



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6

## SVOC DATA PACKAGE

### Client Project Information

Project ID:  
Project Description:  
Contact: Emily Jones

### ALSE Project Information

Project ID: FLS100  
Contact: Breanne Dusureault  
Submission ID(s): L2316030

Final Package Review by:

A handwritten signature in black ink, appearing to read "Breanne Dusureault", is written over a horizontal line.

Date Reviewed: 29-Oct-19



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6

## SVOC DATA PACKAGE

### SECTION 1: PROJECT NARRATIVE

#### ALSE Project Information

Project ID: FLS100

Contact: Breanne Dusureault  
 Submission ID(s): L2316030

#### Client Project Information

Project ID:  
 Project Description:  
 Contact: Emily Jones

**Analytical Method:** PCB Congeners by TO-10A via EPA 1668C

ALS Sample ID	Client Sample Descriptions	Matrix	Date Sampled	Date Received	Date Extracted	Date Analyzed
L2316030-1	HEISER-20190711-0719	Puf	19-Jul-19	24-Jul-19	12-Aug-19	15-Aug-19
L2316030-2	CITY-20190711-0719	Puf	19-Jul-19	24-Jul-19	12-Aug-19	14-Aug-19
L2316030-3	RESIDENTIAL-20190713-0719	Puf	19-Jul-19	24-Jul-19	12-Aug-19	14-Aug-19
WG3081836-1	Method Blank	MEDIA	n/a	n/a	12-Aug-19	14-Aug-19
WG3081836-4	Method Blank	REAGENT	n/a	n/a	12-Aug-19	15-Aug-19
WG3081836-2	Laboratory Control Sample	QC	n/a	n/a	12-Aug-19	14-Aug-19

#### Comments and Notes:

##### a) Sample Integrity:

The samples were received in good condition at 3.6 degrees C.

##### b) Instrumental Analysis:

The responses for PCB-1, PCB-3 and PCB-15 have been omitted from the highest level of the initial calibration due to detector saturation. Four calibration levels have been used for these targets.

No criteria failures or exceedences.

I certify that this data package is in compliance with the terms and condition of the contract , both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package (hardcopy and/or electronic version) has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

\_\_\_\_\_  
 Steve Kennedy, Technical Supervisor

29-Oct-19

\_\_\_\_\_  
 Date

# **SVOC DATA PACKAGE**

## **SECTION 2: DATA SUMMARY REPORT**



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6  
Phone: 905-331-3111, FAX: 905-331-4567

## Certificate of Analysis

<b>ALS Project Contact:</b>	Breanne Dusureault	<b>Client Name:</b>	Floyd Snider
<b>ALS Project ID:</b>	FLS100	<b>Client Address:</b>	601 Union Street, Suite 600
<b>ALS WO#:</b>	L2316030		Seattle, WA 98101
<b>Date of Report:</b>	29-Oct-19		USA
<b>Date of Sample Receipt:</b>	24-Jul-19	<b>Client Contact:</b>	Emily Jones
		<b>Client Project ID:</b>	

**COMMENTS:** PCB Congeners by TO10A/EPA 1668C

PCB Congener Group Totals and Total PCB are a sum of detected values, including EMPC values, consistent with USEPA CLP SOW CBC1.2

Certified by:

Steve Kennedy  
Technical Supervisor

Results in this certificate relate only to the samples as submitted to the laboratory.  
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# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	HEISER-20190711-0719	CITY-20190711-0719	RESIDENTIAL-20190713-0719
ALS Sample ID	L2316030-1	L2316030-2	L2316030-3
Sample Size	1	1	1
Sample size units	Puf	Puf	Puf
Percent Moisture	n/a	n/a	n/a
Sample Matrix	PUF	PUF	PUF
Sampling Date	19-Jul-19	19-Jul-19	19-Jul-19
Extraction Date	12-Aug-19	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>pg</b>	<b>pg</b>	<b>pg</b>
PCB-001	41.3	52.2	27.2
PCB-002	17.5	<9.3	8.93
PCB-003	<25	26.4	20.4
PCB-004	109	162	96.7
PCB-010	<12	<8.0	<8.0
PCB-009	<12	18.4	<8.0
PCB-007	<12	<7.9	<7.9
PCB-006	<12	47.5	<30
PCB-005	<14	<8.5	<8.6
PCB-008	<110	186	113
PCB-014	<7.2	<11	<8.2
PCB-011	262	329	262
PCB-012/013	<7.4	<11	<11
PCB-015	<8.6	<37	34.8
PCB-019	<14	35.8	21.7
PCB-018/030	104	160	110
PCB-017	<44	74.4	<44
PCB-027	<5.3	11.6	<7.4
PCB-024	<4.0	<3.8	<3.5
PCB-016	<34	63.7	<48
PCB-032	<23	40.4	<29
PCB-034	<4.0	<4.4	<4.0
PCB-023	<4.0	<4.4	<4.0
PCB-026/029	<19	27.6	27.8
PCB-025	<7.7	<7.9	11.0
PCB-031	72.6	108	109
PCB-020/028	84.9	120	121
PCB-021/033	48.0	72.2	73.8
PCB-022	26.6	42.5	46.6
PCB-036	<3.5	<3.8	<3.5
PCB-039	<3.8	<4.1	<3.7
PCB-038	<3.9	<4.3	<4.0
PCB-035	<5.8	<4.3	<5.1
PCB-037	<11	<19	<18
PCB-054	<2.8	<2.7	<2.9
PCB-050/053	13.0	17.4	12.5
PCB-045/051	20.7	<20	<16
PCB-046	<5.6	<3.7	<3.8
PCB-052	104	140	114
PCB-073	<2.5	<2.4	<2.3
PCB-043	<4.0	<3.8	<3.7
PCB-049/069	37.7	46.5	46.0
PCB-048	13.9	16.9	<19
PCB-044/047/065	68.9	85.7	<2.9
PCB-059/062/075	6.50	<3.2	<6.2
PCB-042	<8.1	<13	18.6
PCB-040/041/071	28.0	32.4	37.4
PCB-064	24.6	32.3	31.7
PCB-072	<2.5	<3.1	<2.9
PCB-068	<2.5	<3.0	<2.8
PCB-057	<2.7	<3.3	<3.0
PCB-058	<2.6	<3.3	<3.0
PCB-067	<2.6	<3.1	<2.9
PCB-063	<2.4	<2.8	<2.6
PCB-061/070/074/076	63.4	80.6	83.7
PCB-066	22.0	26.8	27.2
PCB-055	<2.8	<3.4	<3.1
PCB-056	<9.4	10.4	16.2
PCB-060	<6.8	<6.6	9.62
PCB-080	<2.4	<2.8	<2.6
PCB-079	<2.3	<2.8	<2.6
PCB-078	<2.7	<3.3	<3.1
PCB-081	<2.9	<3.7	<3.3
PCB-077	5.17	4.83	<4.0
PCB-104	<2.5	<2.0	<2.9
PCB-096	<2.4	<1.9	<2.4
PCB-103	<2.9	<2.9	<3.6
PCB-094	<3.5	<3.6	<4.4
PCB-095	75.8	93.4	69.4
PCB-093/098/100/102	<3.3	<3.4	<4.1

# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	HEISER-20190711-0719	CITY-20190711-0719	RESIDENTIAL-20190713-0719
ALS Sample ID	L2316030-1	L2316030-2	L2316030-3
Sample Size	1	1	1
Sample size units	Puf	Puf	Puf
Percent Moisture	n/a	n/a	n/a
Sample Matrix	PUF	PUF	PUF
Sampling Date	19-Jul-19	19-Jul-19	19-Jul-19
Extraction Date	12-Aug-19	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>p9</b>	<b>p9</b>	<b>p9</b>
PCB-088/091	8.22	13.4	<9.5
PCB-084	<13	24.4	<16
PCB-089	<3.5	<3.5	<4.3
PCB-121	<2.4	<2.4	<3.0
PCB-092	<13	<13	14.3
PCB-090/101/113	72.4	75.7	66.4
PCB-083/099	30.8	<36	29.0
PCB-112	<2.3	<2.3	<2.9
PCB-086/087/097/109/119/125	<34	47.4	41.9
PCB-085/110/115/116/117	63.7	91.2	75.2
PCB-082	<3.8	5.87	5.41
PCB-111	<2.3	<2.4	<3.0
PCB-120	<2.3	<2.3	<2.9
PCB-108/124	<2.6	<3.3	<3.0
PCB-107	<2.5	<3.0	<2.8
PCB-123	<3.1	<4.0	<3.5
PCB-106	<2.7	<3.4	<3.1
PCB-118	29.5	41.1	28.5
PCB-122	<2.9	<3.6	<3.3
PCB-114	<3.0	<3.7	<3.3
PCB-105	<9.3	12.6	<9.2
PCB-127	<2.4	<3.1	<2.9
PCB-126	<3.4	<3.8	<3.4
PCB-155	<1.0	<1.6	<1.5
PCB-152	<1.1	<1.6	<1.4
PCB-150	<1.2	<1.6	<1.4
PCB-136	19.2	10.1	7.17
PCB-145	<1.3	<1.8	<1.5
PCB-148	<1.6	<2.2	<1.9
PCB-135/151	<47	16.5	15.7
PCB-154	<1.4	<2.0	<1.7
PCB-144	<4.1	<2.5	<2.4
PCB-147/149	81.0	35.3	<28
PCB-134/143	<3.1	<3.5	<3.5
PCB-139/140	<1.8	<3.0	<3.0
PCB-131	<2.4	<4.0	<4.0
PCB-142	<2.1	<3.4	<3.4
PCB-132	<18	<12	10.4
PCB-133	<2.0	<3.3	<3.3
PCB-165	<1.6	<2.6	<2.6
PCB-146	8.83	5.73	<5.5
PCB-161	<1.3	<2.3	<2.3
PCB-153/168	58.5	28.2	25.7
PCB-141	<15	<6.1	5.87
PCB-130	3.62	<3.5	<3.5
PCB-137/164	5.19	<3.2	3.69
PCB-129/138/163	44.2	34.2	25.0
PCB-160	<1.5	<2.5	<2.5
PCB-158	<2.7	<3.3	<2.1
PCB-128/166	<4.3	<3.7	<2.7
PCB-159	<1.3	<2.1	<2.1
PCB-162	<1.4	<2.3	<2.3
PCB-167	<1.3	<2.2	<2.0
PCB-156/157	<1.7	<2.8	<2.8
PCB-169	<1.4	<2.2	<2.2
PCB-188	<1.7	<1.8	<2.6
PCB-179	26.2	5.95	5.42
PCB-184	<1.8	<1.7	<2.3
PCB-176	<3.9	<1.8	<2.4
PCB-186	<2.0	<1.8	<2.5
PCB-178	8.31	<2.4	<3.3
PCB-175	<2.5	<2.3	<3.1
PCB-187	37.5	10.9	<8.8
PCB-182	<2.4	<2.2	<3.0
PCB-183	<13	<2.3	<2.9
PCB-185	<2.5	<2.3	<3.2
PCB-174	21.5	<2.6	<3.9
PCB-177	11.4	<2.3	<5.3
PCB-181	<2.4	<2.2	<3.1
PCB-171/173	3.58	<2.4	<3.3
PCB-172	<2.4	<2.3	<3.1

# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	HEISER-20190711-0719	CITY-20190711-0719	RESIDENTIAL-20190713-0719
ALS Sample ID	L2316030-1	L2316030-2	L2316030-3
Sample Size	1	1	1
Sample size units	Puf	Puf	Puf
Percent Moisture	n/a	n/a	n/a
Sample Matrix	PUF	PUF	PUF
Sampling Date	19-Jul-19	19-Jul-19	19-Jul-19
Extraction Date	12-Aug-19	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>pg</b>	<b>pg</b>	<b>pg</b>
PCB-192	<2.0	<1.9	<2.6
PCB-180/193	20.2	<7.0	<5.0
PCB-191	<1.8	<1.7	<2.3
PCB-170	<5.5	<2.3	<3.2
PCB-190	<1.5	<1.5	<2.1
PCB-189	<1.6	<2.3	<2.3
PCB-202	<4.7	<2.2	<4.2
PCB-201	3.93	<3.7	2.37
PCB-204	<1.7	<2.1	<2.1
PCB-197	1.69	<2.1	<2.1
PCB-200	4.31	<2.1	2.99
PCB-198/199	<5.6	<2.7	<4.1
PCB-196	<2.1	<2.6	<2.6
PCB-203	3.56	<2.5	<2.4
PCB-195	<1.9	<3.5	<3.0
PCB-194	<2.6	<3.2	<2.7
PCB-205	<1.7	<2.8	<2.4
PCB-208	17.2	28.3	22.0
PCB-207	<16	28.5	<18
PCB-206	<4.6	<7.2	<8.4
PCB-209	15.9	31.8	<29
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-PCB-001	42	44	42
13C12-PCB-003	43	43	42
13C12-PCB-004	47	47	44
13C12-PCB-015	52	50	45
13C12-PCB-019	53	50	45
13C12-PCB-037	68	69	68
13C12-PCB-054	62	65	57
13C12-PCB-081	79	80	87
13C12-PCB-077	79	78	89
13C12-PCB-104	77	74	71
13C12-PCB-123	85	80	91
13C12-PCB-118	87	85	97
13C12-PCB-114	88	85	93
13C12-PCB-105	86	85	98
13C12-PCB-126	89	92	104
13C12-PCB-155	82	81	84
13C12-PCB-167	89	85	104
13C12-PCB-156/157	90	88	102
13C12-PCB-169	101	104	124
13C12-PCB-188	82	75	84
13C12-PCB-189	94	103	121
13C12-PCB-202	88	80	97
13C12-PCB-205	100	91	106
13C12-PCB-208	84	77	89
13C12-PCB-206	96	89	102
13C12-PCB-209	107	99	113
<b>Field Spike Standards</b>			
13C12-PCB-031	92	94	90
13C12-PCB-095	77	80	72
13C12-PCB-153	81	76	72
<b>Cleanup Standards</b>			
13C12-PCB-028	61	62	59
13C12-PCB-111	70	68	72
13C12-PCB-178	76	72	80

# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	HEISER-20190711-0719	CITY-20190711-0719	RESIDENTIAL-20190713-0719
ALS Sample ID	L2316030-1	L2316030-2	L2316030-3
Sample Size	1	1	1
Sample size units	Puf	Puf	Puf
Percent Moisture	n/a	n/a	n/a
Sample Matrix	PUF	PUF	PUF
Sampling Date	19-Jul-19	19-Jul-19	19-Jul-19
Extraction Date	12-Aug-19	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>pg</b>	<b>pg</b>	<b>pg</b>
<b>Homologue Group Totals</b>			
Total MonoCB	83.8	87.9	56.5
Total DiCB	481	780	548
Total TriCB	500	783	672
Total TetraCB	438	537	446
Total PentaCB	350	454	365
Total HexaCB	315	161	129
Total HeptaCB	151	28.8	28.4
Total OctaCB	26.4	3.70	13.7
Total NonaCB	33.2	56.8	40.0
DecaCB	15.9	31.8	29.0
Total PCB	2390	2920	2330
<b>Toxic Equivalency - (WHO 2005)</b>			
Lower Bound PCB TEQ	0.00140	0.00209	0.000855
Mid Point PCB TEQ	0.193	0.226	0.205
Upper Bound PCB TEQ	0.385	0.450	0.409



# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3116369-1	WG3116369-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	MEDIA	REAGENT
Sampling Date	n/a	n/a
Extraction Date	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>P9</b>	<b>P9</b>
PCB-001	<1.6	<3.4
PCB-002	<2.1	<3.5
PCB-003	<2.0	<4.6
PCB-004	<12	<52
PCB-010	<7.1	<34
PCB-009	<7.1	<34
PCB-007	<7.0	<35
PCB-006	<7.0	<35
PCB-005	<7.6	<42
PCB-008	<6.5	<29
PCB-014	<6.1	<17
PCB-011	60.6	<35
PCB-012/013	<6.1	<17
PCB-015	<7.3	<22
PCB-019	<3.9	<11
PCB-018/030	<9.8	<9.1
PCB-017	<5.8	<11
PCB-027	<4.2	<7.7
PCB-024	<4.4	<8.1
PCB-016	<6.9	<12
PCB-032	<3.9	<7.3
PCB-034	<3.7	<7.6
PCB-023	<3.7	<7.6
PCB-026/029	<3.5	<7.3
PCB-025	<3.5	<7.2
PCB-031	<12	<9.3
PCB-020/028	18.4	10.3
PCB-021/033	<8.8	<7.5
PCB-022	<4.1	<7.6
PCB-036	<3.1	<6.6
PCB-039	<3.4	<7.2
PCB-038	<3.6	<7.5
PCB-035	<3.6	<7.5
PCB-037	<4.5	<10
PCB-054	<1.8	<6.4
PCB-050/053	<2.8	<6.5
PCB-045/051	<2.9	<6.8
PCB-046	<3.3	<7.6
PCB-052	15.2	<13
PCB-073	<2.2	<5.1
PCB-043	<3.4	<8.2
PCB-049/069	<2.6	<6.0
PCB-048	<2.9	<6.7
PCB-044/047/065	<2.7	15.5
PCB-059/062/075	<2.1	<4.9
PCB-042	<3.3	<7.8
PCB-040/041/071	<3.9	<6.7
PCB-064	4.04	<5.3
PCB-072	<2.7	<5.8
PCB-068	<2.6	<5.7
PCB-057	<2.8	<6.2
PCB-058	<2.8	<6.1
PCB-067	<2.7	<5.9
PCB-063	<2.5	<5.4
PCB-061/070/074/076	<9.1	<6.2
PCB-066	<3.0	<5.9
PCB-055	<2.9	<6.5
PCB-056	<2.9	<6.4
PCB-060	<2.9	<6.4
PCB-080	<2.4	<5.4
PCB-079	<2.4	<5.3
PCB-078	<2.8	<6.3
PCB-081	<3.1	<7.1
PCB-077	<3.4	<8.1
PCB-104	<2.1	<6.0
PCB-096	<2.0	<6.4
PCB-103	<2.5	<7.7
PCB-094	<3.0	<9.5
PCB-095	13.8	<8.1
PCB-093/098/100/102	<2.8	<8.8

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3116369-1	WG3116369-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	MEDIA	REAGENT
Sampling Date	n/a	n/a
Extraction Date	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>P9</b>	<b>P9</b>
PCB-088/091	<2.8	<8.7
PCB-084	<3.0	<9.6
PCB-089	<2.9	<9.5
PCB-121	<2.0	<6.4
PCB-092	<2.7	<8.8
PCB-090/101/113	<9.6	<7.4
PCB-083/099	<2.8	<8.6
PCB-112	<1.9	<6.3
PCB-086/087/097/109/119/125	<2.4	<7.6
PCB-085/110/115/116/117	<5.4	<6.9
PCB-082	<3.2	<10
PCB-111	<2.0	<6.3
PCB-120	<1.9	<6.2
PCB-108/124	<2.0	<6.8
PCB-107	<1.9	<6.4
PCB-123	<2.4	<8.1
PCB-106	<2.1	<7.0
PCB-118	<3.8	<7.6
PCB-122	<2.2	<7.4
PCB-114	<2.3	<8.0
PCB-105	<2.2	<7.9
PCB-127	<1.9	<6.3
PCB-126	<2.3	<9.5
PCB-155	<1.6	<2.5
PCB-152	<1.6	<2.8
PCB-150	<1.6	<2.9
PCB-136	<1.6	<2.9
PCB-145	<1.7	<3.2
PCB-148	<2.2	<3.9
PCB-135/151	<2.2	<4.1
PCB-154	<1.9	<3.5
PCB-144	<2.1	<4.0
PCB-147/149	<2.3	6.09
PCB-134/143	<2.4	<5.0
PCB-139/140	<2.0	<4.1
PCB-131	<2.7	<5.5
PCB-142	<2.4	<4.9
PCB-132	<2.4	<5.0
PCB-133	<2.2	<4.5
PCB-165	<1.8	<3.5
PCB-146	<2.0	<4.0
PCB-161	<1.6	<3.1
PCB-153/168	4.04	<3.4
PCB-141	<2.1	<4.3
PCB-130	<2.4	<4.7
PCB-137/164	<1.8	<3.7
PCB-129/138/163	<3.5	4.85
PCB-160	<1.8	<3.3
PCB-158	<1.4	<2.8
PCB-128/166	<1.8	<3.7
PCB-159	<1.5	<3.0
PCB-162	<1.6	<3.2
PCB-167	<1.4	<2.8
PCB-156/157	<2.0	<3.9
PCB-169	<1.5	<3.4
PCB-188	<1.9	<3.5
PCB-179	<1.8	<3.8
PCB-184	<1.7	<3.6
PCB-176	<1.8	<3.8
PCB-186	<1.9	<4.0
PCB-178	<2.4	<5.0
PCB-175	<2.3	<4.9
PCB-187	<2.2	<4.5
PCB-182	<2.2	<4.8
PCB-183	<2.2	<4.6
PCB-185	<2.4	<5.1
PCB-174	<2.3	<4.8
PCB-177	<2.4	<5.1
PCB-181	<2.3	<4.8
PCB-171/173	<2.4	<5.1
PCB-172	<2.3	<4.8

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3116369-1	WG3116369-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	MEDIA	REAGENT
Sampling Date	n/a	n/a
Extraction Date	12-Aug-19	12-Aug-19

  

Target Analytes	P9	P9
PCB-192	<1.9	<3.9
PCB-180/193	<2.0	<4.1
PCB-191	<1.7	<3.5
PCB-170	<2.4	<4.9
PCB-190	<1.5	<3.0
PCB-189	<2.2	<4.0
PCB-202	<1.8	<4.0
PCB-201	<1.7	<4.2
PCB-204	<1.7	<4.3
PCB-197	<1.6	<4.1
PCB-200	<1.7	<4.2
PCB-198/199	<2.2	<5.3
PCB-196	<2.1	<5.1
PCB-203	<1.9	<4.8
PCB-195	<2.2	<4.2
PCB-194	<2.0	<3.8
PCB-205	<1.7	<3.7
PCB-208	<2.0	<3.4
PCB-207	22.7	<25
PCB-206	<5.9	<15
PCB-209	30.4	25.7
<b>Extraction Standards</b>	<b>% Rec</b>	<b>% Rec</b>
13C12-PCB-001	50	43
13C12-PCB-003	50	40
13C12-PCB-004	54	46
13C12-PCB-015	54	44
13C12-PCB-019	53	47
13C12-PCB-037	74	50
13C12-PCB-054	67	51
13C12-PCB-081	85	60
13C12-PCB-077	86	59
13C12-PCB-104	77	60
13C12-PCB-123	85	64
13C12-PCB-118	90	67
13C12-PCB-114	89	66
13C12-PCB-105	92	67
13C12-PCB-126	100	68
13C12-PCB-155	83	65
13C12-PCB-167	96	71
13C12-PCB-156/157	97	69
13C12-PCB-169	116	78
13C12-PCB-188	82	65
13C12-PCB-189	114	75
13C12-PCB-202	91	68
13C12-PCB-205	101	79
13C12-PCB-208	84	68
13C12-PCB-206	98	75
13C12-PCB-209	108	85
<b>Field Spike Standards</b>		
13C12-PCB-031	NS	NS
13C12-PCB-095	NS	NS
13C12-PCB-153	NS	NS
<b>Cleanup Standards</b>		
13C12-PCB-028	65	51
13C12-PCB-111	71	56
13C12-PCB-178	76	62

# ALS Life Sciences

## Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3116369-1	WG3116369-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	MEDIA	REAGENT
Sampling Date	n/a	n/a
Extraction Date	12-Aug-19	12-Aug-19
<b>Target Analytes</b>	<b>P9</b>	<b>P9</b>
<b>Homologue Group Totals</b>		
Total MonoCB	2.10	<3.4
Total DiCB	60.6	35.0
Total TriCB	53.1	19.6
Total TetraCB	35.2	28.5
Total PentaCB	32.6	<6.0
Total HexaCB	9.84	10.9
Total HeptaCB	<1.5	<3.0
Total OctaCB	<1.6	<3.7
Total NonaCB	42.7	59.0
DecaCB	30.4	25.7
Total PCB	267	179
<b>Toxic Equivalency - (WHO 2005)</b>		
Lower Bound PCB TEQ	0.00	0.00
Mid Point PCB TEQ	0.138	0.528
Upper Bound PCB TEQ	0.277	1.06

# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	Laboratory Control Sample
ALS Sample ID	WG3116369-2
Sample Size	1
Sample size units	n/a
Percent Moisture	n/a
Sample Matrix	QC
Sampling Date	n/a
Extraction Date	12-Aug-19
<b>Target Analytes</b>	
	<b>% Rec</b>
PCB-001	107
PCB-003	104
PCB-004	99
PCB-015	104
PCB-019	108
PCB-037	101
PCB-054	101
PCB-081	98
PCB-077	100
PCB-104	88
PCB-123	96
PCB-118	96
PCB-114	96
PCB-105	95
PCB-126	93
PCB-155	92
PCB-167	93
PCB-156/157	93
PCB-169	95
PCB-188	93
PCB-189	102
PCB-202	98
PCB-205	89
PCB-208	104
PCB-206	100
PCB-209	112
	<b>% Rec</b>
<b>Extraction Standards</b>	
13C12-PCB-001	32
13C12-PCB-003	31
13C12-PCB-004	34
13C12-PCB-015	36
13C12-PCB-019	35
13C12-PCB-037	54
13C12-PCB-054	43
13C12-PCB-081	63
13C12-PCB-077	64
13C12-PCB-104	54
13C12-PCB-123	66
13C12-PCB-118	69
13C12-PCB-114	69
13C12-PCB-105	69
13C12-PCB-126	76
13C12-PCB-155	63
13C12-PCB-167	73
13C12-PCB-156/157	73
13C12-PCB-169	86
13C12-PCB-188	62
13C12-PCB-189	86
13C12-PCB-202	70
13C12-PCB-205	78
13C12-PCB-208	66
13C12-PCB-206	74
13C12-PCB-209	84
<b>Field Spike Standards</b>	
13C12-PCB-031	NS
13C12-PCB-095	NS
13C12-PCB-153	NS
<b>Cleanup Standards</b>	
13C12-PCB-028	46
13C12-PCB-111	53
13C12-PCB-178	57

# ALS Life Sciences

## Sample Analysis Summary Report

Sample Name	ccv	ccv
ALS Sample ID	H5-19-CCV-680	H5-19-CCV-680
Sample Size	1	1
Sample size units	n/a	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	n/a	n/a
<b>Target Analytes</b>		
	<b>% Rec</b>	<b>% Rec</b>
PCB-001	100	100
PCB-003	98	95
PCB-004	91	92
PCB-015	98	97
PCB-019	95	94
PCB-037	96	95
PCB-054	93	91
PCB-081	96	95
PCB-077	98	97
PCB-104	93	91
PCB-123	92	92
PCB-118	95	92
PCB-114	93	92
PCB-105	93	93
PCB-126	94	94
PCB-155	92	92
PCB-167	89	89
PCB-156/157	91	92
PCB-169	94	94
PCB-188	93	91
PCB-189	97	96
PCB-202	92	92
PCB-205	88	88
PCB-208	101	101
PCB-206	98	99
PCB-209	96	95
<b>Extraction Standards</b>		
	<b>% Rec</b>	<b>% Rec</b>
13C12-PCB-001	91	88
13C12-PCB-003	92	77
13C12-PCB-004	95	96
13C12-PCB-015	88	71
13C12-PCB-019	97	100
13C12-PCB-037	101	75
13C12-PCB-054	108	107
13C12-PCB-081	100	88
13C12-PCB-077	99	84
13C12-PCB-104	110	110
13C12-PCB-123	96	100
13C12-PCB-118	98	105
13C12-PCB-114	97	102
13C12-PCB-105	99	101
13C12-PCB-126	103	102
13C12-PCB-155	105	109
13C12-PCB-167	107	101
13C12-PCB-156/157	104	101
13C12-PCB-169	120	112
13C12-PCB-188	93	92
13C12-PCB-189	120	132
13C12-PCB-202	103	105
13C12-PCB-205	99	100
13C12-PCB-208	82	83
13C12-PCB-206	96	101
13C12-PCB-209	107	116
<b>Field Spike Standards</b>		
	<b>% Rec</b>	<b>% Rec</b>
13C12-PCB-031	90	101
13C12-PCB-095	90	85
13C12-PCB-153	80	82
<b>Cleanup Standards</b>		
	<b>% Rec</b>	<b>% Rec</b>
13C12-PCB-028	98	90
13C12-PCB-111	87	89
13C12-PCB-178	90	90

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** HEISER-20190711-0719  
 ALS Sample ID L2316030-1  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190815A05  
 Run Date 15-Aug-19 18:44  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.88	41.3	2.4	J		50
PCB-002		10.30	17.5	2.3	J		50
PCB-003		10.41	<25	2.7	J,R	25	50
PCB-004		10.58	109	20			50
PCB-010		NotFnd	<12	12	U		50
PCB-009		NotFnd	<12	12	U		50
PCB-007		NotFnd	<12	12	U		50
PCB-006		NotFnd	<12	12	U		50
PCB-005		NotFnd	<14	14	U		50
PCB-008		12.39	<110	10	M,R	110	50
PCB-014		NotFnd	<7.2	7.2	U		50
PCB-011		13.88	262	7.5	B		50
PCB-012/013		NotFnd	<7.4	7.4	U		50
PCB-015		NotFnd	<8.6	8.6	U		50
PCB-019		12.58	<14	5.3	M,J,R	14	50
PCB-018/030		13.70	104	4.5			50
PCB-017		13.95	<44	5.3	J,R	44	50
PCB-027		14.08	<5.3	3.8	J,R	5.3	50
PCB-024		NotFnd	<4.0	4.0	U		50
PCB-016		14.23	<34	6.1	J,R	34	50
PCB-032		14.52	<23	3.6	J,R	23	50
PCB-034		NotFnd	<4.0	4.0	U		50
PCB-023		NotFnd	<4.0	4.0	U		50
PCB-026/029		15.50	<19	3.9	J,R	19	50
PCB-025		15.63	<7.7	3.8	J,R	7.7	50
PCB-031		15.80	72.6	3.7			50
PCB-020/028		15.98	84.9	3.9	B		50
PCB-021/033		16.11	48.0	4.0	J		50
PCB-022		16.35	26.6	4.0	J		50
PCB-036		NotFnd	<3.5	3.5	U		50
PCB-039		NotFnd	<3.8	3.8	U		50
PCB-038		NotFnd	<3.9	3.9	U		50
PCB-035		17.95	<5.8	3.9	J,R	5.8	50
PCB-037		18.22	<11	5.0	M,J,R	11	50
PCB-054		NotFnd	<2.8	2.8	U		50
PCB-050/053		15.65	13.0	3.2	J		50
PCB-045/051		16.05	20.7	3.3	J		50
PCB-046		16.21	<5.6	3.8	J,R	5.6	50
PCB-052		16.98	104	3.2	B		50
PCB-073		NotFnd	<2.5	2.5	U		50
PCB-043		NotFnd	<4.0	4.0	U		50
PCB-049/069		17.25	37.7	3.0	J		50
PCB-048		17.41	13.9	3.3	J		50
PCB-044/047/065		17.54	68.9	3.0			50
PCB-059/062/075		17.71	6.50	2.4	J		50
PCB-042		17.84	<8.1	3.8	J,R	8.1	50
PCB-040/041/071		18.11	28.0	3.3	J		50
PCB-064		18.23	24.6	2.6	J,B		50
PCB-072		NotFnd	<2.5	2.5	U		50
PCB-068		NotFnd	<2.5	2.5	U		50
PCB-057		NotFnd	<2.7	2.7	U		50
PCB-058		NotFnd	<2.6	2.6	U		50
PCB-067		NotFnd	<2.6	2.6	U		50
PCB-063		19.25	<2.4	2.4	U	0.35	50
PCB-061/070/074/076		19.58	63.4	2.7			50
PCB-066		19.76	22.0	2.6	J		50
PCB-055		NotFnd	<2.8	2.8	U		50
PCB-056		20.13	<9.4	2.8	J,R	9.4	50
PCB-060		20.25	<6.8	2.8	J,R	6.8	50
PCB-080		NotFnd	<2.4	2.4	U		50
PCB-079		NotFnd	<2.3	2.3	U		50
PCB-078		NotFnd	<2.7	2.7	U		50
PCB-081	0.0003	NotFnd	<2.9	2.9	U		50
PCB-077	0.0001	22.10	5.17	3.2	M,J		50
PCB-104		NotFnd	<2.5	2.5	U		50
PCB-096		NotFnd	<2.4	2.4	U		50
PCB-103		NotFnd	<2.9	2.9	U		50
PCB-094		NotFnd	<3.5	3.5	U		50
PCB-095		19.11	75.8	3.0	B		50
PCB-093/098/100/102		NotFnd	<3.3	3.3	U		50

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** HEISER-20190711-0719  
 ALS Sample ID L2316030-1  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190815A05  
 Run Date 15-Aug-19 18:44  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.59	8.22	3.2	M,J		50
PCB-084		19.72	<13	3.6	J,R	13	50
PCB-089		NotFnd	<3.5	3.5	U		50
PCB-121		NotFnd	<2.4	2.4	U		50
PCB-092		20.34	<13	3.3	J,R	13	50
PCB-090/101/113		20.65	72.4	2.7			50
PCB-083/099		20.96	30.8	3.2	J		50
PCB-112		NotFnd	<2.3	2.3	U		50
PCB-086/087/097/109/119/125		21.31	<34	2.8	M,J,R	34	50
PCB-085/110/115/116/117		21.72	63.7	2.5	M		50
PCB-082		NotFnd	<3.8	3.8	U		50
PCB-111		NotFnd	<2.3	2.3	U		50
PCB-120		NotFnd	<2.3	2.3	U		50
PCB-108/124		NotFnd	<2.6	2.6	U		50
PCB-107		NotFnd	<2.5	2.5	U		50
PCB-123	0.00003	NotFnd	<3.1	3.1	U		50
PCB-106		NotFnd	<2.7	2.7	U		50
PCB-118	0.00003	23.27	29.5	2.9	J		50
PCB-122		NotFnd	<2.9	2.9	U		50
PCB-114	0.00003	NotFnd	<3.0	3.0	U		50
PCB-105	0.00003	23.91	<9.3	3.1	J,R	9.3	50
PCB-127		NotFnd	<2.4	2.4	U		50
PCB-126	0.1	NotFnd	<3.4	3.4	U		50
PCB-155		NotFnd	<1.0	1.0	U		50
PCB-152		NotFnd	<1.1	1.1	U		50
PCB-150		NotFnd	<1.2	1.2	U		50
PCB-136		20.96	19.2	1.2	J		50
PCB-145		NotFnd	<1.3	1.3	U		50
PCB-148		NotFnd	<1.6	1.6	U		50
PCB-135/151		22.18	<47	1.6	J,R	47	50
PCB-154		NotFnd	<1.4	1.4	U		50
PCB-144		22.47	<4.1	1.6	J,R	4.1	50
PCB-147/149		22.67	81.0	1.8			50
PCB-134/143		22.80	<3.1	2.2	J,R	3.1	50
PCB-139/140		NotFnd	<1.8	1.8	U		50
PCB-131		NotFnd	<2.4	2.4	U		50
PCB-142		NotFnd	<2.1	2.1	U		50
PCB-132		23.36	<18	2.2	J,R	18	50
PCB-133		NotFnd	<2.0	2.0	U		50
PCB-165		NotFnd	<1.6	1.6	U		50
PCB-146		23.90	8.83	1.7	J		50
PCB-161		NotFnd	<1.3	1.3	U		50
PCB-153/168		24.21	58.5	1.5			50
PCB-141		24.33	<15	1.9	J,R	15	50
PCB-130		24.55	3.62	2.1	J		50
PCB-137/164		24.72	5.19	1.6	J		50
PCB-129/138/163		24.89	44.2	1.8	J		50
PCB-160		NotFnd	<1.5	1.5	U		50
PCB-158		25.11	<2.7	1.3	J,R	2.7	50
PCB-128/166		25.57	<4.3	1.6	J,R	4.3	50
PCB-159		NotFnd	<1.3	1.3	U		50
PCB-162		NotFnd	<1.4	1.4	U		50
PCB-167	0.00003	NotFnd	<1.3	1.3	U		50
PCB-156/157	0.00003	NotFnd	<1.7	1.7	U	100	
PCB-169	0.03	28.68	<1.4	1.4	U	0.94	50
PCB-188		NotFnd	<1.7	1.7	U		50
PCB-179		23.73	26.2	1.9	J		50
PCB-184		NotFnd	<1.8	1.8	U		50
PCB-176		24.19	<3.9	1.9	J,R	3.9	50
PCB-186		NotFnd	<2.0	2.0	U		50
PCB-178		25.10	8.31	2.5	J		50
PCB-175		NotFnd	<2.5	2.5	U		50
PCB-187		25.57	37.5	2.3	J		50
PCB-182		NotFnd	<2.4	2.4	U		50
PCB-183		25.87	<13	2.3	J,R	13	50
PCB-185		25.98	<2.5	2.5	M,U	1.5	50
PCB-174		26.03	21.5	2.4	M,J		50
PCB-177		26.26	11.4	2.6	J		50
PCB-181		NotFnd	<2.4	2.4	U		50
PCB-171/173		26.57	3.58	2.6	J		50
PCB-172		NotFnd	<2.4	2.4	U		50



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** HEISER-20190711-0719  
 ALS Sample ID L2316030-1  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190815A05  
 Run Date 15-Aug-19 18:44  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<2.0	2.0	U		50
PCB-180/193		27.73	20.2	2.0	J		50
PCB-191		NotFnd	<1.8	1.8	U		50
PCB-170		28.42	<5.5	2.4	J,R	5.5	50
PCB-190		NotFnd	<1.5	1.5	U		50
PCB-189	0.00003	NotFnd	<1.6	1.6	U		50
PCB-202		26.30	<4.7	1.6	J,R	4.7	50
PCB-201		26.78	3.93	1.7	M,J		50
PCB-204		NotFnd	<1.7	1.7	U		50
PCB-197		27.23	1.69	1.7	J		50
PCB-200		27.33	4.31	1.7	J		50
PCB-198/199		28.73	<5.6	2.1	J,R	5.6	50
PCB-196		NotFnd	<2.1	2.1	U		50
PCB-203		29.17	3.56	1.9	M,J		50
PCB-195		NotFnd	<1.9	1.9	U		50
PCB-194		31.13	<2.6	1.7	J,R	2.6	50
PCB-205		NotFnd	<1.7	1.7	U		50
PCB-208		29.74	17.2	2.7	J		50
PCB-207		30.22	<16	2.7	M,J,R	16	50
PCB-206		NotFnd	<4.6	4.6	U		50
PCB-209		33.63	15.9	1.5	J,B		50

Extraction Standards	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.87	42	5-145
13C12-PCB-003	4000	10.41	43	5-145
13C12-PCB-004	4000	10.56	47	5-145
13C12-PCB-015	4000	14.25	52	5-145
13C12-PCB-019	4000	12.57	53	5-145
13C12-PCB-037	4000	18.21	68	5-145
13C12-PCB-054	4000	14.43	62	5-145
13C12-PCB-081	4000	21.79	79	10-145
13C12-PCB-077	4000	22.09	79	10-145
13C12-PCB-104	4000	17.49	77	10-145
13C12-PCB-123	4000	23.09	85	10-145
13C12-PCB-118	4000	23.26	87	10-145
13C12-PCB-114	4000	23.56	88	10-145
13C12-PCB-105	4000	23.91	86	10-145
13C12-PCB-126	4000	25.51	89	10-145
13C12-PCB-155	4000	20.51	82	10-145
13C12-PCB-167	4000	26.41	89	10-145
13C12-PCB-156/157	8000	27.04	90	10-145
13C12-PCB-169	4000	28.70	101	10-145
13C12-PCB-188	4000	23.51	82	10-145
13C12-PCB-189	4000	29.99	94	10-145
13C12-PCB-202	4000	26.29	88	10-145
13C12-PCB-205	4000	31.39	100	10-145
13C12-PCB-208	4000	29.73	84	10-145
13C12-PCB-206	4000	32.48	96	10-145
13C12-PCB-209	4000	33.60	107	10-145

Field Spike Standards	pg	Time	% Rec	Limits
13C12-PCB-031	6000	15.79	92	70-130
13C12-PCB-095	6000	19.10	77	70-130
13C12-PCB-153	6000	24.20	81	70-130

Cleanup Standards	pg	Time	% Rec	Limits
13C12-PCB-028	4000	15.97	61	5-145
13C12-PCB-111	4000	22.03	70	10-145
13C12-PCB-178	4000	25.08	76	10-145

# ALS Life Sciences

## Sample Analysis Report

<b>Sample Name</b>	HEISER-20190711-0719	Sampling Date	19-Jul-19	
ALS Sample ID	L2316030-1	Extraction Date	12-Aug-19	Approved: E. Sabljic --e-signature-- 16-Aug-2019
Analysis Method	EPA 1668C	Sample Size	1 Puf	
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	PUF	Split Ratio	2	

<b>Run Information</b>	<b>Run 1</b>
Filename	5-190815A05
Run Date	15-Aug-19 18:44
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
<b>Homologue Group Totals</b>							
Total MonoCB			83.8	2.3	J		200
Total DiCB			481	7.2	J		400
Total TriCB			500	3.5	J		400
Total TetraCB			438	2.3	J		800
Total PentaCB			350	2.3	J		800
Total HexaCB			315	1.0	J		800
Total HeptaCB			151	1.5	J		400
Total OctaCB			26.4	1.6	J		400
Total NonaCB			33.2	2.7	J		200
Total DecaCB			15.9	1.5	J		200
Total PCB			2390		J		1600
<b>Toxic Equivalency - (WHO 2005)</b>							
Lower Bound PCB TEQ			0.00140				
Mid Point PCB TEQ			0.193				
Upper Bound PCB TEQ			0.385				

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** CITY-20190711-0719  
 ALS Sample ID L2316030-2  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190814A32  
 Run Date 15-Aug-19 09:54  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.85	52.2	2.5			50
PCB-002		10.26	<9.3	2.5	M,J,R	9.3	50
PCB-003		10.38	26.4	3.2	J		50
PCB-004		10.55	162	13			50
PCB-010		NotFnd	<8.0	8.0	U		50
PCB-009		11.81	18.4	7.9	M,J		50
PCB-007		NotFnd	<7.9	7.9	U		50
PCB-006		12.08	47.5	7.8	J		50
PCB-005		NotFnd	<8.5	8.5	U		50
PCB-008		12.34	186	7.3			50
PCB-014		NotFnd	<11	11	U		50
PCB-011		13.85	329	11	B		50
PCB-012/013		14.02	<11	11	U	7.9	50
PCB-015		14.23	<37	13	J,R	37	50
PCB-019		12.54	35.8	4.8	J		50
PCB-018/030		13.66	160	4.2			50
PCB-017		13.90	74.4	5.0			50
PCB-027		14.04	11.6	3.6	M,J		50
PCB-024		14.12	<3.8	3.8	M,U	1.8	50
PCB-016		14.20	63.7	6.0	M		50
PCB-032		14.48	40.4	3.4	J		50
PCB-034		NotFnd	<4.4	4.4	U		50
PCB-023		NotFnd	<4.4	4.4	U		50
PCB-026/029		15.45	27.6	4.2	J		50
PCB-025		15.59	<7.9	4.2	J,R	7.9	50
PCB-031		15.76	108	4.0			50
PCB-020/028		15.94	120	4.3	B		50
PCB-021/033		16.09	72.2	4.4			50
PCB-022		16.31	42.5	4.4	J		50
PCB-036		NotFnd	<3.8	3.8	U		50
PCB-039		NotFnd	<4.1	4.1	U		50
PCB-038		NotFnd	<4.3	4.3	U		50
PCB-035		NotFnd	<4.3	4.3	U		50
PCB-037		18.18	<19	5.5	J,R	19	50
PCB-054		NotFnd	<2.7	2.7	U		50
PCB-050/053		15.62	17.4	3.1	J		50
PCB-045/051		16.03	<20	3.3	J,R	20	50
PCB-046		NotFnd	<3.7	3.7	U		50
PCB-052		16.94	140	3.1	B		50
PCB-073		NotFnd	<2.4	2.4	U		50
PCB-043		NotFnd	<3.8	3.8	U		50
PCB-049/069		17.21	46.5	2.9	J		50
PCB-048		17.37	16.9	3.2	J		50
PCB-044/047/065		17.50	85.7	3.0			50
PCB-059/062/075		17.68	<3.2	2.4	J,R	3.2	50
PCB-042		17.80	<13	3.7	J,R	13	50
PCB-040/041/071		18.06	32.4	3.2	J		50
PCB-064		18.19	32.3	2.6	J,B		50
PCB-072		NotFnd	<3.1	3.1	U		50
PCB-068		NotFnd	<3.0	3.0	U		50
PCB-057		NotFnd	<3.3	3.3	U		50
PCB-058		NotFnd	<3.3	3.3	U		50
PCB-067		NotFnd	<3.1	3.1	U		50
PCB-063		NotFnd	<2.8	2.8	U		50
PCB-061/070/074/076		19.54	80.6	3.3			50
PCB-066		19.72	26.8	3.1	J		50
PCB-055		NotFnd	<3.4	3.4	U		50
PCB-056		20.09	10.4	3.3	J		50
PCB-060		20.22	<6.6	3.3	J,R	6.6	50
PCB-080		NotFnd	<2.8	2.8	U		50
PCB-079		NotFnd	<2.8	2.8	U		50
PCB-078		NotFnd	<3.3	3.3	U		50
PCB-081	0.0003	NotFnd	<3.7	3.7	U		50
PCB-077	0.0001	22.05	4.83	4.1	M,J		50
PCB-104		NotFnd	<2.0	2.0	U		50
PCB-096		NotFnd	<1.9	1.9	U		50
PCB-103		NotFnd	<2.9	2.9	U		50
PCB-094		NotFnd	<3.6	3.6	U		50
PCB-095		19.08	93.4	3.1	B		50
PCB-093/098/100/102		NotFnd	<3.4	3.4	U		50

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** CITY-20190711-0719  
 ALS Sample ID L2316030-2  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information**

**Run 1**

Filename 5-190814A32  
 Run Date 15-Aug-19 09:54  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.54	13.4	3.3	J		50
PCB-084		19.69	24.4	3.6	J		50
PCB-089		NotFnd	<3.5	3.5	U		50
PCB-121		NotFnd	<2.4	2.4	U		50
PCB-092		20.31	<13	3.3	J,R	13	50
PCB-090/101/113		20.61	75.7	2.9			50
PCB-083/099		20.92	<36	3.4	J,R	36	50
PCB-112		NotFnd	<2.3	2.3	U		50
PCB-086/087/097/109/119/125		21.26	47.4	2.9	M,J		50
PCB-085/110/115/116/117		21.68	91.2	2.6	M		50
PCB-082		21.86	5.87	3.8	J		50
PCB-111		NotFnd	<2.4	2.4	U		50
PCB-120		NotFnd	<2.3	2.3	U		50
PCB-108/124		NotFnd	<3.3	3.3	U		50
PCB-107		22.98	<3.0	3.0	U	2.5	50
PCB-123	0.00003	NotFnd	<4.0	4.0	U		50
PCB-106		NotFnd	<3.4	3.4	U		50
PCB-118	0.00003	23.23	41.1	3.5	J		50
PCB-122		NotFnd	<3.6	3.6	U		50
PCB-114	0.00003	NotFnd	<3.7	3.7	U		50
PCB-105	0.00003	23.89	12.6	3.6	J		50
PCB-127		NotFnd	<3.1	3.1	U		50
PCB-126	0.1	NotFnd	<3.8	3.8	U		50
PCB-155		NotFnd	<1.6	1.6	U		50
PCB-152		NotFnd	<1.6	1.6	U		50
PCB-150		NotFnd	<1.6	1.6	U		50
PCB-136		20.91	10.1	1.6	J		50
PCB-145		NotFnd	<1.8	1.8	U		50
PCB-148		NotFnd	<2.2	2.2	U		50
PCB-135/151		22.14	16.5	2.3	J		50
PCB-154		NotFnd	<2.0	2.0	U		50
PCB-144		22.45	<2.5	2.1	M,J,R	2.5	50
PCB-147/149		22.63	35.3	2.9	J		50
PCB-134/143		NotFnd	<3.5	3.5	U		50
PCB-139/140		NotFnd	<3.0	3.0	U		50
PCB-131		NotFnd	<4.0	4.0	U		50
PCB-142		NotFnd	<3.4	3.4	U		50
PCB-132		23.32	<12	3.5	J,R	12	50
PCB-133		NotFnd	<3.3	3.3	U		50
PCB-165		NotFnd	<2.6	2.6	U		50
PCB-146		23.85	5.73	2.9	J		50
PCB-161		NotFnd	<2.3	2.3	U		50
PCB-153/168		24.18	28.2	2.5	J,B		50
PCB-141		24.30	<6.1	3.1	J,R	6.1	50
PCB-130		NotFnd	<3.5	3.5	U		50
PCB-137/164		24.67	<3.2	2.7	M,J,R	3.2	50
PCB-129/138/163		24.85	34.2	3.0	J		50
PCB-160		NotFnd	<2.5	2.5	U		50
PCB-158		25.06	<3.3	2.1	J,R	3.3	50
PCB-128/166		25.56	<3.7	2.7	M,J,R	3.7	50
PCB-159		NotFnd	<2.1	2.1	U		50
PCB-162		NotFnd	<2.3	2.3	U		50
PCB-167	0.00003	NotFnd	<2.2	2.2	U		50
PCB-156/157	0.00003	NotFnd	<2.8	2.8	U		100
PCB-169	0.03	NotFnd	<2.2	2.2	U		50
PCB-188		NotFnd	<1.8	1.8	U		50
PCB-179		23.67	5.95	1.8	J		50
PCB-184		NotFnd	<1.7	1.7	U		50
PCB-176		NotFnd	<1.8	1.8	U		50
PCB-186		NotFnd	<1.8	1.8	U		50
PCB-178		NotFnd	<2.4	2.4	U		50
PCB-175		NotFnd	<2.3	2.3	U		50
PCB-187		25.52	10.9	2.1	J		50
PCB-182		NotFnd	<2.2	2.2	U		50
PCB-183		25.84	<2.3	2.1	M,J,R	2.3	50
PCB-185		NotFnd	<2.3	2.3	U		50
PCB-174		25.98	<2.6	2.2	M,J,R	2.6	50
PCB-177		NotFnd	<2.3	2.3	U		50
PCB-181		NotFnd	<2.2	2.2	U		50
PCB-171/173		NotFnd	<2.4	2.4	U		50
PCB-172		NotFnd	<2.3	2.3	U		50

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** CITY-20190711-0719  
 ALS Sample ID L2316030-2  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190814A32  
 Run Date 15-Aug-19 09:54  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<1.9	1.9	U		50
PCB-180/193		27.69	<7.0	1.9	J,R	7.0	50
PCB-191		NotFnd	<1.7	1.7	U		50
PCB-170		NotFnd	<2.3	2.3	U		50
PCB-190		NotFnd	<1.5	1.5	U		50
PCB-189	0.00003	NotFnd	<2.3	2.3	U		50
PCB-202		NotFnd	<2.2	2.2	U		50
PCB-201		26.73	<3.7	2.1	J,R	3.7	50
PCB-204		NotFnd	<2.1	2.1	U		50
PCB-197		NotFnd	<2.1	2.1	U		50
PCB-200		NotFnd	<2.1	2.1	U		50
PCB-198/199		NotFnd	<2.7	2.7	U		50
PCB-196		NotFnd	<2.6	2.6	U		50
PCB-203		NotFnd	<2.5	2.5	U		50
PCB-195		NotFnd	<3.5	3.5	U		50
PCB-194		NotFnd	<3.2	3.2	U		50
PCB-205		NotFnd	<2.8	2.8	U		50
PCB-208		29.70	28.3	4.6	J		50
PCB-207		30.17	28.5	4.3	J,B		50
PCB-206		NotFnd	<7.2	7.2	U		50
PCB-209		33.58	31.8	3.9	J,B		50

Extraction Standards	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.84	44	5-145
13C12-PCB-003	4000	10.37	43	5-145
13C12-PCB-004	4000	10.54	47	5-145
13C12-PCB-015	4000	14.21	50	5-145
13C12-PCB-019	4000	12.53	50	5-145
13C12-PCB-037	4000	18.16	69	5-145
13C12-PCB-054	4000	14.39	65	5-145
13C12-PCB-081	4000	21.75	80	10-145
13C12-PCB-077	4000	22.05	78	10-145
13C12-PCB-104	4000	17.46	74	10-145
13C12-PCB-123	4000	23.05	80	10-145
13C12-PCB-118	4000	23.22	85	10-145
13C12-PCB-114	4000	23.51	85	10-145
13C12-PCB-105	4000	23.86	85	10-145
13C12-PCB-126	4000	25.46	92	10-145
13C12-PCB-155	4000	20.46	81	10-145
13C12-PCB-167	4000	26.36	85	10-145
13C12-PCB-156/157	8000	26.99	88	10-145
13C12-PCB-169	4000	28.66	104	10-145
13C12-PCB-188	4000	23.46	75	10-145
13C12-PCB-189	4000	29.95	103	10-145
13C12-PCB-202	4000	26.24	80	10-145
13C12-PCB-205	4000	31.34	91	10-145
13C12-PCB-208	4000	29.68	77	10-145
13C12-PCB-206	4000	32.41	89	10-145
13C12-PCB-209	4000	33.55	99	10-145

Field Spike Standards	pg	Time	% Rec	Limits
13C12-PCB-031	6000	15.75	94	70-130
13C12-PCB-095	6000	19.07	80	70-130
13C12-PCB-153	6000	24.15	76	70-130

Cleanup Standards	pg	Time	% Rec	Limits
13C12-PCB-028	4000	15.93	62	5-145
13C12-PCB-111	4000	21.99	68	10-145
13C12-PCB-178	4000	25.05	72	10-145

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** CITY-20190711-0719  
 ALS Sample ID L2316030-2  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190814A32  
 Run Date 15-Aug-19 09:54  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
<b>Homologue Group Totals</b>							
Total MonoCB			87.9	2.5	J		200
Total DiCB			780	7.3	J		400
Total TriCB			783	3.4	J		400
Total TetraCB			537	2.4	J		800
Total PentaCB			454	1.9	J		800
Total HexaCB			161	1.6	J		800
Total HeptaCB			28.8	1.5	J		400
Total OctaCB			3.70	2.1	J		400
Total NonaCB			56.8	4.3	J		200
DecaCB			31.8	3.9	J		200
Total PCB			2920		J		1600

**Toxic Equivalency - (WHO 2005)**

Lower Bound PCB TEQ	0.00209
Mid Point PCB TEQ	0.226
Upper Bound PCB TEQ	0.450

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that the analyte was positively identified. The associated numerical result is an estimate.  
 R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 EMPC Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** RESIDENTIAL-20190713-0719  
 ALS Sample ID L2316030-3  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190814A33  
 Run Date 15-Aug-19 10:36  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.87	27.2	2.7	J		50
PCB-002		10.28	8.93	2.5	J		50
PCB-003		10.41	20.4	3.1	M,J		50
PCB-004		10.56	96.7	14			50
PCB-010		10.69	<8.0	8.0	M,U	4.9	50
PCB-009		NotFnd	<8.0	8.0	U		50
PCB-007		NotFnd	<7.9	7.9	U		50
PCB-006		12.11	<30	7.9	J,R	30	50
PCB-005		NotFnd	<8.6	8.6	U		50
PCB-008		12.37	113	7.3			50
PCB-014		NotFnd	<8.2	8.2	U		50
PCB-011		13.86	262	8.5	B		50
PCB-012/013		14.07	<11	8.3	M,J,R	11	50
PCB-015		14.25	34.8	9.7	J		50
PCB-019		12.57	21.7	5.2	J		50
PCB-018/030		13.68	110	4.0			50
PCB-017		13.93	<44	4.7	J,R	44	50
PCB-027		14.06	<7.4	3.4	J,R	7.4	50
PCB-024		14.15	<3.5	3.5	M,U	1.7	50
PCB-016		14.21	<48	5.6	M,J,R	48	50
PCB-032		14.51	<29	3.2	J,R	29	50
PCB-034		NotFnd	<4.0	4.0	U		50
PCB-023		NotFnd	<4.0	4.0	U		50
PCB-026/029		15.48	27.8	3.9	J		50
PCB-025		15.62	11.0	3.8	J		50
PCB-031		15.79	109	3.7			50
PCB-020/028		15.97	121	3.9	B		50
PCB-021/033		16.10	73.8	4.0			50
PCB-022		16.34	46.6	4.1	J		50
PCB-036		NotFnd	<3.5	3.5	U		50
PCB-039		NotFnd	<3.7	3.7	U		50
PCB-038		NotFnd	<4.0	4.0	U		50
PCB-035		17.96	<5.1	3.9	J,R	5.1	50
PCB-037		18.21	<18	4.9	J,R	18	50
PCB-054		NotFnd	<2.9	2.9	U		50
PCB-050/053		15.64	12.5	3.0	J		50
PCB-045/051		16.05	<16	3.1	J,R	16	50
PCB-046		16.21	<3.8	3.5	J,R	3.8	50
PCB-052		16.96	114	3.0	B		50
PCB-073		NotFnd	<2.3	2.3	U		50
PCB-043		NotFnd	<3.7	3.7	U		50
PCB-049/069		17.23	46.0	2.8	J		50
PCB-048		17.40	<19	3.1	J,R	19	50
PCB-044/047/065		NotFnd	<2.9	2.9	U		50
PCB-059/062/075		17.72	<6.2	2.3	J,R	6.2	50
PCB-042		17.81	18.6	3.6	J		50
PCB-040/041/071		18.09	37.4	3.1	M,J		50
PCB-064		18.21	31.7	2.5	J,B		50
PCB-072		NotFnd	<2.9	2.9	U		50
PCB-068		NotFnd	<2.8	2.8	U		50
PCB-057		NotFnd	<3.0	3.0	U		50
PCB-058		NotFnd	<3.0	3.0	U		50
PCB-067		NotFnd	<2.9	2.9	U		50
PCB-063		NotFnd	<2.6	2.6	U		50
PCB-061/070/074/076		19.56	83.7	3.1			50
PCB-066		19.74	27.2	2.9	J		50
PCB-055		NotFnd	<3.1	3.1	U		50
PCB-056		20.13	16.2	3.1	J		50
PCB-060		20.24	9.62	3.1	J		50
PCB-080		NotFnd	<2.6	2.6	U		50
PCB-079		NotFnd	<2.6	2.6	U		50
PCB-078		NotFnd	<3.1	3.1	U		50
PCB-081	0.0003	NotFnd	<3.3	3.3	U		50
PCB-077	0.0001	22.09	<4.0	3.5	M,J,R	4.0	50
PCB-104		NotFnd	<2.9	2.9	U		50
PCB-096		NotFnd	<2.4	2.4	U		50
PCB-103		18.73	<3.6	3.6	U	0.85	50
PCB-094		NotFnd	<4.4	4.4	U		50
PCB-095		19.10	69.4	3.8	B		50
PCB-093/098/100/102		NotFnd	<4.1	4.1	U		50

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** RESIDENTIAL-20190713-0719  
 ALS Sample ID L2316030-3  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190814A33  
 Run Date 15-Aug-19 10:36  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.57	<9.5	4.1	J,R	9.5	50
PCB-084		19.71	<16	4.5	M,J,R	16	50
PCB-089		NotFnd	<4.3	4.3	U		50
PCB-121		NotFnd	<3.0	3.0	U		50
PCB-092		20.33	14.3	4.1	J		50
PCB-090/101/113		20.64	66.4	3.5			50
PCB-083/099		20.95	29.0	4.1	J		50
PCB-112		NotFnd	<2.9	2.9	U		50
PCB-086/087/097/109/119/125		21.29	41.9	3.6	M,J		50
PCB-085/110/115/116/117		21.70	75.2	3.3	M		50
PCB-082		21.90	5.41	4.7	J		50
PCB-111		NotFnd	<3.0	3.0	U		50
PCB-120		NotFnd	<2.9	2.9	U		50
PCB-108/124		NotFnd	<3.0	3.0	U		50
PCB-107		NotFnd	<2.8	2.8	U		50
PCB-123	0.00003	NotFnd	<3.5	3.5	U		50
PCB-106		NotFnd	<3.1	3.1	U		50
PCB-118	0.00003	23.26	28.5	3.1	J		50
PCB-122		NotFnd	<3.3	3.3	U		50
PCB-114	0.00003	NotFnd	<3.3	3.3	U		50
PCB-105	0.00003	23.91	<9.2	3.3	J,R	9.2	50
PCB-127		NotFnd	<2.9	2.9	U		50
PCB-126	0.1	NotFnd	<3.4	3.4	U		50
PCB-155		NotFnd	<1.5	1.5	U		50
PCB-152		NotFnd	<1.4	1.4	U		50
PCB-150		NotFnd	<1.4	1.4	U		50
PCB-136		20.95	7.17	1.4	J		50
PCB-145		NotFnd	<1.5	1.5	U		50
PCB-148		NotFnd	<1.9	1.9	U		50
PCB-135/151		22.17	15.7	2.0	M,J		50
PCB-154		NotFnd	<1.7	1.7	U		50
PCB-144		22.47	<2.4	1.9	M,J,R	2.4	50
PCB-147/149		22.65	<28	2.9	J,R	28	50
PCB-134/143		NotFnd	<3.5	3.5	U		50
PCB-139/140		NotFnd	<3.0	3.0	U		50
PCB-131		NotFnd	<4.0	4.0	U		50
PCB-142		NotFnd	<3.4	3.4	U		50
PCB-132		23.34	10.4	3.5	J		50
PCB-133		NotFnd	<3.3	3.3	U		50
PCB-165		NotFnd	<2.6	2.6	U		50
PCB-146		23.88	<5.5	2.9	J,R	5.5	50
PCB-161		NotFnd	<2.3	2.3	U		50
PCB-153/168		24.20	25.7	2.5	J,B		50
PCB-141		24.32	5.87	3.1	J		50
PCB-130		NotFnd	<3.5	3.5	U		50
PCB-137/164		24.72	3.69	2.7	M,J		50
PCB-129/138/163		24.88	25.0	3.0	J		50
PCB-160		NotFnd	<2.5	2.5	U		50
PCB-158		NotFnd	<2.1	2.1	U		50
PCB-128/166		NotFnd	<2.7	2.7	U		50
PCB-159		NotFnd	<2.1	2.1	U		50
PCB-162		NotFnd	<2.3	2.3	U		50
PCB-167	0.00003	NotFnd	<2.0	2.0	U		50
PCB-156/157	0.00003	NotFnd	<2.8	2.8	U	100	
PCB-169	0.03	NotFnd	<2.2	2.2	U		50
PCB-188		NotFnd	<2.6	2.6	U		50
PCB-179		23.71	5.42	2.4	M,J		50
PCB-184		NotFnd	<2.3	2.3	U		50
PCB-176		NotFnd	<2.4	2.4	U		50
PCB-186		NotFnd	<2.5	2.5	U		50
PCB-178		NotFnd	<3.3	3.3	U		50
PCB-175		NotFnd	<3.1	3.1	U		50
PCB-187		25.54	<8.8	2.9	J,R	8.8	50
PCB-182		NotFnd	<3.0	3.0	U		50
PCB-183		NotFnd	<2.9	2.9	U		50
PCB-185		NotFnd	<3.2	3.2	U		50
PCB-174		26.01	<3.9	3.0	M,J,R	3.9	50
PCB-177		26.26	<5.3	3.2	M,J,R	5.3	50
PCB-181		NotFnd	<3.1	3.1	U		50
PCB-171/173		NotFnd	<3.3	3.3	U		50
PCB-172		NotFnd	<3.1	3.1	U		50



# ALS Life Sciences

## Sample Analysis Report

**Sample Name** RESIDENTIAL-20190713-0719  
 ALS Sample ID L2316030-3  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information**

**Run 1**

Filename 5-190814A33  
 Run Date 15-Aug-19 10:36  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<2.6	2.6	U		50
PCB-180/193		27.71	<5.0	2.7	J,R	5.0	50
PCB-191		NotFnd	<2.3	2.3	U		50
PCB-170		NotFnd	<3.2	3.2	U		50
PCB-190		NotFnd	<2.1	2.1	U		50
PCB-189	0.00003	NotFnd	<2.3	2.3	U		50
PCB-202		26.29	<4.2	2.2	J,R	4.2	50
PCB-201		26.76	2.37	2.1	J		50
PCB-204		NotFnd	<2.1	2.1	U		50
PCB-197		NotFnd	<2.1	2.1	U		50
PCB-200		27.30	2.99	2.1	J		50
PCB-198/199		28.72	<4.1	2.7	J,R	4.1	50
PCB-196		NotFnd	<2.6	2.6	U		50
PCB-203		NotFnd	<2.4	2.4	U		50
PCB-195		NotFnd	<3.0	3.0	U		50
PCB-194		NotFnd	<2.7	2.7	U		50
PCB-205		NotFnd	<2.4	2.4	U		50
PCB-208		29.73	22.0	5.3	J		50
PCB-207		30.20	<18	5.0	J,R	18	50
PCB-206		NotFnd	<8.4	8.4	U		50
PCB-209		33.62	<29	3.6	J,R	29	50

**Extraction Standards**

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.85	42	5-145
13C12-PCB-003	4000	10.40	42	5-145
13C12-PCB-004	4000	10.55	44	5-145
13C12-PCB-015	4000	14.24	45	5-145
13C12-PCB-019	4000	12.55	45	5-145
13C12-PCB-037	4000	18.19	68	5-145
13C12-PCB-054	4000	14.42	57	5-145
13C12-PCB-081	4000	21.78	87	10-145
13C12-PCB-077	4000	22.07	89	10-145
13C12-PCB-104	4000	17.48	71	10-145
13C12-PCB-123	4000	23.08	91	10-145
13C12-PCB-118	4000	23.25	97	10-145
13C12-PCB-114	4000	23.55	93	10-145
13C12-PCB-105	4000	23.89	98	10-145
13C12-PCB-126	4000	25.48	104	10-145
13C12-PCB-155	4000	20.49	84	10-145
13C12-PCB-167	4000	26.40	104	10-145
13C12-PCB-156/157	8000	27.02	102	10-145
13C12-PCB-169	4000	28.68	124	10-145
13C12-PCB-188	4000	23.49	84	10-145
13C12-PCB-189	4000	29.97	121	10-145
13C12-PCB-202	4000	26.27	97	10-145
13C12-PCB-205	4000	31.37	106	10-145
13C12-PCB-208	4000	29.71	89	10-145
13C12-PCB-206	4000	32.45	102	10-145
13C12-PCB-209	4000	33.59	113	10-145

**Field Spike Standards**

13C12-PCB-031	6000	15.78	90	70-130
13C12-PCB-095	6000	19.09	72	70-130
13C12-PCB-153	6000	24.19	72	70-130

**Cleanup Standards**

13C12-PCB-028	4000	15.95	59	5-145
13C12-PCB-111	4000	22.02	72	10-145
13C12-PCB-178	4000	25.07	80	10-145

# ALS Life Sciences

## Sample Analysis Report

**Sample Name** RESIDENTIAL-20190713-0719  
 ALS Sample ID L2316030-3  
 Analysis Method EPA 1668C  
 Analysis Type Sample  
 Sample Matrix PUF

Sampling Date 19-Jul-19  
 Extraction Date 12-Aug-19  
 Sample Size 1 Puf  
 Percent Moisture n/a  
 Split Ratio 2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information** **Run 1**  
 Filename 5-190814A33  
 Run Date 15-Aug-19 10:36  
 Final Volume 25 ul  
 Dilution Factor 1  
 Analysis Units pg  
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
<b>Homologue Group Totals</b>							
Total MonoCB			56.5	2.5	J	200	
Total DiCB			548	7.3	J	400	
Total TriCB			672	3.2	J	400	
Total TetraCB			446	2.3	J	800	
Total PentaCB			365	2.4	J	800	
Total HexaCB			129	1.4	J	800	
Total HeptaCB			28.4	2.1	J	400	
Total OctaCB			13.7	2.1	J	400	
Total NonaCB			40.0	5.0	J	200	
DecaCB			29.0	3.6	J	200	
Total PCB			2330		J	1600	

**Toxic Equivalency - (WHO 2005)**

Lower Bound PCB TEQ	0.000855
Mid Point PCB TEQ	0.205
Upper Bound PCB TEQ	0.409

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.  
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency  
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.  
 M Indicates that a peak has been manually integrated.  
 U Indicates that this compound was not detected above the EDL.  
 J Indicates that the analyte was positively identified. The associated numerical result is an estimate.  
 R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.  
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.  
 EMPC Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

# **SVOC DATA PACKAGE**

## **SECTION 3: METHOD SUMMARY**

**PCB METHOD SUMMARY  
Method 1668**

**Introduction:**

This summary is to provide ALSE Burlington PCB method details in order to provide persons reviewing or validating this data package sufficient information to re-construct the sample calculation, data verification and review. It incorporates the analysis of PCBs via the following reference methods:

US EPA Office of Water, Method 1668A  
US EPA Office of Water, Method 1668C

Any deviations to what is listed herein would be listed in the project narrative.

To avoid the confusion and conflicting nomenclature within the methods, we have defined the labeled standards in terms relating to the time of addition to the sample or extract. Therefore;

The Field or Sampling Standards are added prior to field sampling  
The Extraction Standards are added prior to extraction  
The Clean-up Standards are added prior to extract clean-up  
The Injection Standards are added prior to extract injection.

**Calibration Standard Levels:**

Six levels of standard are available for calibration as listed in Table 1. The low point (the CS0) is below method requirements and therefore is optional.

**Table 1. Concentration of CB congeners in calibration and calibration verification standards**

Solution concentration (ng/mL)

CB congener	IUPAC <sup>1</sup>	CS-0.2 (Hi sens)2	CS-1	CS-2	CS-3 (VER)	CS-4	CS-5
<b>Native Toxics/LOC</b>							
2-MoCB	1	0.2	1	5	50	400	2000
4-MoCB	3	0.2	1	5	50	400	2000
2,2'-DiCB	4	0.2	1	5	50	400	2000
4,4'-DiCB	15	0.2	1	5	50	400	2000
2,2',6'-TriCB	19	0.2	1	5	50	400	2000
3,4,4'-TriCB	37	0.2	1	5	50	400	2000
2,2',6,6'-TeCB	54	0.2	1	5	50	400	2000
3,3',4,4'-TeCB	77	0.2	1	5	50	400	2000
3,4,4',5'-TeCB	81	0.2	1	5	50	400	2000
2,2',4,6,6'-PeCB	104	0.2	1	5	50	400	2000
2,3,3',4,4'-PeCB	105	0.2	1	5	50	400	2000
2,3,4,4',5'-PeCB	114	0.2	1	5	50	400	2000
2,3',4,4',5'-PeCB	118	0.2	1	5	50	400	2000
2',3,4,4',5'-PeCB	123	0.2	1	5	50	400	2000
3,3',4,4',5'-PeCB	126	0.2	1	5	50	400	2000
2,2',4,4',6,6'-HxCB	155	0.2	1	5	50	400	2000
2,3,3',4,4',5'-HxCB	156	0.2	1	5	50	400	2000
2,3,3',4,4',5'-HxCB	157	0.2	1	5	50	400	2000
2,3',4,4',5,5'-HxCB	167	0.2	1	5	50	400	2000
3,3',4,4',5,5'-HxCB	169	0.2	1	5	50	400	2000
2,2',3,4',5,6,6'-HpCB	188	0.2	1	5	50	400	2000
2,3,3',4,4',5,5'-HpCB	189	0.2	1	5	50	400	2000
2,2',3,3',5,5',6,6'-OcCB	202	0.2	1	5	50	400	2000
2,3,3',4,4',5,5',6'-OcCB	205	0.2	1	5	50	400	2000
2,2',3,3',4,4',5,5',6'-NoCB	206	0.2	1	5	50	400	2000
2,2',3,3',4,4',5,5',6,6'-NoCB	208	0.2	1	5	50	400	2000
DeCB 209	209	0.2	1	5	50	400	2000
<b>Labeled Toxics/LOC/window-defining</b>							
13C12-2-MoCB	1L	100	100	100	100	100	100
13C12-4-MoCB	3L	100	100	100	100	100	100
13C12-2,2'-DiCB	4L	100	100	100	100	100	100
13C12-4,4'-DiCB	15L	100	100	100	100	100	100
13C12-2,2',6'-TriCB	19L	100	100	100	100	100	100
13C12-3,4,4'-TriCB	37L	100	100	100	100	100	100
13C12-2,2',6,6'-TeCB	54L	100	100	100	100	100	100
13C12-3,3',4,4'-TeCB	77L	100	100	100	100	100	100
13C12-3,4,4',5'-TeCB	81L	100	100	100	100	100	100
13C12-2,2',4,6,6'-PeCB	104L	100	100	100	100	100	100
13C12-2,3,3',4,4'-PeCB	105L	100	100	100	100	100	100
13C12-2,3,4,4',5'-PeCB	114L	100	100	100	100	100	100
13C12-2,3',4,4',5'-PeCB	118L	100	100	100	100	100	100
13C12-2',3,4,4',5'-PeCB	123L	100	100	100	100	100	100
13C12-3,3',4,4',5'-PeCB	126L	100	100	100	100	100	100
13C12-2,2',4,4',6,6'-HxCB	155L	100	100	100	100	100	100
13C12-2,3,3',4,4',5'-HxCB	156L	100	100	100	100	100	100
13C12-2,3,3',4,4',5'-HxCB	157L	100	100	100	100	100	100
13C12-2,3',4,4',5,5'-HxCB	167L	100	100	100	100	100	100
13C12-3,3',4,4',5,5'-HxCB	169L	100	100	100	100	100	100
13C12-2,2',3,4',5,6,6'-HpCB	188L	100	100	100	100	100	100
13C12-2,3,3',4,4',5,5'-HpCB	189L	100	100	100	100	100	100
13C12-2,2',3,3',5,5',6,6'-OcCB	202L	100	100	100	100	100	100
13C12-2,3,3',4,4',5,5',6'-OcCB	205L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5,5',6'-NoCB	206L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5,5',6,6'-NoCB	208L	100	100	100	100	100	100
13C12-DeCB 209L	209L	100	100	100	100	100	100
<b>Labeled clean-up</b>							
13C12-2,4,4'-TriCB	28L	100	100	100	100	100	100
13C12-2,3,3',5,5'-PeCB	111L	100	100	100	100	100	100
13C12-2,2',3,3',5,5',6'-HpCB	178L	100	100	100	100	100	100
<b>Labeled injection internal</b>							
13C12-2,5'-DiCB	9L	100	100	100	100	100	100
13C12-2,2',5,5'-TeCB	52L	100	100	100	100	100	100
13C12-2,2',4,4',5,5'-PeCB	101L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5'-HxCB	138L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5,5'-OcCB	194L	100	100	100	100	100	100

**Method Control Limits for 1668A**

The initial and continuing calibration control limits for both methods are presented in Table 2 below. For the initial calibration CS1 and for each calibration verification CS3, the signal to noise ratio for each quantification ion for labelled and non-labelled analytes must be greater than or equal to 10:1

**Table 2A. QC acceptance criteria for chlorinated biphenyls in VER, IPR, OPR, and samples <sup>1</sup>**

Congener	IUPAC Number <sup>2</sup>	Test conc (ng/mL)	VER (%)	IPR		OPR (%)	Labelled compound recovery in samples (%)
				RSD (%)	X (%)		
2-MoCB	1	50	70-130	40	60-140	50-150	
4-MoCB	3	50	70-130	40	60-140	50-150	
2,2'-DiCB	4	50	70-130	40	60-140	50-150	
4,4'-DiCB	15	50	70-130	40	60-140	50-150	
2,2',6-TrCB	19	50	70-130	40	60-140	50-150	
3,4,4'-TrCB	37	50	70-130	40	60-140	50-150	
2,2',6,6'-TeCB	54	50	70-130	40	60-140	50-150	
3,3',4,4'-TeCB	77	50	70-130	40	60-140	50-150	
3,4,4',5-TeCB	81	50	70-130	40	60-140	50-150	
2,2',4,6,6'-PeCB	104	50	70-130	40	60-140	50-150	
2,3,3',4,4'-PeCB	105	50	70-130	40	60-140	50-150	
2,3,4,4',5-PeCB	114	50	70-130	40	60-140	50-150	
2,3',4,4',5-PeCB	118	50	70-130	40	60-140	50-150	
2',3,4,4',5-PeCB	123	50	70-130	40	60-140	50-150	
3,3',4,4',5-PeCB	126	50	70-130	40	60-140	50-150	
2,2',4,4',6,6'-HxCB	155	50	70-130	40	60-140	50-150	
2,3,3',4,4',5-HxCB <sup>3</sup>	156	50	70-130	40	60-140	50-150	
2,3,3',4,4',5'-HxCB <sup>3</sup>	157	50	70-130	40	60-140	50-150	
2,3',4,4',5,5'-HxCB	167	50	70-130	40	60-140	50-150	
3,3',4,4',5,5'-HxCB	169	50	70-130	40	60-140	50-150	
2,2',3,4',5,6,6'-HpCB	188	50	70-130	40	60-140	50-150	
2,3,3',4,4',5,5'-HpCB	189	50	70-130	40	60-140	50-150	
2,2',3,3',5,5',6,6'-OcCB	202	50	70-130	40	60-140	50-150	
2,3,3',4,4',5,5',6-OcCB	205	50	70-130	40	60-140	50-150	
2,2',3,3',4,4',5,5',6-NoCB	206	50	70-130	40	60-140	50-150	
2,2',3,3',4,4',5,5',6,6'-NoCB	208	50	70-130	40	60-140	50-150	
DeCB	209	50	70-130	40	60-140	50-150	
13C12-2-MoCB	1L	100	50-150	50	35-135	30-140	25-150
13C12-4-MoCB	3L	100	50-150	50	35-135	30-140	25-150
13C12-2,2'-DiCB	4L	100	50-150	50	35-135	30-140	25-150
13C12-4,4'-DiCB	15L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',6-TrCB	19L	100	50-150	50	35-135	30-140	25-150
13C12-3,4,4'-TrCB	37L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',6,6'-TeCB	54L	100	50-150	50	35-135	30-140	25-150
13C12-3,3',4,4'-TCB	77L	100	50-150	50	35-135	30-140	25-150
13C12-3,4,4',5-TeCB	81L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',4,6,6'-PeCB	104L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4'-PeCB	105L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,4,4',5-PeCB	114L	100	50-150	50	35-135	30-140	25-150
13C12-2,3',4,4',5-PeCB	118L	100	50-150	50	35-135	30-140	25-150
13C12-2',3,4,4',5-PeCB	123L	100	50-150	50	35-135	30-140	25-150
13C12-3,3',4,4',5-PeCB	126L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',4,4',6,6'-HxCB	155L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4',5-HxCB <sup>3</sup>	156L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4',5'-HxCB <sup>3</sup>	157L	100	50-150	50	35-135	30-140	25-150
13C12-2,3',4,4',5,5'-HxCB	167L	100	50-150	50	35-135	30-140	25-150
13C12-3,3',4,4',5,5'-HxCB	169L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,4',5,6,6'-HpCB	188L	100	50-150	50	35-135	30-140	25-150
13C12-2',3,3',4,4',5,5'-HpCB	189L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',5,5',6,6'-OcCB	202L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4',5,5',6-OcCB	205L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',4,4',5,5',6-NoCB	206L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',4,4',5,5',6,6'-NoCB	208L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',4,4',5,5',6,6'-DeCB	209L	100	50-150	50	35-135	30-140	25-150
<b>Cleanup standard</b>							
13C12-2,4,4'-TrCB	28L	100	60-130	45	45-120	40-125	30-135
13C12-2,3,3',5,5'-PeCB	111L	100	60-130	45	45-120	40-125	30-135
13C12-2,2',3,3',5,5',6-HpCB	178L	100	60-130	45	45-120	40-125	30-135

1. QC acceptance criteria for IPR, OPR, and samples based on a 20 ul extract final volume

2. Suffix "L" indicates labelled compound.

3. PCBs 156 and 157 are tested as the sum of two concentrations

**Method Control Limits for 1668C**

The initial and continuing calibration control limits for both methods are presented in Table 2 below. For the initial calibration CS1 and for each calibration verification CS3, the signal to noise ratio for each quantification ion for labelled and non-labelled analytes must be greater than or equal to 10:1

**Table 2A. QC acceptance criteria for chlorinated biphenyls in VER, IPR, OPR, and samples <sup>1</sup>**

Congener	IUPAC Number <sup>2</sup>	Test conc (ng/mL)	VER (%)	IPR		OPR (%)	Labelled compound recovery in samples (%)
				RSD (%)	X (%)		
2-MoCB	1	50	75 - 125	25	70 - 130	60 - 135	
4-MoCB	3	50	75 - 125	25	70 - 130	60 - 135	
2,2'-DiCB	4	50	75 - 125	25	70 - 130	60 - 135	
4,4'-DiCB	15	50	75 - 125	25	70 - 130	60 - 135	
2,2',6-TrCB	19	50	75 - 125	25	70 - 130	60 - 135	
3,4,4'-TrCB	37	50	75 - 125	25	70 - 130	60 - 135	
2,2',6,6'-TeCB	54	50	75 - 125	25	70 - 130	60 - 135	
3,3',4,4'-TeCB	77	50	75 - 125	25	70 - 130	60 - 135	
3,4,4',5-TeCB	81	50	75 - 125	25	70 - 130	60 - 135	
2,2',4,6,6'-PeCB	104	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4'-PeCB	105	50	75 - 125	25	70 - 130	60 - 135	
2,3,4,4',5-PeCB	114	50	75 - 125	25	70 - 130	60 - 135	
2,3',4,4',5-PeCB	118	50	75 - 125	25	70 - 130	60 - 135	
2',3,4,4',5-PeCB	123	50	75 - 125	25	70 - 130	60 - 135	
3,3',4,4',5-PeCB	126	50	75 - 125	25	70 - 130	60 - 135	
2,2',4,4',6,6'-HxCB	155	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5-HxCB <sup>3</sup>	156	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5'-HxCB <sup>3</sup>	157	50	75 - 125	25	70 - 130	60 - 135	
2,3',4,4',5,5'-HxCB	167	50	75 - 125	25	70 - 130	60 - 135	
3,3',4,4',5,5'-HxCB	169	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,4',5,6,6'-HpCB	188	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5,5'-HpCB	189	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,3',5,5',6,6'-OcCB	202	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5,5',6-OcCB	205	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,3',4,4',5,5',6-NoCB	206	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,3',4,5,5',6,6'-NoCB	208	50	75 - 125	25	70 - 130	60 - 135	
DeCB	209	50	75 - 125	25	70 - 130	60 - 135	
13C12-2-MoCB	1L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-4-MoCB	3L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-2,2'-DiCB	4L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-4,4'-DiCB	15L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-2,2',6-TrCB	19L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-3,4,4'-TrCB	37L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-2,2',6,6'-TeCB	54L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-3,3',4,4'-TeCB	77L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-3,4,4',5-TeCB	81L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',4,6,6'-PeCB	104L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4'-PeCB	105L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,4,4',5-PeCB	114L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3',4,4',5-PeCB	118L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2',3,4,4',5-PeCB	123L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-3,3',4,4',5-PeCB	126L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',4,4',6,6'-HxCB	155L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4',5-HxCB <sup>3</sup>	156L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4',5'-HxCB <sup>3</sup>	157L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3',4,4',5,5'-HxCB	167L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-3,3',4,4',5,5'-HxCB	169L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,4',5,6,6'-HpCB	188L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2',3,3',4,4',5,5'-HpCB	189L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',5,5',6,6'-OcCB	202L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4',5,5',6-OcCB	205L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',4,4',5,5',6-NoCB	206L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',4,5,5',6,6'-NoCB	208L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',4,4',5,5',6,6'-DeCB	209L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
<b>Cleanup standards</b>							
13C12-2,4,4'-TrCB	28L	100	65 - 135	70	20 - 135	5 - 145	5 - 145
13C12-2,3,3',5,5'-PeCB	111L	100	75 - 125	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',5,5',6-HpCB	178L	100	75 - 125	50	45 - 135	10 - 145	10 - 145

1. QC acceptance criteria for IPR, OPR, and samples based on a 20-µL extract final volume  
 2. Suffix "L" indicates labeled compound.  
 3. CBs 156/157 and 156L/157L are tested as the sum of the two congeners

**Reporting Limits:**

Unless indicated in the otherwise, the PCB results are reported down to 2.5:1 signal to noise for each isomer grouping for each extract injection. This is consistent to SW846 8290 defined protocols (i.e. EDL or Estimated Detection Limit) and is commonly applied throughout the industry to any or all the HRMS performance based methods applicable to this method summary.

**Method Blank:**

The Method Blank must be below the EMLs published in the required method, 1668A or 1668C.

**MS/MSD:**

The % relative difference between the MS and MSD spike recoveries should be less than or equal to 20%.

**Instrument/Run Performance Criteria:**

- 1 Elution windows must be defined by a 'Window Performance Mix' at the beginning of each 12-hour run sequence
- 2 GC performance criteria of 40% maximum valley between PCB-34/PCB-23, and PCB-187/PCB-182 (Octyl Column).
- 3 At the beginning of and just following the end of each 12 hour run sequence, the instrument must be checked to demonstrate a resolution of 10,000 within each quantification window (8,000 minimum across the window).
- 4 The relative retention times (RRT) of the compounds in the daily 209 congener mix must fall into the ranges presented in Table 4.
- 5 The RT in the daily CS3 verification standards must be within 15 seconds of the CS3 in the initial calibration run.
- 6 The maximum time between scans within a descriptor is 1 second.
- 7 Lock mass deviations to the average response must be less than or equal 20%.

**Laboratory Duplicates:**

The % relative difference between duplicates should be less than or equal to 25% but only where the response is greater than the low calibration standard.

**Analyte Identification Criteria:**

- 1 Ion ratio must be within 15% of theoretical or within 10% of the most recent CS3.
- 2 The retention time (RT) of the peak maxima for each pair of quantification ions must be no more than 2 seconds (i.e. 2 scans) difference.
- 3 The retention time (RT) of the peak maxima of all native analytes for which a labeled analogue is used must be within -1 to +3 seconds of the RT of corresponding <sup>13</sup>C<sub>12</sub>-labelled isomer of that injection run.
- 4 For those native analytes without a corresponding labelled isomer, the relative retention time (RRT) must be within 0.005 of the relative retention time observed in the daily 209 congener run.

## **DEVIATIONS AND CLARIFICATIONS FROM THE PRIMARY REFERENCES**

The reference methods applicable to this document are:

US EPA Office of Water, Method 1668A  
US EPA Office of Water, Method 1668C

These methods are referred-to herein as Method 1668

The following changes and clarifications apply:

1) As stated in method 1668, alternate columns and column systems are allowable changes to the method. In the context of the method, it is clear that Table 2 of this method (including retention times, relative retention times, and quantitation references) is specific to the Octyl GC column if used exactly as suggested in the method.

As a performance based method, changes in the internal standard references could be considered an improvement even when using the SPB-Octyl column. However when using an alternate column system (which may or may not include use of the Octyl column), optimization of the quantitation references can be an important part of optimizing the method. Consider that the MS acquisition method must be divided into mass descriptors or 'functions', each one defining the masses that are monitored during that time range. When monitoring for all 209 PCB congeners, there are large chromatographic regions where elution of target compounds is nearly continuous with little separation between peaks. In addition, there is a slight acquisition "gap" that occurs at each function change (for Water's instruments 1-2 seconds, for Thermo instruments 6-8 seconds), and also the likelihood of slight retention time shifts from one run to another. Consequently, choosing the exact location of each function boundary can be challenging. For a 1668 method, there are typically between 5 and 8 functions dependent upon the column, the GC conditions, the instrument and the choice of the function boundaries by the laboratory. Each function can have 1 to as many as 4 chlorination levels. When optimizing the quantification model in the case where RT and elution patterns have changed – even slightly - the best choice of internal standard references can and should change dependent upon target retention times and placement of function boundaries. For example, the best quantification is achieved using an internal standard reference that elutes at close to the same retention time. Another consideration is that it is best practice where possible (i.e. generally allows for more accurate target determinations) to have the internal standard reference within the same function rather than quantify a target relative to an internal standard from an outside function.

The quantification references used in this analysis are detailed in Table 3.

2) The absolute retention time criterion for decachlorobiphenyl of 55 minutes is not generally followed and is an unnecessary restriction since method 1668 was developed without the use of electronic pressure control on the GC injection system, and there are GC performance criteria that can be met without this restriction. As a result, the RRT criteria of 1668 may not be applicable.

3) Although not clearly stated in method 1668, we maintain that each and every individual clean-up procedure is, by definition, performance-based and optional. There is not an expectation within the industry to follow exactly the descriptions of clean-ups in reference methods. Adaptations which meet or exceed the required performance criteria are therefore acceptable within the scope of each reference method. The reference method descriptions are intended as guidelines or templates available to help the laboratory to define effective in-house clean-up methods. The objective within the laboratory is to provide quality clean extracts to the instrument for analysis. Each individual clean-up is part of the laboratory's available tools in order to achieve this objective.

4) There are differences within the individual reference methods as to the precise spiking protocols for adding extraction standards and native spikes (for LCS, MS and MSD). To ensure consistency within the laboratory between HRMS methods, the PCB preparative method requires solid samples (including stack and ambient sorbants/filters) to be spiked in the soxhlet extractor from a nonane solution and waters are spiked before filtering from an acetone solution. .

5) Sub-sampling of solids and pre-extraction processing is done in a manner that minimizes potential for cross-contamination. These processes are designed around SW846 protocols rather than 1668 protocols. Solids are sub-sampled directly from the bottle as submitted to the laboratory wherever practical. If the sample is submitted such that homogenization in the bottle is impractical (eg. the bottle is too full or lumps cannot be broken down), then transferring the sample to a tray or another bottle maybe in order.

6) The concentration of labelled and native spiking solutions are not consistent with those listed in all of the reference methods. These concentrations are prepared at levels convenient and expedient for accurate laboratory processing.

7) Extraction and injection standard concentrations differ from 1668, in order to aid precise measurement and standardise volumes with other reference methods such as PCDD/F by 1613B.

8) Method 1668C recognizes the option to use the 209 congener mix as the daily calibration verification solution rather than the CS3. This document acknowledges and allows either calibration option for both 1668A and 1668C analytical approaches.

9) For method 1668C analysis, the OPR labelled recovery limits are the same as for the sample recovery limits in method 1668C. This represents a broader acceptance range for the OPR than is currently listed in method 1668C. However, the control of the native (i.e. non-labelled) recovery limits is the key item to demonstrate/monitor in the OPR. Furthermore, in the OPR performance, it is important to demonstrate these native controls are maintained within the same range of labelled recoveries as is observed in the sample data.



**Table 3: Quantitation References for Native and Labeled CBs**

CI No. <sup>1</sup>	Congener No. <sup>2,3</sup>	RT Ref <sup>4</sup>	Quantitation Reference <sup>5</sup>
<b>Native Compounds</b>			
1	1	1L	1L
1	2	3L	1L/3L
1	3	3L	3L
2	4	4L	4L
2	10	4L	4L/15L
2	9	4L	4L/15L
2	7	4L	4L/15L
2	6	4L	4L/15L
2	5	4L	4L/15L
2	8	4L	4L/15L
2	14	15L	4L/15L
2	11	15L	4L/15L
2	13/12	15L	4L/15L
2	15	15L	15L
3	19	19L	19L
3	30/18	19L	19L/37L
3	17	19L	19L/37L
3	27	19L	19L/37L
3	24	19L	19L/37L
3	16	19L	19L/37L
3	32	19L	19L/37L
3	34	19L	19L/37L
3	23	19L	19L/37L
3	26/29	19L	19L/37L
3	25	37L	19L/37L
3	31	37L	19L/37L
3	28/20	37L	19L/37L
3	21/33	37L	19L/37L
3	22	37L	19L/37L
3	36	37L	19L/37L
3	39	37L	19L/37L
3	38	37L	19L/37L
3	35	37L	19L/37L
3	37	37L	37L
4	54	54L	54L
4	50/53	54L	54L/81L/77L
4	45/51	54L	54L/81L/77L
4	46	54L	54L/81L/77L
4	52	54L	54L/81L/77L
4	73	54L	54L/81L/77L
4	43	54L	54L/81L/77L
4	69/49	54L	54L/81L/77L
4	48	54L	54L/81L/77L
4	44/47/65	54L	54L/81L/77L
4	59/62/75	54L	54L/81L/77L
4	42	54L	54L/81L/77L
4	41/40/71	54L	54L/81L/77L
4	64	54L	54L/81L/77L
4	72	81L	54L/81L/77L
4	68	81L	54L/81L/77L

CI No. <sup>1</sup>	Congener No. <sup>2,3</sup>	RT Ref <sup>4</sup>	Quantitation Reference <sup>5</sup>
4	57	81L	54L/81L/77L
4	58	81L	54L/81L/77L
4	67	81L	54L/81L/77L
4	63	81L	54L/81L/77L
4	61/70/74/76	81L	54L/81L/77L
4	66	81L	54L/81L/77L
4	55	81L	54L/81L/77L
4	56	81L	54L/81L/77L
4	60	81L	54L/81L/77L
4	80	81L	54L/81L/77L
4	79	81L	54L/81L/77L
4	78	81L	54L/81L/77L
4	81	81L	81L
4	77	77L	77L
5	104	104L	104L
5	96	104L	104L/123L/114L/118L
5	103	104L	104L/123L/114L/118L
5	94	104L	104L/123L/114L/118L
5	95	104L	104L/123L/114L/118L
5	95/100/93/102/98	104L	104L/123L/114L/118L
5	88/91	104L	104L/123L/114L/118L
5	84	104L	104L/123L/114L/118L
5	89	104L	104L/123L/114L/118L
5	121	104L	104L/123L/114L/118L
5	92	123L	104L/123L/114L/118L
5	113/90/101	104L	104L/123L/114L/118L
5	83/99	104L	104L/123L/114L/118L
5	112	104L	104L/123L/114L/118L
5	108/119/86/97/125/87	104L	104L/123L/114L/118L
5	117/116/85/110/115	104L	104L/123L/114L/118L
5	82	104L	104L/123L/114L/118L
5	111	104L	104L/123L/114L/118L
5	120	104L	104L/123L/114L/118L
5	107/124	104L	104L/123L/114L/118L
5	109	104L	104L/123L/114L/118L
5	123	123L	123L
5	106	123L	104L/123L/114L/118L
5	118	118L	118L
5	122	118L	104L/123L/114L/118L
5	114	114L	114L
5	105	105L	105L
5	127	105L	104L/123L/114L/118L
5	126	126L	126L
6	155	155L	155L
6	152	155L	155L/156L/157L/167L
6	150	155L	155L/156L/157L/167L
6	136	155L	155L/156L/157L/167L
6	145	155L	155L/156L/157L/167L
6	148	155L	155L/156L/157L/167L
6	151/135	135L	155L/156L/157L/167L
6	154	155L	155L/156L/157L/167L
6	144	155L	155L/156L/157L/167L
6	147/149	155L	155L/156L/157L/167L
6	134/143	155L	155L/156L/157L/167L

CI No. <sup>1</sup>	Congener No. <sup>2,3</sup>	RT Ref <sup>4</sup>	Quantitation Reference <sup>5</sup>
6	139/140	155L	155L/156L/157L/167L
6	131	155L	155L/156L/157L/167L
6	142	155L	155L/156L/157L/167L
6	132	155L	155L/156L/157L/167L
6	133	155L	155L/156L/157L/167L
6	165	167L	155L/156L/157L/167L
6	146	167L	155L/156L/157L/167L
6	161	167L	155L/156L/157L/167L
6	153/168	167L	155L/156L/157L/167L
6	141	167L	155L/156L/157L/167L
6	130	167L	155L/156L/157L/167L
6	137/164	167L	155L/156L/157L/167L
6	138/163/129	167L	155L/156L/157L/167L
6	160	167L	155L/156L/157L/167L
6	158	167L	155L/156L/157L/167L
6	128/166	167L	155L/156L/157L/167L
6	159	167L	155L/156L/157L/167L
6	162	167L	155L/156L/157L/167L
6	167	167L	155L/156L/157L/167L
6	156/157	156L/157L	156L/157L
6	169	169L	169L
7	188	188L	188L
7	179	188L	188L/189L
7	184	188L	188L/189L
7	176	188L	188L/189L
7	186	188L	188L/189L
7	178	188L	188L/189L
7	175	188L	188L/189L
7	187	188L	188L/189L
7	182	188L	188L/189L
7	183	188L	188L/189L
7	185	188L	188L/189L
7	174	188L	188L/189L
7	177	188L	188L/189L
7	181	188L	188L/189L
7	171/173	188L	188L/189L
7	172	189L	188L/189L
7	192	189L	188L/189L
7	180/193	189L	188L/189L
7	191	189L	188L/189L
7	170	189L	188L/189L
7	190	189L	188L/189L
7	189	189L	189L
8	202	202L	202L
8	201	202L	202L/205L
8	204	202L	202L/205L
8	197	202L	202L/205L
8	200	202L	202L/205L
8	198/199	202L	202L/205L
8	196	205L	202L/205L
8	203	205L	202L/205L
8	195	205L	202L/205L
8	194	205L	202L/205L
8	205	205L	205L
9	208	208L	208L
9	207	208L	208L/206L
9	206	206L	206L
10	209	209L	209L

CI No. <sup>1</sup>	Congener No. <sup>2,3</sup>	RT Ref <sup>4</sup>	Quantitation Reference <sup>5</sup>
<b>Labelled Extraction Standards</b>			
1	1L	9L	9L
1	3L	9L	9L
2	4L	9L	9L
2	15L	9L	9L
3	19L	9L	9L
3	37L	52L	52L
4	54L	52L	52L
4	81L	101L	101L
4	77L	101L	101L
5	104L	101L	101L
5	123L	101L	101L
5	118L	101L	101L
5	114L	101L	101L
5	105L	101L	101L
5	126L	101L	101L
6	155L	101L	101L
6	167L	138L	138L
6	156L/157L	157L	138L
6	169L	138L	138L
7	188L	138L	138L
7	189L	138L	138L
8	202L	138L	138L
8	205L	194L	194L
9	208L	194L	194L
9	206L	194L	194L
10	209L	194L	194L
<b>Labelled clean-up standards</b>			
3	28L	52L	52L
5	111L	101L	101L
7	178L	138L	138L
<b>Labelled injection internal standards</b>			
2	9L	138L	138L
4	52L	138L	138L
5	101L	138L	138L
6	138L	138L	138L
8	194L	138L	138L

1. Number of chlorines on congener.
2. Suffix "L" indicates labelled compound.
3. Multiple congeners in a box indicates a group of congeners that co-elute or may not be adequately resolved on a 30-m SPB-Octyl column. Congeners included in the group are listed as the last entry in the box.
4. Retention time reference that is used to locate target congener.
5. Labelled congeners that form the quantitation reference. Areas from the exact m/z's of the congeners listed in the quantitation

Table 5: HRMS Instrumental Descriptor Parameters

Function and chlorine level	m/z	m/z type	m/z formula	Substance
Fn-1; Cl-1	180.9888	QC	C4F7	PFK
	188.0393	M	12C12 H9 35Cl	Cl-1 CB
	190.0363	M+2	12C12 H9 37Cl	Cl-1 CB
	200.0795	M	13C12 H9 35Cl	13C12 Cl-1 CB
	202.0766	M+2	13C12 H9 37Cl	13C12 Cl-1 CB
	204.9983	QC	C6F7	PFK
	218.9856	lock	C4 F9	PFK
	230.9850	QC	C5F9	PFK
Fn-2; Cl-2,3	204.9883	QC	C6F7	PFK
	218.9856	QC	C4F9	PFK
	222.0003	M	12C12 H8 35Cl2	Cl-2 PCB
	223.9974	M+2	12C12 H8 35Cl 37Cl	Cl-2 PCB
	225.9944	M+4	12C12 H8 37Cl2	Cl-2 PCB
	234.0406	M	13C12 H8 35Cl2	13C12 Cl-2 PCB
	236.0376	M+2	13C12 H8 35Cl 37 Cl	13C12 Cl-2 PCB
	242.9856	lock	C6 F9	PFK
	255.9613	M	12C12 H7 35Cl3	Cl-3 PCB
	257.9584	M+2	12C12 H7 35Cl2 37Cl	Cl-3 PCB
	268.0016	M	13C12 H7 35Cl3	13C12 Cl-3 PCB
	269.9986	M+2	13C12 H7 35Cl2 37Cl 13C12	13C12 Cl-3 PCB
Fn-3 Cl-3,4,5	255.9613	M	12C12 H7 35Cl3	Cl-3 PCB
	257.9584	M+2	12C12 H7 35Cl2 37Cl	Cl-3 PCB
	268.0016	M	13C12 H7 35Cl3	13C12 Cl-3 PCB
	269.9986	M+2	13C12 H7 35Cl2 37Cl 13C12	13C12 Cl-3 PCB
	280.9825	lock	C6 F11	PFK
	289.9224	M	12C12 H6 35Cl4	Cl-4 PCB
	291.9194	M+2	12C12 H6 35Cl3 37Cl	Cl-4 PCB
	301.9626	M	13C12 H6 35Cl4	13C12 Cl-4 PCB
	303.9597	M+2	13C12 H6 35Cl3 37Cl	13C12 Cl-4 PCB
	323.8834	M	12C12 H5 35Cl5	Cl-5 PCB
	325.8804	M+2 1	2C12 H5 35Cl4 37Cl	Cl-5 PCB
	327.8775	M+4	12C12 H5 35Cl3 37Cl2	Cl-5 PCB
	337.9207	M+2	13C12 H5 35Cl4 37Cl	13C12 Cl-5 PCB
	339.9178	M+4	13C12 H5 35Cl3 37Cl2	13C12 Cl-5 PCB
	Fn-4 Cl-4,5,6	280.9824		C6 F11
289.9224		M	12C12 H6 35Cl4	Cl-4 PCB
291.9194		M+2	12C12 H6 35Cl3 37Cl	Cl-4 PCB
293.9165		M+4	12C12 H6 35Cl2 37Cl2	Cl-4 PCB
301.9626		M+2	13C12 H6 35Cl3 37Cl	13C12 Cl-4 PCB
303.9597		M+4	13C12 H6 35Cl2	13C12 Cl-4 PCB
323.8834		M	12C12 H5 35Cl5	Cl-5 PCB
325.8804		M+2	12C12 H5 35Cl4 37Cl	Cl-5 PCB
327.8775		M+4	12C12 H5 35Cl3 37Cl2	Cl-5 PCB
330.9792		lock	C7 F15	PFK
337.9207		M+2	13C12 H5 35Cl4 37Cl 13C12	Cl-5 PCB
339.9178		M+4	13C12 H5 35Cl3 37Cl2	13C12 Cl-5 PCB
359.8415		M+2	13C12 H4 35Cl5 37Cl	Cl-6 PCB
361.8385		M+4	13C12 H4 35Cl4 37Cl2	Cl-6 PCB
363.8356		M+6	13C12 H4 35Cl3 37Cl2	Cl-6 PCB
371.8817		M+2	13C12 H4 35Cl5 37Cl	13C12 Cl-6 PCB
373.8788		M+4	13C12 H4 35Cl4 37Cl2	13C12 Cl-6 PCB

Function and chlorine level	m/z	m/z type	m/z formula	Substance
Fn-5 Cl-5,6,7	323.8834	M	12C12 H5 35Cl5	Cl-5 PCB
	325.8804	M+2	12C12 H5 35Cl4 37Cl	Cl-5 PCB
	327.8775	M+4	12C12 H5 35Cl3 37Cl2	Cl-5 PCB
	337.9207	M+2	13C12 H5 35Cl4 37Cl	13C12 Cl-5 PCB
	339.9178	M+4	13C12 H5 35Cl3 37Cl2	13C12 Cl-5 PCB
	354.9792	lock	C9 F13	PFK
	359.8415	M+2	12C12 H4 35Cl5 37Cl	Cl-6 PCB
	361.8385	M+4	12C12 H4 35Cl4 37Cl2	Cl-6 PCB
	363.8356	M+6	12C12 H4 35Cl3 37Cl3	Cl-6 PCB
	371.8817	M+2	13C12 H4 35Cl5 37Cl	13C12 Cl-6 PCB
	373.8788	M+4	13C12 H4 35Cl4 37Cl2	13C12 Cl-6 PCB
	393.8025	M+2	12C12 H3 35Cl6 37Cl	Cl-7 PCB
	395.7995	M+4	12C12 H3 35Cl5 37Cl2	Cl-7 PCB
	397.7966	M+6	12C12 H3 35Cl4 37Cl3	Cl-7 PCB
	405.8428	M+2	13C12 H3 35Cl6 37Cl	13C12 Cl-7 PCB
	407.8398	M+4	13C12 H3 35Cl5 37Cl2	13C12 Cl-7 PCB
	427.7635	M+2	12C12 H2 35Cl7 37Cl	Cl-8 PCB
	429.7606	M+4	12C12 H2 35Cl6 37Cl2	Cl-8 PCB
	431.7576	M+6	12C12 H2 35Cl5 37Cl3	Cl-8 PCB
	439.8038	M+2	13C12 H2 35Cl7 37Cl	13C12 Cl-8 PCB
441.8008	M+4	13C12 H2 35Cl6 37Cl2	13C12 Cl-8 PCB	
Fn-6 Cl-7,8,9,10	393.8025	M+2	12C12 H3 35Cl6 37Cl	Cl-7 PCB
	395.7995	M+4	12C12 H3 35Cl5 37Cl2	Cl-7 PCB
	397.7966	M+6	12C12 H3 35Cl4 37Cl3	Cl-7 PCB
	405.8428	M+2	13C12 H3 35Cl6 37Cl 13C12	Cl-7 PCB
	407.8398	M+4	13C12 H3 35Cl5 37Cl2	13C12 Cl-7 PCB
	427.7635	M+2	12C12 H2 35Cl7 37Cl	Cl-8 PCB
	429.7606	M+4	12C12 H2 35Cl6 37Cl2	Cl-8 PCB
	431.7576	M+6	12C12 H2 35Cl5 37Cl3	Cl-8 PCB
	439.8038	M+2	13C12 H2 35Cl7 37Cl	13C12 Cl-8 PCB
	441.8008	M+4	13C12 H2 35Cl6 37Cl2	13C12 Cl-8 PCB
	442.9728	QC	C10 F13	PFK
	454.9728	lock	C11 F13	PFK
	461.7246	M+2	12C12 H1 35Cl8 37Cl	Cl-9 PCB
	463.7216	M+4	12C12 H1 35Cl7 37Cl2	Cl-9 PCB
	465.7187	M+6	12C12 H1 35Cl6 37Cl3	Cl-9 PCB
	473.7648	M+2	13C12 H1 35Cl8 37Cl	13C12 Cl-9 PCB
475.7619	M+4	13C12 H1 35Cl7 37Cl2	13C12 Cl-9 PCB	
495.6856	M+2	13C12 H4 35Cl9 37Cl	Cl-10 PCB	
Fn-7	497.6826	M+4	12C12 35Cl8 37Cl2	Cl-10 PCB
	499.6797	M+6	12C12 35Cl7 37Cl3	Cl-10 PCB
	509.7229	M+4	13C12 H4 35Cl8 37Cl2	13C12 Cl-10 PCB
	511.7199	M+6	13C12 H4 35Cl8 37Cl4	13C12 Cl-10 PCB
	516.9697	lock	C13F19	PFK

### Data Calculations:

#### a) Analyte Concentrations:

The relative response factor of each target relative to the standard against which it is to be calculated is determined using the area responses of both quantification ions via equation 9.1.

In cases where a native target is calculated against an exact labelled analogue, the quantification will be considered to be by isotope dilution. In other cases, the quantification will be considered to be by internal standard.

$$\text{RRF} = \frac{(A_{1t} + A_{2t}) C_s}{(A_{1s} + A_{2s}) C_t} \quad \text{Equ. 9.1}$$

Where,

$A_{1t} + A_{2t}$  = The areas of the two quantification ions for the target analyte

$A_{1s} + A_{2s}$  = The areas of the two quantification ions for the labelled compound against which the target analyte will be calculated.

$C_t$  = The concentration in the calibration standard of the target analyte.

$C_s$  = The concentration in the calibration standard of the labelled compound against which the target will be calculated.

For all analytes to be quantified and from the initial calibration series of standard injections, a table of RRFs is prepared. The relative standard deviation (%RSD, or the coefficient of variance) is checked to confirm that the appropriate method criteria has been met as listed in Table 3. The average of the five or six levels of standard for each analyte,  $\text{RRF}_{av}$  is applied for quantification of samples according to Equations 9.2 and 9.3 below.

$$\text{Amount in sample (pg)} = \frac{(A_{1n} + A_{2n}) Q_i}{(A_{1t} + A_{2t}) (\text{RRF}_{av})} \quad \text{Equ. 9.2}$$

$$\text{Concentration in sample (pg/g or pg/l)} = \frac{(A_{1n} + A_{2n}) Q_i}{(A_{1t} + A_{2t}) (\text{RRF}_{av}) (W_s)} \quad \text{Equ. 9.3}$$

Where,

$Q_i$  = The amount (pg) of labelled compound added to the sample

$W_s$  = The weight (g) or volume (l) of sample

#### b) Extraction, Clean-up, and Sampling Standard Recovery Calculation:

The extraction, clean-up, and sampling standard recoveries are determined by Equation 9.4 below.

$$\% \text{ Recovery} = (\text{Amount in sample}) / (\text{Amount added to sample}) \times 100 \quad \text{Equ. 9.4}$$

#### c) Estimated Detection Limit

$$\text{EDL} = \frac{2.5 \times H_x \times Q_{es}}{H_{es} \times W \times \text{RRF}_{av}} \quad \text{Equ. 9.5}$$

Where,

EDL = estimated detection limit for homologous PCB

$H_x$  = sum of the height of the noise level for each quantification ions for the unlabelled PCB.

$H_{es}$  = Sum of the heights of responses of both quantification ions for the labelled extraction standard.

$W$  = weight of volume of sample

$\text{RRF}_{av}$  = average relative response factor

$Q_{es}$  = Amount of extraction standard added

## Chromatogram Annotation Codes

All manually integrated peaks are expanded and reprinted with the following annotations:

\* Analyst Initials                    AA  
 \* Date                                    YYMMDD  
 \* integration code                    CC

The Syntax is:

AAYYMMDDCC

Example:

SK111220MB

Code	Mnemonic	Description
MB	Manual Baseline	The peak was manually integrated because the initial baseline was determined incorrectly by the software
MS	Manual Split	The peak was manually integrated because the peak was incorrectly or not split by the software
MJ/MC	Manual Join/Manual Combine	The peak was manually integrated because the peak was split by the software and the peak should be integrated as a single peak
MA	Manual Add	The peak was manually integrated because the signal:noise ratio was judged to be >2.5
MD	Manual Delete	The peak was excluded because the signal:noise ratio was judged to be <2.5
MX	Manual Exclude	The peak was excluded due to an interference
NH	Noise Height	The noise height for Estimated Detection Limit calculation was chosen by the analyst (automated noise height not appropriate)
MT	Manual Time	The peak retention time was manually chosen

The following explanatory annotation codes may appear on the chromatograms of peaks that have been reviewed:

Code	Mnemonic	Description
+	Detected Peak	A peak was detected at this mass and retention time that was above 2.5:1 signal to noise
<	Below Detection Limit	The signal at this mass and retention time was below 2.5:1 signal to noise
EMPC	Estimated Maximum Possible Concentration	The signal at this mass and retention time is an interference such that the target compound could not be confirmed
X-RT	Not Detected due to Retention Time non-conformance	The signal at this retention time could not be used to positively identify the target compound because of retention time non-conformance (apex of quantification and confirmation ions do not maximize within the same two seconds, or the retention time of the peak does not fall within the expected range with respect to its labeled analogue)
X-LOC	Not Detected due to interference from a higher level of chlorination	The signal at this retention time is attributable to a fragment from a co-eluting compound at a higher level of chlorination, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)
X-DPE	Not Detected due to diphenyl ether interference	The signal at this retention time is attributable to interference from a chlorinated diphenyl ether, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)
X-IF	Not Detected due to interference	The signal at this retention time is attributable to a co-eluting interference, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)



## **SVOC DATA PACKAGE**

### **SECTION 4: CALIBRATION DATA**

Including:

for Multi-Point Calibration(s)

- Multi-Point Calibration Tables
- Individual Quantitation Reports

for Continuing Calibration(s)

- Individual Quantitation Reports

# ALS Life Sciences

## Calibration Summary Report

Calibration Level	Filename	Run Date
CS-1	5-190502B01	02-May-2019 12:04
CS-2	5-190502B04	02-May-2019 14:13
CS-3	5-190502B03	02-May-2019 13:31
CS-4	5-190502B06	02-May-2019 15:38
CS-5	5-190502B05	02-May-2019 14:56

Approved:	<i>E. Sabljic</i> --e-signature-- 18-Jul-2019
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Target Analytes	Relative Response Factors					Mean	% RSD
	CS-1	CS-2	CS-3	CS-4	CS-5		
<b>PCB-001</b>	1.065	1.105	1.063	1.107		1.085	2%
<b>PCB-003</b>	1.124	1.134	1.117	1.153		1.132	1%
<b>PCB-004</b>	0.896	0.907	0.889	0.932	0.935	0.912	2%
<b>PCB-015</b>	0.987	1.060	1.025	1.084		1.039	4%
<b>PCB-019</b>	1.117	1.165	1.150	1.176	1.152	1.152	2%
<b>PCB-037</b>	1.025	1.074	1.024	1.073	1.075	1.054	3%
<b>PCB-054</b>	1.028	1.039	1.034	1.062	1.070	1.047	2%
<b>PCB-081</b>	1.278	1.195	1.141	1.187	1.172	1.195	4%
<b>PCB-077</b>	1.092	1.123	1.105	1.153	1.142	1.123	2%
<b>PCB-104</b>	1.116	1.175	1.138	1.166	1.156	1.150	2%
<b>PCB-123</b>	1.060	1.093	1.040	1.064	1.064	1.064	2%
<b>PCB-118</b>	1.112	1.167	1.137	1.175	1.162	1.151	2%
<b>PCB-114</b>	1.129	1.189	1.132	1.181	1.185	1.163	3%
<b>PCB-105</b>	1.240	1.174	1.104	1.163	1.163	1.169	4%
<b>PCB-126</b>	1.124	1.187	1.156	1.189	1.186	1.168	2%
<b>PCB-155</b>	1.065	1.075	1.039	1.069	1.065	1.063	1%
<b>PCB-167</b>	1.280	1.235	1.163	1.205	1.194	1.215	4%
<b>PCB-156/157</b>	1.259	1.252	1.182	1.215	1.206	1.223	3%
<b>PCB-169</b>	1.121	1.158	1.153	1.192	1.183	1.161	2%
<b>PCB-188</b>	0.959	1.046	0.981	1.013	1.003	1.000	3%
<b>PCB-189</b>	0.916	0.967	0.942	0.995	0.985	0.961	3%
<b>PCB-202</b>	1.069	1.106	1.067	1.094	1.086	1.084	2%
<b>PCB-205</b>	0.908	0.972	0.966	0.990	0.980	0.963	3%
<b>PCB-208</b>	1.104	1.113	1.078	1.110	1.110	1.103	1%
<b>PCB-206</b>	1.140	1.128	1.107	1.121	1.134	1.126	1%
<b>PCB-209</b>	0.886	0.917	0.892	0.912	0.905	0.902	1%
<b>Extraction Standards</b>							
<b>13C12-PCB-001</b>	0.999	0.986	0.986	1.000	1.024	0.999	2%
<b>13C12-PCB-003</b>	0.923	0.925	0.901	0.946	0.962	0.931	3%
<b>13C12-PCB-004</b>	0.628	0.634	0.636	0.631	0.640	0.634	1%
<b>13C12-PCB-015</b>	0.933	0.907	0.901	0.967	0.988	0.939	4%
<b>13C12-PCB-019</b>	0.484	0.488	0.485	0.492	0.502	0.490	1%
<b>13C12-PCB-037</b>	1.588	1.570	1.544	1.621	1.648	1.594	3%
<b>13C12-PCB-054</b>	1.339	1.351	1.348	1.344	1.349	1.346	0%
<b>13C12-PCB-081</b>	1.617	1.599	1.586	1.580	1.618	1.600	1%
<b>13C12-PCB-077</b>	1.643	1.623	1.603	1.599	1.627	1.619	1%
<b>13C12-PCB-104</b>	1.399	1.422	1.415	1.368	1.401	1.401	1%
<b>13C12-PCB-123</b>	1.453	1.412	1.445	1.429	1.456	1.439	1%
<b>13C12-PCB-118</b>	1.426	1.390	1.420	1.386	1.423	1.409	1%
<b>13C12-PCB-114</b>	1.375	1.330	1.349	1.336	1.348	1.348	1%
<b>13C12-PCB-105</b>	1.384	1.357	1.379	1.353	1.365	1.368	1%
<b>13C12-PCB-126</b>	1.320	1.295	1.291	1.285	1.297	1.298	1%
<b>13C12-PCB-155</b>	1.502	1.546	1.547	1.508	1.519	1.524	1%
<b>13C12-PCB-167</b>	1.182	1.202	1.185	1.184	1.189	1.188	1%
<b>13C12-PCB-156/157</b>	1.147	1.154	1.141	1.146	1.133	1.144	1%
<b>13C12-PCB-169</b>	1.078	1.082	1.068	1.096	1.076	1.080	1%
<b>13C12-PCB-188</b>	1.287	1.299	1.325	1.301	1.302	1.303	1%
<b>13C12-PCB-189</b>	1.074	1.114	1.107	1.077	1.091	1.093	2%
<b>13C12-PCB-202</b>	1.082	1.104	1.119	1.095	1.093	1.099	1%
<b>13C12-PCB-205</b>	1.234	1.241	1.246	1.245	1.260	1.245	1%
<b>13C12-PCB-208</b>	1.079	1.095	1.116	1.086	1.081	1.091	1%
<b>13C12-PCB-206</b>	0.683	0.698	0.709	0.721	0.717	0.706	2%
<b>13C12-PCB-209</b>	1.022	1.031	1.056	1.078	1.084	1.054	3%
<b>Field Spike Standards</b>							
<b>13C12-PCB-031</b>	1.467	1.457	1.315	1.435	1.426	1.420	4%
<b>13C12-PCB-095</b>	0.693	0.713	0.623	0.695	0.698	0.684	5%
<b>13C12-PCB-153</b>	1.042	1.013	0.924	1.025	1.032	1.007	5%
<b>Cleanup Standards</b>							
<b>13C12-PCB-028</b>	1.884	1.901	1.685	1.863	1.879	1.842	5%
<b>13C12-PCB-111</b>	1.337	1.338	1.211	1.325	1.343	1.311	4%
<b>13C12-PCB-178</b>	0.965	0.985	0.887	0.975	0.978	0.958	4%

# ALS Life Sciences

## Calibration Report

ALS Sample ID **H5-19-CS1-005**  
 Analysis Method EPA 1668C  
 Analysis Type Calibration

Filename 5-190502801	Inst # HRMS-5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 12:04	Approved: <i>E. Sabljic</i> --e-signature-- 18-Jul-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
<b>PCB-001</b>	8.9	3.14	1.00	7.88E+04	1.065
<b>PCB-003</b>	10.44	3.32	1.00	7.69E+04	1.124
<b>PCB-004</b>	10.61	1.55	1.00	4.17E+04	0.896
<b>PCB-015</b>	14.3	1.57	1.00	6.82E+04	0.987
<b>PCB-019</b>	12.62	1.10	1.00	4.01E+04	1.117
<b>PCB-037</b>	18.25	1.07	1.00	6.12E+04	1.025
<b>PCB-054</b>	14.47	0.78	1.00	5.18E+04	1.028
<b>PCB-081</b>	21.82	0.81	1.00	6.69E+04	1.278
<b>PCB-077</b>	22.13	0.81	1.00	5.80E+04	1.092
<b>PCB-104</b>	17.55	1.62	1.00	5.05E+04	1.116
<b>PCB-123</b>	23.13	1.39	1.00	4.99E+04	1.060
<b>PCB-118</b>	23.3	1.59	1.00	5.13E+04	1.112
<b>PCB-114</b>	23.59	1.56	1.00	5.02E+04	1.129
<b>PCB-105</b>	23.94	1.56	1.00	5.55E+04	1.240
<b>PCB-126</b>	25.54	1.60	1.00	4.80E+04	1.124
<b>PCB-155</b>	20.55	1.31	1.00	5.18E+04	1.065
<b>PCB-167</b>	26.44	1.26	1.00	5.39E+04	1.280
<b>PCB-156/157</b>	27.07	1.23	2.00	1.03E+05	1.259
<b>PCB-169</b>	28.74	1.31	1.00	4.30E+04	1.121
<b>PCB-188</b>	23.54	1.00	1.00	4.39E+04	0.959
<b>PCB-189</b>	30.02	1.06	1.00	3.50E+04	0.916
<b>PCB-202</b>	26.32	0.89	1.00	4.12E+04	1.069
<b>PCB-205</b>	31.41	0.86	1.00	2.83E+04	0.908
<b>PCB-208</b>	29.76	0.80	1.00	3.01E+04	1.104
<b>PCB-206</b>	32.51	0.70	1.00	1.97E+04	1.140
<b>PCB-209</b>	33.64	1.20	1.00	2.29E+04	0.886

**Extraction Standards**

<b>13C12-PCB-001</b>	8.9	3.15	100.00	7.40E+06	0.999
<b>13C12-PCB-003</b>	10.44	3.12	100.00	6.84E+06	0.923
<b>13C12-PCB-004</b>	10.59	1.60	100.00	4.66E+06	0.628
<b>13C12-PCB-015</b>	14.29	1.58	100.00	6.92E+06	0.933
<b>13C12-PCB-019</b>	12.61	1.04	100.00	3.59E+06	0.484
<b>13C12-PCB-037</b>	18.24	1.06	100.00	5.97E+06	1.588
<b>13C12-PCB-054</b>	14.46	0.79	100.00	5.04E+06	1.339
<b>13C12-PCB-081</b>	21.81	0.79	100.00	5.23E+06	1.617
<b>13C12-PCB-077</b>	22.12	0.79	100.00	5.32E+06	1.643
<b>13C12-PCB-104</b>	17.53	1.58	100.00	4.53E+06	1.399
<b>13C12-PCB-123</b>	23.11	1.59	100.00	4.70E+06	1.453
<b>13C12-PCB-118</b>	23.29	1.58	100.00	4.61E+06	1.426
<b>13C12-PCB-114</b>	23.58	1.61	100.00	4.45E+06	1.375
<b>13C12-PCB-105</b>	23.93	1.60	100.00	4.48E+06	1.384
<b>13C12-PCB-126</b>	25.52	1.60	100.00	4.27E+06	1.320
<b>13C12-PCB-155</b>	20.54	1.26	100.00	4.86E+06	1.502
<b>13C12-PCB-167</b>	26.43	1.29	100.00	4.21E+06	1.182
<b>13C12-PCB-156/157</b>	27.06	1.31	200.00	8.17E+06	1.147
<b>13C12-PCB-169</b>	28.73	1.30	100.00	3.84E+06	1.078
<b>13C12-PCB-188</b>	23.53	1.07	100.00	4.58E+06	1.287
<b>13C12-PCB-189</b>	30.01	1.06	100.00	3.83E+06	1.074
<b>13C12-PCB-202</b>	26.31	0.90	100.00	3.85E+06	1.082
<b>13C12-PCB-205</b>	31.4	0.89	100.00	3.12E+06	1.234
<b>13C12-PCB-208</b>	29.75	0.78	100.00	2.73E+06	1.079
<b>13C12-PCB-206</b>	32.49	0.79	100.00	1.73E+06	0.683
<b>13C12-PCB-209</b>	33.63	1.20	100.00	2.59E+06	1.022

**Field Spike Standards**

<b>13C12-PCB-031</b>	15.82	1.06	100.00	7.02E+06	1.467
<b>13C12-PCB-095</b>	19.13	1.59	100.00	3.17E+06	0.693
<b>13C12-PCB-153</b>	24.22	1.31	100.00	4.43E+06	1.042

**Cleanup Standards**

<b>13C12-PCB-028</b>	16	1.06	100.00	7.09E+06	1.884
<b>13C12-PCB-111</b>	22.06	1.58	100.00	4.32E+06	1.337
<b>13C12-PCB-178</b>	25.1	1.05	100.00	3.44E+06	0.965

**Injection Standards**

<b>13C12-PCB-9</b>	11.87	1.58	100.00	7.41E+06	-
<b>13C12-PCB-52</b>	16.99	0.81	100.00	3.76E+06	-
<b>13C12-PCB-101</b>	20.67	1.58	100.00	3.24E+06	-
<b>13C12-PCB-138</b>	24.91	1.30	100.00	3.56E+06	-
<b>13C12-PCB-194</b>	31.13	0.90	100.00	2.53E+06	-

# ALS Life Sciences

## Calibration Report

ALS Sample ID **H5-19-CS2-005**  
 Analysis Method EPA 1668C  
 Analysis Type Calibration

Filename 5-190502804	Inst # HRMS-5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 14:13	Approved: <i>E. Sabljic</i> --e-signature-- 18-Jul-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
<b>PCB-001</b>	8.88	3.21	5.00	3.39E+05	1.105
<b>PCB-003</b>	10.41	3.30	5.00	3.27E+05	1.134
<b>PCB-004</b>	10.58	1.55	5.00	1.79E+05	0.907
<b>PCB-015</b>	14.26	1.56	5.00	2.99E+05	1.060
<b>PCB-019</b>	12.58	1.06	5.00	1.77E+05	1.165
<b>PCB-037</b>	18.22	1.04	5.00	2.62E+05	1.074
<b>PCB-054</b>	14.44	0.79	5.00	2.18E+05	1.039
<b>PCB-081</b>	21.8	0.76	5.00	2.53E+05	1.195
<b>PCB-077</b>	22.1	0.77	5.00	2.41E+05	1.123
<b>PCB-104</b>	17.51	1.63	5.00	2.21E+05	1.175
<b>PCB-123</b>	23.1	1.61	5.00	2.04E+05	1.093
<b>PCB-118</b>	23.26	1.61	5.00	2.15E+05	1.167
<b>PCB-114</b>	23.57	1.57	5.00	2.09E+05	1.189
<b>PCB-105</b>	23.92	1.58	5.00	2.11E+05	1.174
<b>PCB-126</b>	25.51	1.57	5.00	2.03E+05	1.187
<b>PCB-155</b>	20.51	1.26	5.00	2.20E+05	1.075
<b>PCB-167</b>	26.42	1.25	5.00	2.11E+05	1.235
<b>PCB-156/157</b>	27.05	1.20	10.00	4.11E+05	1.252
<b>PCB-169</b>	28.71	1.23	5.00	1.78E+05	1.158
<b>PCB-188</b>	23.52	1.01	5.00	1.93E+05	1.046
<b>PCB-189</b>	29.99	1.01	5.00	1.53E+05	0.967
<b>PCB-202</b>	26.3	0.87	5.00	1.74E+05	1.106
<b>PCB-205</b>	31.39	0.90	5.00	1.23E+05	0.972
<b>PCB-208</b>	29.74	0.78	5.00	1.24E+05	1.113
<b>PCB-206</b>	32.47	0.80	5.00	8.01E+04	1.128
<b>PCB-209</b>	33.61	1.20	5.00	9.61E+04	0.917

**Extraction Standards**

<b>13C12-PCB-001</b>	8.86	3.11	100.00	6.14E+06	0.986
<b>13C12-PCB-003</b>	10.4	3.06	100.00	5.76E+06	0.925
<b>13C12-PCB-004</b>	10.57	1.61	100.00	3.95E+06	0.634
<b>13C12-PCB-015</b>	14.25	1.57	100.00	5.64E+06	0.907
<b>13C12-PCB-019</b>	12.57	1.04	100.00	3.04E+06	0.488
<b>13C12-PCB-037</b>	18.2	1.04	100.00	4.87E+06	1.570
<b>13C12-PCB-054</b>	14.43	0.79	100.00	4.19E+06	1.351
<b>13C12-PCB-081</b>	21.79	0.79	100.00	4.23E+06	1.599
<b>13C12-PCB-077</b>	22.08	0.79	100.00	4.29E+06	1.623
<b>13C12-PCB-104</b>	17.5	1.60	100.00	3.76E+06	1.422
<b>13C12-PCB-123</b>	23.08	1.58	100.00	3.74E+06	1.412
<b>13C12-PCB-118</b>	23.25	1.59	100.00	3.68E+06	1.390
<b>13C12-PCB-114</b>	23.55	1.60	100.00	3.52E+06	1.330
<b>13C12-PCB-105</b>	23.9	1.60	100.00	3.59E+06	1.357
<b>13C12-PCB-126</b>	25.5	1.60	100.00	3.43E+06	1.295
<b>13C12-PCB-155</b>	20.5	1.26	100.00	4.09E+06	1.546
<b>13C12-PCB-167</b>	26.39	1.31	100.00	3.42E+06	1.202
<b>13C12-PCB-156/157</b>	27.03	1.30	200.00	6.57E+06	1.154
<b>13C12-PCB-169</b>	28.7	1.30	100.00	3.08E+06	1.082
<b>13C12-PCB-188</b>	23.51	1.06	100.00	3.70E+06	1.299
<b>13C12-PCB-189</b>	29.98	1.05	100.00	3.17E+06	1.114
<b>13C12-PCB-202</b>	26.29	0.91	100.00	3.14E+06	1.104
<b>13C12-PCB-205</b>	31.38	0.90	100.00	2.52E+06	1.241
<b>13C12-PCB-208</b>	29.71	0.79	100.00	2.23E+06	1.095
<b>13C12-PCB-206</b>	32.46	0.79	100.00	1.42E+06	0.698
<b>13C12-PCB-209</b>	33.6	1.20	100.00	2.10E+06	1.031

**Field Spike Standards**

<b>13C12-PCB-031</b>	15.79	1.05	100.00	5.76E+06	1.457
<b>13C12-PCB-095</b>	19.1	1.60	100.00	2.62E+06	0.713
<b>13C12-PCB-153</b>	24.18	1.28	100.00	3.51E+06	1.013

**Cleanup Standards**

<b>13C12-PCB-028</b>	15.96	1.05	100.00	5.90E+06	1.901
<b>13C12-PCB-111</b>	22.02	1.60	100.00	3.54E+06	1.338
<b>13C12-PCB-178</b>	25.08	1.06	100.00	2.80E+06	0.985

**Injection Standards**

<b>13C12-PCB-9</b>	11.83	1.60	100.00	6.23E+06	-
<b>13C12-PCB-52</b>	16.96	0.81	100.00	3.10E+06	-
<b>13C12-PCB-101</b>	20.63	1.58	100.00	2.65E+06	-
<b>13C12-PCB-138</b>	24.87	1.29	100.00	2.85E+06	-
<b>13C12-PCB-194</b>	31.1	0.91	100.00	2.03E+06	-

# ALS Life Sciences

## Calibration Report

ALS Sample ID **H5-19-CS3-005**  
 Analysis Method EPA 1668C  
 Analysis Type Calibration

Filename 5-190502803	Inst # HRMS-5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 13:31	Approved: <i>E. Sabljic</i> --e-signature-- 18-Jul-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
<b>PCB-001</b>	8.89	3.15	50.00	1.97E+06	1.063
<b>PCB-003</b>	10.43	3.21	50.00	1.89E+06	1.117
<b>PCB-004</b>	10.59	1.49	50.00	1.06E+06	0.889
<b>PCB-015</b>	14.27	1.56	50.00	1.74E+06	1.025
<b>PCB-019</b>	12.59	1.07	50.00	1.05E+06	1.150
<b>PCB-037</b>	18.23	1.04	50.00	1.52E+06	1.024
<b>PCB-054</b>	14.45	0.80	50.00	1.34E+06	1.034
<b>PCB-081</b>	21.81	0.77	50.00	1.49E+06	1.141
<b>PCB-077</b>	22.11	0.78	50.00	1.46E+06	1.105
<b>PCB-104</b>	17.52	1.58	50.00	1.33E+06	1.138
<b>PCB-123</b>	23.11	1.58	50.00	1.24E+06	1.040
<b>PCB-118</b>	23.28	1.57	50.00	1.33E+06	1.137
<b>PCB-114</b>	23.58	1.59	50.00	1.26E+06	1.132
<b>PCB-105</b>	23.92	1.57	50.00	1.25E+06	1.104
<b>PCB-126</b>	25.52	1.54	50.00	1.23E+06	1.156
<b>PCB-155</b>	20.53	1.26	50.00	1.32E+06	1.039
<b>PCB-167</b>	26.42	1.23	50.00	1.24E+06	1.163
<b>PCB-156/157</b>	27.05	1.23	100.00	2.42E+06	1.182
<b>PCB-169</b>	28.73	1.24	50.00	1.11E+06	1.153
<b>PCB-188</b>	23.53	1.04	50.00	1.17E+06	0.981
<b>PCB-189</b>	29.99	1.03	50.00	9.37E+05	0.942
<b>PCB-202</b>	26.3	0.89	50.00	1.07E+06	1.067
<b>PCB-205</b>	31.4	0.90	50.00	7.73E+05	0.966
<b>PCB-208</b>	29.74	0.80	50.00	7.72E+05	1.078
<b>PCB-206</b>	32.49	0.80	50.00	5.04E+05	1.107
<b>PCB-209</b>	33.63	1.17	50.00	6.05E+05	0.892

**Extraction Standards**

<b>13C12-PCB-001</b>	8.88	3.14	100.00	3.71E+06	0.986
<b>13C12-PCB-003</b>	10.41	3.13	100.00	3.39E+06	0.901
<b>13C12-PCB-004</b>	10.58	1.58	100.00	2.39E+06	0.636
<b>13C12-PCB-015</b>	14.26	1.58	100.00	3.39E+06	0.901
<b>13C12-PCB-019</b>	12.58	1.04	100.00	1.82E+06	0.485
<b>13C12-PCB-037</b>	18.21	1.05	100.00	2.96E+06	1.544
<b>13C12-PCB-054</b>	14.44	0.80	100.00	2.58E+06	1.348
<b>13C12-PCB-081</b>	21.8	0.79	100.00	2.61E+06	1.586
<b>13C12-PCB-077</b>	22.09	0.79	100.00	2.64E+06	1.603
<b>13C12-PCB-104</b>	17.51	1.58	100.00	2.33E+06	1.415
<b>13C12-PCB-123</b>	23.1	1.59	100.00	2.38E+06	1.445
<b>13C12-PCB-118</b>	23.26	1.59	100.00	2.34E+06	1.420
<b>13C12-PCB-114</b>	23.57	1.60	100.00	2.22E+06	1.349
<b>13C12-PCB-105</b>	23.91	1.61	100.00	2.27E+06	1.379
<b>13C12-PCB-126</b>	25.51	1.60	100.00	2.13E+06	1.291
<b>13C12-PCB-155</b>	20.51	1.26	100.00	2.55E+06	1.547
<b>13C12-PCB-167</b>	26.41	1.30	100.00	2.13E+06	1.185
<b>13C12-PCB-156/157</b>	27.03	1.30	200.00	4.10E+06	1.141
<b>13C12-PCB-169</b>	28.71	1.31	100.00	1.92E+06	1.068
<b>13C12-PCB-188</b>	23.51	1.05	100.00	2.38E+06	1.325
<b>13C12-PCB-189</b>	29.98	1.06	100.00	1.99E+06	1.107
<b>13C12-PCB-202</b>	26.29	0.91	100.00	2.01E+06	1.119
<b>13C12-PCB-205</b>	31.39	0.91	100.00	1.60E+06	1.246
<b>13C12-PCB-208</b>	29.72	0.78	100.00	1.43E+06	1.116
<b>13C12-PCB-206</b>	32.46	0.79	100.00	9.10E+05	0.709
<b>13C12-PCB-209</b>	33.6	1.19	100.00	1.36E+06	1.056

**Field Spike Standards**

<b>13C12-PCB-031</b>	15.8	1.05	100.00	3.14E+06	1.315
<b>13C12-PCB-095</b>	19.11	1.59	100.00	1.45E+06	0.623
<b>13C12-PCB-153</b>	24.19	1.29	100.00	2.00E+06	0.924

**Cleanup Standards**

<b>13C12-PCB-028</b>	15.97	1.05	100.00	3.23E+06	1.685
<b>13C12-PCB-111</b>	22.03	1.60	100.00	1.99E+06	1.211
<b>13C12-PCB-178</b>	25.09	1.05	100.00	1.59E+06	0.887

**Injection Standards**

<b>13C12-PCB-9</b>	11.84	1.59	100.00	3.76E+06	-
<b>13C12-PCB-52</b>	16.97	0.80	100.00	1.92E+06	-
<b>13C12-PCB-101</b>	20.64	1.57	100.00	1.65E+06	-
<b>13C12-PCB-138</b>	24.88	1.30	100.00	1.80E+06	-
<b>13C12-PCB-194</b>	31.1	0.91	100.00	1.28E+06	-

# ALS Life Sciences

## Calibration Report

ALS Sample ID **H5-19-CS4-005**  
 Analysis Method EPA 1668C  
 Analysis Type Calibration

Filename 5-190502806	Inst # HRMS-5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 15:38	Approved: <i>E. Sabljic</i> --e-signature-- 18-Jul-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
<b>PCB-001</b>	8.86	3.17	400.00	2.92E+07	1.107
<b>PCB-003</b>	10.4	3.21	400.00	2.88E+07	1.153
<b>PCB-004</b>	10.57	1.50	400.00	1.55E+07	0.932
<b>PCB-015</b>	14.24	1.57	400.00	2.76E+07	1.084
<b>PCB-019</b>	12.57	1.07	400.00	1.52E+07	1.176
<b>PCB-037</b>	18.19	1.03	400.00	2.41E+07	1.073
<b>PCB-054</b>	14.43	0.79	400.00	1.98E+07	1.062
<b>PCB-081</b>	21.78	0.78	400.00	2.30E+07	1.187
<b>PCB-077</b>	22.07	0.78	400.00	2.27E+07	1.153
<b>PCB-104</b>	17.5	1.58	400.00	1.96E+07	1.166
<b>PCB-123</b>	23.08	1.56	400.00	1.87E+07	1.064
<b>PCB-118</b>	23.25	1.56	400.00	2.00E+07	1.175
<b>PCB-114</b>	23.54	1.58	400.00	1.94E+07	1.181
<b>PCB-105</b>	23.89	1.56	400.00	1.93E+07	1.163
<b>PCB-126</b>	25.49	1.58	400.00	1.88E+07	1.189
<b>PCB-155</b>	20.5	1.26	400.00	1.98E+07	1.069
<b>PCB-167</b>	26.39	1.23	400.00	1.85E+07	1.205
<b>PCB-156/157</b>	27.02	1.23	800.00	3.62E+07	1.215
<b>PCB-169</b>	28.69	1.24	400.00	1.70E+07	1.192
<b>PCB-188</b>	23.51	1.03	400.00	1.71E+07	1.013
<b>PCB-189</b>	29.97	1.02	400.00	1.39E+07	0.995
<b>PCB-202</b>	26.29	0.90	400.00	1.56E+07	1.094
<b>PCB-205</b>	31.38	0.90	400.00	1.14E+07	0.990
<b>PCB-208</b>	29.72	0.80	400.00	1.11E+07	1.110
<b>PCB-206</b>	32.46	0.80	400.00	7.46E+06	1.121
<b>PCB-209</b>	33.6	1.18	400.00	9.08E+06	0.912

**Extraction Standards**

<b>13C12-PCB-001</b>	8.86	3.12	100.00	6.59E+06	1.000
<b>13C12-PCB-003</b>	10.39	3.07	100.00	6.24E+06	0.946
<b>13C12-PCB-004</b>	10.55	1.58	100.00	4.16E+06	0.631
<b>13C12-PCB-015</b>	14.23	1.57	100.00	6.37E+06	0.967
<b>13C12-PCB-019</b>	12.55	1.03	100.00	3.24E+06	0.492
<b>13C12-PCB-037</b>	18.18	1.06	100.00	5.62E+06	1.621
<b>13C12-PCB-054</b>	14.42	0.79	100.00	4.66E+06	1.344
<b>13C12-PCB-081</b>	21.76	0.79	100.00	4.86E+06	1.580
<b>13C12-PCB-077</b>	22.06	0.78	100.00	4.91E+06	1.599
<b>13C12-PCB-104</b>	17.48	1.57	100.00	4.20E+06	1.368
<b>13C12-PCB-123</b>	23.06	1.57	100.00	4.39E+06	1.429
<b>13C12-PCB-118</b>	23.24	1.59	100.00	4.26E+06	1.386
<b>13C12-PCB-114</b>	23.53	1.62	100.00	4.11E+06	1.336
<b>13C12-PCB-105</b>	23.88	1.60	100.00	4.16E+06	1.353
<b>13C12-PCB-126</b>	25.48	1.60	100.00	3.95E+06	1.285
<b>13C12-PCB-155</b>	20.48	1.25	100.00	4.64E+06	1.508
<b>13C12-PCB-167</b>	26.38	1.29	100.00	3.84E+06	1.184
<b>13C12-PCB-156/157</b>	27.01	1.31	200.00	7.44E+06	1.146
<b>13C12-PCB-169</b>	28.68	1.31	100.00	3.56E+06	1.096
<b>13C12-PCB-188</b>	23.48	1.06	100.00	4.22E+06	1.301
<b>13C12-PCB-189</b>	29.96	1.05	100.00	3.49E+06	1.077
<b>13C12-PCB-202</b>	26.26	0.92	100.00	3.55E+06	1.095
<b>13C12-PCB-205</b>	31.36	0.89	100.00	2.87E+06	1.245
<b>13C12-PCB-208</b>	29.7	0.78	100.00	2.51E+06	1.086
<b>13C12-PCB-206</b>	32.45	0.79	100.00	1.67E+06	0.721
<b>13C12-PCB-209</b>	33.58	1.19	100.00	2.49E+06	1.078

**Field Spike Standards**

<b>13C12-PCB-031</b>	15.77	1.03	100.00	6.35E+06	1.435
<b>13C12-PCB-095</b>	19.09	1.56	100.00	2.95E+06	0.695
<b>13C12-PCB-153</b>	24.17	1.29	100.00	4.04E+06	1.025

**Cleanup Standards**

<b>13C12-PCB-028</b>	15.94	1.04	100.00	6.45E+06	1.863
<b>13C12-PCB-111</b>	22.01	1.60	100.00	4.07E+06	1.325
<b>13C12-PCB-178</b>	25.07	1.04	100.00	3.16E+06	0.975

**Injection Standards**

<b>13C12-PCB-9</b>	11.82	1.59	100.00	6.59E+06	-
<b>13C12-PCB-52</b>	16.94	0.80	100.00	3.46E+06	-
<b>13C12-PCB-101</b>	20.62	1.57	100.00	3.07E+06	-
<b>13C12-PCB-138</b>	24.86	1.31	100.00	3.25E+06	-
<b>13C12-PCB-194</b>	31.08	0.89	100.00	2.31E+06	-

# ALS Life Sciences

## Calibration Report

ALS Sample ID **H5-19-CS5-005**  
 Analysis Method EPA 1668C  
 Analysis Type Calibration

Filename 5-190502805	Inst # HRMS-5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 14:56	Approved: <i>E. Sabljic</i> --e-signature-- 18-Jul-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
<b>PCB-001</b>	0	0.00	2000.00	0.00E+00	0.000
<b>PCB-003</b>	0	0.00	2000.00	0.00E+00	0.000
<b>PCB-004</b>	10.57	1.51	2000.00	6.14E+07	0.935
<b>PCB-015</b>	0	0.00	2000.00	0.00E+00	0.000
<b>PCB-019</b>	12.57	1.07	2000.00	5.94E+07	1.152
<b>PCB-037</b>	18.18	1.04	2000.00	9.47E+07	1.075
<b>PCB-054</b>	14.43	0.79	2000.00	7.73E+07	1.070
<b>PCB-081</b>	21.77	0.80	2000.00	8.91E+07	1.172
<b>PCB-077</b>	22.07	0.79	2000.00	8.73E+07	1.142
<b>PCB-104</b>	17.5	1.57	2000.00	7.61E+07	1.156
<b>PCB-123</b>	23.08	1.57	2000.00	7.28E+07	1.064
<b>PCB-118</b>	23.25	1.56	2000.00	7.77E+07	1.162
<b>PCB-114</b>	23.54	1.58	2000.00	7.50E+07	1.185
<b>PCB-105</b>	23.89	1.57	2000.00	7.46E+07	1.163
<b>PCB-126</b>	25.49	1.59	2000.00	7.23E+07	1.186
<b>PCB-155</b>	20.5	1.27	2000.00	7.60E+07	1.065
<b>PCB-167</b>	26.39	1.24	2000.00	7.04E+07	1.194
<b>PCB-156/157</b>	27.02	1.23	4000.00	1.36E+08	1.206
<b>PCB-169</b>	28.69	1.24	2000.00	6.31E+07	1.183
<b>PCB-188</b>	23.51	1.03	2000.00	6.47E+07	1.003
<b>PCB-189</b>	29.97	1.04	2000.00	5.33E+07	0.985
<b>PCB-202</b>	26.29	0.91	2000.00	5.89E+07	1.086
<b>PCB-205</b>	31.38	0.91	2000.00	4.36E+07	0.980
<b>PCB-208</b>	29.72	0.80	2000.00	4.24E+07	1.110
<b>PCB-206</b>	32.46	0.80	2000.00	2.87E+07	1.134
<b>PCB-209</b>	33.6	1.18	2000.00	3.47E+07	0.905

**Extraction Standards**

<b>13C12-PCB-001</b>	8.86	3.10	100.00	5.26E+06	1.024
<b>13C12-PCB-003</b>	10.39	3.08	100.00	4.94E+06	0.962
<b>13C12-PCB-004</b>	10.55	1.58	100.00	3.28E+06	0.640
<b>13C12-PCB-015</b>	14.23	1.56	100.00	5.07E+06	0.988
<b>13C12-PCB-019</b>	12.55	1.06	100.00	2.58E+06	0.502
<b>13C12-PCB-037</b>	18.17	1.05	100.00	4.41E+06	1.648
<b>13C12-PCB-054</b>	14.42	0.81	100.00	3.61E+06	1.349
<b>13C12-PCB-081</b>	21.76	0.79	100.00	3.80E+06	1.618
<b>13C12-PCB-077</b>	22.06	0.79	100.00	3.82E+06	1.627
<b>13C12-PCB-104</b>	17.49	1.58	100.00	3.29E+06	1.401
<b>13C12-PCB-123</b>	23.06	1.58	100.00	3.42E+06	1.456
<b>13C12-PCB-118</b>	23.24	1.61	100.00	3.34E+06	1.423
<b>13C12-PCB-114</b>	23.53	1.59	100.00	3.17E+06	1.348
<b>13C12-PCB-105</b>	23.88	1.60	100.00	3.21E+06	1.365
<b>13C12-PCB-126</b>	25.48	1.57	100.00	3.05E+06	1.297
<b>13C12-PCB-155</b>	20.49	1.26	100.00	3.57E+06	1.519
<b>13C12-PCB-167</b>	26.38	1.30	100.00	2.95E+06	1.189
<b>13C12-PCB-156/157</b>	27.01	1.31	200.00	5.62E+06	1.133
<b>13C12-PCB-169</b>	28.68	1.31	100.00	2.67E+06	1.076
<b>13C12-PCB-188</b>	23.49	1.05	100.00	3.23E+06	1.302
<b>13C12-PCB-189</b>	29.96	1.06	100.00	2.71E+06	1.091
<b>13C12-PCB-202</b>	26.26	0.91	100.00	2.71E+06	1.093
<b>13C12-PCB-205</b>	31.36	0.92	100.00	2.23E+06	1.260
<b>13C12-PCB-208</b>	29.71	0.78	100.00	1.91E+06	1.081
<b>13C12-PCB-206</b>	32.45	0.79	100.00	1.27E+06	0.717
<b>13C12-PCB-209</b>	33.58	1.19	100.00	1.92E+06	1.084

**Field Spike Standards**

<b>13C12-PCB-031</b>	15.77	1.04	100.00	4.98E+06	1.426
<b>13C12-PCB-095</b>	19.09	1.58	100.00	2.31E+06	0.698
<b>13C12-PCB-153</b>	24.17	1.30	100.00	3.10E+06	1.032

**Cleanup Standards**

<b>13C12-PCB-028</b>	15.94	1.03	100.00	5.03E+06	1.879
<b>13C12-PCB-111</b>	22.01	1.60	100.00	3.16E+06	1.343
<b>13C12-PCB-178</b>	25.07	1.04	100.00	2.42E+06	0.978

**Injection Standards**

<b>13C12-PCB-9</b>	11.82	1.58	100.00	5.13E+06	-
<b>13C12-PCB-52</b>	16.94	0.80	100.00	2.68E+06	-
<b>13C12-PCB-101</b>	20.62	1.57	100.00	2.35E+06	-
<b>13C12-PCB-138</b>	24.86	1.30	100.00	2.48E+06	-
<b>13C12-PCB-194</b>	31.08	0.90	100.00	1.77E+06	-







Table with columns: Target Aro #, Res, Resa, Resb, Resc, Resd, Rese, Resf, Resg, Resh, Resi, Resj, Resk, Resl, Resm, Resn, Reso, Resp, Resq, Resr, Ress, Resv, Resw, Resx, Resy, Resz, Resaa, Resab, Resac, Resad, Resae, Resaf, Resag, Resah, Resai, Resaj, Resak, Resal, Resam, Resan, Resao, Resap, Resaq, Resar, Resas, Resav, Resaw, Resax, Resay, Resaz, Resba, Resbb, Resbc, Resbd, Resbe, Resbf, Resbg, Resbh, Resbi, Resbj, Resbk, Resbl, Resbm, Resbn, Resbo, Resbp, Resbq, Resbr, Resbs, Resbv, Resbw, Resbx, Resby, Resbz, Resca, Rescb, Rescc, Rescd, Resce, Rescf, Rescg, Resch, Resci, Rescj, Resck, Rescl, Rescm, Rescn, Resco, Rescp, Rescq, Rescr, Rescs, Rescv, Rescw, Rescx, Rescy, Rescz, Resda, Resdb, Resdc, Resdd, Resde, Resdf, Resdg, Resdh, Resdi, Resdj, Resdk, Resdl, Resdm, Resdn, Resdo, Resdp, Resdq, Resdr, Resds, Resdv, Resdw, Resdx, Resdy, Resdz, Resea, Reseb, Resec, Resed, Resee, Resef, Reseg, Reseh, Resei, Resej, Resek, Resel, Resem, Resen, Reseo, Resep, Reseq, Reser, Reses, Resev, Resew, Resex, Resey, Resez, Resfa, Resfb, Resfc, Resfd, Resfe, Resff, Resfg, Resfh, Resfi, Resfj, Resfk, Resfl, Resfm, Resfn, Resfo, Resfp, Resfq, Resfr, Resfs, Resfv, Resfw, Resfx, Resfy, Resfz, Resga, Resgb, Resgc, Resgd, Resge, Resgf, Resgg, Resgh, Resgi, Resgj, Resgk, Resgl, Resgm, Resgn, Resgo, Resgp, Resgq, Resgr, Resgs, Resgv, Resgw, Resgx, Resgy, Resgz, Resha, Reshb, Reshc, Reshd, Reshe, Reshf, Reshg, Reshh, Reshi, Reshj, Reshk, Reshl, Reshm, Reshn, Resho, Reshp, Reshq, Reshr, Reshs, Reshv, Reshw, Reshx, Reshy, Reshz, Resia, Resib, Resic, Resid, Resie, Resif, Resig, Resih, Resij, Resik, Resil, Resim, Resin, Resio, Resip, Resiq, Resir, Resis, Resiv, Resiw, Resix, Resiy, Resiz, Resja, Resjb, Resjc, Resjd, Resje, Resjf, Resjg, Resjh, Resji, Resjj, Resjk, Resjl, Resjm, Resjn, Resjo, Resjp, Resjq, Resjr, Resjs, Resjv, Resjw, Resjx, Resjy, Resjz, Reska, Reskb, Reskc, Reskd, Reske, Reskf, Reskg, Reskh, Reski, Reskj, Reskl, Reskm, Reskn, Resko, Reskp, Reskq, Reskr, Resks, Reskv, Reskw, Reskx, Resky, Reskz, Resla, Reslb, Reslc, Resld, Resle, Reslf, Reslg, Reslh, Resli, Reslj, Reslk, Resll, Reslm, Resln, Reslo, Reslp, Reslq, Reslr, Resls, Reslv, Reslw, Reslx, Resly, Reslz, Resma, Resmb, Resmc, Resmd, Resme, Resmf, Resmg, Resmh, Resmi, Resmj, Resmk, Resml, Resmm, Resmn, Resmo, Resmp, Resmq, Resmr, Resms, Resmv, Resmw, Resmx, Resmy, Resmz, Resna, Resnb, Resnc, Resnd, Resne, Resnf, Resng, Resnh, Resni, Resnj, Resnk, Resnl, Resnm, Resnn, Resno, Resnp, Resnq, Resnr, Resns, Resnv, Resnw, Resnx, Resny, Resnz, Resoa, Resob, Resoc, Resod, Resoe, Resof, Resog, Resoh, Resoi, Resoj, Resok, Resol, Resom, Reson, Resoo, Resop, Resoq, Resor, Resos, Resov, Resow, Resox, Resoy, Resoz, Respa, Respb, Respc, Respd, Respe, Respf, Respg, Resph, Respi, Respj, Respk, Respl, Respm, Respn, Respo, Respp, Respq, Respr, Resps, Respv, Respw, Respx, Respy, Respz, Resqa, Resqb, Resqc, Resqd, Resqe, Resqf, Resqg, Resqh, Resqi, Resqj, Resqk, Resql, Resqm, Resqn, Resqo, Resqp, Resqq, Resqr, Resqs, Resqv, Resqw, Resqx, Resqy, Resqz, Resra, Resrb, Resrc, Resrd, Resre, Resrf, Resrg, Resrh, Resri, Resrj, Resrk, Resrl, Resrm, Resrn, Resro, Resrp, Resrq, Resrr, Resrs, Resrv, Resrw, Resrx, Resry, Resrz, Ressa, Ressb, Ressc, Ressd, Resse, Ressf, Ressg, Ressh, Ressi, Ressj, Ressk, Ressl, Ressm, Ressn, Resso, Ressp, Ressq, Ressr, Resss, Ressv, Ressw, Ressx, Ressy, Ressz, Resta, Restb, Restc, Restd, Reste, Restf, Restg, Resth, Res ti, Res tj, Res tk, Res tl, Res tm, Res tn, Res to, Res tp, Res tq, Res tr, Res ts, Res tv, Res tw, Res tx, Res ty, Res tz, Resua, Resub, Resuc, Resud, Resue, Resuf, Resug, Resuh, Resui, Resuj, Resuk, Resul, Resum, Resun, Resuo, Resup, Resuq, Resur, Resus, Resuv, Resuw, Resux, Resuy, Resuz, Resva, Resvb, Resvc, Resvd, Resve, Resvf, Resvg, Resvh, Resvi, Resvj, Resvk, Resvl, Resvm, Resvn, Resvo, Resvp, Resvq, Resvr, Resvs, Resvv, Resvw, Resvx, Resvy, Resvz, Reswa, Reswb, Reswc, Reswd, Reswe, Reswf, Reswg, Reswh, Reswi, Reswj, Reswk, Reswl, Reswm, Reswn, Reswo, Reswp, Reswq, Reswr, Resws, Reswv, Resww, Reswx, Reswy, Reswz, Resxa, Resxb, Resxc, Resxd, Resxe, Resxf, Resxg, Resxh, Resxi, Resxj, Resxk, Resxl, Resxm, Resxn, Resxo, Resxp, Resxq, Resxr, Resxs, Resxv, Resxw, Resxx, Resxy, Resxz, Resya, Resyb, Resyc, Resyd, Resye, Resyf, Resyg, Resyh, Resyi, Resyj, Resyk, Resyl, Resym, Resyn, Resyo, Resyp, Resyq, Resyr, Resys, Resyv, Resyw, Resyx, Resyy, Resyz, Resza, Reszb, Reszc, Reszd, Resze, Reszf, Reszg, Reszh, Reszi, Reszj, Reszk, Reszl, Reszm, Reszn, Reszo, Reszp, Reszq, Reszr, Reszs, Reszv, Reszw, Reszx, Reszy, Reszz



ALS Life Sciences

Continuing Calibration Report

<b>Sample Name</b>	<b>CCV</b>	Sampling Date	n/a	Approved: <i>E. Sabljic</i> --e-signature-- 16-Aug-2019
ALS Sample ID	H5-19-CCV-680	Extraction Date	n/a	
Analysis Method	EPA 1668C	Sample Size	1 n/a	
Analysis Type	CCV	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

<b>Run Information</b>	<b>Run 1</b>
Filename	5-190814A23
Run Date	15-Aug-19 03:24
Final Volume	25 ul
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS5 SPBOCTYL65972-01A

Target Analytes	pg/uL	Ret. Time	% Rec	Limits	Flags
PCB-001	50	8.88	100	75-125	
PCB-003	50	10.40	98	75-125	
PCB-004	50	10.56	91	75-125	
PCB-015	50	14.23	98	75-125	
PCB-019	50	12.55	95	75-125	
PCB-037	50	18.18	96	75-125	
PCB-054	50	14.42	93	75-125	
PCB-081	50	21.77	96	75-125	
PCB-077	50	22.07	98	75-125	
PCB-104	50	17.48	93	75-125	
PCB-123	50	23.08	92	75-125	
PCB-118	50	23.25	95	75-125	
PCB-114	50	23.55	93	75-125	
PCB-105	50	23.89	93	75-125	
PCB-126	50	25.48	94	75-125	
PCB-155	50	20.50	92	75-125	
PCB-167	50	26.40	89	75-125	
PCB-156/157	100	27.03	91	75-125	
PCB-169	50	28.68	94	75-125	
PCB-188	50	23.50	93	75-125	
PCB-189	50	29.97	97	75-125	
PCB-202	50	26.28	92	75-125	
PCB-205	50	31.38	88	75-125	
PCB-208	50	29.71	101	75-125	
PCB-206	50	32.45	98	75-125	
PCB-209	50	33.60	96	75-125	
<b>Extraction Standards</b>		<b>Time</b>	<b>% Rec</b>	<b>Limits</b>	
13C12-PCB-001	100	8.87	91	50-145	
13C12-PCB-003	100	10.40	92	50-145	
13C12-PCB-004	100	10.55	95	50-145	
13C12-PCB-015	100	14.22	88	50-145	
13C12-PCB-019	100	12.55	97	50-145	
13C12-PCB-037	100	18.17	101	50-145	
13C12-PCB-054	100	14.41	108	50-145	
13C12-PCB-081	100	21.76	100	50-145	
13C12-PCB-077	100	22.06	99	50-145	
13C12-PCB-104	100	17.48	110	50-145	
13C12-PCB-123	100	23.07	96	50-145	
13C12-PCB-118	100	23.23	98	50-145	
13C12-PCB-114	100	23.54	97	50-145	
13C12-PCB-105	100	23.88	99	50-145	
13C12-PCB-126	100	25.47	103	50-145	
13C12-PCB-155	100	20.48	105	50-145	
13C12-PCB-167	100	26.39	107	50-145	
13C12-PCB-156/157	200	27.02	104	50-145	
13C12-PCB-169	100	28.67	120	50-145	
13C12-PCB-188	100	23.49	93	50-145	
13C12-PCB-189	100	29.96	120	50-145	
13C12-PCB-202	100	26.27	103	50-145	
13C12-PCB-205	100	31.35	99	50-145	
13C12-PCB-208	100	29.70	82	50-145	
13C12-PCB-206	100	32.44	96	50-145	
13C12-PCB-209	100	33.58	107	50-145	
<b>Field Spike Standards</b>					
13C12-PCB-031	100	15.77	90	70-130	
13C12-PCB-095	100	19.08	90	70-130	
13C12-PCB-153	100	24.18	80	70-130	
<b>Cleanup Standards</b>					
13C12-PCB-028	100	15.94	98	65-135	
13C12-PCB-111	100	22.01	87	75-125	
13C12-PCB-178	100	25.06	90	75-125	

# ALS Life Sciences

## Continuing Calibration Report

<b>Sample Name</b>	CCV	Sampling Date	n/a	Approved: <i>E. Sabljic</i> --e-signature-- 16-Aug-2019
ALS Sample ID	H5-19-CCV-680	Extraction Date	n/a	
Analysis Method	EPA 1668C	Sample Size	1 n/a	
Analysis Type	CCV	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	1	

<b>Run Information</b>		<b>Run 1</b>
Filename	5-190814A39	
Run Date	15-Aug-19 14:49	
Final Volume	25 ul	
Dilution Factor	1	
Analysis Units	%	
Instrument - Column	HRMS5 SPBOCTYL65972-01A	

Target Analytes	pg/uL	Ret. Time	% Rec	Limits	Flags
PCB-001	50	8.87	100	75-125	
PCB-003	50	10.41	95	75-125	
PCB-004	50	10.56	92	75-125	
PCB-015	50	14.25	97	75-125	
PCB-019	50	12.57	94	75-125	
PCB-037	50	18.20	95	75-125	
PCB-054	50	14.43	91	75-125	
PCB-081	50	21.78	95	75-125	
PCB-077	50	22.08	97	75-125	
PCB-104	50	17.49	91	75-125	
PCB-123	50	23.08	92	75-125	
PCB-118	50	23.26	92	75-125	
PCB-114	50	23.55	92	75-125	
PCB-105	50	23.90	93	75-125	
PCB-126	50	25.49	94	75-125	
PCB-155	50	20.50	92	75-125	
PCB-167	50	26.40	89	75-125	
PCB-156/157	100	27.03	92	75-125	
PCB-169	50	28.68	94	75-125	
PCB-188	50	23.50	91	75-125	
PCB-189	50	29.97	96	75-125	
PCB-202	50	26.28	92	75-125	
PCB-205	50	31.37	88	75-125	
PCB-208	50	29.71	101	75-125	
PCB-206	50	32.45	99	75-125	
PCB-209	50	33.60	95	75-125	
<b>Extraction Standards</b>					
		<b>Time</b>	<b>% Rec</b>	<b>Limits</b>	
13C12-PCB-001	100	8.85	88	50-145	
13C12-PCB-003	100	10.40	77	50-145	
13C12-PCB-004	100	10.55	96	50-145	
13C12-PCB-015	100	14.24	71	50-145	
13C12-PCB-019	100	12.55	100	50-145	
13C12-PCB-037	100	18.19	75	50-145	
13C12-PCB-054	100	14.41	107	50-145	
13C12-PCB-081	100	21.77	88	50-145	
13C12-PCB-077	100	22.07	84	50-145	
13C12-PCB-104	100	17.48	110	50-145	
13C12-PCB-123	100	23.07	100	50-145	
13C12-PCB-118	100	23.23	105	50-145	
13C12-PCB-114	100	23.54	102	50-145	
13C12-PCB-105	100	23.89	101	50-145	
13C12-PCB-126	100	25.48	102	50-145	
13C12-PCB-155	100	20.49	109	50-145	
13C12-PCB-167	100	26.39	101	50-145	
13C12-PCB-156/157	200	27.02	101	50-145	
13C12-PCB-169	100	28.68	112	50-145	
13C12-PCB-188	100	23.49	92	50-145	
13C12-PCB-189	100	29.96	132	50-145	
13C12-PCB-202	100	26.27	105	50-145	
13C12-PCB-205	100	31.35	100	50-145	
13C12-PCB-208	100	29.70	83	50-145	
13C12-PCB-206	100	32.44	101	50-145	
13C12-PCB-209	100	33.58	116	50-145	
<b>Field Spike Standards</b>					
13C12-PCB-031	100	15.78	101	70-130	
13C12-PCB-095	100	19.09	85	70-130	
13C12-PCB-153	100	24.18	82	70-130	
<b>Cleanup Standards</b>					
13C12-PCB-028	100	15.95	90	65-135	
13C12-PCB-111	100	22.01	89	75-125	
13C12-PCB-178	100	25.06	90	75-125	

# **SVOC DATA PACKAGE**

## **SECTION 5: QC SAMPLE DATA**

Including:

- Laboratory Method Blank Analysis Reports
- Laboratory Control Sample Analysis Reports
- Matrix Spike Analysis Reports
- Other QC Sample Analysis Reports (where applicable)

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**  
ALS Sample ID  
Analysis Method  
Analysis Type  
Sample Matrix

**Method Blank**  
WG3116369-1  
EPA 1668C  
Blank  
MEDIA

Sampling Date  
Extraction Date  
Sample Size  
Percent Moisture  
Split Ratio

n/a  
12-Aug-19  
1  
n/a  
2

Blank

Approved:  
E. Sabljic  
--e-signature--  
16-Aug-2019

**Run Information**

**Run 1**

Filename: 5-190814A27  
Run Date: 15-Aug-19 06:23  
Final Volume: 25 ul  
Dilution Factor: 1  
Analysis Units: pg  
Instrument - Column: HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.85	<1.6	1.6	U	1.3	50
PCB-002		10.26	<2.1	1.6	M,J,R	2.1	50
PCB-003		NotFnd	<2.0	2.0	U		50
PCB-004		NotFnd	<12	12	U		50
PCB-010		NotFnd	<7.1	7.1	U		50
PCB-009		NotFnd	<7.1	7.1	U		50
PCB-007		NotFnd	<7.0	7.0	U		50
PCB-006		NotFnd	<7.0	7.0	U		50
PCB-005		NotFnd	<7.6	7.6	U		50
PCB-008		NotFnd	<6.5	6.5	U		50
PCB-014		NotFnd	<6.1	6.1	U		50
PCB-011		13.85	60.6	6.3			50
PCB-012/013		NotFnd	<6.1	6.1	U		50
PCB-015		NotFnd	<7.3	7.3	U		50
PCB-019		NotFnd	<3.9	3.9	U		50
PCB-018/030		13.66	<9.8	4.9	J,R	9.8	50
PCB-017		13.90	<5.8	5.8	M,U	4.6	50
PCB-027		NotFnd	<4.2	4.2	U		50
PCB-024		NotFnd	<4.4	4.4	U		50
PCB-016		NotFnd	<6.9	6.9	U		50
PCB-032		14.49	<3.9	3.9	M,U	3.6	50
PCB-034		NotFnd	<3.7	3.7	U		50
PCB-023		NotFnd	<3.7	3.7	U		50
PCB-026/029		NotFnd	<3.5	3.5	U		50
PCB-025		NotFnd	<3.5	3.5	U		50
PCB-031		15.77	<12	3.3	J,R	12	50
PCB-020/028		15.95	18.4	3.5	J		50
PCB-021/033		16.09	<8.8	3.7	J,R	8.8	50
PCB-022		16.31	<4.1	3.7	J,R	4.1	50
PCB-036		NotFnd	<3.1	3.1	U		50
PCB-039		NotFnd	<3.4	3.4	U		50
PCB-038		NotFnd	<3.6	3.6	U		50
PCB-035		NotFnd	<3.6	3.6	U		50
PCB-037		NotFnd	<4.5	4.5	U		50
PCB-054		NotFnd	<1.8	1.8	U		50
PCB-050/053		15.62	<2.8	2.8	U	1.0	50
PCB-045/051		16.03	<2.9	2.9	U	2.5	50
PCB-046		NotFnd	<3.3	3.3	U		50
PCB-052		16.94	15.2	2.8	J		50
PCB-073		NotFnd	<2.2	2.2	U		50
PCB-043		NotFnd	<3.4	3.4	U		50
PCB-049/069		17.20	<2.6	2.6	U	2.5	50
PCB-048		17.36	<2.9	2.9	U		50
PCB-044/047/065		NotFnd	<2.7	2.7	U		50
PCB-059/062/075		NotFnd	<2.1	2.1	U		50
PCB-042		NotFnd	<3.3	3.3	U		50
PCB-040/041/071		18.06	<3.9	2.9	M,J,R	3.9	50
PCB-064		18.18	4.04	2.3	J		50
PCB-072		NotFnd	<2.7	2.7	U		50
PCB-068		NotFnd	<2.6	2.6	U		50
PCB-057		NotFnd	<2.8	2.8	U		50
PCB-058		NotFnd	<2.8	2.8	U		50
PCB-067		NotFnd	<2.7	2.7	U		50
PCB-063		NotFnd	<2.5	2.5	U		50
PCB-061/070/074/076		19.54	<9.1	2.8	M,J,R	9.1	50
PCB-066		19.72	<3.0	2.6	J,R	3.0	50
PCB-055		NotFnd	<2.9	2.9	U		50
PCB-056		NotFnd	<2.9	2.9	U		50
PCB-060		NotFnd	<2.9	2.9	U		50
PCB-080		20.32	<2.4	2.4	U	0.93	50
PCB-079		NotFnd	<2.4	2.4	U		50
PCB-078		NotFnd	<2.8	2.8	U		50
PCB-081	0.0003	NotFnd	<3.1	3.1	U		50
PCB-077	0.0001	NotFnd	<3.4	3.4	U		50
PCB-104		NotFnd	<2.1	2.1	U		50
PCB-096		NotFnd	<2.0	2.0	U		50
PCB-103		NotFnd	<2.5	2.5	U		50
PCB-094		NotFnd	<3.0	3.0	U		50
PCB-095		19.08	13.8	2.6	J		50
PCB-093/098/100/102		NotFnd	<2.8	2.8	U		50

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**  
ALS Sample ID  
Analysis Method  
Analysis Type  
Sample Matrix

**Method Blank**  
WG3116369-1  
EPA 1668C  
Blank  
MEDIA

Sampling Date  
Extraction Date  
Sample Size  
Percent Moisture  
Split Ratio

n/a  
12-Aug-19  
1  
n/a  
2

Blank

Approved:  
E. Sabljic  
--e-signature--  
16-Aug-2019

**Run Information**

**Run 1**

Filename: 5-190814A27  
Run Date: 15-Aug-19 06:23  
Final Volume: 25 ul  
Dilution Factor: 1  
Analysis Units: pg  
Instrument - Column: HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		NotFnd	<2.8	2.8	U		50
PCB-084		NotFnd	<3.0	3.0	U		50
PCB-089		NotFnd	<2.9	2.9	U		50
PCB-121		NotFnd	<2.0	2.0	U		50
PCB-092		NotFnd	<2.7	2.7	U		50
PCB-090/101/113		20.62	<9.6	2.4	J,R	9.6	50
PCB-083/099		20.92	<2.8	2.8	M,U	1.3	50
PCB-112		NotFnd	<1.9	1.9	U		50
PCB-086/087/097/109/119/125		NotFnd	<2.4	2.4	U		50
PCB-085/110/115/116/117		21.68	<5.4	2.2	J,R	5.4	50
PCB-082		NotFnd	<3.2	3.2	U		50
PCB-111		NotFnd	<2.0	2.0	U		50
PCB-120		NotFnd	<1.9	1.9	U		50
PCB-108/124		NotFnd	<2.0	2.0	U		50
PCB-107		NotFnd	<1.9	1.9	U		50
PCB-123	0.00003	NotFnd	<2.4	2.4	U		50
PCB-106		NotFnd	<2.1	2.1	U		50
PCB-118	0.00003	23.23	<3.8	2.2	M,J,R	3.8	50
PCB-122		NotFnd	<2.2	2.2	U		50
PCB-114	0.00003	NotFnd	<2.3	2.3	U		50
PCB-105	0.00003	NotFnd	<2.2	2.2	U		50
PCB-127		NotFnd	<1.9	1.9	U		50
PCB-126	0.1	NotFnd	<2.3	2.3	U		50
PCB-155		NotFnd	<1.6	1.6	U		50
PCB-152		NotFnd	<1.6	1.6	U		50
PCB-150		NotFnd	<1.6	1.6	U		50
PCB-136		NotFnd	<1.6	1.6	U		50
PCB-145		NotFnd	<1.7	1.7	U		50
PCB-148		NotFnd	<2.2	2.2	U		50
PCB-135/151		22.16	<2.2	2.2	U	0.97	50
PCB-154		NotFnd	<1.9	1.9	U		50
PCB-144		NotFnd	<2.1	2.1	U		50
PCB-147/149		22.63	<2.3	2.0	J,R	2.3	50
PCB-134/143		NotFnd	<2.4	2.4	U		50
PCB-139/140		NotFnd	<2.0	2.0	U		50
PCB-131		NotFnd	<2.7	2.7	U		50
PCB-142		NotFnd	<2.4	2.4	U		50
PCB-132		NotFnd	<2.4	2.4	U		50
PCB-133		NotFnd	<2.2	2.2	U		50
PCB-165		NotFnd	<1.8	1.8	U		50
PCB-146		NotFnd	<2.0	2.0	U		50
PCB-161		NotFnd	<1.6	1.6	U		50
PCB-153/168		24.18	4.04	1.7	M,J		50
PCB-141		NotFnd	<2.1	2.1	U		50
PCB-130		NotFnd	<2.4	2.4	U		50
PCB-137/164		NotFnd	<1.8	1.8	U		50
PCB-129/138/163		24.85	<3.5	2.1	J,R	3.5	50
PCB-160		NotFnd	<1.8	1.8	U		50
PCB-158		NotFnd	<1.4	1.4	U		50
PCB-128/166		NotFnd	<1.8	1.8	U		50
PCB-159		NotFnd	<1.5	1.5	U		50
PCB-162		NotFnd	<1.6	1.6	U		50
PCB-167	0.00003	NotFnd	<1.4	1.4	U		50
PCB-156/157	0.00003	NotFnd	<2.0	2.0	U		100
PCB-169	0.03	NotFnd	<1.5	1.5	U		50
PCB-188		NotFnd	<1.9	1.9	U		50
PCB-179		NotFnd	<1.8	1.8	U		50
PCB-184		NotFnd	<1.7	1.7	U		50
PCB-176		NotFnd	<1.8	1.8	U		50
PCB-186		NotFnd	<1.9	1.9	U		50
PCB-178		NotFnd	<2.4	2.4	U		50
PCB-175		NotFnd	<2.3	2.3	U		50
PCB-187		NotFnd	<2.2	2.2	U		50
PCB-182		NotFnd	<2.2	2.2	U		50
PCB-183		NotFnd	<2.2	2.2	U		50
PCB-185		NotFnd	<2.4	2.4	U		50
PCB-174		NotFnd	<2.3	2.3	U		50
PCB-177		NotFnd	<2.4	2.4	U		50
PCB-181		NotFnd	<2.3	2.3	U		50
PCB-171/173		NotFnd	<2.4	2.4	U		50
PCB-172		NotFnd	<2.3	2.3	U		50



# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**                    **Method Blank**  
 ALS Sample ID                    WG3116369-1  
 Analysis Method                    EPA 1668C  
 Analysis Type                    Blank  
 Sample Matrix                    MEDIA

Sampling Date                    n/a  
 Extraction Date                    12-Aug-19  
 Sample Size                    1                    Blank  
 Percent Moisture                    n/a  
 Split Ratio                    2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information**

**Run 1**

Filename                    5-190814A27  
 Run Date                    15-Aug-19 06:23  
 Final Volume                    25    ul  
 Dilution Factor                    1  
 Analysis Units                    pg  
 Instrument - Column                    HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<1.9	1.9	U		50
PCB-180/193		NotFnd	<2.0	2.0	U		50
PCB-191		NotFnd	<1.7	1.7	U		50
PCB-170		NotFnd	<2.4	2.4	U		50
PCB-190		NotFnd	<1.5	1.5	U		50
PCB-189	0.00003	NotFnd	<2.2	2.2	U		50
PCB-202		NotFnd	<1.8	1.8	U		50
PCB-201		NotFnd	<1.7	1.7	U		50
PCB-204		NotFnd	<1.7	1.7	U		50
PCB-197		NotFnd	<1.6	1.6	U		50
PCB-200		NotFnd	<1.7	1.7	U		50
PCB-198/199		NotFnd	<2.2	2.2	U		50
PCB-196		NotFnd	<2.1	2.1	U		50
PCB-203		NotFnd	<1.9	1.9	U		50
PCB-195		NotFnd	<2.2	2.2	U		50
PCB-194		NotFnd	<2.0	2.0	U		50
PCB-205		NotFnd	<1.7	1.7	U		50
PCB-208		29.70	<20	3.7	J,R	20	50
PCB-207		30.18	22.7	3.5	J		50
PCB-206		NotFnd	<5.9	5.9	U		50
PCB-209		33.58	30.4	3.4	J		50

**Extraction Standards      pg      Time    % Rec    Limits**

13C12-PCB-001	4000	8.84	50	5-145
13C12-PCB-003	4000	10.38	50	5-145
13C12-PCB-004	4000	10.54	54	5-145
13C12-PCB-015	4000	14.21	54	5-145
13C12-PCB-019	4000	12.54	53	5-145
13C12-PCB-037	4000	18.17	74	5-145
13C12-PCB-054	4000	14.40	67	5-145
13C12-PCB-081	4000	21.75	85	10-145
13C12-PCB-077	4000	22.06	86	10-145
13C12-PCB-104	4000	17.47	77	10-145
13C12-PCB-123	4000	23.05	85	10-145
13C12-PCB-118	4000	23.22	90	10-145
13C12-PCB-114	4000	23.52	89	10-145
13C12-PCB-105	4000	23.86	92	10-145
13C12-PCB-126	4000	25.46	100	10-145
13C12-PCB-155	4000	20.47	83	10-145
13C12-PCB-167	4000	26.38	96	10-145
13C12-PCB-156/157	8000	27.00	97	10-145
13C12-PCB-169	4000	28.66	116	10-145
13C12-PCB-188	4000	23.48	82	10-145
13C12-PCB-189	4000	29.95	114	10-145
13C12-PCB-202	4000	26.26	91	10-145
13C12-PCB-205	4000	31.34	101	10-145
13C12-PCB-208	4000	29.69	84	10-145
13C12-PCB-206	4000	32.43	98	10-145
13C12-PCB-209	4000	33.56	108	10-145

**Field Spike Standards**

13C12-PCB-031	0		NS
13C12-PCB-095	0		NS
13C12-PCB-153	0		NS

**Cleanup Standards**

13C12-PCB-028	4000	15.93	65	5-145
13C12-PCB-111	4000	21.99	71	10-145
13C12-PCB-178	4000	25.05	76	10-145

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

<b>Sample Name</b>	<b>Method Blank</b>	Sampling Date	n/a		
ALS Sample ID	WG3116369-1	Extraction Date	12-Aug-19		
Analysis Method	EPA 1668C	Sample Size	1	Blank	
Analysis Type	Blank	Percent Moisture	n/a		
Sample Matrix	MEDIA	Split Ratio	2		
					Approved: E. Sabljic --e-signature-- 16-Aug-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	5-190814A27
Run Date	15-Aug-19 06:23
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
<b>Homologue Group Totals</b>							
Total MonoCB			2.10	1.6	J		200
Total DiCB			60.6	6.1	J		400
Total TriCB			53.1	3.1	J		400
Total TetraCB			35.2	1.8	J		800
Total PentaCB			32.6	1.9	J		800
Total HexaCB			9.84	1.4	J		800
Total HeptaCB			<1.5	1.5	U		400
Total OctaCB			<1.6	1.6	U		400
Total NonaCB			42.7	3.5	J		200
DecaCB			30.4	3.4	J		200
Total PCB			267		J		1600
<b>Toxic Equivalency - (WHO 2005)</b>							
Lower Bound PCB TEQ			0.00				
Mid Point PCB TEQ			0.138				
Upper Bound PCB TEQ			0.277				

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure
NS	Indicates that this standard has not been added

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**                      **Method Blank**  
 ALS Sample ID                    WG3116369-4  
 Analysis Method                  EPA 1668C  
 Analysis Type                      Blank  
 Sample Matrix                      REAGENT

Sampling Date                      n/a  
 Extraction Date                    12-Aug-19  
 Sample Size                        1                                  Blank  
 Percent Moisture                  n/a  
 Split Ratio                         2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information**                      **Run 1**  
 Filename                                5-190815A03  
 Run Date                                15-Aug-19 17:20  
 Final Volume                         25    ul  
 Dilution Factor                       1  
 Analysis Units                        pg  
 Instrument - Column                  HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.88	<3.4	3.4	U	2.5	50
PCB-002		NotFnd	<3.5	3.5	U		50
PCB-003		NotFnd	<4.6	4.6	U		50
PCB-004		NotFnd	<52	52	U		50
PCB-010		NotFnd	<34	34	U		50
PCB-009		NotFnd	<34	34	U		50
PCB-007		NotFnd	<35	35	U		50
PCB-006		NotFnd	<35	35	U		50
PCB-005		NotFnd	<42	42	U		50
PCB-008		NotFnd	<29	29	U		50
PCB-014		NotFnd	<17	17	U		50
PCB-011		13.88	<35	18	M,J,R	35	50
PCB-012/013		NotFnd	<17	17	U		50
PCB-015		NotFnd	<22	22	U		50
PCB-019		NotFnd	<11	11	U		50
PCB-018/030		NotFnd	<9.1	9.1	U		50
PCB-017		NotFnd	<11	11	U		50
PCB-027		NotFnd	<7.7	7.7	U		50
PCB-024		NotFnd	<8.1	8.1	U		50
PCB-016		NotFnd	<12	12	U		50
PCB-032		NotFnd	<7.3	7.3	U		50
PCB-034		NotFnd	<7.6	7.6	U		50
PCB-023		NotFnd	<7.6	7.6	U		50
PCB-026/029		NotFnd	<7.3	7.3	U		50
PCB-025		NotFnd	<7.2	7.2	U		50
PCB-031		15.81	<9.3	6.9	M,J,R	9.3	50
PCB-020/028		15.97	10.3	7.3	J		50
PCB-021/033		16.11	<7.5	7.5	M,U	6.5	50
PCB-022		NotFnd	<7.6	7.6	U		50
PCB-036		NotFnd	<6.6	6.6	U		50
PCB-039		NotFnd	<7.2	7.2	U		50
PCB-038		NotFnd	<7.5	7.5	U		50
PCB-035		NotFnd	<7.5	7.5	U		50
PCB-037		NotFnd	<10	10	U		50
PCB-054		NotFnd	<6.4	6.4	U		50
PCB-050/053		NotFnd	<6.5	6.5	U		50
PCB-045/051		NotFnd	<6.8	6.8	U		50
PCB-046		NotFnd	<7.6	7.6	U		50
PCB-052		16.97	<13	6.4	J,R	13	50
PCB-073		NotFnd	<5.1	5.1	U		50
PCB-043		NotFnd	<8.2	8.2	U		50
PCB-049/069		NotFnd	<6.0	6.0	U		50
PCB-048		NotFnd	<6.7	6.7	U		50
PCB-044/047/065		17.56	15.5	6.2	J		50
PCB-059/062/075		NotFnd	<4.9	4.9	U		50
PCB-042		NotFnd	<7.8	7.8	U		50
PCB-040/041/071		NotFnd	<6.7	6.7	U		50
PCB-064		NotFnd	<5.3	5.3	U		50
PCB-072		NotFnd	<5.8	5.8	U		50
PCB-068		NotFnd	<5.7	5.7	U		50
PCB-057		NotFnd	<6.2	6.2	U		50
PCB-058		NotFnd	<6.1	6.1	U		50
PCB-067		NotFnd	<5.9	5.9	U		50
PCB-063		NotFnd	<5.4	5.4	U		50
PCB-061/070/074/076		19.58	<6.2	6.2	M,U	5.3	50
PCB-066		NotFnd	<5.9	5.9	U		50
PCB-055		NotFnd	<6.5	6.5	U		50
PCB-056		NotFnd	<6.4	6.4	U		50
PCB-060		NotFnd	<6.4	6.4	U		50
PCB-080		NotFnd	<5.4	5.4	U		50
PCB-079		NotFnd	<5.3	5.3	U		50
PCB-078		NotFnd	<6.3	6.3	U		50
PCB-081	0.0003	NotFnd	<7.1	7.1	U		50
PCB-077	0.0001	NotFnd	<8.1	8.1	U		50
PCB-104		NotFnd	<6.0	6.0	U		50
PCB-096		NotFnd	<6.4	6.4	U		50
PCB-103		NotFnd	<7.7	7.7	U		50
PCB-094		NotFnd	<9.5	9.5	U		50
PCB-095		NotFnd	<8.1	8.1	U		50
PCB-093/098/100/102		NotFnd	<8.8	8.8	U		50

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**                    **Method Blank**  
 ALS Sample ID                    WG3116369-4  
 Analysis Method                    EPA 1668C  
 Analysis Type                    Blank  
 Sample Matrix                    REAGENT

Sampling Date                    n/a  
 Extraction Date                    12-Aug-19  
 Sample Size                    1                    Blank  
 Percent Moisture                    n/a  
 Split Ratio                    2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information**                    **Run 1**  
 Filename                    5-190815A03  
 Run Date                    15-Aug-19 17:20  
 Final Volume                    25    ul  
 Dilution Factor                    1  
 Analysis Units                    pg  
 Instrument - Column                    HRMS5    SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		NotFnd	<8.7	8.7	U		50
PCB-084		NotFnd	<9.6	9.6	U		50
PCB-089		NotFnd	<9.5	9.5	U		50
PCB-121		NotFnd	<6.4	6.4	U		50
PCB-092		NotFnd	<8.8	8.8	U		50
PCB-090/101/113		NotFnd	<7.4	7.4	U		50
PCB-083/099		NotFnd	<8.6	8.6	U		50
PCB-112		NotFnd	<6.3	6.3	U		50
PCB-086/087/097/109/119/125		NotFnd	<7.6	7.6	U		50
PCB-085/110/115/116/117		NotFnd	<6.9	6.9	U		50
PCB-082		NotFnd	<10	10	U		50
PCB-111		NotFnd	<6.3	6.3	U		50
PCB-120		NotFnd	<6.2	6.2	U		50
PCB-108/124		NotFnd	<6.8	6.8	U		50
PCB-107		NotFnd	<6.4	6.4	U		50
PCB-123	0.00003	NotFnd	<8.1	8.1	U		50
PCB-106		NotFnd	<7.0	7.0	U		50
PCB-118	0.00003	NotFnd	<7.6	7.6	U		50
PCB-122		NotFnd	<7.4	7.4	U		50
PCB-114	0.00003	NotFnd	<8.0	8.0	U		50
PCB-105	0.00003	NotFnd	<7.9	7.9	U		50
PCB-127		NotFnd	<6.3	6.3	U		50
PCB-126	0.1	NotFnd	<9.5	9.5	U		50
PCB-155		NotFnd	<2.5	2.5	U		50
PCB-152		NotFnd	<2.8	2.8	U		50
PCB-150		NotFnd	<2.9	2.9	U		50
PCB-136		NotFnd	<2.9	2.9	U		50
PCB-145		NotFnd	<3.2	3.2	U		50
PCB-148		NotFnd	<3.9	3.9	U		50
PCB-135/151		NotFnd	<4.1	4.1	U		50
PCB-154		NotFnd	<3.5	3.5	U		50
PCB-144		NotFnd	<4.0	4.0	U		50
PCB-147/149		22.67	6.09	4.1	M,J		50
PCB-134/143		NotFnd	<5.0	5.0	U		50
PCB-139/140		NotFnd	<4.1	4.1	U		50
PCB-131		NotFnd	<5.5	5.5	U		50
PCB-142		NotFnd	<4.9	4.9	U		50
PCB-132		NotFnd	<5.0	5.0	U		50
PCB-133		NotFnd	<4.5	4.5	U		50
PCB-165		NotFnd	<3.5	3.5	U		50
PCB-146		NotFnd	<4.0	4.0	U		50
PCB-161		NotFnd	<3.1	3.1	U		50
PCB-153/168		24.21	<3.4	3.4	U	2.9	50
PCB-141		NotFnd	<4.3	4.3	U		50
PCB-130		NotFnd	<4.7	4.7	U		50
PCB-137/164		NotFnd	<3.7	3.7	U		50
PCB-129/138/163		24.88	4.85	4.2	J		50
PCB-160		NotFnd	<3.3	3.3	U		50
PCB-158		NotFnd	<2.8	2.8	U		50
PCB-128/166		NotFnd	<3.7	3.7	U		50
PCB-159		NotFnd	<3.0	3.0	U		50
PCB-162		NotFnd	<3.2	3.2	U		50
PCB-167	0.00003	NotFnd	<2.8	2.8	U		50
PCB-156/157	0.00003	NotFnd	<3.9	3.9	U		100
PCB-169	0.03	NotFnd	<3.4	3.4	U		50
PCB-188		NotFnd	<3.5	3.5	U		50
PCB-179		NotFnd	<3.8	3.8	U		50
PCB-184		NotFnd	<3.6	3.6	U		50
PCB-176		NotFnd	<3.8	3.8	U		50
PCB-186		NotFnd	<4.0	4.0	U		50
PCB-178		NotFnd	<5.0	5.0	U		50
PCB-175		NotFnd	<4.9	4.9	U		50
PCB-187		NotFnd	<4.5	4.5	U		50
PCB-182		NotFnd	<4.8	4.8	U		50
PCB-183		NotFnd	<4.6	4.6	U		50
PCB-185		NotFnd	<5.1	5.1	U		50
PCB-174		NotFnd	<4.8	4.8	U		50
PCB-177		NotFnd	<5.1	5.1	U		50
PCB-181		NotFnd	<4.8	4.8	U		50
PCB-171/173		NotFnd	<5.1	5.1	U		50
PCB-172		NotFnd	<4.8	4.8	U		50

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**  
ALS Sample ID  
Analysis Method  
Analysis Type  
Sample Matrix

**Method Blank**  
WG3116369-4  
EPA 1668C  
Blank  
REAGENT

Sampling Date  
Extraction Date  
Sample Size  
Percent Moisture  
Split Ratio

n/a  
12-Aug-19  
1  
n/a  
2

Blank

Approved:  
*E. Sabljic*  
--e-signature--  
16-Aug-2019

**Run Information**

**Run 1**

Filename: 5-190815A03  
Run Date: 15-Aug-19 17:20  
Final Volume: 25 ul  
Dilution Factor: 1  
Analysis Units: pg  
Instrument - Column: HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<3.9	3.9	U		50
PCB-180/193		NotFnd	<4.1	4.1	U		50
PCB-191		NotFnd	<3.5	3.5	U		50
PCB-170		NotFnd	<4.9	4.9	U		50
PCB-190		NotFnd	<3.0	3.0	U		50
PCB-189	0.00003	NotFnd	<4.0	4.0	U		50
PCB-202		NotFnd	<4.0	4.0	U		50
PCB-201		NotFnd	<4.2	4.2	U		50
PCB-204		NotFnd	<4.3	4.3	U		50
PCB-197		NotFnd	<4.1	4.1	U		50
PCB-200		NotFnd	<4.2	4.2	U		50
PCB-198/199		NotFnd	<5.3	5.3	U		50
PCB-196		NotFnd	<5.1	5.1	U		50
PCB-203		NotFnd	<4.8	4.8	U		50
PCB-195		NotFnd	<4.2	4.2	U		50
PCB-194		NotFnd	<3.8	3.8	U		50
PCB-205		NotFnd	<3.7	3.7	U		50
PCB-208		29.74	<34	9.0	J,R	34	50
PCB-207		30.21	<25	8.8	J,R	25	50
PCB-206		NotFnd	<15	15	U		50
PCB-209		33.63	25.7	5.2	J		50

**Extraction Standards**

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.87	43	5-145
13C12-PCB-003	4000	10.41	40	5-145
13C12-PCB-004	4000	10.56	46	5-145
13C12-PCB-015	4000	14.25	44	5-145
13C12-PCB-019	4000	12.57	47	5-145
13C12-PCB-037	4000	18.21	50	5-145
13C12-PCB-054	4000	14.43	51	5-145
13C12-PCB-081	4000	21.79	60	10-145
13C12-PCB-077	4000	22.09	59	10-145
13C12-PCB-104	4000	17.49	60	10-145
13C12-PCB-123	4000	23.09	64	10-145
13C12-PCB-118	4000	23.26	67	10-145
13C12-PCB-114	4000	23.56	66	10-145
13C12-PCB-105	4000	23.91	67	10-145
13C12-PCB-126	4000	25.49	68	10-145
13C12-PCB-155	4000	20.51	65	10-145
13C12-PCB-167	4000	26.41	71	10-145
13C12-PCB-156/157	8000	27.04	69	10-145
13C12-PCB-169	4000	28.70	78	10-145
13C12-PCB-188	4000	23.50	65	10-145
13C12-PCB-189	4000	29.99	75	10-145
13C12-PCB-202	4000	26.28	68	10-145
13C12-PCB-205	4000	31.38	79	10-145
13C12-PCB-208	4000	29.71	68	10-145
13C12-PCB-206	4000	32.46	75	10-145
13C12-PCB-209	4000	33.60	85	10-145

**Field Spike Standards**

13C12-PCB-031	0	NS
13C12-PCB-095	0	NS
13C12-PCB-153	0	NS

**Cleanup Standards**

13C12-PCB-028	4000	15.97	51	5-145
13C12-PCB-111	4000	22.03	56	10-145
13C12-PCB-178	4000	25.08	62	10-145

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

**Sample Name**                      **Method Blank**  
 ALS Sample ID                      WG3116369-4  
 Analysis Method                      EPA 1668C  
 Analysis Type                        Blank  
 Sample Matrix                        REAGENT

Sampling Date                        n/a  
 Extraction Date                      12-Aug-19  
 Sample Size                         1                      Blank  
 Percent Moisture                      n/a  
 Split Ratio                            2

Approved:  
*E. Sabljic*  
 --e-signature--  
 16-Aug-2019

**Run Information**

**Run 1**

Filename                                5-190815A03  
 Run Date                                15-Aug-19 17:20  
 Final Volume                         25    ul  
 Dilution Factor                        1  
 Analysis Units                         pg  
 Instrument - Column                    HRMS5    SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
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**Homologue Group Totals**

Total MonoCB			<3.4	3.4	U		200
Total DiCB			35.0	17	J		400
Total TriCB			19.6	6.6	J		400
Total TetraCB			28.5	4.9	J		800
Total PentaCB			<6.0	6.0	U		800
Total HexaCB			10.9	2.5	J		800
Total HeptaCB			<3.0	3.0	U		400
Total OctaCB			<3.7	3.7	U		400
Total NonaCB			59.0	8.8	J		200
DecaCB			25.7	5.2	J		200
Total PCB			179		J		1600

**Toxic Equivalency - (WHO 2005)**

Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.528
Upper Bound PCB TEQ	1.06

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor                      TEQ                      Indicates the Toxic Equivalency
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
NS	Indicates that this standard has not been added

ALS Life Sciences

Laboratory Control Sample Analysis Report

<b>Sample Name</b>	<b>Laboratory Control Sample</b>	Sampling Date	n/a
ALS Sample ID	WG3116369-2	Extraction Date	12-Aug-19
Analysis Method	EPA 1668C	Sample Size	1 n/a
Analysis Type	LCS	Percent Moisture	n/a
Sample Matrix	QC	Split Ratio	1

Approved:  
E. Sabljic  
--e-signature--  
16-Aug-2019

<b>Run Information</b>	<b>Run 1</b>
Filename	5-190814A25
Run Date	15-Aug-19 04:59
Final Volume	25 ul
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMSS SPBOCTYL65972-01A

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
PCB-001	2000	8.85	107	60-135	
PCB-003	2000	10.40	104	60-135	
PCB-004	2000	10.55	99	60-135	
PCB-015	2000	14.23	104	60-135	
PCB-019	2000	12.55	108	60-135	
PCB-037	2000	18.19	101	60-135	
PCB-054	2000	14.42	101	60-135	
PCB-081	2000	21.77	98	60-135	
PCB-077	2000	22.07	100	60-135	
PCB-104	2000	17.48	88	60-135	
PCB-123	2000	23.07	96	60-135	
PCB-118	2000	23.25	96	60-135	
PCB-114	2000	23.54	96	60-135	
PCB-105	2000	23.89	95	60-135	
PCB-126	2000	25.48	93	60-135	
PCB-155	2000	20.49	92	60-135	
PCB-167	2000	26.39	93	60-135	
PCB-156/157	4000	27.02	93	60-135	
PCB-169	2000	28.68	95	60-135	
PCB-188	2000	23.49	93	60-135	
PCB-189	2000	29.96	102	60-135	
PCB-202	2000	26.27	98	60-135	
PCB-205	2000	31.37	89	60-135	
PCB-208	2000	29.70	104	60-135	
PCB-206	2000	32.45	100	60-135	
PCB-209	2000	33.59	112	60-135	

Extraction Standards		Time	% Rec	Limits	
13C12-PCB-001	4000	8.84	32	15-145	
13C12-PCB-003	4000	10.38	31	15-145	
13C12-PCB-004	4000	10.54	34	15-145	
13C12-PCB-015	4000	14.22	36	15-145	
13C12-PCB-019	4000	12.54	35	15-145	
13C12-PCB-037	4000	18.17	54	15-145	
13C12-PCB-054	4000	14.40	43	15-145	
13C12-PCB-081	4000	21.76	63	40-145	
13C12-PCB-077	4000	22.06	64	40-145	
13C12-PCB-104	4000	17.47	54	40-145	
13C12-PCB-123	4000	23.05	66	40-145	
13C12-PCB-118	4000	23.23	69	40-145	
13C12-PCB-114	4000	23.52	69	40-145	
13C12-PCB-105	4000	23.88	69	40-145	
13C12-PCB-126	4000	25.47	76	40-145	
13C12-PCB-155	4000	20.48	63	40-145	
13C12-PCB-167	4000	26.38	73	40-145	
13C12-PCB-156/157	8000	27.01	73	40-145	
13C12-PCB-169	4000	28.67	86	40-145	R
13C12-PCB-188	4000	23.48	62	40-145	
13C12-PCB-189	4000	29.95	86	40-145	
13C12-PCB-202	4000	26.26	70	40-145	
13C12-PCB-205	4000	31.35	78	40-145	
13C12-PCB-208	4000	29.69	66	40-145	
13C12-PCB-206	4000	32.43	74	40-145	
13C12-PCB-209	4000	33.58	84	40-145	

Field Spike Standards			
13C12-PCB-031	0		NS
13C12-PCB-095	0		NS
13C12-PCB-153	0		NS

Cleanup Standards			
13C12-PCB-028	4000	15.94	46 15-145
13C12-PCB-111	4000	22.00	53 40-145
13C12-PCB-178	4000	25.05	57 40-145

R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.

NS Indicates that this standard has not been added



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## SVOC DATA PACKAGE

### SECTION 6: INTERNAL RECORDS

Including:

- Prep Logs
- Independent calculation checks
- Others as listed below:

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<b>Batch ID:</b>	WG3116369
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Batch ID: WG3116369

DX Native Standard:

(Checkmark) Spiked

Sample I.D.	Volume (ul)	Spiked
WG3116369-2	40	✓
WG3116369-3	40	✓

PCB Native Standard:

(Checkmark) Spiked

Sample I.D.	Volume (ul)	Spiked
WG3116369-2	40	✓
WG3116369-3	40	✓

DX Cleanup Standard:

(Checkmark) Spiked

Sample I.D.	Volume (ul)	Spiked
WG3116369-1	20	✓
WG3116369-2	20	✓
WG3116369-3	N/A	N/A
WG3116369-4	20	✓
L2310263-1	20	✓
L2310263-2	20	✓
L2310263-3	20	✓
L2316030-1	20	✓
L2316030-2	20	✓
L2316030-3	20	✓
L2320141-1	20	✓
L2320141-2	20	✓
L2320141-3	20	✓
L2322808-1	20	✓
<del>L2322808-2</del>	<del>20</del>	<del>✓</del>
L2322808-3	20	✓

PCB Cleanup Standard:

(Checkmark) Spiked

Sample I.D.	Volume (ul)	Spiked
WG3116369-1	20	✓
WG3116369-2	20	✓
WG3116369-3	N/A	N/A
WG3116369-4	20	✓
L2310263-1	20	✓
L2310263-2	20	✓
L2310263-3	20	✓
L2316030-1	20	✓
L2316030-2	20	✓
L2316030-3	20	✓
L2320141-1	20	✓
L2320141-2	20	✓
L2320141-3	20	✓
L2322808-1	20	✓
<del>L2322808-2</del>	<del>20</del>	<del>✓</del>
L2322808-3	20	✓

Syringe ID: 322

Standard: 1613B-NS#3-023E

Date & Initials: 12-Aug-2019 JAZ

Syringe ID: 323

Standard: 1668A-NS#1-36C

Date & Initials: 12-Aug-2019 JAZ

Syringe ID: 357

Standard: M23-CL#1-033B

Date & Initials: 13-AUG-2019 CM

Correct Syringe Obtained:

Chemist's Initials

CM

Correct Standard Obtained:

Chemist's Initials

CM

Correct Technique Followed:

Chemist's Initials

CM

JP 12-Aug-19

Syringe ID: 378

Standard: 1668A-CL#2-32J

Date & Initials: 13-AUG-2019 CM

Correct Syringe Obtained:

Chemist's Initials

CM

Correct Standard Obtained:

Chemist's Initials

CM

Correct Technique Followed:

Chemist's Initials

CM

JP 12-Aug-19

Batch ID: WG3116369

DX Injection Standard:

(Checkmark)

Sample I.D.	Volume (ul)	Spiked
WG3116369-1	10	✓
WG3116369-2	10	✓
WG3116369-3	10	✓
WG3116369-4	10	✓
L2310263-1	10	✓
L2310263-2	10	✓
L2310263-3	10	✓
L2316030-1	10	✓
L2316030-2	10	✓
L2316030-3	10	✓
L2320141-1	10	✓
L2320141-2	10	✓
L2320141-3	10	✓
L2322808-1	10	✓
<del>L2322808-2</del>	<del>10</del>	<del>✓</del>
L2322808-3	10	✓

Syringe ID:

335

Standard:

1613B-IS#1- 0765

Date & Initials:

15-AUG-2019 JB

Correct Syringe Obtained:

Chemist's Initials JB

Correct Standard Obtained:

Chemist's Initials JB

Correct Technique Followed:

Chemist's Initials JB

JP  
12-Aug-19

PCB Injection Standard:

(Checkmark)

Sample I.D.	Volume (ul)	Spiked
WG3116369-1	5	✓
WG3116369-2	5	✓
WG3116369-3	5	✓
WG3116369-4	5	✓
L2310263-1	5	✓
L2310263-2	5	✓
L2310263-3	5	✓
L2316030-1	5	✓
L2316030-2	5	✓
L2316030-3	5	✓
L2320141-1	5	✓
L2320141-2	5	✓
L2320141-3	5	✓
L2322808-1	5	✓
<del>L2322808-2</del>	<del>5</del>	<del>✓</del>
L2322808-3	5	✓

Syringe ID:

260

Standard:

1668A-IS#2- 0114

Date & Initials:

14-AUG-2019 JB

Correct Syringe Obtained:

Chemist's Initials JB

Correct Standard Obtained:

Chemist's Initials JB

Correct Technique Followed:

Chemist's Initials JB

JP  
12-Aug-19

<b>Batch ID:</b>	WG3116369
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**Reagent Lot Numbers:**

Reagent	Lot#	Manufacturer
Acetone	104436	
Hexane	104314	
DCM	104596	
Toluene	104369	
Nonane	ORG-WAKONON- 648	
1:1 DCM:HEX	ORG-DH2- 229	
Sodium Sulphate	ORG-SSU- 2116	
Acid Silica	ORG-ASI- 8760	
Neutral Silica	ORG-NSI- 1039	
Alumina	ORG-ALU- 437	
1% Deactivated Silica	ORG-2%DAS- -	
Chromacarb	ORG-CC- 241	

Batch ID: WG3116369

**Procedure:**

**This batchsheet is a guideline only. Please see test procedure for complete set of instructions.**

**Extraction:**

- For MB and LCS you **must** use blank media - if not available see your Team Lead
- Place the PUF in to a pre-cleaned thimble and transfer to the Soxhlet body.
- Spike with Extraction Standard (plus Native for LCS and ENI).
- Soxhlet extract in DCM for 16 hours (check with team lead or supervisor)

**Rotovap:**

- Rotovap and reduce to ~5mL.
- Transfer to a calibrated c-tube (marked at 1ml, 2ml) with 3x2ml hexane
- Mix well then quantitatively spilt the extract **1/2 DX/PCB 1/2 Archive**

Batch ID: WG3116369

**DX/PCB:**

- Perform Acid Silica column
- Solvent Exchange (reduce to **~50ul**, bulk back up to 1ml Hexane, vortex well.
- Perform Alumina Column:
  - Pre-elute the Alumina Column with 7ml Hexane
  - Place F1 c-tube under the column, then load the sample with 3x1ml Hexane rinses
  - F1 (Archive) 1mL Hexane
  - F2 (DX/PCB) 14mL 1:1 DCM:Hexane
- Split Alumina F2 **1/2 PCB 1/2 DX**

**Micro-Vial:**

**PCB:**

- Blow down to ~1/2ml
- Vortex **very** well.
- Transfer every last drop to a micro-vial (Marked at 20uL with nonane).
- Blow down to the line
- Spike PCB Injection Standard. cap and vortex. **FV=25ul**



<b>DX:</b>
- Solvent Exchange to Hexane (Reduce to Just Dry then bulk back up to 1ml Hexane)
- ChromaCarb: - 4cm of well-packed chroma-carb.
- Pre-elute Carbon with 5ml Hexane
- Transfer with 3x1ml Hexane
- F1 = <b>10ml</b> 1:1 DCM:Hexane (Archive)
- After dripping has stopped Invert Column.
- F2 = 14ml Toluene (DX and PCB)
- After the column has stopped dripping reduce the <b>F2</b> portion down to ~1/2ml.
- Vortex well, then transfer to a micro-vial without rinses.
- Blow the micro-vial down to just-dry.
- Spike with Injection Standard, Cap the micro-vial, and Vortex. <b>FV=10ul</b>

Batch ID: WG3116369

Comments:

**NOTE: Label and Save All Columns including Acid Silica Columns**

LZ322808-2 sample has not arrived yet JP 12-Aug-19  
\* flask contained ~5ml water after extraction, water was removed with  
pipette. 13-Aug-19 BR

Approval of Deviation from Standard Method

(Batch Writer): \_\_\_\_\_

Procedure does deviate from Standard Method.

Approved (Supervisor/Manager): \_\_\_\_\_

. made new W3 revid not locate original. W3 b  
spike only w DX IS. KB 15-Aug-19

WG3116369		Prep Analyst:			
PUFS - M23/1668A (HR)		Date:			
	Very Good	Meets Method Req	Some Outliers	Very Poor	Comments / Was spl/batch sent for rework? Why?
<b>MB</b>					
<b>LCS</b>					
<b>DUP</b>					
<b>ES rec</b>					

# ALS Life Sciences

## Sample Calculation Report

**CS3 RRF Check**

Approved:	<i>E. Sabljic</i> --e-signature-- 16-Aug-2019
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$$\text{RRF} = \frac{\text{Response of PCB-118}}{\text{Response of 13C12-PCB-118}} \times \frac{\text{Concentration of 13C12-PCB-118}}{\text{Concentration of PCB-118}}$$

<b>RRF</b>	<b>=</b>	$\frac{1330559.20}{2340165.90} \times \frac{100}{50}$	<b>=</b>	<b>1.14</b>		Calculated Value <b>1.14</b>	Value from TargetLynx <b>1.14</b>
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**Calculation of PCB-118 amount in L2316030-1**

$$\text{pg} = \frac{\text{Response of PCB-118}}{\text{Response of 13C12-PCB-118}} \times \frac{\text{pg of 13C12-PCB-118 spiked}}{\text{Mean RRF} * \text{Sample Size}}$$

<b>pg</b>	<b>=</b>	$\frac{6452}{759194.3} \times \frac{4000}{1.15 * 1.00}$	<b>=</b>	<b>29.5</b>		<b>29.5</b>
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**Calculation of 13C12-PCB-118 Recovery in L2316030-1**

$$\% \text{ Recovery} = \frac{\text{Response of 13C12-PCB-118}}{\text{Response of 13C12-PCB-101}} \times \frac{\text{pg of 13C12-PCB-101 spiked} * 100}{\text{Mean RRF} * \text{pg 13C12-PCB-118 Spiked}}$$

<b>% Recovery</b>	<b>=</b>	$\frac{759194.3}{1240330.1} \times \frac{8000 * 100}{1.41 * 4000}$	<b>=</b>	<b>87</b>		<b>87 %</b>
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# SVOC DATA PACKAGE

## SECTION 7: SHIPPING/RECEIVING DOCUMENTS

Including:

- Airbills
- Chain-of-Custody Records
- Sample Log-in Sheet(s) - where applicable
- Others as listed below:

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L2316030

[ For lab use only ]

# ANALYTICAL REQUEST FORM



1.  **REGULAR Status**

**RUSH Status Requested - ADDITIONAL CHARGE**  
 RESULTS REQUIRED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CONTACT ALS PRIOR TO SENDING SAMPLES

2. Date 07/23/19 Purchase Order No. \_\_\_\_\_

3. Company Name : Floyd/Snider ALS Project Manager: Ron McLeod

Address: 601 Union St Suite 600

Seattle WA 98101

Person to Contact: Emily Jones

Telephone (719) 292-2078

Fax Telephone ( ) \_\_\_\_\_

E-mail Address: emily.jones@floydsnider.com

Billing Address (if different from above) \_\_\_\_\_

4. Quote No. Email quote

5. **Sample Collection**

Sampling Site Background: City, Heiser, Residential

Industrial Process: Background Industry

Date of Collection 7/19/19

Time Collected 0940; 0825; 0931

Date of Shipment \_\_\_\_\_

Chain of Custody No.: \_\_\_\_\_

6. How did you first learn about ALS?  
Referred to by SKC / T&B Systems

## 7. REQUEST FOR ANALYSES

Client Sample Number	Matrix*	Sample/Area Volume	ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
<u>Heiser-20190711-0719</u>	<u>Lo-Vol PUF tube</u>	<u>TBD; 8481 min</u>	<u>PCBs by Method 1668; Dioxins by Method 8290A</u>	<u>1</u>	<u>1</u>
<u>City-20190711-0719</u>	<u>Lo-Vol PUF tube</u>	<u>TBD; 8937.5</u>	<u>PCBs by Method 1668; Dioxins by Method 8290A</u>	<u>1</u>	<u>2</u>
<u>Residential-20190713-0719</u>	<u>Lo-Vol PUF tube</u>	<u>TBD; sample over</u>	<u>PCBs by Method 1668; Dioxins by Method 8290A</u>	<u>1</u>	<u>3</u>
<u>Sample periods:</u>					
<u>Heiser</u>	<u>07/11/19</u>	<u>08:45</u>	<u>07/19/19 0825</u>		
<u>City</u>	<u>07/11/19</u>	<u>09:59</u>	<u>07/19/19 0940</u>		
<u>Residential</u>	<u>7/13/19</u>	<u>13:36</u>	<u>07/19/19 0929</u>		

\* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

\*\* 1. µg/sample 2. mg/m<sup>3</sup> 3. ppm 4. % 5. µg/m<sup>3</sup> 6. \_\_\_\_\_ (other) Please indicate one or more units in the column entitled Units\*\*

Comments Hold for analysis after receiving 5 wks of samples

Possible Contamination and/or Chemical Hazards \_\_\_\_\_

### 7. Chain of Custody (Optional)

Relinquished by	<u>[Signature]</u>	<u>7/23/19 10:15</u>	Date/Time
Received by	<u>ARRON BURTON</u>	<u>24-July-2019 11:00</u>	<u>3.6°C</u>
Relinquished by			Date/Time
Received by			Date/Time

## Sample Receiving Log

Date/Time Received	Client ID	Number/Description of Containers	Temp. on Receipt*	Condition of Samples, Courier & Tracking Information	Receiver's Initials	Date/Time Login Completed	Submission ID	Sample ID Range
24-July-2019 11:00	Floyd Snider	3 x PUFs	3.6°C	Good FedEx 7886 3972 2784	MS	24-July-2019 15:00	L2316030	-1-3

\*Temperatures were recorded using :  VWR Traceable dedicated I.R. gun (model 36934-178 SN 192108143)

Other (specify): \_\_\_\_\_