Data Analysis

PCB Homologue Patterns Plot

- Plot of PCB congener homologue groups for fish data from Ecology's 2012 sampling event at Plante's Ferry along with PCB Task Force river data collected at Plante's Ferry and the nearest upstream discharge appears to show that higher molecular weight congeners (hepta- and octa-) are present in fish but not in the river sample or the nearest upstream discharge

PCB Content vs Age (Large Scale Suckers)

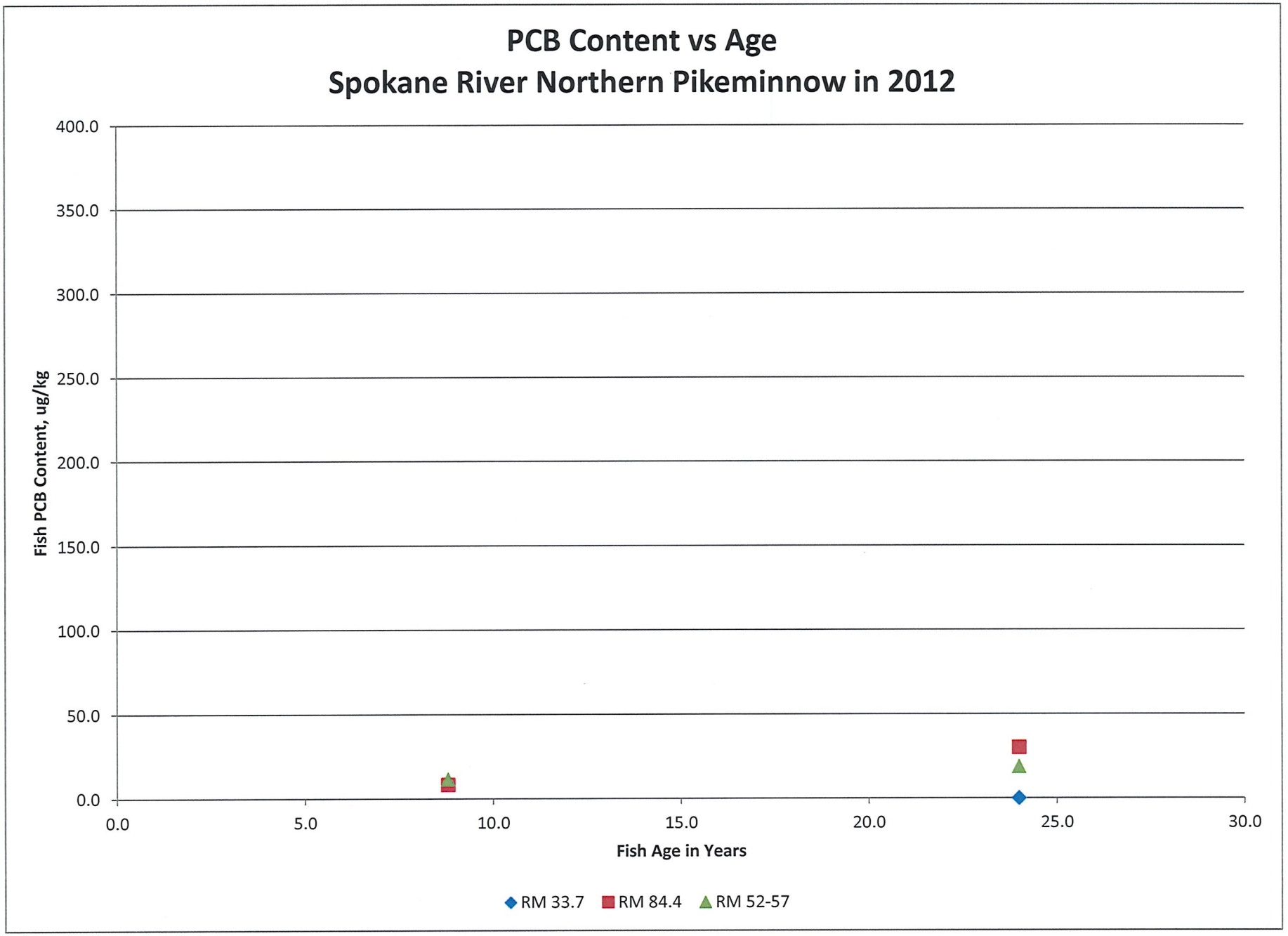
- Plot of PCB levels in large scale suckers at various locations in the river vs age of the fish
- The redish/orange lines show approximate average PCB levels in fish at four different locations on the river where PCB Task Force River data shows PCB levels in the range of ~107 pg/L to ~132 pg/L. While the river PCB concentration is relatively the same at the four locations, the fish concentrations vary by a factor of five
- The blue line shows the approximate average fish PCB concentration at an upriver location relative to the four other locations. PCB Task Force river data shows the PCB concentration to be ~20 pg/L. Fish concentrations however are in within the range of fish concentrations seen in other locations where PCB river concentrations are five to six times higher

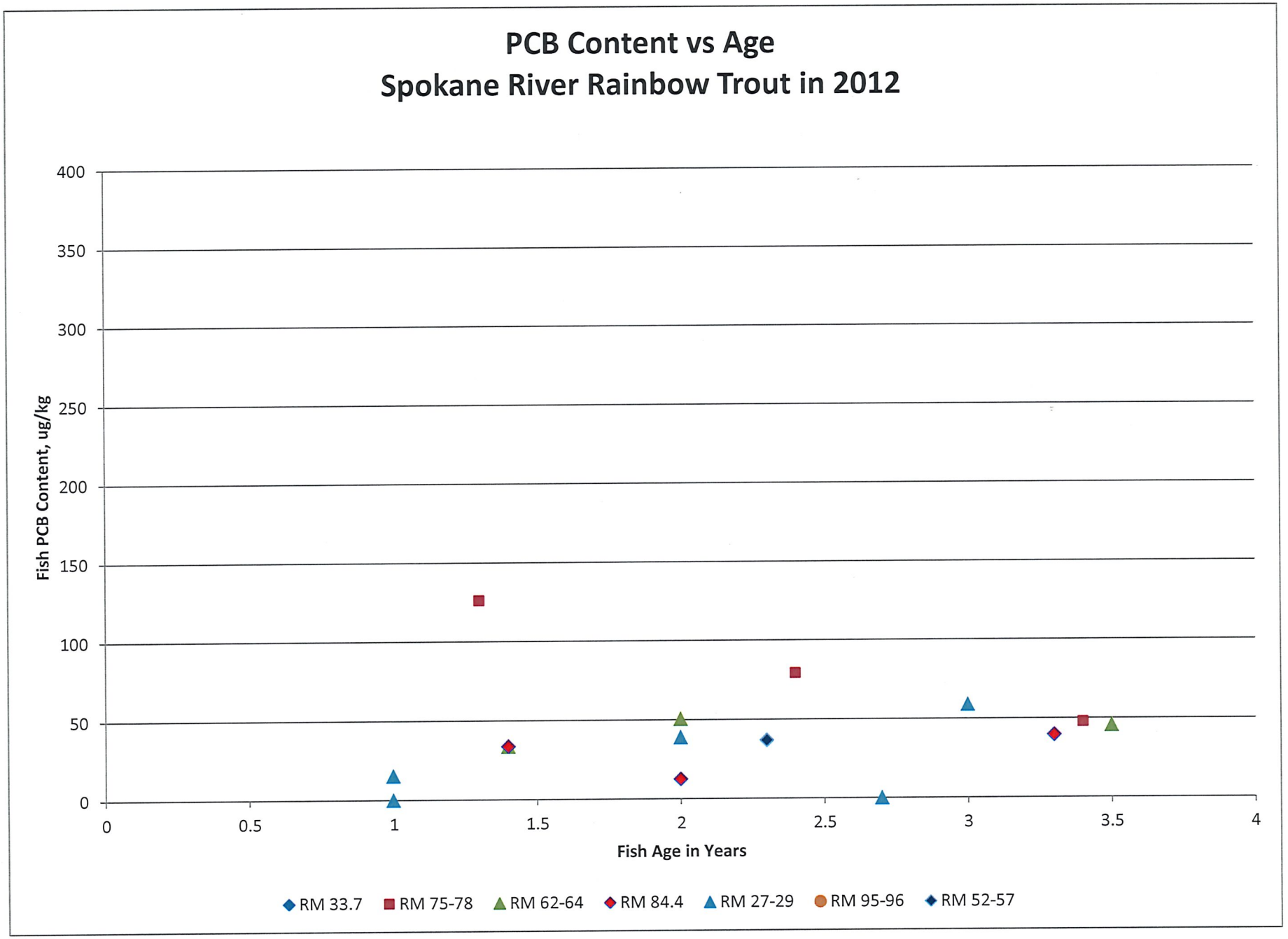
PCB Content vs Age (Mountain White Fish)

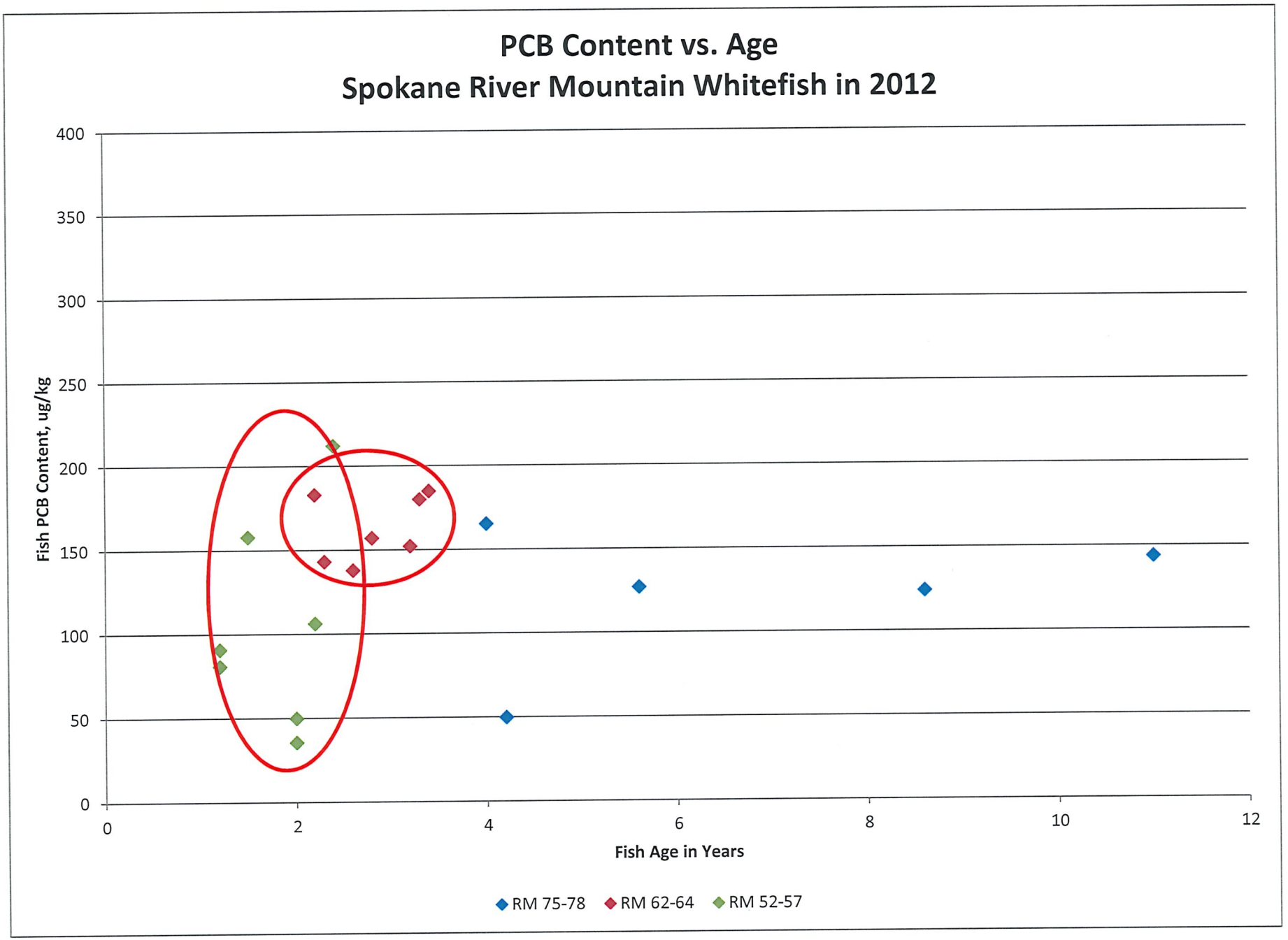
- Plot of PCB levels in mountain white fish at various locations in the river vs age of the fish
- The PCB Task Force River data shows PCB levels in the range of ~107 pg/L to ~132 pg/L at the two locations, however PCB levels in fish are widely different at the two locations with the range of levels in one location being a factor 5 and the other being a factor of ~1.3

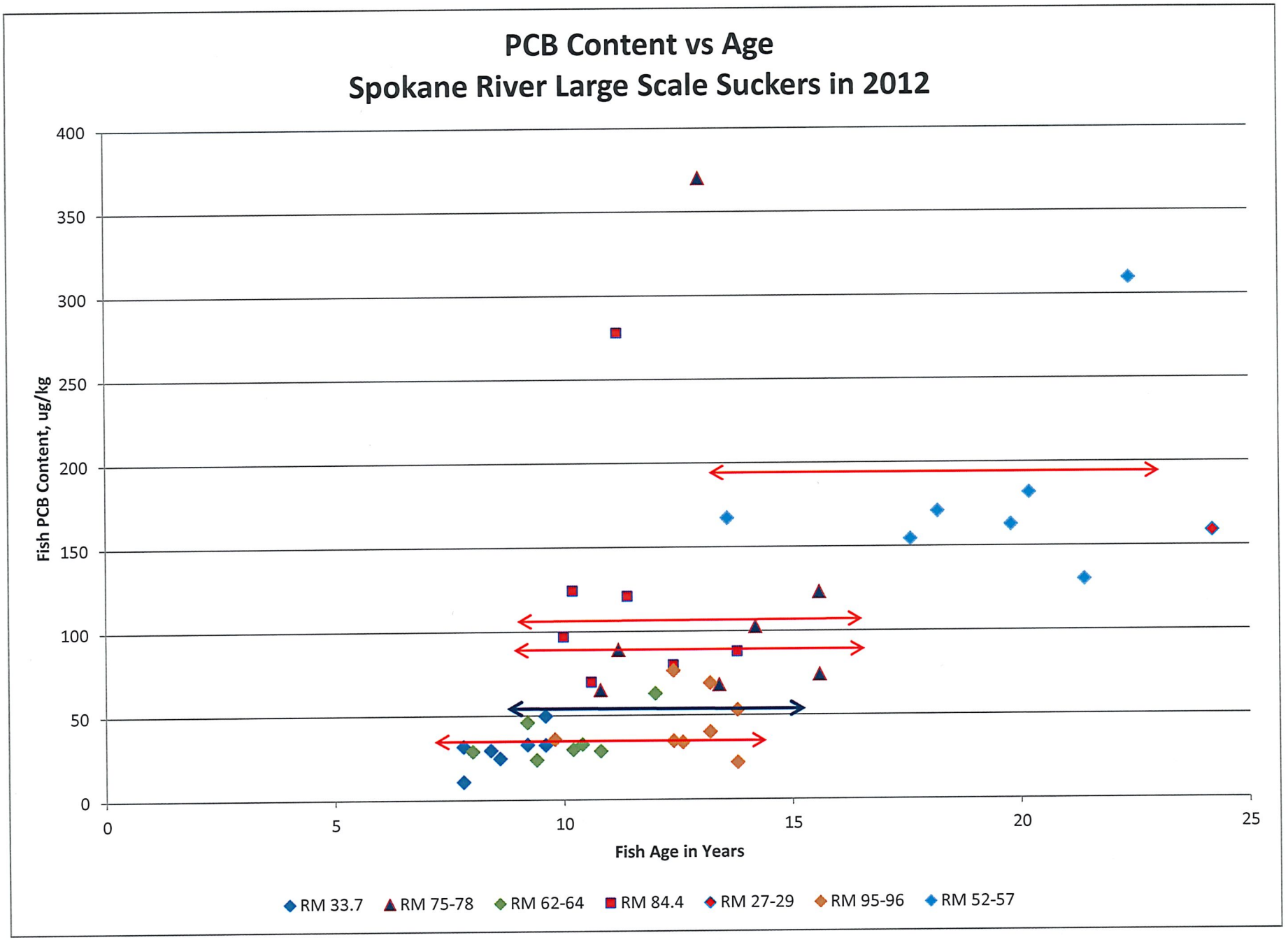
Top Level Congeners in Fish (Large Scale Suckers) vs River Congeners

- Plot of specific congeners that make up ~50% of the mass of PCB in the fish vs the level of those congeners in the river
- Data shows that for seven of the congeners in fish, after blank correction, those same congeners are not in the river water column samples evaluated with three others present at less than 1 pg/L. The remaining two congeners were present in the river at concentrations between 4 pg/L and ~7 pg/L

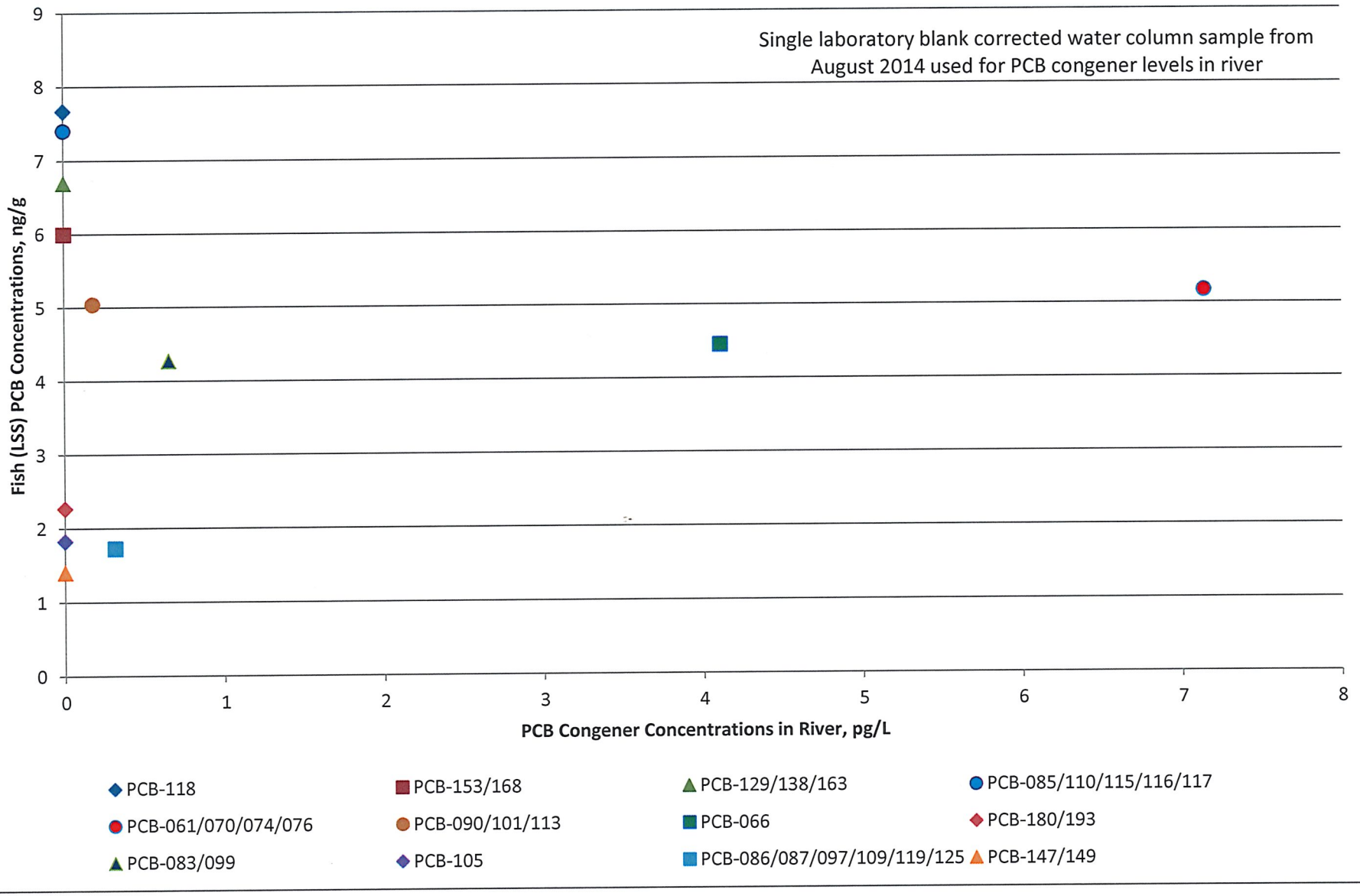

PCB Content vs Age
Spokane River Northern Pikeminnow in 2012
Fish PCB Content, ug/kg
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Fish Age in Years
RM 33.7
RM 84.4
RM 52-57


PCB Content vs Age
Spokane River Rainbow Trout in 2012
Fish PCB Content, ug/kg
400
350
300
250
200
150
100
50
0
0
0.5
1
1.5
2
2.5
3
3.5
4
Fish Age in Years
RM 33.7
RM 75-78
RM 62-64
RM 84.4
RM 27-29
RM 95-96
RM 52-57


PCB Content vs. Age
Spokane River Mountain Whitefish in 2012
Fish PCB Content, ug/kg
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
Fish Age in Years
RM 75-78
RM 62-64
RM 52-57


PCB Content vs Age
Spokane River Large Scale Suckers in 2012
Fish PCB Content, ug/kg
400
350
300
250
200
150
100
50
0
0
5
10
15
20
25
Fish Age in Years
RM 33.7
RM 75-78
RM 62-64
RM 84.4
RM 27-29
RM 95-96
RM 52-57

2012 Fish (LSS) Top Level Congeners vs. River Congener Concentrations at Plante's Ferry



2012 Fish (RBT) Top Level Congeners vs. River Congener Concentrations at Plante's Ferry

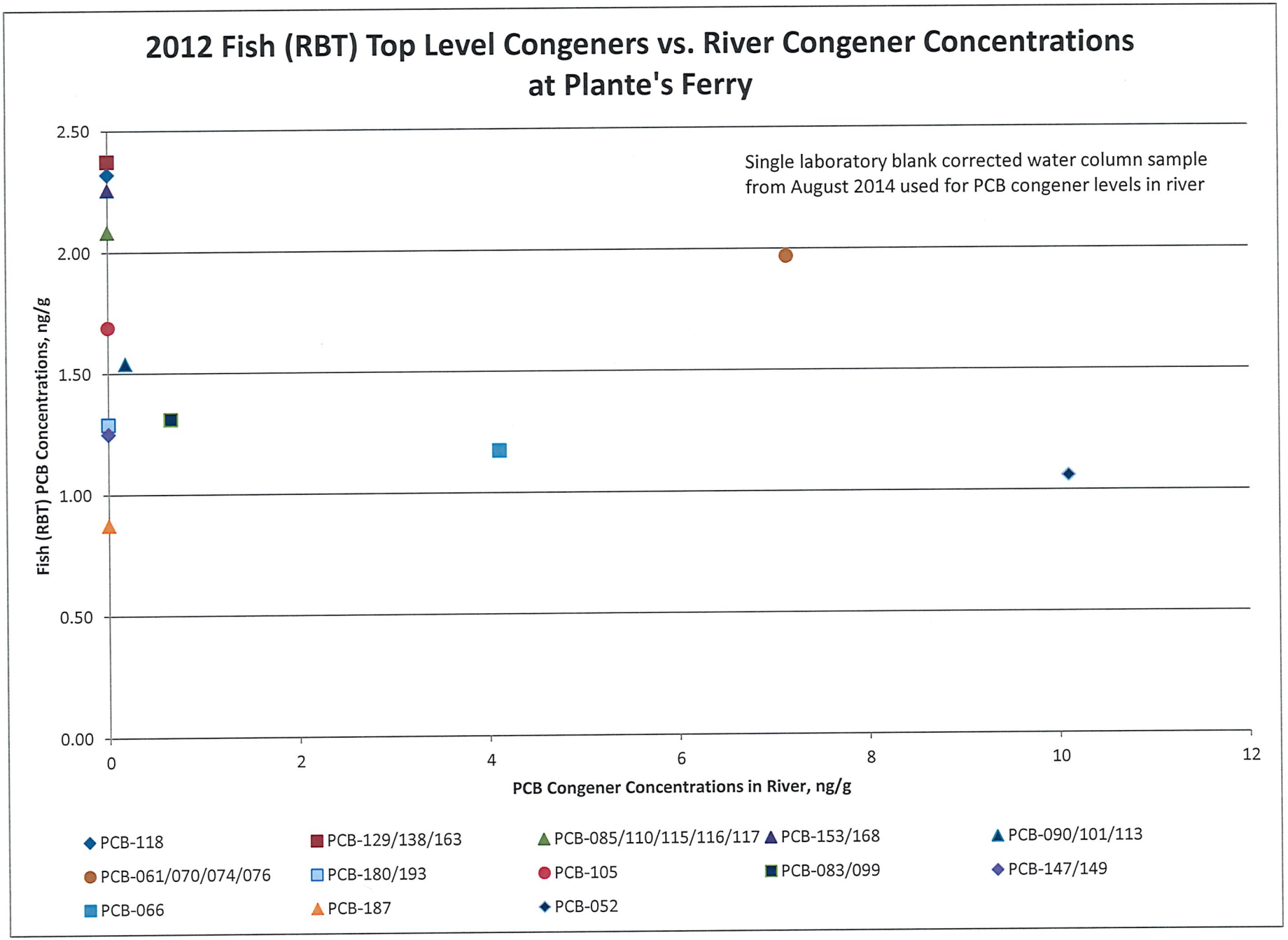


Table 1 . Summary of Existing Spokane River Water Column PCB Concentrations

Lake Coeur d'Alene (SR-15)		
Sample Month	Samples	Concentration
May 2014	6	23 pg/L
August 2014	7	13 pg/L
August 2015		
March 2016	2	14 pg/L
April 2016	1	15 pg/L
May 2016	1	72 pg/L
June 2016	1	3 pg/L
Arithmetic Mean – 17 pg/L Geometric Mean - 14 pg/L		

Trent Bridge/Plante's Ferry (SR-7)		
Sample Month	Samples	Concentration
May 2014		
August 2014	8	172 pg/L
August 2015	6	148 pg/L
March 2016	1	51 pg/L
April 2016	2	16 pg/L
May 2016	1	112 pg/L
June 2016	1	65 pg/L
Arithmetic Mean – 133 pg/L Geometric Mean – 107 pg/L		

Post Falls (SR-12)		
Sample Month	Samples	Concentration
May 2014		
August 2014	8	21 pg/L
August 2015		
March 2016		
April 2016		
May 2016		
June 2016		
Arithmetic Mean – 21 pg/L Geometric Mean - 18 pg/L		

Greene Street Bridge (SR-4)		
Sample Month	Samples	Concentration
May 2014		
August 2014	8	128 pg/L
August 2015	5	153 pg/L
March 2016	1	67 pg/L
April 2016	1	76 pg/L
May 2016	2	57 pg/L
June 2016	1	78 pg/L
Arithmetic Mean – 118 pg/L Geometric Mean – 105 pg/L		

Greenacres/Barker Rd. (SR-9)		
Sample Month	Samples	Concentration
May 2014		
August 2014	8	19 pg/L
August 2015	6	32 pg/L
March 2016		
April 2016		
May 2016		
June 2016		
Arithmetic Mean – 24 pg/L Geometric Mean – 14 pg/L		

Spokane Gage (SR-3)		
Sample Month	Samples	Concentration
May 2014		
August 2014	8	202 pg/L
August 2015	5	175 pg/L
March 2016	1	65 pg/L
April 2016	1	57 pg/L
May 2016	1	50 pg/L
June 2016	2	57 pg/L
Arithmetic Mean – 154 pg/L Geometric Mean – 131 pg/L		

Mirabeau Point (SR-8a)		
Sample Month	Samples	Concentration
May 2014	10	33 pg/L
August 2014		
August 2015	6	44 pg/L
March 2016		
April 2016		
May 2016		
June 2016		
Arithmetic Mean – 37 pg/L Geometric Mean - 18 pg/L		

Nine Mile Dam (SR-1)		
Sample Month	Samples	Concentration
May 2014		
August 2014	8	163 pg/L
August 2015		
March 2016	1	100 pg/L
April 2016	1	68 pg/L
May 2016	1	187 pg/L
June 2016	1	62 pg/L
Arithmetic Mean – 144 pg/L Geometric Mean – 132 pg/L		

2.5 Impairment Status

Nineteen waterbody segments within the Study Area on the Spokane River, Lake Spokane and the Little Spokane River are currently listed as impaired under section 303(d) of the Clean Water Act for exceeding human health water quality criteria for PCBs, based on fish tissue concentrations of PCBs. The fish tissue equivalent concentration (FTEC) for total PCBs on which the 303(d) listings are based represents the