3.0 Data Results

This section summarizes the data results of the archived samples analyzed as part of the second round of the Fidalgo Bay Sediment Investigation. The chemistry data results are provided in Appendix B.

3.1 Surface Sediment Results

Twenty one archived surface sediment samples were submitted for SMS chemistry analysis. Nine of these samples were also submitted for dioxin/furan congener analysis. In addition, two samples that were analyzed for SMS chemistry in the first round of analyses were resubmitted for analysis of dioxin/furan congeners. This section describes the concentrations found in the archive samples and compares them to the SMS, SQS, and CSL as well as the concentrations found in the first round of analyses.

3.1.1 SMS Chemistry

Four of the 21 sediment samples analyzed for SMS chemistry exceeded either the SQS or CSL criteria for phenol or 4-methylphenol. All four samples that exceeded SMS criteria were located in DUA 3. No samples exceeded the SMS criteria for these compounds in the first round of analysis (SAIC 2008). Figure 2 shows the locations of the archived sediment samples analyzed in this round of analysis. Table 4 lists all samples that exceeded SMS criteria in this round of analysis. Figure 3 and Figure 4 show the combined SQS and CSL exceedances from both rounds of chemical analysis.

Table 4. Exceedances of SMS Criteria in the Second Round of Analysis

Station Number	SQS	CSL	A2-40	A2-56	A3-03	A3-18	A3-22b	A3-36	A3-37	A3-42	A4-14
Conventionals											
Total Organic Carbon (% dw)	–		0.98	0.76	2.18	1.86	0.87	1.02	2.38	2.65	0.95
Chlorinated Aromatics in mg/kg TOC											
1,2,4-Trichlorobenzene	0.81	1.8	*0.98*	*1.30*			*1.14*	*0.96*			*1.02*
Phenols in µg/kg dw											
Phenol	420	1200							610		
4-Methylphenol	670	670			680	1000				740	

dw = dry weight, TOC = total organic carbon
Rose-shaded bold font indicates the result exceeded the CSL numeric criteria.
Blue-shaded normal font indicates the result exceeded the SQS numeric criteria.
Italicized font indicates the result is not detected, but reporting limits exceeded the SQS numeric criteria.

DUA 1

Locations A1-09, A1-14, and A1-18 were analyzed in DUA1 due to their proximity to locations with sediment that exhibited toxicity that exceeded the SQS or CSL biological effects criteria (Table 1). Concentrations of metals in these samples were at least an order of magnitude lower than the SQS. Few SVOC analytes were detected, and most analytes were below either the method detection limit (MDL) or method reporting limit (MRL).

DUA 2

Surface sediment from A2-30 was analyzed because of an SQS exceedance of mercury at nearby A2-23 (Table 1). Mercury was detected at 0.061 mg/kg in A2-30, well below the SQS of 0.41 mg/kg. Locations A2-40 and A2-56 were analyzed because of their proximity to sediment toxicity exceeding the SQS observed at A2-38. No elevated concentrations of the SMS analytes were found at these two locations.

DUA 3

As with A2-30 from DUA 2, A3-22b was analyzed because of an SQS exceedance of mercury in the sediment at nearby A2-23. Mercury was detected at 0.025 mg/kg in A3-22b, below the SQS of 0.41 mg/kg.

Sediment from A3-36 was analyzed because of SQS toxicity at A2-38. No elevated concentrations of SMS analytes were found at A2-38.

Surface sediment from locations A3-03, A3-06, A3-18, A3-37, and A3-42 were analyzed due to proximity to CSL toxicity (Table 1). With the exception of A3-06, each of these locations had an SQS or CSL exceedance (Table 4). A3-37 had a phenol concentration of 610 µg/kg. The SQS for phenol is 420 µg/kg. Samples from A3-03, A3-18, and A3-42 exceeded the CSL for 4-methylphenol with concentrations of 680, 1000, and 740 µg/kg, respectively. No other analytes were measured at elevated concentrations. The highest detected concentrations of phenol and 4-methylphenol reported in DUA 3 from the previous round of analysis at A3-16, were 100 µg/kg and 140 µg/kg, respectively (SAIC 2008).

DUA 4

Surface sediment from A4-08 and A4-11 were analyzed due to CSL chemistry and toxicity at nearby locations, A4-14 was analyzed due to nearby SQS chemistry and toxicity exceedance, and A4-28 and A4-30 were analyzed due to nearby CSL chemistry (Table 1). Phenol was detected at a concentration of 410 µg/kg at A4-30, slightly below the SQS of 420 µg/kg. Other than phenol, concentrations of the SMS analytes measured in sediments from DUA 4 were low for the second round of analysis.

In the first round of analysis, surface sediment from A4-29 exceeded the CSL for bis(2-ethylhexyl)phthalate by over two orders of magnitude. Due to the ubiquity of bis(2-ethylhexyl)phthalate in plastics, sample contamination may have been responsible for the high concentration measured. Archived sediment from A4-29 was analyzed in the second round of analysis, and bis(2-ethylhexyl)phthalate was not detected.

Elevated Quantitation Limits

Although 1,2,4-trichlorobenzene was undetected in all samples, the reported values at five locations was greater than the SQS of 0.81 mg/kg TOC (Table 4). However, the values associated with undetected concentrations in Table 4 are the method reporting limits. The method detection limits for 1,2,4-trichlorobenzene at each of these locations is under the SQS. Both the MRL and MDL values are reported in the laboratory reports in Appendix D.

3.1.2 Dioxin/Furan Congeners

Due to the frequent detection of dioxin/furan congeners during the first round, an additional 11 archived sediment samples were analyzed for the second round of analysis. For each sample, a toxic equivalent quotient (TEQ) was calculated using the most recent mammalian TEFs from the WHO (Van den Berg et al. 2006). The TEQ was calculated using both one-half the detection limit and substituting zero for undetected congeners. Results discussed in this report use the one-half detection limit calculation. In addition, sediment dioxin/furan results have not been normalized to TOC.

TEQs from the 11 samples ranged from 0.29 to 8.91 pg TEQ/g, within the same range as the first round of analysis. Figure 5 shows the dioxin/furan concentrations measured in the sediment for all 35 samples analyzed as part of the Fidalgo Bay Sediment Investigation. In Figure 5, locations from the current round of analysis are noted with a red dot.

For the current round of analysis, additional sediment samples in DUAs 3 and 4 were analyzed to further delineate the extent of the dioxin/furan contamination. The highest concentration (41 pg TEQ/g) was found in sediment from A3-32 on the west side of DUA 3. Archived sediment from locations A3-37 and A3-42 to the south of A3-32 were analyzed with concentrations of 3.87 and 3.39 pg TEQ/g, indicating a decrease in TEQ concentration moving south from A3-32 (Figure 5).

The dioxin/furan concentrations in sediment from locations A3-02 and A3-22 prompted analysis of locations A3-03, A3-06, and A3-18. A3-02, with a concentration of 9.37 pg TEQ/g, was located at the entrance to Cap Sante Marina. Sediment from locations A3-03 and A3-06, located about 0.5 km to the west and south, had concentrations of 8.91 and 1.24 pg TEQ/g, respectively. Archive sample A3-18, located north of A3-22 and A3-23, had a concentration of 5.15 pg TEQ/g (Figure 5).

Sediment from locations A4-05 and A4-12 had concentrations of 9.01 and 9.24 pg TEQ/g in the first round of analysis. Six additional archived sediment samples collected in the vicinity of these two locations were analyzed for dioxin/furan congeners in DUA 4. Concentrations from these six samples ranged from 0.29 to 1.72 pg TEQ/g. Dioxin/furan contamination in DUA 4 appears to be in near shore depositional areas away from the strong currents of the Guemes Channel.

Though dioxin/furan concentrations do not have numeric criteria under SMS, comparisons can be made to other criteria. For the first round of analysis, dioxin/furan concentrations were compared to the freshwater sediment apparent effects threshold (AET) for benthic infauna, currently set at 8.8 pg TEQ/g (Avocet 2003) and the interim Canadian Sediment Quality Guidelines (CSeQG 2005). Only location A3-03 was above the freshwater AET with a concentration of 8.91 pg TEQ/g. The interim CSeQG for sediment is 0.85 pg/g TEQ. Seven samples were over this interim level. The CSeQG also established a probable effect level (PEL) of 21.5 pg/g TEQ. No samples in the second round of analysis were over the PEL.

3.2 Tissue Results

A total of 45 archived tissue samples were submitted for analysis of PCB Aroclors, metals, lipids, and dioxin/furan congeners (Table 2 and Table 3). This section describes the analytical results for tissue samples and any relationship present between species or location. Summary tables for the tissue results can be found in Appendix B.

3.2.1 Metals and PCB Aroclors

Metals and PCBs were analyzed in all tissues with the exception of the polychaetes. PCB Aroclors were frequently undetected. Concentrations of metals in tissue residues varied by DUA and/or species. Although lipophilicity (the promotion of absorbability or dissolvability of lipids) varies by oxidation state, most metals are not lipophilic. Concentrations of metals have not been normalized to lipid content.

Flatfish

The range of concentrations between the six fish replicates was small, indicating little difference between the fish of DUA 2 and 3. There appear to be some differences in concentration between species. Table 5 shows the concentration of metals for the six flatfish tissue samples.

Concentrations of mercury in the English sole (A3R1-ES) are nearly an order of magnitude less than those found in the starry flounder. Arsenic concentrations in the English sole are nearly twice the highest amount found in the starry flounder. It is not clear whether these differences are interspecies or age class related. The five English sole in A3R1-ES had the smallest average length and mass of all flatfish replicates (Appendix A). The differences in metals accumulation in English sole caught in Fidalgo Bay could be due to different representative age class, home range, or diet, and thus represent a different exposure and uptake than the starry flounder. It is not possible to make a conclusive determination based on the limited data collected for this investigation.

No PCB Aroclors were detected in any of the fish tissue samples.

Table 5. Concentrations of Metals, Dioxin/Furan TEQ, and Lipids Measured in Fish Tissue

Station Number	A2R1-SF		A2R2-SF		A2R3-SF		A3R1-ES		A3R2-SF		A3R3-SF	
Metals in mg/kg dw		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**
Arsenic	5.4		5.1		6.7		12.5		4.1		6	
Cadmium	0.386	J	0.413	J	0.418	J	0.471	J	0.464	J	0.457	J
Chromium	1.14		0.74		0.63		2.38		2.16		1.28	
Copper	4.72	J	4.45	J	13.1	J	7.42	J	7.15	J	3.3	J
Lead	5.48		5.73		5.82		6.59		6.2		6.31	
Mercury	0.144		0.242		0.35		0.031		0.254		0.225	
Silver	0.017	U	0.018	U	0.018	U	0.015	JU	0.014	JU	0.02	U
Zinc	48.3	J	47.2	J	48.9	J	39.7	J	47.2	J	44.4	J
PCBs in µg/kg ww												
Aroclor-1221	20	U	20	U	20	U	20	U	20	U	20	U
Aroclor-1232	10	U	9.9	U	9.8	U	9.9	U	10	U	9.8	U
Aroclor-1242	10	U	9.9	U	9.8	U	9.9	U	10	U	9.8	U
Aroclor-1016	10	U	9.9	U	9.8	U	9.9	U	10	U	9.8	U
Aroclor-1248	10	U	9.9	U	9.8	U	9.9	U	10	U	9.8	U
Aroclor-1254	10	Ui	9.9	U	9.8	U	9.9	U	10	U	9.8	U
Aroclor-1260	10	Ui	9.9	Ui	9.8	Ui	9.9	Ui	10	U	9.8	U
Total PCBs*	20	U	20	U	20	U	20	U	20	U	20	U
Dioxin/Furan pg/g ww												
TEQ 1/2 DL	0.175		0.142		0.099		0.168		0.139		0.082	
Lipid	1.91		1.47		1.25		2.85		0.99		0.56	

dw = dry weight; ww = wet weight

Clams

Interspecies differences in metals concentrations were examined in clams, but if present they were obscured by the spatial concentration differences. Table 6 lists concentrations of metals at each clam location. For most metals, the highest concentrations were in DUA 4. Copper concentrations in DUA 4 ranged from 2 to 50 times higher than concentrations at other locations. Two exceptions are cadmium and silver, which have their highest average concentrations in DUA 1.

PCB Aroclors were only detected in three clam replicates and all were bentnose clams in DUA 4. Aroclor 1254 had a concentration of 19 µg/kg in A4R1 and 8.3 µg/kg in A4R2. Aroclor 1260 had a concentration of 15 µg/kg in A4R3.

Crabs

Red rock and Dungeness crab were collected as part of the Fidalgo Bay Sediment Investigation and analyzed as hepatopancreas, muscle, and other soft tissue. Due to the differences in species within each DUA, concentrations are presented as individual replicates (Table 7).

Table 6. Concentrations of Metals, Dioxin/Furan TEQ, and Lipids Measured in Clam Tissue

Station Number	A1R1 manila		A1R2 manila		A1R3 manila		A2R1 manila		A2R2 bentnose		A2R3 bentnose		A3R1 horse		A3R2 macoma		A3R3 manila		A4R1 bentnose		A4R2 bentnose		A4R3 bentnose	
Metals in mg/kg dw		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**
Arsenic	12.2		15.7		23.6		14.1		13.8		15.2		14.7				10.6		21.1		12.5		19.3	
Cadmium	1.74	J	1.89	J	2.37	J	0.713	J	1.82	J	0.649	J	0.785	J			1.45	J	0.742		0.732	J	0.637	J
Chromium	2		1.91		2.13		28.4		3.04		30.5		11.6				2.06		26		33.4		28.6	
Copper	12.3	J	12	J	8.34	J	30.3	J	11.8	J	22.9	J	27.1	J			9.87	J	477		75.9	J	61.6	J
Lead	6.31		6.61		7.33		10.2		6.69		8.31		6.55				6.08		37.1		29.9		17.5	
Mercury	0.097		0.161		0.223		0.094		0.09		0.062		0.047				0.059		0.997		0.084		0.102	
Silver	1.7		2.2		1.9		0.606		0.453		0.304		0.764				0.43		0.862	NJ	0.348		0.708	
Zinc	71.1	J	83.1	J	70.5	J	62.7	J	79.1	J	72.4	J	102	J			65	J	235	J	88	J	140	J
PCBs in µg/kg ww																								
Aroclor-1221	20	U	20	U	20	U	20	U	20	U	20	U	20	U			20	U	20	U	20	U	20	U
Aroclor-1232	10	U	10	U	9.7	U	10	U	10	U	9.8	U	10	U			9.9	U	10	U	9.8	U	10	U
Aroclor-1242	10	U	10	U	9.7	U	10	U	10	U	9.8	U	10	U			9.9	U	10	U	9.8	U	10	U
Aroclor-1016	10	U	10	U	9.7	U	10	U	10	U	9.8	U	10	U			9.9	U	10	U	9.8	U	10	U
Aroclor-1248	10	U	10	U	9.7	U	10	U	10	U	9.8	U	10	U			9.9	U	10	U	9.8	U	10	U
Aroclor-1254	10	U	10	U	9.7	U	10	U	10	U	9.8	U	10	U			9.9	U	19		8.3	T	10	U
Aroclor-1260	10	U	10	U	9.7	U	10	U	10	U	9.8	U	10	U			9.9	U	10	U	9.8	U	15	
Total PCBs*	20	U	20	U	20	U	20	U	20	U	20	U	20	U			20	U	19		8.3	U	15	
Dioxin/Furan pg/g ww																								
TEQ 1/2 DL	0.08		0.09		0.07		0.12		0.07		0.09		0.07		0.69		0.07		0.76		0.238		0.31	
Lipid	0.88		0.97		0.6		0.78		1.11		0.68		0.54		0.94		1.35		0.95		0.79		0.51	

Table 7. Concentrations of Metals, Dioxin/Furan TEQ, and Lipids Measured in Crab Tissue

Station Number	A2R1 hepato	RR	A2R1 other	RR	A2R1 muscle	RR	A2R2 hepato	DC	A2R2 other	DC	A2R2 muscle	DC	A2R3 hepato	DC	A2R3 other	DC	A2R3 muscle	DC	A3R1 hepato	DC	A3R1 other	DC	A3R1 muscle	DC	A3R2 hepato	DC	A3R2 other	DC	A3R2 muscle	DC	A4R1 hepato	RR	A4R1 other	RR	A4R1 muscle	RR
Metals in mg/kg dw		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**		**Q**
Arsenic			25.6		22.1		32.2		37.4		49.4		34.4		36.6		50.2		33.3		33.9		42.3		26.6		26.6		35.3		20.1		23.1		23.6	
Cadmium			9.5	J	2.06	J	0.866	J	1.1		0.48	J	1.7		1.55		0.488		1.99		1.22		0.637		1.78		1.19		0.559		32.1		15.9		3.86	
Chromium			2.08		0.5		0.14	JB	2.92		0.28		0.26		5.66		0.41		0.25		3.05		0.45		0.36		2.63		0.29	U	0.92		3.53		0.32	
Copper			83.3	J	30.8	J	145	J	171		55.8	J	180		180		42		78.1		126		46.6		109		126		39.3		93.8		105		36.1	
Lead			8.08		5.64		6.65		7.94		5.64		6.57		8.19		5.79		6.08		7.34		5.88		6.45		8.68		6.11		6.53		8.15		5.66	
Mercury			0.118		0.155		0.192		0.278		0.413		0.254		0.158		0.278		0.266		0.172		0.26		0.243		0.163		0.188		0.09		0.108		0.117	
Silver			1.6		0.377		2		1.7	NJ	1.1		2.4	NJ	1.4	NJ	0.667	NJ	2.2	NJ	1.3	NJ	0.714	NJ	2.1	NJ	1.9	NJ	0.708	NJ	1.3	NJ	1.2	NJ	0.471	NJ
Zinc			167	J	223	J	77.7	J	134	J	216	J	85.8	J	120	J	201	J	108	J	140	J	217	J	86.3	J	127	J	203	J	210	J	183	J	247	Ui
PCBs in µg/kg ww																																				
Aroclor-1221			20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	35	U	23	U	20	Ui
Aroclor-1232			9.9	U	9.7	U	11	Ui	10	U	10	Ui	9.9	U	9.9	U	9.8	U	9.9	U	9.6	U	9.6	Ui	9.8	U	9.6	U	9.8	Ui	18	U	12	U	12	Ui
Aroclor-1242			9.9	U	9.7	U	9.9	Ui	10	U	10	Ui	9.9	U	9.9	U	9.8	U	9.9	U	9.6	U	9.6	U	9.8	U	9.6	U	11	Ui	18	U	12	U	9.9	Ui
Aroclor-1016			9.9	U	9.7	U	12	Ui	10	U	10	Ui	9.9	U	9.9	U	9.8	U	9.9	U	9.6	U	9.6	U	9.8	U	9.6	U	9.8	U	18	U	12	U	9.9	Ui
Aroclor-1248			9.9	U	9.7	U	11	Ui	10	U	10	Ui	9.9	U	9.9	U	9.8	U	9.9	U	9.6	U	9.6	Ui	9.8	U	9.6	U	9.8	Ui	18	U	12	U	9.9	Ui
Aroclor-1254			9.9	U	9.7	U	51	Ui	10	Ui	10	U	22	Ui	9.9	Ui	9.8	Ui	16	Ui	9.6	U	9.6	U	20	Ui	9.6	Ui	9.8	U	22	Ui	12	Ui	9.9	U
Aroclor-1260			9.9	U	9.7	U	110		10	Ui	10	U	33	Ui	9.9	Ui	9.8	Ui	28	Ui	9.6	U	9.6	U	31	Ui	9.6	Ui	9.8	U	20	Ui	12	Ui	9.9	U
Total PCBs*			20	U	20	U	110		20	U	20	U	33	Ui	20	U	20	U	28	UiU	20	U	20	U	20	U	20	U	20	U	35	U	23	U	20	Ui
Dioxin/Furan pg/g ww																																				
TEQ 1/2 DL	0.611		0.128		0.037		10.500		0.471		0.144		5.210		0.582		0.084		2.640		0.355		0.065		2.930		0.336		0.107		6.574		1.532		0.181	
Lipid	4.89		0.68		0.14		15.10		1.03		0.26		8.29		1.22		0.13		6.50		1.12		0.07		11.40		1.10		0.25		13.60		1.08		0.21	

Table 7. Concentrations of Metals, Dioxin/Furan TEQ, and Lipids Measured in Crab Tissue (continued)

Station Number	A4R2 muscle	RR	A4R2 hepato	RR	A4R2 other	RR
Metals in mg/kg dw		**Q**		**Q**		**Q**
Arsenic	32.5		18.2		32.1	
Cadmium	7.42		135	U	44.3	
Chromium	0.6		0.33		2.5	
Copper	55.6		273		181	
Lead	6.2		5.71		8.18	
Mercury	0.319		0.238		0.176	
Silver	0.827	NJ	2	NJ	1.2	NJ
Zinc	309	U	321	U	189	U
PCBs in µg/kg ww						
Aroclor-1221	20	U	200	U	20	U
Aroclor-1232	9.7	Ui	100	U	10	U
Aroclor-1242	9.7	Ui	100	U	10	U
Aroclor-1016	9.7	Ui	100	U	10	U
Aroclor-1248	9.7	Ui	100	U	10	U
Aroclor-1254	9.7	U	100	Ui	10	Ui
Aroclor-1260	9.7	Ui	100	Ui	10	Ui
Total PCBs*	20	U	200	U	20	U
Dioxin/Furan pg/g ww						
TEQ 1/2 DL	0.076				0.780	
Lipid	0.04		5.10		1.26	

In all cases, the hepatopancreas samples had the highest percentage of lipids and the muscle had the least. Given that metals are not lipophilic, the lipid content had little effect on concentration. In most cases, arsenic and zinc had the highest concentrations in muscle; cadmium and silver had the highest concentrations in the hepatopancreas; and chromium, copper, and lead had the highest concentrations in the other soft tissue.

Concentrations of most metals were similar between DUAs. One exception was cadmium at DUA 4, with concentrations 3 to 30 times higher than results observed at the other DUAs for each tissue type.

PCB Aroclor 1260 was detected in A2R2-DC-hepato at a concentration of 110 µg/kg. PCBs were not detected in any other crab tissue samples.

3.2.2 Dioxin/Furan Congeners

Dioxin/furan congeners were analyzed in all tissue samples, though 1,2,3,4,6,7,8-HPCDD, OCDD, and 2,3,7,8-TCDF were frequently the only detected compounds. Table 5 through Table 8 list the wet weight half detection limit TEQ concentrations. Many of the reported concentrations are low. For comparison, it is important to note that if the Axys detection limits are used for all congeners to calculate the half detection limit TEQ, the averaged concentration is 0.08 ± 0.06 pg TEQ/g.

Flatfish had the lowest dioxin/furan concentrations, averaging 0.13 pg TEQ/g for the six replicates. Concentrations ranged from 0.08 to 0.18 pg TEQ/g (Table 5).

Clams had the next lowest concentrations, averaging 0.22 pg TEQ/g. However, there were differences in dioxin/furan concentration by location. With concentrations ranging from 0.07 to 0.12 pg TEQ/g, DUAs 1 and 2 had some of the the lowest measured dioxin/furan TEQ. Concentrations in DUA 3 ranged from 0.07 pg TEQ/g at A3R1-horse and A3R3-manila to 0.69 pg TEQ/g at A3R2-macoma. The bentnose clams in replicates A4R1, A4R2, and A4R3 had concentrations of 0.76, 0.238, and 0.31 pg TEQ/g, respectively (Table 6).

Dioxin/furan concentrations in polychaetes were not as variable as those for clams. Concentrations ranged from 0.08 to 0.38 pg TEQ/g, and averaged 0.25 pg/g. The lowest concentration was for A2R3. All other locations had concentrations above 0.20 pg TEQ/g. Although the polychaetes were collected at the same locations as the clams, there was no relationship between the wet weight concentrations found in the clams and those found in the polychaetes.

Table 8. Dioxin/Furan and Lipid Concentrations Measured in Polychaetes

Station Number	A2R2 polychaete	A2R3 polychaete	A3R1 polychaete	A3R3 polychaete	A4R1 polychaete	A4R2 polychaete
Dioxin/Furan pg/g ww						
TEQ 1/2 DL pg/g ww	0.226	0.0768	0.383	0.284	0.203	0.344
Lipid	0.9	1.41	1.71	4.06	1.71	0.85

Dioxin/furan concentrations in crab tissue were largely dependent upon percent lipids in the tissue. Hepatopancreas tissue had the highest concentrations, reaching 10.50 pg TEQ/g and 15.1 percent lipid in A3R2-DC-hepato. The lowest concentrations were found in crab muscle, with an average of 0.10 pg TEQ/g across all DUAs. Figure 6 shows the relationship between wet weight concentration and percent lipids for the three crab tissue types. The R^2 (0.8465) indicates that nearly 85 percent of the variability in wet weight concentrations is due to the variability in lipid concentrations. When lipid normalized, muscle concentrations are frequently higher than the concentrations found in hepatopancreas.

Comparing concentrations between different DUAs was difficult because of the two species of crab collected. Within DUA 1, where both red rock and Dungeness crab were analyzed, the red rock crab had lower dioxin/furan TEQs than the Dungeness crab for all three tissue types (Table 7).