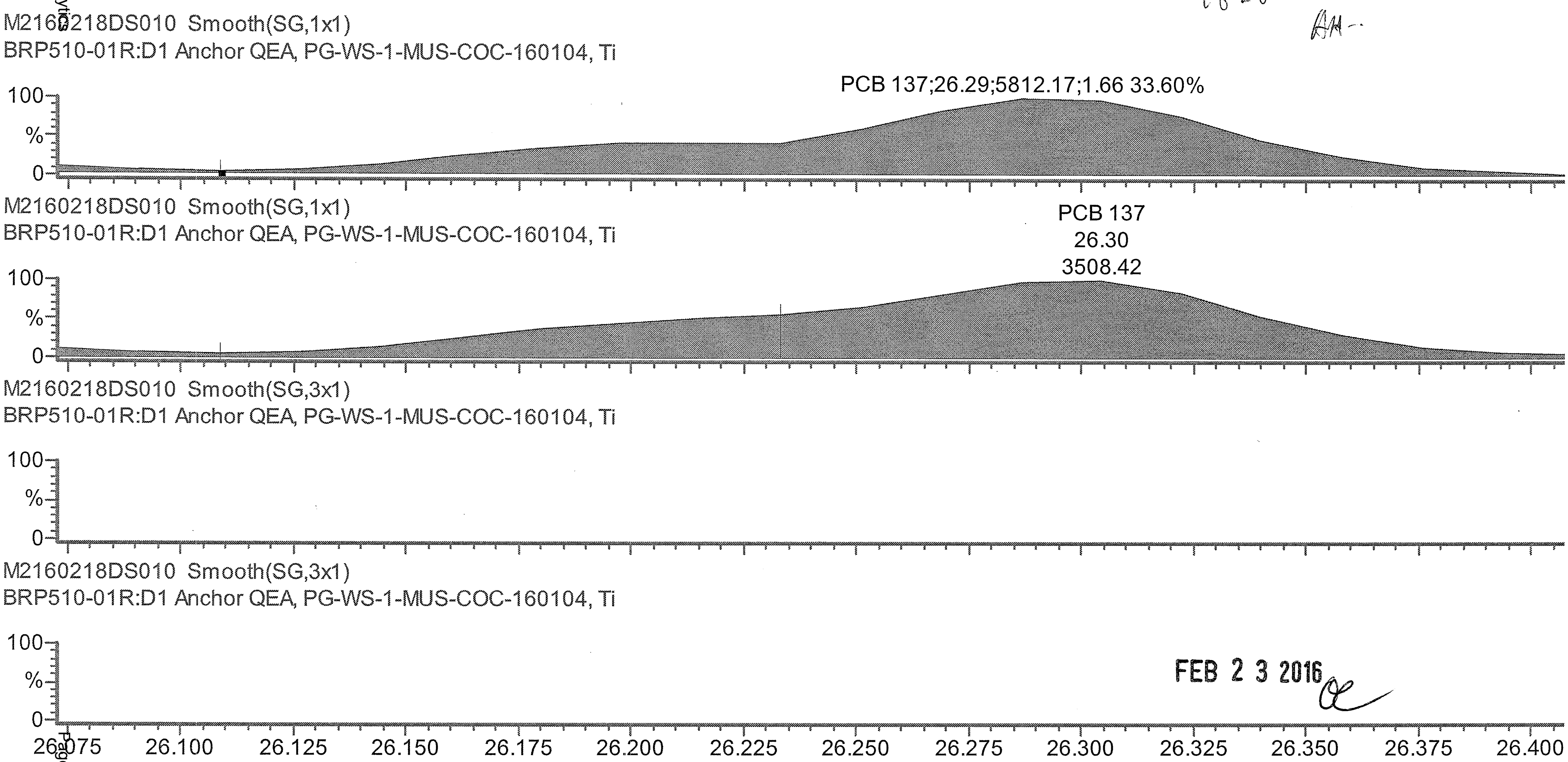


FEB 2 3 2016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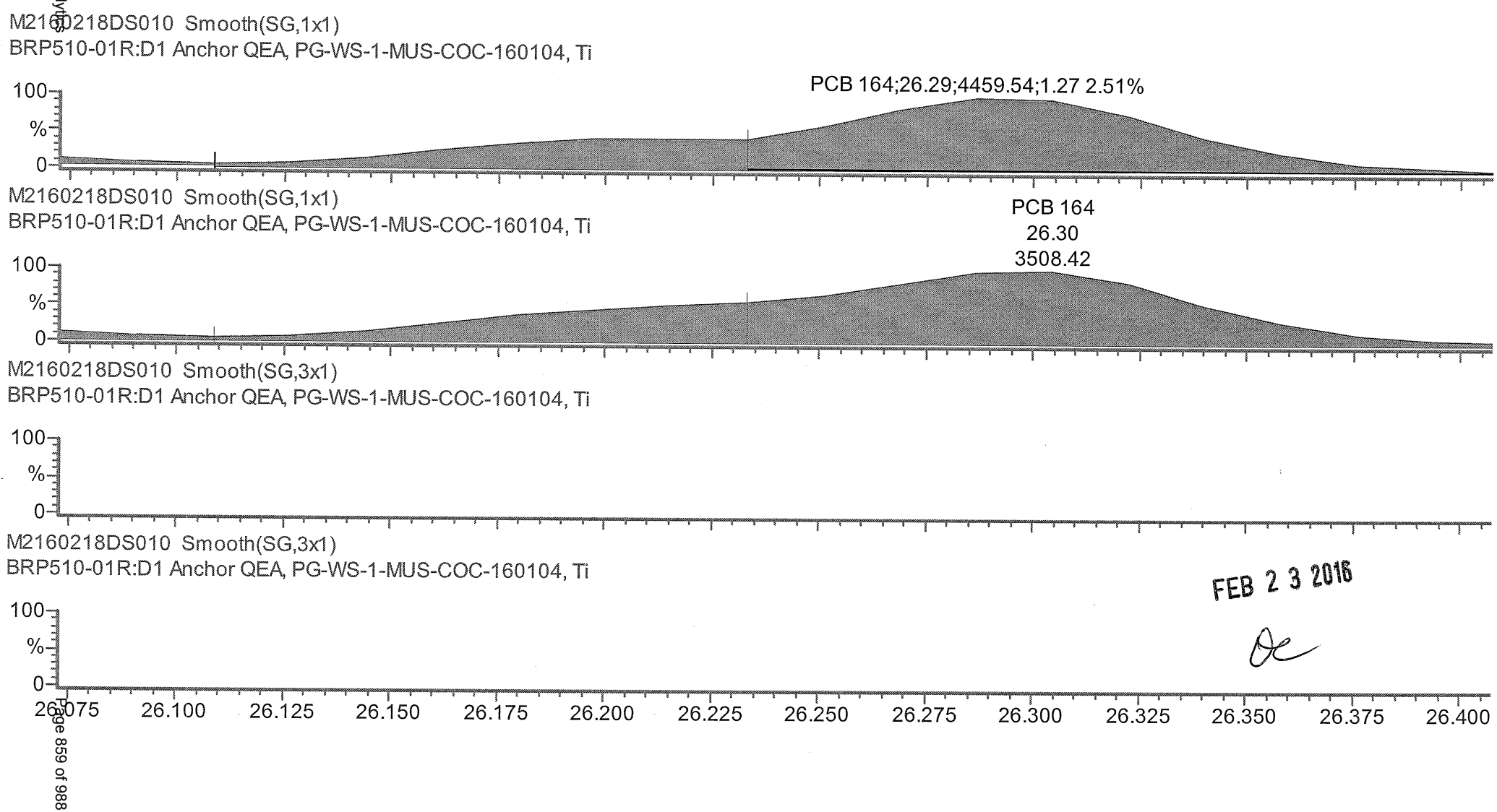
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
PCB 137;26.29;5812.17;1.66 33.60%
100
%
0
M2160218DS010 Smooth(SG,1x1)
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
PCB 137
26.30
3508.42
100
%
0
M2160218DS010 Smooth(SG,3x1)
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
100
%
0
M2160218DS010 Smooth(SG,3x1)
BRP510-01R:D1 Anchor QEA, PG-WS-1-MUS-COC-160104, Ti
100
%
0
FEB 2 3 2016
26.075
26.100
26.125
26.150
26.175
26.200
26.225
26.250
26.275
26.300
26.325
26.350
26.375
26.400

Maxxam Analytics

M2 **16/02/20 : AH**



FEB 2 3 2016

Page 859 of 988

Filename M2160218DS011
Acquired 18/02/2016 2:49 Cali File M2160218D_209

Sample ID BRP511-01R
Comments
Instrument File Ultima 3
Sample Size 10.019 Dil Fac 1.00

Isomers

	Name	mass	RT	Area	ratio	Tot Area	ng	Code	DL	S/N	Mod	rrf	Rec
1	PCB 1	188	NotFnd	*	*	*	-0.00073		-0.00073	*	no	1.082	-
	MoCB	190	8.98	*	no					*			
2	PCB 2	188	NotFnd	*	*	*	-0.00066		-0.00066	*	no	1.2	-
	MoCB	190	10.10	*	no					*			
3	PCB 3	188	NotFnd	*	*	*	-0.00073		-0.00073	*	no	1.079	-
	MoCB	190	10.19	*	no					*			
4	PCB 4	222	NotFnd	*	*	*	-0.00238		-0.00238	*	no	0.954	-
	DiCB	224	10.29	*	no					*			
5	PCB 10	222	NotFnd	*	*	*	-0.00185		-0.00185	*	no	1.229	-
	DiCB	224	10.37	*	no					*			
6	PCB 9	222	NotFnd	*	*	*	-0.00288		-0.00288	*	no	1.311	-
	DiCB	224	11.18	*	no					*			
7	PCB 7	222	NotFnd	*	*	*	-0.00324		-0.00324	*	no	1.165	-
	DiCB	224	11.26	*	no					*			
8	PCB 6	222	NotFnd	*	*	*	-0.00286		-0.00286	*	no	1.319	-
	DiCB	224	11.34	*	no					*			
9	PCB 5	222	NotFnd	*	*	*	-0.00383		-0.00383	*	no	0.983	-
	DiCB	224	11.50	*	no					*			
10	PCB 8	222	11.55	-5925	1.56	-9723.08	-0.00692	PCB 8 NDR	-0.00259	127	xL	1.456	-
	DiCB	224	11.55	-3798.08	OK					7			
11	PCB 14	222	NotFnd	*	*	*	-0.00283		-0.00283	*	no	1.332	-
	DiCB	224	12.26	*	no					*			
12	**PCB 11**	**222**	**12.66**	**5076**	**1.45**	**8589**	**0.006935**		-0.00293	75	no	1.285	-
	DiCB	224	12.66	3513	yes					4			
13	PCB 13/12	222	NotFnd	*	*	*	-0.00312		-0.00312	*	no	1.21	-
	DiCB	224	12.81	*	no					*			
14	**PCB 15**	**222**	**12.95**	**17221**	**1.53**	**28483**	**0.022437**		-0.00433	269	no	0.871	-
	DiCB	224	12.96	11262	yes					12			
15	**PCB 19**	**256**	**11.68**	**1013**	**0.89**	**2148**	**0.004438**		-0.00164	14	no	0.899	-
	TriCB	258	11.70	1135	yes					16			
16	**PCB 30/18**	**256**	**12.49**	**13565**	**1.09**	**25987**	**0.030271**		-0.00181	180	no	0.813	-
	TriCB	258	12.48	12422	yes					173			
17	**PCB 17**	**256**	**12.68**	**2916**	**1.09**	**5599**	**0.007768**		-0.00216	33	no	0.683	-
	TriCB	258	12.69	2683	yes					34			
18	**PCB 27**	**256**	**12.78**	**2721**	**1.06**	**5289**	**0.005**		-0.00147	33	no	1.002	-
	TriCB	258	12.78	2568	yes					32			
19	PCB 24	256	NotFnd	*	*	*	-0.00172		-0.00172	*	no	0.855	-
	TriCB	258	12.87	*	no					*			
20	**PCB 16**	**256**	**12.91**	**4759**	**1.02**	**9400**	**0.01779**		-0.00294	56	no	0.501	-
	TriCB	258	12.90	4641	yes					47			
21	**PCB 32**	**256**	**13.14**	**4749**	**1.01**	**9463**	**0.008204**		-0.00135	58	no	1.093	-
	TriCB	258	13.14	4714	yes					56			
22	PCB 34	256	NotFnd	*	*	*	-0.00078		-0.00078	*	no	1.235	-
	TriCB	258	13.74	*	no					*			
23	PCB 23	256	NotFnd	*	*	*	-0.00093		-0.00093	*	no	1.033	-
	TriCB	258	13.82	*	no					*			
24	**PCB 26/29**	**256**	**13.97**	**11674**	**1**	**23323**	**0.018095**		-0.00079	77	no	1.221	-
	TriCB	258	13.99	11649	yes					82			
25	**PCB 25**	**256**	**14.10**	**5764**	**1.05**	**11251**	**0.00799**		-0.00072	37	no	1.334	-
	TriCB	258	14.10	5488	yes					36			
26	**PCB 31**	**256**	**14.26**	**59026**	**1.01**	**117236**	**0.083188**		-0.00072	401	no	1.335	-
	TriCB	258	14.26	58210	yes					408			
27	**PCB 28/20**	**256**	**14.42**	**167179**	**1.02**	**330565**	**0.263083**		-0.00081	1079	no	1.191	-
	TriCB	258	14.43	163387	yes					1070			
28	**PCB 21/33**	**256**	**14.55**	**29431**	**1.02**	**58200**	**0.043931**		-0.00077	179	no	1.255	-
	TriCB	258	14.53	28769	yes					180			
29	**PCB 22**	**256**	**14.75**	**23511**	**0.98**	**47504**	**0.039938**		-0.00085	141	no	1.127	-
	TriCB	258	14.76	23993	yes					154			
30	PCB 36	256	NotFnd	*	*	*	-0.00061		-0.00061	*	no	1.57	-
	TriCB	258	15.60	*	no					*			
31	**PCB 39**	**256**	**15.83**	**1229**	**1.07**	**2380**	**0.001708**		-0.00073	7	no	1.32	-
	TriCB	258	15.83	1151	yes					7			
32	PCB 38	256	NotFnd	*	*	*	-0.00067		-0.00067	*	no	1.438	-
	TriCB	258	16.18	*	no					*			
33	PCB 35	256	NotFnd	*	*	*	-0.0006		-0.0006	*	no	1.597	-
	TriCB	258	16.45	*	no					*			
34	**PCB 37**	**256**	**16.70**	**23060**	**1**	**46076**	**0.032366**		-0.00106	138	no	0.906	-
	TriCB	258	16.70	23016	yes					140			
35	PCB 54	290	NotFnd	*	*	*	-0.00112		-0.00112	*	no	0.911	-
	TCB	292	13.08	*	no					*			
36	**PCB 53/50**	**290**	**14.12**	**8939**	**0.76**	**20746**	**0.029344**		-0.00173	66	no	0.654	-
	TCB	292	14.11	11807	yes					69			
37	**PCB 45/51**	**290**	**14.48**	**5244**	**0.79**	**11870**	**0.017358**		-0.00178	36	no	0.633	-
	TCB	292	14.49	6626	yes					37			
38	**PCB 46**	**290**	**14.64**	**3185**	**0.85**	**6931**	**0.011584**		-0.00204	25	no	0.554	-
	TCB	292	14.64	3746	yes					21			
39	**PCB 52**	**290**	**15.36**	**67639**	**0.81**	**151522**	**0.168124**		-0.00135	489	no	0.834	-
	TCB	292	15.38	83883	yes					476			
40	PCB 73	290	NotFnd	*	*	*	-0.00139		-0.00139	*	no	0.813	-
	TCB	292	15.46	*	no					*			
41	**PCB 43**	**290**	**15.53**	**3163**	**0.87**	**6798**	**0.012182**		-0.00219	22	yes	0.516	-
	TCB	292	15.52	3636	yes					19			
42	**PCB 69/49**	**290**	**15.65**	**27445**	**0.81**	**61340**	**0.066691**		-0.00133	201	no	0.851	-
	TCB	292	15.64	33895	yes					191			

43 PCB 48	**290**	**15.83**	**17352**	**0.79**	**39376**	**0.054124**			-0.00168	122	no	0.673	-
	TCB 292	15.84	22023	yes						119			
44 PCB 44/47/65	**290**	**15.96**	**64305**	**0.8**	**144836**	**0.171157**			-0.00144	382	no	0.783	-
	TCB 292	15.98	80531	yes						372			
45 PCB 59/62/75	**290**	**16.16**	**8669**	**0.82**	**19292**	**0.017565**			-0.00111	55	no	1.017	-
	TCB 292	16.17	10623	yes						52			
46 PCB 42	**290**	**16.28**	**12666**	**0.85**	**27619**	**0.037504**			-0.00166	83	no	0.682	-
	TCB 292	16.30	14953	yes						78			
47 PCB 40/41/71	**290**	**16.57**	**29442**	**0.83**	**64979**	**0.083116**			-0.00156	171	no	0.724	-
	TCB 292	16.58	35537	yes						158			
48 PCB 64	**290**	**16.72**	**16440**	**0.81**	**36862**	**0.037007**			-0.00123	112	no	0.922	-
	TCB 292	16.71	20422	yes						107			
49 PCB 72	**290**	**17.20**	**996**	**0.72**	**2389**	**0.001695**			-0.00133	3	yes	1.304	-
	TCB 292	17.19	1393	yes						4			
50 PCB 68	290	17.40	819	1.03	1612	-0.00143			-0.00143	*	yes	1.22	-
	TCB 292	17.40	793	no						*			
51 PCB 57	290	17.68	399	0.82	884	-0.00142			-0.00142	*	yes	1.221	-
	TCB 292	17.68	485	no						*			
52 PCB 58	290	NotFnd	*	*	*	-0.00168			-0.00168	*	no	1.035	-
	TCB 292	17.83	*	no						*			
53 PCB 67	**290**	**17.95**	**1980**	**0.78**	**4526**	**0.003111**			-0.00129	7	yes	1.347	-
	TCB 292	17.94	2546	yes						7			
54 PCB 63	**290**	**18.13**	**1845**	**0.76**	**4270**	**0.003155**			-0.00139	6	yes	1.253	-
	TCB 292	18.13	2425	yes						7			
55 PCB 61/70/74/76	**290**	**18.34**	**46676**	**0.79**	**106100**	**0.088573**			-0.00157	110	no	1.109	-
	TCB 292	18.34	59424	yes						108			
56 PCB 66	**290**	**18.57**	**19825**	**0.77**	**45532**	**0.033944**			-0.0014	65	no	1.241	-
	TCB 292	18.58	25707	yes						65			
57 PCB 55	290	NotFnd	*	*	*	-0.00174			-0.00174	*	no	0.998	-
	TCB 292	18.71	*	no						*			
58 PCB 56	**290**	**19.05**	**2669**	**0.83**	**5875**	**0.005462**			-0.00175	9	no	0.995	-
	TCB 292	19.05	3206	yes						9			
59 PCB 60	**290**	**19.22**	**2202**	**0.78**	**5012**	**0.004697**			-0.00176	8	no	0.988	-
	TCB 292	19.22	2811	yes						7			
60 PCB 80	290	NotFnd	*	*	*	-0.00142			-0.00142	*	no	1.224	-
	TCB 292	19.48	*	no						*			
61 PCB 79	290	NotFnd	*	*	*	-0.00119			-0.00119	*	no	1.462	-
	TCB 292	20.61	*	no						*			
62 PCB 78	290	NotFnd	*	*	*	-0.00135			-0.00135	*	no	1.287	-
	TCB 292	21.06	*	no						*			
63 PCB 81	290	NotFnd	*	*	*	-0.00169			-0.00169	*	no	1.027	-
	TCB 292	21.43	*	no						*			
64 PCB 77	**290**	**21.87**	**1059**	**0.82**	**2343**	**0.001646**			-0.00162	3	no	1.077	-
	TCB 292	21.87	1284	yes						3			
65 PCB 104	326	NotFnd	*	*	*	-0.00043			-0.00043	*	no	1.094	-
	PeCB 328	15.94	*	no						*			
66 PCB 96	326	16.16	-647.9	1.55	-1065.9	-0.00106	PCB 96 NDR		-0.00054	12	xL	0.874	-
	PeCB 328	16.16	-418	OK						10			
67 PCB 103	**326**	**17.31**	**836**	**1.63**	**1347**	**0.00159**			-0.00076	8	yes	0.739	-
	PeCB 328	17.33	511	yes						7			
68 PCB 94	326	NotFnd	*	*	*	-0.00104			-0.00104	*	no	0.54	-
	PeCB 328	17.47	*	no						*			
69 PCB 95	**326**	**17.75**	**31365**	**1.63**	**50607**	**0.064668**			-0.00082	256	yes	0.683	-
	PeCB 328	17.77	19242	yes						243			
70 PCB 100/93/102/98	**326**	**18.00**	**3453**	**1.68**	**5509**	**0.007762**			-0.00091	19	yes	0.619	-
	PeCB 328	17.93	2056	yes						17			
71 PCB 88/91	**326**	**18.34**	**2440**	**1.56**	**4007**	**0.005592**			-0.0009	20	yes	0.625	-
	PeCB 328	18.31	1567	yes						20			
72 PCB 84	**326**	**18.50**	**3104**	**1.41**	**5310**	**0.008673**			-0.00105	27	no	0.534	-
	PeCB 328	18.50	2206	yes						27			
73 PCB 89	326	NotFnd	*	*	*	-0.00096			-0.00096	*	no	0.582	-
	PeCB 328	18.84	*	no						*			
74 PCB 121	326	NotFnd	*	*	*	-0.00074			-0.00074	*	no	0.761	-
	PeCB 328	19.08	*	no						*			
75 PCB 92	**326**	**19.36**	**7775**	**1.74**	**12236**	**0.017857**			-0.00094	62	no	0.598	-
	PeCB 328	19.35	4461	yes						55			
76 PCB 113/90/101	**326**	**19.78**	**53436**	**1.67**	**85441**	**0.104935**			-0.00079	413	no	0.71	-
	PeCB 328	19.76	32006	yes						382			
77 PCB 83/99	**326**	**20.23**	**26270**	**1.61**	**42640**	**0.05969**			-0.0009	191	no	0.623	-
	PeCB 328	20.22	16370	yes						181			
78 PCB 112	326	NotFnd	*	*	*	-0.00069			-0.00069	*	no	0.819	-
	PeCB 328	20.33	*	no						*			
79 PCB 109/119/86/97/125/	**326**	**20.62**	**15821**	**1.58**	**25813**	**0.031002**			-0.00077	67	no	0.726	-
	PeCB 328	20.62	9992	yes						63			
80 PCB 117/116/85	**326**	**21.19**	**6529**	**1.66**	**10465**	**0.011476**			-0.00071	44	no	0.796	-
	PeCB 328	21.23	3936	yes						42			
81 PCB 110/115	**326**	**21.32**	**34605**	**1.64**	**55662**	**0.064772**			-0.00075	242	no	0.75	-
	PeCB 328	21.32	21056	yes						223			
82 PCB 82	**326**	**21.57**	**1551**	**1.55**	**2550**	**0.003941**			-0.001	10	no	0.564	-
	PeCB 328	21.59	999	yes						10			
83 PCB 111	326	NotFnd	*	*	*	-0.00069			-0.00069	*	no	0.809	-
	PeCB 328	21.85	*	no						*			
84 PCB 120	326	NotFnd	*	*	*	-0.00059			-0.00059	*	no	0.951	-
	PeCB 328	22.25	*	no						*			
85 PCB 108/124	**326**	**23.20**	**1903**	**1.57**	**3112**	**0.002419**			-0.00096	7	no	1.122	-
	PeCB 328	23.21	1209	yes						8			
86 PCB 107	**326**	**23.42**	**5219**	**1.45**	**8812**	**0.0067**			-0.00093	18	yes	1.147	-
	PeCB 328	23.40	3592	yes						18			
87 PCB 123	326	NotFnd	*	*	*	-0.0012			-0.0012	*	no	0.894	-
	PeCB 328	23.51	*	no						*			
88 PCB 106	326	NotFnd	*	*	*	-0.00088			-0.00088	*	no	1.218	-
	PeCB 328	23.63	*	no						*			
89 PCB 118	**326**	**23.79**	**54659**	**1.54**	**90156**	**0.069981**			-0.00109	188	no	0.981	-
	PeCB 328	23.80	35497	yes						190			

90 PCB 122	326	NotFnd	*	*	*	-0.00099	-0.00099	*	no	1.079	-	
	PeCB 328	24.08	*	no				*				
91 PCB 114	326	NotFnd	*	*	*	-0.00106	-0.00106	*	no	1.01	-	
	PeCB 328	24.28	*	no				*				
92 PCB 105	**326**	**24.84**	**18035**	**1.55**	**29642**	**0.023534**	-0.0011	58	no	0.977	-	
	PeCB 328	24.85	11607	yes				59				
93 PCB 127	326	NotFnd	*	*	*	-0.00087	-0.00087	*	no	1.23	-	
	PeCB 328	26.20	*	no				*				
94 PCB 126	326	NotFnd	*	*	*	-0.0011	-0.0011	*	no	0.977	-	
	PeCB 328	27.72	*	no				*				
95 PCB 155	360	NotFnd	*	*	*	-0.00131	-0.00131	*	no	0.997	-	
	HxCB 362	19.63	*	no				*				
96 PCB 152	360	NotFnd	*	*	*	-0.0016	-0.0016	*	no	0.813	-	
	HxCB 362	19.78	*	no				*				
97 PCB 150	360	NotFnd	*	*	*	-0.002	-0.002	*	no	0.65	-	
	HxCB 362	19.88	*	no				*				
98 PCB 136	**360**	**20.18**	**6740**	**1.31**	**11901**	**0.014992**	-0.00171	35	no	0.761	-	
	HxCB 362	20.18	5162	yes				34				
99 PCB 145	360	NotFnd	*	*	*	-0.00197	-0.00197	*	no	0.662	-	
	HxCB 362	20.41	*	no				*				
100 PCB 148	360	NotFnd	*	*	*	-0.00237	-0.00237	*	no	0.551	-	
	HxCB 362	21.55	*	no				*				
101 PCB 151/135	**360**	**22.03**	**19168**	**1.38**	**33092**	**0.061122**	-0.00251	80	no	0.519	-	
	HxCB 362	22.04	13924	yes				75				
102 PCB 154	**360**	**22.23**	**1162**	**1.28**	**2068**	**0.003209**	-0.00211	6	no	0.618	-	
	HxCB 362	22.22	906	yes				6				
103 PCB 144	**360**	**22.49**	**2140**	**1.18**	**3950**	**0.006737**	-0.00232	11	no	0.562	-	
	HxCB 362	22.51	1811	yes				11				
104 PCB 147/149	**360**	**22.79**	**66311**	**1.33**	**116115**	**0.168106**	-0.0029	210	yes	0.662	-	
	HxCB 362	22.80	49804	yes				198				
105 PCB 134/143	**360**	**22.97**	**1665**	**1.15**	**3117**	**0.0051**	-0.00327	6	no	0.586	-	
	HxCB 362	23.06	1452	yes				6				
106 PCB 139/140	360	NotFnd	*	*	*	-0.00282	-0.00282	*	no	0.68	-	
	HxCB 362	23.31	*	no				*				
107 PCB 131	360	NotFnd	*	*	*	-0.00357	-0.00357	*	no	0.537	-	
	HxCB 362	23.49	*	no				*				
108 PCB 142	360	NotFnd	*	*	*	-0.00306	-0.00306	*	no	0.626	-	
	HxCB 362	23.65	*	no				*				
109 PCB 132	**360**	**23.88**	**7656**	**1.22**	**13930**	**0.023835**	-0.00342	23	no	0.561	-	
	HxCB 362	23.88	6273	yes				23				
110 PCB 133	**360**	**24.29**	**1757**	**1.37**	**3037**	**0.004433**	-0.00292	5	no	0.657	-	
	HxCB 362	24.31	1280	yes				4				
111 PCB 165	360	NotFnd	*	*	*	-0.00251	-0.00251	*	no	0.765	-	
	HxCB 362	24.66	*	no				*				
112 PCB 146	**360**	**24.88**	**17647**	**1.31**	**31075**	**0.042283**	-0.00272	50	no	0.705	-	
	HxCB 362	24.86	13428	yes				48				
113 PCB 161	360	NotFnd	*	*	*	-0.00198	-0.00198	*	no	0.97	-	
	HxCB 362	25.01	*	no				*				
114 PCB 153/168	**360**	**25.43**	**143407**	**1.32**	**252500**	**0.284182**	-0.00225	409	no	0.852	-	
	HxCB 362	25.45	109093	yes				383				
115 PCB 141	**360**	**25.61**	**2852**	**1.37**	**4931**	**0.00694**	-0.00281	8	no	0.681	-	
	HxCB 362	25.60	2079	yes				7				
116 PCB 130	**360**	**25.98**	**3414**	**1.25**	**6147**	**0.009555**	-0.00311	10	no	0.617	-	
	HxCB 362	25.99	2733	yes				10				
117 PCB 137	360	26.21	1095	1.54	1804	-0.00316	-0.00316	*	yes	0.607	-	
	HxCB 362	26.19	709	no				*				
118 PCB 164	**360**	**26.29**	**2734**	**1.23**	**4955**	**0.005205**	-0.0021	7	yes	0.913	-	
	HxCB 362	26.28	2222	yes				8				
119 PCB 138/163/129	**360**	**26.59**	**101766**	**1.3**	**179735**	**0.244661**	-0.00272	270	no	0.705	-	
	HxCB 362	26.60	77968	yes				259				
120 PCB 160	360	NotFnd	*	*	*	-0.00233	-0.00233	*	no	0.822	-	
	HxCB 362	26.78	*	no				*				
121 PCB 158	**360**	**26.96**	**9049**	**1.28**	**16106**	**0.015379**	-0.00191	25	no	1.004	-	
	HxCB 362	26.96	7058	yes				23				
122 PCB 128/166	**360**	**27.80**	**10432**	**1.32**	**18356**	**0.02275**	-0.00248	23	no	0.774	-	
	HxCB 362	27.78	7924	yes				22				
123 PCB 159	360	NotFnd	*	*	*	-0.00086	-0.00086	*	no	1.179	-	
	HxCB 362	28.76	*	no				*				
124 PCB 162	360	29.05	392	1.57	642	-0.00092	-0.00092	*	yes	1.101	-	
	HxCB 362	29.05	250	no				*				
125 PCB 167	**360**	**29.53**	**4811**	**1.32**	**8444**	**0.006458**	-0.00107	22	no	0.946	-	
	HxCB 362	29.52	3634	yes				20				
126 PCB 156/157	**360**	**30.68**	**8671**	**1.26**	**15551**	**0.01205**	-0.00099	35	no	1.017	-	
	HxCB 362	30.71	6880	yes				33				
127 PCB 169	360	NotFnd	*	*	*	-0.00106	-0.00106	*	no	0.954	-	
	HxCB 362	34.11	*	no				*				
128 PCB 188	394	NotFnd	*	*	*	-0.00116	-0.00116	*	no	1.012	-	
	HpCB 396	24.23	*	no				*				
129 PCB 179	**394**	**24.52**	**8834**	**1.1**	**16888**	**0.01889**	-0.00112	51	no	1.047	-	
	HpCB 396	24.52	8055	yes				48				
130 PCB 184	394	NotFnd	*	*	*	-0.00122	-0.00122	*	no	0.961	-	
	HpCB 396	25.00	*	no				*				
131 PCB 176	**394**	**25.32**	**2190**	**1.02**	**4346**	**0.004956**	-0.00114	13	no	1.027	-	
	HpCB 396	25.31	2156	yes				14				
132 PCB 186	394	NotFnd	*	*	*	-0.0013	-0.0013	*	no	0.899	-	
	HpCB 396	25.75	*	no				*				
133 PCB 178	**394**	**27.00**	**3972**	**1.07**	**7671**	**0.012443**	-0.00162	22	no	0.722	-	
	HpCB 396	27.01	3699	yes				23				
134 PCB 175	394	NotFnd	*	*	*	-0.00156	-0.00156	*	no	0.753	-	
	HpCB 396	27.61	*	no				*				
135 PCB 187	**394**	**27.87**	**25722**	**1.09**	**49331**	**0.079901**	-0.00162	142	no	0.723	-	
	HpCB 396	27.88	23609	yes				138				
136 PCB 182	394	NotFnd	*	*	*	-0.00157	-0.00157	*	no	0.747	-	
	HpCB 396	28.10	*	no				*				

137 PCB 183	**394**	**28.48**	**17337**	**1.1**	**33074**	**0.033359**		-0.00181	55	yes	1.162	-
	HpCB 396	28.50	15737	yes					54			
138 PCB 185	394	NotFnd	*	*	*	-0.00248		-0.00248	*	no	0.851	-
	HpCB 396	28.56	*	no					*			
139 PCB 174	394	NotFnd	*	*	*	-0.00217		-0.00217	*	no	0.97	-
	HpCB 396	28.72	*	no					*			
140 PCB 177	**394**	**29.14**	**11654**	**1.08**	**22484**	**0.027935**		-0.00224	36	no	0.943	-
	HpCB 396	29.14	10830	yes					35			
141 PCB 181	394	NotFnd	*	*	*	-0.00236		-0.00236	*	no	0.892	-
	HpCB 396	29.56	*	no					*			
142 PCB 171/173	**394**	**29.78**	**6099**	**1.11**	**11573**	**0.014299**		-0.00222	19	no	0.948	-
	HpCB 396	29.78	5474	yes					19			
143 PCB 172	394	NotFnd	*	*	*	-0.00222		-0.00222	*	no	0.95	-
	HpCB 396	31.42	*	no					*			
144 PCB 192	394	NotFnd	*	*	*	-0.00194		-0.00194	*	no	1.085	-
	HpCB 396	31.74	*	no					*			
145 PCB 193/180	**394**	**32.13**	**34785**	**1.09**	**66754**	**0.069347**		-0.00152	100	no	1.383	-
	HpCB 396	32.06	31969	yes					98			
146 PCB 191	394	NotFnd	*	*	*	-0.00156		-0.00156	*	no	1.352	-
	HpCB 396	32.48	*	no					*			
147 PCB 170	**394**	**33.45**	**5955**	**1.05**	**11637**	**0.014711**		-0.00166	17	no	1.271	-
	HpCB 396	33.45	5682	yes					18			
148 PCB 190	**394**	**34.01**	**3756**	**1.07**	**7253**	**0.006319**		-0.00157	10	no	1.345	-
	HpCB 396	34.02	3497	yes					10			
149 PCB 189	**394**	**36.84**	**1225**	**1.01**	**2436**	**0.001837**		-0.00056	8	no	0.944	-
	HpCB 396	36.88	1211	yes					9			
150 PCB 202	**428**	**29.26**	**2167**	**0.92**	**4525**	**0.007313**		-0.00115	19	no	0.988	-
	OcCB 430	29.27	2358	yes					17			
151 PCB 201	**428**	**30.19**	**1284**	**0.99**	**2581**	**0.003212**		-0.00114	10	no	0.997	-
	OcCB 430	30.18	1297	yes					9			
152 PCB 204	428	NotFnd	*	*	*	-0.00119		-0.00119	*	no	0.962	-
	OcCB 430	30.88	*	no					*			
153 PCB 197	428	31.11	430	0.98	869	-0.0013		-0.0013	*	yes	0.876	-
	OcCB 430	31.12	439	no					*			
154 PCB 200	428	31.27	7	0.76	16	-0.00113		-0.00113	*	yes	1.006	-
	OcCB 430	31.23	9	yes					*			
155 PCB 198/199	428	NotFnd	*	*	*	-0.00174		-0.00174	*	no	0.654	-
	OcCB 430	34.19	*	no					*			
156 PCB 196	428	NotFnd	*	*	*	-0.00169		-0.00169	*	no	0.674	-
	OcCB 430	34.90	*	no					*			
157 PCB 203	**428**	**35.12**	**1382**	**0.92**	**2880**	**0.005421**		-0.00173	11	no	0.659	-
	OcCB 430	35.10	1498	yes					9			
158 PCB 195	428	NotFnd	*	*	*	-0.0008		-0.0008	*	no	1.005	-
	OcCB 430	36.57	*	no					*			
159 PCB 194	428	39.20	-1910.83	0.89	-4057.83	-0.0046	PCB 194 NDR	-0.00074	17	xL	1.091	-
	OcCB 430	39.19	-2147	OK					16			
160 PCB 205	428	NotFnd	*	*	*	-0.00074		-0.00074	*	no	1.091	-
	OcCB 430	39.75	*	no					*			
161 PCB 208	462	NotFnd	*	*	*	-0.00153		-0.00153	*	no	1.023	-
	NoCB 464	36.30	*	no					*			
162 PCB 207	462	NotFnd	*	*	*	-0.00118		-0.00118	*	no	1.32	-
	NoCB 464	37.32	*	no					*			
163 PCB 206	462	NotFnd	*	*	*	-0.00152		-0.00152	*	no	1.027	-
	NoCB 464	41.70	*	no					*			
164 PCB 209	498	NotFnd	*	*	*	-0.0025		-0.0025	*	no	1.04	-
	DCB 500	43.54	*	no					*			
165 PCB 1L	**200**	**8.98**	**166565**	**3.49**	**214235**	**0.144663**		0	4294	no	0.824	72
	202	8.97	47669	yes					404			
166 PCB 3L	**200**	**10.17**	**154383**	**3.58**	**197548**	**0.128924**		0	4104	yes	0.852	65
	202	10.16	43165	yes					383			
167 PCB 4L	**234**	**10.28**	**58670**	**1.67**	**93747**	**0.096104**		0	2545	no	0.543	48
	236	10.28	35077	yes					1497			
168 PCB 15L	**234**	**12.93**	**180033**	**1.62**	**291098**	**0.150724**		0	1451	no	1.074	76
	236	12.91	111064	yes					1585			
169 PCB 19L	**268**	**11.68**	**55706**	**1.08**	**107517**	**0.103433**		0.001	209	no	0.578	52
	270	11.65	51811	yes					589			
170 PCB 37L	**268**	**16.68**	**158142**	**1.02**	**313836**	**0.19998**		0.001	501	no	1.987	100
	270	16.68	155694	yes					867			
171 PCB 54L	**302**	**13.06**	**49374**	**0.82**	**109671**	**0.107012**		0	826	no	1.297	54
	304	13.07	60296	yes					1568			
172 PCB 81L	**302**	**21.41**	**121699**	**0.8**	**273588**	**0.19928**		0	1133	no	1.738	100
	304	21.42	151889	yes					2208			
173 PCB 77L	**302**	**21.85**	**118669**	**0.82**	**263791**	**0.199111**		0	1046	no	1.677	100
	304	21.85	145122	yes					2048			
174 PCB 104L	**338**	**15.92**	**71151**	**1.62**	**115036**	**0.141566**		0	3631	no	1.156	71
	340	15.93	43885	yes					8527			
175 PCB 123L	**338**	**23.49**	**164137**	**1.61**	**265863**	**0.195317**		0	1411	no	1.936	98
	340	23.50	101726	yes					871			
176 PCB 118L	**338**	**23.77**	**161716**	**1.61**	**262019**	**0.195529**		0	1354	no	1.906	98
	340	23.76	100303	yes					841			
177 PCB 114L	**338**	**24.25**	**153325**	**1.7**	**243713**	**0.195508**		0.001	1291	no	1.773	98
	340	24.25	90388	yes					759			
178 PCB 105L	**338**	**24.83**	**160126**	**1.64**	**257469**	**0.200925**		0	1289	no	1.822	101
	340	24.81	97343	yes					784			
179 PCB 126L	**338**	**27.69**	**146441**	**1.57**	**239497**	**0.196261**		0.001	1125	no	1.735	98
	340	27.67	93055	yes					703			
180 PCB 155L	**372**	**19.61**	**72214**	**1.3**	**127691**	**0.126601**		0	4781	no	1.404	63
	374	19.61	55477	yes					2477			
181 PCB 167L	**372**	**29.50**	**156172**	**1.3**	**275970**	**0.182015**		0	2561	no	2.11	91
	374	29.49	119798	yes					1035			
182 PCB 156L/157L	**372**	**30.68**	**284187**	**1.28**	**506592**	**0.366985**		0	3835	yes	1.921	92
	374	30.69	222405	yes					1568			
183 PCB 169L	**372**	**34.08**	**98505**	**1.28**	**175560**	**0.129516**		0	1498	no	1.886	65
	374	34.06	77055	yes					599			

184	**PCB 188L**	**406**	**24.20**	**71625**	**1.08**	**137712**	**0.144151**		0	5141	no	1.329	72
		408	24.21	66087	yes					2416			
185	**PCB 180L**	**406**	**32.09**	**70718**	**1.04**	**138987**	**0.140193**		0	2046	no	1.349	70
		408	32.09	68270	yes					2349			
186	**PCB 170L**	**406**	**33.42**	**65955**	**1.13**	**124243**	**0.143207**		0	1891	no	1.18	72
		408	33.42	58288	yes					1974			
187	**PCB 189L**	**406**	**36.84**	**144161**	**1.06**	**280572**	**0.176913**		0	2476	no	2.157	89
		408	36.83	136411	yes					2493			
188	**PCB 202L**	**440**	**29.25**	**59750**	**0.92**	**125056**	**0.119841**		0	4041	no	1.419	60
		442	29.27	65305	yes					2111			
189	**PCB 205L**	**440**	**39.71**	**95352**	**0.94**	**196878**	**0.174886**		0	1936	no	1.531	88
		442	39.73	101526	yes					2290			
190	**PCB 208L**	**474**	**36.27**	**50337**	**0.76**	**116490**	**0.139066**		0	4013	no	1.139	70
		476	36.28	66153	yes					3829			
191	**PCB 206L**	**474**	**41.70**	**40384**	**0.81**	**89986**	**0.161153**		0	3064	no	0.76	81
		476	41.73	49601	yes					2705			
192	**PCB 209L**	**510**	**43.54**	**43249**	**1.15**	**80910**	**0.151947**		0	4455	no	0.724	76
		512	43.53	37661	yes					1558			
193	**PCB 28L**	**268**	**14.41**	**211487**	**1.06**	**411166**	**0.255225**		0.001	739	no	2.039	115
	PCB Cleanup Standard	270	14.43	199679	yes					1259			
194	**PCB 111L**	**338**	**21.83**	**131003**	**1.66**	**210014**	**0.222388**		0	1187	no	1.343	100
	PCB Cleanup Standard	340	21.84	79011	yes					2848			
195	**PCB 178L**	**406**	**26.98**	**54960**	**1.05**	**107242**	**0.203612**		0	3687	no	0.733	92
	PCB Cleanup Standard	408	26.97	52282	yes					1805			
196	PCB 31L	268	NotFnd	*	*	*			0.001		no	1.934	
	PCB Audit Standard	270	14.26	*	no								
197	PCB 95L	338	NotFnd	*	*	*			0.001		no	0.946	
	PCB Audit Standard	340	17.73	*	no								
198	PCB 153L	372	NotFnd	*	*	*			0		no	1.225	
	PCB Audit Standard	374	25.40	*	no								
199	**PCB 9L**	**234**	**11.17**	**1226711**	**1.6**	**1993434**	**10.21245**		-	10967	no	-	-
	PCB Recovery Standard	236	11.19	766722	yes					12093			
200	**PCB 52L**	**302**	**15.36**	**388693**	**0.8**	**875996**	**6.936327**		-	4723	no	-	-
	PCB Recovery Standard	304	15.36	487303	yes					8627			
201	**PCB 101L**	**338**	**19.77**	**483787**	**1.63**	**779714**	**7.095278**		-	4656	no	-	-
	PCB Recovery Standard	340	19.76	295928	yes					11273			
202	**PCB 138L**	**372**	**26.57**	**452058**	**1.31**	**796876**	**7.398286**		-	13082	no	-	-
	PCB Recovery Standard	374	26.56	344818	yes					10593			
203	**PCB 194L**	**440**	**39.18**	**391355**	**0.92**	**815204**	**7.536248**		-	8061	no	-	-
	PCB Recovery Standard	442	39.17	423849	yes					9691			

Chlorobiphenyls	-0.00073	0	-0.00073
Dichlorobiphenyls	0.029372	2	-0.00433
Trichlorobiphenyls	0.56377	14	-0.00294
Tetrachlorobiphenyls	0.848039	20	-0.00219
Pentachlorobiphenyls	0.484592	16	-0.0012
Hexachlorobiphenyls	0.936997	18	-0.00357
Heptachlorobiphenyls	0.283997	11	-0.00248
Octachlorobiphenyls	0.015946	3	-0.00174
Nonachlorobiphenyls	-0.00153	0	-0.00153
Decachlorobiphenyl	-0.0025	0	-0.0025
PCB (total)	3.162713		

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 02:53:06 PM Eastern Standard Time
Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

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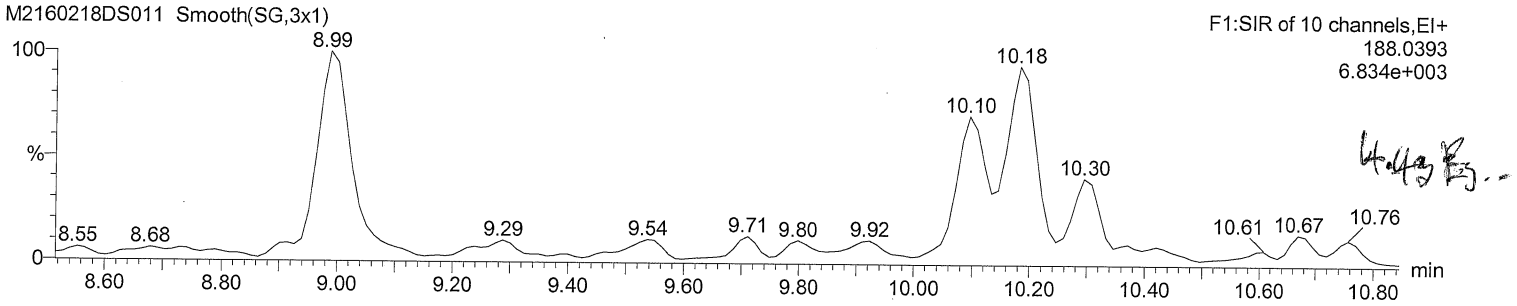
ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total MoCB F1



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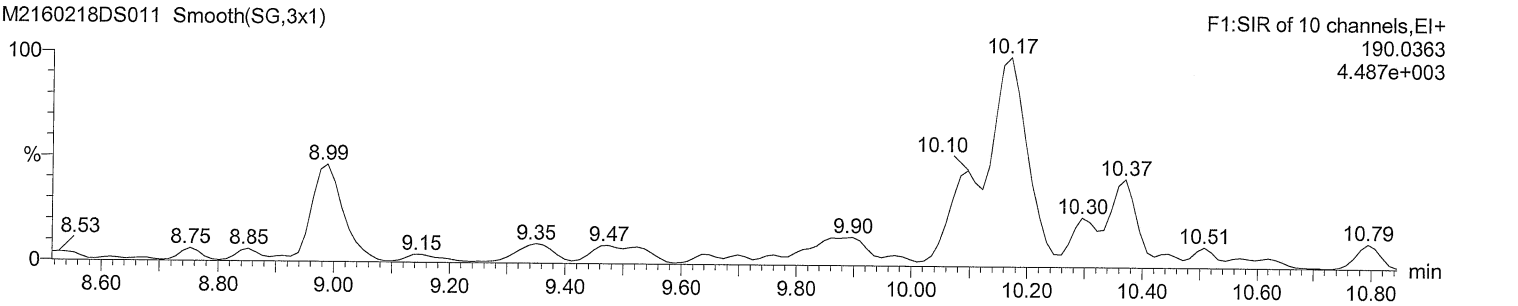

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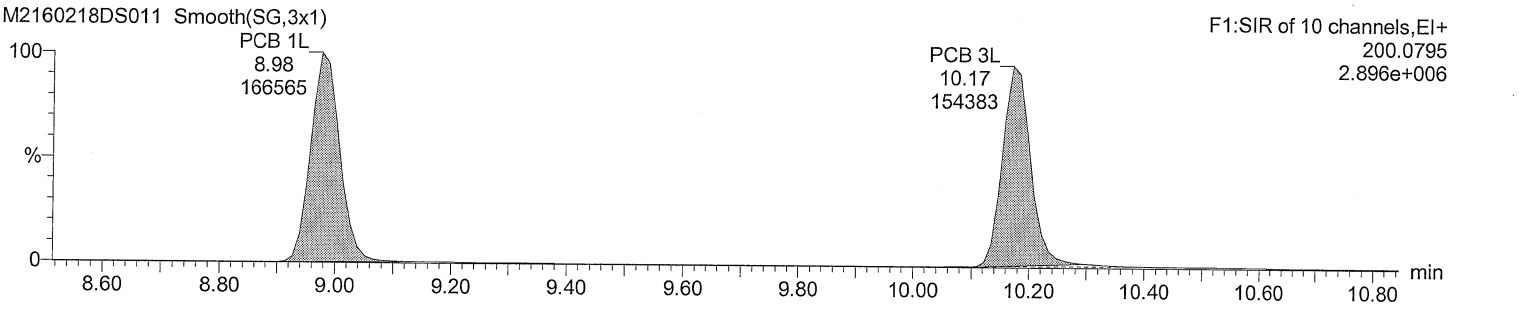

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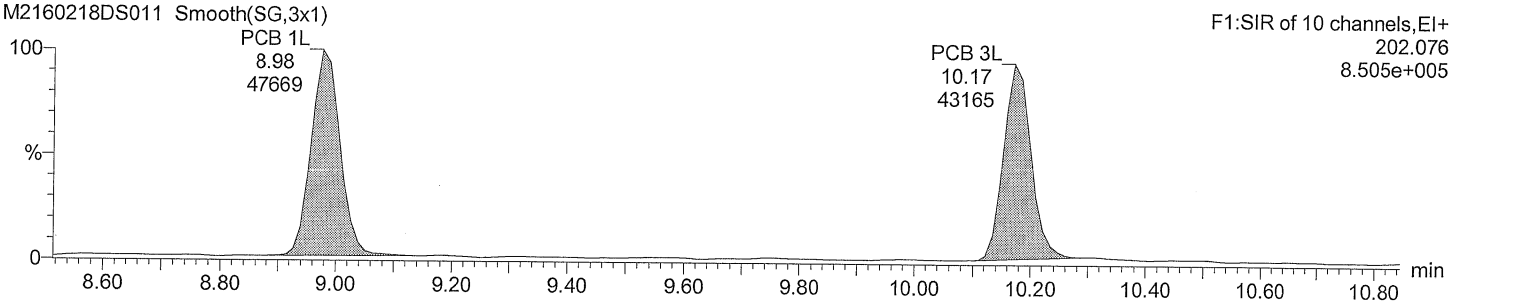

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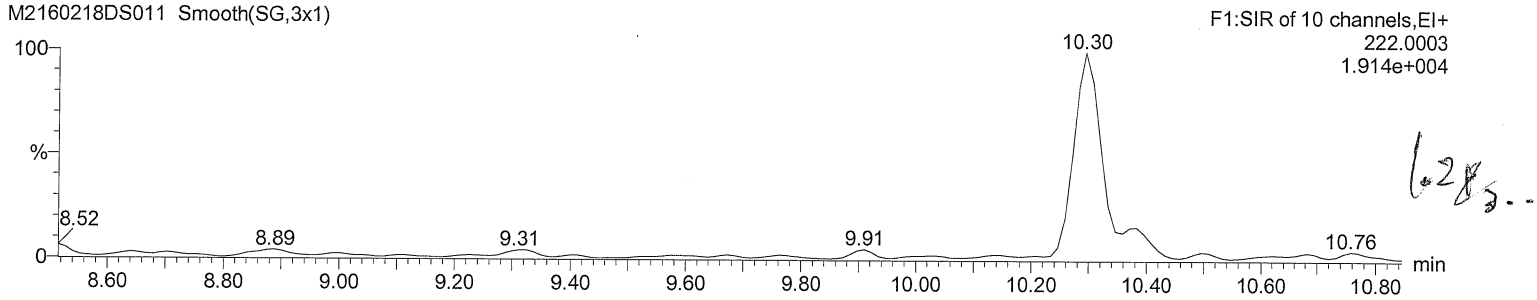
ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total DiCB F1



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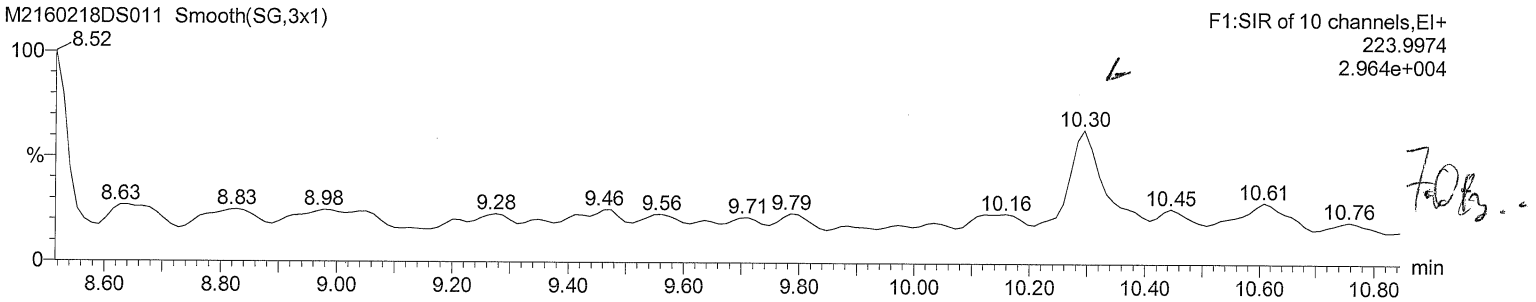

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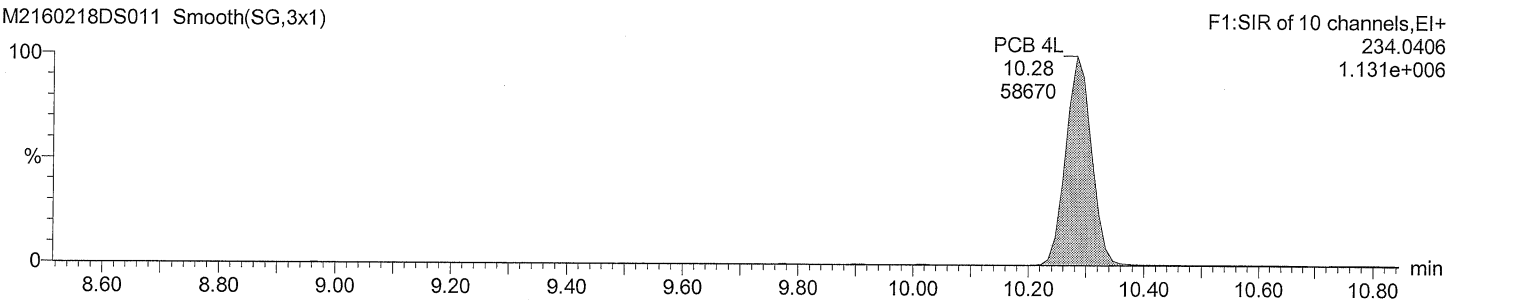

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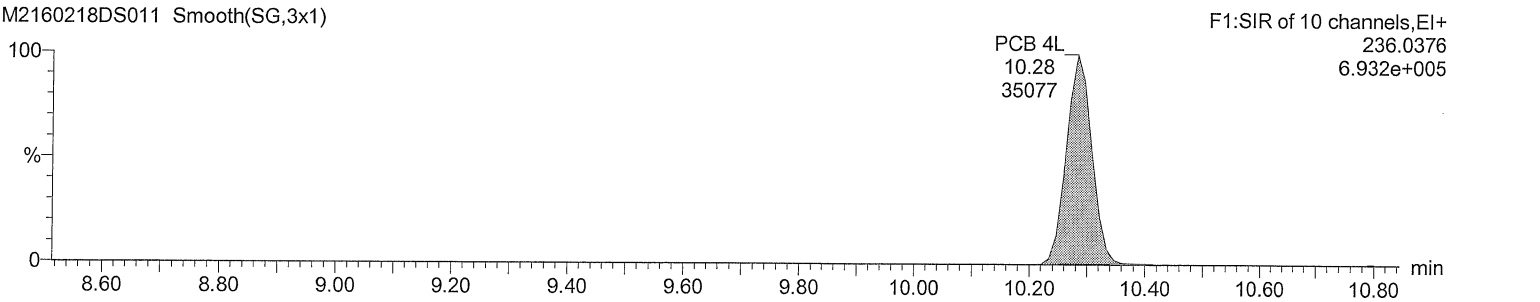

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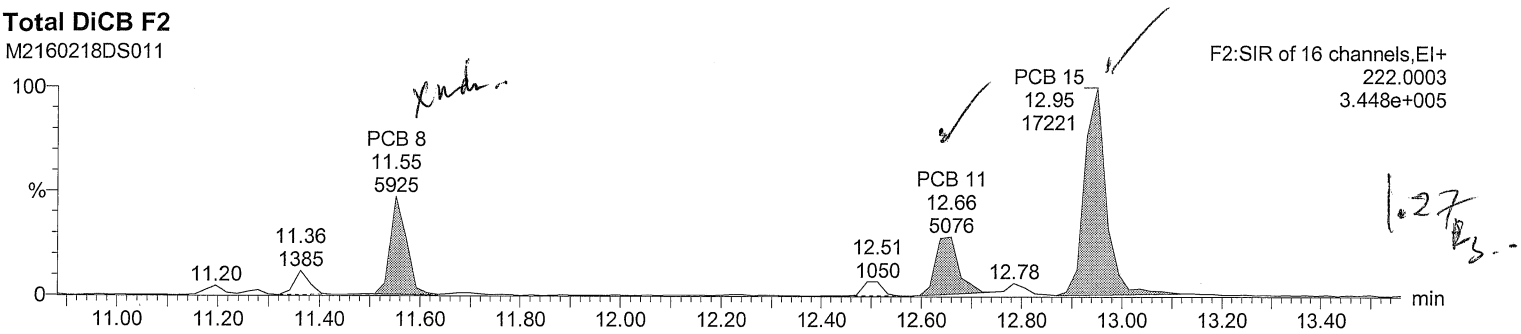
Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total DiCB F2
M2160218DS011



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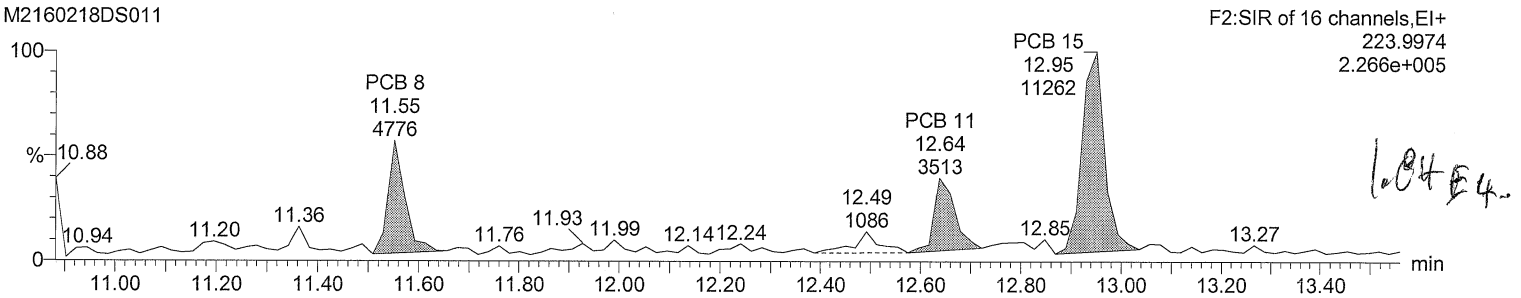

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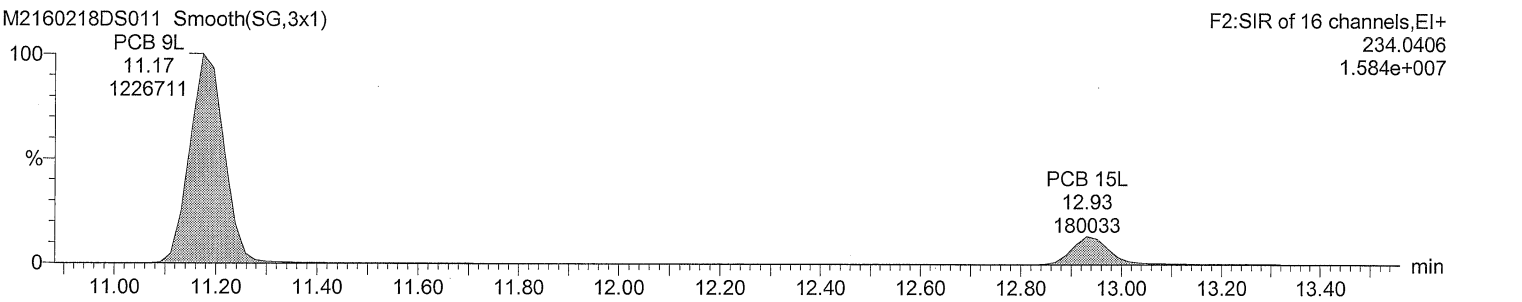

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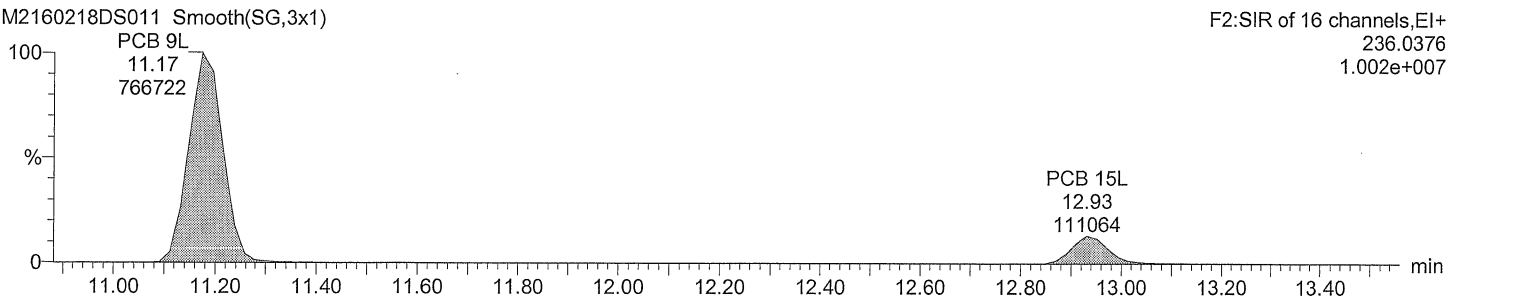

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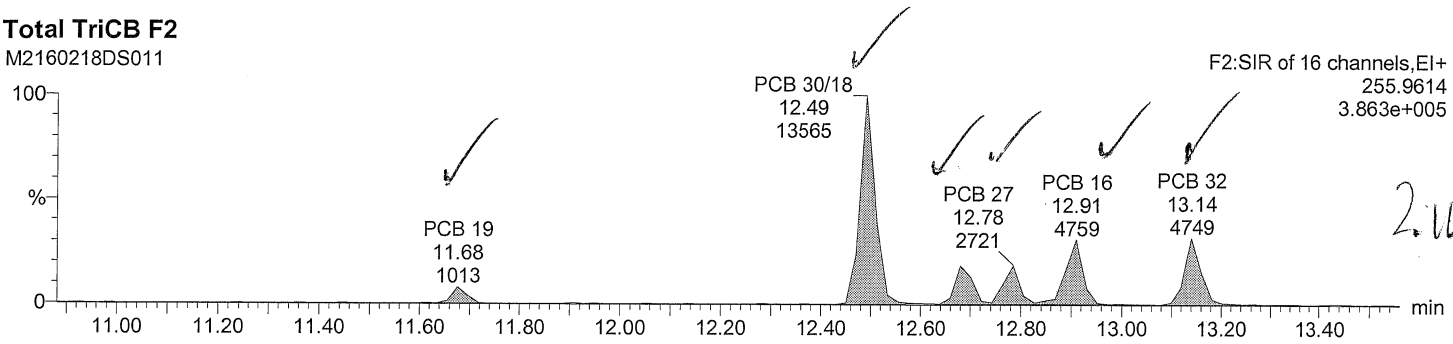
ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total TriCB F2
M2160218DS011



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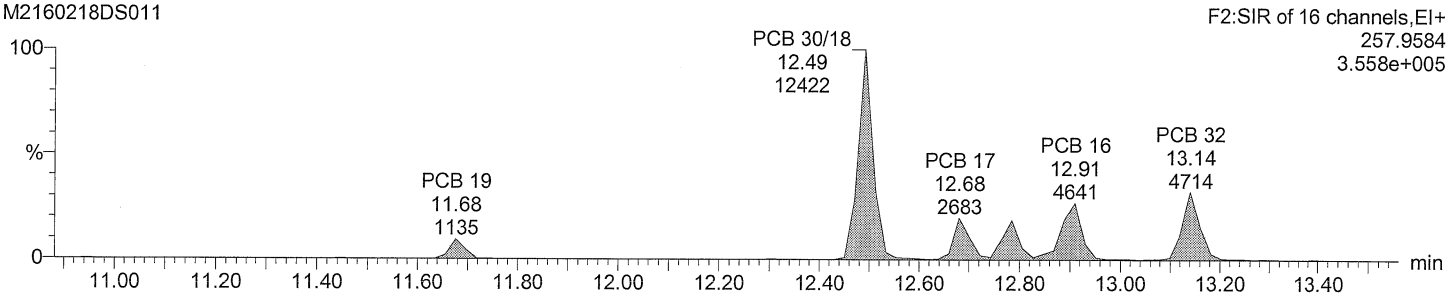

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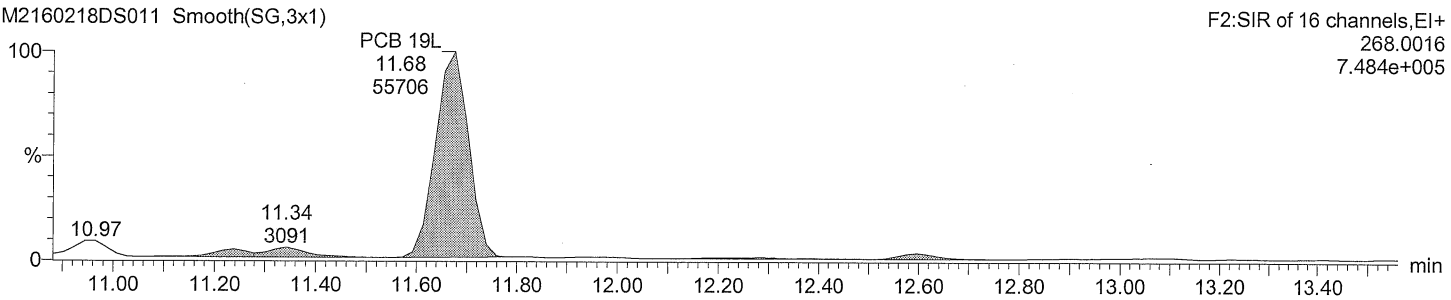

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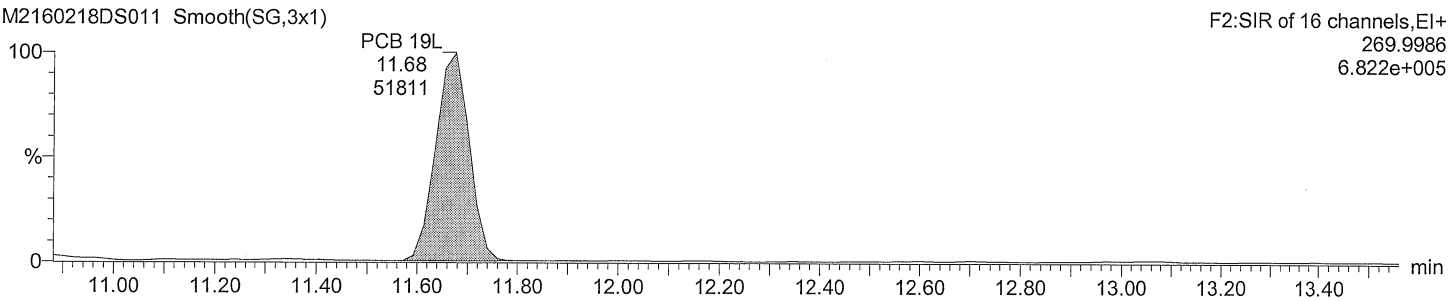

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Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
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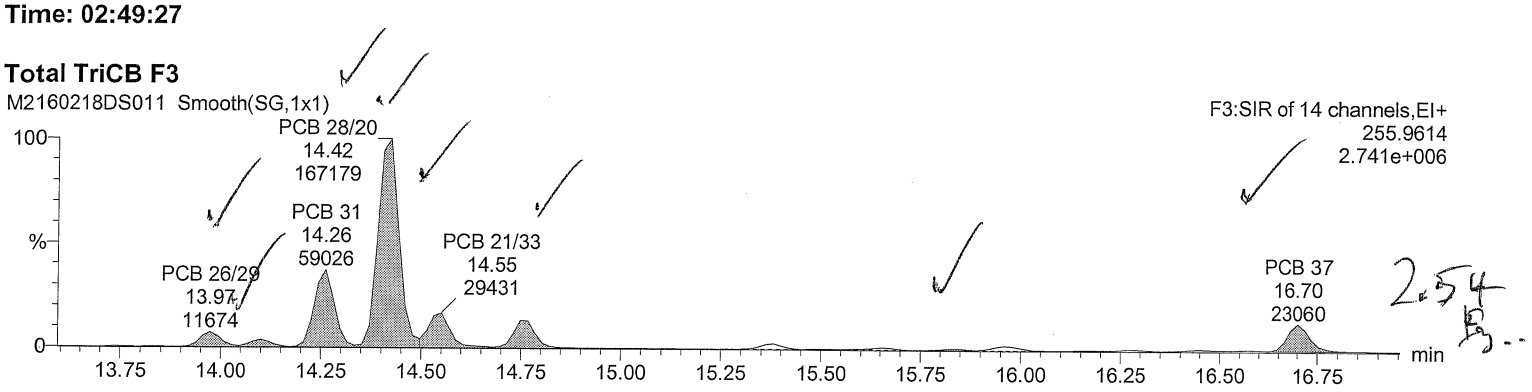
Total TriCB F3



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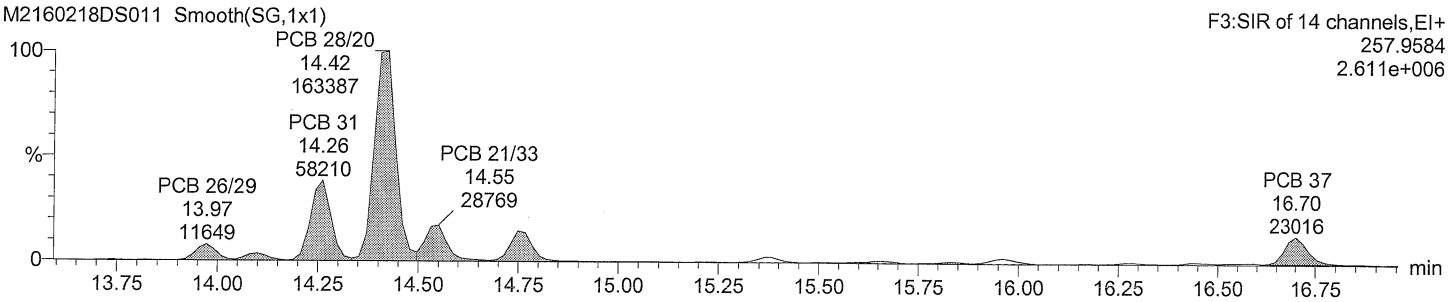

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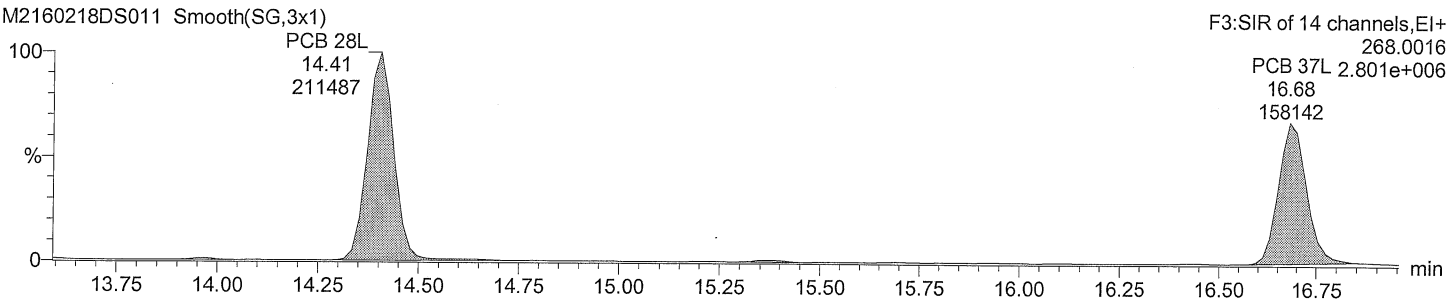

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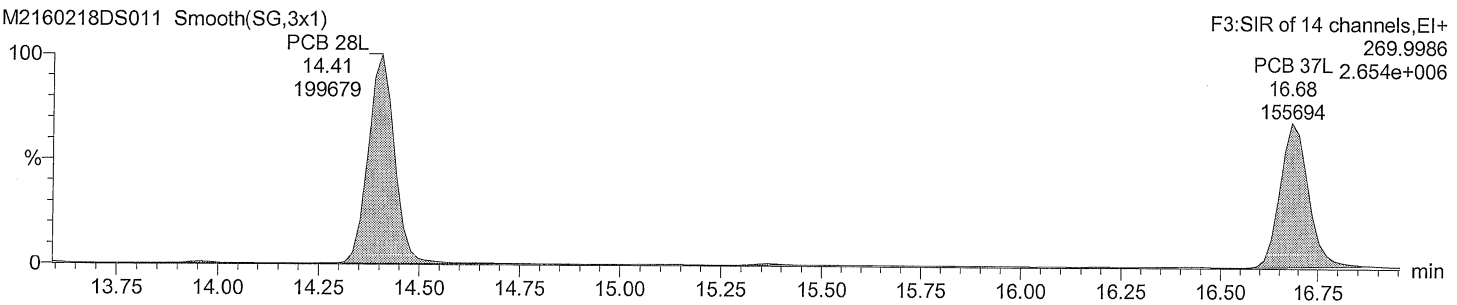

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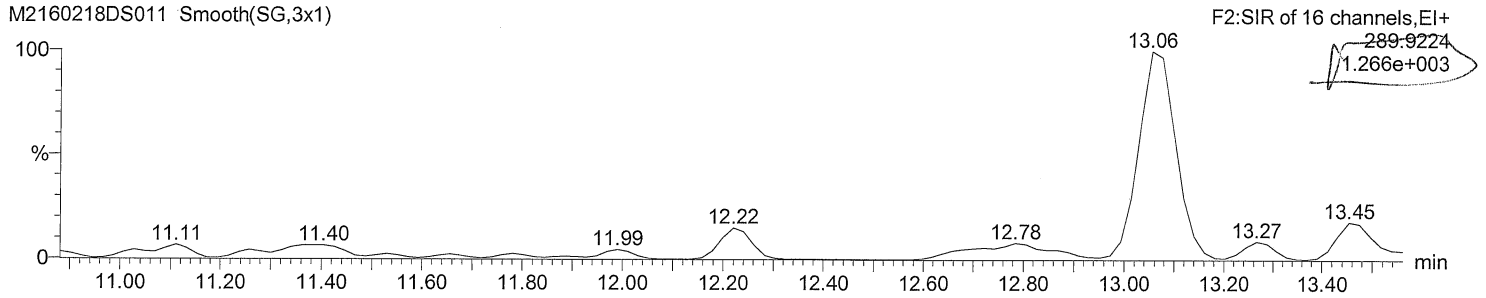
Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total TeCB F2



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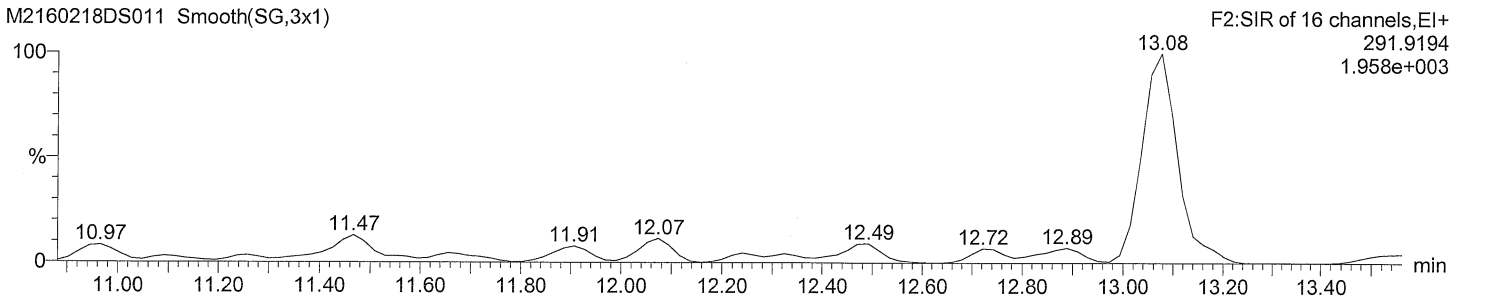

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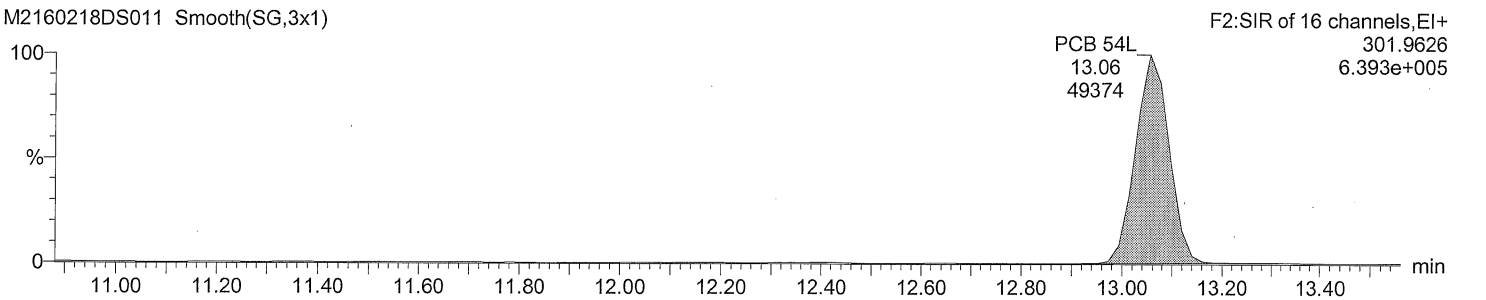

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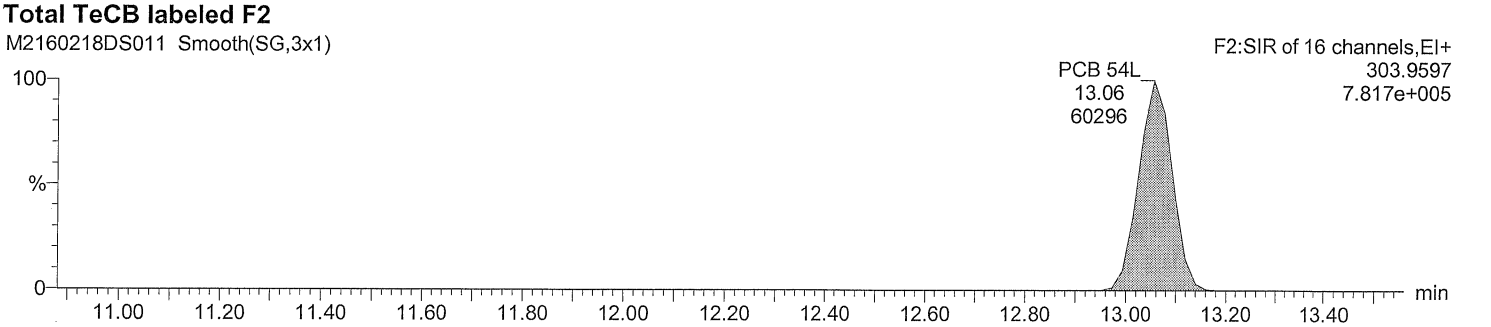

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Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total TeCB F3
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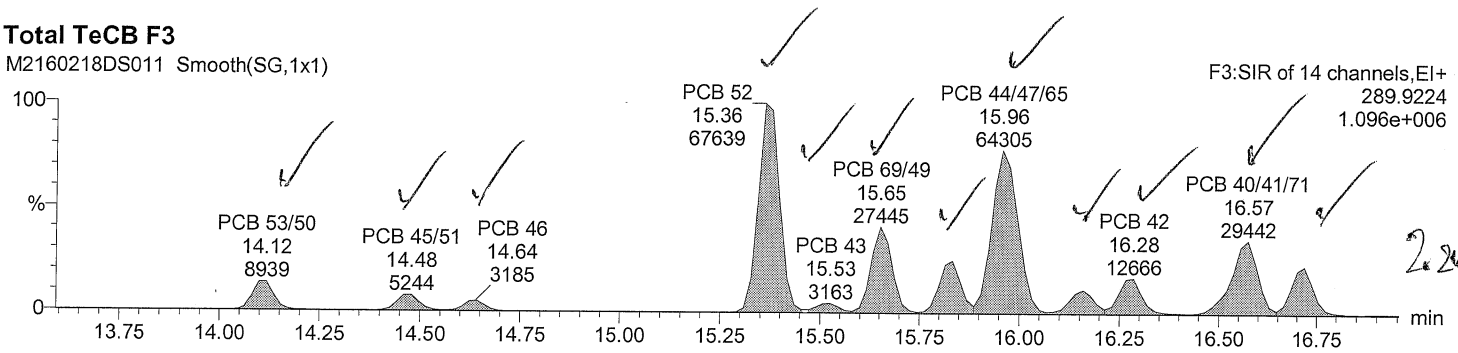

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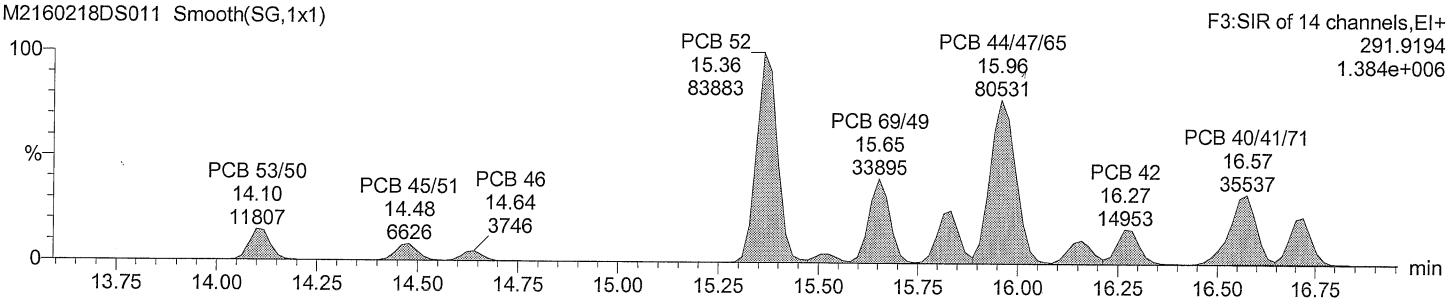

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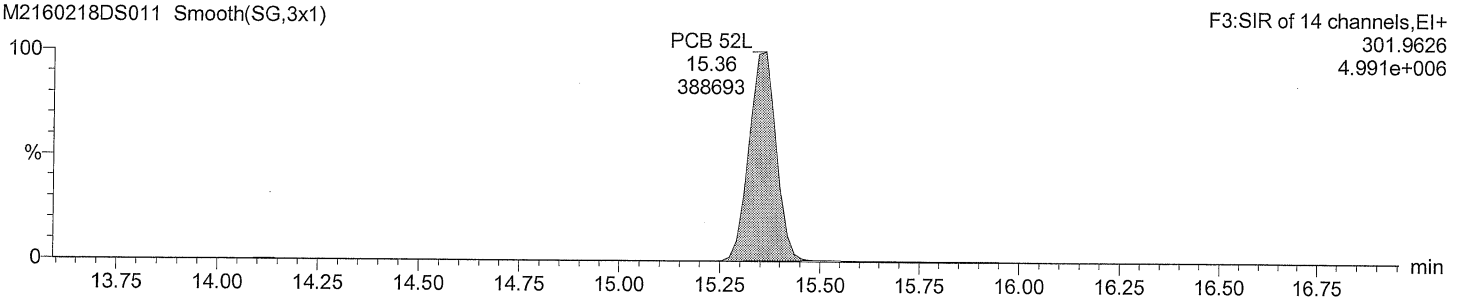

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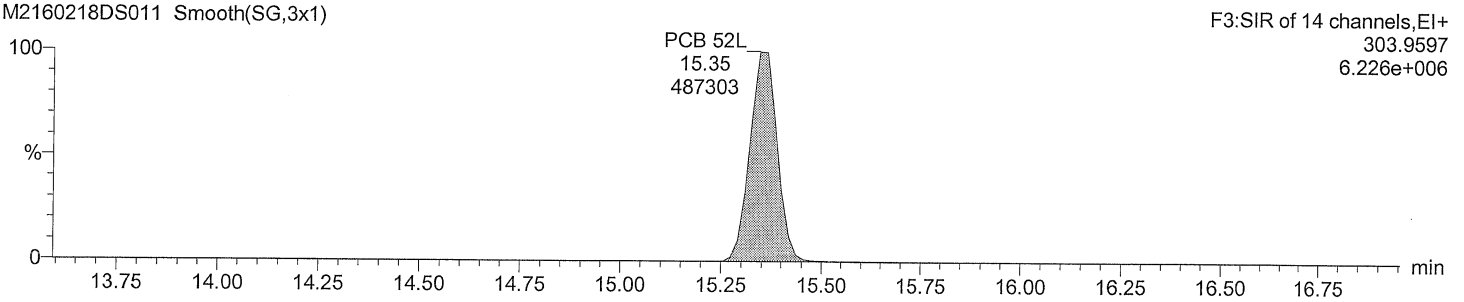

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Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
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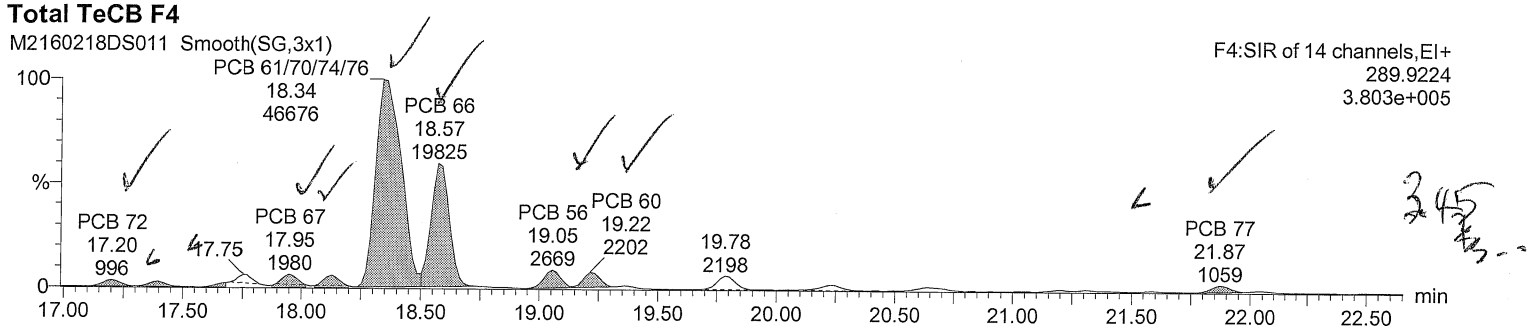
Total TeCB F4



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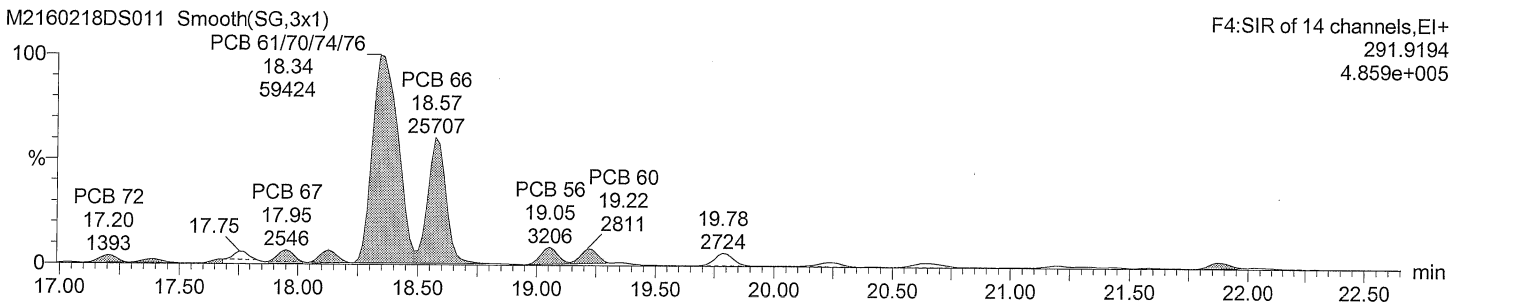

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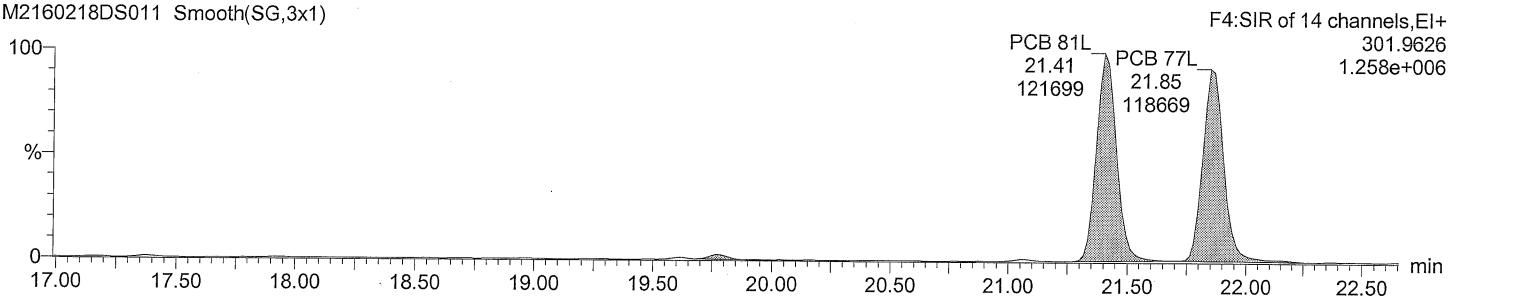

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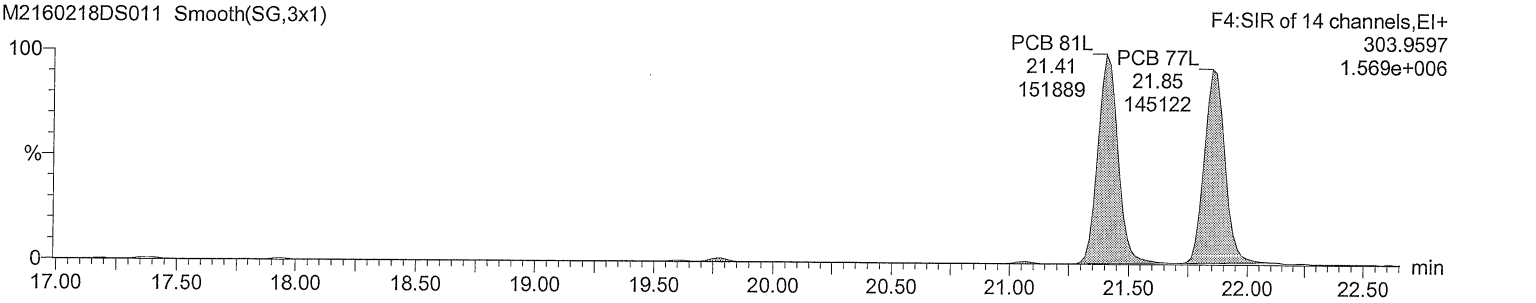

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Last Altered: February 20, 2016 02:53:06 PM Eastern Standard Time
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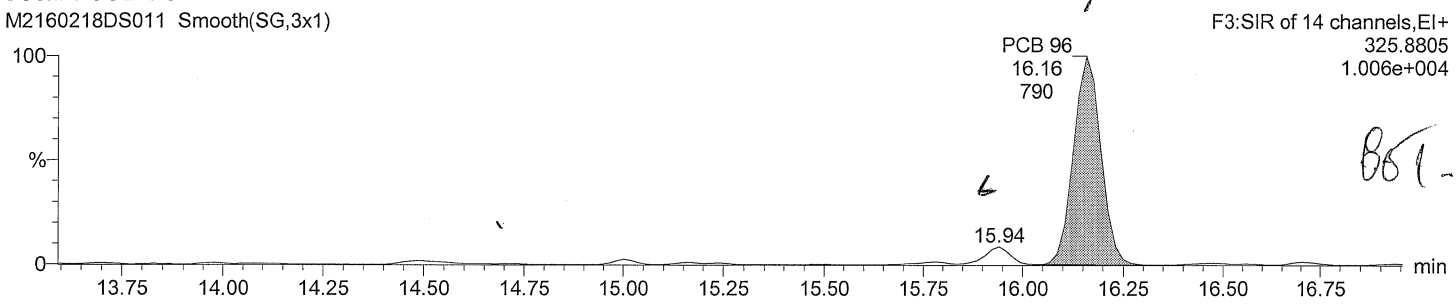
ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

Total PeCB F3



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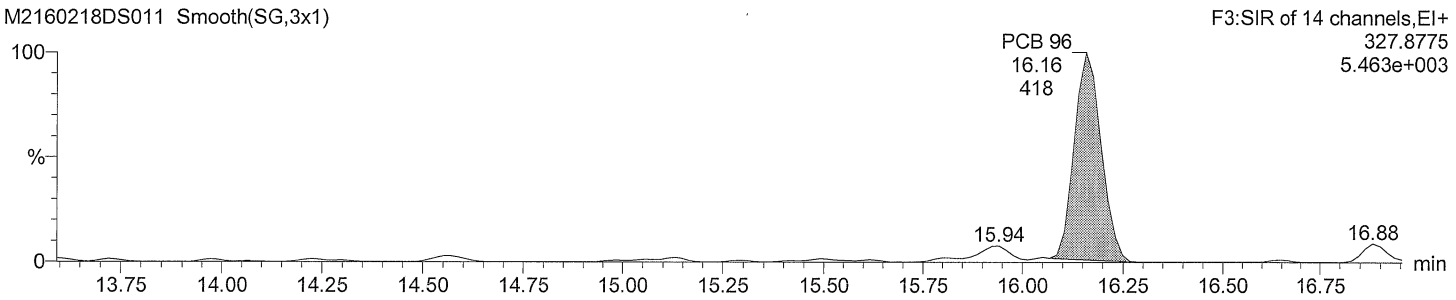

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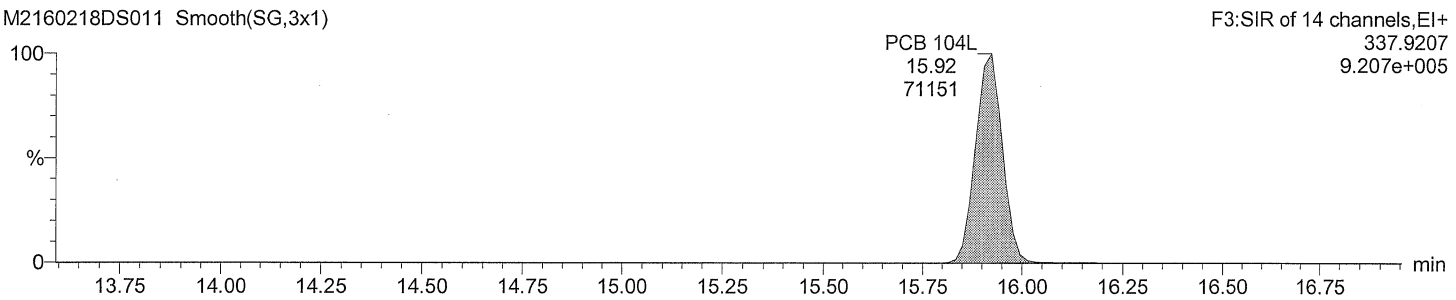

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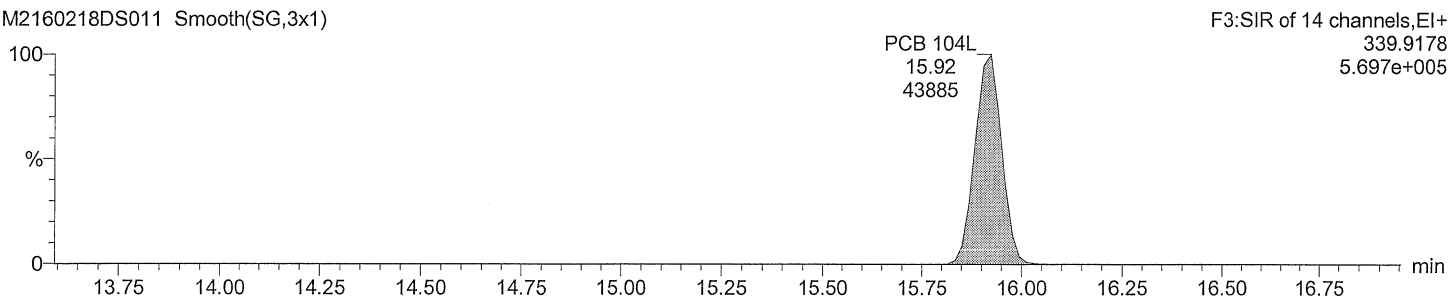

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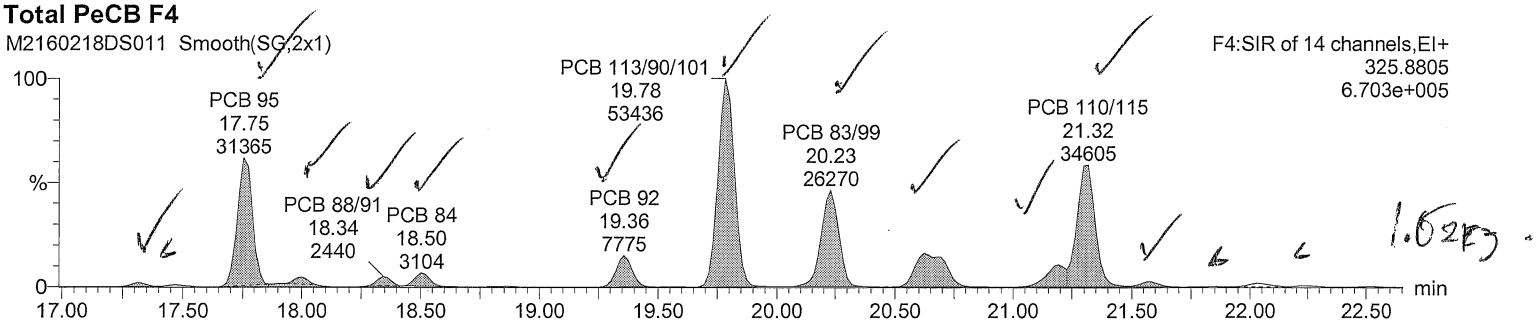
Total PeCB F4



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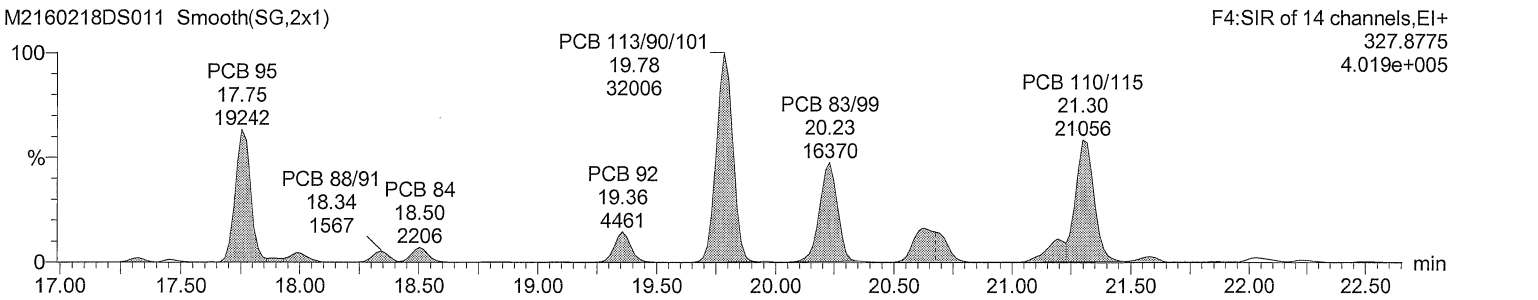

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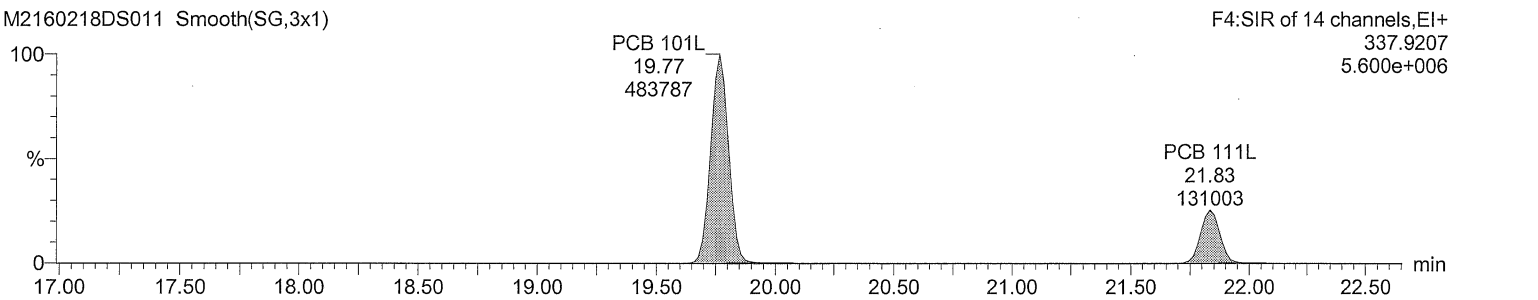

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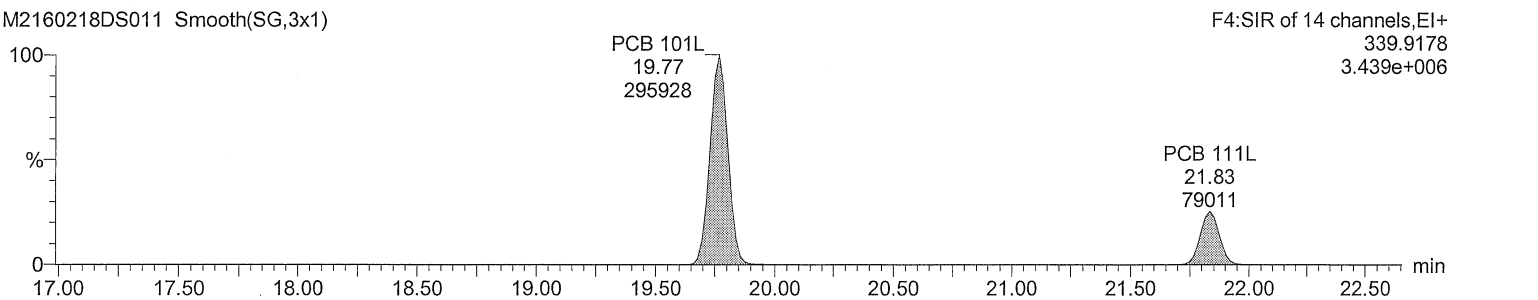

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

Last Altered: February 20, 2016 02:53:06 PM Eastern Standard Time
Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

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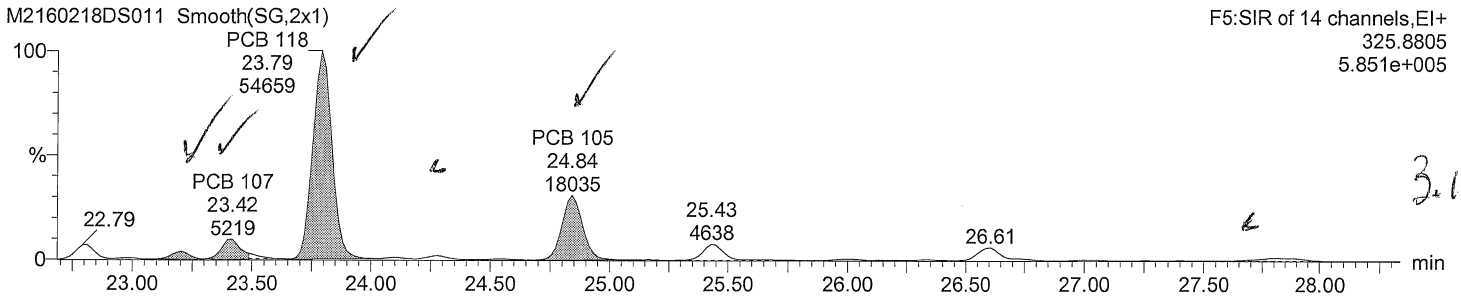

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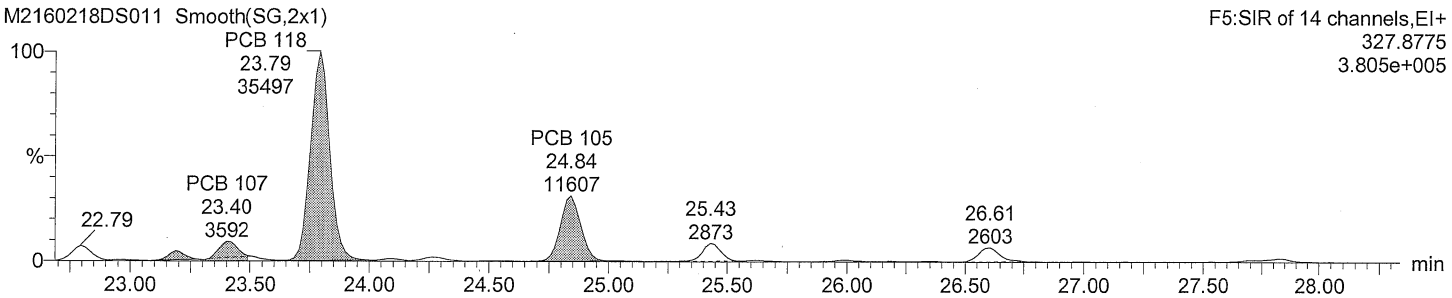

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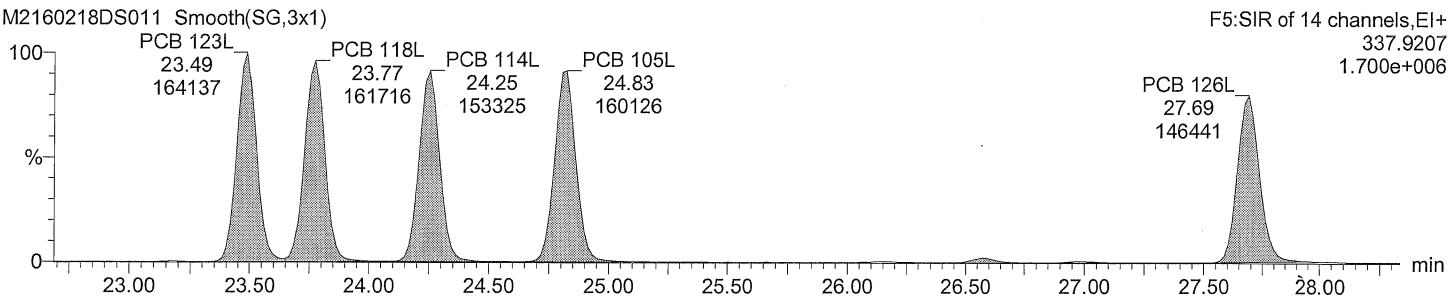

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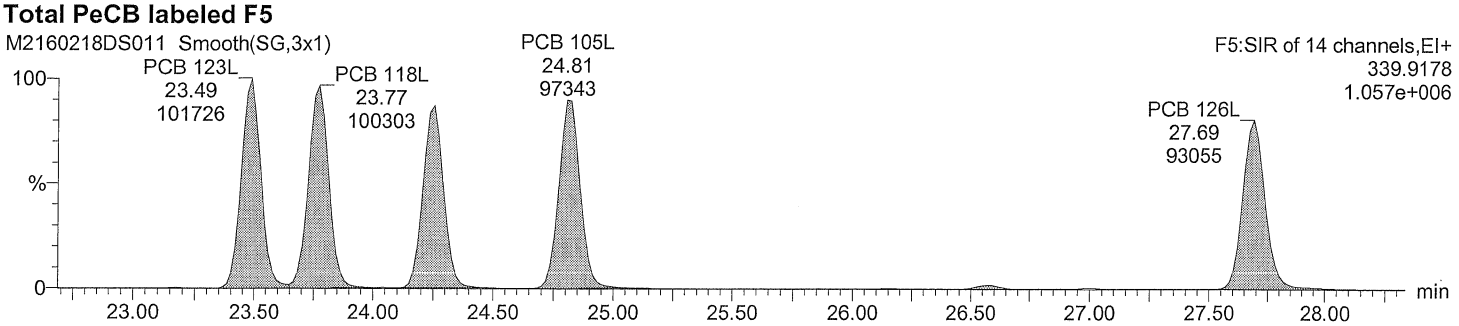

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Date: 18-FEB-2016
Time: 02:49:27

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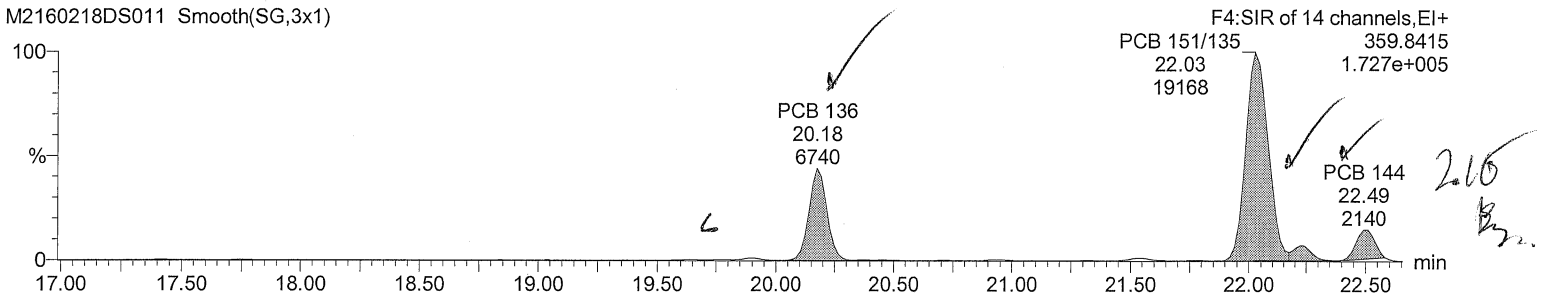

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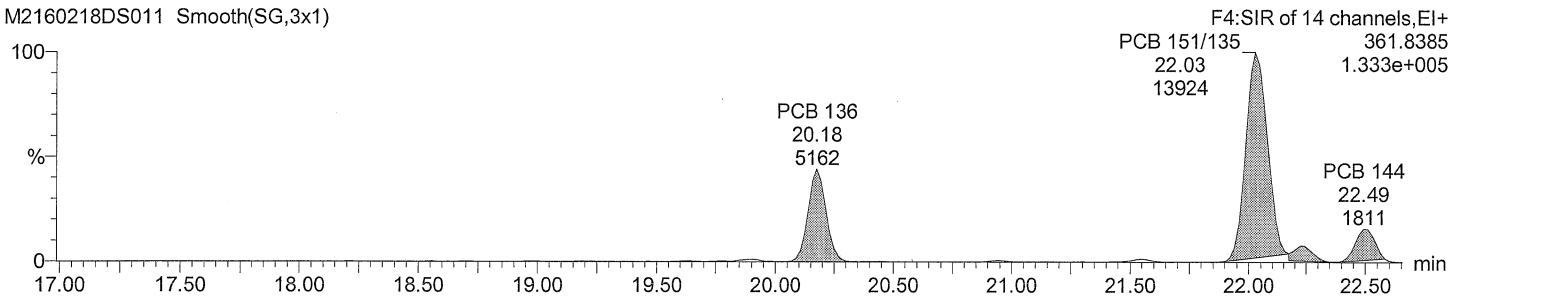

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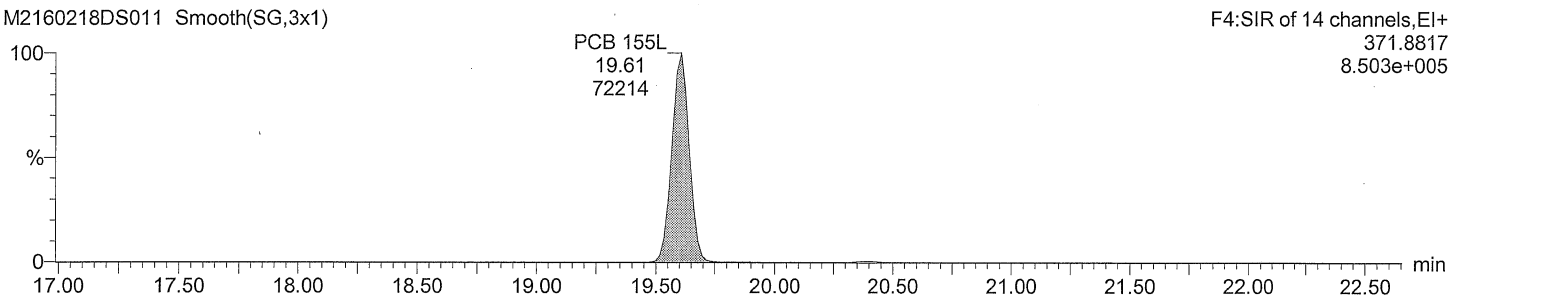

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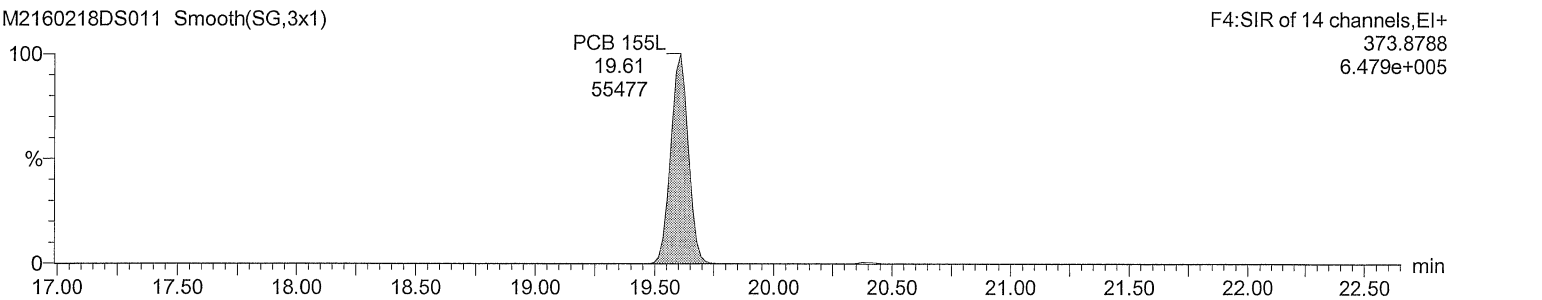

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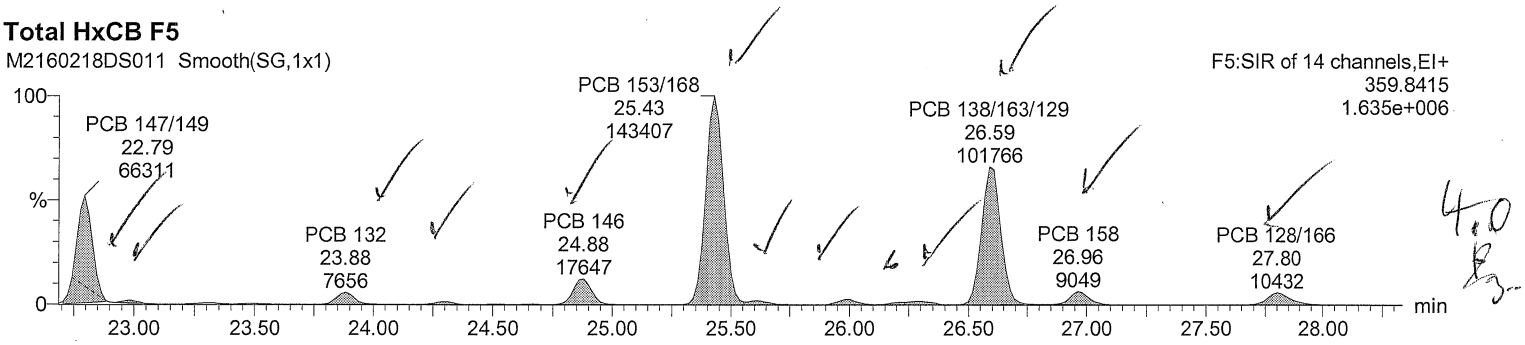

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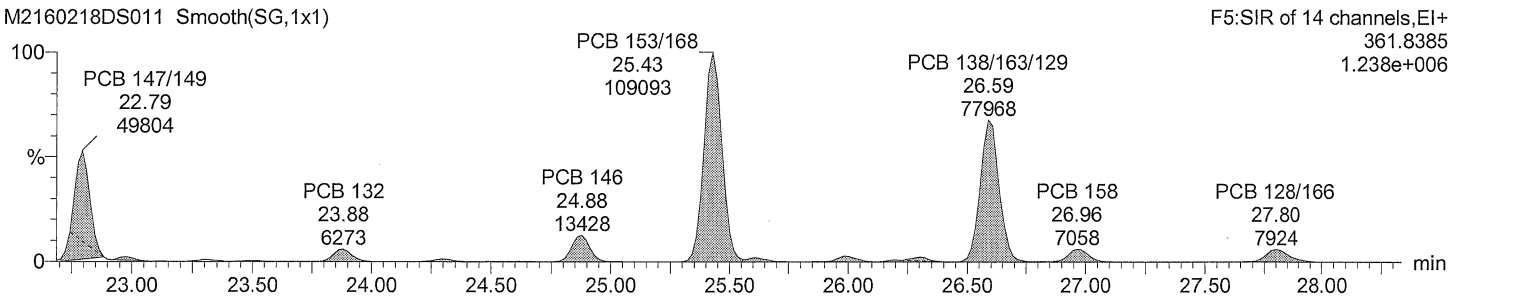

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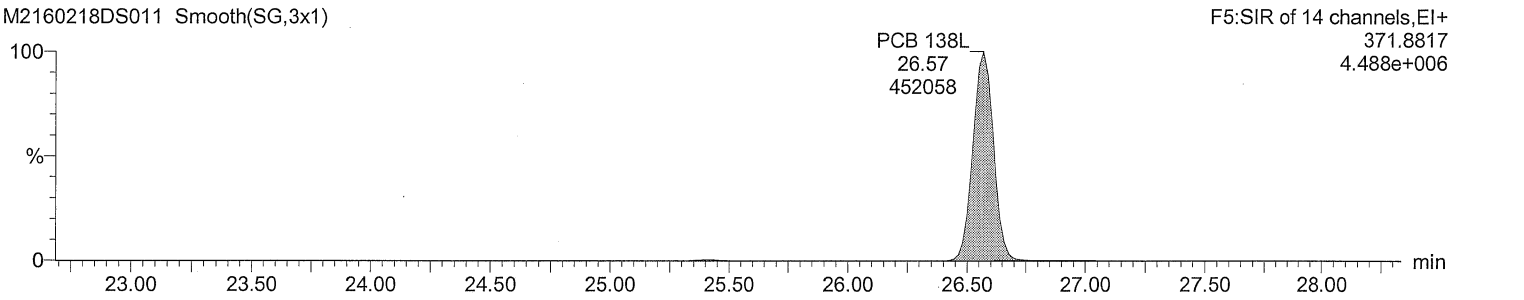

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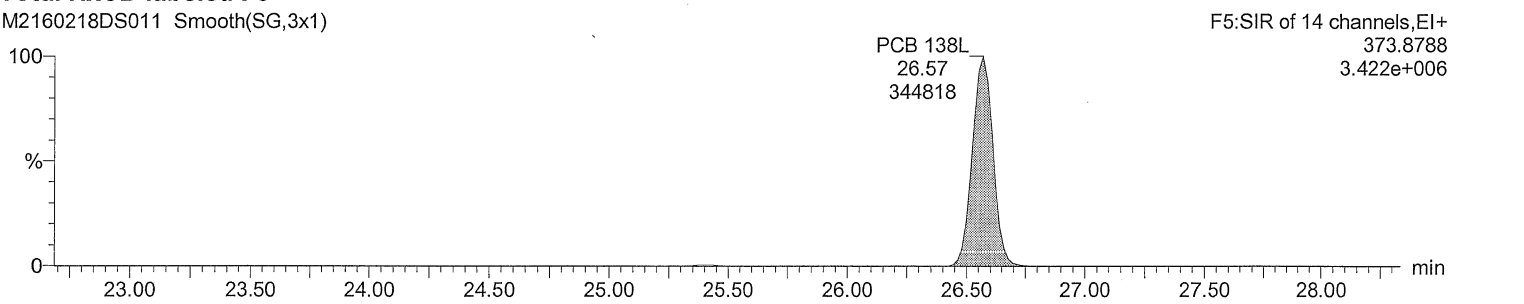

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Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

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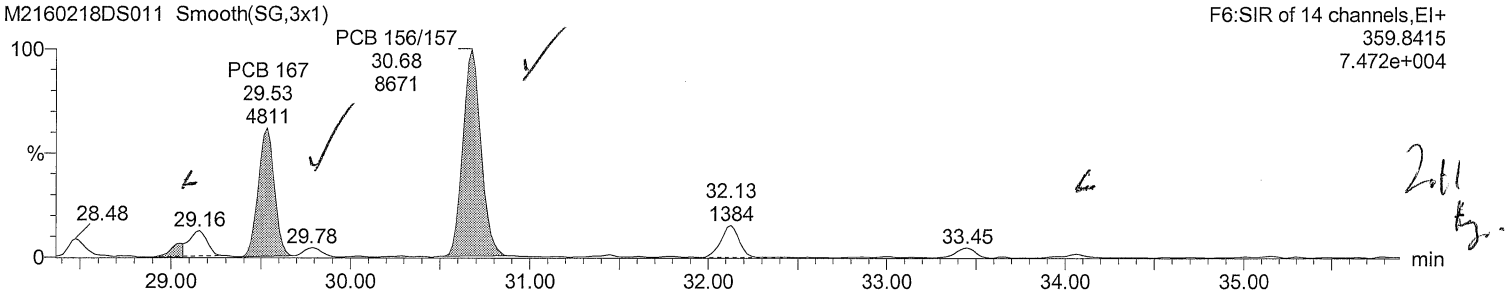

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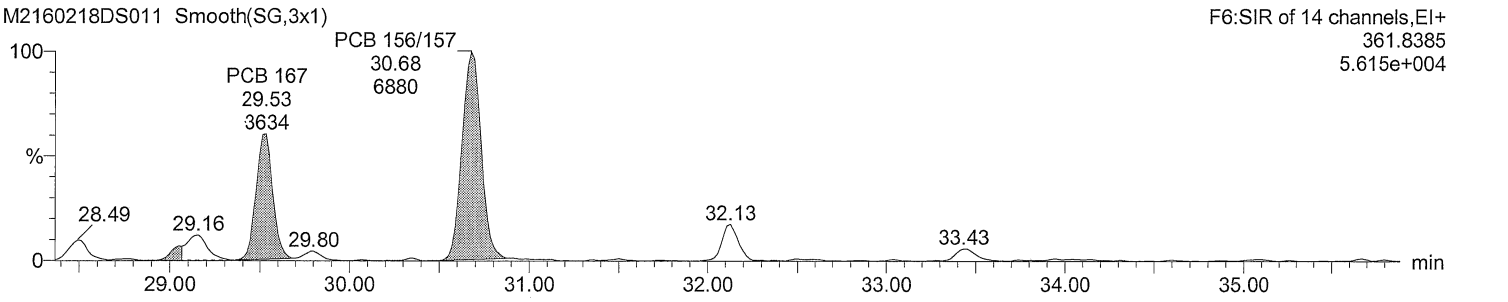

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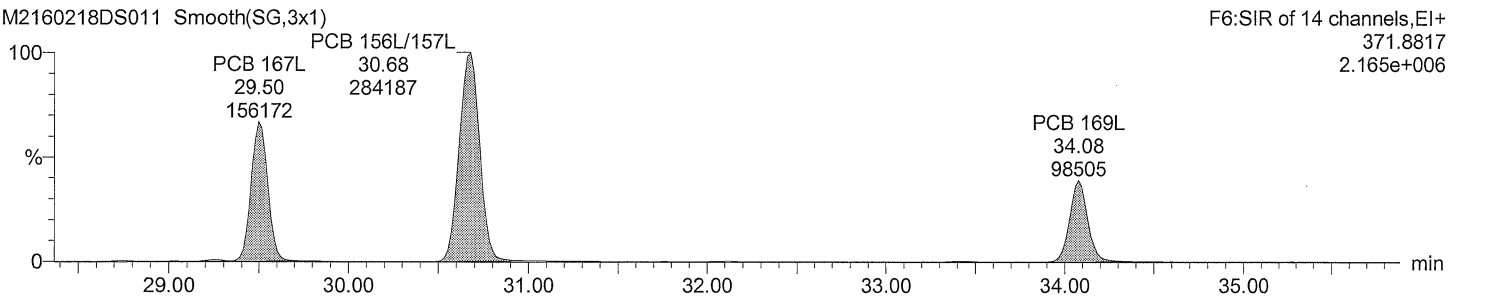

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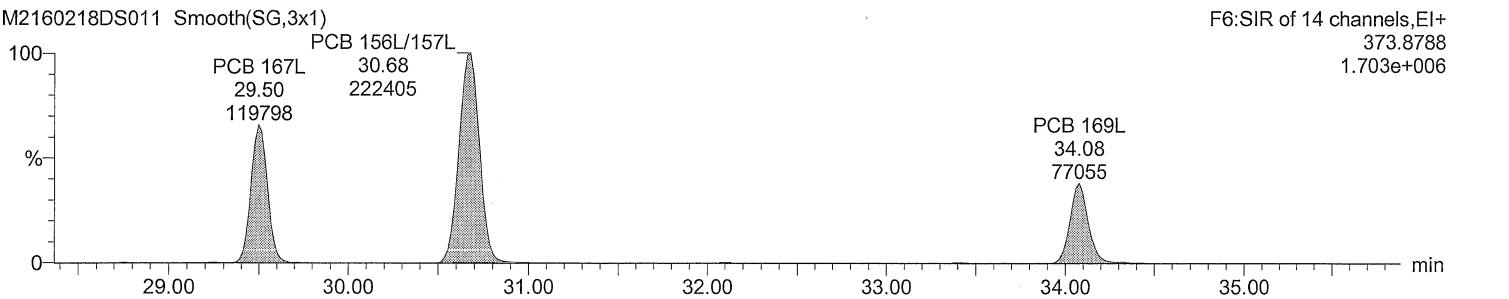

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Vial: 11
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Time: 02:49:27

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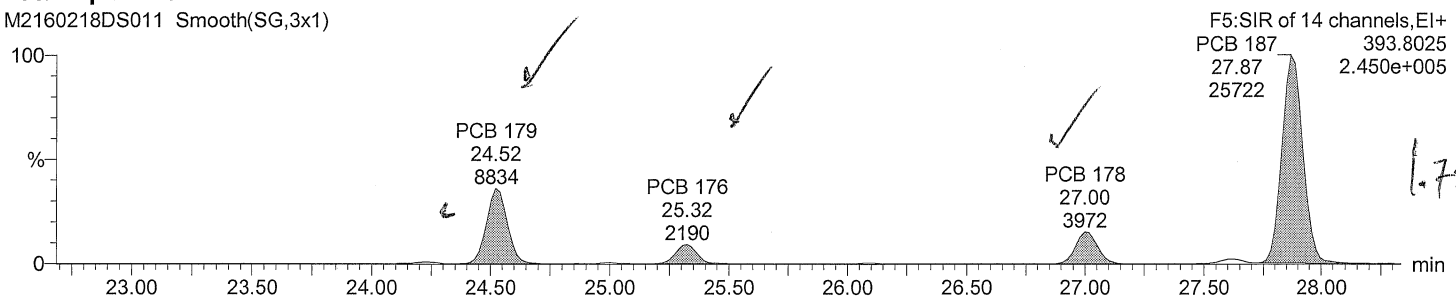

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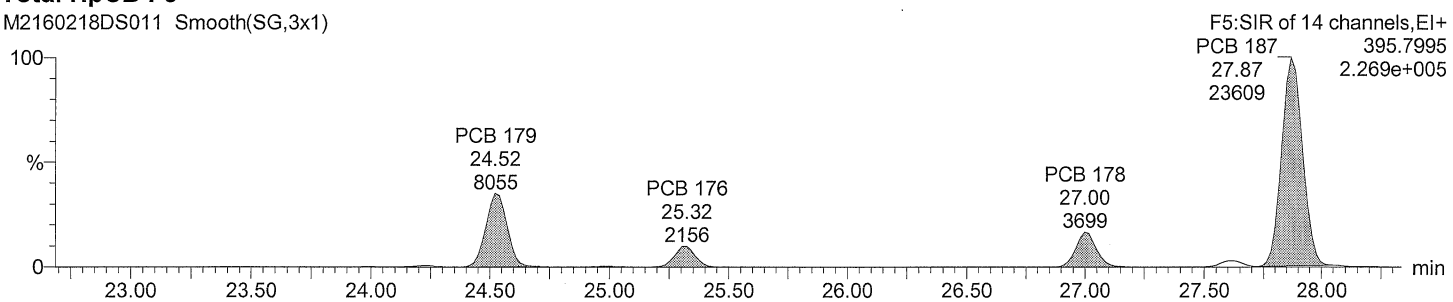

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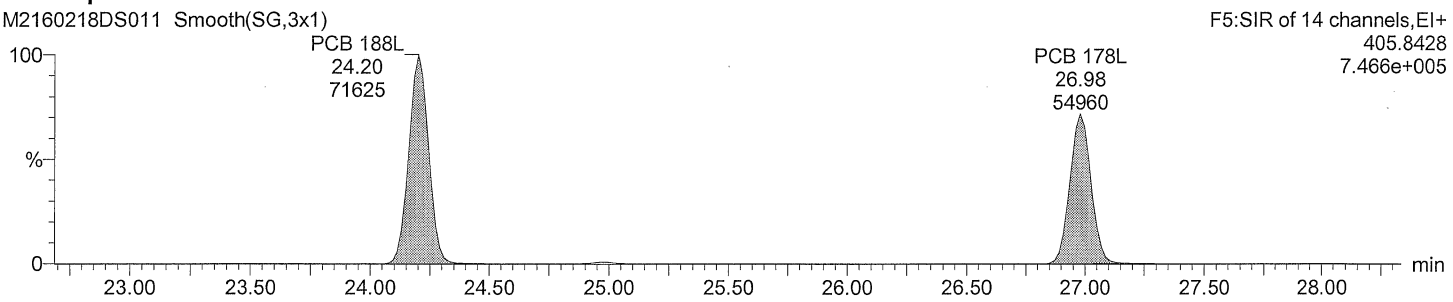

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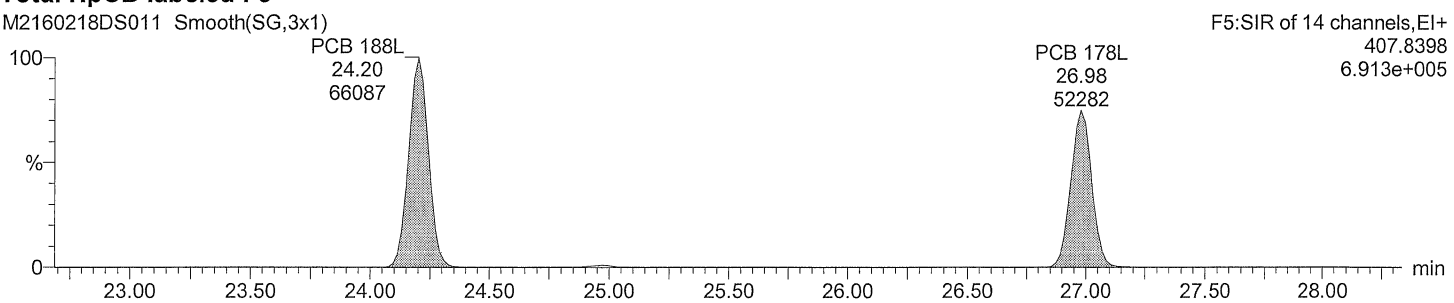

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Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

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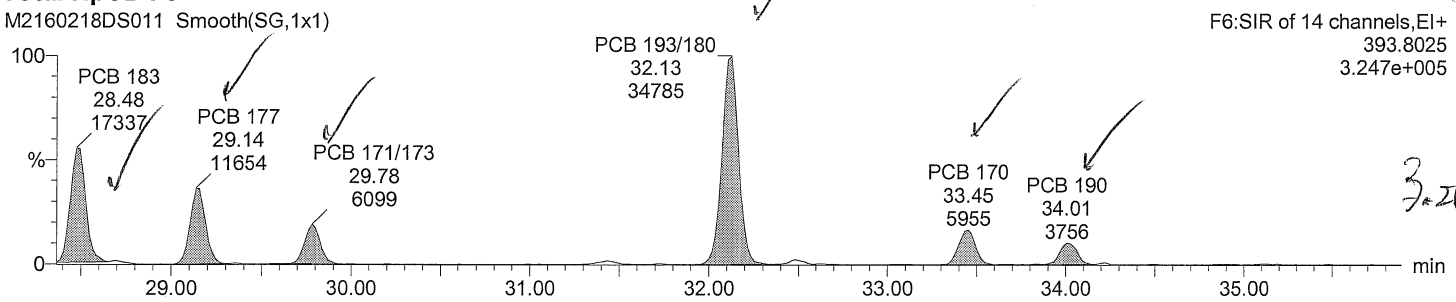

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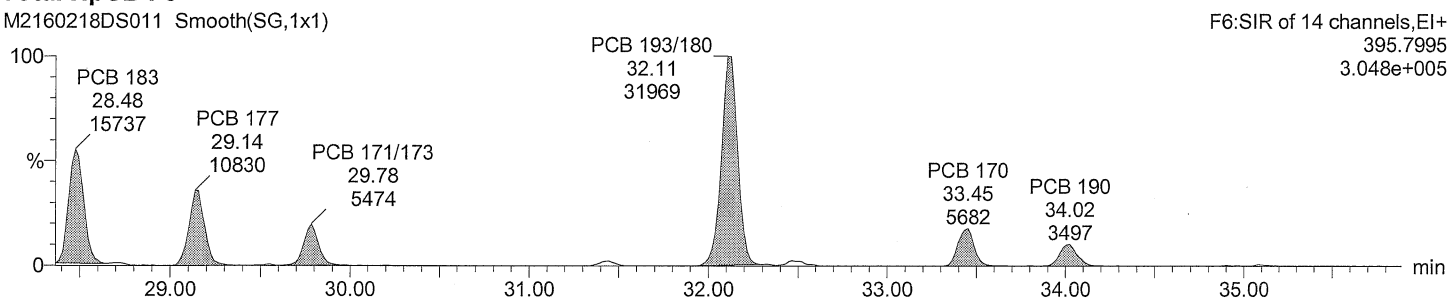

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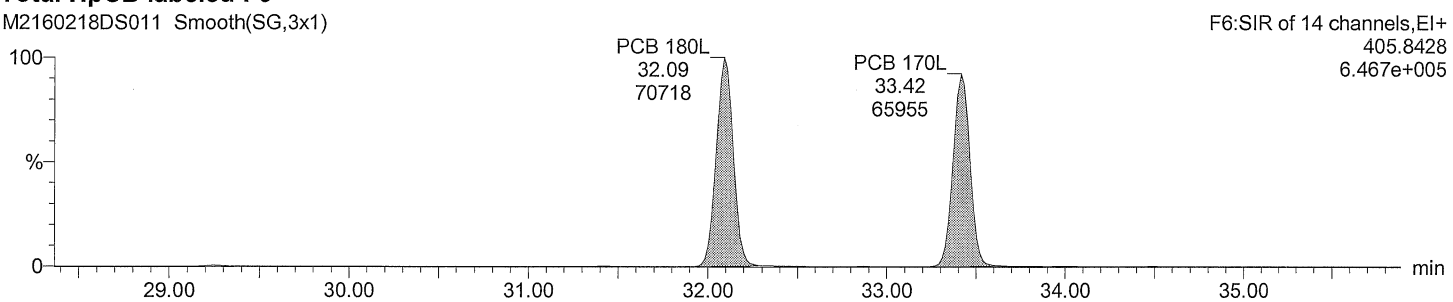

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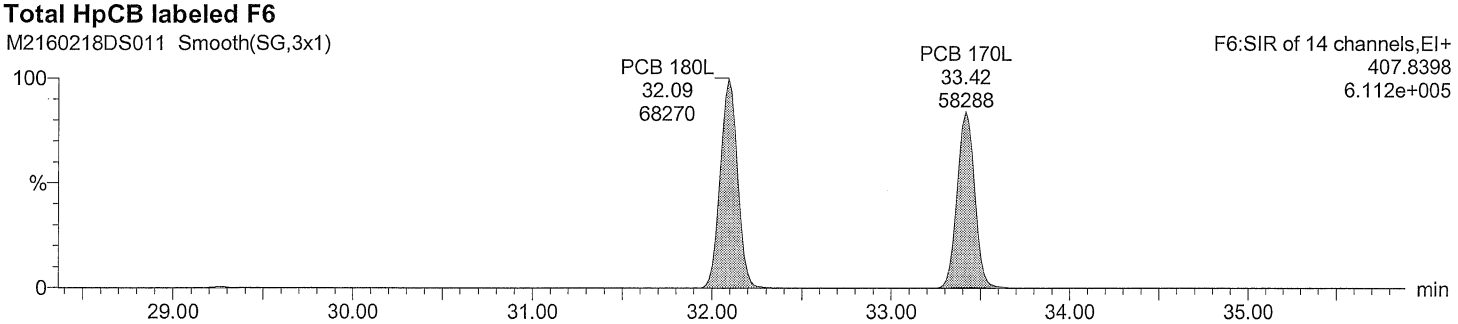

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Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

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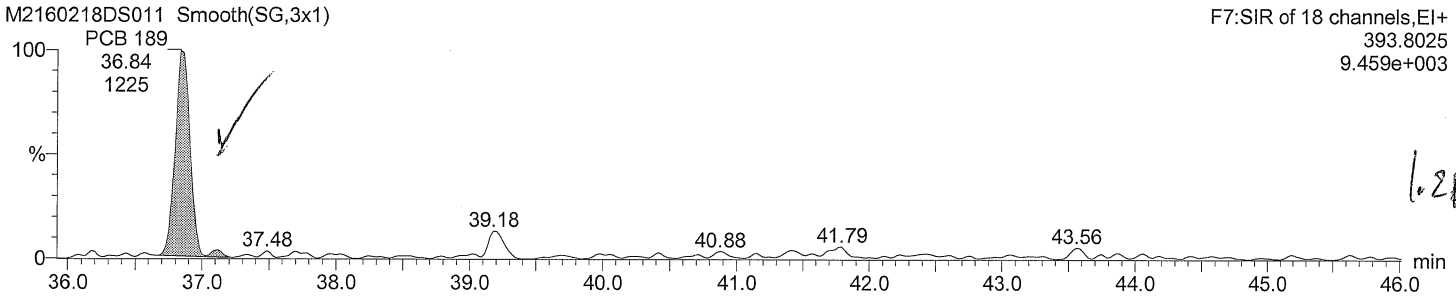

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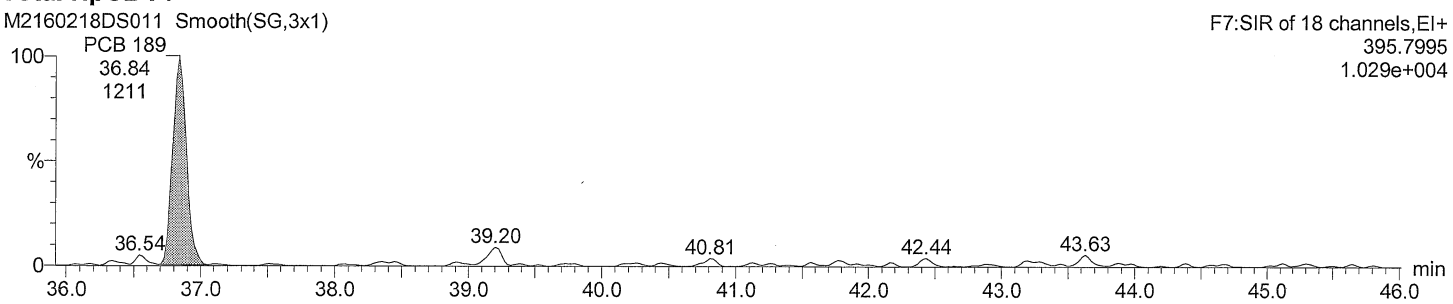

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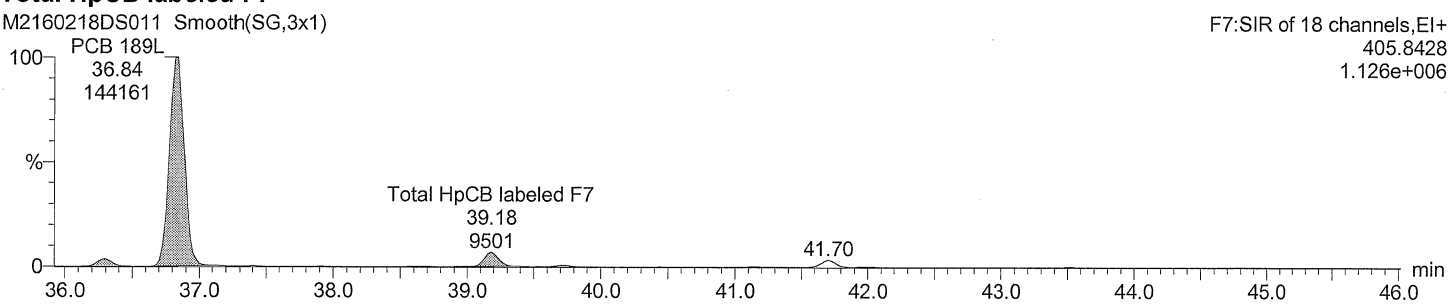

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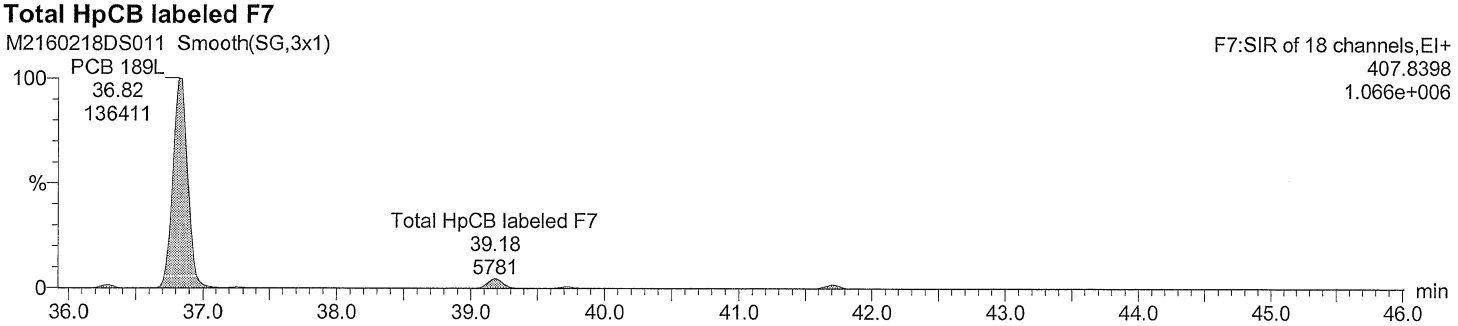

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Time: 02:49:27

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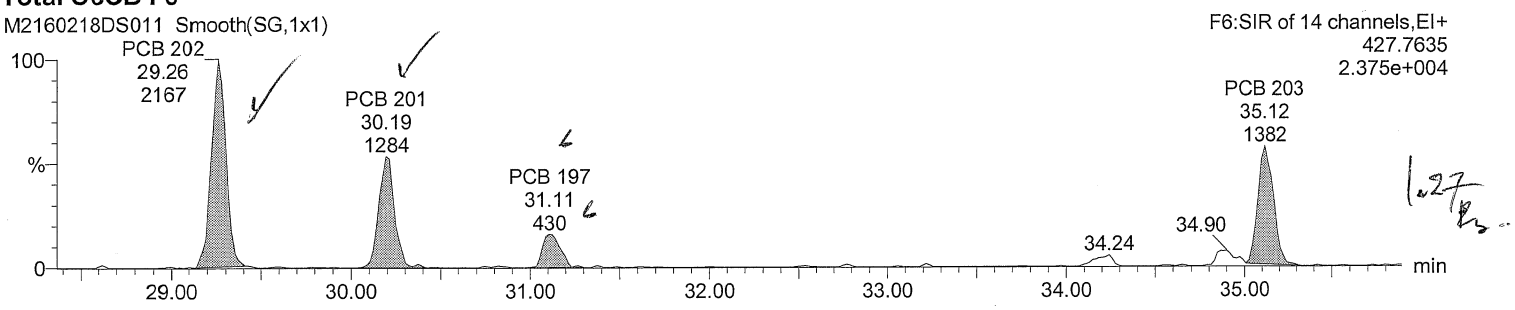

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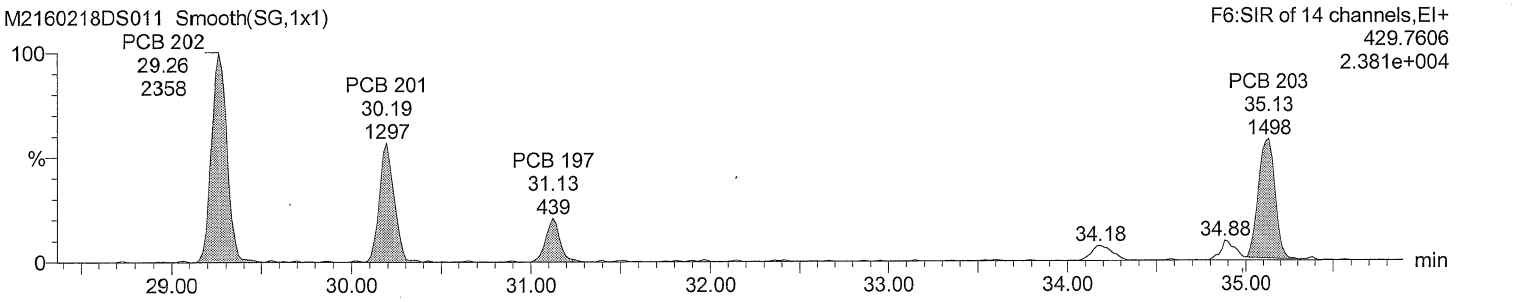

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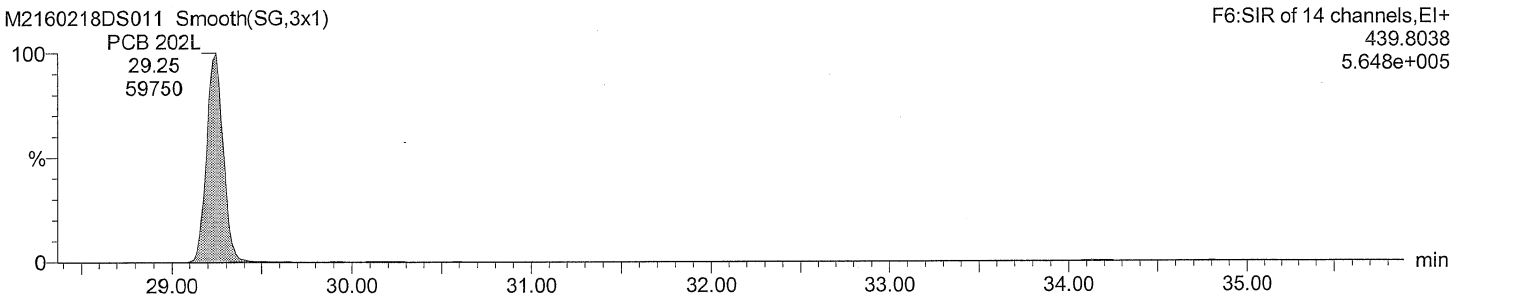

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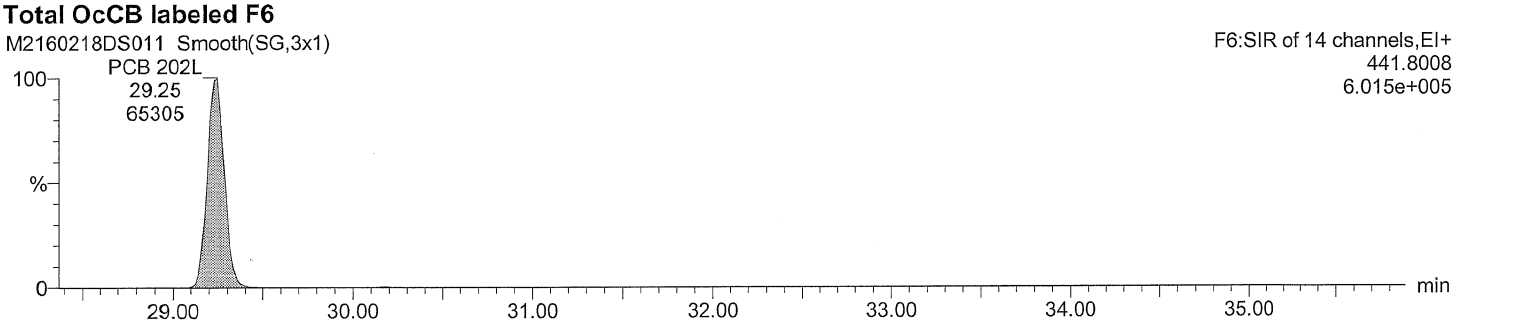

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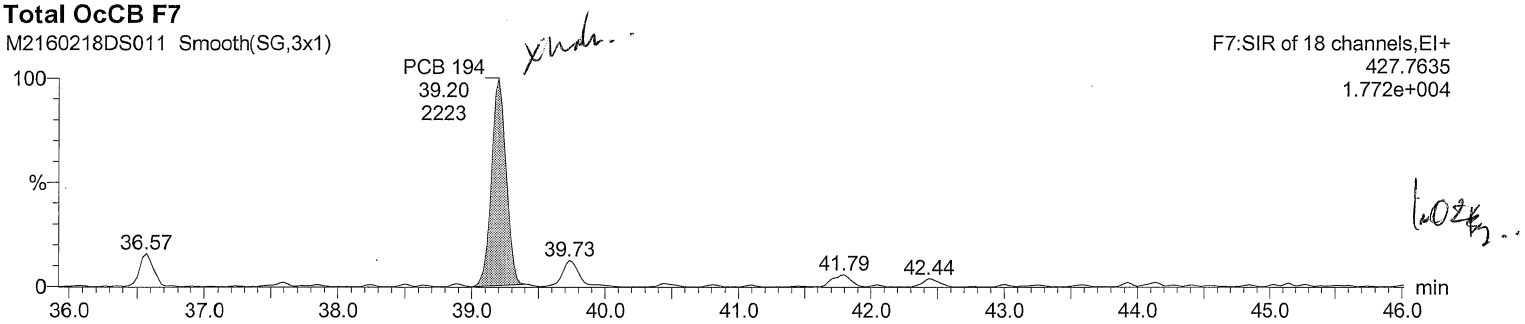

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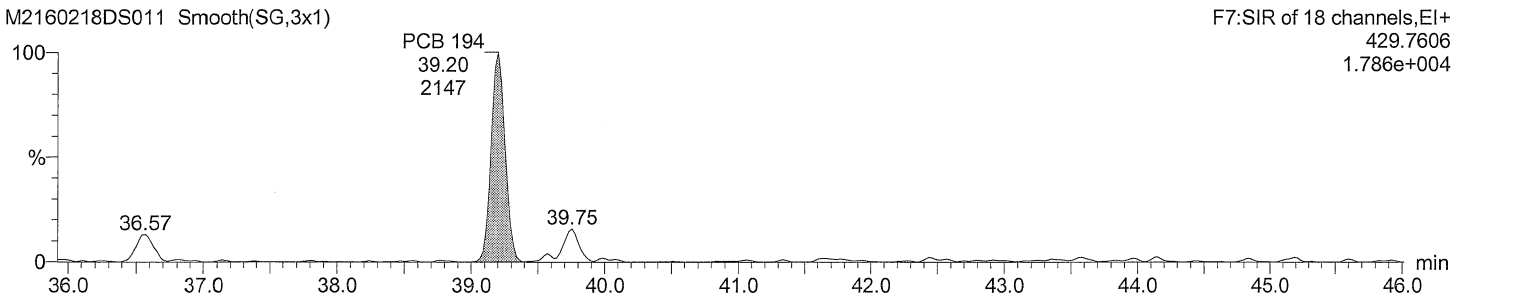

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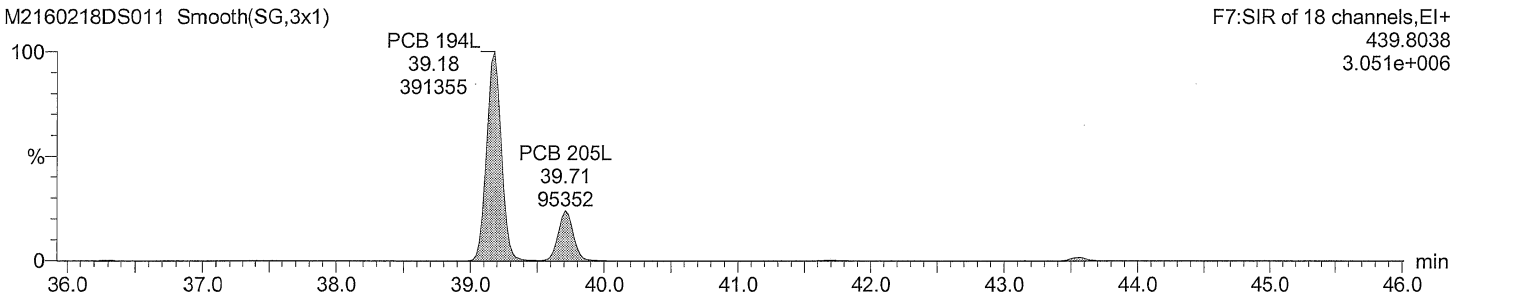

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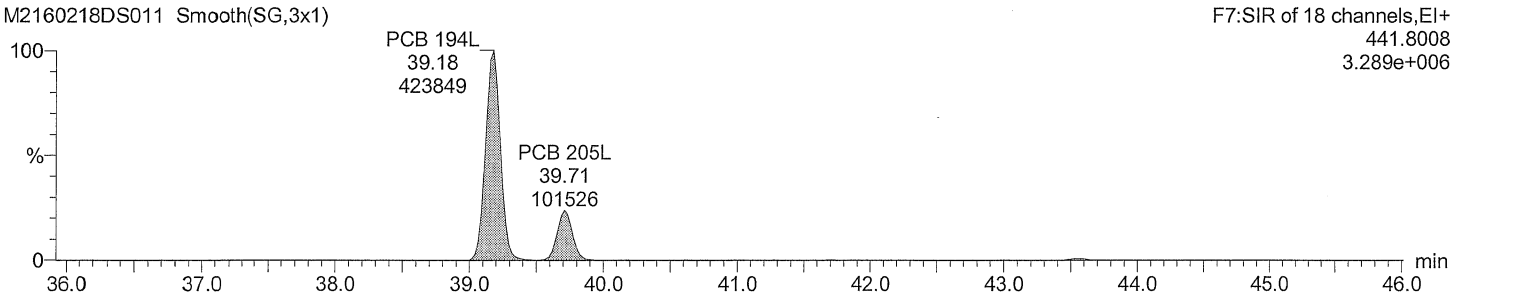

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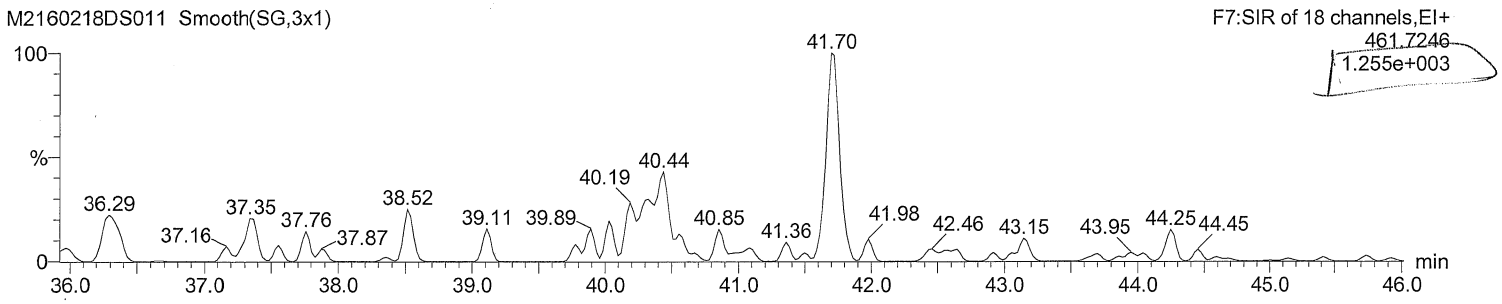

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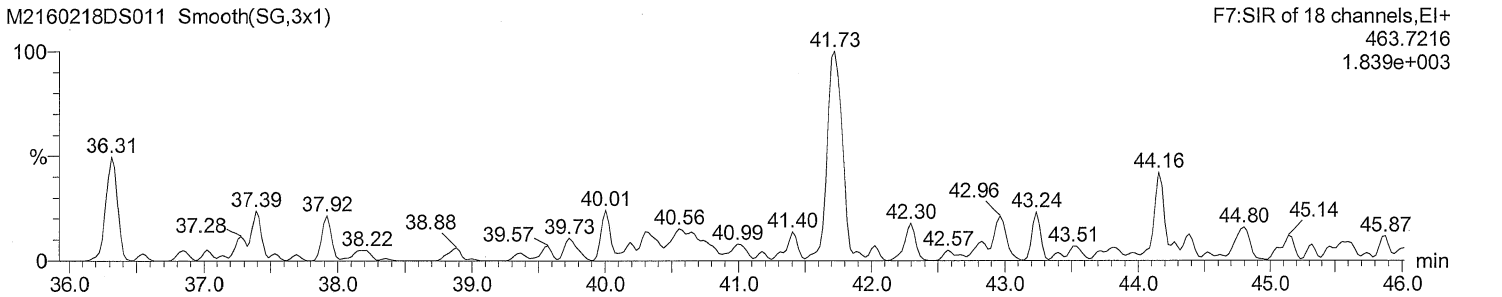

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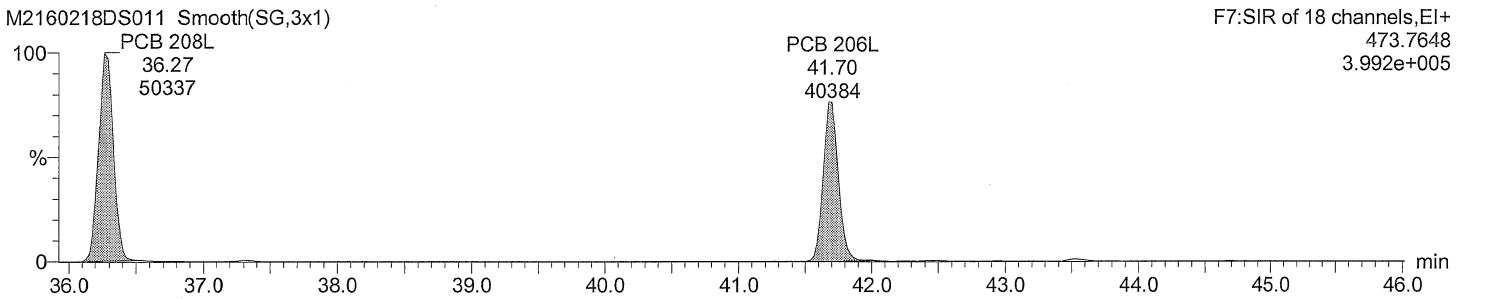

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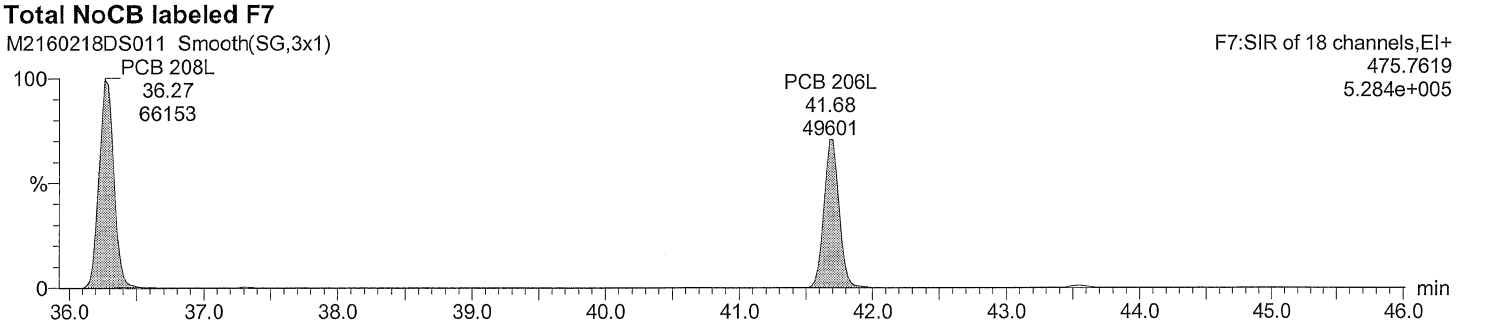

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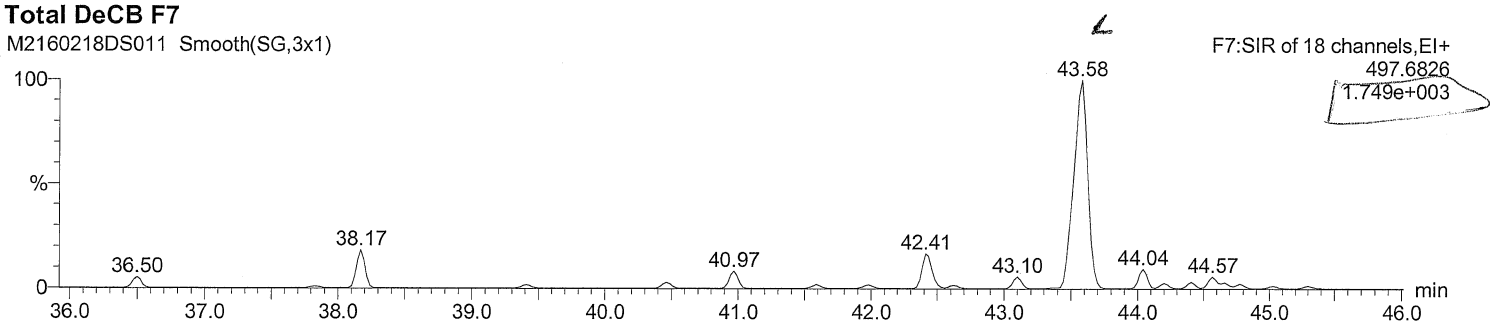

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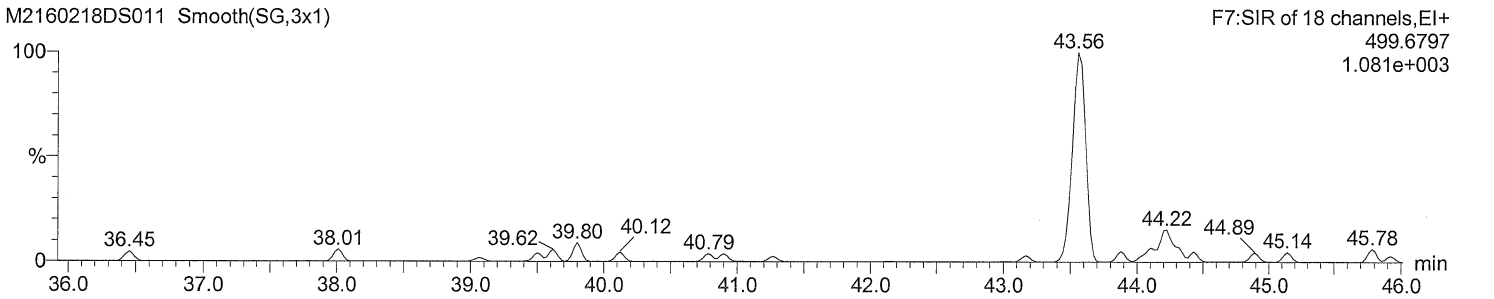

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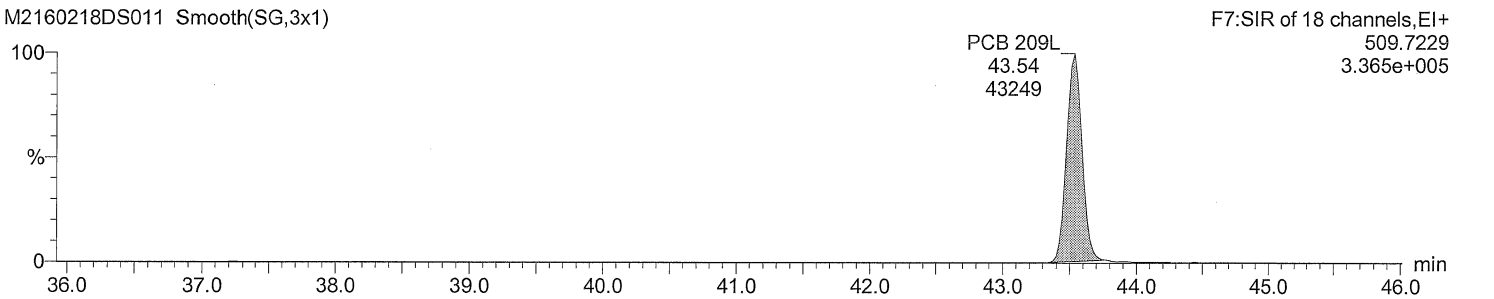

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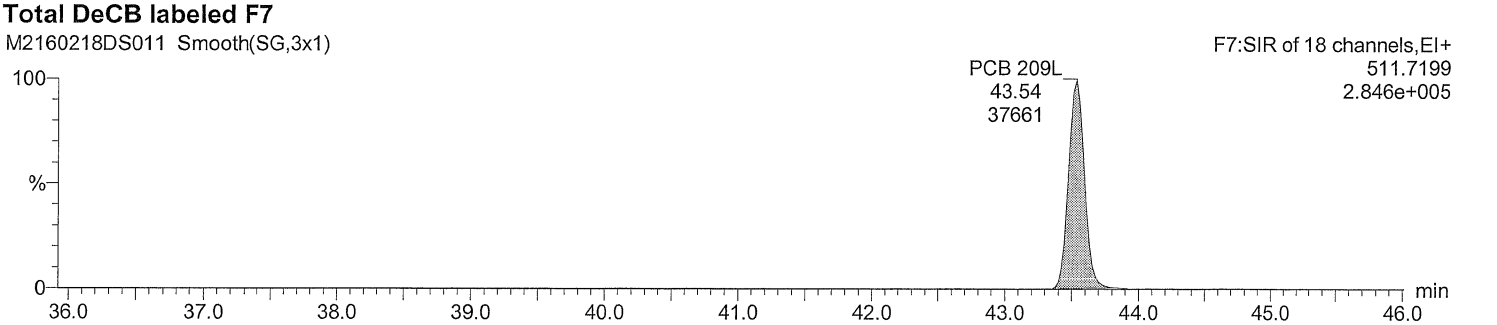

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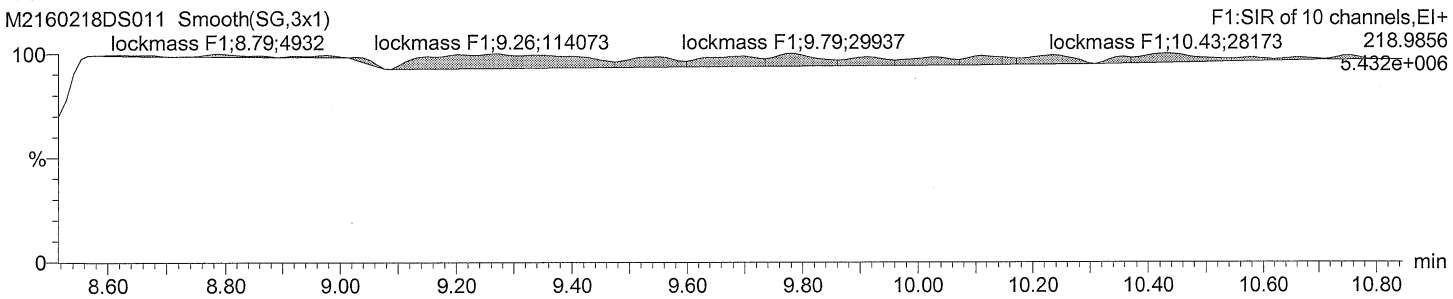
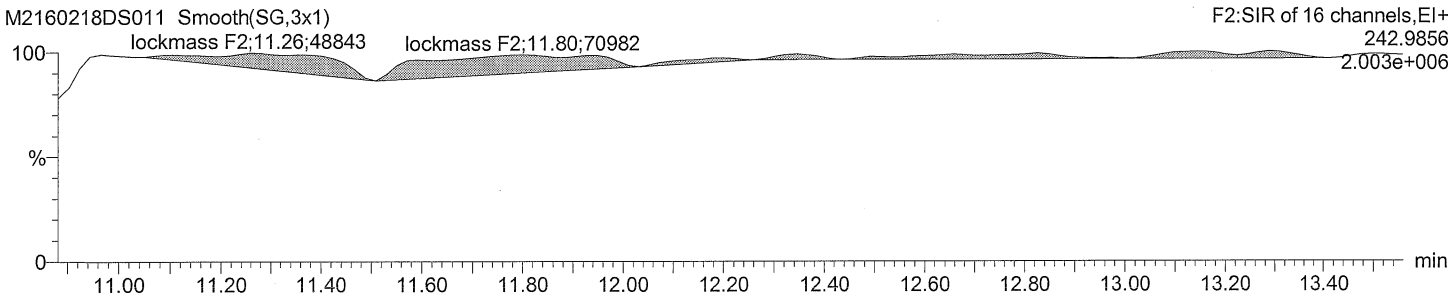
Last Altered: February 20, 2016 02:53:06 PM Eastern Standard Time
Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

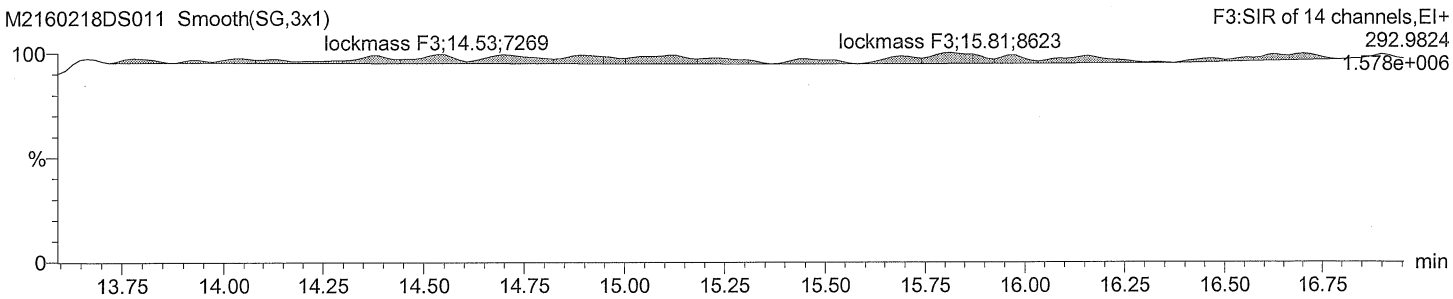
lockmass F1



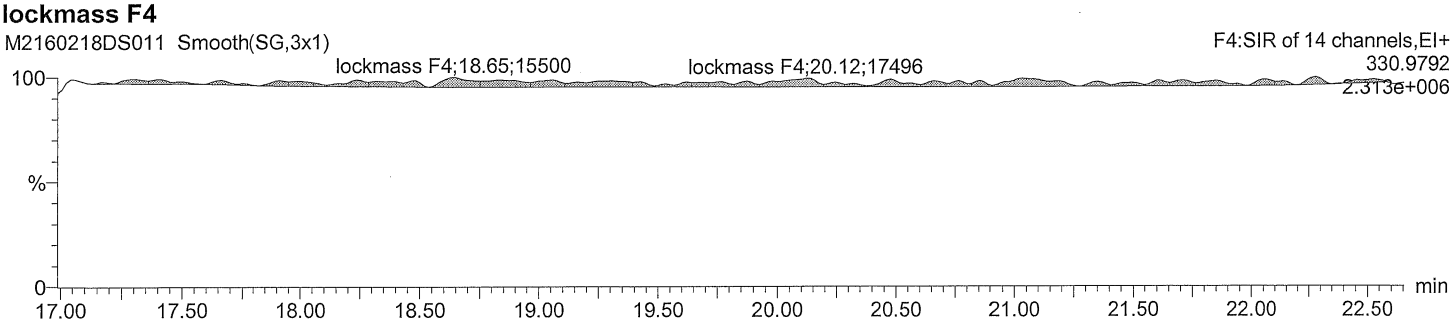
lockmass F2



lockmass F3



lockmass F4



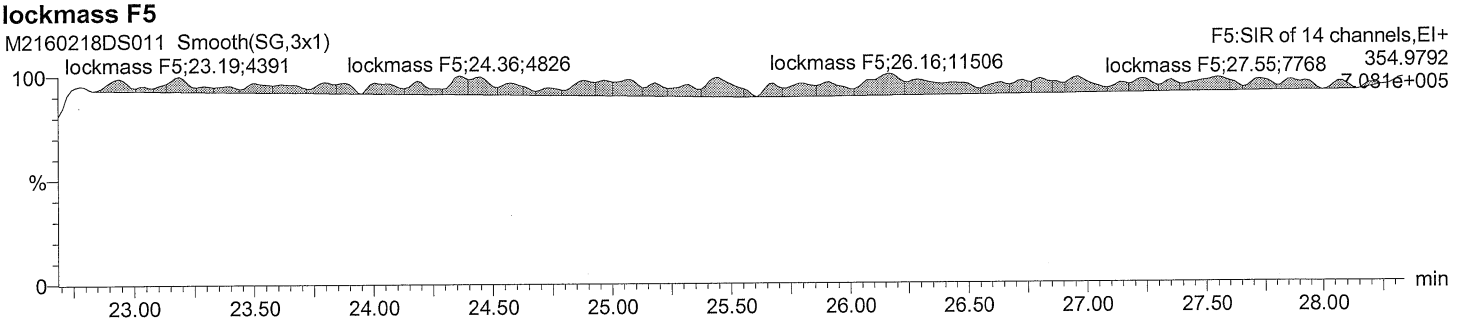
Acquired Date

Dataset: C:\MassLynx\Default.pro\M2160218D_\M2160218D_samples_1668A.qld

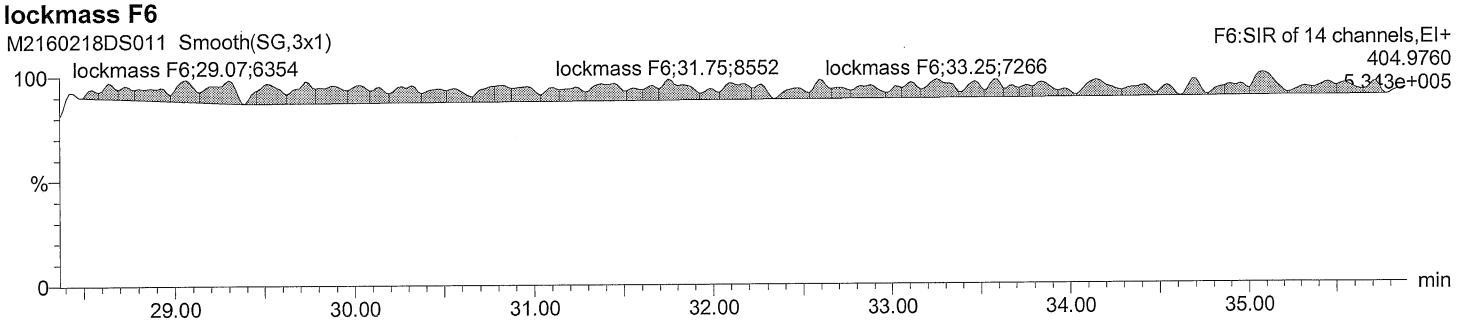
Last Altered: February 20, 2016 02:53:06 PM Eastern Standard Time
Printed: February 20, 2016 02:55:57 PM Eastern Standard Time

ID: Anchor QEA, PG-GP-1-MUS-COC-160104, Ti
Description: BRP511-01R
Vial: 11
Date: 18-FEB-2016
Time: 02:49:27

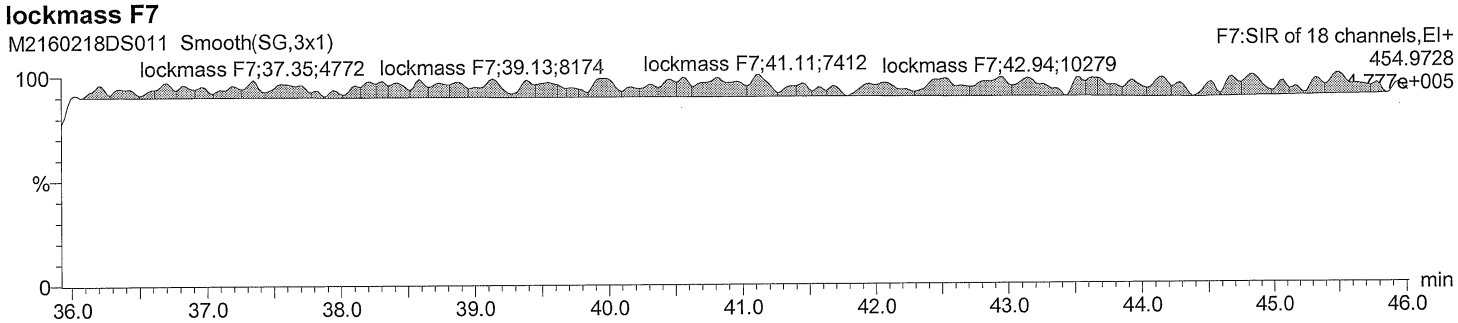
lockmass F5



lockmass F6



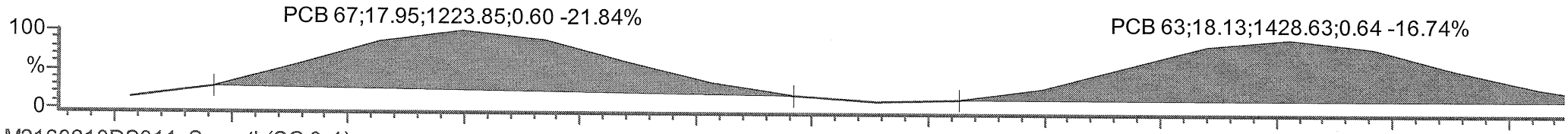
lockmass F7



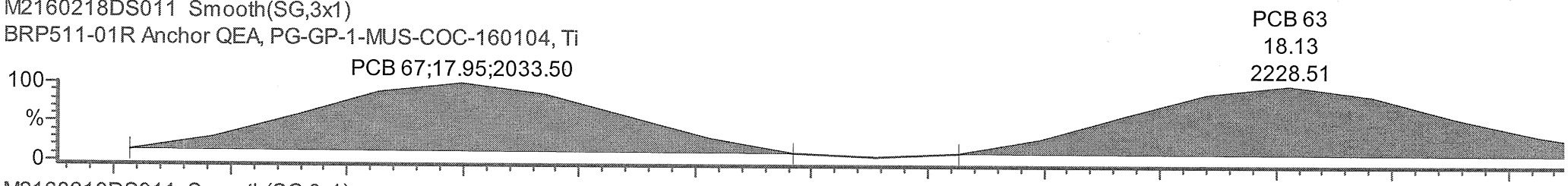
Maxxam Analytics

Before
16-0220
AA

M2160218DS011 Smooth(SG,3x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



M2160218DS011 Smooth(SG,3x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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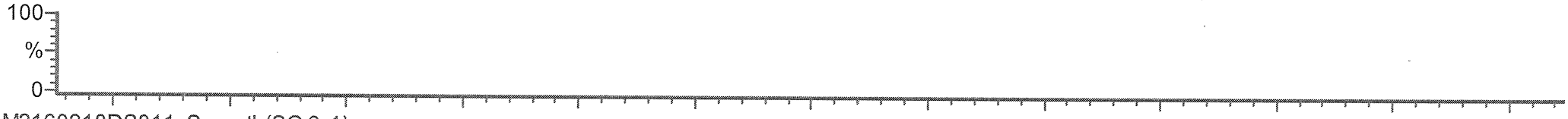
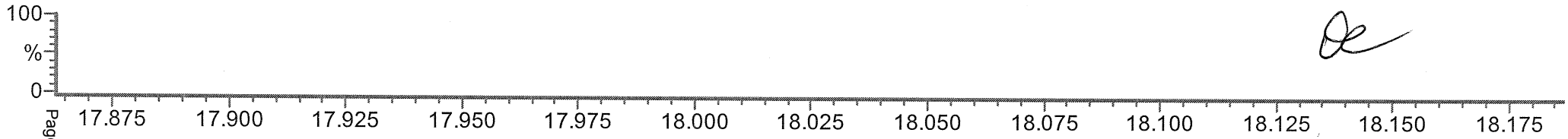
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



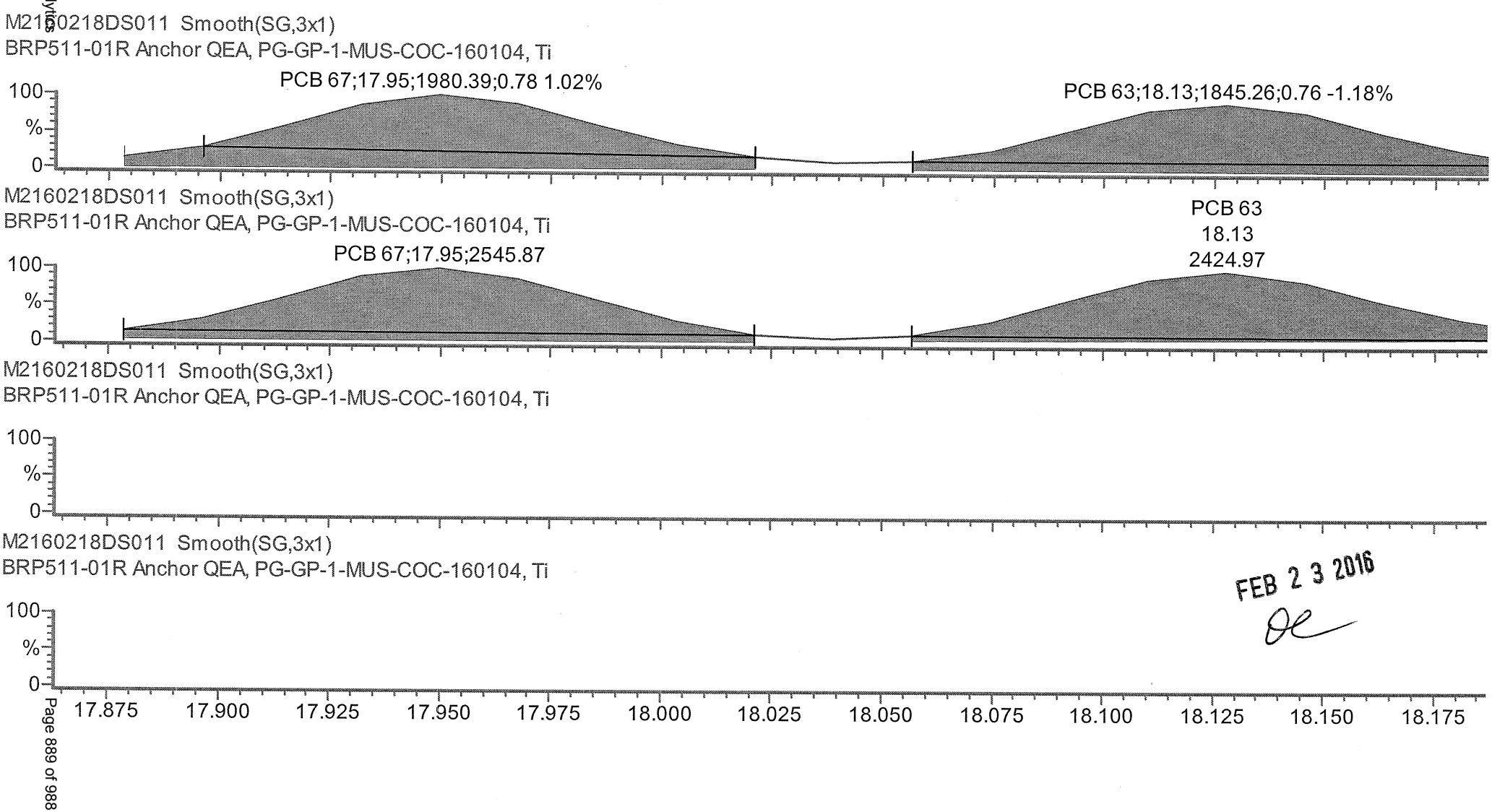
M2160218DS011 Smooth(SG,3x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

FEB 2 3 2016



Maxxam Analytics

M3 **16/02/20 : AH**

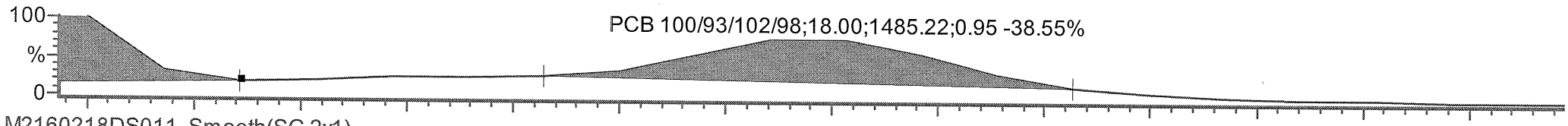


FEB 2 3 2016

Before 15.02.20

Maxxam Analytics

M2160218DS011 Smooth(SG,2x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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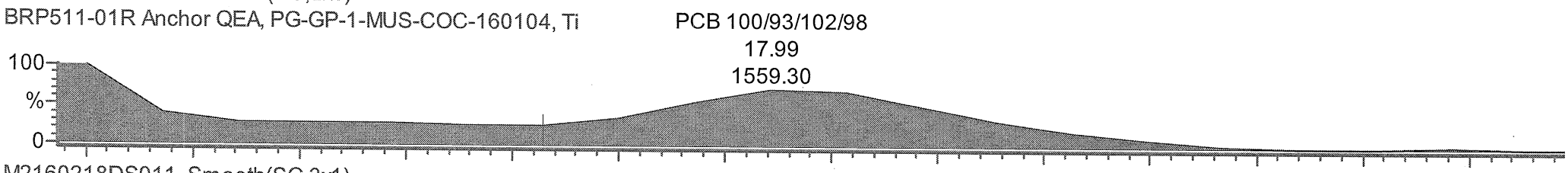
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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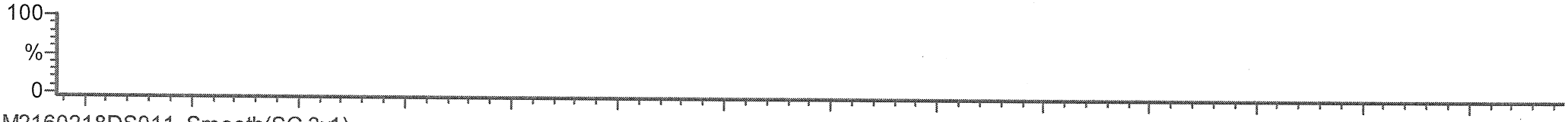
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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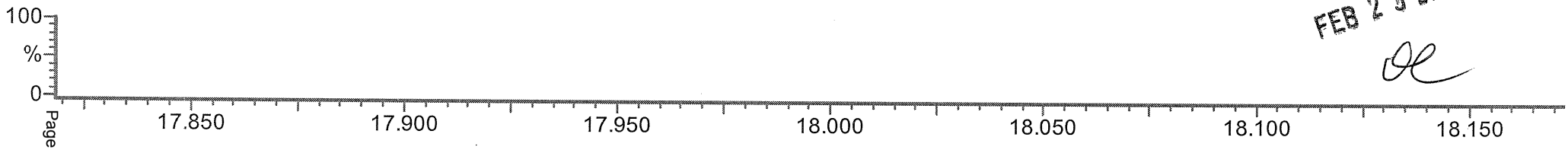
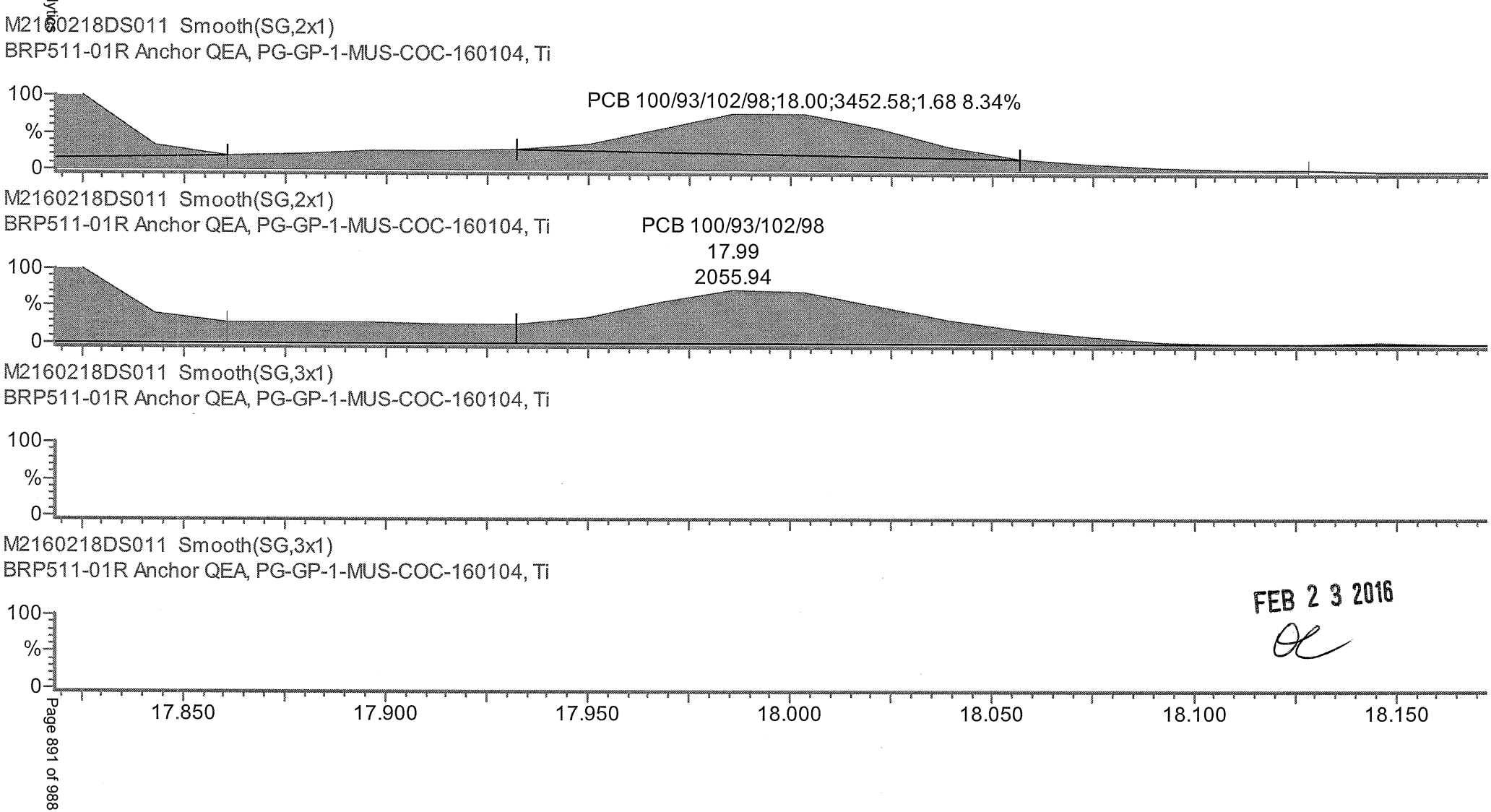
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



FEB 2 3 2016

M3 16/02/20 : AH

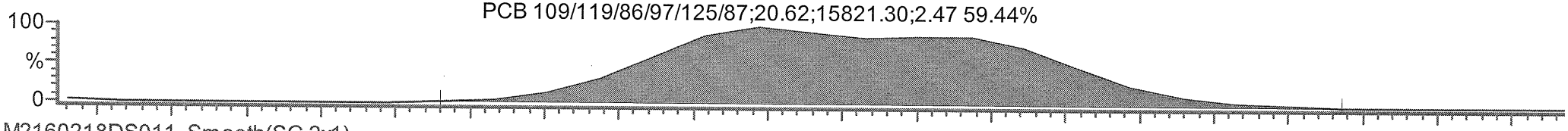


Before
15.02.20

Maxxam Analytics

M2160218DS011 Smooth(SG,2x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

PCB 109/119/86/97/125/87;20.62;15821.30;2.47 59.44%



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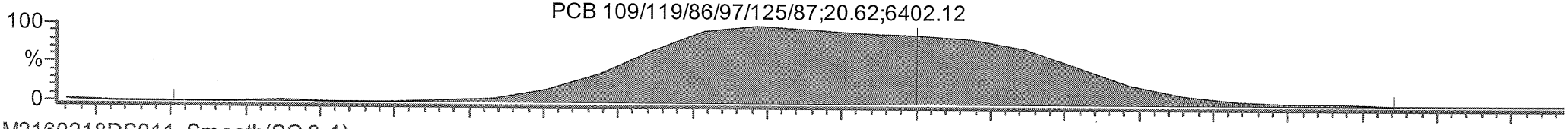
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

PCB 109/119/86/97/125/87;20.62;6402.12



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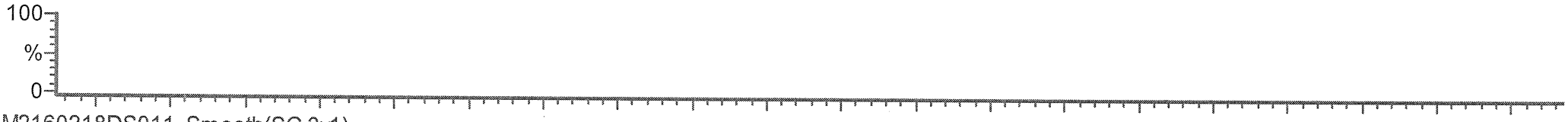
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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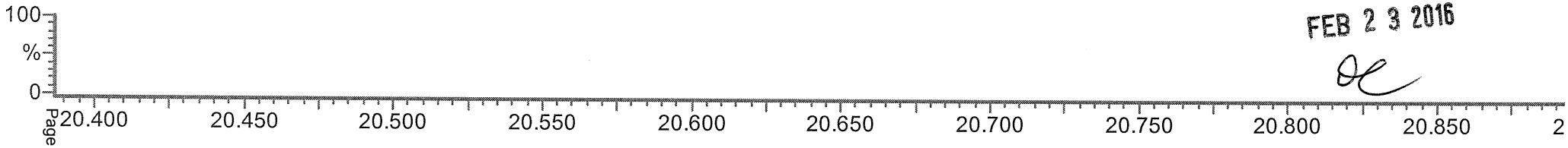
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

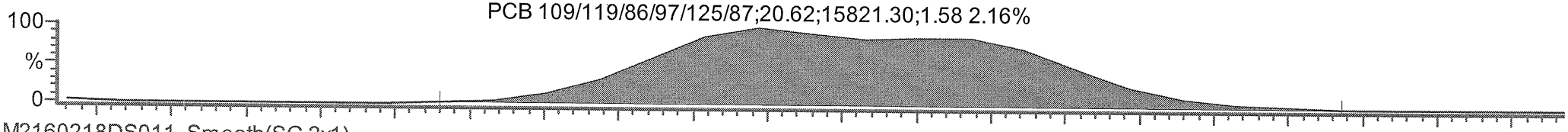


FEB 2 3 2016

M3 **16/02/20 : AH**

M2160218DS011 Smooth(SG,2x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

PCB 109/119/86/97/125/87;20.62;15821.30;1.58 2.16%



M2160218DS011 Smooth(SG,2x1)
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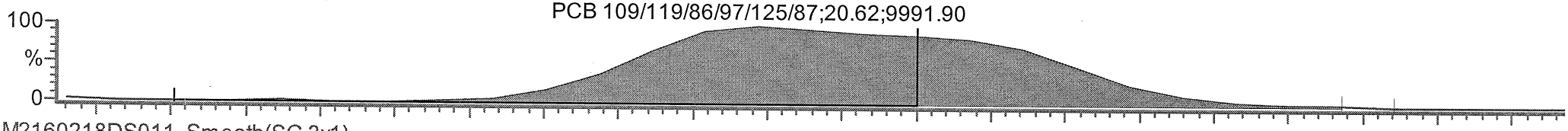

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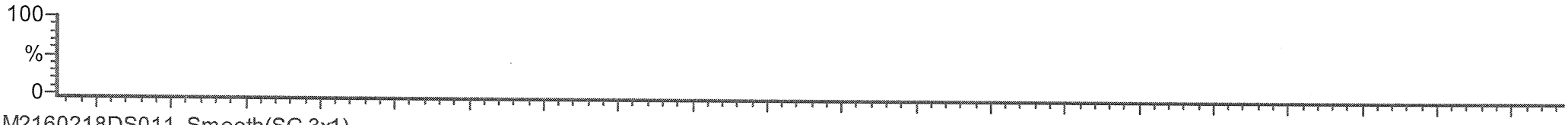
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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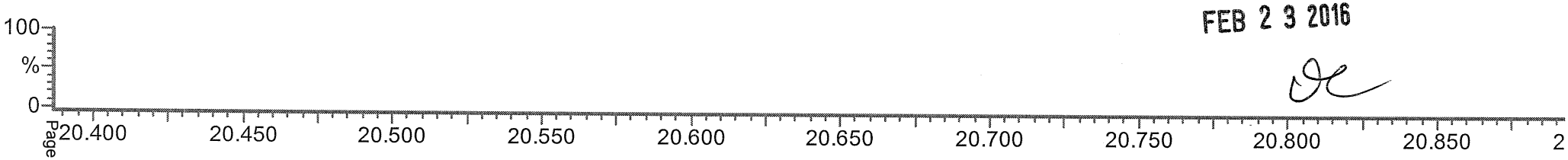
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

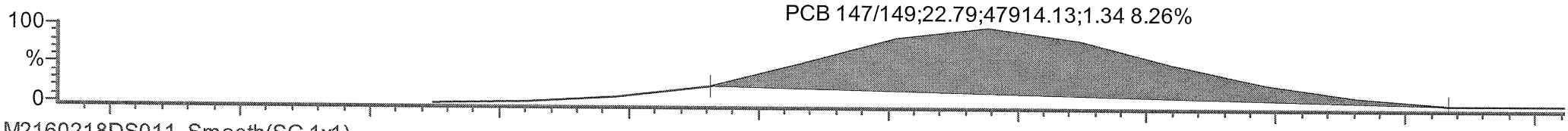
FEB 2 3 2016



Maxxam Analytics

Below
LOQ 2.20
AM

M2160218DS011 Smooth(SG,1x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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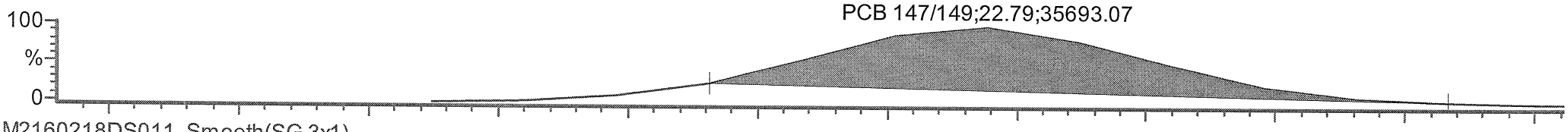

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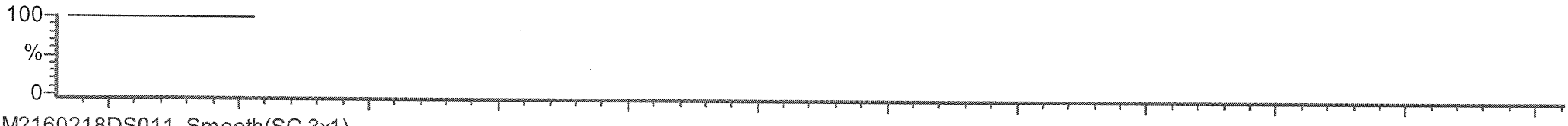

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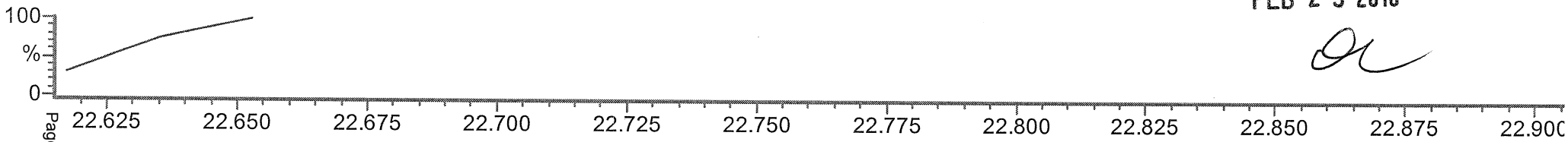
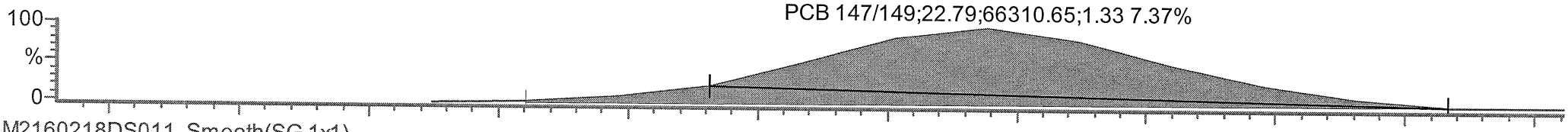
FEB 2 3 2016



M3 16/02/20 : AH

M2160218DS011 Smooth(SG,1x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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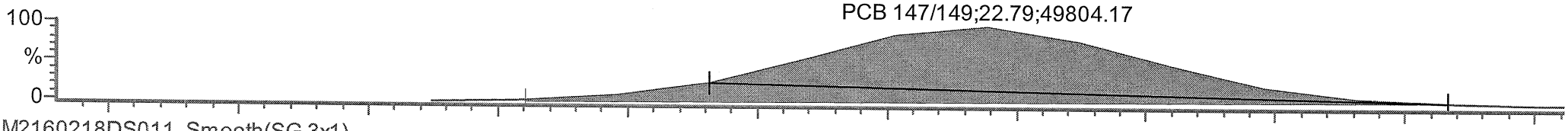
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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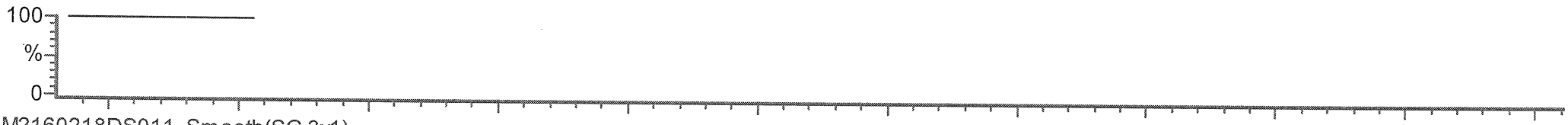

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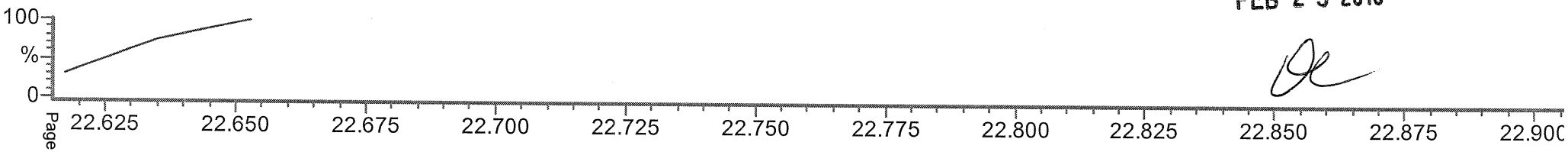
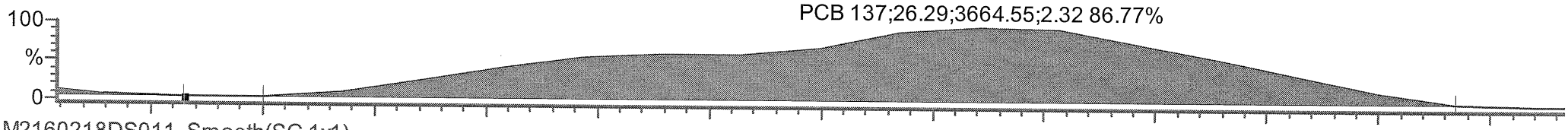


FEB 2 3 2016

Before
18-02-20
AM

Maxxam Analytics

M2160218DS011 Smooth(SG,1x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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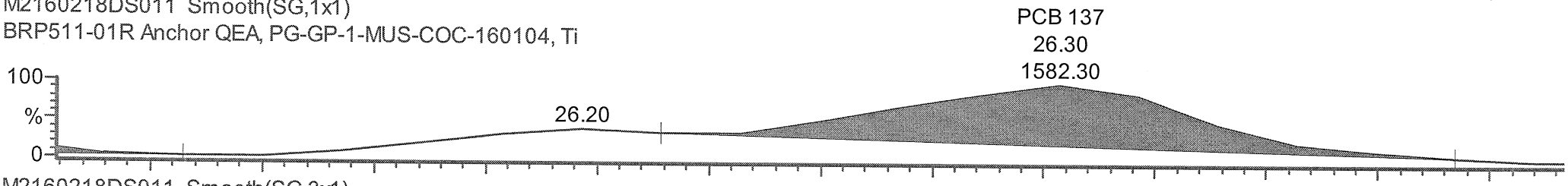
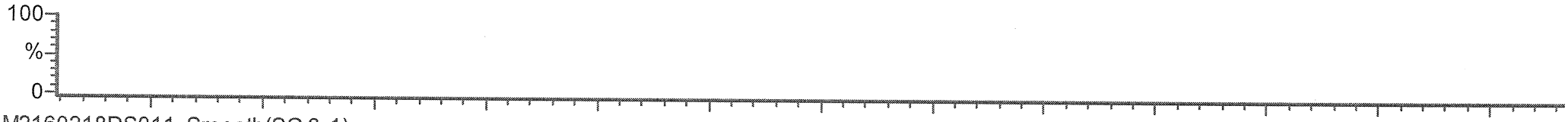
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



M2160218DS011 Smooth(SG,3x1)
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti



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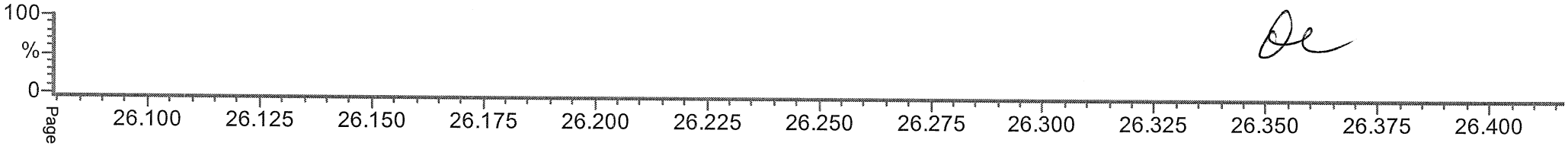
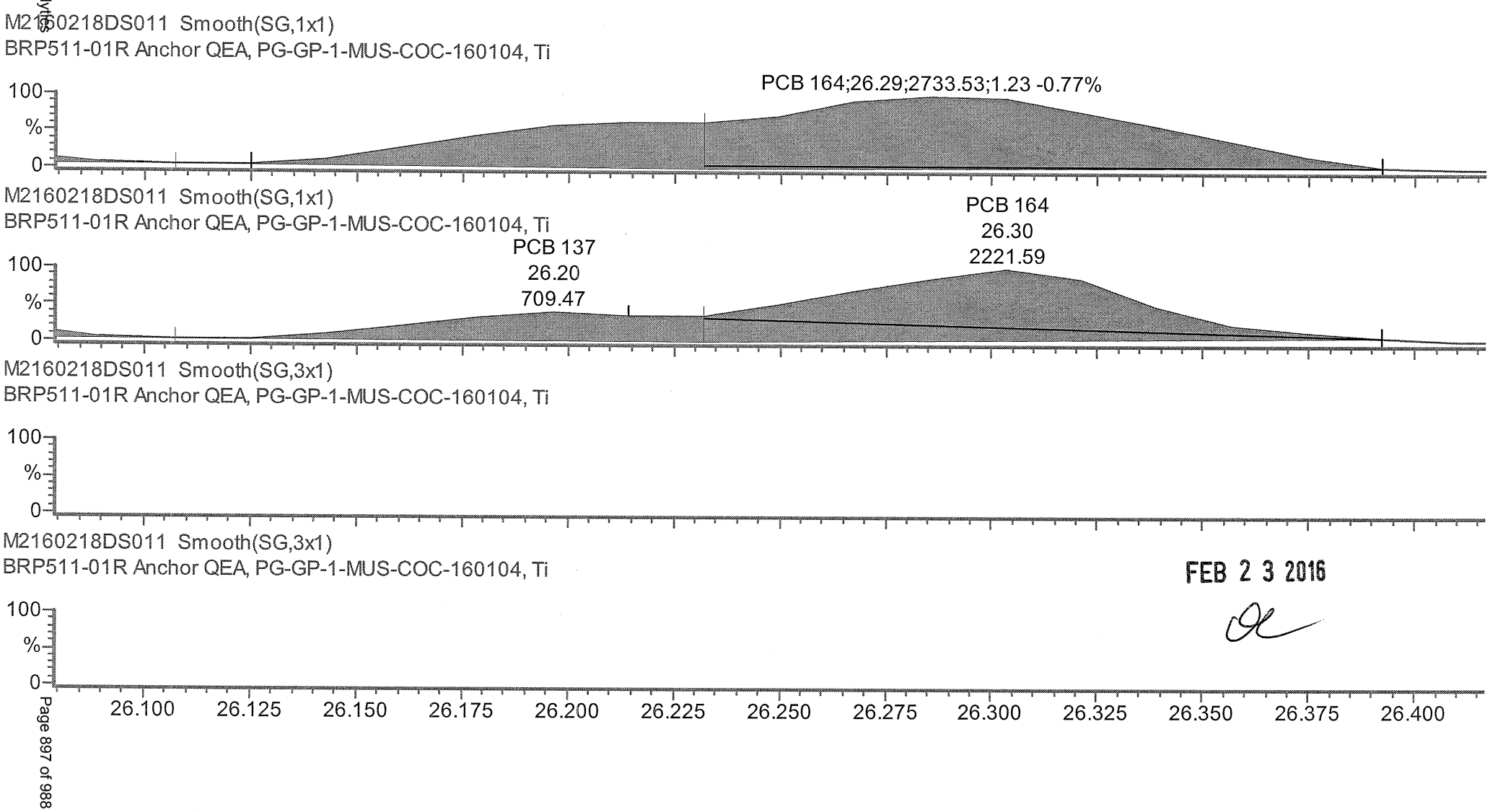
BRP511-01R Anchor QEA, PG-GP-1-MUS-COC-160104, Ti

FEB 2 3 2016

DE



M2 **16/02/20 : AH**



FEB 2 3 2016

Filename M2160219BS003
Acquired 19/02/2016 13:47 Call File M2160219_209

Sample ID BRP512-01R
Comments Anchor QEA, PG-SMA2-5-MUS-COC-16010, Ti
Instrument File Ultima 2
Sample Size 10.634 Dil Fac 1.00

Isomers

	Name		mass	RT	Area	ratio	Tot Area	ng/g	Code	DL	S/N	Mod	rrf	Rec
1	PCB 1		188	8.99	894	3.36	1161	-0.0005		-0.0005	*	Op-O	1.082	-
		MoCB	190	8.99	266	no					*			
2	PCB 2		188	10.10	432	2.52	603	-0.00044		-0.00044	*	yes	1.248	-
		MoCB	190	10.09	171	no					*			
3	PCB 3		188	10.18	-1055	3.13	-1392.06	-0.00063	PCB 3 NDR	-0.00051	3	xL	1.079	-
		MoCB	190	10.19	-337.061	OK					42			
4	**PCB 4**		**222**	**10.30**	**3568**	**1.44**	**6047**	**0.006193**		-0.001	15	yes	0.954	-
		DiCB	224	10.29	2480	yes					17			
5	PCB 10		222	10.38	543	1.15	1015	-0.00081		-0.00081	*	yes	1.177	-
		DiCB	224	10.38	472	no					*			
6	**PCB 9**		**222**	**11.19**	**1984**	**1.37**	**3433**	**0.001227**		-0.00101	7	no	1.357	-
		DiCB	224	11.19	1449	yes					8			
7	PCB 7		222	11.26	1403	1.77	2196	-0.00119		-0.00119	*	no	1.155	-
		DiCB	224	11.25	793	yes					*			
8	**PCB 6**		**222**	**11.36**	**6731**	**1.54**	**11115**	**0.004**		-0.00102	21	no	1.347	-
		DiCB	224	11.35	4383	yes					22			
9	PCB 5		222	NotFnd	*	*	*	-0.00117		-0.00117	*	no	1.169	-
		DiCB	224	11.50	*	no					*			
10	**PCB 8**		**222**	**11.55**	**30122**	**1.54**	**49663**	**0.018424**		-0.00105	82	no	1.307	-
		DiCB	224	11.54	19541	yes					91			
11	PCB 14		222	NotFnd	*	*	*	-0.00101		-0.00101	*	no	1.351	-
		DiCB	224	12.26	*	no					*			
12	**PCB 11**		**222**	**12.66**	**13008**	**1.56**	**21363**	**0.007792**		-0.00103	27	no	1.33	-
		DiCB	224	12.65	8355	yes					26			
13	PCB 13/12		222	12.78	-3063.84	1.56	-5027.84	-0.00196	PCB 13/12 NDR	-0.0011	8	xL	1.241	-
		DiCB	224	12.79	-1964	OK					8			
14	**PCB 15**		**222**	**12.95**	**73252**	**1.63**	**118295**	**0.043826**		-0.00157	176	no	0.871	-
		DiCB	224	12.93	45043	yes					166			
15	**PCB 19**		**256**	**11.68**	**4997**	**1.15**	**9360**	**0.010176**		-0.00141	39	yes	0.899	-
		TriCB	258	11.68	4363	yes					35			
16	**PCB 30/18**		**256**	**12.49**	**54009**	**1.04**	**106109**	**0.052851**		-0.00129	406	no	0.976	-
		TriCB	258	12.48	52100	yes					416			
17	**PCB 17**		**256**	**12.70**	**13061**	**1.04**	**25613**	**0.015745**		-0.0016	81	no	0.79	-
		TriCB	258	12.69	12552	yes					76			
18	**PCB 27**		**256**	**12.78**	**10721**	**1.11**	**20414**	**0.008426**		-0.00107	85	yes	1.177	-
		TriCB	258	12.79	9692	yes					76			
19	**PCB 24**		**256**	**12.87**	**1236**	**0.9**	**2610**	**0.001338**		-0.00133	12	yes	0.948	-
		TriCB	258	12.87	1374	yes					12			
20	**PCB 16**		**256**	**12.91**	**17473**	**1**	**34993**	**0.021436**		-0.00159	129	yes	0.793	-
		TriCB	258	12.90	17520	yes					127			
21	**PCB 32**		**256**	**13.14**	**23806**	**1.07**	**46005**	**0.01674**		-0.00095	156	no	1.335	-
		TriCB	258	13.14	22199	yes					157			
22	**PCB 34**		**256**	**13.74**	**1479**	**0.96**	**3016**	**0.000987**		-0.00067	5	yes	1.484	-
		TriCB	258	13.73	1536	yes					6			
23	PCB 23		256	13.83	505	0.95	1037	-0.00069		-0.00069	*	yes	1.446	-
		TriCB	258	13.82	532	yes					*			
24	**PCB 26/29**		**256**	**13.97**	**49571**	**1.05**	**96865**	**0.029163**		-0.00062	170	no	1.614	-
		TriCB	258	13.99	47295	yes					171			
25	**PCB 25**		**256**	**14.10**	**24266**	**1.04**	**47688**	**0.013356**		-0.00058	81	no	1.735	-
		TriCB	258	14.11	23422	yes					83			
26	**PCB 31**		**256**	**14.26**	**257396**	**1.03**	**506101**	**0.134044**		-0.00055	916	no	1.835	-
		TriCB	258	14.28	248705	yes					922			
27	**PCB 28/20**		**256**	**14.42**	**662644**	**1.03**	**1306060**	**0.375852**		-0.00059	2291	no	1.688	-
		TriCB	258	14.45	643415	yes					2275			
28	**PCB 21/33**		**256**	**14.55**	**122298**	**1.04**	**239713**	**0.068143**		-0.00059	397	no	1.709	-
		TriCB	258	14.55	117415	yes					395			
29	**PCB 22**		**256**	**14.77**	**105560**	**1.01**	**210057**	**0.063852**		-0.00063	343	no	1.599	-
		TriCB	258	14.78	104498	yes					348			
30	PCB 36		256	NotFnd	*	*	*	-0.00054		-0.00054	*	no	1.858	-
		TriCB	258	15.62	*	no					*			
31	**PCB 39**		**256**	**15.83**	**4196**	**0.9**	**8870**	**0.002838**		-0.00066	14	yes	1.519	-
		TriCB	258	15.82	4674	yes					16			
32	PCB 38		256	NotFnd	*	*	*	-0.00064		-0.00064	*	no	1.574	-
		TriCB	258	16.20	*	no					*			
33	**PCB 35**		**256**	**16.45**	**4941**	**1.04**	**9694**	**0.003112**		-0.00066	14	no	1.514	-
		TriCB	258	16.47	4752	yes					14			
34	**PCB 37**		**256**	**16.70**	**94948**	**1.05**	**185730**	**0.066326**		-0.0011	270	no	0.906	-
		TriCB	258	16.72	90782	yes					269			
35	PCB 54		290	13.08	412	1.01	819	-0.00124		-0.00124	*	yes	0.911	-
		TCB	292	13.08	408	no					*			
36	**PCB 53/50**		**290**	**14.12**	**29027**	**0.79**	**65884**	**0.043824**		-0.00141	129	no	0.77	-
		TCB	292	14.11	36857	yes					124			
37	**PCB 45/51**		**290**	**14.48**	**18582**	**0.85**	**40504**	**0.028577**		-0.0015	78	no	0.725	-
		TCB	292	14.49	21921	yes					71			
38	**PCB 46**		**290**	**14.64**	**9352**	**0.8**	**21054**	**0.01784**		-0.0018	41	no	0.604	-
		TCB	292	14.64	11702	yes					40			
39	**PCB 52**		**290**	**15.38**	**208643**	**0.8**	**469595**	**0.319578**		-0.00145	865	no	0.752	-
		TCB	292	15.38	260952	yes					825			
40	PCB 73		290	NotFnd	*	*	*	-0.00109		-0.00109	*	no	1.002	-
		TCB	292	15.43	*	no					*			
41	**PCB 43**		**290**	**15.53**	**8817**	**0.8**	**19881**	**0.020282**		-0.00217	36	no	0.502	-
		TCB	292	15.50	11065	yes					34			
42	**PCB 69/49**		**290**	**15.65**	**93313**	**0.8**	**210028**	**0.12473**		-0.00126	370	no	0.862	-
		TCB	292	15.63	116715	yes					366			

43 PCB 48	**290**	**15.83**	**54049**	**0.8**	**121453**	**0.090979**	-0.00159	230	no	0.683	-
TCB	292	15.84	67404	yes				217			
44 PCB 44/47/65	**290**	**15.96**	**199393**	**0.81**	**446183**	**0.293028**	-0.0014	656	no	0.779	-
TCB	292	15.97	246790	yes				626			
45 PCB 59/62/75	**290**	**16.16**	**26339**	**0.81**	**58682**	**0.03056**	-0.00111	99	no	0.983	-
TCB	292	16.16	32342	yes				95			
46 PCB 42	**290**	**16.28**	**40961**	**0.78**	**93251**	**0.079001**	-0.0018	159	no	0.604	-
TCB	292	16.27	52290	yes				156			
47 PCB 40/41/71	**290**	**16.57**	**94314**	**0.79**	**213842**	**0.158821**	-0.00158	315	no	0.689	-
TCB	292	16.56	119529	yes				309			
48 PCB 64	**290**	**16.72**	**58869**	**0.79**	**133712**	**0.076075**	-0.00121	229	no	0.9	-
TCB	292	16.70	74843	yes				224			
49 PCB 72	**290**	**17.20**	**2741**	**0.72**	**6551**	**0.002658**	-0.00086	9	no	1.261	-
TCB	292	17.20	3810	yes				9			
50 PCB 68	**290**	**17.40**	**1901**	**0.73**	**4507**	**0.001777**	-0.00084	5	no	1.298	-
TCB	292	17.42	2606	yes				5			
51 PCB 57	**290**	**17.70**	**1138**	**0.71**	**2751**	**0.000953**	-0.00074	6	no	1.477	-
TCB	292	17.67	1613	yes				6			
52 PCB 58	290	NotFnd	*	*	*	-0.00085	-0.00085	*	no	1.274	-
TCB	292	17.85	*	no				*			
53 PCB 67	**290**	**17.95**	**6625**	**0.79**	**15053**	**0.00468**	-0.00066	19	no	1.647	-
TCB	292	17.95	8428	yes				19			
54 PCB 63	**290**	**18.13**	**6432**	**0.84**	**14106**	**0.004709**	-0.00071	19	no	1.533	-
TCB	292	18.15	7674	yes				18			
55 PCB 61/70/74/76	**290**	**18.36**	**143320**	**0.78**	**327406**	**0.122081**	-0.00079	294	no	1.373	-
TCB	292	18.36	184086	yes				291			
56 PCB 66	**290**	**18.59**	**60872**	**0.8**	**137159**	**0.044412**	-0.00069	173	no	1.581	-
TCB	292	18.60	76287	yes				168			
57 PCB 55	290	NotFnd	*	*	*	-0.00089	-0.00089	*	no	1.229	-
TCB	292	18.72	*	no				*			
58 PCB 56	**290**	**19.06**	**8397**	**0.83**	**18534**	**0.00741**	-0.00085	24	no	1.28	-
TCB	292	19.07	10137	yes				22			
59 PCB 60	**290**	**19.23**	**7397**	**0.77**	**17016**	**0.00688**	-0.00086	21	no	1.266	-
TCB	292	19.24	9619	yes				20			
60 PCB 80	290	NotFnd	*	*	*	-0.00068	-0.00068	*	no	1.596	-
TCB	292	19.50	*	no				*			
61 PCB 79	**290**	**20.66**	**1267**	**0.88**	**2709**	**0.000818**	-0.00064	5	yes	1.695	-
TCB	292	20.63	1443	yes				4			
62 PCB 78	290	NotFnd	*	*	*	-0.00076	-0.00076	*	no	1.435	-
TCB	292	21.08	*	no				*			
63 PCB 81	290	21.41	321	0.64	822	-0.00106	-0.00106	*	yes	1.027	-
TCB	292	21.45	501	no				*			
64 PCB 77	**290**	**21.89**	**3070**	**0.8**	**6918**	**0.00282**	-0.00101	8	no	1.077	-
TCB	292	21.89	3848	yes				8			
65 PCB 104	326	NotFnd	*	*	*	-0.00103	-0.00103	*	no	1.094	-
PeCB	328	15.94	*	no				*			
66 PCB 96	**326**	**16.18**	**2452**	**1.63**	**3957**	**0.002426**	-0.00141	8	no	0.802	-
PeCB	328	16.15	1504	yes				7			
67 PCB 103	**326**	**17.33**	**2811**	**1.62**	**4552**	**0.003134**	-0.00108	10	no	0.714	-
PeCB	328	17.31	1741	yes				9			
68 PCB 94	**326**	**17.47**	**1205**	**1.74**	**1899**	**0.001793**	-0.00147	4	no	0.521	-
PeCB	328	17.47	694	yes				4			
69 PCB 95	**326**	**17.77**	**93674**	**1.66**	**150043**	**0.115055**	-0.0012	313	no	0.641	-
PeCB	328	17.76	56369	yes				288			
70 PCB 100/93/102/98	**326**	**18.00**	**8773**	**1.61**	**14221**	**0.0125**	-0.00137	18	no	0.559	-
PeCB	328	17.91	5448	yes				18			
71 PCB 88/91	**326**	**18.36**	**7933**	**1.64**	**12762**	**0.011001**	-0.00135	25	no	0.57	-
PeCB	328	18.33	4829	yes				23			
72 PCB 84	**326**	**18.52**	**8027**	**1.65**	**12877**	**0.012885**	-0.00156	25	no	0.491	-
PeCB	328	18.49	4850	yes				23			
73 PCB 89	326	18.84	312	1.65	501	-0.00142	-0.00142	*	yes	0.541	-
PeCB	328	18.84	189	yes				*			
74 PCB 121	326	NotFnd	*	*	*	-0.00105	-0.00105	*	no	0.733	-
PeCB	328	19.08	*	no				*			
75 PCB 92	**326**	**19.36**	**18108**	**1.66**	**29038**	**0.024486**	-0.00132	56	no	0.583	-
PeCB	328	19.35	10930	yes				52			
76 PCB 113/90/101	**326**	**19.78**	**141503**	**1.64**	**227704**	**0.164882**	-0.00113	431	no	0.679	-
PeCB	328	19.76	86202	yes				413			
77 PCB 83/99	**326**	**20.23**	**54781**	**1.64**	**88177**	**0.083683**	-0.00148	159	no	0.518	-
PeCB	328	20.22	33397	yes				152			
78 PCB 112	326	NotFnd	*	*	*	-0.00093	-0.00093	*	no	0.83	-
PeCB	328	20.30	*	no				*			
79 PCB 109/119/86/97/125/	**326**	**20.69**	**38022**	**1.64**	**61243**	**0.045136**	-0.00115	63	no	0.667	-
PeCB	328	20.62	23221	yes				59			
80 PCB 117/116/85	**326**	**21.19**	**11665**	**1.59**	**18989**	**0.013019**	-0.00107	33	no	0.717	-
PeCB	328	21.19	7323	yes				31			
81 PCB 110/115	**326**	**21.32**	**90659**	**1.65**	**145756**	**0.106779**	-0.00114	259	no	0.671	-
PeCB	328	21.32	55097	yes				242			
82 PCB 82	**326**	**21.58**	**3495**	**1.75**	**5491**	**0.005253**	-0.00149	10	yes	0.514	-
PeCB	328	21.59	1996	yes				9			
83 PCB 111	326	NotFnd	*	*	*	-0.00103	-0.00103	*	no	0.749	-
PeCB	328	21.85	*	no				*			
84 PCB 120	326	22.24	847	2.11	1249	-0.0009	-0.0009	*	yes	0.853	-
PeCB	328	22.25	401	no				*			
85 PCB 108/124	**326**	**23.20**	**4977**	**1.59**	**8111**	**0.003187**	-0.00077	11	no	1.251	-
PeCB	328	23.21	3134	yes				11			
86 PCB 107	**326**	**23.42**	**12515**	**1.6**	**20342**	**0.00761**	-0.00073	24	no	1.314	-
PeCB	328	23.40	7827	yes				24			
87 PCB 123	326	23.53	1100	1.13	2074	-0.00107	-0.00107	*	no	0.894	-
PeCB	328	23.51	974	no				*			
88 PCB 106	326	NotFnd	*	*	*	-0.0007	-0.0007	*	no	1.375	-
PeCB	328	23.63	*	no				*			
89 PCB 118	**326**	**23.79**	**147935**	**1.59**	**241096**	**0.107639**	-0.00098	307	no	0.981	-
PeCB	328	23.80	93161	yes				305			

90 PCB 122	326	24.10	1523	1.94	2310	-0.00079	
	PeCB 328	24.08	787	no			
91 PCB 114	**326**	**24.27**	**2786**	**1.71**	**4411**	**0.001995**	
	PeCB 328	24.28	1625	yes			
92 PCB 105	**326**	**24.84**	**45961**	**1.59**	**74873**	**0.034095**	
	PeCB 328	24.85	28912	yes			
93 PCB 127	326	NotFnd	*	*	*	-0.00071	
	PeCB 328	26.20	*	no			
94 PCB 126	326	27.75	863	1.58	1412	-0.00098	
	PeCB 328	27.72	548	yes			
95 PCB 155	360	NotFnd	*	*	*	-0.00066	
	HxCB 362	19.63	*	no			
96 PCB 152	360	NotFnd	*	*	*	-0.00098	
	HxCB 362	19.78	*	no			
97 PCB 150	360	19.91	595	1.36	1033	-0.00103	
	HxCB 362	19.88	438	yes			
98 PCB 136	**360**	**20.18**	**24129**	**1.37**	**41680**	**0.034899**	
	HxCB 362	20.18	17551	yes			
99 PCB 145	360	NotFnd	*	*	*	-0.00114	
	HxCB 362	20.41	*	no			
100 PCB 148	360	21.55	604	1.4	1035	-0.00136	
	HxCB 362	21.55	431	yes			
101 PCB 151/135	**360**	**22.05**	**61852**	**1.28**	**110149**	**0.137525**	
	HxCB 362	22.04	48297	yes			
102 PCB 154	**360**	**22.24**	**3307**	**1.32**	**5818**	**0.006019**	
	HxCB 362	22.21	2511	yes			
103 PCB 144	**360**	**22.51**	**9111**	**1.22**	**16565**	**0.019307**	
	HxCB 362	22.51	7453	yes			
104 PCB 147/149	**360**	**22.80**	**209408**	**1.32**	**368564**	**0.32055**	
	HxCB 362	22.80	159156	yes			
105 PCB 134/143	**360**	**22.99**	**7643**	**1.27**	**13652**	**0.01365**	
	HxCB 362	23.06	6009	yes			
106 PCB 139/140	**360**	**23.31**	**1899**	**1.41**	**3242**	**0.002856**	
	HxCB 362	23.31	1343	yes			
107 PCB 131	**360**	**23.49**	**1029**	**1.21**	**1881**	**0.002063**	
	HxCB 362	23.49	851	yes			
108 PCB 142	360	NotFnd	*	*	*	-0.00144	
	HxCB 362	23.65	*	no			
109 PCB 132	**360**	**23.88**	**27836**	**1.33**	**48785**	**0.052514**	
	HxCB 362	23.88	20949	yes			
110 PCB 133	**360**	**24.31**	**3234**	**1.29**	**5740**	**0.005186**	
	HxCB 362	24.31	2506	yes			
111 PCB 165	360	NotFnd	*	*	*	-0.00118	
	HxCB 362	24.68	*	no			
112 PCB 146	**360**	**24.88**	**40411**	**1.29**	**71738**	**0.060837**	
	HxCB 362	24.88	31328	yes			
113 PCB 161	360	NotFnd	*	*	*	-0.00094	
	HxCB 362	25.03	*	no			
114 PCB 153/168	**360**	**25.43**	**371236**	**1.29**	**658432**	**0.467713**	
	HxCB 362	25.47	287196	yes			
115 PCB 141	**360**	**25.63**	**9514**	**1.39**	**16336**	**0.014796**	
	HxCB 362	25.62	6822	yes			
116 PCB 130	**360**	**26.00**	**7590**	**1.3**	**13425**	**0.013531**	
	HxCB 362	26.00	5835	yes			
117 PCB 137	**360**	**26.23**	**1659**	**1.26**	**2980**	**0.002976**	
	HxCB 362	26.21	1321	yes			
118 PCB 164	**360**	**26.31**	**8226**	**1.28**	**14651**	**0.009974**	
	HxCB 362	26.30	6424	yes			
119 PCB 138/163/129	**360**	**26.61**	**273673**	**1.3**	**483794**	**0.422712**	
	HxCB 362	26.62	210121	yes			
120 PCB 160	360	NotFnd	*	*	*	-0.00116	
	HxCB 362	26.80	*	no			
121 PCB 158	**360**	**26.98**	**26909**	**1.29**	**47726**	**0.029465**	
	HxCB 362	26.98	20817	yes			
122 PCB 128/166	**360**	**27.82**	**23169**	**1.25**	**41690**	**0.033487**	
	HxCB 362	27.80	18522	yes			
123 PCB 159	360	NotFnd	*	*	*	-0.00101	
	HxCB 362	28.78	*	no			
124 PCB 162	**360**	**29.16**	**5410**	**1.22**	**9845**	**0.004417**	
	HxCB 362	29.07	4436	yes			
125 PCB 167	**360**	**29.53**	**15045**	**1.37**	**26001**	**0.011708**	
	HxCB 362	29.55	10956	yes			
126 PCB 156/157	**360**	**30.68**	**29810**	**1.25**	**53569**	**0.024165**	
	HxCB 362	30.71	23759	yes			
127 PCB 169	360	NotFnd	*	*	*	-0.00147	
	HxCB 362	34.13	*	no			
128 PCB 188	394	24.24	224	1.09	430	-0.00064	
	HpCB 396	24.23	206	yes			
129 PCB 179	**394**	**24.54**	**27947**	**1.1**	**53320**	**0.039309**	
	HpCB 396	24.52	25373	yes			
130 PCB 184	394	NotFnd	*	*	*	-0.00069	
	HpCB 396	25.00	*	no			
131 PCB 176	**394**	**25.33**	**8149**	**1.1**	**15561**	**0.011742**	
	HpCB 396	25.32	7412	yes			
132 PCB 186	394	NotFnd	*	*	*	-0.00075	
	HpCB 396	25.75	*	no			
133 PCB 178	**394**	**27.02**	**9693**	**1.07**	**18744**	**0.02046**	
	HpCB 396	27.01	9051	yes			
134 PCB 175	**394**	**27.62**	**2133**	**1.15**	**3983**	**0.004287**	
	HpCB 396	27.62	1851	yes			
135 PCB 187	**394**	**27.89**	**71105**	**1.07**	**137311**	**0.152817**	
	HpCB 396	27.88	66206	yes			
136 PCB 182	394	NotFnd	*	*	*	-0.00096	
	HpCB 396	28.10	*	no			

-0.00079	*	Op-O	1.222	-
-0.00095	* 5	no	1.01	-
-0.00098	5 95	no	0.977	-
-0.00071	93 *	no	1.348	-
-0.00098	* *	yes	0.977	-
-0.00066	* *	no	0.997	-
-0.00098	* *	no	0.675	-
-0.00103	* *	yes	0.639	-
-0.00098	134	no	0.672	-
-0.00114	120 *	no	0.579	-
-0.00136	* *	yes	0.487	-
-0.00147	273	yes	0.451	-
-0.00121	264 19	yes	0.544	-
-0.00137	17 49	yes	0.483	-
-0.0013	48 840	yes	0.647	-
-0.00149	806 28	yes	0.563	-
-0.00131	29 7	no	0.639	-
-0.00164	7 4	no	0.513	-
-0.00144	4 * *	no	0.583	-
-0.0016	106	no	0.523	-
-0.00135	103 13	no	0.623	-
-0.00118	13 * *	no	0.714	-
-0.00127	157	no	0.663	-
-0.00094	149 * *	no	0.888	-
-0.00106	1394	no	0.792	-
-0.00135	1352 36	no	0.621	-
-0.0015	31 27	no	0.558	-
-0.00149	27 9	no	0.563	-
-0.00102	9 29	no	0.826	-
-0.0013	28 1004	no	0.644	-
-0.00116	952 * *	no	0.723	-
-0.00092	94	no	0.911	-
-0.0012	90 69	no	0.7	-
-0.00101	67 * *	no	1.379	-
-0.00111	7	no	1.254	-
-0.00148	8 28	no	0.946	-
-0.00137	25 51	no	1.017	-
-0.00147	50 * *	no	0.954	-
-0.00064	* *	yes	1.012	-
-0.00064	193	no	1.016	-
-0.00069	181 * *	no	0.937	-
-0.00065	53	no	0.993	-
-0.00075	52 * *	no	0.865	-
-0.00094	62	no	0.686	-
-0.00093	61 14	no	0.696	-
-0.00096	13 453	no	0.673	-
-0.00096	443 * *	no	0.674	-

137 PCB 183	**394**	**28.50**	**47588**	**1.13**	**89841**	**0.058342**		-0.00109	166	no	1.153	-
	HpCB 396	28.51	42253	yes					156			
138 PCB 185	394	NotFnd	*	*	*	-0.00156		-0.00156	*	no	0.805	-
	HpCB 396	28.58	*	no					*			
139 PCB 174	394	NotFnd	*	*	*	-0.00133		-0.00133	*	no	0.947	-
	HpCB 396	28.74	*	no					*			
140 PCB 177	**394**	**29.16**	**32670**	**1.06**	**63448**	**0.051608**		-0.00136	111	no	0.921	-
	HpCB 396	29.16	30778	yes					111			
141 PCB 181	394	NotFnd	*	*	*	-0.00142		-0.00142	*	no	0.885	-
	HpCB 396	29.57	*	no					*			
142 PCB 171/173	**394**	**29.80**	**17586**	**1.11**	**33450**	**0.027904**		-0.0014	60	no	0.898	-
	HpCB 396	29.80	15864	yes					56			
143 PCB 172	394	NotFnd	*	*	*	-0.0014		-0.0014	*	no	0.898	-
	HpCB 396	31.44	*	no					*			
144 PCB 192	394	NotFnd	*	*	*	-0.00121		-0.00121	*	no	1.043	-
	HpCB 396	31.76	*	no					*			
145 PCB 193/180	**394**	**32.13**	**112971**	**1.1**	**215700**	**0.151848**		-0.00089	360	no	1.408	-
	HpCB 396	32.08	102729	yes					343			
146 PCB 191	**394**	**32.51**	**2601**	**0.92**	**5424**	**0.003277**		-0.00101	7	no	1.24	-
	HpCB 396	32.50	2823	yes					9			
147 PCB 170	**394**	**33.45**	**19477**	**1.08**	**37557**	**0.03286**		-0.00099	64	no	1.271	-
	HpCB 396	33.47	18080	yes					62			
148 PCB 190	**394**	**34.03**	**12007**	**1**	**23988**	**0.014068**		-0.00098	40	no	1.277	-
	HpCB 396	34.04	11981	yes					39			
149 PCB 189	**394**	**36.87**	**4194**	**0.95**	**8598**	**0.003904**		-0.00056	17	no	0.944	-
	HpCB 396	36.88	4404	yes					18			
150 PCB 202	**428**	**29.26**	**4674**	**0.94**	**9643**	**0.010021**		-0.00087	31	no	0.988	-
	OcCB 430	29.28	4968	yes					30			
151 PCB 201	**428**	**30.21**	**2752**	**0.84**	**6045**	**0.00498**		-0.0008	19	no	1.068	-
	OcCB 430	30.18	3293	yes					18			
152 PCB 204	428	NotFnd	*	*	*	-0.00081		-0.00081	*	no	1.052	-
	OcCB 430	30.88	*	no					*			
153 PCB 197	**428**	**31.13**	**1203**	**0.94**	**2482**	**0.002295**		-0.0009	7	no	0.951	-
	OcCB 430	31.12	1278	yes					7			
154 PCB 200	428	NotFnd	*	*	*	-0.00081		-0.00081	*	no	1.056	-
	OcCB 430	31.24	*	no					*			
155 PCB 198/199	428	34.20	-473.48	0.89	-1005.48	-0.00126	PCB 198/199 NDR	-0.00122	4	xL	0.702	-
	OcCB 430	34.19	-532	OK					3			
156 PCB 196	**428**	**34.92**	**606**	**0.94**	**1254**	**0.001503**		-0.00117	4	yes	0.734	-
	OcCB 430	34.93	647	yes					4			
157 PCB 203	**428**	**35.14**	**4456**	**0.88**	**9533**	**0.011802**		-0.00121	27	yes	0.711	-
	OcCB 430	35.12	5077	yes					28			
158 PCB 195	**428**	**36.59**	**1094**	**0.89**	**2326**	**0.001956**		-0.0008	5	no	1.046	-
	OcCB 430	36.59	1232	yes					5			
159 PCB 194	**428**	**39.21**	**6778**	**0.96**	**13847**	**0.01089**		-0.00074	36	no	1.119	-
	OcCB 430	39.22	7070	yes					32			
160 PCB 205	**428**	**39.76**	**1130**	**1.02**	**2238**	**0.001579**		-0.00076	6	yes	1.091	-
	OcCB 430	39.77	1108	yes					5			
161 PCB 208	462	NotFnd	*	*	*	-0.0008		-0.0008	*	no	1.023	-
	NoCB 464	36.33	*	no					*			
162 PCB 207	462	NotFnd	*	*	*	-0.00063		-0.00063	*	no	1.304	-
	NoCB 464	37.35	*	no					*			
163 PCB 206	462	41.73	223	0.59	601	-0.0008		-0.0008	*	Op-O	1.027	-
	NoCB 464	41.71	378	no					*			
164 PCB 209	498	43.56	155	1.01	309	-0.00097		-0.00097	*	yes	1.04	-
	DCB 500	43.54	153	yes					*			
165 PCB 1L	**200**	**8.99**	**301215**	**3.46**	**388347**	**0.131272**		0	8748	no	0.824	70
	202	8.99	87132	yes					476			
166 PCB 3L	**200**	**10.18**	**299138**	**3.47**	**385401**	**0.125909**		0	8765	no	0.852	67
	202	10.20	86263	yes					479			
167 PCB 4L	**234**	**10.28**	**119440**	**1.63**	**192509**	**0.098791**		0	1915	no	0.543	53
	236	10.30	73069	yes					3595			
168 PCB 15L	**234**	**12.93**	**366398**	**1.69**	**583139**	**0.151147**		0	1591	no	1.074	80
	236	12.93	216741	yes					2096			
169 PCB 19L	**268**	**11.68**	**99999**	**1.08**	**192495**	**0.0927**		0.001	378	no	0.578	49
	270	11.70	92495	yes					312			
170 PCB 37L	**268**	**16.70**	**300924**	**1.07**	**581598**	**0.203724**		0.001	798	no	1.987	108
	270	16.69	280674	yes					532			
171 PCB 54L	**302**	**13.06**	**99973**	**0.79**	**226236**	**0.121349**		0	917	no	1.297	65
	304	13.07	126263	yes					2721			
172 PCB 81L	**302**	**21.42**	**198808**	**0.8**	**447649**	**0.179242**		0	1245	no	1.738	95
	304	21.42	248841	yes					1753			
173 PCB 77L	**302**	**21.87**	**190389**	**0.8**	**428354**	**0.177735**		0	1174	no	1.677	95
	304	21.85	237965	yes					1636			
174 PCB 104L	**338**	**15.92**	**128615**	**1.64**	**206862**	**0.14636**		0	6355	no	1.156	78
	340	15.93	78247	yes					3544			
175 PCB 123L	**338**	**23.49**	**276227**	**1.66**	**442262**	**0.186801**		0	3232	no	1.936	99
	340	23.50	166035	yes					2109			
176 PCB 118L	**338**	**23.77**	**269622**	**1.69**	**429196**	**0.184141**		0	3153	no	1.906	98
	340	23.76	159574	yes					2009			
177 PCB 114L	**338**	**24.26**	**258233**	**1.68**	**411565**	**0.18982**		0	3006	no	1.773	101
	340	24.25	153332	yes					1927			
178 PCB 105L	**338**	**24.83**	**262717**	**1.64**	**422935**	**0.189758**		0	3062	no	1.822	101
	340	24.81	160218	yes					1989			
179 PCB 126L	**338**	**27.69**	**250071**	**1.67**	**399647**	**0.18829**		0	2593	no	1.735	100
	340	27.67	149576	yes					1660			
180 PCB 155L	**372**	**19.61**	**123698**	**1.28**	**220183**	**0.133747**		0	7182	no	1.404	71
	374	19.61	96485	yes					6147			
181 PCB 167L	**372**	**29.52**	**249742**	**1.3**	**441567**	**0.178429**		0	4105	no	2.11	95
	374	29.49	191825	yes					2317			
182 PCB 156L/157L	**372**	**30.68**	**464580**	**1.31**	**819811**	**0.363855**		0	6316	no	1.921	97
	374	30.69	355231	yes					3603			
183 PCB 169L	**372**	**34.10**	**149825**	**1.29**	**265627**	**0.120058**		0	2228	no	1.886	64
	374	34.07	115802	yes					1269			

184 PCB 188L	**406**	**24.20**	**107062**	**1.08**	**206481**	**0.132419**	0	3972	no	1.329	70
	408	24.21	99419	yes				4342			
185 PCB 180L	**406**	**32.11**	**98962**	**1.09**	**189797**	**0.134142**	0	3846	no	1.349	71
	408	32.09	90835	yes				3677			
186 PCB 170L	**406**	**33.44**	**87592**	**1.07**	**169124**	**0.13659**	0	3385	no	1.18	73
	408	33.42	81531	yes				3249			
187 PCB 189L	**406**	**36.84**	**226251**	**1.06**	**438903**	**0.193913**	0	2245	no	2.157	103
	408	36.83	212651	yes				4287			
188 PCB 202L	**440**	**29.25**	**88688**	**0.94**	**183253**	**0.123049**	0	1778	no	1.419	65
	442	29.27	94565	yes				4556			
189 PCB 205L	**440**	**39.73**	**116858**	**0.92**	**244339**	**0.152081**	0	2941	no	1.531	81
	442	39.73	127481	yes				3819			
190 PCB 208L	**474**	**36.29**	**73458**	**0.8**	**165304**	**0.138275**	0	2359	no	1.139	74
	476	36.28	91846	yes				2656			
191 PCB 206L	**474**	**41.71**	**53924**	**0.79**	**122155**	**0.153286**	0	1672	no	0.76	82
	476	41.73	68232	yes				1865			
192 PCB 209L	**510**	**43.54**	**61724**	**1.16**	**114933**	**0.151237**	0	2742	no	0.724	80
	512	43.53	53210	yes				3794			
193 PCB 28L	**268**	**14.41**	**398376**	**1.08**	**766331**	**0.261491**	0.001	1237	no	2.039	125
PCB Cleanup Standard	270	14.43	367955	yes				824			
194 PCB 111L	**338**	**21.83**	**219618**	**1.65**	**352732**	**0.214746**	0	4758	no	1.343	103
PCB Cleanup Standard	340	21.84	133115	yes				2602			
195 PCB 178L	**406**	**26.98**	**82147**	**1.04**	**161299**	**0.187627**	0	2877	no	0.733	90
PCB Cleanup Standard	408	26.97	79152	yes				3269			
196 PCB 31L	268	NotFnd	*	*	*		0.001		no	1.934	
PCB Audit Standard	270	14.26	*	no							
197 PCB 95L	338	NotFnd	*	*	*		0		no	0.946	
PCB Audit Standard	340	17.73	*	no							
198 PCB 153L	372	NotFnd	*	*	*		0		no	1.225	
PCB Audit Standard	374	25.40	*	no							
199 PCB 9L	**234**	**11.19**	**2330435**	**1.64**	**3751749**	**8.393337**	-	11372	no	-	-
PCB Recovery Standard	236	11.19	1421314	yes				15124			
200 PCB 52L	**302**	**15.36**	**666620**	**0.8**	**1501355**	**6.402231**	-	8513	no	-	-
PCB Recovery Standard	304	15.36	834735	yes				7887			
201 PCB 101L	**338**	**19.77**	**789963**	**1.62**	**1277714**	**6.762128**	-	18466	no	-	-
PCB Recovery Standard	340	19.76	487751	yes				10306			
202 PCB 138L	**372**	**26.57**	**689016**	**1.28**	**1225413**	**7.193607**	-	29768	no	-	-
PCB Recovery Standard	374	26.56	536397	yes				26376			
203 PCB 194L	**440**	**39.18**	**529865**	**0.94**	**1096120**	**7.723644**	-	13817	no	-	-
PCB Recovery Standard	442	39.17	566256	yes				17470			

Chlorobiphenyls	-0.00051	0	-0.00051
Dichlorobiphenyls	0.081462	6	-0.00157
Trichlorobiphenyls	0.884385	17	-0.0016
Tetrachlorobiphenyls	1.482493	23	-0.00217
Pentachlorobiphenyls	0.756558	19	-0.00156
Hexachlorobiphenyls	1.69035	22	-0.00164
Heptachlorobiphenyls	0.572426	13	-0.00156
Octachlorobiphenyls	0.045026	8	-0.00122
Nonachlorobiphenyls	-0.0008	0	-0.0008
Decachlorobiphenyl	-0.00097	0	-0.00097
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Printed: February 23, 2016 12:17:46 PM Eastern Standard Time

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Vial: 3
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

R

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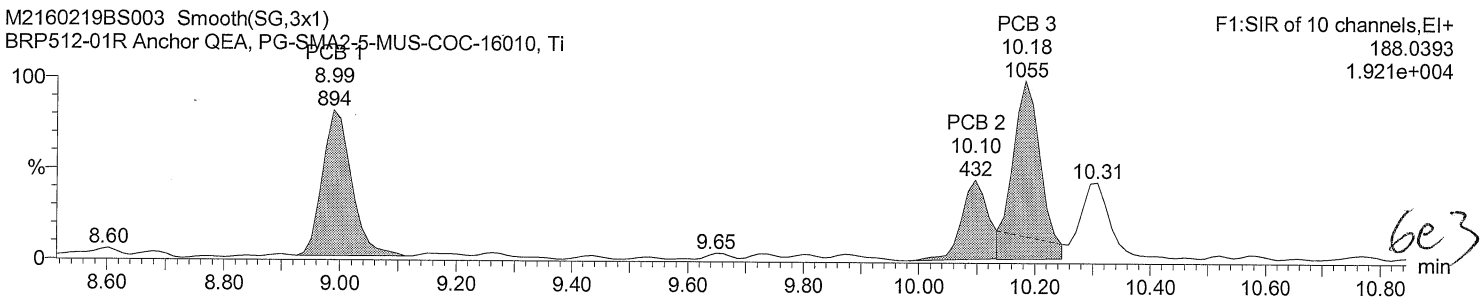

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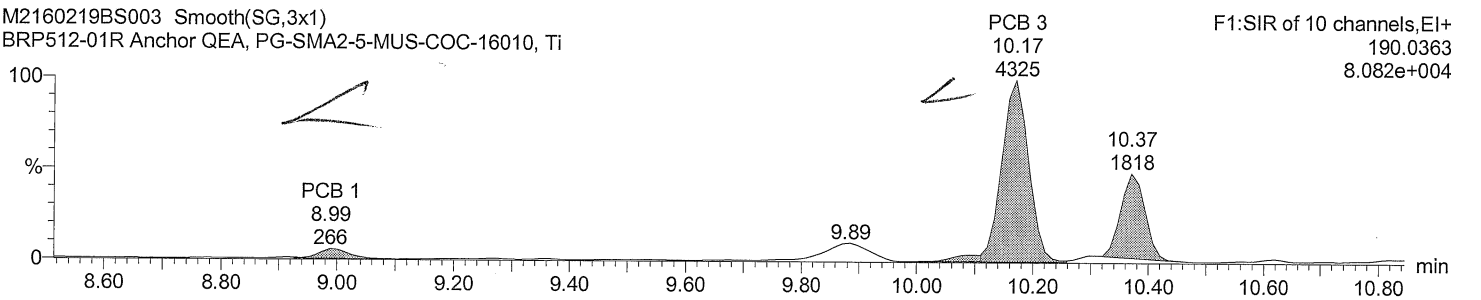

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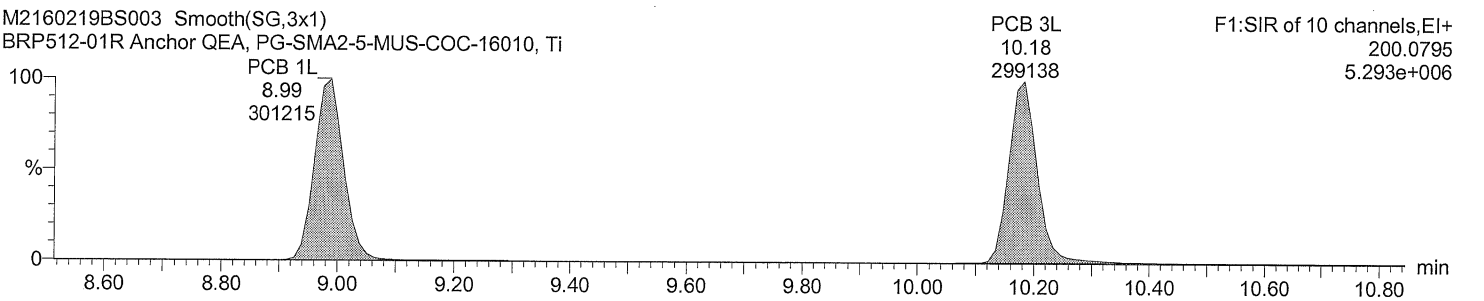

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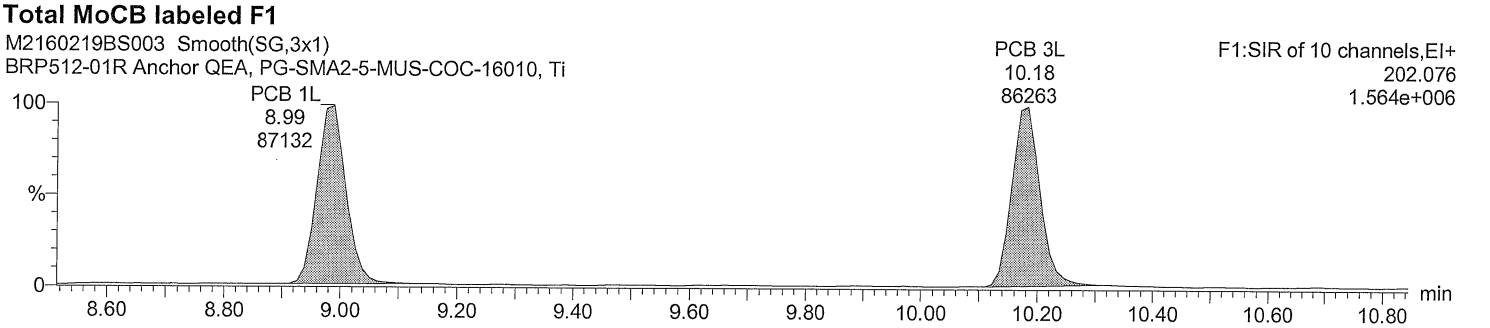

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Vial: 3
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

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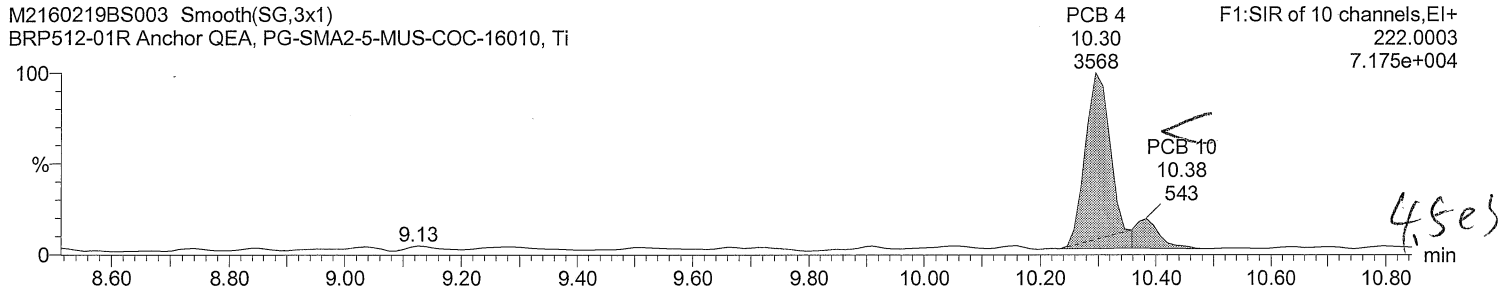

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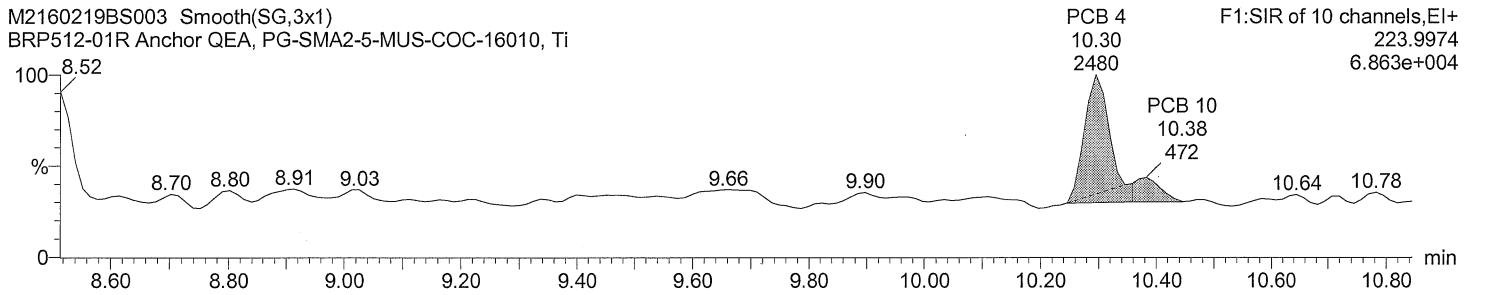

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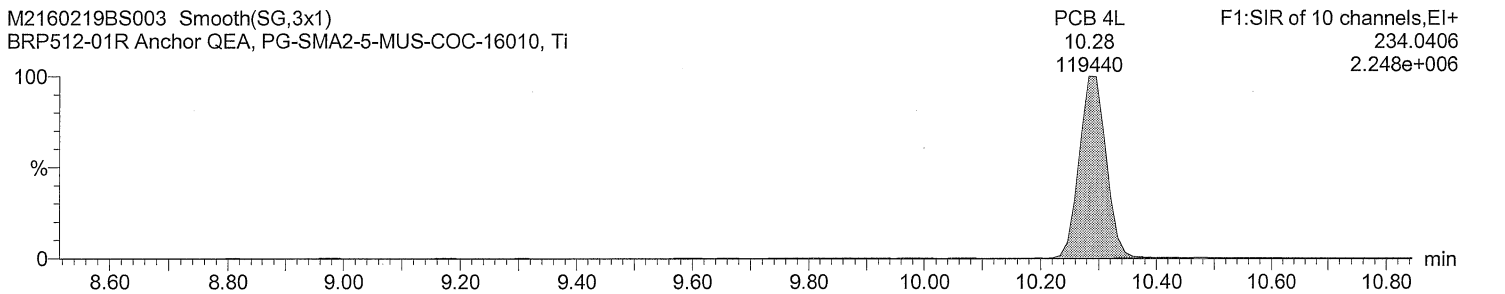

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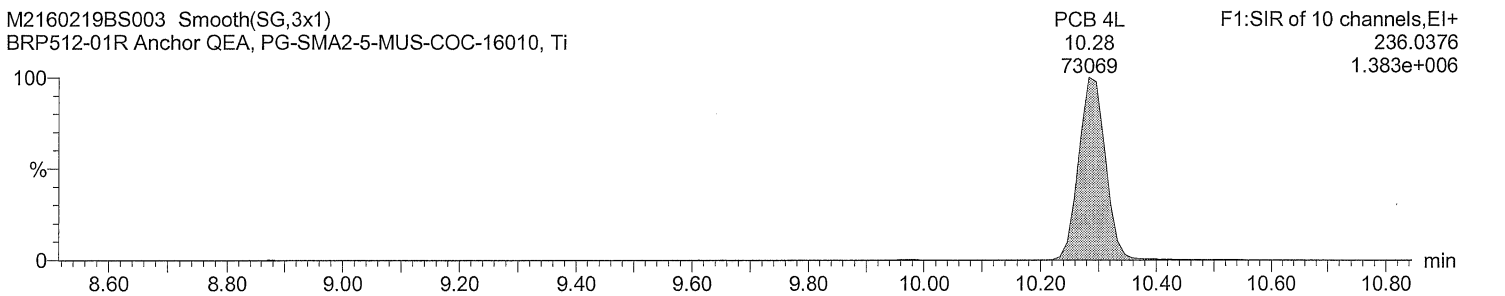

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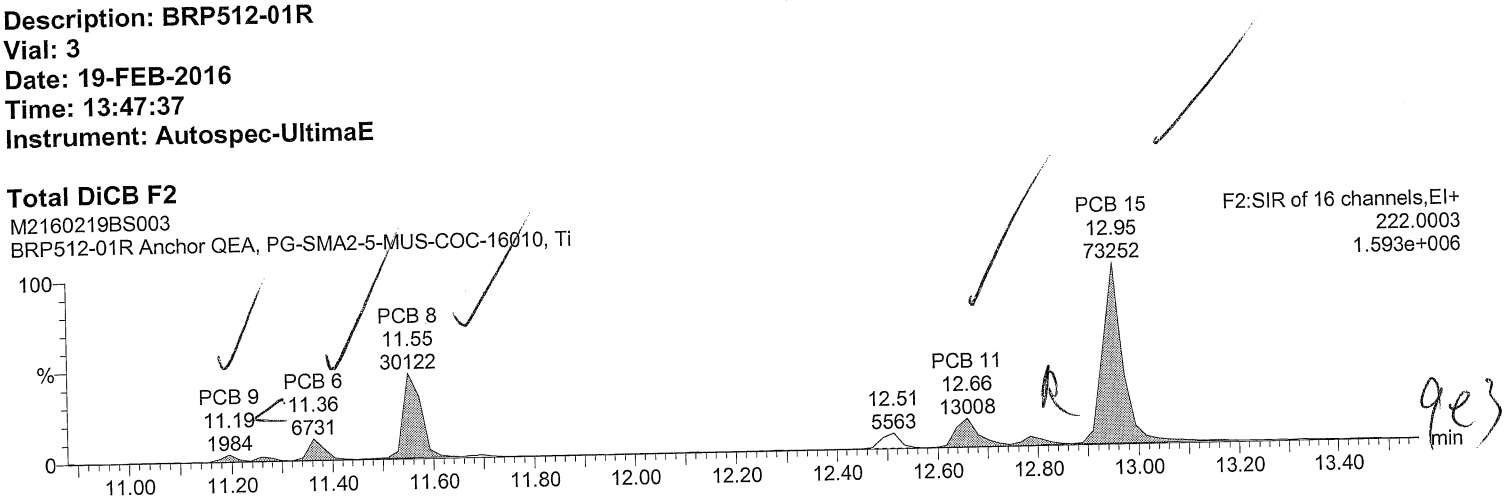
Vial: 3
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

Total DiCB F2
M2160219BS003
BRP512-01R Anchor QEA, PG-SMA2-5-MUS-COC-16010, Ti



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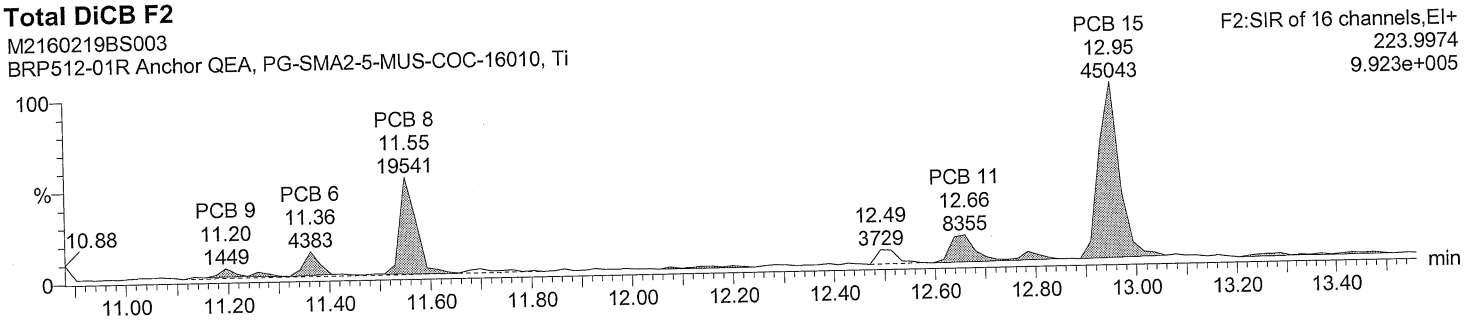
BRP512-01R Anchor QEA, PG-SMA2-5-MUS-COC-16010, Ti



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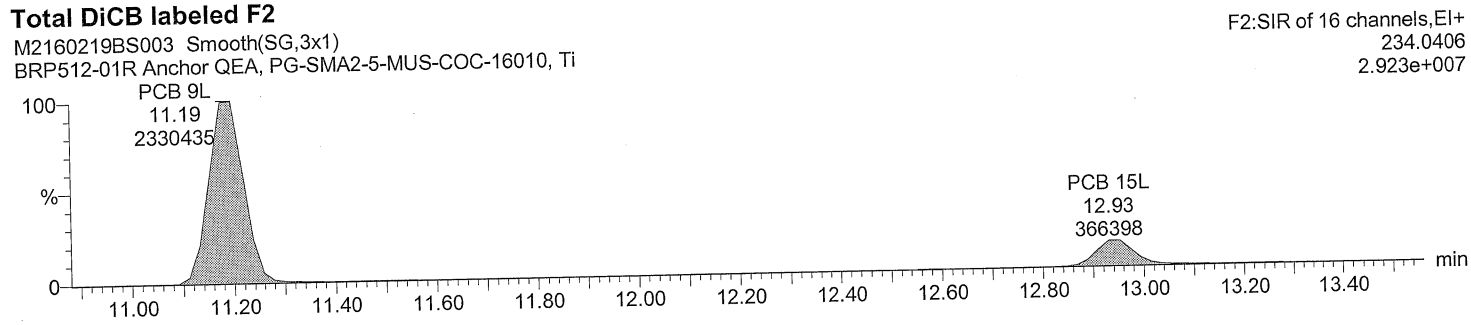

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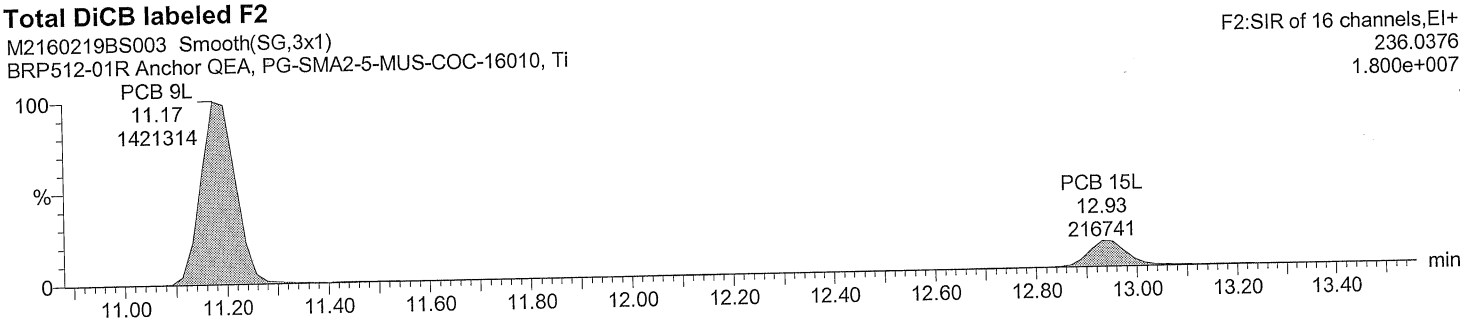

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Date: 19-FEB-2016
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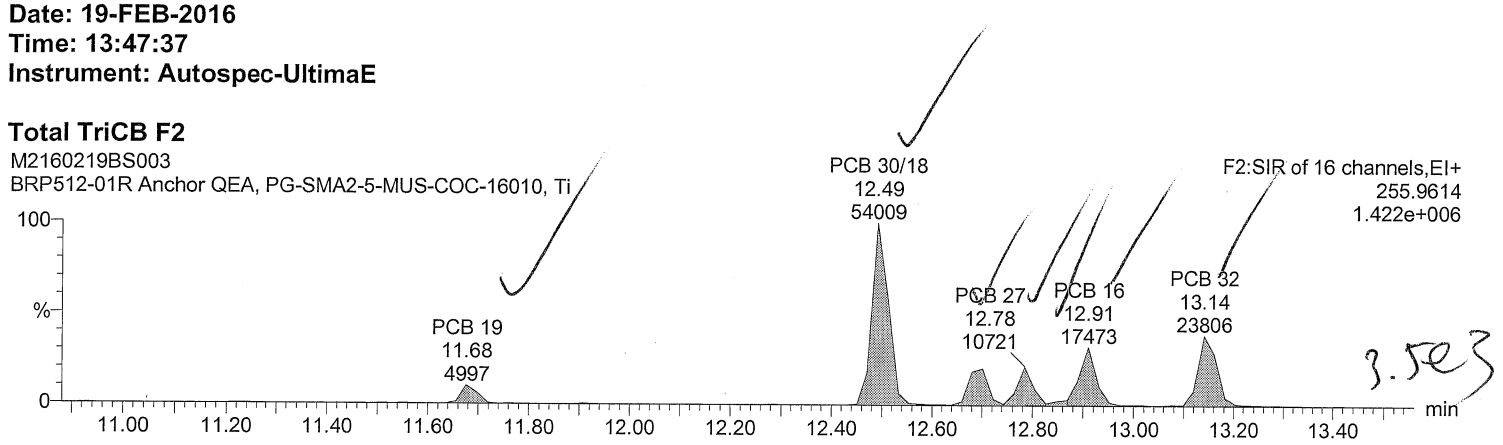
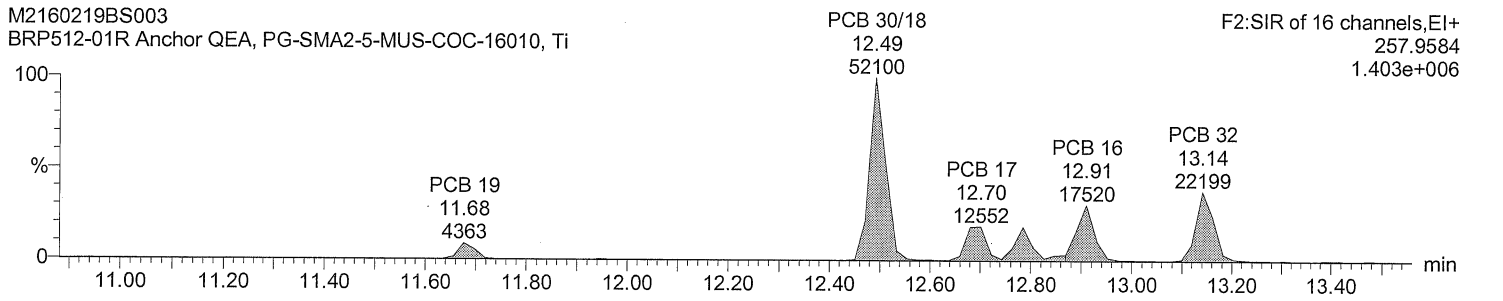
Instrument: Autospec-UltimaE

Total TriCB F2



Total TriCB F2



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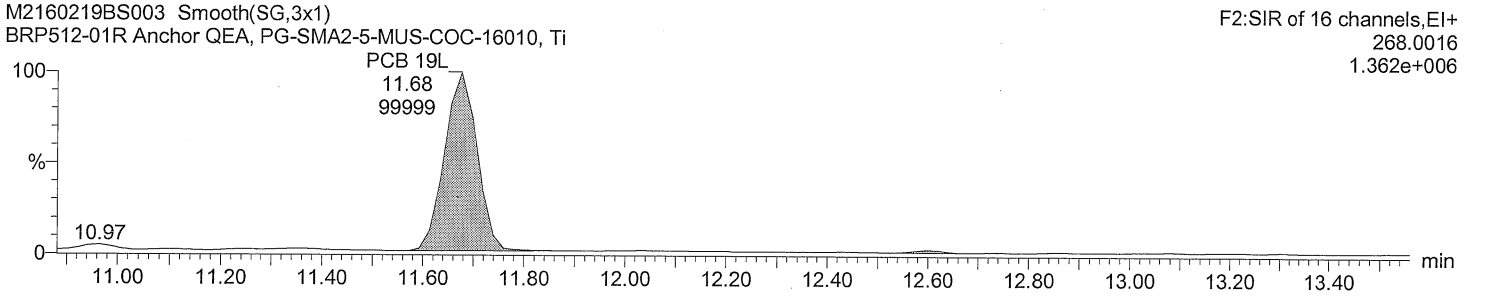

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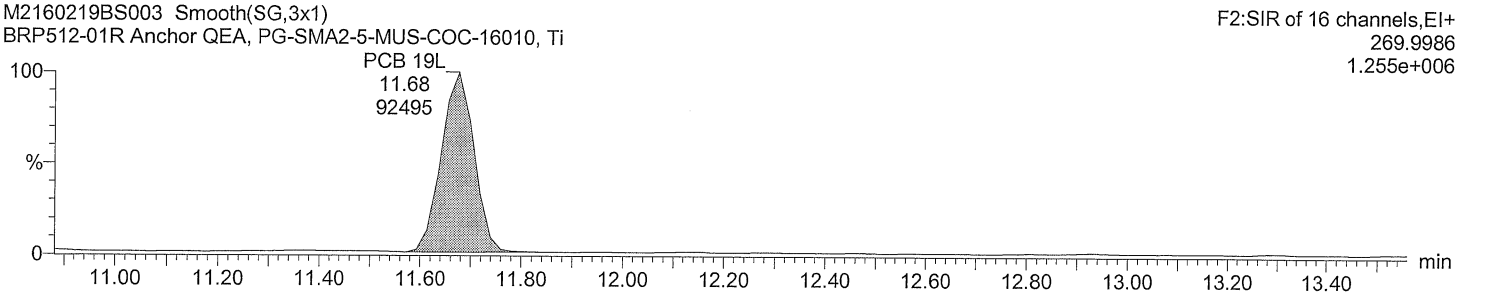
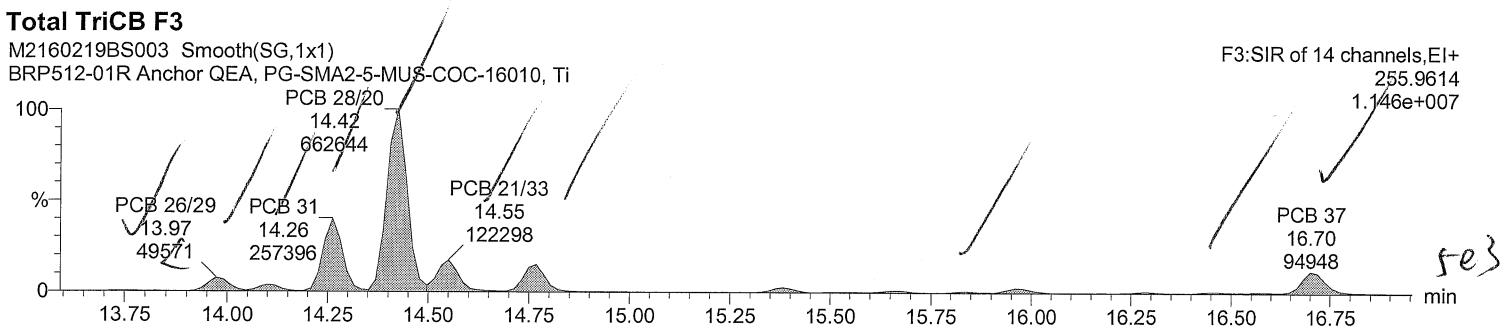


Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

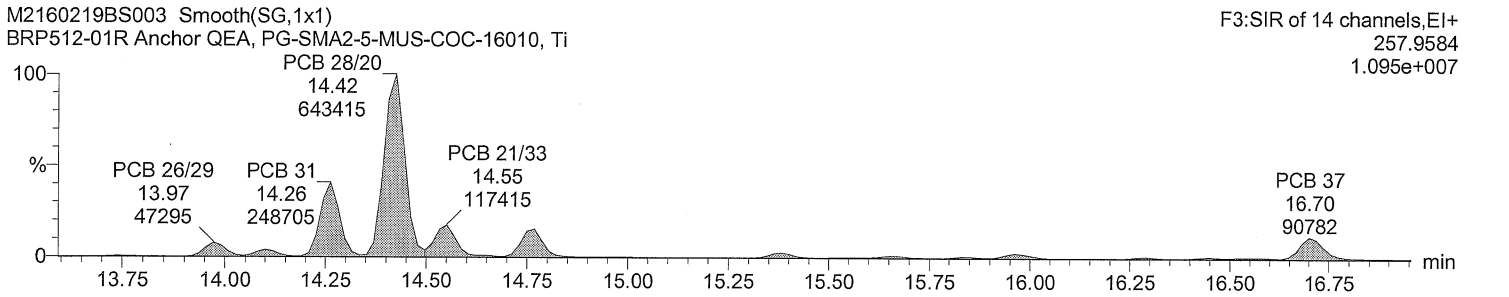
Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
Printed: February 23, 2016 12:17:46 PM Eastern Standard Time

Description: BRP512-01R
Vial: 3
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

Total TriCB F3



Total TriCB F3



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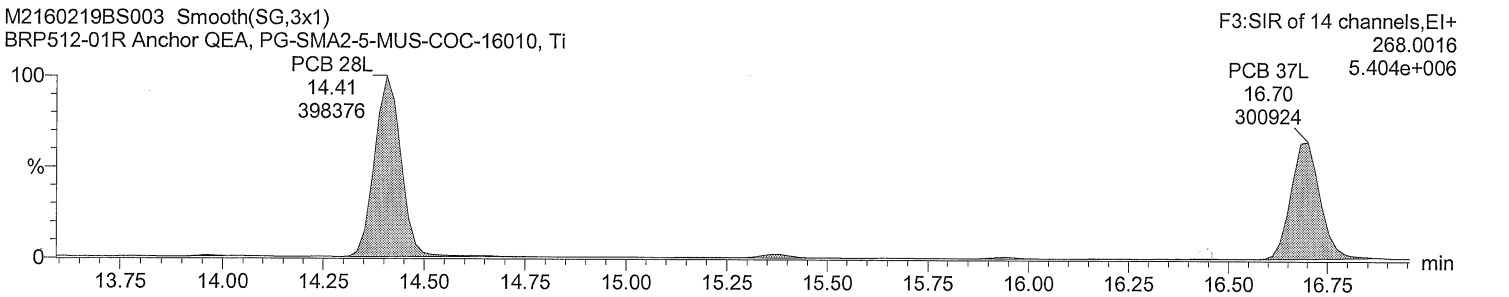

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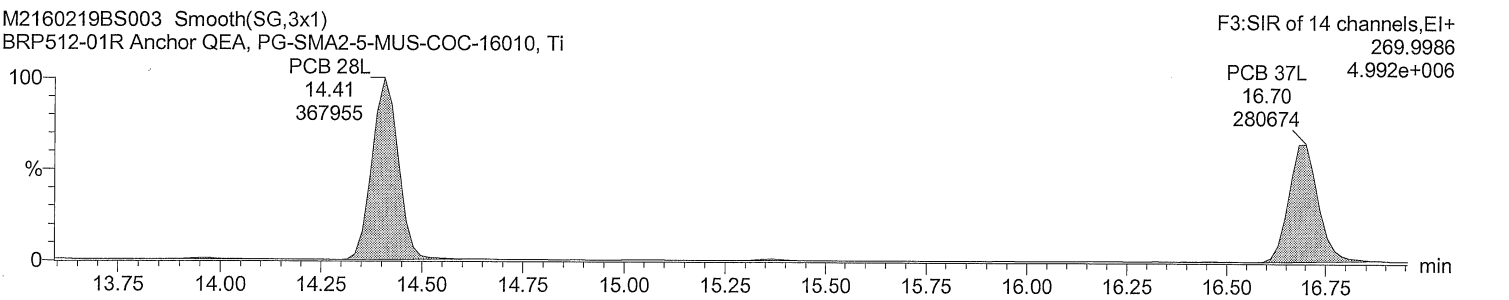

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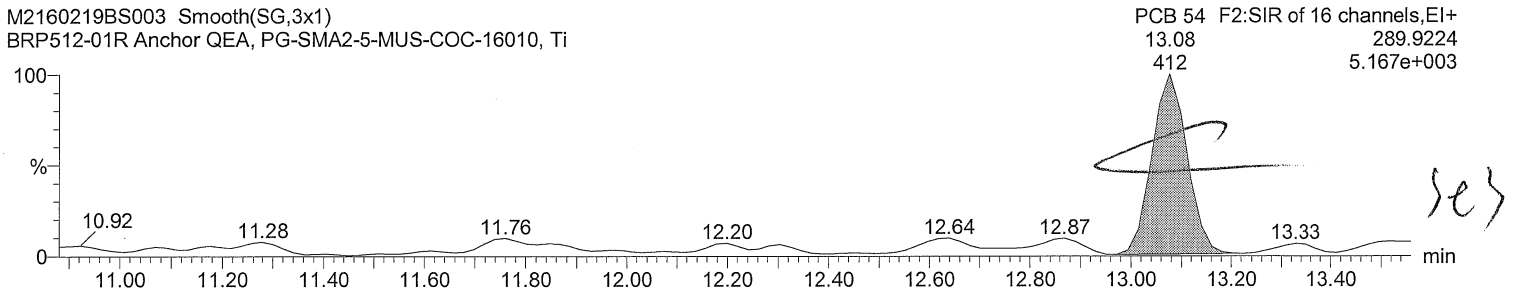
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

Total TeCB F2



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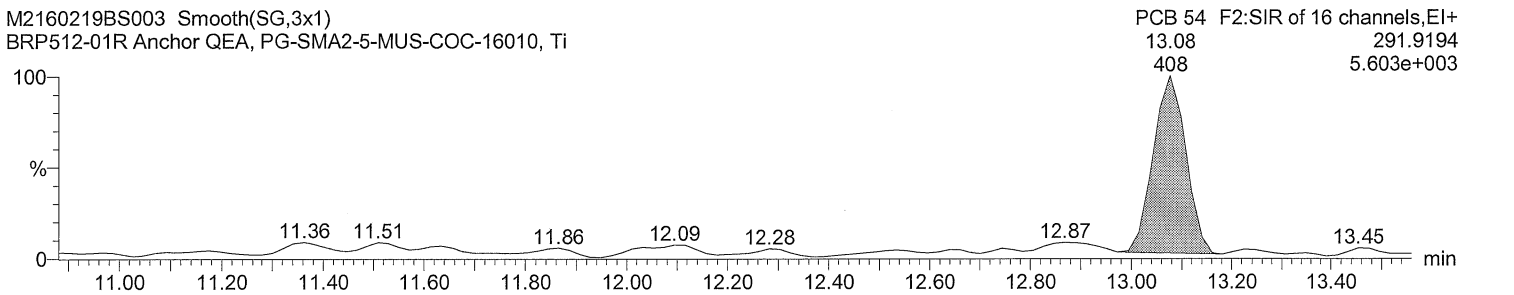

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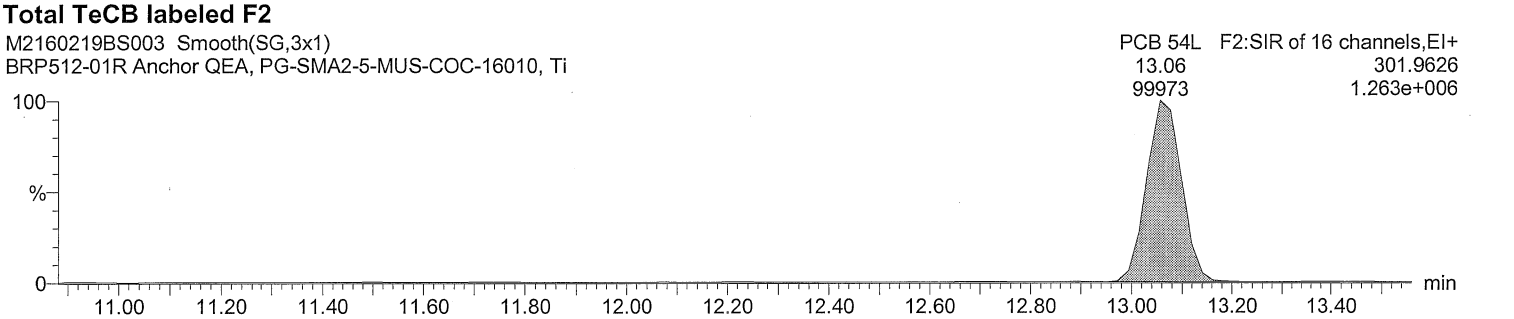

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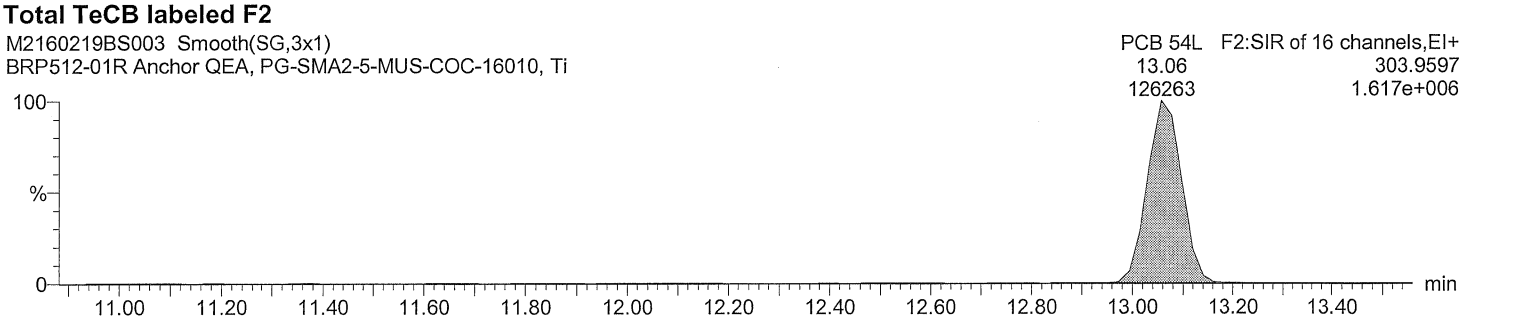

Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

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Description: BRP512-01R
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Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

Total TeCB F3
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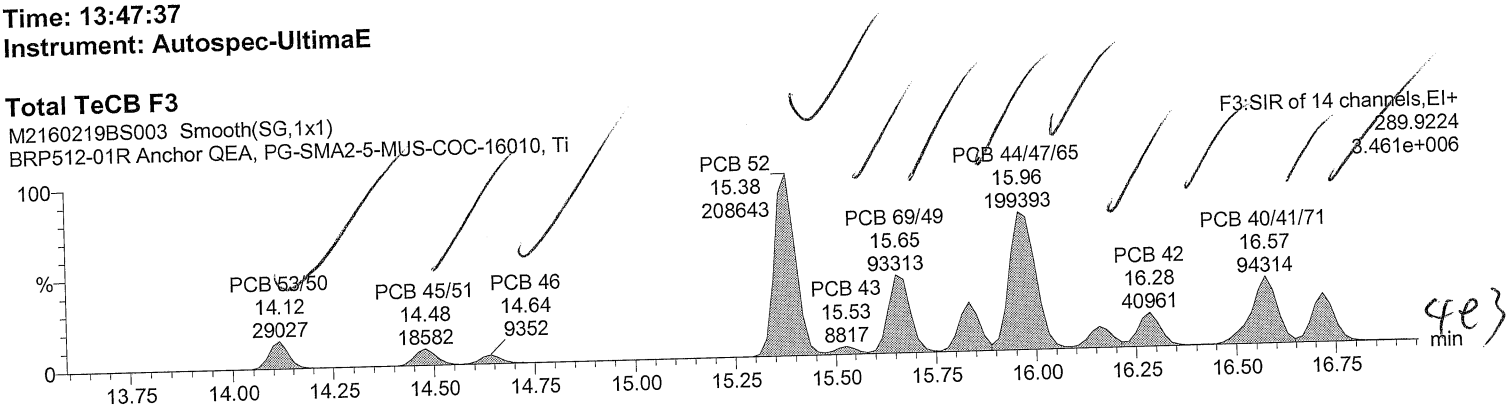
BRP512-01R Anchor QEA, PG-SMA2-5-MUS-COC-16010, Ti



Total TeCB F3
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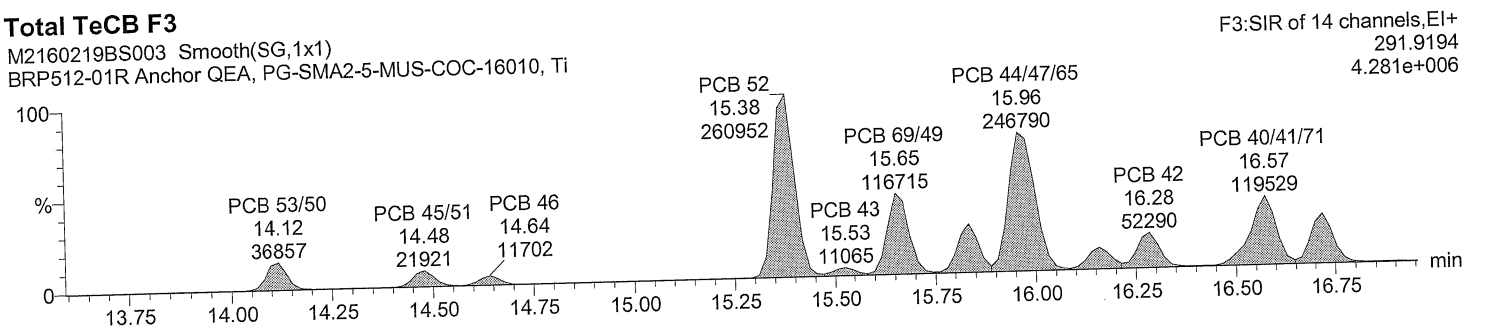
BRP512-01R Anchor QEA, PG-SMA2-5-MUS-COC-16010, Ti



Total TeCB labeled F3
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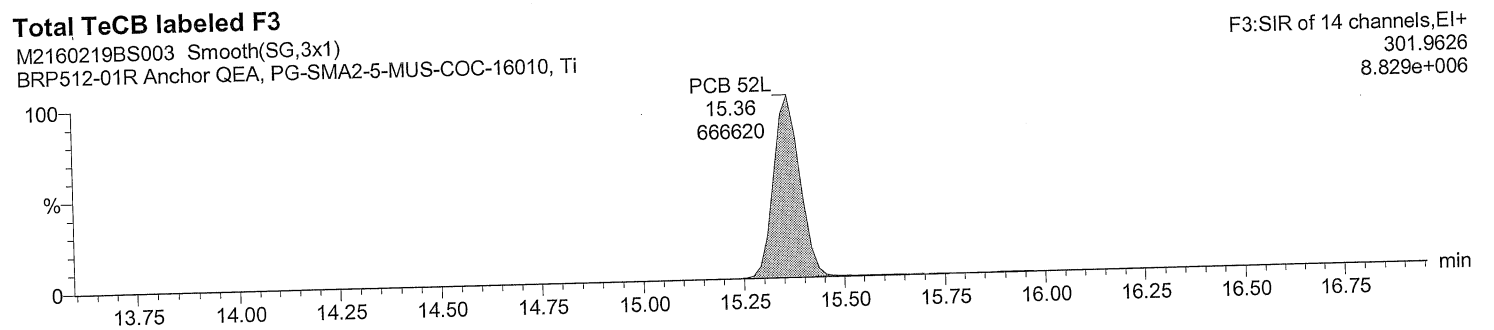

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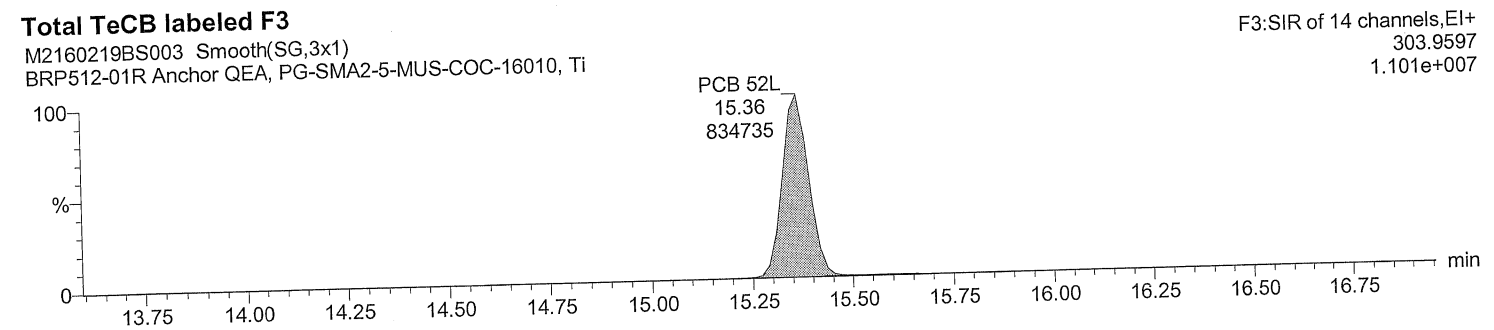

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Description: BRP512-01R
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Date: 19-FEB-2016
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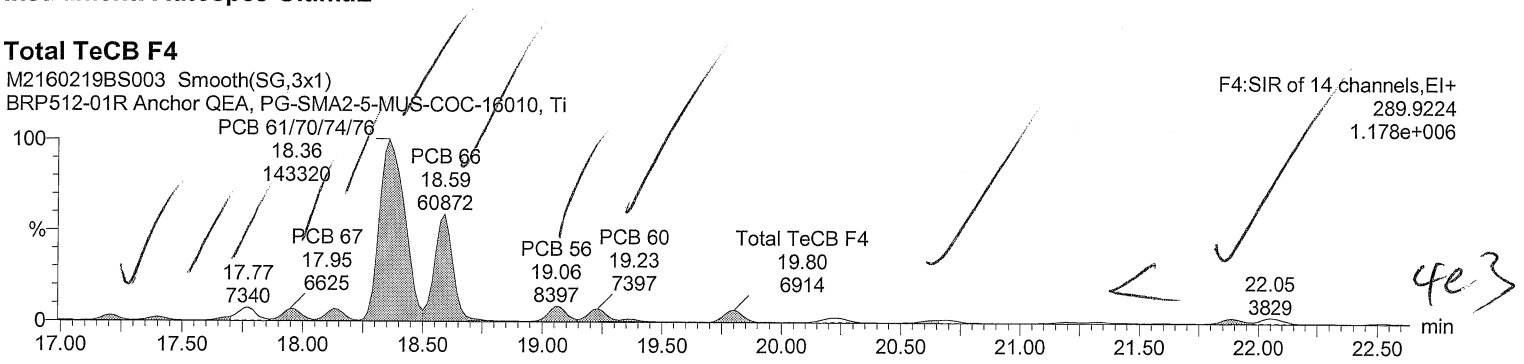
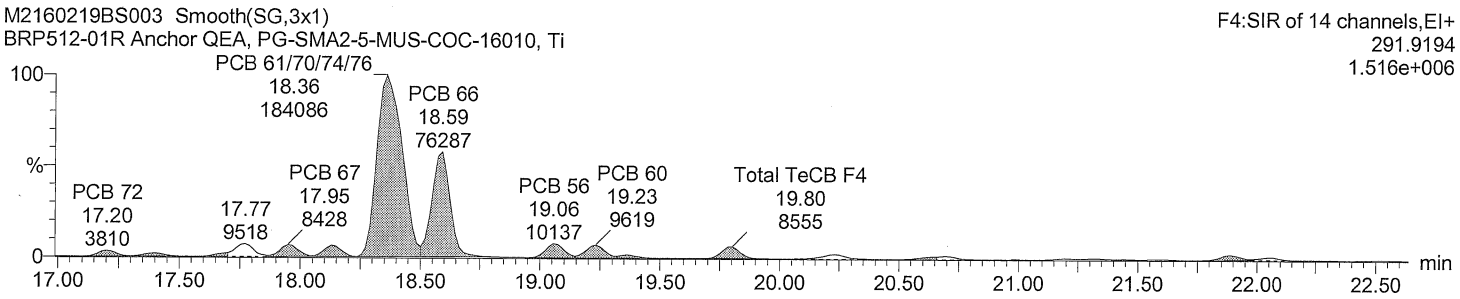
Instrument: Autospec-UltimaE

Total TeCB F4



Total TeCB F4



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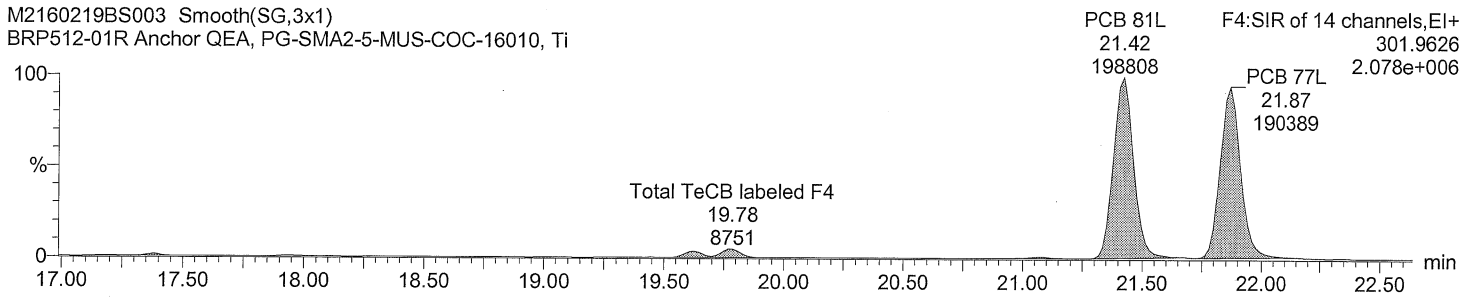

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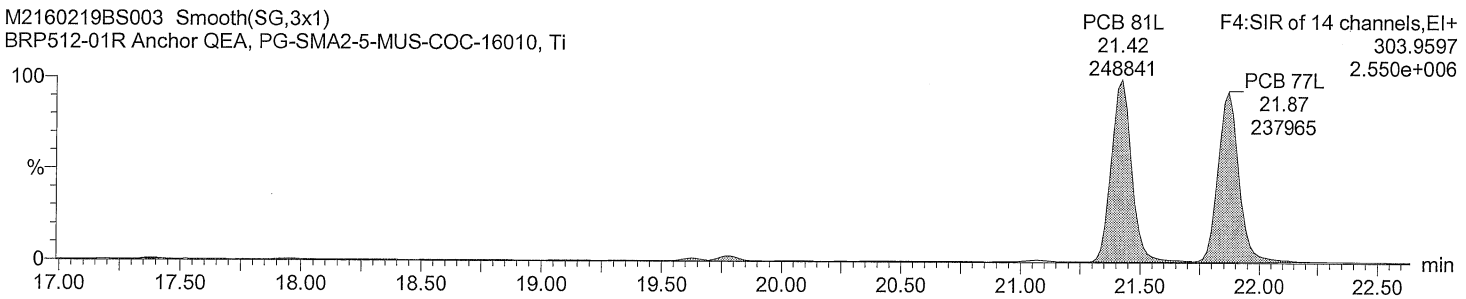

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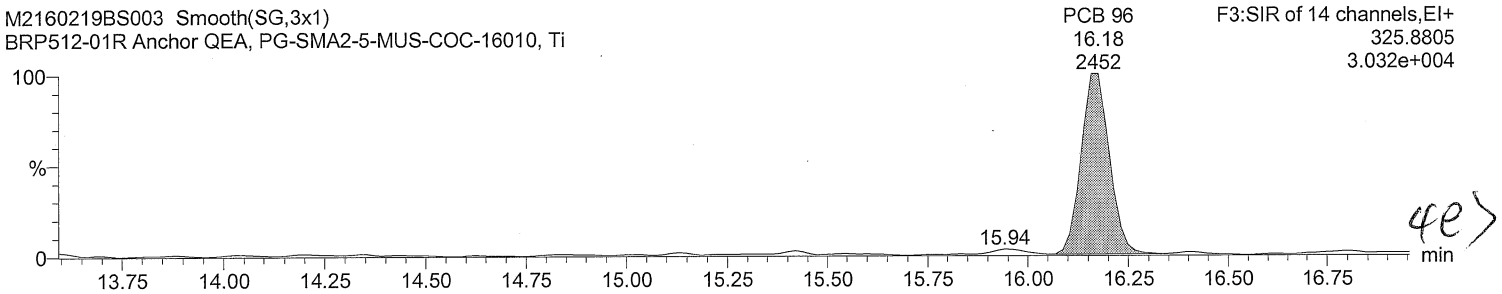
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

Total PeCB F3



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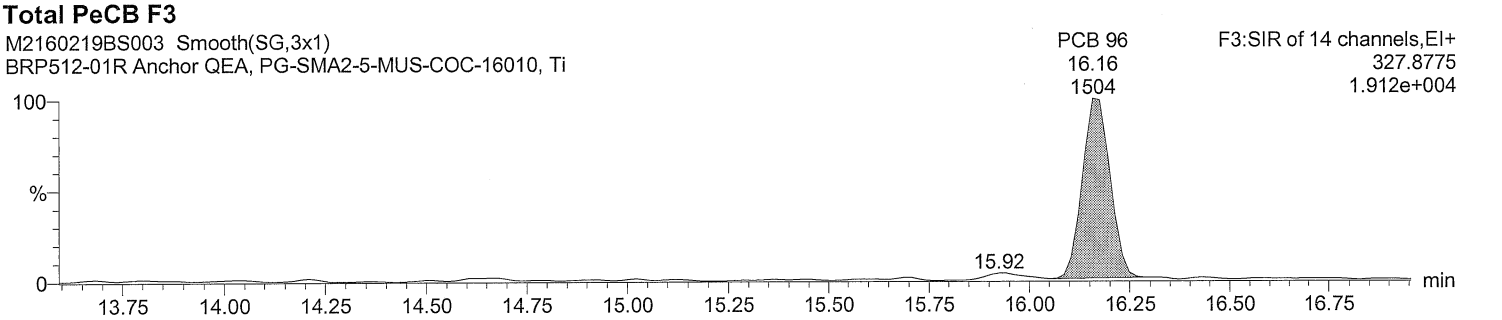

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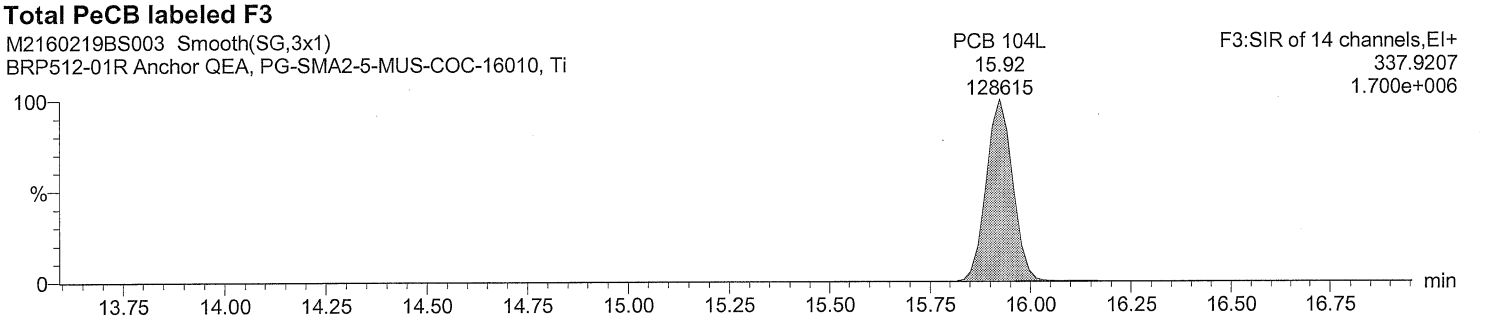

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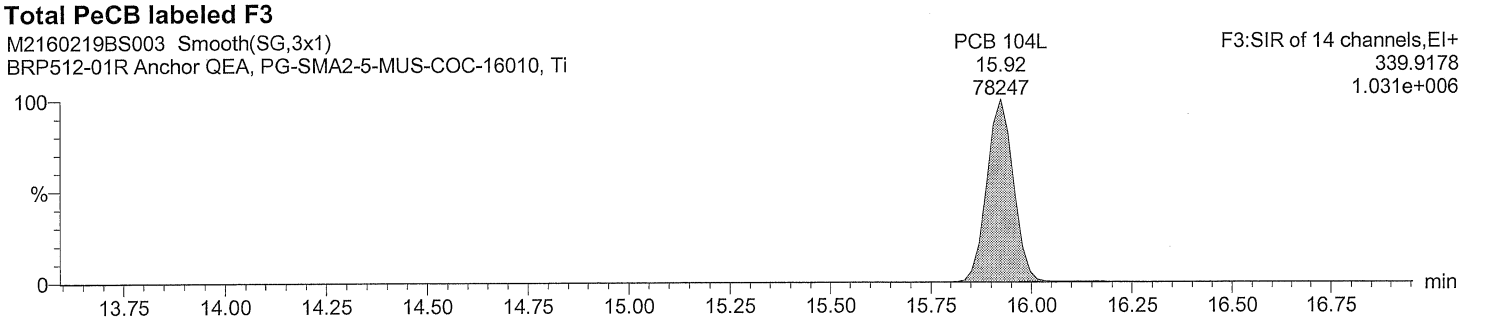

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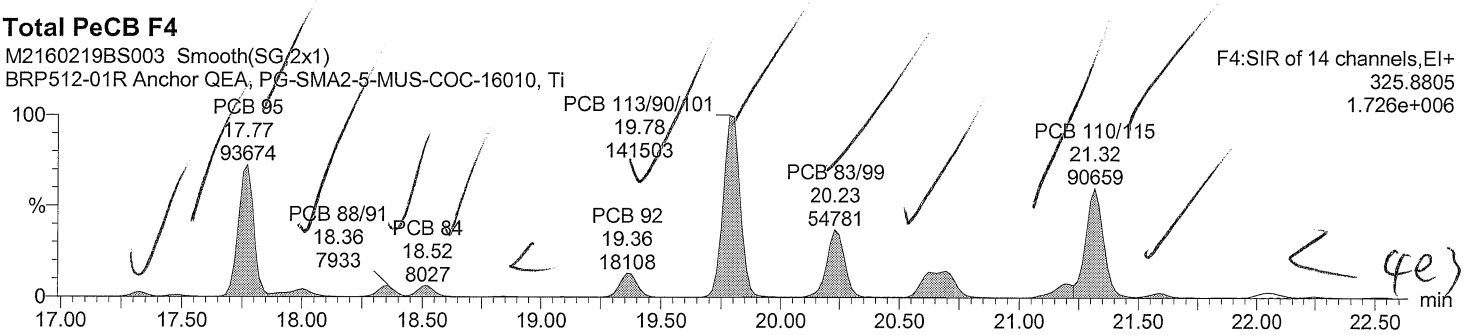
Instrument: Autospec-UltimaE

Total PeCB F4



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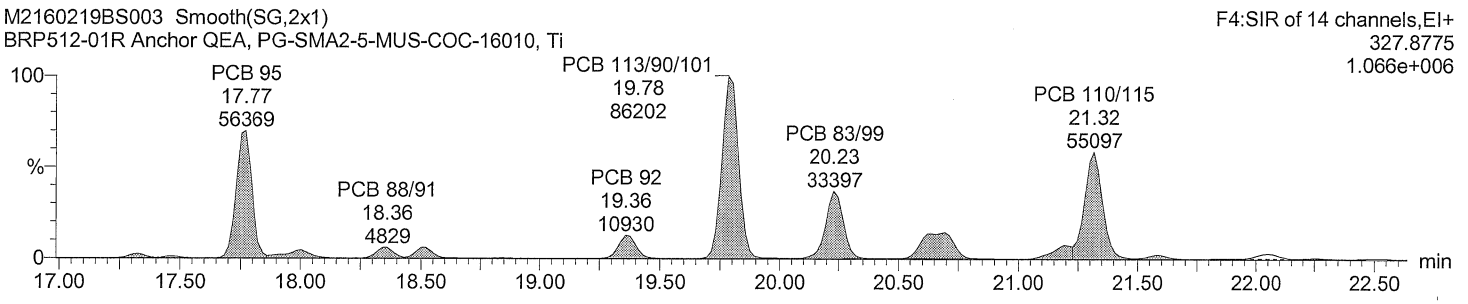

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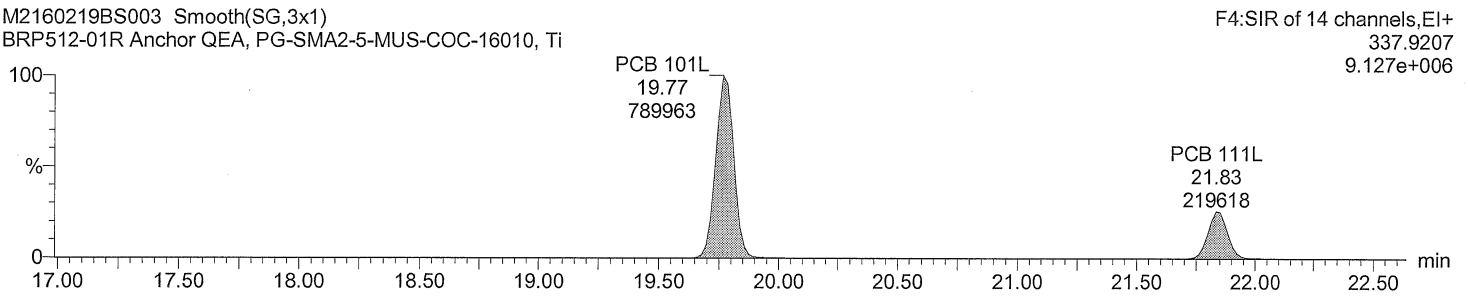

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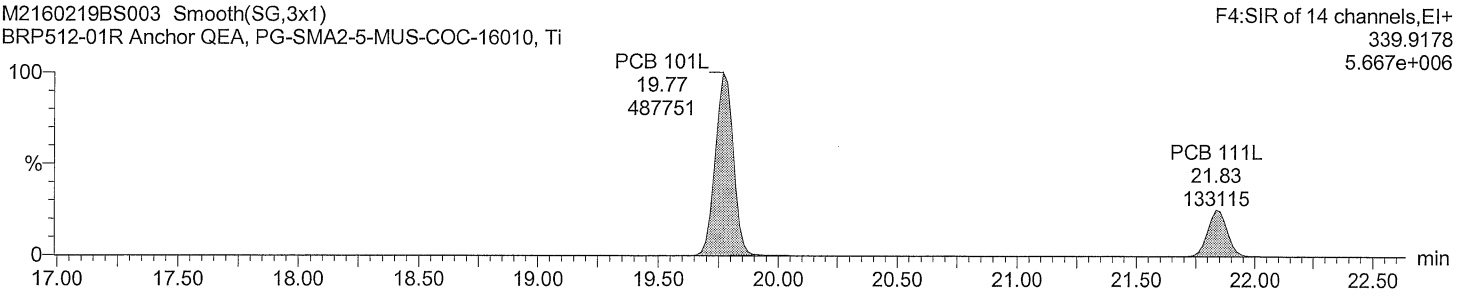

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Description: BRP512-01R
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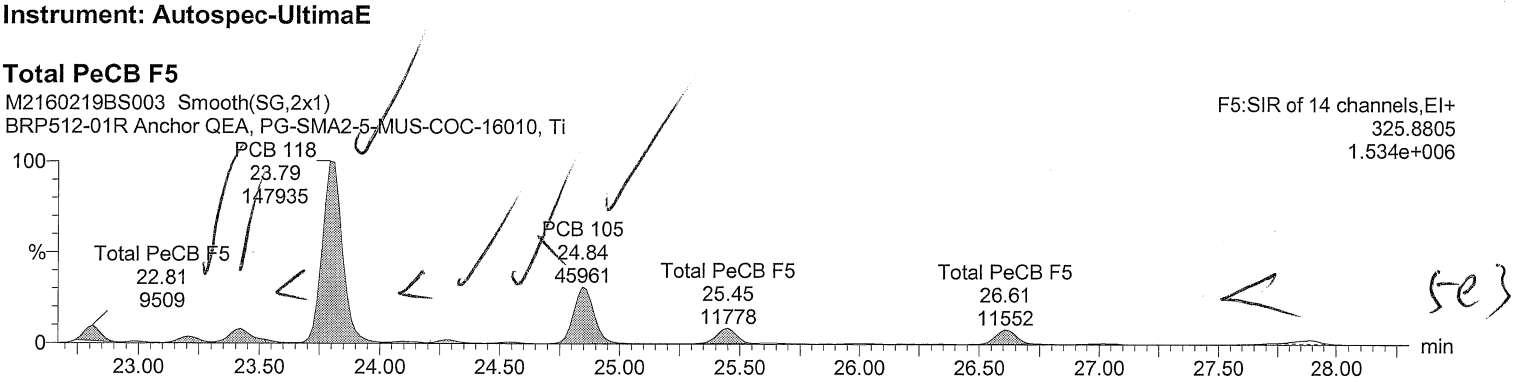
Instrument: Autospec-UltimaE

Total PeCB F5



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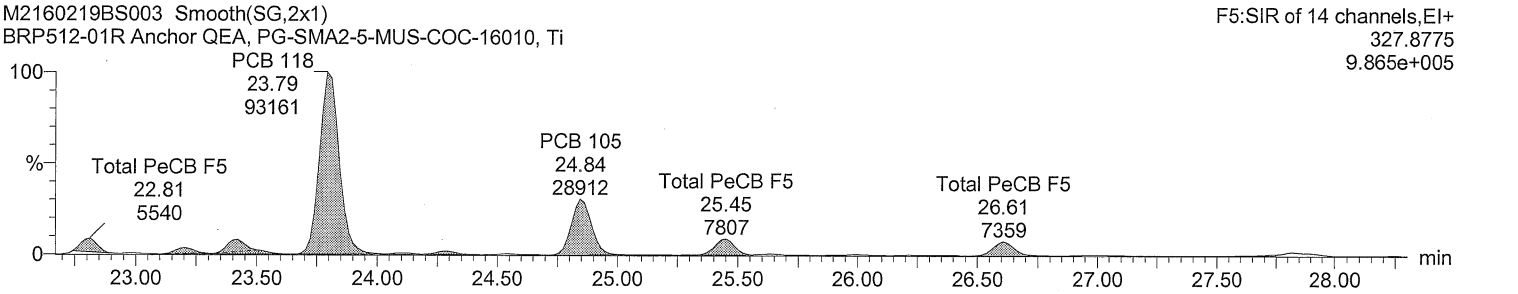

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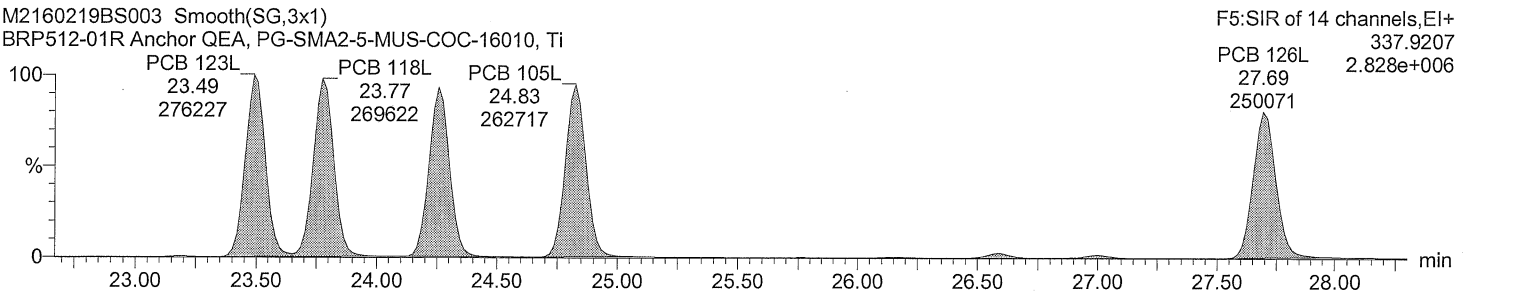

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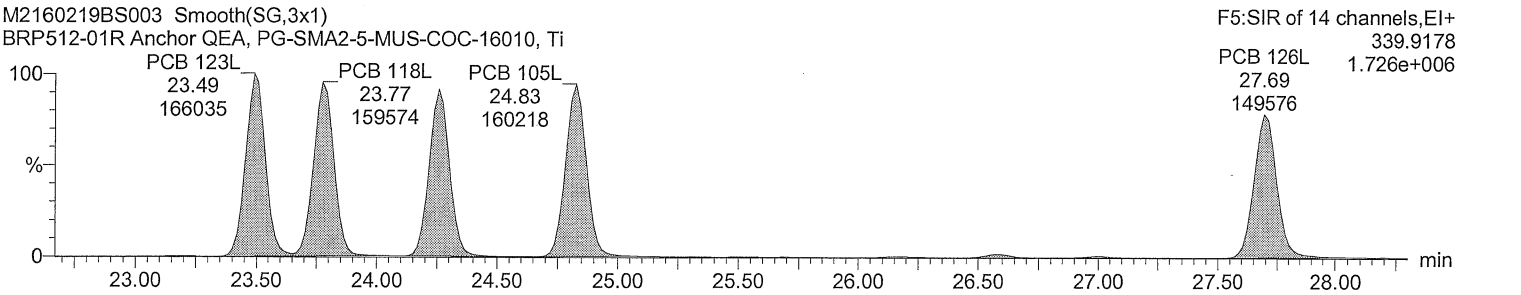

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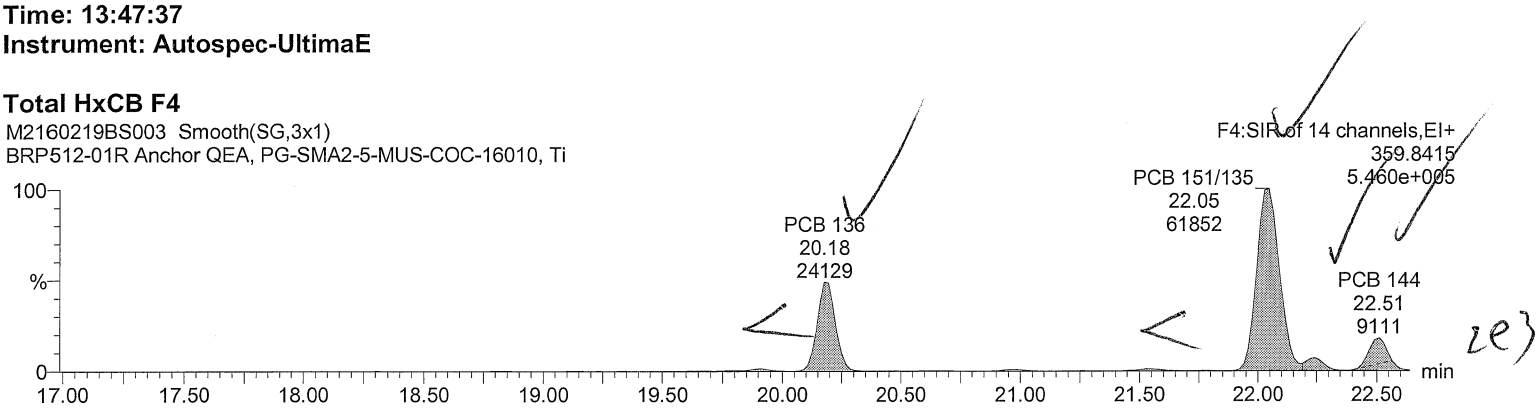
Total HxCB F4



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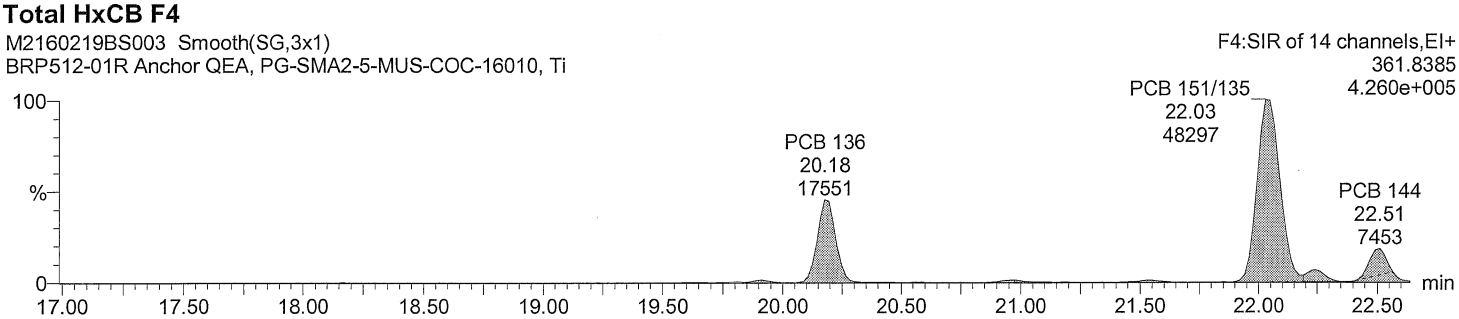

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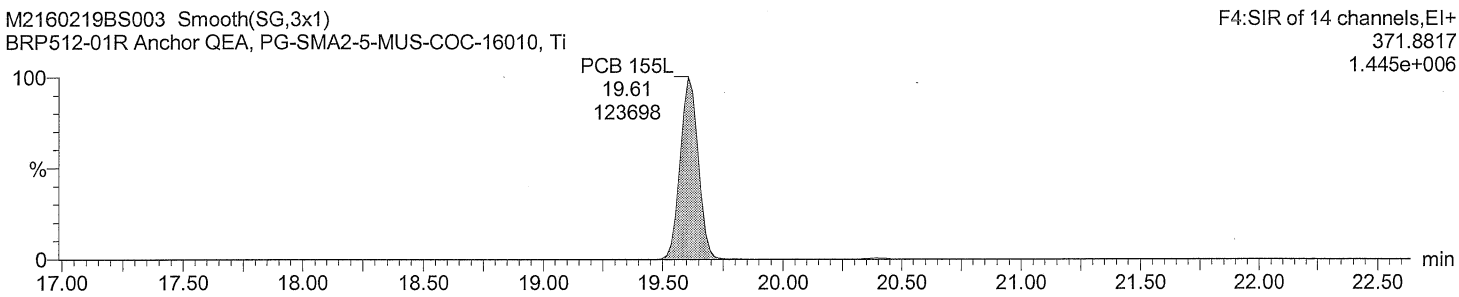

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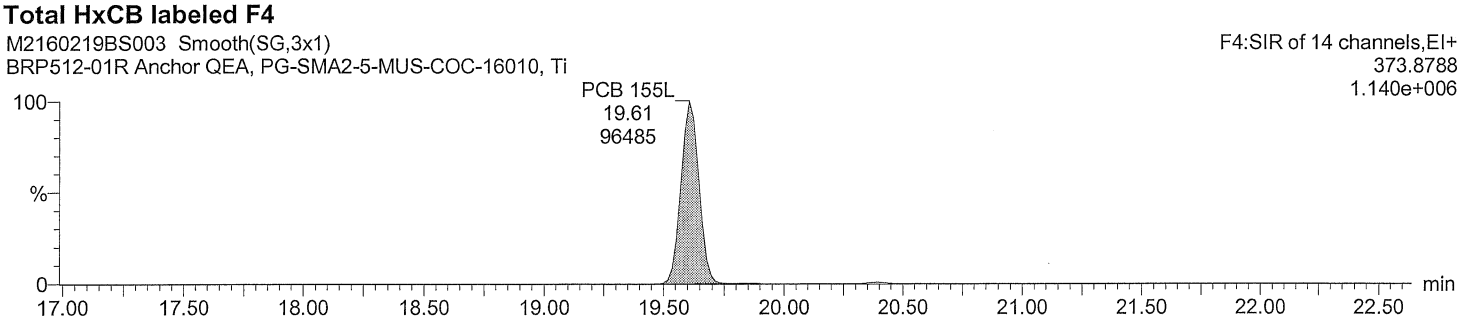

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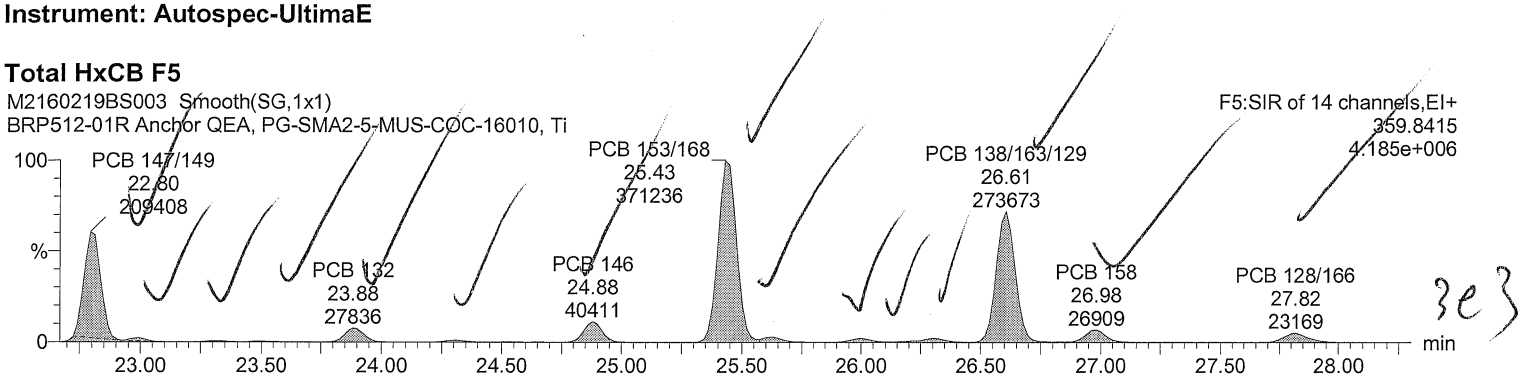
Total HxCB F5



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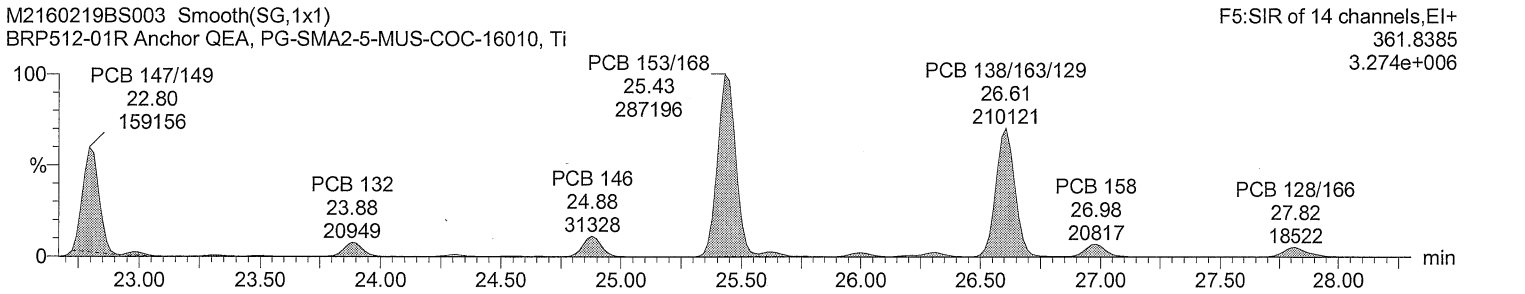

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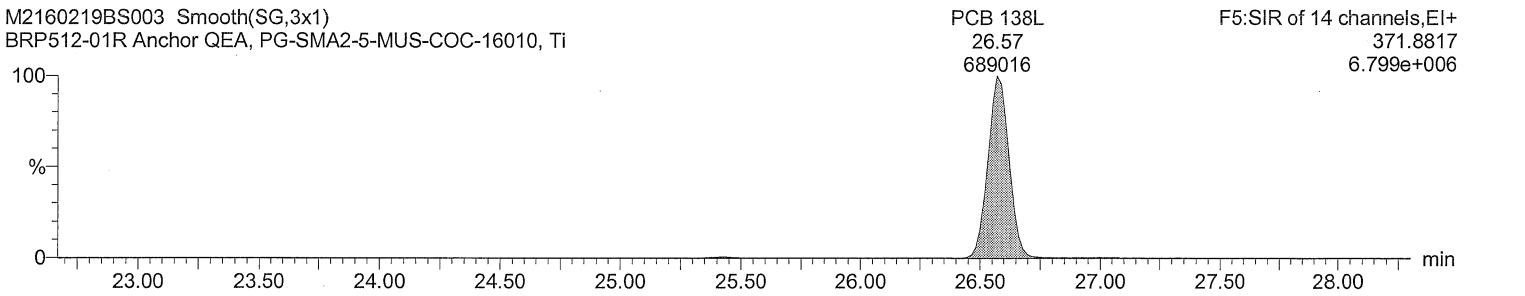

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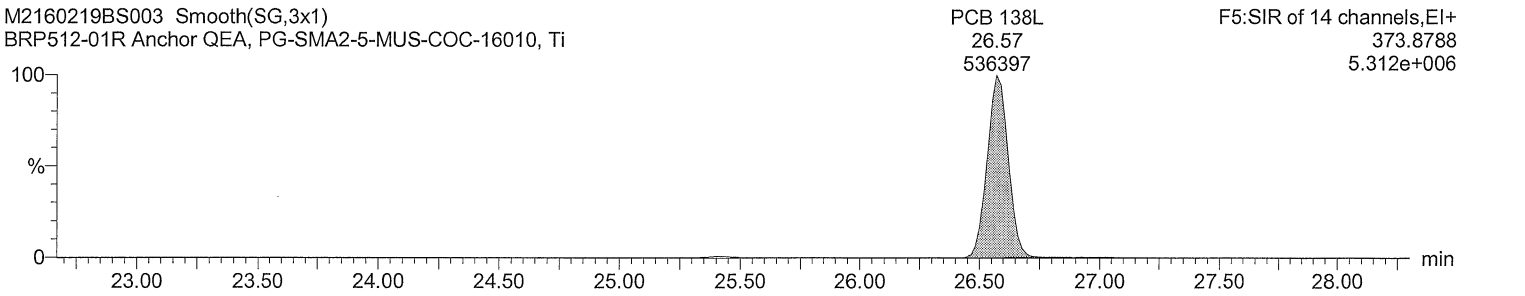

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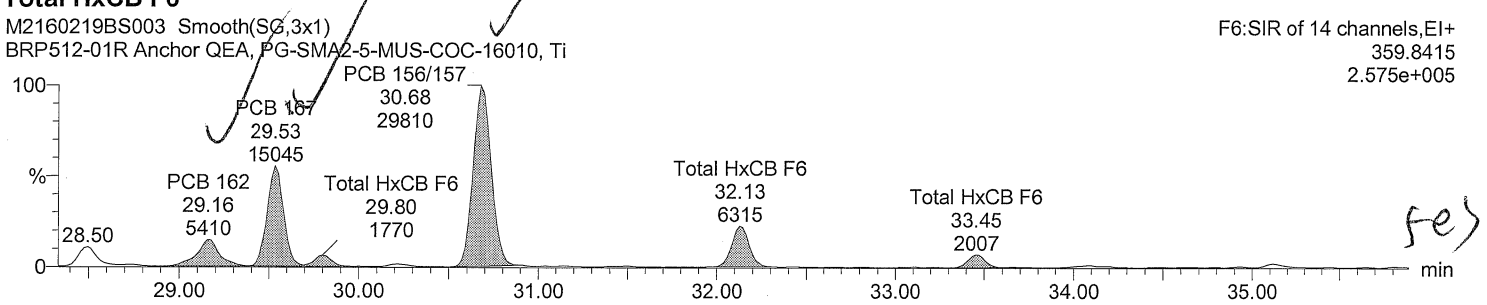
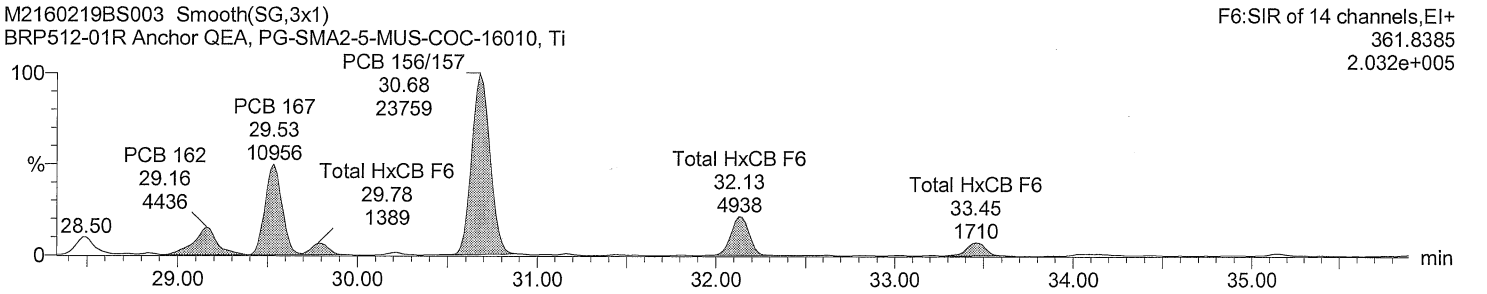
Instrument: Autospec-UltimaE

Total HxCB F6



Total HxCB F6



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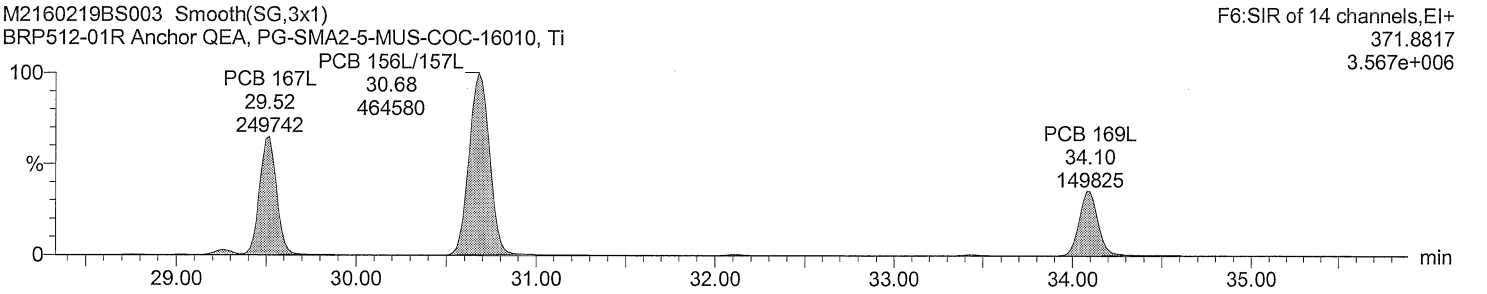

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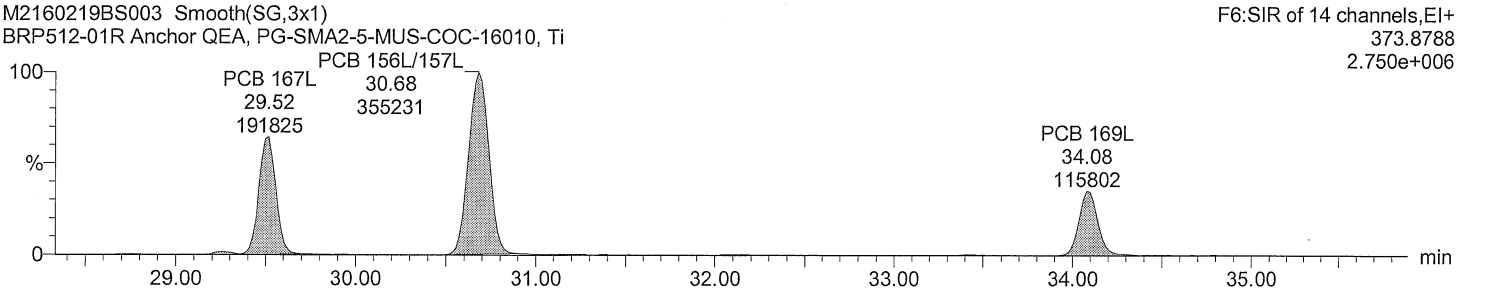

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Date: 19-FEB-2016
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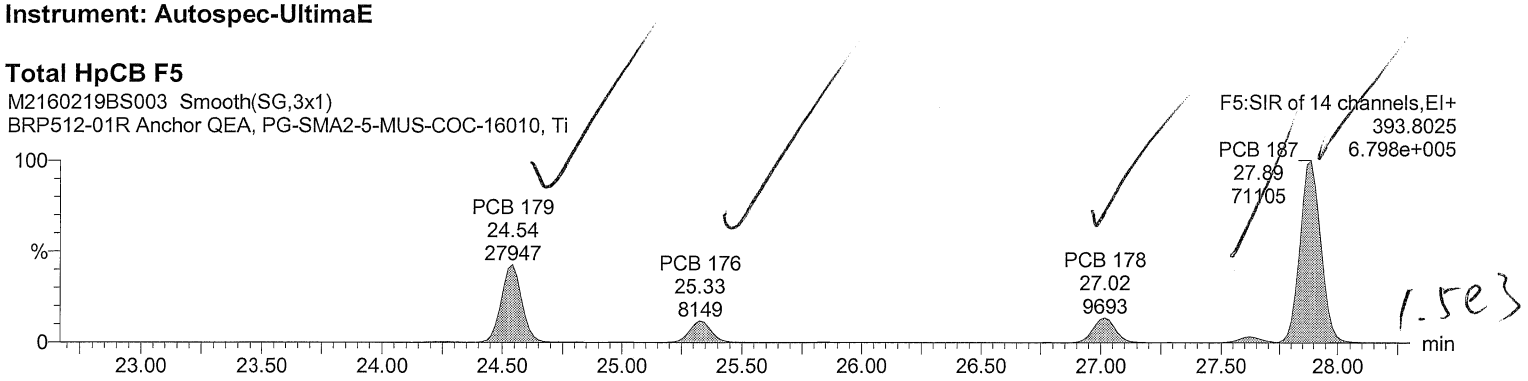
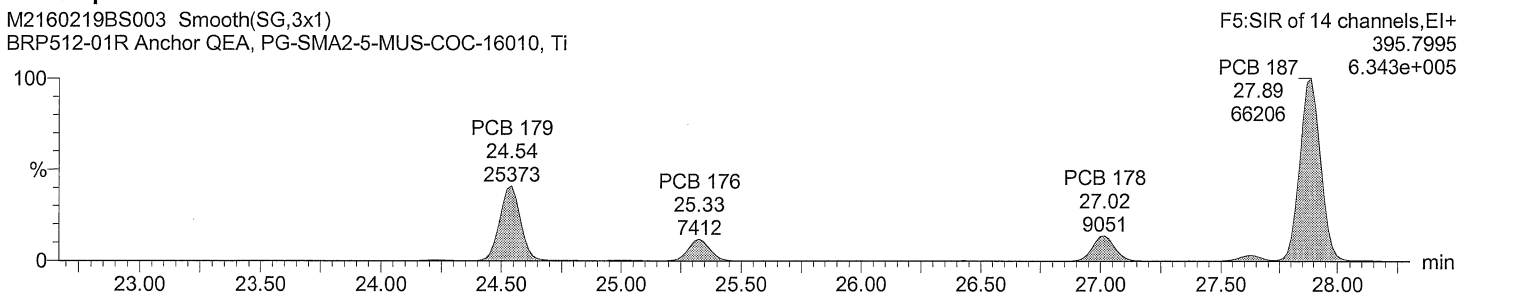
Instrument: Autospec-UltimaE

Total HpCB F5



Total HpCB F5



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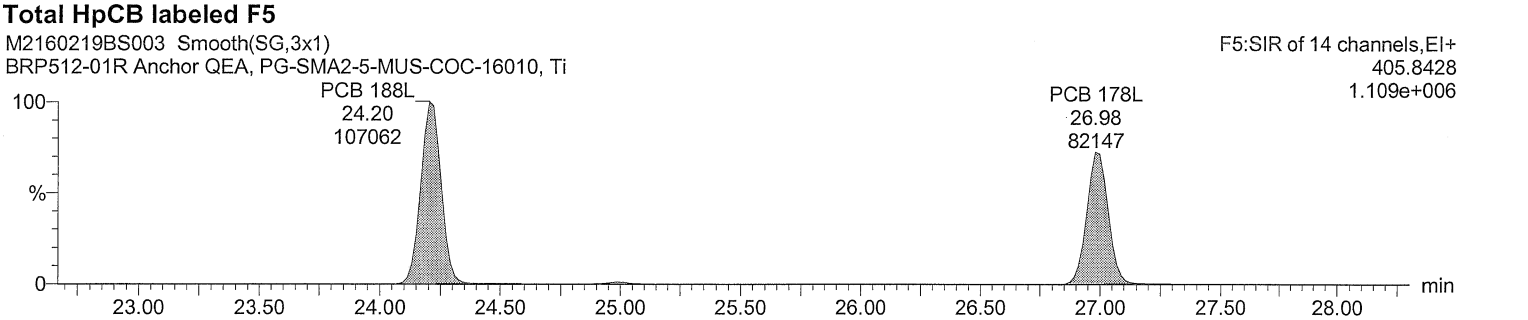

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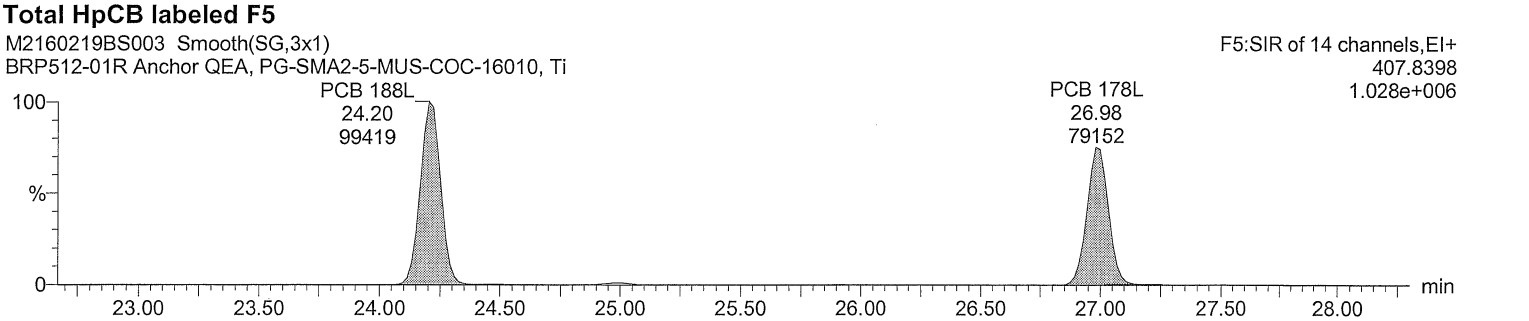

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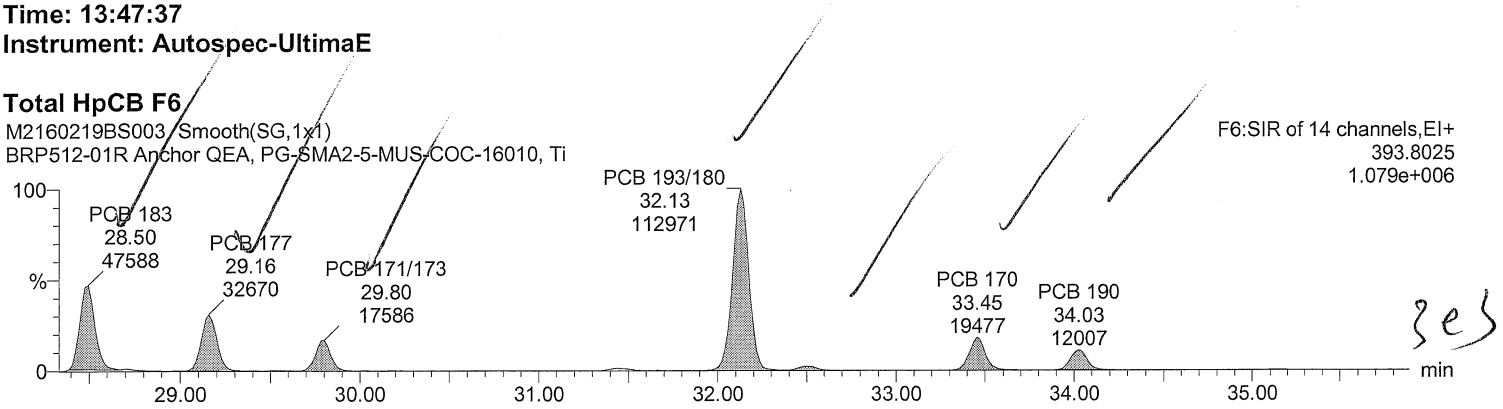
Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
Printed: February 23, 2016 12:17:46 PM Eastern Standard Time

Description: BRP512-01R
Vial: 3
Date: 19-FEB-2016
Time: 13:47:37
Instrument: Autospec-UltimaE

Total HpCB F6



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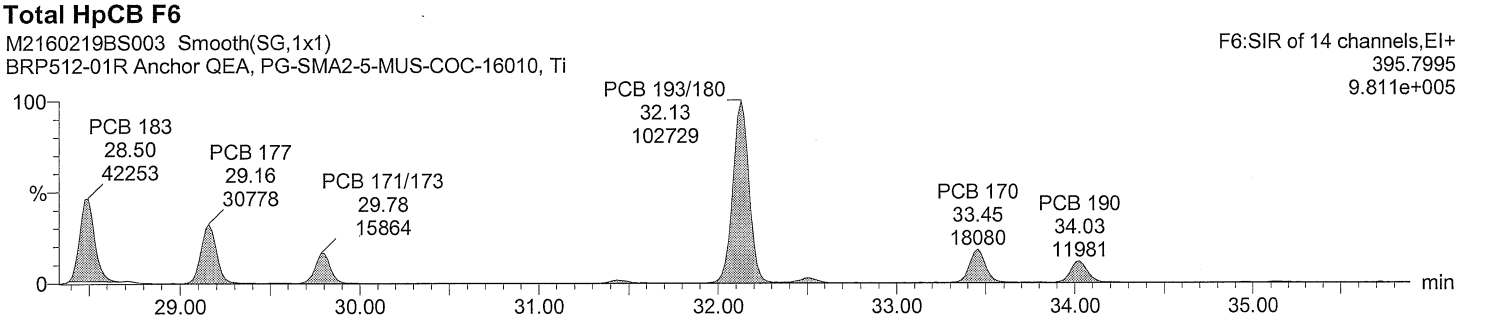

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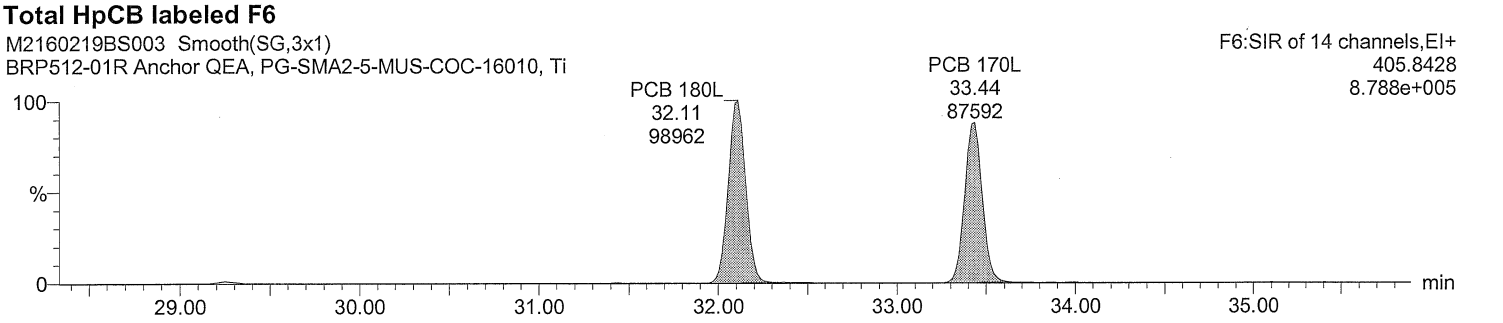

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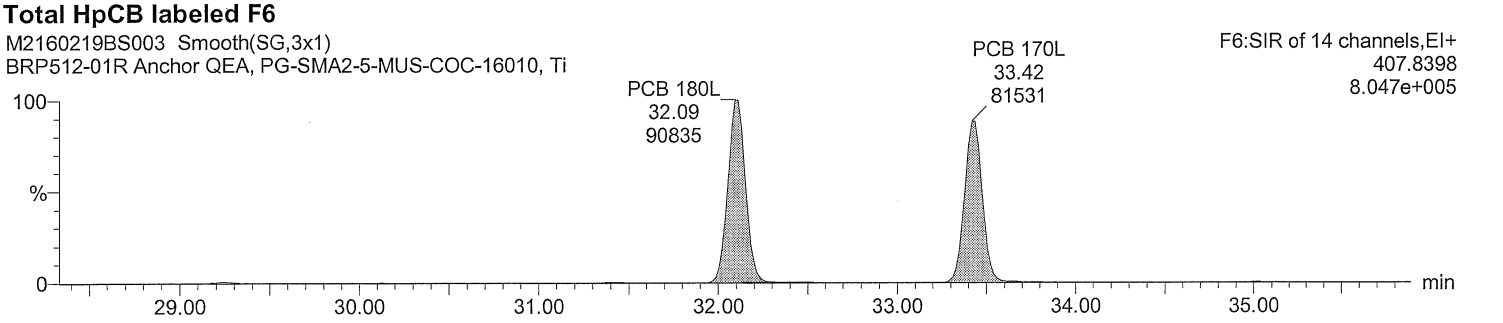

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Time: 13:47:37
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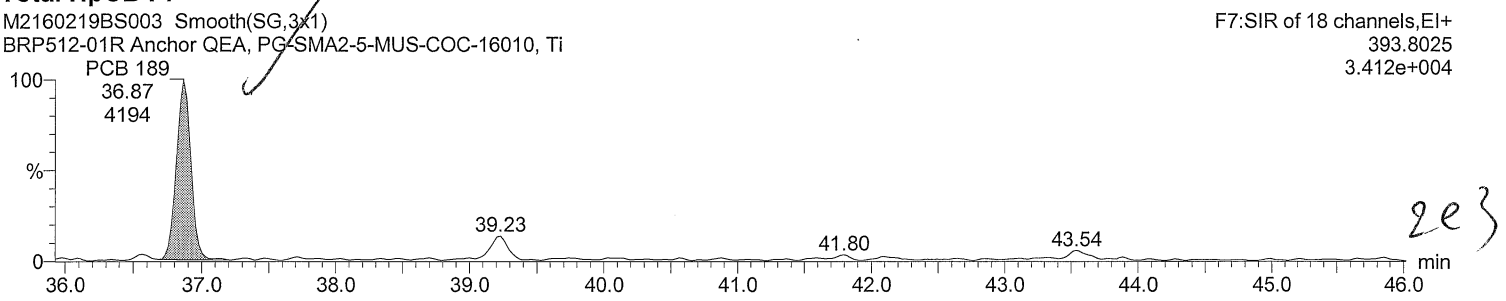

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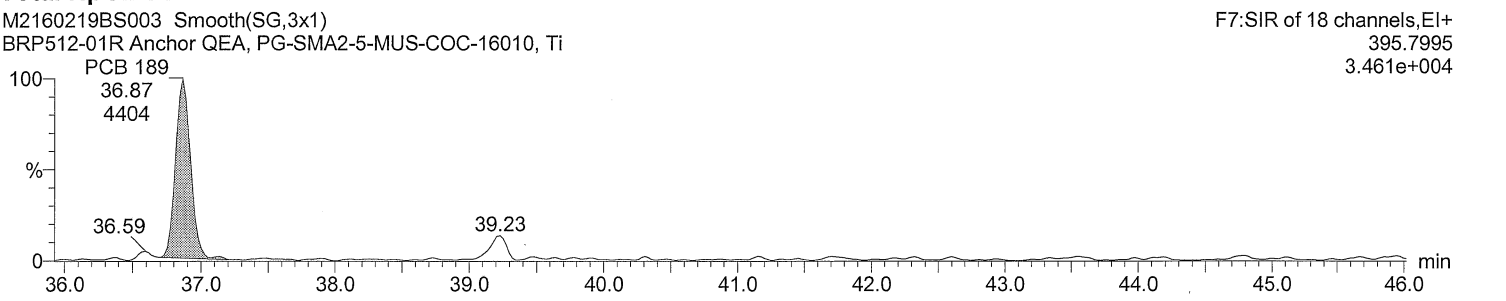

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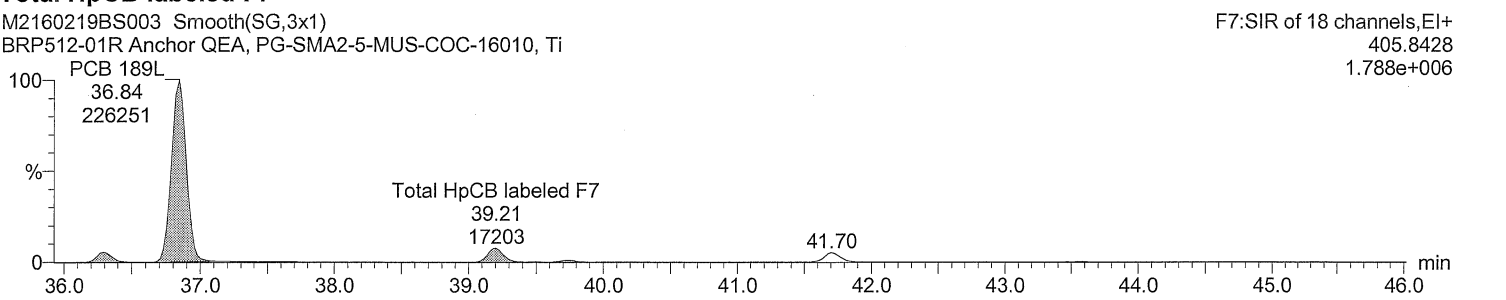

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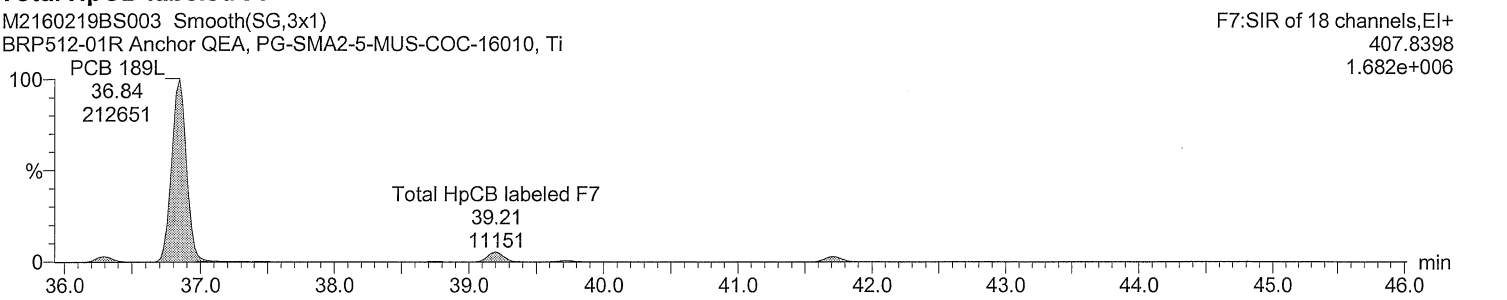

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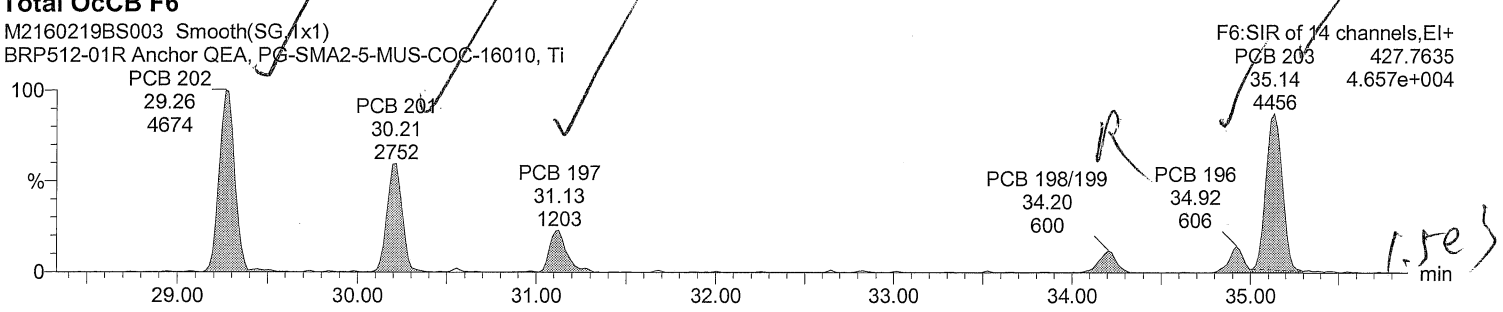

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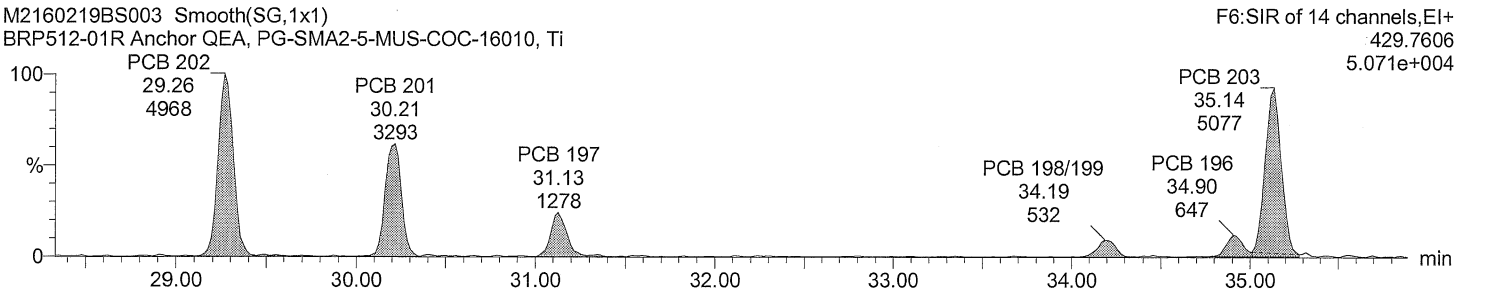

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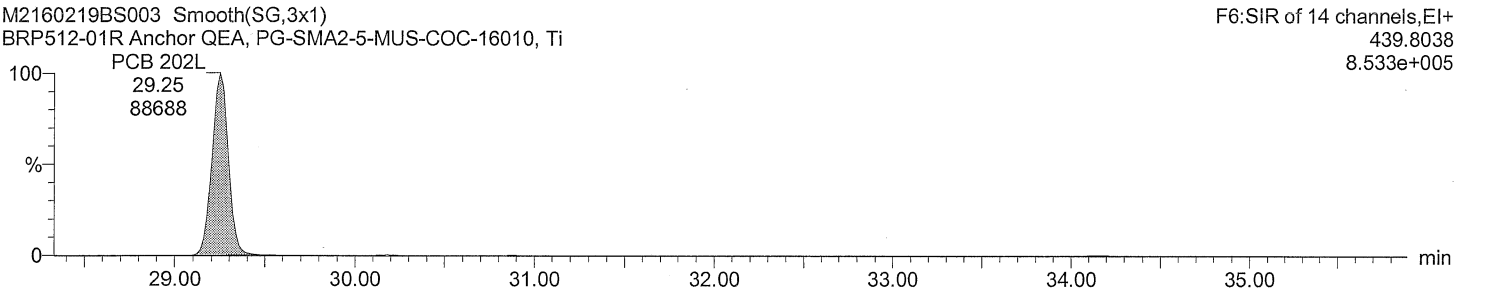

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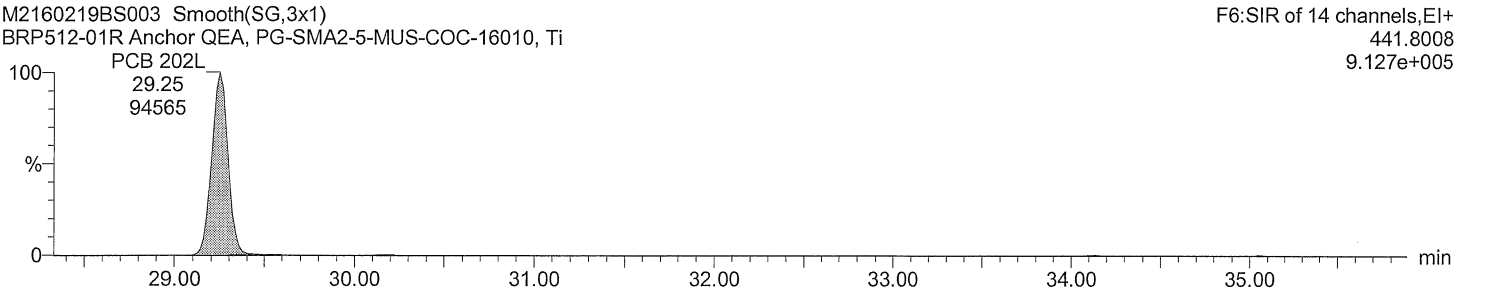

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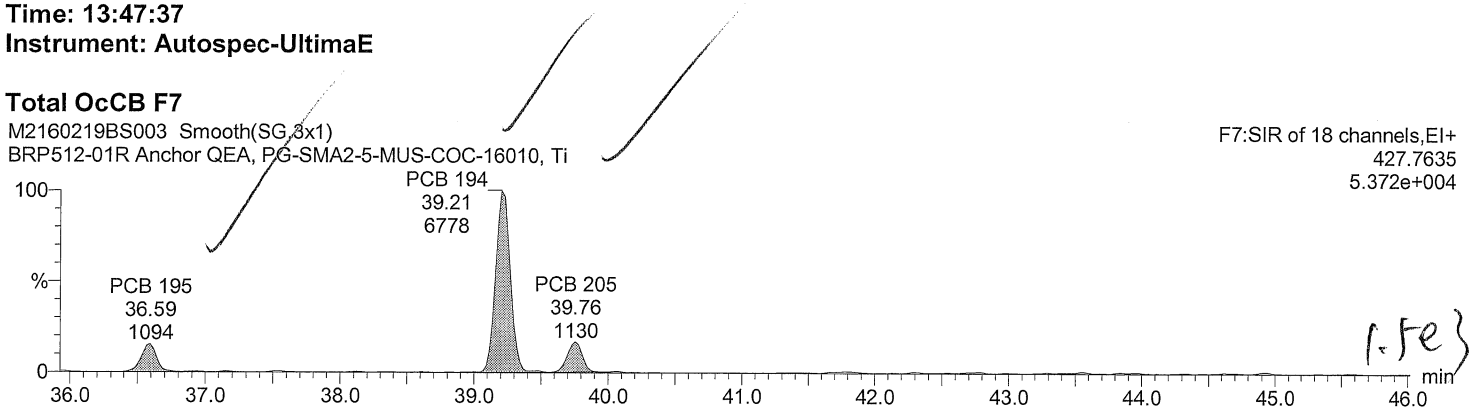

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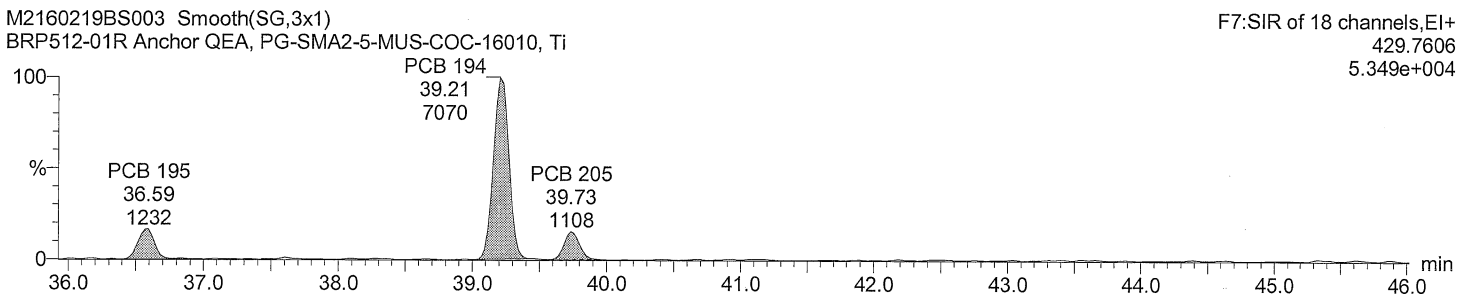

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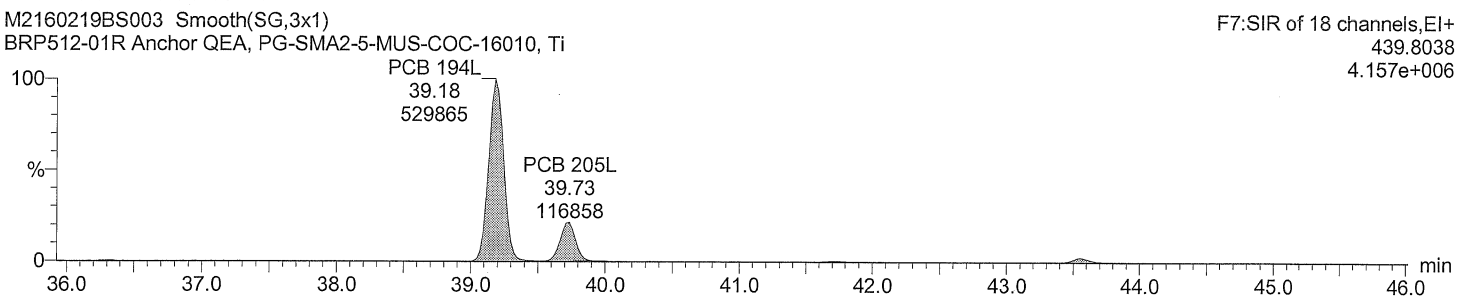

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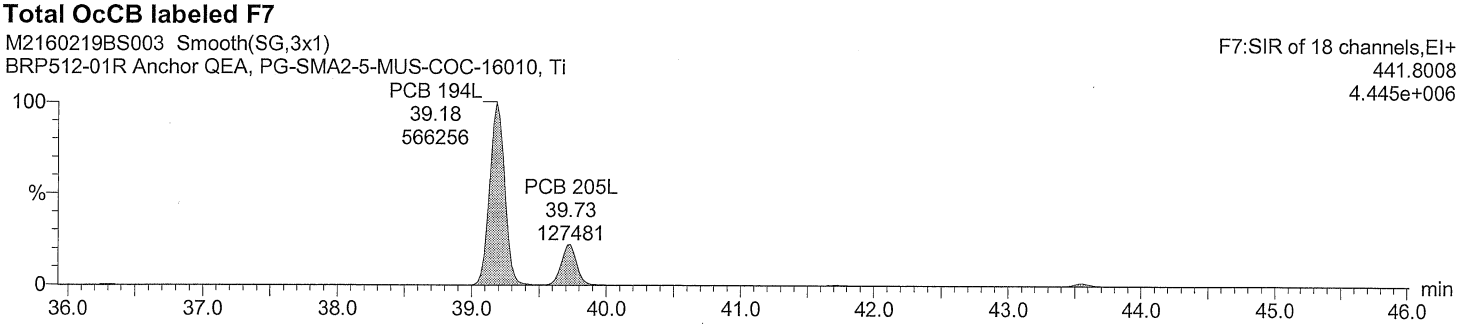

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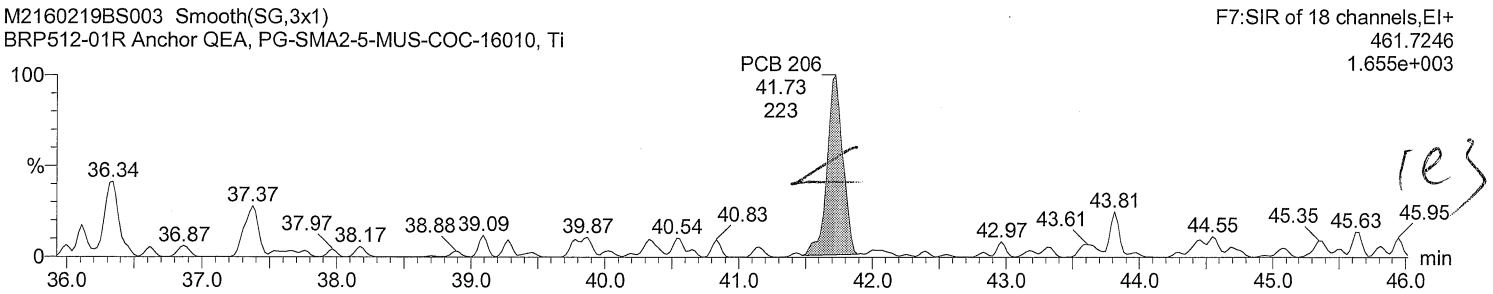

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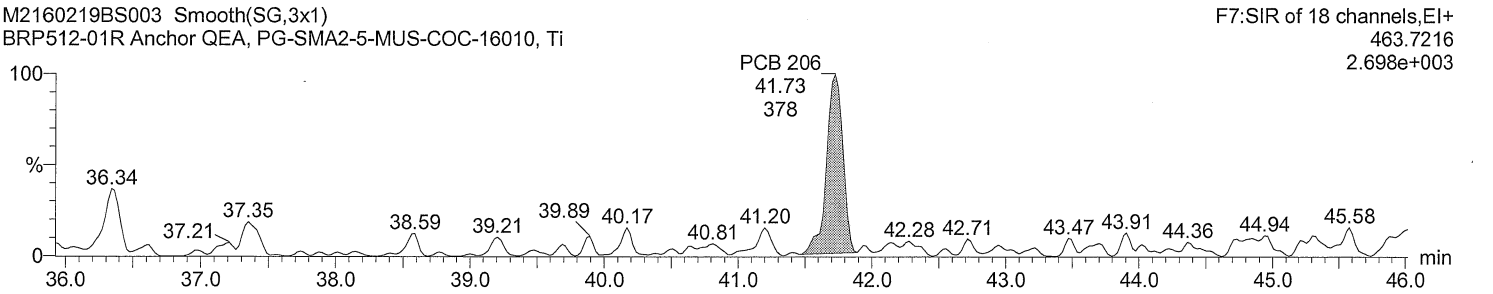

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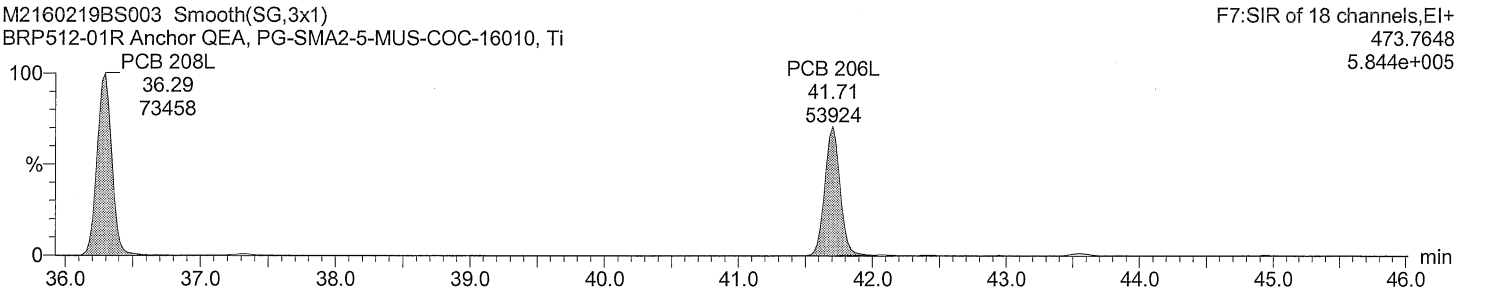

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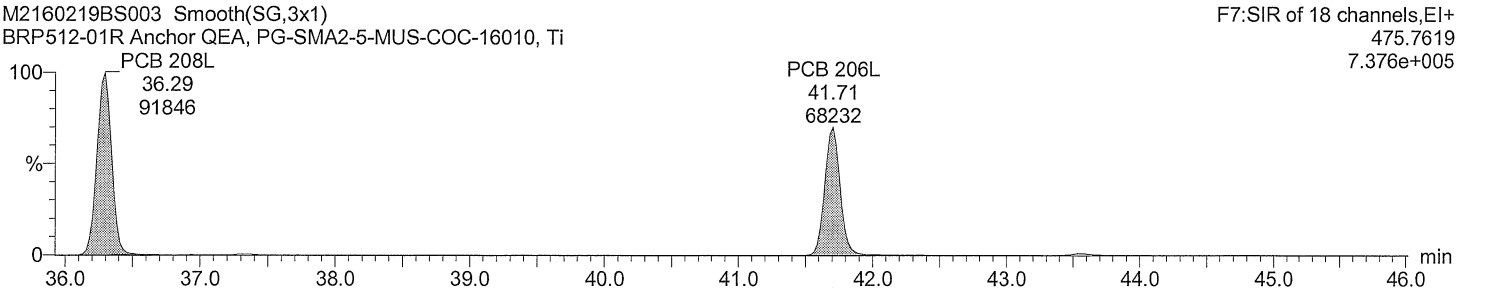

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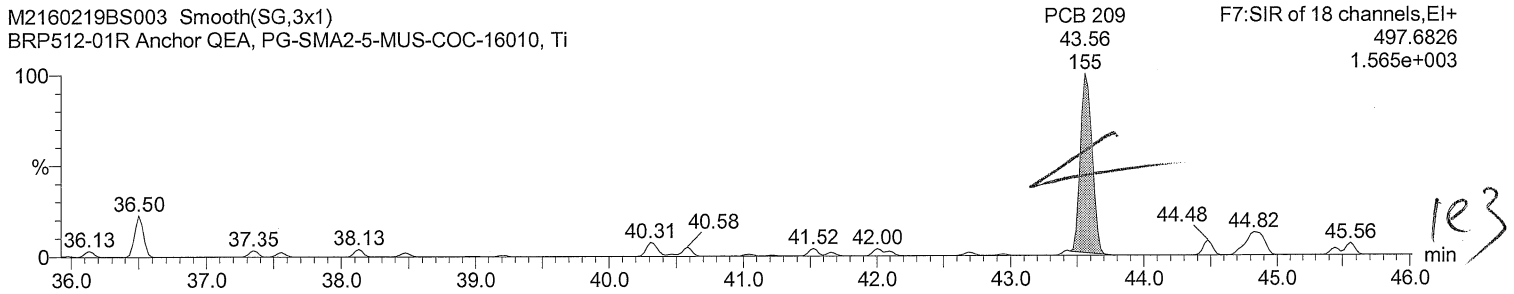

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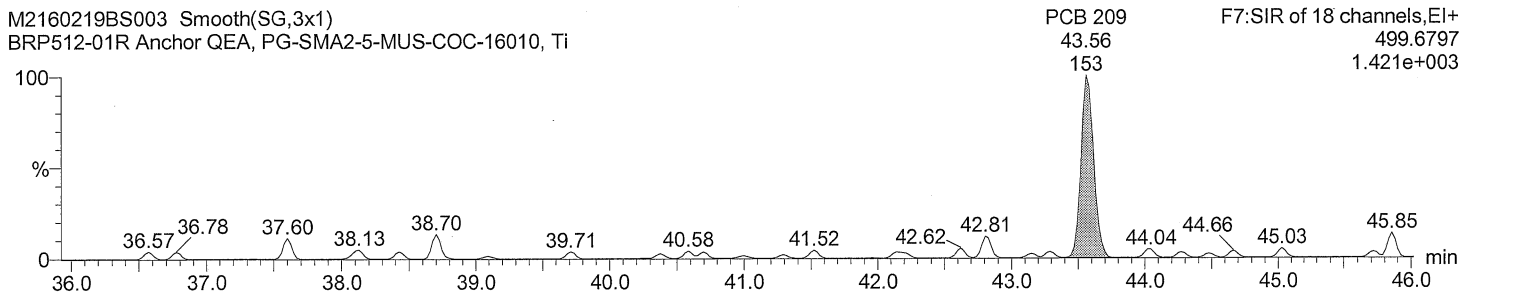

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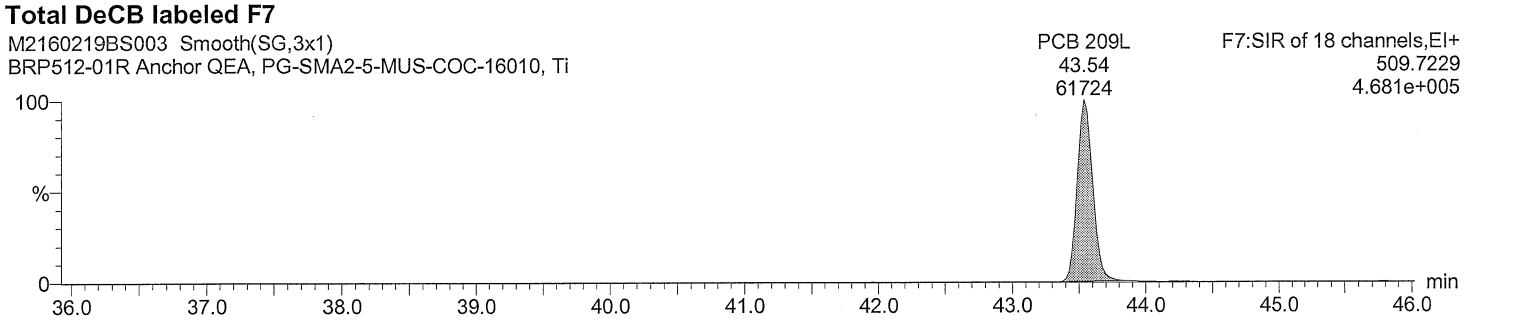

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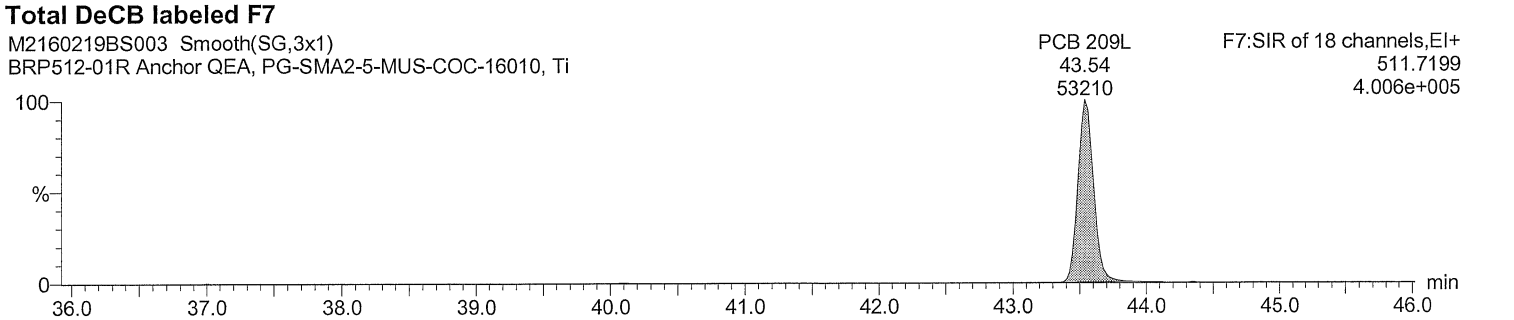

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Vial: 3
Date: 19-FEB-2016
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Instrument: Autospec-UltimaE

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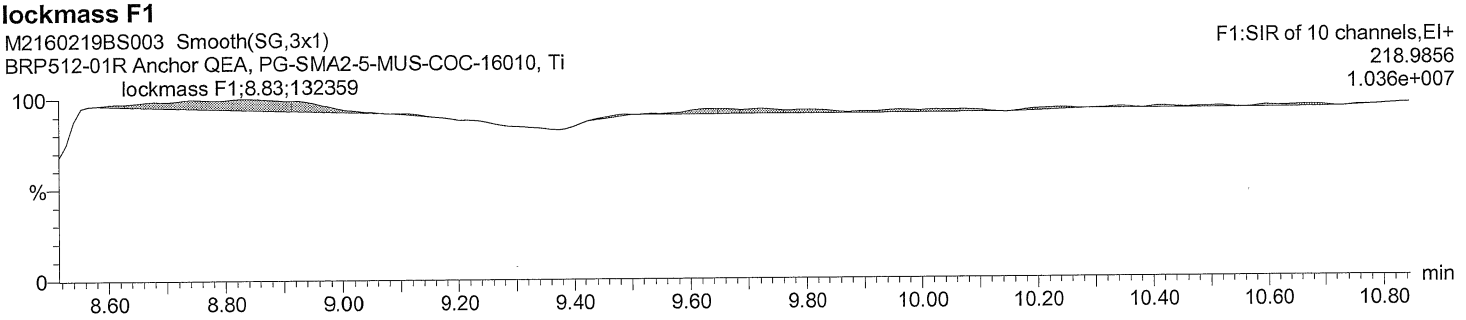

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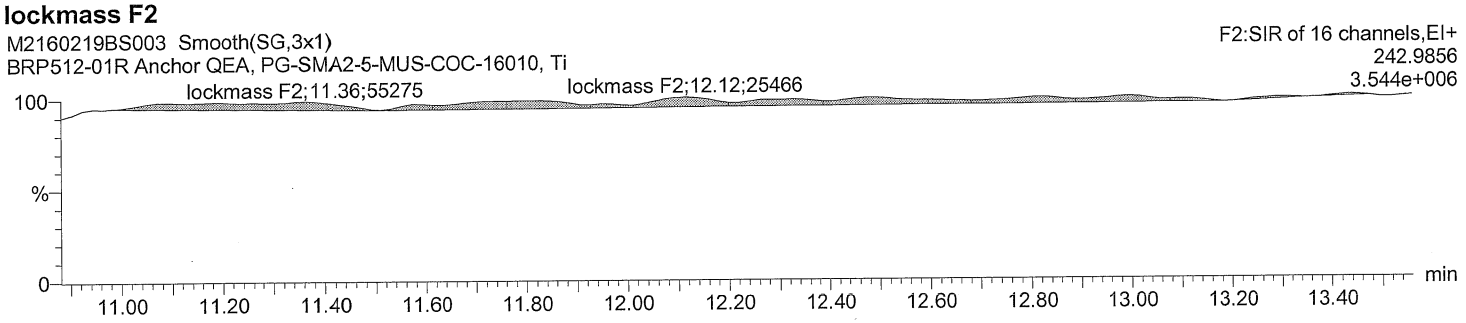

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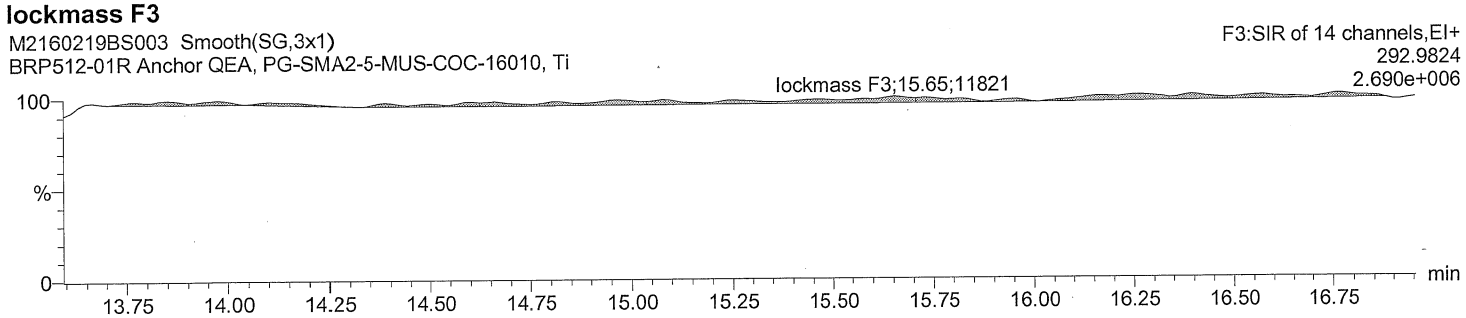

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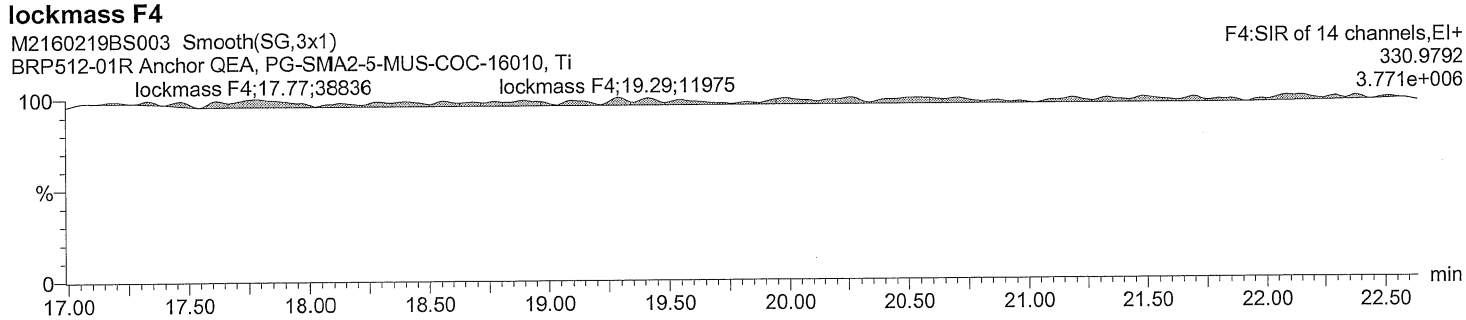

Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

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Vial: 3
Date: 19-FEB-2016
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Instrument: Autospec-UltimaE

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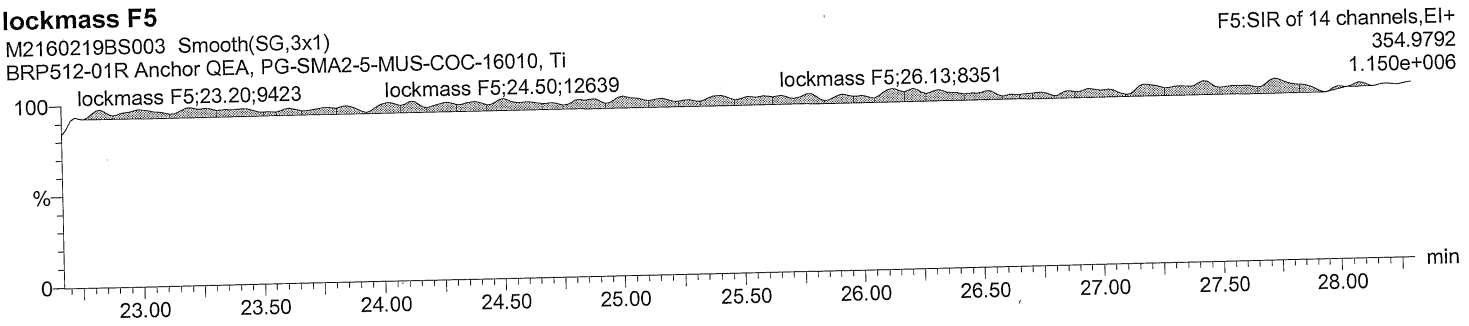

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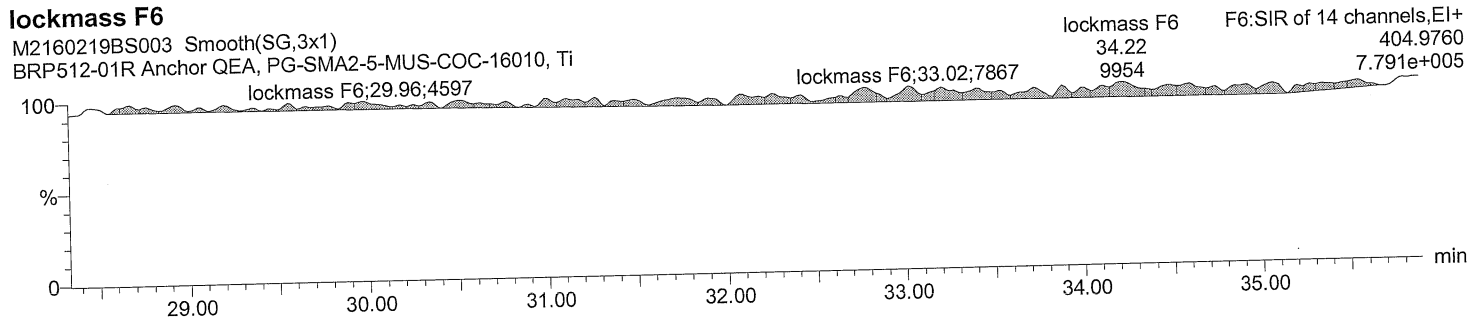

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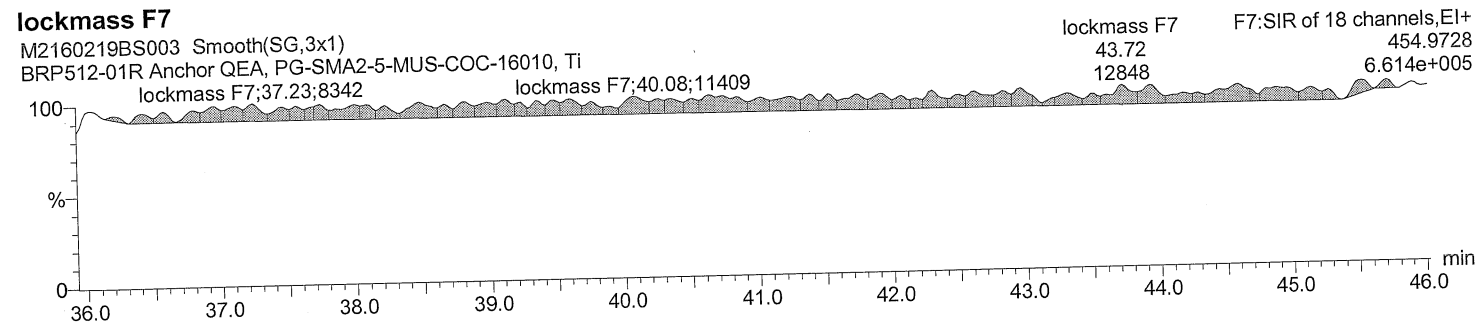

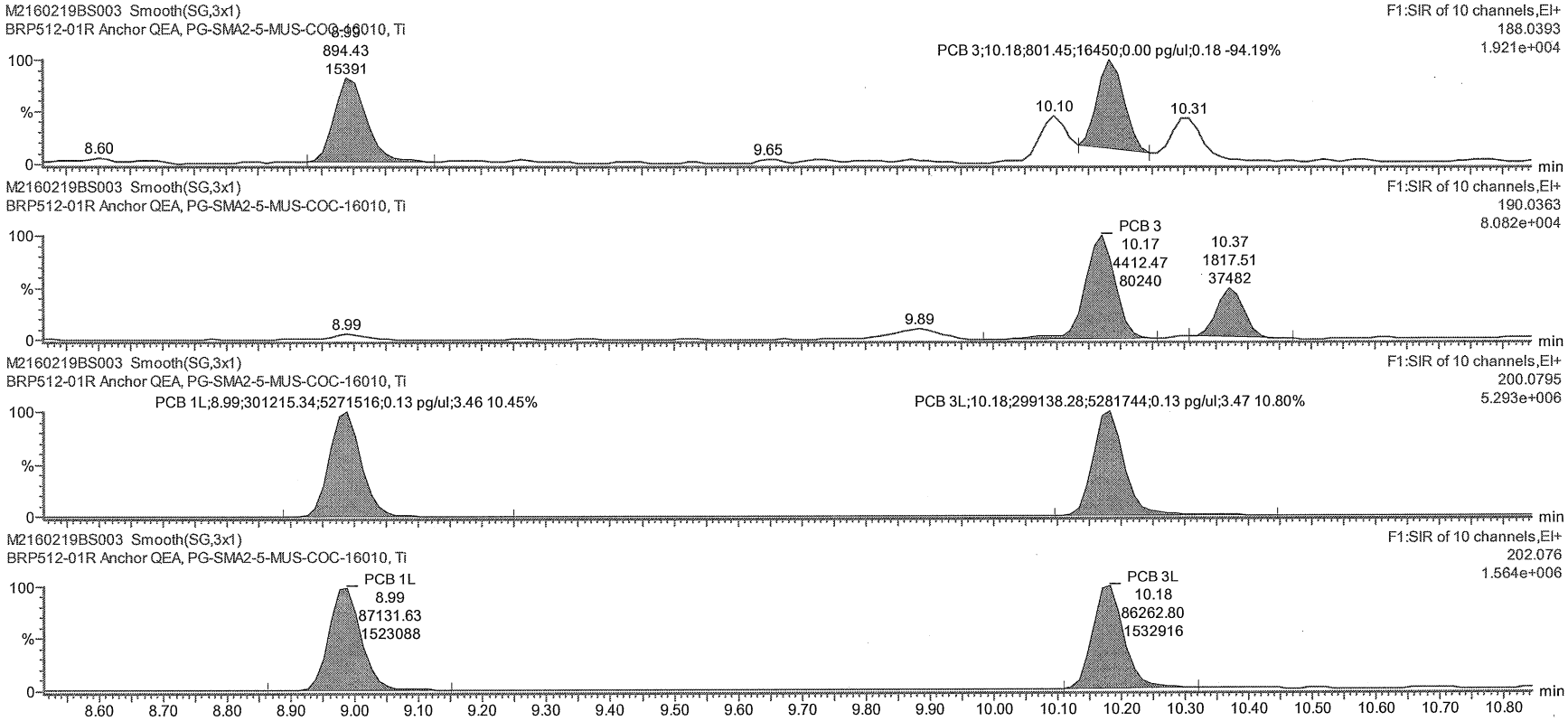

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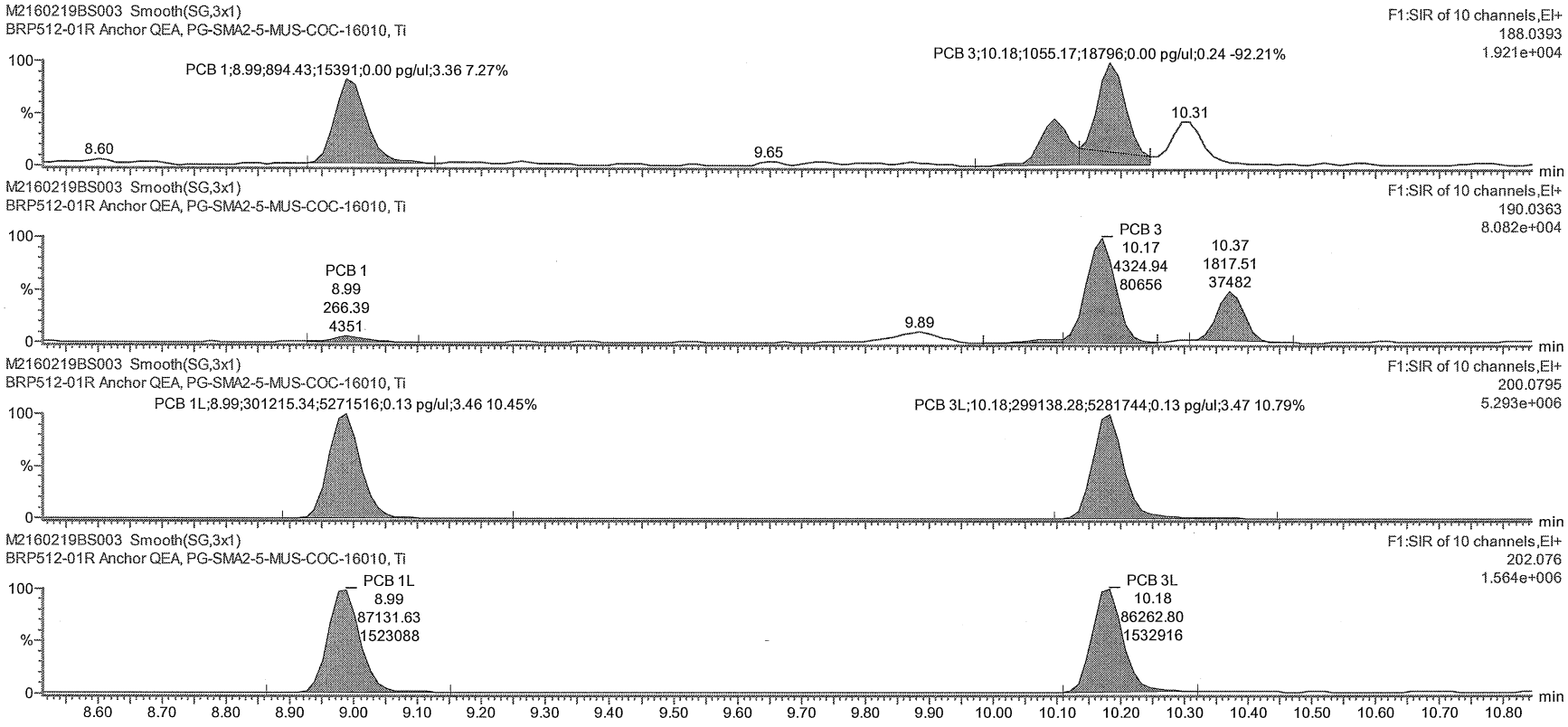
FEB 2 3 2016



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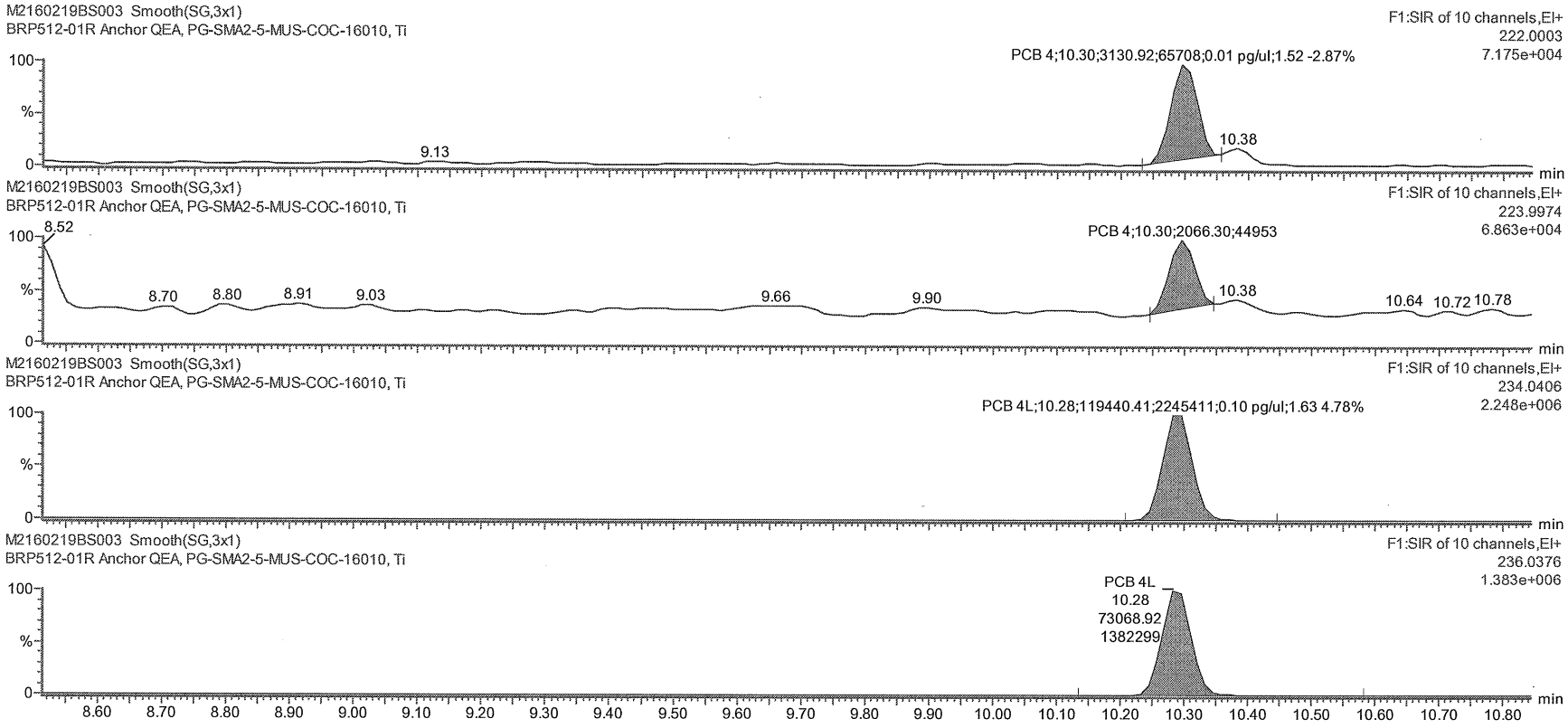

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FEB 2 3 2016

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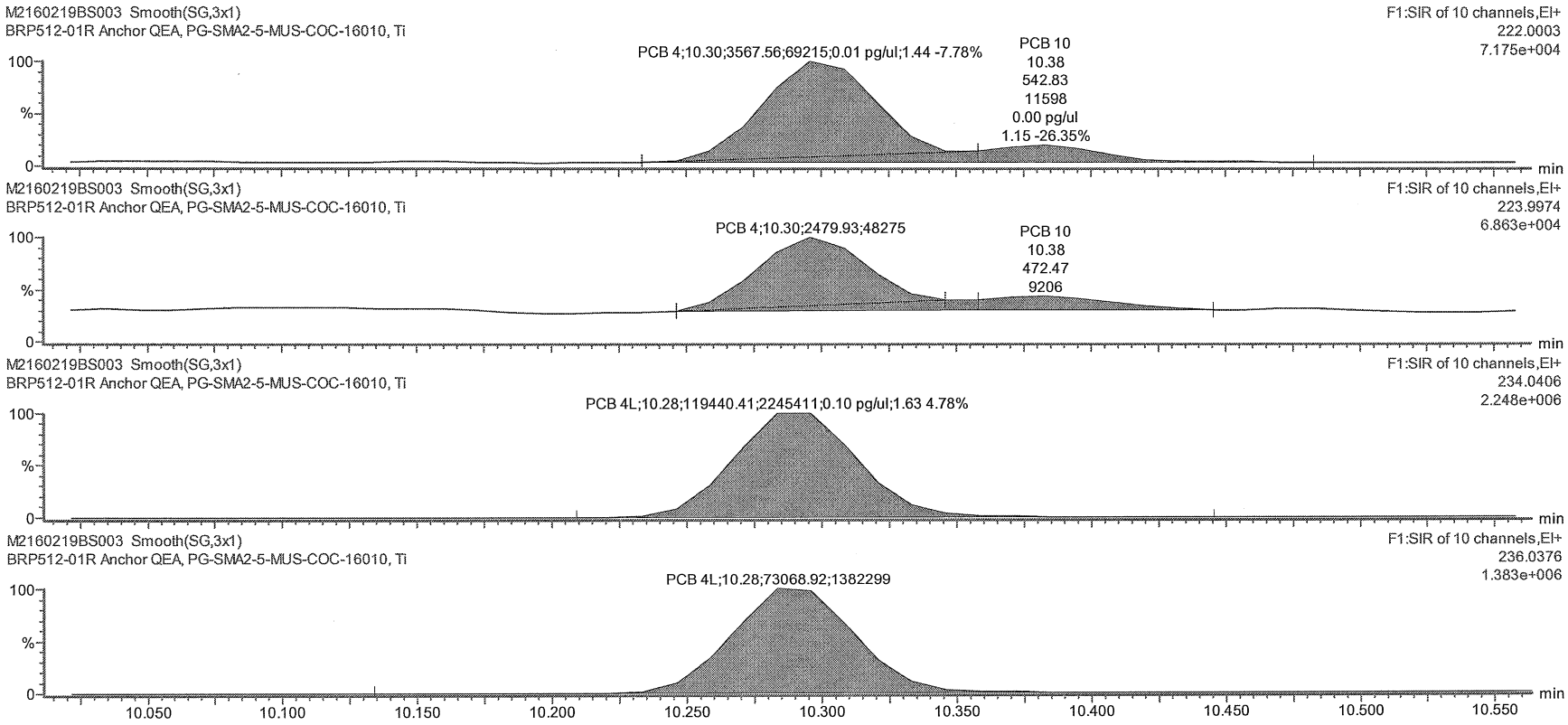

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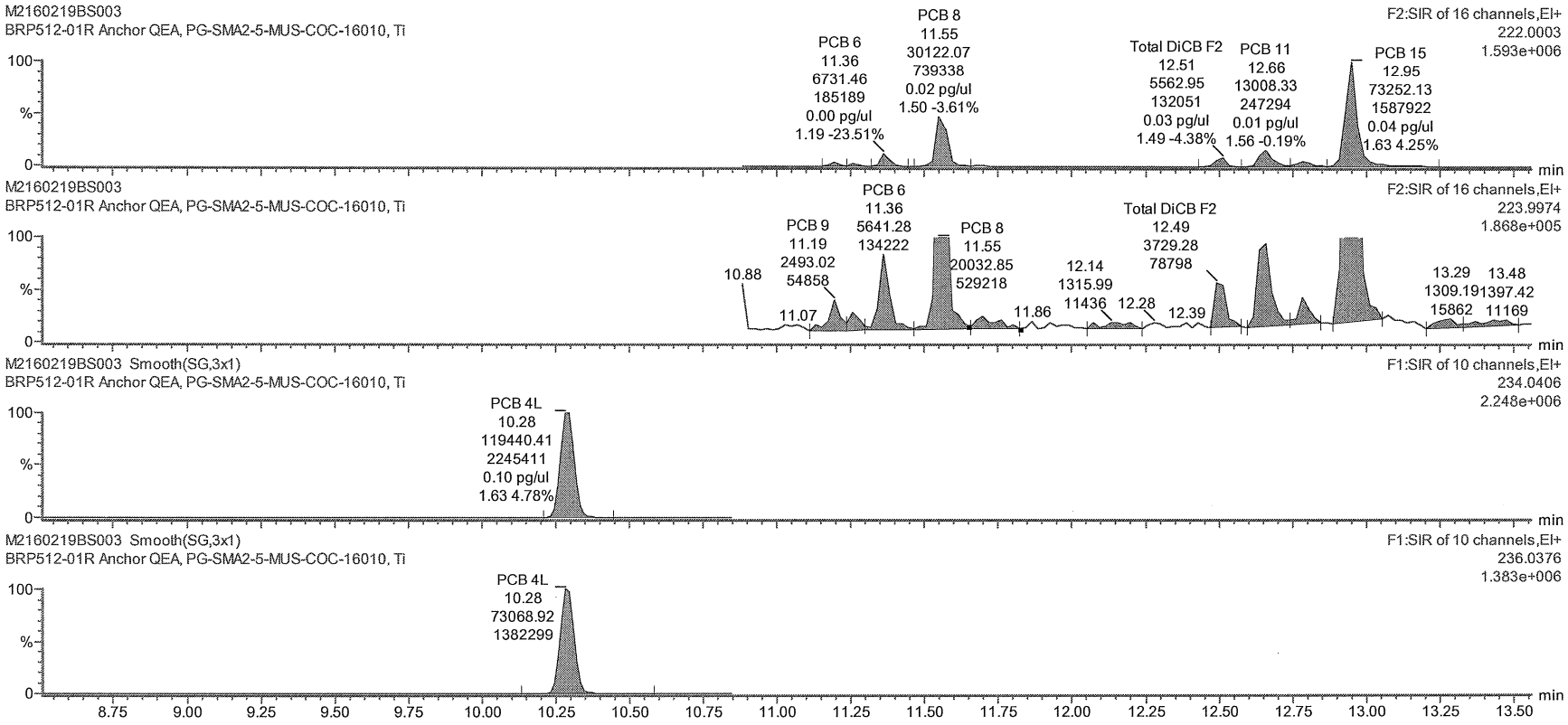

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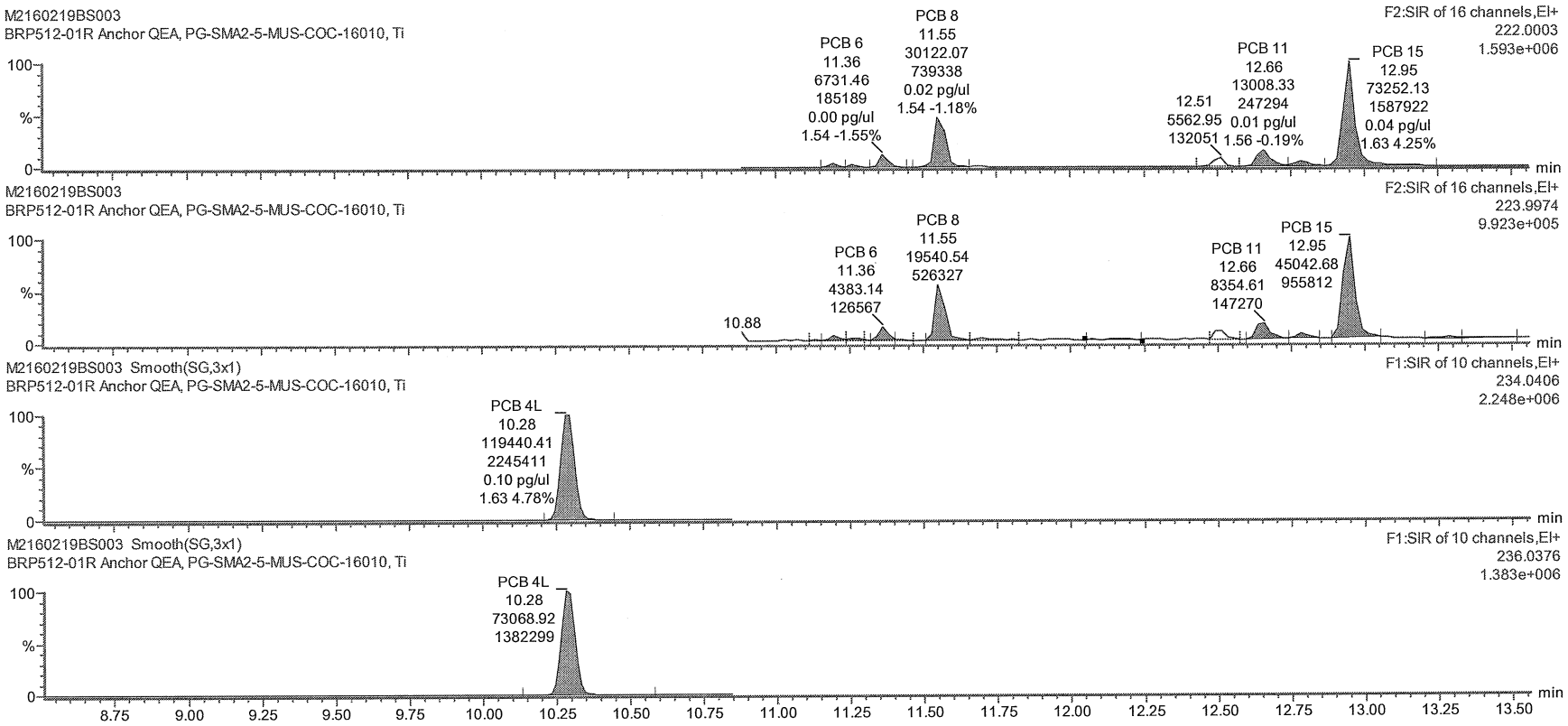

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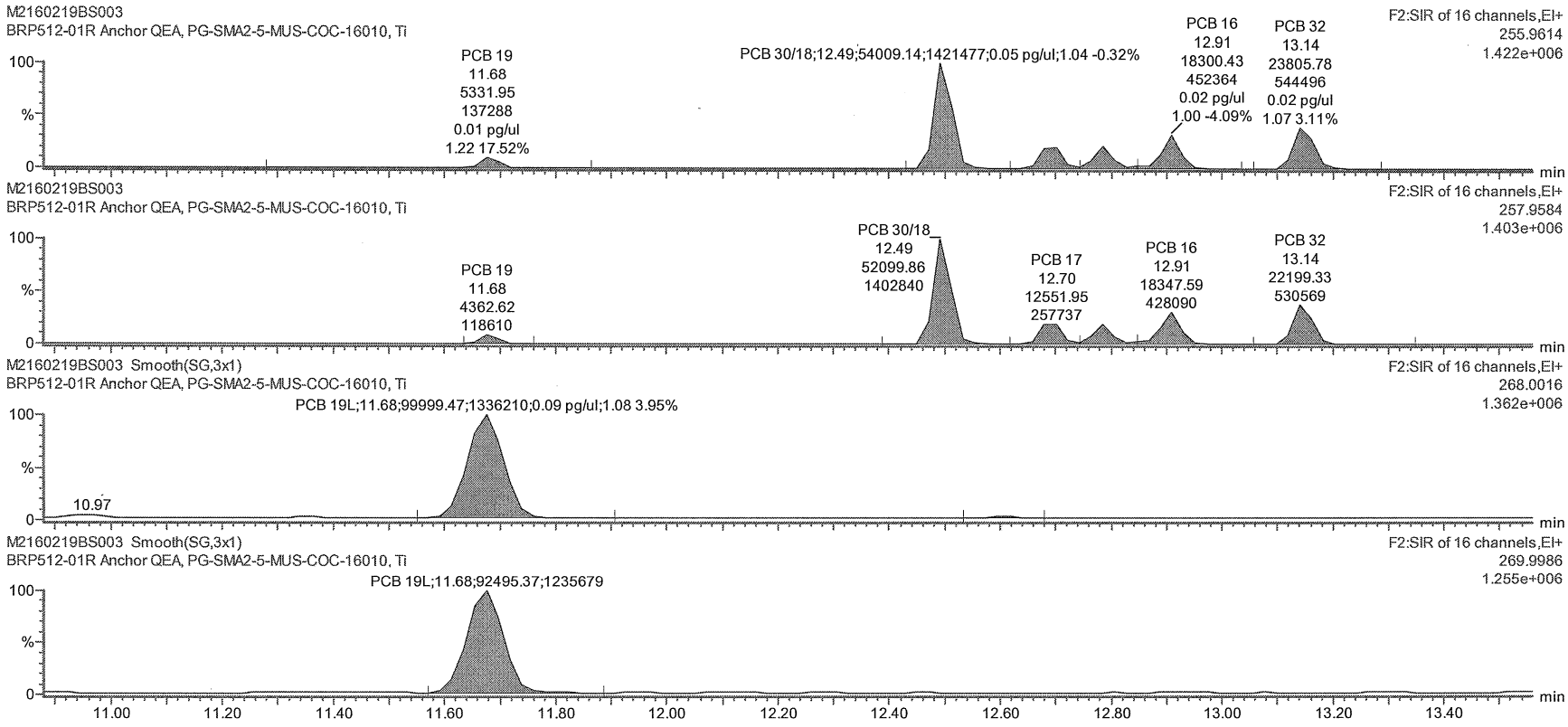

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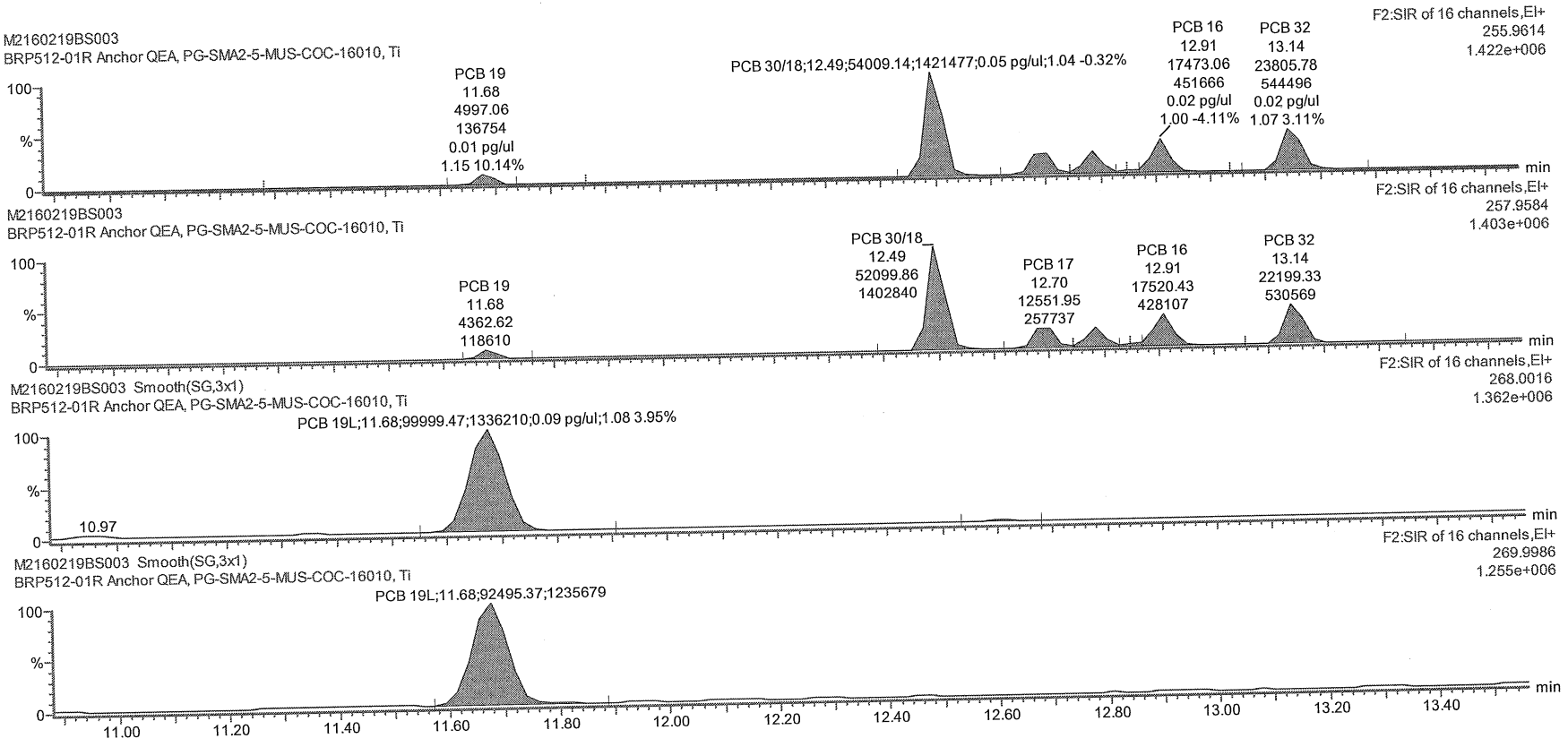

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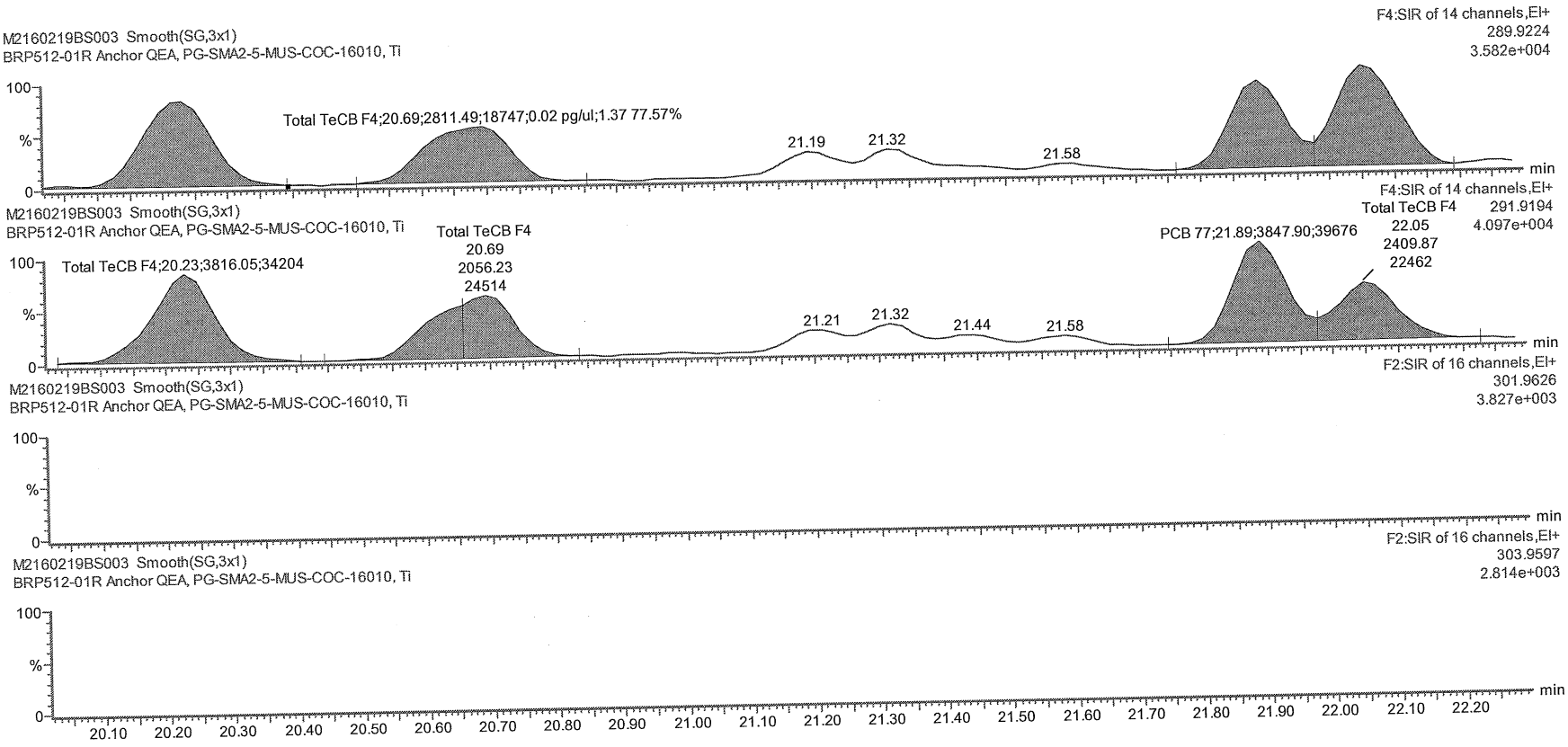

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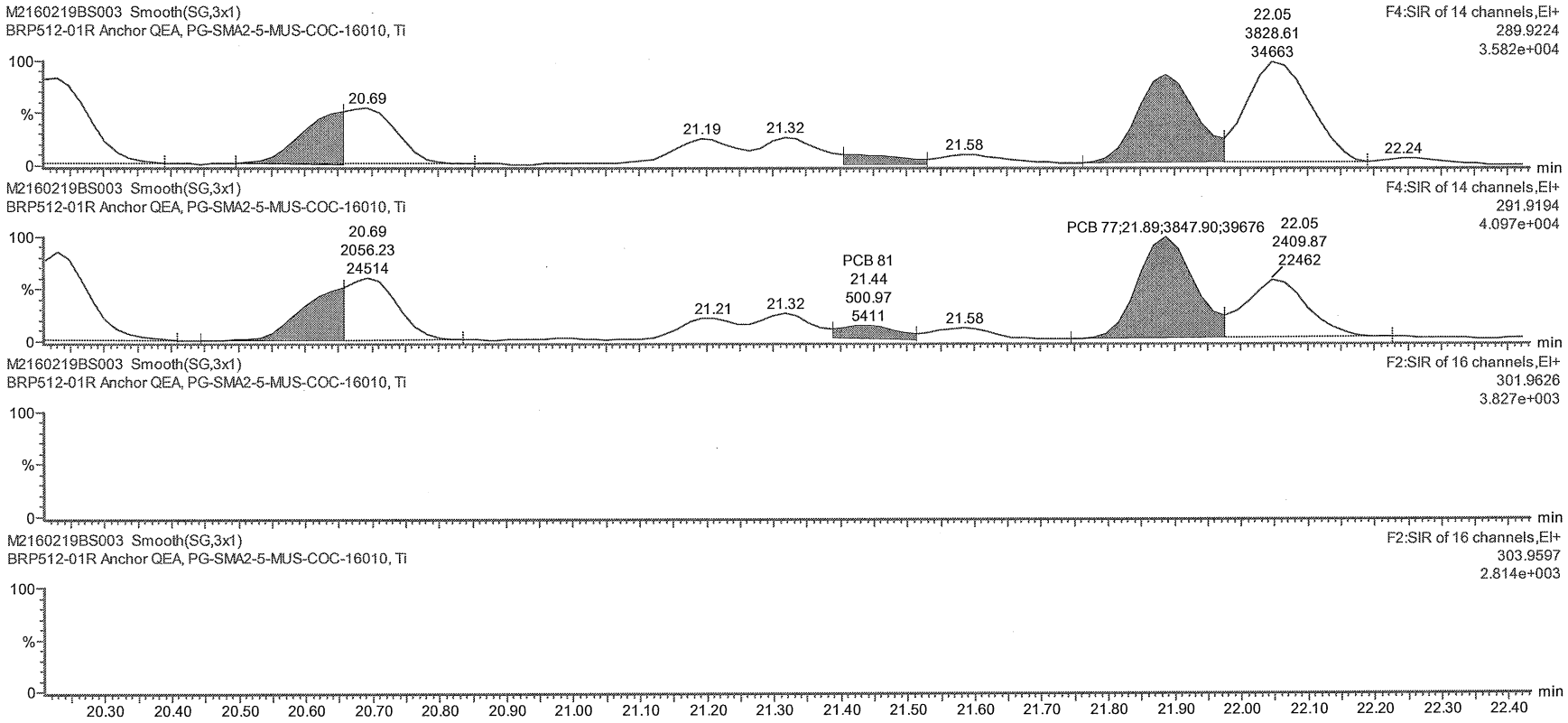

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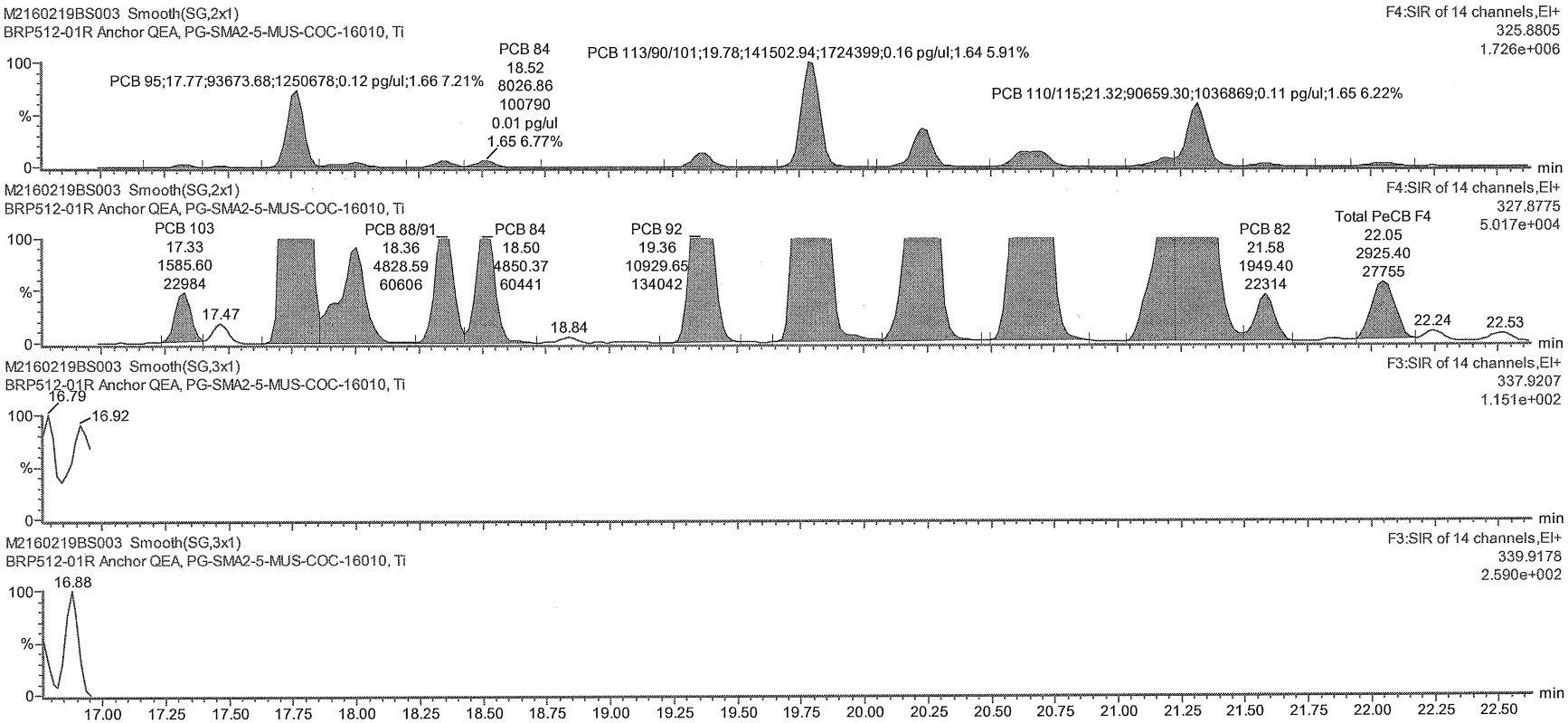

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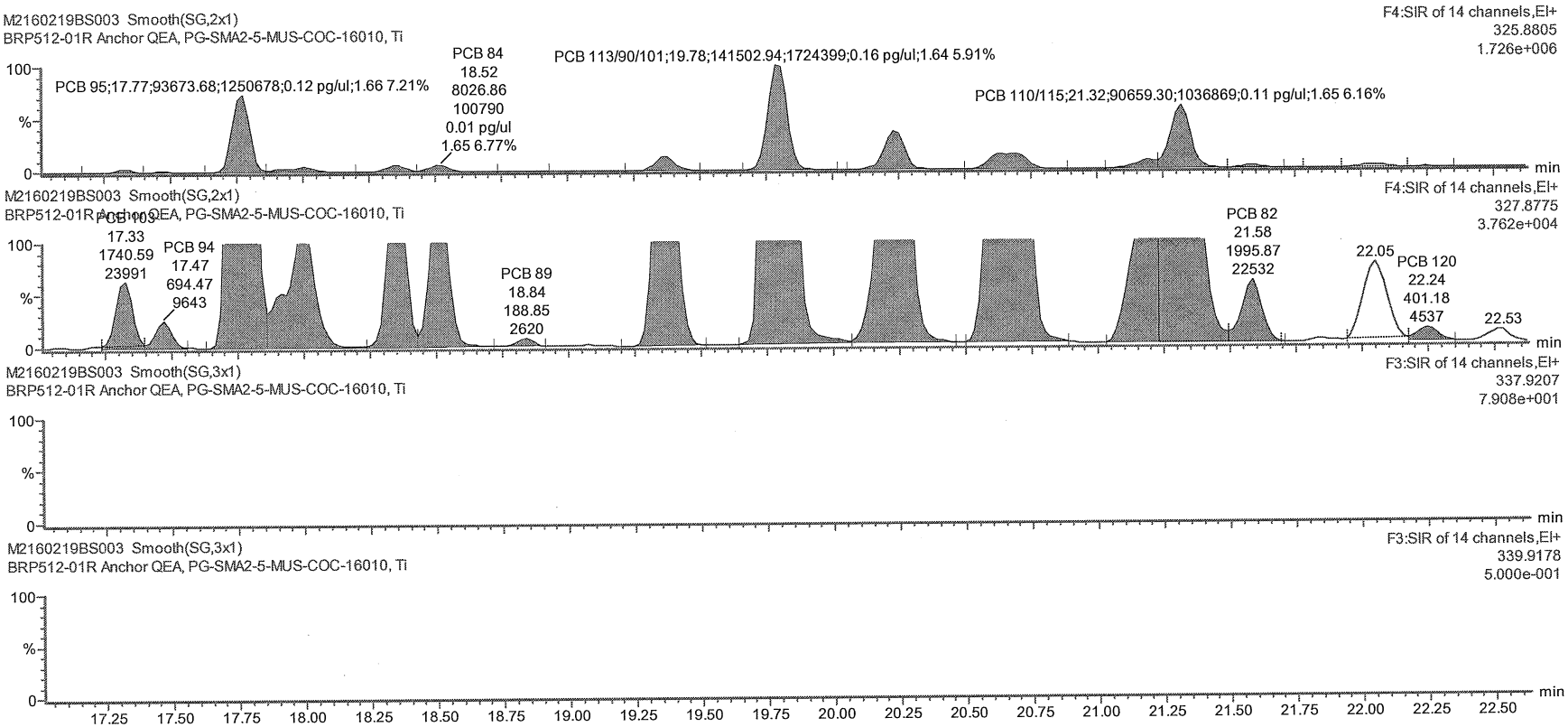

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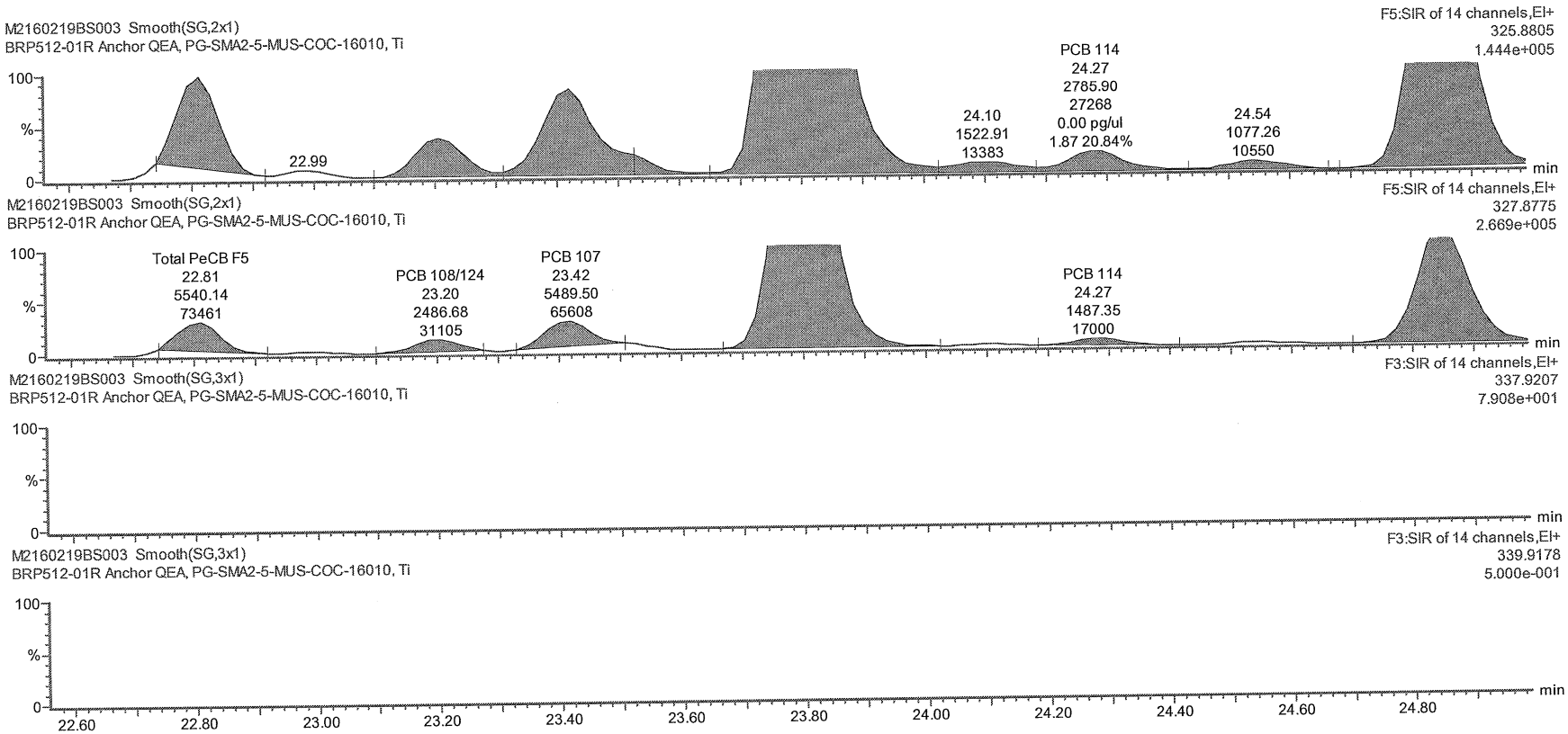

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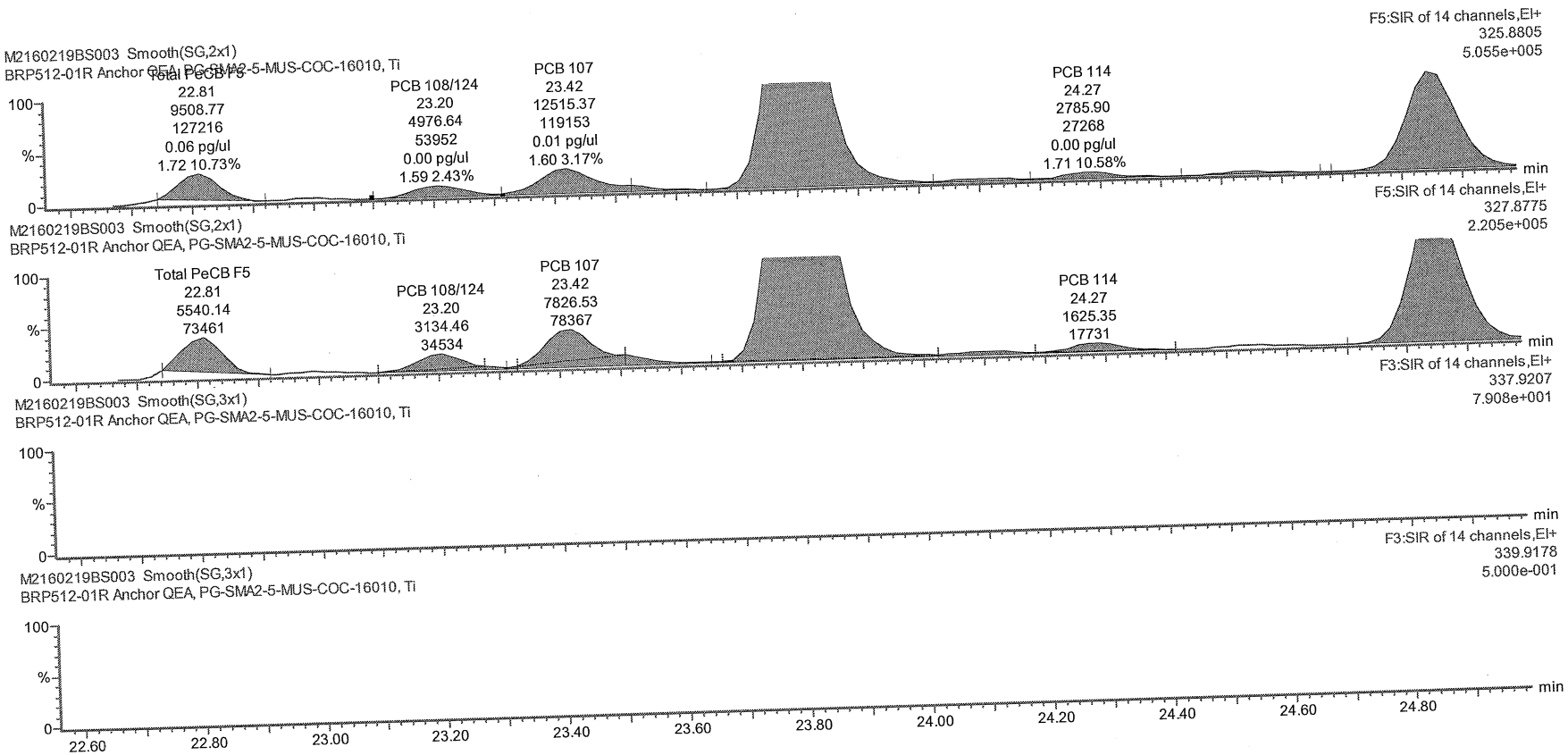

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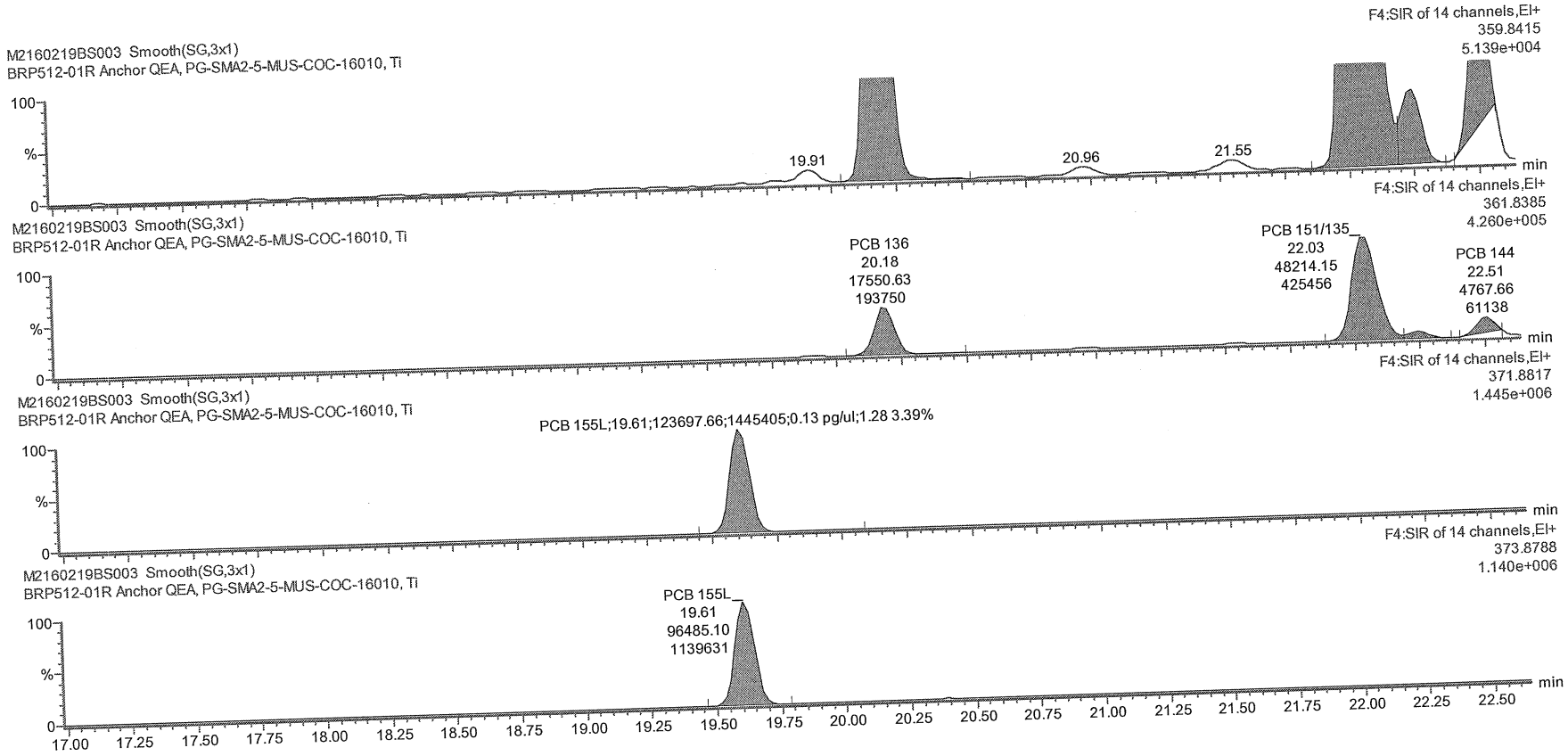

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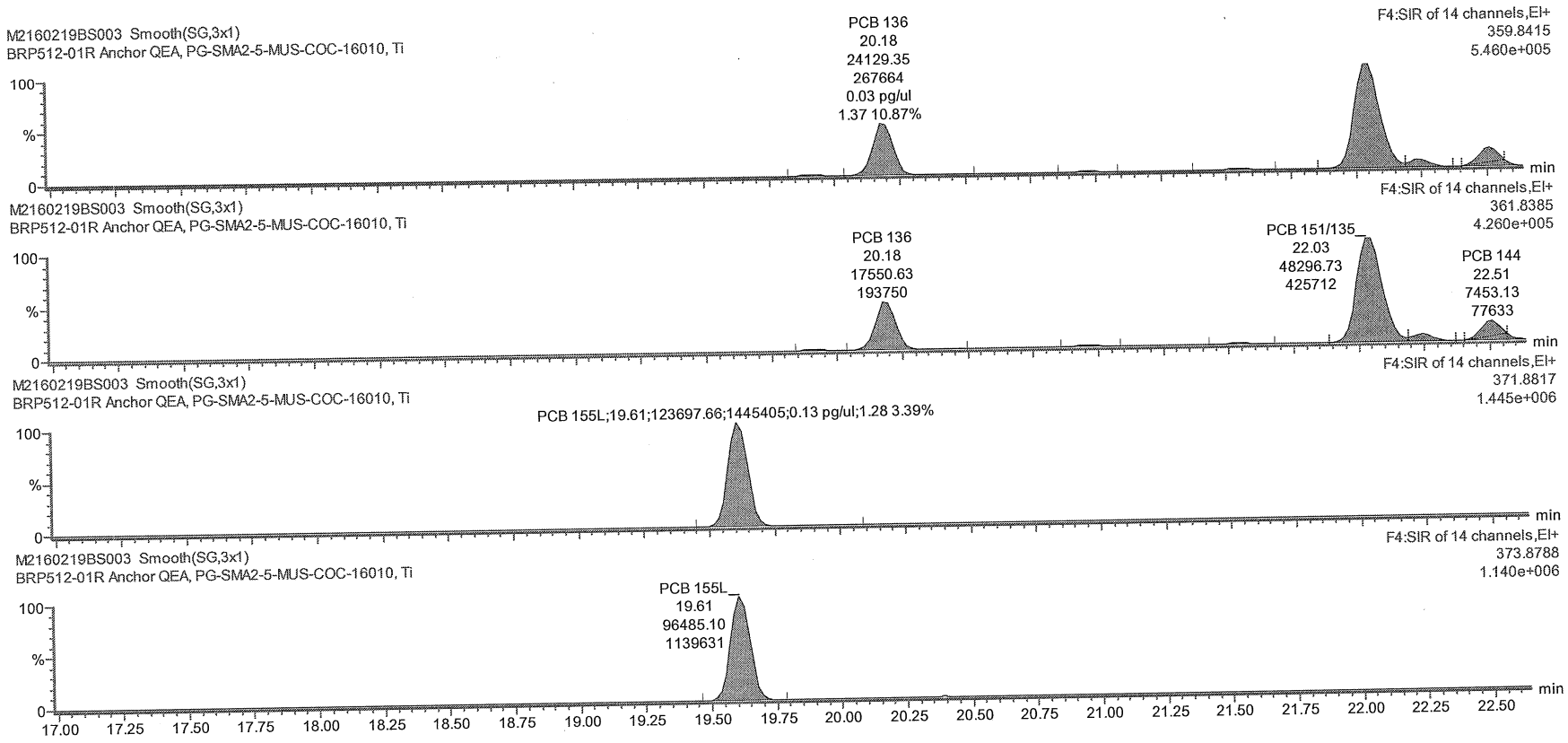

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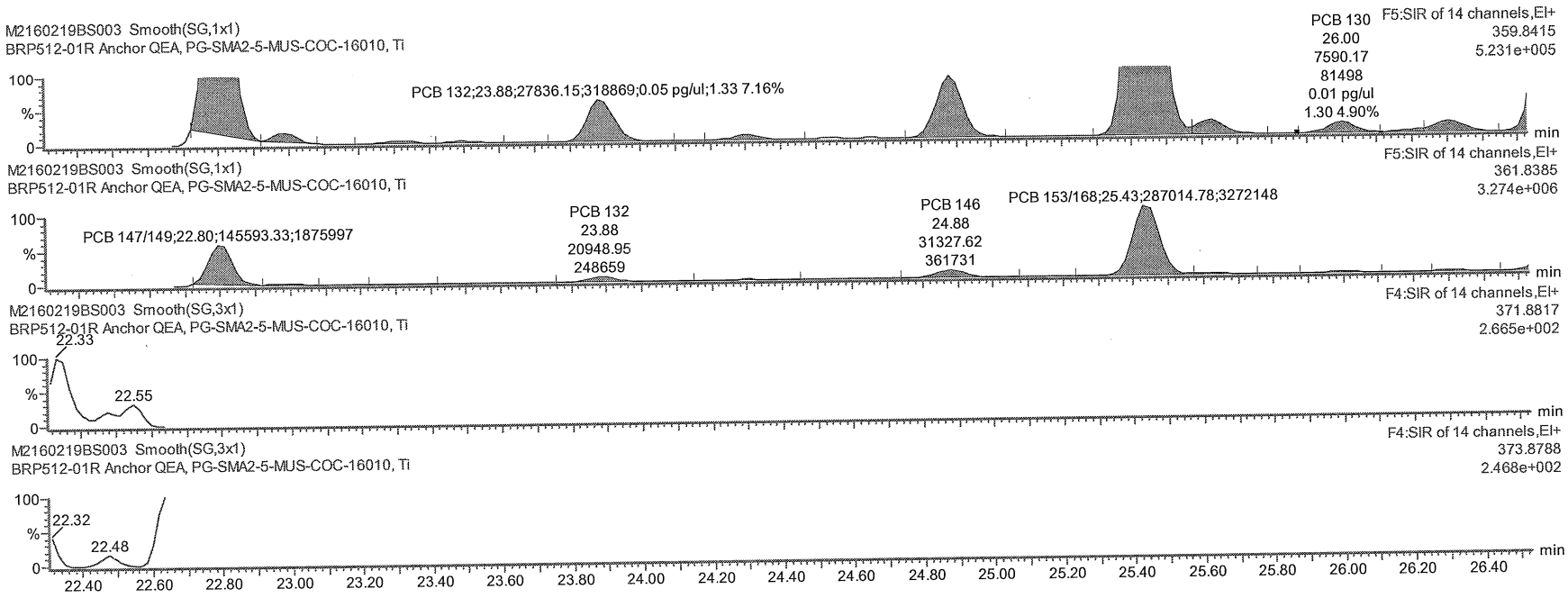

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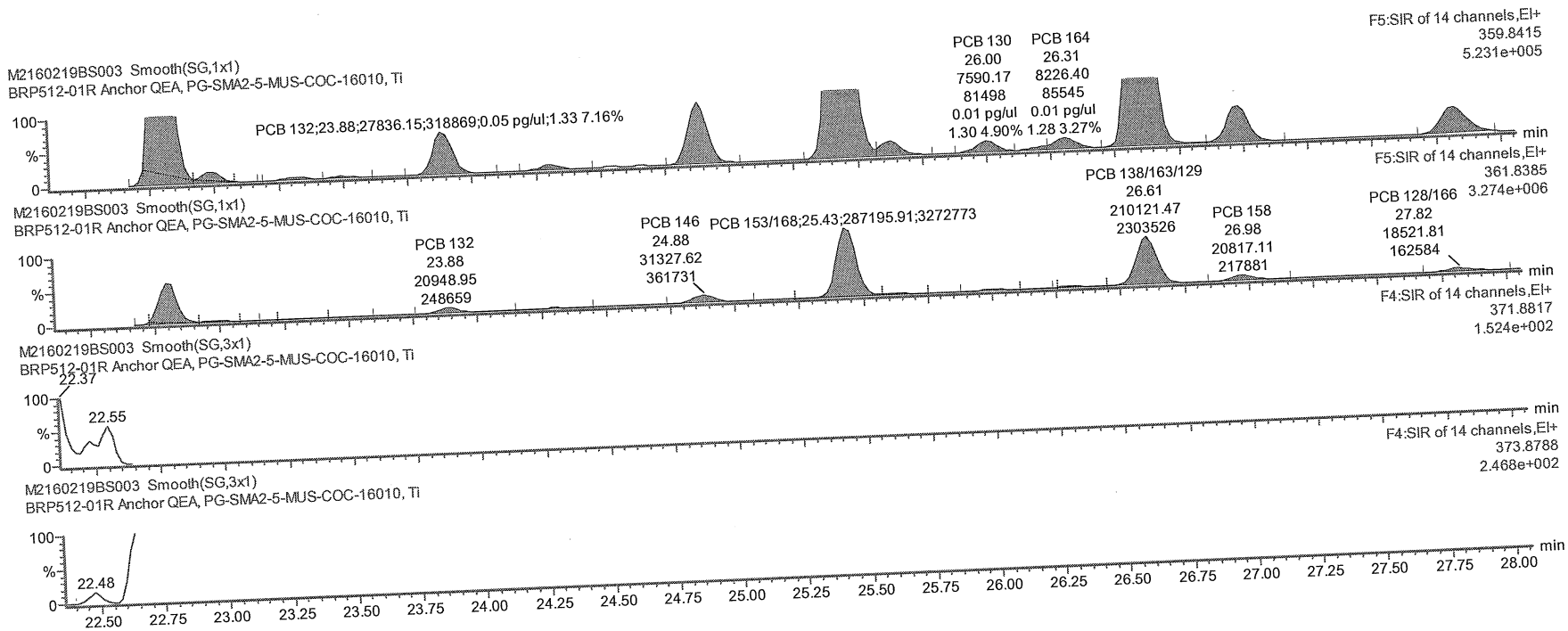
‘2016-02-23

FEB 2 3 2016



M3

'2016-02-23

FEB 2 3 2016

Maxxam Analytics

Analysis Type : PCBCONHR-T

Maxxam ID # : BRP513-01R

Analyte: PCB 202

Instr. File Name : M2160219BS004

Injection Date : 2016/02/19
Injection Time : 14:37:56

SAMPLE DATA: the following is applicable to all reported HRMS analyte calculations

			DAILY RFs Using post concal
Analyte Area (Primary + Secondary Ions) =	8.00E+03	=A	
Recovery Standard Area (Primary + Secondary Ions) =	1.34E+06	=B	
Internal Standard Area (Primary + Secondary Ions) =	2.04E+05	=C	
Amount of Recovery Standard added to the Extract (pg, ng) =	11.11	=D	
Amount of Internal Std. added to the sample (pg, ng) =	2.00	=E	
Average RRF of Analyte =	0.988	=F	1.05
RRF of Internal Standard =	1.419	=G	1.128
Amount of Sample Extracted (g or L) =	10.134	=H	
SPLIT / Dilution Factor =	1	=I	
Analyte Conc. (pg/g, pg/L, Total pg) = or (ng/g, ng/L, Total ng) =	0.0078 ✓	=A*E/(C*H*F)*I	0.007
Internal Standard Recovery (%) =	60 ✓	=C*D*100/(B*E*G)	75

Filename M2160219BS004
Acquired 19/02/2016 14:37 Cali File M2160219_209

Sample ID BRP513-01R
Comments Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti
Instrument File Ultima 2
Sample Size 10.134 Dil Fac 1.00

	Name		mass	RT	Area	ratio	Tot Area	ng/g	Code	Isomers DL	S/N	Mod	rrf	Rec
1	PCB 1		188	9.00	873	2.86	1179	-0.00066		-0.00066	*	no	1.082	-
		MoCB	190	8.99	306	yes					*			
2	PCB 2		188	10.10	374	1.18	692	-0.00057		-0.00057	*	yes	1.248	-
		MoCB	190	10.09	318	no					*			
3	PCB 3		188	10.18	829	0.35	3190	-0.00066		-0.00066	*	Op-O	1.079	-
		MoCB	190	10.19	2361	no					*			
4	**PCB 4**		**222**	**10.30**	**2363**	**1.52**	**3915**	**0.003741**		-0.00103	9	yes	0.954	-
		DiCB	224	10.31	1552	yes					9			
5	PCB 10		222	10.38	333	0.77	768	-0.00083		-0.00083	*	yes	1.177	-
		DiCB	224	10.39	434	no					*			
6	PCB 9		222	11.20	1358	2.76	1850	-0.00092		-0.00092	*	no	1.357	-
		DiCB	224	11.20	492	no					*			
7	PCB 7		222	NotFnd	*	*	*	-0.00108		-0.00108	*	no	1.155	-
		DiCB	224	11.26	*	no					*			
8	**PCB 6**		**222**	**11.36**	**4051**	**1.36**	**7024**	**0.002368**		-0.00093	12	no	1.347	-
		DiCB	224	11.37	2974	yes					16			
9	PCB 5		222	NotFnd	*	*	*	-0.00107		-0.00107	*	no	1.169	-
		DiCB	224	11.51	*	no					*			
10	**PCB 8**		**222**	**11.55**	**16832**	**1.56**	**27617**	**0.009596**		-0.00096	48	no	1.307	-
		DiCB	224	11.55	10785	yes					50			
11	PCB 14		222	NotFnd	*	*	*	-0.00093		-0.00093	*	no	1.351	-
		DiCB	224	12.26	*	no					*			
12	**PCB 11**		**222**	**12.66**	**13437**	**1.41**	**22989**	**0.007854**		-0.00094	31	no	1.33	-
		DiCB	224	12.65	9553	yes					32			
13	PCB 13/12		222	12.78	-2559	1.56	-4199.38	-0.00154	PCB 13/12 NDR	-0.00101	6	xL	1.241	-
		DiCB	224	12.79	-1640.38	OK					10			
14	**PCB 15**		**222**	**12.95**	**51646**	**1.53**	**85314**	**0.02964**		-0.00144	124	no	0.871	-
		DiCB	224	12.93	33668	yes					123			
15	**PCB 19**		**256**	**11.68**	**2553**	**0.96**	**5215**	**0.00535**		-0.00075	35	no	0.899	-
		TriCB	258	11.68	2662	yes					38			
16	**PCB 30/18**		**256**	**12.49**	**35888**	**1.06**	**69627**	**0.032825**		-0.00069	488	no	0.976	-
		TriCB	258	12.48	33739	yes					491			
17	**PCB 17**		**256**	**12.70**	**6778**	**1.08**	**13038**	**0.007586**		-0.00085	72	no	0.79	-
		TriCB	258	12.69	6260	yes					70			
18	**PCB 27**		**256**	**12.78**	**7451**	**1.1**	**14249**	**0.005567**		-0.00057	96	no	1.177	-
		TriCB	258	12.79	6798	yes					89			
19	PCB 24		256	NotFnd	*	*	*	-0.00071		-0.00071	*	no	0.948	-
		TriCB	258	12.87	*	no					*			
20	**PCB 16**		**256**	**12.91**	**12347**	**1.03**	**24360**	**0.014124**		-0.00084	156	no	0.793	-
		TriCB	258	12.90	12012	yes					154			
21	**PCB 32**		**256**	**13.14**	**12809**	**1.06**	**24949**	**0.008593**		-0.0005	149	no	1.335	-
		TriCB	258	13.14	12140	yes					157			
22	PCB 34		256	13.74	1223	1.09	2347	-0.00076		-0.00076	*	yes	1.484	-
		TriCB	258	13.73	1124	yes					*			
23	PCB 23		256	13.83	282	1.52	467	-0.00078		-0.00078	*	yes	1.446	-
		TriCB	258	13.83	185	no					*			
24	**PCB 26/29**		**256**	**13.97**	**35406**	**1.01**	**70385**	**0.020058**		-0.0007	101	no	1.614	-
		TriCB	258	13.99	34979	yes					106			
25	**PCB 25**		**256**	**14.10**	**17951**	**1.02**	**35621**	**0.009443**		-0.00065	51	no	1.735	-
		TriCB	258	14.11	17669	yes					50			
26	**PCB 31**		**256**	**14.26**	**184410**	**1.02**	**366015**	**0.091757**		-0.00061	544	no	1.835	-
		TriCB	258	14.28	181605	yes					564			
27	**PCB 28/20**		**256**	**14.43**	**509958**	**1.01**	**1015018**	**0.276477**		-0.00067	1465	no	1.688	-
		TriCB	258	14.45	505060	yes					1488			
28	**PCB 21/33**		**256**	**14.55**	**88619**	**1.01**	**176764**	**0.047562**		-0.00066	233	no	1.709	-
		TriCB	258	14.55	88146	yes					235			
29	**PCB 22**		**256**	**14.77**	**79170**	**1.01**	**157688**	**0.04537**		-0.00071	220	no	1.599	-
		TriCB	258	14.78	78518	yes					218			
30	PCB 36		256	NotFnd	*	*	*	-0.00061		-0.00061	*	no	1.858	-
		TriCB	258	15.62	*	no					*			
31	**PCB 39**		**256**	**15.83**	**3678**	**0.91**	**7737**	**0.002343**		-0.00074	10	no	1.519	-
		TriCB	258	15.82	4059	yes					11			
32	PCB 38		256	NotFnd	*	*	*	-0.00072		-0.00072	*	no	1.574	-
		TriCB	258	16.20	*	no					*			
33	**PCB 35**		**256**	**16.45**	**3636**	**1.01**	**7231**	**0.002197**		-0.00075	9	no	1.514	-
		TriCB	258	16.47	3595	yes					9			
34	**PCB 37**		**256**	**16.70**	**76038**	**1.04**	**149178**	**0.050477**		-0.00125	181	no	0.906	-
		TriCB	258	16.72	73140	yes					176			
35	PCB 54		290	13.08	279	0.84	610	-0.0006		-0.0006	*	yes	0.911	-
		TCB	292	13.08	331	yes					*			
36	**PCB 53/50**		**290**	**14.12**	**22622**	**0.87**	**48608**	**0.030104**		-0.001	136	no	0.77	-
		TCB	292	14.11	25986	yes					117			
37	**PCB 45/51**		**290**	**14.48**	**13544**	**0.83**	**29839**	**0.019601**		-0.00106	76	no	0.725	-
		TCB	292	14.49	16295	yes					70			
38	**PCB 46**		**290**	**14.64**	**6947**	**0.81**	**15523**	**0.012246**		-0.00128	40	no	0.604	-
		TCB	292	14.64	8576	yes					37			
39	**PCB 52**		**290**	**15.38**	**164672**	**0.8**	**370979**	**0.235062**		-0.00102	918	no	0.752	-
		TCB	292	15.38	206307	yes					867			
40	PCB 73		290	NotFnd	*	*	*	-0.00077		-0.00077	*	no	1.002	-
		TCB	292	15.43	*	no					*			
41	**PCB 43**		**290**	**15.53**	**6897**	**0.77**	**15800**	**0.015008**		-0.00153	37	no	0.502	-
		TCB	292	15.50	8903	yes					37			
42	**PCB 69/49**		**290**	**15.65**	**74967**	**0.81**	**167749**	**0.092754**		-0.00089	401	no	0.862	-
		TCB	292	15.63	92783	yes					385			

43 PCB 48	**290**	**15.83**	**41612**	**0.82**	**92430**	**0.064465**	-0.00113	232	no	0.683	-
TCB 292	15.84	50818	yes					217			
44 PCB 44/47/65	**290**	**15.96**	**157903**	**0.81**	**354036**	**0.216482**	-0.00099	694	no	0.779	-
TCB 292	15.97	196133	yes					664			
45 PCB 59/62/75	**290**	**16.16**	**20546**	**0.8**	**46086**	**0.022346**	-0.00078	104	no	0.983	-
TCB 292	16.16	25540	yes					95			
46 PCB 42	**290**	**16.29**	**31880**	**0.79**	**72176**	**0.056931**	-0.00128	164	no	0.604	-
TCB 292	16.27	40295	yes					160			
47 PCB 40/41/71	**290**	**16.58**	**70309**	**0.79**	**159337**	**0.110182**	-0.00112	315	no	0.689	-
TCB 292	16.56	89028	yes					310			
48 PCB 64	**290**	**16.72**	**47108**	**0.79**	**106859**	**0.056606**	-0.00086	246	no	0.9	-
TCB 292	16.70	59751	yes					237			
49 PCB 72	**290**	**17.20**	**2571**	**0.87**	**5526**	**0.002088**	-0.00081	8	no	1.261	-
TCB 292	17.20	2955	yes					7			
50 PCB 68	**290**	**17.40**	**1837**	**0.74**	**4315**	**0.001584**	-0.00079	5	no	1.298	-
TCB 292	17.42	2478	yes					5			
51 PCB 57	**290**	**17.70**	**953**	**0.69**	**2343**	**0.000756**	-0.00069	4	yes	1.477	-
TCB 292	17.68	1390	yes					5			
52 PCB 58	290	NotFnd	*	*	*	-0.00081	-0.00081	*	no	1.274	-
TCB 292	17.85	*	no					*			
53 PCB 67	**290**	**17.95**	**5651**	**0.78**	**12873**	**0.003726**	-0.00062	16	yes	1.647	-
TCB 292	17.95	7222	yes					16			
54 PCB 63	**290**	**18.13**	**4739**	**0.76**	**11002**	**0.00342**	-0.00067	14	yes	1.533	-
TCB 292	18.15	6263	yes					14			
55 PCB 61/70/74/76	**290**	**18.36**	**114025**	**0.77**	**262583**	**0.091161**	-0.00075	233	yes	1.373	-
TCB 292	18.36	148558	yes					235			
56 PCB 66	**290**	**18.59**	**48374**	**0.77**	**110844**	**0.033417**	-0.00065	134	yes	1.581	-
TCB 292	18.60	62470	yes					135			
57 PCB 55	290	NotFnd	*	*	*	-0.00083	-0.00083	*	no	1.229	-
TCB 292	18.73	*	no					*			
58 PCB 56	**290**	**19.07**	**5897**	**0.72**	**14143**	**0.005264**	-0.0008	17	yes	1.28	-
TCB 292	19.07	8246	yes					18			
59 PCB 60	**290**	**19.23**	**5575**	**0.72**	**13363**	**0.00503**	-0.00081	16	yes	1.266	-
TCB 292	19.24	7788	yes					17			
60 PCB 80	290	NotFnd	*	*	*	-0.00064	-0.00064	*	no	1.596	-
TCB 292	19.50	*	no					*			
61 PCB 79	290	NotFnd	*	*	*	-0.00061	-0.00061	*	no	1.695	-
TCB 292	20.63	*	no					*			
62 PCB 78	290	NotFnd	*	*	*	-0.00072	-0.00072	*	no	1.435	-
TCB 292	21.08	*	no					*			
63 PCB 81	290	21.44	306	0.86	661	-0.001	-0.001	*	yes	1.027	-
TCB 292	21.45	355	yes					*			
64 PCB 77	**290**	**21.89**	**2266**	**0.71**	**5440**	**0.002046**	-0.00095	6	no	1.077	-
TCB 292	21.89	3174	yes					6			
65 PCB 104	326	NotFnd	*	*	*	-0.00061	-0.00061	*	no	1.094	-
PeCB 328	15.94	*	no					*			
66 PCB 96	**326**	**16.16**	**1826**	**1.73**	**2883**	**0.00166**	-0.00084	9	no	0.802	-
PeCB 328	16.15	1057	yes					8			
67 PCB 103	**326**	**17.33**	**1826**	**1.51**	**3032**	**0.001961**	-0.00101	6	yes	0.714	-
PeCB 328	17.31	1206	yes					6			
68 PCB 94	326	17.47	915	1.75	1436	-0.00138	-0.00138	*	yes	0.521	-
PeCB 328	17.47	521	yes					*			
69 PCB 95	**326**	**17.77**	**70348**	**1.66**	**112664**	**0.081135**	-0.00112	233	yes	0.641	-
PeCB 328	17.76	42316	yes					213			
70 PCB 100/93/102/98	**326**	**18.00**	**6681**	**1.69**	**10631**	**0.008775**	-0.00129	15	yes	0.559	-
PeCB 328	17.91	3950	yes					14			
71 PCB 88/91	**326**	**18.34**	**5249**	**1.53**	**8670**	**0.007019**	-0.00126	16	yes	0.57	-
PeCB 328	18.33	3421	yes					17			
72 PCB 84	**326**	**18.50**	**6438**	**1.6**	**10449**	**0.009819**	-0.00147	20	yes	0.491	-
PeCB 328	18.49	4011	yes					19			
73 PCB 89	326	NotFnd	*	*	*	-0.00133	-0.00133	*	no	0.541	-
PeCB 328	18.84	*	no					*			
74 PCB 121	326	NotFnd	*	*	*	-0.00098	-0.00098	*	no	0.733	-
PeCB 328	19.08	*	no					*			
75 PCB 92	**326**	**19.36**	**14139**	**1.6**	**22992**	**0.018208**	-0.00124	44	no	0.583	-
PeCB 328	19.35	8852	yes					42			
76 PCB 113/90/101	**326**	**19.79**	**108259**	**1.63**	**174681**	**0.11879**	-0.00106	328	yes	0.679	-
PeCB 328	19.76	66422	yes					314			
77 PCB 83/99	**326**	**20.23**	**44710**	**1.64**	**71890**	**0.064074**	-0.00139	127	yes	0.518	-
PeCB 328	20.22	27180	yes					122			
78 PCB 112	326	NotFnd	*	*	*	-0.00087	-0.00087	*	no	0.83	-
PeCB 328	20.30	*	no					*			
79 PCB 109/119/86/97/125/	**326**	**20.69**	**29128**	**1.59**	**47444**	**0.032838**	-0.00108	48	no	0.667	-
PeCB 328	20.62	18316	yes					46			
80 PCB 117/116/85	**326**	**21.19**	**9551**	**1.63**	**15420**	**0.009928**	-0.00101	28	no	0.717	-
PeCB 328	21.19	5869	yes					26			
81 PCB 110/115	**326**	**21.32**	**70784**	**1.66**	**113419**	**0.078033**	-0.00107	201	no	0.671	-
PeCB 328	21.32	42636	yes					186			
82 PCB 82	**326**	**21.58**	**2681**	**1.55**	**4411**	**0.003963**	-0.0014	8	no	0.514	-
PeCB 328	21.59	1730	yes					7			
83 PCB 111	326	NotFnd	*	*	*	-0.00096	-0.00096	*	no	0.749	-
PeCB 328	21.85	*	no					*			
84 PCB 120	326	22.24	825	1.74	1298	-0.00085	-0.00085	*	yes	0.853	-
PeCB 328	22.25	473	yes					*			
85 PCB 108/124	**326**	**23.20**	**4000**	**1.51**	**6655**	**0.002456**	-0.00115	5	no	1.251	-
PeCB 328	23.21	2654	yes					5			
86 PCB 107	**326**	**23.42**	**9617**	**1.45**	**16250**	**0.005709**	-0.0011	12	no	1.314	-
PeCB 328	23.40	6634	yes					13			
87 PCB 123	326	23.51	1325	1.51	2202	-0.00161	-0.00161	*	no	0.894	-
PeCB 328	23.51	878	yes					*			
88 PCB 106	326	NotFnd	*	*	*	-0.00105	-0.00105	*	no	1.375	-
PeCB 328	23.63	*	no					*			
89 PCB 118	**326**	**23.81**	**115332**	**1.57**	**188756**	**0.078732**	-0.00147	150	no	0.981	-
PeCB 328	23.80	73424	yes					147			

90 PCB 122		326	24.10	1311	1.54	2161	-0.00118	-0.00118	*	no	1.222	-
	PeCB	328	24.08	851	yes				*			
91 PCB 114		326	24.29	1821	1.36	3156	-0.00143	-0.00143	*	no	1.01	-
	PeCB	328	24.28	1335	yes				*			
92 PCB 105		**326**	**24.84**	**33901**	**1.51**	**56405**	**0.024387**	-0.00148	43	no	0.977	-
	PeCB	328	24.85	22505	yes				45			
93 PCB 127		326	NotFnd	*	*	*	-0.00107	-0.00107	*	no	1.348	-
	PeCB	328	26.20	*	no				*			
94 PCB 126		326	27.75	625	1.41	1068	-0.00148	-0.00148	*	yes	0.977	-
	PeCB	328	27.72	443	yes				*			
95 PCB 155		360	NotFnd	*	*	*	-0.00063	-0.00063	*	no	0.997	-
	HxCB	362	19.63	*	no				*			
96 PCB 152		360	NotFnd	*	*	*	-0.00093	-0.00093	*	no	0.675	-
	HxCB	362	19.78	*	no				*			
97 PCB 150		360	19.89	410	1.41	700	-0.00098	-0.00098	*	yes	0.639	-
	HxCB	362	19.88	290	yes				*			
98 PCB 136		**360**	**20.19**	**16778**	**1.25**	**30210**	**0.02342**	-0.00093	91	no	0.672	-
	HxCB	362	20.18	13432	yes				93			
99 PCB 145		360	NotFnd	*	*	*	-0.00108	-0.00108	*	no	0.579	-
	HxCB	362	20.41	*	no				*			
100 PCB 148		360	21.53	641	1.47	1078	-0.00128	-0.00128	*	yes	0.487	-
	HxCB	362	21.55	437	no				*			
101 PCB 151/135		**360**	**22.03**	**47128**	**1.32**	**82873**	**0.095801**	-0.00139	207	yes	0.451	-
	HxCB	362	22.04	35744	yes				199			
102 PCB 154		**360**	**22.24**	**2272**	**1.15**	**4253**	**0.004074**	-0.00115	13	yes	0.544	-
	HxCB	362	22.21	1981	yes				13			
103 PCB 144		**360**	**22.51**	**6290**	**1.15**	**11763**	**0.012694**	-0.00129	35	yes	0.483	-
	HxCB	362	22.51	5473	yes				36			
104 PCB 147/149		**360**	**22.80**	**156686**	**1.32**	**275767**	**0.222067**	-0.00119	639	yes	0.647	-
	HxCB	362	22.80	119081	yes				606			
105 PCB 134/143		**360**	**22.99**	**5894**	**1.28**	**10507**	**0.009726**	-0.00137	22	yes	0.563	-
	HxCB	362	23.06	4613	yes				21			
106 PCB 139/140		**360**	**23.31**	**1543**	**1.23**	**2792**	**0.002277**	-0.00121	5	yes	0.639	-
	HxCB	362	23.31	1250	yes				6			
107 PCB 131		**360**	**23.49**	**1084**	**1.24**	**1954**	**0.001985**	-0.00151	4	yes	0.513	-
	HxCB	362	23.49	871	yes				4			
108 PCB 142		360	NotFnd	*	*	*	-0.00132	-0.00132	*	no	0.583	-
	HxCB	362	23.65	*	no				*			
109 PCB 132		**360**	**23.88**	**21336**	**1.28**	**38040**	**0.037913**	-0.00148	81	yes	0.523	-
	HxCB	362	23.88	16704	yes				81			
110 PCB 133		**360**	**24.31**	**2710**	**1.4**	**4653**	**0.003892**	-0.00124	10	yes	0.623	-
	HxCB	362	24.31	1942	yes				8			
111 PCB 165		360	24.65	298	1.18	550	-0.00108	-0.00108	*	yes	0.714	-
	HxCB	362	24.68	252	yes				*			
112 PCB 146		**360**	**24.88**	**31997**	**1.31**	**56511**	**0.044372**	-0.00116	122	yes	0.663	-
	HxCB	362	24.88	24513	yes				115			
113 PCB 161		360	NotFnd	*	*	*	-0.00087	-0.00087	*	no	0.888	-
	HxCB	362	25.03	*	no				*			
114 PCB 153/168		**360**	**25.43**	**282524**	**1.29**	**502211**	**0.330304**	-0.00098	1066	no	0.792	-
	HxCB	362	25.47	219686	yes				1027			
115 PCB 141		**360**	**25.63**	**7103**	**1.38**	**12239**	**0.010264**	-0.00124	27	yes	0.621	-
	HxCB	362	25.62	5136	yes				23			
116 PCB 130		**360**	**26.00**	**6685**	**1.32**	**11754**	**0.010969**	-0.00138	23	yes	0.558	-
	HxCB	362	26.00	5069	yes				22			
117 PCB 137		**360**	**26.30**	**7940**	**1.32**	**13977**	**0.012921**	-0.00137	24	yes	0.563	-
	HxCB	362	26.21	6036	yes				21			
118 PCB 164		360	NotFnd	*	*	*	-0.00094	-0.00094	*	no	0.826	-
	HxCB	362	26.30	*	no				*			
119 PCB 138/163/129		**360**	**26.61**	**214081**	**1.31**	**377850**	**0.305677**	-0.0012	784	yes	0.644	-
	HxCB	362	26.62	163768	yes				733			
120 PCB 160		360	NotFnd	*	*	*	-0.00107	-0.00107	*	no	0.723	-
	HxCB	362	26.80	*	no				*			
121 PCB 158		**360**	**26.98**	**20502**	**1.33**	**35957**	**0.020554**	-0.00085	70	yes	0.911	-
	HxCB	362	26.98	15455	yes				66			
122 PCB 128/166		**360**	**27.82**	**19145**	**1.32**	**33648**	**0.025024**	-0.0011	55	no	0.7	-
	HxCB	362	27.80	14503	yes				54			
123 PCB 159		360	NotFnd	*	*	*	-0.00056	-0.00056	*	no	1.379	-
	HxCB	362	28.78	*	no				*			
124 PCB 162		360	29.09	756	1.76	1186	-0.00062	-0.00062	*	yes	1.254	-
	HxCB	362	29.07	430	no				*			
125 PCB 167		**360**	**29.53**	**11792**	**1.28**	**20972**	**0.008667**	-0.00082	36	yes	0.946	-
	HxCB	362	29.55	9180	yes				35			
126 PCB 156/157		**360**	**30.68**	**23282**	**1.26**	**41741**	**0.017662**	-0.00076	65	no	1.017	-
	HxCB	362	30.71	18459	yes				63			
127 PCB 169		360	NotFnd	*	*	*	-0.00081	-0.00081	*	no	0.954	-
	HxCB	362	34.13	*	no				*			
128 PCB 188		394	24.24	241	1.13	455	-0.00081	-0.00081	*	yes	1.012	-
	HpCB	396	24.23	214	yes				*			
129 PCB 179		**394**	**24.54**	**20283**	**1.06**	**39432**	**0.026587**	-0.0008	102	no	1.016	-
	HpCB	396	24.52	19149	yes				102			
130 PCB 184		394	NotFnd	*	*	*	-0.00087	-0.00087	*	no	0.937	-
	HpCB	396	25.00	*	no				*			
131 PCB 176		**394**	**25.33**	**5860**	**1.03**	**11543**	**0.007967**	-0.00082	29	no	0.993	-
	HpCB	396	25.32	5683	yes				29			
132 PCB 186		394	NotFnd	*	*	*	-0.00095	-0.00095	*	no	0.865	-
	HpCB	396	25.75	*	no				*			
133 PCB 178		**394**	**27.02**	**7424**	**1.08**	**14329**	**0.014305**	-0.00119	36	no	0.686	-
	HpCB	396	27.01	6905	yes				35			
134 PCB 175		**394**	**27.62**	**1510**	**1.17**	**2804**	**0.00276**	-0.00117	7	no	0.696	-
	HpCB	396	27.62	1294	yes				7			
135 PCB 187		**394**	**27.89**	**55815**	**1.11**	**106141**	**0.108038**	-0.00121	268	no	0.673	-
	HpCB	396	27.88	50327	yes				255			
136 PCB 182		394	NotFnd	*	*	*	-0.00121	-0.00121	*	no	0.674	-
	HpCB	396	28.10	*	no				*			

137 PCB 183	**394**	**28.50**	**38516**	**1.07**	**74482**	**0.044237**	-0.00099	131	yes	1.153	-
HpCB	396	28.51	35966	yes				131			
138 PCB 185	394	NotFnd	*	*	*	-0.00142	-0.00142	*	no	0.805	-
HpCB	396	28.58	*	no				*			
139 PCB 174	394	NotFnd	*	*	*	-0.00121	-0.00121	*	no	0.947	-
HpCB	396	28.74	*	no				*			
140 PCB 177	**394**	**29.16**	**24716**	**1.03**	**48605**	**0.036159**	-0.00124	86	no	0.921	-
HpCB	396	29.16	23889	yes				85			
141 PCB 181	394	NotFnd	*	*	*	-0.00129	-0.00129	*	no	0.885	-
HpCB	396	29.57	*	no				*			
142 PCB 171/173	**394**	**29.78**	**13100**	**1.07**	**25337**	**0.019331**	-0.00127	42	no	0.898	-
HpCB	396	29.80	12237	yes				44			
143 PCB 172	**394**	**31.45**	**1333**	**1.08**	**2565**	**0.001957**	-0.00127	5	no	0.898	-
HpCB	396	31.44	1231	yes				4			
144 PCB 192	394	NotFnd	*	*	*	-0.0011	-0.0011	*	no	1.043	-
HpCB	396	31.76	*	no				*			
145 PCB 193/180	**394**	**32.13**	**86156**	**1.1**	**164629**	**0.10582**	-0.00081	278	no	1.408	-
HpCB	396	32.08	78473	yes				264			
146 PCB 191	**394**	**32.51**	**1951**	**0.94**	**4033**	**0.002228**	-0.00092	7	no	1.24	-
HpCB	396	32.50	2082	yes				7			
147 PCB 170	**394**	**33.45**	**14977**	**1.11**	**28493**	**0.023299**	-0.0009	48	yes	1.271	-
HpCB	396	33.47	13516	yes				44			
148 PCB 190	**394**	**34.03**	**9387**	**1.02**	**18622**	**0.009988**	-0.00089	31	yes	1.277	-
HpCB	396	34.04	9235	yes				31			
149 PCB 189	**394**	**36.87**	**3403**	**1.1**	**6493**	**0.002631**	-0.00075	9	no	0.944	-
HpCB	396	36.88	3090	yes				8			
150 PCB 202	**428**	**29.28**	**3580**	**0.81**	**8004**	**0.007853**	-0.00083	26	no	0.988	-
OcCB	430	29.28	4424	yes				27			
151 PCB 201	**428**	**30.21**	**2455**	**0.93**	**5108**	**0.003666**	-0.00076	16	no	1.068	-
OcCB	430	30.18	2652	yes				16			
152 PCB 204	428	30.95	3	0.27	13	-0.00078	-0.00078	*	yes	1.052	-
OcCB	430	30.88	10	no				*			
153 PCB 197	**428**	**31.13**	**794**	**0.81**	**1774**	**0.001429**	-0.00086	5	yes	0.951	-
OcCB	430	31.12	980	yes				5			
154 PCB 200	428	NotFnd	*	*	*	-0.00077	-0.00077	*	no	1.056	-
OcCB	430	31.24	*	no				*			
155 PCB 198/199	428	34.21	420	0.86	906	-0.00116	-0.00116	*	yes	0.702	-
OcCB	430	34.19	486	yes				*			
156 PCB 196	428	34.92	342	0.86	739	-0.00111	-0.00111	*	yes	0.734	-
OcCB	430	34.93	397	yes				*			
157 PCB 203	**428**	**35.14**	**3522**	**0.93**	**7312**	**0.007887**	-0.00115	20	no	0.711	-
OcCB	430	35.12	3790	yes				22			
158 PCB 195	428	36.57	645	0.76	1494	-0.00093	-0.00093	*	Op-O	1.046	-
OcCB	430	36.59	850	no				*			
159 PCB 194	**428**	**39.21**	**5449**	**0.92**	**11379**	**0.007796**	-0.00086	21	no	1.119	-
OcCB	430	39.22	5930	yes				20			
160 PCB 205	**428**	**39.76**	**860**	**0.9**	**1810**	**0.001052**	-0.00089	3	yes	1.091	-
OcCB	430	39.77	950	yes				3			
161 PCB 208	462	NotFnd	*	*	*	-0.00084	-0.00084	*	no	1.023	-
NoCB	464	36.33	*	no				*			
162 PCB 207	462	NotFnd	*	*	*	-0.00066	-0.00066	*	no	1.304	-
NoCB	464	37.35	*	no				*			
163 PCB 206	462	41.73	307	0.91	647	-0.00084	-0.00084	*	yes	1.027	-
NoCB	464	41.71	339	no				*			
164 PCB 209	498	43.59	252	1.55	415	-0.00081	-0.00081	*	yes	1.04	-
DCB	500	43.56	163	no				*			
165 PCB 1L	**200**	**8.99**	**339845**	**3.35**	**441203**	**0.143851**	0	6443	no	0.824	73
	202	8.97	101358	yes				890			
166 PCB 3L	**200**	**10.18**	**331450**	**3.43**	**428172**	**0.134923**	0	6128	no	0.852	68
	202	10.18	96723	yes				845			
167 PCB 4L	**234**	**10.30**	**134933**	**1.65**	**216501**	**0.107163**	0	3345	no	0.543	54
	236	10.28	81568	yes				4204			
168 PCB 15L	**234**	**12.93**	**407421**	**1.66**	**652544**	**0.163139**	0	3605	no	1.074	83
	236	12.91	245123	yes				2748			
169 PCB 19L	**268**	**11.68**	**110421**	**1.07**	**214087**	**0.099443**	0.001	431	no	0.578	50
	270	11.68	103666	yes				265			
170 PCB 37L	**268**	**16.70**	**334205**	**1.08**	**644132**	**0.215584**	0.001	850	no	1.987	109
	270	16.69	309927	yes				842			
171 PCB 54L	**302**	**13.06**	**111921**	**0.83**	**247231**	**0.126707**	0	1028	no	1.297	64
	304	13.07	135310	yes				2783			
172 PCB 81L	**302**	**21.42**	**226885**	**0.81**	**508026**	**0.194361**	0	1471	no	1.738	98
	304	21.42	281141	yes				2142			
173 PCB 77L	**302**	**21.87**	**219930**	**0.82**	**487062**	**0.193097**	0	1378	no	1.677	98
	304	21.85	267132	yes				1985			
174 PCB 104L	**338**	**15.92**	**141807**	**1.59**	**230727**	**0.158803**	0	5095	no	1.156	80
	340	15.93	88920	yes				5873			
175 PCB 123L	**338**	**23.49**	**313665**	**1.65**	**503194**	**0.206754**	0	4051	no	1.936	105
	340	23.50	189529	yes				2735			
176 PCB 118L	**338**	**23.77**	**299252**	**1.64**	**482082**	**0.201204**	0	3789	no	1.906	102
	340	23.76	182830	yes				2590			
177 PCB 114L	**338**	**24.26**	**283836**	**1.67**	**453914**	**0.203656**	0	3576	no	1.773	103
	340	24.26	170078	yes				2376			
178 PCB 105L	**338**	**24.83**	**288879**	**1.62**	**467448**	**0.204023**	0	3619	no	1.822	103
	340	24.81	178569	yes				2509			
179 PCB 126L	**338**	**27.69**	**283207**	**1.62**	**457607**	**0.209732**	0	3151	no	1.735	106
	340	27.68	174400	yes				2188			
180 PCB 155L	**372**	**19.61**	**135176**	**1.27**	**241831**	**0.14171**	0	8269	no	1.404	72
	374	19.61	106655	yes				4125			
181 PCB 167L	**372**	**29.52**	**285166**	**1.3**	**504889**	**0.196813**	0	3201	no	2.11	100
	374	29.49	219723	yes				2687			
182 PCB 156L/157L	**372**	**30.68**	**517619**	**1.3**	**917198**	**0.392704**	0	4830	no	1.921	99
	374	30.69	399578	yes				4093			
183 PCB 169L	**372**	**34.10**	**177378**	**1.33**	**310334**	**0.135312**	0	1789	no	1.886	69
	374	34.07	132955	yes				1486			

184 PCB 188L	406	24.20	117538	1.06	228128	0.141135	0	5039	no	1.329	72
	408	24.21	110590	yes				3428			
185 PCB 180L	406	32.11	113947	1.09	218134	0.132564	0	2428	no	1.349	67
	408	32.09	104187	yes				1893			
186 PCB 170L	406	33.44	98110	1.07	189898	0.131875	0	1979	no	1.18	67
	408	33.42	91788	yes				1653			
187 PCB 189L	406	36.84	267623	1.08	516165	0.19609	0	3973	no	2.157	99
	408	36.83	248542	yes				4734			
188 PCB 202L	440	29.25	96791	0.91	203686	0.117603	0	5257	no	1.419	60
	442	29.27	106895	yes				2466			
189 PCB 205L	440	39.73	149342	0.92	311351	0.166633	0	2841	no	1.531	84
	442	39.73	162009	yes				1495			
190 PCB 208L	474	36.29	86948	0.8	195108	0.140334	0	1181	no	1.139	71
	476	36.28	108160	yes				4215			
191 PCB 206L	474	41.71	69004	0.8	155339	0.16761	0	871	no	0.76	85
	476	41.73	86335	yes				3224			
192 PCB 209L	510	43.56	80451	1.23	145994	0.165187	0	5334	no	0.724	84
	512	43.53	65543	yes				3797			
193 PCB 28L	268	14.41	435972	1.06	848988	0.276798	0.001	1297	no	2.039	126
PCB Cleanup Standard	270	14.43	413016	yes				1319			
194 PCB 111L	338	21.83	240499	1.69	383081	0.226877	0	5844	no	1.343	104
PCB Cleanup Standard	340	21.84	142582	yes				4606			
195 PCB 178L	406	27.00	88750	1.05	172943	0.194068	0	3530	no	0.733	89
PCB Cleanup Standard	408	26.97	84193	yes				2443			
196 PCB 31L	268	NotFnd	*	*	*		0.001		no	1.934	
PCB Audit Standard	270	14.26	*	no							
197 PCB 95L	338	NotFnd	*	*	*		0		no	0.946	
PCB Audit Standard	340	17.73	*	no							
198 PCB 153L	372	NotFnd	*	*	*		0		no	1.225	
PCB Audit Standard	374	25.40	*	no							
199 PCB 9L	234	11.18	2553315	1.67	4081764	9.58264	-	24769	no	-	-
PCB Recovery Standard	236	11.19	1528449	yes				18906			
200 PCB 52L	302	15.36	734627	0.8	1648917	7.378756	-	8224	no	-	-
PCB Recovery Standard	304	15.36	914290	yes				14447			
201 PCB 101L	338	19.77	851684	1.62	1378318	7.654827	-	22128	no	-	-
PCB Recovery Standard	340	19.76	526634	yes				18290			
202 PCB 138L	372	26.57	753976	1.3	1333002	8.21167	-	15049	no	-	-
PCB Recovery Standard	374	26.56	579026	yes				24772			
203 PCB 194L	440	39.18	647463	0.94	1337721	9.891587	-	12035	no	-	-
PCB Recovery Standard	442	39.17	690258	yes				6192			

Chlorobiphenyls	-0.00066	0	-0.00066
Dichlorobiphenyls	0.053199	5	-0.00144
Trichlorobiphenyls	0.619729	15	-0.00125
Tetrachlorobiphenyls	1.080279	22	-0.00153
Pentachlorobiphenyls	0.547487	17	-0.00161
Hexachlorobiphenyls	1.200263	20	-0.00151
Heptachlorobiphenyls	0.405307	14	-0.00142
Octachlorobiphenyls	0.029683	6	-0.00116
Nonachlorobiphenyls	-0.00084	0	-0.00084
Decachlorobiphenyl	-0.00081	0	-0.00081
PCB (total)	3.935947		

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Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

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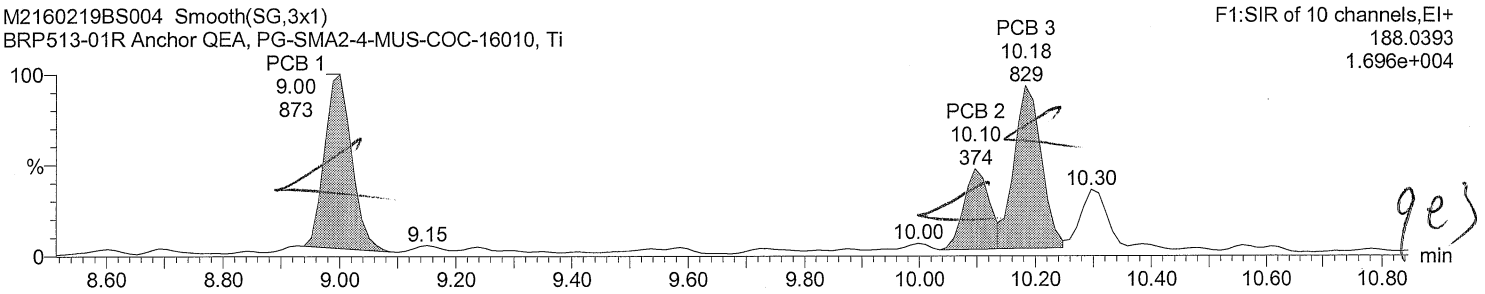

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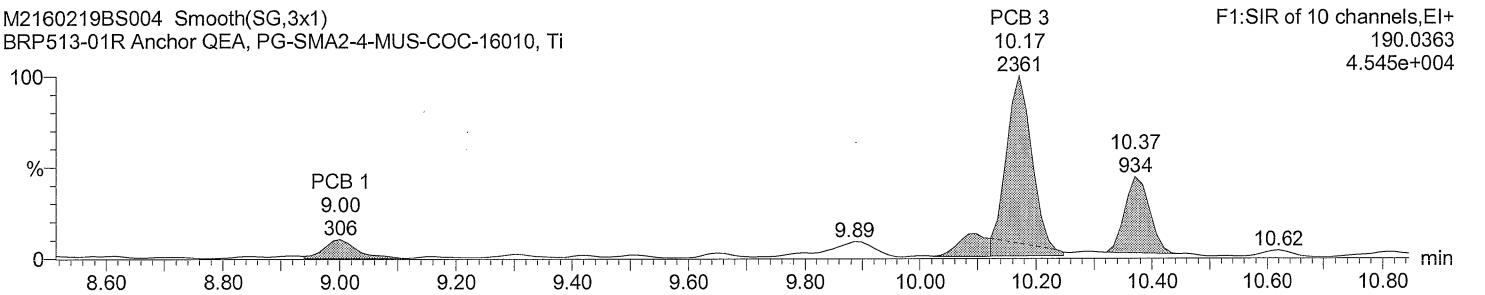

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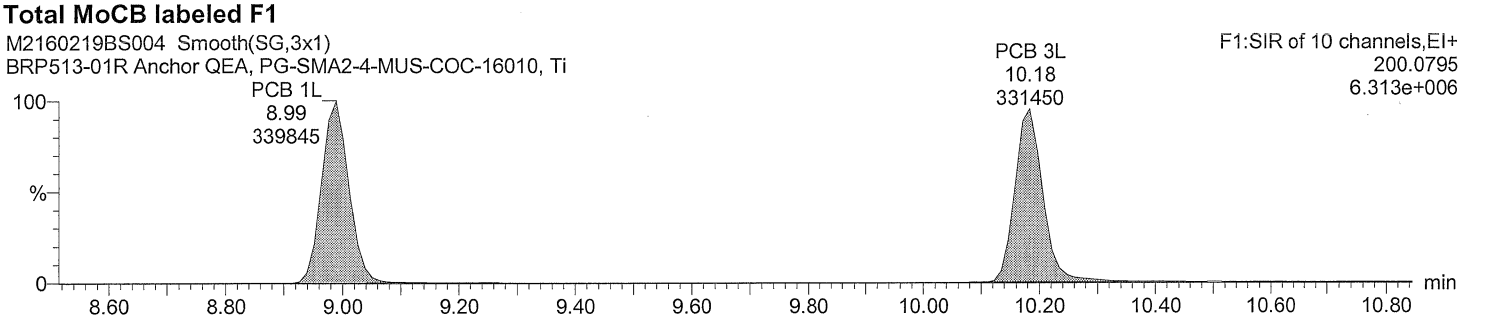

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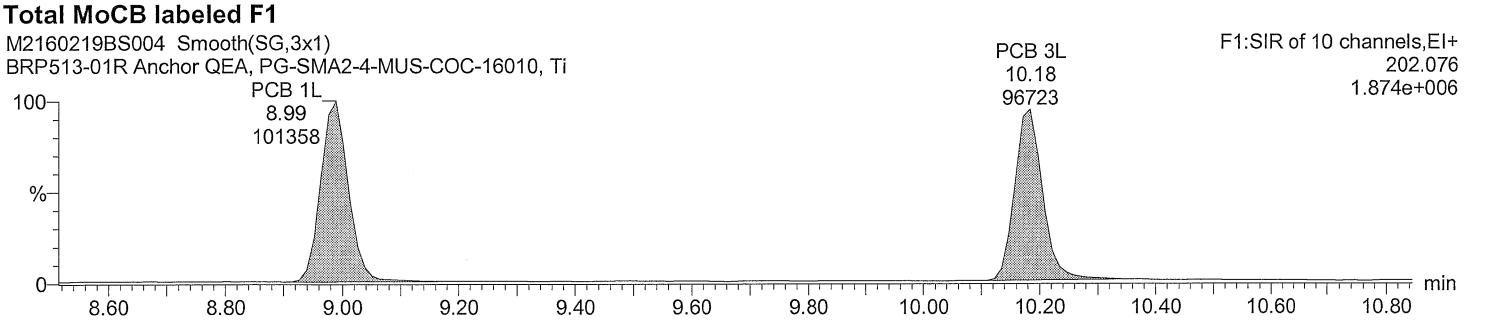

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Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

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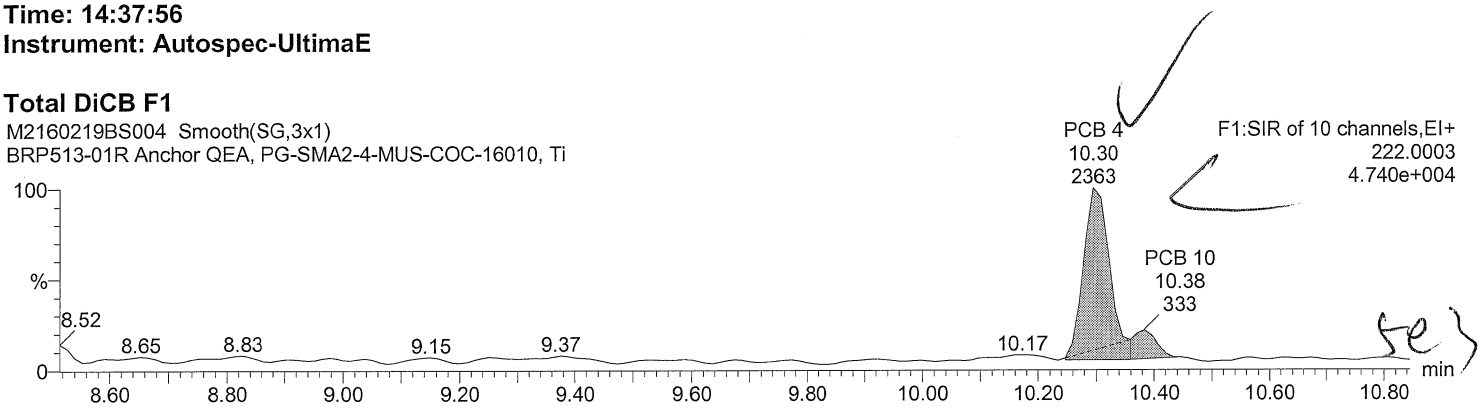

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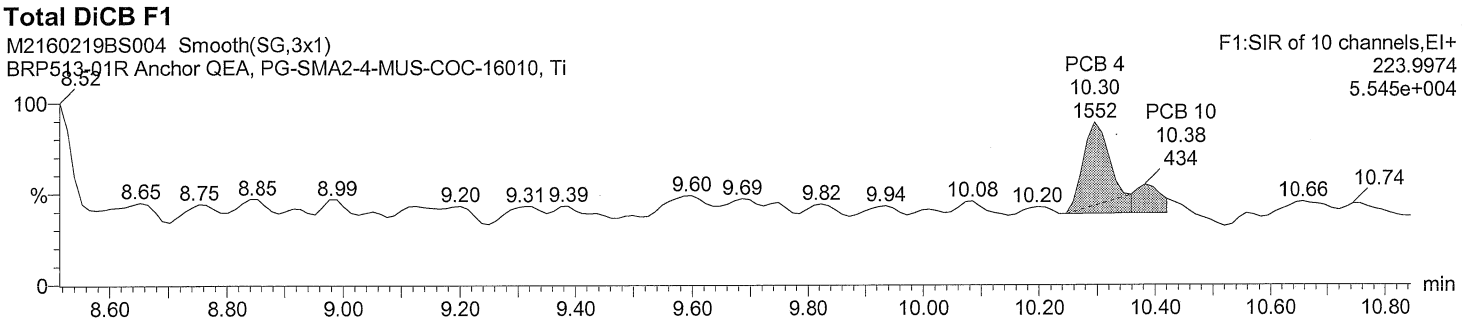

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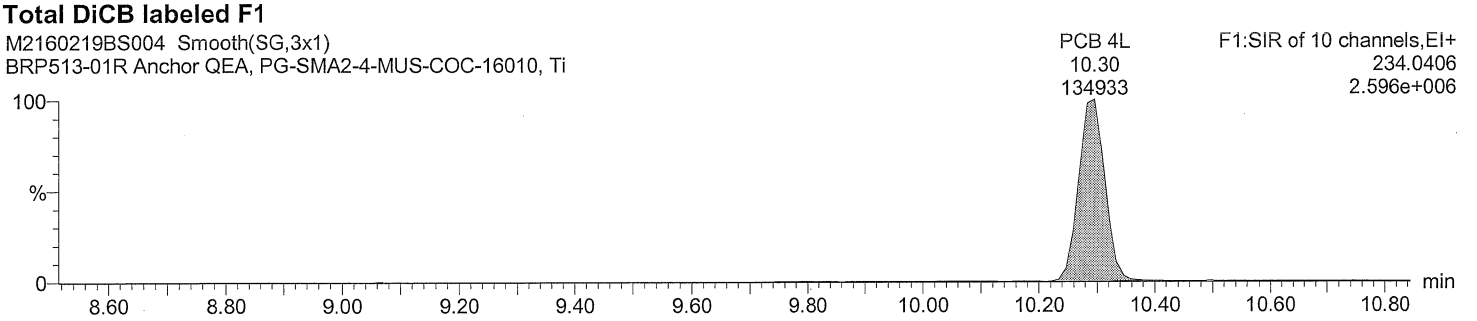
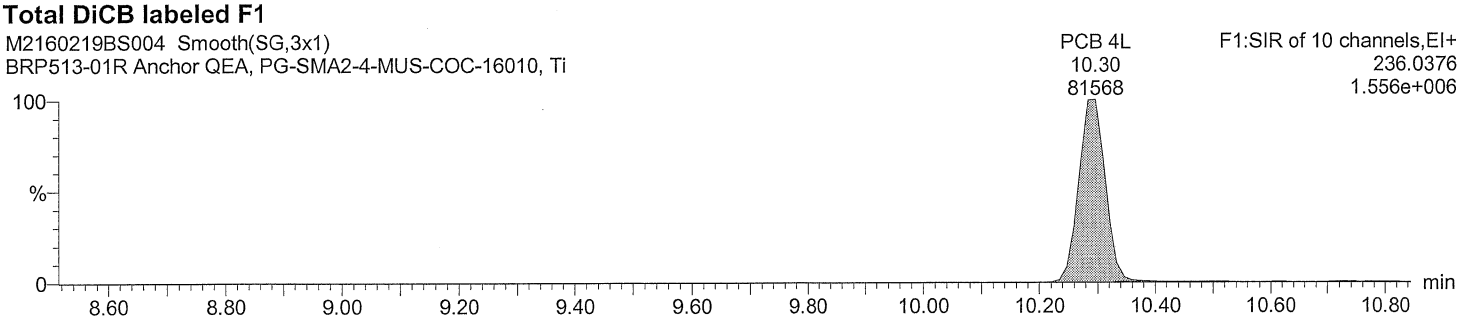


Total DiCB labeled F1



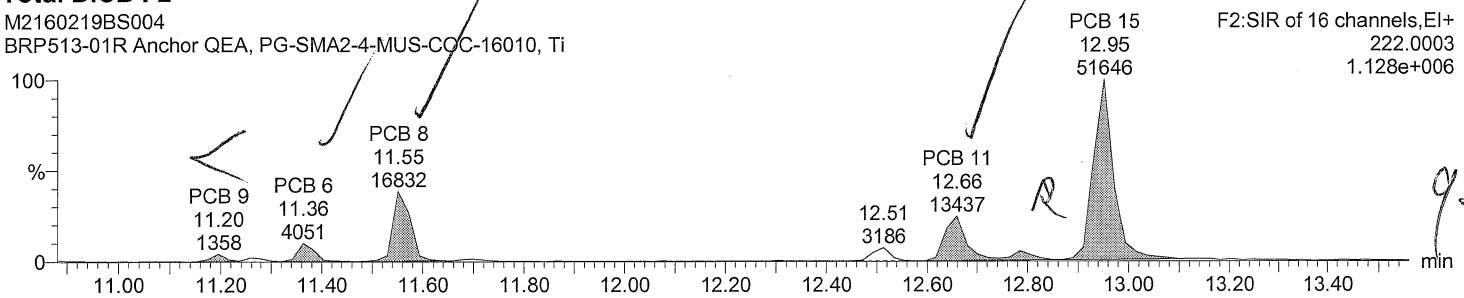
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
Printed: February 23, 2016 12:17:46 PM Eastern Standard Time

Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total DiCB F2



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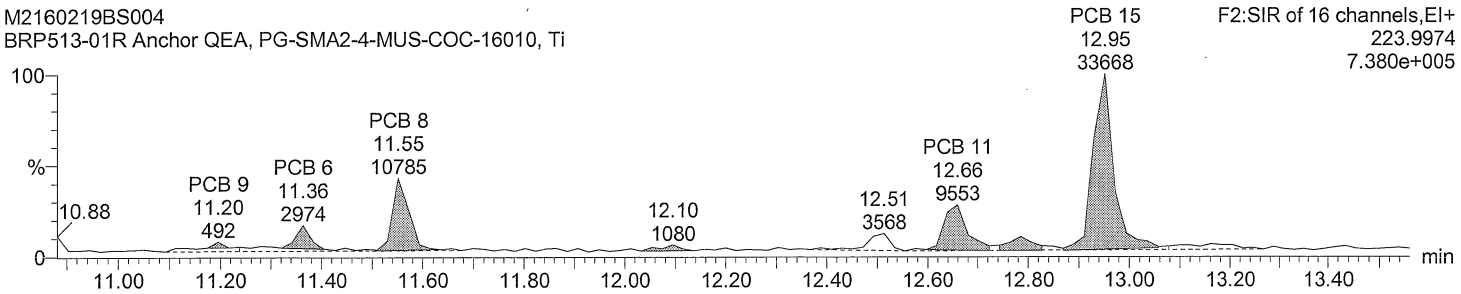

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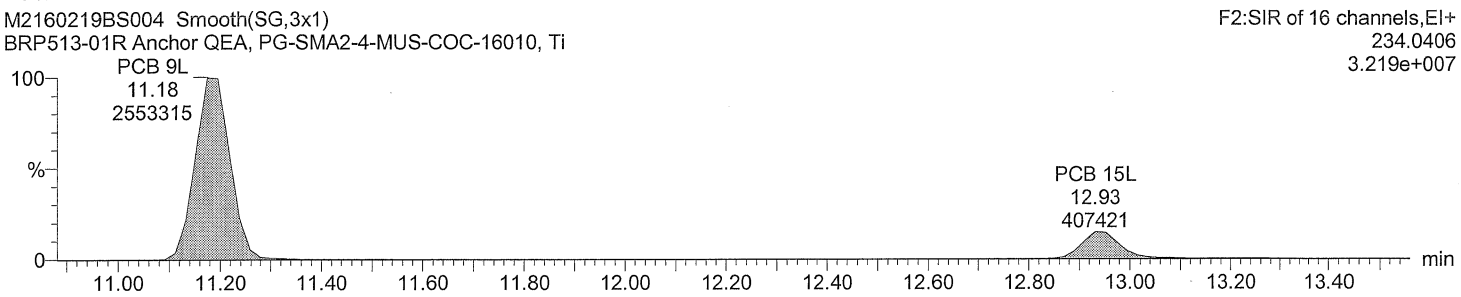

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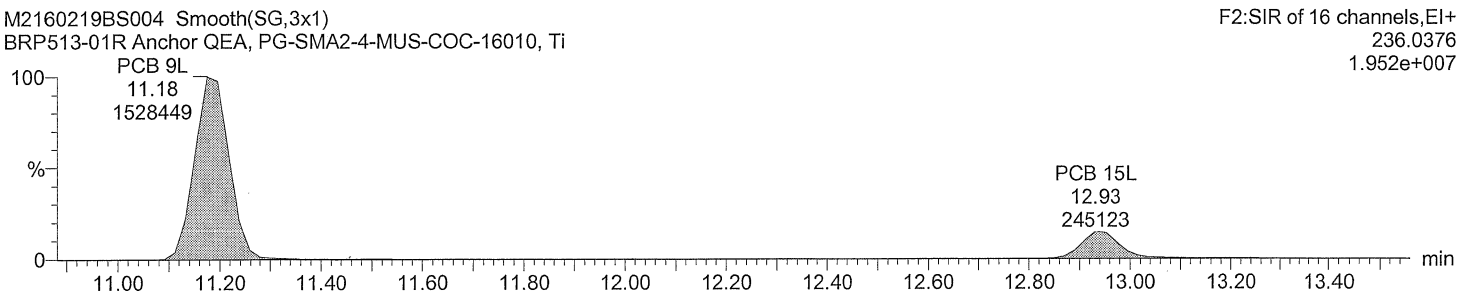

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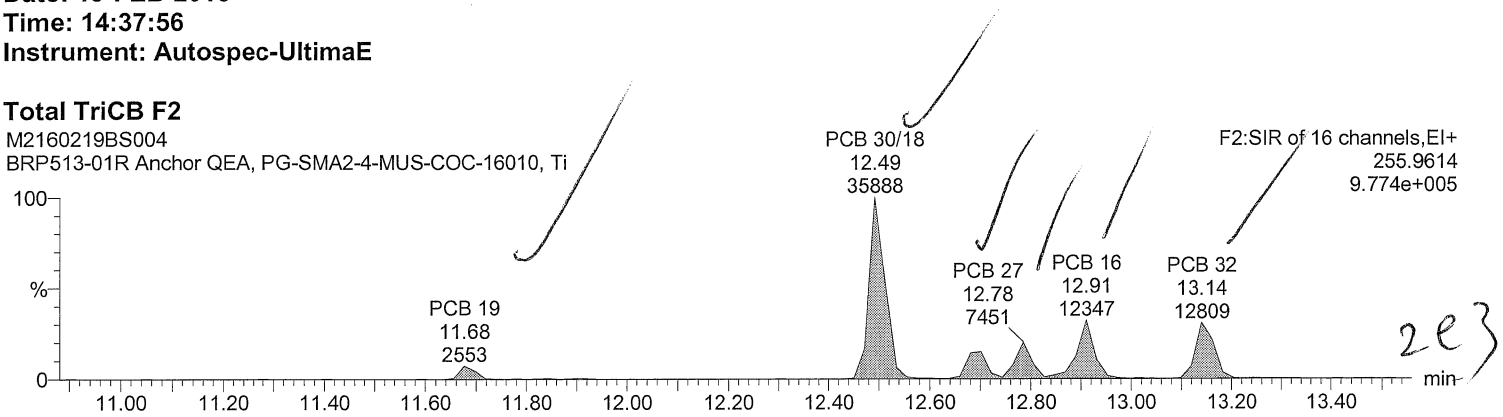
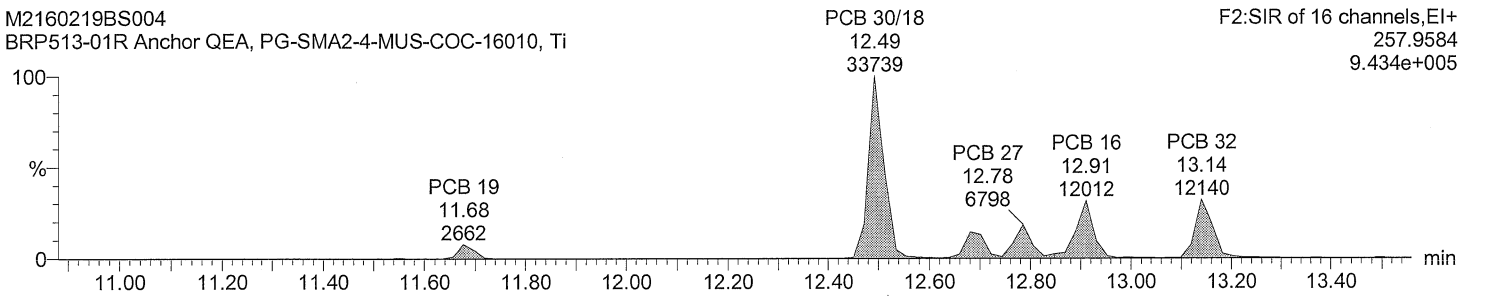
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total TriCB F2



Total TriCB F2



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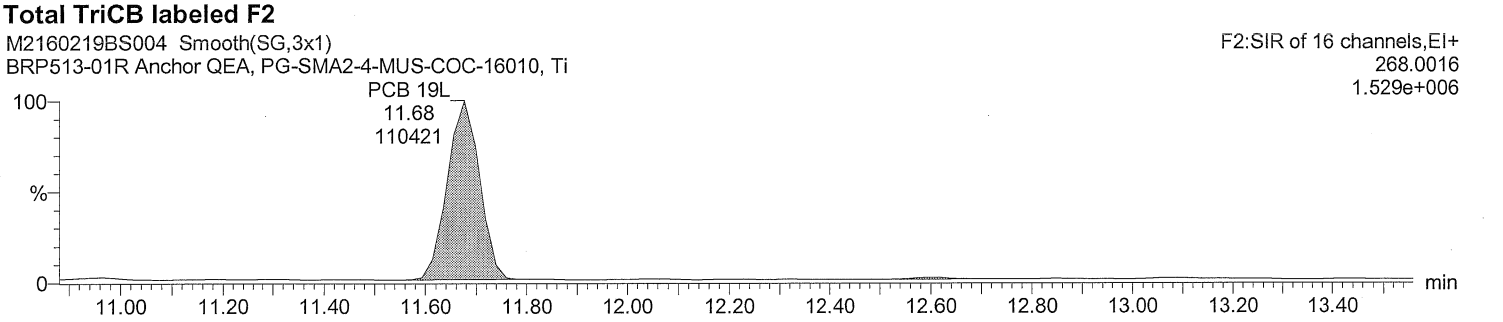

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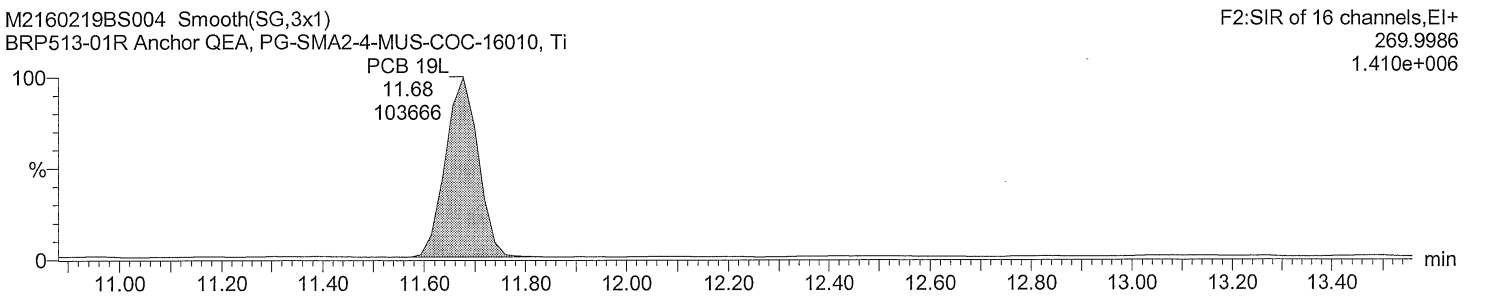

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Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

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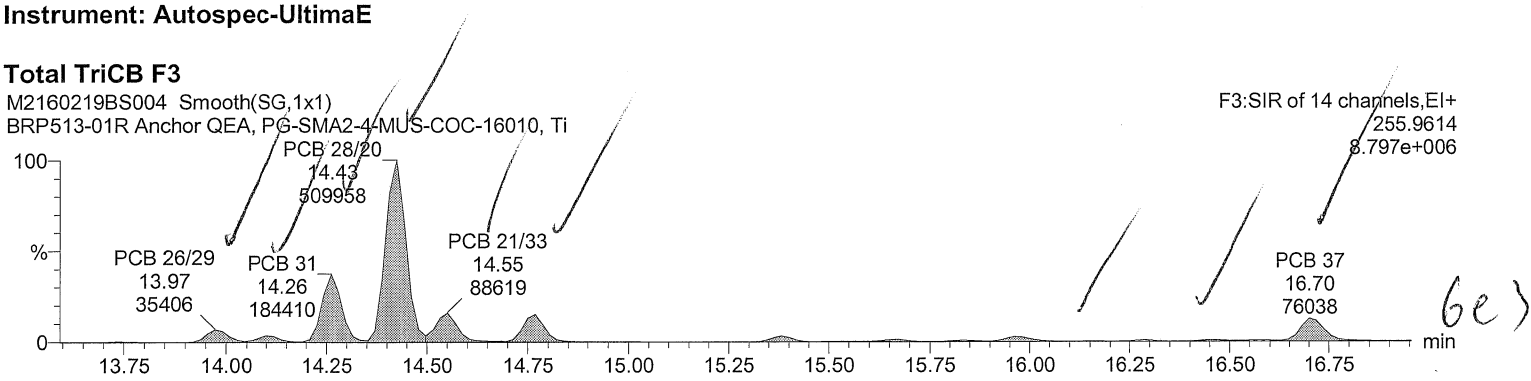
Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total TriCB F3



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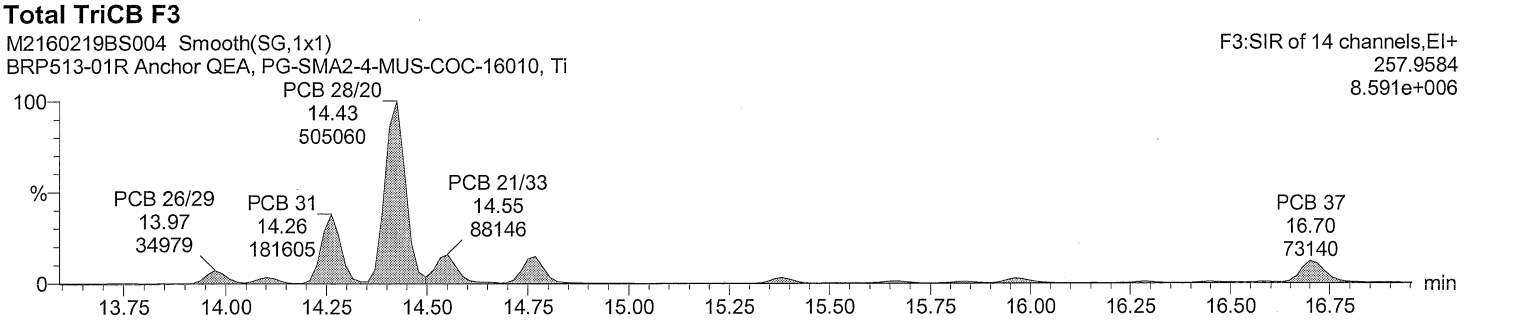
Total TriCB F3



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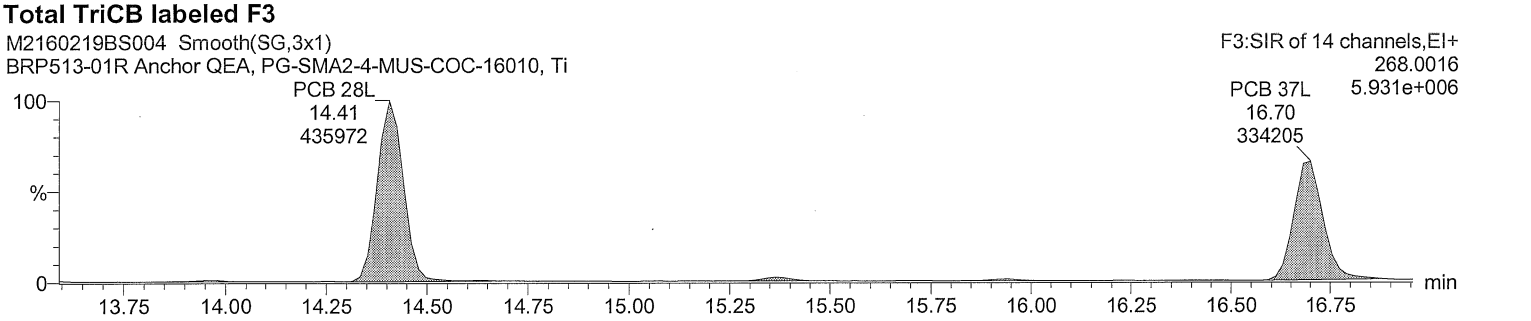

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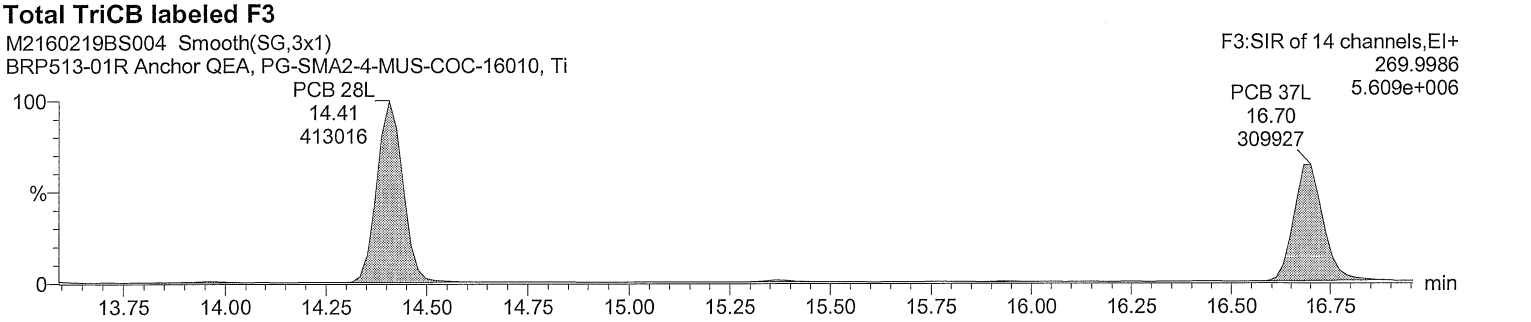

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Date: 19-FEB-2016
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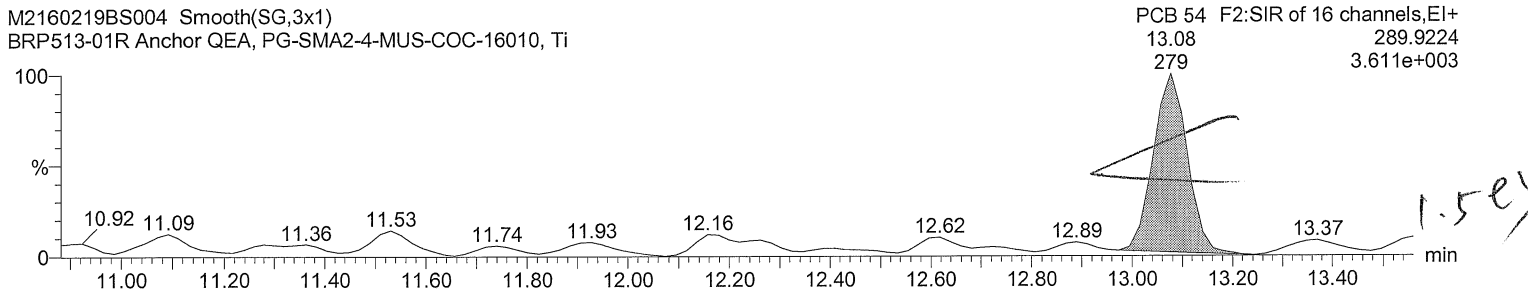
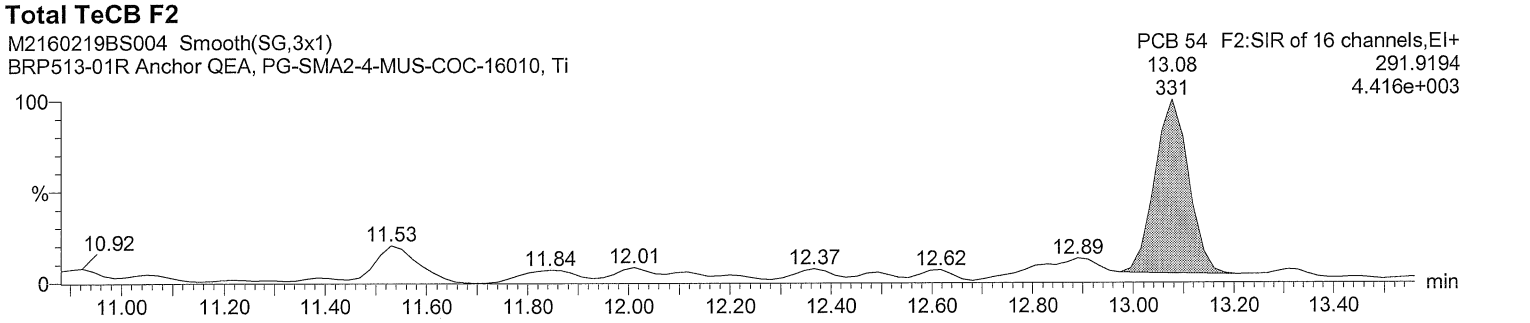
Instrument: Autospec-UltimaE

Total TeCB F2



Total TeCB F2



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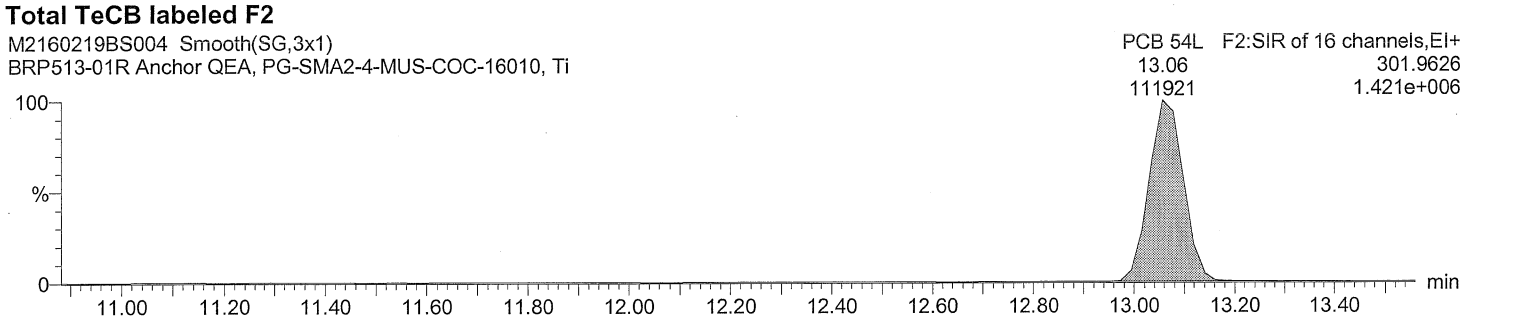

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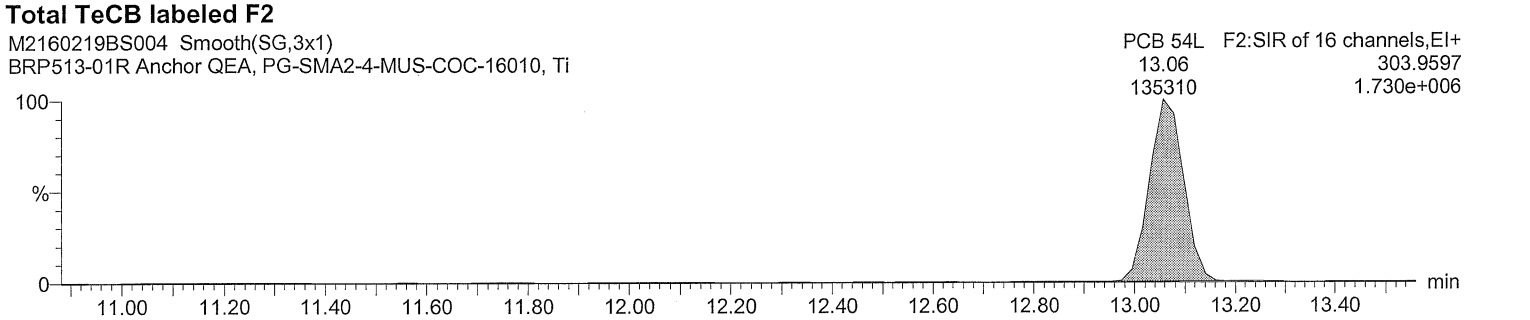

Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

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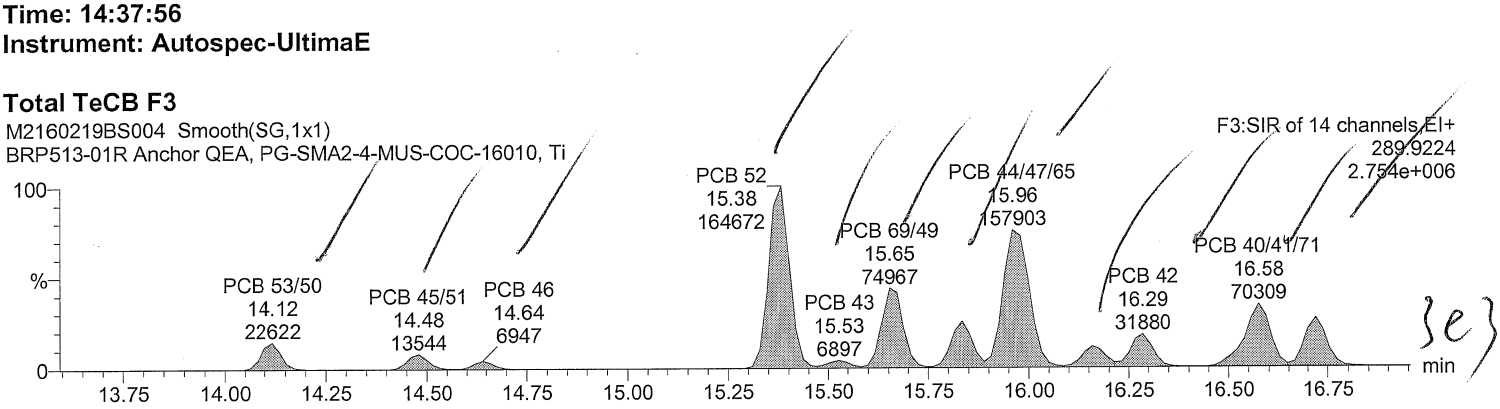
Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total TeCB F3



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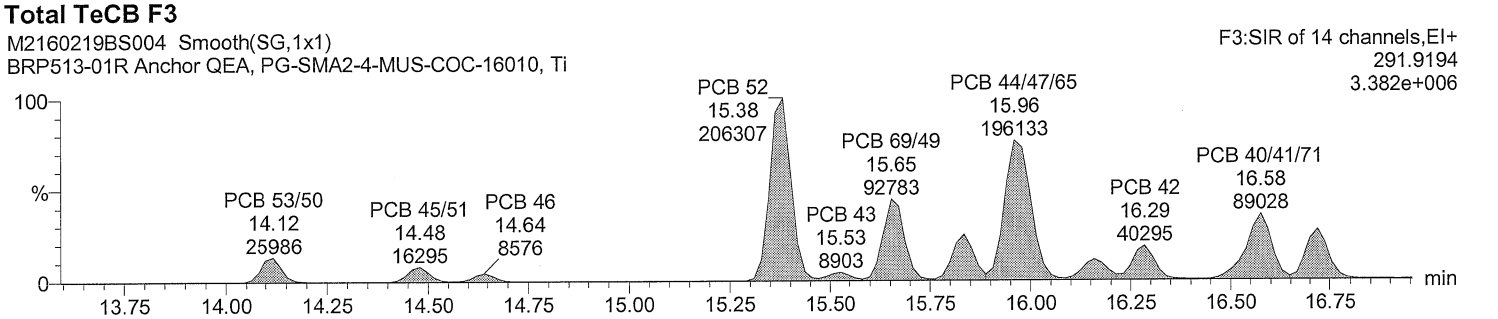

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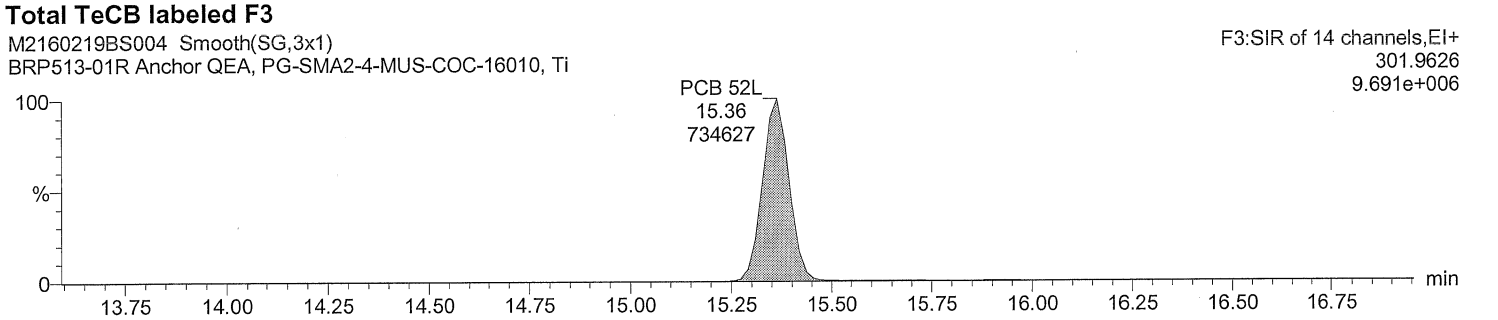

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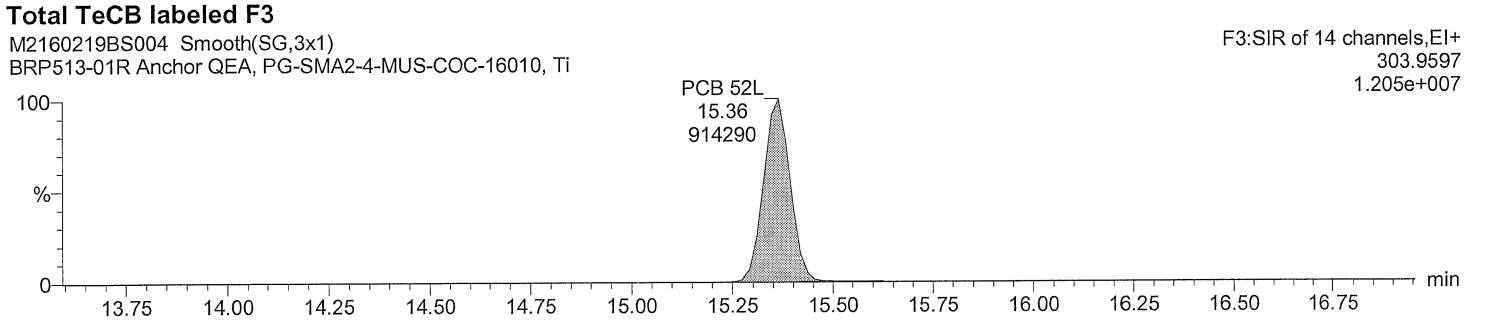

Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
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Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total TeCB F4
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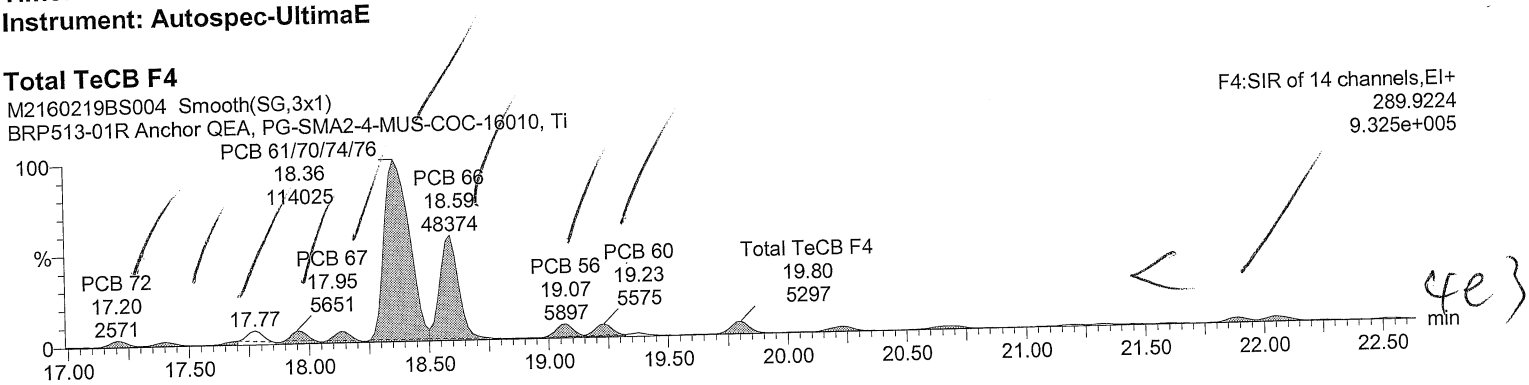
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total TeCB F4
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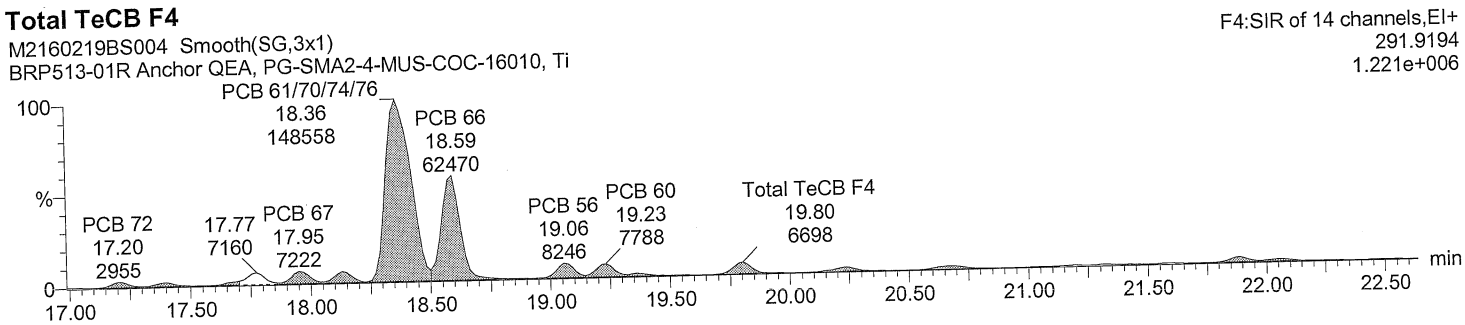
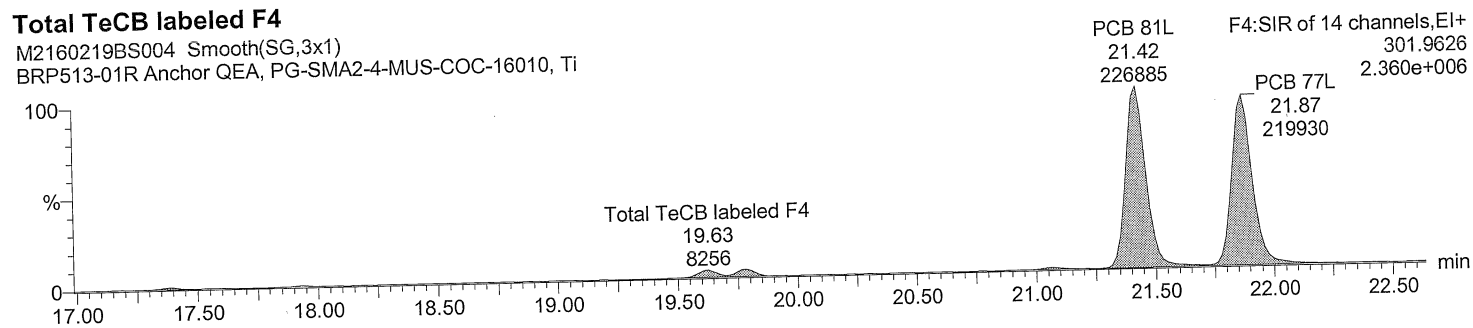
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total TeCB labeled F4
M2160219BS004 Smooth(SG,3x1)
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total TeCB labeled F4
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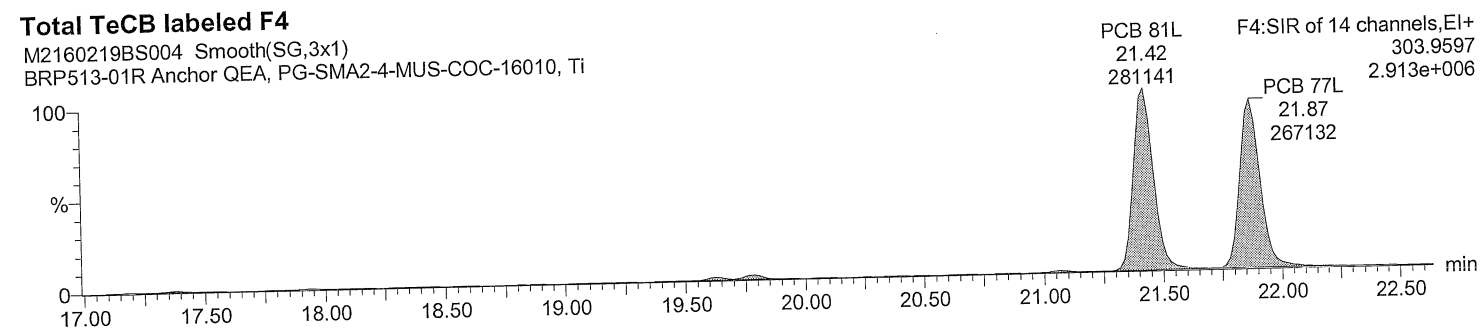
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

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Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total PeCB F3
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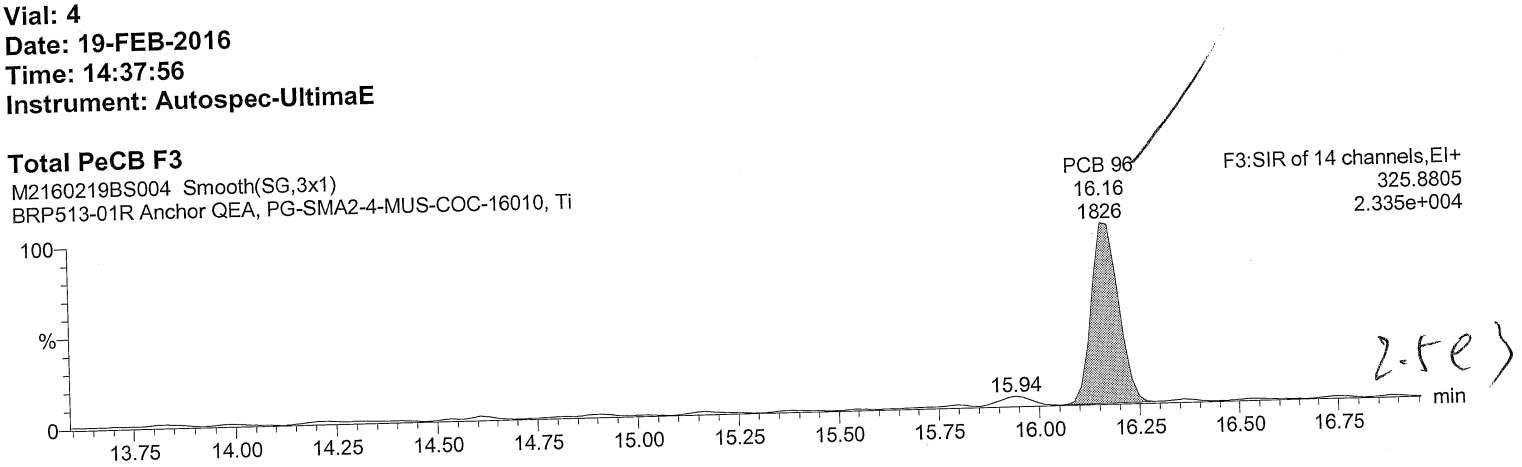
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total PeCB F3
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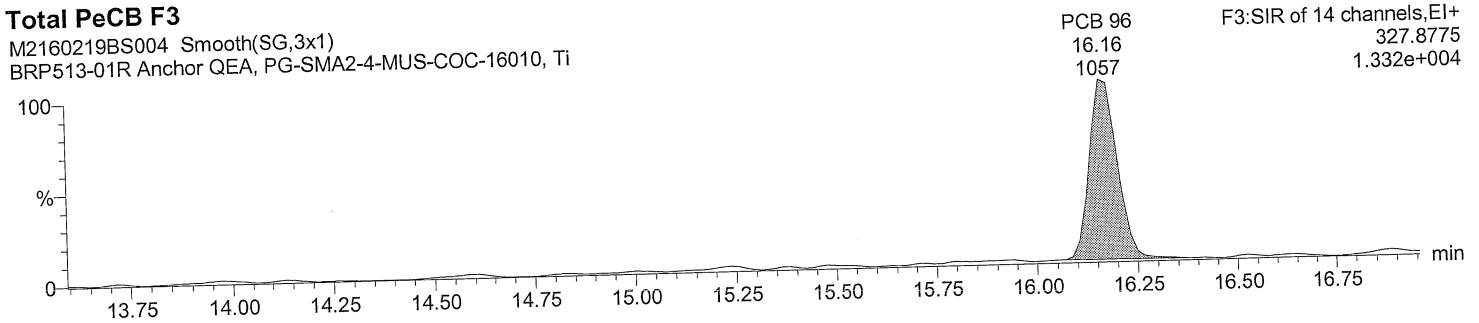
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



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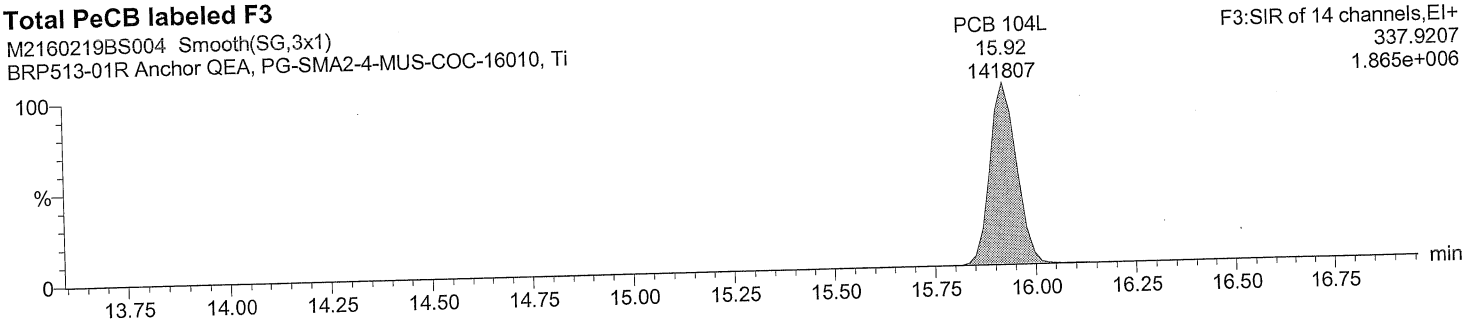

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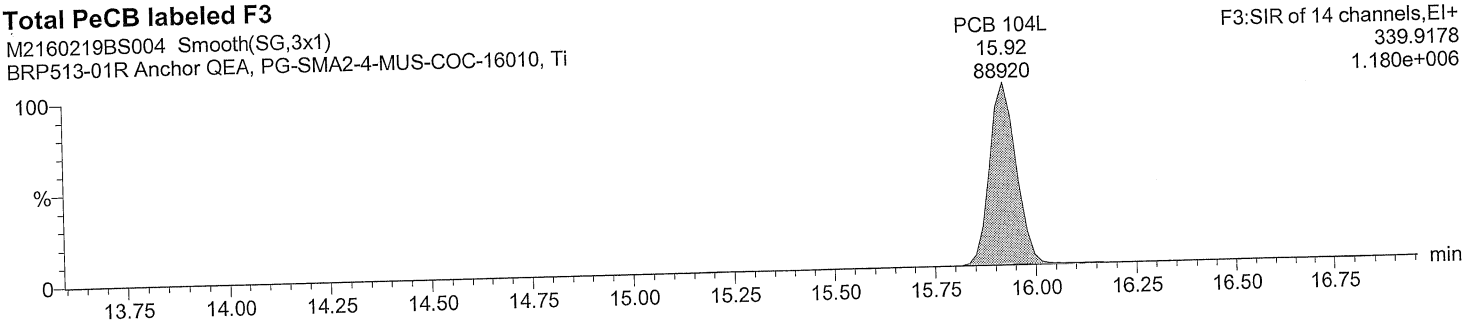
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

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Description: BRP513-01R
Vial: 4
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Time: 14:37:56
Instrument: Autospec-UltimaE

Total PeCB F4
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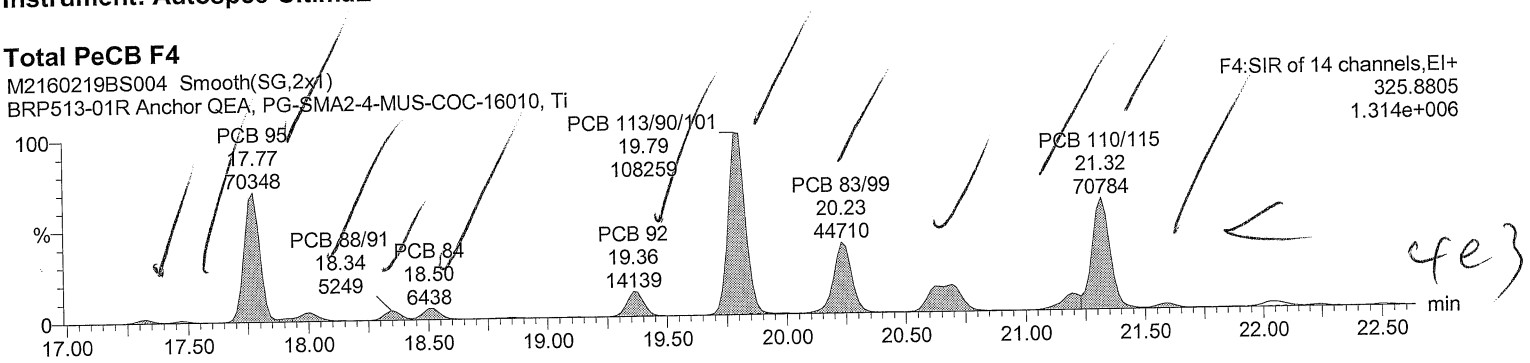

Total PeCB F4
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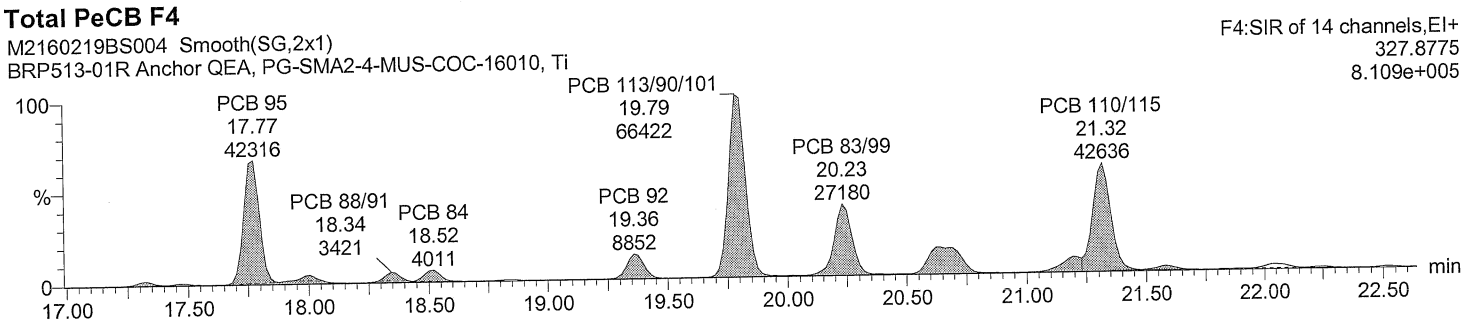
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total PeCB labeled F4
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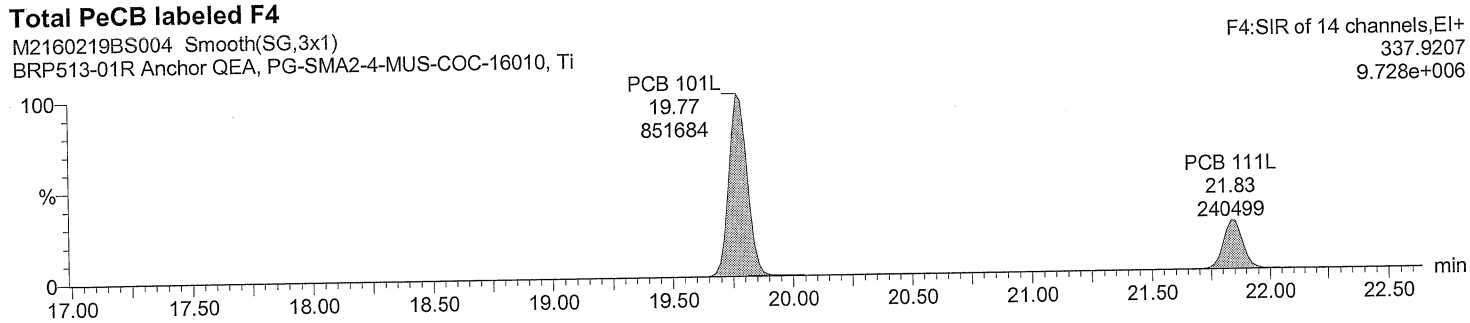
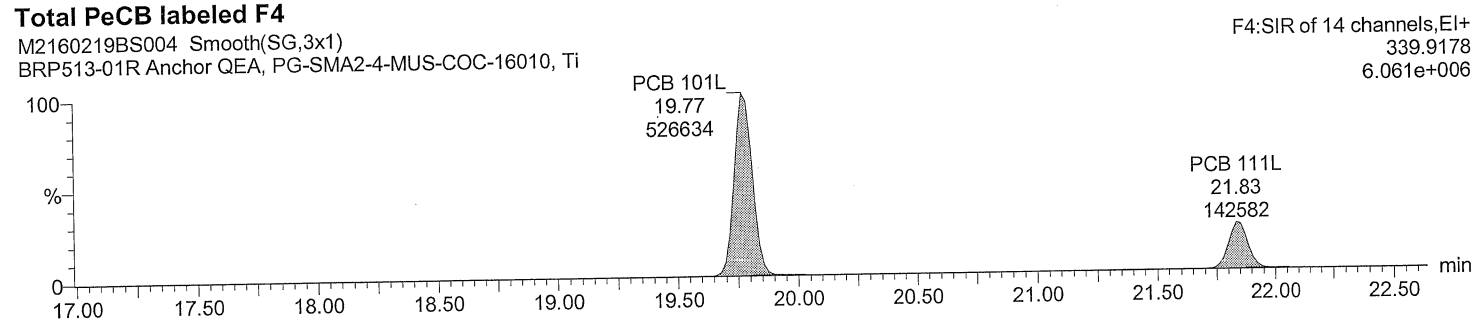
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total PeCB labeled F4
M2160219BS004 Smooth(SG,3x1)
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
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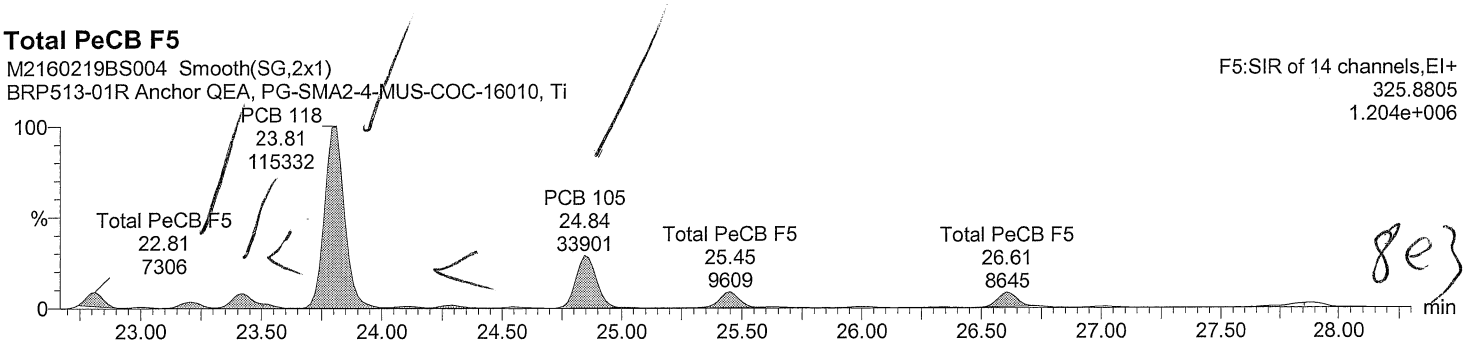
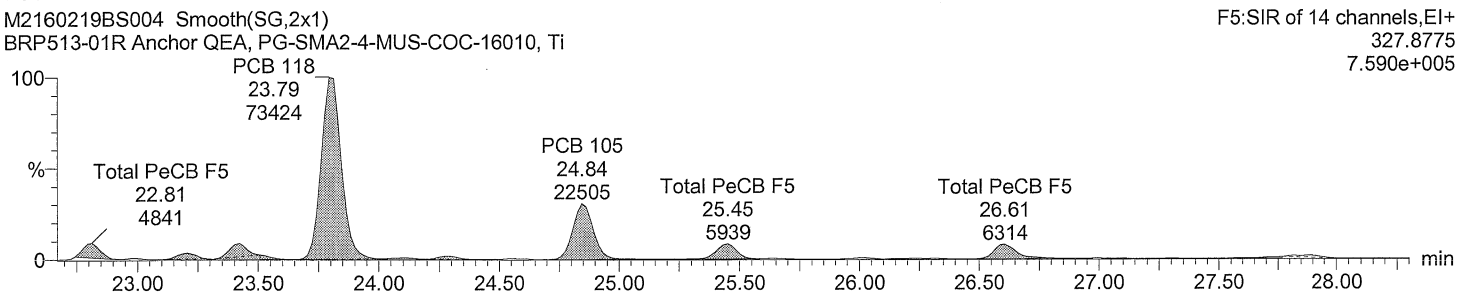
Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

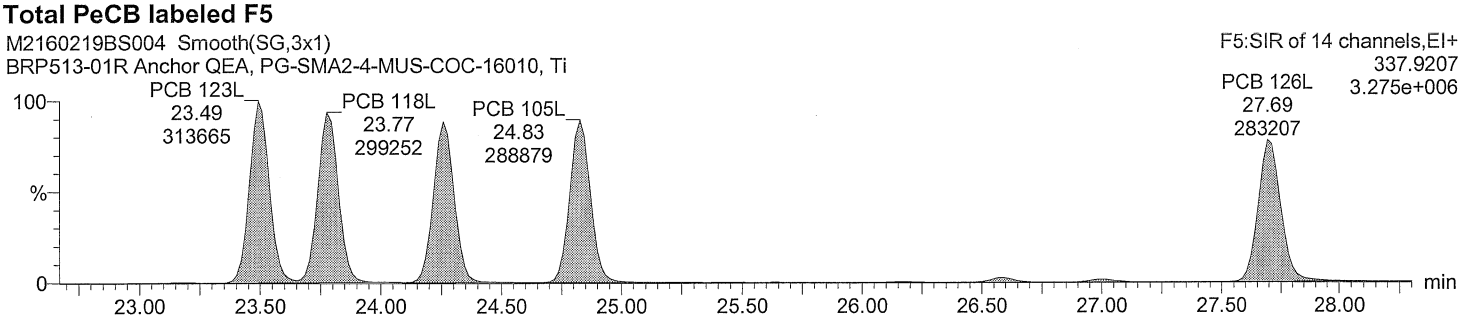
Total PeCB F5



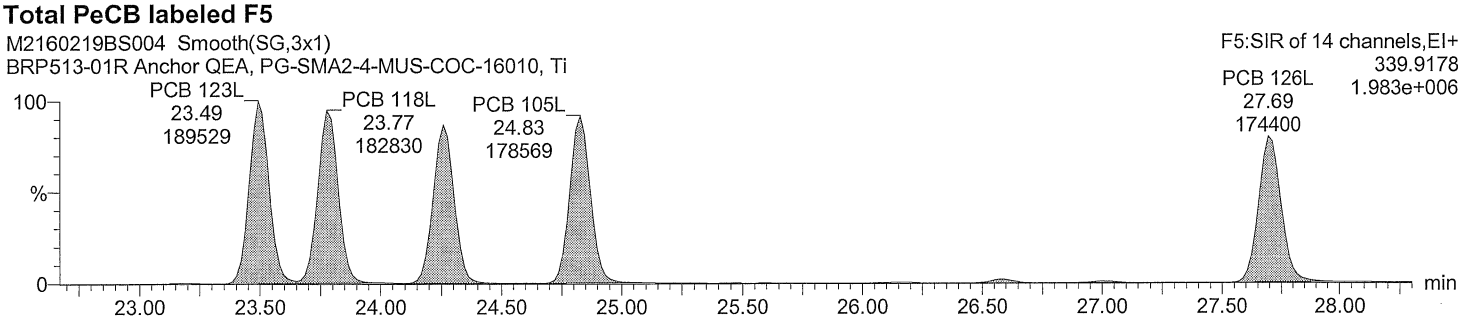
Total PeCB F5



Total PeCB labeled F5



Total PeCB labeled F5



Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
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Description: BRP513-01R
Vial: 4
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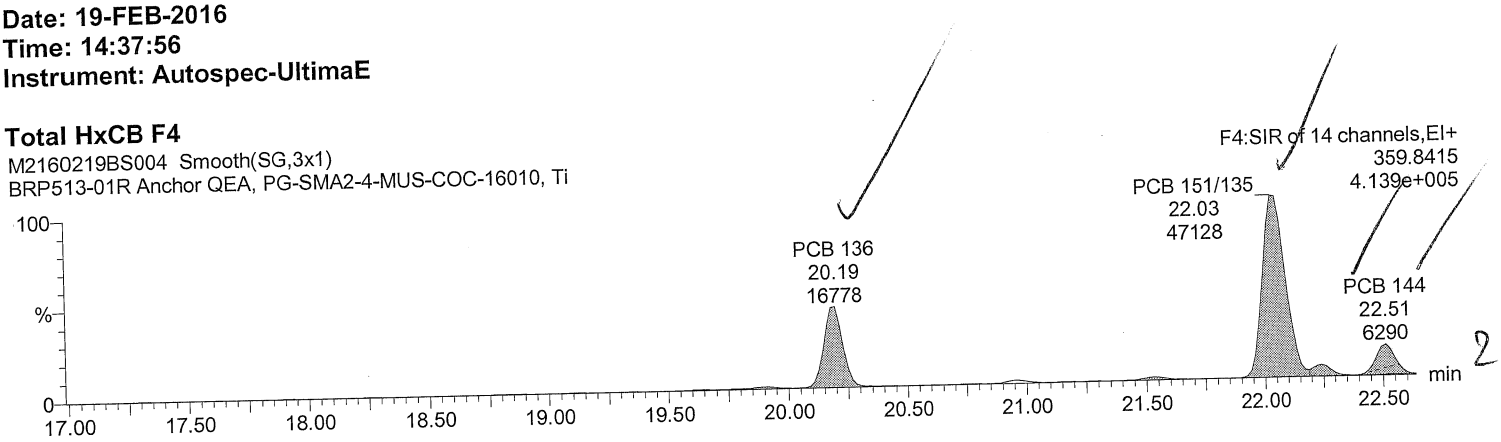
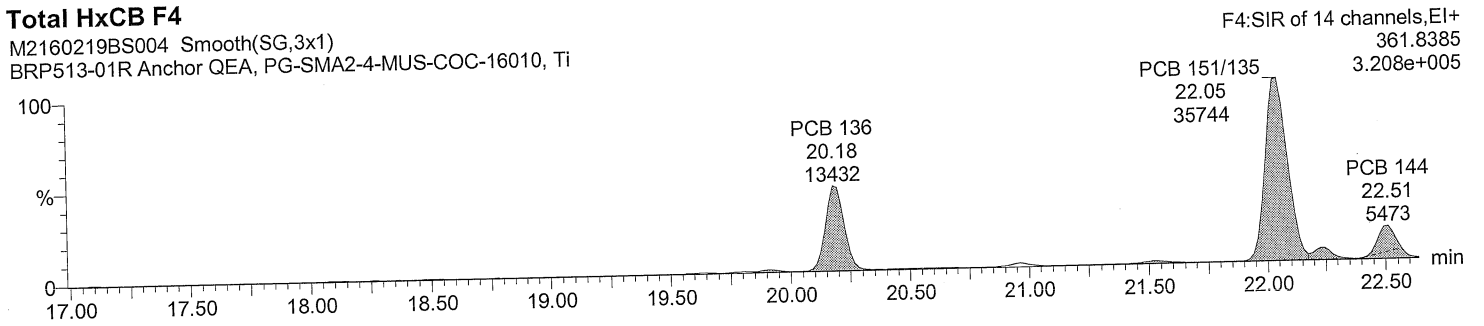
Instrument: Autospec-UltimaE

Total HxCB F4
M2160219BS004 Smooth(SG,3x1)
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total HxCB F4
M2160219BS004 Smooth(SG,3x1)
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total HxCB labeled F4
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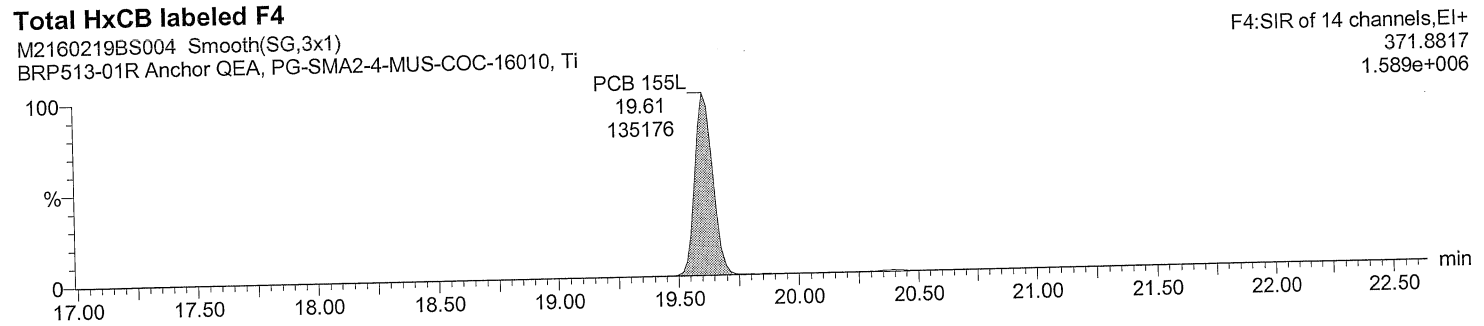
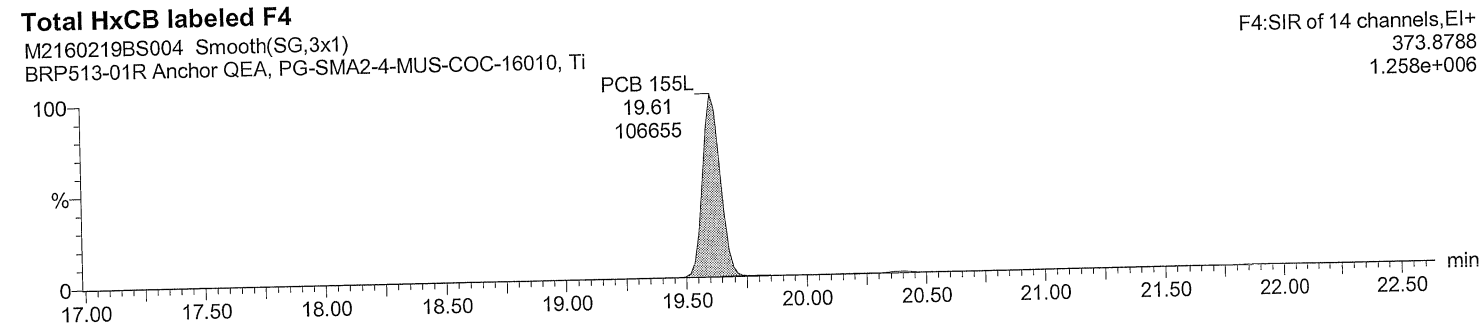
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total HxCB labeled F4
M2160219BS004 Smooth(SG,3x1)
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

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Description: BRP513-01R
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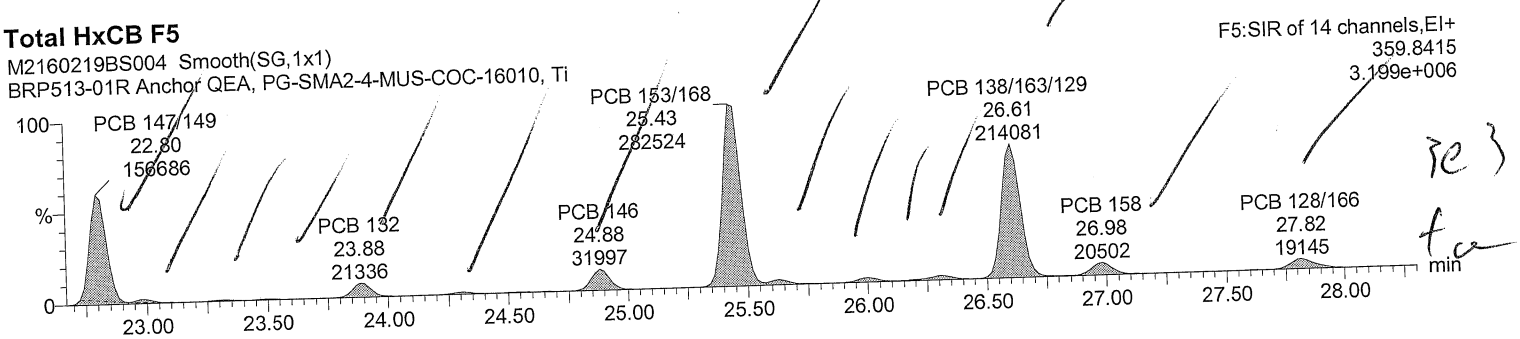
Instrument: Autospec-UltimaE

Total HxCB F5
M2160219BS004 Smooth(SG,1x1)
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total HxCB F5
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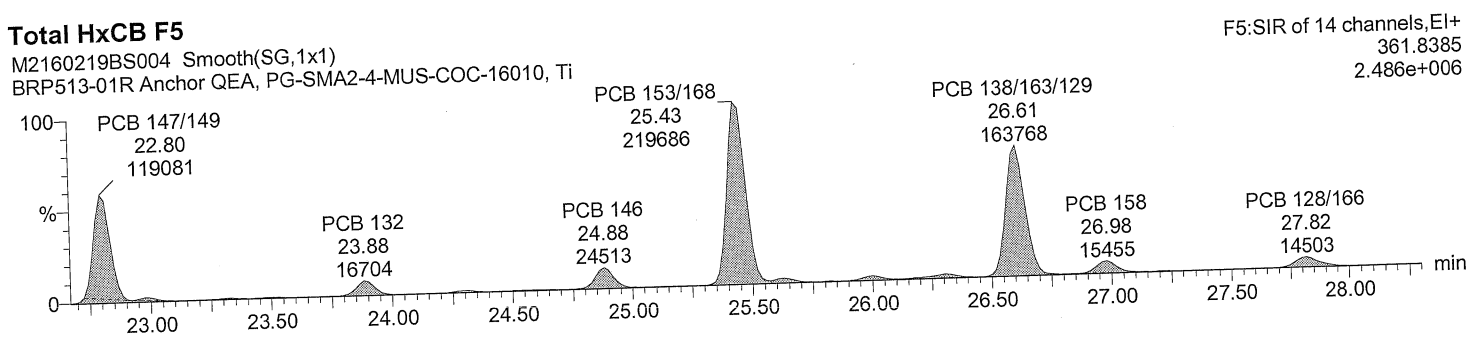

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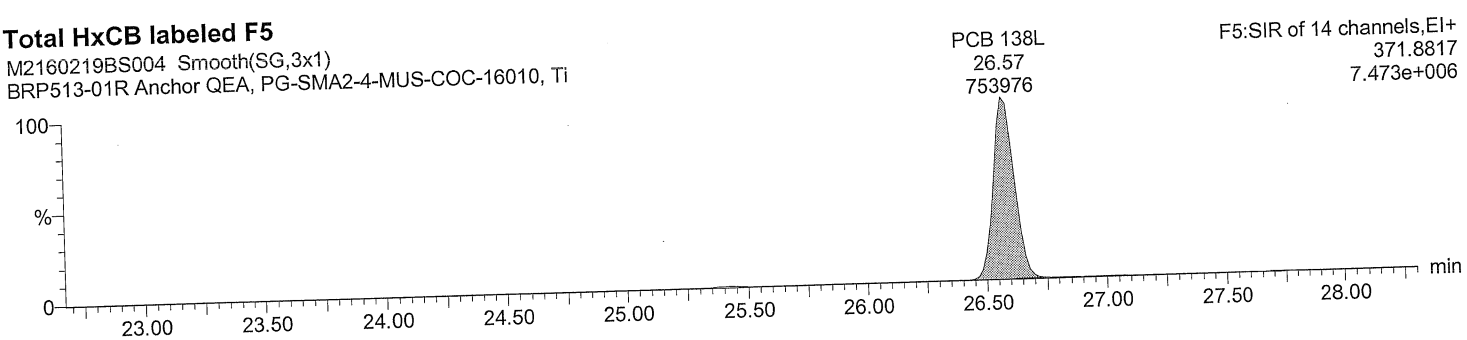

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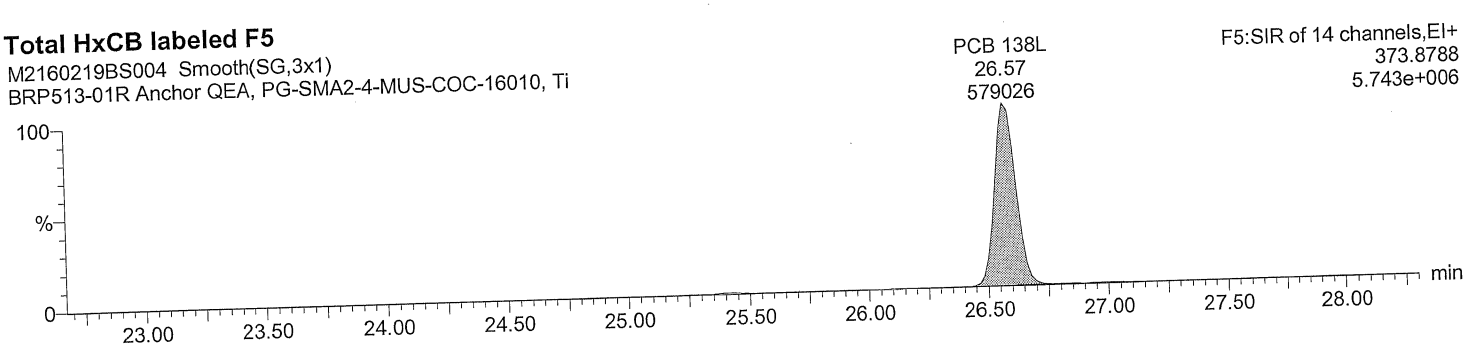

Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
Printed: February 23, 2016 12:17:46 PM Eastern Standard Time

Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

Total HxCB F6
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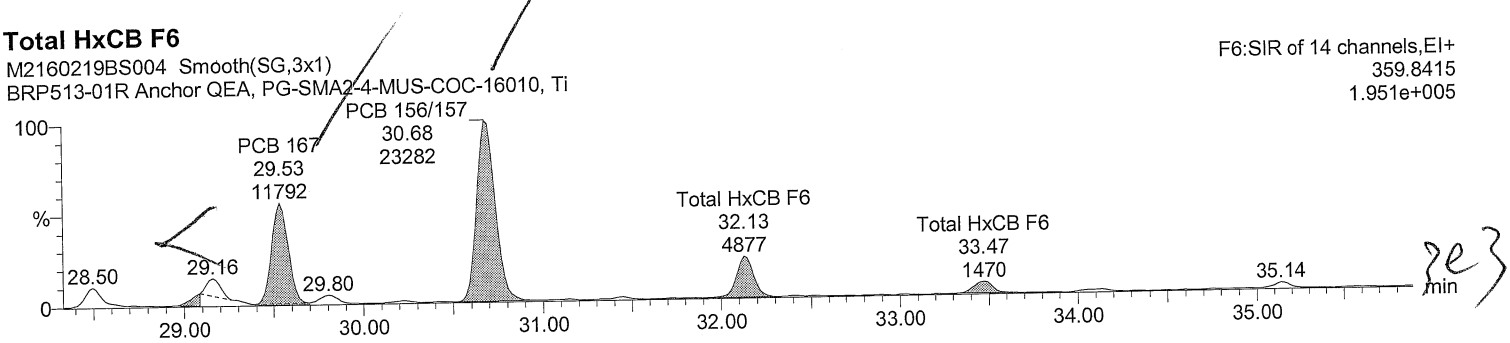

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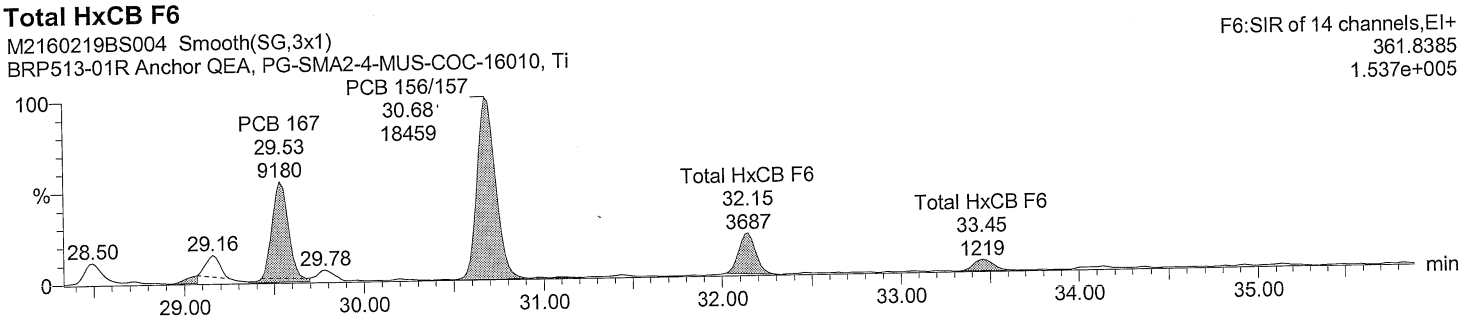

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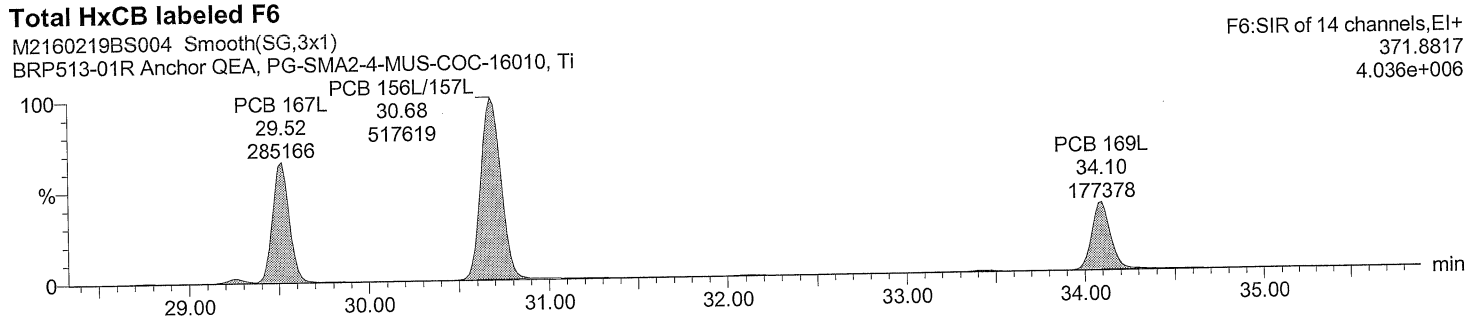

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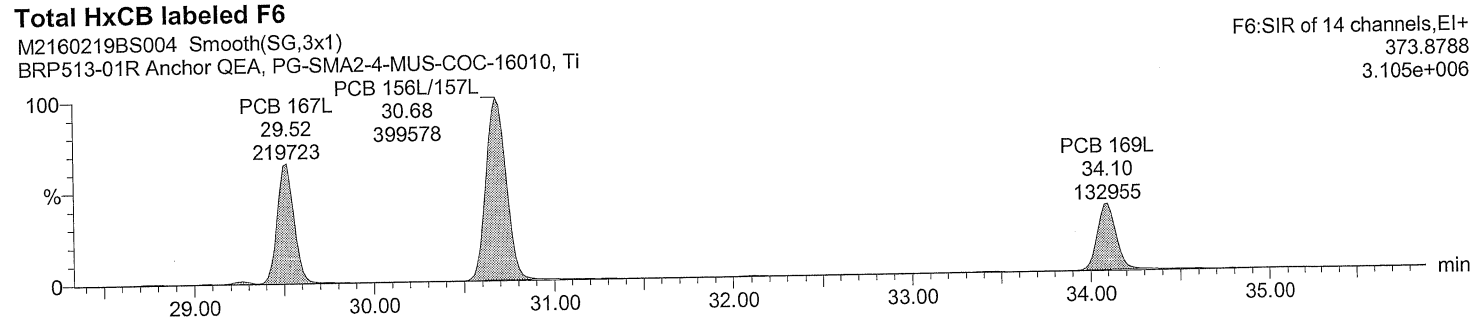

Quantify Sample Report **MassLynx 4.0 SP1**
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Total HpCB F5
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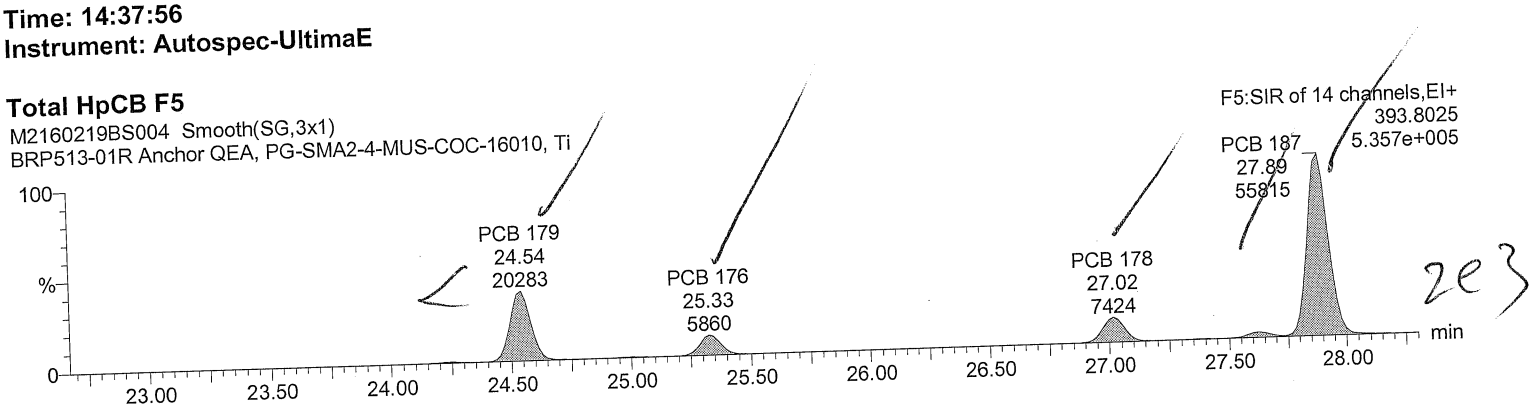

Total HpCB F5
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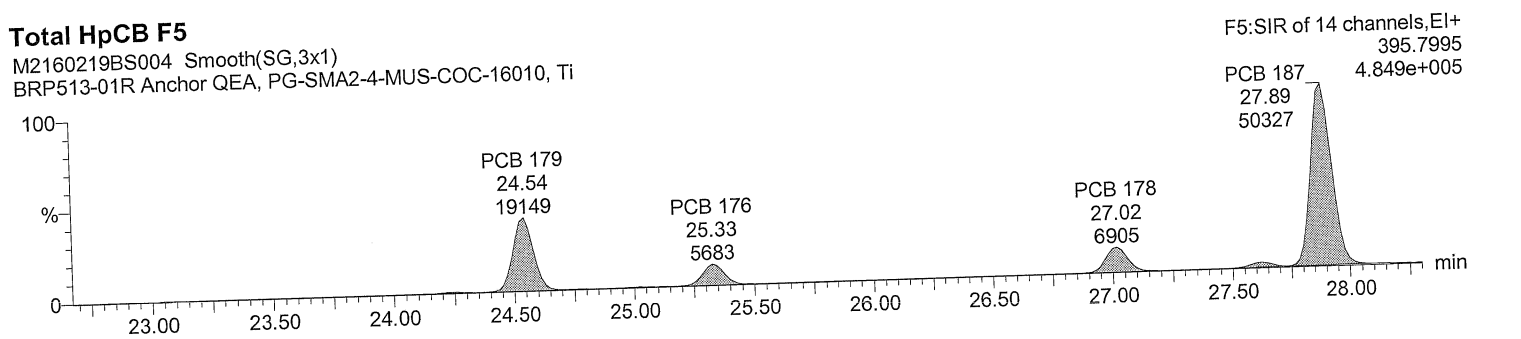
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



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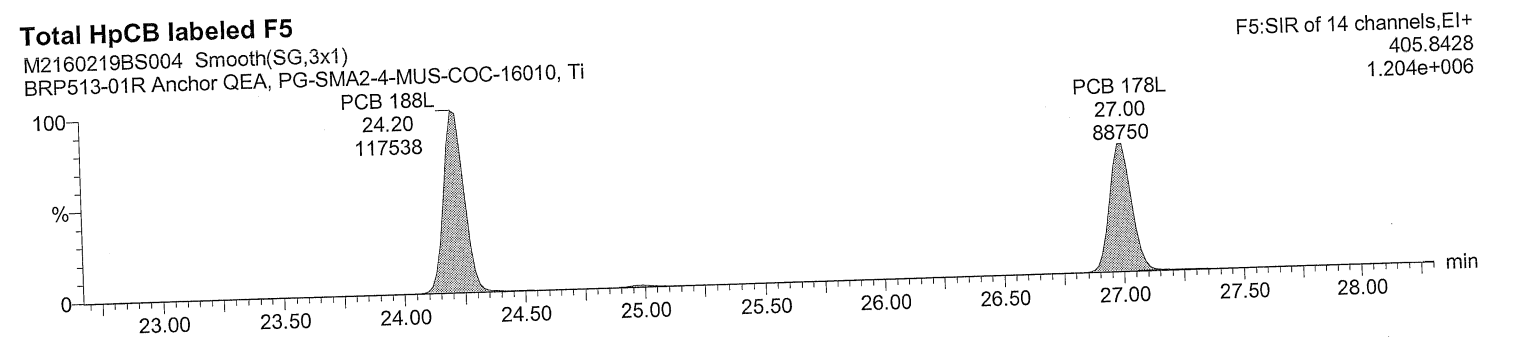

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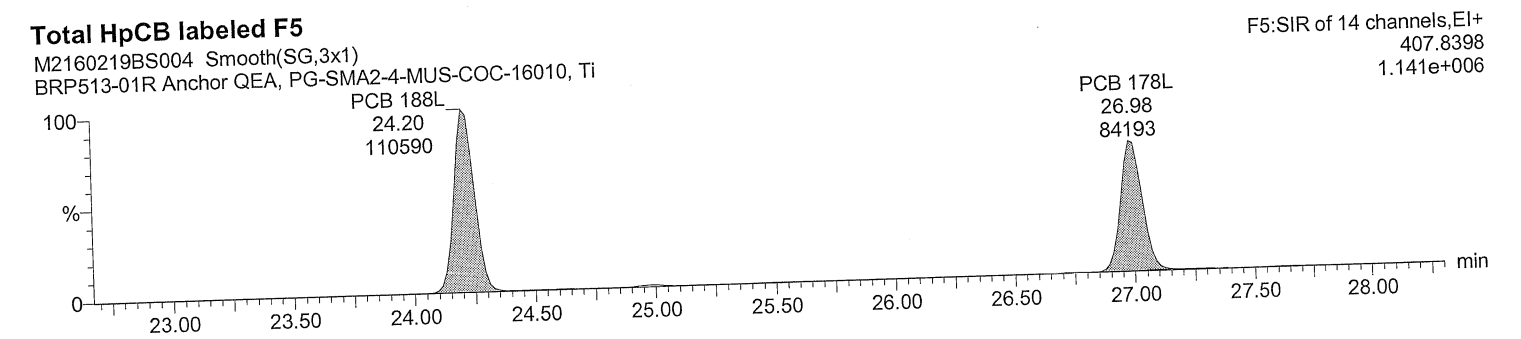
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Quantify Sample Report **MassLynx 4.0 SP1**
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Total HpCB F6
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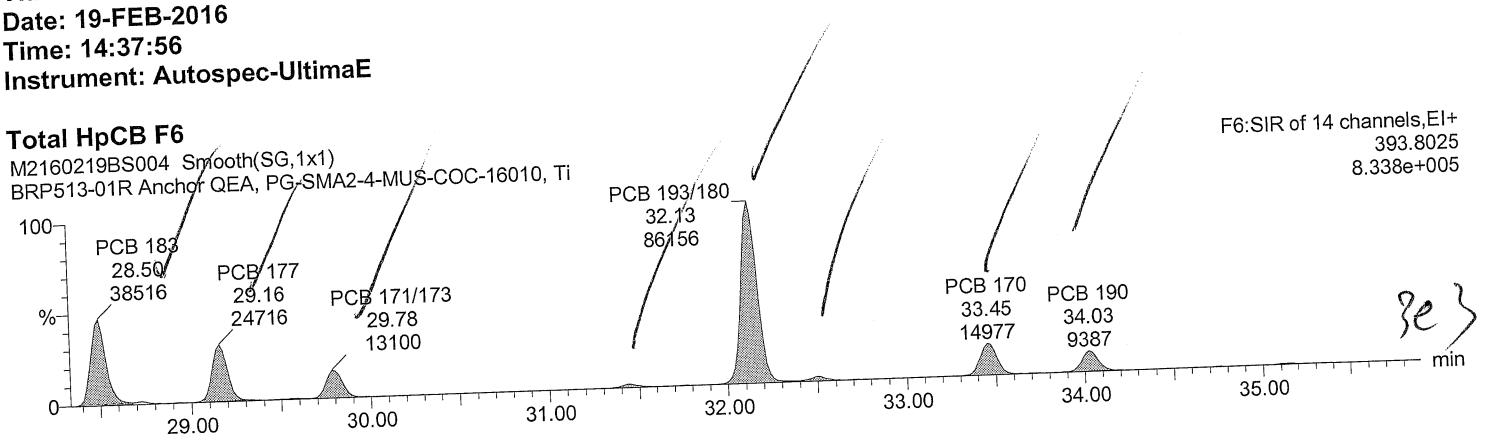
BRP513-01R Anchor QEA, PG-SMA2-4-MUS-COC-16010, Ti



Total HpCB F6
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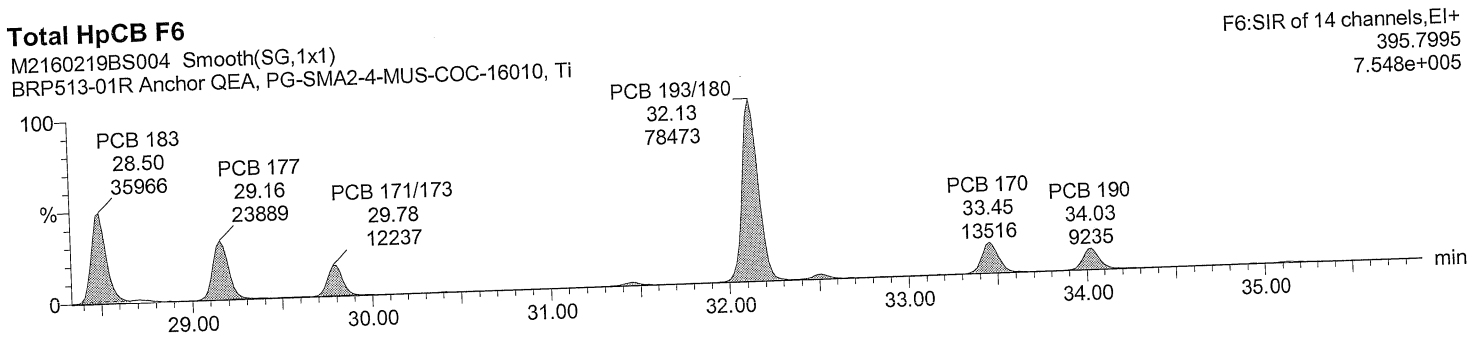

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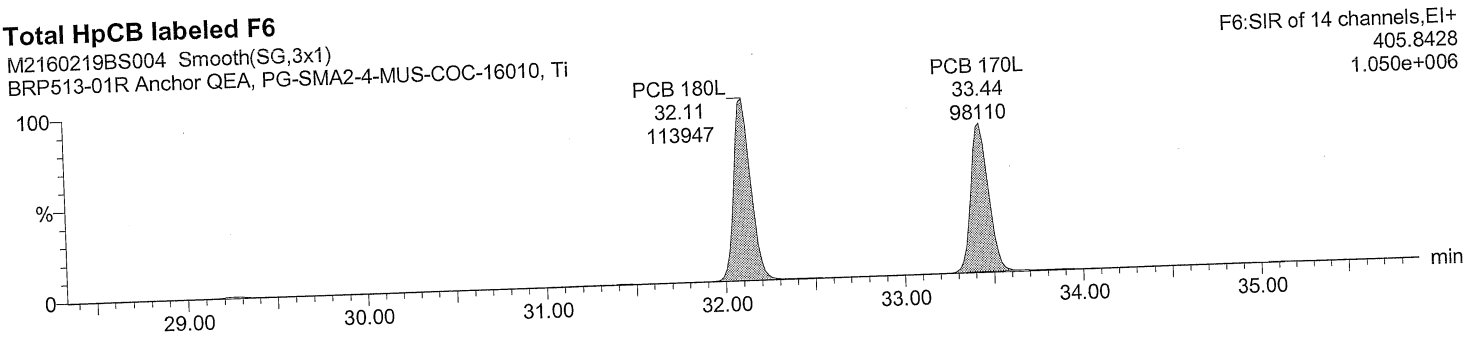

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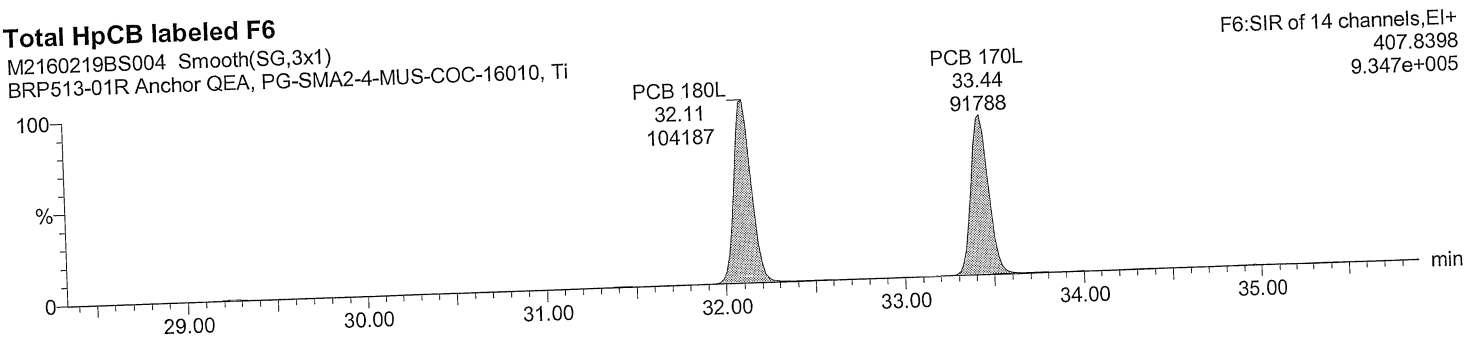

Quantify Sample Report **MassLynx 4.0 SP1**
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Instrument: Autospec-UltimaE

Total HpCB F7
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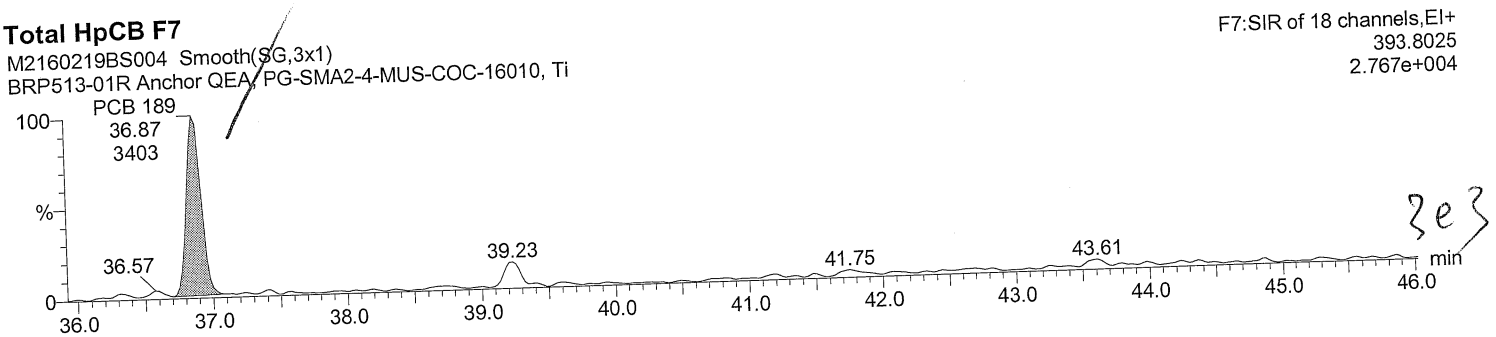

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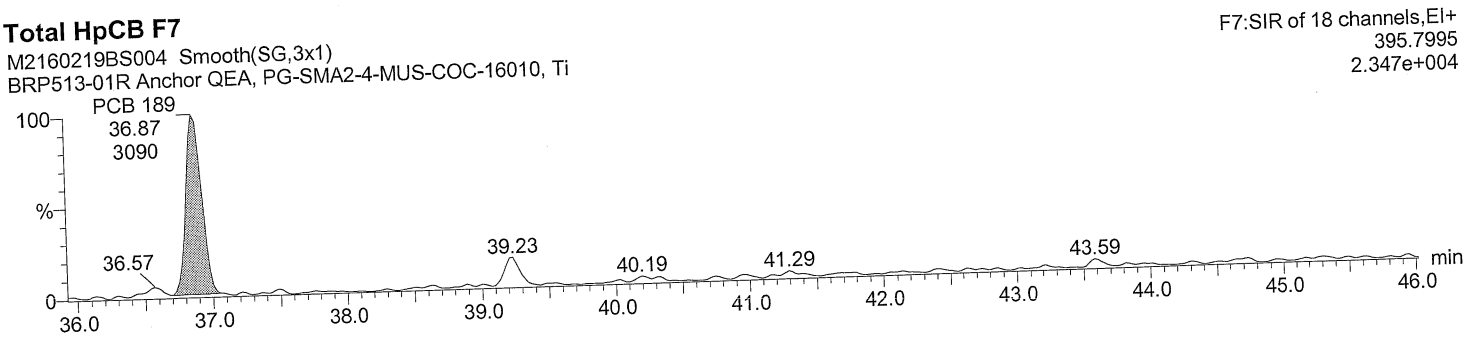

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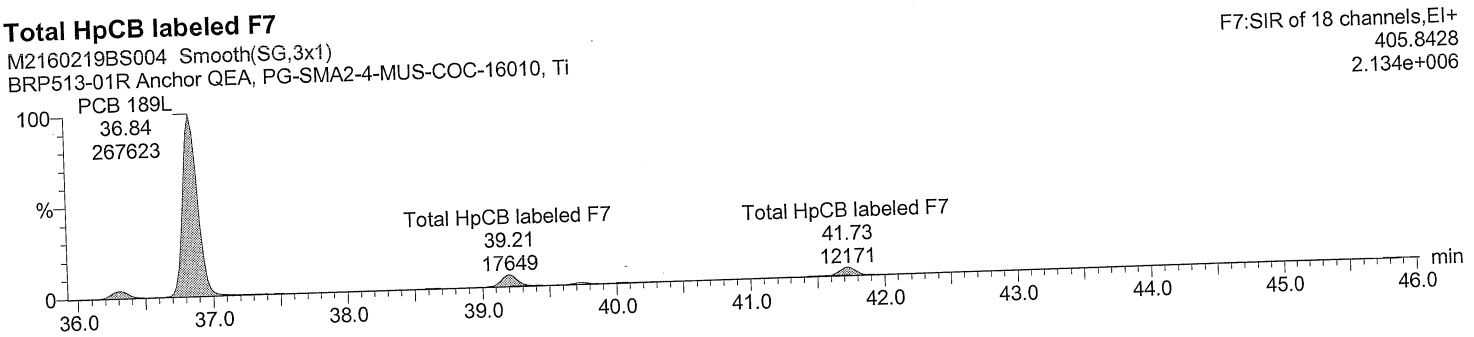

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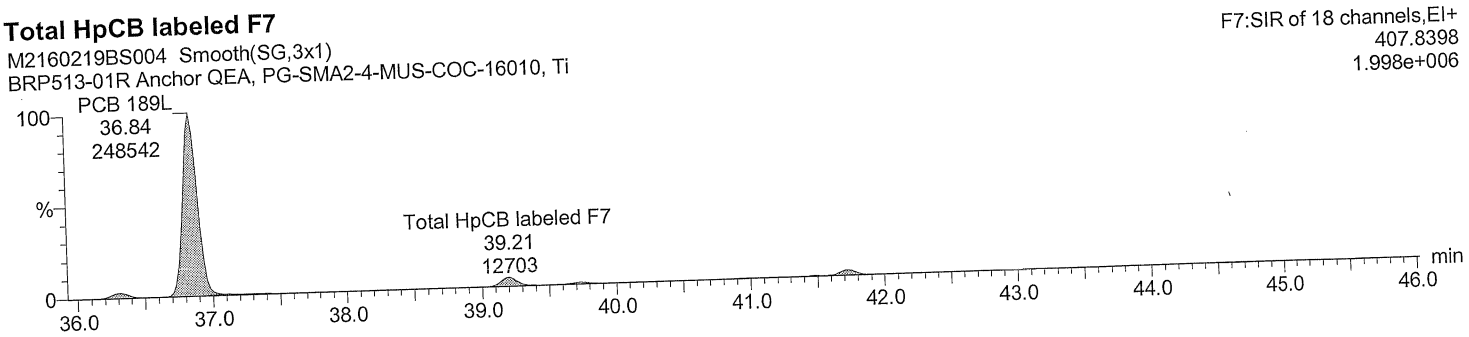

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Instrument: Autospec-UltimaE

Total OcCB F6
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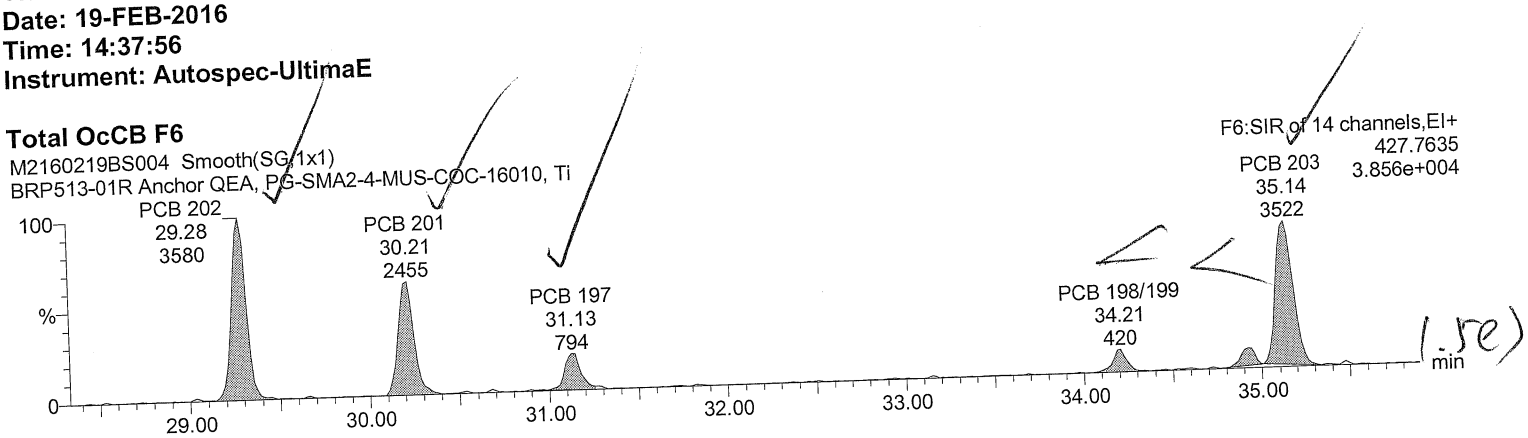

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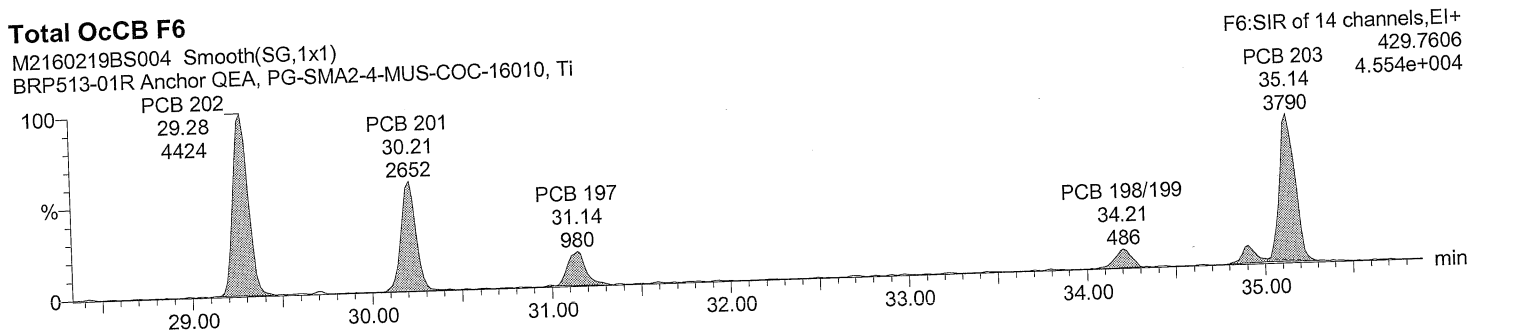

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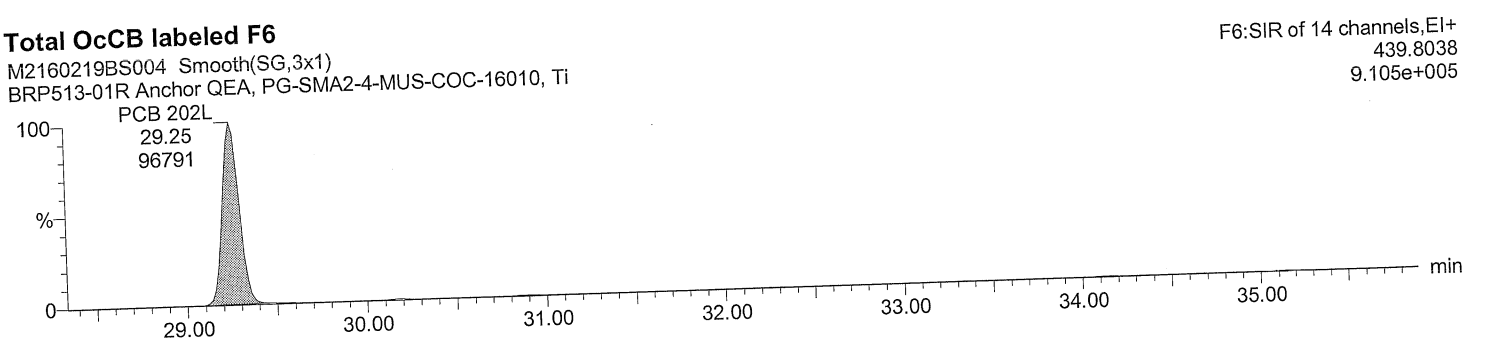

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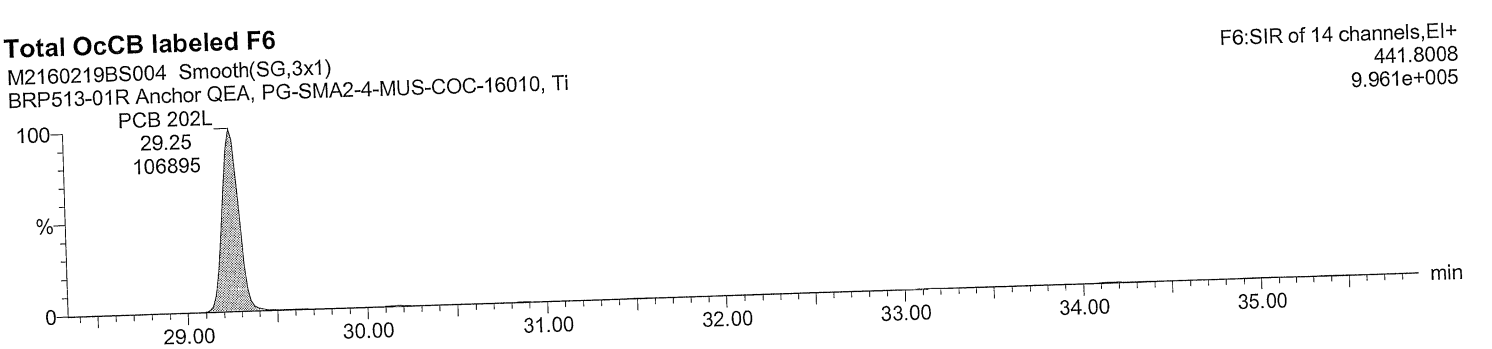

Quantify Sample Report **MassLynx 4.0 SP1**
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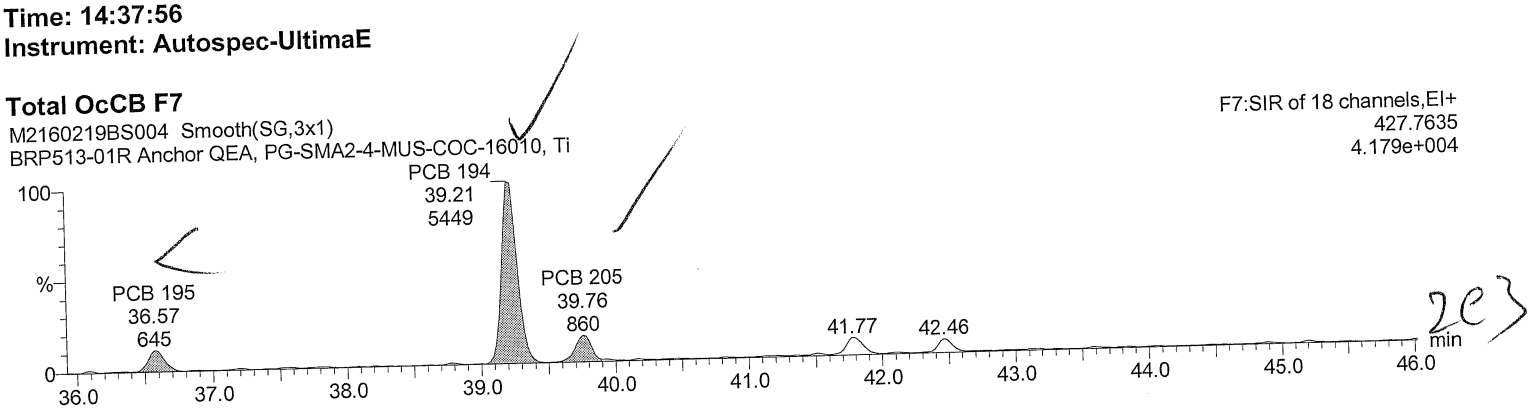

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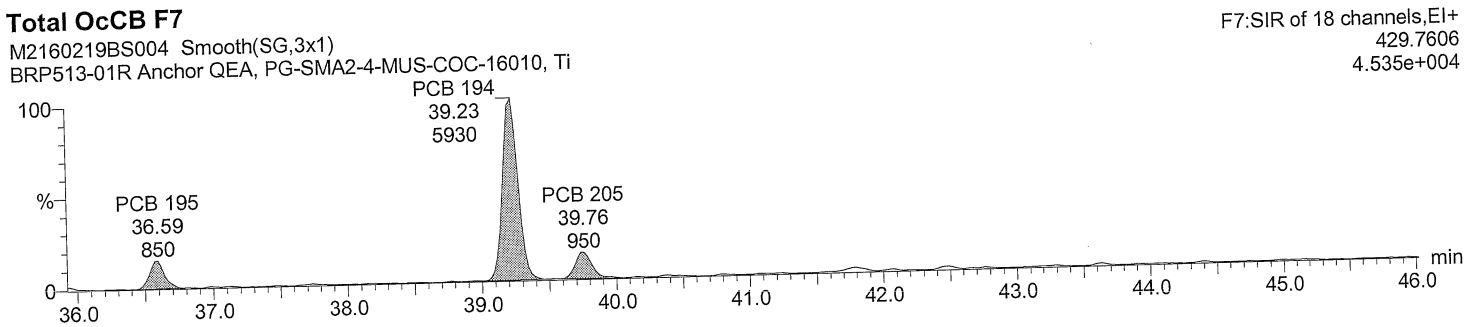

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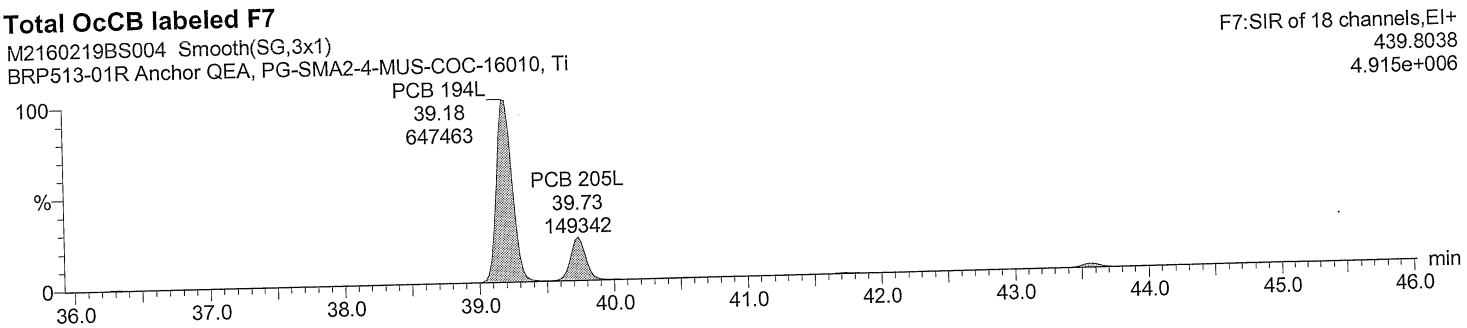

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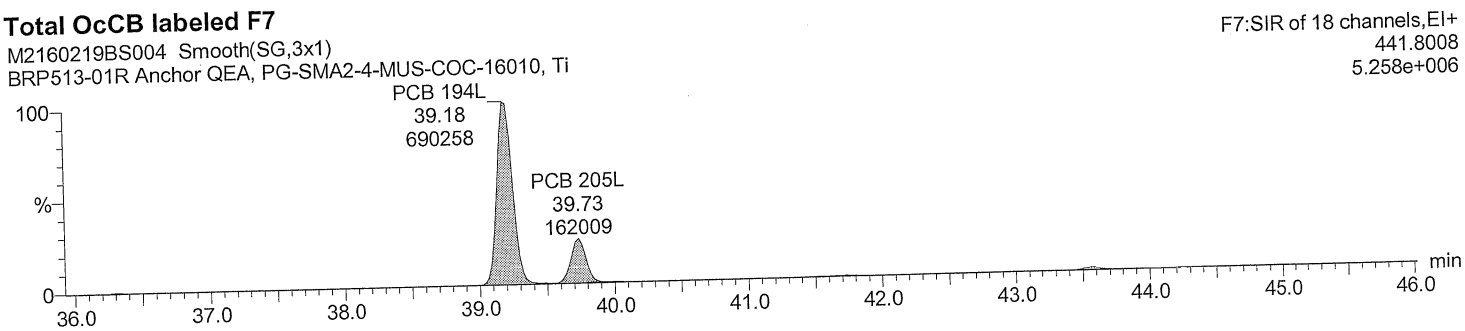

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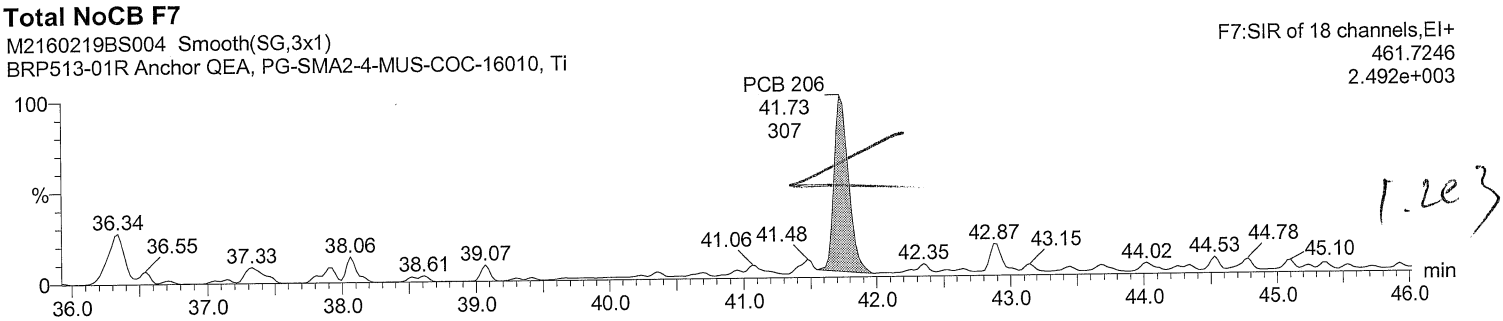

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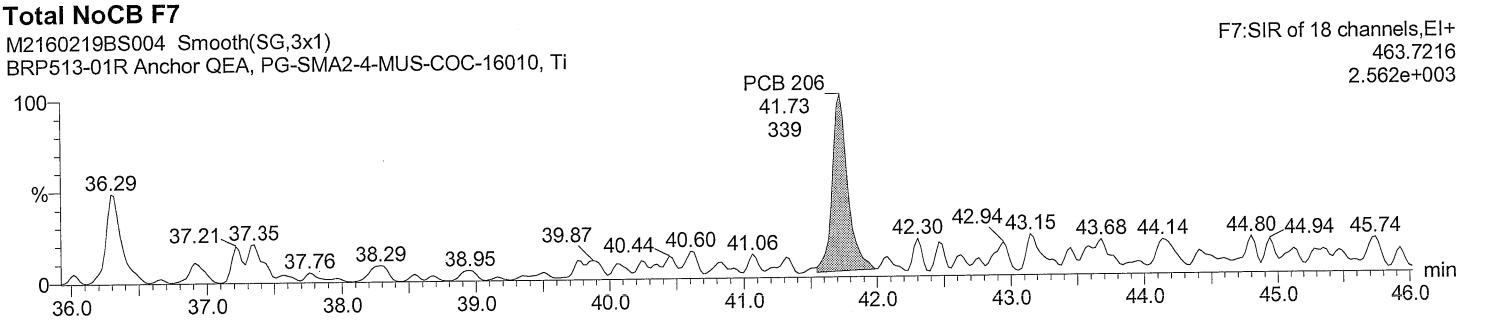

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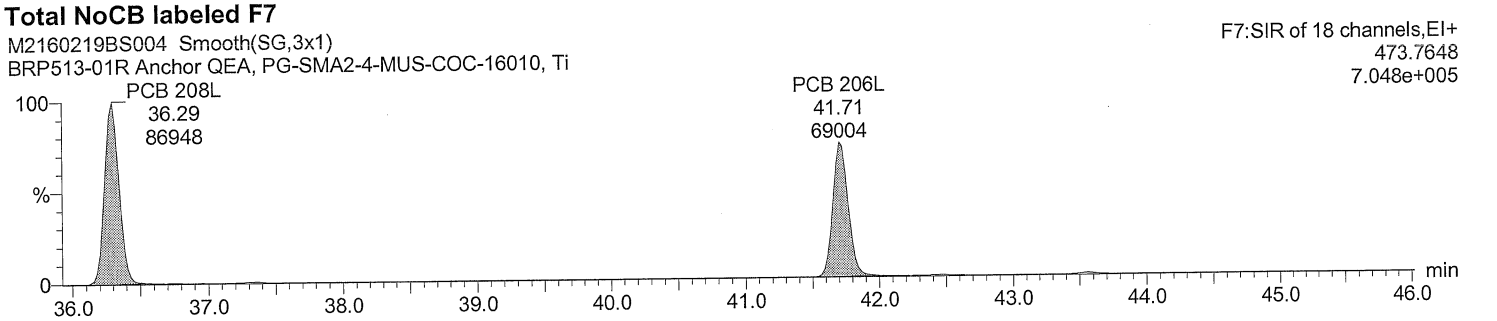

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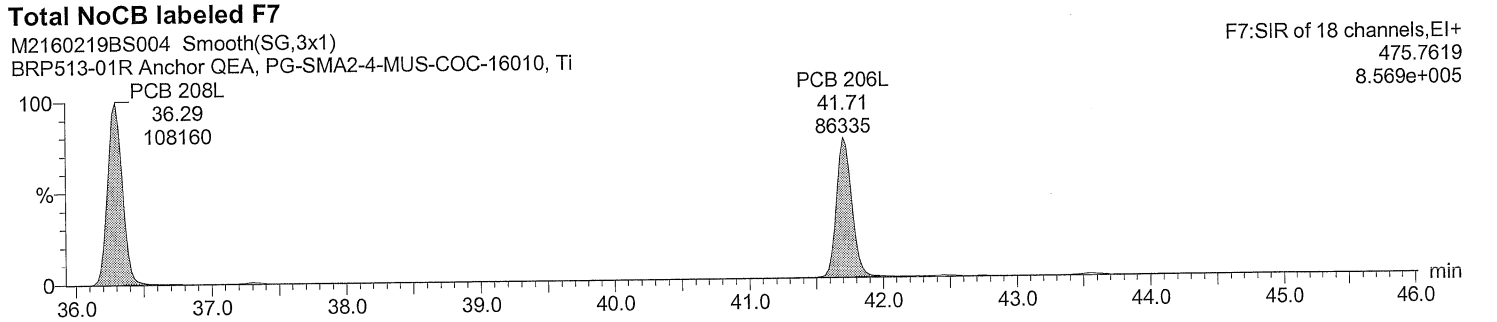

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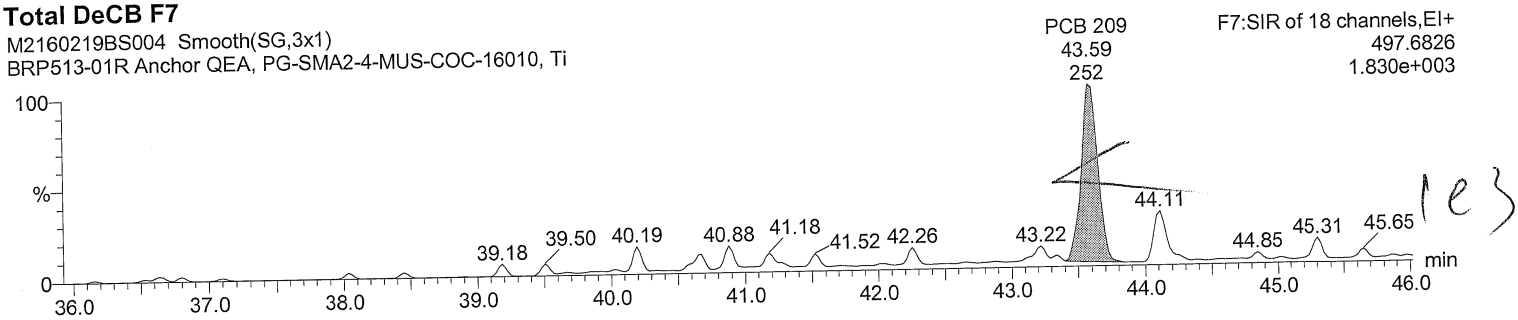

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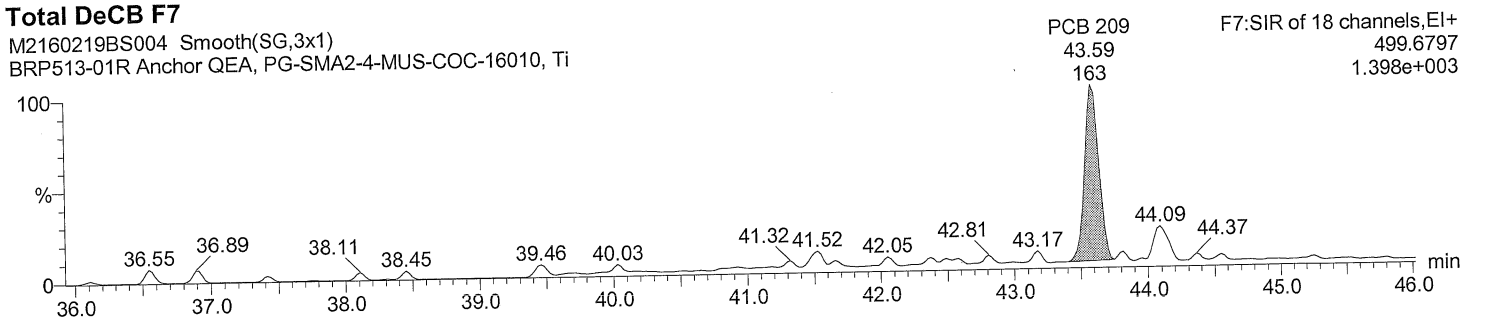

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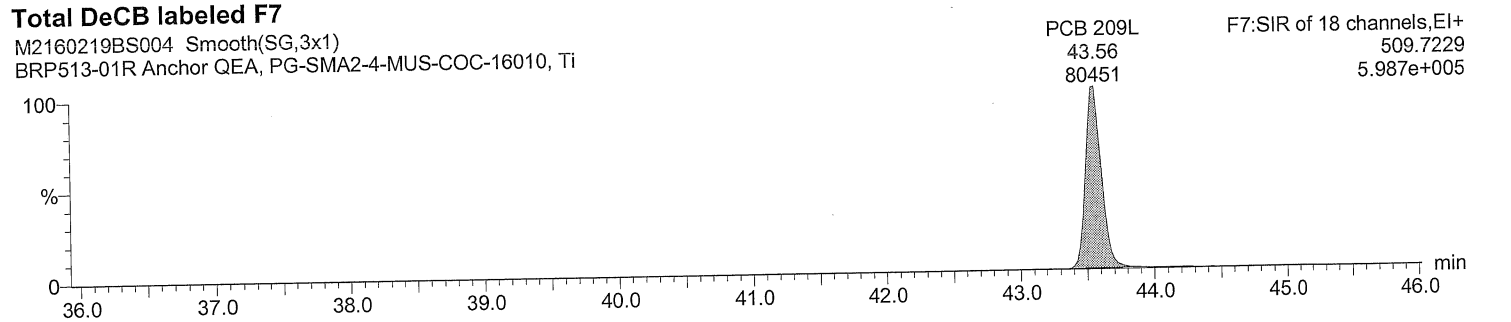

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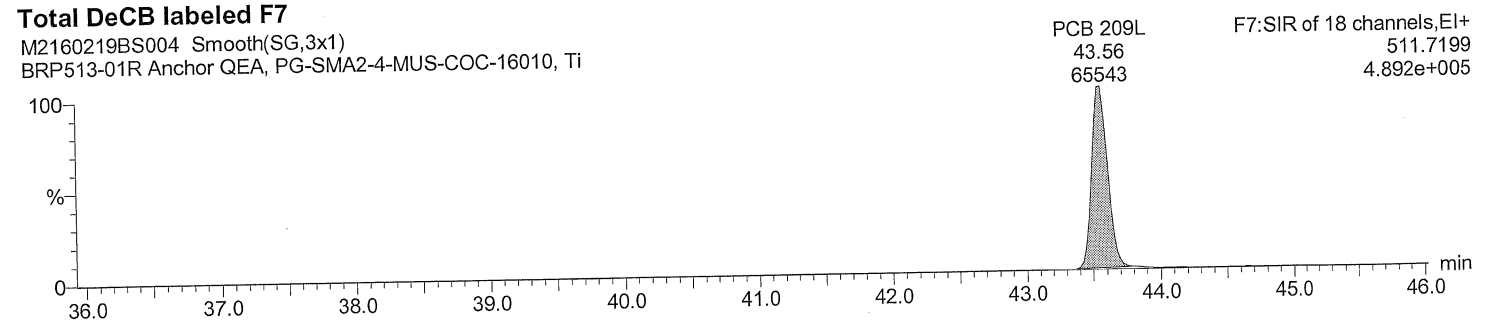

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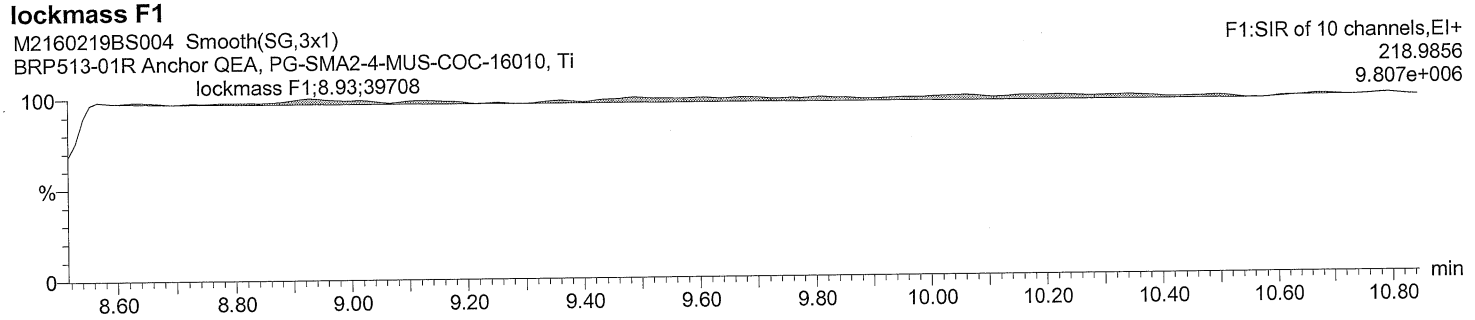
Instrument: Autospec-UltimaE

lockmass F1



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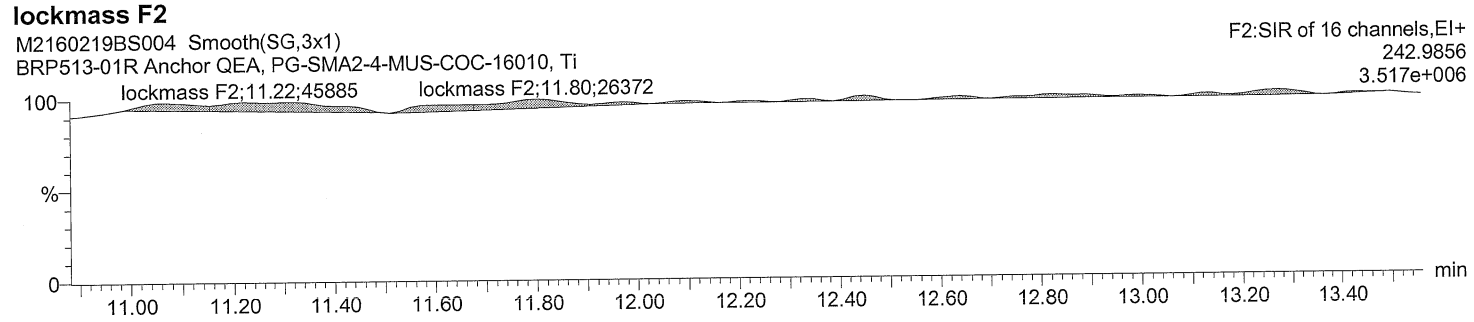

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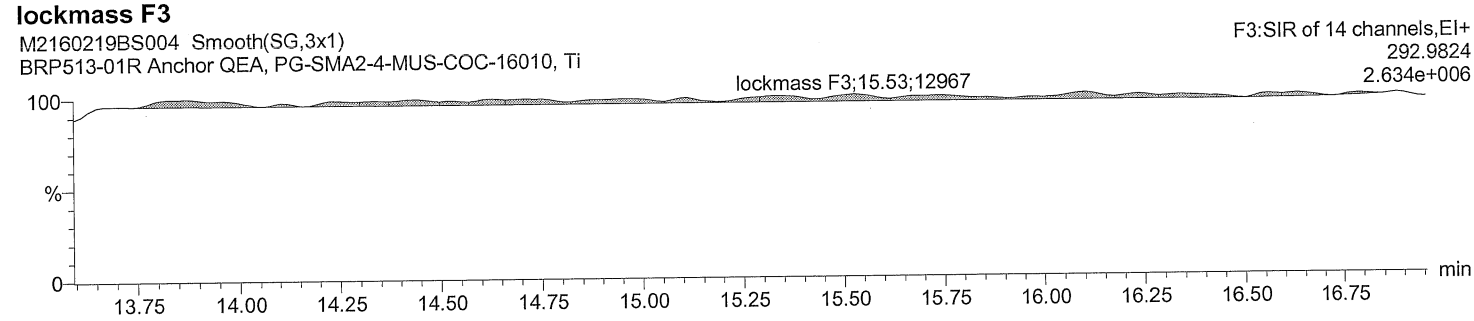

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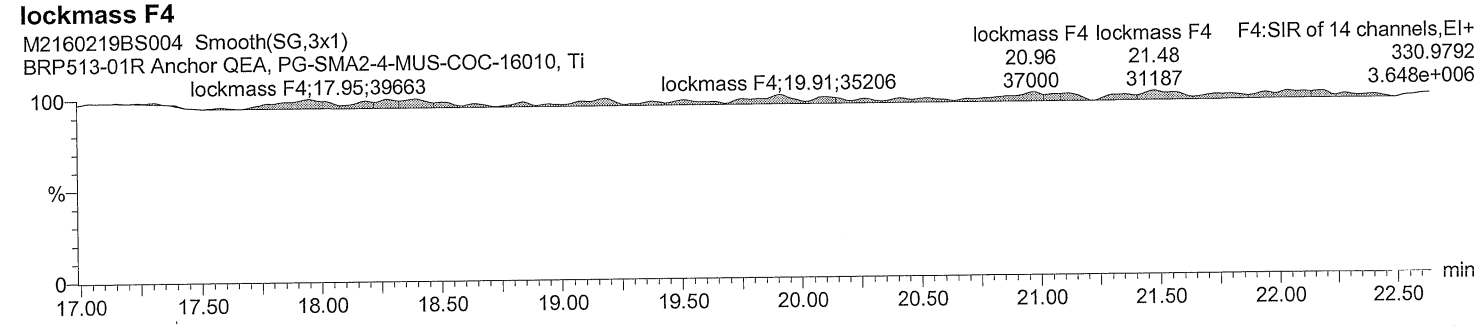

Quantify Sample Report **MassLynx 4.0 SP1**
Acquired Date

Dataset: C:\MassLynx\Default.pro\QLD\M2160219_samples_1668A.qld

Last Altered: February 23, 2016 12:16:16 PM Eastern Standard Time
Printed: February 23, 2016 12:17:46 PM Eastern Standard Time

Description: BRP513-01R
Vial: 4
Date: 19-FEB-2016
Time: 14:37:56
Instrument: Autospec-UltimaE

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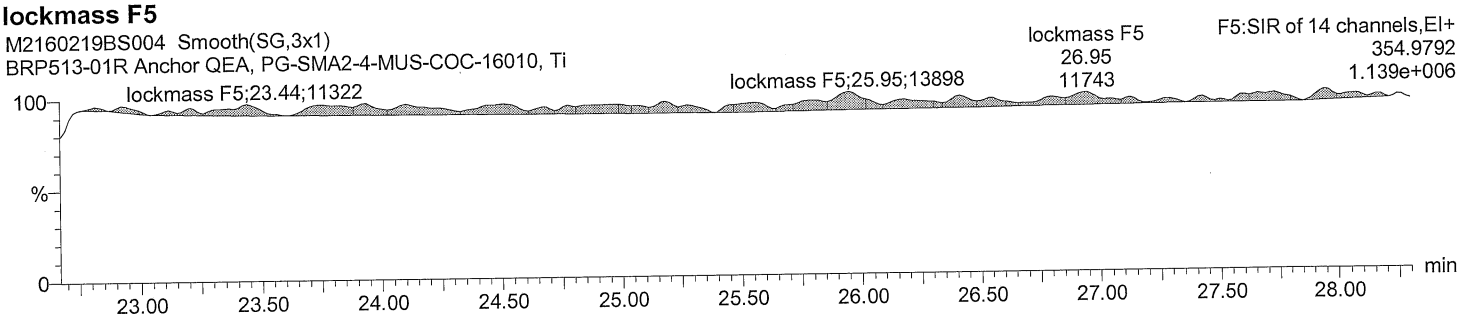

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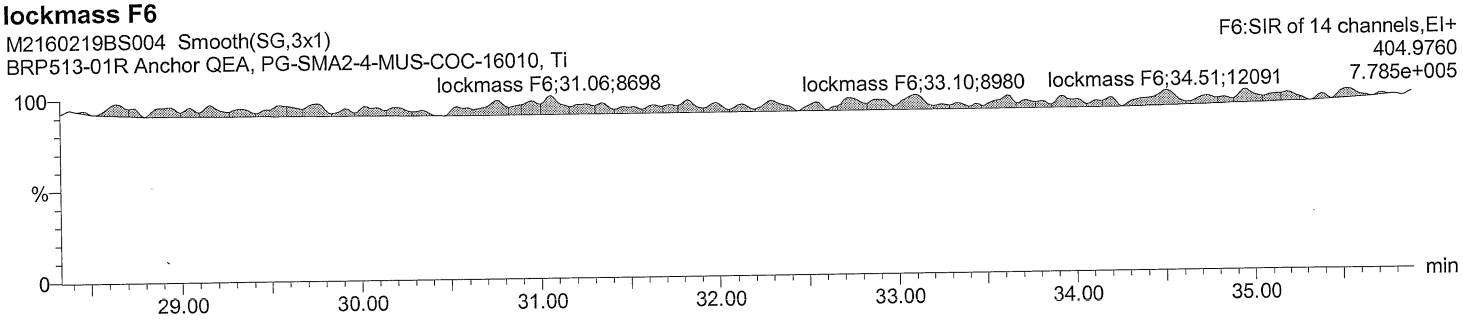

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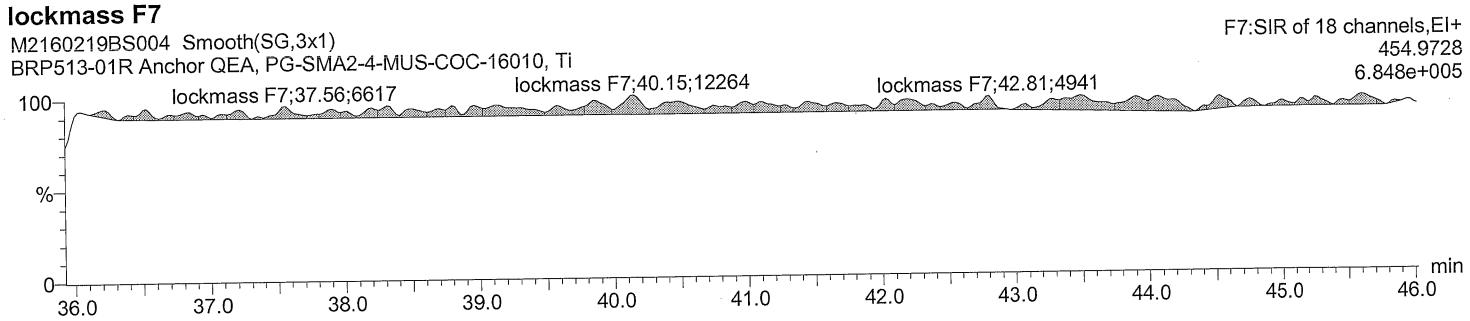

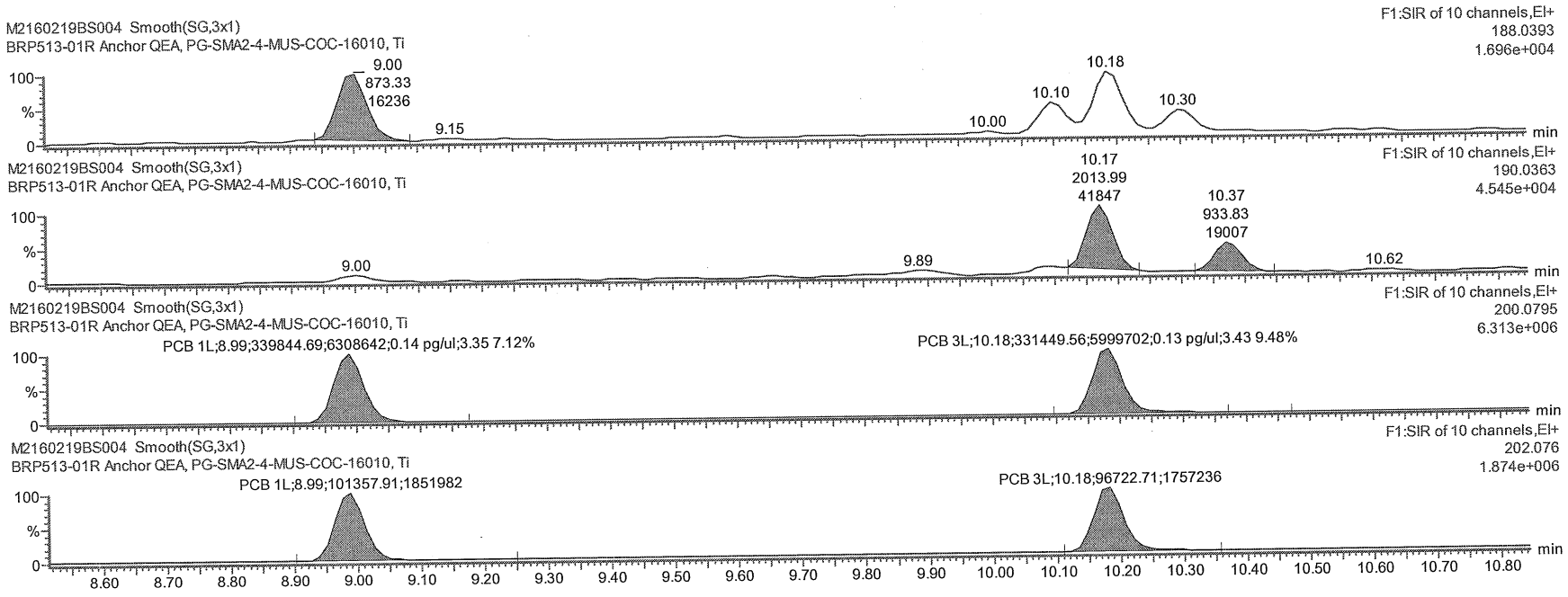

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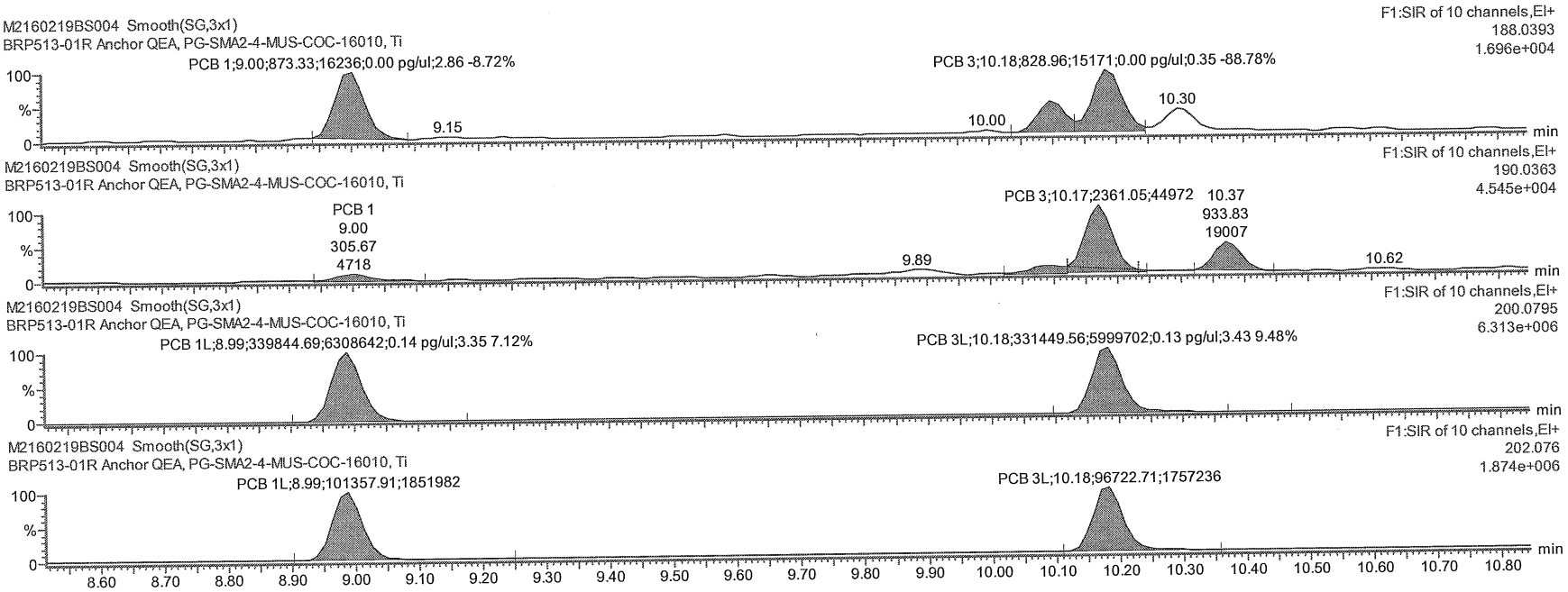
FEB 2 3 2016



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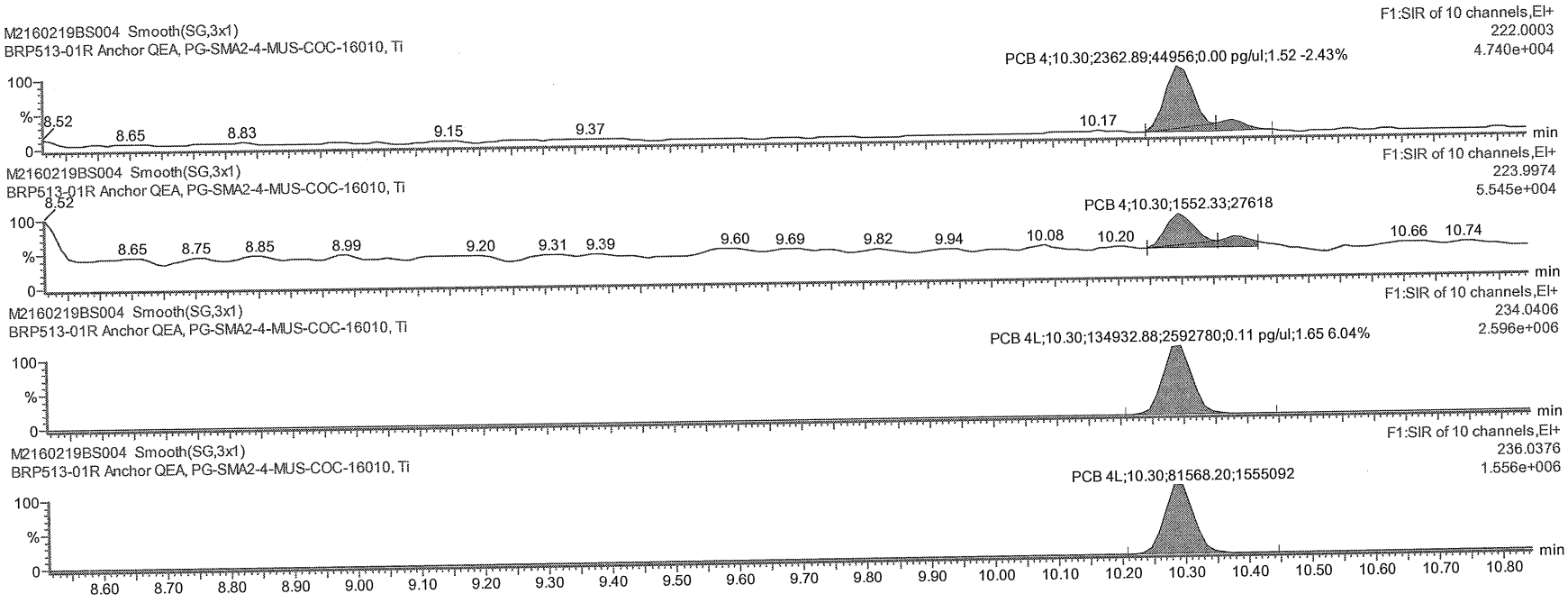

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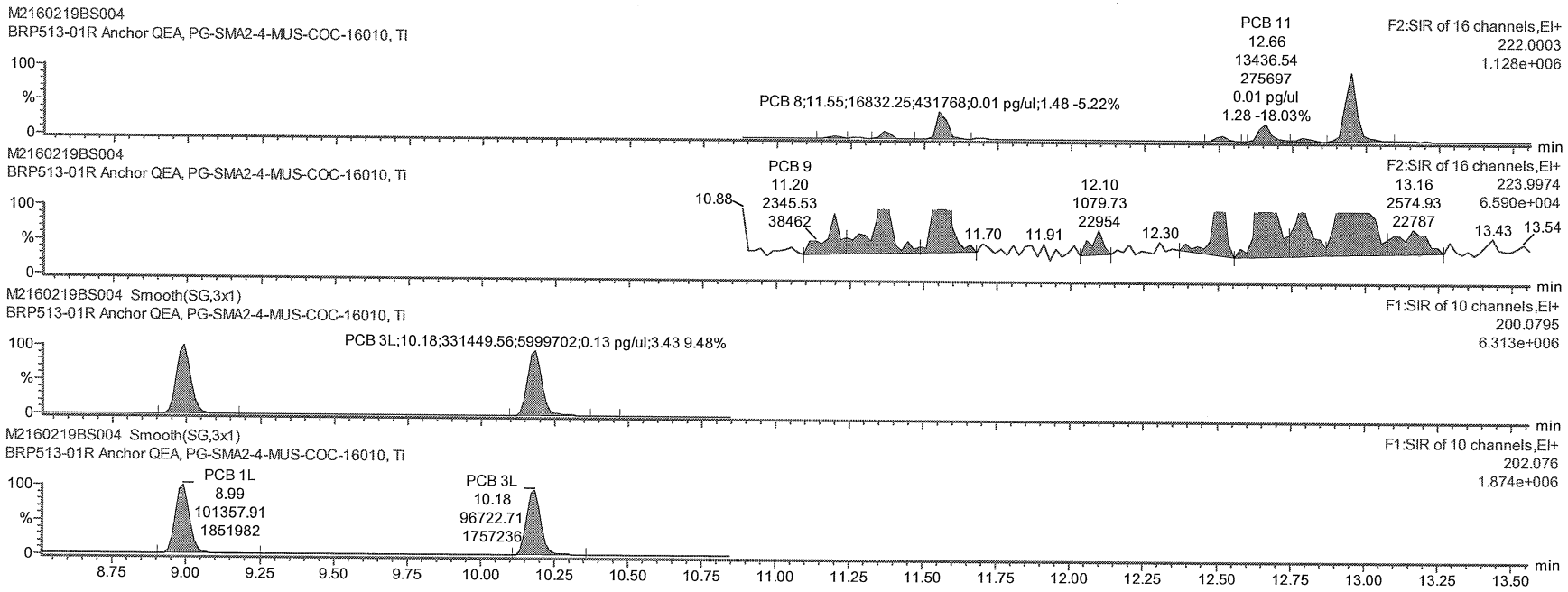

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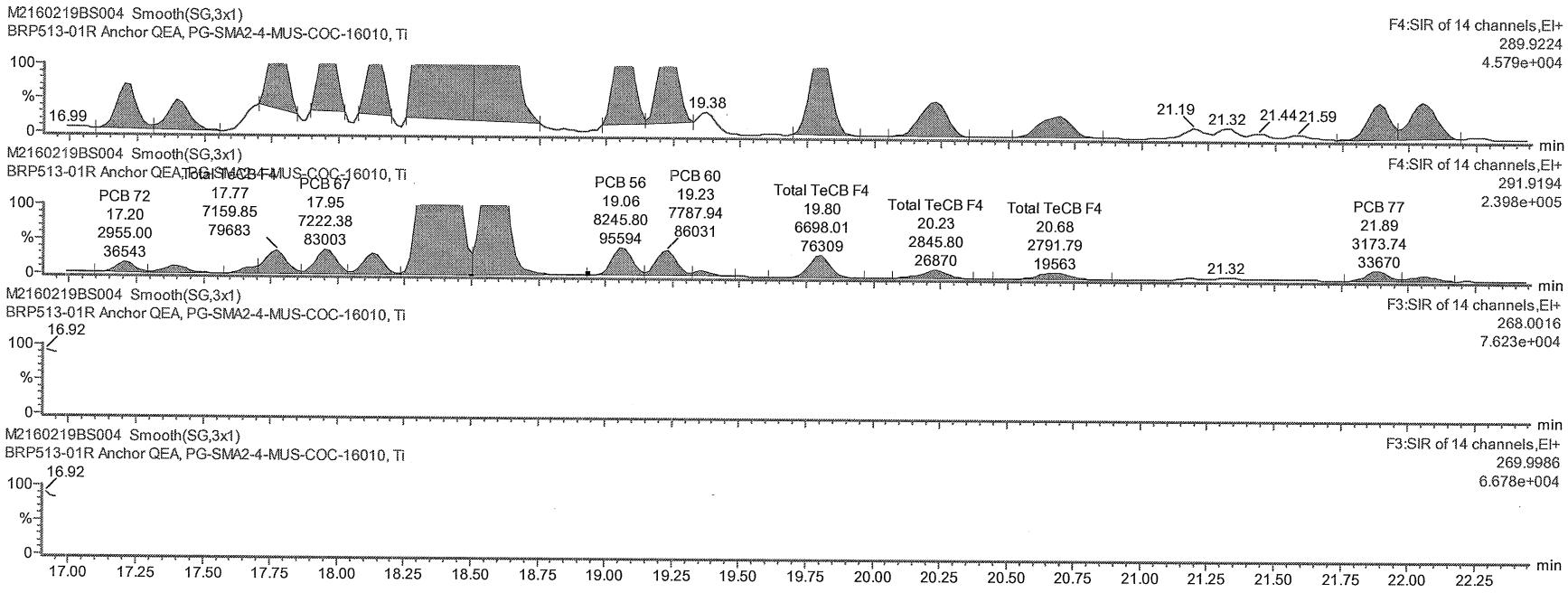

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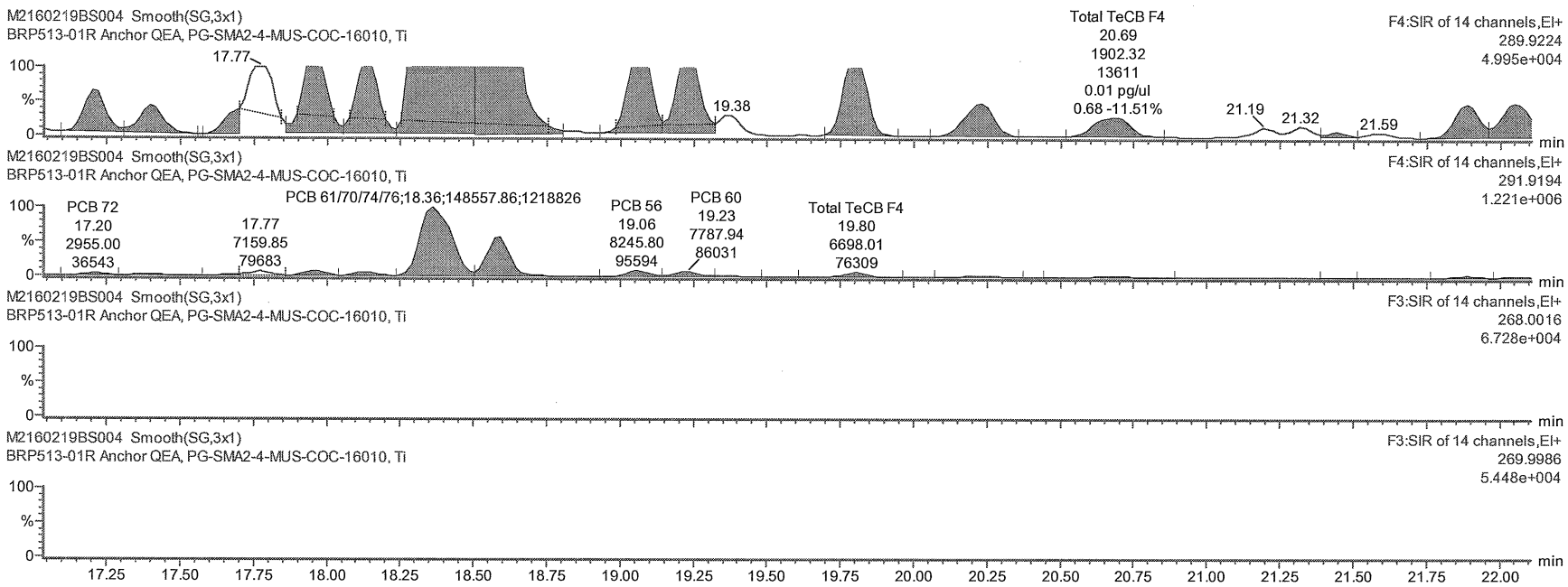

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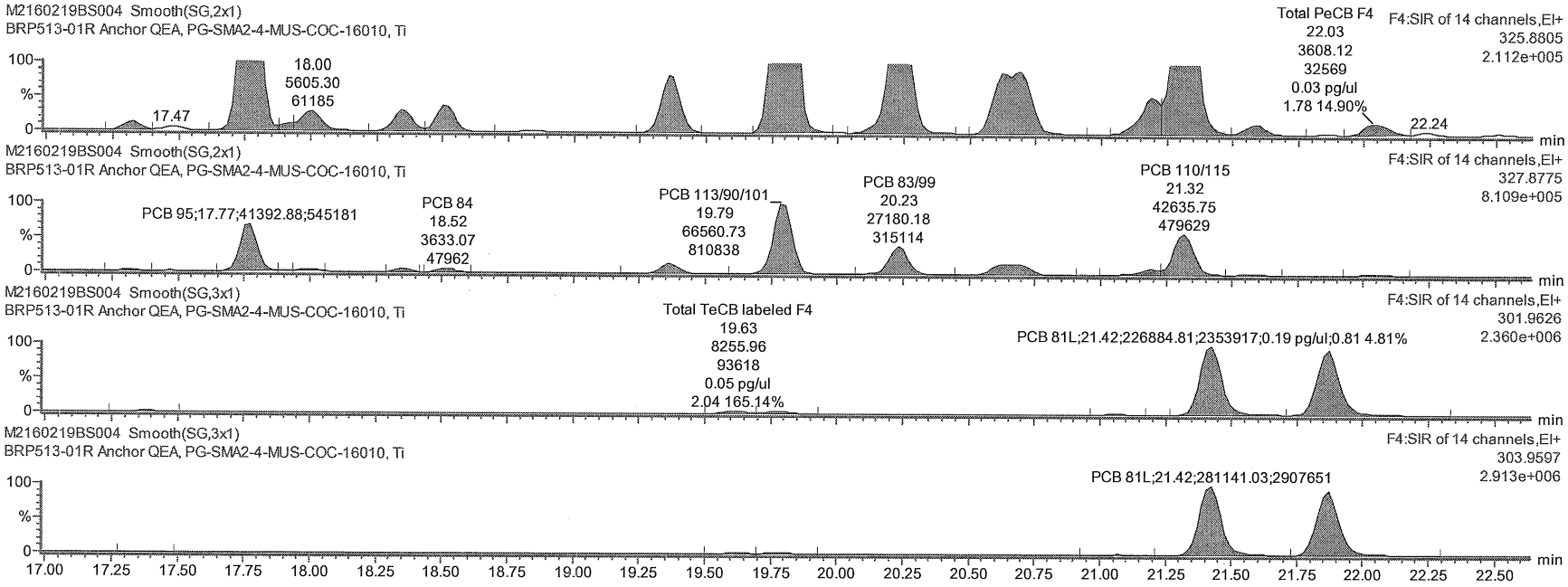

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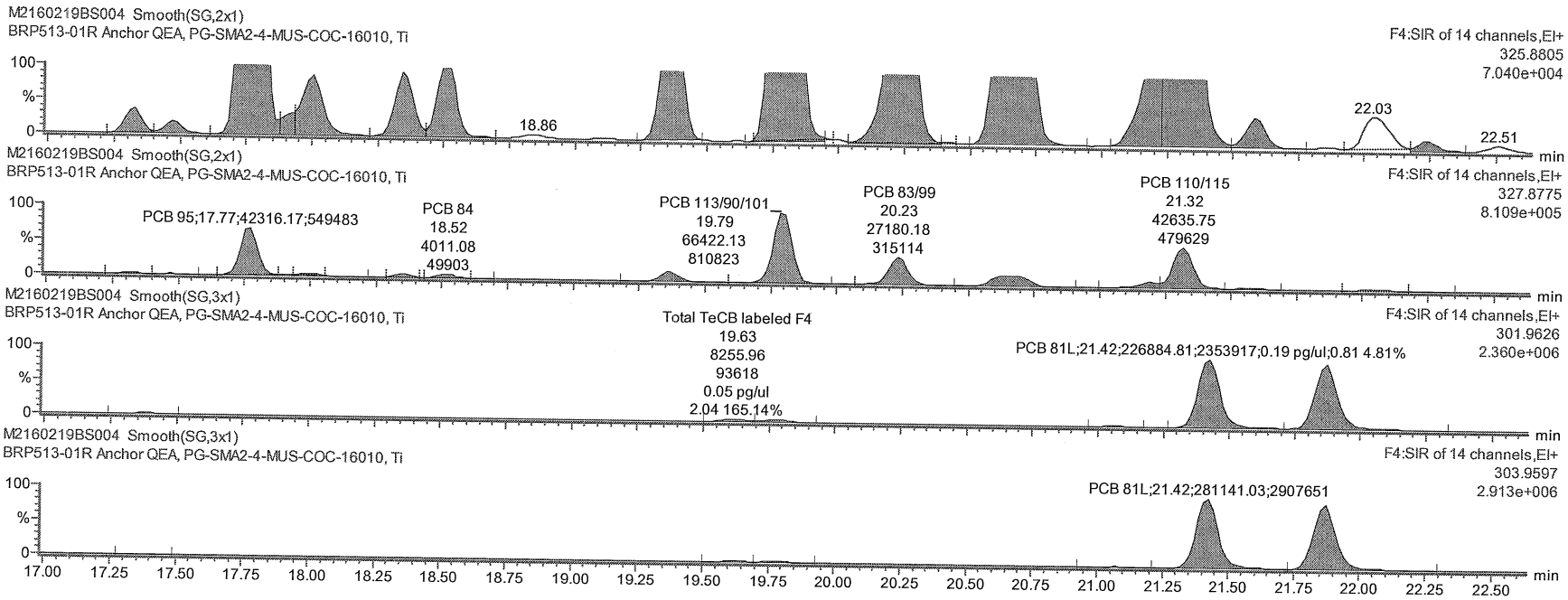

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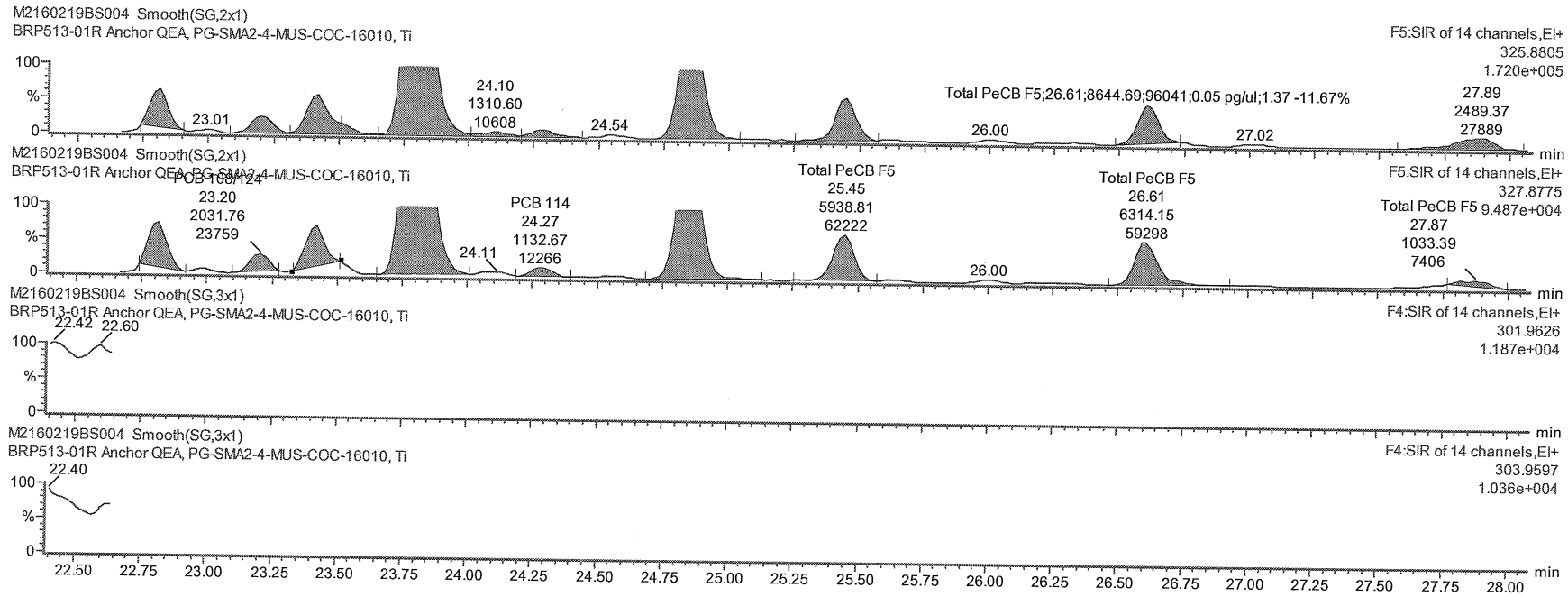

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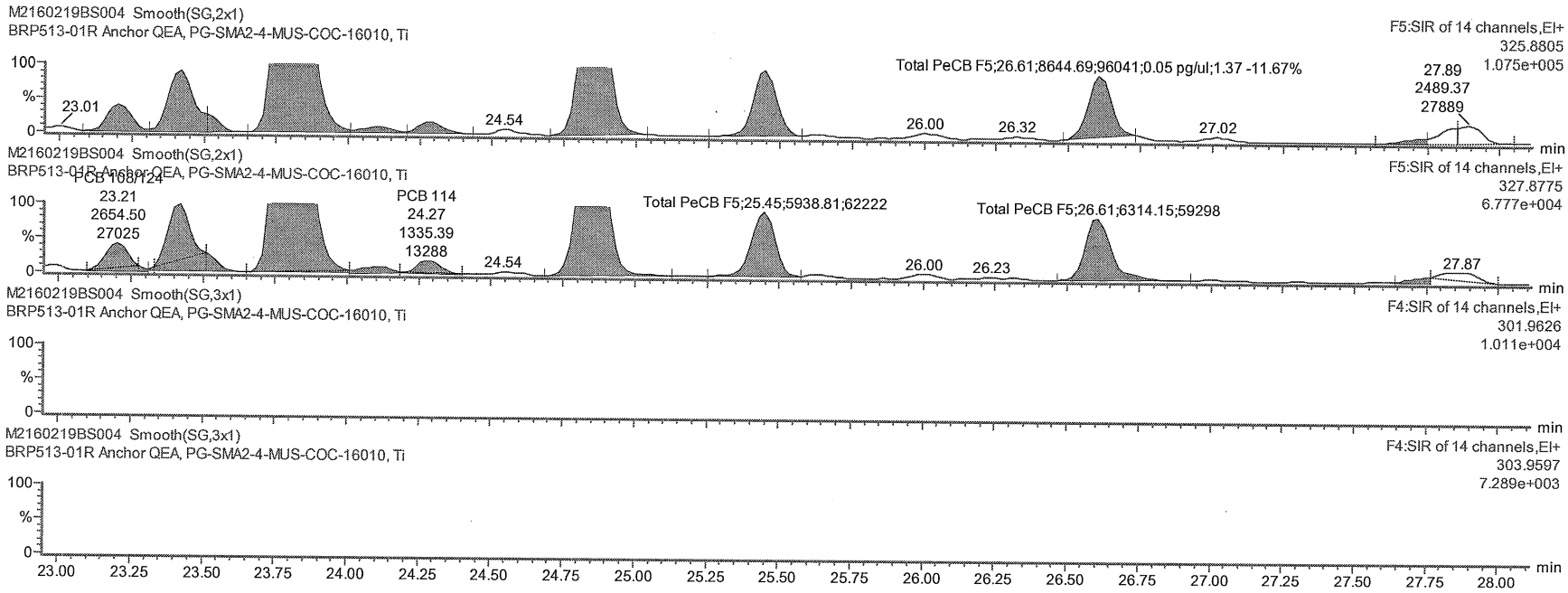

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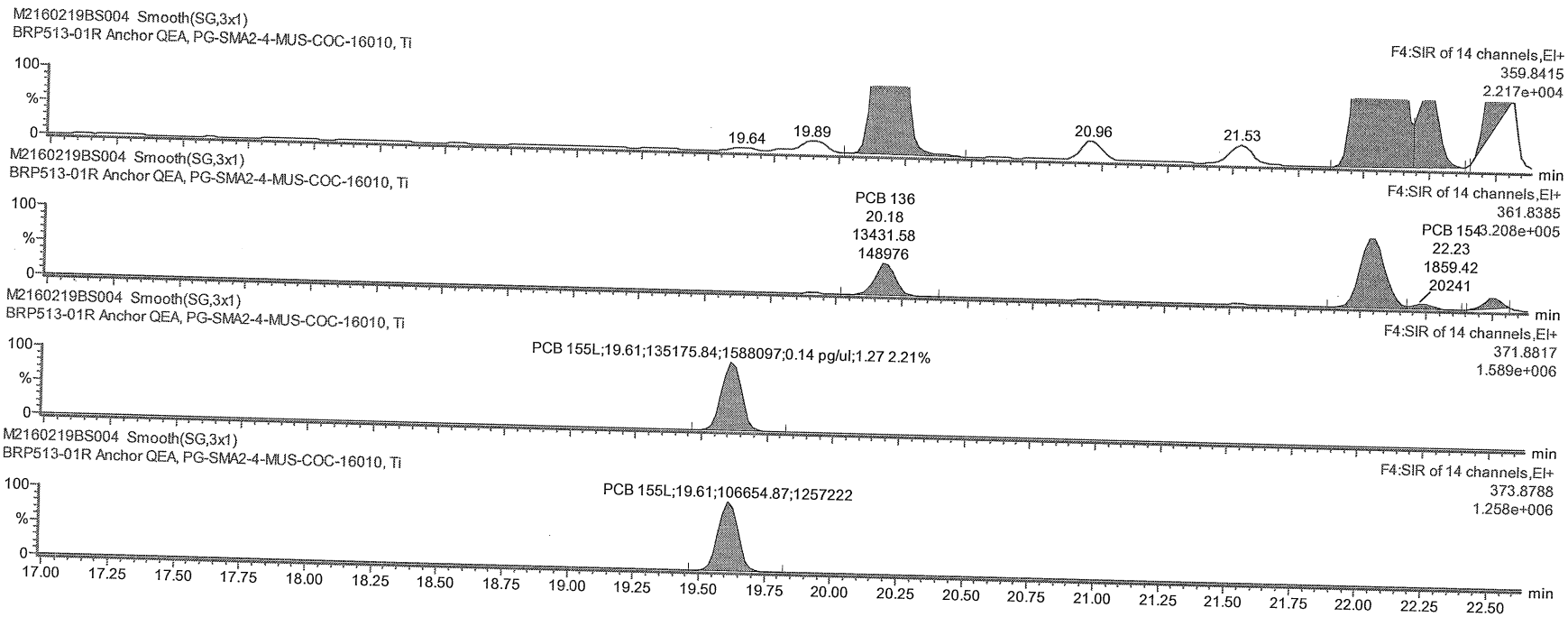

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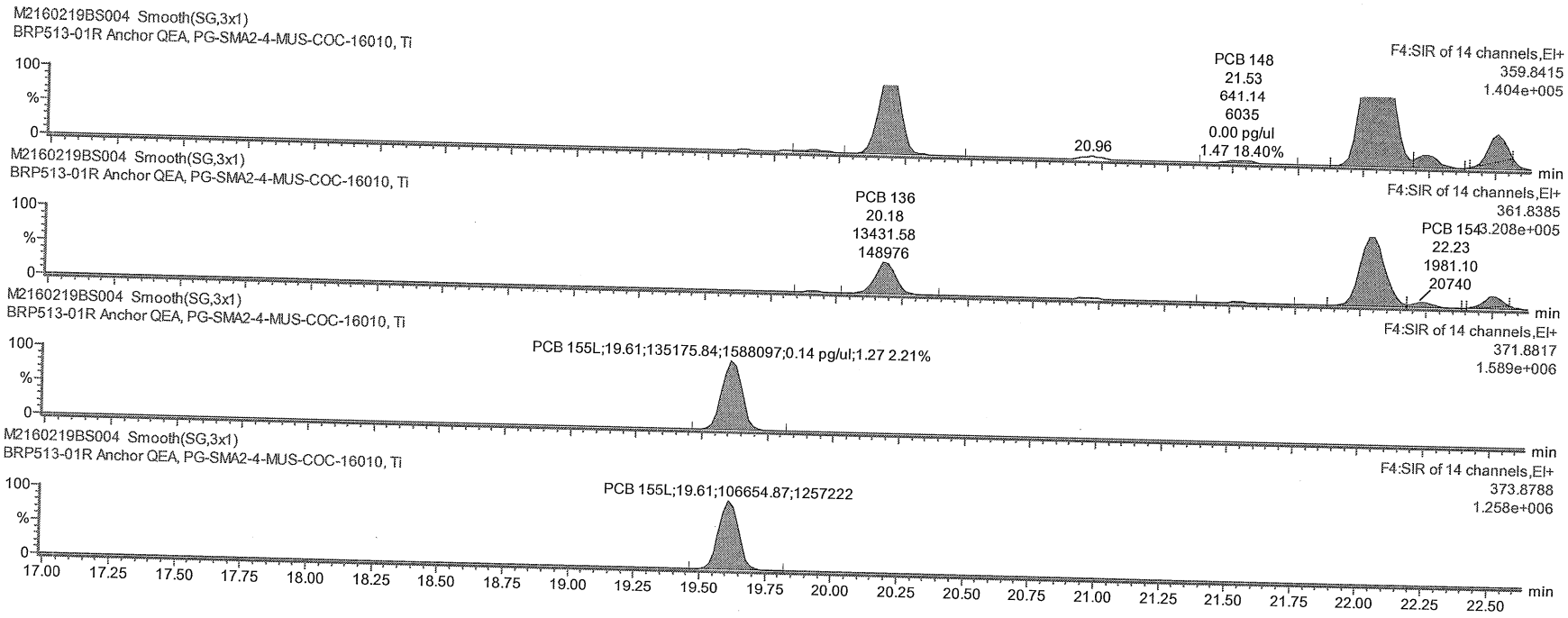

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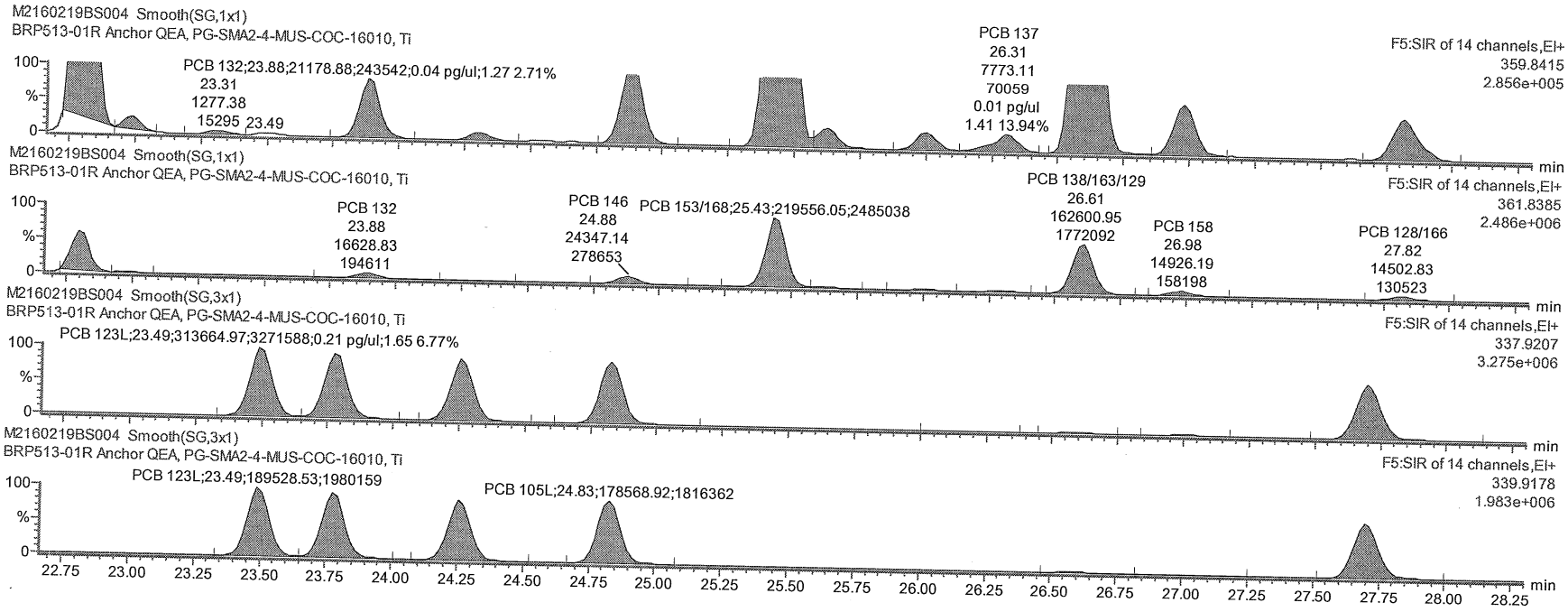

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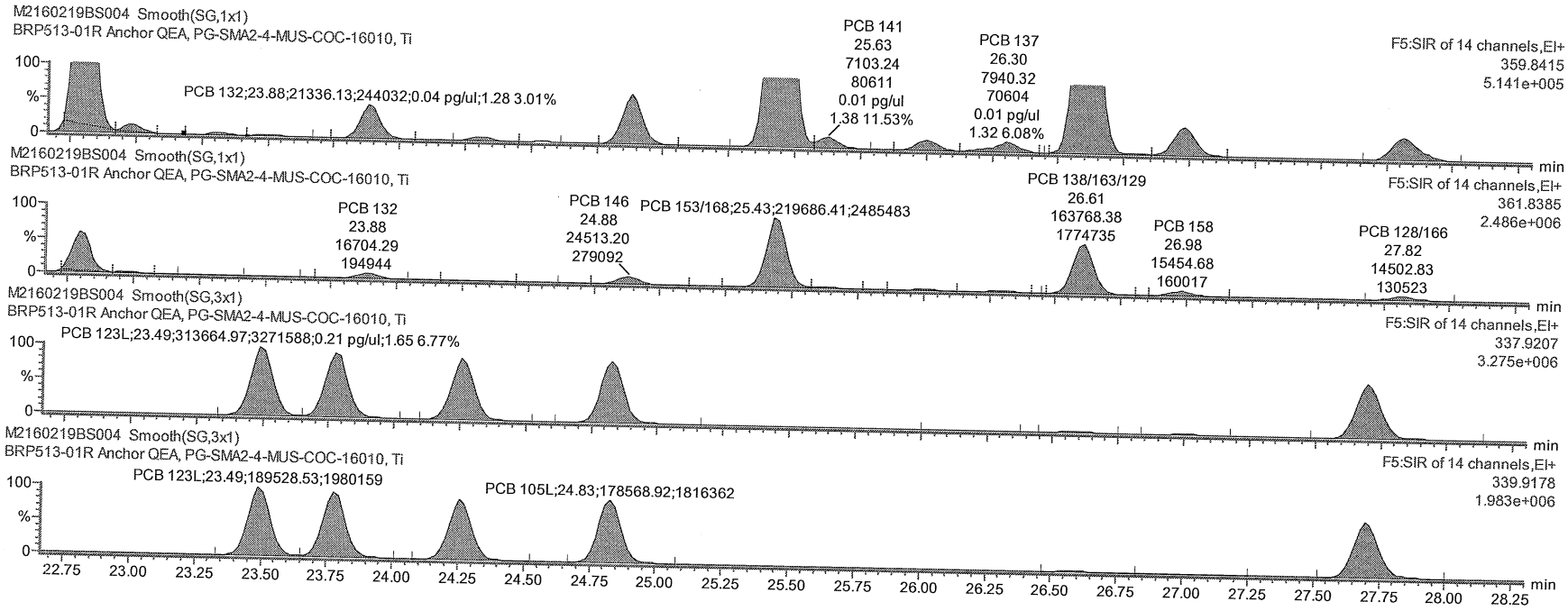

MB

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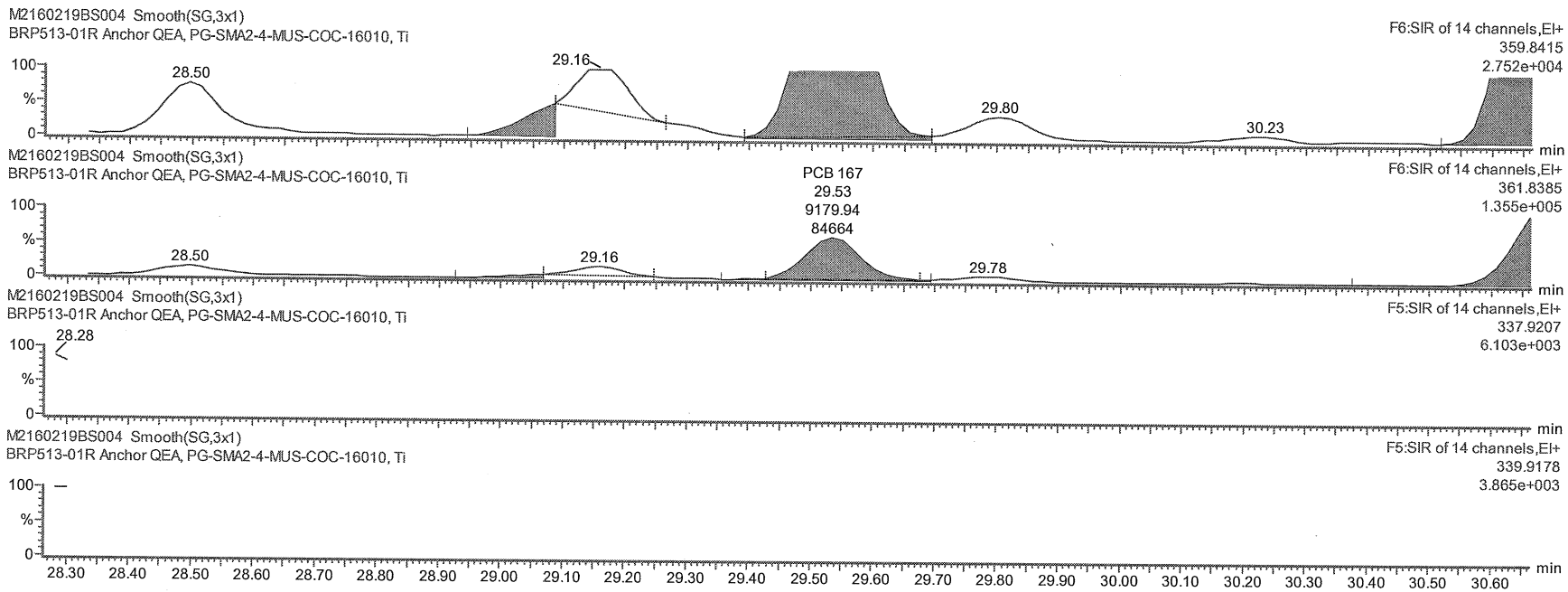

'2016-02-23

FEB 2 3 2016

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Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

APPENDIX E
DATA VALIDATION REPORTS

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor Environmental, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

January 19, 2016

SUBJECT: Port Gamble, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 23, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35625:

SDG #	Fraction
AQJ9	Polynuclear Aromatic Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Port Gamble Bay, Washington, May 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor Environmental, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

February 22, 2016

SUBJECT: Revised Port Gamble, Data Validation

Dear Ms. Fields,

Enclosed is the revised validation report for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

LDC Project #35625:

SDG #	Fraction
AQJ9	Polynuclear Aromatic Hydrocarbons

- Revised to add method blank qualifications.

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble

LDC Report Date: February 22, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): AQJ9

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-GP-1-PEMD-151109-A	AQJ9A	PEMD	11/09/15
PG-PJ-1-PEMD-151109-A	AQJ9C	PEMD	11/09/15
PG-WS-1-PEMD-151109-A	AQJ9E	PEMD	11/09/15
PG-SMA2-5-PEMD-151109-A	AQJ9G	PEMD	11/09/15
PG-SMA2-4-PEMD-151109-A	AQJ9I	PEMD	11/09/15
PG-SMA2-4-PEMD-151109-ADL	AQJ9IDL	PEMD	11/09/15
PG-SMA2-3-PEMD-151110-A	AQJ9K	PEMD	11/10/15
PG-SMA2-3-PEMD-151110-ADL	AQJ9KDL	PEMD	11/10/15
PG-SMA2-3-PEMD-151110-B	AQJ9L	PEMD	11/10/15
PG-SMA2-3-PEMD-151110-BDL	AQJ9LDL	PEMD	11/10/15
PG-SMA2-2-PEMD-151110-A	AQJ9M	PEMD	11/10/15
PG-SMA2-2-PEMD-151110-ADL	AQJ9MDL	PEMD	11/10/15
PG-SMA2-1-PEMD-151110-A	AQJ9O	PEMD	11/10/15
PG-SMA2-1-PEMD-151110-ADL	AQJ9ODL	PEMD	11/10/15
PG-FB-PEMD-151110	AQJ9Q	PEMD	11/10/15
PG-TB-PEMD-151110	AQJ9R	PEMD	11/10/15

PEMD= Polyethylene Membrane Device

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Port Gamble Bay, Washington (May 2014) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
12/14/15	Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	26.0 24.7 37.1	PG-SMA2-4-PEMD-151109-ADL PG-SMA2-3-PEMD-151110-ADL PG-SMA2-3-PEMD-151110-BDL PG-SMA2-2-PEMD-151110-ADL PG-SMA2-1-PEMD-151110-ADL	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-111815	11/18/15	Naphthalene	1.33 ug/Kg	All samples in SDG AQJ9

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PG-SMA2-4-PEMD-151109-ADL (10X)	Naphthalene	22.6 ug/Kg	22.6U ug/Kg
PG-SMA2-3-PEMD-151110-ADL (10X)	Naphthalene	14.3 ug/Kg	14.3U ug/Kg
PG-SMA2-3-PEMD-151110-BDL (10X)	Naphthalene	13.3 ug/Kg	13.3U ug/Kg
PG-SMA2-1-PEMD-151110-ADL (10X)	Naphthalene	18.5 ug/Kg	18.5U ug/Kg
PG-SMA2-2-PEMD-151110-A	Naphthalene	5.47 ug/Kg	5.47U ug/Kg

VI. Field Blanks

Sample PG-TB-PEMD-151110 was identified as a trip blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/Kg)
PG-TB-PEMD-151110	Naphthalene	19.9
	2-Methylnaphthalene	7.28
	Acenaphthene	1.24
	Fluorene	1.48
	Phenanthrene	3.44
	Anthracene	2.40
	Fluoranthene	4.17
	Pyrene	5.21

Sample PG-FB-PEMD-151110 was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/Kg)
PG-FB-PEMD-151110	Naphthalene	41.9
	2-Methylnaphthalene	58.7
	Acenaphthylene	1.61
	Acenaphthene	48.4
	Fluorene	23.6
	Phenanthrene	32.1
	Anthracene	1.71
	Fluoranthene	12.6
	Pyrene	7.47

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for sample PG-SMA2-5-PEMD-151109-A. Using professional judgment, no data were qualified when one surrogate %R was outside the QC limits and the %R was greater than or equal to 10%.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
LCS/D 111815 (All samples in SDG AQJ9)	Naphthalene	47.8 (50-150)	36.2 (50-150)	J (all detects) UJ (all non-detects)	P
	2-Methylnaphthalene	44.5 (50-150)	37.1 (50-150)		
	Acenaphthylene	45.1 (50-150)	35.0 (50-150)		
	Acenaphthene	44.5 (50-150)	33.8 (50-150)		
	Fluorene	-	40.4 (50-150)		
	Phenanthrene	-	49.6 (50-150)		
	Anthracene	-	41.2 (50-150)		
	Fluoranthene	-	49.6 (50-150)		
	Benzo(a)anthracene	-	48.7 (50-150)		
	Chrysene	-	44.5 (50-150)		
	Benzo(b)fluoranthene	-	47.2 (50-150)		
	Benzo(k)fluoranthene	-	43.9 (50-150)		
	Benzo(a)pyrene	47.5 (50-150)	39.8 (50-150)		
	Indeno(1,2,3-cd)pyrene	-	46.0 (50-150)		
	Dibenz(a,h)anthracene	-	47.2 (50-150)		
	Benzo(g,h,i)perylene	-	44.8 (50-150)		
	Perylene	24.1 (50-150)	23.5 (50-150)		
	Benzo(e)pyrene	48.1 (50-150)	40.9 (50-150)		
	Total Benzofluoranthenes	-	43.9 (50-150)		

Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples PG-SMA2-3-PEMD-151110-A and PG-SMA2-3-PEMD-151110-B and samples PG-SMA2-3-PEMD-151110-ADL and PG-SMA2-3-PEMD-151110-BDL were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD
	PG-SMA2-3-PEMD-151110-A	PG-SMA2-3-PEMD-151110-B	
Naphthalene	10.8	9.72	11
2-Methylnaphthalene	5.79	7.41	25
Acenaphthylene	1.29	1.75	30
Acenaphthene	13.2	67.5	135
Fluorene	19.1	63.2	107
Anthracene	24.3	34.2	34
Benzo(a)anthracene	32.4	15.8	69
Chrysene	28.6	14.1	68
Benzo(b)fluoranthene	9.23	3.87	82
Benzo(k)fluoranthene	4.10	1.52	92
Benzo(a)pyrene	7.07	1.86	117
Indeno(1,2,3-cd)pyrene	1.35	1.12U	200
Benzo(g,h,i)perylene	1.48	1.12U	200
Perylene	1.75	1.12U	200
Benzo(e)pyrene	5.71	2.43	81
Total Benzofluoranthense	17.8	7.15	85

Compound	Concentration (ug/Kg)		RPD
	PG-SMA2-3-PEMD-151110-ADL	PG-SMA2-3-PEMD-151110-BDL	
Phenanthrene	204	364	56
Fluoranthene	353	332	6

Compound	Concentration (ug/Kg)		RPD
	PG-SMA2-3-PEMD-151110-ADL	PG-SMA2-3-PEMD-151110-B	
Pyrene	198	110	57

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
PG-SMA2-4-PEMD-151109-A PG-SMA2-3-PEMD-151110-B PG-SMA2-2-PEMD-151110-A	Phenanthrene Fluoranthene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
PG-SMA2-3-PEMD-151110-A	Phenanthrene Fluoranthene Pyrene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A
PG-SMA2-1-PEMD-151110-A	Fluoranthene Pyrene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
PG-SMA2-4-PEMD-151109-A PG-SMA2-3-PEMD-151110-B PG-SMA2-2-PEMD-151110-A	Phenanthrene Fluoranthene	R	A
PG-SMA2-4-PEMD-151109-ADL PG-SMA2-3-PEMD-151110-BDL PG-SMA2-2-PEMD-151110-ADL	All TCL compounds except Phenanthrene Fluoranthene	R	A
PG-SMA2-3-PEMD-151110-A	Phenanthrene Fluoranthene Pyrene	R	A
PG-SMA2-3-PEMD-151110-ADL	All TCL compounds except Phenanthrene Fluoranthene Pyrene	R	A
PG-SMA2-1-PEMD-151110-A	Fluoranthene Pyrene	R	A
PG-SMA2-1-PEMD-151110-ADL	All TCL compounds except Fluoranthene Pyrene	R	A

Due to LCS/LCSD %R, data were qualified as estimated in sixteen samples.

Due to laboratory blank contamination, data were qualified as not detected in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG AQJ9

Sample	Compound	Flag	A or P	Reason
PG-GP-1-PEMD-151109-A PG-PJ-1-PEMD-151109-A PG-WS-1-PEMD-151109-A PG-SMA2-5-PEMD-151109-A PG-SMA2-4-PEMD-151109-A PG-SMA2-4-PEMD-151109-ADL PG-SMA2-3-PEMD-151110-A PG-SMA2-3-PEMD-151110-ADL PG-SMA2-3-PEMD-151110-B PG-SMA2-3-PEMD-151110-BDL PG-SMA2-2-PEMD-151110-A PG-SMA2-2-PEMD-151110-ADL PG-SMA2-1-PEMD-151110-A PG-SMA2-1-PEMD-151110-ADL PG-FB-PEMD-151110 PG-TB-PEMD-151110	Naphthalene 2-Methylnaphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Perylene Benzo(e)pyrene Total Benzofluoranthenes	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
PG-SMA2-4-PEMD-151109-A PG-SMA2-3-PEMD-151110-B PG-SMA2-2-PEMD-151110-A	Phenanthrene Fluoranthene	R	A	Overall assessment of data
PG-SMA2-4-PEMD-151109-ADL PG-SMA2-3-PEMD-151110-BDL PG-SMA2-2-PEMD-151110-ADL	All TCL compounds except Phenanthrene Fluoranthene	R	A	Overall assessment of data
PG-SMA2-3-PEMD-151110-A	Phenanthrene Fluoranthene Pyrene	R	A	Overall assessment of data
PG-SMA2-3-PEMD-151110-ADL	All TCL compounds except Phenanthrene Fluoranthene Pyrene	R	A	Overall assessment of data
PG-SMA2-1-PEMD-151110-A	Fluoranthene Pyrene	R	A	Overall assessment of data
PG-SMA2-1-PEMD-151110-ADL	All TCL compounds except Fluoranthene Pyrene	R	A	Overall assessment of data

Port Gamble
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG AQJ9

Sample	Compound	Modified Final Concentration	A or P
PG-SMA2-4-PEMD-151109-ADL (10X)	Naphthalene	22.6U ug/Kg	A
PG-SMA2-3-PEMD-151110-ADL (10X)	Naphthalene	14.3U ug/Kg	A
PG-SMA2-3-PEMD-151110-BDL (10X)	Naphthalene	13.3U ug/Kg	A
PG-SMA2-1-PEMD-151110-ADL (10X)	Naphthalene	18.5U ug/Kg	A
PG-SMA2-2-PEMD-151110-A	Naphthalene	5.47U ug/Kg	A

LDC #: 35625A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/31/15
SDG #: AQJ9 Stage 2B Page: 1 of 2
Laboratory: Analytical Resources, Inc. Reviewer: FJ
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A, A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FB = 15 TB = 16
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	SW	LCS ID
X.	Field duplicates	SW	D = 7, 9 8, 10
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	SW	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

PEMD = Polyethylene Membrane Device

	Client ID		Lab ID	Matrix	Date
1	PG-GP-1-PEMD-151109-A		AQJ9A	~~Tissue~~ PEMD	11/09/15
2	PG-PJ-1-PEMD-151109-A		AQJ9C	Tissue	11/09/15
3	PG-WS-1-PEMD-151109-A		AQJ9E	Tissue	11/09/15
4	PG-SMA2-5-PEMD-151109-A		AQJ9G	Tissue	11/09/15
5	PG-SMA2-4-PEMD-151109-A		AQJ9I	Tissue	11/09/15
6	PG-SMA2-4-PEMD-151109-ADL		AQJ9IDL	Tissue	11/09/15
7	PG-SMA2-3-PEMD-151110-A	D	AQJ9K	Tissue	11/10/15
8	PG-SMA2-3-PEMD-151110-ADL	D_1	AQJ9KDL	Tissue	11/10/15
9	PG-SMA2-3-PEMD-151110-B	D	AQJ9L	Tissue	11/10/15
10	PG-SMA2-3-PEMD-151110-BDL	D_1	AQJ9LDL	Tissue	11/10/15
11	PG-SMA2-2-PEMD-151110-A		AQJ9M	Tissue	11/10/15
12	PG-SMA2-2-PEMD-151110-ADL		AQJ9MDL	Tissue	11/10/15
13	PG-SMA2-1-PEMD-151110-A		AQJ9O	Tissue	11/10/15

LDC #: 35625A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/31/15
SDG #: AQJ9 Stage 2B Page: 2 of 2
Laboratory: Analytical Resources, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

	Client ID	Lab ID	Matrix	Date
14	PG-SMA2-1-PEMD-151110-ADL	AQJ9ODL	~~Tissue~~ PEMD	11/10/15
15	PG-FB-PEMD-151110	AQJ9Q	Tissue	11/10/15
16	PG-TB-PEMD-151110	AQJ9R	~~Tissue~~	11/10/15
17				
18				
19				
20				
21				

Notes:

	MB - 11815						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1.
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1.
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1.
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1.
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1.
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1.
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1.
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1.
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1.
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1.
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1.
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1.
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1.
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1.
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 2,6-Dinitrotoluene	O1.
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1.
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4 Methylphenol	Q1.
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiphene (4MDT)	R1.
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1.
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1.
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU. Total Benzofluoranthenes	U1.
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV.	V1.
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.	W1.
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX.	X1.
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY.	Y1.
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ.	Z1.

LDC #: 35625A26

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
-	12/14/15	CCV	JJJ	26.0		6, 8, 10, 12, 14	J/UJ/A (ND)
"	0909		KKK	24.7		↓	↓
-			LLL	37.1			

LDC #: 35625A2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/18/15 **Blank analysis date:** 12/5/15
Conc. units: ng/kg Associated Samples: All

Compound	Blank ID								
	MB-111815	5X	6 (10X)	8 (10X)	10 (10X)	14 (10X)	11		
S	1.33	6.65	22.6 U	14.3 U	13.3 U	18.5 U	5.47 U		

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 35625A2b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd reviewer: [signature]

METHOD: GC/MS PAH (EPA SW 846 Method 8270D SIM)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 15 (FB) Field Blank / Rinsate Blank/ Rinsate (circle one)

Compound	Concentration Units (ug/kg)
S	41.9
W	58.7
DD	1.61
GG	48.4
NN	23.6
UU	32.1
VV	1.71
YY	12.6
ZZ	7.47

Sample: 16 (TB) Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/kg)
S	19.9
W	7.28
GG	1.24
NN	1.48
UU	3.44
VV	2.40
YY	4.17
ZZ	5.21

LDC #: 35625A2b

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	4	*	25.0 (30-160)	no qual (1 out of 355)
			( )	
			( )	
			( )	
			( )	
			( )	
		* 2-methylnaphthalene-d10	( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 35625A2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	LCS/D -	S	47.8 (50-150	36.2 (50-150	( )	All	J/UJ (ND+Det)
	111815	W	44.5 ( )	37.1 ( )	( )		
		DD	45.1 ( )	35.0 ( )	( )		
		GG	44.5 ( )	33.8 ( )	( )		
		NN	( )	40.4 ( )	( )		
		UU	( )	49.6 ( )	( )		
		VV	( )	41.2 ( )	( )		
		YY	( )	49.6 ( )	( )		
		CCC	( )	48.7 ( )	( )		
		DDD	( )	44.5 ( )	( )		
		GGG	( )	47.2 ( )	( )		
		HHH	( )	43.9 ( )	( )		
		III	47.5 ( )	39.8 ( )	( )		
		JJJ	( )	46.0 ( )	( )		
		KKK	( )	47.2 ( )	( )		
		LLL	( )	44.8 ( )	( )		
		ZZZ	24.1 ( )	23.5 ( )	( )		
		WWW	48.1 ( )	40.9 ( )	( )		
	Total Benzofluoranthenes		( )	43.9 ( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#: 35625A2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT
2nd Reviewer: CR

METHOD: GCMS PAH (EPA SW 846 Method 8270D-SIM)

Compound	Concentration (ug/Kg)		RPD
	7	9	
S	10.8	9.72	11
W	5.79	7.41	25
DD	1.29	1.75	30
GG	13.2	67.5	135
NN	19.1	63.2	107
VV	24.3	34.2	34
CCC	32.4	15.8	69
DDD	28.6	14.1	68
GGG	9.23	3.87	82
HHH	4.10	1.52	92
III	7.07	1.86	117
JJJ	1.35	1.12U	200
LLL	1.48	1.12U	200
ZZZ	1.75	1.12U	200
WWW	5.71	2.43	81
UUUU	17.8	7.15	85

Compound	Concentration (ug/Kg)		RPD
	8	10	
UU	204	364	56
YY	353	332	6

Compound	Concentration (ug/Kg)		RPD
	8	9	
ZZ	198	110	57

LDC #: 35625 A2b

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Sample ID	Compound	Finding	Qualifications
	5, 9, 11	UU, YY	x'dical Range	J dt / A
	7	UU, YY, ZZ	↓	↓
	13	YY, ZZ	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 35625 A2b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: FT
2nd Reviewer: QL

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Sample ID	Compound	Finding	Qualifications
	5, 9, 11	UU, YY	x'd cal Range	R/A
	6, 10, 12	all except UU, YY	diluted	R/A
	7	UU, YY, ZZ	x'd cal Range	R/A
	8	all except UU, YY, ZZ	diluted	R/A
	13	YY, ZZ	x'd cal Range	R/A
	14	all except YY, ZZ	diluted	R/A

Comments: _____

LDC #: 35625

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date: JAN 19, 16

2nd Reviewer:

The LDC job number listed above was entered by (W).

	EDD Process	Y/N	Init	Comments/Action
I.	EDD Completeness	-		
Ia.	- All methods present?	✓	W	
Ib.	- All samples present/match report?	✓	W	
Ic.	- All reported analytes present?	✓	W	
Id	-10% verification of EDD?	✓	W	
II.	EDD Preparation/Entry	-		
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	✓	W	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	NA	W	
III.	Reasonableness Checks	-		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	✓	W	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	✓	W	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	✓	W	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	NA	W	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	N/A	W	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	✓	W	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	N/A	W	
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	NA	W	

Notes: *see readme

The attached zipped file contains two files:

File	Format	Description
1) Readme_PortGamble_011916.doc	MS Word 2003	A "Readme" file (this document).
2) LDC35625_AQJ9_VEDD_20160107.xls	MS Excel 2007	A spreadsheet for the following SDG(s): AQJ9 35625A

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor Environmental, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

February 19, 2016

SUBJECT: Port Gamble, Shellfish Monitoring, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fractions listed below. This SDG was received on February 1, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35818:

SDG #	Fraction
AUA2	Polynuclear Aromatic Hydrocarbons, Lipids

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project, May 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

HC

Attachment 1

EDD Stage 2B

LDC #35818 (Anchor Environmental-Seattle WA / Port Gamble, Shellfish Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270D-SIM)		% Lipids (B&D)																													
Matrix: Water/Tissue				W	T	W	T	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	AUA2	02/01/16	02/22/16	0	4	0	3																												
Total	A/CR			0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

L:\Anchor\Port Gamble\Shellfish\35818ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 10, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): AUA2

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
13EB_ME-MTW01Z	AUA2A	Tissue	01/07/13
13EB_ME-MTW01ZDL	AUA2A	Tissue	01/07/13
13CPS_DB-MTW01Z	AUA2B	Tissue	01/10/13
13NPS_CIAR2-MTW01Z	AUA2C	Tissue	01/14/13

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

The chain-of-custodies were not provided and therefore were not reviewed. Per client, samples were stored frozen prior to receipt at the laboratory and shipped for overnight delivery.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
01/22/16	Benzo(k)fluoranthene	20.8	13EB_ME-MTW01Z 13CPS_DB-MTW01Z 13NPS_CIAR2-MTW01Z	Benzo(k)fluoranthene Total Benzofluoroanthenes	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS-011416	Acenaphthylene	49.2 (50-150)	All samples in SDG AUA2	J (all detects) UJ (all non-detects)	P

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
13EB_ME-MTW01Z	Fluoranthene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
13EB_ME-MTW01Z	Fluoranthene	R	A
13EB_ME-MTW01ZDL	All TCL compounds except Fluoranthene	R	A

Due to continuing calibration %D and LCS %R, data were qualified as estimated in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG AUA2

Sample	Compound	Flag	A or P	Reason
13EB_ME-MTW01Z 13CPS_DB-MTW01Z 13NPS_CIAR2-MTW01Z	Benzo(k)fluoranthene Total Benzofluoroanthenes	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
13EB_ME-MTW01Z 13CPS_DB-MTW01Z 13NPS_CIAR2-MTW01Z	Acenaphthylene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
13EB_ME-MTW01Z	Fluoranthene	R	A	Overall assessment of data
13EB_ME-MTW01ZDL	All TCL compounds except Fluoranthene	R	A	Overall assessment of data

Port Gamble, Shellfish Monitoring
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG AUA2

No Sample Data Qualified in this SDG

LDC #: 35818A2b

SDG #: AUA2

Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 2/10/16

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤20 ICV ≤30
IV.	Continuing calibration	SW	CCV ≤20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	SW	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	SW	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	13EB_ME-MTW01Z	AUA2A	Tissue	01/07/13
2	13EB_ME-MTW01ZDL	AUA2A	Tissue	01/07/13
3	13CPS_DB-MTW01Z	AUA2B	Tissue	01/10/13
4	13NPS_CIAR2-MTW01Z	AUA2C	Tissue	01/14/13
5				
6				
7				
8				

Notes:

	MB-011416						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU.Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV.Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW.Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

LDC #: 35818A2b

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: F2
2nd Reviewer: [signature]

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MA BNA SW846 METHOD 8270C

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
COC was not provided, therefore not reviewed. Per client prior to receipt at ARI and shipped for overnight delivery. samples were stored frozen							Text

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 35818A2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: Q

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
-	1/22/16 0905	CCV	HHH	20.8		1, 3, 4, MB-011416	J/UJ/A (ND+Det) qual HHH+ Total Benzofluoranthenes

CONCAL.wpd

LDC #: 35818A2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: FT
2nd Reviewer: Q

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	LCS-011416	DD	49.2 (50-150)	( )	( )	All	J/UJ/P (ND+Det)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 35818A2b

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Reviewer: FT
2nd Reviewer: [signature]

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Sample ID	Compound	Finding	Qualifications
	1	YY	x'al cal Range	J det / Δ

Comments: See sample calculation verification worksheet for recalculations

LDC #: 35818A2b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Sample ID	Compound	Finding	Qualifications
	FT 1	YY	x'd cal Range	R/A
	2	all except YY	diluted	R/A

Comments: _____

OVR.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 4, 2016

Parameters: Lipids

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): AUA2

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
13EB_ME-MTW01Z	AUA2A	Tissue	01/07/13
13CPS_DB-MTW01Z	AUA2B	Tissue	01/10/13
13NPS_CIAR2-MTW01Z	AUA2C	Tissue	01/14/13

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Lipids by Bligh and Dyer Method

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

The chain-of-custodies were not provided and therefore were not reviewed. Per client, samples were stored frozen prior to receipt at the laboratory and shipped for overnight delivery.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicates

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the method.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Lipids - Data Qualification Summary - SDG AUA2

No Sample Data Qualified in this SDG

Port Gamble, Shellfish Monitoring
Lipids - Laboratory Blank Data Qualification Summary - SDG AUA2

No Sample Data Qualified in this SDG

LDC #: 35818A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 2/4/16
SDG #: AUA2 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: G
2nd Reviewer: AVC

METHOD: (Analyte) Lipids (Method Bligh & Dyer)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	N	CS
VIII.	Laboratory control samples	N	not required
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	13EB_ME-MTW01Z	AUA2A	Tissue	01/07/13
2	13CPS_DB-MTW01Z	AUA2B	Tissue	01/10/13
3	13NPS_CIAR2-MTW01Z	AUA2C	Tissue	01/14/13
4				
5				
6				
7				
8				
9				
10				
11				

Notes: From - no CoC provided

LDC #: 35815

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date: 2·18·16

2nd Reviewer:

The LDC job number listed above was entered by W.

	EDD Process	Y/N	Init	Comments/Action
I.	EDD Completeness	-		
Ia.	- All methods present?	✓	W	
Ib.	- All samples present/match report?	✓	W	
Ic.	- All reported analytes present?	✓	W	
Id	-10% verification of EDD?	✓	W	
II.	EDD Preparation/Entry	-		
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	✓	W	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	NA	W	
III.	Reasonableness Checks	-		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	✓	W	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	✓	W	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	✓	W	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	NA	W	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	NA	W	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	✓	W	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	N/A	W	
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	✓	W	

Notes: *see readme

The attached zipped file contains two files:

File	Format	Description
1) Readme_Port Gamble_021816.doc	MS Word 2003	A "Readme" file (this document).
2) LDC35818_AUA2_VEDD_20160214.xlsx	MS Excel 2007	A spreadsheet for the following SDG(s): AUA2 35818A

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor Environmental, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

February 26, 2016

SUBJECT: Port Gamble, Shellfish Monitoring, Data Validation

Dear Ms. Fields,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on February 8, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35845:

SDG #	Fraction
APR4, ATS0 AVB4/AVB5	Polynuclear Aromatic Hydrocarbons, Cadmium, Polychlorinated Dioxins/Dibenzofurans, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project, May 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins and Chlorinated Dibenzofurans Data Review, September 2011
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

HC

Attachment 1

EDD Stage 2B

LDC #35845 (Anchor Environmental-Seattle WA / Port Gamble, Shellfish Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270D-SIM)		Cd (6010C)		Dioxins (1613B)		% Lipids (B&D)		Total Solids (2540G)																							
Matrix: Water/Soil/Tissue				W	T	W	T	W	T	W	T	W	T	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	APR4	02/08/16	02/29/16	0	1	0	1	0	1	0	1	-	-																				
B	ATS0	02/08/16	02/29/16	0	6	0	6	0	6	0	6	-	-																				
C	AVB4/AVB5	02/08/16	02/29/16	-	-	-	-	-	-	-	-	0	10																				
Total	A/CR			0	7	0	7	0	7	0	7	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

L:\Anchor\Port Gamble\Shellfish\35845ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 19, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): APR4

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
01/22/16	Benzo(k)fluoranthene	20.8	All samples in SDG APR4	Benzo(k)fluoranthene Total Benzofluoranthenes	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within QC limits. No data were qualified since there were no associated samples in this SDG. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS-011416	Acenaphthylene	49.2 (50-150)	All samples in SDG APR4	UJ (all non-detects)	P

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

SRM ID	Compound	Concentration (Limits)	Associated Samples	Flag	A or P
SRM1974C 011416	2-Methylnaphthalene Fluorene Fluoranthene Benzo(a)anthracene Chrysene Perylene	0.59 ug/Kg (0.750-2.25) 0.98 ug/Kg (1.16-1.73) 22.4 ug/Kg (22.7-68.0) 2.27 ug/Kg (2.84-8.54) 8.90 ug/Kg (9.60-28.8) 0.50U ug/Kg (0.280-0.840)	All samples in SDG APR4	J (all detects) UJ (all non-detects)	A
SRM1974C 011416	Dibenz(a,h)anthracene	0.18 ug/Kg (0.050-0.150)	All samples in SDG APR4	NA	-

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, LCS %R, and SRM concentration, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG APR4

Sample	Compound	Flag	A or P	Reason
PG-T0-MUS-COC-151030	Benzo(k)fluoranthene Total Benzofluoranthenes	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
PG-T0-MUS-COC-151030	Acenaphthylene	UJ (all non-detects)	P	Laboratory control samples (%R)
PG-T0-MUS-COC-151030	2-Methylnaphthalene Fluorene Fluoranthene Benzo(a)anthracene Chrysene Perylene	J (all detects) UJ (all non-detects)	A	Standard reference material (concentration)

Port Gamble, Shellfish Monitoring
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG APR4

No Sample Data Qualified in this SDG

LDC #: 35845A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 2/10/16
SDG #: APR4 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	%R
VIII.	Matrix spike/Matrix spike duplicates	SW	~~MS~~ AT50BMS/D (No Assoc sample)
IX.	Laboratory control samples /SRM	SW/SW	LCS, SRM
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15
2				
3				
4				
5				
6				
7				
8				

Notes:

	MB - 011416						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU.Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV.Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW.Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

LDC #: 35845 A2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
-	1/22/16 0905	CCV	HHH	20.8		All	J/UJ/A (ND+Det) qual HHH + Total Benzofluoranthenes

CONCAL.wpd

LDC #: 35845A2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	LCS - 011416	DD	49.2 (50-150)	( )	( )	All	J/UJ/P (ND)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 35845 A2b

VALIDATION FINDINGS WORKSHEET
SRM

Page: 1 of 1
Reviewer: FT
2nd Reviewer: G

METHOD: GC/MS PAH (EPA SW 846 Method 8270D-SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the SRM values within the certified values?

#	SRM ID	Compound	Reported values (ug/Kg)	Certified true Value (ug/Kg)	Criteria: ± 50% of the certified true value	Associated Samples	Qualifications
	SRM 1974C	W	0.59	1.50	0.750 - 2.25	#1	J/UJ/A (Ref)
	011416	NN	0.98	2.31	1.16 - 1.73		
		YY	22.4	45.3	22.7 - 68.0		
		CCC	2.27	5.69	2.84 - 8.54		
		DDD	8.90	19.2	9.60 - 28.8		
	FT	~~GGG~~	~~2.98~~	~~5.95~~	~~2.98 - 8.92~~		FT
		KKK	0.18	0.100	0.050 - 0.150		J det/A (ND)
		ZZZ	0.504	0.560	0.280 - 0.840		J/R[no]/A* (ND)
		JJJ	0.89	not a target analyte in the SRM 1974C list			text
						*spike at RL	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 19, 2016

Parameters: Cadmium

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): APR4

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15
PG-T0-MUS-COC-151030MS	APR4AMS	Tissue	10/30/15
PG-T0-MUS-COC-151030DUP	APR4ADUP	Tissue	10/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Cadmium by Environmental Protection Agency (EPA) SW 846 Method 6010C

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Cadmium - Data Qualification Summary - SDG APR4

No Sample Data Qualified in this SDG

Port Gamble, Shellfish Monitoring
Cadmium - Laboratory Blank Data Qualification Summary - SDG APR4

No Sample Data Qualified in this SDG

LDC #: 35845A4b

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 2-16-16

SDG #: APR4

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

Reviewer: MG

2nd Reviewer: [illegible]

METHOD: ~~Metals~~ (EPA SW 846 Method ~~6010B/7470A/7471A~~) Cadmium 6010C 9MG

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS
VII.	Duplicate sample analysis	A	DUP
VIII.	Serial Dilution	N	not performed
IX.	Laboratory control samples	A	LCS
X.	Field Duplicates	N	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15
2	PG-T0-MUS-COC-151030MS	APR4AMS	Tissue	10/30/15
3	PG-T0-MUS-COC-151030DUP	APR4ADUP	Tissue	10/30/15
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14	PBS			

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 19, 2016

Parameters: Percent Lipids

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): APR4

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Percent Lipids by Bligh and Dyer Method

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Percent lipids	0.0700 mg/L	All samples in SDG APR4

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis/Triplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) analyses were not required by the method.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Percent Lipids - Data Qualification Summary - SDG APR4

No Sample Data Qualified in this SDG

Port Gamble, Shellfish Monitoring
Percent Lipids - Laboratory Blank Data Qualification Summary - SDG APR4

No Sample Data Qualified in this SDG

LDC #: 35845A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 2-16-16
SDG #: APR4 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: MG
2nd Reviewer: G

METHOD: (Analyte) Percent Lipids (Method Bligh & Dyer)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	PB only
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	A	Trip (SDG: ATSO)
VIII.	Laboratory control samples	N	not required
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15	PBS			

Notes:

LDC #: 35845A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: [signature]

METHOD: Inorganics, Method Bligh & Dyer

Conc. units: mg/L **Associated Samples:** all (>5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual.								
% Lipids	0.0700		0.3500									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 22, 2016

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): APR4

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for unlabeled compounds and labeled compounds with the following exceptions:

Date	Compound	Concentration (Limits)	Associated Samples	Affected Compound	Flag	A or P
10/15/15	1,2,3,4,7,8-HxCDF	59.905 pg (45-56)	All samples in SDG APR4	1,2,3,4,7,8-HxCDF Total HxCDF	NA	-

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within method and validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-012516	01/25/16	1,2,3,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total PeCDD Total HxCDD Total HpCDD Total PeCDF Total HpCDF	0.0500 pg/g 0.142 pg/g 0.374 pg/g 0.541 pg/g 6.16 pg/g 0.0378 pg/g 0.124 pg/g 0.743 pg/g 0.0500 pg/g 0.286 pg/g	All samples in SDG APR4

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PG-T0-MUS-COC-151030	1,2,3,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total PeCDD Total HxCDD Total HpCDD Total HpCDF	0.0518 pg/g 0.189 pg/g 0.775 pg/g 0.502 pg/g 7.46 pg/g 0.0474 pg/g 0.249 pg/g 3.03 pg/g 0.446 pg/g	0.0518U pg/g 0.189U pg/g 0.775U pg/g 0.502U pg/g 7.46U pg/g 0.0474J pg/g 0.249J pg/g 3.03J pg/g 0.446J pg/g

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Ongoing Precision Recovery

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG APR4	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported by the laboratory as EMPCs, data were qualified as estimated in one sample.

Due to laboratory blank contamination, data were qualified as not detected or estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG APR4

Sample	Compound	Flag	A or P	Reason
PG-T0-MUS-COC-151030	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation (EMPC)

Port Gamble, Shellfish Monitoring
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG APR4

Sample	Compound	Modified Final Concentration	A or P
PG-T0-MUS-COC-151030	1,2,3,7,8-PeCDF	0.0518U pg/g	A
	1,2,3,4,6,7,8-HpCDF	0.189U pg/g	
	1,2,3,4,6,7,8-HpCDD	0.775U pg/g	
	OCDF	0.502U pg/g	
	OCDD	7.46U pg/g	
	Total PeCDD	0.0474J pg/g	
	Total HxCDD	0.249J pg/g	
	Total HpCDD	3.03J pg/g	
	Total HpCDF	0.446J pg/g	

LDC #: 35845A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 2-20-16
SDG #: APR4 Stage 4 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: YR
2nd Reviewer: AV

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A, SW	≤20/35 ICV QC limits
IV.	Continuing calibration	A	QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	C-S.
VIII.	Laboratory control samples	A	OPR
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/~~LOQ/LODs~~	SW	
XII.	Target compound identification	N	Not reviewed for Stage 2B
XIII.	System performance	N	↓
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-T0-MUS-COC-151030	APR4A	Tissue	10/30/15
2				
3				
4				
5				
6				
7				
8				
9				
10				

Notes:

	MB-012516						

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 35845A21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were results within the QC limits for the method?

#	Date	Standard ID	Compound	Finding (Limit: pg)	Associated Samples	Qualifications
	10/15/15	15101510	K	56.905 (45-56)	all	Jdets/P (+X) (ND)

LDC #: 35845A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a method blank?

(Y) N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

(Y) N N/A Was the method blank contaminated?

Blank extraction date: 01/25/16 **Blank analysis date:** 01/29/16

Conc. units: pg/g **Associated samples:** all

Compound	Blank ID	Sample Identification								
	MB-012516	5x	1							
I	0.0500*	0.250	0.0518* /U							
O	0.142*	0.710	0.189 /U							
F	0.374	1.87	0.775 /U							
Q	0.541	2.71	0.502 /U							
G	6.16	30.8	7.46 /U							
S	0.0378*	0.189	0.0474* /J							
T	0.124*	0.620	0.249* /J							
U	0.743	3.72	3.03 /J							
W	0.0500*	0.250								
Y	0.286*	1.43	0.446* /J							

*EMPC

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 35845A21

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported RLs

Reviewer: 9r
2nd Reviewer: 9

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N (N/A) Compound quantitation and RLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Compound	Finding	Associated Samples	Qualifications
			EMPC results	all	Jdets/A

Comments: ~~See sample calculation verification worksheet for recalculations~~

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 24, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): ATS0

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/05/16
PG-PJ-1-MUS-COC-160104MS	ATS0BMS	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104MSD	ATS0BMSD	Tissue	01/04/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
01/22/16	Benzo(k)fluoranthene	20.8	All samples in SDG ATS0	Benzo(k)fluoranthene Total Benzofluoranthenes	J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
PG-PJ-1-MUS-COC-160104MS/MSD (PG-PJ-1-MUS-COC-160104)	Naphthalene	44.0 (50-150)	34.7 (50-150)	J (all detects) UJ (all non-detects)	A
	2-Methylnaphthalene	-	43.3 (50-150)		
	Acenaphthene	-	49.3 (50-150)		
	Phenanthrene	-	44.0 (50-150)		
	Fluoranthene	-	46.7 (50-150)		
	Benzo(k)fluoranthene	-	48.7 (50-150)		

Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS-011416	Acenaphthylene	49.2 (50-150)	All samples in SDG ATS0	UJ (all non-detects)	P

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

SRM ID	Compound	Concentration (Limits)	Associated Samples	Flag	A or P
SRM1974C 011416	2-Methylnaphthalene	0.59 ug/Kg (0.750-2.25)	All samples in SDG ATS0	J (all detects) UJ (all non-detects)	A
	Fluorene	0.98 ug/Kg (1.16-1.73)			
	Fluoranthene	22.4 ug/Kg 22.7-68.0)			
	Benzo(a)anthracene	2.27 ug/Kg (2.84-8.54)			
	Chrysene	8.90 ug/Kg (9.60-28.8)			
	Perylene	0.50U ug/Kg (0.280-0.840)			
SRM1974C 011416	Dibenz(a,h)anthracene	0.18 ug/Kg (0.050-0.150)	All samples in SDG ATS0	NA	-

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, MS/MSD %R, LCS %R, and SRM concentration, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG ATS0

Sample	Compound	Flag	A or P	Reason
PG-SMA2-2-MUS-COC-160104 PG-PJ-1-MUS-COC-160104 PG-WS-1-MUS-COC-160104 PG-GP-1-MUS-COC-160104 PG-SMA2-5-MUS-COC-160104 PG-SMA2-4-MUS-COC-160105	Benzo(k)fluoranthene Total Benzofluoranthenes	J (all detects) J (all detects)	A	Continuing calibration (%D)
PG-PJ-1-MUS-COC-160104	Naphthalene 2-Methylnaphthalene Acenaphthene Phenanthrene Fluoranthene Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
PG-SMA2-2-MUS-COC-160104 PG-PJ-1-MUS-COC-160104 PG-WS-1-MUS-COC-160104 PG-GP-1-MUS-COC-160104 PG-SMA2-5-MUS-COC-160104 PG-SMA2-4-MUS-COC-160105	Acenaphthylene	UJ (all non-detects)	P	Laboratory control samples (%R)
PG-SMA2-2-MUS-COC-160104 PG-PJ-1-MUS-COC-160104 PG-WS-1-MUS-COC-160104 PG-GP-1-MUS-COC-160104 PG-SMA2-5-MUS-COC-160104 PG-SMA2-4-MUS-COC-160105	2-Methylnaphthalene Fluorene Fluoranthene Benzo(a)anthracene Chrysene Perylene	J (all detects) UJ (all non-detects)	A	Standard reference materials (concentration)

Port Gamble, Shellfish Monitoring
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG ATS0

No Sample Data Qualified in this SDG

LDC #: 35845B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 2/10/16
SDG #: ATS0 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: FD
2nd Reviewer: CR

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	FT A SW/A	%RSD ≤20 ICV ≤30
IV.	Continuing calibration	SW	CCV ≤20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples /SRM	SW/SW	LCS, SRM
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
2	PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
3	PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
4	PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
5	PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
6	PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/04/16 05
7	PG-PJ-1-MUS-COC-160104MS	ATS0BMS	Tissue	01/04/16
8	PG-PJ-1-MUS-COC-160104MSD	ATS0BMSD	Tissue	01/04/16
9				
10	MB-011416			
11				
12				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1.
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1.
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1.
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1.
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1.
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1.
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1.
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1.
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1.
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1.
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1.
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1.
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1.
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1.
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 2,6-Dinitrotoluene	O1.
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1.
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4 Methylphenol	Q1.
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiphene (4MDT)	R1.
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1.
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1.
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU.	U1.
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV.	V1.
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.	W1.
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX.	X1.
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY.	Y1.
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ.	Z1.

LDC #: 35845B2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: CL

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
-	1/22/16 0905	CCV	HHH	20.8		All	J/UJ/A (Det) qual HHH + Total Benzofluoranthenes

LDC #: 35845B26

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer: 02

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	7+8	S	44.0 (50-150)	34.7 (50-150)	( )	2	J/UJ/A ND+Det
		W	( )	43.3 ( )	( )		
		GG	( )	49.3 ( )			
		UU	( )	44.0 ( )	( )		
		YY	( )	46.7 ( )	( )		
		HHH	( )	48.7 ( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 35845B2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	LCS-011416	DD	49.2 (50-150)	( )	( )	All	J/UJ/P (ND)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 35845B2b

VALIDATION FINDINGS WORKSHEET
SRM

Reviewer: FT
2nd Reviewer: Q

METHOD: GC/MS PAH (EPA SW 846 Method 8270D-SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the SRM values within the certified values?

#	SRM ID	Compound	Reported values (ug/Kg)	Certified true Value (ug/Kg)	Criteria: ± 50% of the certified true value	Associated Samples	Qualifications
	SRM 1974c	W	0.59	1.50	0.750 - 2.25	1→6	J/UJ/A (ND+Det
	011416	NN	0.98	2.31	1.16 - 1.73		
		YY	22.4	45.3	22.7 - 68.0		
		CCC	2.27	5.69	2.84 - 8.54		
		DDD	8.90	19.2	9.60 - 28.8		
	FT	~~GGG~~	~~2.98~~	~~5.95~~	~~2.98 - 8.92~~		J/UJ/A FT
		KKK	0.18	0.100	0.050 - 0.150		J det/A (all ND)
		ZZZ	0.504	0.560	0.280 - 0.840		J/R*/A* (1,2,4= ND)
		JJJ	0.89	not a target analyte in the SRM 1974c list			text
						* Spike at RL	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 19, 2016

Parameters: Cadmium

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): ATS0

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/05/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Cadmium by Environmental Protection Agency (EPA) SW 846 Method 6010C

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Cadmium - Data Qualification Summary - SDG ATS0

No Sample Data Qualified in this SDG

Port Gamble, Shellfish Monitoring
Cadmium - Laboratory Blank Data Qualification Summary - SDG ATS0

No Sample Data Qualified in this SDG

LDC #: 35845B4b

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 2-17-16

SDG #: ATS0

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

Reviewer: MG

2nd Reviewer: a

METHOD: ~~Metals~~ (EPA SW 846 Method ~~6010B/7470A/7471A~~) 6010C Cadmium mG

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS (SDG: APR4)
VII.	Duplicate sample analysis	A	DUP (↓)
VIII.	Serial Dilution	N	not performed
IX.	Laboratory control samples	A	LCS
X.	Field Duplicates	N	
XI.	Sample Result Verification	N	
XII	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
2	PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
3	PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
4	PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
5	PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
6	PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/04/16 → 01/05/16
7				
8				
9				
10				
11				
12				
13				
14	PBS			

mG

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 19, 2016

Parameters: Percent Lipids

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): ATS0

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/05/16
PG-SMA2-2-MUS-COC-160104DUP	ATS0ADUP	Tissue	01/04/16
PG-SMA2-2-MUS-COC-160104TRP	ATS0ATRP	Tissue	01/04/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Percent Lipids by Bligh and Dyer Method

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Percent lipids	0.0700 mg/L	All samples in SDG ATS0

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis/Triplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) analyses were not required by the method.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Percent Lipids - Data Qualification Summary - SDG ATS0

No Sample Data Qualified in this SDG

Port Gamble, Shellfish Monitoring
Percent Lipids - Laboratory Blank Data Qualification Summary - SDG ATS0

No Sample Data Qualified in this SDG

LDC #: 35845B6
SDG #: ATS0
Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 2-17-16
Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Percent Lipids (Method Bligh & Dyer)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	PB only
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	A	Trip (1,7,8)
VIII.	Laboratory control samples	N	not required
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
2	PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
3	PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
4	PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
5	PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
6	PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/04/16
7	#1 DUP			1/5/16
8	#1 TRIP			
9				
10				
11				
12				
13				
14				
15	PBS			

Notes:

LDC #: 35845B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: 9

METHOD: Inorganics, Method Bligh & Dyer

Conc. units: mg/L **Associated Samples:** all (>5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual.								
% Lipids	0.0700		0.3500									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 22, 2016

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): ATS0

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/05/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for unlabeled compounds and labeled compounds with the following exceptions:

Date	Compound	Concentration (Limits)	Associated Samples	Affected Compound	Flag	A or P
10/15/15	1,2,3,4,7,8-HxCDF	56.905 pg (45-56)	PG-GP-1-MUS-COC-160104	1,2,3,4,7,8-HxCDF Total HxCDF	J (all detects)	P
10/15/15	1,2,3,4,7,8-HxCDF	56.905 pg (45-56)	PG-SMA2-2-MUS-COC-160104 PG-PJ-1-MUS-COC-160104 PG-WS-1-MUS-COC-160104 PG-SMA2-5-MUS-COC-160104 PG-SMA2-4-MUS-COC-160105	1,2,3,4,7,8-HxCDF Total HxCDF	NA	-

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within method and validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-012516	01/25/16	1,2,3,7,8-PeCDF	0.0500 pg/g	All samples in SDG ATS0
		1,2,3,4,6,7,8-HpCDF	0.142 pg/g	
		1,2,3,4,6,7,8-HpCDD	0.374 pg/g	
		OCDF	0.541 pg/g	
		OCDD	6.16 pg/g	
		Total PeCDD	0.0378 pg/g	
		Total HxCDD	0.124 pg/g	
		Total HpCDD	0.743 pg/g	
		Total PeCDF	0.0500 pg/g	
		Total HpCDF	0.286 pg/g	

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PG-SMA2-2-MUS-COC-160104	1,2,3,7,8-PeCDF	0.0460 pg/g	0.0460U pg/g
	1,2,3,4,6,7,8-HpCDF	0.127 pg/g	0.127U pg/g
	1,2,3,4,6,7,8-HpCDD	1.01 pg/g	1.01U pg/g
	OCDF	0.376 pg/g	0.376U pg/g
	OCDD	13.6 pg/g	13.6U pg/g
	Total HxCDD	0.494 pg/g	0.494J pg/g
	Total HpCDF	0.296 pg/g	0.296J pg/g
PG-PJ-1-MUS-COC-160104	1,2,3,4,6,7,8-HpCDF	0.175 pg/g	0.175U pg/g
	1,2,3,4,6,7,8-HpCDD	1.36 pg/g	1.36U pg/g
	OCDF	0.437 pg/g	0.437U pg/g
	OCDD	14.0 pg/g	14.0U pg/g
	Total PeCDD	0.173 pg/g	0.173J pg/g
	Total HpCDF	0.496 pg/g	0.496J pg/g
PG-WS-1-MUS-COC-160104	1,2,3,7,8-PeCDF	0.0612 pg/g	0.0612U pg/g
	1,2,3,4,6,7,8-HpCDF	0.173 pg/g	0.173U pg/g
	1,2,3,4,6,7,8-HpCDD	1.20 pg/g	1.20U pg/g
	OCDF	0.443 pg/g	0.443U pg/g
	OCDD	16.1 pg/g	16.1U pg/g
	Total HpCDF	0.393 pg/g	0.393J pg/g

Sample	Compound	Reported Concentration	Modified Final Concentration
PG-GP-1-MUS-COC-160104	1,2,3,4,6,7,8-HpCDF	0.127 pg/g	0.127U pg/g
	1,2,3,4,6,7,8-HpCDD	0.821 pg/g	0.821U pg/g
	OCDF	0.320 pg/g	0.320U pg/g
	OCDD	9.47 pg/g	9.47U pg/g
	Total PeCDD	0.133 pg/g	0.133J pg/g
	Total PeCDF	0.215 pg/g	0.215J pg/g
	Total HpCDF	0.306 pg/g	0.306J pg/g
PG-SMA2-5-MUS-COC-160104	1,2,3,4,6,7,8-HpCDF	0.252 pg/g	0.252U pg/g
	1,2,3,4,6,7,8-HpCDD	1.61 pg/g	1.61U pg/g
	OCDF	0.768 pg/g	0.768U pg/g
	OCDD	19.6 pg/g	19.6U pg/g
	Total HpCDF	0.663 pg/g	0.663J pg/g
PG-SMA2-4-MUS-COC-160105	1,2,3,7,8-PeCDF	0.0449 pg/g	0.0449U pg/g
	1,2,3,4,6,7,8-HpCDF	0.152 pg/g	0.152U pg/g
	1,2,3,4,6,7,8-HpCDD	0.866 pg/g	0.866U pg/g
	OCDF	0.313 pg/g	0.313U pg/g
	OCDD	11.0 pg/g	11.0U pg/g
	Total PeCDD	0.0667 pg/g	0.0667J pg/g
	Total HpCDF	0.373 pg/g	0.373J pg/g

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Ongoing Precision Recovery

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG ATS0	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to ICV concentration and results reported by the laboratory as EMPCs, data were qualified as estimated in six samples.

Due to laboratory blank contamination, data were qualified as not detected or estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG ATS0

Sample	Compound	Flag	A or P	Reason
PG-GP-1-MUS-COC-160104	1,2,3,4,7,8-HxCDF Total HxCDF	J (all detects)	P	Initial calibration verification (concentration)
PG-SMA2-2-MUS-COC-160104 PG-PJ-1-MUS-COC-160104 PG-WS-1-MUS-COC-160104 PG-GP-1-MUS-COC-160104 PG-SMA2-5-MUS-COC-160104 PG-SMA2-4-MUS-COC-160105	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation (EMPC)

Port Gamble, Shellfish Monitoring
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG ATS0

Sample	Compound	Modified Final Concentration	A or P
PG-SMA2-2-MUS-COC-160104	1,2,3,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total HxCDD Total HpCDF	0.0460U pg/g 0.127U pg/g 1.01U pg/g 0.376U pg/g 13.6U pg/g 0.494J pg/g 0.296J pg/g	A
PG-PJ-1-MUS-COC-160104	1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total PeCDD Total HpCDF	0.175U pg/g 1.36U pg/g 0.437U pg/g 14.0U pg/g 0.173J pg/g 0.496J pg/g	A
PG-WS-1-MUS-COC-160104	1,2,3,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total HpCDF	0.0612U pg/g 0.173U pg/g 1.20U pg/g 0.443U pg/g 16.1U pg/g 0.393J pg/g	A
PG-GP-1-MUS-COC-160104	1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total PeCDD Total PeCDF Total HpCDF	0.127U pg/g 0.821U pg/g 0.320U pg/g 9.47U pg/g 0.133J pg/g 0.215J pg/g 0.306J pg/g	A
PG-SMA2-5-MUS-COC-160104	1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total HpCDF	0.252U pg/g 1.61U pg/g 0.768U pg/g 19.6U pg/g 0.663J pg/g	A

Sample	Compound	Modified Final Concentration	A or P
PG-SMA2-4-MUS-COC-160105	1,2,3,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total PeCDD Total HpCDF	0.0449U pg/g 0.152U pg/g 0.866U pg/g 0.313U pg/g 11.0U pg/g 0.0667J pg/g 0.373J pg/g	A

LDC #: 35845B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 2-2016
SDG #: ATS0 Stage 4 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: CM
2nd Reviewer: AL

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / SW	≤20/35 ICV QC limits
IV.	Continuing calibration	A	QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	C.S.
VIII.	Laboratory control samples	A	OPR
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/~~LOQ/LODs~~	SW	
XII.	Target compound identification	N	Not reviewed for Stage 2B
XIII.	System performance	N	↓
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-SMA2-2-MUS-COC-160104	ATS0A	Tissue	01/04/16
2	PG-PJ-1-MUS-COC-160104	ATS0B	Tissue	01/04/16
3	PG-WS-1-MUS-COC-160104	ATS0C	Tissue	01/04/16
4	PG-GP-1-MUS-COC-160104	ATS0D	Tissue	01/04/16
5	PG-SMA2-5-MUS-COC-160104	ATS0E	Tissue	01/04/16
6	PG-SMA2-4-MUS-COC-160105	ATS0F	Tissue	01/05/16
7				
8				
9				
10				

Notes:

	MB-012516						

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

_____

_____

LDC #: 35845B21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y (N) N/A Were results within the QC limits for the method?

#	Date	Standard ID	Compound	Finding (Limit: pg)	Associated Samples	Qualifications
	10/15/15	15101510	K	56.905 (45-56)	all	Jdets/P (+X) (4 = det)

LDC #: 35845B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: 9

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 01/25/16 **Blank analysis date:** 01/29/16
Conc. units: pg/g **Associated samples:** all

Compound	Blank ID	Sample Identification								
	MB-012516	5x	1	2	3	4	5	6		
I	0.0500*	0.250	0.0460* /U		0.0612 /U			0.0449 /U		
O	0.142*	0.710	0.127 /U	0.175 /U	0.173 /U	0.127 /U	0.252 /U	0.152* /U		
F	0.374	1.87	1.01 /U	1.36 /U	1.20 /U	0.821 /U	1.61 /U	0.866 /U		
Q	0.541	2.71	0.376 /U	0.437 /U	0.443 /U	0.320 /U	0.768 /U	0.313* /U		
G	6.16	30.8	13.6 /U	14.0 /U	16.1 /U	9.47 /U	19.6 /U	11.0 /U		
S	0.0378*	0.189		0.173* /J		0.133* /J		0.0667* /J		
T	0.124*	0.620	0.494* /J							
U	0.743	3.72								
W	0.0500*	0.250				0.215* /J				
Y	0.286*	1.43	0.296 /J	0.496 /J	0.393 /J	0.306 /J	0.663* /J	0.373* /J		

*EMPC

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 35845B21

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported RLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N (N/A) Compound quantitation and RLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Compound	Finding	Associated Samples	Qualifications
			EMPC results	all	Jdets/A

Comments: ~~See sample calculation verification worksheet for recalculations~~

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: February 19, 2016

Parameters: Total Solids

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): AVB4/AVB5

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
13EB_ME-MTW01Z	AVB4A	Tissue	01/07/13
13CPS_DB-MTW01Z	AVB4B	Tissue	01/10/13
13NPS_CIAR2-MTW01Z	AVB4C	Tissue	01/14/13
PG-T0-MUS-COC-151030	AVB5A	Tissue	10/30/15
PG-SMA2-2-MUS-COC-160104	AVB5B	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104	AVB5C	Tissue	01/04/16
PG-WS-1-MUS-COC-160104	AVB5D	Tissue	01/04/16
PG-GP-1-MUS-COC-160104	AVB5E	Tissue	01/04/16
PG-SMA2-5-MUS-COC-160104	AVB5F	Tissue	01/04/16
PG-SMA2-4-MUS-COC-160105	AVB5G	Tissue	01/05/16
PG-GP-1-MUS-COC-160104DUP	AVB5EDUP	Tissue	01/04/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Solids by Standard Method 2540G

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) analyses were not required by the method.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Total Solids - Data Qualification Summary - SDG AVB4/AVB5

No Sample Data Qualified in this SDG

Port Gamble, Shellfish Monitoring
Total Solids - Laboratory Blank Data Qualification Summary - SDG AVB4/AVB5

No Sample Data Qualified in this SDG

LDC #: 35845C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 2-17-16
SDG #: AVB4/AVB5 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Total Solids (SM2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	N	not required
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	N	not required
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	*Overall assessment of data*	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	13EB_ME-MTW01Z	AVB4A	Tissue	01/07/13
2	13CPS_DB-MTW01Z	AVB4B	Tissue	01/10/13
3	13NPS_CIAR2-MTW01Z	AVB4C	Tissue	01/14/13
4	PG-T0-MUS-COC-151030	AVB5A	Tissue	10/30/15
5	PG-SMA2-2-MUS-COC-160104	AVB5B	Tissue	01/04/16
6	PG-PJ-1-MUS-COC-160104	AVB5C	Tissue	01/04/16
7	PG-WS-1-MUS-COC-160104	AVB5D	Tissue	01/04/16
8	PG-GP-1-MUS-COC-160104	AVB5E	Tissue	01/04/16
9	PG-SMA2-5-MUS-COC-160104	AVB5F	Tissue	01/04/16
10	PG-SMA2-4-MUS-COC-160105	AVB5G	Tissue	01/04/16
11	PG-GP-1-MUS-COC-160104DUP	AVB5EDUP	Tissue	01/04/16
12				
13				
14				
15				

9MS

Notes:

LDC #: 35845

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date: 8.26.16

2nd Reviewer: SC

The LDC job number listed above was entered by W.

	EDD Process	Y/N	Init	Comments/Action
I.	EDD Completeness	-		
Ia.	- All methods present?	✓	W	
Ib.	- All samples present/match report?	✓	W	
Ic.	- All reported analytes present?	✓	W	
Id	-10% verification of EDD?	✓	W	
II.	EDD Preparation/Entry	-		
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	✓	W	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	✓	W	
III.	Reasonableness Checks	-		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	✓	W	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	✓	W	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	✓	W	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	✓	W	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	NA	W	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	✓	W	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	NA	W	
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	✓	W	

Notes: *see readme

The attached zipped file contains two files:

File	Format	Description
1) Readme_projectname_date.doc	MS Word 2003	A "Readme" file (this document).
2) LDC35845_APR4,ATS0,AVB4,AVB5_VEDD_20160214.xlsx	MS Excel 2007	A spreadsheet for the following SDG(s): APR4 35845A ATS0 35845B AVB4/AVB5 35845C

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor Environmental, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

March 24, 2016

SUBJECT: Port Gamble, Shellfish Monitoring, Data Validation

Dear Ms. Fields,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on February 29, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35972:

SDG #	Fraction
B612062, B612077	Polychlorinated Biphenyls as Congeners

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project, May 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins and Chlorinated Dibenzofurans Data Review, September 2011

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

1685 Pages SF

Attachment 1

EDD Stage 2B

LDC #35972 (Anchor Environmental-Seattle WA / Port Gamble, Shellfish Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PCB Cong. (1668A)																															
Matrix:	Water/Soil/Tissue			W	T	W	T	W	T	W	T	W	T	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	B612062	02/29/16	03/21/16	0	6																														
B	B612077	02/29/16	03/21/16	0	1																														
Total	A/CR			0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

V:\LOGIN\Anchor\Port Gamble\Shellfish\35972ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: March 24, 2016

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Stage 2B

Laboratory: Maxxam

Sample Delivery Group (SDG): B612062

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-SMA2-2-MUS-COC-160104	BRP508	Tissue	01/04/16
PG-PJ-1-MUS-COC-160104	BRP509	Tissue	01/04/16
PG-WS-1-MUS-COC-160104	BRP510	Tissue	01/04/16
PG-GP-1-MUS-COC-160104	BRP511	Tissue	01/04/16
PG-SMA2-5-MUS-COC-160104	BRP512	Tissue	01/04/16
PG-SMA2-4-MUS-COC-160104	BRP513	Tissue	01/04/16
PG-WS-1-MUS-COC-160104DUP	BRP510DUP	Tissue	01/04/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) Method 1668A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all congeners. The chromatographic resolution between the congeners PCB-23 and PCB-34 and congeners PCB-182 and PCB-187 was resolved with a valley of less than or equal to 40%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and labeled compounds.

The ion abundance ratios for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for unlabeled and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for unlabeled compounds and less than or equal to 50.0% for labeled compounds.

The ion abundance ratios for all compounds were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
4386412-MB	02/11/16	PCB-11	0.0092 ng/g	All samples in SDG B612062
		PCB-20/28	0.00436 ng/g	
		PCB-21/33	0.00231 ng/g	
		PCB-22	0.00161 ng/g	
		PCB-26/29	0.00069 ng/g	
		PCB-31	0.00340 ng/g	
		PCB-37	0.00143 ng/g	
		PCB-49/69	0.0016 ng/g	
		PCB-52	0.0020 ng/g	
		PCB-61/70/74/76	0.00519 ng/g	
		PCB-66	0.00281 ng/g	
		PCB-83/99	0.0048 ng/g	
		PCB-85/116/117	0.00113 ng/g	
		PCB-86/87/97/109/119/125	0.00196 ng/g	
		PCB-90/101/113	0.00586 ng/g	
		PCB-105	0.00227 ng/g	
		PCB-107	0.00098 ng/g	
		PCB-110/115	0.00336 ng/g	
		PCB-118	0.00707 ng/g	
		PCB-129/138/163	0.0113 ng/g	
		PCB-146	0.0031 ng/g	
		PCB-147/149	0.0026 ng/g	
		PCB-156/157	0.00125 ng/g	
		PCB-180/193	0.00365 ng/g	
		PCB-187	0.0041 ng/g	
		PCB-209	0.0581 ng/g	

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PG-SMA2-2-MUS-COC-160104	PCB-11	0.0069 ng/g	0.0069U ng/g
PG-PJ-1-MUS-COC-160104	PCB-11	0.0070 ng/g	0.0070U ng/g
PG-WS-1-MUS-COC-160104	PCB-11	0.0099 ng/g	0.0099U ng/g
PG-GP-1-MUS-COC-160104	PCB-11	0.0069 ng/g	0.0069U ng/g
PG-SMA2-5-MUS-COC-160104	PCB-11	0.0078 ng/g	0.0078U ng/g
PG-SMA2-4-MUS-COC-160104	PCB-11	0.00785 ng/g	0.00785U ng/g

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates/Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
4386412-BS/BSD (All samples in SDG B612062)	PCB-209	154 (50-150)	153 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG B612062	Results were flagged (1) by the laboratory to indicate results reported as estimated maximum possible concentration (EMPC)	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported by the laboratory as EMPC, data were qualified as estimated in six samples.

Due to laboratory blank contamination, data were qualified as not detected in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG B612062

Sample	Compound	Flag	A or P	Reason
PG-SMA2-2-MUS-COC-160104 PG-PJ-1-MUS-COC-160104 PG-WS-1-MUS-COC-160104 PG-GP-1-MUS-COC-160104 PG-SMA2-5-MUS-COC-160104 PG-SMA2-4-MUS-COC-160104	Results were flagged (1) by the laboratory to indicate results reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation (EMPC)

Port Gamble, Shellfish Monitoring
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG B612062

Sample	Compound	Modified Final Concentration	A or P
PG-SMA2-2-MUS-COC-160104	PCB-11	0.0069U ng/g	A
PG-PJ-1-MUS-COC-160104	PCB-11	0.0070U ng/g	A
PG-WS-1-MUS-COC-160104	PCB-11	0.0099U ng/g	A
PG-GP-1-MUS-COC-160104	PCB-11	0.0069U ng/g	A
PG-SMA2-5-MUS-COC-160104	PCB-11	0.0078U ng/g	A
PG-SMA2-4-MUS-COC-160104	PCB-11	0.00785U ng/g	A

LDC #: 35972A31
SDG #: B612062
Laboratory: Maxxam

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 3-23-16
Page: 1 of 1
Reviewer: 9m
2nd Reviewer: ar

METHOD: HRGC/HRMS Polychlorinated Biphenyl Congeners (EPA Method 1668A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	≤ 30/50
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates/DUP	N/A	C.S. /D = 3+7
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/~~LOQ/LODs~~	SW	
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-SMA2-2-MUS-COC-160104	BRP508	Tissue	01/04/16
2	PG-PJ-1-MUS-COC-160104	BRP509	Tissue	01/04/16
3	PG-WS-1-MUS-COC-160104	BRP510	Tissue	01/04/16
4	PG-GP-1-MUS-COC-160104	BRP511	Tissue	01/04/16
5	PG-SMA2-5-MUS-COC-160104	BRP512	Tissue	01/04/16
6	PG-SMA2-4-MUS-COC-160104	BRP513	Tissue	01/04/16
7	PG-WS-1-MUS-COC-160104DUP	BRP510DUP	Tissue	01/04/16
8				
9				
10				
11				

Notes:

	438612 MB						

LDC #: 35972A31

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: am
2nd Reviewer: a

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 02/11/16 **Blank analysis date:** 02/18/16 **Associated samples:** all Qual U

Conc. units: ng/g

Compound	Blank ID		Sample Identification								
	4386412-MB	5x	1	2	3	4	5	6			
PCB-11	0.0092	0.0460	0.0069	0.0070	0.0099	0.0069	0.0078	0.00785			
PCB-20/28	0.00436	0.0218									
PCB-21/33	0.00231	0.0116									
PCB-22	0.00161	0.00805									
PCB-26/29	0.00069	0.00345									
PCB-31	0.00340	0.0170									
PCB-37	0.00143	0.00715									
PCB-49/69	0.0016	0.00800									
PCB-52	0.0020	0.0100									
PCB-61/70/74/76	0.00519	0.0260									
PCB-66	0.00281	0.0141									
PCB-83/99	0.0048	0.0240									
PCB-85/116/117	0.00113	0.00565									
PCB-86/87/97/109/119/125	0.00196	0.00980									
PCB-90/101/113	0.00586	0.0293									
PCB-105	0.00227	0.0114									
PCB-107	0.00098	0.00490									
PCB-110/115	0.00336	0.0168									
PCB-118	0.00707	0.0354									
PCB-129/138/163	0.0113	0.0565									

LDC #: 35972A31

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9m
2nd Reviewer: 01

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Compound	Blank ID		Sample Identification								
	4386412-MB	5x	1	2	3	4	5	6			
PCB-146	0.0031	0.0155									
PCB-147/149	0.0026	0.0130									
PCB-156/157	0.00125	0.00625									
PCB-180/193	0.00365	0.0183									
PCB-187	0.0041	0.0205									
PCB-209	0.0581	0.2905									

*EMPC

LDC #: 35972A31

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A — Was a LCS required?

(Y) N N/A — Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y (N) N/A — Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	Lab ID/Reference	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		4386412-BS/BSD	PCB-209	154 (50-150)	153 (50-150)	( )	all	Jdets/P (ND)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 35972A31

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 1h
2nd Reviewer: CL

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Compound	Finding	Associated Samples	Qualifications
			EMPC results results flagged (1) by the laboratory (reported concentration at an elevated EDL)	All	Jdets/A

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Port Gamble, Shellfish Monitoring

LDC Report Date: March 23, 2016

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Stage 2B

Laboratory: Maxxam

Sample Delivery Group (SDG): B612077

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
PG-T0-MUS-COC-151030	BRP572	Tissue	10/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Shellfish Monitoring Plan for Port Gamble Bay Cleanup Project (May 2015) and the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) Method 1668A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all congeners. The chromatographic resolution between the congeners PCB-23 and PCB-34 and congeners PCB-182 and PCB-187 was resolved with a valley of less than or equal to 40%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and labeled compounds.

The ion abundance ratios for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for unlabeled and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% for unlabeled compounds and less than or equal to 50.0% for labeled compounds.

The ion abundance ratios for all compounds were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
4386412-MB	02/11/16	PCB-11	0.0092 ng/g	All samples in SDG B612077
		PCB-20/28	0.00436 ng/g	
		PCB-21/33	0.00231 ng/g	
		PCB-22	0.00161 ng/g	
		PCB-26/29	0.00069 ng/g	
		PCB-31	0.0340 ng/g	
		PCB-37	0.00143 ng/g	
		PCB-49/69	0.0016 ng/g	
		PCB-52	0.020 ng/g	
		PCB-67/70/74/76	0.00519 ng/g	
		PCB-66/95	0.00281 ng/g	
		PCB-83/99	0.0048 ng/g	
		PCB-85/116/117	0.00113 ng/g	
		PCB-86/87/97/109/119/125	0.00196 ng/g	
		PCB-90/101/103	0.00586 ng/g	
		PCB-105	0.00227 ng/g	
		PCB-107	0.00098 ng/g	
		PCB-110/115	0.00336 ng/g	
		PCB-118	0.00707 ng/g	
		PCB-129/138/163	0.0113 ng/g	
		PCB-146	0.0031 ng/g	
		PCB-147/149	0.0026 ng/g	
		PCB-156/157	0.00125 ng/g	
		PCB-180/193	0.00365 ng/g	
		PCB-187	0.0041 ng/g	
		PCB-209	0.0581 ng/g	

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PG-T0-MUS-COC-151030	PCB-11	0.00912 ng/g	0.00912U ng/g
	PCB-66/95	0.0124 ng/g	0.0124U ng/g
	PCB-105	0.0100 ng/g	0.0100U ng/g
	PCB-107	0.00307 ng/g	0.00307U ng/g
	PCB-118	0.0304 ng/g	0.0304U ng/g
	PCB-146	0.0132 ng/g	0.0132U ng/g
	PCB-156/157	0.00290 ng/g	0.00290U ng/g
	PCB-180/193	0.0091 ng/g	0.0091U ng/g
	PCB-187	0.0187 ng/g	0.0187U ng/g

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
4386412-LCS/D (All samples in SDG B612077)	PCB-209	154 (50-150)	153 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG B612077	Results were flagged (1) by the laboratory to indicate results reported as estimated maximum possible concentration (EMPC)	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported by the laboratory as EMPC, data were qualified as estimated in one sample.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Port Gamble, Shellfish Monitoring
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG B612077

Sample	Compound	Flag	A or P	Reason
All samples in SDG B612077	Results were flagged (1) by the laboratory to indicate results reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation (EMPC)

Port Gamble, Shellfish Monitoring
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG B612077

Sample	Compound	Modified Final Concentration	A or P
PG-T0-MUS-COC-151030	PCB-11 PCB-66/95 PCB-105 PCB-107 PCB-118 PCB-146 PCB-156/157 PCB-180/193 PCB-187	0.00912U ng/g 0.0124U ng/g 0.0100U ng/g 0.00307U ng/g 0.0304U ng/g 0.0132U ng/g 0.00290U ng/g 0.0091U ng/g 0.0187U ng/g	A

LDC #: 35972B31
SDG #: B612077
Laboratory: Maxxam

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 3-8-16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Biphenyl Congeners (EPA Method 1668A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	≤20 ICV ≤30
IV.	Continuing calibration	A	≤30/50
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	C.S.
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/~~LOQ/LODs~~	SW	~~No EMPC (reported as ND)~~ TW 3-23-16
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	PG-TØ-MUS-COC-151030	BRP572	Tissue	10/30/15
2				
3				
4				
5				
6				
7				
8				
9				
10				

Notes:

	4386412-MB						

LDC #: 35972B31

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9m
2nd Reviewer: 02

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a method blank?
(Y) N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
(Y) N N/A Was the method blank contaminated?

Blank extraction date: 02/11/16 **Blank analysis date:** 02/18/16 **Associated samples:** all Qual U

Conc. units: ng/g

Compound	Blank ID		Sample Identification								
	4386412-MB	5x	1								
PCB-11	0.0092	0.0460	0.00912								
PCB-20/28	0.00436	0.0218									
PCB-21/33	0.00231	0.0116									
PCB-22	0.00161	0.00805									
PCB-26/29	0.00069	0.00345									
PCB-31	0.00340	0.0170									
PCB-37	0.00143	0.00715									
PCB-49/69	0.0016	0.00800									
PCB-52	0.0020	0.0100									
PCB-61/70/74/76	0.00519	0.0260									
PCB-66/95	0.00281	0.0141	0.0124								
PCB-83/99	0.0048	0.0240									
PCB-85/116/117	0.00113	0.00565									
PCB-86/87/97/109/119/125	0.00196	0.00980									
PCB-90/101/113	0.00586	0.0293									
PCB-105	0.00227	0.0114	0.0100								
PCB-107	0.00098	0.00490	0.00307								
PCB-110/115	0.00336	0.0168									
PCB-118	0.00707	0.0354	0.0304								
PCB-129/138/163	0.0113	0.0565									

LDC #: 35972B31

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9m
2nd Reviewer: a

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Compound	Blank ID		Sample Identification								
	4386412-MB	5x	1								
PCB-146	0.0031	0.0155	0.0132								
PCB-147/149	0.0026	0.0130									
PCB-156/157	0.00125	0.00625	0.00290								
PCB-180/193	0.00365	0.0183	0.0091								
PCB-187	0.0041	0.0205	0.0187								
PCB-209	0.0581	0.2905									

*EMPC

LDC #: 35972B31

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

(Y) N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	Lab ID/Reference	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		4386412-LCS/D	PCB-209	154 (50-150)	153 (50-150)	( )	all	Jdets/P (ND)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 35972B3J

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Compound	Finding	Associated Samples	Qualifications
			EMPC results results flagged (1) by the laboratory (reported concentration at an elevated EDL)	All	Jdets/A

Comments: _____

LDC #: 35972

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date: 3.24.16

Page: 1 of 1

2nd Reviewer:

The LDC job number listed above was entered by (W).

	EDD Process	Y/N	Init	Comments/Action
I.	EDD Completeness	-		
Ia.	- All methods present?	✓	W	
Ib.	- All samples present/match report?	✓	W	
Ic.	- All reported analytes present?	✓	W	
Id	-10% verification of EDD?	✓	W	
II.	EDD Preparation/Entry	-		
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	✓	W	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	✓	W	
III.	Reasonableness Checks	-		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	Na	W	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	✓	W	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	✓	W	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	✓	W	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	NA	W	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	✓	W	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	NA	W	
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	✓	W	

Notes: *see readme

The attached zipped file contains two files:

File	Format	Description	
1) Readme_Gamble_032416.doc	MS Word 2003	A "Readme" file (this document).	
2) LDC35972_B612062,B612077_VEDD_20160311.xlsx	MS Excel 2007	A spreadsheet for the following SDG(s):	
		B612062	35972A
		B612077	35972B

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.