APPENDIX A

Biological Sample Collection and Analysis

This page intentionally left blank

1.0 Summary of Biological Samples Collected in 2004, 2005, and 2006 for Analysis of Hydrocarbons, Metals, and Biomarkers

Table A-1. Station locations and biological samples collected for the 2004 cANIMIDA field survey.

Station ID	Station Type	Latitude	Longitude	Marine Animal/Device				
				Amphipod	Bivalve	Mussel[1] SPMD	Fish	Isopod
3A	BSMP	70°16.931	147°5.447		1	2		
4A	BSMP	70°18.454	147°40.237	1				
5(0)	BSMP	70°22.744	148°0.385	2				1
5B	BSMP	70°34.912	148°55.206	1				
5F	BSMP	70°26.495	148°49.535		1			
5H	BSMP	70°22.232	147°47.787		1	2		
L04	Liberty	70°17.060	147°40.098	1				
L06	Liberty	70°16.925	147°34.058			2		
L08	Liberty	70°16.701	147°30.343		1			
L09	Liberty	70°16.571	147°27.204		1			
L14	Liberty	70°17.010	147°34.744				5[2]	
L18	Liberty	70°19.383	147°45.660	1				
N03	Northstar	70°30.002	148°41.466	1				1
N04	Northstar	70°29.674	148°48.127	1		2		
N05	Northstar	70°29.632	148°44.769			2		
N06	Northstar	70°29.575	148°43.213			2		
N11	Northstar	70°28.417	148°42.942	1				
N12	Northstar	70°27.295	148°42.192	1				
N13	Northstar	70°26.981	148°43.619	1				
N18	Northstar	70° 29.091	148°42.261	1				
N25	Northstar	70° 29.731	148°43.987				5[3]	
PBS	Liberty	70° 17.558	147°48.141				26[4]	
SIS	Northstar	70° 25.908	148°41.567				31[5]	
TGV	Tigvariak Island	70° 12.454	147°14.234				30[6]	
PC (or MZ)	Port Chatham Mussel Collection	59° 12.92	151° 45.405			3		

[1] Two SPMDs and one container of mussels were deployed and then retrieved from these locations.

[2] Five total samples from L14 were collected, three for CYP1A analysis and two for PAH/metals analysis. A total of 10 fish were used in the five samples.

[3] Five total samples from N25 were collected, two for CYP1A analysis and three for PAH/metals analysis. A total of 22 fish were used in the five samples.

[4] A total of 76 samples were collected (organ, bile, and whole fish tissue) from a total of 26 fish.

[5] A total of 83 samples were collected from the 31 fish captured.

[6] A total of 66 samples were collected from the 30 fish captured.

Table A-2. Station locations and biological samples collected for the 2005 cANIMIDA field survey.

Station ID	Station Type	Latitude	Longitude	Marine Animal				
				Amphipod	Bivalve	Mussel[1]	Fish	Isopods
1A	BSMP	70° 1.6122	144° 32.8494		1			1
1C	BSMP	70° 8.1845	145° 1.3494	1				
1D	BSMP	70° 5.6494	144° 5.3693					1
1E	BSMP	70° 6.1382	143° 46.5326		1			
2F	BSMP	70° 10.2965	146° 2.1102	1	1			1
2G	BSMP	70° 6.0678	145° 32.4800			2		
3A	BSMP	70° 16.9269	147° 5.5482		1			
4A	BSMP	70° 18.4546	147° 40.3143	1				
4B	BSMP	70° 21.0243	148° 1.2259	1				1
5(1)	BSMP	70° 25.0315	148° 3.5596	2	1	2		
BP01	Liberty (Boulder Patch)	70° 20.7299	147° 32.9351	2		2		
L07	Liberty	70° 16.769	147° 31.972					1
L08	Liberty	70° 16.7043	147° 30.2275		1	2		2
N03	Northstar	70° 30.0211	148° 41.4504	1		2		
N11	Northstar	70° 28.4263	148° 41.9156	1				
N18	Northstar	70° 29.09	148° 42.2210	1				
PB1	Prudhoe	70° 18.7979	148° 23.2470			2		
E01	Liberty (near Endicott)	70° 21.0939	147° 56.1091	1		2		
SIS	Northstar	70° 25.9061	148° 41.4242				17	
PB	Liberty	70° 17.5666	147° 49.1731				18	
PC (or MZ)	Port Chatham Mussel Collection	59° 12.92	151° 45.405			2		

[1]Two containers of mussels were collected from each deployment location; organisms were combined into one sample during homogenization in the laboratory. The two samples from Port Chatham served as a time zero and a trip blank, these samples were analyzed individually.

Table A-3. Station locations and biological samples collected during the 2006 cANIMIDA field survey.

Station ID	Station Type	Latitude	Longitude	Marine Animal					
				Amphipod	Bivalve	Mussel[1]	Fish	Isopods	Mysid
4A	BSMP	70°18.4578	147°40.1781	1					
5A	BSMP	70°29.7068	148°46.1643			2			
6A	BSMP	70°32.2	149°57.72	1					
6B	BSMP	70°33.3611	150°24.6255	2				1	
6F	BSMP	70°40.1641	151°12.1239	1					
7E	BSMP	70°43.5819	152°4.3662	1					
7G	BSMP	70°38.905	151°53.6441	1					
BP01	Liberty (Boulder Patch)	70°20.7424	147°32.9127	2		2			
E01	Liberty (near Endicott)	70°21.0972	147°56.1293			2			
L03	Liberty	70°17.3384	147°33.2819		1				
L08	Liberty	70°16.6849	147°30.309	1	1	2		1	
L19	Liberty	70°18.6216	147°49.3156	1					
N03	Northstar	70°29.9938	148°41.6367	1		2			
N05N11	Northstar	70°28.5194	148°41.9535					1	1
N06	Northstar	70°29.536	148°43.194	1					
N11	Northstar	70°28.4126	148°41.8829	2		2			
N11N08	Northstar	70°29.4192	148°38.3415	1				1	1
N11S	Northstar	70°27.024	148°41.9833					1	1
N14	Northstar	70°26.006	148°40.429	1					
N26	Northstar	70°29.4989	148°42.1752	2					
N27	Northstar	70°29.5295	148°43.1672	1					
N28	Northstar	70°29.523	148°41.5252	1					
PBS	Liberty	70°17.572	148°49.112				20		
PC	Port Chatham Mussel Collection	59°12.92	151°45.405			3			
SDI-1	SDI	70°19.586	147°52.396			2			
SIS	Northstar	70°25.934	147°41.743				19		
WD01	West Dock	70°23.851	148°31.4687	2		2		1	

[1]Two containers of mussels were collected from each deployment location; organisms were combined into one sample during homogenization in the laboratory. The two samples from Port Chatham served as a time zero and a trip blank, these samples were analyzed individually.

Table A-4. Sample containers and preservation and storage requirements of biota samples collected during the cANIMIDA program.

Sample Type	Analysis	Precleaned Container	Storage/Preservative
Clams and Amphipods	SHC, PAH, biomarker, metals	250 mL glass	Frozen -20°C
Mussels and SPMD's	PAH	Mussels: 250 mL glass or pre-cleaned foil SPMDs: 250 ml glass	Frozen -20°C
Fish (whole)	PAH, metals	250 mL glass or pre-cleaned foil	Frozen -20°C
Fish (gills, gut, kidney, liver)	CYP1A	Plastic vial	Formalin
Fish (bile)	FAC	2 ml glass vial	Frozen -20°C
Source Samples	SHC, PAH, biomarkers	250 mL glass	Frozen -20°C
	Metals	Plastic jar	Frozen -20°C
Equipment Blanks	SHC, PAH	250 mL glass	Frozen -20°C
	Metals	Plastic jar	Frozen -20°C
Field Blanks	SHC, PAH	250 mL glass	Frozen -20°C
	Metals	Plastic jar	Frozen -20°C

2.0 Summary of Biological Samples Analyzed for Hydrocarbons and Metals in 2004, 2005, and 2006

Table A-5. Clam and amphipod samples collected in 2004 and chosen for hydrocarbon and metals analysis.

Sample Type	Station ID	Field Sample ID
Amphipods	4A (BSMP)	04-4A-01-PHC/MET-T-AN
Amphipods	5(0) (BSMP)	04-5(0)-01-PHC/MET-T-AN
Amphipods	5B (BSMP)	04-5B-01-PHC/MET-T
Amphipods	L04 (Liberty)	04-L04-01-PHC/MET-T-AN
Amphipods	L18 (Liberty)	04-L18-01-PHC/MET-T
Amphipods	N03 (Northstar)	04-N03-01-PHC/MET-T
Amphipods	N04 (Northstar)	04-N04-01-PHC/MET-T
Amphipods	N11 (Northstar)	04-N11-01-PHC/MET-T-AN
Clams	3A (BSMP)	04-3A-01-PHC/MET-T-AS
Clams	5F (BSMP)	04-5F-01-PHC/MET-T
Clams	5H (BSMP)	04-5H-01-PHC/MET-T-AS
Clams	L08 (Liberty)	04-L08-01-PHC/MET-T-AS

Table A-6. Mussel and SPMD samples collected in 2004 and chosen for hydrocarbon and metals (mussels only) analysis.

Sample Type	Station ID	Field Sample ID[1]
Mussels	3A (BSMP)	04-3A-01-PHC/MET-T-MU
Mussels	5H (BSMP)	04-5H-01-PHC/MET-T-MU
Mussels	L06 (Liberty)	04-L06-01-PHC/MET-T-MU
Mussels	N04 (Northstar)	04-N04-01-PHC/MET-T-MU
Mussels	N05 (Northstar)	04-N05-01-PHC/MET-T-MU
Mussels	N06 (Northstar)	04-N06-01-PHC/MET-T-MU
Mussels	NA	04-MZ-01-PHC/MET-T-MU
Mussels	NA	04-MZ-02-PHC/MET-T-MU
Mussels	NA	04-MZ-03-PHC/MET-T-MU
SPMD	3A (BSMP)	04-3A-01-PHC-SPMD
SPMD	5H (BSMP)	04-5H-01-PHC-SPMD
SPMD	L06 (Liberty)	04-L06-01-PHC-SPMD
SPMD	N04 (Northstar)	04-N04-01-PHC-SPMD
SPMD	N05 (Northstar)	04-N05-01-PHC-SPMD
SPMD	N06 (Northstar)	04-N06-01-PHC-SPMD
SPMD	N06 (Northstar)	04-N06-02-PHC-SPMD
SPMD	NA	04-SPQC-01-PHC-SPMD-TB
SPMD	NA	Blank/Unopened SPMD

[1] The replicate SPMD samples from the deployed locations were combined and extracted as one sample.

Table A-7. Fish samples collected in 2004 and chosen for hydrocarbon and metals analysis.

Station ID	Station Group	Field Sample ID	Species
SIS	Northstar	04-SIS-06-PHC/MET-T	Arctic Cisco
SIS	Northstar	04-SIS-03-PHC/MET-T	Arctic Cisco
SIS	Northstar	04-SIS-09-PHC/MET-T	Arctic Cisco
SIS	Northstar	04-SIS-17-PHC/MET-T	Arctic Cod
N25	Northstar	04-N25-03-PHC/MET-T	2 Arctic Cod, 1 Four Horn Sculpin
SIS	Northstar	04-SIS-14-PHC/MET-T	Four Horn Sculpin
SIS	Northstar	04-SIS-15-PHC/MET-T	Four Horn Sculpin
SIS	Northstar	04-SIS-01-PHC/MET-T	Least Cisco
SIS	Northstar	04-SIS-07-PHC/MET-T	Least Cisco
PBS	Liberty	04-PBS-26-PHC/MET-T	Arctic Char
PBS	Liberty	04-PBS-04-PHC/MET-T	Arctic Cisco
PBS	Liberty	04-PBS-08-PHC/MET-T	Arctic Cisco
L14	Liberty	04-L14-03-PHC/MET-T	Arctic Cod
L14	Liberty	04-L14-05-PHC/MET	Arctic Cod
PBS	Liberty	04-PBS-21-PHC/MET-T	Broad Whitefish
PBS	Liberty	04-PBS-09-PHC/MET-T	Broad Whitefish
PBS	Liberty	04-PBS-27-PHC/MET-T	Four Horn Sculpin
PBS	Liberty	04-PBS-19-PHC/MET-T	Four Horn Sculpin
PBS	Liberty	04-PBS-25-PHC/MET-T	Least Cisco
PBS	Liberty	04-PBS-06-MET/PHC-T	Least Cisco
TGV	Tigvariak Island	04-TGV-01-PHC/MET-T	Arctic Char
TGV	Tigvariak Island	04-TGV-21-PHC/MET-T	Arctic Char
TGV	Tigvariak Island	04-TGV-04-PHC/MET-T	Arctic Flounder
TGV	Tigvariak Island	04-TGV-06-PHC/MET-T	Arctic Flounder
TGV	Tigvariak Island	04-TGV-08-PHC/MET-T	Four Horn Sculpin
TGV	Tigvariak Island	04-TGV-30-PHC/MET-T	Four Horn Sculpin
TGV	Tigvariak Island	04-TGV-02-PHC/MET-T	Least Cisco
TGV	Tigvariak Island	04-TGV-26-PHC/MET-T	Least Cisco

Table A-8. Amphipod, isopod, and clam samples collected in 2005 chosen for metals and hydrocarbon analysis.

Sample Type	Station ID	Field Sample ID
Amphipod	1C (BSMP)	05-1C-01-PHC-T-AN
Amphipod	2F (BSMP)	05-2F-01-MET-T-AN
Amphipod	4A (BSMP)	05-4A-01-PHC-T-AN
Amphipod	4B (BSMP)	05-4B-01-PHC-T-AN
Amphipod	5(1) (BSMP)	05-5(1)-01-PHC-T-AN
Amphipod	N03 (Northstar)	05-N03-01-PHC-T-AN
Amphipod	N11 (Northstar)	05-N11-01-PHC-T-AN
Amphipod	N18 (Northstar)	05-N18-01-PHC-T-AN
Amphipod	BP01 (Liberty)	05-BP01-01-PHC-T-AN
Amphipod	BP01 (Liberty)	05-BP01-02-PHC-T-AN
Amphipod	E01 (Liberty)	05-E01-01-PHC-T-AN
Isopod	L07 (Liberty)	05-L07-01-PHC-T-ISO
Isopod	1A (BSMP)	05-1A-01-PHC-T-ISO
Isopod	1D (BSMP)	05-1D-01-PHC-T-ISO
Isopod	2F (BSMP)	05-2F-01-PHC-T-ISO
Isopod	4B (BSMP)	05-4B-01-PHC-T-ISO
Isopod	L08 (Liberty)	05-L08-01-PHC-T-ISO
Isopod	L08 (Liberty)	05-L08-02-PHC-T-ISO
Clams[1]	1A (BSMP)	05-1A-01-PHC-T-AS
Clams	1E (BSMP)	05-1E-01-PHC-T-CY
Clams[1]	2F (BSMP)	05-2F-01-PHC-T-CY
Clams	3A (BSMP)	05-3A-01-PHC-T-AS
Clams	5(1) (BSMP)	05-5(1)-01-PHC-T-AS
Clams[2]	5F (BSMP)	02-5F-01-PHC-T-CY
Clams[2]	5H (BSMP)	02-5H-01-PHC-T-AS
Clams[1]	L08 (Liberty)	05-L08-01-PHC-T-AS

[1]Due to volume constraints, these samples were only analyzed for metals.
[2]Historic samples used for the intra-laboratory comparison.

Table A-9. Mussel samples collected in 2005 chosen for hydrocarbon and metals analysis.

Sample Type	Station ID	Field Sample ID
Mussels	N03 (Northstar)	05-N03-01-PHC-T-MU
Mussels	PB1 (Liberty)	05-PB1-01-PHC-T-MU
Mussels	5(1) (BSMP)	05-5(1)-01-PHC-T-MU
Mussels	E01 (BSMP)	05-E01-01-PHC-T-MU
Mussels	BP01 (Liberty)	05-BP01-01-PHC-T-MU
Mussels	L08 (Liberty)	05-L08-01-PHC-T-MU
Mussels	2G (BSMP)	05-2G-01-PHC-T-MU
Mussels	PC	05-PC-01-PHC-T-MU
Mussels	PC	05-PC-02-PHC-T-MU

Table A-10. Fish samples collected in 2005 chosen for hydrocarbon and metals analysis.

Station ID	Station Group	Field Sample ID	Species
SIS	Northstar	05-SIS-02-PHC-T-F	Arctic Char
SIS	Northstar	05-SIS-03-PHC-T-F	Arctic Char
SIS	Northstar	05-SIS-04-PHC-T-F	Arctic Char
SIS	Northstar	05-SIS-05-PHC-T-F	Four Horn Sculpin
SIS	Northstar	05-SIS-06-PHC-T-F	Four Horn Sculpin
SIS	Northstar	05-SIS-07-PHC-T-F	Humpback Broad Whitefish
SIS	Northstar	05-SIS-08-PHC-T-F	Humpback Broad Whitefish
SIS	Northstar	05-SIS-11-PHC-T-F	Humpback Broad Whitefish
SIS	Northstar	05-SIS-13-PHC-T-F	Humpback Broad Whitefish
SIS	Northstar	05-SIS-14-PHC-T-F	Humpback Broad Whitefish
PB	Liberty	05-PB-01-PHC-T-F	Arctic Cisco
PB	Liberty	05-PB-03-PHC-T-F	Arctic Cisco
PB	Liberty	05-PB-09-PHC-T-F	Arctic Cisco
PB	Liberty	05-PB-17-PHC-T-F	Arctic Flounder
PB	Liberty	05-PB-18-PHC-T-F	Arctic Flounder
PB	Liberty	05-PB-07-PHC-T-F	Humpback Broad Whitefish
PB	Liberty	05-PB-10-PHC-T-F	Humpback Broad Whitefish
PB	Liberty	05-PB-11-PHC-T-F	Humpback Broad Whitefish
PB	Liberty	05-PB-13-PHC-T-F	Humpback Broad Whitefish
PB	Liberty	05-PB-14-PHC-T-F	Humpback Broad Whitefish
PB	Liberty	01-PBS-71-PHC-T-FS[1]	Four Horn Sculpin

[1]Historic sample analyzed in duplicate for intra-lab comparison.

Table A-11. Amphipod, isopod, mysid, and clam samples collected in 2006 selected for metals and hydrocarbon analysis.

Sample Type	Station ID[1]	Field Sample ID
Amphipod	N11 (Northstar)	04-N11-01-PHC/MET-T-AN[2]
Amphipod	N11 (Northstar)	05-N11-01-PHC-T-AN[2]
Amphipod	4A (BSMP)	06-4A-01-PHC-AN
Amphipod	6A (BSMP)	06-6A-01-PHC-AN
Amphipod	6B (BSMP)	06-6B-01-PHC-AN[3]
Amphipod	6B (BSMP)	06-6B-02-PHC-AN
Amphipod	6F (BSMP)	06-6F-01-PHC-AN
Amphipod	7E (BSMP)	06-7E-01-PHC-AN[3]
Amphipod	7G (BSMP)	06-7G-01-PHC-AN[3]
Amphipod	BP01 (Liberty)	06-BP01-01-SHC-AN[3]
Amphipod	BP01 (Liberty)	06-BP01-02-PHC-AN[3]
Amphipod	L08 (Liberty)	06-L08-01-PHC-AN[3]
Amphipod	L19 (Liberty)	06-L19-01-PHC-AN[3]
Amphipod	N03 (Northstar)	06-N03-01-PHC-AN
Amphipod	N06 (Northstar)	06-N06-01-PHC-AN
Amphipod	N11 (Northstar)	06-N11-01-PHC-AN
Amphipod	N11 (Northstar)	06-N11-02-PHC-AN
Amphipod	N11N08 (Northstar)	06-N11N08-01-PHC-AM[3]
Amphipod	N14 (Northstar)	06-N14-01-PHC-AN
Amphipod	N26 (Northstar)	06-N26-01-PHC-AN
Amphipod	N26 (Northstar)	06-N26-02-PHC-AN
Amphipod	N27N06 (Northstar)	06-N2706-01-PHC-AN
Amphipod	N28 (Northstar)	06-N28-01-PHC-AN
Amphipod	WD01 (West Dock)	06-WD01-01-PHC-AN
Amphipod	WD01 (West Dock)	06-WD01-02-PHC-AN
Clam	L03 (Liberty)	06-L03-01-PHC-AS
Clam	L08 (Liberty)	06-L08-01-PHC-AS
Isopod	6B (BSMP)	06-6B-01-PHC-ISO[3]
Isopod	L08 (Liberty)	06-L08-01-PHC-ISO[3]
Isopod	N05N11 (Northstar)	06-N05N11-01-PHC-ISO[3]
Isopod	N11N08 (Northstar)	06-N11N08-01-PHC-ISO[3]
Isopod	N11S (Northstar)	06-N11S-01-PHC-ISO[3]
Isopod	WD01 (West Dock)	06-WD01-01-PHC-ISO[3]
Mysid	N05N11 (Northstar)	06-N05N11-01-PHC-MY[3]
Mysid	N11N08 (Northstar)	06-N11N08-01-PHC-MY[3]
Mysid	N11S (Northstar)	06-N11S-01-PHC-MY[3]

[1] Station IDs such as "N05N11" indicate that the organisms were collected during a transit between stations N05 and N11.

[2] Two amphipod samples, one from 2004 and one from 2005, were re-analyzed during the 2006 season in order to further evaluate an observed change in PAH levels between 2004 and 2005.

[3] Samples had limited volume and were only analyzed for organic parameters.

Table A-12. Mussel samples collected in 2006 for hydrocarbon and metals analysis.

Sample Type	Station ID	Field Sample ID
Mussels	5A (BSMP)	06-5A-01-PHC-MU
Mussels	BP01 (Liberty)	06-BP01-01-PHC-MU
Mussels	E01 (Liberty)	06-E01-01-PHC-MU
Mussels	L08 (Liberty)	06-L08-01-PHC-MU
Mussels	N03 (Northstar)	06-N03-01-PHC-MU
Mussels	N11 (Northstar)	06-N11-01-PHC-MU
Mussels	MZ	06-PC-01-PHC-MU
Mussels	MZ	06-PC-02-PHC-MU[1]
Mussels	MZ	06-PC-03-PHC-MU[1]
Mussels	SDI	06-SDI01-01-PHC-MU
Mussels	WD01 (West Dock	06-WD01-01-PHC-MU

[1] Samples had limited volume and were only analyzed for organic parameters.

Table A-13. Fish samples collected in 2006 that were chosen for hydrocarbon and metals analysis.

Station ID	Station Group	Field Sample ID	Species
PBS	Liberty	04-PBS-21-PHC/MET-T[1]	Broad whitefish
PBS	Liberty	05-PB-13-PHC-T-F[1]	Humpback Broad Whitefish
PBS	Liberty	06-PB-01-PHC-F	Broad whitefish
PBS	Liberty	06-PB-02-PHC-F	Humpback Broad Whitefish
PBS	Liberty	06-PB-03-PHC-F	Humpback Broad Whitefish
PBS	Liberty	06-PB-04-PHC-F	Humpback Broad Whitefish
PBS	Liberty	06-PB-05-PHC-F	Least Cisco
PBS	Liberty	06-PB-10-PHC-F	Four Horn Sculpin
PBS	Liberty	06-PB-13-PHC-F	Four Horn Sculpin
PBS	Liberty	06-PB-14-PHC-F	Four Horn Sculpin
PBS	Liberty	06-PB-16-PHC-F	Arctic Flounder
PBS	Liberty	06-PB-19-PHC-F	Least Cisco
PBS	Liberty	06-PB-20-PHC-F	Least Cisco
SIS	Northstar	06-SI-01-PHC-F	Least Cisco
SIS	Northstar	06-SI-06-PHC-F	Least Cisco
SIS	Northstar	06-SI-07-PHC-F	Least Cisco
SIS	Northstar	06-SI-08-PHC-F	Least Cisco
SIS	Northstar	06-SI-09-PHC-F	Arctic Flounder
SIS	Northstar	06-SI-10-PHC-F	Four Horn Sculpin
SIS	Northstar	06-SI-11-PHC-F	Four Horn Sculpin

[1] Two fish samples, one from 2004 and one from 2005, were re-analyzed during the 2006 season in order to further evaluate an observed change in PAH levels between 2004 and 2005.

3.0 Fish bile samples analyzed for bile fluorescent aromatic compounds in 2004 and 2005.

Table A-14. Sample identification, volume, and dilution factor for bile samples received by GERG (SDG # E9151, received September 14, 2004) for analysis of fluorescing aromatic hydrocarbons (FACs) in 2004.

File Number	Battelle ID	Sample Descriptor	Sample Volume (µL)	Dilution Factor	Comments
C45083	S4126	04-SIS-01-FAC-B	12.0	5	
C45084	S4127	04-SIS-02-FAC-B	30.0	2	
C45085	S4128	04-SIS-03-FAC-B	34.5	2	
C45086	S4129	04-SIS-04-FAC-B	>50	1	
C45087	S4130	04-SIS-05-FAC-B	>50	1	
C45088	S4131	04-SIS-06-FAC-B	>50	1	
C45089	S4132	04-SIS-07-FAC-B	>50	1	
C45090	S4134	04-SIS-09-FAC-B	>50	1	
C45091	S4135	04-SIS-10-FAC-B	8.0	10	
C45092	S4138	04-SIS-13-FAC-B	1.5	50	Very Small Amount of Sample
C45093	S4140	04-SIS-19-FAC-B	>50	1	
C45094	S4141	04-SIS-20-FAC-B	1.5	50	Very Small Amount of Sample
C45095	S4142	04-SIS-21-FAC-B	>50	1	
C45096	S4143	04-SIS-22-FAC-B	>50	1	
C45097	S4144	04-SIS-23-FAC-B	>50	1	
C45098	S4146	04-SIS-25-FAC-B	>50	1	
C45099	S4147	04-SIS-26-FAC-B	>50	1	
C45100	S4148	04-SIS-28-FAC-B	22.0	3	
C45101	S4151	04-PBS-27-FAC-B	>50	1	
C45102	S4152	04-PBS-26-FAC-B	2.0	25	Very Small Amount of Sample
C45103	S4153	04-PBS-25-FAC-B	>50	1	
C45104	S4155	04-PBS-23-FAC-B	>50	1	
C45105	S4156	04-PBS-22-FAC-B	>50	1	
C45106	S4157	04-PBS-21-FAC-B	>50	1	
C45107	S4158	04-PBS-19-FAC-B	>50	1	
C45108	S4159	04-PBS-18-FAC-B	33.0	2	
C45109	S4160	04-PBS-17-FAC-B	35.0	2	
C45110	S4161	04-PBS-13-FAC-B	30.0	4	
C45111	S4164	04-PBS-12-FAC-B	>50	1	
C45112	S4165	04-PBS-11-FAC-B	19.0	4	
C45113	S4166	04-PBS-09-FAC-B	22.0	1	
C45114	S4167	04-PBS-08-FAC-B	>50	1	
C45115	S4168	04-PBS-06-FAC-B	>50	1	
C45116	S4169	04-PBS-05-FAC-B	>50	1	

File Number	Battelle ID	Sample Descriptor	Sample Volume (µL)	Dilution Factor	Comments
C45117	S4170	04-PBS-04-FAC-B	18.0	4	
C45118	S4314	04-TGV-04-FAC-B	>50	1	
C45119	S4315	04-TGV-21-FAC-B	10.0	8	
C45120	S4316	04-TGV-26-FAC-B	>50	1	
C45121	S4317	04-TGV-05-FAC-B	>50	1	
C45122	S4318	04-TGV-08-FAC-B	1.0	50	Very Small Amount of Sample
C45123	S4319	04-TGV-27-FAC-B	>50	1	
C45124	S4320	04-TGV-30-FAC-B	>50	1	
C45125	S4322	04-TGV-06-FAC-B	1.0	50	Very Small Amount of Sample
C45126	S4323	04-TGV-24-FAC-B	>50	1	
C45127	S4324	04-TGV-29-FAC-B	>50	1	
C45128	S4325	04-TGV-03-FAC-B	>50	1	
C45129	S4326	04-TGV-02-FAC-B	>50	1	
C45130	S4327	04-TGV-23-FAC-B	>50	1	
C45131	S4328	04-TGV-07-FAC-B	12.0	5	
C45132	S4329	04-TGV-01-FAC-B	>50	1	
C45133	S4136	04-SIS-11-FAC-B	20.0	4	
C45134	S4137	04-SIS-12-FAC-B	>50	1	
C45135	S4145	04-SIS-24-FAC-B	>50	1	
C45136	S4149	04-SIS-27-FAC-B	>50	1	
C45137	S4154	04-PBS-24-FAC-B	25.0	3	
C45138	S4162	04-PBS-14-FAC-B	>50	1	

Table A-15. Sample identification, volume, and dilution factor for bile samples received by GERG (SDG# F9251, received September 9, 2005) for analysis of fluorescing aromatic hydrocarbons (FACs) in 2005.

File Number	Battelle ID	Sample Descriptor	Sample Volume (µL)	Dilution Factor	Comments
C46762	S8814	05-PB-01-FACS-B	>50	1	
C46763	S8813	05-PB-02-FACS-B	>50	1	
C46764	S8812	05-PB-03-FACS-B	>50	1	
C46765	S8815	05-PB-05-FACS-B	>50	1	
C46766	S8816	05-PB-05-FACS-B	>50	1	
C46767	S8817	05-PB-06-FACS-B	>50	1	
C46768	S8818	05-PB-07-FACS-B	>50	1	
C46769	S8819	05-PB-08-FACS-B	>50	1	
C46770	S8820	05-PB-09-FACS-B	>50	1	
C46771	S8821	05-PB-10-FACS-B	>50	1	
C46772	S8822	05-PB-11-FACS-B	>50	1	
C46773	S8823	05-PB-12-FACS-B	>50	1	
C46774	S8824	05-PB-13-FACS-B	>50	1	
C46775	S8825	05-PB-14-FACS-B	>50	1	
C46776	S8828	05-PB-18-FACS-B	14.0	4	
C46777	S8829	05-SIS-01-FACS-B	30.0	2	
C46778	S8830	05-SIS-02-FACS-B	>50	1	
C46779	S8831	05-SIS-03-FACS-B	30.0	2	
C46780	S8832	05-SIS-04-FACS-B	>50	1	
C46781	S8833	05-SIS-05-FACS-B	>50	1	
C46782	S8834	05-SIS-06-FACS-B	>50	1	
C46783	S8835	05-SIS-07-FACS-B	>50	1	
C46784	S8836	05-SIS-08-FACS-B	>50	1	
C46785	S8837	05-SIS-09-FACS-B	>50	1	
C46786	S8838	05-SIS-10-FACS-B	>50	1	
C46787	S8839	05-SIS-11-FACS-B	>50	1	
C46788	S8841	05-SIS-13-FACS-B	>50	1	
C46789	S8842	05-SIS-14-FACS-B	>50	1	
C46790	S8843	05-SIS-15-FACS-B	>50	1	
C46791	S8845	05-SIS-17-FACS-B	>50	1	

4.0 Samples for CYP1A Analysis by Immunohistochemistry

Table A-16. Fish samples collected in 2004 for measurement of CYP1a activity immunohistochemistry.

Region	Station ID	Field Sample ID	Species (common name)	Species (scientific)
Liberty	PBS	04-PBS-26-CYP-T	Arctic Char (Dolly Varden)	*Salvelinus malma*
Liberty	PBS	04-PBS-01-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Liberty	PBS	04-PBS-04-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Liberty	PBS	04-PBS-08-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Liberty	L14	04-L14-01-CYP-T	Arctic Cod	*Boreogadus saida*
Liberty	L14	04-L14-02-CYP-T	Arctic Cod	*Boreogadus saida*
Liberty	L14	04-L14-04-CYP-T	Arctic Cod	*Boreogadus saida*
Liberty	PBS	04-PBS-09-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-10-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-11-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-21-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-22-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-23-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-24-CYP-T	Broad Whitefish	*Coregonus nasus*
Liberty	PBS	04-PBS-30-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Liberty	PBS	04-PBS-19-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Liberty	PBS	04-PBS-20-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Liberty	PBS	04-PBS-27-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Liberty	PBS	04-PBS-28-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Liberty	PBS	04-PBS-29-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Liberty	PBS	04-PBS-03-CYP-T	Least Cisco	*Coregonus sardinella*
Liberty	PBS	04-PBS-05-CYP-T	Least Cisco	*Coregonus sardinella*
Liberty	PBS	04-PBS-06-CYP-T	Least Cisco	*Coregonus sardinella*
Liberty	PBS	04-PBS-12-CYP-T	Least Cisco	*Coregonus sardinella*
Liberty	PBS	04-PBS-25-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-02-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	SIS	04-SIS-03-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	SIS	04-SIS-04-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	SIS	04-SIS-06-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	SIS	04-SIS-08-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	SIS	04-SIS-09-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	SIS	04-SIS-10-CYP-T	Arctic Cisco	*Coregonus autumnalis*

Region	Station ID	Field Sample ID	Species (common name)	Species (scientific)
Northstar	SIS	04-SIS-21-CYP-T	Arctic Cisco	*Coregonus autumnalis*
Northstar	N25	04-N25-02-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	N25	04-N25-02-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	N25	04-N25-04-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	N25	04-N25-04-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	N25	04-N25-04-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	N25	04-N25-04-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	SIS	04-SIS-17-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	SIS	04-SIS-29-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	SIS	04-SIS-30-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	SIS	04-SIS-31-CYP-T	Arctic Cod	*Boreogadus saida*
Northstar	SIS	04-SIS-14-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Northstar	SIS	04-SIS-15-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Northstar	SIS	04-SIS-16-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-01-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-05-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-07-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-13-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-25-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-18-CYP-T	Least Cisco	*Coregonus sardinella*
Northstar	SIS	04-SIS-20-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-01-CYP-T	Arctic Char (Dolly Varden)	*Salvelinus malma*
Tigvariak	TGV	04-TGV-21-CYP-T	Arctic Char (Dolly Varden)	*Salvelinus malma*
Tigvariak	TGV	04-TGV-04-CYP-T	Arctic Flounder	*Pseudopleuronectes americanus*
Tigvariak	TGV	04-TGV-06-CYP-T	Arctic Flounder	*Pseudopleuronectes americanus*
Tigvariak	TGV	04-TGV-05-CYP-T	Arctic Flounder	*Pseudopleuronectes americanus*
Tigvariak	TGV	04-TGV-07-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-10-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-14-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-15-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-16-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-28-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-29-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-30-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-13-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*

Region	Station ID	Field Sample ID	Species (common name)	Species (scientific)
Tigvariak	TGV	04-TGV-08-CYP-T	Four Horn Sculpin	*Myoxocephalus quadricornis*
Tigvariak	TGV	04-TGV-02-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-03-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-22-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-25-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-26-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-23-CYP-T	Least Cisco	*Coregonus sardinella*
Tigvariak	TGV	04-TGV-24-CYP-T	Least Cisco	*Coregonus sardinella*

Table B-17. Fish samples collected in 2005 for measurement of CYP1A activity by immunohistochemistry.

Station ID	Field Sample ID	Species (common name)	Species (scientific)
Point Brower	05-PB-01-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-02-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-03-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-04-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-05-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-06-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-07-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-08-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-09-CYP-T-F	Arctic Cisco	*Coregonus autumnalis*
Point Brower	05-PB-10-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-11-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-12-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-13-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-14-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Point Brower	05-PB-16-CYP-T-F	Four Horn Sculpin	*Myoxocephalus quadricornis*
Point Brower	05-PB-17-CYP-T-F	Arctic Flounder	*Liopsetta glacialis*
Point Brower	05-PB-18-CYP-T-F	Arctic Flounder	*Liopsetta glacialis*
Northstar	05-SIS-01-CYP-T-F	Arctic Char	*Salvelinus alpinus*
Northstar	05-SIS-02-CYP-T-F	Arctic Char	*Salvelinus alpinus*
Northstar	05-SIS-03-CYP-T-F	Arctic Char	*Salvelinus alpinus*
Northstar	05-SIS-04-CYP-T-F	Arctic Char	*Salvelinus alpinus*
Northstar	05-SIS-05-CYP-T-F	Four Horn Sculpin	*Myoxocephalus quadricornis*
Northstar	05-SIS-06-CYP-T-F	Four Horn Sculpin	*Myoxocephalus quadricornis*
Northstar	05-SIS-07-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-08-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-09-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-10-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-11-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-13-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-14-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-15-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*
Northstar	05-SIS-16-CYP-T-F	Humpback Broad Whitefish	*Coregonus nasus*

APPENDIX B

Summary of Analytical Methods

This page intentionally left blank

1.0 Laboratory Analysis

The cANIMIDA Task 5 tissue and SPMD samples were analyzed for a large suite of organic compounds and metals, which varied slightly depending on the biota type. The parameter list was developed based on the likelihood of the animal type to bioaccumulate and/or metabolize the compound, and thus the value of the parameter as an indicator of exposure to contaminants from offshore petroleum exploration, development, and production.

Organic Compounds: Fish tissue samples were analyzed for PAH, fish bile was analyzed for PAH metabolites, and different fish tissue types were analyzed for histological parameters (CPY1A). This full set of analyses was conducted on fish collected in 2004 and 2005; the fish collected in 2006 were only analyzed for PAH compounds. Semi-permeable membrane devices (SPMDs) were analyzed only for PAH and were only utilized during the 2004 field season. Deployed mussels were analyzed for PAH, SHC, and S/T (biomarkers), as were indigenous clams and amphipods. A small number of isopods and mysids were also analyzed, and only for PAH compounds.

Metals: The animal tissue (fish, mussels, clams, amphipods, isopods, and mysids), were also analyzed for a selected set of metals. Additional information on the sample preparation and analysis is summarized below. All analyses were conduced using existing and validated Standard Operating Procedures (SOPs).

2.0 Organic Compound Analysis

2.1 Sample Preparation for Hydrocarbon Analysis (PAH, SHC, S/T)

The extraction method for hydrocarbon analysis of tissues collected as part of the cANIMIDA program differs from that used in the ANIMIDA program. ANIMIDA samples were extracted by a saponification method in which ~10 grams of tissue was digested overnight with 30 mL of 6 N potassium hydroxide at 35˚C. After digestion, 30 mL of ethyl ether was added and the sample was agitated for 5 minutes, followed by centrifugation to facilitate phase separation. The ether layer was then removed and filtered through dried sodium sulfate into a Kuderna-Danish (K-D) apparatus. The ether extraction of the digest was repeated twice and the combined extract was concentrated and solvent exchanged prior to clean-up with an alumina column. After the extracts had been passed through the alumina column they were fractionated on a silica-gel column and submitted for analysis.

The extraction method for hydrocarbon analysis used for cANIMIDA tissues was a serial solvent extraction method (Battelle SOP 5-190), which has been widely used for the past 10+ years to measure trace-levels of PAH and other petroleum-originating organic compounds in tissue samples. All samples were spiked with representative surrogate compounds, serially extracted three times with dichloromethane (DCM). Between extractions the samples were centrifuged to facilitate solvent removal and the extract was decanted into Erlenmeyer flasks. The extracts are then treated with sodium sulfate to remove water and concentrated on a water bath.

The SPMDs were extracted according to the North Sea Bioaccumulation Monitoring Project SOP BMP-A2, *SPMD Extraction for Trace Level Semi-Volatile Organic Contaminants.* The SPMDs were visually inspected for any tears or debris and were placed into pre-cleaned glass extraction jars, to which hexane was added. The SPMD/solvent was spiked with the PAH surrogates and the jars were tightly sealed and serially extracted using hexane. The extracts were then concentrated on a water bath. Prior to additional cleanup, extracts were solvent exchanged to methylene chloride.

All extracts underwent further purification prior to instrumental analysis. The fish tissue and SPMD extracts were passed through an alumina column and eluted with dichloromethane. The sample was again concentrated and an aliquot was removed from the tissue extracts in order to determine the sample lipid weight (lipid weights were not performed on the SPMD extracts). The extracts were further purified by high performance liquid chromatography (HPLC). The extracts were reduced to a final volume under nitrogen and fortified with PAH recovery internal standards (fluorene-d_{10} and chrysene-d_{12}). The pre-injection volume of the samples was approximately 500 µL.

Mussel, amphipod, clam, and isopod extracts were analyzed for PAH, SHC, and S/T and therefore required extract fractionation to remove potential interference and improve the quality of the low-level analysis. These sample extracts were passed through an alumina clean up column in the same manner as the fish and SPMD extracts; however, after the aliquot used to determine the lipid weight was removed, the remaining extract was fractionated on a silica gel column to isolate the PAH, SHC and S/T fractions. The sample was loaded onto the column and eluted first with hexane (F1 fraction), followed by a mixture of hexane and methylene chloride (F2 fraction). The F1 fraction was spiked with recovery internal standards for SHC and S/T analysis, qualitatively split and submitted for SHC analysis by gas chromatography flame ionization detection (GC/FID) and S/T analysis by gas chromatography-mass spectroscopy (GC/MS). The F2 fraction was spiked with PAH recovery internal standards and submitted for analysis by GC/MS.

2.2 Instrumental Analysis for Hydrocarbon Parameters

The GC/MS analysis of sample extracts for PAH and S/T was performed in accordance with Battelle SOP 5-157 (*Identification and Quantification of Semi-volatile Organic Compounds [SVOA] by Gas Chromatography/Mass Spectrometry*), which is a modification of EPA Method 8270 to include additional target compounds (e.g., alkyl PAH and hydrocarbon biomarkers), and to obtain lower detection limits and better specificity by operating the detector in the selected ion monitoring (SIM) mode. Analytical instruments were calibrated before sample analysis with a 5-point calibration (minimum) and varying level check standards were analyzed every 10 samples bracketing field and quality control sample analysis. The North Slope Crude reference oil, North Star control oil, and a series of other quality control (QC) samples were analyzed with the samples. A PAH independent check QC sample was also analyzed.

The concentrations of the individual PAH target compounds were calculated versus the internal standards that were spiked into the sample prior to analysis**.** The target compound

concentrations were corrected for surrogate recoveries to best represent the original sample concentration. The PAH concentrations were quantified using average relative response factors (RRF) generated from the five point calibration. The RRF of the alkyl homologues were based on the RRF of the parent compound for each alkyl homologue series. The target PAH analytes are listed in Table B-1.

Table B-1. Target polycyclic aromatic hydrocarbons (PAH) analyzed in biota samples.

Compound	Internal Standard and Surrogate Reference	Compound	Internal Standard and Surrogate Reference
Naphthalene	A/1	Benzo[a]anthracene	B/3
C1-Naphthalenes	A/2	Chrysene	B/3
C_2-Naphthalenes	A/2	C_1-Chrysenes	B/3
C_3-Naphthalenes	A/2	C_2-Chrysenes	B/3
C_4-Naphthalenes	A/2	C_3-Chrysenes	B/3
Acenaphthylene	A/2	C_4-Chrysenes	B/3
Acenaphthene	A/2	Benzo[b]fluoranthene	B/4
Biphenyl	A/2	Benzo[k]fluoranthene	B/4
Fluorene	A/2	Benzo[e]pyrene	B/4
C_1-Fluorenes	A/2	Benzo[a]pyrene	B/4
C_2-Fluorenes	A/2	Perylene	B/4
C_3-Fluorenes	A/2	Indeno[1,2,3-c,d]pyrene	B/4
Anthracene	A/3	Dibenzo[a,h]anthracene	B/4
Phenanthrene	A/3	Benzo[g,h,i]perylene	B/4
C_1-Phenanthrenes/Anthracenes	A/3		
C_2-Phenanthrenes/Anthracenes	A/3		
C_3-Phenanthrenes/Anthracenes	A/3		
C_4-Phenanthrenes/Anthracenes	A/3	Surrogate Compounds	
Dibenzothiophene	A/3	Naphthalene-d_8	A/1
C_1-Dibenzothiophenes	A/3	Acenaphthene-d_{10}	A/2
C_2-Dibenzothiophenes	A/3	Phenanthrene-d_{10}	A/3
C_3-Dibenzothiophenes	A/3	Benzo(a)pyrene-d_{12}	B/4
Fluoranthene	A/3		
Pyrene	A/3	Internal Standard	
C_1-Fluoranthenes/Pyrenes	A/3	Fluorene-d_{10}	A
C_2-Fluoranthenes/Pyrenes	A/3	Chrysene-d_{12}	B
C_3-Fluoranthenes/Pyrenes	A/3		

The target S/T analytes are listed in Table B-2. The concentrations of all identified S/Ts were calculated versus the internal standard chrysene-d_{12}. All target triterpane concentrations were quantified using the average relative response factor of 17b(H), 21b(H)-hopane (T23) generated from the initial calibration. All target sterane concentrations were quantified using the average relative response factor of cholestane (S17) in the initial calibration. The target

compound concentrations were corrected for surrogate recovery. Surrogate recovery of 5β(H)-cholane was calculated relative to the internal standard.

Table B-2. Target steranes and triterpanes (S/T) analyzed in biota samples.

Steranes/Triterpanes		Reporting Code
Analyte Name	**Common Name[b]**	
13β,17α-diacholestane-20S	Diacholestane	S4
13β,17α-diacholestane-20R	Diacholestane	S5
5α,14α,17α,24-methylcholestane-20R	Methylcholestane	S24
5α,14α,17α,24-ethylcholestane-20S	Ethylcholestane	S25
5α,14α,17α,24-ethylcholestane-20R	Ethylcholestane	S28
C_{23} diterpane	Diterpane	T4
C_{29} tricyclictriterpane	Tricyclictriterpane	T9
C_{29} tricyclictriterpane	Tricyclictriterpane	T10
18α(H)-22,29,30-trisnorhopane-TS	Trisnorhopane (TS)	T11
17α(H)-22,29,30-trisnorhopane-TM	Trisnorhopane (TM)	T12
17α(H),21β(H)-30-norhopane	Norhopane	T15
18α(H)-oleanane	Oleanane	T18
17α(H),21β(H)-hopane	Hopane	T19
22S-17α(H),21β(H)-30-homohopane	Homohopane	T21
22R-17α(H),21β(H)-30-homohopane	Homohopane	T22
*5a, 14a, 17a-Cholestane	5a, 14a, 17a-Cholestane	S17
*17b(H), 21b(H)-Hopane	17b(H), 21b(H)-Hopane	T23

**Compound used in calibration, but not reported*

Samples were analyzed by GC/FID to determine concentrations of saturated hydrocarbons (SHC). Instrumental methods, maintenance, and QC procedures for the GC/FID analysis of samples were performed using Battelle SOP No. 5-202, *Determination of Low Level Total Petroleum Hydrocarbon (Diesel Range Organics – DRO) and Individual Hydrocarbon Concentration in Environmental Samples*, a modification of US Environmental Protection Agency (EPA) Method 8015. Analytical instruments were calibrated before sample analysis with a 5-point calibration (minimum) and check standards bracketed the analytical run of field and quality control samples.

The n-C_9 through n-C_{40} normal alkanes, pristane, phytane and selected isoprenoids were determined in the extract (Table B-3). The total (resolved and unresolved) saturated hydrocarbons (TSHC) were also determined. A reference sample of North Slope crude oil, which has a large historical database of results, was analyzed with the samples. Quantification of the compounds was based on the internal standard compound (d_{62}-triacontane) which was spiked into the sample just prior to analysis. The target compound concentrations were corrected for surrogate recovery

Table B-3. Target saturated hydrocarbons (SHC) analyzed in tissue samples by GC/FID.

Target Compound	
nC8 (optional)	nC23
nC9	nC24
nC10	nC25
nC11	nC26
nC12	nC27
nC13	nC28
1380	nC29
nC14	nC30
1470	nC31
nC15	nC32
1650	nC33
nC16	nC34
nC17	nC35
Pristane	nC36
nC18	nC37
Phytane	nC38
nC19	nC39
nC20	nC40
nC21	Total SHC
nC22	

2.3 Quality Control

2.3.1 Solvent and Standard checks

All solvents used during sample processing were analyzed to confirm the absence of any contamination prior to use in the laboratory. Additionally, any spiking solutions were analyzed, in duplicate against previously approved solutions. Solvent lot numbers, inventory, and checks were documented in the Laboratory Information Management System (LIMS). Spiking solution preparation documentation was recorded in a laboratory information management system (LIMS) and spiking solutions were not used until approved and authorized by a laboratory and analytical supervisor.

2.3.2 Instrument Calibration

Prior to the analysis of sample extracts, a multi-level (minimum of five) calibration curve was analyzed and evaluated. A continuing calibration standard was analyzed periodically to confirm the stability of the instrument response. If the initial calibration or the continuing calibration did not meet the criteria set forth in the workplan, the instrument was re-calibrated and the extracts were reanalyzed.

2.3.3 Reference Samples

A North Slope Crude (NSC) reference oil and a Northstar Crude control oil were submitted with each batch of samples processed. The NSC reference oil is a very well characterized material and has been used as reference oil in the Battelle Duxbury laboratory since the mid 1990's. The results for the NSC were compared against historical laboratory averages to evaluate the instrumental accuracy and were also used to provide petroleum pattern information, aiding in the qualitative identification of target analytes. The Northstar control oil sample was provided specifically for the cANIMIDA project, and provides a frame of reference using oil produced in the study area.

2.3.4 Procedural Blanks

A procedural blank was prepared with every batch of samples processed to monitor possible contamination introduced during sample extraction and extract purification. Solvent blanks were also submitted with all samples analyzed by GC/FID for saturated hydrocarbons. These blanks were used to determine the appropriate values used to correct for the baseline drift.

2.3.5 Laboratory Control Sample

Representative target compounds were spiked into an aliquot of homogenized, well-characterized, clean *Tilapia* to appraise the effectiveness of the sample extraction and cleanup procedures independent of unknown matrix effects. A laboratory control spike (LCS) was prepared with each tissue batch processed.

2.3.6 Laboratory duplicate

A field sample was analyzed in duplicate in every batch of samples processed to assess method precision in each matrix. A duplicate SPMD was not available for analysis; therefore a duplicate Laboratory Control Sample was prepared to evaluate precision.

2.3.7 Standard Reference Material

A solid standard reference material (National Institute Standards and Technology SRM 2978 or 2977) was extracted and analyzed with each batch of tissue samples processed. The results were compared to externally certified values to evaluate extraction efficiency and analytical accuracy.

2.3.8 Laboratory Records

The laboratory maintained all custodial and preparation records within the LIMS. A copy of the sample preparation records is included with each data package and includes documentation of any observations made or deviations noted during sample preparation. While all solution preparation documentation is not included in each data package, it is easily and quickly retrievable using LIMS.

The completed data packages contain adequate information so that a Quality Assurance audit can be performed. The final data package includes copies of the following:

- Sample chains of custody
- A copy of the relevant QAPP
- Sample preparation records
- Instrument sequences

- Instrument calibration results
- Instrument raw data hardcopy, including chromatograms (histograms are provided electronically)
- Miscellaneous documentation detailing any deviations to the QAPP or DQO exceedences
- PAH chromatograms and selected S/T chromatograms

2.3.9 Data Review

A laboratory Quality Control Chemist reviewed each data package to assure that the QAPP had been followed. In addition, the QC chemist performed the following:

- Verified that sample information in the custodies matched that in the data package
- Assured sample extraction dates were entered correctly
- Reviewed peak integrations and quantifications for accuracy
- Reviewed the dilution factors used for calculating sample concentrations
- Reviewed all supporting documentation to assure that any DQO exceedences were properly recorded and traceable.

The data quality objectives for PAH and SHC, and S/T, analyses are summarized in Tables B-4 and B-5, respectively. Upon completion of the QC Chemist's audit, the data packages were submitted to the analytical task leader, who reviewed the data for reasonableness and consistency. Battelle's independent Quality Assurance Unit then performed a formal audit on one data package and submitted a report to the laboratory staff for response. Upon completion of the responses, the auditor provided a copy of the report to the Project Manager and retained a copy for QAU records.

Table B-4. Data Quality Objectives for SHC and PAH Analyses.

Sample Type	Minimum Frequency	Acceptance Criteria/Corrective Action
Initial Calibration	Prior to every instrument sequence for GC/MS analysis and as needed for GC/FID analysis	5 point curve, %RSD < 35% for all target compounds, 90% must be < 25%. Instrument maintenance and recalibration.
Continuing Calibration	After every 12 samples or 16 hours, whichever is more frequent, and at end of instrument sequence	%D < 35% for all CCC target compounds; 90% must be < 25%. Instrument maintenance and recalibration.
Oil Reference Standard	With each instrument sequence (One North Slope Crude)	North Slope Crude < 35% D from laboratory mean for target compounds (use surrogate corrected values) except for compounds below the reporting limit.
Procedural Blank	One per batch	No compound to exceed 5 times the MDL unless sample amount is > 10X blank amount. Re-extract, re-analysis, and/or qualify data with a "B" if value is <5x blank concentration.[1]

Laboratory Control Sample (LCS)	One per batch	Recovery between 35 and 125% for PAH, and 45 to 125% for SHC Re-analysis.[1]
Instrument SRM (1491)	One per instrument sequence (PAH only)	Values must be <15% difference of true value for all certified compounds
Tissue SRM (2978)	One per batch as appropriate (PAH only)	Values must be within 30% of the true value on average for all compounds, not to exceed 35% of true value for more than 30% of the compounds
Duplicate Analysis	One per 40 batch	RPD < 30% for all compounds >10 times the MDL; Mean RPD<30% Qualify data.[1]
Surrogate Standards	Every sample	Recovery between 45 and 125% - (35% for d_8-naphthalene). Re-extract, re-analysis, and/or qualify data.[1]

[1] Project Manager will determine if re-analyses are necessary

Table B-5. Data quality objectives for steranes and triterpanes (St/Tri) in tissue samples.

Sample Type	Minimum Frequency	Acceptance Criteria/ Correction Action
Initial Calibration	Prior to every instrument sequence	4 point curve, %RSD < 25% for all target compounds. Instrument maintenance and recalibration.
Continuing Calibration	After every 12 samples or 16 hours, whichever is more frequent, and at end of instrument sequence	%D < 25% for all compounds. Instrument maintenance and recalibration.
Oil Reference Standard	With each instrument sequence (One North slope Crude)	< 35% D from laboratory mean for North Slope Crude target compounds (use surrogate corrected values) except for compounds below the reporting limit.
Procedural Blank	One per batch	No compound to exceed the 5 times the MDL unless sample amount is > 10X blank amount. Re-extract, re-analysis, and/or qualify data with a "B" if value is <5x blank concentration.[1]
Duplicate Analysis	One per batch.	RPD < 30% for all compounds >10 times the MDL; Mean RPD<30% Qualify data.
Surrogate Standards	Every sample	Recovery between 45 and 125%. Re-extract, re-analysis, and/or qualify data.

3.0 Metals

3.1 Sample Preparation for Metals Analysis

All tissue samples were analyzed for selected trace and major metals by Florida Institute of Technology (FIT), in accordance with FIT SOPs. The target metal analytes, instrumental method of determination, and corresponding method detection limits (MDLs) are listed in Table B-6. The homogenized tissue samples received from Battelle Duxbury were thawed and thoroughly mixed with a Teflon® spatula. Samples were split into two aliquots, one to be digested wet for Hg determination and the other to be freeze dried and digested for the analysis of the remaining metal analytes.

Table B-6. Target metals analyzed in marine tissue samples. Analytical methods and detection limits are included.

Parameter	Method	Method Detection Limit (µg/g dry)
Ag - silver	ZGFAAS	0.004
Al - aluminum	FAAS	2.3
As - arsenic	ZGFAAS	0.012
Ba - barium	ICP-MS	0.01
Be - beryllium	ICP-MS	0.001
Cd - cadmium	ICP-MS	0.001
Co - cobalt	ICP-MS	0.001
Cr - chromium	FAAS	0.01
Cu - copper	FAAS	0.7
Fe - iron	FAAS	2.5
Hg - mercury	CVAAS	0.001
Mn - manganese	FAAS	1.1
Ni - nickel	ICP-MS	0.004
Pb - lead	ICP-MS	0.001
Sb - antimony	ICP-MS	0.001
Se - selenium	ZGFAAS	0.03
Tl - thallium	ICP-MS	0.001
V - vanadium	FAAS	0.002
Zn - zinc	FAAS	0.4

All metals, with the exception of Hg, were determined using a 4- to 6-gram aliquot of the homogenized sample that was placed in a pre-cleaned 100 mL glass digestion flask. These aliquots were freeze-dried and then re-weighed to determine the percent moisture for all samples. The desiccated tissue was then digested by a sequential addition of concentrated, high-purity nitric acid (HNO_3), hydrogen peroxide (H_2O_2), and hydrochloric acid (HCl). The reagents were refluxed gently until the solutions were clear and the tissue samples were

completely dissolved. The solution was then diluted to 20 mL with de-ionized, distilled water (DDW) to rinse the extraction vessels and stored in 30 mL polyethylene screw-cap vials until analysis. Aliquots of tissue standard reference materials (SRMs) were digested with the field samples.

Mercury analyses were performed using 0.4-0.7 grams of wet sample weighed into 50-mL glass digestion vessels. These tissues were digested with concentrated, high-purity nitric acid (HNO_3) and sulfuric acid (H_2SO_4) and refluxed at 90˚C for one hour in the sealed extraction tubes. Upon completion of digestion, the acid solutions were diluted to 20 mL with DDW to rinse the extraction vessels and stored in 30 mL polyethylene screw-cap vials until analysis.

3.2 Sample Analysis for Metals Concentrations

Metal concentrations in the digested tissue samples and associated quality control samples were determined by FAAS, GFAAS (Zeeman or Continuum background correction), CVAAS, or ICP-MS. All analytical techniques followed the manufacturer's specifications, SOPs on file at FIT, and the Quality Assurance/Quality Control (QA/QC) measures detailed below. The analytical methods are all based on USEPA methods described for Series 7000 (FAAS and GFAAS), Series 7470 (CVAAS), and Series 6010A (ICP/MS) (USEPA, 1991).

3.3 Metals Analysis Quality Control

QC measures associated with this task include balance and instrument calibration, as well as analysis of matrix spikes, analytical duplicates, standard reference materials (SRM), and procedural blanks. Samples preparation batches contained no more than 40 samples; a procedural blank, SRM, duplicate, and matrix-spike were each performed at a frequency of at least 1 per 20 field samples. DQOs for these QC measurements are provided in Table B-7.

3.3.1 Sample Handling and Storage

Upon receipt at FIT, all tissue samples were inspected to verify the container integrity and verify agreement between the chain of custody and container labels. Tissue samples were held frozen at -20°C until laboratory preparation.

3.3.2 Instrument Calibration

All electronic balances and pipettes used for measuring samples and reagents were calibrated prior to use. Spectrometers used for metals analysis were initially standardized with a three- to five-point calibration; a linear correlation coefficient of $r \geq 0.999$ was required for sample analysis. Complete three- to five-point calibrations and/or single standard checks were performed after every 5 to 10 samples. If the RSD between the complete calibration and standard check exceeded 15% the instrument was recalibrated and affected samples were reanalyzed.

Table B-7. Data Quality Objectives and Criteria for Metals in Tissues.

Sample Type	Minimum Frequency	DQP/Acceptance Criteria
Initial Calibration	Prior to every batch of samples	3- to 5-point curve depending on the element and a blank. Standard Curve correlation coefficient r $\geq$0.999 for all analytes
Continuing Calibration	Must end every analytical sequence; for flame, repeat all standards every 5 samples; for graphite furnace and ICP/MS recheck standard after every 8 to 10 samples	%RSD <15% for all analytes
Standard Reference Materials	One per batch of 20 samples	Values must be within 20% of accepted values for >85% of the certified analytes and within 25% for Hg.
Method Blank	One per batch of 20 samples	No more than 2 analytes to exceed 5 times MDL unless analyte not detected in associated samples
Matrix Spike and Spike Method Blank	One per batch of 20 samples	%RSD 80 to 120%
Laboratory Duplicate	One per batch of 20 samples	RPD <25% for 65% of the analytes

3.3.3 Procedural Blanks

Procedural blanks were prepared to detect potential contamination resulting from laboratory reagents, glassware, and processing procedures. These blanks were processed using the same analytical scheme, reagents, and handling techniques used for the field samples.

3.3.4 Matrix Spike

Matrix spikes were used to evaluate any possible analytical interference due to the sample matrix (i.e. signal suppression or enhancement) as well as analytical accuracy for some parameters. Spiking frequency was increased to 20 percent and a correction applied to the metal concentrations of the field samples if necessary (i.e., spike recovery results outside the 80 to 120 percent limit).

3.3.5 Laboratory Duplicates

Duplicate samples from homogenized field samples were included as part of each set of sample digestions and analyses and provided a measure of analytical precision.

3.3.6 Standard Reference Materials

Three SRMs were used to evaluate analytical accuracy: Mussel Tissue 2976 (NIST), Dogfish Muscle DORM-2 (NRC), and Trace Elements in Water 1643d (NIST). Metal concentrations obtained for the SRMs were required to be within ±20 percent of accepted values for >85 percent of certified analytes. When no certified values existed for a parameter, matrix spikes were used to evaluate analytical accuracy.

4.0 Bile Fluorescing Aromatic Compounds (FACs)

4.1 Sample Preparation for Analysis of Bile FACs

Upon sample receipt, the volume of each sample was measured and recorded. Any sample with a total volume less than 50 µL was diluted using with an appropriate amount of 0.85% NaCl solution to achieve the target volume (50 µL), and the dilution recorded for correction of the analytical results.

4.2 Sample Analysis for Bile FACs

The analyses of the bile samples for PAH metabolites were conducted at GERG in accordance with the standard operating procedure SOP 0302, Rev. 1, using HPLC-fluorescence spectroscopy, with the detector excitation and emission wavelengths optimized for separate analysis of naphthalene, phenanthrene, and benzo(a)pyrene metabolite equivalence. All data were reviewed for quality. Total protein content was determined by the modified Lowry method (colorimetric assay) using a spectrophotometer.

The PAH metabolite concentrations were reported in micrograms per milliliter (µg/ml), or parts per million on a volume basis (or µg/g, assuming the density of the bile is 1 g/ml). PAH metabolite concentrations also were normalized to protein content and reported as microgram per milliliter (µg/ml), or nanogram metabolites per microgram protein (ng/µg). Analytes below the MDL were "J" qualified.

The 56 bile samples from 2004 were analyzed for PAH metabolites in three (3) QC batches, designated B1155, B1156, and B1157. Total protein content was determined in three (3) QC batches, designated P1155, P1156, and P1157, for the 56 samples.

The 30 bile samples submitted in 2005 were analyzed for PAH metabolites in one (1) QC batch, B1163. Total protein content was determined in one (1) QC batch, P1163, for the 30 samples.

4.3 Bile FACs Analysis Quality Control

4.3.1 Data Quality Objectives

Method detection limits (MDL) were approximately 0.6, 0.1, and 0.05 µg/ml (or µg/g) for naphthalene, phenanthrene, and benzo(a)pyrene metabolites, respectively. Criteria for specific QC samples (i.e. SRM, duplicate) are discussed below.

4.3.2 Sample Handling and Storage

Samples consisted of vials containing bile and all the samples were shipped and received frozen and intact. Samples were logged in under chain of custody and stored in a secured freezer maintained at -20^{o}C.

4.3.3 Instrument Calibration

Bovine serum albumin (BSA) was used as the calibration standard. Quantitation was performed at 595 nm wavelength. The Bile Reference Standards were run in duplicate for protein determination and reported separately for QA purposes. The QA criteria for the RPD between duplicate samples was less than 25% for the duplicate analyses and the protein content of the Bile Reference Material II must be within 25% of the average value of the reference material.

4.3.4 Procedural Blank

A laboratory procedural blanks were processed and analyzed with each batch of 20 or less field samples.

4.3.5 Standard Reference Material

The GERG Standard Bile Reference Material (Bile Reference Standard II) was analyzed in duplicate prior to each analytical batch. The Bile Reference Standard II is a fish bile composite with a PAH metabolite concentrations of 380, 110, and 1.5 μg/ml for naphthalene, phenanthrene, and benzo(a)pyrene metabolites. These concentrations were established by inter-laboratory calibration exercises among several laboratories. The acceptance criteria for this Bile Reference Standard are the range defined by two times of the standard deviation of the established values. Additional replicate analyses were performed on a secondary GERG Standard Bile Reference Material (Bile Reference Standard III) in addition to the duplicate analysis of the Bile Reference Standard II as part of an on-going process to establish a replacement for the GERG Standard Bile Reference Standard II.

Total protein content was determined by the modified Lowry method using a spectrophotometer. Bovine serum albumin (BSA) was used as the calibration standard. Quantification was performed at 595 nm wavelength. The Bile Reference Standards were run in duplicate for protein determination and reported separately for QA purposes. The QA criteria for the RPD between duplicate samples is less than 25% for the duplicate analyses and the protein content of the Bile Reference Material II must be within 25% of the average value of the reference material.

4.3.6 Laboratory Duplicate

The criteria for the relative percent difference (RPD) between duplicate samples are less than 25% for analytes that are above 3 times the method detection limits (MDL).

4.3.7 HPLC Analyses

Trace amounts of interfering compounds were detected in some of the procedural blanks for naphthalene-equivalent metabolites in every QC batch during 2004; in 2005 trace amounts of both naphthalene- and phenanthrene-equivalent metabolites were detected in the procedural blank in the QC batch. Occurrence of the interference for both the naphthalene- and

phenanthrene-equivalent metabolites during the HPLC-fluorescence analysis is common due to the impurities present in the solvent used and bleeding from the column. Because the amount of interference is low compared to sample concentrations, no further corrective action was taken during either year.

Results of duplicate samples from all three analytical batches in 2004 were within acceptable QC limits, ranging from 0.0% to 18.4% relative percent difference. Five sets of duplicates were analyzed with the 2005 QC batch. Results of these duplicate samples were within acceptable QC limits, ranging from 0.0% to 18.4% relative percent difference.

Results for the Bile Reference Standard II in all three QC batches were within acceptable QC limits. Bile Reference Standard III is currently being evaluated as a replacement for Bile Reference Standard II; it does not yet have an established value.

4.3.7 Protein Determination

The RPD for duplicate protein determination in samples analyzed in 2004 varied from 0.2% to 13.7% for the three QC batches, which were within QC limits. Protein content in the bile reference material was within 25% of the average value of the bile reference material. The procedural blank has the reading of protein content ranging from below the detection limit to 3 μg/ml for the three QC batches. No further corrective action was taken.

Three sets of duplicates were analyzed with the samples analyzed in 2005 and the RPD for duplicate protein determination varied from 2.6% to 5.5% for the one (1) QC batch, which is within QC limits. Protein content in the bile reference material was within 25% of the average value of the bile reference material. The protein content of the procedural blank ranged from below the detection limit to 2 μg/ml for the QC batch. No further corrective action was taken.

5.0 Cytochrome P4501A (CYP1A) Analysis

5.1 Sample Preparation and Analysis

Field sampled fish tissues or whole fish in formalin were sent to Woods Hole Oceanographic Institution (WHOI) where they were sub-sectioned into histology cassettes for embedding. Cytochrome P450A (CYP1A) analysis was performed on (1) liver, (2) kidney, (3) gill, and (4) gut/bile duct of each fish selected for analysis. Not every intended tissue type was present in every sample. In some cases, whole fish taken in the field were further dissected and recognizable tissues were removed and sectioned into cassettes. With some small animals, the entire peritoneal cavity and head were split along the midline axis and arranged so that both split faces would be at the cut surface of the paraffin block. Sections of tissues in cassettes were maintained in 10% neutral buffered formalin, embedded in paraffin, sectioned and analyzed immunohistochemically for the presence of CYP1A.

Paired 5 micrometer sections of embedded tissues were mounted on Superfrost Plus slides and analyzed immunohistochemically for the presence of CYP1A by the same methods used during the ANIMIDA project (Smolowitz et al., 1991). Matching serial sections were

incubated using the Shandon® coverslip system for 2 hr with two 150 microliter aliquots of MAb 1-12-3 or with nonspecific purified mouse myeloma protein (MOPC31, IgG1, Sigma), each at 0.3 μg/ml in 1% BSA/TBS added at 0 and 60 minutes. Normal goat serum blocking solution, goat antimouse linker, peroxidase conjugated mouse IgG and color developer were components of the Signet™ (Medford, MA) murine immunoperoxidase kit. Color development was achieved as described before using 2% 3-amino-9-ethylcarbazole and 1% hydrogen peroxide. Sections were counterstained with Mayer's hematoxylin.

Slides were examined with a Zeiss Axioskop™ microscope and relative staining intensities were determined subjectively by comparing the staining of samples to that of control and highly induced scup and winter flounder liver sections included in each run. Nonspecific staining, if present, was determined by comparison with MOPC31 stained sections. Staining occurrence was scored as:

- 0-no staining (or equal to MOPC31 staining)
- 1-rare- few cells staining
- 2-many cells staining
- 3-multifocal and diffuse (all cells staining)

The intensity of staining was scored as:

- 0-none (or equal to MOPC31 staining)
- 1-mild
- 2-moderate
- 3- medium
- 4-strong
- 5-very strong

Intermediate scores also were assigned as appropriate, resulting in a more continuous response curve (e.g., 1.5 for cell occurrence greater than a few but less than many). A scaled product of staining occurrence times the staining intensity (O x I) was determined for each cell type.

Other observations were made, in addition to the CYP1A scoring, including sex (if gonad present), degree of vacuolation in liver (1 low to 5 high), presence of abnormalities in tissues scored, presence of parasites (primarily *Trichodina*) and other signs of infection. These observations were included in the raw data scoring sheets, but were not carried through data reduction or otherwise analyzed. Pathologies noted have not been confirmed by a qualified histopathologist. *Trichodina* assessment is easy and certain, but the assignment of the cyst/nodular appearance of some gills to myxosporidial infection is tentative and outside the scope of this analysis. All observations of CYP1A staining and other conditions were done in a blind study without knowledge of sample identity.

5.2 Data Reduction and Analysis

After microscopic scoring was completed, animal staining scores were assigned using the Battelle ID to field sample/station/species ID. Species-wise one way ANOVA was performed for all species with an $n \geq 3$ occurring at 2 or more stations, and for which CYP1A staining was detectable in the analyzed tissue/cell type. Mean, standard deviations, and standard errors of the mean were determined for scaled scores for each cell type within the four species meeting the requirement for ANOVA analysis. Means were compared ad hoc by ANOVA, using the Tukey's Honestly Significant Difference (Tukey-Kramer) test statistic for unequal sample sizes. This data sorted by species was transferred and analyzed in the SuperAnova™ statistical program.

5.3 CYP1A Analysis Quality Control

The following measures were taken to assure data quality:

1) Internal standards were included in each staining run to assure the consistency and quality of an analysis, and to determine maximum scaled staining score (occurrence 3 X intensity 5=15) and minimum (0) staining.

2) Duplicate slides for all samples were stained with MOPC31 to determine if nonspecific staining was present.

3) As part of the standard Signet protocol, slides were presoaked in 3% H_2O_2 to eliminate endogenous peroxidase activity.

4) Scoring of samples was performed blind. Only the Battelle ID number was known during scoring. Species and station ID's were assigned post scoring.

5) The correlation of subjectively determined CYP1A immunohistochemical staining scores with the independent and nonsubjective protein immunoblotting densities of hepatic microsomes from the same livers has been demonstrated at the WHOI facility (Woodin et al, 1997).

APPENDIX C

Summary of Quality Control (QC) Results

This page intentionally left blank

1.0 Quality Control Results

1.1 Field Quality Control

Equipment/Field Blanks

The two equipment blanks collected at N21 and L01A in 2004 did not contain any detectable levels of steranes and triterpanes; however detectable levels of PAH were present and amounts of SHC were detected in both equipment blanks. The SHC values may be, at least in part, due to analytical instrument contamination isolated to this sample. The blanks collected during the 2005 and 2006 field seasons were not analyzed, based on discussions of priorities and value with the project team.

The two SPMD blanks, a trip blank and an unopened SPMD analyzed in 2004, had notable concentrations of PAH. Naphthalene and C1- through C4-naphthalene concentrations in these SPMD QC samples were comparable to those in the samples that had been deployed in the study area and notable Total PAH concentrations were measured, confounding the interpretation of SPMD data. SPMDs were not use in 2005 or 2006.

Zero Time Mussels

The data for the "time zero" mussels (mussels from the original harvesting location at Port Chatham that were analyzed without field deployment) was discussed in section 3.1.2.3 along with the deployed mussel data, and are only summarized here.

Summer 2004. The three time-zero mussel samples generally had higher levels of total PAH (195 to 275 µg PAH/kg dry weight) than the deployed mussels (92 to 204 µg PAH/kg dry weight), indicating that there were lower water-column PAH concentrations in the Beaufort Sea deployment area than in the waters where the mussels were harvested (Port Chatham). Naphthalene contributed substantially to the total PAH in all the time-zero and deployed mussel samples. Appreciable levels of SHC were also present in the time zero mussels from 2004.

Summer 2005. Two time-zero mussels were collected and analyzed during the 2005 sampling season. The samples were generally clean with respect to PAH; however, it was noted that the time-zero mussels sacrificed after transport to the collection area did have slightly higher PAH concentrations than those secured directly from the harvesting location. Both time-zero mussel samples contained detectable levels of saturated hydrocarbons, with the first sample (taken during collection in Port Chatham) exhibiting generally higher concentrations than the sample sacrificed after transport to the study area.

Summer 2006. The three time-zero mussel samples collected during the 2006 season all had apparent concentrations of PAH and SHC. The hydrocarbons from C21 to C40 were most abundant, and samples deployed in the study area had lower concentrations of SHC than the time-zero mussels. The notable exceptions to this general trend were the mussels deployed at West Dock and SDI, which were selected as locations to serve as possible positive controls and did have higher concentrations of hydrocarbons.

The relatively high concentrations of PAH and SHC compounds in the time zero mussels does confound data interpretation; however, comparison of pre- and post-deployment individual parameter concentrations may still provide useful information regarding the potential loadings of compounds associated with oil and gas production. This is discussed in greater detail within the main context of this report.

1.2 Organic Analysis Laboratory Quality Control Sample Results

1.2.1 FACS Analysis Quality Control

HPLC analyses

Trace amounts of interfering compounds were detected in some of the procedural blanks for naphthalene metabolites in QC batches in 2004; in 2005 trace amounts of both naphthalene and phenanthrene metabolites were detected. Occurrence of the interference for these metabolites during the HPLC-fluorescence analysis is common due to the impurities present in the solvent used and bleeding from the column. Because the amount of interference is low compared to sample concentrations, no further corrective action was taken and it was deemed not to adversely impact the sample data.

Results of duplicate samples from all three analytical batches in 2004 were within acceptable QC limits, ranging from 0.0% to 18.4% relative percent difference. In 2005, five sets of duplicates were analyzed and the results of these duplicate samples were within acceptable QC limits, ranging from 0% to 18.4% relative percent difference. Biota samples from 2006 were not analyzed for FACs.

During both years, the results for the Bile Reference Standard II in all three QC batches were within acceptable QC limits. Bile Reference Standard III is currently being evaluated as a replacement for Bile Reference Standard II; it does yet not have an established value.

Protein determination

Summer 2004. The RPD for duplicate protein determination varied from 0.2% to 13.7% for the three QC batches, which were within QC limits. Protein content in the bile reference material was within 25% of the average value of the bile reference material. The procedural blank has the reading of protein content ranging from below the detection limit to 3 μg/ml for the three QC batches; concentrations deemed not to adversely impact the sample data.

Summer 2005. Three sets of duplicates were analyzed with this batch and the RPD for duplicate protein determination varied from 2.6% to 5.5% for the one (1) QC batch, which is within QC limits. Protein content in the bile reference material was within 25% of the average value of the bile reference material. The protein content of the procedural blank ranged from below the detection limit to 2 μg/ml for the QC batch; concentrations deemed not to adversely impact the sample data.

1.2.2 PAH, SHC, and S/T Analysis Quality Control

Several approaches were used to evaluate the comparability of the 2004, 2005, and 2006 data and the overall reliability and quality of the data. The first step was to evaluate the QC samples processed and analyzed with cANIMIDA field samples, including the laboratory control samples (LCS), standard reference material (SRM), North Slope Crude control oil (NSC), Northstar control oil (CO), laboratory duplicate samples (DUP), and laboratory procedural blank samples (PB). Additionally, archived ANIMIDA samples were re-analyzed and the results compared to the original analyses, and selected cANIMIDA samples collected at the same stations in 2004-2006 were concurrently analyzed in 2006 (i.e., 2004 and 2005 samples were re-analyzed in 2006) and the data evaluated for comparability and trends. These data evaluations are discussed individually below. All the detailed quality control data are presented along with the field sample data in Appendix D.

Surrogate Recoveries (SIS)

The PAH, biomarker, and SHC SIS recovery data (Table C-1) demonstrate that the analysis was widely under control, and that effective sample processing and analysis was performed.

Table C-1. Surrogate Internal Standard (SIS) Recovery Summary Information for cANIMIDA Tissue and SPMD Samples

Matrix	2004		2005		2006	
	Total SIS data points	# Exceedances	Total SIS data points	# Exceedances	Total SIS data points	# Exceedances
Tissue (includes QC)						
Fish						
PAH	184	17	132	12	108	1
Mussels						
PAH	60	1	60	5	48	1
Biomarker	13	0	15	2	15	0
SHC	30	0	28	0	48	1
Clam/Amphipod/ Isopod/Mysid						
PAH	72	0	136	2	191	4
Biomarker	17	2	34	2	70	0
SHC	36	0	64	0	37	0
SPMD						
PAH	56	10	NA	NA	NA	NA

The SIS recoveries in general, met the data quality objectives (DQO), demonstrating effective and reliable laboratory processing of the cANIMIDA tissue samples. In fact, only about 5% of the PAH SIS, less than 4% of S/T SIS, and less than 1% of the SHC SIS measurements performed on tissue samples in the Program did not meet the DQOs; most surrogate recoveries were in the 60-90% range. The most common exceedance was a slight under-recovery of naphthalene in the PAH fraction of some field samples, and a slight over-recovery of the S/T SIS

compound. Some of the control oil samples had slight over-recovery of a PAH or S/T SIS compound. Two of the SPMD samples (from 2004) had low, but consistent, recoveries for all PAH SIS compounds. Fluctuations in the SIS recoveries generally tracked the target compound recoveries, and accurate quantitation of field sample constituents was typically obtained once the SIS recovery correction was performed (cANIMIDA data are reported SIS recovery corrected). The LCS and SRM data indicated that the SIS recoveries were representative of the target compounds, resulting in accurate SIS-corrected contaminant concentration data even for samples with somewhat variable SIS recoveries.

Laboratory Control Sample (LCS)

Independent chemical biomarker (sterane/triterpane; S/T) standards are not available to be used for LCS samples, so the LCS assessment is primarily based on PAH data (SHC LCS results were generated and evaluated for the few tissue sample types that included this analysis). The LCS results are based on surrogate corrected data, to reflect the field sample quantification and to also assess how representative the SIS compounds are for quantification.

Fish. The laboratory control samples associated with the 2004, 2005, and 2006 fish samples did not have any DQO exceedances; the recoveries of the target PAH compounds ranged from 79 to 126% over the three years. The 2006 LCS data were particularly tight; recoveries ranged from 90 to 116%.

Deployed Mussels. The PAH recoveries in the LCS samples analyzed with the mussel samples in 2004 and 2005 met the DQOs, with few exceptions. Anthracene and benz(a)anthracene were slightly over recovered in the one LCS sample in 2004, and fluorene was slightly over recovered (136%) and benzo(b)fluoranthene was slightly under recovered (66%) in the 2005 LCS. The mussels collected in 2006 were analyzed with clams and amphipods: please refer to the section below for the QC detail.

The recoveries of the SHC compound in the LCS samples were generally within the project DQOs. Some lighter molecular weight (C9-C10) compounds were, not surprisingly, slightly under-recovered in some LCS samples; nonane had a recovery of 36% and 66% in the 2004 and 2005 LCS, respectively, and decane had 66% recovery in the 2004 LCS). The slightly low recoveries for nonane and decane is likely due to the relatively involved extract fractionation and clean-up, the multiple concentration steps, and the relative volatility of these compounds. The impact of this under-recovery on the overall usability of the data is negligible; these alkanes are minor components of the SHCs and TPHC.

Clams, Amphipods, Isopods, and Mysids. The PAH recoveries in the LCS sample associated with the 2004 clams, amphipods and isopods all met the DQO. The LCS analyzed with the 2005 amphipods and isopods also me the DQO; the 2005 clam samples were processed with the deployed mussels (see above). The amphipods and clams collected in 2006 were analyzed in two analytical batches, along with the deployed mussels, and all LCS recoveries met the DQO. The isopods and mysids collected in 2006 were analyzed in one batch, and the PAH recoveries in the LCS sample met the DQO except for a slight over-recovery of perylene (137%).

The SHC were generally recovered well in the LCS analyzed with the clams and amphipods. There was a slight under-recovery of nonane (40%), decane (68%), dodecane (67%), and hexatriacontane (57%) in the 2004 LCS sample, and nonane and decane were both slightly under recovered in the 2005 LCS (48% and 66%, respectively). In 2006, the two LCS analyses also widely met the DQOs, with the exception of a slight under-recovery of nonane (43% and 61%) and hexatriacontane (64%). These particular lower molecular weight alkanes are of minor importance for this monitoring work, as discussed earlier.

SPMD. Two LCS samples were processed along with the SPMD samples analyzed in 2004, and PAH recoveries were determined. The recoveries were excellent, meeting the DQOs with only one exception; benzo(a)anthracene had a slightly elevated recovery (136%) in one of the samples.

Standard Reference Material (SRM)

Mussel SRM 2977 and 2978 were used as the SRM material for the organic compound analysis in cANIMIDA; there is no fish, clam, or amphipod SRM material certified for the target compounds. SRM 2977 and 2978 are certified for selected PAH compounds, and not for any of the SHC or chemical biomarker target compounds.

Fish. The 2004, 2005, and 2006 SRM tissue analyses demonstrated high quality analysis. The 2004 SRM samples analyzed with the two fish analytical batches had only one DQO exceedance; perylene was measured at 34% above the certified value, versus a DQO of no more than 30% deviation from the certified value. In 2005, fluoranthene was under recovered by 4-8% relative to the DQO in the two SRM analyses; all other PAH met the DQO. The SRM in 2006 had slightly low recovery for fluoranthene, benzo(a)anthracene, and benzo(a)pyrene; all other PAH met the DQO. The few observed SRM DQO exceedances were for PAH with the lowest certified concentrations; concentrations that were near the limits of detection. Other PAH, which were present in the SRM at concentrations well above the MDL, consistently met the DQO.

Deployed Mussels. The SRMs that were analyzed with the mussel samples in 2004, 2005, and 2006 met the DQO, with few exceptions. Pyrene was under recovered in the SRM processed with the 2004 mussels; the analytical result was 44% below the certified value (compared to a DQO of "within 30%"). The SRM analyzed with the 2005 mussels (and clams) had under-recovery of fluoranthene, pyrene, and indeno(1,2,3-cd)pyrene by about 5%, relative to the DQO recovery range. The mussels collected in 2006 were analyzed with clams and amphipods; please refer to the section below for discussion of the SRM results.

Clams, Amphipods, Isopods, and Mysids. The SRMs that were analyzed with the clams, amphipods, isopods, and mysids also widely met the DQO. The PAH indeno(1,2,3-cd)pyrene was under recovered in the SRM analyzed in 2005; all other compounds met the DQO. In 2005, the clam samples were analyzed with the deployed mussels (see above). The SRM processed with the amphipod and isopod samples in 2005 consistently met the DQO. The SRM analyzed with the isopods and mysids in 2006 had one analyte exceeding the DQO; benzo(a)pyrene was under recovered. The two SRMs associated with the clams, amphipods and mussels in 2006 both had a slight under recovery for benzo(a)pyrene; all other PAH met the DQOs. As with the

fish and mussels analyses, the few observed SRM DQO exceedances with the clam, amphipod, isopod, and mysid analyses were for PAH with certified concentrations that were near the limits of detection. PAH that were present well above the MDL consistently met the SRM DQO.

North Slope Crude (NSC)

The control oil results summarized in this section are those of the North Slope Crude (NSC) oil, for which the Battelle laboratory has historical data from many years of analysis that are used for comparison purposes. Other laboratories have also used this reference oil for quality control purposes over the years.

Fish. The two NSC reference oil samples that were analyzed with the fish samples in 2004 consistently met the DQO. In 2005, two NSC reference oils were analyzed with the fish samples and some small DQO exceedances were observed; there was over-recovery of compounds in the range from C3-phenanthrenes/anthracenes to C4-chrysenes). However, these were identified to be due to a matrix interference resulting from modified surrogate and recovery standard solutions, and were isolated to these analyses. The NSC reference oil analyzed with the fish samples in 2006 did not have any DQO exceedances.

Deployed Mussels. The NSC reference oil that was analyzed with the 2004 mussels met the DQO, except for a slight under recovery of C2-chrysenes and n-heptatriacontane. The 2005 NSC oil analysis had a slight under recovery of C4-naphthalenes, C3-fluorenes, C3-phenanthrenes/anthracenes, C2- and C3-dibenzothiophenes, and C2-chrysenes. This apparent under recovery in 2005 was likely due to the isolated NSC matrix interference discussed above that is causing some of the SIS compounds to be over recovered in this reference oil (and thus the associated target analytes under recovered). The mussels collected in 2006 were analyzed with clams and amphipods (see below).

Clams, Amphipods, Isopods, and Mysids. All analytes met the DQOs in the NSC reference oil analyzed with the 2004 and 2005 samples. The NSC associated with the isopods and mysids analyzed in 2006 also did not contain any DQO exceedances. The NSC sample analyzed with the analytical batch that contained the 2006 mussels and some amphipod samples had slight over recovery for C3- and C4 phenanthrenes/anthracenes and tridecane. The NSC analyzed with the remaining amphipod and clam samples in 2006 had a slight over recovery of tridecane and under recovery for octatriacontane and tetracontane; all minor exceedances of a small proportion of the target analytes.

SPMD. One NSC sample was processed along with the SPMD samples analyzed in 2004, and PAH concentrations were determined. The data compared well with the NSC reference values, with only one exceedance; the concentration of C2-chrysene was determined to be 9% higher than the reference value DQO range.

Northstar Control Oil (CO)

A Northstar control oil was submitted with each set of sample analysis to establish baseline data for this oil for subsequent use in QC evaluation. The Northstar CO sample was prepared and

analyzed like the NSC sample; a Northstar oil collected in 2004 was used. When the data were statistically analyzed and plotted for the Northstar CO analyzed with the field tissue samples, the QC results were similar to those of the NSC. There was good agreement for most PAH, SHC, and S/T parameters, with slightly more variability for some alkylated PAH compounds and some of the lower molecular weight SHCs. The Northstar CO results generated were generally within 10% of historical results, and consistently within 20%

The North Slope and Northstar control oil results indicate that the analysis was under control, and are highly comparable to historical results, where such data are available.

Laboratory Sample Duplicates (DUP)

Fish. Two sets of field duplicates were analyzed with the 2004 fish samples. The relative percent differences (RPD) in the PAH results for the two duplicates was good; all the parameters met the DQO. One laboratory duplicate was processed with the 2005 samples and the RPD in the results ranged from 6% to 23%, also meeting the DQO. In 2006, two fish samples were analyzed in duplicate. The RPDs for the PAH parameters and the two sets of duplicates ranged from 5% to 57%; the overall DQO was met, as the one analyte exhibiting an RPD of 57% met the secondary DQO.

Deployed Mussels. In the 2004 mussel duplicate sample analysis there were six PAH compounds with a precision measure that did not meet the preliminary DQO: naphthalene, C1-napthalenes, C2-napthalenes, C3-napthalenes, biphenyl and phenanthrene. The reason the precision DQO was not met for some compounds was likely partly due to the concentrations being close to the limit of detection (i.e., higher expected analytical fluctuation), and also because of fluctuating low-level background concentrations of these compounds that were near the levels detected in the tissue samples. Only one biomarker analyte (17a(H), 21b(H)-hopane) was detected at a concentration high enough to assess precision; the laboratory duplicate analysis results had an excellent RPD of 4%. Since nearly all SHC analytes were detected at values below the reporting limit, only a limited set of RPDs could be calculated. A slightly elevated RPD was determined in the duplicates for n-hexadecane (33% RPD, vs a DQO of 30% RPD).

In the 2005 duplicate analysis, C1-naphthalenes exceeded the precision DQO; however, the concentrations measured in the two replicates were near the reporting limit. The only SHC compounds detected above the reporting limit were Isoprenoid 1470 and pentadecane, and the precision for both of these parameters met the DQO. No S/T analytes were detected in either of the replicates.

The deployed mussels collected in 2006 were analyzed with clams and amphipods; please refer to the section below.

Clams, Amphipods, Isopods, and Mysids. The duplicates associated with clam and amphipod analyses in 2004 generated precision measures that met the DQO except for four PAH parameters: naphthalene, C1-naphthalenes, C1-flourenes, and phenanthrene. However, these parameters were detected at low concentrations and also had some trace blank contributions,

which likely contributed to the concentration fluctuations. These SHC and S/T duplicate analyses met the DQOs.

Please see the results for the mussels for the precision assessment for the 2005 clam samples. The 2005 amphipods and isopods duplicate analyses met the precision DQO; biphenyl and phenanthrene had somewhat elevated precision measures, but both parameters were detected at low concentrations and had trace blank contribution. The only SHC compounds with concentrations above the reporting limit were tetradecane and heptadecane, and both met the precision DQO in the duplicate analyses.

The isopods and mysids duplicate analyses in 2006 met the precision DQO for the PAH, SHC, and S/T analytes. The duplicate analyses in the laboratory batch containing the remaining amphipod and clam samples met the precision DQO, had an apparently low recovery of a series of PAH and S/T analytes in the replicate sample; pyrene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and norhopane were under recovered, generating RPD values that exceeded the DQO. There were no DQO exceedances in the SHC analysis for this set of duplicates. The second set of duplicate analyses with the 2006 amphipod and clam samples had no DQO exceedances for PAH, SD/T, or SHC.

Laboratory Procedural Blank Samples (PB)

Fish. The procedural blank associated with the first batch of fish samples in 2004 had detectable but low concentrations of naphthalene, C1-naphthalene, dibenzothiophene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, perylene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene. The naphthalene and C1-naphthalene concentrations for a number of field samples were so low that their data were "B" qualified (i.e., the field sample concentrations needed to be at least 5 times the procedural blank levels to not be qualified). The blank analyzed with the other 2004 samples (batch 04-0447) had detectable concentrations of naphthalene, C1-naphthalene, fluoranthene, and pyrene and, similarly, some of the naphthalene and C1-naphthalene field sample data were "B" qualified. Only naphthalene was detected in the procedural blanks processed with the 2005 samples, and a number of the field samples were "B" qualified for naphthalene. The procedural blank analyzed with the 2006 fish tissue samples had detectable levels of naphthalene, C1-naphthalene, biphenyl, phenanthrene, fluoranthene, and pyrene; a the associated field samples were "B" qualified for naphthalene and C1-napthalenes.

The PAH procedural blanks for the 2004, 2005, and 2006 cANIMIDA fish batches, and other biota samples, typically had very low levels of a few compounds (e.g., naphthalene, C1-naphthalene, biphenyl, phenanthrene, fluoranthene, and pyrene); standard trace-analysis background levels that are unfortunately common and mainly a reflection of ultra-sensitive analytical protocols, and would not typically be considered of concern. The need to "B" qualify a number of samples also speaks to the fact that the field samples had very low concentrations of those compounds.

Deployed Mussels. The procedural blank analyzed with the 2004 mussel samples had detectable concentrations of naphthalenes, biphenyl and phenanthrene data that were "B" qualified in a number of samples. There were no biomarker compounds detected in this blank; however, the

field data were “B” qualified for the C16 and C25 alkanes. Naphthalene was the only compound detected in the 2005 blank and needed to be “B” qualified.

The mussels collected in 2006 were analyzed with clams and amphipods in preparation batch 06-0326; please refer to the section below for the QC detail.

Clams, Amphipods, Isopods, and Mysids. The procedural blank analyzed with the clam, amphipod, and isopod samples collected in 2004 had several PAH compounds detected at low concentrations; naphthalene, C1-naphthalene, biphenyl, and phenanthrene were “B” qualified. No biomarker compounds were detected in the blank; however, alkane C16 was “B” qualified.

The clam samples collected in 2005 were analyzed with the mussels (see above). The blank associated with the 2005 amphipods and isopods did not contain any detectable biomarkers or alkanes; however, a number of field samples were “B” flagged for naphthalene, C1-naphthalene, biphenyl, and phenanthrene.

The blank associated with the mysid and isopod samples in 2006 contained detectable levels of some PAH, resulting in “B” qualifiers for naphthalene, C1- and C2-naphthalenes, biphenyl, phenanthrene, C1-phenanthrenes/anthracenes, and C1-dibenzothiophene. The blank analyzed with the mussels and several amphipods in 2006 (batch 06-0326) appears to have been cross contaminated during the preparation process. This blank has detectable levels of almost all the SHC parameters and numerous PAH analytes (and thus “B” qualified); steranes/triterpanes were not detected. The LCS associated with this analytical batch is very clean; the contamination issue appears to be isolated to the blank. The PB analyzed with the remaining amphipods had some field samples “B” qualified for low blank levels of naphthalene and phenanthrene. The blank met the DQOs for alkanes and S/T.

SPMD. The procedural blank sample associated with the 2004 SPMD samples had detectable concentrations of naphthalene, but still quite low (generally below 10 ng); the naphthalene concentrations in the field samples were generally a factor of 10 or more greater than in the procedural blank and the DQO was therefore not exceeded. Trace levels (generally less than 1 ng) of a few other PAH compounds were detected in the procedural blank, also at levels that were low compared to the field sample concentrations and did not pose a DQO issue.

Although a number of target compounds, and particularly selected PAH, were detected in the procedural blank samples processed with the fish, mussel, clam, amphipod, isopod, mysid, and SPMD samples, the measured concentrations were typically very low. These detections, and the resulting “B” qualifiers, are primarily a reflection of modern ultra-sensitive analytical protocols, and are not typically a detection of blank levels that would result in a data quality concern. The need to “B” qualify a number of samples is a reflection of the ability to detect trace background levels, and also the fact that the field samples had very low concentrations of those compounds.

1.3 Metals Analysis Quality Control

A total of four different SRMs were utilized each year during the metals analyses of the cANIMIDA biota samples. These reference materials include the three NIST-certified SRMs 2976, 1643d, and 1566b; additionally the reference standard CRM-DORM 2 was also used. Additionally, spiked samples and duplicate samples were analyzed each year. The SRM and other accuracy results for all three years were within the acceptance criteria; there were a few isolated cases where spiked analyte recoveries but not to the extent that it compromised the analytical results. The precision measures also met the data quality objectives, and there was no evidence of notable laboratory contamination. The detailed metals QC sample results are included with the field sample data in Appendix D.

1.4 ANIMIDA Historical Tissue Intercomparison Sample Analysis

Three archived tissue samples collected during the ANIMIDA program were analyzed for organic parameters along with the field samples collected in 2005, to assess data quality and potential laboratory comparability (the ANIMIDA organic analytical chemistry was performed by Arthur D. Little, and the cANIMIDA analyses by Battelle). A fish sample from the Liberty area (01-PBS-71-FHS) and two clam samples from BSMP stations were analyzed (02-5F-01-PHC-T-CY and 02-5H-01-PHC-T-AS). All historical samples were analyzed in duplicate. The tissue data are presented in Table C-2; the values presented for the 2005 analyses are the average of the laboratory replicates.

Minimal sample mass was available for samples 01-PBS-71-FHS and 02-5H-01-PHC-T-AS; approximately 0.9 g dry weight was available for the fish sample for each replicate and about 6 g of the clam sample was used for each replicate. Clam sample 5F-01-PHC-T-CY also had less than optimum sample amount available for analysis. These low sample masses were clearly reflected in the results (particularly for 01-PBS-71-FHS and 02-5H-01-PHC-T-AS), with insufficient analytical sensitivity to reliably determine contaminant concentrations (Table C-2). The small sample size contributed to the ability to detect contaminants, and the reliability of the near-detection level results for the analytes that were detected analytes, thus having a significant impact on the differences observed between the historical analyses and the 2005 analyses. The hydrocarbon concentrations in the clam sample from station 5F, which did have some detections, were all low and near the detection limit, and many were not detected at all. The total PAH was determined to be 40 µg/kg in the 2005 analysis, compared to 78 µg/kg in the original analysis several years earlier. At these low concentrations, non-detects and even very small differences in measured concentrations can result in large apparent differences in the data comparison.

The discrepancies with some of the hydrocarbon data from the re-analysis of these archived samples, compared to the original analyses, were larger than one would have like to see. For two of the three samples the assessment could not even be performed, because of sample mass issues, as described above. However, this is not surprising. The original and subsequent analyses were conducted three years apart; the storage and handling of these samples prior to receipt at Battelle is unknown, and may have compromised the integrity of the samples. The samples had been transported multiple times since originally collected, both locally and long-distance (three times between Alaska and Massachusetts, for instance). As with the sediment intercomparison

samples, the tissue samples arrived at ambient temperature to Battelle and the storage conditions over several years prior to Battelle's receipt of the samples are not known. Thawing and refreezing can result in the release of water, contaminant re-distribution between phases, and possibly selective compound degradation (e.g., as part of tissue rotting) – maintaining frozen conditions is particularly critical for biological tissue, and that did not happen. Additionally, it is assumed that the samples were thoroughly homogenized each time material was removed to reconstitute the original sample; however, if this were not the case moisture distribution of the remaining sample aliquot may be biased, which could also affect the chemistry. A comparison of the results from the 2002 and 2005 analyses of these ANAMIDA samples is clearly not a reliable method for assessing analytical performance or data comparability; other QC analyses and measures were generated to demonstrate and document the reliability of the data generated during cANIMIDA, as they were during ANIMIDA

Table C-2. Analytical Results for Tissue Intercomparison Samples from Locations PBS, 5F, and 5H

	01-PBS-71-FHS				02-5F-01-PHC-T-CY				02-5H-01-PHC-T-AS			
	2001		2005		2002		2005		2002		2005	
	µg/kg dry	Q	µg/kg dry	Q	µg/kg dry	Q	µg/kg dry	Q	µg/kg dry	Q	µg/kg dry	Q
PAHs												
Naphthalene	17		7.4		3.3	B	2.5	B	9.6	B	8.4	
C1-Naphthalenes	6.4		11		3.1	B	2.0		5.0	JB	5.1	
C2-Naphthalenes	10		10		5.7		2.8		7.4	JB	0	ND
C3-Naphthalenes	11		19		3.8		3.2		5.5	J	0	ND
C4-Naphthalenes	0	ND	0	ND	3.1		2.4		0	ND	0	ND
Biphenyl	8.3		0	ND	1.2	JB	0.80		3.1	JB	6.2	
Acenaphthylene	0	ND	0	ND	0.02	J	0	ND	0	ND	0	ND
Acenaphthene	1.8		0	ND	0.20	JB	0	ND	0.59	JB	0	ND
Fluorene	2.9		0	ND	0.88	JB	0.40		2.2	JB	0	ND
C1-Fluorenes	5.4		0	ND	1.3	J	1.4		2.8	J	0	ND
C2-Fluorenes	14		0	ND	1.9	J	2.1		0	ND	0	ND
C3-Fluorenes	15		0	ND	0	ND	0	ND	0	ND	0	ND
Anthracene	2.3		0	ND	0.20	JB	0	ND	0.52	JB	0	ND
Phenanthrene	14		3.8		4.2	B	2.0		10	B	8.8	
C1-Phenanthrenes/Anthracenes	25		0	ND	7.5		3.5		10		6.3	
C2-Phenanthrenes/Anthracenes	45		0	ND	6.2		3.2		9.6		13	
C3-Phenanthrenes/Anthracenes	26		0	ND	5.7		4.0		6.7	J	0	ND
C4-Phenanthrenes/Anthracenes	18		0	ND	0	ND	0	ND	0	ND	0	ND
Dibenzothiophene	2.8		0	ND	0.53	J	0.20	J	0.89	J	0	ND
C1-Dibenzothiophenes	12		0	ND	0.75	J	0.80		1.3	J	0	ND
C2-Dibenzothiophenes	24		0	ND	2.2	J	1.7		2.8	J	0	ND
C3-Dibenzothiophenes	15		0	ND	1.9	J	1.3		2.4	J	0	ND
Fluoranthene	6.9		0	ND	1.8	J	0.80		2.4	JB	0	ND
Pyrene	12		0	ND	1.7	J	0.80		2.2	JB	1.6	J
C1-Fluoranthenes/Pyrenes	23		0	ND	2.9		2.5		2.9	J	0	ND
C2-Fluoranthenes/Pyrenes	22		0	ND	2.4	J	2.0		0	ND	0	ND
C3-Fluoranthenes/Pyrenes	13		0	ND	0	ND	0	ND	0	ND	0	ND
Benzo(a)anthracene	6.9		0	ND	0	ND	0.30	J	0	ND	0	ND
Chrysene	12		0	ND	2.9		1.8		4.1	J	3.0	J
C1-Chrysenes	19		0	ND	2.1	J	1.7		2.4	J	0	ND

C2-Chrysenes	17		0	ND	0	ND	2.5		0	ND	0	ND
C3-Chrysenes	8.3		0	ND	0	ND	0	ND	0	ND	0	ND
C4-Chrysenes	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
Benzo(b)fluoranthene	2.9		0	ND	1.0	J	0.50		1.2	J	0	ND
Benzo(k)fluoranthene	1.5		0	ND	0.15	J	0	ND	0.15	J	0	ND
Benzo(e)pyrene	3.5		0	ND	0	ND	0.80		0	ND	0	ND
Benzo(a)pyrene	4.1		0	ND	0	ND	0	ND	0	ND	0	ND
Perylene	2.0		1.9	J	8.6		5.7		6.4	J	4.7	
Indeno(1,2,3-cd)pyrene	1.0		0	ND	0.18	J	0	ND	0	ND	0	ND
Dibenz(a,h)anthracene	0.83		0	ND	0.09	J	0	ND	0	ND	0	ND
Benzo(g,h,i)perylene	1.5		0	ND	0.60	J	0.40		0.59	J	0	ND
Total PAH	430		53		78		40		100		57	
Biomarkers												
T4-C23Diterpane	NA		NA		0.15	J	0	ND	0.44	J	0	ND
T9-C29Tricyclictriterpane	NA		NA		0	ND	0	ND	0	ND	0	ND
T10-C29Tricyclictriterpane	NA		NA		0	ND	0	ND	0	ND	0	ND
T11-Trisnorhopane(TS)	NA		NA		0.26	J	0	ND	0.67	J	0	ND
T12-Trisnorhopane(TM)	NA		NA		0.44	J	0	ND	0.74	J	0	ND
T15-Norhopane	NA		NA		0.95	J	0	ND	1.7	J	0	ND
T18-Oleanane	NA		NA		0	ND	0	ND	0	ND	0	ND
T19-Hopane	NA		NA		1.1	J	0	ND	2.1	J	0	ND
T21-Homohopane	NA		NA		0.44	J	0	ND	0.89	J	0	ND
T22-Homohopane	NA		NA		0.95	J	0	ND	1.1	J	0	ND
S4-Diacholestane	NA		NA		0.20	J	0	ND	0.52	J	0	ND
S5-Diacholestane	NA		NA		0.31	J	0	ND	0.81	J	0	ND
S24-Methylcholestane	NA		NA		0.26	J	0	ND	3.4	J	0	ND
S25-Ethylcholestane	NA		NA		0	ND	0	ND	0	ND	0	ND
S28-Ethylcholestane	NA		NA		1.8	J	0	ND	2.5	J	0	ND
S28a	NA		NA		NA		0	ND	NA		0	ND
Sum of S/T	NA		NA		6.9		0		15		0	
SHCs												
n-Nonane (nC9)	NA		NA		6.6	J	21	J	21	J	290	J
n-Decane (nC10)	NA		NA		4.6	J	8.6	J	0	ND	90	J
n-Undecane (nC11)	NA		NA		7.1	J	24	J	21	J	0	ND
n-Dodecane (nC12)	NA		NA		9.3	J	36	J	32	J	0	ND
n-Tridecane (nC13)	NA		NA		6.4	J	20	J	30	J	0	ND

Isoprenoid RRT 1380	NA		NA		5.3	J	3.1	J	0	ND	150	J
n-Tetradecane (nC14)	NA		NA		8.0	J	8.6	J	39	J	130	J
Isoprenoid RRT 1470	NA		NA		13	J	82		64	J	850	
n-Pentadecane (nC15)	NA		NA		12	J	18	J	74	J	210	J
n-Hexadecane (nC16)	NA		NA		12	J	24	J	59	J	190	J
Isoprenoid RRT 1650	NA		NA		6.2	J	0	ND	19	J	0	ND
n-Heptadecane (nC17)	NA		NA		17	J	25	J	74	J	220	J
Pristane	NA		NA		22	J	13	J	74	J	110	J
n-Octadecane (nC18)	NA		NA		13	J	15	J	40	J	100	J
Phytane	NA		NA		0	ND	3.2	J	0	ND	47	J
n-Nonadecane (nC19)	NA		NA		16	J	11	J	36	J	69	J
n-Eicosane (nC20)	NA		NA		18	J	11	J	56	J	50	J
n-Heneicosane (nC21)	NA		NA		22	J	18	J	72	J	48	J
n-Docosane (nC22)	NA		NA		44	J	15	J	150	J	130	J
n-Tricosane (nC23)	NA		NA		130	B	48	J	440	B	400	J
n-Tetracosane (nC24)	NA		NA		180	B	16	J	810		750	
n-Pentacosane (nC25)	NA		NA		310	B	44	J	1,300		1,100	
n-Hexacosane (nC26)	NA		NA		330	B	13	J	1,600	B	1,300	
n-Heptacosane (nC27)	NA		NA		460	B	67	J	1,900	B	1,700	
n-Octacosane (nC28)	NA		NA		400	B	13	J	1,800	B	1,900	
n-Nonacosane (nC29)	NA		NA		420	B	49	J	1,700	B	2,200	
n-Triacontane (nC30)	NA		NA		330	B	7.5	J	1,300	B	1,800	
n-Hentriacontane (nC31)	NA		NA		310	B	41	J	1,200	B	1,400	
n-Dotriacontane (nC32)	NA		NA		150	B	4.7	J	660	B	890	
n-Tritriacontane (nC33)	NA		NA		110	B	13	J	370	B	470	J
n-Tetratriacontane (nC34)	NA		NA		44	JB	1.8	J	150	JB	180	J
n-Pentatriacontane (nC35)	NA		NA		22	J	1.7	J	74	J	69	J
n-Hexatriacontane (nC36)	NA		NA		13	J	0	ND	40	J	35	J
n-Heptatriacontane (nC37)	NA		NA		8.4	J	0	ND	22	J	12	J
n-Octatriacontane (nC38)	NA		NA		6.6	J	0	ND	23	J	0	ND
n-Nonatriacontane (nC38)	NA		NA		0	ND	0	ND	0	ND	0	ND
n-Tetracontane (nC40)	NA		NA		0	ND	0	ND	20	J	0	ND
Sum of Alkanes	NA		NA		3,500		680		14,000		17,000	
TPH	NA		NA		7,100			ND	23,000			ND

1.5 cANIMIDA Tissue Sample Re-Analysis and Comparison

A distinct decline in total PAH a concentration was observed for many biota types and samples between 2004 and 2005, as was also observed for many of the sediment samples. This concentrations fluctuation could be the result of actual changes in the field sample concentrations, laboratory analytical issues, or a combination of both.

The analytical chromatograms of selected 2004 and 2005 fish and mussel samples (Four Horn Sculpin from the Northstar area and the time zero mussels) were reviewed to determine if there were any observable differences. The chromatograms indicated that the 2005 sample extracts appeared to be somewhat "cleaner", possibly including lower amounts of common low-level lipid interference. This contribution effect in the 2004 samples could most readily be seen in the 28-40 minute retention time of the GC/MS analysis using the quantitation masses 83, 101, and 177, which could cause some interference with analytes eluting from fluorene to alkylated phenanthrenes/anthracenes. Lipids may also have altered the SHC chromatograms slightly.

However, these analytical observations would only have a small impact on the results, if at all. In order to better understand this difference, selected fish and amphipod samples collected and analyzed in 2004 and 2005 were re-extracted and re-analyzed along with the 2006 samples, to ensure that all processing and analyses were identical; observed differences would therefore be due to actual field sample concentration differences. Samples for this exercise were selected from stations that were sampled during all three field seasons and the results were compared to the previous analyses to assess if any observed differences can be attributed to analytical differences between different years, or if the changes observed are more likely due changing field sample concentrations. The samples were reanalyzed in duplicate and the data are presented in Tables C-3 and C-4. The Total PAH and Total SHC concentrations from the analyses of the amphipod samples collected at station N11 are presented in Figure C-1.

The fish samples data were compared after the blank levels had been subtracted. Generally, the reanalysis of the 2004 fish sample exhibited somewhat close agreement with the original analysis (Table C-3). Typically, the 2004 analysis had higher concentrations of the lower molecular weight PAHs than did the 2006 re-analysis, but in most cases analytes detected in 2004 were also detected in 2006. The total PAH concentrations were approximately 30 µg/kg in the original 2004 analysis of this fish sample, and about 20 µg/kg in the two re-analyses. Some difference can be expected with tissues stored for two years, and contaminant concentration and distribution changes with tissue/water phase changes in repeated thawing and freezing. However, this discrepancy is significantly lower than had been observed between in the 2004 and 2005 field sample data for the same fish species collected from this location (about 30 µg/kg vs 5 µg/kg). The reanalysis of the 2005 fish sample from this location yielded somewhat higher PAH concentrations than the original analysis but was less useful for interpretation purposes, as the original 2005 analysis had poor sensitivity and limited individual compound data.

Table C-3. cANIMIDA Fish Tissue Intercomparison Data
(blank contribution has been subtracted from the sample data)

	04-PBS-21-PHC/MET-T							05-PBS-13-PHC-T-F					
Battelle ID		**Q**	**2006 #1**	**Q**	**2006 #2**	**Q**		**2005**	**Q**	**2006 #1**	**Q**	**2006 #2**	**Q**
Naphthalene	4.64	B	2.28	BT	3.10	BT		0.72	B	0	BT	0	BT
C1-Naphthalenes	3.79	B	2.87	BT	3.39	T		1.90		0.94	BT	1.50	BT
C2-Naphthalenes	6.22		4.60	T	4.47	T		0	ND	3.94	T	3.30	T
C3-Naphthalenes	6.62		3.42	T	4.14	T		0	ND	3.95	T	3.51	T
C4-Naphthalenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Biphenyl	2.25		0.67	BT	0.90	BT		0	ND	0.38	JT	0.34	JT
Acenaphthylene	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Acenaphthene	3.84		0.35	JT	0.50	JT		0	ND	0	NDT	0	NDT
Fluorene	0.91	J	0.51	JT	0.64	JT		0	ND	0.57	JT	0.45	JT
C1-Fluorenes	1.70		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C2-Fluorenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Fluorenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Anthracene	0	ND	0.19	JT	0.24	JT		0	ND	0.15	JT	0.18	JT
Phenanthrene	2.82		1.53	BT	1.94	T		0.73	J	0.96	BT	0.87	BT
C1-Phenanthrenes/Anthracenes	0	ND	1.35	T	1.64	T		0	ND	1.63	T	1.44	T
C2-Phenanthrenes/Anthracenes	0	ND	0	NDT	0	NDT		0	ND	3.80	T	1.71	T
C3-Phenanthrenes/Anthracenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C4-Phenanthrenes/Anthracenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Dibenzothiophene	0.46	J	0.48	JT	0.55	JT		0	ND	0.33	JT	0.33	JT
C1-Dibenzothiophenes	0	ND	0.85	JT	0.87	JT		0	ND	1.12	T	0.94	JT
C2-Dibenzothiophenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Dibenzothiophenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Fluoranthene	0.20	J	0.10	JT	0.15	JT		0	ND	0.13	JT	0.23	JT
Pyrene	0.39	J	0.29	JT	0.30	JT		0	ND	0.38	JT	0.37	JT
C1-Fluoranthenes/Pyrenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C2-Fluoranthenes/Pyrenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Fluoranthenes/Pyrenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(a)anthracene	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Chrysene	0	ND	0	NDT	0	NDT		0	ND	0.20	JT	0.21	JT
C1-Chrysenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C2-Chrysenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Chrysenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT

C4-Chrysenes	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(b)fluoranthene	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0.14	JT
Benzo(k)fluoranthene	0	ND	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(a)pyrene	0	ND	0	NDT	0	NDT		0.56	J	0	NDT	0.12	JT
Benzo(e)pyrene	0.35	BJ	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Perylene	0	BJ	0.2	JT	0.20	JT		0.89	J	0.19	JT	0.24	JT
Indeno(1,2,3-cd)pyrene	0	BJ	0	NDT	0	NDT		0	ND	0.35	JT	0.11	JT
Dibenz(a,h)anthracene	0	BJ	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(g,h,i)perylene	0	BJ	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Total PAH	34.2		19.7		23.0			4.8		19.0		16.0	

Table C-4. cANIMIDA Amphipod Tissue Intercomparison Data.

(blank contribution has been subtracted from the sample data)

	04-N11-01-PHC/MET-T-AN							05-N11-01-PHC-T-AN					
	2004		2006 #1		2006 #2			2005		2006 #1		2006 #2	
PAH													
Naphthalene	1.68	B	2.33	BT	1.90	BT		0.76	B	1.41	BT	1.41	BT
C1-Naphthalenes	1.59	B	1.94	BT	1.69	BT		0.67	B	1.19	BT	1.40	BT
C2-Naphthalenes	9.80		5.25	T	4.37	T		0	ND	0	NDT	0	NDT
C3-Naphthalenes	3.76		5.11	T	4.90	T		0	ND	0	NDT	0	NDT
C4-Naphthalenes	3.21		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Biphenyl	0.2	B	0.84	T	0.70	T		0.23	B	0.51	JT	0.45	JT
Acenaphthylene	0.14	J	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Acenaphthene	0.16	J	0	NDT	0	NDT		0.27	J	0	NDT	0	NDT
Fluorene	0.43	B	0.62	T	0.43	JT		0.32	J	0	NDT	0.33	JT
C1-Fluorenes	6.80		1.83	T	1.70	T		0	ND	3.70	T	4	T
C2-Fluorenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Fluorenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Anthracene	0	U	0.29	JT	0	NDT		0	ND	0	NDT	0	NDT
Phenanthrene	1.93	B	3.46	T	2.49	T		0.22	B	0.71	BT	0.43	BT
C1-Phenanthrenes/Anthracenes	1.77		2.65	T	2.15	T		0	ND	0	NDT	0	NDT
C2-Phenanthrenes/Anthracenes	2.55		3.67	T	3.46	T		0	ND	0	NDT	0	NDT
C3-Phenanthrenes/Anthracenes	1.80		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C4-Phenanthrenes/Anthracenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Dibenzothiophene	0.27	J	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C1-Dibenzothiophenes	0.67		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C2-Dibenzothiophenes	1.24		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Dibenzothiophenes	0.92		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Fluoranthene	2.52		4.54	T	2.18	T		0.13	J	0	NDT	0.32	JT
Pyrene	2		3.28	T	1.56	T		0.31	J	0	NDT	0.19	JT
C1-Fluoranthenes/Pyrenes	1.80		2.57	T	1.93	T		0	ND	0	NDT	0	NDT
C2-Fluoranthenes/Pyrenes	2.30		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C3-Fluoranthenes/Pyrenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(a)anthracene	0.64		1.36	T	0.39	JT		0	ND	0	NDT	0.12	JT
Chrysene	1.62		2.83	T	1.21	T		0.45	J	0	NDT	0.33	JT
C1-Chrysenes	0.95		1.37	T	0.76	T		0	ND	0	NDT	0	NDT
C2-Chrysenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT

C3-Chrysenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C4-Chrysenes	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(b)fluoranthene	1.21		2.33	T	1.13	T		0	ND	0	NDT	0	NDT
Benzo(k)fluoranthene	0.94	J	2.42	T	0.94	JT		0	ND	0	NDT	0	NDT
Benzo(e)pyrene	0.81		1.98	T	0.75	T		0	ND	0	NDT	0	NDT
Benzo(a)pyrene	0.63		1.43	T	0.53	T		0	ND	0	NDT	0	NDT
Perylene	1.00		1.52	T	1.22	T		0	ND	0	NDT	0	NDT
Indeno(1,2,3-cd)pyrene	0.68		1.92	T	0.36	BT		0	ND	0	NDT	0	NDT
Dibenz(a,h)anthracene	0.22	J	0.46	BT	0	NDT		0	ND	0	NDT	0	NDT
Benzo(g,h,i)perylene	0.67		1.62	T	0.47	BT		0.30	J	0	NDT	0	BJT
Total PAH	56.9		57.6		37.2			3.66		7.52		8.98	
SHC													
n-Nonane	12.6	J	25.4	JT	23.5	JT		44.8	J	0	NDT	0	NDT
n-Decane	14.9	J	23.1	JT	16.5	JT		0	ND	3.83	JT	0	NDT
n-Undecane	14.6	J	13.3	JT	12.8	JT		0	ND	0	NDT	0	NDT
n-Dodecane	9.77	J	1.59	JT	9.90	JT		0	ND	0	NDT	0	NDT
n-Tridecane	14.4	J	16.1	JT	15.9	JT		0	ND	0	NDT	0	NDT
Isoprenoid RRT 1380	5.86	J	8.71	JT	9.59	JT		4.21	J	0	NDT	0	NDT
n-Tetradecane	27.3	J	25.3	JT	25.3	JT		26.7	J	0	NDT	0	NDT
Isoprenoid RRT 1470	16.5	J	24.4	JT	25.3	JT		174		0	NDT	9.15	JT
n-Pentadecane	351		425	T	438	T		129	J	63.7	JT	53.2	JT
n-Hexadecane	47.9	B	46.3	JT	46.3	JT		116	J	0	NDT	8.84	JT
Norpristane (1650)	8.11	J	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
n-Heptadecane	264		39.2	T	46.7	T		58.1	J	59.0	JT	65.4	JT
Pristane	32,600	E	35,600	T	36,900	ET		6,510		624	T	6,710	T
n-Octadecane	34.5	J	44.1	JT	46.6	JT		7.80	J	5.88	JT	5.86	JT
Phytane	16.3	J	15.9	JT	16.1	JT		6.66	J	4.21	JT	4.83	JT
n-Nonadecane	37.5	J	44.9	JT	46.3	JT		7.23	J	6.87	JT	7.91	JT
n-Eicosane	34.3	J	42.6	JT	42.0	JT		4.18	J	9.79	JT	1.23	JT
n-Heneicosane	64.6	J	64.9	JT	66.3	JT		22.2	J	22.6	JT	24.5	JT
n-Docosane	35.5	J	51.2	JT	51.2	JT		26.9	J	24.8	JT	25.7	JT
n-Tricosane	84.0	J	87.7	JT	91.7	JT		67.7	J	62.2	JT	61.5	JT
n-Tetracosane	48.9	J	55.6	JT	59.2	JT		21.4	J	26.6	JT	22.8	JT
n-Pentacosane	83.7	J	93.8	JT	96.6	JT		58.3	J	51.8	JT	48.0	JT
n-Hexacosane	42.6	J	45.4	JT	49.3	JT		19.1	J	28.3	JT	23.9	JT
n-Heptacosane	62.7	J	78.4	JT	78.8	JT		4.17	J	47.7	JT	41.9	JT
n-Octacosane	24.4	J	45.2	JT	47.9	JT		12.4	J	29.7	JT	23.6	JT
n-Nonacosane	59.3	J	80.0	JT	85.4	JT		2.11	J	34.5	JT	29.3	JT

n-Triacontane	33.6	J	48.9	JT	51.6	JT		1.48	J	21.8	JT	17.7	JT
n-Hentriacontane	189		145	T	141	T		18.3	J	16.4	JT	12.6	JT
n-Dotriacontane	36.3	J	26.8	JT	28.6	JT		9.80	J	8.83	JT	6.66	JT
n-Tritriacontane	36.3	J	21.1	JT	2.64	JT		6.75	J	2.87	JT	3.80	JT
n-Tetratriacontane	16.3	J	8.89	JT	8.88	JT		6.81	J	0	NDT	0	NDT
n-Pentatriacontane	15.3	J	4.93	JT	5.33	JT		4.67	J	0	NDT	0	NDT
n-Hexatriacontane	7.31	J	0.17	JT	0	BJT		3.29	J	0	NDT	0	NDT
n-Heptatriacontane	3.24	J	0	NDT	0	NDT		1.87	J	0	NDT	0	NDT
n-Octatriacontane	4.40	J	0	NDT	0	NDT		2.48	J	0	NDT	0	NDT
n-Nonatriacontane	0	U	0	NDT	0	NDT		2.42	J	0	NDT	0	NDT
n-Tetracontane	0	U	0	NDT	0	NDT		1.53	J	0	NDT	0	NDT
Sum of Alkanes	34,400		37,300		38,600			7,380		1,160		7,210	
BIOMARKER													
C23 diterpane (T4)	1.13	J	2.91	T	2.18	T		0	ND	0	NDT	0	NDT
C29 tricyclictriterpane (T9)	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
C29 tricyclictriterpane (T10)	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
18a(H)-22,29,30-trisnorhopane -TS (T11)	0.91	J	1.85	T	0.99	JT		0	ND	0	NDT	0	NDT
17a(H)-22,29,30-trisnorhopane -TM (T12)	0.71	J	1.53	T	1.16	T		0	ND	0	NDT	0	NDT
17a(H),21b(H)-30-norhopane (T15)	2.17		4.25	T	2.11	T		0	ND	0	NDT	0	NDT
18a(H)-oleanane (T18)	0	U	0	NDT	0	NDT		0	ND	0	NDT	0	NDT
17a(H),21b(H)-hopane (T19)	2.76		4.40	T	4.28	T		0	ND	0	NDT	0	NDT
22S-17a(H),21b(H)-30-homohopane (T21)	1.45		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
22R-17a(H),21b(H)-30-homohopane (T22)	1.28		0	NDT	0	NDT		0	ND	0	NDT	0	NDT
13b,17a-diacholestane-20S (S4)	1.56		1.48	T	1.25	T		0.44	J	0	NDT	0	NDT
13b,17a-diacholestane-20R (S5)	0.88		0.99	JT	0.81	JT		0	ND	0	NDT	0	NDT
5a,14a,17a,24-methylcholestane-20R (S24)	0.95		0.77	JT	0.81	JT		0	ND	0	NDT	0	NDT
5a,14a,17a,24-ethylcholestane-20S (S25)	0.68		0.87	JT	0.56	JT		0	ND	0	NDT	0	NDT
5a,14a,17a,24-ethylcholestane-20R (S28)	1.34		1.25	T	1.3	T		0	ND	0	NDT	0	NDT
S28a	1.50		0.65	JT	0.50	JT		0	ND	0	NDT	0	NDT
Sum of S/T	17.3		21.0		16.0			0.44		0		0	

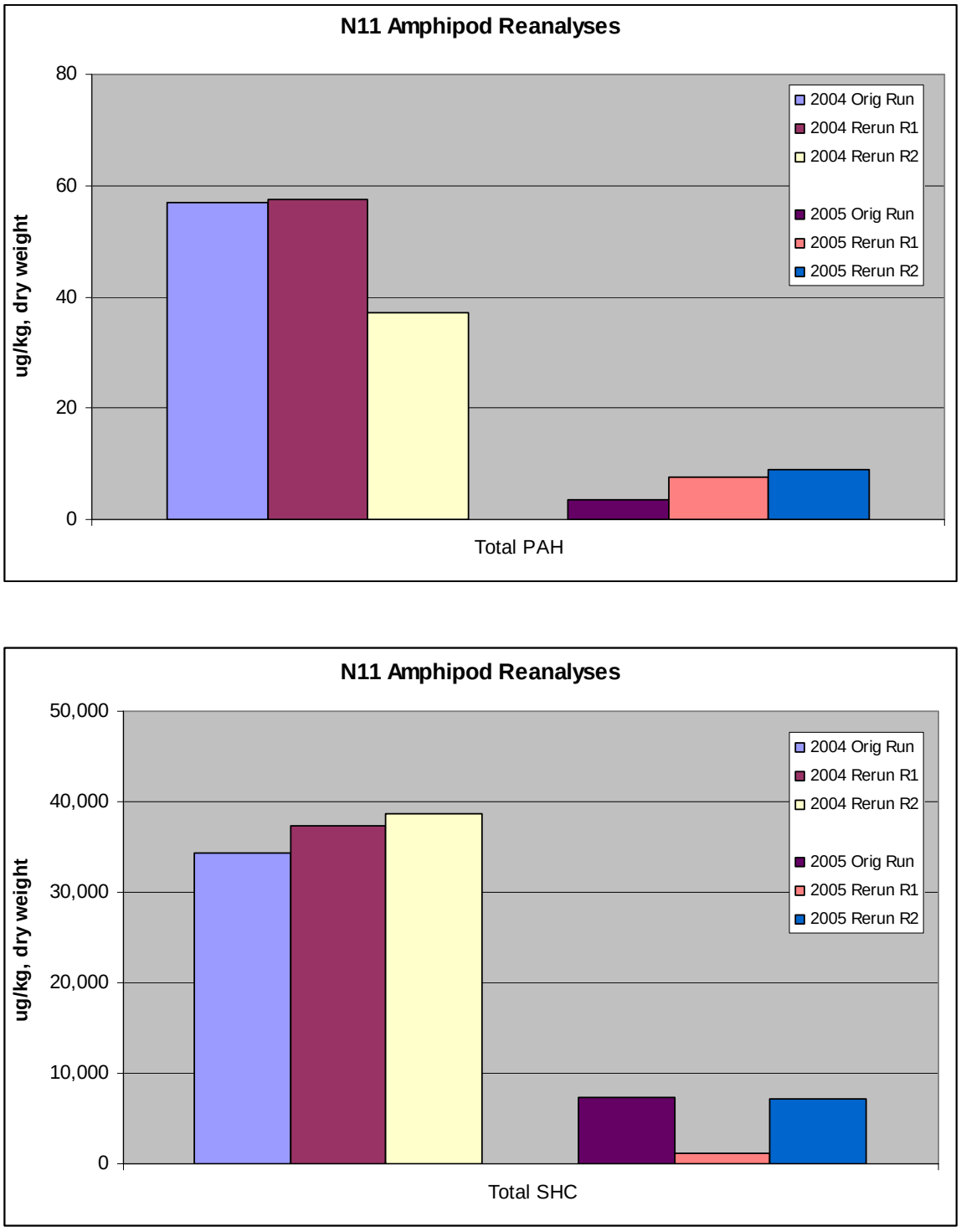


Figure C-1. Total PAH and Total SHC Concentrations in Amphipod Samples from N11 Originally Analyzed in 2004 and 2005 (Orig Run) and Re-Analyzed in 2006 (Rerun R1/R2)

The data from the re-extracted and re-analyzed 2004 and 2005 amphipod samples from station N11 provided more useful information for data evaluation purposes, and included PAH, SHC, and S/T results. The reanalysis agreed quite well with the original analysis for all three organic parameter classes (Table C-4), despite the large differences in the results between 2004 and 2005. For instance, the sample collected in 2004 had a Total PAH concentration of 57 µg/kg in the original 2004 analysis, and 58 and 37 µg/kg in the duplicate re-analyses in 2006 (Figure C-1). The sample collected in 2005 had a Total PAH concentration of 4 µg/kg in the original 2005 analysis, and 8 and 9 µg/kg in the duplicate re-analyses in 2006. The Total SHC concentration was determined to be 37,000 and 39,000 µg/kg in the 2006 duplicate re-analyses, and 34,000 µg/kg in the original 2004 analysis (Figure C-1); the original analysis of the sample from the same location in 2005 yielded a Total SHC concentration of 7,000 µg/kg. The biomarker data were similarly consistent in the re-analysis, and also had similar large year-to-year fluctuations.

The original results were, for the most part, confirmed in the re-analyses, and surprisingly large year-to-year variability in the field sample concentrations of PAH, SHC, and S/T was documented. The results from the analysis of the samples collected in 2006 demonstrate continued relatively large year-to-year fluctuations in field sample concentrations, but with much of the 2006 data falling somewhere between that observed for 2004 and 2005. The data from the re-analysis of the 2004 and 2005 samples, together with the analysis of the 2006 samples, demonstrated that the observed fluctuations could *not* be attributed to laboratory artifacts or any analytical factors, but indeed appear to reflect actual fluctuations in the organic compound concentrations in the field.

2.0 Potential Impact of QC Observations on Use of Data

The program data quality objectives were broadly met. Some data quality objective (DQO) exceedances can be expected with challenging sample matrices and when applying ultra-trace level analytical methods. However, the DQO exceedances that were observed were relatively few and appear to be isolated sample- or analyte-specific incidents that do not represent the analyses and dataset as a whole.

Since the storage conditions and handling prior to receipt at Battelle of the historical samples intended for the intercomparison exercise are questionable, and minimal material was available for the tissue replicates, the new data generated in 2005 for those intercomparison samples should be considered with caution. The results from these analyses do warrant some consideration, but in order to determine whether the cANIMIDA data are reliable and, if year to year data are comparable, one must also consider the remaining QC samples and ensure equal quality of any data these cANIMIDA data are compared with.

The 2006 reanalysis of samples collected in 2004 and 2005 indicates that PAH values for the 2005 fish samples, and possibly also some other 2005 animals, may be biased slightly low as several parameter were not detected during the original analyses, but were detected at levels near the method detection limit in 2006.

The data from the re-analysis of the 2004 and 2005 samples, along with the 2006 sample data, demonstrated that the observed fluctuations primarily reflect actual fluctuations in the organic

compound concentrations in the field samples. The environment in the nearshore Beaufort Sea is far from static and year to year fluctuations in both sediment and biota samples should not be unexpected. This variability is evident, on review of the data from stations that were consistently sampled through ANIMIDA and cANIMIDA. Most of these stations exhibit variability in the PAH and SHC data throughout this study period, even when normalized to factors such as fines, carbon content, and lipid content.

In general, the quality assurance program, including the analysis of laboratory QC samples processed and analyzed with the cANIMIDA sediment and biota samples, produced data that demonstrate that the methods were appropriate, and that the analyses were under control generating high quality and reliable data that can be used with confidence.

This page intentionally left blank

APPENDIX D

Summary of Chemistry Data

This page intentionally left blank

cANIMIDA Tissue Hydrocarbon Data

This page left intentionally blank.

Glossary of Data Qualifiers for Hydrocarbon Data

B	Analyte concentration found in the sample at a concentration <5x the level found in the procedural blank.
D	Dilution Run. Initial run outside linear range of instrument
E	Estimate, result is greater than the highest concentration level in the calibration
H	Surrogate diluted out. Used when surrogate recovery is affected by excessive dilution of the sample extract.
J	Analyte detected below the sample specific reporting limit (RL)
ME	Significant matrix interference – Estimated value
MI	Significant matrix interference – Value could not be determined or estimated
n	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO), but meets the contingency criteria
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO).
NA	Not applicable
T	Holding time (HT) exceeded
ND	Analyte not detected at a 3:1 signal:noise ratio.

This page left intentionally blank.

cANIMIDA Fish Tissue Hydrocarbon Data

This page left intentionally blank.

2004 Fish Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	04-0446	04-0446	04-0446
Client ID	04-PBS-21-PHC/MET-T	04-PBS-25-PHC/MET-T	04-SIS-01-PHC/MET-T
Location	Point Brower/Liberty	Point Brower/Liberty	Stump Island
Battelle ID	S4173-P	S4175-P	S4176-P
Collection Date	08/07/04	08/07/04	08/08/04
% Moisture	78.38	77.57	75.19
% Lipid	1.89	3.14	3.55
Matrix	FISH	FISH	FISH
Sample Size (g dry)	4.59	4.32	4.99
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	10.03 B	11.92 B	5.39 B
C1-Naphthalenes	5.66 B	7.43 B	2.19 B
C2-Naphthalenes	6.22	7.38	4.95
C3-Naphthalenes	6.62	6.2	5.01
C4-Naphthalenes	ND	ND	ND
Biphenyl	2.25	2.01	1.24
Acenaphthylene	ND	ND	ND
Acenaphthene	3.84	ND	ND
Fluorene	0.91 J	1.5	1.47
C1-Fluorenes	1.7	ND	11.65
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	2.82	3.86	ND
C1-Phenanthrenes/Anthracenes	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.54 J	0.62 J	0.31 J
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.38 J	0.37 J	0.87 J
Pyrene	0.63 J	0.77 J	1.12 B
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	ND	ND	0.55 J
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	0.35 J	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	0.55 J	ND	ND
Indeno(1,2,3-cd)pyrene	0.41 J	0.21 J	0.37 J
Dibenz(a,h)anthracene	0.54 J	ND	2.47 B
Benzo(g,h,i)perylene	0.38 J	0.25 J	ND
Total PAH (ug/kg dry)	43.83	42.52	37.59
Surrogate Recoveries (%)			
Naphthalene-d8	47	48	45
Acenaphthene-d10	51	53	50
Phenanthrene-d10	53	58	56
Benzo(a)pyrene-d12	63	64	64

Surrogate Corrected

Laboratory Batch Number	04-0446	04-0446	04-0446
Client ID	04-PBS-27-PHC/MET-T	04-SIS-06-PHC/MET-T	04-SIS-03-PHC/MET-T
Location	Point Brower/Liberty	Stump Island	Stump Island
Battelle ID	S4177-P	S4181-P	S4183-P
Collection Date	08/07/04	08/08/04	08/08/04
% Moisture	78.97	72	69.16
% Lipid	0.51	6.18	9.06
Matrix	FISH	FISH	FISH
Sample Size (g dry)	2.21	5.62	6.19
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	9.86 B	3.94 B	4.44 B
C1-Naphthalenes	7.37 B	2.43 B	3.76 B
C2-Naphthalenes	9.44	5.34	7.74
C3-Naphthalenes	ND	5.04	7.22
C4-Naphthalenes	ND	ND	ND
Biphenyl	3.97	0.99	1.39
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	ND
Fluorene	1.59 J	1.32	1.91
C1-Fluorenes	ND	4.53	12.2
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	49.78	ND	ND
C1-Phenanthrenes/Anthracenes	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.49 J	0.29 J	ND
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.81 J	ND	0.88 B
Pyrene	0.8 J	0.63 J	1.45
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	ND	ND	0.64 J
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	ND	ND	1.59 B
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	0.94 B
Benzo(g,h,i)perylene	0.71 J	ND	ND
Total PAH (ug/kg dry)	84.82	24.51	44.16
Surrogate Recoveries (%)			
Naphthalene-d8	46	39 N	34 N
Acenaphthene-d10	52	44	38 N
Phenanthrene-d10	55	47	42
Benzo(a)pyrene-d12	70	56	54

Surrogate Corrected

Laboratory Batch Number	04-0446	04-0446	04-0446
Client ID	04-SIS-07-PHC/MET-T	04-PBS-26-PHC/MET-T	04-SIS-09-PHC/MET-T
Location	Stump Island	Point Brower/Liberty	Stump Island
Battelle ID	S4185-P	S4186-P	S4187-P
Collection Date	08/08/04	08/07/04	08/08/04
% Moisture	77.76	74.84	66.97
% Lipid	2.34	4.94	9.73
Matrix	FISH	FISH	FISH
Sample Size (g dry)	4.45	1.80	6.70
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	5.55 B	21.54 B	6.27 B
C1-Naphthalenes	3.31 B	14.29	4.4 B
C2-Naphthalenes	ND	15.87	10.16
C3-Naphthalenes	ND	15.58	6.38
C4-Naphthalenes	ND	ND	ND
Biphenyl	1.62	3.47	1.75
Acenaphthylene	0.6 J	ND	ND
Acenaphthene	1.48	ND	ND
Fluorene	3.25	2.45	2.86
C1-Fluorenes	3.43	ND	15.37
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	ND	ND	ND
C1-Phenanthrenes/Anthracenes	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.2 J	ND	0.49 J
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.48 J	ND	1.32 B
Pyrene	1.03 B	2.24 J	2.5
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	ND	ND	ND
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND
Total PAH (ug/kg dry)	20.95	75.44	51.5
Surrogate Recoveries (%)			
Naphthalene-d8	42	46	34 N
Acenaphthene-d10	47	52	39 N
Phenanthrene-d10	51	56	43
Benzo(a)pyrene-d12	68	67	50

Surrogate Corrected

Laboratory Batch Number	04-0446	04-0446	04-0446
Client ID	04-PBS-04-PHC/MET-T	04-PBS-09-PHC/MET-T	04-PBS-06-PHC/MET-T
Location	Point Brower/Liberty	Point Brower/Liberty	Point Brower/Liberty
Battelle ID	S4194-P	S4198-P	S4201-P
Collection Date	08/06/04	08/06/04	08/06/04
% Moisture	77.65	76.53	78.36
% Lipid	2.46	3.62	3.25
Matrix	FISH	FISH	FISH
Sample Size (g dry)	4.51	4.88	4.35
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	13.09 B	7.32 B	5.47 B
C1-Naphthalenes	9.27 B	6.82 B	4.43 B
C2-Naphthalenes	10.29	10.76	ND
C3-Naphthalenes	ND	ND	ND
C4-Naphthalenes	ND	ND	ND
Biphenyl	2.44	1.89	1.36
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	1.4
Fluorene	2.69	2.22	2.03
C1-Fluorenes	10.57	ND	ND
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	2.61	2.52	1.93
C1-Phenanthrenes/Anthracenes	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	ND	ND	ND
Pyrene	ND	ND	0.69 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	ND	ND	ND
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	ND	10.79	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	ND	3.88 B	2.08 B
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND
Total PAH (ug/kg dry)	50.96	46.2	19.39
Surrogate Recoveries (%)			
Naphthalene-d8	44	36 N	41
Acenaphthene-d10	50	40	46
Phenanthrene-d10	55	44	51
Benzo(a)pyrene-d12	67	53	60

Surrogate Corrected

Laboratory Batch Number	04-0446		04-0446		04-0446	
Client ID	04-PBS-08-PHC/MET-T		04-SIS-14-PHC/MET-T		04-SIS-15-PHC/MET-T	
Location	Point Brower/Liberty		Stump Island		Stump Island	
Battelle ID	S4208-P		S4209-P		S4211-P	
Collection Date	08/06/04		08/08/04		08/08/04	
% Moisture	73.88		77.22		78.35	
% Lipid	3.25		2.39		1.51	
Matrix	FISH		FISH		FISH	
Sample Size (g dry)	5.25		4.99		2.22	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:						
Naphthalene	5.18	B	4.78	B	7.28	B
C1-Naphthalenes	ND		5.19	B	5.88	B
C2-Naphthalenes	ND		11.62		ND	
C3-Naphthalenes	ND		10.16		ND	
C4-Naphthalenes	ND		ND		ND	
Biphenyl	1.17		1.08		1.48	J
Acenaphthylene	ND		0.6	J	ND	
Acenaphthene	ND		ND		ND	
Fluorene	0.6	J	1.7		3.17	
C1-Fluorenes	12.2		2.92		9.25	
C2-Fluorenes	ND		ND		ND	
C3-Fluorenes	ND		ND		ND	
Anthracene	ND		ND		ND	
Phenanthrene	2.1		ND		ND	
C1-Phenanthrenes/Anthracenes	ND		ND		ND	
C2-Phenanthrenes/Anthracenes	ND		ND		ND	
C3-Phenanthrenes/Anthracenes	ND		ND		ND	
C4-Phenanthrenes/Anthracenes	ND		ND		ND	
Dibenzothiophene	ND		ND		ND	
C1-Dibenzothiophenes	ND		ND		ND	
C2-Dibenzothiophenes	ND		ND		ND	
C3-Dibenzothiophenes	ND		ND		ND	
Fluoranthene	ND		ND		0.55	J
Pyrene	4.63		ND		1.02	J
C1-Fluoranthenes/Pyrenes	ND		ND		ND	
C2-Fluoranthenes/Pyrenes	ND		ND		ND	
C3-Fluoranthenes/Pyrenes	ND		ND		ND	
Benzo(a)anthracene	ND		ND		ND	
Chrysene	ND		ND		ND	
C1-Chrysenes	ND		ND		ND	
C2-Chrysenes	ND		ND		ND	
C3-Chrysenes	ND		ND		ND	
C4-Chrysenes	ND		ND		ND	
Benzo(b)fluoranthene	ND		0.45	J	ND	
Benzo(k)fluoranthene	ND		0.17	J	ND	
Benzo(e)pyrene	0.85		0.61	J	0.69	J
Benzo(a)pyrene	ND		0.34	J	0.52	J
Perylene	ND		1.02	B	1.05	J
Indeno(1,2,3-cd)pyrene	0.63	J	0.47	J	ND	
Dibenz(a,h)anthracene	ND		ND		ND	
Benzo(g,h,i)perylene	ND		0.37	J	ND	
Total PAH (ug/kg dry)	27.36		41.48		30.89	
Surrogate Recoveries (%)						
Naphthalene-d8	50		45		45	
Acenaphthene-d10	59		51		51	
Phenanthrene-d10	62		54		55	
Benzo(a)pyrene-d12	76		64		63	

Surrogate Corrected

Laboratory Batch Number	04-0446	04-0446	04-0446
Client ID	04-SIS-17-PHC/MET-T	04-L14-03-PHC/MET-T	04-L14-05-PHC/MET-T
Location	Stump Island	Liberty	Liberty
Battelle ID	S4213-P	S4306-P	S4311-P
Collection Date	08/08/04	08/13/04	08/13/04
% Moisture	72.96	79.61	78.18
% Lipid	6.29	4.23	3.7
Matrix	FISH	FISH	FISH
Sample Size (g dry)	2.50	0.72	1.24
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	6.2 B	22.39 B	17.22 B
C1-Naphthalenes	6.19 B	17.04	16.3
C2-Naphthalenes	13.25	29.05	26.56
C3-Naphthalenes	ND	ND	ND
C4-Naphthalenes	ND	ND	ND
Biphenyl	1.73 J	4.02 J	4.43
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	6.7	ND
Fluorene	2.29	2.86 J	4.67
C1-Fluorenes	7.31	10.82	64.27
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	0.61 J
Phenanthrene	ND	ND	4.63
C1-Phenanthrenes/Anthracenes	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	ND	1.17 J	0.67 J
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.71 J	1.82 J	1.4 J
Pyrene	1.81	2.02 J	1.42 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	ND	ND	1.48 J
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	3.6 J	3.18 J
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	1.62 J	1.38 J	0.98 J
Benzo(a)pyrene	ND	ND	ND
Perylene	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND
Total PAH (ug/kg dry)	41.11	102.87	147.82
Surrogate Recoveries (%)			
Naphthalene-d8	43	71	45
Acenaphthene-d10	48	81	51
Phenanthrene-d10	52	85	54
Benzo(a)pyrene-d12	63	100	61

Surrogate Corrected

Laboratory Batch Number	04-0447	04-0447	04-0447
Client ID	04-N25-03-PHC/MET-T	04-N25-01-PHC/MET-T	04-TGV-01-PHC/MET-T
Location	Northstar	Northstar	Tigvariak Island
Battelle ID	S4312-P	S4313-P	S4370-P
Collection Date	08/15/04	08/15/04	08/12/04
% Moisture	77	78.64	74.34
% Lipid	8.48	6.07	4.53
Matrix	FISH	FISH	FISH
Sample Size (g dry)	1.00	0.45	5.23
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	8.07	21.12	2.91 B
C1-Naphthalenes	8.22	13.2	3.32 B
C2-Naphthalenes	20.1	24.92	4.56
C3-Naphthalenes	ND	ND	3.83
C4-Naphthalenes	ND	ND	ND
Biphenyl	ND	3.98 J	1.6
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	ND
Fluorene	3.37 J	2.68 J	0.65 J
C1-Fluorenes	6.07	ND	1.66
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	154.56	4.45 J	1.2
C1-Phenanthrenes/Anthracenes	4 J	6.3 J	ND
C2-Phenanthrenes/Anthracenes	5.76	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	1.11 J	1.21 J	0.21 J
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	1.07 J	1.58 J	0.26 J
Pyrene	1.41 J	1.75 J	0.3 J
C1-Fluoranthenes/Pyrenes	6.36	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	2.75 J	ND	ND
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	1.83 J	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND
Total PAH (ug/kg dry)	224.68	81.19	20.5
Surrogate Recoveries (%)			
Naphthalene-d8	66	59	67
Acenaphthene-d10	74	66	72
Phenanthrene-d10	73	67	73
Benzo(a)pyrene-d12	90	83	89

Surrogate Corrected

Laboratory Batch Number	04-0447	04-0447	04-0447
Client ID	04-TGV-04-PHC/MET-T	04-TGV-06-PHC/MET-T	04-TGV-08-PHC/MET-T
Location	Tigvariak Island	Tigvariak Island	Tigvariak Island
Battelle ID	S4372-P	S4377-P	S4378-P
Collection Date	08/12/04	08/12/04	08/12/04
% Moisture	75.52	75.2	78.68
% Lipid	3	2.91	1.38
Matrix	FISH	FISH	FISH
Sample Size (g dry)	5.38	3.24	2.20
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	2.94 B	3.8 B	5.76 B
C1-Naphthalenes	2.67 B	3.85 B	5.76 B
C2-Naphthalenes	4.74	7.46	7.42
C3-Naphthalenes	5.28	5.66	8.5
C4-Naphthalenes	9.99	ND	ND
Biphenyl	1.16	1.49	1.79 J
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	ND
Fluorene	0.48 J	1.1 J	0.65 J
C1-Fluorenes	1.01	ND	1.76 J
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	1.32	2.66	1.56 J
C1-Phenanthrenes/Anthracenes	1.09	1.47	1.54 J
C2-Phenanthrenes/Anthracenes	1.31	ND	1.3 J
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.28 J	0.36 J	0.31 J
C1-Dibenzothiophenes	0.51 J	1.09 J	0.7 J
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.49 J	0.34 J	0.39 J
Pyrene	0.44 J	0.37 J	0.38 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	0.39 J	ND	ND
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	0.18 J	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	0.18 J	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	0.21 J	ND	0.95 J
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	0.14 J	ND	ND
Total PAH (ug/kg dry)	34.81	29.65	38.77
Surrogate Recoveries (%)			
Naphthalene-d8	62	60	59
Acenaphthene-d10	66	62	64
Phenanthrene-d10	66	63	64
Benzo(a)pyrene-d12	78	73	77

Surrogate Corrected

Laboratory Batch Number	04-0447	04-0447	04-0447
Client ID	04-TGV-21-PHC/MET-T	04-TGV-02-PHC/MET-T	04-TGV-26-PHC/MET-T
Location	Tigvariak Island	Tigvariak Island	Tigvariak Island
Battelle ID	S4381-P	S4384-P	S4386-P
Collection Date	08/12/04	08/12/04	08/12/04
% Moisture	73.51	74.02	75.39
% Lipid	2.92	3.04	2.92
Matrix	FISH	FISH	FISH
Sample Size (g dry)	5.32	5.36	4.85
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	4.79 B	2.65 B	4.8 B
C1-Naphthalenes	4.69 B	1.92 B	4.9 B
C2-Naphthalenes	6.19	3.79	6.82
C3-Naphthalenes	4.43	3.3	5.46
C4-Naphthalenes	ND	ND	ND
Biphenyl	2.29	1.22	1.72
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	ND
Fluorene	0.72 J	0.62 J	0.94 J
C1-Fluorenes	3.62	1.16	4.31
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	0.12 J	ND	ND
Phenanthrene	1.15	1.18	2.3
C1-Phenanthrenes/Anthracenes	0.86 J	0.89	1.79
C2-Phenanthrenes/Anthracenes	1.73	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.19 J	0.17 J	0.37 J
C1-Dibenzothiophenes	ND	ND	0.72 J
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.3 J	0.22 J	0.52 J
Pyrene	0.51 J	0.16 J	0.32 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Chrysene	ND	ND	0.48 J
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND
Total PAH (ug/kg dry)	31.59	17.28	35.45
Surrogate Recoveries (%)			
Naphthalene-d8	45	59	48
Acenaphthene-d10	48	62	52
Phenanthrene-d10	49	63	52
Benzo(a)pyrene-d12	55	72	58

Surrogate Corrected

Laboratory Batch Number	04-0447	05-0038
Client ID	04-TGV-30-PHC/MET-T	04-PBS-19-PHC/MET-T
Location	Tigvariak Island	Point Brower/Liberty
Battelle ID	S4388-P	S4204-P1
Collection Date	08/12/04	08/06/04
% Moisture	80	77.05
% Lipid	2.95	2.78
Matrix	FISH	FISH
Sample Size (g dry)	4.21	4.76
Units	UG/KG_DRY	UG/KG_DRY
PAH:		
Naphthalene	5.51 B	6.98 B
C1-Naphthalenes	6.74	4.75
C2-Naphthalenes	6.85	6.13
C3-Naphthalenes	5.66	ND
C4-Naphthalenes	4.47	ND
Biphenyl	1.77	ND
Acenaphthylene	ND	ND
Acenaphthene	ND	ND
Fluorene	0.51 J	0.66 J
C1-Fluorenes	1.07 J	ND
C2-Fluorenes	ND	ND
C3-Fluorenes	ND	ND
Anthracene	ND	ND
Phenanthrene	0.93 J	13.77
C1-Phenanthrenes/Anthracenes	1.33	ND
C2-Phenanthrenes/Anthracenes	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND
Dibenzothiophene	0.15 J	ND
C1-Dibenzothiophenes	ND	ND
C2-Dibenzothiophenes	ND	ND
C3-Dibenzothiophenes	ND	ND
Fluoranthene	0.26 J	ND
Pyrene	0.24 J	ND
C1-Fluoranthenes/Pyrenes	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND
Benzo(a)anthracene	ND	ND
Chrysene	ND	ND
C1-Chrysenes	ND	ND
C2-Chrysenes	ND	ND
C3-Chrysenes	ND	ND
C4-Chrysenes	ND	ND
Benzo(b)fluoranthene	ND	ND
Benzo(k)fluoranthene	ND	ND
Benzo(e)pyrene	ND	ND
Benzo(a)pyrene	ND	ND
Perylene	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND
Dibenz(a,h)anthracene	ND	ND
Benzo(g,h,i)perylene	ND	ND
Total PAH (ug/kg dry)	35.49	
Surrogate Recoveries (%)		
Naphthalene-d8	62	44
Acenaphthene-d10	65	51
Phenanthrene-d10	65	52
Benzo(a)pyrene-d12	82	52

Surrogate Corrected

Laboratory Batch Number	04-0446	04-0447	05-0038
Client ID	Procedural Blank	Procedural Blank	Procedural Blank
Location			
Battelle ID	BF397PB-P	BF400PB-P	BF807PB-P
Collection Date	12/09/04	01/03/05	02/01/05
% Moisture	75.82	76.23	77.05
% Lipid	NA	NA	NA
Matrix	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	3.97	3.65	4.76
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	5.39 N	1.5	1.85
C1-Naphthalenes	1.87	1.21 J	ND
C2-Naphthalenes	ND	ND	ND
C3-Naphthalenes	ND	ND	ND
C4-Naphthalenes	ND	ND	ND
Biphenyl	ND	ND	ND
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	ND
Fluorene	ND	ND	ND
C1-Fluorenes	ND	ND	ND
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	ND	ND
Phenanthrene	ND	ND	ND
C1-Phenanthrenes/Anthracenes	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.08 J	ND	ND
C1-Dibenzothiophenes	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	0.36 J	0.12 J	ND
Pyrene	0.24 J	0.16 J	ND
C1-Fluoranthenes/Pyrenes	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	1.67	ND	ND
Chrysene	0.69 J	ND	ND
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND
Perylene	6.26 N	ND	ND
Indeno(1,2,3-cd)pyrene	0.99 J	ND	ND
Dibenz(a,h)anthracene	0.83 J	ND	ND
Benzo(g,h,i)perylene	0.68 J	ND	ND
Total PAH (ug/kg dry)	19.06	2.99	1.85
Surrogate Recoveries (%)			
Naphthalene-d8	16 N	62	58
Acenaphthene-d10	20 N	62	62
Phenanthrene-d10	21 N	64	60
Benzo(a)pyrene-d12	21 N	81	58

Laboratory Batch Number	04-0446				04-0447			
Client ID	041029-01: Clean Cod Fillet				041029-01: Clean Cod Fillet			
Location								
Battelle ID	BF398LCS-P				BF401LCS-P			
Collection Date	12/09/04				01/03/05			
% Moisture	81.34				NA			
% Lipid	NA				NA			
Matrix	TISSUE				TISSUE			
Sample Size (g dry)	2.80				NA			
Units	UG/KG_DRY	Target	% Recovery	Qualifier	NG	Target	% Recovery	Qualifier
PAH:								
Naphthalene	481.92	455.36	106		1237.94	1251.88	99	
C1-Naphthalenes	621.24				1449.37			
C2-Naphthalenes	ND				ND			
C3-Naphthalenes	ND				ND			
C4-Naphthalenes	ND				ND			
Biphenyl	416.29	450.89	92		1208.07	1253.75	96	
Acenaphthylene	457.08	450.89	101		1331.34	1251.88	106	
Acenaphthene	453.94	450.89	101		1193.65	1251.25	95	
Fluorene	504.91	455.36	111		1230.2	1250.63	98	
C1-Fluorenes	ND				ND			
C2-Fluorenes	ND				ND			
C3-Fluorenes	ND				ND			
Anthracene	513.21	447.32	115		1390.2	1251.88	111	
Phenanthrene	440.06	455.36	97		1161.8	1251.25	93	
C1-Phenanthrenes/Anthracenes	ND				ND			
C2-Phenanthrenes/Anthracenes	ND				ND			
C3-Phenanthrenes/Anthracenes	ND				ND			
C4-Phenanthrenes/Anthracenes	ND				ND			
Dibenzothiophene	459.14	450.89	102		1115.32	1254.50	89	
C1-Dibenzothiophenes	ND				ND			
C2-Dibenzothiophenes	ND				ND			
C3-Dibenzothiophenes	ND				ND			
Fluoranthene	487.43	455.36	107		1277.37	1251.25	102	
Pyrene	486.45	455.36	107		1309.17	1251.25	105	
C1-Fluoranthenes/Pyrenes	ND				3.51	J		
C2-Fluoranthenes/Pyrenes	ND				ND			
C3-Fluoranthenes/Pyrenes	ND				ND			
Benzo(a)anthracene	524.22	450.89	116		1572.49	1250.63	126	
Chrysene	481.39	450.89	107		1441.71	1251.88	115	
C1-Chrysenes	ND				ND			
C2-Chrysenes	ND				ND			
C3-Chrysenes	ND				ND			
C4-Chrysenes	ND				ND			
Benzo(b)fluoranthene	504.74	450.89	112		1234.45	1252.50	99	
Benzo(k)fluoranthene	ND				1212.56	1252.50	97	
Benzo(e)pyrene	495.1	452.68	109		1241.5	1247.00	100	
Benzo(a)pyrene	461.23	455.36	101		1244.79	1250.63	100	
Perylene	471.71	450.89	105		1297.06	1250.25	104	
Indeno(1,2,3-cd)pyrene	415.27	450.89	92		1318.02	1251.88	105	
Dibenz(a,h)anthracene	427.57	450.89	95		1297.16	1251.25	104	
Benzo(g,h,i)perylene	405.31	450.89	90		1190.61	1252.50	95	
Total PAH (ug/kg dry)	9508.21				26958.29			
Surrogate Recoveries (%)								
Naphthalene-d8	41				56			
Acenaphthene-d10	46				58			
Phenanthrene-d10	51				61			
Benzo(a)pyrene-d12	54				73			

Laboratory Batch Number	05-0038			
	041029-01: Clean Cod			
Client ID	Fillet			
Location				
Battelle ID	BF808LCS-P			
Collection Date	02/01/05			
% Moisture	81.34			
% Lipid	NA			
Matrix	TISSUE			
Sample Size (g dry)	3.57			
Units	UG/KG_DRY	Target	% Recovery	Qualifier
PAH:				
Naphthalene	471.91	350.14	135	N
C1-Naphthalenes	583.84			
C2-Naphthalenes	ND			
C3-Naphthalenes	ND			
C4-Naphthalenes	ND			
Biphenyl	389.68	350.14	111	
Acenaphthylene	453.09	350.14	129	
Acenaphthene	432.26	350.14	123	
Fluorene	501.21	350.14	143	N
C1-Fluorenes	ND			
C2-Fluorenes	ND			
C3-Fluorenes	ND			
Anthracene	529.04	350.14	151	N
Phenanthrene	425.87	350.14	122	
C1-Phenanthrenes/Anthracenes	ND			
C2-Phenanthrenes/Anthracenes	ND			
C3-Phenanthrenes/Anthracenes	ND			
C4-Phenanthrenes/Anthracenes	ND			
Dibenzothiophene	500.52	350.14	143	N
C1-Dibenzothiophenes	ND			
C2-Dibenzothiophenes	ND			
C3-Dibenzothiophenes	ND			
Fluoranthene	507.58	350.14	145	N
Pyrene	527.3	350.14	151	N
C1-Fluoranthenes/Pyrenes	ND			
C2-Fluoranthenes/Pyrenes	ND			
C3-Fluoranthenes/Pyrenes	ND			
Benzo(a)anthracene	489.26	350.14	140	N
Chrysene	470.85	350.14	134	N
C1-Chrysenes	ND			
C2-Chrysenes	ND			
C3-Chrysenes	ND			
C4-Chrysenes	ND			
Benzo(b)fluoranthene	514.35	350.14	147	N
Benzo(k)fluoranthene	598.12	350.14	171	N
Benzo(e)pyrene	538.02	350.14	154	N
Benzo(a)pyrene	478.35	350.14	137	N
Perylene	507.05	350.14	145	N
Indeno(1,2,3-cd)pyrene	492.73	350.14	141	N
Dibenz(a,h)anthracene	483.33	350.14	138	N
Benzo(g,h,i)perylene	468.55	350.14	134	N
Total PAH (ug/kg dry)	10362.91			
Surrogate Recoveries (%)				
Naphthalene-d8	46			
Acenaphthene-d10	52			
Phenanthrene-d10	57			
Benzo(a)pyrene-d12	56			

Surrogate Corrected

Laboratory Batch Number	04-0446				
Client ID	031105-01: SRM 2978				
Location					
Battelle ID	BF399SRM-P				
Collection Date	12/09/04				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	0.50				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
PAH:					
Naphthalene	21.65				
C1-Naphthalenes	16.41				
C2-Naphthalenes	22.52				
C3-Naphthalenes	56.04				
C4-Naphthalenes	47.15				
Biphenyl	6.28	J			
Acenaphthylene	6.54	J			
Acenaphthene	3.15	J			
Fluorene	8.96				
C1-Fluorenes	122.1				
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	71.39				
Phenanthrene	77.63				
C1-Phenanthrenes/Anthracenes	68.67				
C2-Phenanthrenes/Anthracenes	120.63				
C3-Phenanthrenes/Anthracenes	115.4				
C4-Phenanthrenes/Anthracenes	50.28				
Dibenzothiophene	8.11	J			
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes	57.19				
C3-Dibenzothiophenes	109.68				
Fluoranthene	160.01		154.00 - 178.00	1.0	
Pyrene	286.02		235.01 - 276.99	3.3	
C1-Fluoranthenes/Pyrenes	138.99				
C2-Fluoranthenes/Pyrenes	76.75				
C3-Fluoranthenes/Pyrenes	44.2				
Benzo(a)anthracene	29.18				
Chrysene	112.18				
C1-Chrysenes	49.92				
C2-Chrysenes	30.25				
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	45.06				
Benzo(k)fluoranthene	48.74		41.70 - 52.50	1.0	
Benzo(e)pyrene	78.54		83.00 - 95.60	5.4	
Benzo(a)pyrene		ND			
Perylene	5.89	J	3.77 - 4.41	33.6	n
Indeno(1,2,3-cd)pyrene	14.15		9.30 - 15.10	1.0	
Dibenz(a,h)anthracene	7.87	J			
Benzo(g,h,i)perylene	18.33		15.30 - 24.10	1.0	
Total PAH (ug/kg dry)	2135.86				
Surrogate Recoveries (%)					
Naphthalene-d8	39	N			
Acenaphthene-d10	46				
Phenanthrene-d10	51				
Benzo(a)pyrene-d12	53				

Surrogate Corrected

Laboratory Batch Number	04-0447				
Client ID	031105-01: SRM 2978				
Location					
Battelle ID	BF402SRM-P				
Collection Date	01/03/05				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	0.50				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
PAH:					
Naphthalene	15.49				
C1-Naphthalenes	13.32				
C2-Naphthalenes	29.29				
C3-Naphthalenes	47.53				
C4-Naphthalenes	34.4				
Biphenyl	3.58	J			
Acenaphthylene	6.21	J			
Acenaphthene	2.57	J			
Fluorene	9.37				
C1-Fluorenes	125.27				
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	67.25				
Phenanthrene	82.79				
C1-Phenanthrenes/Anthracenes	68.19				
C2-Phenanthrenes/Anthracenes	104.5				
C3-Phenanthrenes/Anthracenes	96.75				
C4-Phenanthrenes/Anthracenes	52.96				
Dibenzothiophene	10.16				
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes	67.72				
C3-Dibenzothiophenes	127.11				
Fluoranthene	168.13		154.00 - 178.00	1.0	
Pyrene	313.38		235.01 - 276.99	13.1	
C1-Fluoranthenes/Pyrenes	128.36				
C2-Fluoranthenes/Pyrenes	95.19				
C3-Fluoranthenes/Pyrenes	52.92				
Benzo(a)anthracene	32.84				
Chrysene	125.09				
C1-Chrysenes	59.91				
C2-Chrysenes	31.24				
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	48.01				
Benzo(k)fluoranthene	43.58		41.70 - 52.50	1.0	
Benzo(e)pyrene	86.03		83.00 - 95.60	1.0	
Benzo(a)pyrene	4.5	J			
Perylene	2.63	J	3.77 - 4.41	30.2	n
Indeno(1,2,3-cd)pyrene	11.58		9.30 - 15.10	1.0	
Dibenz(a,h)anthracene	4.21	J			
Benzo(g,h,i)perylene	18.3		15.30 - 24.10	1.0	
Total PAH (ug/kg dry)	2190.36				
Surrogate Recoveries (%)					
Naphthalene-d8	61				
Acenaphthene-d10	65				
Phenanthrene-d10	71				
Benzo(a)pyrene-d12	85				

Surrogate Corrected

Laboratory Batch Number	05-0038				
Client ID	031105-01: SRM 2978				
Location					
Battelle ID	BF809SRM-P				
Collection Date	02/01/05				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	0.55				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
PAH:					
Naphthalene	19.63				
C1-Naphthalenes	12.12				
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl		ND			
Acenaphthylene	6.92	J			
Acenaphthene		ND			
Fluorene	6.82	J			
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	52.21				
Phenanthrene	75.84				
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes	177.72				
C3-Phenanthrenes/Anthracenes	134.95				
C4-Phenanthrenes/Anthracenes	77.86				
Dibenzothiophene		ND			
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes	134.54				
C3-Dibenzothiophenes	167.91				
Fluoranthene	219.37		154.00 - 178.00	23.2	
Pyrene	396.57		235.01 - 276.99	43.2	N
C1-Fluoranthenes/Pyrenes	197.1				
C2-Fluoranthenes/Pyrenes	122.92				
C3-Fluoranthenes/Pyrenes	77.11				
Benzo(a)anthracene	33.12				
Chrysene	127.32				
C1-Chrysenes	60.06				
C2-Chrysenes	34.46				
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	61.12				
Benzo(k)fluoranthene	57.75		41.70 - 52.50	10.0	
Benzo(e)pyrene	116.66		83.00 - 95.60	22.0	
Benzo(a)pyrene		ND			
Perylene		ND	3.77 - 4.41	100.0	n
Indeno(1,2,3-cd)pyrene	12.21		9.30 - 15.10	1.0	
Dibenz(a,h)anthracene		ND			
Benzo(g,h,i)perylene	25.48		15.30 - 24.10	5.7	
Total PAH (ug/kg dry)	2407.77				
Surrogate Recoveries (%)					
Naphthalene-d8	48				
Acenaphthene-d10	55				
Phenanthrene-d10	61				
Benzo(a)pyrene-d12	55				

Surrogate Corrected

Laboratory Batch Number	04-0446				04-0447			
Client ID	GG08: North Slope Crude				GG08: North Slope Crude			
Location								
Battelle ID	BF499NSC-P				BF691NSC-P			
Collection Date	12/06/04				01/07/05			
% Moisture	NA				NA			
% Lipid	NA				NA			
Matrix	SEDIMENT				TISSUE			
Sample Size (g dry)	5.07				5.07			
Units	MG/KG_OIL	Target	% Difference	Qualifier	MG/KG_OIL	Target	% Difference	Qualifier
PAH:								
Naphthalene	829.96	714.43	16.2		760.34	714.43	6.4	
C1-Naphthalenes	1530.43	1534.53	0.3		1402.5	1534.53	8.6	
C2-Naphthalenes	1821.17	1897.27	4.0		1740.2	1897.27	8.3	
C3-Naphthalenes	1302.03	1436.53	9.4		1249	1436.53	13.1	
C4-Naphthalenes	711.48	773.42	8.0		737.32	773.42	4.7	
Biphenyl	205.90	216.49	4.9		205.31	216.49	5.2	
Acenaphthylene	ND				ND			
Acenaphthene	13.91				17.44			
Fluorene	98.68	87.56	12.7		92.06	87.56	5.1	
C1-Fluorenes	205.37	219.89	6.6		207.61	219.89	5.6	
C2-Fluorenes	318.72	341.20	6.6		336.48	341.20	1.4	
C3-Fluorenes	265.18	299.61	11.5		311.41	299.61	3.9	
Anthracene	ND				ND			
Phenanthrene	287.10	272.58	5.3		274.32	272.58	0.6	
C1-Phenanthrenes/Anthracenes	607.81	564.81	7.6		560.33	564.81	0.8	
C2-Phenanthrenes/Anthracenes	619.62	660.43	6.2		625.94	660.43	5.2	
C3-Phenanthrenes/Anthracenes	399.84	448.76	10.9		444.86	448.76	0.9	
C4-Phenanthrenes/Anthracenes	162.39	176.00	7.7		170.46	176.00	3.1	
Dibenzothiophene	244.75	218.80	11.9		229.42	218.80	4.9	
C1-Dibenzothiophenes	429.26	434.54	1.2		430.7	434.54	0.9	
C2-Dibenzothiophenes	558.29	551.44	1.2		565.52	551.44	2.6	
C3-Dibenzothiophenes	461.30	460.96	0.1		504.26	460.96	9.4	
Fluoranthene	ND				ND			
Pyrene	20.76				15.49			
C1-Fluoranthenes/Pyrenes	94.41	78.43	20.4		88.59	78.43	13.0	
C2-Fluoranthenes/Pyrenes	153.65	132.93	15.6		152.35	132.93	14.6	
C3-Fluoranthenes/Pyrenes	171.92	151.73	13.3		178.45	151.73	17.6	
Benzo(a)anthracene	ND				ND			
Chrysene	58.71	50.99	15.1		58.34	50.99	14.4	
C1-Chrysenes	97.06	81.69	18.8		97.57	81.69	19.4	
C2-Chrysenes	120.05	95.93	25.1		126.41	95.93	31.8	N
C3-Chrysenes	115.05	89.87	28.0		100.08	89.87	11.4	
C4-Chrysenes	72.41	76.33	5.1		68.09	76.33	10.8	
Benzo(b)fluoranthene	5.88				6.67			
Benzo(k)fluoranthene	6.52				ND			
Benzo(e)pyrene	12.52				11.51			
Benzo(a)pyrene	ND				0.85			
Perylene	0.69 J				ND			
Indeno(1,2,3-cd)pyrene	0.67 J				ND			
Dibenz(a,h)anthracene	1.26				1.17			
Benzo(g,h,i)perylene	3.49				3.2			
Total PAH (ug/kg dry)	12008.24				11774.25			
Surrogate Recoveries (%)								
Naphthalene-d8	71				83			
Acenaphthene-d10	85				94			
Phenanthrene-d10	82				94			
Benzo(a)pyrene-d12	103				126 N			

Surrogate Corrected

Laboratory Batch Number	04-0446		04-0447	
Client ID	GG09: NorthSTAR Control Oil - cANIMIDA		GG09: NorthSTAR Control Oil - cANIMIDA	
Location				
Battelle ID	BF500CO-P		BF692CO-P	
Collection Date	12/06/04		01/07/05	
% Moisture	NA		NA	
% Lipid	NA		NA	
Matrix	SEDIMENT		TISSUE	
Sample Size (g dry)	5.00		5.00	
Units	MG/KG_OIL		MG/KG_OIL	
PAH:				
Naphthalene	1056.92		990.52	
C1-Naphthalenes	2223.95		1957.07	
C2-Naphthalenes	2637.66		2397.83	
C3-Naphthalenes	1757.26		1562.34	
C4-Naphthalenes	809.58		794.05	
Biphenyl	349.43		327.9	
Acenaphthylene	ND		ND	
Acenaphthene	17.75		19.93	
Fluorene	172.28		148.91	
C1-Fluorenes	271.69		263.45	
C2-Fluorenes	317.23		338.1	
C3-Fluorenes	232.80		258.03	
Anthracene	ND		ND	
Phenanthrene	323.74		315.61	
C1-Phenanthrenes/Anthracenes	654.46		618.99	
C2-Phenanthrenes/Anthracenes	612.59		641.08	
C3-Phenanthrenes/Anthracenes	397.97		434.14	
C4-Phenanthrenes/Anthracenes	151.60		168.71	
Dibenzothiophene	87.24		82.56	
C1-Dibenzothiophenes	164.22		173.37	
C2-Dibenzothiophenes	187.47		192.34	
C3-Dibenzothiophenes	114.45		133.31	
Fluoranthene	6.85		ND	
Pyrene	22.49		20.23	
C1-Fluoranthenes/Pyrenes	100.14		95.42	
C2-Fluoranthenes/Pyrenes	146.49		146.31	
C3-Fluoranthenes/Pyrenes	148.15		159.38	
Benzo(a)anthracene	ND		ND	
Chrysene	49.01		50.5	
C1-Chrysenes	84.39		90.45	
C2-Chrysenes	112.01		119.81	
C3-Chrysenes	100.02		92	
C4-Chrysenes	61.51		63.37	
Benzo(b)fluoranthene	5.01		3.73	
Benzo(k)fluoranthene	ND		ND	
Benzo(e)pyrene	11.54		10.62	
Benzo(a)pyrene	ND		0.84	
Perylene	ND		ND	
Indeno(1,2,3-cd)pyrene	ND		ND	
Dibenz(a,h)anthracene	0.83	J	0.72	
Benzo(g,h,i)perylene	1.44		1.3	
Total PAH (ug/kg dry)	13390.17		12672.92	
Surrogate Recoveries (%)				
Naphthalene-d8	76		87	
Acenaphthene-d10	86		99	
Phenanthrene-d10	85		95	
Benzo(a)pyrene-d12	107		125	N

Surrogate Corrected

Laboratory Batch Number	04-0446		04-0446			
Client ID	04-PBS-21-PHC/MET-T		04-PBS-21-PHC/MET-T			
Location	Point Brower/Liberty		Point Brower/Liberty			
Battelle ID	S4173-P		S4173DUP-P			
Collection Date	08/07/04		8/7/2004			
% Moisture	78.38		78.38			
% Lipid	1.89		NA			
Matrix	FISH		FISH			
Sample Size (g dry)	4.59		4.43			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	10.03	B	8.62	B	15.1	
C1-Naphthalenes	5.66	B	5.22	B	8.1	
C2-Naphthalenes	6.22		5.3		16.0	
C3-Naphthalenes	6.62		7.25		9.1	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	2.25		2.7		18.2	
Acenaphthylene	ND		ND		NA	
Acenaphthene	3.84		3.65		5.1	
Fluorene	0.91	J	1.22		29.1	
C1-Fluorenes	1.7		1.97		14.7	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	2.82		2.47		13.2	
C1-Phenanthrenes/Anthracenes	ND		ND		NA	
C2-Phenanthrenes/Anthracenes	ND		ND		NA	
C3-Phenanthrenes/Anthracenes	ND		ND		NA	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	0.54	J	0.62	J	NA	
C1-Dibenzothiophenes	ND		ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	0.38	J	0.75	J	NA	
Pyrene	0.63	J	0.73	J	NA	
C1-Fluoranthenes/Pyrenes	ND		ND		NA	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		1.11	B	82.8	n
Chrysene	ND		1.42	B	103.7	n
C1-Chrysenes	ND		ND		NA	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	ND		0.36	J	NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	0.35	J	0.42	J	NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	0.55	J	2.23	B	120.9	n
Indeno(1,2,3-cd)pyrene	0.41	J	0.49	J	NA	
Dibenz(a,h)anthracene	0.54	J	0.31	J	NA	
Benzo(g,h,i)perylene	0.38	J	0.34	J	NA	
Total PAH (ug/kg dry)	43.83		47.18			
Surrogate Recoveries (%)						
Naphthalene-d8	47		30	N		
Acenaphthene-d10	51		33	N		
Phenanthrene-d10	53		35	N		
Benzo(a)pyrene-d12	63		39	N		

Surrogate Corrected

Laboratory Batch Number	04-0447		04-0447			
Client ID	04-TGV-30-PHC/MET-T		04-TGV-30-PHC/MET-T			
Location	Tigvariak Island		Tigvariak Island			
Battelle ID	S4388-P		S4388DUP-P			
Collection Date	08/12/04		8/12/2004			
% Moisture	80		80			
% Lipid	2.95		NA			
Matrix	FISH		FISH			
Sample Size (g dry)	4.21		4.15			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	5.51	B	5.08	B	8.1	
C1-Naphthalenes	6.74		7.23		7.0	
C2-Naphthalenes	6.85		7.15		4.3	
C3-Naphthalenes	5.66		5.29		6.8	
C4-Naphthalenes	4.47		5.67		23.7	
Biphenyl	1.77		2		12.2	
Acenaphthylene	ND		ND		NA	
Acenaphthene	ND		ND		NA	
Fluorene	0.51	J	0.65	J	NA	
C1-Fluorenes	1.07	J	1.3		19.4	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	0.93	J	1.69		58.0	n
C1-Phenanthrenes/Anthracenes	1.33		1.34		0.7	
C2-Phenanthrenes/Anthracenes	ND		ND		NA	
C3-Phenanthrenes/Anthracenes	ND		ND		NA	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	0.15	J	0.31	J	NA	
C1-Dibenzothiophenes	ND		ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	0.26	J	0.54	J	NA	
Pyrene	0.24	J	0.3	J	NA	
C1-Fluoranthenes/Pyrenes	ND		ND		NA	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		ND		NA	
Chrysene	ND		ND		NA	
C1-Chrysenes	ND		ND		NA	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	ND		ND		NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	ND		ND		NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	ND		ND		NA	
Indeno(1,2,3-cd)pyrene	ND		ND		NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	ND		ND		NA	
Total PAH (ug/kg dry)	35.49		38.55			
Surrogate Recoveries (%)						
Naphthalene-d8	62		59			
Acenaphthene-d10	65		63			
Phenanthrene-d10	65		62			
Benzo(a)pyrene-d12	82		77			

Surrogate Corrected

2005 Fish Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	05-0339	05-0339	05-0339	05-0339
Client ID	01-PBS-71-PHC-T-FS	05-PB-01-PHC-T-F	05-PB-03-PHC-T-F	05-PB-07-PHC-T-F
Location	Liberty	Liberty	Liberty	Liberty
Battelle ID	S8763-P	S8794-P	S8796-P	S8800-P
Collection Date	09/15/05	08/04/05	08/04/05	08/04/05
% Moisture	82.67	67.13	73.88	77.7
% Lipid	1.87	14.44	7.21	2.25
Matrix	FISH	FISH	FISH	FISH
Sample Size (g dry)	0.90	4.94	3.99	3.35
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	8.07	1.94 B	1.95 B	1.34 B
C1-Naphthalenes	10.24	3.33	2.15	1.78
C2-Naphthalenes	11.47	7.11	3.44	ND
C3-Naphthalenes	18.73	7.69	5.37	ND
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	4.42	1.64	0.98 J	ND
C1-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	1.92 J	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH (ug/kg dry)	54.85	21.71	13.89	3.12
Surrogate Recoveries (%)				
Naphthalene-d8	68	64	71	76
Acenaphthene-d10	66	58	67	72
Phenanthrene-d10	77	52	76	79
Benzo(a)pyrene-d12	83	124 N	106	101

Laboratory Batch Number	05-0339	05-0339	05-0339	05-0339
Client ID	05-PB-09-PHC-T-F	05-PB-10-PHC-T-F	05-PB-11-PHC-T-F	05-PB-13-PHC-T-F
Location	Liberty	Liberty	Liberty	Liberty
Battelle ID	S8802-P	S8803-P	S8804-P	S8806-P
Collection Date	08/04/05	08/04/05	08/04/05	08/04/05
% Moisture	70.41	70.16	78.73	70.28
% Lipid	7.16	7.34	1.89	5.48
Matrix	FISH	FISH	FISH	FISH
Sample Size (g dry)	4.60	4.64	3.21	4.68
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	1.56 B	1.62 B	1.88 B	1.59 B
C1-Naphthalenes	2.05	2.37	ND	1.9
C2-Naphthalenes	ND	4.31	ND	ND
C3-Naphthalenes	ND	5.31	ND	ND
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	0.84 J	1.03	1.04 J	0.73 J
C1-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	0.56 J
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	0.89 J
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH (ug/kg dry)	4.45	14.64	2.92	5.67
Surrogate Recoveries (%)				
Naphthalene-d8	68	70	69	67
Acenaphthene-d10	64	66	68	63
Phenanthrene-d10	66	61	75	68
Benzo(a)pyrene-d12	110	122 N	83	99

Laboratory Batch Number	05-0339	05-0339	05-0339	05-0339
Client ID	05-PB-17-PHC-T-F	05-PB-18-PHC-T-F	05-SIS-02-PHC-T-F	05-SIS-03-PHC-T-F
Location	Liberty	Liberty	NorthStar	NorthStar
Battelle ID	S8810-P	S8811-P	S8847-P	S8848-P
Collection Date	08/04/05	08/04/05	08/01/05	08/01/05
% Moisture	79.32	76.81	74.91	75.89
% Lipid	2.81	3.33	5.49	2.86
Matrix	FISH	FISH	FISH	FISH
Sample Size (g dry)	3.18	3.57	3.79	3.73
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	3.09 B	2.58 B	2.02 B	1.5 B
C1-Naphthalenes	2.85	1.83	1.94	ND
C2-Naphthalenes	4.51	3.49	ND	ND
C3-Naphthalenes	6.68	ND	ND	ND
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	ND	0.51 J	0.91 J	ND
C1-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH (ug/kg dry)	17.13	8.41	4.87	1.5
Surrogate Recoveries (%)				
Naphthalene-d8	65	66	74	74
Acenaphthene-d10	62	64	67	68
Phenanthrene-d10	69	69	74	77
Benzo(a)pyrene-d12	79	86	95	88

Laboratory Batch Number	05-0339	05-0339	05-0339	05-0339
Client ID	05-SIS-04-PHC-T-F	05-SIS-05-PHC-T-F	05-SIS-06-PHC-T-F	05-SIS-07-PHC-T-F
Location	NorthStar	NorthStar	NorthStar	NorthStar
Battelle ID	S8849-P	S8850-P	S8851-P	S8852-P
Collection Date	08/01/05	08/01/05	08/01/05	08/01/05
% Moisture	76.24	81.11	84.39	73.09
% Lipid	4.88	5.8	2.69	7.24
Matrix	FISH	FISH	FISH	FISH
Sample Size (g dry)	3.57	2.89	2.40	4.21
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	1.62 B	2.43 B	6.29	1.63 B
C1-Naphthalenes	ND	3.28	3.27	1.98
C2-Naphthalenes	ND	ND	ND	4.17
C3-Naphthalenes	ND	ND	ND	6.46
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	ND	ND	1.55 J	ND
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	0.56 J	0.79 J	1.81	0.94 J
C1-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH (ug/kg dry)	2.18	6.5	12.92	15.18
Surrogate Recoveries (%)				
Naphthalene-d8	74	66	68	71
Acenaphthene-d10	65	64	65	63
Phenanthrene-d10	74	73	74	62
Benzo(a)pyrene-d12	92	81	83	115

Surrogate Corrected

Laboratory Batch Number	05-0339	05-0339	05-0339	05-0339
Client ID	05-SIS-08-PHC-T-F	05-SIS-11-PHC-T-F	05-SIS-13-PHC-T-F	05-SIS-14-PHC-T-F
Location	NorthStar	NorthStar	NorthStar	NorthStar
Battelle ID	S8853-P	S8856-P	S8858-P	S8859-P
Collection Date	08/01/05	08/01/05	08/01/05	08/01/05
% Moisture	74.47	70.58	73.71	75.36
% Lipid	2.93	5.34	4.07	6.01
Matrix	FISH	FISH	FISH	FISH
Sample Size (g dry)	3.98	4.52	4.07	3.72
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	1.44 B	1.76 B	1.44 B	2.03 B
C1-Naphthalenes	3.46	1.69	1.56	2.59
C2-Naphthalenes	3.91	2.66	ND	ND
C3-Naphthalenes	6.67	4.72	ND	ND
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	1.39	0.56 J	0.92 J	1.35
C1-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.91 J	ND	ND	0.35 J
Pyrene	1.6	ND	ND	0.7 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	1.34	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	0.86 J	1.76	ND	1.3
Benzo(a)pyrene	0.4 J	ND	ND	ND
Perylene	1.33	ND	1.32	0.88 J
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.31 J	ND	ND	ND
Total PAH (ug/kg dry)	23.62	13.15	5.24	9.2
Surrogate Recoveries (%)				
Naphthalene-d8	66	71	75	62
Acenaphthene-d10	63	67	70	58
Phenanthrene-d10	63	73	75	61
Benzo(a)pyrene-d12	112	109	107	98

Laboratory Batch Number	05-0340	
Client ID	05-PB-14-PHC-T-F	
Location	Lliberty	
Battelle ID	S8807-P	
Collection Date	08/04/05	
% Moisture	72.26	
% Lipid	6.65	
Matrix	FISH	
Sample Size (g dry)	4.17	
Units	UG/KG_DRY	
PAH:		
Naphthalene	2.04	B
C1-Naphthalenes	2.3	
C2-Naphthalenes	4.16	
C3-Naphthalenes		ND
C4-Naphthalenes		ND
Biphenyl		ND
Acenaphthylene		ND
Acenaphthene		ND
Fluorene		ND
C1-Fluorenes		ND
C2-Fluorenes		ND
C3-Fluorenes		ND
Anthracene		ND
Phenanthrene	0.78	J
C1-Phenanthrenes/Anthracenes		ND
C2-Phenanthrenes/Anthracenes		ND
C3-Phenanthrenes/Anthracenes		ND
C4-Phenanthrenes/Anthracenes		ND
Dibenzothiophene		ND
C1-Dibenzothiophenes		ND
C2-Dibenzothiophenes		ND
C3-Dibenzothiophenes		ND
Fluoranthene		ND
Pyrene		ND
C1-Fluoranthenes/Pyrenes		ND
C2-Fluoranthenes/Pyrenes		ND
C3-Fluoranthenes/Pyrenes		ND
Benzo(a)anthracene		ND
Chrysene		ND
C1-Chrysenes		ND
C2-Chrysenes		ND
C3-Chrysenes		ND
C4-Chrysenes		ND
Benzo(b)fluoranthene		ND
Benzo(k)fluoranthene		ND
Benzo(e)pyrene		ND
Benzo(a)pyrene		ND
Perylene		ND
Indeno(1,2,3-cd)pyrene		ND
Dibenz(a,h)anthracene		ND
Benzo(g,h,i)perylene		ND
Total PAH (ug/kg dry)	9.28	
Surrogate Recoveries (%)		
Naphthalene-d8	66	
Acenaphthene-d10	60	
Phenanthrene-d10	64	
Benzo(a)pyrene-d12	104	

Laboratory Batch Number	05-0339	05-0340
Client ID	Procedural Blank	Procedural Blank
Location/QC type		
Battelle ID	BH122PB-P	BH125PB-P
Collection Date	09/15/05	09/15/05
% Moisture	75.34	72.26
% Lipid	NA	NA
Matrix	TISSUE	TISSUE
Sample Size (g dry)	3.66	4.17
Units	UG/KG_DRY	UG/KG_DRY
PAH:		
Naphthalene	0.87 J	1.74
C1-Naphthalenes	ND	ND
C2-Naphthalenes	ND	ND
C3-Naphthalenes	ND	ND
C4-Naphthalenes	ND	ND
Biphenyl	ND	ND
Acenaphthylene	ND	ND
Acenaphthene	ND	ND
Fluorene	ND	ND
C1-Fluorenes	ND	ND
C2-Fluorenes	ND	ND
C3-Fluorenes	ND	ND
Anthracene	ND	ND
Phenanthrene	ND	ND
C1-Phenanthrenes/Anthracenes	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND
Dibenzothiophene	ND	ND
C1-Dibenzothiophenes	ND	ND
C2-Dibenzothiophenes	ND	ND
C3-Dibenzothiophenes	ND	ND
Fluoranthene	ND	ND
Pyrene	ND	ND
C1-Fluoranthenes/Pyrenes	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND
Benzo(a)anthracene	ND	ND
Chrysene	ND	ND
C1-Chrysenes	ND	ND
C2-Chrysenes	ND	ND
C3-Chrysenes	ND	ND
C4-Chrysenes	ND	ND
Benzo(b)fluoranthene	ND	ND
Benzo(k)fluoranthene	ND	ND
Benzo(e)pyrene	ND	ND
Benzo(a)pyrene	ND	ND
Perylene	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND
Dibenz(a,h)anthracene	ND	ND
Benzo(g,h,i)perylene	ND	ND
Surrogate Recoveries (%)		
Naphthalene-d8	69	32 N
Acenaphthene-d10	68	32 N
Phenanthrene-d10	78	36 N
Benzo(a)pyrene-d12	84	44

Laboratory Batch Number	05-0339				
Client ID	050831-01: Tilapia				
Location/QC type					
Battelle ID	BH123LCS-P				
Collection Date	09/15/05				
% Moisture	79.14				
% Lipid	1.29				
Matrix	TISSUE				
Sample Size (g dry)	3.20				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	369.04		390.86	94	
C1-Naphthalenes		ND			
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	388.41		390.98	99	
Acenaphthylene	404.95		390.88	104	
Acenaphthene	402.04		390.92	103	
Fluorene	416.26		390.90	106	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	396.72		390.88	101	
Phenanthrene	358.41		390.88	92	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	373.79		392.42	95	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	347.58		390.82	89	
Pyrene	353.74		390.82	91	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	394.68		390.86	101	
Chrysene	378.6		390.92	97	
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	355.35		390.92	91	
Benzo(k)fluoranthene	401.76		390.88	103	
Benzo(e)pyrene	369.69		391.33	94	
Benzo(a)pyrene	372.17		390.88	95	
Perylene	486.76		390.70	125	
Indeno(1,2,3-cd)pyrene	377.6		390.86	97	
Dibenz(a,h)anthracene	379.71		390.84	97	
Benzo(g,h,i)perylene	341.02		390.90	87	
Surrogate Recoveries (%)					
Naphthalene-d8	59				
Acenaphthene-d10	57				
Phenanthrene-d10	65				
Benzo(a)pyrene-d12	68				

Laboratory Batch Number	05-0340				
Client ID	050831-01: Tilapia				
Location/QC type					
Battelle ID	BH126LCS-P				
Collection Date	09/15/05				
% Moisture	79.14				
% Lipid	1.43				
Matrix	TISSUE				
Sample Size (g dry)	3.16				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	371.65		395.81	94	
C1-Naphthalenes		ND			
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	394.73		395.93	100	
Acenaphthylene	407.93		395.83	103	
Acenaphthene	399.08		395.87	101	
Fluorene	414.61		395.85	105	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	399.55		395.83	101	
Phenanthrene	349.27		395.83	88	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	371.68		397.39	94	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	336.29		395.77	85	
Pyrene	348.58		395.77	88	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	413.67		395.81	105	
Chrysene	386.17		395.87	98	
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	329.76		395.87	83	
Benzo(k)fluoranthene	371.52		395.83	94	
Benzo(e)pyrene	355.96		396.28	90	
Benzo(a)pyrene	363.95		395.83	92	
Perylene	475.38		395.65	120	
Indeno(1,2,3-cd)pyrene	346.98		395.81	88	
Dibenz(a,h)anthracene	355.39		395.79	90	
Benzo(g,h,i)perylene	312.21		395.85	79	
Surrogate Recoveries (%)					
Naphthalene-d8	69				
Acenaphthene-d10	66				
Phenanthrene-d10	75				
Benzo(a)pyrene-d12	86				

Laboratory Batch Number	05-0339					
	050329-01: SRM					
Client ID	2977					
Location/QC type						
Battelle ID	BH124SRM-P					
Collection Date	09/15/05					
% Moisture	NA					
% Lipid	49.39					
Matrix	TISSUE					
Sample Size (g dry)	2.03			Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
PAH:						
Naphthalene	8.24					
C1-Naphthalenes	8.85					
C2-Naphthalenes	125.07					
C3-Naphthalenes	254.28					
C4-Naphthalenes	246.58					
Biphenyl	3.82					
Acenaphthylene	ND					
Acenaphthene	ND					
Fluorene	7.44	10.24	0.43	34.2	27.3	
C1-Fluorenes	38.76					
C2-Fluorenes	154.07					
C3-Fluorenes	327.01					
Anthracene	ND					
Phenanthrene	28	35.1	3.80	40.83	20.2	
C1-Phenanthrenes/Anthracenes	115.65					
C2-Phenanthrenes/Anthracenes	337.83					
C3-Phenanthrenes/Anthracenes	442.07					
C4-Phenanthrenes/Anthracenes	241.87					
Dibenzothiophene	20.25					
C1-Dibenzothiophenes	165.78					
C2-Dibenzothiophenes	558.48					
C3-Dibenzothiophenes	689.95					
Fluoranthene	23.93	38.7	1.00	32.58	38.2	N
Pyrene	52.37	78.9	3.50	34.44	33.6	
C1-Fluoranthenes/Pyrenes	79.71					
C2-Fluoranthenes/Pyrenes	107.83					
C3-Fluoranthenes/Pyrenes	105.76					
Benzo(a)anthracene	20.42	20.34	0.78	33.83	0.4	
Chrysene	88.42					
C1-Chrysenes	90.85					
C2-Chrysenes	112.75					
C3-Chrysenes	51.27					
C4-Chrysenes	ND					
Benzo(b)fluoranthene	8.52	11.01	0.28	32.54	22.6	
Benzo(k)fluoranthene	7.68					
Benzo(e)pyrene	12.21	13.1	1.10	38.4	6.8	
Benzo(a)pyrene	4.24					
Perylene	2.41	3.5	0.76	51.71	31.1	
Indeno(1,2,3-cd)pyrene	3.21	4.84	0.81	46.74	33.7	
Dibenz(a,h)anthracene	1.74 J	1.41	0.19	43.48	23.4	
Benzo(g,h,i)perylene	6.88	9.53	0.43	34.51	27.8	
Surrogate Recoveries (%)						
Naphthalene-d8	83					
Acenaphthene-d10	63					
Phenanthrene-d10	62					
Benzo(a)pyrene-d12	120					

Laboratory Batch Number	05-0340					
	050329-01: SRM					
Client ID	2977					
Location/QC type						
Battelle ID	BH127SRM-P					
Collection Date	09/15/05					
% Moisture	NA					
% Lipid	39.75					
Matrix	TISSUE					
Sample Size (g dry)	1.81			Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
PAH:						
Naphthalene	9.81					
C1-Naphthalenes	9.8					
C2-Naphthalenes	144.25					
C3-Naphthalenes	274.56					
C4-Naphthalenes	255.73					
Biphenyl	4.05					
Acenaphthylene	ND					
Acenaphthene	ND					
Fluorene	9.26	10.24	0.43	34.2	9.6	
C1-Fluorenes	35.75					
C2-Fluorenes	158.95					
C3-Fluorenes	334.01					
Anthracene	ND					
Phenanthrene	29.49	35.1	3.80	40.83	16	
C1-Phenanthrenes/Anthracenes	118.4					
C2-Phenanthrenes/Anthracenes	370.47					
C3-Phenanthrenes/Anthracenes	483.16					
C4-Phenanthrenes/Anthracenes	212.01					
Dibenzothiophene	22.76					
C1-Dibenzothiophenes	179.79					
C2-Dibenzothiophenes	598.86					
C3-Dibenzothiophenes	720.86					
Fluoranthene	25.42	38.7	1.00	32.58	34.3	N
Pyrene	56.72	78.9	3.50	34.44	28.1	
C1-Fluoranthenes/Pyrenes	80.62					
C2-Fluoranthenes/Pyrenes	117.7					
C3-Fluoranthenes/Pyrenes	117.48					
Benzo(a)anthracene	23.09	20.34	0.78	33.83	13.5	
Chrysene	100.08					
C1-Chrysenes	106.29					
C2-Chrysenes	138.79					
C3-Chrysenes	62.48					
C4-Chrysenes	ND					
Benzo(b)fluoranthene	8.85	11.01	0.28	32.54	19.6	
Benzo(k)fluoranthene	7.49					
Benzo(e)pyrene	12.72	13.1	1.10	38.4	2.9	
Benzo(a)pyrene	4.69					
Perylene	3.18	3.5	0.76	51.71	9.1	
Indeno(1,2,3-cd)pyrene	3.28	4.84	0.81	46.74	32.2	
Dibenz(a,h)anthracene	1.35 J	1.41	0.19	43.48	4.3	
Benzo(g,h,i)perylene	6.95	9.53	0.43	34.51	27.1	
Surrogate Recoveries (%)						
Naphthalene-d8	66					
Acenaphthene-d10	55					
Phenanthrene-d10	52					
Benzo(a)pyrene-d12	109					

Laboratory Batch Number	05-0339				
	GJ53: North Slope				
Client ID	Crude				
Location/QC type					
Battelle ID	BH136NSC-P				
Collection Date	09/20/05				
% Moisture	NA				
% Lipid	NA				
Matrix	OIL				
Sample Size (g dry)	5.01				
Units	UG/KG_OIL		Target	% Difference	Qualifier
PAH:					
Naphthalene	855.29		714.43	19.7	
C1-Naphthalenes	1875.64		1534.53	22.2	
C2-Naphthalenes	2336.84		1897.27	23.2	
C3-Naphthalenes	1806.95		1436.53	25.8	
C4-Naphthalenes	972.23		773.42	25.7	
Biphenyl	249.19		216.49	15.1	
Acenaphthylene		ND			
Acenaphthene		ND			
Fluorene	86.84		87.56	0.8	
C1-Fluorenes	246.08		219.89	11.9	
C2-Fluorenes	400.49		341.20	17.4	
C3-Fluorenes	341.04		299.61	13.8	
Anthracene		ND			
Phenanthrene	278.1		272.58	2.0	
C1-Phenanthrenes/Anthracenes	698.13		564.81	23.6	
C2-Phenanthrenes/Anthracenes	776.92		660.43	17.6	
C3-Phenanthrenes/Anthracenes	589.57		448.76	31.4	N
C4-Phenanthrenes/Anthracenes	221.95		176.00	26.1	
Dibenzothiophene	244.82		218.80	11.9	
C1-Dibenzothiophenes	545.42		434.54	25.5	
C2-Dibenzothiophenes	756.07		551.44	37.1	N
C3-Dibenzothiophenes	636.63		460.96	38.1	N
Fluoranthene	3.83				
Pyrene	16.7				
C1-Fluoranthenes/Pyrenes	99.96		78.43	27.5	
C2-Fluoranthenes/Pyrenes	152.09		132.93	14.4	
C3-Fluoranthenes/Pyrenes	157.13		151.73	3.6	
Benzo(a)anthracene		ND			
Chrysene	67.89		50.99	33.1	N
C1-Chrysenes	111.91		81.69	37.0	N
C2-Chrysenes	156.91		95.93	63.6	N
C3-Chrysenes	107.73		89.87	19.9	
C4-Chrysenes	93.35		76.33	22.3	
Benzo(b)fluoranthene	5.85				
Benzo(k)fluoranthene		ND			
Benzo(e)pyrene	12.6				
Benzo(a)pyrene		ND			
Perylene		ND			
Indeno(1,2,3-cd)pyrene		ND			
Dibenz(a,h)anthracene	1.35				
Benzo(g,h,i)perylene	3.46				
Surrogate Recoveries (%)					
Naphthalene-d8	121	N			
Acenaphthene-d10	95				
Phenanthrene-d10	77				
Benzo(a)pyrene-d12	127	N			

Laboratory Batch Number	05-0340				
	GJ53: North Slope				
Client ID	Crude				
Location/QC type					
Battelle ID	BH138NSC-P				
Collection Date	09/20/05				
% Moisture	NA				
% Lipid	NA				
Matrix	OIL				
Sample Size (g dry)	5.01				
Units	UG/KG_OIL		Target	% Difference	Qualifier
PAH:					
Naphthalene	814.29		714.43	14.0	
C1-Naphthalenes	1817.32		1534.53	18.4	
C2-Naphthalenes	2201.83		1897.27	16.1	
C3-Naphthalenes	1740.5		1436.53	21.2	
C4-Naphthalenes	974.7		773.42	26.0	
Biphenyl	240.76		216.49	11.2	
Acenaphthylene		ND			
Acenaphthene		ND			
Fluorene	81.96		87.56	6.4	
C1-Fluorenes	225.5		219.89	2.5	
C2-Fluorenes	354.04		341.20	3.8	
C3-Fluorenes	325.11		299.61	8.5	
Anthracene		ND			
Phenanthrene	265.05		272.58	2.8	
C1-Phenanthrenes/Anthracenes	656.06		564.81	16.2	
C2-Phenanthrenes/Anthracenes	745.04		660.43	12.8	
C3-Phenanthrenes/Anthracenes	626.3		448.76	39.6	N
C4-Phenanthrenes/Anthracenes	273.91		176.00	55.6	N
Dibenzothiophene	232.22		218.80	6.1	
C1-Dibenzothiophenes	500.13		434.54	15.1	
C2-Dibenzothiophenes	757.15		551.44	37.3	N
C3-Dibenzothiophenes	639.46		460.96	38.7	N
Fluoranthene	3.59				
Pyrene	14.89				
C1-Fluoranthenes/Pyrenes	83.46		78.43	6.4	
C2-Fluoranthenes/Pyrenes	133.68		132.93	0.6	
C3-Fluoranthenes/Pyrenes	150.85		151.73	0.6	
Benzo(a)anthracene		ND			
Chrysene	74.85		50.99	46.8	N
C1-Chrysenes	121.89		81.69	49.2	N
C2-Chrysenes	183.13		95.93	90.9	N
C3-Chrysenes	138.59		89.87	54.2	N
C4-Chrysenes	99.56		76.33	30.4	N
Benzo(b)fluoranthene	5.06				
Benzo(k)fluoranthene		ND			
Benzo(e)pyrene	11.25				
Benzo(a)pyrene		ND			
Perylene		ND			
Indeno(1,2,3-cd)pyrene		ND			
Dibenz(a,h)anthracene		ND			
Benzo(g,h,i)perylene	4.34				
Surrogate Recoveries (%)					
Naphthalene-d8	125	N			
Acenaphthene-d10	95				
Phenanthrene-d10	72				
Benzo(a)pyrene-d12	129				

Laboratory Batch Number	05-0339		05-0340	
	GG09: NorthSTAR		GG09: NorthSTAR	
	Control Oil -		Control Oil -	
Client ID	cANIMIDA		cANIMIDA	
Location/QC type				
Battelle ID	BH137CO-P		BH139CO-P	
Collection Date	09/20/05		09/20/05	
% Moisture	NA		NA	
% Lipid	NA		NA	
Matrix	OIL		OIL	
Sample Size (g dry)	5.00		5.00	
Units	UG/KG_OIL		UG/KG_OIL	
PAH:				
Naphthalene	1191.1		1197.66	
C1-Naphthalenes	2541.4		2598.64	
C2-Naphthalenes	3143.51		3163.44	
C3-Naphthalenes	2210.82		2230.05	
C4-Naphthalenes	1040.33		1060.19	
Biphenyl	397.14		398.44	
Acenaphthylene		ND		ND
Acenaphthene		ND		ND
Fluorene	136.19		138.59	
C1-Fluorenes	292.62		283.59	
C2-Fluorenes	379.03		361.63	
C3-Fluorenes	329.19		303.05	
Anthracene		ND		ND
Phenanthrene	301.47		300.98	
C1-Phenanthrenes/Anthracenes	734.32		700.92	
C2-Phenanthrenes/Anthracenes	745.05		728.41	
C3-Phenanthrenes/Anthracenes	592.05		565.1	
C4-Phenanthrenes/Anthracenes	227.88		213.69	
Dibenzothiophene	82.73		84.71	
C1-Dibenzothiophenes	209.16		196.22	
C2-Dibenzothiophenes	259.8		243.89	
C3-Dibenzothiophenes	172.7		161.97	
Fluoranthene	4.4		5.16	
Pyrene	16.83		16.07	
C1-Fluoranthenes/Pyrenes	89.69		92.29	
C2-Fluoranthenes/Pyrenes	134.53		128.28	
C3-Fluoranthenes/Pyrenes	134.36		132.86	
Benzo(a)anthracene		ND		ND
Chrysene	61.05		62.71	
C1-Chrysenes	106.99		111.59	
C2-Chrysenes	159.48		175.67	
C3-Chrysenes	110.36		125.46	
C4-Chrysenes	81.44		83	
Benzo(b)fluoranthene	3.38		3.6	
Benzo(k)fluoranthene		ND		ND
Benzo(e)pyrene	11.02		11.28	
Benzo(a)pyrene		ND		ND
Perylene		ND		ND
Indeno(1,2,3-cd)pyrene		ND		ND
Dibenz(a,h)anthracene		ND		ND
Benzo(g,h,i)perylene	1.6		1.52	
Surrogate Recoveries (%)				
Naphthalene-d8	123	N	127	N
Acenaphthene-d10	96		95	
Phenanthrene-d10	76		74	
Benzo(a)pyrene-d12	131	N	133	N

Laboratory Batch Number	05-0339	05-0339		
Client ID	01-PBS-71-PHC-T-FS	01-PBS-71-PHC-T-FS		
Location/QC type	Liberty	Liberty		
Battelle ID	S8763-P	S8763DUP-P		
Collection Date	09/15/05	9/15/2005		
% Moisture	82.67	82.67		
% Lipid	1.87	1.62		
Matrix	FISH	FISH		
Sample Size (g dry)	0.90	0.96		
Units	UG/KG_DRY	UG/KG_DRY	RPD	Qualifier
PAH:				
Naphthalene	8.07	6.74	18.0	
C1-Naphthalenes	10.24	11.44	11.1	
C2-Naphthalenes	11.47	8.62	28.4	
C3-Naphthalenes	18.73	18.78	0.3	
C4-Naphthalenes	ND	ND	NA	
Biphenyl	ND	ND	NA	
Acenaphthylene	ND	ND	NA	
Acenaphthene	ND	ND	NA	
Fluorene	ND	ND	NA	
C1-Fluorenes	ND	ND	NA	
C2-Fluorenes	ND	ND	NA	
C3-Fluorenes	ND	ND	NA	
Anthracene	ND	ND	NA	
Phenanthrene	4.42	3.13	34.2	n
C1-Phenanthrenes/Anthracenes	ND	ND	NA	
C2-Phenanthrenes/Anthracenes	ND	ND	NA	
C3-Phenanthrenes/Anthracenes	ND	ND	NA	
C4-Phenanthrenes/Anthracenes	ND	ND	NA	
Dibenzothiophene	ND	ND	NA	
C1-Dibenzothiophenes	ND	ND	NA	
C2-Dibenzothiophenes	ND	ND	NA	
C3-Dibenzothiophenes	ND	ND	NA	
Fluoranthene	ND	ND	NA	
Pyrene	ND	ND	NA	
C1-Fluoranthenes/Pyrenes	ND	ND	NA	
C2-Fluoranthenes/Pyrenes	ND	ND	NA	
C3-Fluoranthenes/Pyrenes	ND	ND	NA	
Benzo(a)anthracene	ND	ND	NA	
Chrysene	ND	ND	NA	
C1-Chrysenes	ND	ND	NA	
C2-Chrysenes	ND	ND	NA	
C3-Chrysenes	ND	ND	NA	
C4-Chrysenes	ND	ND	NA	
Benzo(b)fluoranthene	ND	ND	NA	
Benzo(k)fluoranthene	ND	ND	NA	
Benzo(e)pyrene	ND	ND	NA	
Benzo(a)pyrene	ND	ND	NA	
Perylene	1.92 J	1.77 J	NA	
Indeno(1,2,3-cd)pyrene	ND	ND	NA	
Dibenz(a,h)anthracene	ND	ND	NA	
Benzo(g,h,i)perylene	ND	ND	NA	
Surrogate Recoveries (%)				
Naphthalene-d8	68	60		
Acenaphthene-d10	66	62		
Phenanthrene-d10	77	76		
Benzo(a)pyrene-d12	83	81		

Laboratory Batch Number	05-0340					
Client ID	05-PB-14-PHC-T-F		05-PB-14-PHC-T-F			
Location/QC type	Liberty		Liberty			
Battelle ID	S8807-P		S8807DUP-P			
Collection Date	08/04/05		8/4/2005			
% Moisture	72.26		73.33			
% Lipid	6.65		6.36			
Matrix	FISH		FISH			
Sample Size (g dry)	4.17		4.16			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	2.04	B	1.62	B	23.0	
C1-Naphthalenes	2.3		2.16		6.3	
C2-Naphthalenes	4.16		3.85		7.7	
C3-Naphthalenes	ND		ND		NA	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	ND		ND		NA	
Acenaphthylene	ND		ND		NA	
Acenaphthene	ND		ND		NA	
Fluorene	ND		ND		NA	
C1-Fluorenes	ND		ND		NA	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	0.78	J	0.75	J	NA	
C1-Phenanthrenes/Anthracenes	ND		ND		NA	
C2-Phenanthrenes/Anthracenes	ND		ND		NA	
C3-Phenanthrenes/Anthracenes	ND		ND		NA	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	ND		ND		NA	
C1-Dibenzothiophenes	ND		ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	ND		ND		NA	
Pyrene	ND		ND		NA	
C1-Fluoranthenes/Pyrenes	ND		ND		NA	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		ND		NA	
Chrysene	ND		ND		NA	
C1-Chrysenes	ND		ND		NA	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	ND		ND		NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	ND		ND		NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	ND		ND		NA	
Indeno(1,2,3-cd)pyrene	ND		ND		NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	ND		ND		NA	
Surrogate Recoveries (%)						
Naphthalene-d8	66		71			
Acenaphthene-d10	60		67			
Phenanthrene-d10	64		74			
Benzo(a)pyrene-d12	104		115			

2006 Fish Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	06-0324	06-0324	06-0324	06-0324
Client ID	06-PB-01-PHC-F	06-PB-02-PHC-F	06-PB-03-PHC-F	06-PB-04-PHC-F
Location/QC type	Liberty	Liberty	Liberty	Liberty
Battelle ID	R2131-P	R2132-P	R2133-P	R2134-P
Collection Date	07/29/06	07/29/06	07/29/06	07/29/06
% Moisture	74.36	74.64	74.6	76.87
% Lipid	4.53	4.59	6.02	3.49
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	5.15	5.11	5.13	4.66
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	4.51 B	5.52 B	5.61 B	4 B
C1-Naphthalenes	1.94 B	2.39 B	2.44 B	2 B
C2-Naphthalenes	2.98	3.76	3.45	2.46
C3-Naphthalenes	3.49	5.33	4.37	3.42
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	0.69 J	0.71 J	0.9 J	0.65 J
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	0.48 J	0.57 J	0.45 J	0.51 J
C1-Fluorenes	ND	ND	1.38	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	1.41	ND	ND	ND
Phenanthrene	1.23 B	1.52 B	1.29 B	0.91 J
C1-Phenanthrenes/Anthracenes	1.46	1.87	1.75	1.03 J
C2-Phenanthrenes/Anthracenes	2.27	3.57	4.77	ND
C3-Phenanthrenes/Anthracenes	ND	2.47	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	0.21 J	0.29 J	0.28 J	0.25 J
C1-Dibenzothiophenes	ND	0.7 J	1.14	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.42 J	0.71 J	0.58 J	0.24 J
Pyrene	0.52 J	0.77 J	0.71 J	0.35 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	0.14 J	0.27 J	0.12 J	0.17 J
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	0.11 J	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	0.13 J	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	0.13 J	ND	ND
Total PAH	21.86	30.71	29.24	15.99
Total PAH less Napthalene	18.46	27.31	25.84	12.59
Surrogate Recoveries (%)				
Naphthalene-d8	85	67	86	78
Acenaphthene-d10	83	73	87	76
Phenanthrene-d10	98	92	102	90
Benzo(a)pyrene-d12	79	75	89	78

Laboratory Batch Number	06-0324	06-0324	06-0324	06-0324
Client ID	06-PB-05-PHC-F	06-PB-10-PHC-F	06-PB-13-PHC-F	06-PB-14-PHC-F
Location/QC type	Liberty	Liberty	Liberty	Liberty
Battelle ID	R2135-P	R2140-P	R2143-P	R2144-P
Collection Date	07/29/06	07/29/06	07/29/06	07/29/06
% Moisture	75.15	77.06	80.76	76.72
% Lipid	4.35	4.13	1.57	3.73
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	4.98	4.73	3.86	4.70
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	4.05 B	5.58 B	5.83 B	5.72 B
C1-Naphthalenes	2.12 B	2.98 B	3.28 B	3.56 B
C2-Naphthalenes	3.81	3.77	3.51	4.84
C3-Naphthalenes	4.84	ND	ND	4.14
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	0.69 J	0.89 J	0.84 J	1.19 B
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	0.24 J	ND	ND	ND
Fluorene	0.57 J	0.29 J	0.47 J	0.48 J
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	1.95 B	3.99	20.03	2.93
C1-Phenanthrenes/Anthracenes	1.99	0.9 J	1.47	0.92 J
C2-Phenanthrenes/Anthracenes	3.29	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	0.34 J	ND	0.31 J	0.27 J
C1-Dibenzothiophenes	0.99 J	ND	ND	0.51 J
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.59 J	0.2 J	0.28 J	0.23 J
Pyrene	0.57 J	0.32 J	0.47 J	0.38 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	0.22 J	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH	26.26	18.92	36.49	25.17
Total PAH less Napthalene	22.86	15.52	33.09	21.77
Surrogate Recoveries (%)				
Naphthalene-d8	83	81	78	81
Acenaphthene-d10	82	77	76	77
Phenanthrene-d10	97	90	92	92
Benzo(a)pyrene-d12	83	83	85	87

Laboratory Batch Number	06-0324	06-0324	06-0324	06-0324
Client ID	06-PB-16-PHC-F	06-PB-19-PHC-F	06-PB-20-PHC-F	06-SI-01-PHC-F
Location/QC type	Liberty	Liberty	Liberty	Northstar
Battelle ID	R2146-P	R2149-P	R2150-P	R2357-P
Collection Date	07/29/06	07/29/06	07/29/06	08/07/06
% Moisture	78.52	77.74	76.29	76.55
% Lipid	2.62	3.38	3.45	3.01
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	4.42	4.45	4.83	4.81
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	4.31 B	5.87 B	6.61 B	6.57 B
C1-Naphthalenes	2.51 B	2.83 B	3.81	5.29
C2-Naphthalenes	3.9	3.87	4.93	3.97
C3-Naphthalenes	ND	4.81	5.29	3.96
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	0.84 J	0.85 J	1.13 B	0.82 J
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	0.48 J	ND	0.47 J
Fluorene	0.58 J	0.44 J	0.71 J	0.52 J
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	0.99 J	1.51 B	1.72 B	1.76 B
C1-Phenanthrenes/Anthracenes	0.98 J	1.36	1.92	1.47
C2-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	0.26 J	0.38 J	0.38 J	0.4 J
C1-Dibenzothiophenes	0.69 J	0.71 J	1.13	0.81 J
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.23 J	0.34 J	0.38 J	0.39 J
Pyrene	0.44 J	0.56 J	0.66 J	0.65 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	ND	ND	0.19 J	0.14 J
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH	15.73	24.01	28.86	27.22
Total PAH less Napthalene	12.33	20.61	25.46	23.82
Surrogate Recoveries (%)				
Naphthalene-d8	81	82	79	81
Acenaphthene-d10	78	83	81	82
Phenanthrene-d10	91	98	95	98
Benzo(a)pyrene-d12	81	85	80	80

Surrogate Corrected

Laboratory Batch Number	06-0324	06-0324	06-0324	06-0324
Client ID	06-SI-06-PHC-F	06-SI-07-PHC-F	06-SI-08-PHC-F	06-SI-09-PHC-F
Location/QC type	Northstar	Northstar	Northstar	Northstar
Battelle ID	R2359-P	R2360-P	R2361-P	R2362-P
Collection Date	08/08/06	08/08/06	08/08/06	08/08/06
% Moisture	74.15	71.55	75.68	76.1
% Lipid	5.55	7.15	4.32	4.3
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	5.32	5.76	4.94	4.90
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	8.6 B	10.71 B	11.46 B	9.31 B
C1-Naphthalenes	9.08	12.57	13.13	9.4
C2-Naphthalenes	10.12	8.48	8.45	6.44
C3-Naphthalenes	9.06	5.41	4.96	4.69
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	1.6	2.1	1.97	1.5
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	0.51 J	ND	0.85 J	0.43 J
Fluorene	0.89 J	0.89 J	0.96 J	0.69 J
C1-Fluorenes	3.51	ND	1.33	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	0.2 J	ND
Phenanthrene	2.53	2.21	2.82	1.67 B
C1-Phenanthrenes/Anthracenes	1.86	1.56	1.69	1.93
C2-Phenanthrenes/Anthracenes	2.73	8.87	2.13	2.21
C3-Phenanthrenes/Anthracenes	1.67	ND	ND	1.87
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	0.71 J	0.35 J	0.43 J	0.43 J
C1-Dibenzothiophenes	1.63	1.12	0.85 J	0.83 J
C2-Dibenzothiophenes	1.95	ND	ND	1.24
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.43 J	0.55 J	0.74 J	0.41 J
Pyrene	0.7 J	1.47	0.76 J	0.74 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	0.43 J	0.17 J	0.21 J	0.22 J
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	0.17 J	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	0.19 J	ND	0.07 J	0.12 J
Benzo(a)pyrene	0.19 J	ND	ND	ND
Perylene	0.14 J	ND	0.14 J	0.5 J
Indeno(1,2,3-cd)pyrene	0.17 J	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.15 J	ND	ND	ND
Total PAH	59.02	56.46	53.15	44.63
Total PAH less Napthalene	55.62	53.06	49.75	41.23
Surrogate Recoveries (%)				
Naphthalene-d8	79	76	88	90
Acenaphthene-d10	82	79	87	89
Phenanthrene-d10	100	97	103	105
Benzo(a)pyrene-d12	85	89	94	96

Laboratory Batch Number	06-0324		06-0324	
Client ID	06-SI-10-PHC-F		06-SI-11-PHC-F	
Location/QC type	Northstar		Northstar	
Battelle ID	R2363-P		R2364-P	
Collection Date	08/08/06		08/08/06	
% Moisture	79.27		77.14	
% Lipid	2.58		3.38	
Matrix	TISSUE		TISSUE	
Sample Size (g dry)	4.20		4.62	
Units	UG/KG_DRY		UG/KG_DRY	
PAH:				
Naphthalene	14.35	B	15.56	B
C1-Naphthalenes	15.37		17.57	
C2-Naphthalenes	10.42		10.12	
C3-Naphthalenes	6.19		5.06	
C4-Naphthalenes	ND		ND	
Biphenyl	2.54		2.83	
Acenaphthylene	ND		ND	
Acenaphthene	0.56	J	0.65	J
Fluorene	0.71	J	0.6	J
C1-Fluorenes	ND		ND	
C2-Fluorenes	ND		ND	
C3-Fluorenes	ND		3	
Anthracene	0.1	J	ND	
Phenanthrene	1.92	B	2.74	
C1-Phenanthrenes/Anthracenes	1.78		1.16	
C2-Phenanthrenes/Anthracenes	2.95		ND	
C3-Phenanthrenes/Anthracenes	1.85		ND	
C4-Phenanthrenes/Anthracenes	ND		ND	
Dibenzothiophene	0.41	J	0.33	J
C1-Dibenzothiophenes	0.74	J	0.63	J
C2-Dibenzothiophenes	ND		1.37	
C3-Dibenzothiophenes	ND		ND	
Fluoranthene	0.67	J	0.32	J
Pyrene	0.88	J	0.63	J
C1-Fluoranthenes/Pyrenes	0.91	J	ND	
C2-Fluoranthenes/Pyrenes	ND		ND	
C3-Fluoranthenes/Pyrenes	ND		ND	
Benzo(a)anthracene	ND		ND	
Chrysene	0.2	J	0.2	J
C1-Chrysenes	ND		ND	
C2-Chrysenes	ND		ND	
C3-Chrysenes	ND		ND	
C4-Chrysenes	ND		ND	
Benzo(b)fluoranthene	ND		ND	
Benzo(k)fluoranthene	ND		ND	
Benzo(e)pyrene	0.13	J	ND	
Benzo(a)pyrene	ND		ND	
Perylene	0.45	J	0.22	J
Indeno(1,2,3-cd)pyrene	ND		ND	
Dibenz(a,h)anthracene	ND		ND	
Benzo(g,h,i)perylene	ND		0.05	J
Total PAH	63.13		63.04	
Total PAH less Napthalene	59.73		59.64	
Surrogate Recoveries (%)				
Naphthalene-d8	81		84	
Acenaphthene-d10	81		83	
Phenanthrene-d10	97		99	
Benzo(a)pyrene-d12	90		92	

Laboratory Batch Number	06-0324		06-0324				
Client ID	Procedural Blank		060313-01: Tilapia				
Battelle ID	BJ449PB-P		BJ450LCS-P				
Collection Date	09/26/06		09/26/06				
% Moisture	76		78.37				
% Lipid	NA		1.88				
Matrix	TISSUE		TISSUE				
Sample Size (g dry)	4.87		4.34				
Units	UG/KG_DRY		UG/KG_DRY		Target	% Recovery	Qualifier
PAHs:							
Naphthalene	3.4		278.2		288.08	97	
C1-Naphthalenes	0.72	J	ND				
C2-Naphthalenes	ND		ND				
C3-Naphthalenes	ND		ND				
C4-Naphthalenes	ND		ND				
Biphenyl	0.3	J	326.11		288.51	113	
Acenaphthylene	ND		314.25		288.28	109	
Acenaphthene	ND		316.87		288.21	110	
Fluorene	ND		322.16		288.18	112	
C1-Fluorenes	ND		ND				
C2-Fluorenes	ND		ND				
C3-Fluorenes	ND		ND				
Anthracene	ND		311.81		288.06	108	
Phenanthrene	0.44	J	280.26		288.16	97	
C1-Phenanthrenes/Anthracenes	ND		ND				
C2-Phenanthrenes/Anthracenes	ND		ND				
C3-Phenanthrenes/Anthracenes	ND		ND				
C4-Phenanthrenes/Anthracenes	ND		ND				
Dibenzothiophene	ND		279.54		289.34	97	
C1-Dibenzothiophenes	ND		0.73	J			
C2-Dibenzothiophenes	ND		ND				
C3-Dibenzothiophenes	ND		ND				
Fluoranthene	0.16	J	276.37		288.16	96	
Pyrene	0.27	J	284.33		288.12	99	
C1-Fluoranthenes/Pyrenes	ND		ND				
C2-Fluoranthenes/Pyrenes	ND		ND				
C3-Fluoranthenes/Pyrenes	ND		ND				
Benzo(a)anthracene	ND		258.66		288.09	90	
Chrysene	ND		249.58		288.13	87	
C1-Chrysenes	ND		ND				
C2-Chrysenes	ND		ND				
C3-Chrysenes	ND		ND				
C4-Chrysenes	ND		ND				
Benzo(b)fluoranthene	ND		280.84		288.26	97	
Benzo(k)fluoranthene	ND		315.42		288.18	109	
Benzo(e)pyrene	ND		278.58		288.74	96	
Benzo(a)pyrene	ND		295.91		288.25	103	
Perylene	ND		333.53		288.61	116	
Indeno(1,2,3-cd)pyrene	ND		319.11		288.16	111	
Dibenz(a,h)anthracene	ND		328.14		288.18	114	
Benzo(g,h,i)perylene	ND		315.9		288.10	110	
Surrogate Recoveries (%)							
Naphthalene-d8	70		82				
Acenaphthene-d10	68		78				
Phenanthrene-d10	84		93				
Benzo(a)pyrene-d12	83		85				

Laboratory Batch Number	06-0324					
Client ID	060814-01: Nist 2977					
Battelle ID	BJ452SRM-P					
Collection Date	09/26/06					
% Moisture	NA					
% Lipid	5.57					
Matrix	TISSUE					
Sample Size (g dry)	2.02			Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
PAHs:						
Naphthalene	16.43					
C1-Naphthalenes	10.9					
C2-Naphthalenes	111.62					
C3-Naphthalenes	220.89					
C4-Naphthalenes	238.12					
Biphenyl	2.1 J					
Acenaphthylene	2.39 J					
Acenaphthene	2.87					
Fluorene	7.56	10.24	0.43	34.2	26.2	
C1-Fluorenes	40.71					
C2-Fluorenes	148.38					
C3-Fluorenes	335.4					
Anthracene	1.87 J					
Phenanthrene	25.26	35.1	3.80	40.83	28	
C1-Phenanthrenes/Anthracenes	104.29					
C2-Phenanthrenes/Anthracenes	344.76					
C3-Phenanthrenes/Anthracenes	361.12					
C4-Phenanthrenes/Anthracenes	180.8					
Dibenzothiophene	17.39					
C1-Dibenzothiophenes	137.37					
C2-Dibenzothiophenes	455.7					
C3-Dibenzothiophenes	555.36					
Fluoranthene	24.69	38.7	1.00	32.58	36.2	N
Pyrene	52.41	78.9	3.50	34.44	33.6	
C1-Fluoranthenes/Pyrenes	60.42					
C2-Fluoranthenes/Pyrenes	85.07					
C3-Fluoranthenes/Pyrenes	72.66					
Benzo(a)anthracene	12.35	20.34	0.78	33.83	39.3	N
Chrysene	49.87					
C1-Chrysenes	43.41					
C2-Chrysenes	37.57					
C3-Chrysenes	29.55					
C4-Chrysenes	14.56					
Benzo(b)fluoranthene	7.49	11.01	0.28	32.54	32	
Benzo(k)fluoranthene	7.73					
Benzo(e)pyrene	10.8	13.1	1.10	38.4	17.6	
Benzo(a)pyrene	3.62	8.35	0.72	38.62	56.6	N
Perylene	1.68 J	3.5	0.76	51.71	52	n
Indeno(1,2,3-cd)pyrene	2.4 J	4.84	0.81	46.74	50.4	n
Dibenz(a,h)anthracene	0.93 J	1.41	0.19	43.48	34	
Benzo(g,h,i)perylene	5.92	9.53	0.43	34.51	37.9	n
Surrogate Recoveries (%)						
Naphthalene-d8	66					
Acenaphthene-d10	73					
Phenanthrene-d10	89					
Benzo(a)pyrene-d12	81					

Laboratory Batch Number	06-0324				06-0324	
Client ID	GN62: North Slope Crude				GG09: NorthSTAR Control Oil - cANIMIDA	
Battelle ID	BJ451NSC-P				BJ467CO-P	
Collection Date	10/03/06				10/03/06	
% Moisture	NA				NA	
% Lipid	NA				NA	
Matrix	OIL				OIL	
Sample Size (g dry)	5.01				5.02	
Units	MG/KG_OIL	Target	% Difference	Qualifier	MG/KG_OIL	
PAHs:						
Naphthalene	706.17	740.29	4.6		954.81	
C1-Naphthalenes	1536.02	1516.04	1.3		2213.77	
C2-Naphthalenes	2025.74	2000.10	1.3		2825.65	
C3-Naphthalenes	1559.27	1526.96	2.1		1980.81	
C4-Naphthalenes	920.25	898.03	2.5		993.65	
Biphenyl	221.42	220.82	0.3		361.73	
Acenaphthylene	ND					ND
Acenaphthene	15.49	14.50	6.8		17.94	
Fluorene	84.6	92.51	8.6		142.48	
C1-Fluorenes	229.43	227.01	1.1		282.19	
C2-Fluorenes	395.8	367.09	7.8		376.46	
C3-Fluorenes	378.86	326.32	16.1		338.8	
Anthracene	ND					ND
Phenanthrene	260.21	249.49	4.3		302.8	
C1-Phenanthrenes/Anthracenes	572.78	549.17	4.3		636.62	
C2-Phenanthrenes/Anthracenes	733.73	642.72	14.2		735.3	
C3-Phenanthrenes/Anthracenes	507.91	446.11	13.9		471.11	
C4-Phenanthrenes/Anthracenes	227.82	180.02	26.6		194.61	
Dibenzothiophene	211.92	210.35	0.7		77.73	
C1-Dibenzothiophenes	399.96	409.03	2.2		163.14	
C2-Dibenzothiophenes	581.48	551.46	5.4		196.76	
C3-Dibenzothiophenes	490.71	471.36	4.1		133.91	
Fluoranthene	4.1				5.13	
Pyrene	15.66	12.99	20.6		17.97	
C1-Fluoranthenes/Pyrenes	71.77	70.92	1.2		81.33	
C2-Fluoranthenes/Pyrenes	130.53	117.89	10.7		114.9	
C3-Fluoranthenes/Pyrenes	146.4	137.25	6.7		124.7	
Benzo(a)anthracene	ND					ND
Chrysene	39.09	47.18	17.1		35.72	
C1-Chrysenes	64.83	78.82	17.7		61.89	
C2-Chrysenes	87.69	102.67	14.6		82.81	
C3-Chrysenes	67.53	85.36	20.9		71.78	
C4-Chrysenes	54.6	61.99	11.9		46.68	
Benzo(b)fluoranthene	5.55	6.08	8.7		4.61	
Benzo(k)fluoranthene	ND					ND
Benzo(e)pyrene	10.14	12.88	21.3		10.46	
Benzo(a)pyrene	ND					ND
Perylene	ND					ND
Indeno(1,2,3-cd)pyrene	ND				0.25	J
Dibenz(a,h)anthracene	0.99	J			0.9	J
Benzo(g,h,i)perylene	3.42	3.44	0.6		1.28	J
Surrogate Recoveries (%)						
Naphthalene-d8	112				112	
Acenaphthene-d10	111				111	
Phenanthrene-d10	121	N			115	
Benzo(a)pyrene-d12	120				118	

Laboratory Batch Number	06-0324		06-0324			
Client ID	04-PBS-21-PHC/MET-T		04-PBS-21-PHC/MET-T			
Battelle ID	S4173-P1		S4173DUP-P1			
Collection Date	08/07/04		8/7/2004			
% Moisture	73.41		77.47			
% Lipid	3.12		3.03			
Matrix	FISH		FISH			
Sample Size (g dry)	5.38		4.51			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAHs:						
Naphthalene	5.68	BT	6.5	BT	13.5	
C1-Naphthalenes	3.59	BT	4.11	T	13.5	
C2-Naphthalenes	4.06	T	4.47	T	9.6	
C3-Naphthalenes	3.42	T	4.14	T	19.0	
C4-Naphthalenes		NDT		NDT	NA	
Biphenyl	0.97	BT	1.2	BT	21.2	
Acenaphthylene		NDT		NDT	NA	
Acenaphthene	0.35	JT	0.5	JT	NA	
Fluorene	0.51	JT	0.64	JT	NA	
C1-Fluorenes		NDT		NDT	NA	
C2-Fluorenes		NDT		NDT	NA	
C3-Fluorenes		NDT		NDT	NA	
Anthracene	0.19	JT	0.24	JT	NA	
Phenanthrene	1.97	BT	2.38	T	18.9	
C1-Phenanthrenes/Anthracenes	1.35	T	1.64	T	19.4	
C2-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C3-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C4-Phenanthrenes/Anthracenes		NDT		NDT	NA	
Dibenzothiophene	0.48	JT	0.55	JT	NA	
C1-Dibenzothiophenes	0.85	JT	0.87	JT	NA	
C2-Dibenzothiophenes		NDT		NDT	NA	
C3-Dibenzothiophenes		NDT		NDT	NA	
Fluoranthene	0.26	JT	0.31	JT	NA	
Pyrene	0.56	JT	0.57	JT	NA	
C1-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C2-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C3-Fluoranthenes/Pyrenes		NDT		NDT	NA	
Benzo(a)anthracene		NDT		NDT	NA	
Chrysene		NDT		NDT	NA	
C1-Chrysenes		NDT		NDT	NA	
C2-Chrysenes		NDT		NDT	NA	
C3-Chrysenes		NDT		NDT	NA	
C4-Chrysenes		NDT		NDT	NA	
Benzo(b)fluoranthene		NDT		NDT	NA	
Benzo(k)fluoranthene		NDT		NDT	NA	
Benzo(e)pyrene		NDT		NDT	NA	
Benzo(a)pyrene		NDT		NDT	NA	
Perylene	0.2	JT	0.2	JT	NA	
Indeno(1,2,3-cd)pyrene		NDT		NDT	NA	
Dibenz(a,h)anthracene		NDT		NDT	NA	
Benzo(g,h,i)perylene		NDT		NDT	NA	
Surrogate Recoveries (%)						
Naphthalene-d8	86		83			
Acenaphthene-d10	84		82			
Phenanthrene-d10	100		99			
Benzo(a)pyrene-d12	87		88			

Surrogate Corrected

Laboratory Batch Number	06-0324		06-0324			
Client ID	05-PB-13-PHC-T-F		05-PB-13-PHC-T-F			
Battelle ID	S8806-P1		S8806DUP-P			
Collection Date	8/4/2005		8/4/2005			
% Moisture	73.47		73.42			
% Lipid	6.74		5.11			
Matrix	FISH		FISH			
Sample Size (g dry)	5.43		5.47			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAHs:						
Naphthalene	2.59	BT	2.48	BT	4.3	
C1-Naphthalenes	1.66	BT	1.77	BT	6.4	
C2-Naphthalenes	3.94	T	3.3	T	17.7	
C3-Naphthalenes	3.95	T	3.51	T	11.8	
C4-Naphthalenes		NDT		NDT	NA	
Biphenyl	0.68	JT	0.64	JT	NA	
Acenaphthylene		NDT		NDT	NA	
Acenaphthene		NDT		NDT	NA	
Fluorene	0.57	JT	0.45	JT	NA	
C1-Fluorenes		NDT		NDT	NA	
C2-Fluorenes		NDT		NDT	NA	
C3-Fluorenes		NDT		NDT	NA	
Anthracene	0.15	JT	0.18	JT	NA	
Phenanthrene	1.4	BT	1.31	BT	6.6	
C1-Phenanthrenes/Anthracenes	1.63	T	1.44	T	12.4	
C2-Phenanthrenes/Anthracenes	3.08	T	1.71	T	57.2	n
C3-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C4-Phenanthrenes/Anthracenes		NDT		NDT	NA	
Dibenzothiophene	0.33	JT	0.33	JT	NA	
C1-Dibenzothiophenes	1.12	T	0.94	JT	17.5	
C2-Dibenzothiophenes		NDT		NDT	NA	
C3-Dibenzothiophenes		NDT		NDT	NA	
Fluoranthene	0.29	JT	0.39	JT	NA	
Pyrene	0.65	JT	0.64	JT	NA	
C1-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C2-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C3-Fluoranthenes/Pyrenes		NDT		NDT	NA	
Benzo(a)anthracene		NDT		NDT	NA	
Chrysene	0.2	JT	0.21	JT	NA	
C1-Chrysenes		NDT		NDT	NA	
C2-Chrysenes		NDT		NDT	NA	
C3-Chrysenes		NDT		NDT	NA	
C4-Chrysenes		NDT		NDT	NA	
Benzo(b)fluoranthene		NDT	0.14	JT	NA	
Benzo(k)fluoranthene		NDT		NDT	NA	
Benzo(e)pyrene		NDT	0.12	JT	NA	
Benzo(a)pyrene		NDT		NDT	NA	
Perylene	0.19	JT	0.24	JT	NA	
Indeno(1,2,3-cd)pyrene	0.35	JT	0.11	JT	NA	
Dibenz(a,h)anthracene		NDT		NDT	NA	
Benzo(g,h,i)perylene		NDT		NDT	NA	
Surrogate Recoveries (%)						
Naphthalene-d8	83		88			
Acenaphthene-d10	84		87			
Phenanthrene-d10	99		102			
Benzo(a)pyrene-d12	91		89			

Surrogate Corrected

cANIMIDA Indigenous Biota Tissue Hydrocarbon Data

This page left intentionally blank.

2004 Indigenous Biota Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	04-0469		04-0469		04-0469		04-0469	
Client ID	04-5(0)-01-PHC/MET-T-		04-4A-01-PHC/MET-T-		04-N11-01-PHC/MET-T-		04-L04-01-PHC/MET-T-	
Location/QC type	BSMP		BSMP		Northstar		Liberty	
Battelle ID	S3875-P		S3876-P		S3882-P		S3883-P	
Collection Date	08/03/04		08/03/04		07/29/04		08/02/04	
% Moisture	74.81		78.6		75.05		78.05	
% Lipid	2.05		1.53		2.47		1.84	
Matrix	AMPHIPODS		AMPHIPODS		AMPHIPODS		AMPHIPODS	
Sample Size (g dry)	5.15		4.31		5.01		4.45	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:								
Naphthalene	4.51	B	4.24	B	4.18	B	4.26	B
C1-Naphthalenes	2.5	B	2.01	B	2.36	B	2.24	B
C2-Naphthalenes	9.67		12.18		9.8		12.57	
C3-Naphthalenes	3.35		3.57		3.76		3.86	
C4-Naphthalenes	ND		ND		3.21		ND	
Biphenyl	1.75	B	1.76	B	1.18	B	1.66	B
Acenaphthylene	ND		0.17	J	0.14	J	ND	
Acenaphthene	0.17	J	0.17	J	0.16	J	0.19	J
Fluorene	0.5	J	0.5	J	0.61	B	0.75	B
C1-Fluorenes	7.75		7.48		6.8		22.69	
C2-Fluorenes	ND		ND		ND		2.21	
C3-Fluorenes	ND		ND		ND		ND	
Anthracene	ND		ND		ND		ND	
Phenanthrene	1.41	B	1.4	B	2.73	B	1.58	B
C1-Phenanthrenes/Anthracenes	1.28		1.21		1.77		1.67	
C2-Phenanthrenes/Anthracenes	2		1.8		2.55		2.44	
C3-Phenanthrenes/Anthracenes	1.58		ND		1.8		3.01	
C4-Phenanthrenes/Anthracenes	ND		ND		ND		ND	
Dibenzothiophene	0.16	J	0.19	J	0.29	J	0.22	J
C1-Dibenzothiophenes	0.48	J	0.46	J	0.67		0.85	
C2-Dibenzothiophenes	ND		ND		1.24		ND	
C3-Dibenzothiophenes	ND		ND		0.92		ND	
Fluoranthene	0.32	J	0.44	J	2.62		0.5	J
Pyrene	0.25	J	0.36	J	2.07		0.46	J
C1-Fluoranthenes/Pyrenes	ND		ND		1.8		1.14	
C2-Fluoranthenes/Pyrenes	ND		ND		2.03		ND	
C3-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
Benzo(a)anthracene	ND		0.18	J	0.64		0.2	J
Chrysene	0.45	J	0.38	J	1.62		0.54	J
C1-Chrysenes	0.79		ND		0.95		0.75	
C2-Chrysenes	ND		ND		ND		ND	
C3-Chrysenes	ND		ND		ND		ND	
C4-Chrysenes	ND		ND		ND		ND	
Benzo(b)fluoranthene	ND		0.26	J	1.21		0.32	J
Benzo(k)fluoranthene	ND		0.2	J	0.94	J	0.24	J
Benzo(e)pyrene	ND		0.22	J	0.81		0.29	J
Benzo(a)pyrene	ND		ND		0.63		ND	
Perylene	0.64		0.61	J	1		1.12	
Indeno(1,2,3-cd)pyrene	ND		0.17	J	0.68		0.18	J
Dibenz(a,h)anthracene	ND		ND		0.22	J	0.15	J
Benzo(g,h,i)perylene	ND		0.23	J	0.67		0.24	J
Total PAH (ug/kg dry)	39.56		40.19		62.06		66.33	
Surrogate Recoveries (%)								
Naphthalene-d8	47		55		55		49	
Acenaphthene-d10	69		73		67		64	
Phenanthrene-d10	75		80		71		75	
Benzo(a)pyrene-d12	90		99		87		97	

Surrogate Corrected

Laboratory Batch Number	04-0469		04-0469		04-0469		04-0469	
Client ID	04-5(0)-01-PHC/MET-T-		04-4A-01-PHC/MET-T-		04-N11-01-PHC/MET-T-		04-L04-01-PHC/MET-T-	
Location/QC type	BSMP		BSMP		Northstar		Liberty	
Battelle ID	S3875-P		S3876-P		S3882-P		S3883-P	
Collection Date	08/03/04		08/03/04		07/29/04		08/02/04	
% Moisture	74.81		78.6		75.05		78.05	
% Lipid	2.05		1.53		2.47		1.84	
Matrix	AMPHIPODS		AMPHIPODS		AMPHIPODS		AMPHIPODS	
Sample Size (g dry)	5.15		4.31		5.01		4.45	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
SHC:								
n-Nonane	7.14	J	22.25	J	12.64	J	10.33	J
n-Decane	5.99	J	33.3	J	14.94	J	43.31	J
n-Undecane	14.02	J	89.63	J	14.61	J	38.53	J
n-Dodecane	13.88	J	47.39	J	9.77	J	24.87	J
n-Tridecane	13.77	J	36.05	J	14.37	J	20.4	J
Isoprenoid RRT 1380	3.81	J	5.35	J	5.86	J	5.82	J
n-Tetradecane	26.37	J	56.45	J	27.28	J	37.2	J
Isoprenoid RRT 1470	13.57	J	13.29	J	16.05	J	14.68	J
n-Pentadecane	389.1		259.93		351.23		397	
n-Hexadecane	80.42	J	138.85	B	131.56	B	134.22	B
Norpristane (1650)	1.48	J	6.8	J	8.11	J	3.42	J
n-Heptadecane	215.04		185.5		263.99		252.8	
Pristane	22903.03		25904.85		32581.03	E	26393.56	
n-Octadecane	21.05	J	27.42	J	39.55	J	27.28	J
Phytane	8.22	J	10.26	J	16.29	J	8.37	J
n-Nonadecane	22.44	J	39.31	J	37.52	J	38.92	J
n-Eicosane	18.87	J	23.2	J	39.47	J	22.92	J
n-Heneicosane	45.36	J	40.93	J	68.36	J	45.56	J
n-Docosane	32.57	J	30.29	J	49.15	J	35.88	J
n-Tricosane	73.67	J	51.27	J	87.18	J	64.72	J
n-Tetracosane	37.41	J	35.25	J	61.16	J	35.94	J
n-Pentacosane	73.51	J	116.88	J	89.78	J	113.96	J
n-Hexacosane	34.11	J	38.35	J	55.09	J	32.96	J
n-Heptacosane	52.79	J	55.5	J	73.91	J	59.93	J
n-Octacosane	25.26	J	43.31	J	38.43	J	43.6	J
n-Nonacosane	43.98	J	51.41	J	70.15	J	53.3	J
n-Triacontane	30.33	J	38.96	J	44.02	J	35.97	J
n-Hentriacontane	117.92		103.81	J	195.05		139.35	
n-Dotriacontane	31.14	J	24.91	J	36.28	J	22.7	J
n-Tritriacontane	29.92	J	22.79	J	36.34	J	23.25	J
n-Tetratriacontane	18.97	J	11.85	J	16.32	J	10.38	J
n-Pentatriacontane	17.97	J	12.77	J	15.33	J	8.67	J
n-Hexatriacontane	13.5	J	4.84	J	7.31	J	4.28	J
n-Heptatriacontane	9.49	J	3.89	J	3.24	J	3.88	J
n-Octatriacontane	9.52	J	5.81	J	4.4	J	3.46	J
n-Nonatriacontane	6.35	J	2.34	J	ND		ND	
n-Tetracontane	9.57	J	1.75	J	ND		ND	
SHC(total)	44950.98	B	50921.63	B	54077.5	B	52727.49	B
Surrogate Recoveries (%)								
n-Tetracosane-d50	63		61		60		63	
5a-androstane	63		62		61		64	
S/T:								
C23 diterpane (T4)	0.33	J	0.47	J	1.13	J	0.43	J
C29 tricyclictriterpane (T9)	ND		ND		ND		ND	
C29 tricyclictriterpane (T10)	ND		ND		ND		ND	
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND		ND		0.91	J	ND	
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND		ND		0.71	J	ND	
17a(H),21b(H)-30-norhopane (T15)	0.92	J	1.34	J	2.17		1.29	J
18a(H)-oleanane (T18)	ND		ND		ND		ND	
17a(H),21b(H)-hopane (T19)	1.1	J	2.1		2.76		1.61	
22S-17a(H),21b(H)-30-homohopane (T21)	0.62	J	0.92	J	1.45		0.86	J
22R-17a(H),21b(H)-30-homohopane (T22)	0.81	J	1.2	J	1.28		1.38	
13b,17a-diacholestane-20S (S4)	ND		ND		1.56		0.84	
13b,17a-diacholestane-20R (S5)	ND		ND		0.88		0.56	J
5a,14a,17a,24-methylcholestane-20R (S24)	ND		ND		0.95		ND	
5a,14a,17a,24-ethylcholestane-20S (S25)	ND		ND		0.68		ND	
5a,14a,17a,24-ethylcholestane-20R (S28)	ND		ND		1.34		ND	
S28a					1.41		1.87	
Surrogate Recoveries (%)								
5b(H)-Cholane	106		100		103		104	

Surrogate Corrected

Laboratory Batch Number	04-0469	04-0469	04-0469	04-0469
Client ID	04-N04-01-PHC/MET-	04-N03-01-PHC/MET-	04-5B-01-PHC/MET-	04-L18-01-PHC/MET-
Location/QC type	Northstar	Northstar	BSMP	Liberty
Battelle ID	S4105-P	S4106-P	S4107-P	S4309-P
Collection Date	08/09/04	08/08/04	08/09/04	08/13/04
% Moisture	77.13	78.96	79.62	78.46
% Lipid	2.38	2.45	4.19	1.59
Matrix	AMPHIPODS	AMPHIPODS	AMPHIPODS	AMPHIPODS
Sample Size (g dry)	4.64	4.22	4.17	4.38
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	3.66 B	6.08 B	29.39	3.62 B
C1-Naphthalenes	1.67 B	2.44 B	8.17	1.88 B
C2-Naphthalenes	5.36	6.67	11.13	16.93
C3-Naphthalenes	2.31	3.01	3.3	2.95
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	0.83 B	1.19 B	2.46 B	1.49 B
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	0.23 J	0.96	0.27 J
Fluorene	0.44 J	0.67 J	0.75 B	0.46 J
C1-Fluorenes	18.49	112.68	2.35	38.08
C2-Fluorenes	3.37	ND	ND	2.99
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	0.88 B	1.14 B	1.07 B	1.14 B
C1-Phenanthrenes/Anthracenes	0.8	1.16	0.79	1.19
C2-Phenanthrenes/Anthracenes	2.42	2.01	1.88	1.62
C3-Phenanthrenes/Anthracenes	ND	ND	1.61	1.34
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	0.14 J	0.15 J	0.17 J	0.19 J
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.38 J	0.4 J	0.35 J	0.39 J
Pyrene	0.28 J	0.41 J	0.35 J	0.36 J
C1-Fluoranthenes/Pyrenes	ND	1.13	ND	0.83
C2-Fluoranthenes/Pyrenes	ND	ND	ND	1.06
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	0.26 J	0.19 J	0.23 J
Chrysene	0.53 J	0.63 J	0.59 J	0.63 J
C1-Chrysenes	1.09	0.77	1.07	0.68
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	0.33 J	0.34 J	0.66 J	0.38 J
Benzo(k)fluoranthene	0.16 J	0.21 J	0.35 J	0.28 J
Benzo(e)pyrene	0.22 J	0.25 J	0.2 J	0.27 J
Benzo(a)pyrene	0.13 J	0.12 J	0.11 J	0.17 J
Perylene	0.79	0.89	0.54 J	0.99
Indeno(1,2,3-cd)pyrene	0.13 J	0.2 J	0.16 J	0.2 J
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.2 J	0.25 J	0.18 J	0.26 J
Total PAH (ug/kg dry)	44.61	143.29	68.78	80.88
Surrogate Recoveries (%)				
Naphthalene-d8	55	59	61	60
Acenaphthene-d10	70	74	79	77
Phenanthrene-d10	76	81	84	83
Benzo(a)pyrene-d12	87	100	103	103

Surrogate Corrected

Laboratory Batch Number	04-0469	04-0469	04-0469	04-0469
Client ID	04-N04-01-PHC/MET-	04-N03-01-PHC/MET-	04-5B-01-PHC/MET-	04-L18-01-PHC/MET-
Location/QC type	Northstar	Northstar	BSMP	Liberty
Battelle ID	S4105-P	S4106-P	S4107-P	S4309-P
Collection Date	08/09/04	08/08/04	08/09/04	08/13/04
% Moisture	77.13	78.96	79.62	78.46
% Lipid	2.38	2.45	4.19	1.59
Matrix	AMPHIPODS	AMPHIPODS	AMPHIPODS	AMPHIPODS
Sample Size (g dry)	4.64	4.22	4.17	4.38
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	10.21 J	9.76 J	7.01 J	4.94 J
n-Decane	14.47 J	23.95 J	8.02 J	15.25 J
n-Undecane	18.59 J	65.96 J	24.23 J	60.34 J
n-Dodecane	12.95 J	18.03 J	14.58 J	27.97 J
n-Tridecane	14.25 J	19.17 J	23.56 J	25.17 J
Isoprenoid RRT 1380	4.89 J	8.38 J	12.01 J	4.84 J
n-Tetradecane	24.26 J	45.96 J	35.23 J	36.44 J
Isoprenoid RRT 1470	14.61 J	16.56 J	36.58 J	13.23 J
n-Pentadecane	369.52	287.95	70.51 J	220.43
n-Hexadecane	107.43 J	115.37 J	119.93 J	118.71 J
Norpristane (1650)	ND	ND	14.24 J	5.32 J
n-Heptadecane	243.76	150.16	233.74	131.3 J
Pristane	30317.07	26196.91	32954.59 E	22874.93 E
n-Octadecane	21.58 J	18.94 J	24.83 J	20.74 J
Phytane	6.76 J	7.6 J	14.46 J	5.1 J
n-Nonadecane	23.59 J	14.03 J	8.58 J	15.75 J
n-Eicosane	21.8 J	18.35 J	15.89 J	17.69 J
n-Heneicosane	55.87 J	77.72 J	22.71 J	31.25 J
n-Docosane	48.11 J	64.34 J	35.92 J	46.94 J
n-Tricosane	103.16 J	123.21 J	91.37 J	60.57 J
n-Tetracosane	62.15 J	52.17 J	41.71 J	34.71 J
n-Pentacosane	74.35 J	131.64 J	31.67 J	133.66 J
n-Hexacosane	47.09 J	37.18 J	22.45 J	31.38 J
n-Heptacosane	57.07 J	57.68 J	32.04 J	54.02 J
n-Octacosane	38.3 J	ND	23.03 J	24.27 J
n-Nonacosane	56.37 J	13.6 J	4.57 J	36.29 J
n-Triacontane	39.14 J	28.77 J	ND	20.35 J
n-Hentriacontane	108.84 J	100.55 J	18.11 J	67.88 J
n-Dotriacontane	25.68 J	20.73 J	8.38 J	11.32 J
n-Tritriacontane	22.68 J	23.73 J	6.21 J	16.41 J
n-Tetratriacontane	9.13 J	9.91 J	3.5 J	8.84 J
n-Pentatriacontane	5.58 J	7.74 J	ND	4.85 J
n-Hexatriacontane	1.92 J	4.8 J	ND	3.65 J
n-Heptatriacontane	ND	3.73 J	ND	1.69 J
n-Octatriacontane	ND	3.87 J	ND	2.76 J
n-Nonatriacontane	ND	2.31 J	ND	1.47 J
n-Tetracontane	ND	2.73 J	ND	1.79 J
SHC(total)	46760.28 B	37318.56 B	38307.1 B	29844.51 B
Surrogate Recoveries (%)				
n-Tetracosane-d50	64	65	63	62
5a-androstane	65	66	64	64
S/T:				
C23 diterpane (T4)	0.44 J	0.43 J	ND	ND
C29 tricyclictriterpane (T9)	ND	ND	ND	ND
C29 tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-norhopane (T15)	1.63	1.57	0.62 J	1.18 J
18a(H)-oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	1.68	1.99	0.68 J	1.59
22S-17a(H),21b(H)-30-homohopane (T21)	0.94 J	0.96 J	ND	0.98 J
22R-17a(H),21b(H)-30-homohopane (T22)	0.87 J	1.35 J	ND	0.95 J
13b,17a-diacholestane-20S (S4)	0.75	0.78	ND	0.67 J
13b,17a-diacholestane-20R (S5)	0.51 J	0.43 J	ND	0.34 J
5a,14a,17a,24-methylcholestane-20R (S24)	0.46 J	0.51 J	ND	0.42 J
5a,14a,17a,24-ethylcholestane-20S (S25)	0.54 J	0.33 J	ND	0.44 J
5a,14a,17a,24-ethylcholestane-20R (S28)	0.81	0.69 J	ND	ND
S28a	1.23	1.36		1.25
Surrogate Recoveries (%)				
5b(H)-Cholane	101	115	108	107

Surrogate Corrected

Laboratory Batch Number	04-0469		04-0469		04-0469		04-0469	
Client ID	04-L08-01-PHC/MET-T-		04-5H-01-PHC/MET-T-		04-5F-01-PHC/MET-		04-3A-01-PHC/MET-T-	
Location/QC type	Liberty		BSMP		BSMP		BSMP	
Battelle ID	S3881-P		S3884-P		S4104-P		S4333-P	
Collection Date	08/02/04		08/02/04		08/09/04		08/12/04	
% Moisture	84.49		85.78		82.47		86.16	
% Lipid	1.42		1.25		1.85		1.05	
Matrix	CLAMS		CLAMS		CLAMS		CLAMS	
Sample Size (g dry)	2.95		1.67		3.53		2.80	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:								
Naphthalene	5.6	B	7.58	B	4.51	B	4.74	B
C1-Naphthalenes	3.62	B	3.76	B	3.55	B	1.63	B
C2-Naphthalenes	5.85		6.66		7.31		2.67	
C3-Naphthalenes	5.33		6.1		6.32		3.27	
C4-Naphthalenes	3.78		ND		5.34		ND	
Biphenyl	2.53	B	4.13	B	2.3	B	2.24	B
Acenaphthylene	ND		ND		ND		ND	
Acenaphthene	0.29	J	0.31	J	ND		0.15	J
Fluorene	0.88	J	1.19	J	1.11		0.76	J
C1-Fluorenes	2.85		3.66		2.54		2.08	
C2-Fluorenes	9.29		ND		7.31		ND	
C3-Fluorenes	ND		ND		ND		ND	
Anthracene	ND		ND		ND		ND	
Phenanthrene	3.25	B	3.23	B	4.44		1.65	B
C1-Phenanthrenes/Anthracenes	4.82		3.53		7.59		1.78	
C2-Phenanthrenes/Anthracenes	6.38		5.49		11.06		3.2	
C3-Phenanthrenes/Anthracenes	4.13		4.07		13.28		2.35	
C4-Phenanthrenes/Anthracenes	4.26		3.82		15.58		2	
Dibenzothiophene	0.46	J	0.41	J	0.56	J	0.16	J
C1-Dibenzothiophenes	1.15		0.84	J	1.84		ND	
C2-Dibenzothiophenes	2.34		2.23		5.17		ND	
C3-Dibenzothiophenes	2.15		2.35		5.32		ND	
Fluoranthene	0.85	J	1.02	J	3.42		0.62	J
Pyrene	1.02		1.19	J	4.97		0.65	J
C1-Fluoranthenes/Pyrenes	2.69		3.12		7.01		1.9	
C2-Fluoranthenes/Pyrenes	3.09		3.53		6.43		2.38	
C3-Fluoranthenes/Pyrenes	ND		ND		4.23		ND	
Benzo(a)anthracene	0.3	J	0.42	J	0.89		0.24	J
Chrysene	2.7		2.25		4.75		1.69	
C1-Chrysenes	2.4		1.98		4.61		1.33	
C2-Chrysenes	ND		ND		10.64		ND	
C3-Chrysenes	ND		ND		ND		ND	
C4-Chrysenes	ND		ND		ND		ND	
Benzo(b)fluoranthene	0.92	J	0.93	J	1.34		0.58	J
Benzo(k)fluoranthene	0.32	J	0.55	J	0.65	J	0.4	J
Benzo(e)pyrene	1.23		1.03	J	1.83		0.81	J
Benzo(a)pyrene	ND		0.27	J	0.33	J	0.18	J
Perylene	6.49		3.68		10.56		2.56	
Indeno(1,2,3-cd)pyrene	0.25	J	0.39	J	0.43	J	0.2	J
Dibenz(a,h)anthracene	ND		ND		ND		ND	
Benzo(g,h,i)perylene	0.63	J	0.86	J	0.88		0.44	J
Total PAH (ug/kg dry)	91.85		80.58		168.1		42.66	
Surrogate Recoveries (%)								
Naphthalene-d8	57		64		68		56	
Acenaphthene-d10	68		73		79		71	
Phenanthrene-d10	71		78		84		81	
Benzo(a)pyrene-d12	82		92		102		97	

Surrogate Corrected

Laboratory Batch Number	04-0469		04-0469		04-0469		04-0469	
Client ID	04-L08-01-PHC/MET-T-		04-5H-01-PHC/MET-T-		04-5F-01-PHC/MET-		04-3A-01-PHC/MET-T-	
Location/QC type	Liberty		BSMP		BSMP		BSMP	
Battelle ID	S3881-P		S3884-P		S4104-P		S4333-P	
Collection Date	08/02/04		08/02/04		08/09/04		08/12/04	
% Moisture	84.49		85.78		82.47		86.16	
% Lipid	1.42		1.25		1.85		1.05	
Matrix	CLAMS		CLAMS		CLAMS		CLAMS	
Sample Size (g dry)	2.95		1.67		3.53		2.80	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
SHC:								
n-Nonane	25.36	J	40.2	J	49.92	J	24.46	J
n-Decane	36.76	J	51.91	J	26.27	J	30.03	J
n-Undecane	179.6	J	240.41	J	98.74	J	189.9	J
n-Dodecane	95.14	J	116.04	J	65.14	J	79.72	J
n-Tridecane	76.5	J	83.11	J	36.34	J	51.85	J
Isoprenoid RRT 1380	26.45	J	47.1	J	19.76	J	15.61	J
n-Tetradecane	74.02	J	87.72	J	36.24	J	64.47	J
Isoprenoid RRT 1470	42.74	J	65.91	J	67.02	J	31.59	J
n-Pentadecane	93.41	J	74.28	J	41.77	J	69.82	J
n-Hexadecane	170.59	J	265.11	J	103.51	J	156.98	J
Norpristane (1650)	5.03	J	1.92	J	4.15	J	5.38	J
n-Heptadecane	208.18		124.11	J	51.99	J	90.68	J
Pristane	80.24	J	133.13	J	208.95		115.35	J
n-Octadecane	31.93	J	28.18	J	19.2	J	18.05	J
Phytane	6.29	J	ND		10.07	J	ND	
n-Nonadecane	47.89	J	30.59	J	14.8	J	11.79	J
n-Eicosane	19.16	J	20.02	J	19.21	J	9.56	J
n-Heneicosane	23.82	J	17.44	J	32.36	J	9.74	J
n-Docosane	29.45	J	39.56	J	34.1	J	20.69	J
n-Tricosane	56.6	J	70.69	J	76.66	J	32.29	J
n-Tetracosane	31.99	J	57.65	J	38.65	J	28.19	J
n-Pentacosane	45.17	J	113.05	J	69.93	J	106.57	J
n-Hexacosane	24.73	J	104.75	J	34.53	J	34.09	J
n-Heptacosane	68.5	J	170.56	J	120.52	J	52.87	J
n-Octacosane	21.31	J	175.88	J	36.1	J	39.08	J
n-Nonacosane	55.39	J	229.13	J	93.54	J	41.17	J
n-Triacontane	14.67	J	152.41	J	26.95	J	20.44	J
n-Hentriacontane	48.49	J	161.26	J	79.98	J	30.42	J
n-Dotriacontane	ND		89.42	J	ND		11.24	J
n-Tritriacontane	5.05	J	7.63	J	4.59	J	11.82	J
n-Tetratriacontane	ND		ND		ND		5.27	J
n-Pentatriacontane	ND		ND		ND		2.66	J
n-Hexatriacontane	ND		ND		ND		2.04	J
n-Heptatriacontane	ND		ND		ND		1.76	J
n-Octatriacontane	ND		ND		ND		ND	
n-Nonatriacontane	ND		ND		ND		28.94	J
n-Tetracontane	ND		ND		ND		ND	
SHC(total)	34446.37	B	39658.82	B	26198.87	B	6774.75	B
Surrogate Recoveries (%)								
n-Tetracosane-d50	65		62		69		64	
5a-androstane	66		62		69		65	
S/T:								
C23 diterpane (T4)	ND		ND		ND		ND	
C29 tricyclictriterpane (T9)	ND		ND		ND		ND	
C29 tricyclictriterpane (T10)	ND		ND		ND		ND	
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND		ND		1.72		ND	
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND		ND		0.86	J	ND	
17a(H),21b(H)-30-norhopane (T15)	1.82	J	1.52	J	1.49	J	1.22	J
18a(H)-oleanane (T18)	ND		ND		ND		ND	
17a(H),21b(H)-hopane (T19)	2.27		1.95	J	2.27		1.7	J
22S-17a(H),21b(H)-30-homohopane (T21)	1.21	J	ND		1.24	J	ND	
22R-17a(H),21b(H)-30-homohopane (T22)	1.72	J	ND		2.68		ND	
13b,17a-diacholestane-20S (S4)	ND		ND		0.57	J	ND	
13b,17a-diacholestane-20R (S5)	ND		ND		0.46	J	ND	
5a,14a,17a,24-methylcholestane-20R (S24)	ND		ND		0.85		ND	
5a,14a,17a,24-ethylcholestane-20S (S25)	ND		ND		0.63	J	ND	
5a,14a,17a,24-ethylcholestane-20R (S28)	ND		ND		1.34		ND	
S28a	1.97		1.74		2.95			
Surrogate Recoveries (%)								
5b(H)-Cholane	108		102		114		106	

Surrogate Corrected

Laboratory Batch Number	04-0469		04-0469				
Client ID	Procedural Blank		041029-01: Clean Cod Fillet				
Battelle ID	BF486PB-P		BF487LCS-P				
Collection Date	01/06/05		01/06/05				
% Moisture	79.96		81.34				
% Lipid	NA		NA				
Matrix	TISSUE		TISSUE				
Sample Size	3.89		3.73				
Size Unit-Basis	G_DRY		G_DRY				
Units	UG/KG_DRY		UG/KG_DRY		Target	% Recovery	Qualifier
PAH:							
Naphthalene	2.5	N	341.52		335.12	102	
C1-Naphthalenes	0.77		430.74				
C2-Naphthalenes	ND		ND				
C3-Naphthalenes	ND		ND				
C4-Naphthalenes	ND		ND				
Biphenyl	1.16		323.81		335.12	97	
Acenaphthylene	ND		345.9		335.12	103	
Acenaphthene	ND		325.42		335.12	97	
Fluorene	0.18	J	369.85		335.12	110	
C1-Fluorenes	ND		1.51				
C2-Fluorenes	ND		ND				
C3-Fluorenes	ND		ND				
Anthracene	ND		389.71		335.12	116	
Phenanthrene	0.8		334.69		335.12	100	
C1-Phenanthrenes/Anthracenes	ND		ND				
C2-Phenanthrenes/Anthracenes	ND		ND				
C3-Phenanthrenes/Anthracenes	ND		ND				
C4-Phenanthrenes/Anthracenes	ND		ND				
Dibenzothiophene	0.02	J	327.66		335.12	98	
C1-Dibenzothiophenes	ND		ND				
C2-Dibenzothiophenes	ND		ND				
C3-Dibenzothiophenes	ND		ND				
Fluoranthene	0.1	J	362.88		335.12	108	
Pyrene	0.07	J	382.64		335.12	114	
C1-Fluoranthenes/Pyrenes	ND		ND				
C2-Fluoranthenes/Pyrenes	ND		ND				
C3-Fluoranthenes/Pyrenes	ND		ND				
Benzo(a)anthracene	ND		400.1		335.12	119	
Chrysene	ND		362.38		335.12	108	
C1-Chrysenes	ND		ND				
C2-Chrysenes	ND		ND				
C3-Chrysenes	ND		ND				
C4-Chrysenes	ND		ND				
Benzo(b)fluoranthene	ND		306.81		335.12	92	
Benzo(k)fluoranthene	ND		379.14		335.12	113	
Benzo(e)pyrene	ND		329.63		335.12	98	
Benzo(a)pyrene	ND		314.66		335.12	94	
Perylene	ND		334.24		335.12	100	
Indeno(1,2,3-cd)pyrene	ND		304.55		335.12	91	
Dibenz(a,h)anthracene	ND		299.1		335.12	89	
Benzo(g,h,i)perylene	ND		291.53		335.12	87	
Total PAH (ug/kg dry)	5.6		7258.47				
Surrogate Recoveries (%)							
Naphthalene-d8	51		62				
Acenaphthene-d10	70		69				
Phenanthrene-d10	78		76				
Benzo(a)pyrene-d12	90		99				

Surrogate Corrected

]

Laboratory Batch Number	04-0469		04-0469				
Client ID	Procedural Blank		041029-01: Clean Cod Fillet				
Battelle ID	BF486PB-P		BF487LCS-P				
Collection Date	01/06/05		01/06/05				
% Moisture	79.96		81.34				
% Lipid	NA		NA				
Matrix	TISSUE		TISSUE				
Sample Size	3.89		3.73				
Size Unit-Basis	G_DRY		G_DRY				
Units	UG/KG_DRY		UG/KG_DRY		Target	% Recovery	Qualifier
SHC:							
n-Nonane	ND		1334.9		3351.21	40	N
n-Decane	ND		2269.81		3351.21	68	N
n-Undecane	ND		98.94	J			
n-Dodecane	ND		2231.02		3351.21	67	N
n-Tridecane	ND		36.66	J			
Isoprenoid RRT 1380	ND		ND				
n-Tetradecane	ND		2684.27		3351.21	80	
Isoprenoid RRT 1470	ND		5.78	J			
n-Pentadecane	ND		15.31	J			
Norpristane (1650)	ND		ND				
n-Hexadecane	83.71	J	2969.77		3351.21	89	
n-Heptadecane	ND		12.19	J			
Pristane	ND		3008.12		3351.21	90	
n-Octadecane	5.03	J	3015.33		3351.21	90	
Phytane	ND		3176.66		3351.21	95	
n-Nonadecane	ND		3327.06		3351.21	99	
n-Eicosane	5.16	J	3193.58		3351.21	95	
n-Heneicosane	3.74	J	6.59	J			
n-Docosane	13.68	J	3168.09		3351.21	95	
n-Tricosane	3.2	J	24.56	J			
n-Tetracosane	12.28	J	3412.73		3351.21	102	
n-Pentacosane	6.07	J	27.02	J			
n-Hexacosane	12.45	J	3397.22		3351.21	101	
n-Heptacosane	11.17	J	46.92	J			
n-Octacosane	14.08	J	3247.16		3351.21	97	
n-Nonacosane	10.85	J	598.94				
n-Triacontane	10.44	J	3328.88		3351.21	99	
n-Hentriacontane	5.84	J	58.72	J			
n-Dotriacontane	ND		30.64	J			
n-Tritriacontane	ND		18.15	J			
n-Tetratriacontane	ND		14.84	J			
n-Pentatriacontane	ND		8.98	J			
n-Hexatriacontane	ND		1921.95		3351.21	57	N
n-Heptatriacontane	ND		ND				
n-Octatriacontane	ND		ND				
n-Nonatriacontane	ND		ND				
n-Tetracontane	ND		ND				
SHC(total)	15693.74		64347.54				
Surrogate Recoveries (%)							
n-Tetracosane-d50	67		60				
5a-androstane	66		61				
S/T:							
C23 diterpane (T4)	ND						
C29 tricyclictriterpane (T9)	ND						
C29 tricyclictriterpane (T10)	ND						
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND						
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND						
17a(H),21b(H)-30-norhopane (T15)	ND						
18a(H)-oleanane (T18)	ND						
17a(H),21b(H)-hopane (T19)	ND						
22S-17a(H),21b(H)-30-homohopane (T21)	ND						
22R-17a(H),21b(H)-30-homohopane (T22)	ND						
13b,17a-diacholestane-20S (S4)	ND						
13b,17a-diacholestane-20R (S5)	ND						
5a,14a,17a,24-methylcholestane-20R (S24)	ND						
5a,14a,17a,24-ethylcholestane-20S (S25)	ND						
5a,14a,17a,24-ethylcholestane-20R (S28)	ND						
S28a							
Surrogate Recoveries (%)							
5b(H)-Cholane	111						

Surrogate Corrected

]

Laboratory Batch Number	04-0469				
Client ID	031105-01: SRM 2978				
Battelle ID	BF488SRM-P				
Collection Date	01/06/05				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size	0.50				
Size Unit-Basis	G_DRY				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
PAH:					
Naphthalene	21.82				
C1-Naphthalenes	10.66				
C2-Naphthalenes	18.52				
C3-Naphthalenes	31.49				
C4-Naphthalenes	37.49				
Biphenyl	12.23				
Acenaphthylene	7.16				
Acenaphthene	4.31	J			
Fluorene	10.51				
C1-Fluorenes	134.96				
C2-Fluorenes	63.04				
C3-Fluorenes		ND			
Anthracene	68.06				
Phenanthrene	86.38				
C1-Phenanthrenes/Anthracenes	63.31				
C2-Phenanthrenes/Anthracenes	103.59				
C3-Phenanthrenes/Anthracenes	102.43				
C4-Phenanthrenes/Anthracenes	60.88				
Dibenzothiophene	12.08				
C1-Dibenzothiophenes	48.5				
C2-Dibenzothiophenes	64.52				
C3-Dibenzothiophenes	101.25				
Fluoranthene	178.17		154.00 - 178.00	0.1	
Pyrene	327		235.01 - 276.99	18.1	
C1-Fluoranthenes/Pyrenes	147.72				
C2-Fluoranthenes/Pyrenes	74.1				
C3-Fluoranthenes/Pyrenes	37.47				
Benzo(a)anthracene	36.58				
Chrysene	122.77				
C1-Chrysenes	60.46				
C2-Chrysenes	74.81				
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	55.18				
Benzo(k)fluoranthene	49.62		41.70 - 52.50	1.0	
Benzo(e)pyrene	92.5		83.00 - 95.60	1.0	
Benzo(a)pyrene	9.18				
Perylene	10.26		3.77 - 4.41	132.7	n
Indeno(1,2,3-cd)pyrene	22.98		9.30 - 15.10	52.2	N
Dibenz(a,h)anthracene	16.07				
Benzo(g,h,i)perylene	30.14		15.30 - 24.10	25.1	
Total PAH (ug/kg dry)	2408.2				
Surrogate Recoveries (%)					
Naphthalene-d8	64				
Acenaphthene-d10	70				
Phenanthrene-d10	78				
Benzo(a)pyrene-d12	94				

Surrogate Corrected

]

Laboratory Batch Number	04-0469				
Client ID	031105-01: SRM 2978				
Battelle ID	BF488SRM-P				
Collection Date	01/06/05				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size	0.50				
Size Unit-Basis	G_DRY				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
SHC:					
n-Nonane	77.14	J			
n-Decane	43.58	J			
n-Undecane	63.9	J			
n-Dodecane		ND			
n-Tridecane		ND			
Isoprenoid RRT 1380		ND			
n-Tetradecane	100.18	J			
Isoprenoid RRT 1470	35.14	J			
n-Pentadecane	248.77	J			
Norpristane (1650)	54.64	J			
n-Hexadecane	768.17	J			
n-Heptadecane	268.92	J			
Pristane	131.53	J			
n-Octadecane	304.66	J			
Phytane	325.54	J			
n-Nonadecane		ND			
n-Eicosane	260.71	J			
n-Heneicosane	109.04	J			
n-Docosane	367.03	J			
n-Tricosane	234.36	J			
n-Tetracosane	354.72	J			
n-Pentacosane	324.11	J			
n-Hexacosane	434.8	J			
n-Heptacosane	207.19	J			
n-Octacosane	412.24	J			
n-Nonacosane	224.81	J			
n-Triacontane	402.06	J			
n-Hentriacontane	263.72	J			
n-Dotriacontane	331.07	J			
n-Tritriacontane	274.64	J			
n-Tetratriacontane	174.42	J			
n-Pentatriacontane	90.31	J			
n-Hexatriacontane	46.98	J			
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
SHC(total)	336367.61				
Surrogate Recoveries (%)					
n-Tetracosane-d50	60				
5a-androstane	61				
S/T:					
C23 diterpane (T4)					
C29 tricyclictriterpane (T9)					
C29 tricyclictriterpane (T10)					
18a(H)-22,29,30-trisnorhopane -TS (T11)					
17a(H)-22,29,30-trisnorhopane -TM (T12)					
17a(H),21b(H)-30-norhopane (T15)					
18a(H)-oleanane (T18)					
17a(H),21b(H)-hopane (T19)					
22S-17a(H),21b(H)-30-homohopane (T21)					
22R-17a(H),21b(H)-30-homohopane (T22)					
13b,17a-diacholestane-20S (S4)					
13b,17a-diacholestane-20R (S5)					
5a,14a,17a,24-methylcholestane-20R (S24)					
5a,14a,17a,24-ethylcholestane-20S (S25)					
5a,14a,17a,24-ethylcholestane-20R (S28)					
S28a					
Surrogate Recoveries (%)					
5b(H)-Cholane					

Surrogate Corrected

]

Laboratory Batch Number	04-0469		04-0469			
Client ID	04-5(0)-01-PHC/MET-T-AN		04-5(0)-01-PHC/MET-T-AN			
Battelle ID	BSMP		QA Duplicate			
Collection Date	S3875-P		S3875DUP-P			
% Moisture	08/03/04		8/3/2004			
% Lipid	74.81		74.81			
Matrix	2.05		NA			
Sample Size	AMPHIPODS		AMPHIPODS			
Size Unit-Basis	5.15		5.13			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	4.51	B	2.66	B	51.6	N
C1-Naphthalenes	2.5	B	1.67	B	39.8	N
C2-Naphthalenes	9.67		11.56		17.8	
C3-Naphthalenes	3.35		2.79		18.2	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	1.75	B	1.4	B	22.2	
Acenaphthylene	ND		ND		NA	
Acenaphthene	0.17	J	0.14	J	NA	
Fluorene	0.5	J	0.49	J	NA	
C1-Fluorenes	7.75		1.72		127.3	N
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	1.41	B	0.94	B	40.0	N
C1-Phenanthrenes/Anthracenes	1.28		1.01		23.6	
C2-Phenanthrenes/Anthracenes	2		1.53		26.6	
C3-Phenanthrenes/Anthracenes	1.58		1.36		15.0	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	0.16	J	0.11	J	NA	
C1-Dibenzothiophenes	0.48	J	ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	0.32	J	0.28	J	NA	
Pyrene	0.25	J	0.21	J	NA	
C1-Fluoranthenes/Pyrenes	ND		ND		NA	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		ND		NA	
Chrysene	0.45	J	0.43	J	NA	
C1-Chrysenes	0.79		0.91		14.1	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	ND		ND		NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	ND		ND		NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	0.64		0.53	J	18.8	
Indeno(1,2,3-cd)pyrene	ND		ND		NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	ND		0.18	J	NA	
Total PAH (ug/kg dry)	39.56		29.92			
Surrogate Recoveries (%)						
Naphthalene-d8	47		50			
Acenaphthene-d10	69		60			
Phenanthrene-d10	75		63			
Benzo(a)pyrene-d12	90		81			

Surrogate Corrected

]

Laboratory Batch Number	04-0469		04-0469		
Client ID	04-5(0)-01-PHC/MET-T-AN		04-5(0)-01-PHC/MET-T-AN		
Battelle ID	BSMP		QA Duplicate		
Collection Date	S3875-P		S3875DUP-P		
% Moisture	08/03/04		8/3/2004		
% Lipid	74.81		74.81		
Matrix	2.05		NA		
Sample Size	AMPHIPODS		AMPHIPODS		
Size Unit-Basis	5.15		5.13		
Units	UG/KG_DRY		UG/KG_DRY		RPD Qualifier
SHC:					
n-Nonane	7.14	J	8.5	J	NA
n-Decane	5.99	J	14.04	J	NA
n-Undecane	14.02	J	32.99	J	NA
n-Dodecane	13.88	J	16.28	J	NA
n-Tridecane	13.77	J	16.32	J	NA
Isoprenoid RRT 1380	3.81	J	3.76	J	NA
n-Tetradecane	26.37	J	23.6	J	NA
Isoprenoid RRT 1470	13.57	J	12.96	J	NA
n-Pentadecane	389.1		418.27		7.2
Norpristane (1650)	1.48	J	1.31	J	NA
n-Hexadecane	80.42	J	95.05	J	NA
n-Heptadecane	215.04		224.74		4.4
Pristane	22903.03		24078.84		5.0
n-Octadecane	21.05	J	20.11	J	NA
Phytane	8.22	J	7.79	J	NA
n-Nonadecane	22.44	J	19.48	J	NA
n-Eicosane	18.87	J	16.94	J	NA
n-Heneicosane	45.36	J	40.85	J	NA
n-Docosane	32.57	J	30.88	J	NA
n-Tricosane	73.67	J	72.35	J	NA
n-Tetracosane	37.41	J	33.94	J	NA
n-Pentacosane	73.51	J	66.67	J	NA
n-Hexacosane	34.11	J	31.73	J	NA
n-Heptacosane	52.79	J	52.62	J	NA
n-Octacosane	25.26	J	23.3	J	NA
n-Nonacosane	43.98	J	45.64	J	NA
n-Triacontane	30.33	J	30.42	J	NA
n-Hentriacontane	117.92		117.97		0.0
n-Dotriacontane	31.14	J	27.7	J	NA
n-Tritriacontane	29.92	J	26.96	J	NA
n-Tetratriacontane	18.97	J	15.98	J	NA
n-Pentatriacontane	17.97	J	12.64	J	NA
n-Hexatriacontane	13.5	J	8.24	J	NA
n-Heptatriacontane	9.49	J	6.54	J	NA
n-Octatriacontane	9.52	J	6.21	J	NA
n-Nonatriacontane	6.35	J	3.74	J	NA
n-Tetracontane	9.57	J	2	J	NA
SHC(total)	44950.98	B	37172.47	B	18.9
Surrogate Recoveries (%)					
n-Tetracosane-d50	63		57		
5a-androstane	63		59		
S/T:					
C23 diterpane (T4)	0.33	J	0.34	J	NA
C29 tricyclictriterpane (T9)		ND		ND	NA
C29 tricyclictriterpane (T10)		ND		ND	NA
18a(H)-22,29,30-trisnorhopane -TS (T11)		ND		ND	NA
17a(H)-22,29,30-trisnorhopane -TM (T12)		ND		ND	NA
17a(H),21b(H)-30-norhopane (T15)	0.92	J	1	J	NA
18a(H)-oleanane (T18)		ND		ND	NA
17a(H),21b(H)-hopane (T19)	1.1	J	1.06	J	NA
22S-17a(H),21b(H)-30-homohopane (T21)	0.62	J	0.68	J	NA
22R-17a(H),21b(H)-30-homohopane (T22)	0.81	J	0.79	J	NA
13b,17a-diacholestane-20S (S4)		ND		ND	NA
13b,17a-diacholestane-20R (S5)		ND		ND	NA
5a,14a,17a,24-methylcholestane-20R (S24)		ND		ND	NA
5a,14a,17a,24-ethylcholestane-20S (S25)		ND		ND	NA
5a,14a,17a,24-ethylcholestane-20R (S28)		ND		ND	NA
S28a					
Surrogate Recoveries (%)					
5b(H)-Cholane	106		98		

Surrogate Corrected

]

Laboratory Batch Number	04-0469			
Client ID	GG08: North Slope Crude			
Battelle ID	BF709NSC-P			
Collection Date	01/12/05			
% Moisture	NA			
% Lipid	NA			
Matrix	TISSUE			
Sample Size	5.07			
Size Unit-Basis	G_OIL			
Units	UG/KG_OIL		Target	% Difference Qualifier
PAH:				
Naphthalene	764.37		714.43	7.0
C1-Naphthalenes	1393.73		1534.53	9.2
C2-Naphthalenes	1732.04		1897.27	8.7
C3-Naphthalenes	1233.82		1436.53	14.1
C4-Naphthalenes	727.75		773.42	5.9
Biphenyl	205.84		216.49	4.9
Acenaphthylene		ND		
Acenaphthene	14.19			
Fluorene	89.03		87.56	1.7
C1-Fluorenes	220.15		219.89	0.1
C2-Fluorenes	337.91		341.20	1.0
C3-Fluorenes	292.31		299.61	2.4
Anthracene		ND		
Phenanthrene	292.4		272.58	7.3
C1-Phenanthrenes/Anthracenes	597.96		564.81	5.9
C2-Phenanthrenes/Anthracenes	673.94		660.43	2.0
C3-Phenanthrenes/Anthracenes	485.65		448.76	8.2
C4-Phenanthrenes/Anthracenes	221.45		176.00	25.8
Dibenzothiophene	244.78		218.80	11.9
C1-Dibenzothiophenes	455.67		434.54	4.9
C2-Dibenzothiophenes	614.54		551.44	11.4
C3-Dibenzothiophenes	547.89		460.96	18.9
Fluoranthene		ND		
Pyrene	17.3			
C1-Fluoranthenes/Pyrenes	94.84		78.43	20.9
C2-Fluoranthenes/Pyrenes	171.34		132.93	28.9
C3-Fluoranthenes/Pyrenes	182.37		151.73	20.2
Benzo(a)anthracene		ND		
Chrysene	62.52		50.99	22.6
C1-Chrysenes	100.9		81.69	23.5
C2-Chrysenes	120.17		95.93	25.3
C3-Chrysenes	106.83		89.87	18.9
C4-Chrysenes	72.35		76.33	5.2
Benzo(b)fluoranthene	7.37			
Benzo(k)fluoranthene		ND		
Benzo(e)pyrene	13.84			
Benzo(a)pyrene	1.33			
Perylene		ND		
Indeno(1,2,3-cd)pyrene		ND		
Dibenz(a,h)anthracene	1.39			
Benzo(g,h,i)perylene	4.05			
Total PAH (ug/kg dry)	12102.02			
Surrogate Recoveries (%)				
Naphthalene-d8	83			
Acenaphthene-d10	95			
Phenanthrene-d10	89			
Benzo(a)pyrene-d12	106			

Surrogate Corrected

]

Laboratory Batch Number	04-0469				
Client ID	GG08: North Slope Crude				
Battelle ID	BF709NSC-P				
Collection Date	01/12/05				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size	5.07				
Size Unit-Basis	G_OIL				
Units	UG/KG_OIL		Target	% Difference	Qualifier
SHC:					
n-Nonane	4200.81		4621.98	9.1	
n-Decane	4395.86		4361.84	0.8	
n-Undecane	4156.36		4367.26	4.8	
n-Dodecane	4024.79		4220.03	4.6	
n-Tridecane	3683.93		4074.35	9.6	
Isoprenoid RRT 1380	936.33		1013.69	7.6	
n-Tetradecane	3501.97		3868.35	9.5	
Isoprenoid RRT 1470	1228.67		1474.33	16.7	
n-Pentadecane	3784.92		3867.48	2.1	
Norpristane (1650)	1008.23		1065.49	5.4	
n-Hexadecane	3195.23		3699.97	13.6	
n-Heptadecane	2587.41		3042.58	15.0	
Pristane	2243.18		2313.50	3.0	
n-Octadecane	2390.34		2772.62	13.8	
Phytane	1655.57		1507.37	9.8	
n-Nonadecane	2426.49		2470.80	1.8	
n-Eicosane	2537.66		2502.77	1.4	
n-Heneicosane	2199.97		2189.60	0.5	
n-Docosane	1977.91		2153.99	8.2	
n-Tricosane	1805.37		2007.15	10.1	
n-Tetracosane	1691.75		2059.31	17.8	
n-Pentacosane	1686.78		1662.92	1.4	
n-Hexacosane	1353.98		1485.96	8.9	
n-Heptacosane	1041.06		1154.00	9.8	
n-Octacosane	781.79		972.83	19.6	
n-Nonacosane	689.63		859.52	19.8	
n-Triacontane	582.04		618.93	6.0	
n-Hentriacontane	475.27		588.39	19.2	
n-Dotriacontane	442.37		424.08	4.3	
n-Tritriacontane	426.24		401.62	6.1	
n-Tetratriacontane	416.1		342.44	21.5	
n-Pentatriacontane	347.18		344.76	0.7	
n-Hexatriacontane	185.43	J	217.69	14.8	
n-Heptatriacontane	184.74	J	187.40	1.4	
n-Octatriacontane	228.73		196.72	16.3	
n-Nonatriacontane	135.88	J	135.00	0.7	
n-Tetracontane	139.92	J	152.10	8.0	
SHC(total)	545244.67		671799.11	18.8	
Surrogate Recoveries (%)					
n-Tetracosane-d50	81				
5a-androstane	86				
S/T:					
C23 diterpane (T4)	49.05				
C29 tricyclictriterpane (T9)	15.79				
C29 tricyclictriterpane (T10)	15.87				
18a(H)-22,29,30-trisnorhopane -TS (T11)	18.85				
17a(H)-22,29,30-trisnorhopane -TM (T12)	25.94				
17a(H),21b(H)-30-norhopane (T15)	69.25				
18a(H)-oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)	123.15		171.67	28.3	
22S-17a(H),21b(H)-30-homohopane (T21)	61.96				
22R-17a(H),21b(H)-30-homohopane (T22)	41.63				
13b,17a-diacholestane-20S (S4)	50.41				
13b,17a-diacholestane-20R (S5)	30.02				
5a,14a,17a,24-methylcholestane-20R (S24)	38.95				
5a,14a,17a,24-ethylcholestane-20S (S25)	41.7				
5a,14a,17a,24-ethylcholestane-20R (S28)	44.95				
S28a					
Surrogate Recoveries (%)	132	N			
5b(H)-Cholane					

Surrogate Corrected

]

Laboratory Batch Number	04-0469	
	GG09: NorthSTAR Control Oil-	
Client ID	cANIMIDA	
Battelle ID	BF710CO-P	
Collection Date	01/12/05	
% Moisture	NA	
% Lipid	NA	
Matrix	TISSUE	
Sample Size	5.00	
Size Unit-Basis	G_OIL	
Units	UG/KG_OIL	
PAH:		
Naphthalene	1002.16	
C1-Naphthalenes	1935.98	
C2-Naphthalenes	2387.67	
C3-Naphthalenes	1573.17	
C4-Naphthalenes	776.08	
Biphenyl	328.41	
Acenaphthylene		ND
Acenaphthene	17.76	
Fluorene	149.41	
C1-Fluorenes	274.51	
C2-Fluorenes	331.77	
C3-Fluorenes	268.35	
Anthracene		ND
Phenanthrene	335.29	
C1-Phenanthrenes/Anthracenes	661.71	
C2-Phenanthrenes/Anthracenes	677.99	
C3-Phenanthrenes/Anthracenes	462.5	
C4-Phenanthrenes/Anthracenes	174.96	
Dibenzothiophene	88.12	
C1-Dibenzothiophenes	184.35	
C2-Dibenzothiophenes	203.64	
C3-Dibenzothiophenes	136.04	
Fluoranthene		ND
Pyrene	21.13	
C1-Fluoranthenes/Pyrenes	103.13	
C2-Fluoranthenes/Pyrenes	159.83	
C3-Fluoranthenes/Pyrenes	173.61	
Benzo(a)anthracene		ND
Chrysene	52.23	
C1-Chrysenes	91.59	
C2-Chrysenes	116.34	
C3-Chrysenes	96.4	
C4-Chrysenes	59.55	
Benzo(b)fluoranthene	4.78	
Benzo(k)fluoranthene		ND
Benzo(e)pyrene	12.86	
Benzo(a)pyrene	1.29	
Perylene		ND
Indeno(1,2,3-cd)pyrene		ND
Dibenz(a,h)anthracene	0.98	J
Benzo(g,h,i)perylene	1.42	
Total PAH (ug/kg dry)	12865.01	
Surrogate Recoveries (%)		
Naphthalene-d8	86	
Acenaphthene-d10	100	
Phenanthrene-d10	91	
Benzo(a)pyrene-d12	104	

Surrogate Corrected

]

Laboratory Batch Number	04-0469	
	GG09: NorthSTAR Control Oil-	
Client ID	cANIMIDA	
Battelle ID	BF710CO-P	
Collection Date	01/12/05	
% Moisture	NA	
% Lipid	NA	
Matrix	TISSUE	
Sample Size	5.00	
Size Unit-Basis	G_OIL	
Units	UG/KG_OIL	
SHC:		
n-Nonane	11028.21	
n-Decane	10991.27	
n-Undecane	9849.56	
n-Dodecane	8477.26	
n-Tridecane	7660.1	
Isoprenoid RRT 1380	1700.05	
n-Tetradecane	7046.48	
Isoprenoid RRT 1470	2726.3	
n-Pentadecane	7468.77	
Norpristane (1650)	2115.77	
n-Hexadecane	5936.92	
n-Heptadecane	4696.94	
Pristane	4001.8	
n-Octadecane	4135.42	
Phytane	2506.83	
n-Nonadecane	3886.04	
n-Eicosane	3671.57	
n-Heneicosane	3082.68	
n-Docosane	2789.25	
n-Tricosane	2465.36	
n-Tetracosane	2286.99	
n-Pentacosane	2250.93	
n-Hexacosane	1641.83	
n-Heptacosane	1485.43	
n-Octacosane	1079.98	
n-Nonacosane	1020.28	
n-Triacontane	905.63	
n-Hentriacontane	785.77	
n-Dotriacontane	546.92	
n-Tritriacontane	476.16	
n-Tetratriacontane	365.97	
n-Pentatriacontane	294.78	
n-Hexatriacontane	168.76	J
n-Heptatriacontane	171.05	J
n-Octatriacontane	248.4	
n-Nonatriacontane	92.45	J
n-Tetracontane	70.86	J
SHC(total)	559936.89	
Surrogate Recoveries (%)		
n-Tetracosane-d50	82	
5a-androstane	83	
S/T:		
C23 diterpane (T4)	32.87	
C29 tricyclictriterpane (T9)	17.16	
C29 tricyclictriterpane (T10)	17.72	
18a(H)-22,29,30-trisnorhopane -TS (T11)	8.26	
17a(H)-22,29,30-trisnorhopane -TM (T12)	6.24	
17a(H),21b(H)-30-norhopane (T15)	16.07	
18a(H)-oleanane (T18)		ND
17a(H),21b(H)-hopane (T19)	42.84	
22S-17a(H),21b(H)-30-homohopane (T21)	32.69	
22R-17a(H),21b(H)-30-homohopane (T22)	12.39	
13b,17a-diacholestane-20S (S4)	48.83	
13b,17a-diacholestane-20R (S5)	30.85	
5a,14a,17a,24-methylcholestane-20R (S24)	12.59	
5a,14a,17a,24-ethylcholestane-20S (S25)	19.52	
5a,14a,17a,24-ethylcholestane-20R (S28)	18.91	
S28a		
Surrogate Recoveries (%)	128	N
5b(H)-Cholane		

Surrogate Corrected

]

2005 Indigenous Biota Tissue Hydrocarbon Data

This page left intentionally blank.

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329	05-0329	05-0329	05-0329
Client ID	02-5H-01-PHC-T-AS	02-5F-01-PHC-T	05-3A-01-PHC-T-AS	05-1E-01-PHC-T-CY
Location			BSMP	BSMP
Battelle ID	S8759-P	S8766-P	S8863-P	S9170-P
Collection Date	09/07/05	08/07/02	07/30/05	08/07/05
% Moisture	88.73	47.4	85.36	80.32
% Lipid	1.23	1.35	1.76	2.77
Matrix	TISSUE	TISSUE	CLAMS	CLAMS
Sample Size (g dry)	0.71	7.30	2.23	3.06
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	6.55	2.59 BT	2.16 B	2.06 B
C1-Naphthalenes	4.16	1.98 T	2.01	ND
C2-Naphthalenes	ND	2.69 T	4.17	ND
C3-Naphthalenes	ND	2.97 T	5.72	ND
C4-Naphthalenes	ND	2.26 T	ND	ND
Biphenyl	4.81	0.71 T	1.54	1.66
Acenaphthylene	ND	NDT	ND	ND
Acenaphthene	ND	NDT	ND	ND
Fluorene	ND	0.4 T	ND	1.74
C1-Fluorenes	ND	1.4 T	ND	ND
C2-Fluorenes	ND	2.21 T	ND	ND
C3-Fluorenes	ND	NDT	ND	ND
Anthracene	ND	NDT	ND	ND
Phenanthrene	6.25	1.88 T	2.3	3.2
C1-Phenanthrenes/Anthracenes	6.32	3.29 T	2.77	2.25
C2-Phenanthrenes/Anthracenes	12.18	3.13 T	5.2	3.55
C3-Phenanthrenes/Anthracenes	ND	3.91 T	4.33	2.6
C4-Phenanthrenes/Anthracenes	ND	NDT	ND	ND
Dibenzothiophene	ND	0.22 JT	ND	ND
C1-Dibenzothiophenes	ND	0.7 T	ND	ND
C2-Dibenzothiophenes	ND	1.66 T	ND	ND
C3-Dibenzothiophenes	ND	1.24 T	ND	ND
Fluoranthene	ND	0.76 T	ND	0.53 J
Pyrene	1.6 J	0.83 T	0.4 J	0.37 J
C1-Fluoranthenes/Pyrenes	ND	2.71 T	ND	ND
C2-Fluoranthenes/Pyrenes	ND	2.19 T	ND	ND
C3-Fluoranthenes/Pyrenes	ND	NDT	ND	ND
Benzo(a)anthracene	ND	0.34 JT	ND	ND
Chrysene	3.16 J	1.91 T	2.36	1.33
C1-Chrysenes	ND	1.71 T	2.69	ND
C2-Chrysenes	ND	2.46 T	ND	ND
C3-Chrysenes	ND	NDT	ND	ND
C4-Chrysenes	ND	NDT	ND	ND
Benzo(b)fluoranthene	ND	0.5 T	ND	ND
Benzo(k)fluoranthene	ND	NDT	ND	ND
Benzo(e)pyrene	ND	0.75 T	1.1 J	ND
Benzo(a)pyrene	ND	NDT	ND	ND
Perylene	5.04	5.75 T	4.89	2.47
Indeno(1,2,3-cd)pyrene	ND	NDT	ND	ND
Dibenz(a,h)anthracene	ND	NDT	ND	ND
Benzo(g,h,i)perylene	ND	0.32 JT	0.61 J	ND
Total PAH (ug/kg dry)	50.07	53.47	42.25	21.76
Surrogate Recoveries (%)				
Naphthalene-d8	40	58	67	66
Acenaphthene-d10	42	62	67	69
Phenanthrene-d10	58	80	72	78
Benzo(a)pyrene-d12	64	96	104	106

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329		05-0329		05-0329		05-0329	
Client ID	02-5H-01-PHC-T-AS		02-5F-01-PHC-T		05-3A-01-PHC-T-AS		05-1E-01-PHC-T-CY	
Location					BSMP		BSMP	
Battelle ID	S8759-P		S8766-P		S8863-P		S9170-P	
Collection Date	09/07/05		08/07/02		07/30/05		08/07/05	
% Moisture	88.73		47.4		85.36		80.32	
% Lipid	1.23		1.35		1.76		2.77	
Matrix	TISSUE		TISSUE		CLAMS		CLAMS	
Sample Size (g dry)	0.71		7.30		2.23		3.06	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
SHC:								
n-Nonane	296.63	J	24.99	JT	86.19	J	78.16	J
n-Decane	15.12	J	10.04	JT	20.98	J	ND	
n-Undecane	ND		25.59	JT	45.4	J	197.23	
n-Dodecane	ND		36.45	JT	ND		27.95	J
n-Tridecane	ND		21.41	JT	ND		ND	
Isoprenoid RRT 1380	139.52	J	2.83	JT	3.48	J	25.21	J
n-Tetradecane	85.24	J	11.67	JT	ND		21.14	J
Isoprenoid RRT 1470	842.44		79.22	T	245.64		289.98	
n-Pentadecane	179.27	J	18.88	JT	75.12	J	11.53	J
n-Hexadecane	146.77	J	30.01	JT	44.84	J	ND	
Norpristane (1650)	ND		NDT		ND		ND	
n-Heptadecane	219.61	J	27.7	JT	62.14	J	130.81	J
Pristane	93.61	J	13.24	JT	55.62	J	1159.37	
n-Octadecane	128.05	J	20.46	JT	15.7	J	8.61	J
Phytane	ND		4.19	JT	4.26	J	2.96	J
n-Nonadecane	67.24	J	11.67	JT	20.1	J	9.8	J
n-Eicosane	44.4	J	10.57	JT	6.84	J	8.54	J
n-Heneicosane	34.87	J	17.82	JT	14.07	J	16.32	J
n-Docosane	95.96	J	15.55	JT	13.48	J	13.91	J
n-Tricosane	315.62	J	47.45	JT	46.24	J	38.28	J
n-Tetracosane	548.83	J	15.74	JT	16.59	J	15.81	J
n-Pentacosane	938.73		44.17	JT	35.14	J	23.83	J
n-Hexacosane	1039.33		13.96	JT	14.79	J	12.62	J
n-Heptacosane	1183.22		66.35	JT	53.68	J	26	J
n-Octacosane	1250.83		13.31	JT	15.42	J	34.91	J
n-Nonacosane	1418.18		47.67	JT	48.92	J	25.52	J
n-Triacontane	874.8		7.26	JT	11	J	9.9	J
n-Hentriacontane	687.71	J	39.82	JT	41.62	J	25.77	J
n-Dotriacontane	422.83	J	4.55	JT	7.95	J	ND	
n-Tritriacontane	246.51	J	13.45	JT	15.03	J	8.31	J
n-Tetratriacontane	94.73	J	1.88	JT	4.37	J	2.96	J
n-Pentatriacontane	35.96	J	1.72	JT	2.1	J	2.72	J
n-Hexatriacontane	17.74	J	NDT		ND		ND	
n-Heptatriacontane	ND		NDT		2.44	J	ND	
n-Octatriacontane	ND		NDT		ND		ND	
n-Nonatriacontane	ND		NDT		ND		ND	
n-Tetracontane	ND		NDT		ND		ND	
Total SHC	ND		NDT		ND		10580.5	
Surrogate Recoveries (%)								
5a-androstane	87		92		80		90	
n-Tetracosane-d50	89		94		82		91	
S/T:								
C23 diterpane (T4)	ND		NDT		ND		ND	
C29 Tricyclictrierpane (T9)	ND		NDT		ND		ND	
C29 Tricyclictriterpane (T10)	ND		NDT		ND		ND	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND		NDT		ND		ND	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND		NDT		ND		ND	
17a(H),21b(H)-30-Norhopane (T15)	ND		NDT		ND		5.16	
18a(H)-Oleanane (T18)	ND		NDT		ND		ND	
17a(H),21b(H)-hopane (T19)	ND		NDT		ND		ND	
22S-17a(H),21b(H)-30-homohopane (T21)	ND		NDT		ND		ND	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		NDT		ND		ND	
13b,17a-Diacholestane-20S (S4)	ND		NDT		ND		ND	
13b,17a-Diacholestane-20R (S5)	ND		NDT		ND		ND	
5a,14a,17a-methylcholestane-20R (S24)	ND		NDT		ND		ND	
5a,14a,17a-Ethylcholestane-20S (S25)	ND		NDT		ND		ND	
5a,14a,17a-Ethylcholestane-20R (S28)	ND		NDT		ND		ND	
S28a	ND		NDT		ND		ND	
Surrogate Recoveries (%)								
5b(H)-Cholane	110		115		103		118	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329	05-0330	05-0330	05-0330
Client ID	05-5(1)-01-PHC-T-AS	05-4A-01-PHC-T-AN	05-E01-01-PHC-T-AN	05-BP01-01-PHC-T-AN
Location	BSMP	BSMP	Other	Blouder Patch
Battelle ID	S9225-P	S8864-P	S8867-P	S8868-P
Collection Date	08/09/05	07/31/05	08/02/05	08/02/05
% Moisture	84.78	80.71	75.4	79.89
% Lipid	2.79	1.87	3.62	4.15
Matrix	CLAMS	AMPHIPODS	AMPHIPODS	AMPHIPODS
Sample Size (g dry)	2.43	2.90	3.81	3.02
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	1.88 B	2.62 B	2.97 B	8.81
C1-Naphthalenes	1.58	1.73 B	1.97 B	5.55
C2-Naphthalenes	3.55	ND	ND	8.75
C3-Naphthalenes	5.32	ND	ND	4.41
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	1.17	1.38 B	1.22 B	1.82 B
Acenaphthylene	ND	ND	ND	0.4 J
Acenaphthene	ND	ND	ND	1.14
Fluorene	0.77 J	0.54 J	0.55 J	1.95
C1-Fluorenes	1.99	2.6	ND	ND
C2-Fluorenes	4.86	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	2.06	2.44 B	2.11 B	3.61 B
C1-Phenanthrenes/Anthracenes	2.93	1.51	1.35	ND
C2-Phenanthrenes/Anthracenes	4.98	ND	6.53	ND
C3-Phenanthrenes/Anthracenes	3.99	ND	3.61	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.62 J	0.48 J	0.46 J	0.91 B
Pyrene	0.77 J	0.44 J	0.45 J	0.88
C1-Fluoranthenes/Pyrenes	2.69	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	2.35	ND	1.81	ND
C1-Chrysenes	2.34	ND	2.42	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	0.73 J	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	0.99 J	ND	0.16 J	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	5.63	ND	3.84	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	0.4 J	0.36 J	0.46 J
Total PAH (ug/kg dry)	51.2	14.14	29.81	38.69
Surrogate Recoveries (%)				
Naphthalene-d8	68	72	64	68
Acenaphthene-d10	73	75	70	68
Phenanthrene-d10	81	82	79	80
Benzo(a)pyrene-d12	85	88	84	82

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329	05-0330	05-0330	05-0330
Client ID	05-5(1)-01-PHC-T-AS	05-4A-01-PHC-T-AN	05-E01-01-PHC-T-AN	05-BP01-01-PHC-T-AN
Location	BSMP	BSMP	Other	Blouder Patch
Battelle ID	S9225-P	S8864-P	S8867-P	S8868-P
Collection Date	08/09/05	07/31/05	08/02/05	08/02/05
% Moisture	84.78	80.71	75.4	79.89
% Lipid	2.79	1.87	3.62	4.15
Matrix	CLAMS	AMPHIPODS	AMPHIPODS	AMPHIPODS
Sample Size (g dry)	2.43	2.90	3.81	3.02
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	73.17 J	69.51 J	46.9 J	69.47 J
n-Decane	2.34 J	16.07 J	19.27 J	21.28 J
n-Undecane	ND	70.93 J	83.33 J	84.96 J
n-Dodecane	ND	10.3 J	14.07 J	14.6 J
n-Tridecane	ND	9.91 J	9.95 J	9.14 J
Isoprenoid RRT 1380	20.72 J	3.49 J	22.8 J	4.16 J
n-Tetradecane	33.97 J	49.41 J	51.77 J	63.87 J
Isoprenoid RRT 1470	251.53	170.7 J	115.86 J	188.01
n-Pentadecane	59.54 J	966.11	421.13	873.36
n-Hexadecane	41.12 J	141.69 J	98.26 J	133.42 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	47.81 J	416.95	222.23	571.8
Pristane	85.8 J	41621.31	23228.27	57413.65
n-Octadecane	11.77 J	31.64 J	16.39 J	34.72 J
Phytane	6.79 J	9.02 J	15.34 J	9.84 J
n-Nonadecane	23.99 J	31.44 J	23.18 J	34.27 J
n-Eicosane	8.7 J	13.77 J	17.17 J	14.47 J
n-Heneicosane	25.62 J	51.87 J	93.2 J	55.64 J
n-Docosane	26.37 J	22.69 J	85.74 J	26.02 J
n-Tricosane	63.48 J	47.25 J	236.51	65.81 J
n-Tetracosane	35.24 J	22.45 J	61.01 J	38.19 J
n-Pentacosane	51.76 J	55.47 J	102.72 J	75.71 J
n-Hexacosane	24.56 J	24.29 J	25.46 J	35.04 J
n-Heptacosane	87.97 J	44.47 J	63.97 J	55.18 J
n-Octacosane	27.6 J	23.56 J	18.31 J	39.58 J
n-Nonacosane	83.51 J	34.99 J	33.15 J	46.51 J
n-Triacontane	27.62 J	19.69 J	15.16 J	33.79 J
n-Hentriacontane	71.91 J	28.47 J	29.35 J	16.32 J
n-Dotriacontane	16.71 J	16.4 J	13.48 J	5.96 J
n-Tritriacontane	28.93 J	13.14 J	ND	20.28 J
n-Tetratriacontane	9.54 J	9.66 J	ND	16.79 J
n-Pentatriacontane	6.15 J	6.73 J	ND	12.7 J
n-Hexatriacontane	6.63 J	5.94 J	ND	9.07 J
n-Heptatriacontane	5.07 J	ND	ND	5.54 J
n-Octatriacontane	7.37 J	ND	ND	6.17 J
n-Nonatriacontane	ND	ND	ND	5.32 J
n-Tetracontane	ND	ND	ND	6.36 J
Total SHC	ND	51106.04	32201.03	67119.92
Surrogate Recoveries (%)				
5a-androstane	85	87	87	82
n-Tetracosane-d50	87	88	88	82
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	1.52	1.82
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	1.42	2.89
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	0.77 J	0.51 J	1.31 J
13b,17a-Diacholestane-20R (S5)	ND	ND	0.38 J	0.75 J
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	0.38 J	0.64 J
S28a	ND	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	102	77	75	76

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330		05-0330		05-0330		05-0330	
Client ID	05-1C-01-PHC-T-AN		05-5(1)-01-PHC-T-AN		05-N03-01-PHC-T-AN		05-N18-01-PHC-T-AN	
Location	BSMP		BSMP		NorthStar		NorthStar	
Battelle ID	S9168-P		S9239-P		S9240-P		S9241-P	
Collection Date	08/08/05		08/11/05		08/11/05		08/11/05	
% Moisture	76.91		77.99		76.71		74.35	
% Lipid	3.54		1.82		2.77		2.81	
Matrix	AMPHIPODS		AMPHIPODS		AMPHIPODS		AMPHIPODS	
Sample Size (g dry)	3.49		0.88		3.58		3.92	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:								
Naphthalene	4.22	B	7.38	B	4.5	B	2.71	B
C1-Naphthalenes	2.31	B	3.76		2.48	B	1.79	B
C2-Naphthalenes	11.13		ND		6.5		ND	
C3-Naphthalenes	3.01		ND		2.85		ND	
C4-Naphthalenes	ND		ND		ND		ND	
Biphenyl	1.25	B	3.91		1.22	B	1.06	B
Acenaphthylene	ND		ND		ND		ND	
Acenaphthene	0.54	J	0.59	J	0.46	J	ND	
Fluorene	0.81		1.17	J	0.46	J	0.45	J
C1-Fluorenes	ND		3.37		ND		ND	
C2-Fluorenes	ND		ND		ND		ND	
C3-Fluorenes	ND		ND		ND		ND	
Anthracene	ND		ND		ND		ND	
Phenanthrene	2.15	B	7.26		2.1	B	1.61	B
C1-Phenanthrenes/Anthracenes	1.29		2.95		1.61		ND	
C2-Phenanthrenes/Anthracenes	ND		ND		ND		ND	
C3-Phenanthrenes/Anthracenes	ND		ND		ND		ND	
C4-Phenanthrenes/Anthracenes	ND		ND		ND		ND	
Dibenzothiophene	ND		ND		ND		ND	
C1-Dibenzothiophenes	ND		ND		ND		ND	
C2-Dibenzothiophenes	ND		ND		ND		ND	
C3-Dibenzothiophenes	ND		ND		ND		ND	
Fluoranthene	0.5	J	1.51		0.37	J	0.3	J
Pyrene	0.33	J	0.98	J	0.31	J	0.2	J
C1-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
C2-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
C3-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
Benzo(a)anthracene	0.15	J	ND		ND		ND	
Chrysene	0.64	J	ND		ND		0.49	J
C1-Chrysenes	ND		ND		ND		ND	
C2-Chrysenes	ND		ND		ND		ND	
C3-Chrysenes	ND		ND		ND		ND	
C4-Chrysenes	ND		ND		ND		ND	
Benzo(b)fluoranthene	ND		ND		ND		ND	
Benzo(k)fluoranthene	ND		ND		ND		ND	
Benzo(e)pyrene	ND		ND		ND		ND	
Benzo(a)pyrene	ND		ND		ND		ND	
Perylene	ND		ND		0.99		ND	
Indeno(1,2,3-cd)pyrene	ND		ND		ND		ND	
Dibenz(a,h)anthracene	ND		ND		ND		ND	
Benzo(g,h,i)perylene	0.41	J	0.99	J	0.25	J	0.31	J
Total PAH (ug/kg dry)	28.74		33.87		24.1		8.92	
Surrogate Recoveries (%)								
Naphthalene-d8	74		66		74		70	
Acenaphthene-d10	78		68		77		71	
Phenanthrene-d10	83		72		84		79	
Benzo(a)pyrene-d12	87		84		87		81	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330	05-0330	05-0330	05-0330
Client ID	05-1C-01-PHC-T-AN	05-5(1)-01-PHC-T-AN	05-N03-01-PHC-T-AN	05-N18-01-PHC-T-AN
Location	BSMP	BSMP	NorthStar	NorthStar
Battelle ID	S9168-P	S9239-P	S9240-P	S9241-P
Collection Date	08/08/05	08/11/05	08/11/05	08/11/05
% Moisture	76.91	77.99	76.71	74.35
% Lipid	3.54	1.82	2.77	2.81
Matrix	AMPHIPODS	AMPHIPODS	AMPHIPODS	AMPHIPODS
Sample Size (g dry)	3.49	0.88	3.58	3.92
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	61.67 J	165.27 J	45.74 J	55.44 J
n-Decane	14.32 J	42.66 J	19.52 J	14.24 J
n-Undecane	52.81 J	164.91 J	85.84 J	60.14 J
n-Dodecane	8.55 J	30.38 J	7.75 J	6.11 J
n-Tridecane	4.85 J	ND	3.71 J	6.27 J
Isoprenoid RRT 1380	6.47 J	ND	5.78 J	4.59 J
n-Tetradecane	45.44 J	76.08 J	53.9 J	23.48 J
Isoprenoid RRT 1470	157.69	282.96 J	145.62	139.64
n-Pentadecane	557.65	344.38 J	717.79	173.25
n-Hexadecane	102.66 J	171.83 J	118.04 J	103.03 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	310.5	337.1 J	280.08	64.46 J
Pristane	30977.3	7536.85	21385.52	21894.43
n-Octadecane	26.7 J	31.03 J	19.49 J	8.73 J
Phytane	7.5 J	17.91 J	8.46 J	6.35 J
n-Nonadecane	26.09 J	27.49 J	21.44 J	9.53 J
n-Eicosane	12.49 J	25.87 J	14.89 J	7.16 J
n-Heneicosane	68.46 J	53.02 J	59.11 J	44.82 J
n-Docosane	45.88 J	48.45 J	38.34 J	36.01 J
n-Tricosane	97.98 J	139.05 J	105.62 J	97.7 J
n-Tetracosane	35.05 J	50.55 J	37.02 J	32.24 J
n-Pentacosane	50.46 J	126.37 J	73.61 J	72.88 J
n-Hexacosane	19.31 J	56.75 J	20.86 J	18.04 J
n-Heptacosane	30.94 J	99.78 J	38.92 J	35.2 J
n-Octacosane	22.48 J	94.96 J	19.06 J	13.67 J
n-Nonacosane	29.88 J	149.79 J	26.88 J	16.47 J
n-Triacontane	18.12 J	92.7 J	13.04 J	8.75 J
n-Hentriacontane	26.08 J	129.15 J	23.27 J	17.05 J
n-Dotriacontane	15.05 J	80.24 J	11.48 J	8.83 J
n-Tritriacontane	11.29 J	49.11 J	9.36 J	6.87 J
n-Tetratriacontane	8.11 J	29.25 J	8.68 J	6.57 J
n-Pentatriacontane	4.68 J	21.01 J	7.25 J	4.59 J
n-Hexatriacontane	4.36 J	12.08 J	4.4 J	3.47 J
n-Heptatriacontane	5.36 J	19.01 J	2.69 J	4.58 J
n-Octatriacontane	4.18 J	9.97 J	4.81 J	2.69 J
n-Nonatriacontane	3.24 J	10.67 J	4.98 J	2.43 J
n-Tetracontane	3.61 J	9.74 J	5.57 J	2.39 J
Total SHC	33425.36	15019.47	24284.45	23965.67
Surrogate Recoveries (%)				
5a-androstane	83	82	89	84
n-Tetracosane-d50	88	83	90	85
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	0.44 J	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	0.36 J	ND	0.37 J	ND
S28a	ND	ND	0.48 J	0.41 J
Surrogate Recoveries (%)				
5b(H)-Cholane	73	76	81	71

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330	05-0330	05-0330	05-0330
Client ID	05-N11-01-PHC-T-AN	05-4B-01-PHC-T-AN	05-BP01-02-PHC-T-AN	05-L08-01-PHC-T-ISO
Location	NorthStar	BSMP	Blouder Patch	Liberty
Battelle ID	S9246-P	S9248-P	S9251-P	S8865-P
Collection Date	08/11/05	08/12/05	08/12/05	08/01/05
% Moisture	77.92	79.32	82.95	82.89
% Lipid	1.95	2.52	3.41	1.89
Matrix	AMPHIPODS	AMPHIPODS	AMPHIPODS	ISOPODS
Sample Size (g dry)	3.32	3.21	2.41	2.65
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	2.34 B	3.26 B	10.27	3.78 B
C1-Naphthalenes	1.22 B	2.94	8.44	4.04
C2-Naphthalenes	ND	5.63	10.85	11.82
C3-Naphthalenes	ND	ND	6.08	8.1
C4-Naphthalenes	ND	ND	ND	5.75
Biphenyl	1.01 B	1.36 B	2.2 B	1.94 B
Acenaphthylene	ND	ND	0.56 J	0.39 J
Acenaphthene	0.27 J	ND	1.01 J	0.38 J
Fluorene	0.32 J	0.64 J	2.2	0.94 J
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	1.48 B	1.99 B	4.36 B	4.59 B
C1-Phenanthrenes/Anthracenes	ND	0.9	2.18	3.96
C2-Phenanthrenes/Anthracenes	ND	ND	ND	9.78
C3-Phenanthrenes/Anthracenes	ND	ND	ND	3.01
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	0.49 J
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.43 J	0.42 J	0.74 J	1.17 B
Pyrene	0.43 J	0.38 J	0.84 J	1.13
C1-Fluoranthenes/Pyrenes	ND	ND	ND	1.62
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	0.29 J
Chrysene	0.45 J	ND	ND	1.49
C1-Chrysenes	ND	ND	ND	2.02
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	0.85 J
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	4.52
Indeno(1,2,3-cd)pyrene	ND	ND	ND	0.39 J
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.3 J	0.18 J	0.23 J	1.12
Total PAH (ug/kg dry)	8.25	17.7	49.96	73.57
Surrogate Recoveries (%)				
Naphthalene-d8	74	77	74	67
Acenaphthene-d10	76	79	76	71
Phenanthrene-d10	83	85	85	83
Benzo(a)pyrene-d12	93	83	94	92

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330	05-0330	05-0330	05-0330
Client ID	05-N11-01-PHC-T-AN	05-4B-01-PHC-T-AN	05-BP01-02-PHC-T-AN	05-L08-01-PHC-T-ISO
Location	NorthStar	BSMP	Blouder Patch	Liberty
Battelle ID	S9246-P	S9248-P	S9251-P	S8865-P
Collection Date	08/11/05	08/12/05	08/12/05	08/01/05
% Moisture	77.92	79.32	82.95	82.89
% Lipid	1.95	2.52	3.41	1.89
Matrix	AMPHIPODS	AMPHIPODS	AMPHIPODS	ISOPODS
Sample Size (g dry)	3.32	3.21	2.41	2.65
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	44.84 J	58.63 J	77.33 J	64.56 J
n-Decane	ND	8.81 J	17.05 J	22.7 J
n-Undecane	ND	30.67 J	65.39 J	51.92 J
n-Dodecane	ND	ND	21.46 J	18.81 J
n-Tridecane	ND	ND	7.59 J	15.07 J
Isoprenoid RRT 1380	4.21 J	4.11 J	ND	10.48 J
n-Tetradecane	26.71 J	25.52 J	65.83 J	54.76 J
Isoprenoid RRT 1470	174.17	147.79 J	230.24	203.7
n-Pentadecane	129.25 J	602.58	916.47	110.76 J
n-Hexadecane	115.5 J	98.82 J	180.81 J	148.59 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	58.13 J	163.24	347.7	68.57 J
Pristane	6514.75	18518.9	45739.95	1895.19
n-Octadecane	7.08 J	11.85 J	30.81 J	23.23 J
Phytane	6.66 J	6.12 J	9.85 J	23.6 J
n-Nonadecane	7.23 J	15.23 J	27.61 J	36.95 J
n-Eicosane	4.18 J	12.22 J	13.75 J	22.5 J
n-Heneicosane	22.21 J	44.27 J	51.33 J	80.91 J
n-Docosane	26.09 J	25.98 J	30.17 J	71.65 J
n-Tricosane	67.65 J	62.75 J	54.35 J	158.37 J
n-Tetracosane	21.44 J	25.8 J	45.47 J	91.57 J
n-Pentacosane	58.3 J	66.79 J	88.45 J	306.61
n-Hexacosane	19.1 J	19.7 J	49.89 J	89.85 J
n-Heptacosane	40.17 J	36.67 J	67.93 J	336.7
n-Octacosane	12.38 J	17.18 J	54.83 J	59.37 J
n-Nonacosane	20.11 J	23.28 J	59.13 J	172.67 J
n-Triacontane	10.48 J	14.73 J	41.61 J	56.93 J
n-Hentriacontane	18.34 J	24.19 J	47.35 J	147.68 J
n-Dotriacontane	9.08 J	13.42 J	33.59 J	ND
n-Tritriacontane	6.75 J	10.45 J	22.18 J	ND
n-Tetratriacontane	6.81 J	7.1 J	18.6 J	ND
n-Pentatriacontane	4.67 J	5.75 J	13.66 J	ND
n-Hexatriacontane	3.29 J	3.72 J	10.34 J	ND
n-Heptatriacontane	1.87 J	3.01 J	9.15 J	ND
n-Octatriacontane	2.48 J	3.17 J	7.56 J	ND
n-Nonatriacontane	2.42 J	4.21 J	6.74 J	ND
n-Tetracontane	1.53 J	3.99 J	6.48 J	ND
Total SHC	5171.18	19379.75	43858.75	33048.46
Surrogate Recoveries (%)				
5a-androstane	89	89	82	89
n-Tetracosane-d50	89	91	83	90
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	0.84 J
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	2.02
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	3.02	2.79
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	0.44 J	0.51 J	ND	1.12 J
13b,17a-Diacholestane-20R (S5)	ND	ND	ND	0.73 J
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	0.43 J
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	0.68 J
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	ND	0.83 J
S28a	ND	ND	ND	0.7 J
Surrogate Recoveries (%)				
5b(H)-Cholane	65	88	78	85

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330		05-0330		05-0330		05-0330	
Client ID	05-2F-01-PHC-T-ISO		05-1A-01-PHC-T-ISO		05-L07-01-PHC-T-ISO		05-4B-01-PHC-T-ISO	
Location	BSMP		BSMP		Liberty		BSMP	
Battelle ID	S9171-P		S9172-P		S9247-P		S9249-P	
Collection Date	08/07/05		08/08/05		08/12/05		08/12/05	
% Moisture	79.37		74.71		77.63		79.33	
% Lipid	1.73		3.68		2.35		2.52	
Matrix	ISOPODS		ISOPODS		ISOPODS		ISOPODS	
Sample Size (g dry)	1.36		2.13		3.43		1.45	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:								
Naphthalene	5.43	B	5.88	B	3.23	B	6.54	B
C1-Naphthalenes	4.56		4.14		2.9		4.93	
C2-Naphthalenes	9.46		9.25		10.75		9.99	
C3-Naphthalenes	6.7		5.12		4.57		6.31	
C4-Naphthalenes	3.44		ND		3.7		ND	
Biphenyl	3.17	B	2.32	B	1.36	B	3.4	B
Acenaphthylene	0.28	J	0.17	J	ND		ND	
Acenaphthene	0.49	J	0.47	J	0.29	J	0.66	J
Fluorene	0.91	J	0.84		0.62	J	0.86	J
C1-Fluorenes	ND		ND		ND		ND	
C2-Fluorenes	ND		ND		ND		ND	
C3-Fluorenes	ND		ND		ND		ND	
Anthracene	ND		ND		ND		ND	
Phenanthrene	6.9		5.58	B	3.18	B	6.26	B
C1-Phenanthrenes/Anthracenes	4.91		4.03		3.27		4.45	
C2-Phenanthrenes/Anthracenes	12.59		10.17		8.5		10.34	
C3-Phenanthrenes/Anthracenes	3.66		2.99		3.71		3.42	
C4-Phenanthrenes/Anthracenes	ND		ND		ND		ND	
Dibenzothiophene	ND		ND		ND		ND	
C1-Dibenzothiophenes	ND		ND		ND		ND	
C2-Dibenzothiophenes	ND		ND		ND		ND	
C3-Dibenzothiophenes	ND		ND		ND		ND	
Fluoranthene	1.46	B	1.4	B	0.52	J	0.97	B
Pyrene	1.53		1.38		0.55	J	1.03	
C1-Fluoranthenes/Pyrenes	2.7		2.49		1.64		2.37	
C2-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
C3-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
Benzo(a)anthracene	ND		0.25	J	ND		ND	
Chrysene	1.6		1.72		1.12		1.16	
C1-Chrysenes	1.67		2.01		ND		2.18	
C2-Chrysenes	ND		ND		ND		ND	
C3-Chrysenes	ND		ND		ND		ND	
C4-Chrysenes	ND		ND		ND		ND	
Benzo(b)fluoranthene	ND		ND		ND		ND	
Benzo(k)fluoranthene	ND		ND		ND		ND	
Benzo(e)pyrene	0.7	J	1.28		ND		ND	
Benzo(a)pyrene	ND		ND		ND		ND	
Perylene	5.31		7.53		5.2		5.04	
Indeno(1,2,3-cd)pyrene	ND		0.54	J	ND		ND	
Dibenz(a,h)anthracene	ND		ND		ND		ND	
Benzo(g,h,i)perylene	0.94	J	1.34		0.61	J	0.9	
Total PAH (ug/kg dry)	78.41		70.9		55.72		70.81	
Surrogate Recoveries (%)								
Naphthalene-d8	57		68		67		64	
Acenaphthene-d10	64		71		74		64	
Phenanthrene-d10	71		79		84		78	
Benzo(a)pyrene-d12	73		78		84		82	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330		05-0330		05-0330		05-0330	
Client ID	05-2F-01-PHC-T-ISO		05-1A-01-PHC-T-ISO		05-L07-01-PHC-T-ISO		05-4B-01-PHC-T-ISO	
Location	BSMP		BSMP		Liberty		BSMP	
Battelle ID	S9171-P		S9172-P		S9247-P		S9249-P	
Collection Date	08/07/05		08/08/05		08/12/05		08/12/05	
% Moisture	79.37		74.71		77.63		79.33	
% Lipid	1.73		3.68		2.35		2.52	
Matrix	ISOPODS		ISOPODS		ISOPODS		ISOPODS	
Sample Size (g dry)	1.36		2.13		3.43		1.45	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
SHC:								
n-Nonane	90.86	J	60.39	J	62.53	J	85.05	J
n-Decane	36.01	J	34.02	J	15.21	J	54.94	J
n-Undecane	187.72	J	161.95		50.17	J	230.1	
n-Dodecane	18.56	J	22.03	J	13.41	J	38.16	J
n-Tridecane	10.13	J	16.24	J	6.95	J	18.69	J
Isoprenoid RRT 1380	ND		7.53	J	2.31	J	ND	
n-Tetradecane	74.23	J	92.9	J	31.18	J	105.24	J
Isoprenoid RRT 1470	177.63	J	119.01	J	158.36		183.99	J
n-Pentadecane	135.38	J	290.54		291.65		154.59	J
n-Hexadecane	110.25	J	94.61	J	127.04	J	104.97	J
Norpristane (1650)	ND		ND		ND		ND	
n-Heptadecane	47.49	J	150.62		157.25		45.75	J
Pristane	1338.96		16963.78		11649.69		500.49	
n-Octadecane	23.36	J	36.63	J	20.4	J	21.88	J
Phytane	12.96	J	17.13	J	10.83	J	18.02	J
n-Nonadecane	23.5	J	56.27	J	24.83	J	24.21	J
n-Eicosane	21.42	J	48.16	J	18.5	J	26.79	J
n-Heneicosane	82.82	J	150.69		89.97	J	141.12	J
n-Docosane	46.68	J	107.16	J	72.12	J	114.61	J
n-Tricosane	25.99	J	245.44		188.19		227.1	
n-Tetracosane	52.28	J	90.78	J	95.54	J	79.21	J
n-Pentacosane	216.75	J	270.75		318.66		245.36	
n-Hexacosane	80.66	J	74.04	J	93.36	J	72.92	J
n-Heptacosane	308.98		302.75		389.79		309.03	
n-Octacosane	42.57	J	39.65	J	50.66	J	78.84	J
n-Nonacosane	153.58	J	190.04		197.25		223.07	
n-Triacontane	53.85	J	37.18	J	47.75	J	44.76	J
n-Hentriacontane	146.46	J	165.81		159.51		213.49	J
n-Dotriacontane	ND		ND		67.88	J	34.97	J
n-Tritriacontane	ND		44.26	J	44.71	J	56.44	J
n-Tetratriacontane	ND		86.35	J	ND		ND	
n-Pentatriacontane	ND		45.06	J	ND		ND	
n-Hexatriacontane	ND		ND		ND		ND	
n-Heptatriacontane	ND		ND		ND		ND	
n-Octatriacontane	ND		ND		ND		ND	
n-Nonatriacontane	ND		ND		ND		ND	
n-Tetracontane	ND		ND		ND		ND	
Total SHC	21011.07		38762.77		27784		17752.44	
Surrogate Recoveries (%)								
5a-androstane	80		86		84		87	
n-Tetracosane-d50	83		91		85		87	
S/T:								
C23 diterpane (T4)	ND		ND		ND		ND	
C29 Tricyclictrierpane (T9)	ND		ND		ND		ND	
C29 Tricyclictriterpane (T10)	ND		ND		ND		ND	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND		ND		ND		ND	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND		ND		ND		ND	
17a(H),21b(H)-30-Norhopane (T15)	ND		3.86		3.38		ND	
18a(H)-Oleanane (T18)	ND		ND		ND		ND	
17a(H),21b(H)-hopane (T19)	5.63		5.15		3.59		6.11	
22S-17a(H),21b(H)-30-homohopane (T21)	ND		ND		ND		ND	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		ND		ND		ND	
13b,17a-Diacholestane-20S (S4)	1.39	J	1.02	J	0.73	J	0.86	J
13b,17a-Diacholestane-20R (S5)	ND		0.77	J	ND		ND	
5a,14a,17a-methylcholestane-20R (S24)	ND		ND		ND		ND	
5a,14a,17a-Ethylcholestane-20S (S25)	ND		ND		ND		ND	
5a,14a,17a-Ethylcholestane-20R (S28)	1.56	J	1.06	J	ND		ND	
S28a	1.04	J	1.26	J	0.87	J	1.93	J
Surrogate Recoveries (%)								
5b(H)-Cholane	74		81		78		74	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330	
Client ID	05-L08-02-PHC-T-ISO	
Location	Liberty	
Battelle ID	S9250-P	
Collection Date	08/12/05	
% Moisture	80.34	
% Lipid	1.9	
Matrix	ISOPODS	
Sample Size (g dry)	1.74	
Units	UG/KG_DRY	
PAH:		
Naphthalene	5.03	B
C1-Naphthalenes	5.18	
C2-Naphthalenes	12.91	
C3-Naphthalenes	7.88	
C4-Naphthalenes	6.6	
Biphenyl	2.82	B
Acenaphthylene		ND
Acenaphthene	0.66	J
Fluorene	0.89	
C1-Fluorenes		ND
C2-Fluorenes		ND
C3-Fluorenes		ND
Anthracene		ND
Phenanthrene	4.68	B
C1-Phenanthrenes/Anthracenes	4	
C2-Phenanthrenes/Anthracenes	10.3	
C3-Phenanthrenes/Anthracenes		ND
C4-Phenanthrenes/Anthracenes		ND
Dibenzothiophene		ND
C1-Dibenzothiophenes		ND
C2-Dibenzothiophenes		ND
C3-Dibenzothiophenes		ND
Fluoranthene	0.69	J
Pyrene	0.88	
C1-Fluoranthenes/Pyrenes	1.89	
C2-Fluoranthenes/Pyrenes		ND
C3-Fluoranthenes/Pyrenes		ND
Benzo(a)anthracene		ND
Chrysene	1.06	
C1-Chrysenes	1.57	
C2-Chrysenes		ND
C3-Chrysenes		ND
C4-Chrysenes		ND
Benzo(b)fluoranthene		ND
Benzo(k)fluoranthene		ND
Benzo(e)pyrene		ND
Benzo(a)pyrene		ND
Perylene	3.86	
Indeno(1,2,3-cd)pyrene		ND
Dibenz(a,h)anthracene		ND
Benzo(g,h,i)perylene	0.87	
Total PAH (ug/kg dry)	71.77	
Surrogate Recoveries (%)		
Naphthalene-d8	62	
Acenaphthene-d10	64	
Phenanthrene-d10	75	
Benzo(a)pyrene-d12	80	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330	
Client ID	05-L08-02-PHC-T-ISO	
Location	Liberty	
Battelle ID	S9250-P	
Collection Date	08/12/05	
% Moisture	80.34	
% Lipid	1.9	
Matrix	ISOPODS	
Sample Size (g dry)	1.74	
Units	UG/KG_DRY	
SHC:		
n-Nonane	67.01	J
n-Decane	23.26	J
n-Undecane	66.46	J
n-Dodecane	39.55	J
n-Tridecane	66.93	J
Isoprenoid RRT 1380	13.91	J
n-Tetradecane	91.04	J
Isoprenoid RRT 1470	170.98	J
n-Pentadecane	622.34	
n-Hexadecane	136.56	J
Norpristane (1650)		ND
n-Heptadecane	227.41	
Pristane	16482.28	
n-Octadecane	46.22	J
Phytane	24.47	J
n-Nonadecane	36.52	J
n-Eicosane	30.8	J
n-Heneicosane	107.5	J
n-Docosane	84.89	J
n-Tricosane	182.91	
n-Tetracosane	84.63	J
n-Pentacosane	287.02	
n-Hexacosane	99.63	J
n-Heptacosane	420.97	
n-Octacosane	72.66	J
n-Nonacosane	208.15	
n-Triacontane	60.55	J
n-Hentriacontane	174.28	J
n-Dotriacontane		ND
n-Tritriacontane		ND
n-Tetratriacontane		ND
n-Pentatriacontane		ND
n-Hexatriacontane		ND
n-Heptatriacontane		ND
n-Octatriacontane		ND
n-Nonatriacontane		ND
n-Tetracontane		ND
Total SHC	37030.28	
Surrogate Recoveries (%)		
5a-androstane	79	
n-Tetracosane-d50	79	
S/T:		
C23 diterpane (T4)		ND
C29 Tricyclictrierpane (T9)		ND
C29 Tricyclictriterpane (T10)		ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND
17a(H),21b(H)-30-Norhopane (T15)	3.51	
18a(H)-Oleanane (T18)		ND
17a(H),21b(H)-hopane (T19)	3.53	
22S-17a(H),21b(H)-30-homohopane (T21)		ND
22R-17a(H),21b(H)-30-homohopane (T22)		ND
13b,17a-Diacholestane-20S (S4)	1.41	J
13b,17a-Diacholestane-20R (S5)		ND
5a,14a,17a-methylcholestane-20R (S24)		ND
5a,14a,17a-Ethylcholestane-20S (S25)		ND
5a,14a,17a-Ethylcholestane-20R (S28)		ND
S28a	1.79	
Surrogate Recoveries (%)		
5b(H)-Cholane	75	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329	05-0330
Client ID	Procedural Blank	Procedural Blank
Location		
Battelle ID	BH078PB-P	BH081PB-P
Collection Date	09/07/05	09/21/05
% Moisture	85.04	78.51
% Lipid	NA	NA
Matrix	TISSUE	TISSUE
Sample Size (g dry)	2.20	2.71
Units	UG/KG_DRY	UG/KG_DRY
PAH:		
Naphthalene	1.03 J	1.58
C1-Naphthalenes	ND	0.55 J
C2-Naphthalenes	ND	ND
C3-Naphthalenes	ND	ND
C4-Naphthalenes	ND	ND
Biphenyl	ND	0.78 J
Acenaphthylene	ND	ND
Acenaphthene	ND	ND
Fluorene	ND	ND
C1-Fluorenes	ND	ND
C2-Fluorenes	ND	ND
C3-Fluorenes	ND	ND
Anthracene	ND	ND
Phenanthrene	ND	1.26
C1-Phenanthrenes/Anthracenes	ND	ND
C2-Phenanthrenes/Anthracenes	ND	ND
C3-Phenanthrenes/Anthracenes	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND
Dibenzothiophene	ND	ND
C1-Dibenzothiophenes	ND	ND
C2-Dibenzothiophenes	ND	ND
C3-Dibenzothiophenes	ND	ND
Fluoranthene	ND	0.3 J
Pyrene	ND	0.12 J
C1-Fluoranthenes/Pyrenes	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND
Benzo(a)anthracene	ND	ND
Chrysene	ND	ND
C1-Chrysenes	ND	ND
C2-Chrysenes	ND	ND
C3-Chrysenes	ND	ND
C4-Chrysenes	ND	ND
Benzo(b)fluoranthene	ND	ND
Benzo(k)fluoranthene	ND	ND
Benzo(e)pyrene	ND	ND
Benzo(a)pyrene	ND	ND
Perylene	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND
Dibenz(a,h)anthracene	ND	ND
Benzo(g,h,i)perylene	ND	ND
Surrogate Recoveries (%)		
Naphthalene-d8	58	62
Acenaphthene-d10	61	62
Phenanthrene-d10	79	73
Benzo(a)pyrene-d12	83	73

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329	05-0330
Client ID	Procedural Blank	Procedural Blank
Location		
Battelle ID	BH078PB-P	BH081PB-P
Collection Date	09/07/05	09/21/05
% Moisture	85.04	78.51
% Lipid	NA	NA
Matrix	TISSUE	TISSUE
Sample Size (g dry)	2.20	2.71
Units	UG/KG_DRY	UG/KG_DRY
SHC:		
n-Nonane	ND	ND
n-Decane	ND	ND
n-Undecane	ND	ND
n-Dodecane	ND	ND
n-Tridecane	ND	ND
Isoprenoid RRT 1380	ND	ND
n-Tetradecane	ND	ND
Isoprenoid RRT 1470	ND	ND
n-Pentadecane	ND	ND
n-Hexadecane	ND	ND
Norpristane (1650)	ND	ND
n-Heptadecane	ND	ND
Pristane	ND	ND
n-Octadecane	ND	ND
Phytane	ND	ND
n-Nonadecane	ND	ND
n-Eicosane	ND	ND
n-Heneicosane	ND	ND
n-Docosane	ND	ND
n-Tricosane	ND	ND
n-Tetracosane	ND	ND
n-Pentacosane	ND	ND
n-Hexacosane	ND	ND
n-Heptacosane	ND	ND
n-Octacosane	ND	ND
n-Nonacosane	ND	ND
n-Triacontane	ND	ND
n-Hentriacontane	ND	ND
n-Dotriacontane	ND	ND
n-Tritriacontane	ND	ND
n-Tetratriacontane	ND	ND
n-Pentatriacontane	ND	ND
n-Hexatriacontane	ND	ND
n-Heptatriacontane	ND	ND
n-Octatriacontane	ND	ND
n-Nonatriacontane	ND	ND
n-Tetracontane	ND	ND
Total SHC	ND	920.42
Surrogate Recoveries (%)		
5a-androstane	83	83
n-Tetracosane-d50	89	89
S/T:		
C23 diterpane (T4)	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND
18a(H)-Oleanane (T18)	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND
S28a	ND	ND
Surrogate Recoveries (%)		
5b(H)-Cholane	101	84

Surrogate Corrected

Laboratory Batch Number	05-0329				
Client ID	050831-01: Tilapia				
Location					
Battelle ID	BH079LCS-P				
Collection Date	09/07/05				
% Moisture	79.14				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	3.28				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	356.03		381.33	93	
C1-Naphthalenes		ND			
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	411.6		381.17	108	
Acenaphthylene	430.06		381.35	113	
Acenaphthene	377.23		381.38	99	
Fluorene	517.61		381.36	136	N
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	357.61		381.35	94	
Phenanthrene	346.14		381.35	91	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	320.04		381.48	84	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	378.36		381.29	99	
Pyrene	355.64		381.29	93	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	378.28		381.33	99	
Chrysene	370.93		381.38	97	
C1-Chrysenes		ND			
C2-Chrysenes	1.8				
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	250.1		381.38	66	N
Benzo(k)fluoranthene	312.64		381.35	82	
Benzo(e)pyrene	366.47		381.78	96	
Benzo(a)pyrene	359.14		381.35	94	
Perylene	431.74		381.17	113	
Indeno(1,2,3-cd)pyrene	417.74		381.33	110	
Dibenz(a,h)anthracene	448.43		381.31	118	
Benzo(g,h,i)perylene	390.96		381.36	103	
Surrogate Recoveries (%)					
Naphthalene-d8	41				
Acenaphthene-d10	45				
Phenanthrene-d10	65				
Benzo(a)pyrene-d12	63				

Surrogate Corrected

Laboratory Batch Number	05-0329
Client ID	050831-01: Tilapia
Location	
Battelle ID	BH079LCS-P
Collection Date	09/07/05
% Moisture	79.14
% Lipid	NA
Matrix	TISSUE
Sample Size (g dry)	3.28

Units	UG/KG_DRY		Target	% Recovery	Qualifier
SHC:					
n-Nonane	2403.21		3810.98	63	N
n-Decane	2844.89		3810.98	75	
n-Undecane		ND			
n-Dodecane	3284.59		3810.98	86	
n-Tridecane		ND			
Isoprenoid RRT 1380		ND			
n-Tetradecane	3398.27		3810.98	89	
Isoprenoid RRT 1470	286.86				
n-Pentadecane	184.18				
n-Hexadecane	3617.22		3810.98	95	
Norpristane (1650)		ND			
n-Heptadecane		ND			
Pristane	3633.32		3811.74	95	
n-Octadecane	3651.19		3810.98	96	
Phytane	3534.62		3813.64	93	
n-Nonadecane	3467.24		3810.98	91	
n-Eicosane	3681.78		3810.98	97	
n-Heneicosane		ND			
n-Docosane	3675.28		3810.98	96	
n-Tricosane		ND			
n-Tetracosane	3713.95		3810.98	97	
n-Pentacosane	181.93				
n-Hexacosane	3777.02		3810.98	99	
n-Heptacosane	152.88				
n-Octacosane	3764.09		3810.98	99	
n-Nonacosane	181.13				
n-Triacontane	3576.1		3810.98	94	
n-Hentriacontane		ND			
n-Dotriacontane		ND			
n-Tritriacontane		ND			
n-Tetratriacontane		ND			
n-Pentatriacontane		ND			
n-Hexatriacontane	3366.95		3810.98	88	
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
Total SHC	64918.57				
Surrogate Recoveries (%)					
5a-androstane	78				
n-Tetracosane-d50	80				
S/T:					
C23 diterpane (T4)		ND			
C29 Tricyclictrierpane (T9)		ND			
C29 Tricyclictriterpane (T10)		ND			
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND			
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND			
17a(H),21b(H)-30-Norhopane (T15)		ND			
18a(H)-Oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)		ND			
22S-17a(H),21b(H)-30-homohopane (T21)		ND			
22R-17a(H),21b(H)-30-homohopane (T22)		ND			
13b,17a-Diacholestane-20S (S4)		ND			
13b,17a-Diacholestane-20R (S5)		ND			
5a,14a,17a-methylcholestane-20R (S24)		ND			
5a,14a,17a-Ethylcholestane-20S (S25)		ND			
5a,14a,17a-Ethylcholestane-20R (S28)		ND			
S28a		ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	92				

Surrogate Corrected

Laboratory Batch Number	05-0330				
Client ID	050831-01: Tilapia				
Location					
Battelle ID	BH082LCS-P				
Collection Date	09/21/05				
% Moisture	79.14				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	3.13				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	363.92		399.60	91	
C1-Naphthalenes		ND			
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	435.05		399.72	109	
Acenaphthylene	415.78		399.62	104	
Acenaphthene	412.23		399.66	103	
Fluorene	412.02		399.64	103	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	387.55		399.62	97	
Phenanthrene	364.31		399.62	91	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	382.52		401.20	95	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	373.39		399.56	93	
Pyrene	364.47		399.56	91	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	392.57		399.60	98	
Chrysene	374.09		399.66	94	
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	352.56		399.66	88	
Benzo(k)fluoranthene	409.63		399.62	103	
Benzo(e)pyrene	369.84		400.08	92	
Benzo(a)pyrene	380.49		399.62	95	
Perylene	465.77		399.44	117	
Indeno(1,2,3-cd)pyrene	394.74		399.60	99	
Dibenz(a,h)anthracene	408		399.58	102	
Benzo(g,h,i)perylene	359.4		399.64	90	
Surrogate Recoveries (%)					
Naphthalene-d8	71				
Acenaphthene-d10	66				
Phenanthrene-d10	74				
Benzo(a)pyrene-d12	79				

Surrogate Corrected

Laboratory Batch Number	05-0330
Client ID	050831-01: Tilapia
Location	
Battelle ID	BH082LCS-P
Collection Date	09/21/05
% Moisture	79.14
% Lipid	NA
Matrix	TISSUE
Sample Size (g dry)	3.13

Units	UG/KG_DRY		Target	% Recovery	Qualifier
SHC:					
n-Nonane	1923.63		3993.61	48	N
n-Decane	2636.11		3993.61	66	N
n-Undecane		ND			
n-Dodecane	3182.52		3993.61	80	
n-Tridecane		ND			
Isoprenoid RRT 1380		ND			
n-Tetradecane	3522.76		3993.61	88	
Isoprenoid RRT 1470		ND			
n-Pentadecane		ND			
n-Hexadecane	3775.4		3993.61	95	
Norpristane (1650)		ND			
n-Heptadecane		ND			
Pristane	3837.77		3994.41	96	
n-Octadecane	3762.62		3993.61	94	
Phytane	3630.35		3996.41	91	
n-Nonadecane	3720.43		3993.61	93	
n-Eicosane	3918.25		3993.61	98	
n-Heneicosane		ND			
n-Docosane	3921.4		3993.61	98	
n-Tricosane		ND			
n-Tetracosane	3937.62		3993.61	99	
n-Pentacosane		ND			
n-Hexacosane	4007.37		3993.61	100	
n-Heptacosane		ND			
n-Octacosane	3909.87		3993.61	98	
n-Nonacosane		ND			
n-Triacontane	3806.62		3993.61	95	
n-Hentriacontane		ND			
n-Dotriacontane		ND			
n-Tritriacontane		ND			
n-Tetratriacontane		ND			
n-Pentatriacontane		ND			
n-Hexatriacontane	3604.71		3993.61	90	
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
Total SHC	59512.77				
Surrogate Recoveries (%)					
5a-androstane	78				
n-Tetracosane-d50	79				
S/T:					
C23 diterpane (T4)		ND			
C29 Tricyclictrierpane (T9)		ND			
C29 Tricyclictriterpane (T10)		ND			
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND			
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND			
17a(H),21b(H)-30-Norhopane (T15)		ND			
18a(H)-Oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)		ND			
22S-17a(H),21b(H)-30-homohopane (T21)		ND			
22R-17a(H),21b(H)-30-homohopane (T22)		ND			
13b,17a-Diacholestane-20S (S4)		ND			
13b,17a-Diacholestane-20R (S5)		ND			
5a,14a,17a-methylcholestane-20R (S24)		ND			
5a,14a,17a-Ethylcholestane-20S (S25)		ND			
5a,14a,17a-Ethylcholestane-20R (S28)		ND			
S28a		ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	71				

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329				
Client ID	GJ53: North Slope Crude				
Location	BH108NSC (PAH) BH106NSC (SHC)				
Battelle ID	BH107NSC (S/T)				
Collection Date	9/12/2005				
% Moisture	NA				
% Lipid	NA				
Matrix	OIL				
Sample Size (g dry)	5.014				
Units	UG/KG_OIL		Target	% Difference	Qualifier
PAH:					
Naphthalene	851.29		714.43	19.2	
C1-Naphthalenes	1844.06		1534.53	20.2	
C2-Naphthalenes	2375.67		1897.27	25.2	
C3-Naphthalenes	1856.02		1436.53	29.2	
C4-Naphthalenes	1049.49		773.42	35.7	N
Biphenyl	275.58		216.49	27.3	
Acenaphthylene		ND			
Acenaphthene		ND			
Fluorene	89.54		87.56	2.3	
C1-Fluorenes	263.02		219.89	19.6	
C2-Fluorenes	421.34		341.20	23.5	
C3-Fluorenes	402.49		299.61	34.3	N
Anthracene		ND			
Phenanthrene	277.32		272.58	1.7	
C1-Phenanthrenes/Anthracenes	682.32		564.81	20.8	
C2-Phenanthrenes/Anthracenes	780.08		660.43	18.1	
C3-Phenanthrenes/Anthracenes	679.11		448.76	51.3	N
C4-Phenanthrenes/Anthracenes	228.38		176.00	29.8	
Dibenzothiophene	237.65		218.80	8.6	
C1-Dibenzothiophenes	550.77		434.54	26.7	
C2-Dibenzothiophenes	778.26		551.44	41.1	N
C3-Dibenzothiophenes	679.39		460.96	47.4	N
Fluoranthene	4.63				
Pyrene	15.38				
C1-Fluoranthenes/Pyrenes	94.02		78.43	19.9	
C2-Fluoranthenes/Pyrenes	165.95		132.93	24.8	
C3-Fluoranthenes/Pyrenes	170.84		151.73	12.6	
Benzo(a)anthracene		ND			
Chrysene	63.31		50.99	24.2	
C1-Chrysenes	101.09		81.69	23.7	
C2-Chrysenes	132.1		95.93	37.7	N
C3-Chrysenes	101.33		89.87	12.7	
C4-Chrysenes	81		76.33	6.1	
Benzo(b)fluoranthene	4.39				
Benzo(k)fluoranthene		ND			
Benzo(e)pyrene	11.38				
Benzo(a)pyrene		ND			
Perylene		ND			
Indeno(1,2,3-cd)pyrene		ND			
Dibenz(a,h)anthracene		ND			
Benzo(g,h,i)perylene	3.65				
Surrogate Recoveries (%)					
Naphthalene-d8	107				
Acenaphthene-d10	93				
Phenanthrene-d10	84				
Benzo(a)pyrene-d12	122	N			

Surrogate Corrected

Laboratory Batch Number	05-0329				
Client ID	GJ53: North Slope Crude				
Location	BH108NSC (PAH) BH106NSC (SHC)				
Battelle ID	BH107NSC (S/T)				
Collection Date	9/12/2005				
% Moisture	NA				
% Lipid	NA				
Matrix	OIL				
Sample Size (g dry)	5.014				
Units	UG/KG_OIL		Target	% Difference	Qualifier
SHC:					
n-Nonane	4582.13		4621.98	0.9	
n-Decane	4446.5		4361.84	1.9	
n-Undecane	4274.62		4367.26	2.1	
n-Dodecane	4333.95		4220.03	2.7	
n-Tridecane	4182.06		4074.35	2.6	
Isoprenoid RRT 1380	990.25		1013.69	2.3	
n-Tetradecane	4076.82		3868.35	5.4	
Isoprenoid RRT 1470	1518.37		1474.33	3.0	
n-Pentadecane	4088.11		3867.48	5.7	
n-Hexadecane	3895.15		3699.97	5.3	
Norpristane (1650)	1115.85		1065.49	4.7	
n-Heptadecane	3371.63		3042.58	10.8	
Pristane	2381.26		2313.50	2.9	
n-Octadecane	3040.35		2772.62	9.7	
Phytane	1436.85		1507.37	4.7	
n-Nonadecane	2594.4		2470.80	5.0	
n-Eicosane	2689.04		2502.77	7.4	
n-Heneicosane	2468.6		2189.60	12.7	
n-Docosane	2336.65		2153.99	8.5	
n-Tricosane	2176.65		2007.15	8.4	
n-Tetracosane	2029.61		2059.31	1.4	
n-Pentacosane	1788.28		1662.92	7.5	
n-Hexacosane	1651.84		1485.96	11.2	
n-Heptacosane	1363.68		1154.00	18.2	
n-Octacosane	1076.98		972.83	10.7	
n-Nonacosane	827.13		859.52	3.8	
n-Triacontane	676.81		618.93	9.4	
n-Hentriacontane	588.06		588.39	0.1	
n-Dotriacontane	468.04		424.08	10.4	
n-Tritriacontane	327.7		401.62	18.4	
n-Tetratriacontane	285.19	J	342.44	16.7	
n-Pentatriacontane	332.68		344.76	3.5	
n-Hexatriacontane	225.45	J	217.69	3.6	
n-Heptatriacontane	160.34	J	187.40	14.4	
n-Octatriacontane	173.73	J	196.72	11.7	
n-Nonatriacontane	143.55	J	135.00	6.3	
n-Tetracontane	132.19	J	152.10	13.1	
Total SHC	577388.08		671799.11	14.1	
Surrogate Recoveries (%)					
5a-androstane	100				
n-Tetracosane-d50	102				
S/T:					
C23 diterpane (T4)	52.3				
C29 Tricyclictrierpane (T9)	13.94				
C29 Tricyclictriterpane (T10)	12.3				
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	15.65				
17a(H)-22,29,30-Trisnorhopane -TM (T12)	19.34				
17a(H),21b(H)-30-Norhopane (T15)	59.47				
18a(H)-Oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)	92.07		171.67	46.4	N
22S-17a(H),21b(H)-30-homohopane (T21)	43.08				
22R-17a(H),21b(H)-30-homohopane (T22)	32.32				
13b,17a-Diacholestane-20S (S4)	37.96				
13b,17a-Diacholestane-20R (S5)	19.92				
5a,14a,17a-methylcholestane-20R (S24)	26.63				
5a,14a,17a-Ethylcholestane-20S (S25)	28.65				
5a,14a,17a-Ethylcholestane-20R (S28)	26.09				
S28a		ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	143	N			

Surrogate Corrected

Laboratory Batch Number	05-0330			
Client ID	GJ53: North Slope Crude			
Location				
Battelle ID	BH169NSC (PAH) BH171NSC (SHC) BH173NSC (S/T)			
Collection Date	09/28/05			
% Moisture	NA			
% Lipid	NA			
Matrix	OIL			
Sample Size (g dry)	5.01			
Units	UG/KG_OIL		Target	% Difference Qualifier
PAH:				
Naphthalene	679.92		714.43	4.8
C1-Naphthalenes	1597.64		1534.53	4.1
C2-Naphthalenes	2155.62		1897.27	13.6
C3-Naphthalenes	1623.81		1436.53	13.0
C4-Naphthalenes	962.64		773.42	24.5
Biphenyl	248.26		216.49	14.7
Acenaphthylene	9.96			
Acenaphthene	10.94			
Fluorene	93.28		87.56	6.5
C1-Fluorenes	240.64		219.89	9.4
C2-Fluorenes	353.89		341.20	3.7
C3-Fluorenes	306.83		299.61	2.4
Anthracene	4.85			
Phenanthrene	268.26		272.58	1.6
C1-Phenanthrenes/Anthracenes	586.86		564.81	3.9
C2-Phenanthrenes/Anthracenes	691.02		660.43	4.6
C3-Phenanthrenes/Anthracenes	461.82		448.76	2.9
C4-Phenanthrenes/Anthracenes	150.59		176.00	14.4
Dibenzothiophene	229.96		218.80	5.1
C1-Dibenzothiophenes	466.18		434.54	7.3
C2-Dibenzothiophenes	607.06		551.44	10.1
C3-Dibenzothiophenes	515.79		460.96	11.9
Fluoranthene	4.17			
Pyrene	15.67			
C1-Fluoranthenes/Pyrenes	70.2		78.43	10.5
C2-Fluoranthenes/Pyrenes	117.87		132.93	11.3
C3-Fluoranthenes/Pyrenes	151.95		151.73	0.1
Benzo(a)anthracene	1.45			
Chrysene	55.68		50.99	9.2
C1-Chrysenes	96.79		81.69	18.5
C2-Chrysenes	116.02		95.93	20.9
C3-Chrysenes	89.86		89.87	0.0
C4-Chrysenes	83.28		76.33	9.1
Benzo(b)fluoranthene	5.77			
Benzo(k)fluoranthene		ND		
Benzo(e)pyrene	12.08			
Benzo(a)pyrene		ND		
Perylene		ND		
Indeno(1,2,3-cd)pyrene		ND		
Dibenz(a,h)anthracene		ND		
Benzo(g,h,i)perylene	3.91			
Surrogate Recoveries (%)				
Naphthalene-d8	109			
Acenaphthene-d10	95			
Phenanthrene-d10	92			
Benzo(a)pyrene-d12	114			

Surrogate Corrected

Laboratory Batch Number	05-0330				
Client ID	GJ53: North Slope Crude				
Location					
Battelle ID	BH169NSC (PAH) BH171NSC (SHC) BH173NSC (S/T)				
Collection Date	09/28/05				
% Moisture	NA				
% Lipid	NA				
Matrix	OIL				
Sample Size (g dry)	5.01				
Units	UG/KG_OIL		Target	% Difference	Qualifier
SHC:					
n-Nonane	4482.31		4621.98	3.0	
n-Decane	4260.35		4361.84	2.3	
n-Undecane	4028.76		4367.26	7.8	
n-Dodecane	4214.6		4220.03	0.1	
n-Tridecane	3962.34		4074.35	2.7	
Isoprenoid RRT 1380	921.41		1013.69	9.1	
n-Tetradecane	3796.4		3868.35	1.9	
Isoprenoid RRT 1470	1451.48		1474.33	1.5	
n-Pentadecane	3911.26		3867.48	1.1	
n-Hexadecane	3713.24		3699.97	0.4	
Norpristane (1650)	1040.21		1065.49	2.4	
n-Heptadecane	3192.84		3042.58	4.9	
Pristane	2200.29		2313.50	4.9	
n-Octadecane	2913.67		2772.62	5.1	
Phytane	1355.65		1507.37	10.1	
n-Nonadecane	2507.35		2470.80	1.5	
n-Eicosane	2554.87		2502.77	2.1	
n-Heneicosane	2445.71		2189.60	11.7	
n-Docosane	2225.71		2153.99	3.3	
n-Tricosane	2033.03		2007.15	1.3	
n-Tetracosane	1951.34		2059.31	5.2	
n-Pentacosane	1687.24		1662.92	1.5	
n-Hexacosane	1589.66		1485.96	7.0	
n-Heptacosane	1252.62		1154.00	8.5	
n-Octacosane	1035.98		972.83	6.5	
n-Nonacosane	811.21		859.52	5.6	
n-Triacontane	671.81		618.93	8.5	
n-Hentriacontane	586.83		588.39	0.3	
n-Dotriacontane	456.55		424.08	7.7	
n-Tritriacontane	352		401.62	12.4	
n-Tetratriacontane	327.93		342.44	4.2	
n-Pentatriacontane	339.64		344.76	1.5	
n-Hexatriacontane	222.07	J	217.69	2.0	
n-Heptatriacontane	159.43	J	187.40	14.9	
n-Octatriacontane	188.59	J	196.72	4.1	
n-Nonatriacontane	126.57	J	135.00	6.2	
n-Tetracontane	134.98	J	152.10	11.3	
Total SHC	528393.73		671799.11	21.3	
Surrogate Recoveries (%)					
5a-androstane	101				
n-Tetracosane-d50	104				
S/T:					
C23 diterpane (T4)	69.85				
C29 Tricyclictrierpane (T9)	21.64				
C29 Tricyclictriterpane (T10)	22.51				
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	24.86				
17a(H)-22,29,30-Trisnorhopane -TM (T12)	35.11				
17a(H),21b(H)-30-Norhopane (T15)	98.1				
18a(H)-Oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)	159.41		171.67	7.1	
22S-17a(H),21b(H)-30-homohopane (T21)	71.8				
22R-17a(H),21b(H)-30-homohopane (T22)	49.43				
13b,17a-Diacholestane-20S (S4)	49.19				
13b,17a-Diacholestane-20R (S5)	29.5				
5a,14a,17a-methylcholestane-20R (S24)	39.68				
5a,14a,17a-Ethylcholestane-20S (S25)	44.9				
5a,14a,17a-Ethylcholestane-20R (S28)	47.26				
S28a		ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	93				

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329		05-0330	
Client ID	GG09: NorthSTAR Control Oil - cANIMIDA		GG09: NorthSTAR Control Oil - cANIMIDA	
Location				
Battelle ID	BH113CO (PAH) (SHC) BH111CO BH112CO (S/T)		BH170CO (PAH) BH172CO (SHC) BH174CO (S/T)	
Collection Date	9/12/2005		09/28/05	
% Moisture	NA		NA	
% Lipid	NA		NA	
Matrix	OIL		OIL	
Sample Size (g dry)	5		5.00	
Units	UG/KG_OIL		UG/KG_OIL	
PAH:				
Naphthalene	1223.82		884.98	
C1-Naphthalenes	2577.17		2128.7	
C2-Naphthalenes	3169.28		2801.04	
C3-Naphthalenes	2185.27		1930.51	
C4-Naphthalenes	1072.36		1011.75	
Biphenyl	402.04		372.74	
Acenaphthylene		ND	9.56	
Acenaphthene		ND	10.72	
Fluorene	141.58		149.97	
C1-Fluorenes	301.52		288.63	
C2-Fluorenes	387.87		367.38	
C3-Fluorenes	338.6		330.12	
Anthracene		ND		ND
Phenanthrene	301.37		316.46	
C1-Phenanthrenes/Anthracenes	734.91		638.38	
C2-Phenanthrenes/Anthracenes	765.83		702.47	
C3-Phenanthrenes/Anthracenes	577.68		472.27	
C4-Phenanthrenes/Anthracenes	212.8		160.14	
Dibenzothiophene	83.58		81.41	
C1-Dibenzothiophenes	211.87		193.89	
C2-Dibenzothiophenes	259.87		198.75	
C3-Dibenzothiophenes	170.66		135	
Fluoranthene	4.82		5.02	
Pyrene	16.6		18.68	
C1-Fluoranthenes/Pyrenes	96.44		90.46	
C2-Fluoranthenes/Pyrenes	144.96		123.73	
C3-Fluoranthenes/Pyrenes	143.92		133.19	
Benzo(a)anthracene		ND	2.6	
Chrysene	55.71		45.81	
C1-Chrysenes	102.8		81.17	
C2-Chrysenes	135.29		112.85	
C3-Chrysenes	110.27		82.62	
C4-Chrysenes	67.73		35.94	
Benzo(b)fluoranthene	3.67		3.87	
Benzo(k)fluoranthene		ND		ND
Benzo(e)pyrene	11.05		12.44	
Benzo(a)pyrene		ND		ND
Perylene		ND		ND
Indeno(1,2,3-cd)pyrene		ND		ND
Dibenz(a,h)anthracene		ND		ND
Benzo(g,h,i)perylene		ND	2.16	
Surrogate Recoveries (%)				
Naphthalene-d8	117		108	
Acenaphthene-d10	96		98	
Phenanthrene-d10	81		93	
Benzo(a)pyrene-d12	121	N	106	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329		05-0330	
Client ID	GG09: NorthSTAR Control Oil - cANIMIDA		GG09: NorthSTAR Control Oil - cANIMIDA	
Location				
Battelle ID	BH113CO (PAH) (SHC) BH111CO BH112CO (S/T)		BH170CO (PAH) BH172CO (SHC) BH174CO (S/T)	
Collection Date	9/12/2005		09/28/05	
% Moisture	NA		NA	
% Lipid	NA		NA	
Matrix	OIL		OIL	
Sample Size (g dry)	5		5.00	
Units	UG/KG_OIL		UG/KG_OIL	
SHC:				
n-Nonane	12634.45		12799.6	
n-Decane	11430.19		11635.51	
n-Undecane	10331.69		10479.57	
n-Dodecane	9726.29		9726.6	
n-Tridecane	8830.81		8976.92	
Isoprenoid RRT 1380	1887.22		1910.55	
n-Tetradecane	8200.95		8426.86	
Isoprenoid RRT 1470	3156.97		3104.6	
n-Pentadecane	8093.48		8200.66	
n-Hexadecane	7301.35		7439.22	
Norpristane (1650)	2268.97		2259.66	
n-Heptadecane	6099.66		6202.6	
Pristane	4015.2		4014.57	
n-Octadecane	5119.55		5325.83	
Phytane	2171.1		2302.94	
n-Nonadecane	4337.52		4312.33	
n-Eicosane	4096.15		4236.28	
n-Heneicosane	3568.97		3654.28	
n-Docosane	3157.25		3212.32	
n-Tricosane	2910.75		2998.62	
n-Tetracosane	2449.76		2499.87	
n-Pentacosane	2292.7		2284.23	
n-Hexacosane	1882.74		1916.49	
n-Heptacosane	1735.76		1733.36	
n-Octacosane	1415.55		1418.55	
n-Nonacosane	1162.37		1197.09	
n-Triacontane	1004.59		1038.46	
n-Hentriacontane	916.81		943.73	
n-Dotriacontane	639.46		648.6	
n-Tritriacontane	525.62		493.49	
n-Tetratriacontane	352.53		392.62	
n-Pentatriacontane	321.25		339.27	
n-Hexatriacontane	188.2	J	209.3	J
n-Heptatriacontane	157.51	J	168.22	J
n-Octatriacontane	156.49	J	177.4	J
n-Nonatriacontane	107.31	J	102.89	J
n-Tetracontane	69.49	J	90.55	J
Total SHC	582442.82		565654.24	
Surrogate Recoveries (%)				
5a-androstane	100		97	
n-Tetracosane-d50	103		100	
S/T:				
C23 diterpane (T4)	37.72		44.91	
C29 Tricyclictrierpane (T9)	13.38		19.71	
C29 Tricyclictriterpane (T10)	14.58		23.16	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	10.1		11.82	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	7.68		8.43	
17a(H),21b(H)-30-Norhopane (T15)	15.81		20.97	
18a(H)-Oleanane (T18)		ND		ND
17a(H),21b(H)-hopane (T19)	25.81		51.69	
22S-17a(H),21b(H)-30-homohopane (T21)	16.41		24.27	
22R-17a(H),21b(H)-30-homohopane (T22)	13.88		14.25	
13b,17a-Diacholestane-20S (S4)	36.22		46.33	
13b,17a-Diacholestane-20R (S5)	23.84		32.49	
5a,14a,17a-methylcholestane-20R (S24)	10.65		15	
5a,14a,17a-Ethylcholestane-20S (S25)	12.82		19.67	
5a,14a,17a-Ethylcholestane-20R (S28)	10.51		20.29	
S28a		ND		ND
Surrogate Recoveries (%)				
5b(H)-Cholane	144	N	87	

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329		05-0329			
Client ID	02-5H-01-PHC-T-AS		02-5H-01-PHC-T-AS			
Location						
Battelle ID	S8759-P		S8759DUP-P			
Collection Date	9/7/2005		9/7/2005			
% Moisture	88.73		88.73			
% Lipid	1.23		1.48			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	0.71		0.72			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	6.55		10.33		44.8	n
C1-Naphthalenes	4.16		6.06		37.2	n
C2-Naphthalenes		ND		ND	NA	
C3-Naphthalenes		ND		ND	NA	
C4-Naphthalenes		ND		ND	NA	
Biphenyl	4.81		7.52		44.0	n
Acenaphthylene		ND		ND	NA	
Acenaphthene		ND		ND	NA	
Fluorene		ND		ND	NA	
C1-Fluorenes		ND		ND	NA	
C2-Fluorenes		ND		ND	NA	
C3-Fluorenes		ND		ND	NA	
Anthracene		ND		ND	NA	
Phenanthrene	6.25		11.3		57.5	n
C1-Phenanthrenes/Anthracenes	6.32		6.22		1.6	
C2-Phenanthrenes/Anthracenes	12.18		14.8		19.4	
C3-Phenanthrenes/Anthracenes		ND		ND	NA	
C4-Phenanthrenes/Anthracenes		ND		ND	NA	
Dibenzothiophene		ND		ND	NA	
C1-Dibenzothiophenes		ND		ND	NA	
C2-Dibenzothiophenes		ND		ND	NA	
C3-Dibenzothiophenes		ND		ND	NA	
Fluoranthene		ND		ND	NA	
Pyrene	1.6	J	1.53	J	NA	
C1-Fluoranthenes/Pyrenes		ND		ND	NA	
C2-Fluoranthenes/Pyrenes		ND		ND	NA	
C3-Fluoranthenes/Pyrenes		ND		ND	NA	
Benzo(a)anthracene		ND		ND	NA	
Chrysene	3.16	J	2.91	J	NA	
C1-Chrysenes		ND		ND	NA	
C2-Chrysenes		ND		ND	NA	
C3-Chrysenes		ND		ND	NA	
C4-Chrysenes		ND		ND	NA	
Benzo(b)fluoranthene		ND		ND	NA	
Benzo(k)fluoranthene		ND		ND	NA	
Benzo(e)pyrene		ND		ND	NA	
Benzo(a)pyrene		ND		ND	NA	
Perylene	5.04		4.34		14.9	
Indeno(1,2,3-cd)pyrene		ND		ND	NA	
Dibenz(a,h)anthracene		ND		ND	NA	
Benzo(g,h,i)perylene		ND		ND	NA	
Surrogate Recoveries (%)	50.07		65.01			
Naphthalene-d8						
Acenaphthene-d10	40		72			
Phenanthrene-d10	42		72			
Benzo(a)pyrene-d12	58		81			
	64		91			

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329		05-0329			
Client ID	02-5H-01-PHC-T-AS		02-5H-01-PHC-T-AS			
Location						
Battelle ID	S8759-P		S8759DUP-P			
Collection Date	9/7/2005		9/7/2005			
% Moisture	88.73		88.73			
% Lipid	1.23		1.48			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	0.71		0.72			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane	296.63	J	287.45	J	NA	
n-Decane	15.12	J	164.09	J	NA	
n-Undecane		ND		ND	NA	
n-Dodecane		ND		ND	NA	
n-Tridecane		ND		ND	NA	
Isoprenoid RRT 1380	139.52	J	151.82	J	NA	
n-Tetradecane	85.24	J	174.52	J	NA	
Isoprenoid RRT 1470	842.44		859.33		2.0	
n-Pentadecane	179.27	J	232.09	J	NA	
n-Hexadecane	146.77	J	236.54	J	NA	
Norpristane (1650)		ND		ND	NA	
n-Heptadecane	219.61	J	210.78	J	NA	
Pristane	93.61	J	128.28	J	NA	
n-Octadecane	128.05	J	71.36	J	NA	
Phytane		ND	47.17	J	NA	
n-Nonadecane	67.24	J	70.43	J	NA	
n-Eicosane	44.4	J	55.51	J	NA	
n-Heneicosane	34.87	J	61.5	J	NA	
n-Docosane	95.96	J	154.94	J	NA	
n-Tricosane	315.62	J	481.58	J	NA	
n-Tetracosane	548.83	J	953.66		53.9	n
n-Pentacosane	938.73		1335.63		34.9	n
n-Hexacosane	1039.33		1660.04		46.0	n
n-Heptacosane	1183.22		2139.23		57.5	n
n-Octacosane	1250.83		2533.76		67.8	n
n-Nonacosane	1418.18		3039.5		72.7	n
n-Triacontane	874.8		2643.52		100.5	n
n-Hentriacontane	687.71	J	2207.41		105.0	n
n-Dotriacontane	422.83	J	1363.9		105.3	n
n-Tritriacontane	246.51	J	697.09	J	NA	
n-Tetratriacontane	94.73	J	268.62	J	NA	
n-Pentatriacontane	35.96	J	102.55	J	NA	
n-Hexatriacontane	17.74	J	52.92	J	NA	
n-Heptatriacontane		ND	11.67	J	NA	
n-Octatriacontane		ND		ND	NA	
n-Nonatriacontane		ND		ND	NA	
n-Tetracontane		ND		ND	NA	
Total SHC		ND		ND	NA	
Surrogate Recoveries (%)						
5a-androstane	87		82			
n-Tetracosane-d50	89		87			
S/T:						
C23 diterpane (T4)		ND		ND	NA	
C29 Tricyclictrierpane (T9)		ND		ND	NA	
C29 Tricyclictriterpane (T10)		ND		ND	NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND		ND	NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND		ND	NA	
17a(H),21b(H)-30-Norhopane (T15)		ND		ND	NA	
18a(H)-Oleanane (T18)		ND		ND	NA	
17a(H),21b(H)-hopane (T19)		ND		ND	NA	
22S-17a(H),21b(H)-30-homohopane (T21)		ND		ND	NA	
22R-17a(H),21b(H)-30-homohopane (T22)		ND		ND	NA	
13b,17a-Diacholestane-20S (S4)		ND		ND	NA	
13b,17a-Diacholestane-20R (S5)		ND		ND	NA	
5a,14a,17a-methylcholestane-20R (S24)		ND		ND	NA	
5a,14a,17a-Ethylcholestane-20S (S25)		ND		ND	NA	
5a,14a,17a-Ethylcholestane-20R (S28)		ND		ND	NA	
S28a		ND	61.9		200.0	N
Surrogate Recoveries (%)						
5b(H)-Cholane	110		105			

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329		05-0329			
Client ID	02-5F-01-PHC-T		02-5F-01-PHC-T			
Location						
Battelle ID	S8766-P		S8766DUP-P			
Collection Date	8/7/2002		8/7/2002			
% Moisture	47.4		49.11			
% Lipid	1.35		0.94			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	7.3		7.32			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	2.59	BT	2.48	BT	4.3	
C1-Naphthalenes	1.98	T	1.99	T	0.5	
C2-Naphthalenes	2.69	T	2.99	T	10.6	
C3-Naphthalenes	2.97	T	3.44	T	14.7	
C4-Naphthalenes	2.26	T	2.49	T	9.7	
Biphenyl	0.71	T	0.88	T	21.4	
Acenaphthylene		NDT		NDT	NA	
Acenaphthene		NDT		NDT	NA	
Fluorene	0.4	T	0.43	T	7.2	
C1-Fluorenes	1.4	T	1.34	T	4.4	
C2-Fluorenes	2.21	T	2.03	T	8.5	
C3-Fluorenes		NDT		NDT	NA	
Anthracene		NDT		NDT	NA	
Phenanthrene	1.88	T	2.18	T	14.8	
C1-Phenanthrenes/Anthracenes	3.29	T	3.64	T	10.1	
C2-Phenanthrenes/Anthracenes	3.13	T	3.36	T	7.1	
C3-Phenanthrenes/Anthracenes	3.91	T	4.05	T	3.5	
C4-Phenanthrenes/Anthracenes		NDT		NDT	NA	
Dibenzothiophene	0.22	JT	0.27	JT	NA	
C1-Dibenzothiophenes	0.7	T	0.87	T	21.7	
C2-Dibenzothiophenes	1.66	T	1.68	T	1.2	
C3-Dibenzothiophenes	1.24	T	1.37	T	10.0	
Fluoranthene	0.76	T	0.75	T	1.3	
Pyrene	0.83	T	0.82	T	1.2	
C1-Fluoranthenes/Pyrenes	2.71	T	2.32	T	15.5	
C2-Fluoranthenes/Pyrenes	2.19	T	1.75	T	22.3	
C3-Fluoranthenes/Pyrenes		NDT		NDT	NA	
Benzo(a)anthracene	0.34	JT	0.3	JT	NA	
Chrysene	1.91	T	1.78	T	7.0	
C1-Chrysenes	1.71	T	1.67	T	2.4	
C2-Chrysenes	2.46	T	2.57	T	4.4	
C3-Chrysenes		NDT		NDT	NA	
C4-Chrysenes		NDT		NDT	NA	
Benzo(b)fluoranthene	0.5	T	0.52	T	3.9	
Benzo(k)fluoranthene		NDT		NDT	NA	
Benzo(e)pyrene	0.75	T	0.81	T	7.7	
Benzo(a)pyrene		NDT		NDT	NA	
Perylene	5.75	T	5.62	T	2.3	
Indeno(1,2,3-cd)pyrene		NDT		NDT	NA	
Dibenz(a,h)anthracene		NDT		NDT	NA	
Benzo(g,h,i)perylene	0.32	JT	0.38	T	17.1	
Surrogate Recoveries (%)	53.47		54.78			
Naphthalene-d8						
Acenaphthene-d10	58		61			
Phenanthrene-d10	62		65			
Benzo(a)pyrene-d12	80		79			
	96		95			

Surrogate Corrected

Laboratory Batch Number	05-0329		05-0329			
Client ID	02-5F-01-PHC-T		02-5F-01-PHC-T			
Location						
Battelle ID	S8766-P		S8766DUP-P			
Collection Date	8/7/2002		8/7/2002			
% Moisture	47.4		49.11			
% Lipid	1.35		0.94			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	7.3		7.32			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane	24.99	JT	16.87	JT	NA	
n-Decane	10.04	JT	7.18	JT	NA	
n-Undecane	25.59	JT	21.39	JT	NA	
n-Dodecane	36.45	JT	36.02	JT	NA	
n-Tridecane	21.41	JT	17.51	JT	NA	
Isoprenoid RRT 1380	2.83	JT	3.46	JT	NA	
n-Tetradecane	11.67	JT	5.62	JT	NA	
Isoprenoid RRT 1470	79.22	T	84.59	T	6.6	
n-Pentadecane	18.88	JT	17.5	JT	NA	
n-Hexadecane	30.01	JT	17.98	JT	NA	
Norpristane (1650)		NDT		NDT	NA	
n-Heptadecane	27.7	JT	22.17	JT	NA	
Pristane	13.24	JT	12.32	JT	NA	
n-Octadecane	20.46	JT	8.67	JT	NA	
Phytane	4.19	JT	2.3	JT	NA	
n-Nonadecane	11.67	JT	10.66	JT	NA	
n-Eicosane	10.57	JT	10.35	JT	NA	
n-Heneicosane	17.82	JT	18.56	JT	NA	
n-Docosane	15.55	JT	15.3	JT	NA	
n-Tricosane	47.45	JT	47.66	JT	NA	
n-Tetracosane	15.74	JT	15.96	JT	NA	
n-Pentacosane	44.17	JT	42.9	JT	NA	
n-Hexacosane	13.96	JT	12.84	JT	NA	
n-Heptacosane	66.35	JT	68.08	JT	NA	
n-Octacosane	13.31	JT	13.42	JT	NA	
n-Nonacosane	47.67	JT	50.17	JT	NA	
n-Triacontane	7.26	JT	7.8	JT	NA	
n-Hentriacontane	39.82	JT	41.67	JT	NA	
n-Dotriacontane	4.55	JT	4.8	JT	NA	
n-Tritriacontane	13.45	JT	12.69	JT	NA	
n-Tetratriacontane	1.88	JT	1.69	JT	NA	
n-Pentatriacontane	1.72	JT	1.75	JT	NA	
n-Hexatriacontane		NDT		NDT	NA	
n-Heptatriacontane		NDT		NDT	NA	
n-Octatriacontane		NDT		NDT	NA	
n-Nonatriacontane		NDT		NDT	NA	
n-Tetracontane		NDT		NDT	NA	
Total SHC		NDT		NDT	NA	
Surrogate Recoveries (%)						
5a-androstane	92		86			
n-Tetracosane-d50	94		88			
S/T:						
C23 diterpane (T4)		NDT		NDT	NA	
C29 Tricyclictrierpane (T9)		NDT		NDT	NA	
C29 Tricyclictriterpane (T10)		NDT		NDT	NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		NDT		NDT	NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)		NDT		NDT	NA	
17a(H),21b(H)-30-Norhopane (T15)		NDT		NDT	NA	
18a(H)-Oleanane (T18)		NDT		NDT	NA	
17a(H),21b(H)-hopane (T19)		NDT		NDT	NA	
22S-17a(H),21b(H)-30-homohopane (T21)		NDT		NDT	NA	
22R-17a(H),21b(H)-30-homohopane (T22)		NDT		NDT	NA	
13b,17a-Diacholestane-20S (S4)		NDT		NDT	NA	
13b,17a-Diacholestane-20R (S5)		NDT		NDT	NA	
5a,14a,17a-methylcholestane-20R (S24)		NDT		NDT	NA	
5a,14a,17a-Ethylcholestane-20S (S25)		NDT		NDT	NA	
5a,14a,17a-Ethylcholestane-20R (S28)		NDT		NDT	NA	
S28a		NDT		NDT	NA	
Surrogate Recoveries (%)						
5b(H)-Cholane	115		103			

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330		05-0330			
Client ID	05-N11-01-PHC-T-AN		05-N11-01-PHC-T-AN			
Location	NorthStar		NorthStar			
Battelle ID	S9246-P		S9246DUP-P			
Collection Date	08/11/05		8/11/2005			
% Moisture	77.92		77.76			
% Lipid	1.95		1.78			
Matrix	AMPHIPODS		AMPHIPODS			
Sample Size (g dry)	3.32		3.54			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	2.34	B	2.85	B	19.7	
C1-Naphthalenes	1.22	B	1.3	B	6.3	
C2-Naphthalenes	ND		ND		NA	
C3-Naphthalenes	ND		ND		NA	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	1.01	B	1.94	B	63.1	n
Acenaphthylene	ND		ND		NA	
Acenaphthene	0.27	J	ND		NA	
Fluorene	0.32	J	0.4	J	NA	
C1-Fluorenes	ND		ND		NA	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	1.48	B	3.4	B	78.7	n
C1-Phenanthrenes/Anthracenes	ND		ND		NA	
C2-Phenanthrenes/Anthracenes	ND		ND		NA	
C3-Phenanthrenes/Anthracenes	ND		ND		NA	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	ND		ND		NA	
C1-Dibenzothiophenes	ND		ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	0.43	J	0.39	J	NA	
Pyrene	0.43	J	0.21	J	NA	
C1-Fluoranthenes/Pyrenes	ND		ND		NA	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		ND		NA	
Chrysene	0.45	J	0.32	J	NA	
C1-Chrysenes	ND		ND		NA	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	ND		ND		NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	ND		ND		NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	ND		ND		NA	
Indeno(1,2,3-cd)pyrene	ND		ND		NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	0.3	J	0.33	J	NA	
Surrogate Recoveries (%)	8.25		11.14			
Naphthalene-d8						
Acenaphthene-d10	74		71			
Phenanthrene-d10	76		67			
Benzo(a)pyrene-d12	83		80			
	93		68			

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330		05-0330			
Client ID	05-N11-01-PHC-T-AN		05-N11-01-PHC-T-AN			
Location	NorthStar		NorthStar			
Battelle ID	S9246-P		S9246DUP-P			
Collection Date	08/11/05		8/11/2005			
% Moisture	77.92		77.76			
% Lipid	1.95		1.78			
Matrix	AMPHIPODS		AMPHIPODS			
Sample Size (g dry)	3.32		3.54			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane	44.84	J	56.87	J	NA	
n-Decane	ND		ND		NA	
n-Undecane	ND		ND		NA	
n-Dodecane	ND		ND		NA	
n-Tridecane	ND		ND		NA	
Isoprenoid RRT 1380	4.21	J	2.95	J	NA	
n-Tetradecane	26.71	J	21.5	J	NA	
Isoprenoid RRT 1470	174.17		160.46		8.2	
n-Pentadecane	129.25	J	102.39	J	NA	
n-Hexadecane	115.5	J	108.44	J	NA	
Norpristane (1650)	ND		ND		NA	
n-Heptadecane	58.13	J	53.24	J	NA	
Pristane	6514.75		6155.28		5.7	
n-Octadecane	7.08	J	9.24	J	NA	
Phytane	6.66	J	9.54	J	NA	
n-Nonadecane	7.23	J	7.06	J	NA	
n-Eicosane	4.18	J	9.35	J	NA	
n-Heneicosane	22.21	J	23.61	J	NA	
n-Docosane	26.09	J	25.93	J	NA	
n-Tricosane	67.65	J	56.42	J	NA	
n-Tetracosane	21.44	J	21.74	J	NA	
n-Pentacosane	58.3	J	57.23	J	NA	
n-Hexacosane	19.1	J	16.1	J	NA	
n-Heptacosane	40.17	J	37.33	J	NA	
n-Octacosane	12.38	J	9.99	J	NA	
n-Nonacosane	20.11	J	15.95	J	NA	
n-Triacontane	10.48	J	6.81	J	NA	
n-Hentriacontane	18.34	J	15.25	J	NA	
n-Dotriacontane	9.08	J	7.47	J	NA	
n-Tritriacontane	6.75	J	5.35	J	NA	
n-Tetratriacontane	6.81	J	4.21	J	NA	
n-Pentatriacontane	4.67	J	3.25	J	NA	
n-Hexatriacontane	3.29	J	2.49	J	NA	
n-Heptatriacontane	1.87	J	3.07	J	NA	
n-Octatriacontane	2.48	J	2.53	J	NA	
n-Nonatriacontane	2.42	J	2.43	J	NA	
n-Tetracontane	1.53	J	1.95	J	NA	
Total SHC	5171.18		9247.66		56.5	n
Surrogate Recoveries (%)						
5a-androstane	89		81			
n-Tetracosane-d50	89		83			
S/T:						
C23 diterpane (T4)	ND		ND		NA	
C29 Tricyclictrierpane (T9)	ND		ND		NA	
C29 Tricyclictriterpane (T10)	ND		ND		NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND		ND		NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND		ND		NA	
17a(H),21b(H)-30-Norhopane (T15)	ND		ND		NA	
18a(H)-Oleanane (T18)	ND		ND		NA	
17a(H),21b(H)-hopane (T19)	ND		ND		NA	
22S-17a(H),21b(H)-30-homohopane (T21)	ND		ND		NA	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		ND		NA	
13b,17a-Diacholestane-20S (S4)	0.44	J	0.43	J	NA	
13b,17a-Diacholestane-20R (S5)	ND		ND		NA	
5a,14a,17a-methylcholestane-20R (S24)	ND		ND		NA	
5a,14a,17a-Ethylcholestane-20S (S25)	ND		ND		NA	
5a,14a,17a-Ethylcholestane-20R (S28)	ND		ND		NA	
S28a	ND		ND		NA	
Surrogate Recoveries (%)						
5b(H)-Cholane	65		74			

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329						
Client ID	050329-01: SRM 2977						
Location							
Battelle ID	BH080SRM-P						
Collection Date	09/07/05						
% Moisture	NA						
% Lipid	NA						
Matrix	TISSUE						
Sample Size (g dry)	2.03		Certified		Passing	Actual	
Units	UG/KG_DRY		Value	+/-	%Difference	%Difference	Qualifier
PAH:							
Naphthalene	7.04						
C1-Naphthalenes	7.04						
C2-Naphthalenes	73.02						
C3-Naphthalenes	188.4						
C4-Naphthalenes	195.5						
Biphenyl	3.06						
Acenaphthylene		ND					
Acenaphthene	2.18						
Fluorene	7.17		10.24	0.43	34.2	30	
C1-Fluorenes	37.28						
C2-Fluorenes	129.9						
C3-Fluorenes	219.34						
Anthracene		ND					
Phenanthrene	30.13		35.1	3.80	40.83	14.2	
C1-Phenanthrenes/Anthracenes	115.33						
C2-Phenanthrenes/Anthracenes	301.55						
C3-Phenanthrenes/Anthracenes	417.14						
C4-Phenanthrenes/Anthracenes	192.47						
Dibenzothiophene	21.04						
C1-Dibenzothiophenes	338.22						
C2-Dibenzothiophenes	497.91						
C3-Dibenzothiophenes	613.96						
Fluoranthene	23.63		38.7	1.00	32.58	38.9	N
Pyrene	49.62		78.9	3.50	34.44	37.1	N
C1-Fluoranthenes/Pyrenes	66.91						
C2-Fluoranthenes/Pyrenes	83.67						
C3-Fluoranthenes/Pyrenes	76.63						
Benzo(a)anthracene	22.92		20.34	0.78	33.83	12.7	
Chrysene	87.99						
C1-Chrysenes	87.92						
C2-Chrysenes	112.07						
C3-Chrysenes	58.61						
C4-Chrysenes		ND					
Benzo(b)fluoranthene	7.92		11.01	0.28	32.54	28.1	
Benzo(k)fluoranthene	7.92						
Benzo(e)pyrene	11.78		13.1	1.10	38.4	10.1	
Benzo(a)pyrene	4.29						
Perylene	1.84		3.5	0.76	51.71	47.4	
Indeno(1,2,3-cd)pyrene	2.44		4.84	0.81	46.74	49.6	N
Dibenz(a,h)anthracene	1.11	J	1.41	0.19	43.48	21.3	
Benzo(g,h,i)perylene	6.28		9.53	0.43	34.51	34.1	
Surrogate Recoveries (%)							
Naphthalene-d8	77						
Acenaphthene-d10	75						
Phenanthrene-d10	70						
Benzo(a)pyrene-d12	109						

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0329					
Client ID	050329-01: SRM 2977					
Location						
Battelle ID	BH080SRM-P					
Collection Date	09/07/05					
% Moisture	NA					
% Lipid	NA					
Matrix	TISSUE					
Sample Size (g dry)	2.03	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
SHC:						
n-Nonane						
n-Decane						
n-Undecane						
n-Dodecane						
n-Tridecane						
Isoprenoid RRT 1380						
n-Tetradecane						
Isoprenoid RRT 1470						
n-Pentadecane						
n-Hexadecane						
Norpristane (1650)						
n-Heptadecane						
Pristane						
n-Octadecane						
Phytane						
n-Nonadecane						
n-Eicosane						
n-Heneicosane						
n-Docosane						
n-Tricosane						
n-Tetracosane						
n-Pentacosane						
n-Hexacosane						
n-Heptacosane						
n-Octacosane						
n-Nonacosane						
n-Triacontane						
n-Hentriacontane						
n-Dotriacontane						
n-Tritriacontane						
n-Tetratriacontane						
n-Pentatriacontane						
n-Hexatriacontane						
n-Heptatriacontane						
n-Octatriacontane						
n-Nonatriacontane						
n-Tetracontane						
Total SHC						
Surrogate Recoveries (%)						
5a-androstane						
n-Tetracosane-d50						
S/T:						
C23 diterpane (T4)						
C29 Tricyclictrierpane (T9)						
C29 Tricyclictriterpane (T10)						
18a(H)-22,29,30-Trisnorneohopane -TS (T11)						
17a(H)-22,29,30-Trisnorhopane -TM (T12)						
17a(H),21b(H)-30-Norhopane (T15)						
18a(H)-Oleanane (T18)						
17a(H),21b(H)-hopane (T19)						
22S-17a(H),21b(H)-30-homohopane (T21)						
22R-17a(H),21b(H)-30-homohopane (T22)						
13b,17a-Diacholestane-20S (S4)						
13b,17a-Diacholestane-20R (S5)						
5a,14a,17a-methylcholestane-20R (S24)						
5a,14a,17a-Ethylcholestane-20S (S25)						
5a,14a,17a-Ethylcholestane-20R (S28)						
S28a						
Surrogate Recoveries (%)						
5b(H)-Cholane						

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330					
Client ID	050329-01: SRM 2977					
Location						
Battelle ID	BH083SRM-P					
Collection Date	09/21/05					
% Moisture	NA					
% Lipid	44.02					
Matrix	TISSUE					
Sample Size (g dry)	2.20	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
PAH:						
Naphthalene	7.59					
C1-Naphthalenes	9.66					
C2-Naphthalenes	52.35					
C3-Naphthalenes	198.24					
C4-Naphthalenes	265.52					
Biphenyl	3.43					
Acenaphthylene	1.64					
Acenaphthene	2.95					
Fluorene	8.73	10.24	0.43	34.2	14.7	
C1-Fluorenes	42.82					
C2-Fluorenes	158.61					
C3-Fluorenes	276.2					
Anthracene	2.21					
Phenanthrene	33.8	35.1	3.80	40.83	3.7	
C1-Phenanthrenes/Anthracenes	131.73					
C2-Phenanthrenes/Anthracenes	376.32					
C3-Phenanthrenes/Anthracenes	377.59					
C4-Phenanthrenes/Anthracenes	193.26					
Dibenzothiophene	25.57					
C1-Dibenzothiophenes	202.56					
C2-Dibenzothiophenes	552.25					
C3-Dibenzothiophenes	645.94					
Fluoranthene	32.15	38.7	1.00	32.58	16.9	
Pyrene	63.19	78.9	3.50	34.44	19.9	
C1-Fluoranthenes/Pyrenes	80.91					
C2-Fluoranthenes/Pyrenes	93.88					
C3-Fluoranthenes/Pyrenes	76.76					
Benzo(a)anthracene	19.05	20.34	0.78	33.83	6.3	
Chrysene	75.2					
C1-Chrysenes	78.29					
C2-Chrysenes	102.36					
C3-Chrysenes	36.81					
C4-Chrysenes	28.43					
Benzo(b)fluoranthene	10.31	11.01	0.28	32.54	6.4	
Benzo(k)fluoranthene	10.56					
Benzo(e)pyrene	14.48	13.1	1.10	38.4	10.5	
Benzo(a)pyrene	4.86					
Perylene	2.58	3.5	0.76	51.71	26.3	
Indeno(1,2,3-cd)pyrene	3.31	4.84	0.81	46.74	31.6	
Dibenz(a,h)anthracene	1.22	1.41	0.19	43.48	13.5	
Benzo(g,h,i)perylene	8.81	9.53	0.43	34.51	7.6	
Surrogate Recoveries (%)						
Naphthalene-d8	79					
Acenaphthene-d10	76					
Phenanthrene-d10	83					
Benzo(a)pyrene-d12	97					

Surrogate Corrected

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number	05-0330					
Client ID	050329-01: SRM 2977					
Location						
Battelle ID	BH083SRM-P					
Collection Date	09/21/05					
% Moisture	NA					
% Lipid	44.02					
Matrix	TISSUE					
Sample Size (g dry)	2.20	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
SHC:						
n-Nonane						
n-Decane						
n-Undecane						
n-Dodecane						
n-Tridecane						
Isoprenoid RRT 1380						
n-Tetradecane						
Isoprenoid RRT 1470						
n-Pentadecane						
n-Hexadecane						
Norpristane (1650)						
n-Heptadecane						
Pristane						
n-Octadecane						
Phytane						
n-Nonadecane						
n-Eicosane						
n-Heneicosane						
n-Docosane						
n-Tricosane						
n-Tetracosane						
n-Pentacosane						
n-Hexacosane						
n-Heptacosane						
n-Octacosane						
n-Nonacosane						
n-Triacontane						
n-Hentriacontane						
n-Dotriacontane						
n-Tritriacontane						
n-Tetratriacontane						
n-Pentatriacontane						
n-Hexatriacontane						
n-Heptatriacontane						
n-Octatriacontane						
n-Nonatriacontane						
n-Tetracontane						
Total SHC						
Surrogate Recoveries (%)						
5a-androstane						
n-Tetracosane-d50						
S/T:						
C23 diterpane (T4)						
C29 Tricyclictrierpane (T9)						
C29 Tricyclictriterpane (T10)						
18a(H)-22,29,30-Trisnorneohopane -TS (T11)						
17a(H)-22,29,30-Trisnorhopane -TM (T12)						
17a(H),21b(H)-30-Norhopane (T15)						
18a(H)-Oleanane (T18)						
17a(H),21b(H)-hopane (T19)						
22S-17a(H),21b(H)-30-homohopane (T21)						
22R-17a(H),21b(H)-30-homohopane (T22)						
13b,17a-Diacholestane-20S (S4)						
13b,17a-Diacholestane-20R (S5)						
5a,14a,17a-methylcholestane-20R (S24)						
5a,14a,17a-Ethylcholestane-20S (S25)						
5a,14a,17a-Ethylcholestane-20R (S28)						
S28a						
Surrogate Recoveries (%)						
5b(H)-Cholane						

Surrogate Corrected

2006 Indigenous Biota Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch ID	06-0325	06-0325	06-0325
Client ID	06-L08-01-PHC-ISO	06-N11N08-01-PHC-MY	06-N11N08-01-PHC-ISO
Location	Liberty	Northstar	Northstar
Battelle ID	R2173-P	R2388-P	R2390-P
Collection Date	07/29/06	08/10/06	08/10/06
% Moisture	74.77	79.7	73.87
% Lipid	1.31	5.24	2.76
Matrix	Isopod	Mysid	Isopod
Sample Size (g dry)	5.08	1.43	5.40
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	3.6 B	14.17	4.07 B
C1-Naphthalenes	3.57 B	9.96	4.39 B
C2-Naphthalenes	5.53 B	12.24 B	5.68 B
C3-Naphthalenes	12.41	13.25	9.49
C4-Naphthalenes	18.17	ND	ND
Biphenyl	1.17 B	2.99	1.01 B
Acenaphthylene	0.72 J	2.09	0.96
Acenaphthene	0.79 J	1.36 J	0.71 J
Fluorene	0.9 J	2.16 B	0.75 J
C1-Fluorenes	2.16	3	1.73
C2-Fluorenes	3.83	11.99	3.4
C3-Fluorenes	ND	ND	ND
Anthracene	0.17 J	0.59 J	0.14 J
Phenanthrene	2.47 B	4.84 B	2.35 B
C1-Phenanthrenes/Anthracenes	3.02 B	4.83	3.2 B
C2-Phenanthrenes/Anthracenes	3.94	5.58	3.84
C3-Phenanthrenes/Anthracenes	2.66	3.07	2.23
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	0.48 J	1.02 J	0.49 J
C1-Dibenzothiophenes	0.95 J	1.55 J	0.9 J
C2-Dibenzothiophenes	2.59	3.54	1.55
C3-Dibenzothiophenes	2.69	ND	ND
Fluoranthene	1.01 J	1.56 J	0.55 J
Pyrene	1.25 B	2.53 B	0.83 J
C1-Fluoranthenes/Pyrenes	1.51 B	1.77 J	1.34 B
C2-Fluoranthenes/Pyrenes	1.47	1.54 J	1.44
C3-Fluoranthenes/Pyrenes	1.43	ND	ND
Benzo(a)anthracene	0.29 J	0.47 J	0.13 J
Chrysene	1.18 B	1.11 J	0.92 J
C1-Chrysenes	0.8 J	0.62 J	0.79 J
C2-Chrysenes	1.32	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	0.75 J	0.79 J	0.44 J
Benzo(k)fluoranthene	0.58 J	0.67 J	0.2 J
Benzo(e)pyrene	0.82 J	0.65 J	0.61 J
Benzo(a)pyrene	0.42 J	0.46 J	0.19 J
Perylene	3.03	2.58	4.53
Indeno(1,2,3-cd)pyrene	0.29 J	0.3 J	ND
Dibenz(a,h)anthracene	ND	ND	ND
Benzo(g,h,i)perylene	0.51 J	0.42 J	0.38 J
Total PAH			
Surrogate Recoveries (%)			
Naphthalene-d8	60	67	67
Acenaphthene-d10	73	80	80
Phenanthrene-d10	92	98	96
Benzo(a)pyrene-d12	91	97	99

Laboratory Batch ID	06-0325		06-0325		06-0325	
Client ID	06-N05N11-01-PHC-ISO		06-N05N11-01-PHC-MY		06-N11S-01-PHC-ISO	
Location	Northstar		Northstar		Northstar	
Battelle ID	R2397-P		R2401-P		R2403-P	
Collection Date	08/10/06		08/10/06		08/10/06	
% Moisture	72.83		79.7		73.71	
% Lipid	2.23		3.03		2.04	
Matrix	Isopod		Mysid		Isopod	
Sample Size (g dry)	5.48		1.84		3.35	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:						
Naphthalene	5.03	B	11.6	B	7.63	B
C1-Naphthalenes	4.03	B	8.82		5.31	B
C2-Naphthalenes	5.17	B	9.93	B	8.56	B
C3-Naphthalenes	8.41		9.83		11.8	
C4-Naphthalenes	ND		ND		ND	
Biphenyl	0.97	B	2.42	B	1.5	J
Acenaphthylene	ND		1.01	J	ND	
Acenaphthene	0.5	J	0.97	J	ND	
Fluorene	0.8	J	1.73	B	0.78	J
C1-Fluorenes	1.56		2.56		2.31	
C2-Fluorenes	3.01		7.35		4.35	
C3-Fluorenes	ND		ND		ND	
Anthracene	ND		0.41	J	ND	
Phenanthrene	2.35	B	3.56	B	3.47	B
C1-Phenanthrenes/Anthracenes	3.11	B	3.88	B	4.53	
C2-Phenanthrenes/Anthracenes	4.06		4.47		5.23	
C3-Phenanthrenes/Anthracenes	2.27		2.37		2.93	
C4-Phenanthrenes/Anthracenes	ND		ND		ND	
Dibenzothiophene	0.46	J	0.74	J	0.89	J
C1-Dibenzothiophenes	0.99	B	1.5	B	1.54	J
C2-Dibenzothiophenes	1.8		2.5		2.19	
C3-Dibenzothiophenes	ND		ND		ND	
Fluoranthene	0.49	J	1.21	J	0.84	J
Pyrene	0.88	J	1.81	B	1.32	J
C1-Fluoranthenes/Pyrenes	1.57	B	1.63	B	2.29	B
C2-Fluoranthenes/Pyrenes	1.6		1.19	J	1.9	
C3-Fluoranthenes/Pyrenes	1.51		ND		2.09	
Benzo(a)anthracene	0.17	J	0.31	J	0.23	J
Chrysene	0.95	B	0.82	J	1.35	J
C1-Chrysenes	1		0.55	J	1.12	J
C2-Chrysenes	ND		ND		ND	
C3-Chrysenes	ND		ND		ND	
C4-Chrysenes	ND		ND		ND	
Benzo(b)fluoranthene	0.51	J	0.68	J	0.67	J
Benzo(k)fluoranthene	ND		0.66	J	ND	
Benzo(e)pyrene	0.76	J	0.57	J	0.92	J
Benzo(a)pyrene	0.18	J	0.37	J	0.23	J
Perylene	6.28		3.11		5.84	
Indeno(1,2,3-cd)pyrene	0.2	J	0.23	J	ND	
Dibenz(a,h)anthracene	ND		ND		ND	
Benzo(g,h,i)perylene	0.57	J	0.32	J	0.58	J
Total PAH						
Surrogate Recoveries (%)						
Naphthalene-d8	83		69		78	
Acenaphthene-d10	85		81		81	
Phenanthrene-d10	101		101		96	
Benzo(a)pyrene-d12	92		97		89	

Laboratory Batch ID	06-0325		06-0325		06-0325	
Client ID	06-N11S-01-PHC-MY		06-6B-01-PHC-ISO		06-WD01-01-PHC-ISO	
Location	Northstar		BSMP		Other	
Battelle ID	R2404-P		R2514-P		R2567-P	
Collection Date	08/10/06		08/03/06		08/08/06	
% Moisture	79.7		73.71		73.71	
% Lipid	4.98		1.97		0.65	
Matrix	Mysid		Isopod		Isopod	
Sample Size (g dry)	3.31		3.72		5.38	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:						
Naphthalene	9.54	B	8.3	B	31.82	
C1-Naphthalenes	10.82		10.22		12.51	
C2-Naphthalenes	11.84	B	12.84		20	
C3-Naphthalenes	8.73		14.78		19.54	
C4-Naphthalenes	ND		ND		9.79	
Biphenyl	2.78	B	2.03	B	1.94	B
Acenaphthylene	ND		ND		ND	
Acenaphthene	ND		ND		21.16	
Fluorene	1.31	J	1.39	J	3.23	
C1-Fluorenes	1.9		3.17		2.94	
C2-Fluorenes	ND		5.34		3.77	
C3-Fluorenes	ND		ND		ND	
Anthracene	ND		ND		1.37	
Phenanthrene	2.72	B	4.74	B	20.91	
C1-Phenanthrenes/Anthracenes	2.9	B	6.97		6.22	
C2-Phenanthrenes/Anthracenes	4.04		7.3		5.38	
C3-Phenanthrenes/Anthracenes	ND		4.92		2.3	
C4-Phenanthrenes/Anthracenes	ND		ND		ND	
Dibenzothiophene	0.7	J	0.76	J	3.58	
C1-Dibenzothiophenes	1.3	J	1.91	B	2.05	B
C2-Dibenzothiophenes	ND		3		2.42	
C3-Dibenzothiophenes	ND		2.15		ND	
Fluoranthene	0.61	J	0.82	J	4.47	
Pyrene	1.1	J	1.35	J	4.35	
C1-Fluoranthenes/Pyrenes	ND		3.09		1.64	B
C2-Fluoranthenes/Pyrenes	ND		3.16		0.97	
C3-Fluoranthenes/Pyrenes	ND		3.06		1.02	
Benzo(a)anthracene	ND		0.23	J	0.35	J
Chrysene	0.51	J	1.47		0.6	J
C1-Chrysenes	0.87	J	1.51		0.47	J
C2-Chrysenes	ND		ND		ND	
C3-Chrysenes	ND		ND		ND	
C4-Chrysenes	ND		ND		ND	
Benzo(b)fluoranthene	0.34	J	0.87	J	0.32	J
Benzo(k)fluoranthene	ND		ND		0.27	J
Benzo(e)pyrene	0.4	J	1.14	J	0.49	J
Benzo(a)pyrene	ND		0.37	J	0.24	J
Perylene	2.25		5.82		1.5	
Indeno(1,2,3-cd)pyrene	ND		0.22	J	0.18	J
Dibenz(a,h)anthracene	ND		ND		ND	
Benzo(g,h,i)perylene	0.31	J	0.95	J	0.23	J
Total PAH						
Surrogate Recoveries (%)						
Naphthalene-d8	92		72		70	
Acenaphthene-d10	90		76		80	
Phenanthrene-d10	108		92		102	
Benzo(a)pyrene-d12	92		83		89	

Laboratory Batch ID	06-0326	06-0327
Client ID	Procedural Blank	Procedural Blank
Battelle ID	BJ457PB-P	BJ462PB-P
Collection Date	11/21/06	11/28/06
% Moisture	85.03	76.26
% Lipid	NA	NA
Matrix	TISSUE	TISSUE
Sample Size (g dry)	2.70	4.57
Units	UG/KG_DRY	UG/KG_DRY
PAH:		
Naphthalene	3.12	1.13
C1-Naphthalenes	1.35	0.5 J
C2-Naphthalenes	ND	ND
C3-Naphthalenes	ND	ND
C4-Naphthalenes	ND	ND
Biphenyl	ND	ND
Acenaphthylene	ND	ND
Acenaphthene	ND	ND
Fluorene	ND	ND
C1-Fluorenes	ND	ND
C2-Fluorenes	ND	ND
C3-Fluorenes	ND	ND
Anthracene	ND	ND
Phenanthrene	3.46	0.33 J
C1-Phenanthrenes/Anthracenes	3.62	ND
C2-Phenanthrenes/Anthracenes	4.39 N	ND
C3-Phenanthrenes/Anthracenes	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND
Dibenzothiophene	1.12	ND
C1-Dibenzothiophenes	ND	ND
C2-Dibenzothiophenes	ND	ND
C3-Dibenzothiophenes	ND	ND
Fluoranthene	2.1	ND
Pyrene	4.04	0.1 J
C1-Fluoranthenes/Pyrenes	1.67	ND
C2-Fluoranthenes/Pyrenes	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND
Benzo(a)anthracene	0.74 J	ND
Chrysene	1.08	ND
C1-Chrysenes	ND	ND
C2-Chrysenes	ND	ND
C3-Chrysenes	ND	ND
C4-Chrysenes	ND	ND
Benzo(b)fluoranthene	1.07	ND
Benzo(k)fluoranthene	1.32 J	ND
Benzo(e)pyrene	0.86 J	ND
Benzo(a)pyrene	0.7 J	ND
Perylene	0.57 J	ND
Indeno(1,2,3-cd)pyrene	1.05	0.18 J
Dibenz(a,h)anthracene	0.44 J	0.13 J
Benzo(g,h,i)perylene	0.77 J	0.16 J
Total PAH		
Surrogate Recoveries (%)		
Naphthalene-d8	71	77
Acenaphthene-d10	72	79
Benzo(a)pyrene-d12	80	86

Laboratory Batch ID	06-0326	06-0327
Client ID	Procedural Blank	Procedural Blank
Battelle ID	BJ457PB-P	BJ462PB-P
Collection Date	11/21/06	11/28/06
% Moisture	85.03	76.26
% Lipid	NA	NA
Matrix	TISSUE	TISSUE
Sample Size (g dry)	2.70	4.57
Units	UG/KG_DRY	UG/KG_DRY
SHC:		
n-Nonane	34.07 J	ND
n-Decane	109.24 J	15.43 J
n-Undecane	60.1 J	7.22 J
n-Dodecane	10.11 J	4.07 J
n-Tridecane	5.92 J	ND
Isoprenoid RRT 1380	ND	ND
n-Tetradecane	12.08 J	ND
Isoprenoid RRT 1470	ND	ND
n-Pentadecane	9.73 J	17.89 J
n-Hexadecane	18.31 J	ND
Norpristane (1650)	ND	ND
n-Heptadecane	10.24 J	ND
Pristane	5.41 J	ND
n-Octadecane	15.45 J	ND
Phytane	ND	ND
n-Nonadecane	6.33 J	ND
n-Eicosane	15.53 J	ND
n-Heneicosane	12.49 J	ND
n-Docosane	16.92 J	ND
n-Tricosane	32.75 J	ND
n-Tetracosane	26.44 J	ND
n-Pentacosane	38.22 J	5.78 J
n-Hexacosane	47.2 J	8.18 J
n-Heptacosane	53.65 J	8.01 J
n-Octacosane	53.01 J	7.93 J
n-Nonacosane	56.3 J	ND
n-Triacontane	47.43 J	ND
n-Hentriacontane	49.15 J	ND
n-Dotriacontane	71.23 J	ND
n-Tritriacontane	33.91 J	ND
n-Tetratriacontane	54.44 J	ND
n-Pentatriacontane	21.24 J	ND
n-Hexatriacontane	47.24 J	2 J
n-Heptatriacontane	14.04 J	ND
n-Octatriacontane	11.81 J	ND
n-Nonatriacontane	35.35 J	ND
n-Tetracontane	8.51 J	ND
Total SHC	686.88	10511.6
Surrogate Recoveries (%)		
5a-androstane	81	89
n-Tetracosane-d50	86	88
S/T:		
C23 diterpane (T4)	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND
18a(H)-Oleanane (T18)	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND
S28a	ND	ND
Surrogate Recoveries (%)		
5b(H)-Cholane	80	83

Surrogate Corrected

Laboratory Batch ID	06-0326				
Client ID	060313-01: Tilapia				
Battelle ID	BJ458LCS-P				
Collection Date	11/21/06				
% Moisture	78.37				
% Lipid	2.24				
Matrix	TISSUE				
Sample Size (g dry)	4.36				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	293.97		286.75	103	
C1-Naphthalenes	414.99				
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	304.3		287.18	106	
Acenaphthylene	310.15		286.96	108	
Acenaphthene	318.2		286.88	111	
Fluorene	305.78		286.85	107	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	345.86		286.74	121	
Phenanthrene	315.68		286.84	110	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	319.89		288.02	111	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	310.81		286.84	108	
Pyrene	322.39		286.80	112	
C1-Fluoranthenes/Pyrenes	0.88				
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	280.33		286.77	98	
Chrysene	266.24		286.81	93	
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	268.91		286.94	94	
Benzo(k)fluoranthene	342.82		286.85	120	
Benzo(e)pyrene	268.77		287.41	94	
Benzo(a)pyrene	286.15		286.93	100	
Perylene	320.51		287.28	112	
Indeno(1,2,3-cd)pyrene	290.1		286.84	101	
Dibenz(a,h)anthracene	300.37		286.85	105	
Benzo(g,h,i)perylene	274.84		286.78	96	
Total PAH					
Surrogate Recoveries (%)					
Naphthalene-d8	76				
Acenaphthene-d10	78				
Benzo(a)pyrene-d12	75				

Laboratory Batch ID	06-0326
Client ID	060313-01: Tilapia
Battelle ID	BJ458LCS-P
Collection Date	11/21/06
% Moisture	78.37
% Lipid	2.24
Matrix	TISSUE
Sample Size (g dry)	4.36

Units	UG/KG_DRY		Target	% Recovery	Qualifier
SHC:					
n-Nonane	1221.41		2866.97	43	N
n-Decane	2217.87		2866.97	77	
n-Undecane	359.97				
n-Dodecane	2709.26		2866.97	94	
n-Tridecane		ND			
Isoprenoid RRT 1380		ND			
n-Tetradecane	2746.07		2866.97	96	
Isoprenoid RRT 1470		ND			
n-Pentadecane		ND			
n-Hexadecane	2840.52		2866.97	99	
Norpristane (1650)		ND			
n-Heptadecane		ND			
Pristane	3106.61		2867.55	108	
n-Octadecane	2844.56		2866.97	99	
Phytane	2767.4		2868.98	96	
n-Nonadecane	2817.14		2866.97	98	
n-Eicosane	2857.85		2866.97	100	
n-Heneicosane		ND			
n-Docosane	2941.07		2866.97	103	
n-Tricosane		ND			
n-Tetracosane	2876.09		2866.97	100	
n-Pentacosane		ND			
n-Hexacosane	2897.57		2866.97	101	
n-Heptacosane		ND			
n-Octacosane	2842.95		2866.97	99	
n-Nonacosane		ND			
n-Triacontane	2792.68		2866.97	97	
n-Hentriacontane		ND			
n-Dotriacontane		ND			
n-Tritriacontane		ND			
n-Tetratriacontane		ND			
n-Pentatriacontane		ND			
n-Hexatriacontane	2672.09		2866.97	93	
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
Total SHC		ND			
Surrogate Recoveries (%)					
5a-androstane	80				
n-Tetracosane-d50	81				
S/T:					
C23 diterpane (T4)		ND			
C29 Tricyclictrierpane (T9)		ND			
C29 Tricyclictriterpane (T10)		ND			
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND			
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND			
17a(H),21b(H)-30-Norhopane (T15)		ND			
18a(H)-Oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)		ND			
22S-17a(H),21b(H)-30-homohopane (T21)		ND			
22R-17a(H),21b(H)-30-homohopane (T22)		ND			
13b,17a-Diacholestane-20S (S4)		ND			
13b,17a-Diacholestane-20R (S5)		ND			
5a,14a,17a-methylcholestane-20R (S24)		ND			
5a,14a,17a-Ethylcholestane-20S (S25)		ND			
5a,14a,17a-Ethylcholestane-20R (S28)		ND			
S28a		ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	76				

Laboratory Batch ID	06-0327
Client ID	060313-01: Tilapia
Battelle ID	BJ463LCS-P
Collection Date	11/28/06
% Moisture	78.37
% Lipid	2.11
Matrix	TISSUE
Sample Size (g dry)	4.39

Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	284.66		284.79	100	
C1-Naphthalenes		ND			
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	310.55		285.22	109	
Acenaphthylene	314.12		284.99	110	
Acenaphthene	320.75		284.92	113	
Fluorene	310.79		284.89	109	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	353.83		284.78	124	
Phenanthrene	323.27		284.88	113	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	320.74		286.05	112	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	324.33		284.88	114	
Pyrene	333.93		284.84	117	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	293.14		284.81	103	
Chrysene	281.35		284.85	99	
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	266.83		284.98	94	
Benzo(k)fluoranthene	338.37		284.89	119	
Benzo(e)pyrene	266.54		285.45	93	
Benzo(a)pyrene	272.23		284.97	96	
Perylene	317.51		285.32	111	
Indeno(1,2,3-cd)pyrene	279.86		284.88	98	
Dibenz(a,h)anthracene	299.2		284.89	105	
Benzo(g,h,i)perylene	267.37		284.82	94	
Total PAH					
Surrogate Recoveries (%)					
Naphthalene-d8	71				
Acenaphthene-d10	69				
Benzo(a)pyrene-d12	71				

Laboratory Batch ID	06-0327
Client ID	060313-01: Tilapia
Battelle ID	BJ463LCS-P
Collection Date	11/28/06
% Moisture	78.37
% Lipid	2.11
Matrix	TISSUE
Sample Size (g dry)	4.39

Units	UG/KG_DRY		Target	% Recovery	Qualifier
SHC:					
n-Nonane	1731.33		2847.38	61	N
n-Decane	2404.78		2847.38	84	
n-Undecane		ND			
n-Dodecane	2793.83		2847.38	98	
n-Tridecane		ND			
Isoprenoid RRT 1380		ND			
n-Tetradecane	2813.39		2847.38	99	
Isoprenoid RRT 1470		ND			
n-Pentadecane		ND			
n-Hexadecane	2886.61		2847.38	101	
Norpristane (1650)		ND			
n-Heptadecane		ND			
Pristane	3182.17		2847.95	112	
n-Octadecane	2878.34		2847.38	101	
Phytane	2841.48		2849.37	100	
n-Nonadecane	2858.46		2847.38	100	
n-Eicosane	2893.02		2847.38	102	
n-Heneicosane		ND			
n-Docosane	2934.94		2847.38	103	
n-Tricosane		ND			
n-Tetracosane	2844.98		2847.38	100	
n-Pentacosane		ND			
n-Hexacosane	2848.66		2847.38	100	
n-Heptacosane		ND			
n-Octacosane	2830.54		2847.38	99	
n-Nonacosane		ND			
n-Triacontane	2798.36		2847.38	98	
n-Hentriacontane		ND			
n-Dotriacontane		ND			
n-Tritriacontane		ND			
n-Tetratriacontane		ND			
n-Pentatriacontane		ND			
n-Hexatriacontane	1822.78		2847.38	64	N
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
Total SHC		ND			
Surrogate Recoveries (%)					
5a-androstane	75				
n-Tetracosane-d50	75				
S/T:					
C23 diterpane (T4)		ND			
C29 Tricyclictrierpane (T9)		ND			
C29 Tricyclictriterpane (T10)		ND			
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND			
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND			
17a(H),21b(H)-30-Norhopane (T15)		ND			
18a(H)-Oleanane (T18)		ND			
17a(H),21b(H)-hopane (T19)		ND			
22S-17a(H),21b(H)-30-homohopane (T21)		ND			
22R-17a(H),21b(H)-30-homohopane (T22)		ND			
13b,17a-Diacholestane-20S (S4)		ND			
13b,17a-Diacholestane-20R (S5)		ND			
5a,14a,17a-methylcholestane-20R (S24)		ND			
5a,14a,17a-Ethylcholestane-20S (S25)		ND			
5a,14a,17a-Ethylcholestane-20R (S28)		ND			
S28a		ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	68				

Laboratory Batch ID	06-0326						
Client ID	060814-01: Nist 2977						
Battelle ID	BJ459SRM-P						
Collection Date	11/21/06						
% Moisture	NA						
% Lipid	5.85						
Matrix	TISSUE						
Sample Size (g dry)	2.14		Certified		Passing	Actual	
Units	UG/KG_DRY		Value	+/-	%Difference	%Difference	Qualifier
PAH:							
Naphthalene	9.94						
C1-Naphthalenes	10.22						
C2-Naphthalenes	50.01						
C3-Naphthalenes	180.26						
C4-Naphthalenes	270.24						
Biphenyl	2.92						
Acenaphthylene		ND					
Acenaphthene	2.41						
Fluorene	8.44		10.24	0.43	34.2	17.6	
C1-Fluorenes	40.68						
C2-Fluorenes	171.34						
C3-Fluorenes	320.95						
Anthracene		ND					
Phenanthrene	40.7		35.1	3.80	40.83	16	
C1-Phenanthrenes/Anthracenes	163.89						
C2-Phenanthrenes/Anthracenes	449.74						
C3-Phenanthrenes/Anthracenes	526.46						
C4-Phenanthrenes/Anthracenes	266.11						
Dibenzothiophene	26.68						
C1-Dibenzothiophenes	206.93						
C2-Dibenzothiophenes	691.44						
C3-Dibenzothiophenes	821.47						
Fluoranthene	36.12		38.7	1.00	32.58	6.7	
Pyrene	78.15		78.9	3.50	34.44	1	
C1-Fluoranthenes/Pyrenes	100.04						
C2-Fluoranthenes/Pyrenes	121.9						
C3-Fluoranthenes/Pyrenes	105.62						
Benzo(a)anthracene	18.2		20.34	0.78	33.83	10.5	
Chrysene	66.55						
C1-Chrysenes	61.07						
C2-Chrysenes	81.33						
C3-Chrysenes	40.64						
C4-Chrysenes	41.48						
Benzo(b)fluoranthene	9.49		11.01	0.28	32.54	13.8	
Benzo(k)fluoranthene	8.11						
Benzo(e)pyrene	13.26		13.1	1.10	38.4	1.2	
Benzo(a)pyrene	4.83		8.35	0.72	38.62	42.2	N
Perylene	3.58		3.5	0.76	51.71	2.3	
Indeno(1,2,3-cd)pyrene	3.12		4.84	0.81	46.74	35.5	
Dibenz(a,h)anthracene	1.19	J	1.41	0.19	43.48	15.6	
Benzo(g,h,i)perylene	6.98		9.53	0.43	34.51	26.8	
Total PAH							
Surrogate Recoveries (%)							
Naphthalene-d8	60						
Acenaphthene-d10	62						
Benzo(a)pyrene-d12	70						

Laboratory Batch ID	06-0326					
Client ID	060814-01: Nist 2977					
Battelle ID	BJ459SRM-P					
Collection Date	11/21/06					
% Moisture	NA					
% Lipid	5.85					
Matrix	TISSUE					
Sample Size (g dry)	2.14	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
SHC:						
n-Nonane						
n-Decane						
n-Undecane						
n-Dodecane						
n-Tridecane						
Isoprenoid RRT 1380						
n-Tetradecane						
Isoprenoid RRT 1470						
n-Pentadecane						
n-Hexadecane						
Norpristane (1650)						
n-Heptadecane						
Pristane						
n-Octadecane						
Phytane						
n-Nonadecane						
n-Eicosane						
n-Heneicosane						
n-Docosane						
n-Tricosane						
n-Tetracosane						
n-Pentacosane						
n-Hexacosane						
n-Heptacosane						
n-Octacosane						
n-Nonacosane						
n-Triacontane						
n-Hentriacontane						
n-Dotriacontane						
n-Tritriacontane						
n-Tetratriacontane						
n-Pentatriacontane						
n-Hexatriacontane						
n-Heptatriacontane						
n-Octatriacontane						
n-Nonatriacontane						
n-Tetracontane						
Total SHC						
Surrogate Recoveries (%)						
5a-androstane						
n-Tetracosane-d50						
S/T:						
C23 diterpane (T4)	30.76					
C29 Tricyclictrierpane (T9)	5.58					
C29 Tricyclictriterpane (T10)	3.75					
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	21.67					
17a(H)-22,29,30-Trisnorhopane -TM (T12)	18.75					
17a(H),21b(H)-30-Norhopane (T15)	73.68					
18a(H)-Oleanane (T18)	ND					
17a(H),21b(H)-hopane (T19)	93.56					
22S-17a(H),21b(H)-30-homohopane (T21)	34.55					
22R-17a(H),21b(H)-30-homohopane (T22)	28.27					
13b,17a-Diacholestane-20S (S4)	7.35					
13b,17a-Diacholestane-20R (S5)	5.61					
5a,14a,17a-methylcholestane-20R (S24)	26.5					
5a,14a,17a-Ethylcholestane-20S (S25)	7.78					
5a,14a,17a-Ethylcholestane-20R (S28)	34.49					
S28a	16.34					
Surrogate Recoveries (%)						
5b(H)-Cholane	67					

Surrogate Corrected

Laboratory Batch ID	06-0327					
Client ID	060814-01: Nist 2977					
Battelle ID	BJ464SRM-P					
Collection Date	11/28/06					
% Moisture	NA					
% Lipid	8.09					
Matrix	TISSUE					
Sample Size (g dry)	2.00	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
PAH:						
Naphthalene	7.96					
C1-Naphthalenes	8.76					
C2-Naphthalenes	44.45					
C3-Naphthalenes	168.86					
C4-Naphthalenes	259.25					
Biphenyl	2.25					
Acenaphthylene	0.93 J					
Acenaphthene	2.64					
Fluorene	7.18	10.24	0.43	34.2	29.9	
C1-Fluorenes	33.35					
C2-Fluorenes	155.86					
C3-Fluorenes	277.1					
Anthracene	3.44					
Phenanthrene	33.09	35.1	3.80	40.83	5.7	
C1-Phenanthrenes/Anthracenes	146.57					
C2-Phenanthrenes/Anthracenes	461.84					
C3-Phenanthrenes/Anthracenes	528.6					
C4-Phenanthrenes/Anthracenes	250.99					
Dibenzothiophene	22.83					
C1-Dibenzothiophenes	190.26					
C2-Dibenzothiophenes	667.54					
C3-Dibenzothiophenes	812.74					
Fluoranthene	32.85	38.7	1.00	32.58	15.1	
Pyrene	71.21	78.9	3.50	34.44	9.7	
C1-Fluoranthenes/Pyrenes	92.82					
C2-Fluoranthenes/Pyrenes	118.26					
C3-Fluoranthenes/Pyrenes	103.45					
Benzo(a)anthracene	16.33	20.34	0.78	33.83	19.7	
Chrysene	62.68					
C1-Chrysenes	57.79					
C2-Chrysenes	78.84					
C3-Chrysenes	40.92					
C4-Chrysenes	42.44					
Benzo(b)fluoranthene	9.15	11.01	0.28	32.54	16.9	
Benzo(k)fluoranthene	7.84					
Benzo(e)pyrene	13.24	13.1	1.10	38.4	1.1	
Benzo(a)pyrene	4.16	8.35	0.72	38.62	50.2	N
Perylene	2.8	3.5	0.76	51.71	20	
Indeno(1,2,3-cd)pyrene	2.8	4.84	0.81	46.74	42.1	
Dibenz(a,h)anthracene	1.22 J	1.41	0.19	43.48	13.5	
Benzo(g,h,i)perylene	6.45	9.53	0.43	34.51	32.3	
Total PAH						
Surrogate Recoveries (%)						
Naphthalene-d8	73					
Acenaphthene-d10	73					
Benzo(a)pyrene-d12	81					

Laboratory Batch ID	06-0327
Client ID	060814-01: Nist 2977
Battelle ID	BJ464SRM-P
Collection Date	11/28/06
% Moisture	NA
% Lipid	8.09
Matrix	TISSUE
Sample Size (g dry)	2.00

Units	UG/KG_DRY	Certified Value	+/-	Passing %Difference	Actual %Difference	Qualifier
SHC:						
n-Nonane						
n-Decane						
n-Undecane						
n-Dodecane						
n-Tridecane						
Isoprenoid RRT 1380						
n-Tetradecane						
Isoprenoid RRT 1470						
n-Pentadecane						
n-Hexadecane						
Norpristane (1650)						
n-Heptadecane						
Pristane						
n-Octadecane						
Phytane						
n-Nonadecane						
n-Eicosane						
n-Heneicosane						
n-Docosane						
n-Tricosane						
n-Tetracosane						
n-Pentacosane						
n-Hexacosane						
n-Heptacosane						
n-Octacosane						
n-Nonacosane						
n-Triacontane						
n-Hentriacontane						
n-Dotriacontane						
n-Tritriacontane						
n-Tetratriacontane						
n-Pentatriacontane						
n-Hexatriacontane						
n-Heptatriacontane						
n-Octatriacontane						
n-Nonatriacontane						
n-Tetracontane						
Total SHC						
Surrogate Recoveries (%)						
5a-androstane						
n-Tetracosane-d50						
S/T:						
C23 diterpane (T4)	32.32					
C29 Tricyclictrierpane (T9)	4.99					
C29 Tricyclictriterpane (T10)	5.23					
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	23.45					
17a(H)-22,29,30-Trisnorhopane -TM (T12)	19.81					
17a(H),21b(H)-30-Norhopane (T15)	75.53					
18a(H)-Oleanane (T18)	ND					
17a(H),21b(H)-hopane (T19)	91.86					
22S-17a(H),21b(H)-30-homohopane (T21)	43.27					
22R-17a(H),21b(H)-30-homohopane (T22)	30.33					
13b,17a-Diacholestane-20S (S4)	7.09					
13b,17a-Diacholestane-20R (S5)	4.84					
5a,14a,17a-methylcholestane-20R (S24)	27.74					
5a,14a,17a-Ethylcholestane-20S (S25)	7.74					
5a,14a,17a-Ethylcholestane-20R (S28)	35.23					
S28a	ND					
Surrogate Recoveries (%)						
5b(H)-Cholane	74					

Surrogate Corrected

Laboratory Batch ID	06-0326				06-0327
Client ID	GN62: North Slope Crude				GN62: North Slope Crude
Battelle ID	BJ460NSC (PAH), BJ780NSC (SHC), BJ778NSC(S/T)				BJ465NSC (PAH), BJ787NSC (SHC), BJ785NSC (S/T)
Collection Date	12/11/06				12/11/06
% Moisture	NA				NA
% Lipid	NA				NA
Matrix	OIL				OIL
Sample Size (g dry)	5.01				5.01
Units	MG/KG_OIL		Target	% Difference	Qualifier	MG/KG_OIL
PAH:						
Naphthalene	668.88		740.29	9.6		667.53
C1-Naphthalenes	1504.04		1516.04	0.8		1522.56
C2-Naphthalenes	2041.17		2000.10	2.1		2043.17
C3-Naphthalenes	1713.51		1526.96	12.2		1694.4
C4-Naphthalenes	1066.78		898.03	18.8		1043.35
Biphenyl	199.93		220.82	9.5		199.39
Acenaphthylene		ND				
Acenaphthene	12.73		14.50	12.2		11.38
Fluorene	91.54		92.51	1.0		94.89
C1-Fluorenes	230.5		227.01	1.5		232.64
C2-Fluorenes	404.37		367.09	10.2		392.44
C3-Fluorenes	384.78		326.32	17.9		381.08
Anthracene		ND				
Phenanthrene	261.58		249.49	4.8		263.92
C1-Phenanthrenes/Anthracenes	617.02		549.17	12.4		619.02
C2-Phenanthrenes/Anthracenes	798.31		642.72	24.2		789.92
C3-Phenanthrenes/Anthracenes	584.23		446.11	31.0	N	571.96
C4-Phenanthrenes/Anthracenes	241.28		180.02	34.0	N	205.32
Dibenzothiophene	221.52		210.35	5.3		222.5
C1-Dibenzothiophenes	468.8		409.03	14.6		467.08
C2-Dibenzothiophenes	698.43		551.46	26.7		694.3
C3-Dibenzothiophenes	599.24		471.36	27.1		607.97
Fluoranthene		ND				
Pyrene	12.71		12.99	2.2		12.46
C1-Fluoranthenes/Pyrenes	87.52		70.92	23.4		82.67
C2-Fluoranthenes/Pyrenes	151.73		117.89	28.7		146.08
C3-Fluoranthenes/Pyrenes	166.97		137.25	21.7		158.3
Benzo(a)anthracene	4.75					3.24
Chrysene	42.55		47.18	9.8		43.46
C1-Chrysenes	72.01		78.82	8.6		68.56
C2-Chrysenes	94.03		102.67	8.4		92.99
C3-Chrysenes	77.99		85.36	8.6		78.1
C4-Chrysenes	52.43		61.99	15.4		61.91
Benzo(b)fluoranthene	5.31		6.08	12.7		4.86
Benzo(k)fluoranthene		ND				
Benzo(e)pyrene	9.86		12.88	23.4		9.73
Benzo(a)pyrene		ND				
Perylene		ND				
Indeno(1,2,3-cd)pyrene		ND				
Dibenz(a,h)anthracene	1.18	J				1.27
Benzo(g,h,i)perylene	3.05		3.44	11.3		2.55
Total PAH						
Surrogate Recoveries (%)						
Naphthalene-d8	111					115
Acenaphthene-d10	113					114
Benzo(a)pyrene-d12	123	N				123

Laboratory Batch ID	06-0326				06-0327
Client ID	GN62: North Slope Crude				GN62: North Slope Crude
Battelle ID	BJ460NSC (PAH), BJ780NSC (SHC), BJ778NSC(S/T)				BJ465NSC (PAH), BJ787NSC (SHC), BJ785NSC (S/T)
Collection Date	12/11/06				12/11/06
% Moisture	NA				NA
% Lipid	NA				NA
Matrix	OIL				OIL
Sample Size (g dry)	5.01				5.01
Units	MG/KG_OIL		Target	% Difference	Qualifier	MG/KG_OIL
SHC:						
n-Nonane	5847.32		4670.06	25.2		5489.68
n-Decane	5179.6		4951.66	4.6		5239.16
n-Undecane	5081.14		4506.16	12.8		5335.45
n-Dodecane	3841.42		4576.43	16.1		5569.32
n-Tridecane	6658.46	ME	4189.33	58.9	N	6950.61
Isoprenoid RRT 1380	925.59		961.81	3.8		955.17
n-Tetradecane	4548.07		3919.50	16.0		4736.36
Isoprenoid RRT 1470	1873.43		1532.69	22.2		1953.8
n-Pentadecane	4158.75		3990.56	4.2		4601.62
n-Hexadecane	3849.76		3640.11	5.8		4049.68
Norpristane (1650)	1091.71		1141.72	4.4		1179.17
n-Heptadecane	3390.62		3078.38	10.1		3533.89
Pristane	2419.61		2280.61	6.1		2501.29
n-Octadecane	2851.76		2796.74	2.0		2943.25
Phytane	1516.74		1659.88	8.6		1576.34
n-Nonadecane	2536.89		2540.37	0.1		2712.15
n-Eicosane	2745.65		2502.77	9.7		2744.18
n-Heneicosane	2550.79		2419.45	5.4		2557.51
n-Docosane	2436.82		2251.79	8.2		2443.94
n-Tricosane	2110.77		2050.41	2.9		2118.41
n-Tetracosane	2040.91		1948.20	4.8		2027.57
n-Pentacosane	1735.29		1795.70	3.4		1716.42
n-Hexacosane	1604.8		1639.60	2.1		1589.88
n-Heptacosane	1296.07		1230.99	5.3		1220.43
n-Octacosane	1004.78		1004.15	0.1		1004.58
n-Nonacosane	813.1		872.21	6.8		839.95
n-Triacontane	700.83		669.33	4.7		614
n-Hentriacontane	634.08		606.82	4.5		603.44
n-Dotriacontane	457.07		465.97	1.9		385.33
n-Tritriacontane	354.53		399.05	11.2		312.86
n-Tetratriacontane	324.82		371.75	12.6		278.64
n-Pentatriacontane	328.76		378.11	13.1		282.38
n-Hexatriacontane	217.92	J	235.65	7.5		158.39
n-Heptatriacontane	189.12	J	210.06	10.0		134.59
n-Octatriacontane	171.95	J	205.75	16.4		110.39
n-Nonatriacontane	168.17	J	153.92	9.3		93.83
n-Tetracontane	146	J	161.64	9.7		82.98
Total SHC	591103.08		578973.63	2.1		635031.56
Surrogate Recoveries (%)						
5a-androstane	97					97
n-Tetracosane-d50	98					95
S/T:						
C23 diterpane (T4)	59.83		47.76	25.3		56.83
C29 Tricyclictrierpane (T9)	17.34		14.70	18.0		16.91
C29 Tricyclictriterpane (T10)	18.09		14.64	23.6		13.58
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	19.79		15.96	24.0		16.04
17a(H)-22,29,30-Trisnorhopane -TM (T12)	28.32		24.82	14.1		29.05
17a(H),21b(H)-30-Norhopane (T15)	88.44		69.58	27.1		79.11
18a(H)-Oleanane (T18)		ND				
17a(H),21b(H)-hopane (T19)	141.45		120.14	17.7		139.02
22S-17a(H),21b(H)-30-homohopane (T21)	65.82		59.93	9.8		65.53
22R-17a(H),21b(H)-30-homohopane (T22)	43.58		39.69	9.8		38.84
13b,17a-Diacholestane-20S (S4)	44.67		44.18	1.1		43.26
13b,17a-Diacholestane-20R (S5)	28.94		25.52	13.4		25.83
5a,14a,17a-methylcholestane-20R (S24)	32.28		33.94	4.9		32.02
5a,14a,17a-Ethylcholestane-20S (S25)	41.32		35.93	15.0		37.85
5a,14a,17a-Ethylcholestane-20R (S28)	41.26		39.17	5.3		37.24
S28a		ND				
Surrogate Recoveries (%)						
5b(H)-Cholane	93					95

Laboratory Batch ID

Client ID

Battelle ID
Collection Date
% Moisture
% Lipid
Matrix
Sample Size (g dry)

Units		Target	% Difference	Qualifier
PAH:				
Naphthalene		740.29	9.8	
C1-Naphthalenes		1516.04	0.4	
C2-Naphthalenes		2000.10	2.2	
C3-Naphthalenes		1526.96	11.0	
C4-Naphthalenes		898.03	16.2	
Biphenyl		220.82	9.7	
Acenaphthylene	ND			
Acenaphthene		14.50	21.5	
Fluorene		92.51	2.6	
C1-Fluorenes		227.01	2.5	
C2-Fluorenes		367.09	6.9	
C3-Fluorenes		326.32	16.8	
Anthracene	ND			
Phenanthrene		249.49	5.8	
C1-Phenanthrenes/Anthracenes		549.17	12.7	
C2-Phenanthrenes/Anthracenes		642.72	22.9	
C3-Phenanthrenes/Anthracenes		446.11	28.2	
C4-Phenanthrenes/Anthracenes		180.02	14.1	
Dibenzothiophene		210.35	5.8	
C1-Dibenzothiophenes		409.03	14.2	
C2-Dibenzothiophenes		551.46	25.9	
C3-Dibenzothiophenes		471.36	29.0	
Fluoranthene	ND			
Pyrene		12.99	4.1	
C1-Fluoranthenes/Pyrenes		70.92	16.6	
C2-Fluoranthenes/Pyrenes		117.89	23.9	
C3-Fluoranthenes/Pyrenes		137.25	15.3	
Benzo(a)anthracene				
Chrysene		47.18	7.9	
C1-Chrysenes		78.82	13.0	
C2-Chrysenes		102.67	9.4	
C3-Chrysenes		85.36	8.5	
C4-Chrysenes		61.99	0.1	
Benzo(b)fluoranthene		6.08	20.1	
Benzo(k)fluoranthene	ND			
Benzo(e)pyrene		12.88	24.5	
Benzo(a)pyrene	ND			
Perylene	ND			
Indeno(1,2,3-cd)pyrene	ND			
Dibenz(a,h)anthracene				
Benzo(g,h,i)perylene		3.44	25.9	
Total PAH				
Surrogate Recoveries (%)				
Naphthalene-d8				
Acenaphthene-d10				
Benzo(a)pyrene-d12	N			

Surrogate Corrected

Laboratory Batch ID

Client ID

Battelle ID
Collection Date
% Moisture
% Lipid
Matrix
Sample Size (g dry)

Units		Target	% Difference	Qualifier
SHC:				
n-Nonane		4670.06	17.6	
n-Decane		4951.66	5.8	
n-Undecane		4506.16	18.4	
n-Dodecane		4576.43	21.7	
n-Tridecane		4189.33	65.9	N
Isoprenoid RRT 1380		961.81	0.7	
n-Tetradecane		3919.50	20.8	
Isoprenoid RRT 1470		1532.69	27.5	
n-Pentadecane		3990.56	15.3	
n-Hexadecane		3640.11	11.3	
Norpristane (1650)		1141.72	3.3	
n-Heptadecane		3078.38	14.8	
Pristane		2280.61	9.7	
n-Octadecane		2796.74	5.2	
Phytane		1659.88	5.0	
n-Nonadecane		2540.37	6.8	
n-Eicosane		2502.77	9.6	
n-Heneicosane		2419.45	5.7	
n-Docosane		2251.79	8.5	
n-Tricosane		2050.41	3.3	
n-Tetracosane		1948.20	4.1	
n-Pentacosane		1795.70	4.4	
n-Hexacosane		1639.60	3.0	
n-Heptacosane		1230.99	0.9	
n-Octacosane		1004.15	0.0	
n-Nonacosane		872.21	3.7	
n-Triacontane		669.33	8.3	
n-Hentriacontane		606.82	0.6	
n-Dotriacontane		465.97	17.3	
n-Tritriacontane		399.05	21.6	
n-Tetratriacontane	J	371.75	25.0	
n-Pentatriacontane	J	378.11	25.3	
n-Hexatriacontane	J	235.65	32.8	
n-Heptatriacontane	J	210.06	35.9	
n-Octatriacontane	J	205.75	46.3	N
n-Nonatriacontane	J	153.92	39.0	
n-Tetracontane	J	161.64	48.7	N
Total SHC		578973.63	9.7	
Surrogate Recoveries (%)				
5a-androstane				
n-Tetracosane-d50				
S/T:				
C23 diterpane (T4)		47.76	19.0	
C29 Tricyclictrierpane (T9)		14.70	15.0	
C29 Tricyclictriterpane (T10)		14.64	7.2	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		15.96	0.5	
17a(H)-22,29,30-Trisnorhopane -TM (T12)		24.82	17.0	
17a(H),21b(H)-30-Norhopane (T15)		69.58	13.7	
18a(H)-Oleanane (T18)	ND			
17a(H),21b(H)-hopane (T19)		120.14	15.7	
22S-17a(H),21b(H)-30-homohopane (T21)		59.93	9.3	
22R-17a(H),21b(H)-30-homohopane (T22)		39.69	2.1	
13b,17a-Diacholestane-20S (S4)		44.18	2.1	
13b,17a-Diacholestane-20R (S5)		25.52	1.2	
5a,14a,17a-methylcholestane-20R (S24)		33.94	5.7	
5a,14a,17a-Ethylcholestane-20S (S25)		35.93	5.3	
5a,14a,17a-Ethylcholestane-20R (S28)		39.17	4.9	
S28a	ND			
Surrogate Recoveries (%)				
5b(H)-Cholane				

Surrogate Corrected

Laboratory Batch ID	06-0326		06-0327	
Client ID	GG09: NorthSTAR Control Oil - cANIMIDA		GG09: NorthSTAR Control Oil - cANIMIDA	
Battelle ID	BJ461CO (PAH), BJ781CO (SHC), BJ779CO (S/T)		BJ466CO (PAH), BJ788CO (SHC), BJ786CO (S/T)	
Collection Date	12/11/06		12/11/06	
% Moisture	NA		NA	
% Lipid	NA		NA	
Matrix	OIL		OIL	
Sample Size (g dry)	5.02		5.02	
Units	MG/KG_OIL		MG/KG_OIL	
PAH:				
Naphthalene	825.37		912.32	
C1-Naphthalenes	2028.6		2197.92	
C2-Naphthalenes	2692.36		2878.33	
C3-Naphthalenes	2043.02		2162.32	
C4-Naphthalenes	1072.84		1080.67	
Biphenyl	303.84		327.08	
Acenaphthylene		ND		ND
Acenaphthene		ND		ND
Fluorene	156.63		166.48	
C1-Fluorenes	260.07		268.48	
C2-Fluorenes	361.84		393.79	
C3-Fluorenes	331.98		349.53	
Anthracene		ND		ND
Phenanthrene	275.39		287.18	
C1-Phenanthrenes/Anthracenes	618.7		662.5	
C2-Phenanthrenes/Anthracenes	738.07		778.5	
C3-Phenanthrenes/Anthracenes	498.63		503.38	
C4-Phenanthrenes/Anthracenes	193.54		193.41	
Dibenzothiophene	74.17		78.07	
C1-Dibenzothiophenes	173.58		182.27	
C2-Dibenzothiophenes	215.08		226.42	
C3-Dibenzothiophenes	146.89		159.37	
Fluoranthene		ND		ND
Pyrene	15.14		16.01	
C1-Fluoranthenes/Pyrenes	89.32		93.64	
C2-Fluoranthenes/Pyrenes	130.45		137.26	
C3-Fluoranthenes/Pyrenes	131.78		140.35	
Benzo(a)anthracene		ND	4.71	
Chrysene	34.7		36.59	
C1-Chrysenes	60.87		61.98	
C2-Chrysenes	78.56		81.67	
C3-Chrysenes	65.11		65.65	
C4-Chrysenes	35.94		35.86	
Benzo(b)fluoranthene	3.74		3.56	
Benzo(k)fluoranthene		ND		ND
Benzo(e)pyrene	9.51		10.07	
Benzo(a)pyrene		ND	0.91	J
Perylene		ND		ND
Indeno(1,2,3-cd)pyrene		ND		ND
Dibenz(a,h)anthracene	0.7	J	0.94	J
Benzo(g,h,i)perylene	1.36		1.18	J
Total PAH				
Surrogate Recoveries (%)				
Naphthalene-d8	114		114	
Acenaphthene-d10	115		117	
Benzo(a)pyrene-d12	124	N	122	N

Laboratory Batch ID	06-0326		06-0327	
Client ID	GG09: NorthSTAR Control Oil - cANIMIDA		GG09: NorthSTAR Control Oil - cANIMIDA	
Battelle ID	BJ461CO (PAH), BJ781CO (SHC), BJ779CO (S/T)		BJ466CO (PAH), BJ788CO (SHC), BJ786CO (S/T)	
Collection Date	12/11/06		12/11/06	
% Moisture	NA		NA	
% Lipid	NA		NA	
Matrix	OIL		OIL	
Sample Size (g dry)	5.02		5.02	
Units	MG/KG_OIL		MG/KG_OIL	
SHC:				
n-Nonane	16131.19		16589.26	
n-Decane	14804.63		15098.39	
n-Undecane	13774.48		14257.78	
n-Dodecane	13197.97		13348.27	
n-Tridecane	14377.94		14694.86	
Isoprenoid RRT 1380	2246.07		2293.46	
n-Tetradecane	10390.63		10750.32	
Isoprenoid RRT 1470	4039.4		4114.14	
n-Pentadecane	9427.75		9709.03	
n-Hexadecane	8441.07		8615.02	
Norpristane (1650)	2557.57		2613.39	
n-Heptadecane	7130.7		7311.94	
Pristane	4795.57		4940.32	
n-Octadecane	5828.56		5884.82	
Phytane	2693.46		2823.7	
n-Nonadecane	5320.47		5525.79	
n-Eicosane	4739.2		4735.64	
n-Heneicosane	4224.87		4215.51	
n-Docosane	3780.43		3780.96	
n-Tricosane	3339.51		3300.48	
n-Tetracosane	2877.69		2872.6	
n-Pentacosane	2580.65		2582.8	
n-Hexacosane	2129.65		2076.42	
n-Heptacosane	1931.22		1884.44	
n-Octacosane	1626.4		1540.65	
n-Nonacosane	1398.58		1309.26	
n-Triacontane	1126.77		1087.85	
n-Hentriacontane	1027.14		963.96	
n-Dotriacontane	711.27		646.34	
n-Tritriacontane	600.5		512.77	
n-Tetratriacontane	415.14		372.04	
n-Pentatriacontane	361.49		365.7	
n-Hexatriacontane	222.51	J	193.99	J
n-Heptatriacontane	213.16	J	155.37	J
n-Octatriacontane	127.87	J	79.35	J
n-Nonatriacontane	110.49	J	71.45	J
n-Tetracontane	74.19	J	39.39	J
Total SHC	713063.08		728635.89	
Surrogate Recoveries (%)				
5a-androstane	93		93	
n-Tetracosane-d50	97		96	
S/T:				
C23 diterpane (T4)	41.84		41.28	
C29 Tricyclictrierpane (T9)	21.15		20.18	
C29 Tricyclictriterpane (T10)	20.74		18.12	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	11.26		11.73	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	7.06		7.65	
17a(H),21b(H)-30-Norhopane (T15)	23.64		22.38	
18a(H)-Oleanane (T18)		ND		ND
17a(H),21b(H)-hopane (T19)	53.81		50.67	
22S-17a(H),21b(H)-30-homohopane (T21)	20.9		24.13	
22R-17a(H),21b(H)-30-homohopane (T22)	12.23		13.39	
13b,17a-Diacholestane-20S (S4)	47.15		47.32	
13b,17a-Diacholestane-20R (S5)	27.57		28.24	
5a,14a,17a-methylcholestane-20R (S24)	15.23		11.85	
5a,14a,17a-Ethylcholestane-20S (S25)	20.23		19.57	
5a,14a,17a-Ethylcholestane-20R (S28)	17.08		20.41	
S28a		ND		ND
Surrogate Recoveries (%)				
5b(H)-Cholane	96		96	

Surrogate Corrected

Laboratory Batch ID	06-0326		06-0326			
Client ID	06-PC-01-PHC-MU		06-PC-01-PHC-MU			
Battelle ID	R2641-P		R2641DUP-P			
Collection Date	07/24/06		7/24/2006			
% Moisture	89.57		89.57			
% Lipid	0.94		0.97			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	2.10		2.1			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	4.7	B	4.96	B	5.4	
C1-Naphthalenes	2.16	B	2.47	B	13.4	
C2-Naphthalenes	5.86		6.51		10.5	
C3-Naphthalenes	7.94		6.91		13.9	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	2.1		1.11	J	61.7	n
Acenaphthylene	ND		ND		NA	
Acenaphthene	ND		ND		NA	
Fluorene	1.29		1	J	25.3	
C1-Fluorenes	ND		ND		NA	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		1.09	J	NA	
Phenanthrene	5.53	B	7.34	B	28.1	
C1-Phenanthrenes/Anthracenes	10.5	B	10.28	B	2.1	
C2-Phenanthrenes/Anthracenes	14.52	B	12.4	B	15.8	
C3-Phenanthrenes/Anthracenes	6.76		6.44		4.8	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	1.41	B	1.7	B	18.6	
C1-Dibenzothiophenes	4.15		3.69		11.7	
C2-Dibenzothiophenes	7.36		5.28		32.9	N
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	5.03	B	6.85	B	30.6	N
Pyrene	6.79	B	9.52	B	33.5	n
C1-Fluoranthenes/Pyrenes	3.62	B	4.7	B	26.0	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	1.59	B	3.12	B	65.0	N
Chrysene	2.43	B	4.88	B	67.0	N
C1-Chrysenes	ND		2.09		125.3	n
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	2.94	B	4.32	B	38.0	N
Benzo(k)fluoranthene	4.81	B	5.79	B	18.5	
Benzo(e)pyrene	1.72	B	3.99	B	79.5	n
Benzo(a)pyrene	2.86	B	2.76	B	3.6	
Perylene	4.65		4.08		13.1	
Indeno(1,2,3-cd)pyrene	3.66	B	2.77	B	27.7	
Dibenz(a,h)anthracene	0.45	J	1.67	B	115.1	n
Benzo(g,h,i)perylene	1.45	B	2.42	B	50.1	n
Total PAH	116.28		130.14			
Surrogate Recoveries (%)						
Naphthalene-d8	81		78			
Acenaphthene-d10	81		81			
Benzo(a)pyrene-d12	85		81			

Laboratory Batch ID	06-0326	06-0326			
Client ID	06-PC-01-PHC-MU	06-PC-01-PHC-MU			
Battelle ID	R2641-P	R2641DUP-P			
Collection Date	07/24/06	7/24/2006			
% Moisture	89.57	89.57			
% Lipid	0.94	0.97			
Matrix	TISSUE	TISSUE			
Sample Size (g dry)	2.10	2.1			
Units	UG/KG_DRY	UG/KG_DRY		RPD	Qualifier
SHC:					
n-Nonane	65.69 J	37.12	J	NA	
n-Decane	185.97 J	110.93	J	NA	
n-Undecane	116.93 J	85.88	J	NA	
n-Dodecane	77.33 J	62.76	J	NA	
n-Tridecane	62.81 J	57.66	J	NA	
Isoprenoid RRT 1380	32.51 J	31.94	J	NA	
n-Tetradecane	147.11 J	144.83	J	NA	
Isoprenoid RRT 1470	123.31 J	122.55	J	NA	
n-Pentadecane	635.84	637.2		0.2	
n-Hexadecane	156.64 J	164.26	J	NA	
Norpristane (1650)	ND		ND	NA	
n-Heptadecane	229.37 J	229.6	J	NA	
Pristane	516.4	577.29		11.1	
n-Octadecane	31.55 J	39.04	J	NA	
Phytane	11.79 J	40.87	J	NA	
n-Nonadecane	15.74 J	26.18	J	NA	
n-Eicosane	40.03 J	38.25	J	NA	
n-Heneicosane	61.93 J	75.41	J	NA	
n-Docosane	158.98 J	203.84	J	NA	
n-Tricosane	415.85	540.45		26.1	
n-Tetracosane	897.38	1101.98		20.5	
n-Pentacosane	1387.05	1731.88		22.1	
n-Hexacosane	1826.65	2351.48		25.1	
n-Heptacosane	1982.04	2762.58		32.9	n
n-Octacosane	1948.9	3243.43		49.9	n
n-Nonacosane	1879.61	3796.34		67.5	n
n-Triacontane	1867.72	3734.29		66.6	n
n-Hentriacontane	1658.56	3199.94		63.5	n
n-Dotriacontane	1543.57	2582.4		50.4	n
n-Tritriacontane	1243.65	1811.96		37.2	n
n-Tetratriacontane	965.14	1169.73		19.2	
n-Pentatriacontane	743.4	810.81		8.7	
n-Hexatriacontane	568.61	598.7		5.2	
n-Heptatriacontane	377.65	400.18		5.8	
n-Octatriacontane	191.93 J	221.55	J	NA	
n-Nonatriacontane	165.23 J	177.54	J	NA	
n-Tetracontane	95.48 J	94.07	J	NA	
Total SHC	43109.5	76895.8		56.3	n
Surrogate Recoveries (%)					
5a-androstane	81	84			
n-Tetracosane-d50	82	84			
S/T:					
C23 diterpane (T4)	ND	2.55		137.7	n
C29 Tricyclictrierpane (T9)	ND		ND	NA	
C29 Tricyclictriterpane (T10)	ND		ND	NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND		ND	NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	3.91		157.1	n
17a(H),21b(H)-30-Norhopane (T15)	ND	5.52		168.6	n
18a(H)-Oleanane (T18)	ND		ND	NA	
17a(H),21b(H)-hopane (T19)	ND	10.72		183.2	n
22S-17a(H),21b(H)-30-homohopane (T21)	ND		ND	NA	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		ND	NA	
13b,17a-Diacholestane-20S (S4)	ND	2.22	J	NA	
13b,17a-Diacholestane-20R (S5)	ND	1.77	J	NA	
5a,14a,17a-methylcholestane-20R (S24)	ND	3.2		148.8	n
5a,14a,17a-Ethylcholestane-20S (S25)	ND		ND	NA	
5a,14a,17a-Ethylcholestane-20R (S28)	ND	3.25		149.5	n
S28a	ND	55.15		200.0	N
Surrogate Recoveries (%)					
5b(H)-Cholane	78	79			

Surrogate Corrected

Laboratory Batch ID	06-0327		06-0327			
Client ID	04-N11-01-PHC/MET-T-AN		04-N11-01-PHC/MET-T-AN			
Battelle ID	S3882-P1		S3882DUP-P			
Collection Date	07/29/04		7/29/2004			
% Moisture	74.86		75.48			
% Lipid	3.1		3.27			
Matrix	AMPHIPODS		AMPHIPODS			
Sample Size (g dry)	5.14		5.02			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	3.46	BT	3.03	BT	13.3	
C1-Naphthalenes	2.44	BT	2.19	BT	10.8	
C2-Naphthalenes	5.25	T	4.37	T	18.3	
C3-Naphthalenes	5.11	T	4.09	T	22.2	
C4-Naphthalenes		NDT		NDT	NA	
Biphenyl	0.84	T	0.7	T	18.2	
Acenaphthylene		NDT		NDT	NA	
Acenaphthene		NDT		NDT	NA	
Fluorene	0.62	T	0.43	JT	36.2	n
C1-Fluorenes	1.83	T	1.7	T	7.4	
C2-Fluorenes		NDT		NDT	NA	
C3-Fluorenes		NDT		NDT	NA	
Anthracene	0.29	JT		NDT	NA	
Phenanthrene	3.79	T	2.82	T	29.3	
C1-Phenanthrenes/Anthracenes	2.65	T	2.15	T	20.8	
C2-Phenanthrenes/Anthracenes	3.67	T	3.46	T	5.9	
C3-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C4-Phenanthrenes/Anthracenes		NDT		NDT	NA	
Dibenzothiophene		NDT		NDT	NA	
C1-Dibenzothiophenes		NDT		NDT	NA	
C2-Dibenzothiophenes		NDT		NDT	NA	
C3-Dibenzothiophenes		NDT		NDT	NA	
Fluoranthene	4.54	T	2.18	T	70.2	N
Pyrene	3.38	T	1.66	T	68.3	n
C1-Fluoranthenes/Pyrenes	2.57	T	1.93	T	28.4	
C2-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C3-Fluoranthenes/Pyrenes		NDT		NDT	NA	
Benzo(a)anthracene	1.36	T	0.39	JT	110.9	n
Chrysene	2.83	T	1.21	T	80.2	N
C1-Chrysenes	1.37	T	0.76	T	57.3	n
C2-Chrysenes		NDT		NDT	NA	
C3-Chrysenes		NDT		NDT	NA	
C4-Chrysenes		NDT		NDT	NA	
Benzo(b)fluoranthene	2.33	T	1.13	T	69.4	N
Benzo(k)fluoranthene	2.42	T	0.94	JT	88.1	N
Benzo(e)pyrene	1.98	T	0.75	T	90.1	n
Benzo(a)pyrene	1.43	T	0.53	T	91.8	n
Perylene	1.52	T	1.22	T	21.9	
Indeno(1,2,3-cd)pyrene	2.1	T	0.54	BT	118.2	n
Dibenz(a,h)anthracene	0.59	BT		NDT	157.6	n
Benzo(g,h,i)perylene	1.78	T	0.63	BT	95.4	n
Total PAH	60.15		38.81			
Surrogate Recoveries (%)						
Naphthalene-d8	41		73			
Acenaphthene-d10	51		79			
Benzo(a)pyrene-d12	74		74			

Laboratory Batch ID	06-0327		06-0327				
Client ID	04-N11-01-PHC/MET-T-AN		04-N11-01-PHC/MET-T-AN				
Battelle ID	S3882-P1		S3882DUP-P				
Collection Date	07/29/04		7/29/2004				
% Moisture	74.86		75.48				
% Lipid	3.1		3.27				
Matrix	AMPHIPODS		AMPHIPODS				
Sample Size (g dry)	5.14		5.02				
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier	
SHC:							
n-Nonane	25.35	JT	23.54	JT	NA		
n-Decane	38.53	JT	31.88	JT	NA		
n-Undecane	20.52	JT	19.97	JT	NA		
n-Dodecane	14.66	JT	13.97	JT	NA		
n-Tridecane	16.14	JT	15.85	JT	NA		
Isoprenoid RRT 1380	8.71	JT	9.59	JT	NA		
n-Tetradecane	25.03	JT	25.32	JT	NA		
Isoprenoid RRT 1470	24.43	JT	25.28	JT	NA		
n-Pentadecane	441.95	T	456.21	T	3.2		
n-Hexadecane	46.27	JT	46.34	JT	NA		
Norpristane (1650)		NDT		NDT	NA		
n-Heptadecane	390.22	T	406.7	T	4.1		
Pristane	35635.81	T	36892.66	ET	3.5		
n-Octadecane	44.01	JT	46.64	JT	NA		
Phytane	15.93	JT	16.01	JT	NA		
n-Nonadecane	44.94	JT	46.34	JT	NA		
n-Eicosane	42.06	JT	41.96	JT	NA		
n-Heneicosane	64.94	JT	66.32	JT	NA		
n-Docosane	51.17	JT	51.21	JT	NA		
n-Tricosane	87.67	JT	91.74	JT	NA		
n-Tetracosane	55.61	JT	59.19	JT	NA		
n-Pentacosane	99.54	JT	102.36	JT	NA		
n-Hexacosane	53.55	JT	57.44	JT	NA		
n-Heptacosane	86.36	JT	86.84	JT	NA		
n-Octacosane	52.95	JT	55.79	JT	NA		
n-Nonacosane	79.96	JT	85.04	JT	NA		
n-Triacontane	48.09	JT	51.59	JT	NA		
n-Hentriacontane	144.07	T	141.37	T	1.9		
n-Dotriacontane	26.08	JT	28.64	JT	NA		
n-Tritriacontane	21.12	JT	20.64	JT	NA		
n-Tetratriacontane	8.89	JT	8.88	JT	NA		
n-Pentatriacontane	4.93	JT	5.33	JT	NA		
n-Hexatriacontane	2.17	JT	1.87	JT	NA		
n-Heptatriacontane		NDT		NDT	NA		
n-Octatriacontane		NDT		NDT	NA		
n-Nonatriacontane		NDT		NDT	NA		
n-Tetracontane		NDT		NDT	NA		
Total SHC	55883.26	T	55254.03	T	1.1		
Surrogate Recoveries (%)							
5a-androstane	87		88				
n-Tetracosane-d50	86		85				
S/T:							
C23 diterpane (T4)	2.91	T	2.18	T	28.7		
C29 Tricyclictrierpane (T9)		NDT		NDT	NA		
C29 Tricyclictriterpane (T10)		NDT		NDT	NA		
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	1.85	T	0.99	JT	60.6	n	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	1.53	T	1.16	T	27.5		
17a(H),21b(H)-30-Norhopane (T15)	4.25	T	2.11	T	67.3	N	
18a(H)-Oleanane (T18)		NDT		NDT	NA		
17a(H),21b(H)-hopane (T19)	4.4	T	4.28	T	2.8		
22S-17a(H),21b(H)-30-homohopane (T21)		NDT		NDT	NA		
22R-17a(H),21b(H)-30-homohopane (T22)		NDT		NDT	NA		
13b,17a-Diacholestane-20S (S4)	1.48	T	1.25	T	16.8		
13b,17a-Diacholestane-20R (S5)	0.99	JT	0.81	JT	NA		
5a,14a,17a-methylcholestane-20R (S24)	0.77	JT	0.81	JT	NA		
5a,14a,17a-Ethylcholestane-20S (S25)	0.87	JT	0.56	JT	NA		
5a,14a,17a-Ethylcholestane-20R (S28)	1.25	T	1.03	T	19.3		
S28a	0.65	JT	0.5	JT	NA		
Surrogate Recoveries (%)							
5b(H)-Cholane	80		81				

Surrogate Corrected

Laboratory Batch ID	06-0327		06-0327			
Client ID	05-N11-01-PHC-T-AN		05-N11-01-PHC-T-AN			
Battelle ID	S9246-P1		S9246DUP-P1			
Collection Date	8/11/2005		8/11/2005			
% Moisture	77.45		77.05			
% Lipid	2.19		2.37			
Matrix	AMPHIPODS		AMPHIPODS			
Sample Size (g dry)	4.63		4.7			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	2.54	BT	2.54	BT	0.0	
C1-Naphthalenes	1.69	BT	1.54	BT	9.3	
C2-Naphthalenes		NDT		NDT	NA	
C3-Naphthalenes		NDT		NDT	NA	
C4-Naphthalenes		NDT		NDT	NA	
Biphenyl	0.51	JT	0.45	JT	NA	
Acenaphthylene		NDT		NDT	NA	
Acenaphthene		NDT		NDT	NA	
Fluorene		NDT	0.33	JT	NA	
C1-Fluorenes	3.7	T	4	T	7.8	
C2-Fluorenes		NDT		NDT	NA	
C3-Fluorenes		NDT		NDT	NA	
Anthracene		NDT		NDT	NA	
Phenanthrene	1.04	BT	0.76	BT	31.1	n
C1-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C2-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C3-Phenanthrenes/Anthracenes		NDT		NDT	NA	
C4-Phenanthrenes/Anthracenes		NDT		NDT	NA	
Dibenzothiophene		NDT		NDT	NA	
C1-Dibenzothiophenes		NDT		NDT	NA	
C2-Dibenzothiophenes		NDT		NDT	NA	
C3-Dibenzothiophenes		NDT		NDT	NA	
Fluoranthene		NDT	0.32	JT	NA	
Pyrene		NDT	0.29	JT	NA	
C1-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C2-Fluoranthenes/Pyrenes		NDT		NDT	NA	
C3-Fluoranthenes/Pyrenes		NDT		NDT	NA	
Benzo(a)anthracene		NDT	0.12	JT	NA	
Chrysene		NDT	0.33	JT	NA	
C1-Chrysenes		NDT		NDT	NA	
C2-Chrysenes		NDT		NDT	NA	
C3-Chrysenes		NDT		NDT	NA	
C4-Chrysenes		NDT		NDT	NA	
Benzo(b)fluoranthene		NDT		NDT	NA	
Benzo(k)fluoranthene		NDT		NDT	NA	
Benzo(e)pyrene		NDT		NDT	NA	
Benzo(a)pyrene		NDT		NDT	NA	
Perylene		NDT		NDT	NA	
Indeno(1,2,3-cd)pyrene		NDT		NDT	NA	
Dibenz(a,h)anthracene		NDT		NDT	NA	
Benzo(g,h,i)perylene		NDT	0.19	JT	NA	
Total PAH	9.48		10.87			
Surrogate Recoveries (%)						
Naphthalene-d8	73		70			
Acenaphthene-d10	80		74			
Benzo(a)pyrene-d12	94		88			

Surrogate Corrected

Laboratory Batch ID	06-0327		06-0327			
Client ID	05-N11-01-PHC-T-AN		05-N11-01-PHC-T-AN			
Battelle ID	S9246-P1		S9246DUP-P1			
Collection Date	8/11/2005		8/11/2005			
% Moisture	77.45		77.05			
% Lipid	2.19		2.37			
Matrix	AMPHIPODS		AMPHIPODS			
Sample Size (g dry)	4.63		4.7			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane		NDT		NDT	NA	
n-Decane	46.26	JT		NDT	NA	
n-Undecane		NDT		NDT	NA	
n-Dodecane		NDT		NDT	NA	
n-Tridecane		NDT		NDT	NA	
Isoprenoid RRT 1380		NDT		NDT	NA	
n-Tetradecane		NDT		NDT	NA	
Isoprenoid RRT 1470		NDT	9.15	JT	NA	
n-Pentadecane	81.61	JT	71.06	JT	NA	
n-Hexadecane		NDT	8.84	JT	NA	
Norpristane (1650)		NDT		NDT	NA	
n-Heptadecane	58.97	JT	65.42	JT	NA	
Pristane	6023.05	T	6712.38	T	10.8	
n-Octadecane	5.88	JT	5.86	JT	NA	
Phytane	4.21	JT	4.83	JT	NA	
n-Nonadecane	6.87	JT	7.91	JT	NA	
n-Eicosane	9.79	JT	10.23	JT	NA	
n-Heneicosane	22.56	JT	24.53	JT	NA	
n-Docosane	24.75	JT	25.72	JT	NA	
n-Tricosane	62.17	JT	61.45	JT	NA	
n-Tetracosane	26.57	JT	22.77	JT	NA	
n-Pentacosane	56.86	JT	53.75	JT	NA	
n-Hexacosane	36.5	JT	31.27	JT	NA	
n-Heptacosane	55.68	JT	49.92	JT	NA	
n-Octacosane	37.65	JT	30.99	JT	NA	
n-Nonacosane	34.53	JT	29.31	JT	NA	
n-Triacontane	21.84	JT	17.69	JT	NA	
n-Hentriacontane	16.36	JT	12.59	JT	NA	
n-Dotriacontane	8.83	JT	6.66	JT	NA	
n-Tritriacontane	2.87	JT	3.8	JT	NA	
n-Tetratriacontane		NDT		NDT	NA	
n-Pentatriacontane		NDT		NDT	NA	
n-Hexatriacontane		NDT		NDT	NA	
n-Heptatriacontane		NDT		NDT	NA	
n-Octatriacontane		NDT		NDT	NA	
n-Nonatriacontane		NDT		NDT	NA	
n-Tetracontane		NDT		NDT	NA	
Total SHC	11559.05	BT	11729.97	BT	1.5	
Surrogate Recoveries (%)						
5a-androstane	83		81			
n-Tetracosane-d50	86		81			
S/T:						
C23 diterpane (T4)		NDT		NDT	NA	
C29 Tricyclictrierpane (T9)		NDT		NDT	NA	
C29 Tricyclictriterpane (T10)		NDT		NDT	NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		NDT		NDT	NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)		NDT		NDT	NA	
17a(H),21b(H)-30-Norhopane (T15)		NDT		NDT	NA	
18a(H)-Oleanane (T18)		NDT		NDT	NA	
17a(H),21b(H)-hopane (T19)		NDT		NDT	NA	
22S-17a(H),21b(H)-30-homohopane (T21)		NDT		NDT	NA	
22R-17a(H),21b(H)-30-homohopane (T22)		NDT		NDT	NA	
13b,17a-Diacholestane-20S (S4)		NDT		NDT	NA	
13b,17a-Diacholestane-20R (S5)		NDT		NDT	NA	
5a,14a,17a-methylcholestane-20R (S24)		NDT		NDT	NA	
5a,14a,17a-Ethylcholestane-20S (S25)		NDT		NDT	NA	
5a,14a,17a-Ethylcholestane-20R (S28)		NDT		NDT	NA	
S28a		NDT		NDT	NA	
Surrogate Recoveries (%)						
5b(H)-Cholane	78		74			

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-L19-01-PHC-AN	06-L08-01-PHC-AN	06-BP01-01-SHC-AN	06-4A-01-PHC-AN
Location	Liberty	Liberty		
Battelle ID	R2171-P	R2172-P	R2174-P	R2175-P
Collection Date	07/28/06	07/29/06	07/29/06	07/29/06
% Moisture	82.14	75.45	77.57	77.29
% Lipid	1.98	4.28	3.93	2.22
Matrix	Amphipods	Amphipods	Amphipods	Amphipods
Sample Size (g dry)	3.63	4.97	3.27	4.64
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	8.39 B	4.76 B	9.95 B	4.87 B
C1-Naphthalenes	12.02	4.77 B	7.84	6.01 B
C2-Naphthalenes	17.55	14.35	9.64	13.14
C3-Naphthalenes	8.62	6.21	6.99	4.16
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	2.98	1.42	2.22	1.56
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	0.45 J	0.83	ND
Fluorene	1.28	1.01	2.24	0.85
C1-Fluorenes	5.24	8.63	ND	2.35
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	3.7 B	3.19 B	5.08 B	3.53 B
C1-Phenanthrenes/Anthracenes	7.17 B	5.65 B	5.73 B	4.16 B
C2-Phenanthrenes/Anthracenes	11.76 B	9.88 B	14.66 B	4.42 B
C3-Phenanthrenes/Anthracenes	7.4	ND	5.96	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	1.26 B	0.89 B	1.36 B	0.95 B
C1-Dibenzothiophenes	2.34	2.37	3.07	1.55
C2-Dibenzothiophenes	ND	ND	ND	2.36
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	2.45 B	1.76 B	2.46 B	1.67 B
Pyrene	4 B	3.3 B	4.83 B	2.96 B
C1-Fluoranthenes/Pyrenes	3.8 B	ND	ND	1.46 B
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	0.4 J	0.54 J	0.31 J
Chrysene	2 B	0.79 B	2.18 B	0.91 B
C1-Chrysenes	2.16	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	1.21 B	0.6 B	0.69 J	0.7 B
Benzo(k)fluoranthene	1.09 J	0.52 J	0.72 J	0.75 J
Benzo(e)pyrene	0.82 B	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	2.88	1.63 B	ND	1.52 B
Indeno(1,2,3-cd)pyrene	0.43 J	0.38 J	ND	0.54 J
Dibenz(a,h)anthracene	ND	ND	ND	0.3 J
Benzo(g,h,i)perylene	0.46 J	0.42 J	0.37 J	0.63 B
Total PAH	111.01	73.38	87.36	61.66
Surrogate Recoveries (%)				
Naphthalene-d8	72	75	77	79
Acenaphthene-d10	73	79	78	80
Benzo(a)pyrene-d12	80	92	89	90

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-L19-01-PHC-AN	06-L08-01-PHC-AN	06-BP01-01-SHC-AN	06-4A-01-PHC-AN
Location	Liberty	Liberty		
Battelle ID	R2171-P	R2172-P	R2174-P	R2175-P
Collection Date	07/28/06	07/29/06	07/29/06	07/29/06
% Moisture	82.14	75.45	77.57	77.29
% Lipid	1.98	4.28	3.93	2.22
Matrix	Amphipods	Amphipods	Amphipods	Amphipods
Sample Size (g dry)	3.63	4.97	3.27	4.64
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	34.29 J	18.06 J	45.98 J	23.92 J
n-Decane	123.72 J	84.94 J	132.91 J	96.1 J
n-Undecane	81.3 J	56.21 J	77.14 J	57.33 J
n-Dodecane	24.09 J	13.37 J	16.16 J	11.08 J
n-Tridecane	30.49 J	24.59 J	22.15 J	13.94 J
Isoprenoid RRT 1380	46.1 J	9.04 J	5.38 J	4.22 J
n-Tetradecane	30.06 J	35.3 J	37.15 J	22.12 J
Isoprenoid RRT 1470	99.56 J	34.22 J	26.32 J	16.11 J
n-Pentadecane	442.21	1246.89	1228.81	405.64
n-Hexadecane	39.3 J	57.35 J	65.63 J	35.14 J
Norpristane (1650)	9.64 J	ND	7.46 J	4.04 J
n-Heptadecane	544.47	886.7	642.36	351.86
Pristane	22277.13	74004.69 E	136561.92 E	30806 E
n-Octadecane	48.34 J	59.85 J	73.86 J	41.05 J
Phytane	22.42 J	14.35 J	16.44 J	9.59 J
n-Nonadecane	62.69 J	59.62 J	63.13 J	33.87 J
n-Eicosane	43.76 J	30.79 J	41.26 J	24.48 J
n-Heneicosane	290.27	66.33 J	56.89 J	42.55 J
n-Docosane	117.48 J	55.82 J	51.57 J	40.46 J
n-Tricosane	361.97	122.59 B	82.02 J	75.41 J
n-Tetracosane	90.98 J	67.92 J	73.41 J	52.32 J
n-Pentacosane	163.78 B	135.56 B	122.66 J	92.49 J
n-Hexacosane	81.96 J	76.11 J	99.92 J	65.59 J
n-Heptacosane	167.98 B	122.21 B	145.02 J	100.84 J
n-Octacosane	89.07 J	84.89 J	121.37 J	70.57 J
n-Nonacosane	139.66 J	119.57 B	156.1 J	106.42 J
n-Triacontane	110.01 J	99.6 J	98.36 J	68.08 J
n-Hentriacontane	192.7 B	205.72 B	286.47	194.84 B
n-Dotriacontane	91.25 J	82.98 J	115.97 J	73.34 J
n-Tritriacontane	66.22 J	59.27 J	80.34 J	54.73 J
n-Tetratriacontane	68.02 J	52.77 J	76.9 J	49.61 J
n-Pentatriacontane	35.9 J	29.19 J	39.32 J	35.71 J
n-Hexatriacontane	51.26 J	41.09 J	57.65 J	40.18 J
n-Heptatriacontane	19.2 J	18.11 J	25.38 J	15.51 J
n-Octatriacontane	13.92 J	12.97 J	18.22 J	12.39 J
n-Nonatriacontane	37.84 J	34.37 J	44.41 J	30.6 J
n-Tetracontane	10.73 J	12.53 J	15.15 J	10.4 J
Total SHC	39738.08	93071.76	153756.2	43674.41
Surrogate Recoveries (%)				
5a-androstane	73	77	85	81
n-Tetracosane-d50	73	78	86	81
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	2.92	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	3.17	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	0.91 J	0.92 J	0.97 J	0.53 J
13b,17a-Diacholestane-20R (S5)	0.62 J	0.77 J	0.74 J	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	0.79 J	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	0.76 J	0.62 J	ND
5a,14a,17a-Ethylcholestane-20R (S28)	0.68 J	1.12	1.06 J	0.77 J
S28a	0.75 J	ND	ND	1.18
Surrogate Recoveries (%)				
5b(H)-Cholane	69	73	80	77

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-L08-01-PHC-AS	06-L03-01-PHC-AS	06-WD01-02-PHC-AN	06-N11N08-01-PHC-AM
Location	Liberty	Liberty	Other	Northstar
Battelle ID	R2176-P	R2177-P	R2395-P	R2398-P
Collection Date	07/29/06	07/29/06	08/08/06	08/10/06
% Moisture	87.31	86.65	76.87	77.57
% Lipid	1.24	1.31	2.05	2.05
Matrix	Clam	Clam	Amphipods	Amphipod
Sample Size (g dry)	2.57	2.67	4.75	1.28
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	4.3 B	4.18 B	6.8 B	10.75 B
C1-Naphthalenes	4.01 B	5.4 B	6.95	8.5
C2-Naphthalenes	7.09	7.53	12.37	12.42
C3-Naphthalenes	8.44	6.55	5.53	9.93
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	1.21	1.63	1.56	2.24
Acenaphthylene	ND	0.6 J	ND	ND
Acenaphthene	0.49 J	1.76	1.1	0.6 J
Fluorene	1.18	1.99	0.95	1.41
C1-Fluorenes	ND	ND	2.48	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	0.92 J	0.59	0.61 J
Phenanthrene	5.75 B	7.21 B	6.2 B	7.63 B
C1-Phenanthrenes/Anthracenes	8.5 B	8.49 B	4.04 B	9.19 B
C2-Phenanthrenes/Anthracenes	10.03 B	10.91 B	5.16 B	7.98 B
C3-Phenanthrenes/Anthracenes	5.43	7.29	3.16	4.51
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	1.49 B	1.83 B	1.04 B	1.84 B
C1-Dibenzothiophenes	3.12	2.76	1.74	3.38
C2-Dibenzothiophenes	7.72	6.39	2.8	5.39
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	2.51 B	4.9 B	5.24 B	3.59 B
Pyrene	5.04 B	7.7 B	3.79 B	7.2 B
C1-Fluoranthenes/Pyrenes	3.29 B	4.95 B	2.69 B	3.32 B
C2-Fluoranthenes/Pyrenes	4.02	5.2	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	5.07	1.53 B	0.65 J
Chrysene	3.22 B	8.79	1.97 B	1.88 B
C1-Chrysenes	2.45	3.23	1.14	1.26
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	1.35 B	9.73	0.9 B	1 J
Benzo(k)fluoranthene	0.69 J	12.23	1.1 B	0.7 J
Benzo(e)pyrene	1.8 B	9.65	0.4 J	1.82 B
Benzo(a)pyrene	0.58 J	4.75	0.62 B	0.64 J
Perylene	4.87	9.49	1.23 B	4.05
Indeno(1,2,3-cd)pyrene	0.6 J	8.2	0.28 J	0.58 J
Dibenz(a,h)anthracene	0.42 J	5.75	ND	ND
Benzo(g,h,i)perylene	0.94 J	7.24	0.28 J	0.85 J
Total PAH	100.54	182.32	83.64	113.92
Surrogate Recoveries (%)				
Naphthalene-d8	73	78	70	71
Acenaphthene-d10	77	81	72	79
Benzo(a)pyrene-d12	87	81	75	86

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-L08-01-PHC-AS	06-L03-01-PHC-AS	06-WD01-02-PHC-AN	06-N11N08-01-PHC-AM
Location	Liberty	Liberty	Other	Northstar
Battelle ID	R2176-P	R2177-P	R2395-P	R2398-P
Collection Date	07/29/06	07/29/06	08/08/06	08/10/06
% Moisture	87.31	86.65	76.87	77.57
% Lipid	1.24	1.31	2.05	2.05
Matrix	Clam	Clam	Amphipods	Amphipod
Sample Size (g dry)	2.57	2.67	4.75	1.28
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	61.61 J	61.18 J	23.02 J	59.25 J
n-Decane	124.24 J	125.56 J	89.78 J	215.79 J
n-Undecane	98.21 J	104.12 J	58.67 J	152.54 J
n-Dodecane	55.61 J	56.37 J	13.13 J	40 J
n-Tridecane	26.96 J	27.76 J	18.09 J	25.9 J
Isoprenoid RRT 1380	6.56 J	5.28 J	25.22 J	17.42 J
n-Tetradecane	26.9 J	25.38 J	21.23 J	39.36 J
Isoprenoid RRT 1470	22.94 J	21.97 J	51.47 J	51.44 J
n-Pentadecane	61.44 J	62.36 J	193.29	37.82 J
n-Hexadecane	38.62 J	41 J	24.78 J	41.7 J
Norpristane (1650)	5.22 J	ND	5.97 J	ND
n-Heptadecane	60.21 J	58.58 J	90.89 J	34.16 J
Pristane	122.08 J	71.13 J	14599.5	6372.48
n-Octadecane	32.04 J	32.17 J	21.04 J	40.82 J
Phytane	7.09 J	5.66 J	14.73 J	11.94 J
n-Nonadecane	24.84 J	26.69 J	22 J	23.7 J
n-Eicosane	27.67 J	29.01 J	31.29 J	43.81 J
n-Heneicosane	38.41 J	35.27 J	151.92	46.84 J
n-Docosane	61.24 J	55.46 J	119.83	69.11 J
n-Tricosane	143.15 J	111.61 J	318.44	141.01 J
n-Tetracosane	215.05	155.74 J	79.66 J	112.11 J
n-Pentacosane	352.79	257.2	129.23 B	228.15 J
n-Hexacosane	438.94	315.05	51.17 J	181.43 J
n-Heptacosane	508.64	381.19	96.2 J	257.82 B
n-Octacosane	500.55	348.9	51.43 J	199.51 J
n-Nonacosane	492.25	384.29	72.02 J	230.24 J
n-Triacontane	459.22	318.3	56.33 J	205.21 J
n-Hentriacontane	415.51	326.31	84.21 J	187.32 J
n-Dotriacontane	373.77	289.95 B	62.03 J	212.15 J
n-Tritriacontane	294.23	226.93	37.57 J	124.27 J
n-Tetratriacontane	242.57 B	186.39 J	42.43 J	145.75 J
n-Pentatriacontane	170.29 J	127.04 J	23.16 J	74.15 J
n-Hexatriacontane	160.66 J	124.93 J	33.54 J	100.04 J
n-Heptatriacontane	98.35 J	76.48 J	13.28 J	34.3 J
n-Octatriacontane	60.04 J	44.85 J	8.35 J	12.97 J
n-Nonatriacontane	78.52 J	60.92 J	15.83 J	21.58 J
n-Tetracontane	35.09 J	29.05 J	5.15 J	4.33 J
Total SHC	14982.94	10167.87	25210.55	20238.95
Surrogate Recoveries (%)				
5a-androstane	85	82	76	83
n-Tetracosane-d50	85	82	77	82
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	ND	ND
S28a	ND	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	81	77	72	77

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0327	06-0327	06-0327
Client ID	06-WD01-01-PHC-AN	06-BP01-02-PHC-AN	06-6F-01-PHC-AN	06-6A-01-PHC-AN
Location	Other	Boulder Patch	BSMP	BSMP
Battelle ID	R2399-P	R2405-P	R2495-P	R2512-P
Collection Date	08/08/06	08/09/06	08/03/06	08/04/06
% Moisture	76.12	76.26	73.83	73.27
% Lipid	2.18	3.9	3.51	3.45
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.83	1.61	5.28	5.46
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	6.13 B	8.82	2.96 B	6.04
C1-Naphthalenes	5.85 B	7.74	2.75	7.3
C2-Naphthalenes	13.75	12.48	11.34	13.95
C3-Naphthalenes	6.71	8.46	2.39	5.2
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	1.96	2.86	0.77	1.68
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	1.14	ND	0.2 J	ND
Fluorene	1.46	1.3	0.42 J	0.82
C1-Fluorenes	4.91	2.83	4.15	1.29
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	0.52 J	ND	ND	ND
Phenanthrene	6.64 B	2.75	1.3 B	1.67
C1-Phenanthrenes/Anthracenes	7.08 B	2.22	1.87	2.13
C2-Phenanthrenes/Anthracenes	12.16 B	ND	2.68	5.95
C3-Phenanthrenes/Anthracenes	6.69	ND	ND	6.7
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	0.99 B	0.41 J	ND	ND
C1-Dibenzothiophenes	2.16	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	9.21 B	0.89	0.29 J	0.5
Pyrene	9.13 B	0.87	ND	0.49 B
C1-Fluoranthenes/Pyrenes	4.8 B	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	3.09 B	ND	0.2 J	ND
Chrysene	3.56 B	0.87	0.59	3.32
C1-Chrysenes	1.8	ND	ND	2.54
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	2.4 B	0.43 J	0.54	1.15
Benzo(k)fluoranthene	3.21 B	0.58 J	ND	0.41 J
Benzo(e)pyrene	1.12 B	ND	ND	ND
Benzo(a)pyrene	1.86 B	ND	ND	ND
Perylene	1.89 B	ND	2.03	1.5
Indeno(1,2,3-cd)pyrene	1.65 B	0.48 J	ND	0.23 J
Dibenz(a,h)anthracene	0.22 J	ND	ND	ND
Benzo(g,h,i)perylene	0.78 B	0.38 J	0.31 J	0.31 J
Total PAH	122.87	54.37	34.79	63.18
Surrogate Recoveries (%)				
Naphthalene-d8	72	71	80	66
Acenaphthene-d10	74	71	82	69
Benzo(a)pyrene-d12	87	85	95	86

Laboratory Batch ID	06-0326	06-0327	06-0327	06-0327
Client ID	06-WD01-01-PHC-AN	06-BP01-02-PHC-AN	06-6F-01-PHC-AN	06-6A-01-PHC-AN
Location	Other	Boulder Patch	BSMP	BSMP
Battelle ID	R2399-P	R2405-P	R2495-P	R2512-P
Collection Date	08/08/06	08/09/06	08/03/06	08/04/06
% Moisture	76.12	76.26	73.83	73.27
% Lipid	2.18	3.9	3.51	3.45
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.83	1.61	5.28	5.46
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	29.52 J	35.68 J	9.12 J	20.4 J
n-Decane	105.98 J	88.75 J	27.31 J	67.44 J
n-Undecane	64.14 J	50.22 J	15.85 J	ND
n-Dodecane	17.39 J	ND	6.21 J	ND
n-Tridecane	297.11	30.26 J	11.34 J	28.06 J
Isoprenoid RRT 1380	26.18 J	20.43 J	7.69 J	73.69 J
n-Tetradecane	25.38 J	45.36 J	10.24 J	40.16 J
Isoprenoid RRT 1470	54.55 J	59.17 J	19.7 J	100.71
n-Pentadecane	225.56	839.96	164.67	1040.45
n-Hexadecane	25.53 J	56.65 J	13.31 J	36.08 J
Norpristane (1650)	6.6 J	ND	ND	ND
n-Heptadecane	170.39	528.96	81.6 J	321.35
Pristane	16649.4	91440.53	20083.35	33098.28
n-Octadecane	25.94 J	47.05 J	8.56 J	24.75 J
Phytane	18.06 J	20.33 J	6.5 J	31.99 J
n-Nonadecane	25.21 J	52.56 J	10.96 J	41.75 J
n-Eicosane	33.56 J	56.94 J	13.97 J	42.85 J
n-Heneicosane	151.6	127.98 J	52.49 J	180.53
n-Docosane	120.67	66.08 J	41.6 J	132.92
n-Tricosane	329.28	175.79 J	119.42	334.32
n-Tetracosane	76.47 J	93.79 J	52.94 J	91.07 J
n-Pentacosane	131.02 B	182.98 J	76.76 J	141.72
n-Hexacosane	53.62 J	125.51 J	33.14 J	58.25 J
n-Heptacosane	100.98 J	190.15 J	49.01 J	99.23
n-Octacosane	56.87 J	140.7 J	35.68 J	61.65 J
n-Nonacosane	82.03 J	272.32	54.27 J	92.6 J
n-Triacontane	59.24 J	134.44 J	31.01 J	50.74 J
n-Hentriacontane	64.46 J	258.94	44.32 J	119.87
n-Dotriacontane	74.46 J	78.63 J	16.74 J	22.65 J
n-Tritriacontane	38.79 J	56.55 J	12.31 J	18.7 J
n-Tetratriacontane	55.36 J	31.72 J	7.96 J	14.16 J
n-Pentatriacontane	24.06 J	36.46 J	4.26 J	19.06 J
n-Hexatriacontane	40.47 J	13.96 J	2.02 J	ND
n-Heptatriacontane	11.76 J	ND	ND	ND
n-Octatriacontane	6.59 J	ND	ND	ND
n-Nonatriacontane	14.03 J	ND	ND	ND
n-Tetracontane	3.6 J	ND	ND	ND
Total SHC	26674.84	137166.28	26062.32 B	65388.18
Surrogate Recoveries (%)				
5a-androstane	80	80	86	77
n-Tetracosane-d50	80	77	85	74
S/T:				
C23 diterpane (T4)	ND	4.49	ND	1.02
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	2.51	ND	2.11
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	5.52	ND	2.99
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	1.39 J	ND	0.64 J
13b,17a-Diacholestane-20R (S5)	ND	1.14 J	ND	0.55 J
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	0.57 J
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	0.45 J
5a,14a,17a-Ethylcholestane-20R (S28)	ND	1.66	ND	0.89 J
S28a	ND	ND	ND	0.67 J
Surrogate Recoveries (%)				
5b(H)-Cholane	74	71	79	70

Surrogate Corrected

Laboratory Batch ID	06-0327	06-0327	06-0327	06-0327
Client ID	06-6B-02-PHC-AN	06-7G-01-PHC-AN	06-6B-01-PHC-AN	06-7E-01-PHC-AN
Location	BSMP	BSMP	BSMP	BSMP
Battelle ID	R2513-P	R2515-P	R2516-P	R2517-P
Collection Date	08/03/06	08/03/06	08/01/06	08/02/06
% Moisture	75.71	76.68	74.57	76.26
% Lipid	4.38	4.02	4.76	5.73
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.88	4.77	5.16	3.32
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	7.03	5.47 B	6.38	6.8
C1-Naphthalenes	8.57	7.23	7.18	10.39
C2-Naphthalenes	20.08	14.95	15.02	22.54
C3-Naphthalenes	6.54	5.33	5.07	7.15
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	2.09	1.47	1.39	1.79
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	0.32 J	ND	ND	ND
Fluorene	0.93	0.82	0.6	0.9
C1-Fluorenes	2.29	ND	1.65	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	2.32	2.01	1.51 B	2.85
C1-Phenanthrenes/Anthracenes	3.08	2.33	2.7	4.05
C2-Phenanthrenes/Anthracenes	5.77	4.58	4.35	9.1
C3-Phenanthrenes/Anthracenes	ND	3.16	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	0.26 J	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.47 J	0.82	0.49 J	0.88
Pyrene	0.36 J	0.79	0.37 J	1
C1-Fluoranthenes/Pyrenes	2.75	1.66	ND	ND
C2-Fluoranthenes/Pyrenes	4.73	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	0.41 J	0.32 J	0.39 J	ND
Chrysene	2.59	1.73	3.11	2.05
C1-Chrysenes	2.7	ND	2.58	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	1.29	0.97	1.53	1.15
Benzo(k)fluoranthene	0.56 J	0.57 J	0.38 J	ND
Benzo(e)pyrene	0.63	ND	0.38 J	ND
Benzo(a)pyrene	0.44 J	ND	0.42 J	ND
Perylene	3.94	ND	2.77	2.48
Indeno(1,2,3-cd)pyrene	0.21 J	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	0.54 B	ND	ND
Total PAH	80.1	55.01	58.27	73.13
Surrogate Recoveries (%)				
Naphthalene-d8	69	75	71	77
Acenaphthene-d10	74	79	76	80
Benzo(a)pyrene-d12	90	97	91	97

Laboratory Batch ID	06-0327	06-0327	06-0327	06-0327
Client ID	06-6B-02-PHC-AN	06-7G-01-PHC-AN	06-6B-01-PHC-AN	06-7E-01-PHC-AN
Location	BSMP	BSMP	BSMP	BSMP
Battelle ID	R2513-P	R2515-P	R2516-P	R2517-P
Collection Date	08/03/06	08/03/06	08/01/06	08/02/06
% Moisture	75.71	76.68	74.57	76.26
% Lipid	4.38	4.02	4.76	5.73
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.88	4.77	5.16	3.32
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	15.88 J	14.68 J	ND	16.33 J
n-Decane	46.85 J	42.44 J	28.67 J	45.33 J
n-Undecane	27.14 J	29.56 J	22.18 J	67.22 J
n-Dodecane	ND	14.31 J	ND	25.85 J
n-Tridecane	16.85 J	90.7 J	12.91 J	49.7 J
Isoprenoid RRT 1380	39.31 J	16.31 J	52.12 J	21.26 J
n-Tetradecane	27.42 J	32.07 J	19.3 J	76.62 J
Isoprenoid RRT 1470	80.13 J	38.61 J	103.7	70.45 J
n-Pentadecane	813.54	714.28	261.71	2416.15
n-Hexadecane	39.04 J	50.64 J	23.52 J	113.47 J
Norpristane (1650)	ND	ND	ND	15.15 J
n-Heptadecane	360.33	758.89	199.41	1856.45
Pristane	86347.05 E	88515.23 E	19080.28	1970.5
n-Octadecane	30.61 J	52.15 J	20.95 J	144.96 J
Phytane	38.22 J	23.7 J	39.76 J	60.64 J
n-Nonadecane	43.91 J	65.64 J	31.43 J	184.22
n-Eicosane	44.14 J	54.74 J	33.08 J	102.95 J
n-Heneicosane	151.53	337.35	158.45	314.4
n-Docosane	116.25	139.16	135.64	258.1
n-Tricosane	269.91	385.77	338.02	566.35
n-Tetracosane	84.74 J	114.26	88.29 J	252.01
n-Pentacosane	137.34	182.18	133.63	317.25
n-Hexacosane	67.69 J	82.95 J	53.82 J	179.78
n-Heptacosane	116.18	136.64	100.51 J	391.48
n-Octacosane	76.88 J	95.79 J	59.07 J	286.11
n-Nonacosane	123.21	240.86	83.71 J	476.07
n-Triacontane	70.94 J	94.48 J	49.5 J	170.61
n-Hentriacontane	178.09	248.69	130.33	408.42
n-Dotriacontane	38.38 J	49.3 J	26.73 J	75.4 J
n-Tritriacontane	32.42 J	41.94 J	19.95 J	96.74 J
n-Tetratriacontane	16.03 J	19.87 J	10.18 J	67.88 J
n-Pentatriacontane	9.27 J	12.56 J	5.1 J	2.23 J
n-Hexatriacontane	4.33 J	6.56 J	ND	17.47 J
n-Heptatriacontane	ND	ND	ND	7.72 J
n-Octatriacontane	ND	ND	ND	1.43 J
n-Nonatriacontane	ND	ND	ND	3.85 J
n-Tetracontane	ND	ND	ND	ND
Total SHC	108412.15	111421	32110.87 B	248697.84
Surrogate Recoveries (%)				
5a-androstane	80	85	70	86
n-Tetracosane-d50	78	82	68	84
S/T:				
C23 diterpane (T4)	ND	1.42	1.64	2.61
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	3.34
17a(H)-22,29,30-Trisnorhopane -TM (T12)	1.31	ND	ND	2.47
17a(H),21b(H)-30-Norhopane (T15)	2.68	1.84	1.78	9.01
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	2.32	2.95	2.4	13.63
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	4.8
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	3.85
13b,17a-Diacholestane-20S (S4)	1.05 J	0.98 J	0.56 J	3.36
13b,17a-Diacholestane-20R (S5)	0.79 J	0.74 J	0.33 J	2.07
5a,14a,17a-methylcholestane-20R (S24)	ND	0.62 J	0.54 J	1.83
5a,14a,17a-Ethylcholestane-20S (S25)	ND	0.64 J	ND	1.55 J
5a,14a,17a-Ethylcholestane-20R (S28)	1.17	0.97 J	0.93 J	2.82
S28a	0.39 J	0.57 J	0.31 J	1.29 J
Surrogate Recoveries (%)				
5b(H)-Cholane	74	77	74	79

Surrogate Corrected

Laboratory Batch ID	06-0327	06-0327	06-0327	06-0327
Client ID	06-N11-01-PHC-AN	06-N11-02-PHC-AN	06-N14-01-PHC-AN	06-N06-01-PHC-AN
Location	Northstar	Northstar	Northstar	Northstar
Battelle ID	R2558-P	R2559-P	R2560-P	R2561-P
Collection Date	08/06/06	08/06/06	08/06/06	08/06/06
% Moisture	78.57	79.52	78.38	73.32
% Lipid	2.15	1.89	1.59	2.95
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.39	4.26	4.43	5.37
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	3.05 B	2.98 B	3.95 B	2.75 B
C1-Naphthalenes	2.68	2.22 B	5.79	2.7
C2-Naphthalenes	12.06	12.59	16.15	9.87
C3-Naphthalenes	ND	ND	5.31	2.73
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	0.7	0.63	1.32	0.63
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	0.75
Fluorene	0.31 J	ND	0.61	0.39 J
C1-Fluorenes	ND	ND	1.15	2.25
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	1.34 B	0.66 B	1.49 B	1.19 B
C1-Phenanthrenes/Anthracenes	ND	ND	2.16	1.01
C2-Phenanthrenes/Anthracenes	ND	ND	3.23	1.84
C3-Phenanthrenes/Anthracenes	ND	ND	3.52	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	0.24 J	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.21 J	ND	0.56 J	0.23 J
Pyrene	0.2 J	0.25 J	0.61	0.25 J
C1-Fluoranthenes/Pyrenes	ND	ND	1.29	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	0.19 J	ND
Chrysene	ND	ND	1.17	0.39 J
C1-Chrysenes	ND	ND	1.3	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	0.36 J	0.7	0.28 J
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	2.31	ND
Indeno(1,2,3-cd)pyrene	ND	ND	0.29 J	0.14 J
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	0.35 J	0.21 J
Total PAH	20.55	19.69	53.69	27.61
Surrogate Recoveries (%)				
Naphthalene-d8	73	69	73	71
Acenaphthene-d10	77	73	75	75
Benzo(a)pyrene-d12	91	85	91	88

Laboratory Batch ID	06-0327	06-0327	06-0327	06-0327
Client ID	06-N11-01-PHC-AN	06-N11-02-PHC-AN	06-N14-01-PHC-AN	06-N06-01-PHC-AN
Location	Northstar	Northstar	Northstar	Northstar
Battelle ID	R2558-P	R2559-P	R2560-P	R2561-P
Collection Date	08/06/06	08/06/06	08/06/06	08/06/06
% Moisture	78.57	79.52	78.38	73.32
% Lipid	2.15	1.89	1.59	2.95
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.39	4.26	4.43	5.37
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	ND	12.03 J	18.37 J	9.85 J
n-Decane	18.27 J	116.63 J	40.41 J	27.37 J
n-Undecane	14.52 J	20.23 J	23.41 J	14.88 J
n-Dodecane	7.27 J	9.51 J	15.4 J	7.14 J
n-Tridecane	5.58 J	5.6 J	13.99 J	5.71 J
Isoprenoid RRT 1380	5.05 J	4.83 J	16.75 J	5.5 J
n-Tetradecane	10.32 J	10.21 J	21.26 J	10.98 J
Isoprenoid RRT 1470	25.08 J	23.78 J	49.42 J	18.85 J
n-Pentadecane	80.63 J	49.96 J	324.12	262.36
n-Hexadecane	14.93 J	14.62 J	25.55 J	18.41 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	84.51 J	90.14 J	156.39	136.14
Pristane	9054.29	8703.76	22649.97	14234.1
n-Octadecane	8.98 J	8.58 J	16.07 J	12.73 J
Phytane	6.73 J	6.67 J	9.52 J	6.21 J
n-Nonadecane	8.86 J	10.47 J	22.46 J	13.74 J
n-Eicosane	9.95 J	13.02 J	29.09 J	14.85 J
n-Heneicosane	25.74 J	27.59 J	156.07	51.65 J
n-Docosane	36.5 J	37.24 J	116.95 J	58.96 J
n-Tricosane	94.21 J	94.31 J	356.79	164.13
n-Tetracosane	42.06 J	46.84 J	82.17 J	74.8 J
n-Pentacosane	88.25 J	86.43 J	139.12	103.31
n-Hexacosane	54.59 J	50.3 J	59.64 J	54.35 J
n-Heptacosane	91.54 J	84 J	119.7	79.44 J
n-Octacosane	70.28 J	60.27 J	62.94 J	60.33 J
n-Nonacosane	79.21 J	65.2 J	91.84 J	81.95 J
n-Triacontane	63.34 J	48.54 J	55.11 J	48.2 J
n-Hentriacontane	64.37 J	49.21 J	69.08 J	57.38 J
n-Dotriacontane	35.93 J	25.57 J	31.74 J	23.68 J
n-Tritriacontane	22.21 J	15.46 J	21.79 J	14.59 J
n-Tetratriacontane	11.24 J	8.29 J	9.83 J	6.57 J
n-Pentatriacontane	6.96 J	4.27 J	6.58 J	4.2 J
n-Hexatriacontane	3.29 J	ND	2.92 J	ND
n-Heptatriacontane	ND	ND	ND	ND
n-Octatriacontane	ND	ND	ND	ND
n-Nonatriacontane	ND	ND	ND	ND
n-Tetracontane	ND	ND	ND	ND
Total SHC	15087.58 B	13686.93 B	33916.11 B	21046.97 B
Surrogate Recoveries (%)				
5a-androstane	82	78	82	80
n-Tetracosane-d50	79	77	81	78
S/T:				
C23 diterpane (T4)	ND	ND	1.81	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	2.4	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND	0.36 J	0.35 J
13b,17a-Diacholestane-20R (S5)	ND	ND	0.39 J	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	0.34 J	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	0.37 J	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	0.63 J	0.62 J
S28a	ND	ND	1.18	1.75
Surrogate Recoveries (%)				
5b(H)-Cholane	74	71	73	71

Surrogate Corrected

Laboratory Batch ID	06-0327	06-0327	06-0327	06-0327
Client ID	06-N03-01-PHC-AN	06-N2706-01-PHC-AN	06-N28-01-PHC-AN	06-N26-01-PHC-AN
Location	Northstar	Northstar	Northstar	Northstar
Battelle ID	R2562-P	R2563-P	R2564-P	R2569-P
Collection Date	08/06/06	08/06/06	08/06/06	08/07/06
% Moisture	75.68	75	78.21	77.69
% Lipid	3.48	2.64	2.43	3.1
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.88	5.09	4.40	4.52
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	4.91 B	3.61 B	6.88	6.89
C1-Naphthalenes	4.18	2.89	4.76	4.44
C2-Naphthalenes	9.77	8.68	8.32	8.48
C3-Naphthalenes	3.38	ND	3.71	3.22
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	0.9	0.76	0.87	0.81
Acenaphthylene	0.18 J	ND	ND	ND
Acenaphthene	0.37 J	ND	0.63	0.72
Fluorene	0.69	0.46 J	0.62	0.69
C1-Fluorenes	3.03	2.4	2.86	2.19
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	1.6 B	1.49 B	1.54 B	1.35 B
C1-Phenanthrenes/Anthracenes	1.58	1.12	1.33	ND
C2-Phenanthrenes/Anthracenes	3.3	5.76	ND	3.06
C3-Phenanthrenes/Anthracenes	ND	ND	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.36 J	0.25 J	0.28 J	0.27 J
Pyrene	0.4 J	0.26 J	0.31 J	0.28 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	0.16 J	ND	ND	ND
Chrysene	0.46 J	ND	ND	0.37 J
C1-Chrysenes	ND	0.71	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	0.46 J	0.38 J	0.36 J	0.44 J
Benzo(k)fluoranthene	0.33 J	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	2.14	1.36	ND	1.3
Indeno(1,2,3-cd)pyrene	0.24 J	0.23 J	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.32 J	ND	ND	ND
Total PAH	38.76	30.36	32.47	34.51
Surrogate Recoveries (%)				
Naphthalene-d8	74	66	71	75
Acenaphthene-d10	79	70	75	79
Benzo(a)pyrene-d12	96	89	91	99

Laboratory Batch ID	06-0327	06-0327	06-0327	06-0327
Client ID	06-N03-01-PHC-AN	06-N2706-01-PHC-AN	06-N28-01-PHC-AN	06-N26-01-PHC-AN
Location	Northstar	Northstar	Northstar	Northstar
Battelle ID	R2562-P	R2563-P	R2564-P	R2569-P
Collection Date	08/06/06	08/06/06	08/06/06	08/07/06
% Moisture	75.68	75	78.21	77.69
% Lipid	3.48	2.64	2.43	3.1
Matrix	Amphipod	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.88	5.09	4.40	4.52
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	10.69 J	9.75 J	11.74 J	11.12 J
n-Decane	26.55 J	19.34 J	24.67 J	18.59 J
n-Undecane	15.04 J	17.63 J	17 J	11.67 J
n-Dodecane	7.98 J	6.78 J	ND	6.5 J
n-Tridecane	16.3 J	5.9 J	6.75 J	15.02 J
Isoprenoid RRT 1380	8.03 J	5.85 J	4.67 J	6.85 J
n-Tetradecane	22.91 J	12.3 J	13.53 J	20.25 J
Isoprenoid RRT 1470	26.75 J	19.86 J	20.64 J	27.17 J
n-Pentadecane	646.33	192.68	358.24	499.98
n-Hexadecane	33.21 J	17.12 J	19.53 J	28.57 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	481.02	207.42	121.56	591.94
Pristane	52909.58 E	23062.88	17267.51	60952.21 E
n-Octadecane	28.11 J	13.3 J	11.53 J	27.71 J
Phytane	11.12 J	7.06 J	8.01 J	11.3 J
n-Nonadecane	31.41 J	16.44 J	13.85 J	33.27 J
n-Eicosane	21.95 J	15.16 J	18.53 J	17.65 J
n-Heneicosane	70.2 J	53.6 J	51.44 J	63.53 J
n-Docosane	57.33 J	55.59 J	49.35 J	52.95 J
n-Tricosane	164.12	164.28	149.11	170.87
n-Tetracosane	73.2 J	67.46 J	70.16 J	71.39 J
n-Pentacosane	122.43	94.38 J	113.86 J	123.67
n-Hexacosane	56.09 J	36.92 J	41.23 J	40.82 J
n-Heptacosane	93.64 J	59.35 J	68.63 J	62.58 J
n-Octacosane	59.97 J	33.54 J	42.14 J	37.57 J
n-Nonacosane	91.33 J	40.81 J	58.65 J	39.16 J
n-Triacontane	51.98 J	24.48 J	36.53 J	24.72 J
n-Hentriacontane	78.02 J	30.87 J	59.89 J	26.03 J
n-Dotriacontane	23.91 J	10.15 J	18.89 J	10.9 J
n-Tritriacontane	15.15 J	6.77 J	12.12 J	7.07 J
n-Tetratriacontane	8.37 J	1.47 J	5.2 J	ND
n-Pentatriacontane	3.39 J	1.17 J	2.22 J	ND
n-Hexatriacontane	ND	ND	ND	ND
n-Heptatriacontane	ND	ND	ND	ND
n-Octatriacontane	ND	ND	ND	ND
n-Nonatriacontane	ND	ND	ND	ND
n-Tetracontane	ND	ND	ND	ND
Total SHC	63879.89	28272.04 B	26446.14 B	71652.44
Surrogate Recoveries (%)				
5a-androstane	82	78	83	87
n-Tetracosane-d50	79	74	80	83
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	0.71 J	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	ND	ND
S28a	ND	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	73	69	75	78

Surrogate Corrected

Laboratory Batch ID	06-0327	06-0327	06-0327
Client ID	06-N26-02-PHC-AN	04-N11-01-PHC/MET-T-AN	05-N11-01-PHC-T-AN
Location	Northstar	Northstar	Northstar
Battelle ID	R2570-P	S3882-P1	S9246-P1
Collection Date	08/07/06	07/29/04	08/11/05
% Moisture	77.38	74.86	77.45
% Lipid	3.03	3.1	2.19
Matrix	Amphipod	Amphipod	Amphipod
Sample Size (g dry)	4.61	5.14	4.63
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	8.31	3.46 BT	2.54 BT
C1-Naphthalenes	5.01	2.44 BT	1.69 BT
C2-Naphthalenes	9.29	5.25 T	NDT
C3-Naphthalenes	3.74	5.11 T	NDT
C4-Naphthalenes	ND	NDT	NDT
Biphenyl	0.89	0.84 T	0.51 JT
Acenaphthylene	ND	NDT	NDT
Acenaphthene	0.65	NDT	NDT
Fluorene	0.75	0.62 T	NDT
C1-Fluorenes	2.44	1.83 T	3.7 T
C2-Fluorenes	ND	NDT	NDT
C3-Fluorenes	ND	NDT	NDT
Anthracene	ND	0.29 JT	NDT
Phenanthrene	1.5 B	3.79 T	1.04 BT
C1-Phenanthrenes/Anthracenes	1.61	2.65 T	NDT
C2-Phenanthrenes/Anthracenes	2.39	3.67 T	NDT
C3-Phenanthrenes/Anthracenes	ND	NDT	NDT
C4-Phenanthrenes/Anthracenes	ND	NDT	NDT
Dibenzothiophene	ND	NDT	NDT
C1-Dibenzothiophenes	ND	NDT	NDT
C2-Dibenzothiophenes	ND	NDT	NDT
C3-Dibenzothiophenes	ND	NDT	NDT
Fluoranthene	0.75	4.54 T	NDT
Pyrene	0.71	3.38 T	NDT
C1-Fluoranthenes/Pyrenes	ND	2.57 T	NDT
C2-Fluoranthenes/Pyrenes	ND	NDT	NDT
C3-Fluoranthenes/Pyrenes	ND	NDT	NDT
Benzo(a)anthracene	ND	1.36 T	NDT
Chrysene	0.6	2.83 T	NDT
C1-Chrysenes	ND	1.37 T	NDT
C2-Chrysenes	ND	NDT	NDT
C3-Chrysenes	ND	NDT	NDT
C4-Chrysenes	ND	NDT	NDT
Benzo(b)fluoranthene	0.66	2.33 T	NDT
Benzo(k)fluoranthene	ND	2.42 T	NDT
Benzo(e)pyrene	ND	1.98 T	NDT
Benzo(a)pyrene	ND	1.43 T	NDT
Perylene	1.67	1.52 T	NDT
Indeno(1,2,3-cd)pyrene	0.28 J	2.1 T	NDT
Dibenz(a,h)anthracene	ND	0.59 BT	NDT
Benzo(g,h,i)perylene	0.32 J	1.78 T	NDT
Total PAH	41.57	60.15	9.48
Surrogate Recoveries (%)			
Naphthalene-d8	61	41	73
Acenaphthene-d10	63	51	80
Benzo(a)pyrene-d12	75	74	94

Laboratory Batch ID	06-0327		06-0327		06-0327	
Client ID	06-N26-02-PHC-AN		04-N11-01-PHC/MET-T-AN		05-N11-01-PHC-T-AN	
Location	Northstar		Northstar		Northstar	
Battelle ID	R2570-P		S3882-P1		S9246-P1	
Collection Date	08/07/06		07/29/04		08/11/05	
% Moisture	77.38		74.86		77.45	
% Lipid	3.03		3.1		2.19	
Matrix	Amphipod		Amphipod		Amphipod	
Sample Size (g dry)	4.61		5.14		4.63	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
SHC:						
n-Nonane	15.05	J	25.35	JT		NDT
n-Decane	29.08	J	38.53	JT	46.26	JT
n-Undecane	15.48	J	20.52	JT		NDT
n-Dodecane		ND	14.66	JT		NDT
n-Tridecane	16.9	J	16.14	JT		NDT
Isoprenoid RRT 1380	6.2	J	8.71	JT		NDT
n-Tetradecane	18.2	J	25.03	JT		NDT
Isoprenoid RRT 1470	31.58	J	24.43	JT		NDT
n-Pentadecane	395.34		441.95	T	81.61	JT
n-Hexadecane	28.64	J	46.27	JT		NDT
Norpristane (1650)		ND		NDT		NDT
n-Heptadecane	461.53		390.22	T	58.97	JT
Pristane	32287.71		35635.81	T	6023.05	T
n-Octadecane	25.4	J	44.01	JT	5.88	JT
Phytane	11.63	J	15.93	JT	4.21	JT
n-Nonadecane	29.18	J	44.94	JT	6.87	JT
n-Eicosane	19.25	J	42.06	JT	9.79	JT
n-Heneicosane	63.25	J	64.94	JT	22.56	JT
n-Docosane	56.05	J	51.17	JT	24.75	JT
n-Tricosane	171.36		87.67	JT	62.17	JT
n-Tetracosane	79.63	J	55.61	JT	26.57	JT
n-Pentacosane	147.02		99.54	JT	56.86	JT
n-Hexacosane	58.75	J	53.55	JT	36.5	JT
n-Heptacosane	89.08	J	86.36	JT	55.68	JT
n-Octacosane	55.63	J	52.95	JT	37.65	JT
n-Nonacosane	61.85	J	79.96	JT	34.53	JT
n-Triacontane	39.19	J	48.09	JT	21.84	JT
n-Hentriacontane	45.72	J	144.07	T	16.36	JT
n-Dotriacontane	15.34	J	26.08	JT	8.83	JT
n-Tritriacontane	8.76	J	21.12	JT	2.87	JT
n-Tetratriacontane	4.1	J	8.89	JT		NDT
n-Pentatriacontane		ND	4.93	JT		NDT
n-Hexatriacontane		ND	2.17	JT		NDT
n-Heptatriacontane		ND		NDT		NDT
n-Octatriacontane		ND		NDT		NDT
n-Nonatriacontane		ND		NDT		NDT
n-Tetracontane		ND		NDT		NDT
Total SHC	43729.64	B	55883.26	T	11559.05	BT
Surrogate Recoveries (%)						
5a-androstane	69		87		83	
n-Tetracosane-d50	67		86		86	
S/T:						
C23 diterpane (T4)		ND	2.91	T		NDT
C29 Tricyclictrierpane (T9)		ND		NDT		NDT
C29 Tricyclictriterpane (T10)		ND		NDT		NDT
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND	1.85	T		NDT
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND	1.53	T		NDT
17a(H),21b(H)-30-Norhopane (T15)		ND	4.25	T		NDT
18a(H)-Oleanane (T18)		ND		NDT		NDT
17a(H),21b(H)-hopane (T19)		ND	4.4	T		NDT
22S-17a(H),21b(H)-30-homohopane (T21)		ND		NDT		NDT
22R-17a(H),21b(H)-30-homohopane (T22)		ND		NDT		NDT
13b,17a-Diacholestane-20S (S4)		ND	1.48	T		NDT
13b,17a-Diacholestane-20R (S5)		ND	0.99	JT		NDT
5a,14a,17a-methylcholestane-20R (S24)		ND	0.77	JT		NDT
5a,14a,17a-Ethylcholestane-20S (S25)		ND	0.87	JT		NDT
5a,14a,17a-Ethylcholestane-20R (S28)		ND	1.25	T		NDT
S28a		ND	0.65	JT		NDT
Surrogate Recoveries (%)						
5b(H)-Cholane	61		80		78	

Surrogate Corrected

Laboratory Batch ID	06-0325		06-0325				
Client ID	Procedural Blank		060313-01: Tilapia				
Battelle ID	BJ453PB-P		BJ454LCS-P				
Collection Date	10/03/06		10/03/06				
% Moisture	75.74		78.37				
% Lipid	NA		1.5				
Matrix	TISSUE		TISSUE				
Sample Size (g dry)	3.79		4.34				
Units	UG/KG_DRY		UG/KG_DRY		Target	% Recovery	Qualifier
PAH:							
Naphthalene	2.39		312.1		288.08	108	
C1-Naphthalenes	1.41			ND			
C2-Naphthalenes	2.52			ND			
C3-Naphthalenes		ND		ND			
C4-Naphthalenes		ND		ND			
Biphenyl	0.59	J	315.44		288.51	109	
Acenaphthylene		ND	333.66		288.28	116	
Acenaphthene		ND	336.61		288.21	117	
Fluorene	0.46	J	355.19		288.18	123	
C1-Fluorenes		ND	1.56				
C2-Fluorenes		ND		ND			
C3-Fluorenes		ND		ND			
Anthracene	0.2	J	352.33		288.06	122	
Phenanthrene	1.19	J	296.31		288.16	103	
C1-Phenanthrenes/Anthracenes	0.88	J		ND			
C2-Phenanthrenes/Anthracenes		ND		ND			
C3-Phenanthrenes/Anthracenes		ND		ND			
C4-Phenanthrenes/Anthracenes		ND		ND			
Dibenzothiophene		ND	302.16		289.34	104	
C1-Dibenzothiophenes	0.5	J	1.1	J			
C2-Dibenzothiophenes		ND		ND			
C3-Dibenzothiophenes		ND		ND			
Fluoranthene	0.52	J	298.97		288.16	104	
Pyrene	0.7	J	303.47		288.12	105	
C1-Fluoranthenes/Pyrenes	0.58	J	0.56	J			
C2-Fluoranthenes/Pyrenes		ND		ND			
C3-Fluoranthenes/Pyrenes		ND		ND			
Benzo(a)anthracene	0.24	J	268.25		288.09	93	
Chrysene	0.27	J	249.11		288.13	86	
C1-Chrysenes		ND		ND			
C2-Chrysenes		ND		ND			
C3-Chrysenes		ND		ND			
C4-Chrysenes		ND		ND			
Benzo(b)fluoranthene	0.42	J	320.44		288.26	111	
Benzo(k)fluoranthene	0.46	J	351.7		288.18	122	
Benzo(e)pyrene	0.29	J	310.72		288.74	108	
Benzo(a)pyrene	0.29	J	348.9		288.25	121	
Perylene		ND	395.14		288.61	137	N
Indeno(1,2,3-cd)pyrene		ND	300.72		288.16	104	
Dibenz(a,h)anthracene		ND	329.49		288.18	114	
Benzo(g,h,i)perylene		ND	331.18		288.10	115	
Total PAH (ug/kg dry)							
Surrogate Recoveries (%)							
Naphthalene-d8	59		54				
Acenaphthene-d10	65		58				
Phenanthrene-d10	88		72				
Benzo(a)pyrene-d12	90		60				

Laboratory Batch ID	06-0325					
Client ID	060814-01: Nist 2977					
Battelle ID	BJ455SRM-P					
Collection Date	10/03/06					
% Moisture	NA					
% Lipid	5.51					
Matrix	TISSUE					
Sample Size (g dry)	2.00	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
PAH:						
Naphthalene	10.93					
C1-Naphthalenes	8.91					
C2-Naphthalenes	125.95					
C3-Naphthalenes	278.97					
C4-Naphthalenes	338.18					
Biphenyl	2.73					
Acenaphthylene	2.82					
Acenaphthene	4.37					
Fluorene	9.82	10.24	0.43	34.2	4.1	
C1-Fluorenes	48.86					
C2-Fluorenes	203.68					
C3-Fluorenes	436.22					
Anthracene	3.83					
Phenanthrene	31.59	35.1	3.80	40.83	10	
C1-Phenanthrenes/Anthracenes	131.59					
C2-Phenanthrenes/Anthracenes	416.87					
C3-Phenanthrenes/Anthracenes	468.86					
C4-Phenanthrenes/Anthracenes	236.17					
Dibenzothiophene	22.26					
C1-Dibenzothiophenes	177.04					
C2-Dibenzothiophenes	574.02					
C3-Dibenzothiophenes	727.59					
Fluoranthene	29.03	38.7	1.00	32.58	25	
Pyrene	61.76	78.9	3.50	34.44	21.7	
C1-Fluoranthenes/Pyrenes	80.67					
C2-Fluoranthenes/Pyrenes	107.53					
C3-Fluoranthenes/Pyrenes	100.89					
Benzo(a)anthracene	15.81	20.34	0.78	33.83	22.3	
Chrysene	57.62					
C1-Chrysenes	52.68					
C2-Chrysenes	47.33					
C3-Chrysenes	31.1					
C4-Chrysenes	12.81					
Benzo(b)fluoranthene	8.95	11.01	0.28	32.54	18.7	
Benzo(k)fluoranthene	10.01					
Benzo(e)pyrene	11.76	13.1	1.10	38.4	10.2	
Benzo(a)pyrene	4.33	8.35	0.72	38.62	48.1	N
Perylene	2.53 J	3.5	0.76	51.71	27.7	
Indeno(1,2,3-cd)pyrene	2.95	4.84	0.81	46.74	39	
Dibenz(a,h)anthracene	1.18 J	1.41	0.19	43.48	16.3	
Benzo(g,h,i)perylene	6.38	9.53	0.43	34.51	33.1	
Total PAH (ug/kg dry)						
Surrogate Recoveries (%)						
Naphthalene-d8	55					
Acenaphthene-d10	66					
Phenanthrene-d10	84					
Benzo(a)pyrene-d12	91					

Laboratory Batch ID	06-0325				06-0325	
	GN62: North Slope				GG09: NorthSTAR Control	
Client ID	Crude				Oil - cANIMIDA	
Battelle ID	BJ456NSC-P				BJ468CO-P	
Collection Date	10/06/06				10/06/06	
% Moisture	NA				NA	
% Lipid	NA				NA	
Matrix	OIL				OIL	
Sample Size (g dry)	5.01				5.02	
Units	MG/KG_OIL	Target	% Difference	Qualifier	MG/KG_OIL	
PAH:						
Naphthalene	620.24	740.29	16.2		794.44	
C1-Naphthalenes	1273.38	1516.04	16.0		1761.06	ND
C2-Naphthalenes	2013.25	2000.10	0.7		2719.03	ND
C3-Naphthalenes	1748.33	1526.96	14.5		2167.3	ND
C4-Naphthalenes	1160.81	898.03	29.3		1265.49	ND
Biphenyl	212.99	220.82	3.5		329.84	
Acenaphthylene	ND					ND
Acenaphthene	16.09	14.50	11.0		21.02	
Fluorene	96.35	92.51	4.2		157.97	
C1-Fluorenes	269.39	227.01	18.7		340.19	
C2-Fluorenes	465.92	367.09	26.9		469.32	
C3-Fluorenes	421.98	326.32	29.3		426.99	
Anthracene	ND					ND
Phenanthrene	237.03	249.49	5.0		275.69	
C1-Phenanthrenes/Anthracenes	569.15	549.17	3.6		632.9	
C2-Phenanthrenes/Anthracenes	741.42	642.72	15.4		763.98	
C3-Phenanthrenes/Anthracenes	549.93	446.11	23.3		540.52	
C4-Phenanthrenes/Anthracenes	233.08	180.02	29.5		219.98	
Dibenzothiophene	208.33	210.35	1.0		82.82	
C1-Dibenzothiophenes	440.53	409.03	7.7		188.93	
C2-Dibenzothiophenes	649.38	551.46	17.8		231.39	
C3-Dibenzothiophenes	596.3	471.36	26.5		157.97	
Fluoranthene	3.93				4.64	
Pyrene	14.36	12.99	10.5		17.85	
C1-Fluoranthenes/Pyrenes	81.8	70.92	15.3		93.65	
C2-Fluoranthenes/Pyrenes	139.76	117.89	18.6		134.4	
C3-Fluoranthenes/Pyrenes	159.84	137.25	16.5		138.45	
Benzo(a)anthracene	ND					ND
Chrysene	48.94	47.18	3.7		44.41	
C1-Chrysenes	81.19	78.82	3.0		78.75	
C2-Chrysenes	116.89	102.67	13.9		106.32	
C3-Chrysenes	101.64	85.36	19.1		86.98	
C4-Chrysenes	69.96	61.99	12.9		58.05	
Benzo(b)fluoranthene	6.41	6.08	5.4		4.26	
Benzo(k)fluoranthene	ND					ND
Benzo(e)pyrene	10.71	12.88	16.8		11.15	
Benzo(a)pyrene	ND				1.18	J
Perylene	ND					ND
Indeno(1,2,3-cd)pyrene	ND					ND
Dibenz(a,h)anthracene	0.84	J			1	J
Benzo(g,h,i)perylene	3.15	3.44	8.4		1.39	
Total PAH (ug/kg dry)						
Surrogate Recoveries (%)						
Naphthalene-d8	84				83	
Acenaphthene-d10	93				95	
Phenanthrene-d10	97				98	
Benzo(a)pyrene-d12	122	N			122	N

Laboratory Batch ID	06-0325		06-0325			
Client ID	06-N05N11-01-PHC-ISO		06-N05N11-01-PHC-ISO			
Battelle ID	R2397-P		R2397DUP-P			
Collection Date	08/10/06		8/10/2006			
% Moisture	72.83		73.36			
% Lipid	2.23		2.17			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	5.48		5.39			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	5.03	B	4.52	B	10.7	
C1-Naphthalenes	4.03	B	4.05	B	0.5	
C2-Naphthalenes	5.17	B	4.93	B	4.8	
C3-Naphthalenes	8.41		8.63		2.6	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	0.97	B	0.99	B	2.0	
Acenaphthylene	ND		ND		NA	
Acenaphthene	0.5	J	ND		NA	
Fluorene	0.8	J	0.83	J	NA	
C1-Fluorenes	1.56		1.54		1.3	
C2-Fluorenes	3.01		3.67		19.8	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	2.35	B	2.5	B	6.2	
C1-Phenanthrenes/Anthracenes	3.11	B	3.51	B	12.1	
C2-Phenanthrenes/Anthracenes	4.06		3.97		2.2	
C3-Phenanthrenes/Anthracenes	2.27		2.34		3.0	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	0.46	J	0.45	J	NA	
C1-Dibenzothiophenes	0.99	B	1.14	B	14.1	
C2-Dibenzothiophenes	1.8		1.82		1.1	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	0.49	J	0.55	J	NA	
Pyrene	0.88	J	0.93	J	NA	
C1-Fluoranthenes/Pyrenes	1.57	B	1.67	B	6.2	
C2-Fluoranthenes/Pyrenes	1.6		1.68		4.9	
C3-Fluoranthenes/Pyrenes	1.51		1.54		2.0	
Benzo(a)anthracene	0.17	J	0.23	J	NA	
Chrysene	0.95	B	1.03	B	8.1	
C1-Chrysenes	1		1.04		3.9	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	0.51	J	0.59	J	NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	0.76	J	0.85	J	NA	
Benzo(a)pyrene	0.18	J	0.19	J	NA	
Perylene	6.28		6.43		2.4	
Indeno(1,2,3-cd)pyrene	0.2	J	0.2	J	NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	0.57	J	0.63	J	NA	
Total PAH (ug/kg dry)	61.19		62.45			
Surrogate Recoveries (%)						
Naphthalene-d8	83		81			
Acenaphthene-d10	85		83			
Phenanthrene-d10	101		100			
Benzo(a)pyrene-d12	92		93			

This page left intentionally blank.

cANIMIDA Deployed Mussel Tissue Hydrocarbon Data

This page left intentionally blank.

2004 Deployed Mussel Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	04-0445	04-0445	04-0445	04-0445
Client ID	04-MZ-01-PHC/MET-T-MU	04-MZ-03-PHC/MET-T-MU	04-MZ-02-PHC/MET-T-MU	04-L06-01-PHC/MET-T-MU
Location	Reference Mussels	Reference Mussels	Reference Mussels	Liberty
Battelle ID	S3873-P	S3874-P	S3887-P	S4330-P
Collection Date	07/30/04	07/30/04	07/29/04	08/13/04
% Moisture	85.84	89.42	86.64	88.58
% Lipid	3.05	2.3	2.55	2.65
Matrix	MUSSELS	MUSSELS	MUSSELS	MUSSELS
Sample Size (g dry)	2.18	1.60	2.47	2.29
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	49.95 B	53.12 B	47.17 B	11.76 B
C1-Naphthalenes	13.09 B	15.6 B	10.92 B	2.8 B
C2-Naphthalenes	12.55 B	36.14	11.75 B	3.35 B
C3-Naphthalenes	10.72	18.32	10.06	2.19 J
C4-Naphthalenes	7.52	10.92	6.98	ND
Biphenyl	12.02 B	12.01 B	8.4 B	12.25 B
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	0.72 J	0.89 J	ND	0.21 J
Fluorene	2.4 J	2.05 J	1.45 J	1.79 J
C1-Fluorenes	5.59	6.1	4.64	3.35
C2-Fluorenes	8.73	11.9	10.95	3.97
C3-Fluorenes	ND	ND	ND	ND
Anthracene	1.21 J	1.14 J	0.56 J	ND
Phenanthrene	8.24 B	8 B	5.21 B	4.33 B
C1-Phenanthrenes/Anthracenes	7.7	9.17	5.7	3.36
C2-Phenanthrenes/Anthracenes	15.76	20.45	16.78	7.6
C3-Phenanthrenes/Anthracenes	8.3	11.21	10.83	3.58
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	2.36 J	1.49 J	0.85 J	0.23 J
C1-Dibenzothiophenes	3.56	4.16	3.16	ND
C2-Dibenzothiophenes	9.48	12.13	11.23	3.01
C3-Dibenzothiophenes	10.5	13.22	15.35	3.14
Fluoranthene	3.73	5.3	3.05	1.74 J
Pyrene	3.43	5.05	2.94	1.24 J
C1-Fluoranthenes/Pyrenes	2.22 J	3.51 J	ND	2.05 J
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	1 J	1.39 J	0.52 J	0.22 J
Chrysene	1.98 J	3.24 J	1.6 J	1.42 J
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	1.33 J	1.67 J	0.9 J	ND
Benzo(k)fluoranthene	1.17 J	1.77 J	0.77 J	ND
Benzo(e)pyrene	1.09 J	1.46 J	0.67 J	ND
Benzo(a)pyrene	0.79 J	1.24 J	0.72 J	ND
Perylene	1.41 J	ND	ND	18.64
Indeno(1,2,3-cd)pyrene	0.83 J	1.16 J	0.64 J	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.99 J	1.38 J	0.71 J	0.58 J
Total PAH (ug/kg dry)	210.37	275.19	194.51	92.81
Surrogate Recoveries (%)				
Naphthalene-d8	64	61	66	60
Acenaphthene-d10	73	69	75	68
Phenanthrene-d10	75	70	77	71
Benzo(a)pyrene-d12	87	87	94	86

Surrogate Corrected

	04-MZ-01-PHC/MET-T-MU	04-MZ-03-PHC/MET-T-MU	04-MZ-02-PHC/MET-T-MU	04-L06-01-PHC/MET-T-MU
Client ID				
Location	Reference Mussels	Reference Mussels	Reference Mussels	Liberty
Battelle ID	S3873-P	S3874-P	S3887-P	S4330-P
Collection Date	07/30/04	07/30/04	07/29/04	08/13/04
% Moisture	85.84	89.42	86.64	88.58
% Lipid	3.05	2.3	2.55	2.65
Matrix	MUSSELS	MUSSELS	MUSSELS	MUSSELS
Sample Size (g dry)	2.18	1.60	2.47	2.29
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	45.52 J	74.67 J	51.32 J	55.42 J
n-Decane	78.53 J	110.72 J	79.94 J	115.86 J
n-Undecane	35.42 J	38.72 J	29.01 J	61.54 J
n-Dodecane	187.98 J	241.88 J	192.04 J	356.45 J
n-Tridecane	196.5 J	234.04 J	188.32 J	435.5 B
Isoprenoid RRT 1380	43.17 J	48.5 J	44.02 J	37.73 J
n-Tetradecane	214.57 J	265.52 J	243.28 J	310.33 J
Isoprenoid RRT 1470	188.18 J	217.53 J	189.95 J	141.89 J
n-Pentadecane	437.37 J	549.7 J	488.52	614.35
n-Hexadecane	598.73 B	779.89 B	610.92 B	753.98 B
Norpristane (1650)	59.87 J	59.54 J	76.91 J	13.91 J
n-Heptadecane	312.34 J	503.16 J	412.64	641.18
Pristane	713.17	557.91 J	638.93	337.06 J
n-Octadecane	65.24 J	55.49 J	54.51 J	88.91 J
Phytane	221.38 J	207.56 J	253.82 J	68.89 J
n-Nonadecane	25.83 J	20.09 J	29.33 J	17.86 J
n-Eicosane	43.2 J	47.71 J	49.65 J	60.09 J
n-Heneicosane	55.68 J	48.29 J	57.21 J	34.09 J
n-Docosane	83.64 J	82.27 J	75.05 J	65.1 J
n-Tricosane	102.73 J	114.62 J	100.17 J	79.09 J
n-Tetracosane	113.02 J	128.07 J	108.29 J	85.12 J
n-Pentacosane	607.88 B	794.91 B	564.11 B	534.73 B
n-Hexacosane	112.5 J	135.79 J	119.33 J	79.99 J
n-Heptacosane	176.07 J	221.35 J	172.64 J	118.92 J
n-Octacosane	128.29 J	156.74 J	118.17 J	72.34 J
n-Nonacosane	223.47 J	259.79 J	206.53 J	150.44 J
n-Triacontane	108.32 J	153.83 J	109.97 J	64.86 J
n-Hentriacontane	146.95 J	209.62 J	151.19 J	119.09 J
n-Dotriacontane	93.9 J	149.65 J	91.09 J	51.04 J
n-Tritriacontane	80.5 J	124.61 J	82.67 J	58 J
n-Tetratriacontane	50.01 J	92.87 J	60.94 J	40.42 J
n-Pentatriacontane	28.81 J	41.82 J	32.96 J	23.15 J
n-Hexatriacontane	18.6 J	30.24 J	22.63 J	18.28 J
n-Heptatriacontane	15.3 J	16.17 J	16.16 J	11.89 J
n-Octatriacontane	15.18 J	13.14 J	15.91 J	7.86 J
n-Nonatriacontane	ND	ND	ND	ND
n-Tetracontane	ND	ND	ND	ND
SHC(total)	52022.19	133789.87	24377.65	868.03
Surrogate Recoveries (%)				
n-Tetracosane-d50	72	71	77	79
5a-androstane	72	73	78	79
S/T:				
C23 diterpane (T4)	0.91 J	1.02 J	1.16 J	0.65 J
C29 tricyclictriterpane (T9)	ND	ND	ND	ND
C29 tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-norhopane (T15)	2.2 J	3.08	2.5	2.14 J
18a(H)-oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	2.94	4.58	3.6	3.62
22S-17a(H),21b(H)-30-homohopane (T21)	ND	2.75 J	1.44 J	1.56 J
22R-17a(H),21b(H)-30-homohopane (T22)	ND	2.01 J	1.32 J	1.78 J
13b,17a-diacholestane-20S (S4)	0.92 J	1.1 J	0.98 J	0.89 J
13b,17a-diacholestane-20R (S5)	ND	ND	0.43 J	0.6 J
5a,14a,17a,24-methylcholestane-20R (S24)	ND	ND	0.46 J	0.87 J
5a,14a,17a,24-ethylcholestane-20S (S25)	ND	ND	0.54 J	0.64 J
5a,14a,17a,24-ethylcholestane-20R (S28)	ND	1.38 J	1.13 J	1.39 J
S28a				
Surrogate Recoveries (%)				
5b(H)-Cholane	92	90	95	96

Surrogate Corrected

Laboratory Batch Number	04-0445		04-0445		04-0445		04-0445	
Client ID	04-3A-01-PHC/MET-T-MU		04-5H-01-PHC/MET-T-MU		04-N05-01-PHC/MET-T-MU		04-N06-01-PHC/MET-T-MU	
Location	BSMP		BSMP		Northstar		Northstar	
Battelle ID	S4331-P		S4332-P		S4335-P		S4336-P	
Collection Date	08/13/04		08/14/04		08/15/04		08/15/04	
% Moisture	87.92		89.51		91.32		88.71	
% Lipid	2.92		2.2		2.11		2.05	
Matrix	MUSSELS		MUSSELS		MUSSELS		MUSSELS	
Sample Size (g dry)	1.22		2.18		1.78		2.27	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
PAH:								
Naphthalene	96	B	31.89	B	54.92	B	12.3	B
C1-Naphthalenes	9.86	B	5.65	B	8.45	B	5.5	B
C2-Naphthalenes	16.12	B	10.2	B	16.11	B	5.75	B
C3-Naphthalenes	18.77		7.29		14.34		5.35	
C4-Naphthalenes	ND		ND		ND		ND	
Biphenyl	13.15	B	6.34	B	9.76	B	10.35	B
Acenaphthylene	ND		ND		ND		ND	
Acenaphthene	0.73	J	ND		ND		ND	
Fluorene	2.09	J	1.36	J	1.86	J	2.22	J
C1-Fluorenes	6.08		ND		ND		3.92	
C2-Fluorenes	ND		ND		ND		ND	
C3-Fluorenes	ND		ND		ND		ND	
Anthracene	0.82	J	ND		ND		ND	
Phenanthrene	5.91	B	4.43	B	5.44	B	5.7	B
C1-Phenanthrenes/Anthracenes	6.6		5.33		6.14		5.67	
C2-Phenanthrenes/Anthracenes	12.48		11.75		13.74		9.05	
C3-Phenanthrenes/Anthracenes	7.62		5.82		9.11		3.41	
C4-Phenanthrenes/Anthracenes	ND		ND		ND		ND	
Dibenzothiophene	0.65	J	0.43	J	0.73	J	0.37	J
C1-Dibenzothiophenes	ND		ND		ND		ND	
C2-Dibenzothiophenes	ND		5.97		ND		2.6	
C3-Dibenzothiophenes	ND		8.12		ND		3.2	
Fluoranthene	1.68	J	1.15	J	1.71	J	1.89	J
Pyrene	1.66	J	1.14	J	2.2	J	1.28	J
C1-Fluoranthenes/Pyrenes	ND		ND		ND		4.01	
C2-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
C3-Fluoranthenes/Pyrenes	ND		ND		ND		ND	
Benzo(a)anthracene	ND		ND		ND		0.7	J
Chrysene	1.57	J	1.25	J	2.35	J	2.01	J
C1-Chrysenes	ND		ND		ND		ND	
C2-Chrysenes	ND		ND		ND		ND	
C3-Chrysenes	ND		ND		ND		ND	
C4-Chrysenes	ND		ND		ND		ND	
Benzo(b)fluoranthene	0.79	J	0.7	J	1.09	J	ND	
Benzo(k)fluoranthene	0.77	J	ND		ND		ND	
Benzo(e)pyrene	ND		0.61	J	1.09	J	ND	
Benzo(a)pyrene	ND		0.57	J	ND		ND	
Perylene	ND		ND		ND		4.42	
Indeno(1,2,3-cd)pyrene	ND		ND		ND		0.62	J
Dibenz(a,h)anthracene	ND		ND		ND		0.36	J
Benzo(g,h,i)perylene	0.98	J	0.65	J	0.92	J	0.85	J
Total PAH (ug/kg dry)	204.33		110.65		149.96		91.53	
Surrogate Recoveries (%)								
Naphthalene-d8	58		68		43		51	
Acenaphthene-d10	68		79		50		56	
Phenanthrene-d10	70		80		52		58	
Benzo(a)pyrene-d12	85		93		61		72	

Surrogate Corrected

	04-3A-01-PHC/MET-T-		04-5H-01-PHC/MET-T-		04-N05-01-PHC/MET-T-		04-N06-01-PHC/MET-T-	
Client ID	MU		MU		MU		MU	
Location	BSMP		BSMP		Northstar		Northstar	
Battelle ID	S4331-P		S4332-P		S4335-P		S4336-P	
Collection Date	08/13/04		08/14/04		08/15/04		08/15/04	
% Moisture	87.92		89.51		91.32		88.71	
% Lipid	2.92		2.2		2.11		2.05	
Matrix	MUSSELS		MUSSELS		MUSSELS		MUSSELS	
Sample Size (g dry)	1.22		2.18		1.78		2.27	
Units	UG/KG_DRY		UG/KG_DRY		UG/KG_DRY		UG/KG_DRY	
SHC:								
n-Nonane	89.52	J	75.82	J	64.46	J	66.39	J
n-Decane	114.16	J	161.08	J	112.77	J	151.84	J
n-Undecane	20.33	J	71.68	J	33.88	J	46.82	J
n-Dodecane	255.91	J	487.51	B	304.59	J	373.7	J
n-Tridecane	266.71	J	581.7	B	377.26	J	409.55	J
Isoprenoid RRT 1380	39.71	J	40.24	J	50.58	J	35.89	J
n-Tetradecane	269.11	J	383.79	J	262.67	J	305.29	J
Isoprenoid RRT 1470	161.07	J	152.54	J	185.44	J	132.78	J
n-Pentadecane	489.65	J	723.09		532.07	J	559.6	
n-Hexadecane	1007.3	B	825.9	B	781.6	B	769.83	B
Norpristane (1650)	ND		11.11	J	21.15	J	54.77	J
n-Heptadecane	415.6	J	694.13		518.52	J	443.09	
Pristane	575.1	J	251.2	J	464.65	J	270.12	J
n-Octadecane	78.46	J	101.52	J	83.04	J	96.23	J
Phytane	112.11	J	61.79	J	91.5	J	60.98	J
n-Nonadecane	27.99	J	26.57	J	38.36	J	28.73	J
n-Eicosane	57.75	J	69.82	J	63.86	J	74.65	J
n-Heneicosane	63.51	J	37.15	J	56.53	J	54.27	J
n-Docosane	124.91	J	68.82	J	80.71	J	111.96	J
n-Tricosane	127.2	J	62.28	J	96.33	J	115.48	J
n-Tetracosane	132.6	J	57.83	J	97.38	J	139.23	J
n-Pentacosane	890.21	B	465.19	B	613.72	B	617.93	B
n-Hexacosane	84.76	J	47.27	J	68.3	J	120	J
n-Heptacosane	150.89	J	113.61	J	139.64	J	176.81	J
n-Octacosane	106.72	J	47.3	J	74.2	J	108.8	J
n-Nonacosane	215.79	J	154.25	J	230.65	J	175.79	J
n-Triacontane	111.86	J	47.98	J	54.78	J	83.39	J
n-Hentriacontane	154.54	J	133.1	J	139.03	J	164.86	J
n-Dotriacontane	102.72	J	46.35	J	30.75	J	62.13	J
n-Tritriacontane	79.2	J	54.71	J	45.84	J	62.23	J
n-Tetratriacontane	43.76	J	35.6	J	31.69	J	49.8	J
n-Pentatriacontane	ND		18.44	J	15.92	J	25.81	J
n-Hexatriacontane	ND		12.9	J	ND		12.48	J
n-Heptatriacontane	ND		ND		ND		ND	
n-Octatriacontane	ND		ND		ND		ND	
n-Nonatriacontane	ND		ND		ND		ND	
n-Tetracontane	ND		ND		ND		ND	
SHC(total)	58803.87		26103.89		11370.99		28928.59	
Surrogate Recoveries (%)								
n-Tetracosane-d50	69		70		72		61	
5a-androstane	71		70		72		60	
S/T:								
C23 diterpane (T4)	ND		0.54	J	0.47	J	0.59	J
C29 tricyclictriterpane (T9)	ND		ND		ND		ND	
C29 tricyclictriterpane (T10)	ND		ND		ND		ND	
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND		ND		ND		ND	
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND		1.11	J	ND		ND	
17a(H),21b(H)-30-norhopane (T15)	ND		3.93		1.1	J	1.77	J
18a(H)-oleanane (T18)	ND		ND		ND		ND	
17a(H),21b(H)-hopane (T19)	3.36	J	4.6		2	J	3.08	
22S-17a(H),21b(H)-30-homohopane (T21)	ND		2.36		ND		1	J
22R-17a(H),21b(H)-30-homohopane (T22)	ND		2.45		ND		1.74	J
13b,17a-diacholestane-20S (S4)	0.91	J	0.62	J	ND		0.74	J
13b,17a-diacholestane-20R (S5)	ND		ND		ND		0.45	J
5a,14a,17a,24-methylcholestane-20R (S24)	ND		0.66	J	ND		0.6	J
5a,14a,17a,24-ethylcholestane-20S (S25)	ND		0.42	J	ND		ND	
5a,14a,17a,24-ethylcholestane-20R (S28)	0.83	J	1.46	J	ND		0.83	J
S28a	2.59		2.40				2.13	
Surrogate Recoveries (%)								
5b(H)-Cholane	85		96		91		77	

Surrogate Corrected

Laboratory Batch Number	04-0445	
	04-N25-01-PHC/MET-T-	
Client ID	MU	
Location	Northstar	
Battelle ID	S4347-P	
Collection Date	08/15/04	
% Moisture	89.61	
% Lipid	2.57	
Matrix	MUSSELS	
Sample Size (g dry)	1.17	
Units	UG/KG_DRY	
PAH:		
Naphthalene	72.26	B
C1-Naphthalenes	11.72	B
C2-Naphthalenes	22.25	B
C3-Naphthalenes	17.15	
C4-Naphthalenes		ND
Biphenyl	15.15	B
Acenaphthylene		ND
Acenaphthene		ND
Fluorene	2.39	J
C1-Fluorenes		ND
C2-Fluorenes		ND
C3-Fluorenes		ND
Anthracene		ND
Phenanthrene	9.16	B
C1-Phenanthrenes/Anthracenes	8.25	
C2-Phenanthrenes/Anthracenes	19.03	
C3-Phenanthrenes/Anthracenes	10.5	
C4-Phenanthrenes/Anthracenes		ND
Dibenzothiophene	0.8	J
C1-Dibenzothiophenes		ND
C2-Dibenzothiophenes		ND
C3-Dibenzothiophenes		ND
Fluoranthene	2.07	J
Pyrene	1.87	J
C1-Fluoranthenes/Pyrenes	6.26	
C2-Fluoranthenes/Pyrenes		ND
C3-Fluoranthenes/Pyrenes		ND
Benzo(a)anthracene		ND
Chrysene	2.6	J
C1-Chrysenes		ND
C2-Chrysenes		ND
C3-Chrysenes		ND
C4-Chrysenes		ND
Benzo(b)fluoranthene		ND
Benzo(k)fluoranthene	1.31	J
Benzo(e)pyrene		ND
Benzo(a)pyrene		ND
Perylene		ND
Indeno(1,2,3-cd)pyrene		ND
Dibenz(a,h)anthracene		ND
Benzo(g,h,i)perylene	1.01	J
Total PAH (ug/kg dry)	203.78	
Surrogate Recoveries (%)		
Naphthalene-d8	54	
Acenaphthene-d10	63	
Phenanthrene-d10	65	
Benzo(a)pyrene-d12	79	

Surrogate Corrected

	04-N25-01-PHC/MET-T-	
Client ID	MU	
Location	Northstar	
Battelle ID	S4347-P	
Collection Date	08/15/04	
% Moisture	89.61	
% Lipid	2.57	
Matrix	MUSSELS	
Sample Size (g dry)	1.17	
Units	UG/KG_DRY	
SHC:		
n-Nonane	103.09	J
n-Decane	226.46	J
n-Undecane	55.66	J
n-Dodecane	650.4	J
n-Tridecane	806.01	J
Isoprenoid RRT 1380	44.85	J
n-Tetradecane	413.88	J
Isoprenoid RRT 1470	141.63	J
n-Pentadecane	411.94	J
n-Hexadecane	1228.07	B
Norpristane (1650)		ND
n-Heptadecane	272.98	J
Pristane	360.74	J
n-Octadecane	172.64	J
Phytane	386.16	J
n-Nonadecane	55.01	J
n-Eicosane	197.23	J
n-Heneicosane	374.43	J
n-Docosane	789.37	J
n-Tricosane	825.35	J
n-Tetracosane	727.02	J
n-Pentacosane	1360.59	B
n-Hexacosane	298.85	J
n-Heptacosane	309.51	J
n-Octacosane	173.67	J
n-Nonacosane	290.05	J
n-Triacontane	113.94	J
n-Hentriacontane	168.51	J
n-Dotriacontane	75.95	J
n-Tritriacontane	69.87	J
n-Tetratriacontane	34.98	J
n-Pentatriacontane	9.47	J
n-Hexatriacontane		ND
n-Heptatriacontane		ND
n-Octatriacontane		ND
n-Nonatriacontane		ND
n-Tetracontane		ND
SHC(total)	54407.63	
Surrogate Recoveries (%)		
n-Tetracosane-d50	63	
5a-androstane	62	
S/T:		
C23 diterpane (T4)	1.51	J
C29 tricyclictriterpane (T9)		ND
C29 tricyclictriterpane (T10)		ND
18a(H)-22,29,30-trisnorhopane -TS (T11)		ND
17a(H)-22,29,30-trisnorhopane -TM (T12)	1.91	J
17a(H),21b(H)-30-norhopane (T15)	5.22	
18a(H)-oleanane (T18)		ND
17a(H),21b(H)-hopane (T19)	10.13	
22S-17a(H),21b(H)-30-homohopane (T21)	2.49	J
22R-17a(H),21b(H)-30-homohopane (T22)	1.57	J
13b,17a-diacholestane-20S (S4)	2.38	J
13b,17a-diacholestane-20R (S5)	1.31	J
5a,14a,17a,24-methylcholestane-20R (S24)	1.7	J
5a,14a,17a,24-ethylcholestane-20S (S25)		ND
5a,14a,17a,24-ethylcholestane-20R (S28)		ND
S28a	13.35	
Surrogate Recoveries (%)		
5b(H)-Cholane	78	

Surrogate Corrected

Laboratory Batch Number	04-0445	
Client ID	Procedural Blank	
Battelle ID	BF394PB-P	
Location		
Collection Date	12/02/04	
% Moisture	88.62	
% Lipid	NA	
Matrix	TISSUE	
Sample Size (g dry)	1.92	
Units	UG/KG_DRY	
PAH:		
Naphthalene	46.83	N
C1-Naphthalenes	5.49	
C2-Naphthalenes	6.06	
C3-Naphthalenes		ND
C4-Naphthalenes		ND
Biphenyl	12.71	N
Acenaphthylene		ND
Acenaphthene		ND
Fluorene	1.13	J
C1-Fluorenes		ND
C2-Fluorenes		ND
C3-Fluorenes		ND
Anthracene		ND
Phenanthrene	4.57	N
C1-Phenanthrenes/Anthracenes		ND
C2-Phenanthrenes/Anthracenes		ND
C3-Phenanthrenes/Anthracenes		ND
C4-Phenanthrenes/Anthracenes		ND
Dibenzothiophene		ND
C1-Dibenzothiophenes		ND
C2-Dibenzothiophenes		ND
C3-Dibenzothiophenes		ND
Fluoranthene	0.56	J
Pyrene		ND
C1-Fluoranthenes/Pyrenes		ND
C2-Fluoranthenes/Pyrenes		ND
C3-Fluoranthenes/Pyrenes		ND
Benzo(a)anthracene		ND
Chrysene		ND
C1-Chrysenes		ND
C2-Chrysenes		ND
C3-Chrysenes		ND
C4-Chrysenes		ND
Benzo(b)fluoranthene		ND
Benzo(k)fluoranthene		ND
Benzo(e)pyrene		ND
Benzo(a)pyrene		ND
Perylene		ND
Indeno(1,2,3-cd)pyrene		ND
Dibenz(a,h)anthracene		ND
Benzo(g,h,i)perylene		ND
Surrogate Recoveries (%)		
Naphthalene-d8	41	
Acenaphthene-d10	60	
Phenanthrene-d10	69	
Benzo(a)pyrene-d12	81	

Surrogate Corrected

Client ID	Procedural Blank	
Battelle ID	BF394PB-P	
Location		
Collection Date	12/02/04	
% Moisture	88.62	
% Lipid	NA	
Matrix	TISSUE	
Sample Size (g dry)	1.92	
Units	UG/KG_DRY	
SHC:		
n-Nonane	30.21	J
n-Decane	88.51	J
n-Undecane	23.27	J
n-Dodecane	180.77	J
n-Tridecane	200.48	J
Isoprenoid RRT 1380		ND
n-Tetradecane	100.35	J
Isoprenoid RRT 1470	11.43	J
n-Pentadecane	31.82	J
n-Hexadecane	503.76	N
Norpristane (1650)		ND
n-Heptadecane	11.26	J
Pristane	14.6	J
n-Octadecane	57.94	J
Phytane		ND
n-Nonadecane	13.92	J
n-Eicosane	65.67	J
n-Heneicosane	16.98	J
n-Docosane	96.15	J
n-Tricosane	55.95	J
n-Tetracosane	122.78	J
n-Pentacosane	521.82	
n-Hexacosane	98.13	J
n-Heptacosane	31.45	J
n-Octacosane	99.16	J
n-Nonacosane	40.19	J
n-Triacontane	52.47	J
n-Hentriacontane	28.69	J
n-Dotriacontane	24.06	J
n-Tritriacontane		ND
n-Tetratriacontane		ND
n-Pentatriacontane		ND
n-Hexatriacontane		ND
n-Heptatriacontane		ND
n-Octatriacontane		ND
n-Nonatriacontane		ND
n-Tetracontane		ND
SHC(total)	69.95	J
Surrogate Recoveries (%)		
n-Tetracosane-d50	76	
5a-androstane	73	
S/T:		
C23 diterpane (T4)		ND
C29 tricyclictriterpane (T9)		ND
C29 tricyclictriterpane (T10)		ND
18a(H)-22,29,30-trisnorhopane -TS (T11)		ND
17a(H)-22,29,30-trisnorhopane -TM (T12)		ND
17a(H),21b(H)-30-norhopane (T15)		ND
18a(H)-oleanane (T18)		ND
17a(H),21b(H)-hopane (T19)		ND
22S-17a(H),21b(H)-30-homohopane (T21)		ND
22R-17a(H),21b(H)-30-homohopane (T22)		ND
13b,17a-diacholestane-20S (S4)		ND
13b,17a-diacholestane-20R (S5)		ND
5a,14a,17a,24-methylcholestane-20R (S24)		ND
5a,14a,17a,24-ethylcholestane-20S (S25)		ND
5a,14a,17a,24-ethylcholestane-20R (S28)		ND
S28a		ND
Surrogate Recoveries (%)		
5b(H)-Cholane	95	

Surrogate Corrected

Laboratory Batch Number	04-0445				
Client ID	041029-01: Clean Cod Fillet				
Battelle ID	BF395LCS-P				
Location					
Collection Date	12/02/04				
% Moisture	82.21				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	3.60				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
PAH:					
Naphthalene	416.94		354.17	118	
C1-Naphthalenes	509.17				
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	385.57		350.69	110	
Acenaphthylene	410.31		350.69	117	
Acenaphthene	385.54		350.69	110	
Fluorene	439.79		354.17	124	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	458.77		347.92	132	N
Phenanthrene	399.01		354.17	113	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	381.71		350.69	109	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	434.03		354.17	123	
Pyrene	456.42		354.17	129	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	503.75		350.69	144	N
Chrysene	444.07		350.69	127	
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	347.29		350.69	99	
Benzo(k)fluoranthene		ND			
Benzo(e)pyrene	376.64		352.08	107	
Benzo(a)pyrene	356.03		354.17	101	
Perylene	402.42		350.69	115	
Indeno(1,2,3-cd)pyrene	377.22		350.69	108	
Dibenz(a,h)anthracene	364.83		350.69	104	
Benzo(g,h,i)perylene	349.77		350.69	100	
Surrogate Recoveries (%)					
Naphthalene-d8	48				
Acenaphthene-d10	54				
Phenanthrene-d10	59				
Benzo(a)pyrene-d12	83				

Client ID	041029-01: Clean Cod Fillet				
Battelle ID	BF395LCS-P				
Location					
Collection Date	12/02/04				
% Moisture	82.21				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	3.60				
Units	UG/KG_DRY		Target	% Recovery	Qualifier
SHC:					
n-Nonane	1249.79		3506.94	36	N
n-Decane	2300.85	J	3506.94	66	N
n-Undecane	28.55	J			
n-Dodecane	2496.24		3506.94	71	
n-Tridecane	213.85	J			
Isoprenoid RRT 1380		ND			
n-Tetradecane	2855.62		3506.94	81	
Isoprenoid RRT 1470		ND			
n-Pentadecane	42.67	J			
n-Hexadecane	3192.77		3506.94	91	
Norpristane (1650)		ND			
n-Heptadecane	17.48	J			
Pristane	2775		3506.94	79	
n-Octadecane	3009.87		3506.94	86	
Phytane		ND			
n-Nonadecane	3305.57		3506.94	94	
n-Eicosane	3230.1		3506.94	92	
n-Heneicosane		ND			
n-Docosane	3280.61		3506.94	94	
n-Tricosane	104.72	J			
n-Tetracosane	3616.75		3506.94	103	
n-Pentacosane	409.4				
n-Hexacosane	3611.24		3506.94	103	
n-Heptacosane	96.78	J			
n-Octacosane	3496.81		3506.94	100	
n-Nonacosane	77.56	J			
n-Triacontane	3718.02		3506.94	106	
n-Hentriacontane	42.57	J			
n-Dotriacontane	33	J			
n-Tritriacontane	16.28	J			
n-Tetratriacontane	17.15	J			
n-Pentatriacontane		ND			
n-Hexatriacontane	3257.27		3541.67	92	
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
SHC(total)	50512.62				
Surrogate Recoveries (%)					
n-Tetracosane-d50	66				
5a-androstane	64				
S/T:					
C23 diterpane (T4)	NA				
C29 tricyclictriterpane (T9)	NA				
C29 tricyclictriterpane (T10)	NA				
18a(H)-22,29,30-trisnorhopane -TS (T11)	NA				
17a(H)-22,29,30-trisnorhopane -TM (T12)	NA				
17a(H),21b(H)-30-norhopane (T15)	NA				
18a(H)-oleanane (T18)	NA				
17a(H),21b(H)-hopane (T19)	NA				
22S-17a(H),21b(H)-30-homohopane (T21)	NA				
22R-17a(H),21b(H)-30-homohopane (T22)	NA				
13b,17a-diacholestane-20S (S4)	NA				
13b,17a-diacholestane-20R (S5)	NA				
5a,14a,17a,24-methylcholestane-20R (S24)	NA				
5a,14a,17a,24-ethylcholestane-20S (S25)	NA				
5a,14a,17a,24-ethylcholestane-20R (S28)	NA				
S28a	NA				
Surrogate Recoveries (%)					
5b(H)-Cholane					

Surrogate Corrected

Laboratory Batch Number	04-0445				
Client ID	031105-01: SRM 2978				
Battelle ID	BF396SRM-P				
Location					
Collection Date	12/02/04				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	0.50				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
PAH:					
Naphthalene	176.56				
C1-Naphthalenes	27.46				
C2-Naphthalenes	55.02				
C3-Naphthalenes	70.36				
C4-Naphthalenes	76.7				
Biphenyl	28.34				
Acenaphthylene	7.51	J			
Acenaphthene	7.83	J			
Fluorene	18.29				
C1-Fluorenes	189.83				
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	94.45				
Phenanthrene	127.3				
C1-Phenanthrenes/Anthracenes	88.91				
C2-Phenanthrenes/Anthracenes	152.11				
C3-Phenanthrenes/Anthracenes	128.88				
C4-Phenanthrenes/Anthracenes	85.84				
Dibenzothiophene	16.27				
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes	86.96				
C3-Dibenzothiophenes	134.46				
Fluoranthene	220.39		154.00 - 178.00	23.8	
Pyrene	400.61		235.01 - 276.99	44.6	N
C1-Fluoranthenes/Pyrenes	188.26				
C2-Fluoranthenes/Pyrenes	100.58				
C3-Fluoranthenes/Pyrenes	49.48				
Benzo(a)anthracene	44.56				
Chrysene	148.12				
C1-Chrysenes	74.39				
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	64.77				
Benzo(k)fluoranthene	56.85		41.70 - 52.50	8.3	
Benzo(e)pyrene	106.77		83.00 - 95.60	11.7	
Benzo(a)pyrene	5.09	J			
Perylene	3.2	J	3.77 - 4.41	15.1	
Indeno(1,2,3-cd)pyrene	14.24		9.30 - 15.10	1.0	
Dibenz(a,h)anthracene	5.62	J			
Benzo(g,h,i)perylene	24.19		15.30 - 24.10	0.4	
Surrogate Recoveries (%)					
Naphthalene-d8	56				
Acenaphthene-d10	64				
Phenanthrene-d10	69				
Benzo(a)pyrene-d12	80				

Client ID	031105-01: SRM 2978				
Battelle ID	BF396SRM-P				
Location					
Collection Date	12/02/04				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size (g dry)	0.50				
Units	UG/KG_DRY		Certified Range	% Difference	Qualifier
SHC:					
n-Nonane	179.37	J			
n-Decane	283.42	J			
n-Undecane	185.02	J			
n-Dodecane	642.84	J			
n-Tridecane	536.37	J			
Isoprenoid RRT 1380		ND			
n-Tetradecane	508	J			
Isoprenoid RRT 1470	65.89	J			
n-Pentadecane	779.89	J			
n-Hexadecane	2331.44				
Norpristane (1650)	85.89	J			
n-Heptadecane	451.88	J			
Pristane	255.6	J			
n-Octadecane	376.03	J			
Phytane	985.99	J			
n-Nonadecane	2579.39				
n-Eicosane	479.65	J			
n-Heneicosane	175.52	J			
n-Docosane	412.3	J			
n-Tricosane	472.38	J			
n-Tetracosane	591.89	J			
n-Pentacosane	2622.17				
n-Hexacosane	545.87	J			
n-Heptacosane	519.88	J			
n-Octacosane	369.83	J			
n-Nonacosane	292.06	J			
n-Triacontane	304.21	J			
n-Hentriacontane	314.69	J			
n-Dotriacontane	392.66	J			
n-Tritriacontane	292.03	J			
n-Tetratriacontane	180.57	J			
n-Pentatriacontane	95.08	J			
n-Hexatriacontane		ND			
n-Heptatriacontane		ND			
n-Octatriacontane		ND			
n-Nonatriacontane		ND			
n-Tetracontane		ND			
SHC(total)	384538.16				
Surrogate Recoveries (%)					
n-Tetracosane-d50	75				
5a-androstane	73				
S/T:					
C23 diterpane (T4)	NA				
C29 tricyclictriterpane (T9)	NA				
C29 tricyclictriterpane (T10)	NA				
18a(H)-22,29,30-trisnorhopane -TS (T11)	NA				
17a(H)-22,29,30-trisnorhopane -TM (T12)	NA				
17a(H),21b(H)-30-norhopane (T15)	NA				
18a(H)-oleanane (T18)	NA				
17a(H),21b(H)-hopane (T19)	NA				
22S-17a(H),21b(H)-30-homohopane (T21)	NA				
22R-17a(H),21b(H)-30-homohopane (T22)	NA				
13b,17a-diacholestane-20S (S4)	NA				
13b,17a-diacholestane-20R (S5)	NA				
5a,14a,17a,24-methylcholestane-20R (S24)	NA				
5a,14a,17a,24-ethylcholestane-20S (S25)	NA				
5a,14a,17a,24-ethylcholestane-20R (S28)	NA				
S28a	NA				
Surrogate Recoveries (%)					
5b(H)-Cholane					

Surrogate Corrected

Laboratory Batch Number	04-0445		04-0445			
Client ID	04-3A-01-PHC/MET-T-MU		04-3A-01-PHC/MET-T-MU			
Battelle ID	BSMP		BSMP			
Location	S4331-P		S4331DUP-P			
Collection Date	08/13/04		8/13/2004			
% Moisture	87.92		87.92			
% Lipid	2.92		NA			
Matrix	MUSSELS		MUSSELS			
Sample Size (g dry)	1.22		1.98			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	96	B	36.2	B	90.5	N
C1-Naphthalenes	9.86	B	6.68	B	38.5	n
C2-Naphthalenes	16.12	B	10.32	B	43.9	N
C3-Naphthalenes	18.77		9.11		69.3	N
C4-Naphthalenes	ND		ND		NA	
Biphenyl	13.15	B	7.69	B	52.4	N
Acenaphthylene	ND		ND		NA	
Acenaphthene	0.73	J	0.65	J	NA	
Fluorene	2.09	J	1.58	J	NA	
C1-Fluorenes	6.08		4.83		22.9	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	0.82	J	0.41	J	NA	
Phenanthrene	5.91	B	4.08	B	36.6	N
C1-Phenanthrenes/Anthracenes	6.6		5.37		20.6	
C2-Phenanthrenes/Anthracenes	12.48		9.77		24.4	
C3-Phenanthrenes/Anthracenes	7.62		6.51		15.7	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	0.65	J	0.31	J	NA	
C1-Dibenzothiophenes	ND		ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	1.68	J	1.25	J	NA	
Pyrene	1.66	J	1.22	J	NA	
C1-Fluoranthenes/Pyrenes	ND		3.36		93.4	n
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		ND		NA	
Chrysene	1.57	J	1.35	J	NA	
C1-Chrysenes	ND		ND		NA	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	0.79	J	0.48	J	NA	
Benzo(k)fluoranthene	0.77	J	0.58	J	NA	
Benzo(e)pyrene	ND		ND		NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	ND		ND		NA	
Indeno(1,2,3-cd)pyrene	ND		ND		NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	0.98	J	0.59	J	NA	
	204.33		112.34			
Surrogate Recoveries (%)						
Naphthalene-d8	58		60			
Acenaphthene-d10	68		69			
Phenanthrene-d10	70		72			
Benzo(a)pyrene-d12	85		88			

Client ID	04-3A-01-PHC/MET-T-MU		04-3A-01-PHC/MET-T-MU			
Battelle ID	BSMP		BSMP			
Location	S4331-P		S4331DUP-P			
Collection Date	08/13/04		8/13/2004			
% Moisture	87.92		87.92			
% Lipid	2.92		NA			
Matrix	MUSSELS		MUSSELS			
Sample Size (g dry)	1.22		1.98			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane	89.52	J	61.65	J	NA	
n-Decane	114.16	J	156.56	J	NA	
n-Undecane	20.33	J	53.12	J	NA	
n-Dodecane	255.91	J	384.42	J	NA	
n-Tridecane	266.71	J	420.95	J	NA	
Isoprenoid RRT 1380	39.71	J	37.92	J	NA	
n-Tetradecane	269.11	J	298.93	J	NA	
Isoprenoid RRT 1470	161.07	J	143.09	J	NA	
n-Pentadecane	489.65	J	437.66	J	NA	
n-Hexadecane	1007.3	B	723.08	B	32.9	N
Norpristane (1650)	ND		23.22	J	NA	
n-Heptadecane	415.6	J	333.34	J	NA	
Pristane	575.1	J	490.9		15.8	
n-Octadecane	78.46	J	90.15	J	NA	
Phytane	112.11	J	84.51	J	NA	
n-Nonadecane	27.99	J	25.91	J	NA	
n-Eicosane	57.75	J	73.42	J	NA	
n-Heneicosane	63.51	J	38.74	J	NA	
n-Docosane	124.91	J	78.49	J	NA	
n-Tricosane	127.2	J	70.68	J	NA	
n-Tetracosane	132.6	J	85.38	J	NA	
n-Pentacosane	890.21	B	580.63	B	42.1	n
n-Hexacosane	84.76	J	84.73	J	NA	
n-Heptacosane	150.89	J	123.22	J	NA	
n-Octacosane	106.72	J	93.48	J	NA	
n-Nonacosane	215.79	J	170.68	J	NA	
n-Triacontane	111.86	J	73.91	J	NA	
n-Hentriacontane	154.54	J	121.08	J	NA	
n-Dotriacontane	102.72	J	61.4	J	NA	
n-Tritriacontane	79.2	J	53.49	J	NA	
n-Tetratriacontane	43.76	J	37.49	J	NA	
n-Pentatriacontane	ND		24.43	J	NA	
n-Hexatriacontane	ND		11.13	J	NA	
n-Heptatriacontane	ND			ND	NA	
n-Octatriacontane	ND			ND	NA	
n-Nonatriacontane	ND			ND	NA	
n-Tetracontane	ND			ND	NA	
SHC(total)	58803.87		15491.02		116.6	n
Surrogate Recoveries (%)						
n-Tetracosane-d50	69		74			
5a-androstane	71		72			
S/T:						
C23 diterpane (T4)	ND		0.61	J	NA	
C29 tricyclictriterpane (T9)	ND			ND	NA	
C29 tricyclictriterpane (T10)	ND			ND	NA	
18a(H)-22,29,30-trisnorhopane -TS (T11)	ND			ND	NA	
17a(H)-22,29,30-trisnorhopane -TM (T12)	ND			ND	NA	
17a(H),21b(H)-30-norhopane (T15)	ND		1.64	J	NA	
18a(H)-oleanane (T18)	ND			ND	NA	
17a(H),21b(H)-hopane (T19)	3.36	J	3.24		3.6	
22S-17a(H),21b(H)-30-homohopane (T21)	ND		0.84	J	NA	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		1.03	J	NA	
13b,17a-diacholestane-20S (S4)	0.91	J	0.63	J	NA	
13b,17a-diacholestane-20R (S5)	ND		0.39	J	NA	
5a,14a,17a,24-methylcholestane-20R (S24)	ND			ND	NA	
5a,14a,17a,24-ethylcholestane-20S (S25)	ND			ND	NA	
5a,14a,17a,24-ethylcholestane-20R (S28)	0.83	J	1.11	J	NA	
S28a	2.59		2.00			
Surrogate Recoveries (%)						
5b(H)-Cholane	85		90			

Surrogate Corrected

Laboratory Batch Number	04-0445		04-0445				
	GG09: NorthSTAR Control Oil						
Client ID	- cANIMIDA		GG08: North Slope Crude				
Battelle ID	BF668CO-P		BF667NSC-P				
Location							
Collection Date	01/03/05		01/03/05				
% Moisture	NA		NA				
% Lipid	NA		NA				
Matrix	OIL		OIL				
Sample Size (g dry)	5.00		5.07				
Units	MG/KG_OIL		MG/KG_OIL		Target	% Difference	Qualifier
PAH:							
Naphthalene	989.35		758.09		714.43	6.1	
C1-Naphthalenes	1967.82		1412.89		1534.53	7.9	
C2-Naphthalenes	2414.31		1755.6		1897.27	7.5	
C3-Naphthalenes	1586.12		1242.09		1436.53	13.5	
C4-Naphthalenes	796.93		733.09		773.42	5.2	
Biphenyl	332.51		206.8		216.49	4.5	
Acenaphthylene		ND		ND			
Acenaphthene	23.34		13.96				
Fluorene	148.28		91.37		87.56	4.4	
C1-Fluorenes	278.48		220.13		219.89	0.1	
C2-Fluorenes	337.05		339.34		341.20	0.5	
C3-Fluorenes	337.55		295.97		299.61	1.2	
Anthracene		ND		ND			
Phenanthrene	319.2		275.59		272.58	1.1	
C1-Phenanthrenes/Anthracenes	641.42		569.15		564.81	0.8	
C2-Phenanthrenes/Anthracenes	650.61		630.75		660.43	4.5	
C3-Phenanthrenes/Anthracenes	482.36		461.85		448.76	2.9	
C4-Phenanthrenes/Anthracenes	231.33		192.94		176.00	9.6	
Dibenzothiophene	86.39		229.59		218.80	4.9	
C1-Dibenzothiophenes	181.08		428.73		434.54	1.3	
C2-Dibenzothiophenes	198.4		562.1		551.44	1.9	
C3-Dibenzothiophenes	144.75		514.61		460.96	11.6	
Fluoranthene	6.52		4.86				
Pyrene	21.16		17.53				
C1-Fluoranthenes/Pyrenes	111.49		92.04		78.43	17.4	
C2-Fluoranthenes/Pyrenes	159.74		160.35		132.93	20.6	
C3-Fluoranthenes/Pyrenes	165.26		171.31		151.73	12.9	
Benzo(a)anthracene		ND		ND			
Chrysene	49.47		58.1		50.99	13.9	
C1-Chrysenes	90.6		95.25		81.69	16.6	
C2-Chrysenes	115.31		126.64		95.93	32.0	N
C3-Chrysenes	100.69		100.48		89.87	11.8	
C4-Chrysenes	63.14		75		76.33	1.7	
Benzo(b)fluoranthene	4.08		5.84				
Benzo(k)fluoranthene		ND		ND			
Benzo(e)pyrene	11.84		11.26				
Benzo(a)pyrene		ND		ND			
Perylene		ND		ND			
Indeno(1,2,3-cd)pyrene		ND		ND			
Dibenz(a,h)anthracene	1.06	J	0.97	J			
Benzo(g,h,i)perylene	1.25		3.19				
	13048.89		11857.46				
Surrogate Recoveries (%)							
Naphthalene-d8	89		84				
Acenaphthene-d10	101		94				
Phenanthrene-d10	97		94				
Benzo(a)pyrene-d12	122	N	120				

Surrogate Corrected

	GG09: NorthSTAR Control Oil		GG08: North Slope Crude				
Client ID	- cANIMIDA						
Battelle ID	BF668CO-P		BF667NSC-P				
Location							
Collection Date	01/03/05		01/03/05				
% Moisture	NA		NA				
% Lipid	NA		NA				
Matrix	OIL		OIL				
Sample Size (g dry)	5.00		5.07				
Units	MG/KG_OIL		MG/KG_OIL		Target	% Difference	Qualifier
SHC:							
n-Nonane	12246.78		4552.78		4621.98	1.5	
n-Decane	12847.68		4767.93		4361.84	9.3	
n-Undecane	10791.45		4308.08		4367.26	1.4	
n-Dodecane	9169.45		4100.79		4220.03	2.8	
n-Tridecane	8872.01		3688.8		4074.35	9.5	
Isoprenoid RRT 1380	1816.7		1003.61		1013.69	1.0	
n-Tetradecane	7824.42		3660.49		3868.35	5.4	
Isoprenoid RRT 1470	2864.49		1399.54		1474.33	5.1	
n-Pentadecane	7558.16		3895.1		3867.48	0.7	
n-Hexadecane	6421.22		3326.45		3699.97	10.1	
Norpristane (1650)	2342.18		1184.21		1065.49	11.1	
n-Heptadecane	4911.93		2479.6		3042.58	18.5	
Pristane	4065.3		2338.84		2313.50	1.1	
n-Octadecane	4178.64		2304.83		2772.62	16.9	
Phytane	2678.57		1689.93		1507.37	12.1	
n-Nonadecane	4077.15		2480.38		2470.80	0.4	
n-Eicosane	3742.84		2304.17		2502.77	7.9	
n-Heneicosane	3202.51		2107.89		2189.60	3.7	
n-Docosane	2909.71		1956.31		2153.99	9.2	
n-Tricosane	2532.78		1787.62		2007.15	10.9	
n-Tetracosane	2376.28		1854.59		2059.31	9.9	
n-Pentacosane	2188.78		1696.24		1662.92	2.0	
n-Hexacosane	1704.37		1423.79		1485.96	4.2	
n-Heptacosane	1520.45		1097.88		1154.00	4.9	
n-Octacosane	1167.48		820.05		972.83	15.7	
n-Nonacosane	1090.67		768.48		859.52	10.6	
n-Triacontane	934.61		631.03		618.93	2.0	
n-Hentriacontane	840.29		513.65		588.39	12.7	
n-Dotriacontane	682.43		551.41		424.08	30.0	
n-Tritriacontane	534.11		451.79		401.62	12.5	
n-Tetratriacontane	396.46		371.98		342.44	8.6	
n-Pentatriacontane	306.28		324.44		344.76	5.9	
n-Hexatriacontane	182.46	J	189.44	J	217.69	13.0	
n-Heptatriacontane	204.1	J	267.18		187.40	42.6	N
n-Octatriacontane	193.28	J	238.87	J	196.72	21.4	
n-Nonatriacontane	105.43	J	154.03	J	135.00	14.1	
n-Tetracontane	83.27	J	151.75	J	152.10	0.2	
SHC(total)	676929.62		604779.37		671799.11	10.0	
Surrogate Recoveries (%)							
n-Tetracosane-d50	98		96				
5a-androstane	100		97				
S/T:							
C23 diterpane (T4)							
C29 tricyclictriterpane (T9)	31.15		46.06				
C29 tricyclictriterpane (T10)	16.6		13.89				
18a(H)-22,29,30-trisnorhopane -TS (T11)	16.34		14.32				
17a(H)-22,29,30-trisnorhopane -TM (T12)	7.54		16.56				
17a(H),21b(H)-30-norhopane (T15)	6.12		24.97				
18a(H)-oleanane (T18)	16.21		69.71				
17a(H),21b(H)-hopane (T19)		ND		ND			
22S-17a(H),21b(H)-30-homohopane (T21)	41.38		120.09		171.67	30.0	
22R-17a(H),21b(H)-30-homohopane (T22)	30.96		62.12				
13b,17a-diacholestane-20S (S4)	11.74		39.71				
13b,17a-diacholestane-20R (S5)	45.32		49.35				
5a,14a,17a,24-methylcholestane-20R (S24)	28.5		27.36				
5a,14a,17a,24-ethylcholestane-20S (S25)	10.81		33.57				
5a,14a,17a,24-ethylcholestane-20R (S28)	18.62		38.08				
S28a	17.4		41.8				
Surrogate Recoveries (%)							
5b(H)-Cholane	93		96				

Surrogate Corrected

2005 Deployed Mussel Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	05-0329	05-0329	05-0329	05-0329
Client ID	05-PC-01-PHC-MU	05-PC-02-PHC-T-M	05-PB1-01-PHC-T-MU	05-N03-01-PHC-T-MU
Location	Zero time	Zero time	Prudoe Bay	Prudoe Bay
Battelle ID	S8716-P	S8869-P	S9235-P	S9237-P
Collection Date	07/26/05	08/02/05	08/10/05	08/11/05
% Moisture	90	89.89	89.54	89.72
% Lipid	1.19	2	1.59	1.65
Matrix	MUSSELS	MUSSELS	MUSSELS	MUSSELS
Sample Size (g dry)	1.53	1.52	1.65	1.61
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	2.17 B	11.53	4.86 B	2.4 B
C1-Naphthalenes	1.72	8.27	4.2	1.14 J
C2-Naphthalenes	ND	6.71	8.23	ND
C3-Naphthalenes	ND	7.3	9.87	ND
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	ND	5.32	4.19	2.2
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	ND	1.7 J	1.29 J	ND
C1-Fluorenes	ND	4.97	4.25	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	1.92	8.71	7.22	4.11
C1-Phenanthrenes/Anthracenes	ND	3.39	4.77	1.94
C2-Phenanthrenes/Anthracenes	ND	ND	9.57	ND
C3-Phenanthrenes/Anthracenes	ND	ND	5.04	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	ND	1.02 J	ND	0.74 J
Pyrene	ND	0.84 J	0.73 J	0.52 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH (ug/kg dry)	5.81	59.76	64.22	13.05
Surrogate Recoveries (%)				
Naphthalene-d8	70	53	60	72
Acenaphthene-d10	66	58	63	74
Phenanthrene-d10	57	71	70	79
Benzo(a)pyrene-d12	112	91	105	113

Surrogate Corrected

Laboratory Batch Number	05-0329	05-0329	05-0329	05-0329
Client ID	05-PC-01-PHC-MU	05-PC-02-PHC-T-M	05-PB1-01-PHC-T-MU	05-N03-01-PHC-T-MU
Location	Zero time	Zero time	Prudoe Bay	Prudoe Bay
Battelle ID	S8716-P	S8869-P	S9235-P	S9237-P
Collection Date	07/26/05	08/02/05	08/10/05	08/11/05
% Moisture	90	89.89	89.54	89.72
% Lipid	1.19	2	1.59	1.65
Matrix	MUSSELS	MUSSELS	MUSSELS	MUSSELS
Sample Size (g dry)	1.53	1.52	1.65	1.61
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	173.54 J	112 J	179.63 J	74.72 J
n-Decane	ND	328.46 J	73.3 J	149.58 J
n-Undecane	ND	122.8 J	307 J	ND
n-Dodecane	ND	91.43 J	ND	ND
n-Tridecane	ND	43.24 J	ND	ND
Isoprenoid RRT 1380	44.86 J	43.89 J	43.08 J	51 J
n-Tetradecane	47.63 J	184.05 J	182.37 J	181.21 J
Isoprenoid RRT 1470	511.83	518.71	469.95	485.78
n-Pentadecane	963.55	949.31	320.56	1145.58
n-Hexadecane	74.65 J	214.79 J	173.95 J	189.1 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	85.76 J	190.99 J	182.78 J	211.42 J
Pristane	259.24 J	281.01 J	369.08	273.22 J
n-Octadecane	10.46 J	41.19 J	33.66 J	14.71 J
Phytane	20.51 J	37.8 J	32.48 J	23.21 J
n-Nonadecane	15.74 J	16.62 J	45.28 J	18.1 J
n-Eicosane	ND	ND	32.77 J	ND
n-Heneicosane	14.01 J	ND	107.62 J	20.83 J
n-Docosane	20.81 J	14.8 J	99.57 J	13.47 J
n-Tricosane	68.5 J	48.67 J	242.31 J	45.56 J
n-Tetracosane	41.93 J	29.31 J	120.59 J	42.81 J
n-Pentacosane	135.52 J	64.73 J	248.72 J	66.72 J
n-Hexacosane	96.93 J	23.46 J	98.99 J	ND
n-Heptacosane	179.33 J	113.45 J	390.41	102.38 J
n-Octacosane	130.52 J	22.86 J	81.59 J	ND
n-Nonacosane	186.49 J	81.89 J	299.1 J	83.19 J
n-Triacontane	131.13 J	33.21 J	79.24 J	ND
n-Hentriacontane	148.36 J	86.29 J	332.09	95.28 J
n-Dotriacontane	83.63 J	50.18 J	46.56 J	92.91 J
n-Tritriacontane	36.22 J	ND	172.7 J	ND
n-Tetratriacontane	ND	37.61 J	54.32 J	ND
n-Pentatriacontane	ND	ND	ND	ND
n-Hexatriacontane	ND	ND	ND	ND
n-Heptatriacontane	ND	ND	ND	ND
n-Octatriacontane	ND	ND	ND	ND
n-Nonatriacontane	ND	ND	ND	ND
n-Tetracontane	ND	ND	ND	ND
Total SHC	18113.05	ND	ND	3593.67
Surrogate Recoveries (%)				
5a-androstane	73	83	76	89
n-Tetracosane-d50	79	84	83	91
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	6.9
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	ND	ND
S28a	11.74	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	96	98	105	109

Surrogate Corrected

Laboratory Batch Number	05-0329	05-0329	05-0329	05-0329
Client ID	05-E01-01-PHC-T-MU	05-5(1)-01-PHC-T-MU	05-L08-01-PHC-T-MU	05-BP01-01-PHC-T-MU
Location	Other	BSMP	Liberty	Boulder Patch
Battelle ID	S9242-P	S9244-P	S9252-P	S9254-P
Collection Date	08/11/05	08/11/05	08/12/05	08/12/05
% Moisture	87.63	89.06	87.69	90.71
% Lipid	2.28	2.63	1.76	1.15
Matrix	MUSSELS	MUSSELS	MUSSELS	MUSSELS
Sample Size (g dry)	1.89	1.67	1.89	1.45
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	2.89 B	2.53 B	2.79 B	2.78 B
C1-Naphthalenes	3.03	2.33	1.76	3
C2-Naphthalenes	5.48	4.68	ND	4
C3-Naphthalenes	6.55	ND	ND	ND
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	2.31	1.9	2.75	1.76 J
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Fluorene	0.92 J	0.75 J	ND	ND
C1-Fluorenes	3.95	4.23	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Phenanthrene	3.75	2.94	3.18	3.03
C1-Phenanthrenes/Anthracenes	3.68	3.02	ND	3.04
C2-Phenanthrenes/Anthracenes	6.19	5.16	ND	ND
C3-Phenanthrenes/Anthracenes	3.71	2.97	ND	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	ND	ND	ND	ND
C1-Dibenzothiophenes	ND	ND	ND	ND
C2-Dibenzothiophenes	ND	ND	ND	ND
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	0.75 J	0.58 J	ND	0.54 J
Pyrene	0.89 J	0.63 J	ND	0.75 J
C1-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C2-Fluoranthenes/Pyrenes	ND	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Chrysene	0.99 J	1.25 J	ND	ND
C1-Chrysenes	ND	ND	ND	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Benzo(e)pyrene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Perylene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Total PAH (ug/kg dry)	45.09	32.97	10.48	18.90
Surrogate Recoveries (%)				
Naphthalene-d8	71	75	49	77
Acenaphthene-d10	71	74	51	77
Phenanthrene-d10	79	80	63	83
Benzo(a)pyrene-d12	84	99	94	107

Surrogate Corrected

Laboratory Batch Number	05-0329	05-0329	05-0329	05-0329
Client ID	05-E01-01-PHC-T-MU	05-5(1)-01-PHC-T-MU	05-L08-01-PHC-T-MU	05-BP01-01-PHC-T-MU
Location	Other	BSMP	Liberty	Boulder Patch
Battelle ID	S9242-P	S9244-P	S9252-P	S9254-P
Collection Date	08/11/05	08/11/05	08/12/05	08/12/05
% Moisture	87.63	89.06	87.69	90.71
% Lipid	2.28	2.63	1.76	1.15
Matrix	MUSSELS	MUSSELS	MUSSELS	MUSSELS
Sample Size (g dry)	1.89	1.67	1.89	1.45
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	77.4 J	135.42 J	142.3 J	172.17 J
n-Decane	ND	ND	ND	ND
n-Undecane	ND	ND	ND	ND
n-Dodecane	ND	ND	ND	ND
n-Tridecane	ND	ND	ND	ND
Isoprenoid RRT 1380	39.52 J	34.17 J	29.08 J	28.44 J
n-Tetradecane	181.8 J	159.86 J	93.71 J	92.2 J
Isoprenoid RRT 1470	441.84	442.71	447.42	461.04
n-Pentadecane	724.71	449.13	326.7	289.74 J
n-Hexadecane	216.22 J	188.94 J	134.99 J	168.65 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	233.17 J	156.12 J	134.26 J	127.5 J
Pristane	186.3 J	395.76	117.04 J	137.42 J
n-Octadecane	17.92 J	16.65 J	41.14 J	18.18 J
Phytane	11.51 J	23.57 J	14.37 J	9.68 J
n-Nonadecane	22.22 J	24.04 J	14.33 J	21.24 J
n-Eicosane	25.42 J	ND	ND	ND
n-Heneicosane	50.79 J	39.78 J	22.9 J	43.14 J
n-Docosane	38.15 J	31.79 J	26.99 J	30.57 J
n-Tricosane	94.84 J	89.17 J	65.98 J	73.98 J
n-Tetracosane	55.23 J	72.96 J	57.11 J	46.32 J
n-Pentacosane	126.57 J	113.71 J	91.21 J	125.04 J
n-Hexacosane	45.71 J	51.81 J	32.56 J	32.61 J
n-Heptacosane	178.08 J	180.7 J	124.35 J	125.82 J
n-Octacosane	46.66 J	98.47 J	27.85 J	30.46 J
n-Nonacosane	148.46 J	212.07 J	97.04 J	117.34 J
n-Triacontane	ND	134.34 J	ND	33.55 J
n-Hentriacontane	164.65 J	226.47 J	109.62 J	147.04 J
n-Dotriacontane	63.68 J	92.92 J	ND	53.26 J
n-Tritriacontane	ND	75.76 J	219.49 J	45.32 J
n-Tetratriacontane	38.72 J	47.66 J	ND	34.89 J
n-Pentatriacontane	ND	ND	ND	ND
n-Hexatriacontane	ND	22.45 J	ND	ND
n-Heptatriacontane	ND	ND	ND	ND
n-Octatriacontane	ND	ND	ND	ND
n-Nonatriacontane	ND	ND	ND	ND
n-Tetracontane	ND	ND	ND	ND
Total SHC	ND	ND	ND	ND
Surrogate Recoveries (%)				
5a-androstane	82	86	72	85
n-Tetracosane-d50	84	88	75	88
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	ND	ND
S28a	ND	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	103	114	92	115

Surrogate Corrected

Laboratory Batch Number	05-0329	
Client ID	05-2G-02-PHC-T-MU	
Location	BSMP	
Battelle ID	S9270-P	
Collection Date	08/17/05	
% Moisture	89.7	
% Lipid	1.62	
Matrix	MUSSELS	
Sample Size (g dry)	1.59	
Units	UG/KG_DRY	
PAH:		
Naphthalene	4.38	B
C1-Naphthalenes	3.19	
C2-Naphthalenes	ND	
C3-Naphthalenes	ND	
C4-Naphthalenes	ND	
Biphenyl	2.32	
Acenaphthylene	ND	
Acenaphthene	ND	
Fluorene	ND	
C1-Fluorenes	ND	
C2-Fluorenes	ND	
C3-Fluorenes	ND	
Anthracene	ND	
Phenanthrene	6.73	
C1-Phenanthrenes/Anthracenes	3.72	
C2-Phenanthrenes/Anthracenes	ND	
C3-Phenanthrenes/Anthracenes	ND	
C4-Phenanthrenes/Anthracenes	ND	
Dibenzothiophene	ND	
C1-Dibenzothiophenes	ND	
C2-Dibenzothiophenes	ND	
C3-Dibenzothiophenes	ND	
Fluoranthene	3.99	
Pyrene	2.82	
C1-Fluoranthenes/Pyrenes	ND	
C2-Fluoranthenes/Pyrenes	ND	
C3-Fluoranthenes/Pyrenes	ND	
Benzo(a)anthracene	ND	
Chrysene	2.9	
C1-Chrysenes	ND	
C2-Chrysenes	ND	
C3-Chrysenes	ND	
C4-Chrysenes	ND	
Benzo(b)fluoranthene	ND	
Benzo(k)fluoranthene	ND	
Benzo(e)pyrene	ND	
Benzo(a)pyrene	ND	
Perylene	ND	
Indeno(1,2,3-cd)pyrene	ND	
Dibenz(a,h)anthracene	ND	
Benzo(g,h,i)perylene	ND	
Total PAH (ug/kg dry)	30.05	
Surrogate Recoveries (%)		
Naphthalene-d8	31	N
Acenaphthene-d10	33	N
Phenanthrene-d10	45	
Benzo(a)pyrene-d12	60	

Surrogate Corrected

Laboratory Batch Number	05-0329	
Client ID	05-2G-02-PHC-T-MU	
Location	BSMP	
Battelle ID	S9270-P	
Collection Date	08/17/05	
% Moisture	89.7	
% Lipid	1.62	
Matrix	MUSSELS	
Sample Size (g dry)	1.59	
Units	UG/KG_DRY	
SHC:		
n-Nonane	123.85	J
n-Decane		ND
n-Undecane		ND
n-Dodecane		ND
n-Tridecane		ND
Isoprenoid RRT 1380	33.56	J
n-Tetradecane	104.62	J
Isoprenoid RRT 1470	442.35	
n-Pentadecane	491.35	
n-Hexadecane	203.29	J
Norpristane (1650)		ND
n-Heptadecane	321.33	J
Pristane	183.54	J
n-Octadecane	93.19	J
Phytane	31.63	J
n-Nonadecane		ND
n-Eicosane		ND
n-Heneicosane	23.31	J
n-Docosane	14.35	J
n-Tricosane	55.14	J
n-Tetracosane	32.12	J
n-Pentacosane	75.3	J
n-Hexacosane	20.48	J
n-Heptacosane	124.41	J
n-Octacosane	150	J
n-Nonacosane		ND
n-Triacontane		ND
n-Hentriacontane	110.39	J
n-Dotriacontane	68.8	J
n-Tritriacontane		ND
n-Tetratriacontane	54.29	J
n-Pentatriacontane		ND
n-Hexatriacontane		ND
n-Heptatriacontane		ND
n-Octatriacontane		ND
n-Nonatriacontane		ND
n-Tetracontane		ND
Total SHC	13531.36	
Surrogate Recoveries (%)		
5a-androstane	87	
n-Tetracosane-d50	88	
S/T:		
C23 diterpane (T4)		ND
C29 Tricyclictrierpane (T9)		ND
C29 Tricyclictriterpane (T10)		ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND
17a(H),21b(H)-30-Norhopane (T15)		ND
18a(H)-Oleanane (T18)		ND
17a(H),21b(H)-hopane (T19)		ND
22S-17a(H),21b(H)-30-homohopane (T21)		ND
22R-17a(H),21b(H)-30-homohopane (T22)		ND
13b,17a-Diacholestane-20S (S4)		ND
13b,17a-Diacholestane-20R (S5)		ND
5a,14a,17a-methylcholestane-20R (S24)		ND
5a,14a,17a-Ethylcholestane-20S (S25)		ND
5a,14a,17a-Ethylcholestane-20R (S28)		ND
S28a		ND
Surrogate Recoveries (%)		
5b(H)-Cholane	108	

Surrogate Corrected

Laboratory Batch Number	05-0329	05-0329			
Client ID	Procedural Blank	050831-01: Tilapia			
Location					
Battelle ID	BH078PB-P	BH079LCS-P			
Collection Date	09/07/05	09/07/05			
% Moisture	85.04	79.14			
% Lipid	NA	NA			
Matrix	TISSUE	TISSUE			
Sample Size (g dry)	2.20	3.28			
Units	UG/KG_DRY	UG/KG_DRY	Target	% Recovery	Qualifier
PAH:					
Naphthalene	1.03 J	356.03	381.33	93	
C1-Naphthalenes	ND	ND			
C2-Naphthalenes	ND	ND			
C3-Naphthalenes	ND	ND			
C4-Naphthalenes	ND	ND			
Biphenyl	ND	411.6	381.17	108	
Acenaphthylene	ND	430.06	381.35	113	
Acenaphthene	ND	377.23	381.38	99	
Fluorene	ND	517.61	381.36	136	N
C1-Fluorenes	ND	ND			
C2-Fluorenes	ND	ND			
C3-Fluorenes	ND	ND			
Anthracene	ND	357.61	381.35	94	
Phenanthrene	ND	346.14	381.35	91	
C1-Phenanthrenes/Anthracenes	ND	ND			
C2-Phenanthrenes/Anthracenes	ND	ND			
C3-Phenanthrenes/Anthracenes	ND	ND			
C4-Phenanthrenes/Anthracenes	ND	ND			
Dibenzothiophene	ND	320.04	381.48	84	
C1-Dibenzothiophenes	ND	ND			
C2-Dibenzothiophenes	ND	ND			
C3-Dibenzothiophenes	ND	ND			
Fluoranthene	ND	378.36	381.29	99	
Pyrene	ND	355.64	381.29	93	
C1-Fluoranthenes/Pyrenes	ND	ND			
C2-Fluoranthenes/Pyrenes	ND	ND			
C3-Fluoranthenes/Pyrenes	ND	ND			
Benzo(a)anthracene	ND	378.28	381.33	99	
Chrysene	ND	370.93	381.38	97	
C1-Chrysenes	ND	ND			
C2-Chrysenes	ND	1.8			
C3-Chrysenes	ND	ND			
C4-Chrysenes	ND	ND			
Benzo(b)fluoranthene	ND	250.1	381.38	66	N
Benzo(k)fluoranthene	ND	312.64	381.35	82	
Benzo(e)pyrene	ND	366.47	381.78	96	
Benzo(a)pyrene	ND	359.14	381.35	94	
Perylene	ND	431.74	381.17	113	
Indeno(1,2,3-cd)pyrene	ND	417.74	381.33	110	
Dibenz(a,h)anthracene	ND	448.43	381.31	118	
Benzo(g,h,i)perylene	ND	390.96	381.36	103	
Surrogate Recoveries (%)					
Naphthalene-d8	58	41			
Acenaphthene-d10	61	45			
Phenanthrene-d10	79	65			
Benzo(a)pyrene-d12	83	63			

Surrogate Corrected

Laboratory Batch Number	05-0329	05-0329			
Client ID	Procedural Blank	050831-01: Tilapia			
Location					
Battelle ID	BH078PB-P	BH079LCS-P			
Collection Date	09/07/05	09/07/05			
% Moisture	85.04	79.14			
% Lipid	NA	NA			
Matrix	TISSUE	TISSUE			
Sample Size (g dry)	2.20	3.28			
Units	UG/KG_DRY	UG/KG_DRY	Target	% Recovery	Qualifier
SHC:					
n-Nonane	ND	2403.21	3810.98	63	N
n-Decane	ND	2844.89	3810.98	75	
n-Undecane	ND	ND			
n-Dodecane	ND	3284.59	3810.98	86	
n-Tridecane	ND	ND			
Isoprenoid RRT 1380	ND	ND			
n-Tetradecane	ND	3398.27	3810.98	89	
Isoprenoid RRT 1470	ND	286.86			
n-Pentadecane	ND	184.18			
n-Hexadecane	ND	3617.22	3810.98	95	
Norpristane (1650)	ND	ND			
n-Heptadecane	ND	ND			
Pristane	ND	3633.32	3811.74	95	
n-Octadecane	ND	3651.19	3810.98	96	
Phytane	ND	3534.62	3813.64	93	
n-Nonadecane	ND	3467.24	3810.98	91	
n-Eicosane	ND	3681.78	3810.98	97	
n-Heneicosane	ND	ND			
n-Docosane	ND	3675.28	3810.98	96	
n-Tricosane	ND	ND			
n-Tetracosane	ND	3713.95	3810.98	97	
n-Pentacosane	ND	181.93			
n-Hexacosane	ND	3777.02	3810.98	99	
n-Heptacosane	ND	152.88			
n-Octacosane	ND	3764.09	3810.98	99	
n-Nonacosane	ND	181.13			
n-Triacontane	ND	3576.1	3810.98	94	
n-Hentriacontane	ND	ND			
n-Dotriacontane	ND	ND			
n-Tritriacontane	ND	ND			
n-Tetratriacontane	ND	ND			
n-Pentatriacontane	ND	ND			
n-Hexatriacontane	ND	3366.95	3810.98	88	
n-Heptatriacontane	ND	ND			
n-Octatriacontane	ND	ND			
n-Nonatriacontane	ND	ND			
n-Tetracontane	ND	ND			
Total SHC	ND	64918.57			
Surrogate Recoveries (%)					
5a-androstane	83	78			
n-Tetracosane-d50	89	80			
S/T:					
C23 diterpane (T4)	ND	ND			
C29 Tricyclictrierpane (T9)	ND	ND			
C29 Tricyclictriterpane (T10)	ND	ND			
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND			
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND			
17a(H),21b(H)-30-Norhopane (T15)	ND	ND			
18a(H)-Oleanane (T18)	ND	ND			
17a(H),21b(H)-hopane (T19)	ND	ND			
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND			
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND			
13b,17a-Diacholestane-20S (S4)	ND	ND			
13b,17a-Diacholestane-20R (S5)	ND	ND			
5a,14a,17a-methylcholestane-20R (S24)	ND	ND			
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND			
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND			
S28a	ND	ND			
Surrogate Recoveries (%)					
5b(H)-Cholane	101	92			

Surrogate Corrected

Laboratory Batch Number	05-0329						
Client ID	050329-01: SRM 2977						
Location							
Battelle ID	BH080SRM-P						
Collection Date	09/07/05						
% Moisture	NA						
% Lipid	NA						
Matrix	TISSUE						
Sample Size (g dry)	2.03		Certified		Passing	Actual	
Units	UG/KG_DRY		Value	+/-	%Difference	%Difference	Qualifier
PAH:							
Naphthalene	7.04						
C1-Naphthalenes	7.04						
C2-Naphthalenes	73.02						
C3-Naphthalenes	188.4						
C4-Naphthalenes	195.5						
Biphenyl	3.06						
Acenaphthylene		ND					
Acenaphthene	2.18						
Fluorene	7.17		10.24	0.43	34.2	30	
C1-Fluorenes	37.28						
C2-Fluorenes	129.9						
C3-Fluorenes	219.34						
Anthracene		ND					
Phenanthrene	30.13		35.1	3.80	40.83	14.2	
C1-Phenanthrenes/Anthracenes	115.33						
C2-Phenanthrenes/Anthracenes	301.55						
C3-Phenanthrenes/Anthracenes							
C4-Phenanthrenes/Anthracenes	192.47						
Dibenzothiophene	21.04						
C1-Dibenzothiophenes	338.22						
C2-Dibenzothiophenes	497.91						
C3-Dibenzothiophenes	613.96						
Fluoranthene	23.63		38.7	1.00	32.58	38.9	N
Pyrene	49.62		78.9	3.50	34.44	37.1	N
C1-Fluoranthenes/Pyrenes	66.91						
C2-Fluoranthenes/Pyrenes	83.67						
C3-Fluoranthenes/Pyrenes	76.63						
Benzo(a)anthracene	22.92		20.34	0.78	33.83	12.7	
Chrysene	87.99						
C1-Chrysenes	87.92						
C2-Chrysenes	112.07						
C3-Chrysenes	58.61						
C4-Chrysenes		ND					
Benzo(b)fluoranthene	7.92		11.01	0.28	32.54	28.1	
Benzo(k)fluoranthene	7.92						
Benzo(e)pyrene	11.78		13.1	1.10	38.4	10.1	
Benzo(a)pyrene	4.29						
Perylene	1.84		3.5	0.76	51.71	47.4	
Indeno(1,2,3-cd)pyrene	2.44		4.84	0.81	46.74	49.6	N
Dibenz(a,h)anthracene	1.11	J	1.41	0.19	43.48	21.3	
Benzo(g,h,i)perylene	6.28		9.53	0.43	34.51	34.1	
Surrogate Recoveries (%)							
Naphthalene-d8	77						
Acenaphthene-d10	75						
Phenanthrene-d10	70						
Benzo(a)pyrene-d12	109						

Surrogate Corrected

Laboratory Batch Number	05-0329					
Client ID	050329-01: SRM 2977					
Location						
Battelle ID	BH080SRM-P					
Collection Date	09/07/05					
% Moisture	NA					
% Lipid	NA					
Matrix	TISSUE					
Sample Size (g dry)	2.03	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
SHC:						
n-Nonane						
n-Decane						
n-Undecane						
n-Dodecane						
n-Tridecane						
Isoprenoid RRT 1380						
n-Tetradecane						
Isoprenoid RRT 1470						
n-Pentadecane						
n-Hexadecane						
Norpristane (1650)						
n-Heptadecane						
Pristane						
n-Octadecane						
Phytane						
n-Nonadecane						
n-Eicosane						
n-Heneicosane						
n-Docosane						
n-Tricosane						
n-Tetracosane						
n-Pentacosane						
n-Hexacosane						
n-Heptacosane						
n-Octacosane						
n-Nonacosane						
n-Triacontane						
n-Hentriacontane						
n-Dotriacontane						
n-Tritriacontane						
n-Tetratriacontane						
n-Pentatriacontane						
n-Hexatriacontane						
n-Heptatriacontane						
n-Octatriacontane						
n-Nonatriacontane						
n-Tetracontane						
Total SHC						
Surrogate Recoveries (%)						
5a-androstane						
n-Tetracosane-d50						
S/T:						
C23 diterpane (T4)	52.2					
C29 Tricyclictrierpane (T9)	4.4					J
C29 Tricyclictriterpane (T10)	5.62					
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	20.08					
17a(H)-22,29,30-Trisnorhopane -TM (T12)	18.91					
17a(H),21b(H)-30-Norhopane (T15)	61.62					
18a(H)-Oleanane (T18)	ND					
17a(H),21b(H)-hopane (T19)	71.63					
22S-17a(H),21b(H)-30-homohopane (T21)	30.97					
22R-17a(H),21b(H)-30-homohopane (T22)	21.35					
13b,17a-Diacholestane-20S (S4)	7.44					
13b,17a-Diacholestane-20R (S5)	6.92					
5a,14a,17a-methylcholestane-20R (S24)	24.44					
5a,14a,17a-Ethylcholestane-20S (S25)	8.44					
5a,14a,17a-Ethylcholestane-20R (S28)	34.56					
S28a	ND					
Surrogate Recoveries (%)						
5b(H)-Cholane	107					

Surrogate Corrected

Laboratory Batch Number	05-0329					05-0329	
Client ID	GJ53: North Slope Crude					GG09: NorthSTAR Control Oil - cANIMIDA	
Location							
Battelle ID	BH108NSC (PAH) BH106NSC (SHC) BH107NSC (S/T)					BH113CO (PAH) BH111CO (SHC) BH112CO (S/T)	
Collection Date	9/12/2005					9/12/2005	
% Moisture	NA					NA	
% Lipid	NA					NA	
Matrix	OIL					OIL	
Sample Size (g dry)	5.014					5	
Units	UG/KG_OIL		Target	% Difference	Qualifier	UG/KG_OIL	
PAH:							
Naphthalene	851.29		714.43	19.2		1223.82	
C1-Naphthalenes	1844.06		1534.53	20.2		2577.17	
C2-Naphthalenes	2375.67		1897.27	25.2		3169.28	
C3-Naphthalenes	1856.02		1436.53	29.2		2185.27	
C4-Naphthalenes	1049.49		773.42	35.7	N	1072.36	
Biphenyl	275.58		216.49	27.3		402.04	
Acenaphthylene		ND					ND
Acenaphthene		ND					ND
Fluorene	89.54		87.56	2.3		141.58	
C1-Fluorenes	263.02		219.89	19.6		301.52	
C2-Fluorenes	421.34		341.20	23.5		387.87	
C3-Fluorenes	402.49		299.61	34.3	N	338.6	
Anthracene		ND					ND
Phenanthrene	277.32		272.58	1.7		301.37	
C1-Phenanthrenes/Anthracenes	682.32		564.81	20.8		734.91	
C2-Phenanthrenes/Anthracenes	780.08		660.43	18.1		765.83	
C3-Phenanthrenes/Anthracenes	679.11		448.76	51.3	N	577.68	
C4-Phenanthrenes/Anthracenes	228.38		176.00	29.8		212.8	
Dibenzothiophene	237.65		218.80	8.6		83.58	
C1-Dibenzothiophenes	550.77		434.54	26.7		211.87	
C2-Dibenzothiophenes	778.26		551.44	41.1	N	259.87	
C3-Dibenzothiophenes	679.39		460.96	47.4	N	170.66	
Fluoranthene	4.63					4.82	
Pyrene	15.38					16.6	
C1-Fluoranthenes/Pyrenes	94.02		78.43	19.9		96.44	
C2-Fluoranthenes/Pyrenes	165.95		132.93	24.8		144.96	
C3-Fluoranthenes/Pyrenes	170.84		151.73	12.6		143.92	
Benzo(a)anthracene		ND					ND
Chrysene	63.31		50.99	24.2		55.71	
C1-Chrysenes	101.09		81.69	23.7		102.8	
C2-Chrysenes	132.1		95.93	37.7	N	135.29	
C3-Chrysenes	101.33		89.87	12.7		110.27	
C4-Chrysenes	81		76.33	6.1		67.73	
Benzo(b)fluoranthene	4.39					3.67	
Benzo(k)fluoranthene		ND					ND
Benzo(e)pyrene	11.38					11.05	
Benzo(a)pyrene		ND					ND
Perylene		ND					ND
Indeno(1,2,3-cd)pyrene		ND					ND
Dibenz(a,h)anthracene		ND					ND
Benzo(g,h,i)perylene	3.65						ND
Surrogate Recoveries (%)							
Naphthalene-d8	107					117	
Acenaphthene-d10	93					96	
Phenanthrene-d10	84					81	
Benzo(a)pyrene-d12	122	N				121	N

Surrogate Corrected

Laboratory Batch Number	05-0329					05-0329	
Client ID	GJ53: North Slope Crude					GG09: NorthSTAR Control Oil - cANIMIDA	
Location							
Battelle ID	BH108NSC (PAH) BH106NSC (SHC) BH107NSC (S/T)					BH113CO (PAH) BH111CO (SHC) BH112CO (S/T)	
Collection Date	9/12/2005					9/12/2005	
% Moisture	NA					NA	
% Lipid	NA					NA	
Matrix	OIL					OIL	
Sample Size (g dry)	5.014					5	
Units	UG/KG_OIL		Target	% Difference	Qualifier	UG/KG_OIL	
SHC:							
n-Nonane	4582.13		4621.98	0.9		12634.45	
n-Decane	4446.5		4361.84	1.9		11430.19	
n-Undecane	4274.62		4367.26	2.1		10331.69	
n-Dodecane	4333.95		4220.03	2.7		9726.29	
n-Tridecane	4182.06		4074.35	2.6		8830.81	
Isoprenoid RRT 1380	990.25		1013.69	2.3		1887.22	
n-Tetradecane	4076.82		3868.35	5.4		8200.95	
Isoprenoid RRT 1470	1518.37		1474.33	3.0		3156.97	
n-Pentadecane	4088.11		3867.48	5.7		8093.48	
n-Hexadecane	3895.15		3699.97	5.3		7301.35	
Norpristane (1650)	1115.85		1065.49	4.7		2268.97	
n-Heptadecane	3371.63		3042.58	10.8		6099.66	
Pristane	2381.26		2313.50	2.9		4015.2	
n-Octadecane	3040.35		2772.62	9.7		5119.55	
Phytane	1436.85		1507.37	4.7		2171.1	
n-Nonadecane	2594.4		2470.80	5.0		4337.52	
n-Eicosane	2689.04		2502.77	7.4		4096.15	
n-Heneicosane	2468.6		2189.60	12.7		3568.97	
n-Docosane	2336.65		2153.99	8.5		3157.25	
n-Tricosane	2176.65		2007.15	8.4		2910.75	
n-Tetracosane	2029.61		2059.31	1.4		2449.76	
n-Pentacosane	1788.28		1662.92	7.5		2292.7	
n-Hexacosane	1651.84		1485.96	11.2		1882.74	
n-Heptacosane	1363.68		1154.00	18.2		1735.76	
n-Octacosane	1076.98		972.83	10.7		1415.55	
n-Nonacosane	827.13		859.52	3.8		1162.37	
n-Triacontane	676.81		618.93	9.4		1004.59	
n-Hentriacontane	588.06		588.39	0.1		916.81	
n-Dotriacontane	468.04		424.08	10.4		639.46	
n-Tritriacontane	327.7		401.62	18.4		525.62	
n-Tetratriacontane	285.19	J	342.44	16.7		352.53	
n-Pentatriacontane	332.68		344.76	3.5		321.25	
n-Hexatriacontane	225.45	J	217.69	3.6		188.2	J
n-Heptatriacontane	160.34	J	187.40	14.4		157.51	J
n-Octatriacontane	173.73	J	196.72	11.7		156.49	J
n-Nonatriacontane	143.55	J	135.00	6.3		107.31	J
n-Tetracontane	132.19	J	152.10	13.1		69.49	J
Total SHC	577388.08		671799.11	14.1		582442.82	
Surrogate Recoveries (%)							
5a-androstane	100					100	
n-Tetracosane-d50	102					103	
S/T:							
C23 diterpane (T4)	52.3					37.72	
C29 Tricyclictrierpane (T9)	13.94					13.38	
C29 Tricyclictriterpane (T10)	12.3					14.58	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	15.65					10.1	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	19.34					7.68	
17a(H),21b(H)-30-Norhopane (T15)	59.47					15.81	
18a(H)-Oleanane (T18)		ND					ND
17a(H),21b(H)-hopane (T19)	92.07		171.67	46.4	N	25.81	
22S-17a(H),21b(H)-30-homohopane (T21)	43.08					16.41	
22R-17a(H),21b(H)-30-homohopane (T22)	32.32					13.88	
13b,17a-Diacholestane-20S (S4)	37.96					36.22	
13b,17a-Diacholestane-20R (S5)	19.92					23.84	
5a,14a,17a-methylcholestane-20R (S24)	26.63					10.65	
5a,14a,17a-Ethylcholestane-20S (S25)	28.65					12.82	
5a,14a,17a-Ethylcholestane-20R (S28)	26.09					10.51	
S28a		ND					ND
Surrogate Recoveries (%)							
5b(H)-Cholane	143	N				144	N

Surrogate Corrected

Laboratory Batch Number	05-0329		05-0329			
Client ID	05-PC-01-PHC-MU		05-PC-01-PHC-MU			
Location	Zero Time		Zero Time			
Battelle ID	S8716-P		S8716DUP-P			
Collection Date	07/26/05		7/26/2005			
% Moisture	90		89.44			
% Lipid	1.19		1.23			
Matrix	MUSSELS		MUSSELS			
Sample Size (g dry)	1.53		1.64			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	2.17	B	1.71	B	23.7	
C1-Naphthalenes	1.72		1.01	J	52.0	n
C2-Naphthalenes	ND		ND		NA	
C3-Naphthalenes	ND		ND		NA	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	ND		ND		NA	
Acenaphthylene	ND		ND		NA	
Acenaphthene	ND		ND		NA	
Fluorene	ND		ND		NA	
C1-Fluorenes	ND		ND		NA	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		ND		NA	
Phenanthrene	1.92		2.18		12.7	
C1-Phenanthrenes/Anthracenes	ND		ND		NA	
C2-Phenanthrenes/Anthracenes	ND		ND		NA	
C3-Phenanthrenes/Anthracenes	ND		ND		NA	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	ND		ND		NA	
C1-Dibenzothiophenes	ND		ND		NA	
C2-Dibenzothiophenes	ND		ND		NA	
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	ND		ND		NA	
Pyrene	ND		ND		NA	
C1-Fluoranthenes/Pyrenes	ND		ND		NA	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	ND		ND		NA	
Chrysene	ND		ND		NA	
C1-Chrysenes	ND		ND		NA	
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	ND		ND		NA	
Benzo(k)fluoranthene	ND		ND		NA	
Benzo(e)pyrene	ND		ND		NA	
Benzo(a)pyrene	ND		ND		NA	
Perylene	ND		ND		NA	
Indeno(1,2,3-cd)pyrene	ND		ND		NA	
Dibenz(a,h)anthracene	ND		ND		NA	
Benzo(g,h,i)perylene	ND		ND		NA	
Surrogate Recoveries (%)						
Naphthalene-d8	70		83			
Acenaphthene-d10	66		82			
Phenanthrene-d10	57		78			
Benzo(a)pyrene-d12	112		140	N		

Surrogate Corrected

Laboratory Batch Number	05-0329		05-0329			
Client ID	05-PC-01-PHC-MU		05-PC-01-PHC-MU			
Location	Zero Time		Zero Time			
Battelle ID	S8716-P		S8716DUP-P			
Collection Date	07/26/05		7/26/2005			
% Moisture	90		89.44			
% Lipid	1.19		1.23			
Matrix	MUSSELS		MUSSELS			
Sample Size (g dry)	1.53		1.64			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane	173.54	J	114.56	J	NA	
n-Decane	ND		ND		NA	
n-Undecane	ND		ND		NA	
n-Dodecane	ND		ND		NA	
n-Tridecane	ND		ND		NA	
Isoprenoid RRT 1380	44.86	J	35.2	J	NA	
n-Tetradecane	47.63	J	40.35	J	NA	
Isoprenoid RRT 1470	511.83		414.28		21.1	
n-Pentadecane	963.55		908		5.9	
n-Hexadecane	74.65	J	65.83	J	NA	
Norpristane (1650)	ND		ND		NA	
n-Heptadecane	85.76	J	70.13	J	NA	
Pristane	259.24	J	236.66	J	NA	
n-Octadecane	10.46	J	5.84	J	NA	
Phytane	20.51	J	13.38	J	NA	
n-Nonadecane	15.74	J	12.16	J	NA	
n-Eicosane	ND		ND		NA	
n-Heneicosane	14.01	J	19.92	J	NA	
n-Docosane	20.81	J	16.81	J	NA	
n-Tricosane	68.5	J	60.5	J	NA	
n-Tetracosane	41.93	J	30.11	J	NA	
n-Pentacosane	135.52	J	96.91	J	NA	
n-Hexacosane	96.93	J	60.5	J	NA	
n-Heptacosane	179.33	J	135.54	J	NA	
n-Octacosane	130.52	J	86.87	J	NA	
n-Nonacosane	186.49	J	138.98	J	NA	
n-Triacontane	131.13	J	94.28	J	NA	
n-Hentriacontane	148.36	J	124.78	J	NA	
n-Dotriacontane	83.63	J	67.72	J	NA	
n-Tritriacontane	36.22	J	35.63	J	NA	
n-Tetratriacontane	ND		ND		NA	
n-Pentatriacontane	ND		ND		NA	
n-Hexatriacontane	ND		ND		NA	
n-Heptatriacontane	ND		ND		NA	
n-Octatriacontane	ND		ND		NA	
n-Nonatriacontane	ND		ND		NA	
n-Tetracontane	ND		ND		NA	
Total SHC	18113.05		4905.94		114.7	n
Surrogate Recoveries (%)						
5a-androstane	73		98			
n-Tetracosane-d50	79		99			
S/T:						
C23 diterpane (T4)	ND		ND		NA	
C29 Tricyclictrierpane (T9)	ND		ND		NA	
C29 Tricyclictriterpane (T10)	ND		ND		NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND		ND		NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND		ND		NA	
17a(H),21b(H)-30-Norhopane (T15)	ND		ND		NA	
18a(H)-Oleanane (T18)	ND		ND		NA	
17a(H),21b(H)-hopane (T19)	ND		ND		NA	
22S-17a(H),21b(H)-30-homohopane (T21)	ND		ND		NA	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		ND		NA	
13b,17a-Diacholestane-20S (S4)	ND		ND		NA	
13b,17a-Diacholestane-20R (S5)	ND		ND		NA	
5a,14a,17a-methylcholestane-20R (S24)	ND		ND		NA	
5a,14a,17a-Ethylcholestane-20S (S25)	ND		ND		NA	
5a,14a,17a-Ethylcholestane-20R (S28)	ND		ND		NA	
S28a	11.74		7.66		42.1	N
Surrogate Recoveries (%)						
5b(H)-Cholane	96		108			

Surrogate Corrected

2006 Deployed Mussel Tissue Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch ID	06-0326	06-0326	06-0326
Client ID	06-PC-01-PHC-MU Port Chatham/Time	06-PC-02-PHC-MU Port Chatham/Time	06-PC-03-PHC-MU Port Chatham/Time
Location	Zero	Zero	Zero
Battelle ID	R2641-P	R2386-P	R2387-P
Collection Date	07/24/06	07/26/06	07/26/06
% Moisture	89.57	89.05	89.05
% Lipid	0.94	1.92	1.79
Matrix	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	2.10	0.99	0.85
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:			
Naphthalene	4.7 B	13.45 B	14.84 B
C1-Naphthalenes	2.16 B	6.07 B	6.54 B
C2-Naphthalenes	5.86	12.91	13.31
C3-Naphthalenes	7.94	10.4	9.06
C4-Naphthalenes	ND	ND	ND
Biphenyl	2.1	4.33	3.01
Acenaphthylene	ND	ND	ND
Acenaphthene	ND	ND	0.99 J
Fluorene	1.29	2.18	2.38
C1-Fluorenes	ND	ND	ND
C2-Fluorenes	ND	ND	ND
C3-Fluorenes	ND	ND	ND
Anthracene	ND	1.44	1.18 J
Phenanthrene	5.53 B	18.56	17.9
C1-Phenanthrenes/Anthracenes	10.5 B	19.32	16.17 B
C2-Phenanthrenes/Anthracenes	14.52 B	26.5	18.82 B
C3-Phenanthrenes/Anthracenes	6.76	11.73	6.85
C4-Phenanthrenes/Anthracenes	ND	ND	ND
Dibenzothiophene	1.41 B	4.93 B	5.68
C1-Dibenzothiophenes	4.15	6.67	6.88
C2-Dibenzothiophenes	7.36	14.86	10.93
C3-Dibenzothiophenes	ND	ND	ND
Fluoranthene	5.03 B	10.81	8.09 B
Pyrene	6.79 B	18.31 B	15.43 B
C1-Fluoranthenes/Pyrenes	3.62 B	5.35 B	4.1 B
C2-Fluoranthenes/Pyrenes	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND
Benzo(a)anthracene	1.59 B	2.08 B	1.44 J
Chrysene	2.43 B	3.16 B	2.43 B
C1-Chrysenes	ND	ND	ND
C2-Chrysenes	ND	ND	ND
C3-Chrysenes	ND	ND	ND
C4-Chrysenes	ND	ND	ND
Benzo(b)fluoranthene	2.94 B	1.63 B	1.31 J
Benzo(k)fluoranthene	4.81 B	2.36 J	1.46 J
Benzo(e)pyrene	1.72 B	ND	ND
Benzo(a)pyrene	2.86 B	1.88 B	ND
Perylene	4.65	2.12 B	ND
Indeno(1,2,3-cd)pyrene	3.66 B	1.04 J	1.01 J
Dibenz(a,h)anthracene	0.45 J	0.39 J	0.56 J
Benzo(g,h,i)perylene	1.45 B	1.38 B	1.35 J
Total PAH	116.28	203.86	171.72
Surrogate Recoveries (%)			
Naphthalene-d8	81	73	72
Acenaphthene-d10	81	76	77
Benzo(a)pyrene-d12	85	91	90

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326
Client ID	06-PC-01-PHC-MU	06-PC-02-PHC-MU	06-PC-03-PHC-MU
	Port Chatham/Time	Port Chatham/Time	Port Chatham/Time
Location	Zero	Zero	Zero
Battelle ID	R2641-P	R2386-P	R2387-P
Collection Date	07/24/06	07/26/06	07/26/06
% Moisture	89.57	89.05	89.05
% Lipid	0.94	1.92	1.79
Matrix	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	2.10	0.99	0.85
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:			
n-Nonane	65.69 J	100.85 J	102.38 J
n-Decane	185.97 J	320.62 B	380.95 B
n-Undecane	116.93 J	232.17 J	277.09 J
n-Dodecane	77.33 J	66.98 J	64.75 J
n-Tridecane	62.81 J	70.79 J	53.03 J
Isoprenoid RRT 1380	32.51 J	49.07 J	44.03 J
n-Tetradecane	147.11 J	96.32 J	84.78 J
Isoprenoid RRT 1470	123.31 J	189.82 J	162.34 J
n-Pentadecane	635.84	1007.05	717.74
n-Hexadecane	156.64 J	191.3 J	139.89 J
Norpristane (1650)	ND	12.42 J	ND
n-Heptadecane	229.37 J	564.97	338.97 J
Pristane	516.4	639.35	726.14
n-Octadecane	31.55 J	63.85 J	76.19 J
Phytane	11.79 J	21.9 J	24.85 J
n-Nonadecane	15.74 J	33.5 J	33.11 J
n-Eicosane	40.03 J	65.16 J	80.16 J
n-Heneicosane	61.93 J	80.35 J	86.65 J
n-Docosane	158.98 J	182.36 J	203.08 J
n-Tricosane	415.85	405.66	490.04
n-Tetracosane	897.38	726.7	929.39
n-Pentacosane	1387.05	1145.73	1477.31
n-Hexacosane	1826.65	1505.12	2011.16
n-Heptacosane	1982.04	1674.02	2208.09
n-Octacosane	1948.9	1671.33	2274.5
n-Nonacosane	1879.61	1533.47	2185.18
n-Triacontane	1867.72	1564.97	2146.87
n-Hentriacontane	1658.56	1352.83	1856.29
n-Dotriacontane	1543.57	1298.84	1770.28
n-Tritriacontane	1243.65	1002.15	1411.81
n-Tetratriacontane	965.14	850.92	1127.3
n-Pentatriacontane	743.4	621.31	852.3
n-Hexatriacontane	568.61	547.31	708.36
n-Heptatriacontane	377.65	340.01	461.95
n-Octatriacontane	191.93 J	199.65 J	271.35 J
n-Nonatriacontane	165.23 J	235.85 J	312.89 J
n-Tetracontane	95.48 J	122.39 J	170.56 J
Total SHC	43109.5	61086.88	72149.76
Surrogate Recoveries (%)			
5a-androstane	81	85	77
n-Tetracosane-d50	82	89	78
S/T:			
C23 diterpane (T4)	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND
17a(H),21b(H)-hopane (T19)	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	ND	ND	ND
S28a	ND	ND	ND
Surrogate Recoveries (%)			
5b(H)-Cholane	78	82	73

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-SDI01-01-PHC-MU	06-L08-01-PHC-MU	06-E01-01-PHC-MU	06-BP01-01-PHC-MU
Location	Other	Liberty	Other	Boulder Patch
Battelle ID	R2391-P	R2393-P	R2396-P	R2400-P
Collection Date	08/09/06	08/09/06	08/09/06	08/09/06
% Moisture	89.4	89.9	91.55	92.06
% Lipid	1.03	1.03	0.84	0.77
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	2.13	2.03	1.70	1.66
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	5.81 B	5.27 B	5.76 B	5.86 B
C1-Naphthalenes	5.07 B	4.75 B	5.03 B	3.88 B
C2-Naphthalenes	10.29	8.24	10.29	9.83
C3-Naphthalenes	9.15	8.89	9.64	8.3
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	2.12	1.65	2.5	1.62
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	0.55 J	1.38	1.09 J	1.05 J
Fluorene	1.32	1.27 J	1.84	1.37 J
C1-Fluorenes	3.06	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	0.48 J	0.6 J	0.73 J	0.58 J
Phenanthrene	9.33 B	8.59 B	9 B	12.69 B
C1-Phenanthrenes/Anthracenes	11.07 B	10.19 B	12.03 B	11.14 B
C2-Phenanthrenes/Anthracenes	12.31 B	10.08 B	14.44 B	12.49 B
C3-Phenanthrenes/Anthracenes	5.71	5.57	8.09	5.75
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	2.31 B	2.08 B	2.33 B	2.21 B
C1-Dibenzothiophenes	3.65	3.06	3.92	4.06
C2-Dibenzothiophenes	7.26	6.9	7.81	8.25
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	3.22 B	4.54 B	3.81 B	9.45 B
Pyrene	6.53 B	8.07 B	6.83 B	12.06 B
C1-Fluoranthenes/Pyrenes	3.92 B	4 B	4.43 B	5.41 B
C2-Fluoranthenes/Pyrenes	ND	3.08	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	0.6 J	1.67 B	0.59 J	2.17 B
Chrysene	2.06 B	3.55 B	2.14 B	3.87 B
C1-Chrysenes	2.41	2.68	2.17	2.02
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	1.14 J	3.8 B	0.79 J	2.53 B
Benzo(k)fluoranthene	0.59 J	5.07 B	0.5 J	2.38 J
Benzo(e)pyrene	1.44 B	2.56 B	1.42 J	2.38 B
Benzo(a)pyrene	0.38 J	2.58 B	ND	2.03 B
Perylene	8.04	8.02	8.27	5.89
Indeno(1,2,3-cd)pyrene	0.58 J	3.62 B	ND	1.52 J
Dibenz(a,h)anthracene	ND	0.77 J	ND	ND
Benzo(g,h,i)perylene	0.99 J	1.97 B	0.74 J	1.92 B
Total PAH	121.39	134.5	126.19	142.71
Surrogate Recoveries (%)				
Naphthalene-d8	69	67	77	74
Acenaphthene-d10	73	71	80	77
Benzo(a)pyrene-d12	77	74	86	80

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-SDI01-01-PHC-MU	06-L08-01-PHC-MU	06-E01-01-PHC-MU	06-BP01-01-PHC-MU
Location	Other	Liberty	Other	Boulder Patch
Battelle ID	R2391-P	R2393-P	R2396-P	R2400-P
Collection Date	08/09/06	08/09/06	08/09/06	08/09/06
% Moisture	89.4	89.9	91.55	92.06
% Lipid	1.03	1.03	0.84	0.77
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	2.13	2.03	1.70	1.66
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	77.32 J	68.58 J	76.69 J	81.19 J
n-Decane	183.38 J	182.9 J	214.22 J	235.52 J
n-Undecane	136.77 J	136.76 J	153.14 J	159.08 J
n-Dodecane	73.48 J	77.81 J	80.17 J	67.61 J
n-Tridecane	83.59 J	79.5 J	79.6 J	67.49 J
Isoprenoid RRT 1380	31.75 J	28.18 J	28.68 J	23.41 J
n-Tetradecane	157.2 J	155.88 J	141.66 J	123.61 J
Isoprenoid RRT 1470	112.51 J	113.22 J	121.32 J	95.28 J
n-Pentadecane	411.94	495.28	450.03	424.93
n-Hexadecane	176.17 J	177.02 J	167.17 J	160.91 J
Norpristane (1650)	ND	ND	ND	ND
n-Heptadecane	259.42	277.08	259.64 J	228.71 J
Pristane	577.56	1253.53	856.36	1351.22
n-Octadecane	51.13 J	44.52 J	44.95 J	43.28 J
Phytane	40.31 J	13.38 J	16.04 J	13.85 J
n-Nonadecane	50.28 J	54.61 J	39.11 J	27.9 J
n-Eicosane	46.04 J	51.84 J	47.3 J	46.54 J
n-Heneicosane	88.27 J	92.91 J	71.34 J	63.56 J
n-Docosane	140.87 J	175.16 J	112.77 J	124.6 J
n-Tricosane	356.35	452.55	283.57 J	306.85 J
n-Tetracosane	802.79	773.85	419.76	530.63
n-Pentacosane	865.36	1240.29	698.55	823.03
n-Hexacosane	1115.64	1532.93	857.36	1066.7
n-Heptacosane	1598.64	1699.46	1001.2	1156.21
n-Octacosane	1985.04	1616.18	950.91	1132.48
n-Nonacosane	2502.13	1602.08	954.16	1125.3
n-Triacontane	2316.03	1507.46	896.7	1137.56
n-Hentriacontane	2009.86	1395.06	830	991.19
n-Dotriacontane	1438.41	1245.09	742.77	951.27
n-Tritriacontane	929.09	1017.94	587.52	727.91
n-Tetratriacontane	523.94	790.83	468.8	617.76
n-Pentatriacontane	326.96	604.36	331.39	427.28
n-Hexatriacontane	269.17	485.68	290.35 J	383.81
n-Heptatriacontane	152.08 J	331.11	182.63 J	214.38 J
n-Octatriacontane	108.88 J	188.58 J	94.07 J	98.27 J
n-Nonatriacontane	97.43 J	184.14 J	103.12 J	94.77 J
n-Tetracontane	51.17 J	110.54 J	51.76 J	35.47 J
Total SHC	67400.07	42918.54	27915.82	29753.16
Surrogate Recoveries (%)				
5a-androstane	78	78	83	80
n-Tetracosane-d50	78	77	83	80
S/T:				
C23 diterpane (T4)	ND	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	2.92	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	4.23	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	7.17	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	13.55	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	3.77	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	4.1	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	3.52	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	2.18 J	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	4.36	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	1 J	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	4.52	ND	ND	ND
S28a	101.34	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	73	73	79	76

Surrogate Corrected

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-WD01-01-PHC-MU	06-5A-01-PHC-MU	06-N03-01-PHC-MU	06-N11-01-PHC-MU
Location	Near West Dock	BSMP	Northstar	Northstar
Battelle ID	R2565-P	R2571-P	R2573-P	R2384-P
Collection Date	08/08/06	08/07/06	08/07/06	08/07/06
% Moisture	89.19	87.65	89.05	87.17
% Lipid	1.09	0.91	1.44	1.39
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	2.18	2.52	2.15	2.60
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
PAH:				
Naphthalene	5.53 B	3.51 B	5.27 B	4.05 B
C1-Naphthalenes	5.02 B	2.13 B	2.49 B	2.76 B
C2-Naphthalenes	10.57	4.42	6.85	6.29
C3-Naphthalenes	10.36	5.12	7.04	7.54
C4-Naphthalenes	ND	ND	ND	ND
Biphenyl	1.92	0.99 J	1.1 J	1.59
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	0.85 J	0.41 J	2.02	ND
Fluorene	1.75	0.65 J	0.73 J	0.94 J
C1-Fluorenes	ND	ND	ND	ND
C2-Fluorenes	ND	ND	ND	ND
C3-Fluorenes	ND	ND	ND	ND
Anthracene	0.79 J	0.39 J	0.51 J	0.4 J
Phenanthrene	10.58 B	4.61 B	6.69 B	5.72 B
C1-Phenanthrenes/Anthracenes	12.28 B	5.06 B	7.25 B	6.89 B
C2-Phenanthrenes/Anthracenes	15.81 B	5.94 B	9.39 B	9.4 B
C3-Phenanthrenes/Anthracenes	8.67	ND	3.25	ND
C4-Phenanthrenes/Anthracenes	ND	ND	ND	ND
Dibenzothiophene	1.98 B	1.32 B	1.55 B	1.28 B
C1-Dibenzothiophenes	3.98	2.2	2.51	3.1
C2-Dibenzothiophenes	6.75	ND	ND	4.92
C3-Dibenzothiophenes	ND	ND	ND	ND
Fluoranthene	5.56 B	2.54 B	5.02 B	3.06 B
Pyrene	8.77 B	5.2 B	7.17 B	5.06 B
C1-Fluoranthenes/Pyrenes	5.52 B	1.87 B	2.95 B	ND
C2-Fluoranthenes/Pyrenes	4.01	ND	ND	ND
C3-Fluoranthenes/Pyrenes	ND	ND	ND	ND
Benzo(a)anthracene	1.4 B	0.5 J	1.44 B	1.25 B
Chrysene	3.2 B	0.87 J	2.72 B	1.8 B
C1-Chrysenes	2.7	ND	1.41	ND
C2-Chrysenes	ND	ND	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	1.75 B	ND	2.58 B	2.58 B
Benzo(k)fluoranthene	1.41 J	ND	3.62 B	4.42 B
Benzo(e)pyrene	2.56 B	0.94 J	1.77 B	0.88 J
Benzo(a)pyrene	1.3 B	ND	2.37 B	2.43 B
Perylene	11.47	2.13 B	3.72	5.39
Indeno(1,2,3-cd)pyrene	1.22 B	0.56 J	2.76 B	3.67 B
Dibenz(a,h)anthracene	0.7 J	0.28 J	0.79 J	ND
Benzo(g,h,i)perylene	1.76 B	1.01 J	1.85 B	1.03 B
Total PAH	150.17	52.65	96.82	86.45
Surrogate Recoveries (%)				
Naphthalene-d8	75	74	77	79
Acenaphthene-d10	78	77	78	80
Benzo(a)pyrene-d12	83	78	79	85

Laboratory Batch ID	06-0326	06-0326	06-0326	06-0326
Client ID	06-WD01-01-PHC-MU	06-5A-01-PHC-MU	06-N03-01-PHC-MU	06-N11-01-PHC-MU
Location	Near West Dock	BSMP	Northstar	Northstar
Battelle ID	R2565-P	R2571-P	R2573-P	R2384-P
Collection Date	08/08/06	08/07/06	08/07/06	08/07/06
% Moisture	89.19	87.65	89.05	87.17
% Lipid	1.09	0.91	1.44	1.39
Matrix	TISSUE	TISSUE	TISSUE	TISSUE
Sample Size (g dry)	2.18	2.52	2.15	2.60
Units	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY	UG/KG_DRY
SHC:				
n-Nonane	77.68 J	66.27 J	66.34 J	45.75 J
n-Decane	200.53 J	152.2 J	179.76 J	133.08 J
n-Undecane	155.08 J	97.83 J	117.23 J	95.97 J
n-Dodecane	93.87 J	48.44 J	71.19 J	47.89 J
n-Tridecane	89.12 J	58.58 J	69.45 J	45.41 J
Isoprenoid RRT 1380	46.29 J	23.54 J	47.65 J	33.77 J
n-Tetradecane	163.67 J	97.96 J	136.83 J	109.91 J
Isoprenoid RRT 1470	139.51 J	91.89 J	176.04 J	122.96 J
n-Pentadecane	454.04	627.45	734.12	373.7
n-Hexadecane	175.08 J	163.05 J	181.06 J	140 J
Norpristane (1650)	ND	ND	ND	6.67 J
n-Heptadecane	298.2	257.08	289.28	233.17
Pristane	804.99	850.09	851.08	490.25
n-Octadecane	41.61 J	36.2 J	30.94 J	24.78 J
Phytane	16.6 J	15.19 J	14.12 J	10.58 J
n-Nonadecane	43.49 J	19.63 J	14.91 J	12.22 J
n-Eicosane	57.04 J	36.33 J	34.36 J	30.28 J
n-Heneicosane	120.45 J	48.18 J	63.42 J	51.26 J
n-Docosane	255.98	113.18 J	170.14 J	129.85 J
n-Tricosane	663.18	283.81	447.26	335.56
n-Tetracosane	1210.97	588.09	971.96	706.86
n-Pentacosane	1876.92	909.53	1507.41	1078.66
n-Hexacosane	2375.34	1201.26	2002.97	1447.75
n-Heptacosane	2615.35	1278.77	2110.92	1490.47
n-Octacosane	2544.14	1337.88	2125.04	1490.59
n-Nonacosane	2513.68	1220.56	2035.16	1424.02
n-Triacontane	2414.11	1260.93	2019.81	1407.01
n-Hentriacontane	2186.88	1083.81	1798.31	1243.96
n-Dotriacontane	1971.45	1067.96	1680.67	1165.56
n-Tritriacontane	1605.33	827.44	1343.84	942.95
n-Tetratriacontane	1233.4	684.49	1040.48	730.42
n-Pentatriacontane	895.32	501.53	796.05	567.72
n-Hexatriacontane	736.49	431.98	599.98	448.18
n-Heptatriacontane	462.8	254.87	403.66	313.35
n-Octatriacontane	255.64	124.96 J	212.19 J	184.55 J
n-Nonatriacontane	222.75 J	120.87 J	176.2 J	184.46 J
n-Tetracontane	116.61 J	51.34 J	102.92 J	125.2 J
Total SHC	66118.62	32897.25	48959.42	37778.1
Surrogate Recoveries (%)				
5a-androstane	80	78	82	83
n-Tetracosane-d50	79	77	83	84
S/T:				
C23 diterpane (T4)	3.81	ND	ND	ND
C29 Tricyclictrierpane (T9)	ND	ND	ND	ND
C29 Tricyclictriterpane (T10)	ND	ND	ND	ND
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND	ND	ND	ND
17a(H)-22,29,30-Trisnorhopane -TM (T12)	4.34	ND	ND	ND
17a(H),21b(H)-30-Norhopane (T15)	7.2	ND	ND	ND
18a(H)-Oleanane (T18)	ND	ND	ND	ND
17a(H),21b(H)-hopane (T19)	10.83	ND	ND	ND
22S-17a(H),21b(H)-30-homohopane (T21)	ND	ND	ND	ND
22R-17a(H),21b(H)-30-homohopane (T22)	ND	ND	ND	ND
13b,17a-Diacholestane-20S (S4)	1.65 J	ND	ND	ND
13b,17a-Diacholestane-20R (S5)	1.07 J	ND	ND	ND
5a,14a,17a-methylcholestane-20R (S24)	1.57 J	ND	ND	ND
5a,14a,17a-Ethylcholestane-20S (S25)	0.84 J	ND	ND	ND
5a,14a,17a-Ethylcholestane-20R (S28)	3.02	ND	ND	ND
S28a	25.29	ND	ND	ND
Surrogate Recoveries (%)				
5b(H)-Cholane	75	74	76	79

Surrogate Corrected

Laboratory Batch ID	06-0326		06-0326				
Client ID	Procedural Blank		060313-01: Tilapia				
Battelle ID	BJ457PB-P		BJ458LCS-P				
Sample Type	PB		LCS				
Collection Date	11/21/06		11/21/06				
% Moisture	85.03		78.37				
% Lipid	NA		2.24				
Matrix	TISSUE		TISSUE				
Sample Size (g dry)	2.70		4.36				
Units	UG/KG_DRY		UG/KG_DRY		Target	% Recovery	Qualifier
PAH:							
Naphthalene	3.12		293.97		286.75	103	
C1-Naphthalenes	1.35		414.99				
C2-Naphthalenes	ND		ND				
C3-Naphthalenes	ND		ND				
C4-Naphthalenes	ND		ND				
Biphenyl	ND		304.3		287.18	106	
Acenaphthylene	ND		310.15		286.96	108	
Acenaphthene	ND		318.2		286.88	111	
Fluorene	ND		305.78		286.85	107	
C1-Fluorenes	ND		ND				
C2-Fluorenes	ND		ND				
C3-Fluorenes	ND		ND				
Anthracene	ND		345.86		286.74	121	
Phenanthrene	3.46		315.68		286.84	110	
C1-Phenanthrenes/Anthracenes	3.62		ND				
C2-Phenanthrenes/Anthracenes	4.39	N	ND				
C3-Phenanthrenes/Anthracenes	ND		ND				
C4-Phenanthrenes/Anthracenes	ND		ND				
Dibenzothiophene	1.12		319.89		288.02	111	
C1-Dibenzothiophenes	ND		ND				
C2-Dibenzothiophenes	ND		ND				
C3-Dibenzothiophenes	ND		ND				
Fluoranthene	2.1		310.81		286.84	108	
Pyrene	4.04		322.39		286.80	112	
C1-Fluoranthenes/Pyrenes	1.67		0.88				
C2-Fluoranthenes/Pyrenes	ND		ND				
C3-Fluoranthenes/Pyrenes	ND		ND				
Benzo(a)anthracene	0.74	J	280.33		286.77	98	
Chrysene	1.08		266.24		286.81	93	
C1-Chrysenes	ND		ND				
C2-Chrysenes	ND		ND				
C3-Chrysenes	ND		ND				
C4-Chrysenes	ND		ND				
Benzo(b)fluoranthene	1.07		268.91		286.94	94	
Benzo(k)fluoranthene	1.32	J	342.82		286.85	120	
Benzo(e)pyrene	0.86	J	268.77		287.41	94	
Benzo(a)pyrene	0.7	J	286.15		286.93	100	
Perylene	0.57	J	320.51		287.28	112	
Indeno(1,2,3-cd)pyrene	1.05		290.1		286.84	101	
Dibenz(a,h)anthracene	0.44	J	300.37		286.85	105	
Benzo(g,h,i)perylene	0.77	J	274.84		286.78	96	
Surrogate Recoveries (%)							
Naphthalene-d8	71		76				
Acenaphthene-d10	72		78				
Benzo(a)pyrene-d12	80		75				

Laboratory Batch ID	06-0326		06-0326				
Client ID	Procedural Blank		060313-01: Tilapia				
Battelle ID	BJ457PB-P		BJ458LCS-P				
Sample Type	PB		LCS				
Collection Date	11/21/06		11/21/06				
% Moisture	85.03		78.37				
% Lipid	NA		2.24				
Matrix	TISSUE		TISSUE				
Sample Size (g dry)	2.70		4.36				
Units	UG/KG_DRY		UG/KG_DRY		Target	% Recovery	Qualifier
SHC:							
n-Nonane	34.07	J	1221.41		2866.97	43	N
n-Decane	109.24	J	2217.87		2866.97	77	
n-Undecane	60.1	J	359.97				
n-Dodecane	10.11	J	2709.26		2866.97	94	
n-Tridecane	5.92	J		ND			
Isoprenoid RRT 1380		ND		ND			
n-Tetradecane	12.08	J	2746.07		2866.97	96	
Isoprenoid RRT 1470		ND		ND			
n-Pentadecane	9.73	J		ND			
n-Hexadecane	18.31	J	2840.52		2866.97	99	
Norpristane (1650)		ND		ND			
n-Heptadecane	10.24	J		ND			
Pristane	5.41	J	3106.61		2867.55	108	
n-Octadecane	15.45	J	2844.56		2866.97	99	
Phytane		ND	2767.4		2868.98	96	
n-Nonadecane	6.33	J	2817.14		2866.97	98	
n-Eicosane	15.53	J	2857.85		2866.97	100	
n-Heneicosane	12.49	J		ND			
n-Docosane	16.92	J	2941.07		2866.97	103	
n-Tricosane	32.75	J		ND			
n-Tetracosane	26.44	J	2876.09		2866.97	100	
n-Pentacosane	38.22	J		ND			
n-Hexacosane	47.2	J	2897.57		2866.97	101	
n-Heptacosane	53.65	J		ND			
n-Octacosane	53.01	J	2842.95		2866.97	99	
n-Nonacosane	56.3	J		ND			
n-Triacontane	47.43	J	2792.68		2866.97	97	
n-Hentriacontane	49.15	J		ND			
n-Dotriacontane	71.23	J		ND			
n-Tritriacontane	33.91	J		ND			
n-Tetratriacontane	54.44	J		ND			
n-Pentatriacontane	21.24	J		ND			
n-Hexatriacontane	47.24	J	2672.09		2866.97	93	
n-Heptatriacontane	14.04	J		ND			
n-Octatriacontane	11.81	J		ND			
n-Nonatriacontane	35.35	J		ND			
n-Tetracontane	8.51	J		ND			
Total SHC	686.88			ND			
Surrogate Recoveries (%)							
5a-androstane	81		80				
n-Tetracosane-d50	86		81				
S/T:							
C23 diterpane (T4)		ND		ND			
C29 Tricyclictrierpane (T9)		ND		ND			
C29 Tricyclictriterpane (T10)		ND		ND			
18a(H)-22,29,30-Trisnorneohopane -TS (T11)		ND		ND			
17a(H)-22,29,30-Trisnorhopane -TM (T12)		ND		ND			
17a(H),21b(H)-30-Norhopane (T15)		ND		ND			
18a(H)-Oleanane (T18)		ND		ND			
17a(H),21b(H)-hopane (T19)		ND		ND			
22S-17a(H),21b(H)-30-homohopane (T21)		ND		ND			
22R-17a(H),21b(H)-30-homohopane (T22)		ND		ND			
13b,17a-Diacholestane-20S (S4)		ND		ND			
13b,17a-Diacholestane-20R (S5)		ND		ND			
5a,14a,17a-methylcholestane-20R (S24)		ND		ND			
5a,14a,17a-Ethylcholestane-20S (S25)		ND		ND			
5a,14a,17a-Ethylcholestane-20R (S28)		ND		ND			
S28a		ND		ND			
Surrogate Recoveries (%)							
5b(H)-Cholane	80		76				

Laboratory Batch ID	06-0326						
Client ID	060814-01: Nist 2977						
Battelle ID	BJ459SRM-P						
Sample Type	SRM						
Collection Date	11/21/06						
% Moisture	NA						
% Lipid	5.85						
Matrix	TISSUE						
Sample Size (g dry)	2.14		Certified		Passing	Actual	
Units	UG/KG_DRY		Value	+/-	%Difference	%Difference	Qualifier
PAH:							
Naphthalene	9.94						
C1-Naphthalenes	10.22						
C2-Naphthalenes	50.01						
C3-Naphthalenes	180.26						
C4-Naphthalenes	270.24						
Biphenyl	2.92						
Acenaphthylene		ND					
Acenaphthene	2.41						
Fluorene	8.44		10.24	0.43	34.2	17.6	
C1-Fluorenes	40.68						
C2-Fluorenes	171.34						
C3-Fluorenes	320.95						
Anthracene		ND					
Phenanthrene	40.7		35.1	3.80	40.83	16	
C1-Phenanthrenes/Anthracenes	163.89						
C2-Phenanthrenes/Anthracenes	449.74						
C3-Phenanthrenes/Anthracenes	526.46						
C4-Phenanthrenes/Anthracenes	266.11						
Dibenzothiophene	26.68						
C1-Dibenzothiophenes	206.93						
C2-Dibenzothiophenes	691.44						
C3-Dibenzothiophenes	821.47						
Fluoranthene	36.12		38.7	1.00	32.58	6.7	
Pyrene	78.15		78.9	3.50	34.44	1	
C1-Fluoranthenes/Pyrenes	100.04						
C2-Fluoranthenes/Pyrenes	121.9						
C3-Fluoranthenes/Pyrenes	105.62						
Benzo(a)anthracene	18.2		20.34	0.78	33.83	10.5	
Chrysene	66.55						
C1-Chrysenes	61.07						
C2-Chrysenes	81.33						
C3-Chrysenes	40.64						
C4-Chrysenes	41.48						
Benzo(b)fluoranthene	9.49		11.01	0.28	32.54	13.8	
Benzo(k)fluoranthene	8.11						
Benzo(e)pyrene	13.26		13.1	1.10	38.4	1.2	
Benzo(a)pyrene	4.83		8.35	0.72	38.62	42.2	N
Perylene	3.58		3.5	0.76	51.71	2.3	
Indeno(1,2,3-cd)pyrene	3.12		4.84	0.81	46.74	35.5	
Dibenz(a,h)anthracene	1.19	J	1.41	0.19	43.48	15.6	
Benzo(g,h,i)perylene	6.98		9.53	0.43	34.51	26.8	
Surrogate Recoveries (%)							
Naphthalene-d8	60						
Acenaphthene-d10	62						
Benzo(a)pyrene-d12	70						

Laboratory Batch ID	06-0326					
Client ID	060814-01: Nist 2977					
Battelle ID	BJ459SRM-P					
Sample Type	SRM					
Collection Date	11/21/06					
% Moisture	NA					
% Lipid	5.85					
Matrix	TISSUE					
Sample Size (g dry)	2.14	Certified		Passing	Actual	
Units	UG/KG_DRY	Value	+/-	%Difference	%Difference	Qualifier
SHC:						
n-Nonane						
n-Decane						
n-Undecane						
n-Dodecane						
n-Tridecane						
Isoprenoid RRT 1380						
n-Tetradecane						
Isoprenoid RRT 1470						
n-Pentadecane						
n-Hexadecane						
Norpristane (1650)						
n-Heptadecane						
Pristane						
n-Octadecane						
Phytane						
n-Nonadecane						
n-Eicosane						
n-Heneicosane						
n-Docosane						
n-Tricosane						
n-Tetracosane						
n-Pentacosane						
n-Hexacosane						
n-Heptacosane						
n-Octacosane						
n-Nonacosane						
n-Triacontane						
n-Hentriacontane						
n-Dotriacontane						
n-Tritriacontane						
n-Tetratriacontane						
n-Pentatriacontane						
n-Hexatriacontane						
n-Heptatriacontane						
n-Octatriacontane						
n-Nonatriacontane						
n-Tetracontane						
Total SHC						
Surrogate Recoveries (%)						
5a-androstane						
n-Tetracosane-d50						
S/T:						
C23 diterpane (T4)	30.76					
C29 Tricyclictrierpane (T9)	5.58					
C29 Tricyclictriterpane (T10)	3.75					
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	21.67					
17a(H)-22,29,30-Trisnorhopane -TM (T12)	18.75					
17a(H),21b(H)-30-Norhopane (T15)	73.68					
18a(H)-Oleanane (T18)	ND					
17a(H),21b(H)-hopane (T19)	93.56					
22S-17a(H),21b(H)-30-homohopane (T21)	34.55					
22R-17a(H),21b(H)-30-homohopane (T22)	28.27					
13b,17a-Diacholestane-20S (S4)	7.35					
13b,17a-Diacholestane-20R (S5)	5.61					
5a,14a,17a-methylcholestane-20R (S24)	26.5					
5a,14a,17a-Ethylcholestane-20S (S25)	7.78					
5a,14a,17a-Ethylcholestane-20R (S28)	34.49					
S28a	16.34					
Surrogate Recoveries (%)						
5b(H)-Cholane	67					

Surrogate Corrected

Laboratory Batch ID	06-0326					
Client ID	GN62: North Slope Crude				GG09: NorthSTAR Control Oil - cANIMIDA	
Battelle ID	BJ460NSC (PAH), BJ780NSC (SHC), BJ778NSC(S/T)				BJ461CO (PAH), BJ781CO (SHC), BJ779CO (S/T)	
Sample Type	NSC				CO	
Collection Date	12/11/06				12/11/06	
% Moisture	NA				NA	
% Lipid	NA				NA	
Matrix	OIL				OIL	
Sample Size (g dry)	5.01				5.02	
Units	MG/KG_OIL		Target	% Difference	Qualifier	MG/KG_OIL	
PAH:							
Naphthalene	668.88		740.29	9.6		825.37	
C1-Naphthalenes	1504.04		1516.04	0.8		2028.6	
C2-Naphthalenes	2041.17		2000.10	2.1		2692.36	
C3-Naphthalenes	1713.51		1526.96	12.2		2043.02	
C4-Naphthalenes	1066.78		898.03	18.8		1072.84	
Biphenyl	199.93		220.82	9.5		303.84	
Acenaphthylene		ND					ND
Acenaphthene	12.73		14.50	12.2			ND
Fluorene	91.54		92.51	1.0		156.63	
C1-Fluorenes	230.5		227.01	1.5		260.07	
C2-Fluorenes	404.37		367.09	10.2		361.84	
C3-Fluorenes	384.78		326.32	17.9		331.98	
Anthracene		ND					ND
Phenanthrene	261.58		249.49	4.8		275.39	
C1-Phenanthrenes/Anthracenes	617.02		549.17	12.4		618.7	
C2-Phenanthrenes/Anthracenes	798.31		642.72	24.2		738.07	
C3-Phenanthrenes/Anthracenes	584.23		446.11	31.0	N	498.63	
C4-Phenanthrenes/Anthracenes	241.28		180.02	34.0	N	193.54	
Dibenzothiophene	221.52		210.35	5.3		74.17	
C1-Dibenzothiophenes	468.8		409.03	14.6		173.58	
C2-Dibenzothiophenes	698.43		551.46	26.7		215.08	
C3-Dibenzothiophenes	599.24		471.36	27.1		146.89	
Fluoranthene		ND					ND
Pyrene	12.71		12.99	2.2		15.14	
C1-Fluoranthenes/Pyrenes	87.52		70.92	23.4		89.32	
C2-Fluoranthenes/Pyrenes	151.73		117.89	28.7		130.45	
C3-Fluoranthenes/Pyrenes	166.97		137.25	21.7		131.78	
Benzo(a)anthracene	4.75						ND
Chrysene	42.55		47.18	9.8		34.7	
C1-Chrysenes	72.01		78.82	8.6		60.87	
C2-Chrysenes	94.03		102.67	8.4		78.56	
C3-Chrysenes	77.99		85.36	8.6		65.11	
C4-Chrysenes	52.43		61.99	15.4		35.94	
Benzo(b)fluoranthene	5.31		6.08	12.7		3.74	
Benzo(k)fluoranthene		ND					ND
Benzo(e)pyrene	9.86		12.88	23.4		9.51	
Benzo(a)pyrene		ND					ND
Perylene		ND					ND
Indeno(1,2,3-cd)pyrene		ND					ND
Dibenz(a,h)anthracene	1.18	J				0.7	J
Benzo(g,h,i)perylene	3.05		3.44	11.3		1.36	
Surrogate Recoveries (%)							
Naphthalene-d8	111					114	
Acenaphthene-d10	113					115	
Benzo(a)pyrene-d12	123	N				124	N

Surrogate Corrected

Laboratory Batch ID	06-0326						
Client ID	GN62: North Slope Crude					GG09: NorthSTAR Control Oil - cANIMIDA	
Battelle ID	BJ460NSC (PAH), BJ780NSC (SHC), BJ778NSC(S/T)					BJ461CO (PAH), BJ781CO (SHC), BJ779CO (S/T)	
Sample Type	NSC					CO	
Collection Date	12/11/06					12/11/06	
% Moisture	NA					NA	
% Lipid	NA					NA	
Matrix	OIL					OIL	
Sample Size (g dry)	5.01					5.02	
Units	MG/KG_OIL		Target	% Difference	Qualifier	MG/KG_OIL	
SHC:							
n-Nonane	5847.32		4670.06	25.2		16131.19	
n-Decane	5179.6		4951.66	4.6		14804.63	
n-Undecane	5081.14		4506.16	12.8		13774.48	
n-Dodecane	3841.42		4576.43	16.1		13197.97	
n-Tridecane	6658.46	ME	4189.33	58.9	N	14377.94	
Isoprenoid RRT 1380	925.59		961.81	3.8		2246.07	
n-Tetradecane	4548.07		3919.50	16.0		10390.63	
Isoprenoid RRT 1470	1873.43		1532.69	22.2		4039.4	
n-Pentadecane	4158.75		3990.56	4.2		9427.75	
n-Hexadecane	3849.76		3640.11	5.8		8441.07	
Norpristane (1650)	1091.71		1141.72	4.4		2557.57	
n-Heptadecane	3390.62		3078.38	10.1		7130.7	
Pristane	2419.61		2280.61	6.1		4795.57	
n-Octadecane	2851.76		2796.74	2.0		5828.56	
Phytane	1516.74		1659.88	8.6		2693.46	
n-Nonadecane	2536.89		2540.37	0.1		5320.47	
n-Eicosane	2745.65		2502.77	9.7		4739.2	
n-Heneicosane	2550.79		2419.45	5.4		4224.87	
n-Docosane	2436.82		2251.79	8.2		3780.43	
n-Tricosane	2110.77		2050.41	2.9		3339.51	
n-Tetracosane	2040.91		1948.20	4.8		2877.69	
n-Pentacosane	1735.29		1795.70	3.4		2580.65	
n-Hexacosane	1604.8		1639.60	2.1		2129.65	
n-Heptacosane	1296.07		1230.99	5.3		1931.22	
n-Octacosane	1004.78		1004.15	0.1		1626.4	
n-Nonacosane	813.1		872.21	6.8		1398.58	
n-Triacontane	700.83		669.33	4.7		1126.77	
n-Hentriacontane	634.08		606.82	4.5		1027.14	
n-Dotriacontane	457.07		465.97	1.9		711.27	
n-Tritriacontane	354.53		399.05	11.2		600.5	
n-Tetratriacontane	324.82		371.75	12.6		415.14	
n-Pentatriacontane	328.76		378.11	13.1		361.49	
n-Hexatriacontane	217.92	J	235.65	7.5		222.51	J
n-Heptatriacontane	189.12	J	210.06	10.0		213.16	J
n-Octatriacontane	171.95	J	205.75	16.4		127.87	J
n-Nonatriacontane	168.17	J	153.92	9.3		110.49	J
n-Tetracontane	146	J	161.64	9.7		74.19	J
Total SHC	591103.08		578973.63	2.1		713063.08	
Surrogate Recoveries (%)							
5a-androstane	97					93	
n-Tetracosane-d50	98					97	
S/T:							
C23 diterpane (T4)	59.83		47.76	25.3		41.84	
C29 Tricyclictrierpane (T9)	17.34		14.70	18.0		21.15	
C29 Tricyclictriterpane (T10)	18.09		14.64	23.6		20.74	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	19.79		15.96	24.0		11.26	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	28.32		24.82	14.1		7.06	
17a(H),21b(H)-30-Norhopane (T15)	88.44		69.58	27.1		23.64	
18a(H)-Oleanane (T18)		ND					ND
17a(H),21b(H)-hopane (T19)	141.45		120.14	17.7		53.81	
22S-17a(H),21b(H)-30-homohopane (T21)	65.82		59.93	9.8		20.9	
22R-17a(H),21b(H)-30-homohopane (T22)	43.58		39.69	9.8		12.23	
13b,17a-Diacholestane-20S (S4)	44.67		44.18	1.1		47.15	
13b,17a-Diacholestane-20R (S5)	28.94		25.52	13.4		27.57	
5a,14a,17a-methylcholestane-20R (S24)	32.28		33.94	4.9		15.23	
5a,14a,17a-Ethylcholestane-20S (S25)	41.32		35.93	15.0		20.23	
5a,14a,17a-Ethylcholestane-20R (S28)	41.26		39.17	5.3		17.08	
S28a		ND					ND
Surrogate Recoveries (%)							
5b(H)-Cholane	93						

Laboratory Batch ID	06-0326		06-0326			
Client ID	06-PC-01-PHC-MU		06-PC-01-PHC-MU			
Battelle ID	R2641-P		R2641DUP-P			
Sample Type	SA		QADU			
Collection Date	07/24/06		7/24/2006			
% Moisture	89.57		89.57			
% Lipid	0.94		0.97			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	2.10		2.1			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
PAH:						
Naphthalene	4.7	B	4.96	B	5.4	
C1-Naphthalenes	2.16	B	2.47	B	13.4	
C2-Naphthalenes	5.86		6.51		10.5	
C3-Naphthalenes	7.94		6.91		13.9	
C4-Naphthalenes	ND		ND		NA	
Biphenyl	2.1		1.11	J	61.7	n
Acenaphthylene	ND		ND		NA	
Acenaphthene	ND		ND		NA	
Fluorene	1.29		1	J	25.3	
C1-Fluorenes	ND		ND		NA	
C2-Fluorenes	ND		ND		NA	
C3-Fluorenes	ND		ND		NA	
Anthracene	ND		1.09	J	NA	
Phenanthrene	5.53	B	7.34	B	28.1	
C1-Phenanthrenes/Anthracenes	10.5	B	10.28	B	2.1	
C2-Phenanthrenes/Anthracenes	14.52	B	12.4	B	15.8	
C3-Phenanthrenes/Anthracenes	6.76		6.44		4.8	
C4-Phenanthrenes/Anthracenes	ND		ND		NA	
Dibenzothiophene	1.41	B	1.7	B	18.6	
C1-Dibenzothiophenes	4.15		3.69		11.7	
C2-Dibenzothiophenes	7.36		5.28		32.9	N
C3-Dibenzothiophenes	ND		ND		NA	
Fluoranthene	5.03	B	6.85	B	30.6	N
Pyrene	6.79	B	9.52	B	33.5	n
C1-Fluoranthenes/Pyrenes	3.62	B	4.7	B	26.0	
C2-Fluoranthenes/Pyrenes	ND		ND		NA	
C3-Fluoranthenes/Pyrenes	ND		ND		NA	
Benzo(a)anthracene	1.59	B	3.12	B	65.0	N
Chrysene	2.43	B	4.88	B	67.0	N
C1-Chrysenes	ND		2.09		125.3	n
C2-Chrysenes	ND		ND		NA	
C3-Chrysenes	ND		ND		NA	
C4-Chrysenes	ND		ND		NA	
Benzo(b)fluoranthene	2.94	B	4.32	B	38.0	N
Benzo(k)fluoranthene	4.81	B	5.79	B	18.5	
Benzo(e)pyrene	1.72	B	3.99	B	79.5	n
Benzo(a)pyrene	2.86	B	2.76	B	3.6	
Perylene	4.65		4.08		13.1	
Indeno(1,2,3-cd)pyrene	3.66	B	2.77	B	27.7	
Dibenz(a,h)anthracene	0.45	J	1.67	B	115.1	n
Benzo(g,h,i)perylene	1.45	B	2.42	B	50.1	n
Surrogate Recoveries (%)						
Naphthalene-d8	81		78			
Acenaphthene-d10	81		81			
Benzo(a)pyrene-d12	85		81			

Surrogate Corrected

Laboratory Batch ID	06-0326		06-0326			
Client ID	06-PC-01-PHC-MU		06-PC-01-PHC-MU			
Battelle ID	R2641-P		R2641DUP-P			
Sample Type	SA		QADU			
Collection Date	07/24/06		7/24/2006			
% Moisture	89.57		89.57			
% Lipid	0.94		0.97			
Matrix	TISSUE		TISSUE			
Sample Size (g dry)	2.10		2.1			
Units	UG/KG_DRY		UG/KG_DRY		RPD	Qualifier
SHC:						
n-Nonane	65.69	J	37.12	J	NA	
n-Decane	185.97	J	110.93	J	NA	
n-Undecane	116.93	J	85.88	J	NA	
n-Dodecane	77.33	J	62.76	J	NA	
n-Tridecane	62.81	J	57.66	J	NA	
Isoprenoid RRT 1380	32.51	J	31.94	J	NA	
n-Tetradecane	147.11	J	144.83	J	NA	
Isoprenoid RRT 1470	123.31	J	122.55	J	NA	
n-Pentadecane	635.84		637.2		0.2	
n-Hexadecane	156.64	J	164.26	J	NA	
Norpristane (1650)	ND		ND		NA	
n-Heptadecane	229.37	J	229.6	J	NA	
Pristane	516.4		577.29		11.1	
n-Octadecane	31.55	J	39.04	J	NA	
Phytane	11.79	J	40.87	J	NA	
n-Nonadecane	15.74	J	26.18	J	NA	
n-Eicosane	40.03	J	38.25	J	NA	
n-Heneicosane	61.93	J	75.41	J	NA	
n-Docosane	158.98	J	203.84	J	NA	
n-Tricosane	415.85		540.45		26.1	
n-Tetracosane	897.38		1101.98		20.5	
n-Pentacosane	1387.05		1731.88		22.1	
n-Hexacosane	1826.65		2351.48		25.1	
n-Heptacosane	1982.04		2762.58		32.9	n
n-Octacosane	1948.9		3243.43		49.9	n
n-Nonacosane	1879.61		3796.34		67.5	n
n-Triacontane	1867.72		3734.29		66.6	n
n-Hentriacontane	1658.56		3199.94		63.5	n
n-Dotriacontane	1543.57		2582.4		50.4	n
n-Tritriacontane	1243.65		1811.96		37.2	n
n-Tetratriacontane	965.14		1169.73		19.2	
n-Pentatriacontane	743.4		810.81		8.7	
n-Hexatriacontane	568.61		598.7		5.2	
n-Heptatriacontane	377.65		400.18		5.8	
n-Octatriacontane	191.93	J	221.55	J	NA	
n-Nonatriacontane	165.23	J	177.54	J	NA	
n-Tetracontane	95.48	J	94.07	J	NA	
Total SHC	43109.5		76895.8		56.3	n
Surrogate Recoveries (%)						
5a-androstane	81		84			
n-Tetracosane-d50	82		84			
S/T:						
C23 diterpane (T4)	ND		2.55		137.7	n
C29 Tricyclictrierpane (T9)	ND		ND		NA	
C29 Tricyclictriterpane (T10)	ND		ND		NA	
18a(H)-22,29,30-Trisnorneohopane -TS (T11)	ND		ND		NA	
17a(H)-22,29,30-Trisnorhopane -TM (T12)	ND		3.91		157.1	n
17a(H),21b(H)-30-Norhopane (T15)	ND		5.52		168.6	n
18a(H)-Oleanane (T18)	ND		ND		NA	
17a(H),21b(H)-hopane (T19)	ND		10.72		183.2	n
22S-17a(H),21b(H)-30-homohopane (T21)	ND		ND		NA	
22R-17a(H),21b(H)-30-homohopane (T22)	ND		ND		NA	
13b,17a-Diacholestane-20S (S4)	ND		2.22	J	NA	
13b,17a-Diacholestane-20R (S5)	ND		1.77	J	NA	
5a,14a,17a-methylcholestane-20R (S24)	ND		3.2		148.8	n
5a,14a,17a-Ethylcholestane-20S (S25)	ND		ND		NA	
5a,14a,17a-Ethylcholestane-20R (S28)	ND		3.25		149.5	n
S28a	ND		55.15		200.0	N
Surrogate Recoveries (%)						
5b(H)-Cholane	78		79			

Surrogate Corrected

cANIMIDA Deployed SPMD Hydrocarbon Data

This page left intentionally blank.

2004 Deployed SPMD Hydrocarbon Data

This page left intentionally blank.

Laboratory Batch Number	04-0053	04-0053	04-0053	04-0053
Client ID	04-SPQC-01-PHC-SPMD-TB	04-L06-01-PHC-SPMD	04-5H-01-PHC-SPMD	04-N04-01-PHC-SPMD
Location	Trip Blan k	Liberty	BSMP	Northstar
Battelle ID	S3880-P	S4307-P	S4338-P	S4339-P
Collection Date	07/30/04	08/13/04	08/14/04	08/15/04
% Moisture	NA	NA	NA	NA
% Lipid	NA	NA	NA	NA
Matrix	SPMD	SPMD	SPMD	SPMD
Sample Size (No. SPMDs)	2.00	2.00	2.00	2.00
Units	NG/SPMD_NA	NG/SPMD_NA	NG/SPMD_NA	NG/SPMD_NA
PAH:				
Naphthalene	115.72	35.04	29.62	36.35
C1-Naphthalenes	126.05	50.05	36.25	42.8
C2-Naphthalenes	113	110.47	57.77	64.33
C3-Naphthalenes	86.24	119.09	69.82	78.38
C4-Naphthalenes	34.77	65.56	45.36	51.94
Biphenyl	15.63	10.57	7.94	8.94
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	6.1	4.75	5.78	5.88
Fluorene	5.85	8.81	7.72	7.72
C1-Fluorenes	8.59	16.28	11.68	12.77
C2-Fluorenes	12.38	27.8	33.01	23.45
C3-Fluorenes	ND	44.61	52.21	ND
Anthracene	1.6 J	2.28	3.91	ND
Phenanthrene	31.04	39.91	28.08	32.83
C1-Phenanthrenes/Anthracenes	14.99	39.58	31.61	30.03
C2-Phenanthrenes/Anthracenes	11.71	56.64	46.13	43.76
C3-Phenanthrenes/Anthracenes	7.28	56.84	48.41	36.83
C4-Phenanthrenes/Anthracenes	7.07	25.74	20.85	23.12
Dibenzothiophene	3.11	4.96	3.85	3.86
C1-Dibenzothiophenes	4.86	12	11.52	7.79
C2-Dibenzothiophenes	6.68	42.89	31.7	16.96
C3-Dibenzothiophenes	6.8	60.36	46.27	29.88
Fluoranthene	7.52	31.26	18.44	25.17
Pyrene	5.73	24.59	17.54	19.01
C1-Fluoranthenes/Pyrenes	3.18	15.93	16.09	14.05
C2-Fluoranthenes/Pyrenes	3.19	14.38	13.45	11.75
C3-Fluoranthenes/Pyrenes	ND	9.29	8.5	ND
Benzo(a)anthracene	0.36 J	0.56 J	0.46 J	3.34
Chrysene	1.2 J	4.01	4.23	4.48
C1-Chrysenes	1.3 J	2.75	2.22	2.09
C2-Chrysenes	ND	3.37	ND	ND
C3-Chrysenes	ND	ND	ND	ND
C4-Chrysenes	ND	ND	ND	ND
Benzo(b)fluoranthene	0.39 J	0.56 J	0.79 J	1.18 J
Benzo(k)fluoranthene	ND	ND	0.59 J	0.73 J
Benzo(e)pyrene	0.72 J	0.77 J	0.82 J	1.58 J
Benzo(a)pyrene	ND	0.17 J	0.28 J	ND
Perylene	ND	2.05 J	1.85 J	18.96
Indeno(1,2,3-cd)pyrene	ND	0.2 J	0.35 J	0.5 J
Dibenz(a,h)anthracene	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.39 J	0.44 J	0.48 J	0.98 J
Total PAH (ng/SPMD)	643.45	944.56	715.58	661.44
Surrogate Recoveries (%)				
Naphthalene-d8	47	40	47	16 N
Acenaphthene-d10	52	59	62	21 N
Phenanthrene-d10	52	62	65	24 N
Benzo(a)pyrene-d12	58	70	73	22 N

Surrogate Corrected

Laboratory Batch Number	04-0053		04-0053		04-0053		04-0053	
Client ID	04-N05-01-PHC-SPMD		04-N06-01-PHC-SPMD		04-N06-02-PHC-SPMD		04-3A-01-PHC-SPMD	
Location	Northstar		Northstar		Northstar		BSMP	
Battelle ID	S4341-P		S4343-P		S4344-P		S4345-P	
Collection Date	08/15/04		08/15/04		08/15/04		08/13/04	
% Moisture	NA		NA		NA		NA	
% Lipid	NA		NA		NA		NA	
Matrix	SPMD		SPMD		SPMD		SPMD	
Sample Size (No. SPMDs)	2.00		2.00		2.00		2.00	
Units	NG/SPMD_NA		NG/SPMD_NA		NG/SPMD_NA		NG/SPMD_NA	
PAH:								
Naphthalene	31.9		28.74		32.17		31.49	
C1-Naphthalenes	41.14		39.1		40.92		36.06	
C2-Naphthalenes	58.61		59.49		68.76		55.34	
C3-Naphthalenes	75.19		68.24		77.98		62.84	
C4-Naphthalenes	55.61		47.07		46.76		46.13	
Biphenyl	7.95		7.64		7.99		7.47	
Acenaphthylene	ND		ND		ND		ND	
Acenaphthene	6.46		3.34		3.36		4.51	
Fluorene	6.9		6.44		8.07		5.63	
C1-Fluorenes	12.54		11.59		14.12		12.49	
C2-Fluorenes	24.75		25.42		30.68		19.69	
C3-Fluorenes	31.73		35.9		75.94		15.78	
Anthracene	ND		2.08	J	2.28		ND	
Phenanthrene	33.25		36.03		44.11		29.46	
C1-Phenanthrenes/Anthracenes	32.15		34.12		44.34		25.51	
C2-Phenanthrenes/Anthracenes	45.95		42.63		66.6		28.58	
C3-Phenanthrenes/Anthracenes	40.32		25.43		73.85		12.69	
C4-Phenanthrenes/Anthracenes	23.31		15.91		25.78		7.67	
Dibenzothiophene	3.71		4.16		4.33		3.56	
C1-Dibenzothiophenes	8.96		9.63		16.44		6.79	
C2-Dibenzothiophenes	17.22		20.78		88.28		10.93	
C3-Dibenzothiophenes	32.68		25.54		116.82		12.2	
Fluoranthene	25.81		26.42		33.56		21.15	
Pyrene	19.25		20.34		26.52		14.99	
C1-Fluoranthenes/Pyrenes	14.81		10.65		18.21		5.56	
C2-Fluoranthenes/Pyrenes	13.13		7.7		17.39		3.81	
C3-Fluoranthenes/Pyrenes	8.21		4.92		11.11		3.34	
Benzo(a)anthracene	0.42	J	0.61	J	0.83	J	0.82	J
Chrysene	4.43		3.55		6.06		3.37	
C1-Chrysenes	2.24		2.18		4.34		1.19	J
C2-Chrysenes	ND		ND		4.83		ND	
C3-Chrysenes	ND		ND		ND		ND	
C4-Chrysenes	ND		ND		ND		ND	
Benzo(b)fluoranthene	1.08	J	0.97	J	1.22	J	1.02	J
Benzo(k)fluoranthene	ND		ND		0.35	J	0.86	J
Benzo(e)pyrene	1.14	J	1.05	J	1.73	J	0.93	J
Benzo(a)pyrene	ND		0.23	J	0.31	J	0.28	J
Perylene	3.58		4.23		4.68		2.05	J
Indeno(1,2,3-cd)pyrene	ND		0.3	J	0.39	J	0.46	J
Dibenz(a,h)anthracene	ND		ND		ND		ND	
Benzo(g,h,i)perylene	0.72	J	0.61	J	0.93	J	0.89	J
Total PAH (ng/SPMD)	685.15		633.04		1022.04		495.54	
Surrogate Recoveries (%)								
Naphthalene-d8	17	N	43		44		37	N
Acenaphthene-d10	23	N	59		62		46	
Phenanthrene-d10	24	N	63		67		49	
Benzo(a)pyrene-d12	22	N	67		70		53	

Surrogate Corrected

Laboratory Batch Number	04-0053	
Client ID	BLANK SPMD-QC-4	
Location	Blank SPMD	
Battelle ID	S4725-P	
Collection Date	09/20/04	
% Moisture	NA	
% Lipid	NA	
Matrix	SPMD	
Sample Size (No. SPMDs)	2.00	
Units	NG/SPMD_NA	
PAH:		
Naphthalene	85.18	
C1-Naphthalenes	81.94	
C2-Naphthalenes	85.48	
C3-Naphthalenes	78.42	
C4-Naphthalenes	38.08	
Biphenyl	12.09	
Acenaphthylene		ND
Acenaphthene	5.84	
Fluorene	5.86	
C1-Fluorenes	10.3	
C2-Fluorenes	27.83	
C3-Fluorenes	27.05	
Anthracene	1.9	J
Phenanthrene	31	
C1-Phenanthrenes/Anthracenes	22.49	
C2-Phenanthrenes/Anthracenes	34.94	
C3-Phenanthrenes/Anthracenes	35.29	
C4-Phenanthrenes/Anthracenes	29.07	
Dibenzothiophene	3.51	
C1-Dibenzothiophenes	7.72	
C2-Dibenzothiophenes	15.26	
C3-Dibenzothiophenes	26.65	
Fluoranthene	13.74	
Pyrene	11.8	
C1-Fluoranthenes/Pyrenes	14.03	
C2-Fluoranthenes/Pyrenes	16.37	
C3-Fluoranthenes/Pyrenes	14.56	
Benzo(a)anthracene	0.77	J
Chrysene	3.33	
C1-Chrysenes	3.7	
C2-Chrysenes	3.92	
C3-Chrysenes		ND
C4-Chrysenes		ND
Benzo(b)fluoranthene	0.91	J
Benzo(k)fluoranthene	0.58	J
Benzo(e)pyrene	1.61	J
Benzo(a)pyrene	0.22	J
Perylene	1.13	J
Indeno(1,2,3-cd)pyrene	0.33	J
Dibenz(a,h)anthracene		ND
Benzo(g,h,i)perylene	0.66	J
Total PAH (ng/SPMD)	753.56	
Surrogate Recoveries (%)		
Naphthalene-d8	43	
Acenaphthene-d10	54	
Phenanthrene-d10	57	
Benzo(a)pyrene-d12	63	

Laboratory Batch Number	04-0053		04-0053				
Client ID	Procedural Blank		Laboratory Control Sample				
Location							
Battelle ID	BF419PB-P		BF420LCS-P				
Collection Date	11/17/04		11/17/04				
% Moisture	NA		NA				
% Lipid	NA		NA				
Matrix	TISSUE		TISSUE				
Sample Size	2.00		NA				
Size Unit-Basis	SPMD_NA		NA				
Units	NG/SPMD_NA		NG		Target	% Recovery	Qualifier
PAH:							
Naphthalene	4.16		1330.25		1275.00	104	
C1-Naphthalenes	1.22	J	ND				
C2-Naphthalenes	ND		ND				
C3-Naphthalenes	ND		ND				
C4-Naphthalenes	ND		ND				
Biphenyl	0.47	J	1314.17		1262.50	104	
Acenaphthylene	ND		1279.44		1262.50	101	
Acenaphthene	ND		1302.04		1262.50	103	
Fluorene	0.17	J	1487.56		1275.00	117	
C1-Fluorenes	ND		ND				
C2-Fluorenes	ND		ND				
C3-Fluorenes	ND		ND				
Anthracene	ND		1558.77		1252.50	124	
Phenanthrene	0.38	J	1397.84		1275.00	110	
C1-Phenanthrenes/Anthracenes	ND		ND				
C2-Phenanthrenes/Anthracenes	ND		ND				
C3-Phenanthrenes/Anthracenes	ND		ND				
C4-Phenanthrenes/Anthracenes	ND		ND				
Dibenzothiophene	0.13	J	1392.91		1262.50	110	
C1-Dibenzothiophenes	ND		ND				
C2-Dibenzothiophenes	ND		ND				
C3-Dibenzothiophenes	ND		ND				
Fluoranthene	0.08	J	1400.26		1275.00	110	
Pyrene	0.11	J	1447.77		1275.00	114	
C1-Fluoranthenes/Pyrenes	ND		ND				
C2-Fluoranthenes/Pyrenes	ND		ND				
C3-Fluoranthenes/Pyrenes	ND		ND				
Benzo(a)anthracene	ND		1581.14		1262.50	125	
Chrysene	ND		1641.89		1262.50	130	
C1-Chrysenes	ND		ND				
C2-Chrysenes	ND		ND				
C3-Chrysenes	ND		ND				
C4-Chrysenes	ND		ND				
Benzo(b)fluoranthene	ND		1464.58		1262.50	116	
Benzo(k)fluoranthene	ND		ND				
Benzo(e)pyrene	ND		1622.74		1267.50	128	
Benzo(a)pyrene	ND		1462.53		1275.00	115	
Perylene	ND		1327.7		1262.50	105	
Indeno(1,2,3-cd)pyrene	ND		1421.2		1262.50	113	
Dibenz(a,h)anthracene	ND		1500.94		1262.50	119	
Benzo(g,h,i)perylene	ND		1408.89		1262.50	112	
Total PAH (ng/SPMD)	6.72		27342.62				
Surrogate Recoveries (%)							
Naphthalene-d8	63		63				
Acenaphthene-d10	62		66				
Phenanthrene-d10	62		68				
Benzo(a)pyrene-d12	44		70				

Surrogate Corrected

Laboratory Batch Number	04-0053				
Client ID	Laboratory Control Sample Duplicate				
Location					
Battelle ID	BF421LCSD-P				
Collection Date	11/17/2004				
% Moisture	NA				
% Lipid	NA				
Matrix	TISSUE				
Sample Size	NA				
Size Unit-Basis	NA				
Units	NG		Target	% Recovery	Qualifier
PAH:					
Naphthalene	1381.35		1275.00	108	
C1-Naphthalenes		ND			
C2-Naphthalenes		ND			
C3-Naphthalenes		ND			
C4-Naphthalenes		ND			
Biphenyl	1185.53		1262.50	94	
Acenaphthylene	1189.08		1262.50	94	
Acenaphthene	1270.74		1262.50	101	
Fluorene	1536.07		1275.00	120	
C1-Fluorenes		ND			
C2-Fluorenes		ND			
C3-Fluorenes		ND			
Anthracene	1538.81		1252.50	123	
Phenanthrene	1384.69		1275.00	109	
C1-Phenanthrenes/Anthracenes		ND			
C2-Phenanthrenes/Anthracenes		ND			
C3-Phenanthrenes/Anthracenes		ND			
C4-Phenanthrenes/Anthracenes		ND			
Dibenzothiophene	1361.59		1262.50	108	
C1-Dibenzothiophenes		ND			
C2-Dibenzothiophenes		ND			
C3-Dibenzothiophenes		ND			
Fluoranthene	1442.31		1275.00	113	
Pyrene	1506.34		1275.00	118	
C1-Fluoranthenes/Pyrenes		ND			
C2-Fluoranthenes/Pyrenes		ND			
C3-Fluoranthenes/Pyrenes		ND			
Benzo(a)anthracene	1640.4		1262.50	130	
Chrysene	1711.53		1262.50	136	N
C1-Chrysenes		ND			
C2-Chrysenes		ND			
C3-Chrysenes		ND			
C4-Chrysenes		ND			
Benzo(b)fluoranthene	1472.29		1262.50	117	
Benzo(k)fluoranthene		ND			
Benzo(e)pyrene	1636.91		1267.50	129	
Benzo(a)pyrene	1477.44		1275.00	116	
Perylene	1302.45		1262.50	103	
Indeno(1,2,3-cd)pyrene	1403.12		1262.50	111	
Dibenz(a,h)anthracene	1473.26		1262.50	117	
Benzo(g,h,i)perylene	1409.04		1262.50	112	
Total PAH (ng/SPMD)	27322.95				
Surrogate Recoveries (%)					
Naphthalene-d8	28	N			
Acenaphthene-d10	53				
Phenanthrene-d10	60				
Benzo(a)pyrene-d12	64				

Surrogate Corrected

Laboratory Batch Number	04-0053				04-0053	
Client ID	GF66: North Slope Crude				GG09: NorthSTAR Control Oil - cANIMIDA	
Location						
Battelle ID	BF479NSC-P				BF480CO-P	
Collection Date	11/24/04				11/24/04	
% Moisture	NA				NA	
% Lipid	NA				NA	
Matrix	TISSUE				TISSUE	
Sample Size	5.04				5.00	
Size Unit-Basis	SPMD_OIL				SPMD_OIL	
Units	MG/KG_OIL		Target	% Difference	Qualifier	MG/KG_OIL	
PAH:						
Naphthalene	781.66		714.43	9.4		1009.71	
C1-Naphthalenes	1570.77		1534.53	2.4		2231.96	
C2-Naphthalenes	2012.74		1897.27	6.1		2799.3	
C3-Naphthalenes	1465.58		1436.53	2.0		1871	
C4-Naphthalenes	877.79		773.42	13.5		939.9	
Biphenyl	229.78		216.49	6.1		376.11	
Acenaphthylene		ND					ND
Acenaphthene	15.72					20.2	
Fluorene	112.12		87.56	28.1		186.33	
C1-Fluorenes	251.49		219.89	14.4		317.07	
C2-Fluorenes	390.29		341.20	14.4		382.35	
C3-Fluorenes	323.68		299.61	8.0		293.31	
Anthracene		ND					ND
Phenanthrene	302.79		272.58	11.1		358.82	
C1-Phenanthrenes/Anthracenes	638.78		564.81	13.1		728.71	
C2-Phenanthrenes/Anthracenes	703.73		660.43	6.6		741.99	
C3-Phenanthrenes/Anthracenes	496.16		448.76	10.6		493.84	
C4-Phenanthrenes/Anthracenes	194.1		176.00	10.3		198.24	
Dibenzothiophene	253.4		218.80	15.8		96.35	
C1-Dibenzothiophenes	475.23		434.54	9.4		197.9	
C2-Dibenzothiophenes	626.44		551.44	13.6		208.59	
C3-Dibenzothiophenes	551.41		460.96	19.6		138.61	
Fluoranthene	3.52					4.36	
Pyrene	18					22.88	
C1-Fluoranthenes/Pyrenes	90.74		78.43	15.7		106.03	
C2-Fluoranthenes/Pyrenes	159.43		132.93	19.9		164.05	
C3-Fluoranthenes/Pyrenes	196.01		151.73	29.2		170.67	
Benzo(a)anthracene	5.9					5.61	
Chrysene	62.97		50.99	23.5		58.07	
C1-Chrysenes	104.79		81.69	28.3		102.13	
C2-Chrysenes	133.56		95.93	39.2	N	132.68	
C3-Chrysenes	102.45		89.87	14.0		115.69	
C4-Chrysenes	79.67		76.33	4.4		71.41	
Benzo(b)fluoranthene	6.3					4.39	
Benzo(k)fluoranthene		ND					ND
Benzo(e)pyrene	13.17					13.36	
Benzo(a)pyrene	0.79	J				0.86	J
Perylene	0.66	J					ND
Indeno(1,2,3-cd)pyrene		ND					ND
Dibenz(a,h)anthracene	1.11	J				0.71	J
Benzo(g,h,i)perylene	3.37					1.35	
Total PAH (ng/SPMD)	13256.1					14564.54	
Surrogate Recoveries (%)							
Naphthalene-d8	77					83	
Acenaphthene-d10	85					91	
Phenanthrene-d10	85					86	
Benzo(a)pyrene-d12	107					112	

Surrogate Corrected

cANIMIDA Tissue Metals Data

This page left intentionally blank.

2004 Tissue Metals Data

This page left intentionally blank.

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Complete: Last Revised: RPT 6/22/05

Table 1. Station Data for Trace Metal Organism Samples.

Sample Identification	Station Identification	Station Grouping	Collection Date	Organism Type	Comments
04-N03-01-PHC/MET-T	N03	Northstar	8/8/2004	Amphipods	
04-N04-01-PHC/MET-T	N04	Northstar	8/9/2004	"	
04-N11-01-PHC/MET-T-AN	N11	Northstar	7/29/2004	"	
04-L04-01-PHC/MET-T-AN	L04	Liberty	8/2/2004	"	
04-L18-01-PHC/MET-T	L18	Liberty	8/13/2004	"	
04-4A-01-PHC/MET-T-AN	4A	BSMP	8/3/2004	"	
04-5B-01-PHC/MET-T	5B	BSMP	8/9/2004	"	
04-5(0)-01-PHC/MET-T-AN	5(0)	BSMP	8/3/2004	"	
04-L08-01-PHC/MET-T-AS	L08	Liberty	8/2/2004	Clams	
04-3A-01-PHC/MET-T-AS	3A	BSMP	8/12/2004	"	
04-5F-01-PHC/MET-T	5F	BSMP	8/9/2004	"	
04-5H-01-PHC/MET-T-AS	5H	BSMP	8/2/2004	"	
04-N04-01-PHC/MET-T-MU	N04	Northstar	8/15/2004	Mussels	
04-N05-01-PHC/MET-T-MU	N05	Northstar	8/15/2004	"	
04-N06-01-PHC/MET-T-MU	N06	Northstar	8/15/2004	"	
04-L06-01-PHC/MET-T-MU	L06	Liberty	8/13/2004	"	
04-3A-01-PHC/MET-T-MU	3A	BSMP	8/13/2004	"	
04-5H-01-PHC/MET-T-MU	5H	BSMP	8/14/2004	"	
04-MZ-01-PHC/MET-T-MU	-	-	7/30/2004	"	
04-MZ-02-PHC/MET-T-MU	-	-	7/29/2004	"	
04-MZ-03-PHC/MET-T-MU	-	-	7/30/2004	"	
04-N25-01-PHC/MET-T	N25	Northstar	8/15/2004	Arctic Cod	Composite of 3 fish, small tissue mass
04-N25-03-PHC/MET-T	N25	Northstar	8/15/2004	Arctic Cod	Composite of 5 fish, small tissue mass
04-L14-03-PHC/MET-T	L14	Liberty	8/13/2004	Arctic Cod	Composite of 3 fish, small tissue mass
04-L14-05-PHC/MET-T	L14	Liberty	8/13/2004	Arctic Cod	Composite of 4 fish, small tissue mass
04-PBS-04-PHC/MET-T	PBS	-	8/6/2004	Arctic Cisco	
04-PBS-06-PHC/MET-T	PBS	-	8/6/2004	Least Cisco	
04-PBS-08-PHC/MET-T	PBS	-	8/6/2008	Arctic Cisco	
04-PBS-09-PHC/MET-T	PBS	-	8/6/2004	Broad Whitefish	
04-PBS-19-PHC/MET-T	PBS	-	8/6/2004	Four Horn Sculpin	
04-PBS-21-PHC/MET-T	PBS	-	8/7/2004	Broad Whitefish	
04-PBS-25-PHC/MET-T	PBS	-	8/7/2004	Least Cisco	
04-PBS-26-PHC/MET-T	PBS	-	8/7/2004	Arctic Char (Dolly Varden)	Small tissue mass
04-PBS-27-PHC/MET-T	PBS	-	8/7/2004	Four Horn Sculpin	
04-SIS-01-PHC/MET-T	SIS	-	8/8/2004	Least Cisco	
04-SIS-03-PHC/MET-T	SIS	-	8/8/2004	Arctic Cisco	
04-SIS-06-PHC/MET-T	SIS	-	8/8/2004	Arctic Cisco	
04-SIS-07-PHC/MET-T	SIS	-	8/8/2004	Least Cisco	
04-SIS-09-PHC/MET-T	SIS	-	8/8/2004	Arctic Cisco	
04-SIS-14-PHC/MET-T	SIS	-	8/8/2004	Four Horn Sculpin	
04-SIS-15-PHC/MET-T	SIS	-	8/8/2004	Four Horn Sculpin	
04-SIS-17-PHC/MET-T	SIS	-	8/8/2004	Arctic Cod	
04-TGV-01-PHC/MET-T	TGV	-	8/12/2004	Arctic Char (Dolly Varden)	
04-TGV-02-PHC/MET-T	TGV	-	8/12/2004	Least Cisco	
04-TGV-04-PHC/MET-T	TGV	-	8/12/2004	Arctic Flounder	
04-TGV-06-PHC/MET-T	TGV	-	8/12/2004	Arctic Flounder	
04-TGV-08-PHC/MET-T	TGV	-	8/12/2004	Four Horn Sculpin	
04-TGV-21-PHC/MET-T	TGV	-	8/12/2004	Arctic Char (Dolly Varden)	
04-TGV-26-PHC/MET-T	TGV	-	8/12/2004	Least Cisco	
04-TGV-30-PHC/MET-T	TGV	-	8/12/2004	Four Horn Sculpin	

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Table 2. Trace Metal Concentrations in Amphipod, Clam, and Mussel Samples (dry weight) and Water Content.

Sample Identification	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)	Comments
04-N03-01-PHC/MET-T	78	3.43	322	12.5	22.8	0.008	0.660	2.16	0.43	206	240	0.052	39.7	2.12	1.27	0.034	-	0.018	1.30	118	Amphipods
04-N04-01-PHC/MET-T	76	2.75	271	9.97	31.3	0.007	0.434	2.23	0.58	176	218	0.045	44.3	1.70	0.371	0.020	-	0.014	1.60	103	"
04-N11-01-PHC/MET-T-AN	73	5.96	740	15.9	50.4	0.019	1.32	3.48	0.85	333	439	0.059	99.4	5.51	4.39	0.020	-	0.008	3.48	214	"
04-L04-01-PHC/MET-T-AN #1	78	2.98	545	7.57	25.1	0.011	0.569	2.44	0.96	160	337	0.063	40.9	2.69	0.291	0.016	-	0.012	2.73	104	Lab Duplicate
04-L04-01-PHC/MET-T-AN #2	78	3.04	555	7.57	23.0	0.013	0.597	2.44	0.95	160	345	0.070	42.5	2.62	0.305	0.015	-	0.011	2.67	105	Lab Duplicate
04-L18-01-PHC/MET-T	76	2.91	494	6.59	23.5	0.010	0.605	2.21	0.66	147	297	0.080	45.5	2.37	0.285	0.013	-	0.010	2.34	101	"
04-4A-01-PHC/MET-T-AN	78	2.84	358	6.66	14.1	0.008	0.559	2.07	0.60	139	212	0.068	40.1	2.20	0.097	0.009	-	0.011	1.91	94.8	"
04-5B-01-PHC/MET-T	79	1.85	164	9.26	10.7	0.005	2.05	0.95	0.35	108	103	0.191	10.3	1.05	0.379	0.016	-	0.028	2.02	170	"
04-5(0)-01-PHC/MET-T-AN	74	2.54	312	6.39	35.6	0.010	0.763	2.44	0.43	158	237	0.053	56.2	2.17	0.187	0.017	-	0.009	1.16	103	"
04-L08-01-PHC/MET-T-AS	83	0.123	2150	14.3	20.2	0.042	5.24	3.92	4.41	13.2	3640	0.075	637	5.28	1.16	0.026	-	0.015	6.91	88.5	Clams
04-3A-01-PHC/MET-T-AS	86	0.092	721	15.2	18.5	0.044	5.04	3.01	2.28	11.2	2700	0.072	348	4.35	0.636	0.021	-	0.016	3.92	68.7	"
04-5F-01-PHC/MET-T	80	0.134	1810	8.22	10.8	0.043	0.527	1.11	2.41	18.5	1440	0.066	68.3	1.92	0.728	0.018	-	0.024	5.31	77.1	"
04-5H-01-PHC/MET-T-AS	85	0.087	1020	10.8	22.5	0.049	5.85	1.82	2.58	11.6	1040	0.062	152	3.97	0.607	0.021	-	0.026	3.34	82.4	"
04-N04-01-PHC/MET-T-MU	87	0.111	2030	9.84	20.0	0.044	1.51	1.04	3.40	7.5	1230	0.074	21.2	2.39	0.956	0.020	-	0.023	4.65	88.3	Mussels
04-N05-01-PHC/MET-T-MU #1	88	0.133	854	11.5	8.5	0.018	2.71	0.87	1.63	9.4	569	0.091	13.7	1.74	1.10	0.009	-	0.023	2.79	121	Lab Duplicate
04-N05-01-PHC/MET-T-MU #2	87	0.126	889	10.7	8.3	0.019	2.66	0.88	1.66	8.9	580	0.087	14.7	1.79	1.06	0.009	-	0.022	2.90	117	Lab Duplicate
04-N06-01-PHC/MET-T-MU	87	0.096	1570	8.92	15.2	0.025	2.40	0.99	2.66	7.5	1080	0.109	18.6	1.91	0.861	0.014	-	0.028	4.24	46.8	"
04-L06-01-PHC/MET-T-MU	87	0.095	479	8.52	8.6	0.012	2.58	0.59	1.52	8.1	380	0.069	9.0	1.44	0.731	0.013	-	0.035	1.90	93.8	"
04-3A-01-PHC/MET-T-MU	86	0.104	569	8.86	8.8	0.017	1.87	0.65	1.53	7.7	461	0.078	10.1	1.29	0.777	0.015	-	0.029	2.11	98.8	"
04-5H-01-PHC/MET-T-MU	87	0.089	1760	8.93	12.7	0.037	2.42	0.86	3.72	8.2	1160	0.108	25.6	2.22	0.853	0.012	-	0.024	4.31	86.6	"
04-MZ-01-PHC/MET-T-MU	86	0.084	130	8.59	3.1	0.005	2.64	0.71	0.99	7.5	198	0.092	5.8	1.07	1.10	0.012	-	0.005	1.03	131	"
04-MZ-02-PHC/MET-T-MU	87	0.094	211	9.59	3.3	0.007	2.92	0.77	1.02	8.0	245	0.099	6.9	1.29	1.05	0.013	-	0.005	0.98	104	"
04-MZ-03-PHC/MET-T-MU	87	0.080	1000	6.91	9.3	0.016	1.58	0.62	2.26	5.5	678	0.116	15.8	1.68	0.504	0.015	-	0.006	2.99	64.1	"

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Table 3. Trace Metal Concentrations in Whole Fish Samples (dry weight) and Water Content.

Sample Identification	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)	Comments
04-PBS-26-PHC/MET-T	73	0.025	-	1.59	1.7	-	0.128	-	0.17	4.7	53.6	0.086	-	0.05	0.333	-	5.07	-	0.10	53.1	Arctic Char (Dolly Varden)
04-TGV-01-PHC/MET-T	74	0.051	-	3.03	1.7	-	0.111	-	0.10	4.7	37.7	0.057	-	0.08	0.123	-	2.71	-	0.13	96.6	"
04-TGV-21-PHC/MET-T	72	0.038	-	2.90	2.1	-	0.045	-	0.09	4.2	72.2	0.045	-	0.06	0.110	-	3.29	-	0.19	66.2	"
04-PBS-04-PHC/MET-T	76	0.026	-	3.79	2.6	-	0.039	-	0.14	3.6	49.6	0.077	-	0.16	0.022	-	2.35	-	0.16	82.5	Arctic Cisco
04-PBS-08-PHC/MET-T	74	0.009	-	2.69	8.9	-	0.034	-	0.54	3.3	112	0.075	-	0.37	0.097	-	2.53	-	0.40	76.3	"
04-SIS-03-PHC/MET-T	67	0.024	-	2.80	0.3	-	0.138	-	0.05	2.6	40.0	0.035	-	0.17	0.115	-	1.57	-	0.05	36.0	"
04-SIS-06-PHC/MET-T	70	0.024	-	3.39	0.4	-	0.054	-	0.16	3.2	42.0	0.056	-	0.15	0.033	-	1.68	-	0.07	38.6	"
04-SIS-09-PHC/MET-T	66	0.023	-	2.57	0.5	-	0.076	-	0.06	2.4	71.6	0.035	-	0.11	0.065	-	1.59	-	0.05	60.7	"
04-N25-01-PHC/MET-T	64	0.061	-	6.66	4.5	-	0.069	-	0.64	2.8	253	0.021	-	0.65	0.360	-	1.73	-	3.02	44.5	Arctic Cod
04-N25-03-PHC/MET-T	78	0.135	-	11.4	6.9	-	0.272	-	1.14	7.9	424	0.027	-	0.91	0.574	-	3.69	-	1.49	86.1	"
04-L14-03-PHC/MET-T	80	0.091	-	16.2	1.7	-	0.188	-	0.25	5.2	55.0	0.023	-	0.43	0.165	-	4.12	-	0.52	97.8	"
04-L14-05-PHC/MET-T	79	0.088	-	10.9	2.7	-	0.272	-	0.48	4.6	92.5	0.020	-	0.69	0.292	-	4.07	-	0.36	97.8	"
04-SIS-17-PHC/MET-T	72	0.099	-	2.07	2.1	-	0.052	-	0.12	2.2	37.2	0.062	-	0.30	0.087	-	3.08	-	0.19	88.3	"
04-TGV-04-PHC/MET-T	75	0.033	-	6.36	7.0	-	0.056	-	0.65	4.0	139	0.231	-	0.47	0.153	-	3.38	-	0.65	80.2	Arctic Flounder
04-TGV-06-PHC/MET-T	74	0.017	-	5.12	4.1	-	0.029	-	0.48	2.7	41.8	0.111	-	0.24	0.074	-	3.00	-	0.45	103	"
04-PBS-09-PHC/MET-T	75	0.022	-	1.12	2.7	-	0.071	-	0.37	3.2	180	0.048	-	0.22	0.032	-	2.32	-	0.50	59.2	Broad Whitefish
04-PBS-21-PHC/MET-T	77	0.108	-	1.74	2.7	-	0.026	-	0.27	4.2	143	0.099	-	0.18	0.177	-	2.96	-	0.63	41.8	"
04-PBS-19-PHC/MET-T	78	0.182	-	3.40	9.0	-	0.166	-	0.22	9.3	117	0.237	-	0.18	0.231	-	4.51	-	0.60	89.9	Four Horn Sculpin
04-PBS-27-PHC/MET-T	78	0.179	-	3.61	18.2	-	0.143	-	1.17	12.1	541	0.180	-	0.92	0.245	-	2.49	-	3.38	70.8	"
04-SIS-14-PHC/MET-T	74	0.348	-	3.84	14.2	-	0.166	-	0.58	18.2	318	0.139	-	0.61	0.324	-	4.08	-	1.33	99.5	"
04-SIS-15-PHC/MET-T	78	0.254	-	4.99	11.0	-	0.243	-	0.48	11.9	228	0.139	-	0.79	0.157	-	4.03	-	1.21	106	"
04-TGV-08-PHC/MET-T	77	0.062	-	3.92	9.2	-	0.046	-	0.46	6.1	191	0.096	-	0.23	0.258	-	3.81	-	1.03	92.5	"
04-TGV-30-PHC/MET-T	78	0.141	-	9.47	3.0	-	0.323	-	0.31	9.1	114	0.454	-	0.17	0.074	-	5.66	-	0.34	105	"
04-PBS-06-PHC/MET-T	77	0.007	-	1.56	3.0	-	0.029	-	0.11	2.0	49.0	0.152	-	0.11	0.038	-	2.37	-	0.05	109	Least Cisco
04-PBS-25-PHC/MET-T	77	0.022	-	2.45	0.7	-	0.032	-	0.08	2.9	44.5	0.050	-	0.09	0.052	-	2.38	-	0.07	51.4	"
04-SIS-01-PHC/MET-T	74	0.039	-	3.91	0.7	-	0.184	-	0.11	2.6	49.1	0.094	-	0.35	0.110	-	2.23	-	0.15	47.9	"
04-SIS-07-PHC/MET-T	73	0.017	-	3.94	1.0	-	0.022	-	0.16	2.3	57.6	0.163	-	0.26	0.116	-	1.89	-	0.19	38.7	"
04-TGV-02-PHC/MET-T #1	74	0.024	-	2.77	0.5	-	0.044	-	0.13	1.4	51.9	0.196	-	0.14	0.173	-	2.57	-	0.12	83.1	Lab Duplicate
04-TGV-02-PHC/MET-T #2	76	0.022	-	2.97	0.5	-	0.044	-	0.10	1.5	53.7	0.196	-	0.14	0.177	-	2.60	-	0.11	80.8	Lab Duplicate
04-TGV-26-PHC/MET-T	74	0.030	-	3.17	2.0	-	0.059	-	0.07	2.8	87.1	0.199	-	0.17	0.082	-	2.36	-	0.19	70.1	"

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Table 6. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Results for the Standard Reference Material (SRM) Mussel Tissue #2976 certified by the National Institute of Standards and Technology (NIST), Certified Reference Material (CRM) Dogfish Muscle DORM-2 certified by the National Research Council of Canada (NRC), and the SRM Trace Elements in Water #1643d certified by NIST.

Reference Material	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
SRM #2976	0.010	152	12.0	0.7	0.004	0.959	0.60	0.47	3.9	173	0.058	34.1	0.85	1.12	0.014	1.83	0.002	0.70	145
This Study	0.010	-	13.0	0.7	-	0.736	-	0.43	3.80	172	0.063	-	0.86	1.19	-	-	-	0.83	147
SRM #2976	0.011*	134*	13.3	-	-	0.82	0.61*	0.50*	4.02	171.0	0.061	33*	0.93*	1.19	-	1.80	0.001**	-	137
NIST Certified Values	± 0.005	± 34	± 1.8	-	-	± 0.16	± 0.02	± 0.16	± 0.33	± 4.9	± 0.0036	± 2	± 0.12	± 0.18	-	± 0.15	-	-	± 13
CRM DORM-2	0.047	11.9	17.2	2.1	0.004	0.048	0.168	32.8	2.4	137	4.68	3.6	16.9	0.061	0.026	1.37	0.007	0.22	24.4
This Study	0.041	-	17.4	2.3	-	0.037	-	34.4	2.2	147	4.67	-	18.4	0.064	-	-	-	0.33	26.1
CRM DORM-2	0.041	10.9	18.0	-	-	0.043	0.182	34.7	2.34	142	4.64	3.66	19.4	0.065	-	1.40	0.004**	-	25.6
NRC Certified Values	± 0.013	± 1.7	± 1.1	-	-	± 0.008	± 0.031	± 5.5	± 0.16	± 10	± 0.26	± 0.34	± 3.1	± 0.007	-	± 0.09	-	-	± 2.3
				(µg/L)	(µg/L)										(µg/L)		(µg/L)	(µg/L)	
SRM #1643d	-	-	-	508	12.38	-	-	-	-	-	-	-	-	-	54.9	-	7.46	34.9	-
This Study	-	-	-	504	-	-	-	-	-	-	-	-	-	-	-	-	-	34.7	-
SRM #1643d	-	-	-	506.5	12.53	-	-	-	-	-	-	-	-	-	54.1	-	7.28	35.1	-
NIST Certified Values	-	-	-	± 8.9	± 0.28	-	-	-	-	-	-	-	-	-	± 1.1	-	± 0.25	± 1.4	-

* Reference Value, not Certified. ** Information Value, not Certified.

Method Detection Limits (MDLs).

	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Method Detection Limit	0.004	2.3	0.03	0.01	0.001	0.001	0.003	0.01	0.7	2.5	0.001	1.1	0.01	0.003	0.001	0.03	0.005	0.01	0.4

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Table 6. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Percent Spike Recovery.

	Ag***	Al	As***	Ba	Be	Cd	Co***	Cr	Cu	Fe	Hg***	Mn	Ni	Pb	Sb	Se	Tl***	V	Zn
Mean	88.6	104.4	73.5	101.5	94.3	97.1	87.9	103.8	96.7	97.0	55.7	100.4	96.1	94.3	95.7	105.7	51.5	94.3	96.1
Standard Deviation	9.4	2.1	1.3	6.5	2.6	3.6	3.7	6.2	3.2	3.3	6.1	1.3	2.7	4.4	2.5	4.0	2.1	3.3	1.7
(n =)	4	2	4	4	2	4	2	4	4	4	12	2	4	4	2	2	2	2	4

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

	Ag	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Se	Tl	V	Zn
04-L04-01-PHC/MET-T-AN	1.4	1.3	0.0	6.2	11.8	3.4	0.0	0.7	0.0	1.7	7.4	2.7	1.9	3.3	4.6	-	6.1	1.6	0.7
04-N05-01-PHC/MET-T-MU	3.8	2.8	5.1	1.7	3.8	1.3	0.8	1.3	3.9	1.4	3.2	5.0	2.0	2.6	0.0	-	3.1	2.7	2.4
04-TGV-02-PHC/MET-T	6.1	-	4.9	0.0	-	0.0	-	18.4	4.9	2.4	0.0	-	0.0	1.6	-	0.8	-	6.1	2.0

Percent RSD = (standard deviation / mean) X 100

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Table 4. Statistics for Trace Metal Concentrations in Amphipod, Clam, and Mussel Samples (dry weight) and Water Content. Lab Duplicates were averaged prior to statistical analysis.

Sample Identification	Statistic	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Amphipods	Mean	76.5	3.16	401	9.36	26.6	0.010	0.872	2.25	0.61	178	261	0.077	47.2	2.47	0.910	0.018	-	0.014	2.06	126
	Std. Dev.	2.1	1.22	183	3.38	12.6	0.004	0.546	0.69	0.21	68.6	99.7	0.047	24.8	1.32	1.45	0.007	-	0.007	0.77	42.9
	n	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	-	8	8	8
	Maximum	79	5.96	740	15.9	50.4	0.019	2.05	3.48	0.96	333	439	0.191	99.4	5.51	4.39	0.034	-	0.028	3.48	214
	Minimum	73	1.85	164	6.39	10.7	0.005	0.434	0.95	0.35	108	103	0.045	10.3	1.05	0.097	0.009	-	0.008	1.16	94.8
Clams	Mean	83.5	0.109	1425	12.1	18.0	0.045	4.16	2.47	2.92	13.6	2205	0.069	301	3.88	0.783	0.022	-	0.020	4.87	79.2
	Std. Dev.	2.6	0.023	667	3.22	5.1	0.003	2.45	1.25	1.00	3.4	1190	0.006	253	1.42	0.257	0.003	-	0.006	1.59	8.4
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	-	4	4	4
	Maximum	86	0.134	2150	15.2	22.5	0.049	5.85	3.92	4.41	18.5	3640	0.075	637	5.28	1.16	0.026	-	0.026	6.91	88.5
	Minimum	80	0.087	721	8.22	10.8	0.042	0.527	1.11	2.28	11.2	1040	0.062	68.3	1.92	0.607	0.018	-	0.015	3.34	68.7
Mussels	Mean	86.8	0.098	958	9.03	9.9	0.020	2.29	0.79	2.08	7.7	667	0.093	14.1	1.67	0.879	0.014	-	0.020	2.78	92.5
	Std. Dev.	0.5	0.015	689	1.13	5.4	0.013	0.51	0.16	0.99	1.0	397	0.017	6.8	0.45	0.193	0.003	-	0.011	1.39	25.8
	n	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	-	9	9	9
	Maximum	88	0.130	2030	11.1	20.0	0.044	2.92	1.04	3.72	9.2	1230	0.116	25.6	2.39	1.10	0.020	-	0.035	4.65	131
	Minimum	86	0.080	130	6.91	3.1	0.005	1.51	0.59	0.99	5.5	198	0.069	5.8	1.07	0.504	0.009	-	0.005	0.98	46.8

MMS Beaufort Sea cANIMDA Project: Summer 2004 Sampling

Table 5. Statistics for Trace Metal Concentrations in Whole Fish Samples (dry weight) and Water Content. Lab Duplicates were averaged prior to statistical analysis.

Sample Identification	Statistic	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Arctic Char	Mean	73.0	0.038	-	2.51	1.9	-	0.095	-	0.12	4.5	54.5	0.063	-	0.06	0.189	-	3.69	-	0.14	72.0
(Dolly Varden)	Std. Dev.	1.0	0.013	-	0.80	0.3	-	0.044	-	0.04	0.3	17.3	0.021	-	0.02	0.125	-	1.23	-	0.05	22.3
	n	3	3	-	3	2	-	3	-	3	3	3	3	-	3	3	-	3	-	3	3
	Maximum	74	0.051	-	3.03	2.1	-	0.128	-	0.17	4.7	72.2	0.086	-	0.08	0.333	-	5.07	-	0.19	96.6
	Minimum	72	0.025	-	1.59	1.7	-	0.045	-	0.09	4.2	37.7	0.045	-	0.05	0.110	-	2.71	-	0.10	53.1
Arctic	Mean	70.6	0.021	-	3.05	2.5	-	0.068	-	0.19	3.0	63.0	0.056	-	0.19	0.066	-	1.94	-	0.15	58.8
Cisco	Std. Dev.	4.3	0.007	-	0.52	4.3	-	0.042	-	0.20	0.5	30.1	0.021	-	0.10	0.040	-	0.46	-	0.15	21.2
	n	5	5	-	5	4	-	5	-	5	5	5	5	-	5	5	-	5	-	5	5
	Maximum	76	0.026	-	3.79	8.9	-	0.138	-	0.54	3.6	112	0.077	-	0.37	0.115	-	2.53	-	0.40	82.5
	Minimum	66	0.009	-	2.57	0.3	-	0.034	-	0.05	2.4	40.0	0.035	-	0.11	0.022	-	1.57	-	0.05	36.0
Arctic	Mean	74.6	0.095	-	9.45	4.0	-	0.171	-	0.53	4.5	172	0.031	-	0.60	0.296	-	3.34	-	1.12	82.9
Cod	Std. Dev.	6.7	0.027	-	5.33	2.3	-	0.106	-	0.40	2.2	165	0.018	-	0.24	0.189	-	0.99	-	1.18	22.1
	n	5	5	-	5	4	-	5	-	5	5	5	5	-	5	5	-	5	-	5	5
	Maximum	80	0.135	-	16.2	6.9	-	0.272	-	1.14	7.9	424	0.062	-	0.91	0.574	-	4.12	-	3.02	97.8
	Minimum	64	0.061	-	2.07	1.7	-	0.052	-	0.12	2.2	37.2	0.020	-	0.30	0.087	-	1.73	-	0.19	44.5
Arctic	Mean	74.5	0.025	-	5.74	5.6	-	0.043	-	0.57	3.4	90.4	0.171	-	0.36	0.114	-	3.19	-	0.55	91.6
Flounder	Std. Dev.	0.7	0.011	-	0.88	2.1	-	0.019	-	0.12	0.9	68.7	0.085	-	0.16	0.056	-	0.27	-	0.14	16.1
	n	2	2	-	2	2	-	2	-	2	2	2	2	-	2	2	-	2	-	2	2
	Maximum	75	0.033	-	6.36	7.0	-	0.056	-	0.65	4.0	139	0.231	-	0.47	0.153	-	3.38	-	0.65	103
	Minimum	74	0.017	-	5.12	4.1	-	0.029	-	0.48	2.7	41.8	0.111	-	0.24	0.074	-	3.00	-	0.45	80.2
Broad	Mean	76.0	0.065	-	1.43	2.7	-	0.049	-	0.32	3.7	162	0.074	-	0.20	0.105	-	2.64	-	0.57	50.5
Whitefish	Std. Dev.	1.4	0.061	-	0.44	0.0	-	0.032	-	0.07	0.7	26.2	0.036	-	0.03	0.103	-	0.45	-	0.09	12.3
	n	2	2	-	2	2	-	2	-	2	2	2	2	-	2	2	-	2	-	2	2
	Maximum	77	0.108	-	1.74	2.7	-	0.071	-	0.37	4.2	180	0.099	-	0.22	0.177	-	2.96	-	0.63	59.2
	Minimum	75	0.022	-	1.12	2.7	-	0.026	-	0.27	3.2	143	0.048	-	0.18	0.032	-	2.32	-	0.50	41.8
Four Horn	Mean	77.2	0.194	-	4.87	9.3	-	0.181	-	0.54	11.1	252	0.208	-	0.48	0.215	-	4.10	-	1.32	94.0
Sculpin	Std. Dev.	1.6	0.098	-	2.32	4.1	-	0.094	-	0.34	4.1	161	0.130	-	0.33	0.087	-	1.03	-	1.08	13.1
	n	6	6	-	6	5	-	6	-	6	6	6	6	-	6	6	-	6	-	6	6
	Maximum	78	0.348	-	9.47	14.2	-	0.323	-	1.17	18.2	541	0.454	-	0.92	0.324	-	5.66	-	3.38	106
	Minimum	74	0.062	-	3.40	3.0	-	0.046	-	0.22	6.1	114	0.096	-	0.17	0.074	-	2.49	-	0.34	70.8
Least	Mean	75.0	0.023	-	2.98	1.3	-	0.062	-	0.11	2.3	56.7	0.142	-	0.19	0.096	-	2.30	-	0.13	66.5
Cisco	Std. Dev.	1.7	0.011	-	0.91	1.0	-	0.061	-	0.03	0.5	15.5	0.059	-	0.10	0.050	-	0.23	-	0.06	26.1
	n	6	6	-	6	6	-	6	-	6	6	6	6	-	6	6	-	6	-	6	6
	Maximum	77	0.039	-	3.94	3.0	-	0.184	-	0.16	2.9	87.1	0.199	-	0.35	0.175	-	2.59	-	0.19	109
	Minimum	73	0.007	-	1.56	0.5	-	0.022	-	0.07	1.5	44.5	0.050	-	0.09	0.038	-	1.89	-	0.05	38.7

This page left intentionally blank.

2005 Tissue Metals Data

This page left intentionally blank.

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Complete: Last Revised: RPT 12/23/05

Table 1. Station Data for Trace Metal Organism Samples.

Sample Identification	Station Identification	Station Grouping	Collection Date	Organism Type	Comments
05-N03-01-PHC-T-AN	N03	Northstar	8/11/2005	Amphipods	Anonyx
05-N11-01-PHC-T-AN	N11	Northstar	8/11/2005	"	"
05-N18-01-PHC-T-AN	N18	Northstar	8/11/2005	"	"
05-BP01-01-PHC-T-AN	BP01	Boulder Patch	8/2/2005	"	"
05-BP01-02-PHC-T-AN	BP01	Boulder Patch	8/12/2005	"	"
05-E01-01-PHC-T-AN	E01	Endicott	8/2/2005	"	"
05-1C-01-PHC-T-AN	1C	BSMP	8/8/2005	"	"
05-2F-01-PHC-T-AN	2F	BSMP	8/7/2005	"	"
05-4A-01-PHC-T-AN	4A	BSMP	7/31/2005	"	"
05-4B-01-PHC-T-AN	4B	BSMP	8/12/2005	"	"
05-5(1)-01-PHC-T-AN	5(1)	BSMP	8/11/2005	"	"
05-L08-01-PHC-T-AS	L08	Liberty	7/30/2005	Clams	Astarte
05-1A-01-PHC-T-AS	1A	BSMP	8/7/2005	"	"
05-3A-01-PHC-T-AS	3A	BSMP	7/30/2005	"	"
05-5(1)-01-PHC-T-AS	5(1)	BSMP	8/9/2005	"	"
05-1E-01-PHC-T-CY	1E	BSMP	8/7/2005	"	Cyrtodaria
05-2F-01-PHC-T-CY	2F	BSMP	8/6/2005	"	"
05-L07-01-PHC-T-ISO	L07	Liberty	8/12/2005	Isopods	
05-L08-01-PHC-T-ISO	L08	Liberty	8/1/2005	"	
05-L08-02-PHC-T-ISO	L08	Liberty	8/12/2005	"	
05-1A-01-PHC-T-ISO	1A	BSMP	8/8/2005	"	
05-1D-01-PHC-T-ISO	1D	BSMP	8/8/2005	"	
05-2F-01-PHC-T-ISO	2F	BSMP	8/7/2005	"	
05-4B-01-PHC-T-ISO	4B	BSMP	8/12/2005	"	
05-N03-01-PHC-T-MU	N03	Northstar	8/11/2005	Mussels	Transplanted
05-PB1-01-PHC-T-MU	PB1	Prudhoe Bay	8/10/2005	"	"
05-BP01-01-PHC-T-MU	BP01	Boulder Patch	8/12/2005	"	"
05-E01-01-PHC-T-MU	E01	Endicott	8/11/2005	"	"
05-L08-01-PHC-T-MU	L08	Liberty	8/12/2005	"	"
05-2G-01-PHC-T-MU	2G	BSMP	8/17/2005	"	"
05-5(1)-01-PHC-T-MU	5(1)	BSMP	8/11/2005	"	"
05-PC-01-PHC-T-MU	PC	Port Chatham	7/26/2005	"	Zero Time
05-PC-02-PHC-T-MU	PC	Port Chatham	8/2/2005	"	"
05-SIS-02-PHC-T-F	SIS	Northstar	8/1/2005	Arctic Char	
05-SIS-03-PHC-T-F	SIS	Northstar	8/1/2005	"	
05-SIS-04-PHC-T-F	SIS	Northstar	8/1/2005	"	
05-PB-01-PHC-T-F	PB	Point Brower	8/4/2005	Arctic Cisco	
05-PB-03-PHC-T-F	PB	Point Brower	8/4/2005	"	
05-PB-09-PHC-T-F	PB	Point Brower	8/4/2005	"	
05-PB-17-PHC-T-F	PB	Point Brower	8/4/2005	Arctic Flounder	
05-PB-18-PHC-T-F	PB	Point Brower	8/4/2005	"	
05-SIS-05-PHC-T-F	SIS	Northstar	8/1/2005	Four Horn Sculpin	
05-SIS-06-PHC-T-F	SIS	Northstar	8/1/2005	"	
05-PB-07-PHC-T-F	PB	Point Brower	8/4/2005	Humpback Broad Whitefish	
05-PB-10-PHC-T-F	PB	Point Brower	8/4/2005	"	
05-PB-11-PHC-T-F	PB	Point Brower	8/4/2005	"	
05-PB-13-PHC-T-F	PB	Point Brower	8/4/2005	"	
05-PB-14-PHC-T-F	PB	Point Brower	8/4/2005	"	
04-SIS-07-PHC-T-F	SIS	Northstar	8/1/2005	"	
04-SIS-08-PHC-T-F	SIS	Northstar	8/1/2005	"	
04-SIS-11-PHC-T-F	SIS	Northstar	8/1/2005	"	
04-SIS-13-PHC-T-F	SIS	Northstar	8/1/2005	"	
04-SIS-14-PHC-T-F	SIS	Northstar	8/1/2005	"	

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Table 2. Trace Metal Concentrations in Amphipod, Clam, Isopod and Mussel Samples (dry weight) and Water Content. Values in (red) have been excluded from statistical analysis.

Sample Identification	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)	Comments
05-N03-01-PHC-T-AN	74	2.94	305	14.2	25.1	0.021	0.938	1.69	0.55	189	235	0.095	28.8	0.84	0.308	0.027	-	0.009	1.09	119	Anonyx Amphipods
05-N11-01-PHC-T-AN	77	2.85	263	7.90	25.1	0.024	0.796	1.69	0.41	173	177	0.055	47.7	1.75	0.271	0.022	-	0.010	1.02	102	"
05-N18-01-PHC-T-AN #1	74	2.98	172	12.4	24.6	0.027	0.701	2.02	2.94	196	212	0.048	47.2	2.95	0.228	0.027	-	0.009	1.21	108	Lab Duplicate
05-N18-01-PHC-T-AN #2	74	2.99	168	12.6	25.4	0.024	0.680	2.01	3.05	200	207	0.045	47.0	3.03	0.217	0.027	-	0.009	1.16	106	Lab Duplicate
05-BP01-01-PHC-T-AN	78	3.91	169	12.9	16.8	0.017	2.37	1.44	0.62	185	183	0.115	15.3	1.17	0.131	0.029	-	0.010	0.80	151	"
05-BP01-02-PHC-T-AN	80	4.04	95.8	17.4	11.8	0.018	1.93	1.41	0.60	183	191	0.081	17.7	1.07	0.296	0.039	-	0.017	1.06	156	"
05-E01-01-PHC-T-AN	72	2.16	233	5.01	40.7	0.019	0.615	1.38	0.62	132	193	0.049	45.1	1.92	0.057	0.024	-	0.015	0.52	79.4	"
05-1C-01-PHC-T-AN	75	3.23	352	13.3	20.1	0.023	1.39	1.59	0.59	169	280	0.117	36.9	1.40	0.120	0.025	-	0.009	1.50	125	"
05-2F-01-PHC-T-AN	76	1.61	145	13.2	39.6	0.014	0.681	2.88	0.68	100	240	0.001	27.0	5.20	0.071	0.030	-	0.005	1.74	85.7	"
05-4A-01-PHC-T-AN	79	2.30	379	8.12	31.6	0.024	0.838	1.80	3.00	149	211	0.062	26.6	3.14	0.159	0.031	-	0.011	0.89	91.1	"
05-4B-01-PHC-T-AN	78	3.39	216	9.76	28.5	0.014	1.24	2.32	0.56	196	168	0.107	39.1	2.39	0.074	0.028	-	0.010	0.66	110	"
05-5(1)-01-PHC-T-AN	79	2.72	259	8.98	35.9	0.014	0.798	2.13	0.73	142	254	0.055	44.9	2.13	0.047	0.038	-	0.026	1.40	104	"
05-L08-01-PHC-T-AS	79	0.066	1220	16.0	24.8	0.085	3.88	1.67	3.70	11.1	1910	0.081	65.5	4.45	0.707	0.045	-	0.021	3.37	73.1	Astarte Clams
05-1A-01-PHC-T-AS	78	0.080	98.5	11.3	39.5	0.036	9.55	0.97	0.91	12.1	771	0.043	87.3	5.34	0.184	0.059	-	0.021	1.33	77.6	"
05-3A-01-PHC-T-AS	84	0.052	912	13.2	15.1	0.065	5.57	1.22	2.18	12.0	1570	0.044	78.4	4.22	0.593	0.051	-	0.028	2.92	64.9	"
05-5(1)-01-PHC-T-AS	84	0.074	511	11.4	7.9	0.044	4.00	1.68	1.72	12.5	807	0.047	205	3.79	0.275	0.031	-	0.015	2.11	79.3	"
05-1E-01-PHC-T-CY	78	0.080	271	11.8	7.9	0.019	1.43	0.75	5.15	16.4	879	0.030	96.3	4.87	0.345	0.038	-	0.030	0.97	57.8	Cyrtodaria Clams
05-2F-01-PHC-T-CY	75	0.137	1320	17.4	16.1	0.066	1.13	1.16	2.33	17.1	2110	0.046	174	2.04	1.24	0.050	-	0.018	4.72	74.6	"
05-L07-01-PHC-T-ISO	69	2.47	2820	21.4	66.1	0.096	0.981	4.13	5.69	104	2250	0.053	594	4.78	1.01	0.032	-	0.021	5.09	80.1	Isopods
05-L08-01-PHC-T-ISO	76	2.90	1650	24.1	51.8	0.071	1.01	3.71	2.71	141	1710	0.049	316	2.74	0.635	0.022	-	0.037	6.55	91.8	"
05-L08-02-PHC-T-ISO	74	2.68	1930	22.6	56.7	0.079	0.782	3.67	3.14	128	1570	0.059	322	3.44	0.767	0.028	-	0.036	9.52	80.8	"
05-1A-01-PHC-T-ISO	67	2.00	4480	34.4	68.8	0.170	0.833	3.56	6.72	104	3810	0.041	350	5.72	1.66	0.025	-	0.033	12.7	77.8	"
05-1D-01-PHC-T-ISO	73	1.88	4440	15.5	73.0	0.169	1.67	4.61	5.91	122	3180	0.071	342	5.67	2.01	0.018	-	0.023	7.17	80.9	"
05-2F-01-PHC-T-ISO	75	2.28	2480	22.7	60.0	0.113	1.38	5.31	3.98	111	2420	0.095	234	7.21	1.07	0.029	-	0.038	8.88	90.7	"
05-4B-01-PHC-T-ISO	71	2.77	2250	13.9	53.6	0.093	1.95	5.42	4.08	160	1740	0.076	608	3.27	1.09	0.023	-	0.014	6.37	79.5	"
05-N03-01-PHC-T-MU	88	0.089	131	11.3	7.2	0.017	4.77	0.76	1.12	7.0	265	0.253	8.5	1.27	0.524	0.008	-	0.037	0.99	95.6	Transplanted Mussels
05-PB1-01-PHC-T-MU	87	0.086	1470	12.1	8.6	0.050	4.25	1.01	3.31	9.2	1180	0.451	29.1	2.86	0.899	0.018	-	0.017	3.23	104	"
05-BP01-01-PHC-T-MU	88	0.074	803	12.1	10.8	0.028	4.11	0.69	1.93	8.6	688	0.063	17.1	1.79	0.780	0.020	-	0.020	2.15	113	"
05-E01-01-PHC-T-MU	87	0.078	606	10.7	8.3	0.019	3.97	0.57	1.46	6.5	520	0.068	14.8	1.56	0.602	0.007	-	0.035	1.08	76.0	"
05-L08-01-PHC-T-MU	86	0.069	1010	10.2	7.2	0.034	3.89	0.85	2.14	7.5	847	0.066	17.7	1.94	0.608	0.017	-	0.032	1.73	90.2	"
05-2G-01-PHC-T-MU	88	0.106	306	12.0	5.4	0.011	4.34	0.46	1.80	7.1	417	0.082	12.8	1.66	0.537	0.018	-	0.018	1.04	97.6	"
05-5(1)-01-PHC-T-MU	87	0.077	919	10.4	8.3	0.037	3.61	0.59	2.01	7.5	794	0.064	21.1	1.47	0.674	0.007	-	0.032	0.91	99.1	"
05-PC-01-PHC-T-MU	88	0.071	399	13.1	6.5	0.010	5.43	0.67	2.35	7.6	460	0.051	14.4	1.72	0.620	0.022	-	0.022	1.07	99.0	Zero Time Mussels
05-PC-02-PHC-T-MU	89	0.080	342	11.6	5.5	0.018	3.94	0.60	2.06	8.1	461	0.052	14.7	1.90	0.599	0.021	-	0.021	1.15	102	"

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Table 3. Trace Metal Concentrations in Whole Fish Samples (dry weight) and Water Content. Values in(red) have been excluded from statistical analysis.

Sample Identification	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)	Comments
05-SIS-02-PHC-T-F	72	0.032	-	7.35	0.5	-	0.054	-	0.04	3.7	54.4	0.045	-	0.03	0.110	-	2.49	-	0.12	59.5	Arctic Char
05-SIS-03-PHC-T-F	75	0.038	-	2.28	0.6	-	0.055	-	0.08	4.8	51.3	0.071	-	0.05	0.094	-	3.18	-	0.14	119	"
05-SIS-04-PHC-T-F	71	0.029	-	3.53	2.2	-	0.018	-	0.75	4.2	55.2	0.071	-	0.08	0.133	-	3.01	-	0.15	103	"
05-PB-01-PHC-T-F	61	0.007	-	3.72	1.2	-	0.010	-	0.04	1.1	19.4	0.056	-	0.10	0.054	-	0.94	-	0.08	40.9	Arctic Cisco
05-PB-03-PHC-T-F	69	0.010	-	3.38	3.5	-	0.030	-	0.13	2.8	62.9	0.063	-	0.15	0.096	-	1.83	-	0.15	90.5	"
05-PB-09-PHC-T-F	68	0.012	-	2.59	3.3	-	0.030	-	0.03	2.7	48.2	0.058	-	0.07	0.028	-	1.64	-	0.08	76.3	"
05-PB-17-PHC-T-F	75	0.017	-	3.08	4.5	-	0.026	-	0.15	2.1	31.9	0.084	-	0.18	0.095	-	3.31	-	0.09	98.6	Arctic Flounder
05-PB-18-PHC-T-F	72	0.042	-	3.40	15.6	-	0.041	-	0.78	4.1	211	0.072	-	0.47	0.112	-	2.84	-	0.54	113	"
05-SIS-05-PHC-T-F	77	0.352	-	3.85	46.6	-	0.212	-	3.81	21.2	1250	0.207	-	1.82	0.792	-	3.64	-	3.92	93.7	Four Horn Sculpin
05-SIS-06-PHC-T-F	79	0.077	-	2.91	18.7	-	0.370	-	0.60	4.7	61.3	0.030	-	0.41	0.118	-	3.35	-	0.92	89.9	"
05-PB-07-PHC-T-F #1	76	0.023	-	1.82	5.5	-	0.057	-	0.39	2.5	196	0.210	-	0.32	0.113	-	3.40	-	0.58	75.9	Humpback Broad Whitefish
05-PB-07-PHC-T-F #2	77	0.021	-	1.83	5.7	-	0.054	-	0.36	2.9	189	0.201	-	0.31	0.111	-	3.55	-	0.54	77.0	Lab Duplicate
05-PB-10-PHC-T-F	64	0.011	-	1.44	3.4	-	0.033	-	0.08	1.8	36.9	0.072	-	0.16	0.032	-	2.46	-	0.16	60.3	"
05-PB-11-PHC-T-F	76	0.014	-	0.81	5.6	-	0.017	-	0.07	1.8	45.7	0.266	-	0.19	0.054	-	2.66	-	0.25	74.8	"
05-PB-13-PHC-T-F	70	0.018	-	2.12	10.2	-	0.027	-	0.28	3.3	98.9	0.119	-	0.23	0.093	-	3.52	-	0.55	115	"
05-PB-14-PHC-T-F	71	0.015	-	1.87	3.5	-	0.018	-	0.08	2.1	56.3	0.103	-	0.17	0.070	-	2.68	-	0.19	51.2	"
04-SIS-07-PHC-T-F	73	0.016	-	1.00	0.7	-	0.041	-	0.05	2.2	58.8	0.201	-	0.18	0.110	-	2.34	-	0.16	77.7	"
04-SIS-08-PHC-T-F	70	0.010	-	1.37	1.7	-	0.028	-	0.21	2.3	50.9	0.124	-	0.20	0.055	-	2.28	-	0.20	45.9	"
04-SIS-11-PHC-T-F	73	0.009	-	1.27	2.2	-	0.028	-	0.07	2.3	30.8	0.065	-	0.14	0.033	-	2.23	-	0.12	46.2	"
04-SIS-13-PHC-T-F	69	0.040	-	1.45	9.3	-	0.083	-	0.92	5.6	507	0.109	-	0.53	0.256	-	2.21	-	0.74	42.4	"
04-SIS-14-PHC-T-F	74	0.012	-	1.37	3.6	-	0.044	-	0.17	2.1	88.1	0.102	-	0.29	0.082	-	2.95	-	0.18	44.6	"

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Table 6. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Results for the Standard Reference Material (SRM) Mussel Tissue #2976 certified by the National Institute of Standards and Technology (NIST), Certified Reference Material (CRM) Dogfish Muscle DORM-2 certified by the National Research Council of Canada (NRC), and the SRM Trace Elements in Water #1643d certified by NIST.

Reference Material	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
SRM #2976	0.009	137	13.3	0.7	0.012	0.82	0.61	0.47	3.8	171	0.059	33.6	0.85	1.14	0.017	1.76	0.002	0.73	146
This Study	0.012	-	14.5	0.8	-	0.95	-	0.47	4.0	175	0.060	-	0.84	1.24	-	-	-	0.73	143
SRM #2976	0.011*	134*	13.3	-	-	0.82	0.61*	0.50*	4.02	171.0	0.061	33*	0.93*	1.19	-	1.8	0.001**	-	137
NIST Certified Values	± 0.005	± 34	± 1.8	-	-	± 0.16	± 0.02	± 0.16	± 0.33	± 4.9	± 0.0036	± 2	± 0.12	± 0.18	-	± 0.15	-	-	± 13
CRM DORM-2	0.044	10.9	17.3	1.9	0.009	0.049	0.193	33.3	2.2	139	4.71	3.7	18.0	0.065	0.027	1.32	0.002	0.23	25.8
This Study	0.049	-	17.4	2.5	-	0.048	-	33.0	2.4	144	4.53	-	21.2	0.065	-	-	-	0.18	24.8
CRM DORM-2	0.041	10.9	18.0	-	-	0.043	0.182	34.7	2.34	142	4.64	3.66	19.4	0.065	-	1.4	0.004**	-	25.6
NRC Certified Values	± 0.013	± 1.7	± 1.1	-	-	± 0.008	± 0.031	± 5.5	± 0.16	± 10	± 0.26	± 0.34	± 3.1	± 0.007	-	± 0.09	-	-	± 2.3
				(µg/L)	(µg/L)										(µg/L)		(µg/L)	(µg/L)	
SRM #1643d	-	-	-	502	12.63	-	-	-	-	-	-	-	-	-	54.0		7.36	34.8	-
This Study	-	-	-	512	-	-	-	-	-	-	-	-	-	-	-	-	-	33.9	-
SRM #1643d	-	-	-	506.5	12.53	-	-	-	-	-	-	-	-	-	54.1	-	7.28	35.1	-
NIST Certified Values	-	-	-	± 8.9	± 0.28	-	-	-	-	-	-	-	-	-	± 1.1	-	± 0.25	± 1.4	-

* Reference Value, not Certified. ** Information Value, not Certified.

Method Detection Limits (MDLs).

	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Method Detection Limit	0.004	2.3	0.03	0.01	0.001	0.001	0.003	0.01	0.7	2.5	0.001	1.1	0.01	0.003	0.001	0.03	0.005	0.01	0.4

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Table 6. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Percent Spike Recovery.

	Ag	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg***	Mn	Ni	Pb	Sb	Se	Tl***	V	Zn
Mean	97.9	97.7	97.2	102.8	104.5	103.8	92.0	102.7	98.7	96.1	55.4	97.3	100.3	93.3	93.6	100.1	58.5		98.1
Standard Deviation	5.7	1.0	4.3	6.8	7.7	3.9	0.6	4.6	5.2	3.7	8.9	3.3	2.2	2.2	0.1	3.0	0.4		3.5
(n =)	4	2	4	4	2	4	2	4	4	4	9	2	4	4	2	2	2		4

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

	Ag	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Se	Tl	V	Zn
05-N18-01-PHC-T-AN	0.2	1.7	1.1	2.3	8.3	2.2	0.3	2.6	1.4	1.7	4.6	0.3	1.9	3.5	0.0	-	0.0	3.0	1.3
05-PB-07-PHC-T-F	6.4	-	0.4	2.5	-	3.8	-	5.7	10.5	2.6	3.1	-	2.2	1.3	-	3.1	-	5.1	1.0

Percent RSD = (standard deviation / mean) X 100

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Table 4. Statistics for Trace Metal Concentrations in Amphipod, Clam, Isopod and Mussel Samples (dry weight) and Water Content. Lab Duplicates were averaged prior to statistical analysis.

Sample Identification	Statistic	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Anonyx Amphipods	Mean	76.5	2.92	235	11.2	27.3	0.019	1.12	1.85	0.60	165	213	0.071	34.2	2.18	0.160	0.029	-	0.012	1.08	112
	Std. Dev.	2.5	0.73	87.8	3.55	9.2	0.004	0.571	0.46	0.09	30.9	35.4	0.035	11.8	1.25	0.099	0.005	-	0.006	0.37	24.6
	n	11	11	11	11	11	11	11	11	9	11	11	11	11	11	11	11	-	11	11	11
	Maximum	80	4.04	379	17.4	40.7	0.026	2.37	2.88	0.73	198	280	0.117	47.7	5.20	0.308	0.039	-	0.026	1.74	156
	Minimum	72	1.61	95.8	5.01	11.8	0.014	0.615	1.38	0.41	100	168	0.001	15.3	0.84	0.047	0.022	-	0.005	0.52	79.4
Astarte Clams	Mean	81.3	0.068	685	13.0	21.8	0.058	5.75	1.39	2.13	11.9	1265	0.054	109	4.45	0.440	0.047	-	0.021	2.43	73.7
	Std. Dev.	3.2	0.012	487	2.20	13.7	0.022	2.65	0.35	1.17	0.6	567	0.018	64.6	0.65	0.250	0.012	-	0.005	0.90	6.4
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	-	4	4	4
	Maximum	84	0.080	1220	16.0	39.5	0.085	9.55	1.68	3.7	12.5	1910	0.081	205	5.34	0.707	0.059	-	0.028	3.37	79.3
	Minimum	78	0.052	98.5	11.3	7.9	0.036	3.88	0.97	0.91	11.1	771	0.043	65.5	3.79	0.184	0.031	-	0.015	1.33	64.9
Cyrtodaria Clams	Mean	76.5	0.109	796	14.6	12.0	0.043	1.28	0.96	3.74	16.8	1495	0.038	135	3.46	0.793	0.044	-	0.024	2.85	66.2
	Std. Dev.	2.1	0.040	742	3.96	5.8	0.033	0.212	0.29	1.99	0.5	870	0.011	54.9	2.00	0.633	0.008	-	0.008	2.65	11.9
	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	2	2	2
	Maximum	78	0.137	1320	17.4	16.1	0.066	1.43	1.16	5.15	17.1	2110	0.046	174	4.87	1.24	0.050	-	0.030	4.72	74.6
	Minimum	75	0.080	271	11.8	7.9	0.019	1.13	0.75	2.33	16.4	879	0.030	96.3	2.04	0.345	0.038	-	0.018	0.97	57.8
Cumulative Clams	Mean	79.7	0.082	722	13.5	18.6	0.053	4.26	1.24	2.67	13.5	1341	0.049	118	4.12	0.557	0.046	-	0.022	2.57	71.2
	Std. Dev.	3.6	0.029	506	2.60	12.0	0.024	3.09	0.37	1.52	2.5	599	0.017	57.3	1.15	0.388	0.010	-	0.006	1.39	8.3
	n	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	-	6	6	6
	Maximum	84	0.137	1320	17.4	39.5	0.085	9.55	1.68	5.15	17.1	2110	0.081	205	5.34	1.24	0.059	-	0.030	4.72	79.3
	Minimum	75	0.052	98.5	11.3	7.9	0.019	1.13	0.75	0.91	11.1	771	0.030	65.5	2.04	0.184	0.031	-	0.015	0.97	57.8
Isopods	Mean	72.1	2.43	2864	22.1	61.4	0.113	1.23	4.34	4.60	124	2383	0.063	395	4.69	1.18	0.025	-	0.029	8.04	83.1
	Std. Dev.	3.3	0.39	1152	6.67	8.0	0.041	0.448	0.78	1.51	20.7	838	0.018	146	1.62	0.489	0.005	-	0.009	2.55	5.7
	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	-	7	7	7
	Maximum	76	2.90	4480	34.4	73.0	0.170	1.95	5.42	6.72	160	3810	0.095	608	7.21	2.01	0.032	-	0.038	12.7	91.8
	Minimum	67	1.88	1650	13.9	51.8	0.071	0.782	3.56	2.71	104	1570	0.041	234	2.74	0.635	0.018	-	0.014	5.09	77.8
Transplanted Mussels	Mean	87.3	0.083	749	11.3	8.0	0.028	4.13	0.70	1.97	7.6	673	0.150	17.3	1.79	0.661	0.014	-	0.027	1.59	96.5
	Std. Dev.	0.8	0.012	451	0.83	1.7	0.013	0.370	0.19	0.69	0.9	305	0.150	6.6	0.52	0.136	0.006	-	0.009	0.86	11.5
	n	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	-	7	7	7
	Maximum	88	0.106	1470	12.1	10.8	0.050	4.77	1.01	3.31	9.2	1180	0.451	29.1	2.86	0.899	0.020	-	0.037	3.23	113
	Minimum	86	0.069	131	10.2	5.4	0.011	3.61	0.46	1.12	6.5	265	0.063	8.5	1.27	0.524	0.007	-	0.017	0.91	76.0
Zero Time Mussels	Mean	88.5	0.076	371	12.4	6.0	0.014	4.69	0.64	2.21	7.9	461	0.052	14.6	1.81	0.610	0.022	-	0.022	1.11	101
	Std. Dev.	0.7	0.006	40.3	1.06	0.7	0.006	1.05	0.05	0.21	0.4	1	0.001	0.2	0.13	0.015	0.001	-	0.001	0.06	2.1
	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	2	2	2
	Maximum	89	0.080	399	13.1	6.5	0.018	5.43	0.67	2.35	8.1	461	0.052	14.7	1.90	0.620	0.022	-	0.022	1.15	102
	Minimum	88	0.071	342	11.6	5.5	0.010	3.94	0.60	2.06	7.6	460	0.051	14.4	1.72	0.599	0.021	-	0.021	1.07	99

MMS Beaufort Sea cANIMDA Project: Summer 2005 Sampling

Table 5. Statistics for Trace Metal Concentrations in Whole Fish Samples (dry weight) and Water Content. Lab Duplicates were averaged prior to statistical analysis.

Sample Identification	Statistic	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Arctic Char	Mean	72.7	0.033	-	4.39	1.1	-	0.042	-	0.29	4.2	53.6	0.062	-	0.05	0.112	-	2.89	-	0.14	93.8
	Std. Dev.	2.1	0.005	-	2.64	1.0	-	0.021	-	0.40	0.6	2.1	0.015	-	0.03	0.020	-	0.36	-	0.02	30.8
	n	3	3	-	3	3	-	3	-	3	3	3	3	-	3	3	-	3	-	3	3
	Maximum	75	0.038	-	7.35	2.2	-	0.055	-	0.75	4.8	55.2	0.071	-	0.08	0.133	-	3.18	-	0.15	119
	Minimum	71	0.029	-	2.28	0.5	-	0.018	-	0.04	3.7	51.3	0.045	-	0.03	0.094	-	2.49	-	0.12	59.5
Arctic Cisco	Mean	66	0.010	-	3.23	2.7	-	0.023	-	0.07	2.2	43.5	0.059	-	0.11	0.059	-	1.47	-	0.10	69.2
	Std. Dev.	4.4	0.003	-	0.58	1.3	-	0.012	-	0.06	1.0	22.1	0.004	-	0.04	0.034	-	0.47	-	0.04	25.5
	n	3	3	-	3	3	-	3	-	3	3	3	3	-	3	3	-	3	-	3	3
	Maximum	69	0.012	-	3.72	3.5	-	0.03	-	0.13	2.8	62.9	0.063	-	0.15	0.096	-	1.83	-	0.15	90.5
	Minimum	61	0.007	-	2.59	1.2	-	0.010	-	0.03	1.1	19.4	0.056	-	0.07	0.028	-	0.94	-	0.08	40.9
Arctic Flounder	Mean	73.5	0.030	-	3.24	10.1	-	0.034	-	0.47	3.1	121	0.078	-	0.33	0.104	-	3.08	-	0.32	106
	Std. Dev.	2.1	0.018	-	0.23	7.8	-	0.011	-	0.45	1.4	127	0.008	-	0.21	0.012	-	0.33	-	0.32	10.2
	n	2	2	-	2	2	-	2	-	2	2	2	2	-	2	2	-	2	-	2	2
	Maximum	75	0.042	-	3.40	15.6	-	0.041	-	0.78	4.1	211	0.084	-	0.47	0.112	-	3.31	-	0.54	113
	Minimum	72	0.017	-	3.08	4.5	-	0.026	-	0.15	2.1	31.9	0.072	-	0.18	0.095	-	2.84	-	0.09	98.6
Four Horn Sculpin	Mean	78.0	0.215	-	3.38	32.7	-	0.291	-	2.21	13.0	656	0.119	-	1.12	0.455	-	3.50	-	2.42	91.8
	Std. Dev.	1.4	0.194	-	0.66	19.7	-	0.112	-	2.27	11.7	841	0.125	-	1.00	0.477	-	0.21	-	2.12	2.7
	n	2	2	-	2	2	-	2	-	2	2	2	2	-	2	2	-	2	-	2	2
	Maximum	79	0.352	-	3.85	46.6	-	0.370	-	3.81	21.2	1250	0.207	-	1.82	0.792	-	3.64	-	3.92	93.7
	Minimum	77	0.077	-	2.91	18.7	-	0.212	-	0.60	4.7	61.3	0.03	-	0.41	0.118	-	3.35	-	0.92	89.9
PB Humpback Broad Whitefish	Mean	71.5	0.016	-	1.61	5.7	-	0.030	-	0.18	2.3	86.1	0.153	-	0.21	0.072	-	2.96	-	0.34	75.6
	Std. Dev.	5.1	0.004	-	0.51	2.8	-	0.016	-	0.14	0.7	64.1	0.080	-	0.06	0.031	-	0.50	-	0.20	24.4
	n	5	5	-	5	5	-	5	-	5	5	5	5	-	5	5	-	5	-	5	5
	Maximum	77	0.022	-	2.12	10.2	-	0.056	-	0.38	3.3	193	0.266	-	0.32	0.112	-	3.52	-	0.56	115
	Minimum	64	0.011	-	0.81	3.4	-	0.017	-	0.07	1.8	36.9	0.072	-	0.16	0.032	-	2.46	-	0.16	51.2
SIS Humpback Broad Whitefish	Mean	71.8	0.017	-	1.29	3.5	-	0.045	-	0.28	2.9	147	0.120	-	0.27	0.107	-	2.40	-	0.28	51.4
	Std. Dev.	2.2	0.013	-	0.18	3.4	-	0.023	-	0.36	1.5	202	0.050	-	0.16	0.088	-	0.31	-	0.26	14.8
	n	5	5	-	5	5	-	5	-	5	5	5	5	-	5	5	-	5	-	5	5
	Maximum	74	0.040	-	1.45	9.3	-	0.083	-	0.92	5.6	507	0.201	-	0.53	0.256	-	2.95	-	0.74	77.7
	Minimum	69	0.009	-	1.00	0.7	-	0.028	-	0.05	2.1	30.8	0.065	-	0.14	0.033	-	2.21	-	0.12	42.4
Cumulative Humpback Broad Whitefish	Mean	71.7	0.017	-	1.45	4.6	-	0.037	-	0.23	2.6	117	0.137	-	0.24	0.090	-	2.68	-	0.31	63.5
	Std. Dev.	3.7	0.009	-	0.40	3.1	-	0.020	-	0.27	1.1	145	0.065	-	0.12	0.065	-	0.49	-	0.22	22.9
	n	10	10	-	10	10	-	10	-	10	10	10	10	-	10	10	-	10	-	10	10
	Maximum	77	0.040	-	2.12	10.2	-	0.083	-	0.92	5.6	507	0.266	-	0.53	0.256	-	3.52	-	0.74	115
	Minimum	64	0.009	-	0.81	0.7	-	0.017	-	0.05	1.8	30.8	0.065	-	0.14	0.032	-	2.21	-	0.12	42.4

This page left intentionally blank.

2006 Tissue Metals Data

This page left intentionally blank.

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling **Complete: Last Revised: RPT 2/07/07**

Table 1. Station Data for Trace Metal Organism Samples.

Sample Identification	Station Identification	Station Grouping	Collection Date	Organism Type	Comments
06-N03-01-PHC-AN	N03	Northstar	8/6/2006	Amphipods	Anonyx
06-N06-01-PHC-AN	N05	Northstar	8/6/2006	"	"
06-N11-01-PHC-AN	N11	Northstar	8/6/2006	"	"
06-N11-02-PHC-AN	N11	Northstar	8/6/2006	"	"
06-N14-01-PHC-AN	N14	Northstar	8/6/2006	"	"
06-N26-01-PHC-AN	N26	Northstar	8/7/2006	"	"
06-N26-02-PHC-AN	N26	Northstar	8/7/2006	"	"
06-N2706-01-PHC-AN	N27	Northstar	8/6/2006	"	"
06-N28-01-PHC-AN	N28	Northstar	8/6/2006	"	"
06-WD01-01-PHC-AN	WD	West Dock	8/8/2006	"	"
06-WD01-02-PHC-AN	WD	West Dock	8/8/2006	"	"
06-4A-01-PHC-AN	4A	BSMP	7/29/2006	"	"
06-6A-01-PHC-AN	6A	BSMP	8/4/2006	"	"
06-6B-02-PHC-AN	6B	BSMP	8/3/2006	"	"
06-6F-01-PHC-AN	6F	BSMP	8/3/2006	"	"
06-L03-01-PHC-AS	L03	Liberty	7/29/2006	Clams	Astarte
06-L08-01-PHC-AS	L08	Liberty	7/29/2006	"	"
06-N03-01-PHC-MU	N03	Northstar	8/7/2006	Mussels	Transplanted
06-N11-01-PHC-MU	N11	Northstar	8/7/2006	"	"
06-WD01-01-PHC-MU	WD	West Dock	8/8/2006	"	"
06-BP01-01-PHC-MU	BP01	Boulder Patch	8/9/2006	"	"
06-E01-01-PHC-MU	E01	Endicott	8/9/2006	"	"
06-SDI01-01-PHC-MU	SDI	Endicott	8/9/2006	"	"
06-L08-01-PHC-MU	L08	Liberty	8/9/2006	"	"
06-5A-01-PHC-T-MU	5A	BSMP	8/7/2006	"	"
06-PC-01-PHC-T-MU	PC	Port Chatham	7/24/2006	"	Zero Time
06-PB-16-PHC-F	PB	Point Brower	7/29/2006	Arctic Flounder	
06-SI-09-PHC-F	SI	Stump Island	8/8/2006	"	
06-PB-01-PHC-F	PB	Point Brower	7/29/2006	Broad Whitefish	
06-PB-10-PHC-F	PB	Point Brower	7/29/2006	Four Horn Sculpin	
06-PB-13-PHC-F	PB	Point Brower	7/29/2006	"	
06-PB-14-PHC-F	PB	Point Brower	7/29/2006	"	
06-SI-10-PHC-F	SI	Stump Island	8/8/2006	"	
06-SI-11-PHC-F	SI	Stump Island	8/8/2006	"	
06-PB-02-PHC-F	PB	Point Brower	7/29/2006	Humpback Broad Whitefish	
06-PB-03-PHC-F	PB	Point Brower	7/29/2006	"	
06-PB-04-PHC-F	PB	Point Brower	7/29/2006	"	
06-PB-05-PHC-F	PB	Point Brower	7/29/2006	Least Cisco	
06-PB-19-PHC-F	PB	Point Brower	7/29/2006	"	
06-PB-20-PHC-F	PB	Point Brower	7/29/2006	"	
06-SI-01-PHC-F	SI	Stump Island	8/7/2006	"	
06-SI-06-PHC-F	SI	Stump Island	8/8/2006	"	
06-SI-07-PHC-F	SI	Stump Island	8/8/2006	"	
06-SI-08-PHC-F	SI	Stump Island	8/8/2006	"	

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling

Table 2. Trace Metal Concentrations in Amphipod, Clam and Mussel Samples (dry weight) and Water Content. Values in(red) have been excluded from statistical analysis.

Sample Identification	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)	Comments
06-N03-01-PHC-AN	74.0	3.01	333	16.9	17.6	0.011	1.29	1.81	0.58	174	297	0.094	25.8	2.92	0.159	0.007	-	0.009	1.27	125	Anonyx Amphipods
06-N06-01-PHC-AN	72.5	1.05	207	14.7	16.2	0.006	0.672	1.79	0.32	189	215	0.057	31.8	2.86	0.141	0.016	-	0.008	1.36	105	"
06-N11-01-PHC-AN	76.2	2.80	137	7.92	16.5	0.005	0.733	1.53	0.18	161	137	0.050	41.3	3.15	0.101	0.018	-	0.007	0.89	96.7	"
06-N11-02-PHC-AN	78.4	2.66	124	8.28	15.6	0.005	0.784	1.56	0.24	167	145	0.053	39.9	3.32	0.091	0.018	-	0.007	0.94	101	"
06-N14-01-PHC-AN	76.9	1.19	747	4.97	33.5	0.017	0.386	1.29	1.04	124	431	0.046	48.6	2.56	0.248	0.019	-	0.011	1.59	83.6	"
06-N26-01-PHC-AN	76.5	2.51	163	16.0	12.4	0.006	1.57	1.37	0.32	173	172	0.146	22.9	2.40	0.126	0.013	-	0.008	1.25	142	"
06-N26-02-PHC-AN	76.0	2.73	198	15.9	12.0	0.006	1.74	1.29	0.35	172	176	0.158	21.6	2.31	0.229	0.011	-	0.008	1.10	145	"
06-N2706-01-PHC-AN	73.5	0.95	204	14.8	16.1	0.007	0.756	1.72	0.42	177	223	0.069	30.5	2.91	0.130	0.016	-	0.007	1.49	109	"
06-N28-01-PHC-AN	76.5	2.76	189	15.3	15.0	0.007	1.18	1.62	0.38	168	203	0.121	28.1	2.67	0.109	0.007	-	0.008	1.57	139	"
06-WD01-01-PHC-AN	75.8	2.24	385	5.64	37.0	0.012	0.534	1.80	0.65	147	298	0.076	69.0	3.59	0.147	0.017	-	0.012	1.05	87.9	"
06-WD01-02-PHC-AN	75.8	2.51	305	5.34	36.8	0.012	0.504	1.74	0.71	142	252	0.086	71.1	3.68	0.112	0.018	-	0.012	1.05	85.8	"
06-4A-01-PHC-AN	76.1	2.65	894	8.46	23.9	0.020	0.909	1.68	1.86	143	477	0.066	37.1	3.71	0.219	0.007	-	0.014	1.99	94.8	"
06-6A-01-PHC-AN	71.1	1.55	307	7.39	44.9	0.009	0.401	1.73	0.51	114	262	0.037	43.2	3.92	0.113	0.020	-	0.012	0.86	74.4	"
06-6B-02-PHC-AN	72.6	1.95	288	6.77	59.0	0.012	0.466	1.40	0.54	123	254	0.044	58.0	3.34	0.223	0.040	-	0.019	0.88	86.0	"
06-6F-01-PHC-AN #1	72.2	2.48	211	13.1	16.2	0.006	0.796	1.61	0.30	203	221	0.060	36.4	2.78	0.070	0.014	-	0.006	1.32	104	Lab Duplicate
06-6F-01-PHC-AN #2	71.8	2.26	207	13.7	16.8	0.007	0.815	1.68	0.30	198	221	0.057	36.0	2.80	0.076	0.015	-	0.006	1.27	104	Lab Duplicate
06-L03-01-PHC-AS	85.3	0.078	1010	10.7	13.7	0.037	6.86	1.03	2.49	10.2	1630	0.066	47.1	3.66	0.202	0.047	-	0.013	4.73	76.3	Astarte Clams
06-L08-01-PHC-AS	85.8	0.062	973	11.6	12.4	0.074	8.69	1.22	2.82	10.2	1550	0.069	73.3	4.02	0.731	0.010	-	0.018	4.23	81.4	"
06-N03-01-PHC-MU	84.1	0.062	275	9.30	2.92	0.009	3.40	0.599	1.11	5.4	366	0.064	11.0	1.57	0.478	0.013	-	0.010	1.71	87.6	Transplanted Mussels
06-N11-01-PHC-MU	85.6	0.067	380	8.63	3.76	0.014	2.88	0.512	1.27	6.1	481	0.060	15.0	1.68	0.435	0.009	-	0.007	2.05	96.1	"
06-WD01-01-PHC-MU	88.7	0.050	1690	10.1	14.4	0.038	3.72	1.08	3.24	8.2	1470	0.121	29.6	3.12	0.631	0.013	-	0.011	4.48	105	"
06-BP01-01-PHC-MU	91.3	0.080	665	11.1	7.09	0.022	4.39	0.772	1.75	6.9	669	0.093	13.8	1.70	0.849	0.007	-	0.019	2.68	98.8	"
06-E01-01-PHC-MU	90.5	0.064	1450	10.8	12.1	0.032	3.98	0.928	2.64	8.0	1190	0.102	21.4	2.33	0.513	0.007	-	0.012	4.05	97.9	"
06-SDI01-01-PHC-MU	88.7	0.069	1860	10.8	17.9	0.038	4.16	1.20	4.17	7.9	1790	0.112	29.8	3.40	0.933	0.011	-	0.024	5.27	110	"
06-L08-01-PHC-MU	88.8	0.081	1430	10.8	12.0	0.030	4.33	0.895	2.57	7.1	1070	0.091	18.7	2.21	0.728	0.007	-	0.017	5.46	114	"
06-5A-01-PHC-T-MU	87.5	0.103	1910	11.7	8.72	0.021	5.27	1.56	7.32	7.4	2010	0.104	61.5	4.94	0.795	0.011	-	0.019	6.74	95.0	"
06-PC-01-PHC-T-MU	88.5	0.070	474	10.8	3.75	0.011	4.07	0.803	2.09	6.0	659	0.086	21.3	2.10	0.587	0.005	-	0.012	2.98	85.9	Zero Time Mussels

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling

Table 3. Trace Metal Concentrations in Whole Fish Samples (dry weight) and Water Content. Values in(red) have been excluded from statistical analysis.

Sample Identification	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)	Comments
06-PB-16-PHC-F	77.2	0.004	-	6.27	9.54	-	0.088	-	0.41	3.1	49.0	0.198	-	0.76	0.055	-	4.53	-	0.82	87.7	Arctic Flounder
06-SI-09-PHC-F	75.0	0.014	-	3.31	7.73	-	0.060	-	0.60	2.6	249	0.098	-	0.73	0.130	-	4.31	-	5.02	72.3	"
06-PB-01-PHC-F	74.0	0.008	-	0.55	1.43	-	0.024	-	0.07	2.5	41.3	0.053	-	0.15	0.007	-	2.80	-	0.60	84.2	Broad Whitefish
06-PB-10-PHC-F	76.0	0.085	-	4.04	8.06	-	0.272	-	0.21	6.3	129	0.408	-	0.43	0.093	-	5.24	-	2.64	83.8	Four Horn Sculpin
06-PB-13-PHC-F	80.7	0.061	-	3.51	4.28	-	0.159	-	0.43	6.6	113	0.201	-	0.59	0.064	-	4.19	-	2.05	103	"
06-PB-14-PHC-F	76.5	0.055	-	2.92	8.17	-	0.109	-	0.22	6.9	90.6	0.257	-	0.63	0.085	-	3.54	-	2.88	90.0	"
06-SI-10-PHC-F	77.9	0.087	-	3.08	8.68	-	0.076	-	0.58	7.8	152	0.121	-	0.73	0.092	-	3.50	-	3.69	105	"
06-SI-11-PHC-F	76.7	0.112	-	1.63	7.27	-	0.080	-	0.28	7.2	94.5	0.123	-	0.60	0.108	-	3.37	-	2.06	84.3	"
06-PB-02-PHC-F #1	74.9	0.004	-	2.20	2.70	-	0.022	-	0.10	2.4	61.0	0.109	-	0.21	0.047	-	3.09	-	1.03	51.5	Humpback Broad Whitefish
06-PB-02-PHC-F #2	75.1	0.005	-	2.45	2.78	-	0.023	-	0.11	2.4	61.0	0.106	-	0.21	0.044	-	3.33	-	1.13	52.2	Lab Duplicate
06-PB-03-PHC-F	73.5	0.004	-	1.54	1.68	-	0.017	-	0.18	1.8	51.3	0.093	-	0.19	0.013	-	2.75	-	0.52	47.2	"
06-PB-04-PHC-F	76.2	0.009	-	1.66	3.69	-	0.046	-	0.22	3.2	132	0.082	-	0.31	0.048	-	3.03	-	0.95	71.3	"
06-PB-05-PHC-F	74.7	0.004	-	2.73	1.13	-	0.029	-	0.18	2.2	48.4	0.088	-	0.23	0.008	-	3.17	-	0.42	74.1	Least Cisco
06-PB-19-PHC-F	77.2	0.006	-	1.55	1.65	-	0.028	-	0.10	2.0	38.7	0.098	-	0.24	0.010	-	2.13	-	0.33	85.0	"
06-PB-20-PHC-F	76.7	0.004	-	1.66	2.22	-	0.030	-	0.18	2.3	44.6	0.068	-	0.28	0.006	-	2.50	-	0.63	81.8	"
06-SI-01-PHC-F	75.9	0.005	-	2.32	1.09	-	0.027	-	0.08	2.4	45.2	0.116	-	0.28	0.007	-	2.79	-	0.25	75.9	"
06-SI-06-PHC-F	73.8	0.018	-	2.19	2.51	-	0.042	-	0.08	3.0	40.8	0.100	-	0.37	0.007	-	2.39	-	0.42	63.0	"
06-SI-07-PHC-F	71.7	0.015	-	2.02	3.06	-	0.032	-	0.26	3.2	65.8	0.111	-	0.44	0.011	-	2.42	-	0.43	78.2	"
06-SI-08-PHC-F	74.9	0.033	-	1.96	2.78	-	0.028	-	0.15	4.7	64.5	0.046	-	0.38	0.028	-	2.77	-	0.34	76.3	"

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling

Table 6. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Results for the Standard Reference Materials (SRMs) Mussel Tissue #2976 and Oyster Tissue #1566b certified by the National Institute of Standards and Technology (NIST), Certified Reference Material (CRM) Dogfish Muscle DORM-2 certified by the National Research Council of Canada (NRC), and the SRM Trace Elements in Water #1643d certified by the NIST.

Reference Material	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
SRM #2976 This Study	0.011	130	13.4	0.60	0.007	0.80	0.59	0.43	3.90	172	0.062	30.8	0.85	1.03	0.013	-	0.002	0.80	146
SRM #2976 NIST Certified Values	0.011* ± 0.005	134* ± 34	13.3 ± 1.8	- -	- -	0.82 ± 0.16	0.61* ± 0.02	0.50* ± 0.16	4.02 ± 0.33	171.0 ± 4.9	0.061 ± 0.0036	33* ± 2	0.93* ± 0.12	1.19 ± 0.18	- -	1.80 ± 0.15	0.001** -	- -	137 ± 13
SRM #1566b This Study	0.670	201	7.90	8.49	0.012	2.45	0.365	0.32	71.4	205	0.037	18.3	1.00	0.312	0.012	-	0.004	0.561	1446
SRM #1566b NIST Certified Values	0.666 ± 0.009	197.2 ± 6.0	7.65 ± 0.65	8.6* ± 0.3	- -	2.48 ± 0.08	0.371 ± 0.009	- -	71.6 ± 1.6	205.8 ± 6.8	0.0371 ± 0.0013	18.5 ± 0.2	1.04 ± 0.09	0.308 ± 0.009	0.011* ± 0.002	2.06 ± 0.15	- -	0.577 ± 0.023	1424 ± 46
CRM DORM-2 This Study	0.034 0.036	- -	18.8 18.2	1.79 2.04	- -	0.047 0.048	- -	31.3 34.9	2.23 2.46	147 145	4.66 4.62	- -	17.7 19.4	0.065 0.068	- -	1.47 1.44	- -	- -	25.3 24.4
CRM DORM-2 NRC Certified Values	0.041 ± 0.013	10.9 ± 1.7	18.0 ± 1.1	- -	- -	0.043 ± 0.008	0.182 ± 0.031	34.7 ± 5.5	2.34 ± 0.16	142 ± 10	4.64 ± 0.26	3.66 ± 0.34	19.4 ± 3.1	0.065 ± 0.007	- -	1.40 ± 0.09	0.004** -	- -	25.6 ± 2.3
				(µg/L)	(µg/L)										(µg/L)		(µg/L)	(µg/L)	
SRM #1643d This Study	- -	- -	- -	506.4 512.3	12.30 -	- -	- -	- -	- -	- -	- -	- -	- -	- -	54.9 -	-	7.32 -	33.9 -	- -
SRM #1643d NIST Certified Values	- -	- -	- -	506.5 ± 8.9	12.53 ± 0.28	- -	- -	- -	- -	- -	- -	- -	- -	- -	54.1 ± 1.1	- -	7.28 ± 0.25	35.1 ± 1.4	- -

* Reference Value, not Certified. ** Information Value, not Certified.

Method Detection Limits (MDLs).

	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Method Detection Limit	0.004	2.3	0.012	0.01	0.001	0.001	0.001	0.01	0.7	2.5	0.001	1.1	0.004	0.001	0.001	0.03	0.0001	0.002	0.4

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling

Table 6. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Percent Spike Recovery.

	Ag	Al	As	Ba	Be***	Cd	Co	Cr	Cu	Fe	Hg***	Mn	Ni	Pb	Sb	Se	Tl	V	Zn
Mean	104.6	97.3	101.2	101.3	71.3	102.1	97.0	106.7	104.4	95.4	73.4	96.8	102.6	98.1	100.7	104.5	93.4	97.0	102.8
Standard Deviation	1.6	1.3	3.6	4.5	1.0	7.2	2.7	2.9	2.4	2.0	9.8	3.0	7.0	3.9	1.7	3.4	0.8	3.7	5.8
(n =)	4	2	4	4	2	4	2	4	4	4	11	2	4	4	2	2	2	4	4

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

	Ag	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Se	Tl	V	Zn
06-6F-01-PHC-AN	6.6	1.0	3.2	2.6	10.9	1.7	3.0	0.0	1.8	0.0	3.6	0.8	0.5	5.8	4.9	-	0.0	2.7	0.0
06-PB-02-PHC-F	15.7	-	7.6	2.1	-	3.1	-	4.7	0.0	0.0	2.0	-	0.0	4.7	-	5.3	-	6.5	1.0

Percent RSD = (standard deviation / mean) X 100

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling

Table 4. Statistics for Trace Metal Concentrations in Amphipod, Clam, Isopod and Mussel Samples (dry weight) and Water Content. Lab Duplicates were averaged prior to statistical analysis.

Sample Identification	Statistic	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
Anonyx Amphipods	Mean	75.0	2.14	311	10.3	25.4	0.009	0.817	1.58	0.56	157	248	0.076	41.4	3.09	0.147	0.017	-	0.010	1.24	104
	Std. Dev.	2.2	0.68	229	4.36	14.5	0.005	0.416	0.180	0.44	25.8	98.9	0.038	15.6	0.52	0.058	0.008	-	0.004	0.33	22.8
	n	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	-	14	14	14
	Maximum	78.4	2.8	894	16	59.0	0.020	1.74	1.80	1.86	201	477	0.158	71.1	3.92	0.248	0.040	-	0.019	1.99	145
	Minimum	71.1	0.95	124	4.97	12.0	0.005	0.386	1.29	0.18	114	137	0.037	21.6	2.31	0.073	0.007	-	0.006	0.86	74.4
Astarte Clams	Mean	85.6	0.070	992	11.2	13.1	0.056	7.78	1.13	2.66	10.2	1590	0.068	60.2	3.84	0.467	0.029	-	0.016	4.48	78.9
	Std. Dev.	0.4	0.011	26.2	0.64	0.92	0.026	1.29	0.134	0.23	0.0	56.6	0.002	18.5	0.25	0.374	0.026	-	0.004	0.35	3.6
	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	2	2	2
	Maximum	85.8	0.078	1010	11.6	13.7	0.074	8.69	1.22	2.82	10.2	1630	0.069	73.3	4.02	0.731	0.047	-	0.018	4.73	81.4
	Minimum	85.3	0.062	973	10.7	12.4	0.037	6.86	1.03	2.49	10.2	1550	0.066	47.1	3.66	0.202	0.010	-	0.013	4.23	76.3
Transplanted Mussels	Mean	88.2	0.072	1208	10.4	9.86	0.026	4.02	0.943	3.01	7.1	1131	0.093	25.1	2.62	0.670	0.010	-	0.015	4.06	101
	Std. Dev.	2.4	0.016	666	1.01	5.20	0.011	0.716	0.338	2.02	1.0	604	0.022	16.3	1.15	0.185	0.003	-	0.006	1.78	8.6
	n	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	-	8	8	8
	Maximum	91.3	0.103	1910	11.7	17.9	0.038	5.27	1.56	7.32	8.2	2010	0.121	61.5	4.94	0.933	0.013	-	0.024	6.74	114
	Minimum	84.1	0.050	275	8.63	2.92	0.009	2.88	0.512	1.11	5.4	366	0.060	11.0	1.57	0.435	0.007	-	0.007	1.71	87.6

MMS Beaufort Sea cANIMDA Project: Summer 2006 Sampling

Table 5. Statistics for Trace Metal Concentrations in Whole Fish Samples (dry weight) and Water Content. Lab Duplicates were averaged prior to statistical analysis.

Sample Identification	Statistic	Water Content (%)	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	Hg (µg/g)	Mn (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Tl (µg/g)	V (µg/g)	Zn (µg/g)
PB & SI Arctic Flounder	Mean	76.1	0.009	-	4.79	8.64	-	0.074	-	0.51	2.9	149	0.148	-	0.75	0.093	-	4.42	-	2.92	80.0
	Std. Dev.	1.6	0.007	-	2.09	1.28	-	0.020	-	0.13	0.4	141	0.071	-	0.02	0.053	-	0.16	-	2.97	10.9
	n	2	2	-	2	2	-	2	-	2	2	2	2	-	2	2	-	2	-	2	2
	Maximum	77.2	0.014	-	6.27	9.54	-	0.088	-	0.60	3.1	249	0.198	-	0.76	0.130	-	4.53	-	5.02	87.7
	Minimum	75.0	0.004	-	3.31	7.73	-	0.060	-	0.41	2.6	49.0	0.098	-	0.73	0.055	-	4.31	-	0.82	72.3
PB Four Horn Sculpin	Mean	77.7	0.067	-	3.49	6.84	-	0.180	-	0.29	6.6	111	0.289	-	0.55	0.081	-	4.32	-	2.52	92.3
	Std. Dev.	2.6	0.016	-	0.56	2.21	-	0.084	-	0.12	0.3	19.3	0.107	-	0.11	0.015	-	0.86	-	0.43	9.8
	n	3	3	-	3	3	-	3	-	3	3	3	3	-	3	3	-	3	-	3	3
	Maximum	80.7	0.085	-	4.04	8.17	-	0.272	-	0.43	6.9	129	0.408	-	0.63	0.093	-	5.24	-	2.88	103
	Minimum	76.0	0.055	-	2.92	4.28	-	0.109	-	0.21	6.3	90.6	0.201	-	0.43	0.064	-	3.54	-	2.05	83.8
SI Four Horn Sculpin	Mean	77.3	0.100	-	2.36	7.98	-	0.078	-	0.43	7.5	123	0.122	-	0.67	0.100	-	3.44	-	2.88	94.7
	Std. Dev.	0.8	0.018	-	1.03	1.00	-	0.003	-	0.21	0.4	40.7	0.001	-	0.09	0.011	-	0.09	-	1.15	14.6
	n	2	2	-	2	2	-	2	-	2	2	2	2	-	2	2	-	2	-	2	2
	Maximum	77.9	0.112	-	3.08	8.68	-	0.080	-	0.58	7.8	152	0.123	-	0.73	0.108	-	3.50	-	3.69	105
	Minimum	76.7	0.087	-	1.63	7.27	-	0.076	-	0.28	7.2	94.5	0.121	-	0.60	0.092	-	3.37	-	2.06	84.3
Cumulative Four Horn Sculpin	Mean	77.6	0.080	-	3.04	7.29	-	0.139	-	0.34	7.0	116	0.222	-	0.60	0.088	-	3.97	-	2.66	93.2
	Std. Dev.	1.9	0.023	-	0.90	1.76	-	0.081	-	0.16	0.6	25.4	0.119	-	0.11	0.016	-	0.78	-	0.68	10.2
	n	5	5	-	5	5	-	5	-	5	5	5	5	-	5	5	-	5	-	5	5
	Maximum	80.7	0.112	-	4.04	8.68	-	0.272	-	0.58	7.8	152	0.408	-	0.73	0.108	-	5.24	-	3.69	105
	Minimum	76.0	0.055	-	1.63	4.28	-	0.076	-	0.21	6.3	90.6	0.121	-	0.43	0.064	-	3.37	-	2.05	83.8
PB Humpback Broad Whitefish	Mean	74.9	0.0058	-	1.84	2.70	-	0.029	-	0.17	2.5	81.4	0.094	-	0.24	0.036	-	3.00	-	0.85	56.8
	Std. Dev.	1.4	0.003	-	0.42	1.01	-	0.015	-	0.06	0.7	44.1	0.013	-	0.06	0.020	-	0.23	-	0.29	12.8
	n	3	3	-	3	3	-	3	-	3	3	3	3	-	3	3	-	3	-	3	3
	Maximum	76.2	0.009	-	2.33	3.69	-	0.046	-	0.22	3.2	132	0.108	-	0.31	0.048	-	3.21	-	1.08	71.3
	Minimum	73.5	0.004	-	1.54	1.68	-	0.017	-	0.11	1.8	51.3	0.082	-	0.19	0.013	-	2.75	-	0.52	47.2
PB Least Cisco	Mean	76.2	0.005	-	1.98	1.67	-	0.029	-	0.15	2.2	43.9	0.085	-	0.25	0.008	-	2.60	-	0.46	80.3
	Std. Dev.	1.3	0.001	-	0.65	0.55	-	0.001	-	0.05	0.2	4.9	0.015	-	0.03	0.002	-	0.53	-	0.15	5.6
	n	3	3	-	3	3	-	3	-	3	3	3	3	-	3	3	-	3	-	3	3
	Maximum	77.2	0.006	-	2.73	2.22	-	0.030	-	0.18	2.3	48.4	0.098	-	0.28	0.01	-	3.17	-	0.63	85.0
	Minimum	74.7	0.004	-	1.55	1.13	-	0.028	-	0.10	2.0	38.7	0.068	-	0.23	0.006	-	2.13	-	0.33	74.1
SI Least Cisco	Mean	74.1	0.018	-	2.12	2.36	-	0.032	-	0.14	3.3	54.1	0.093	-	0.37	0.013	-	2.59	-	0.36	73.4
	Std. Dev.	1.8	0.012	-	0.16	0.88	-	0.007	-	0.09	1.0	12.9	0.032	-	0.07	0.010	-	0.22	-	0.08	7.0
	n	4	4	-	4	4	-	4	-	4	4	4	4	-	4	4	-	4	-	4	4
	Maximum	75.9	0.033	-	2.32	3.06	-	0.042	-	0.26	4.7	65.8	0.116	-	0.44	0.028	-	2.79	-	0.43	78.2
	Minimum	71.7	0.005	-	1.96	1.09	-	0.027	-	0.08	2.4	40.8	0.046	-	0.28	0.007	-	2.39	-	0.25	63.0
Cumulative Least Cisco	Mean	75.0	0.012	-	2.06	2.06	-	0.031	-	0.15	2.8	49.7	0.090	-	0.32	0.011	-	2.60	-	0.40	76.3
	Std. Dev.	1.9	0.011	-	0.40	0.79	-	0.005	-	0.07	0.9	11.0	0.025	-	0.08	0.008	-	0.34	-	0.12	7.0
	n	7	7	-	7	7	-	7	-	7	7	7	7	-	7	7	-	7	-	7	7
	Maximum	77.2	0.033	-	2.73	3.06	-	0.042	-	0.26	4.7	65.8	0.116	-	0.44	0.028	-	3.17	-	0.63	85.0
	Minimum	71.7	0.004	-	1.55	1.09	-	0.027	-	0.08	2.0	38.7	0.046	-	0.23	0.006	-	2.13	-	0.25	63.0

cANIMIDA Tissue CYP1A Data

This page left intentionally blank.

2004 Tissue CYP1A Data

This page left intentionally blank.

cAnimida CYP1A staining; Occ=Occurrence, Int=Intensity															
sample #			627			628A			628B			629A			629B
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int
hepatocytes	0	0	0	2	0.5	1	0	0	0	0	0	0	0	0	0
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vacuolation (1-5)			5			5			4			5			4
gill pillar cells	0.5	2	1	0	0	0	0.5	1	0.5	0	0	0	0	0	0
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
kidney tubules				0	0	0	0	0	0				0	0	0
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
atrial endothelium										0	0	0	0	0	0
ventricle endothelium										0	0	0			
sex															
gonad vascular endothelium															
gut epithelium	1.5	3	4.5	1.5	3	4.5	0	0	0	1	2	2	1	1	1
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0			
Notes															
sample #			629C			629D			630			632			633
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int
hepatocytes	0	0	0	0	0	0	3	1	3	3	1	3	3	0.5	1.5
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
vacuolation (1-5)			4			3			1			1			1
gill pillar cells	0	0	0	1	1	1	0	0	0	0	0	0	1	1	1
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
kidney tubules	0	0	0	0	0	0							0	0	0
kidney vascular endothelium	0	0	0	0	0	0							0	0	0
atrial endothelium				0	0	0	0	0	0						
ventricle endothelium				0	0	0	0	0	0						
sex												f			
gonad vascular endothelium										0	0	0			
gut epithelium	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Notes															

sample #			634			635			636			637			638	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	3	0.5	1.5	3	1	3	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1									1			2	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
								lots of trichodinia			numerous cysts					
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																
sample #			639			641			645			646			649	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	3	1.5	4.5	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			2			1			5			2	
gill pillar cells	0	0	0	1.5	2	3	0	0	0	0	0	0	2	3	6	
gill epithelium	0	0	0	1.5	2	3	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		hyperplasia, some trich				some trich								many cysts-myxosporids?		
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	
atrial endothelium										0	0	0				
ventricle endothelium										0	0	0				
sex												m				
gonad vascular endothelium										0	0	0				
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	
Notes		sick (necrotic?) liver														

sample #			650			652			654			656			657	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			2			3			2			2			3	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		some cysts-myxosporids?			many cysts-myxosporids?						lots of trichodinia			some cysts-myxosporids?		
kidney tubules	1	0.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes		granular hepatocytes														
sample #			658			659			660			661			662	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	3	0.5	1.5	3	1	3	3	1.5	4.5	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			4			2			5			3	
gill pillar cells	0	0	0	2	1	2	0	0	0	2	1	2	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		lots of trichodinia			little tissue in section			trichodinia, hyperplasia						lots of trichodinia		
kidney tubules							0	0	0				0	0	0	
kidney vascular endothelium							0	0	0				0	0	0	
atrial endothelium	1.5	2	3	1.5	2	3				0	0	0				
ventricle endothelium	1.5	2	3	1.5	2	3				0	0	0				
sex			m			m										
gonad vascular endothelium	0	0	0	0	0	0										
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
													pharynx-no other dig tract present			
Notes																

sample #			663			664			665			666			668	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	3	0.5	1.5	3	0.5	1.5	3	0.5	1.5	3	0.5	1.5	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			1			1			1			2	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney tubules	0	0	0				0	0	0	1	1	1	0	0	0	
kidney vascular endothelium	0	0	0				0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium				0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium				0	0	0	0	0	0	0	0	0	0	0	0	
Notes																
sample #			669			670			671			672			677	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			1			2			1			4	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																

sample #			678			679			680			681			682	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			4			1			1			1			1	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																
sample #			683			684			685			686			689	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			1			1			1			1	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
														some cysts-myxosporids?		
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																

sample #			690			691			692			693			694	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			2			3			1			3	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
											some cysts-myxosporids?					
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																
sample #			695			696			697			698			699	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			3			4			4			1	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
							some cysts-myxosporids? edema							some cysts-myxosporids?		
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium																
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																

sample #			700			703			706			708			711	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			3			1			1			2			2	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		some cysts-myxosporids?			some cysts-myxosporids?						many cysts-myxosporids?				trichodinia	
kidney tubules	0	0	0	0	0	0	0	0	0	0	0	0	1.5	1	1.5	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium																
ventricle endothelium													0	0	0	
sex															f	
gonad vascular endothelium													0	0	0	
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																
sample #			712			713			714			715			716	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			1			5			5			5	
gill pillar cells	0	0	0	0	0	0	0	0	0				0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0				0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0				0	0	0	
					many cysts-myxosporids?							not in section				
kidney tubules	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
atrial endothelium													0	0	0	
ventricle endothelium													0	0	0	
sex									f						m	
gonad vascular endothelium							0	0	0				0	0	0	
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																

sample #			717			719			720			721			722	
tissue/cell type	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	Occ	Int	Occ X Int	
hepatocytes	0	0	0	0	0	0	0	0	0	0	0	0	3	0.5	1.5	
liver vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
bile duct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
vacuolation (1-5)			1			5			5			3			2	
gill pillar cells	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gill vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		lots of trichodina												lots of trichodina		
kidney tubules	0	0	0				0	0	0	0	0	0	0	0	0	
kidney vascular endothelium	0	0	0				0	0	0	0	0	0	0	0	0	
atrial endothelium				0	0	0	0	0	0							
ventricle endothelium				0	0	0	0	0	0							
sex																
gonad vascular endothelium																
gut epithelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
gut vascular endothelium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Notes																

cAnimida CYP1A Occurrence X Intensity reduced data

Battelle Duxbury ID	Station ID	Species (common name)	sample #	hepatocytes	liver vascular endothelium	bile duct	gill pillar cells	gill epithelium	gill vascular endothelium	kidney tubules	kidney vascular endothelium	atrial endothelium	ventricle endothelium	sex	gonad vascular endothelium	gut epithelium	gut vasc endothe
S4627	L14	Arctic Cod	627	0	0	0	1	0	0		0					4.5	0
S4714	L14	Arctic Cod	714	0	0	0	0	0	0	0	0			f	0	0	0
S4715	L14	Arctic Cod	715	0	0	0				0	0					0	0
S4628	N25	Arctic Cod	628A	1	0	0	0	0	0	0	0					4.5	0
S4628	N25	Arctic Cod	628B	0	0	0	0.5	0	0	0	0					0	0
S4629	N25	Arctic Cod	629A	0	0	0	0	0	0		0	0	0			2	0
S4629	N25	Arctic Cod	629B	0	0	0	0	0	0	0	0	0				1	
S4629	N25	Arctic Cod	629C	0	0	0	0	0	0	0	0					2	0
S4629	N25	Arctic Cod	629D	0	0	0	1	0	0	0	0	0	0			1	0
S4684	PBS	Arctic Char (Dolly Varden)	684	0	0	0	0	0	0	0	0					0	0
S4630	PBS	Arctic Cisco	630	3	0	0	0	0	0			0	0			0	0
S4664	PBS	Arctic Cisco	664	1.5	0	0	0	0	0							0	0
S4668	PBS	Arctic Cisco	668	1.5	0	0	0	0	0	0	0					0	0
S4669	PBS	Broad Whitefish	669	3	0	0	0	0	0	0	0					0	0
S4670	PBS	Broad Whitefish	670	0	0	0	0	0	0	0	0					0	0
S4671	PBS	Broad Whitefish	671	0	0	0	0	0	0	0	0					0	0
S4679	PBS	Broad Whitefish	679	0	0	0	0	0	0	0	0					0	0
S4680	PBS	Broad Whitefish	680	0	0	0	0	0	0	0	0					0	0
S4681	PBS	Broad Whitefish	681	0	0	0	0	0	0	0	0					0	0
S4682	PBS	Broad Whitefish	682	0	0	0	0	0	0	0	0					0	0
S4632	PBS	Four Horn Sculpin	632	3	0	0	0	0	0					f	0	0	0
S4677	PBS	Four Horn Sculpin	677	0	0	0	0	0	0	0	0					0	0
S4678	PBS	Four Horn Sculpin	678	0	0	0	0	0	0	0	0					0	0
S4685	PBS	Four Horn Sculpin	685	0	0	0	0	0	0	0	0					0	0
S4686	PBS	Four Horn Sculpin	686	0	0	0	0	0	0	0	0					0	0
S4716	PBS	Four Horn Sculpin	716	0	0	0	0	0	0	0	0	0	0	m	0	0	0
S4663	PBS	Least Cisco	663	0	0	0	0	0	0	0	0						
S4665	PBS	Least Cisco	665	1.5	0	0	0	0	0	0	0					0	0
S4666	PBS	Least Cisco	666	1.5	0	0	0	0	0	1	0					0	0
S4672	PBS	Least Cisco	672	0	0	0	0	0	0	0	0					0	0
S4683	PBS	Least Cisco	683	0	0	0	0	0	0	0	0					0	0
S4690	SIS	Arctic Cisco	690	0	0	0	0	0	0	0	0					0	0
S4691	SIS	Arctic Cisco	691	0	0	0	0	0	0	0	0					0	0
S4692	SIS	Arctic Cisco	692	0	0	0	0	0	0	0	0					0	0
S4694	SIS	Arctic Cisco	694	0	0	0	0	0	0	0	0					0	0
S4696	SIS	Arctic Cisco	696	0	0	0	0	0	0	0	0					0	0
S4697	SIS	Arctic Cisco	697	0	0	0	0	0	0	0	0					0	0
S4698	SIS	Arctic Cisco	698	0	0	0	0	0	0	0	0					0	0
S4700	SIS	Arctic Cisco	700	0	0	0	0	0	0	0	0					0	0
S4654	SIS	Arctic Cod	656	0	0	0	0	0	0	0	0					0	0
S4656	SIS	Arctic Cod	657	0	0	0	0	0	0	0	0					0	0
S4719	SIS	Arctic Cod	719	0	0	0	0	0	0			0	0			0	0
S4720	SIS	Arctic Cod	720	0	0	0	0	0	0	0	0	0	0			0	0
S4636	SIS	Four Horn Sculpin	636	0	0	0	0	0	0	0	0					0	0
S4717	SIS	Four Horn Sculpin	717	0	0	0	0	0	0	0	0					0	0
S4645	SIS	Least Cisco	645	0	0	0	0	0	0	0	0					0	0
S4689	SIS	Least Cisco	689	0	0	0	0	0	0	0	0					0	0
S4693	SIS	Least Cisco	693	0	0	0	0	0	0	0	0					0	0
S4695	SIS	Least Cisco	695	0	0	0	0	0	0	0	0					0	0
S4699	SIS	Least Cisco	699	0	0	0	0	0	0	0	0					0	0
S4703	SIS	Least Cisco	703	0	0	0	0	0	0	0	0					0	0
S4706	SIS	Least Cisco	706	0	0	0	0	0	0	0	0					0	0
S4708	SIS	Least Cisco	708	0	0	0	0	0	0	0	0					0	0
S4633	TGV	Arctic Char (Dolly Varden)	633	1.5	0	0	1	0	0	0	0					0	0
S4649	TGV	Arctic Char (Dolly Varden)	649	0	0	0	6	0	0	0	0					0	2
S4637	TGV	Arctic Flounder	637	1.5	2	0	0	0	0	0	0					0	0
S4638	TGV	Arctic Flounder	638	3	0	0	0	0	0	0	0					0	0
S4721	TGV	Arctic Flounder	721	0	0	0	0	0	0	0	0					0	0

S4639	TGV	Four Horn Sculpin	639	0	0	0	0	0	0	0	0					0	0
S4641	TGV	Four Horn Sculpin	641	4.5	0	0	3	3	0	0	2					0	0
S4646	TGV	Four Horn Sculpin	646	0	0	0	0	0	0	0	0	0	0	m	0	0	0
S4658	TGV	Four Horn Sculpin	658	1.5	0	0	0	0	0			3	3	m	0	0	0
S4659	TGV	Four Horn Sculpin	659	3	0	0	2	0	0			3	3	m	0	0	0
S4660	TGV	Four Horn Sculpin	660	4.5	0	0	0	0	0	0	0					0	0
S4661	TGV	Four Horn Sculpin	661	0	0	0	2	0	0			0	0			0	0
S4662	TGV	Four Horn Sculpin	662	0	0	0	0	0	0	0	0					0	0
S4711	TGV	Four Horn Sculpin	711	0	0	0	0	0	0	1.5	0		0	f	0	0	0
S4722	TGV	Four Horn Sculpin	722	1.5	0	0	0	0	0	0	0					0	0
S4634	TGV	Least Cisco	634	0	0	0	0	0	0	0	0					0	0
S4635	TGV	Least Cisco	635	0	0	0	0	0	0	0	0					0	0
S4650	TGV	Least Cisco	650	0	0	0	0	0	0	0.5	0					0	0
S4651	TGV	Least Cisco	652	0	0	0	0	0	0	0	0					0	0
S4652	TGV	Least Cisco	654	0	0	0	0	0	0	0	0					0	0
S4712	TGV	Least Cisco	712	0	0	0	0	0	0	1	0					0	0
S4713	TGV	Least Cisco	713	0	0	0	0	0	0	0	0					0	0

cAnimida CYP1A Occurrence X Intensity reduced data for statistical site comparisons (n≥3 animals per species at n≥2 sites), (site sorted

Battelle Duxbury ID	Station ID	Species (common name)	sample #	hepatocytes	liver vascular endothelium	bile duct	gill pillar cells	gill epithelium	gill vascular endothelium	kidney tubules	kidney vascular endothelium	gut epithelium	gut vascular endothelium					
S4627	L14	Arctic Cod	627	0	0	0	1	0	0		0	4.5	0					
S4714	L14	Arctic Cod	714	0	0	0	0	0	0	0	0	0	0					
S4715	L14	Arctic Cod	715	0	0	0				0	0	0	0					
S4628	N25	Arctic Cod	628A	1	0	0	0	0	0	0	0	4.5	0					
S4628	N25	Arctic Cod	628B	0	0	0	0.5	0	0	0	0	0	0					
S4629	N25	Arctic Cod	629A	0	0	0	0	0	0		0	2	0					
S4629	N25	Arctic Cod	629B	0	0	0	0	0	0	0	0	1						
S4629	N25	Arctic Cod	629C	0	0	0	0	0	0	0	0	2	0					
S4629	N25	Arctic Cod	629D	0	0	0	1	0	0	0	0	1	0					
S4630	PBS	Arctic Cisco	630	3	0	0	0	0	0			0	0					
S4664	PBS	Arctic Cisco	664	1.5	0	0	0	0	0			0	0					
S4668	PBS	Arctic Cisco	668	1.5	0	0	0	0	0	0	0	0	0					
S4632	PBS	Four Horn Sculpin	632	3	0	0	0	0	0			0	0					
S4677	PBS	Four Horn Sculpin	677	0	0	0	0	0	0	0	0	0	0					
S4678	PBS	Four Horn Sculpin	678	0	0	0	0	0	0	0	0	0	0					
S4685	PBS	Four Horn Sculpin	685	0	0	0	0	0	0	0	0	0	0					
S4686	PBS	Four Horn Sculpin	686	0	0	0	0	0	0	0	0	0	0					
S4716	PBS	Four Horn Sculpin	716	0	0	0	0	0	0	0	0	0	0					
S4663	PBS	Least Cisco	663	0	0	0	0	0	0	0	0							
S4665	PBS	Least Cisco	665	1.5	0	0	0	0	0	0	0	0	0					
S4666	PBS	Least Cisco	666	1.5	0	0	0	0	0	1	0	0	0					
S4672	PBS	Least Cisco	672	0	0	0	0	0	0	0	0	0	0					
S4683	PBS	Least Cisco	683	0	0	0	0	0	0	0	0	0	0					
S4690	SIS	Arctic Cisco	690	0	0	0	0	0	0	0	0	0	0					
S4691	SIS	Arctic Cisco	691	0	0	0	0	0	0	0	0	0	0					
S4692	SIS	Arctic Cisco	692	0	0	0	0	0	0	0	0	0	0					
S4694	SIS	Arctic Cisco	694	0	0	0	0	0	0	0	0	0	0					
S4696	SIS	Arctic Cisco	696	0	0	0	0	0	0	0	0	0	0					
S4697	SIS	Arctic Cisco	697	0	0	0	0	0	0	0	0	0	0					
S4698	SIS	Arctic Cisco	698	0	0	0	0	0	0	0	0	0	0					
S4700	SIS	Arctic Cisco	700	0	0	0	0	0	0	0	0	0	0					
S4654	SIS	Arctic Cod	656	0	0	0	0	0	0	0	0	0	0					
S4656	SIS	Arctic Cod	657	0	0	0	0	0	0	0	0	0	0					
S4719	SIS	Arctic Cod	719	0	0	0	0	0	0			0	0					
S4720	SIS	Arctic Cod	720	0	0	0	0	0	0	0	0	0	0					
S4645	SIS	Least Cisco	645	0	0	0	0	0	0	0	0	0	0					
S4689	SIS	Least Cisco	689	0	0	0	0	0	0	0	0	0	0					
S4693	SIS	Least Cisco	693	0	0	0	0	0	0	0	0	0	0					
S4695	SIS	Least Cisco	695	0	0	0	0	0	0	0	0	0	0					
S4699	SIS	Least Cisco	699	0	0	0	0	0	0	0	0	0	0					
S4703	SIS	Least Cisco	703	0	0	0	0	0	0	0	0	0	0					
S4706	SIS	Least Cisco	706	0	0	0	0	0	0	0	0	0	0					
S4708	SIS	Least Cisco	708	0	0	0	0	0	0	0	0	0	0					
S4639	TGV	Four Horn Sculpin	639	0	0	0	0	0	0	0	0	0	0					
S4641	TGV	Four Horn Sculpin	641	4.5	0	0	3	3	0	0	2	0	0					
S4646	TGV	Four Horn Sculpin	646	0	0	0	0	0	0	0	0	0	0					
S4658	TGV	Four Horn Sculpin	658	1.5	0	0	0	0	0			0	0					
S4659	TGV	Four Horn Sculpin	659	3	0	0	2	0	0			0	0					
S4660	TGV	Four Horn Sculpin	660	4.5	0	0	0	0	0	0	0	0	0					
S4661	TGV	Four Horn Sculpin	661	0	0	0	2	0	0			0	0					
S4662	TGV	Four Horn Sculpin	662	0	0	0	0	0	0	0	0	0	0					
S4711	TGV	Four Horn Sculpin	711	0	0	0	0	0	0	1.5	0	0	0					
S4722	TGV	Four Horn Sculpin	722	1.5	0	0	0	0	0	0	0	0	0					
S4634	TGV	Least Cisco	634	0	0	0	0	0	0	0	0	0	0					
S4635	TGV	Least Cisco	635	0	0	0	0	0	0	0	0	0	0					
S4650	TGV	Least Cisco	650	0	0	0	0	0	0	0.5	0	0	0					
S4651	TGV	Least Cisco	652	0	0	0	0	0	0	0	0	0	0					
S4652	TGV	Least Cisco	654	0	0	0	0	0	0	0	0	0	0					
S4712	TGV	Least Cisco	712	0	0	0	0	0	0	1	0	0	0					
S4713	TGV	Least Cisco	713	0	0	0	0	0	0	0	0	0	0					

cAnimida CYP1A Occurrence X Intensity reduced data for statistical site comparisons (n≥3 animals per species at n≥2 sites), (species sor

Battelle Duxbury ID	Station ID	Species (common name)	sample #	hepatocytes	liver vascular endothelium	bile duct	gill pillar cells	gill epithelium	gill vascular endothelium	kidney tubules	kidney vascular endothelium	gut epithelium	gut vascular endothelium				
S4630	PBS	Arctic Cisco	630	3	0	0	0	0	0			0	0				
S4664	PBS	Arctic Cisco	664	1.5	0	0	0	0	0			0	0				
S4668	PBS	Arctic Cisco	668	1.5	0	0	0	0	0	0	0	0	0				
S4690	SIS	Arctic Cisco	690	0	0	0	0	0	0	0	0	0	0				
S4691	SIS	Arctic Cisco	691	0	0	0	0	0	0	0	0	0	0				
S4692	SIS	Arctic Cisco	692	0	0	0	0	0	0	0	0	0	0				
S4694	SIS	Arctic Cisco	694	0	0	0	0	0	0	0	0	0	0				
S4696	SIS	Arctic Cisco	696	0	0	0	0	0	0	0	0	0	0				
S4697	SIS	Arctic Cisco	697	0	0	0	0	0	0	0	0	0	0				
S4698	SIS	Arctic Cisco	698	0	0	0	0	0	0	0	0	0	0				
S4700	SIS	Arctic Cisco	700	0	0	0	0	0	0	0	0	0	0				
S4627	L14	Arctic Cod	627	0	0	0	1	0	0		0	4.5	0				
S4714	L14	Arctic Cod	714	0	0	0	0	0	0	0	0	0	0				
S4715	L14	Arctic Cod	715	0	0	0				0	0	0	0				
S4628	N25	Arctic Cod	628A	1	0	0	0	0	0	0	0	4.5	0				
S4628	N25	Arctic Cod	628B	0	0	0	0.5	0	0	0	0	0	0				
S4629	N25	Arctic Cod	629A	0	0	0	0	0	0		0	2	0				
S4629	N25	Arctic Cod	629B	0	0	0	0	0	0	0	0	1					
S4629	N25	Arctic Cod	629C	0	0	0	0	0	0	0	0	2	0				
S4629	N25	Arctic Cod	629D	0	0	0	1	0	0	0	0	1	0				
S4654	SIS	Arctic Cod	656	0	0	0	0	0	0	0	0	0	0				
S4656	SIS	Arctic Cod	657	0	0	0	0	0	0	0	0	0	0				
S4719	SIS	Arctic Cod	719	0	0	0	0	0	0			0	0				
S4720	SIS	Arctic Cod	720	0	0	0	0	0	0	0	0	0	0				
S4632	PBS	Four Horn Sculpin	632	3	0	0	0	0	0			0	0				
S4677	PBS	Four Horn Sculpin	677	0	0	0	0	0	0	0	0	0	0				
S4678	PBS	Four Horn Sculpin	678	0	0	0	0	0	0	0	0	0	0				
S4685	PBS	Four Horn Sculpin	685	0	0	0	0	0	0	0	0	0	0				
S4686	PBS	Four Horn Sculpin	686	0	0	0	0	0	0	0	0	0	0				
S4716	PBS	Four Horn Sculpin	716	0	0	0	0	0	0	0	0	0	0				
S4639	TGV	Four Horn Sculpin	639	0	0	0	0	0	0	0	0	0	0				
S4641	TGV	Four Horn Sculpin	641	4.5	0	0	3	3	0	0	2	0	0				
S4646	TGV	Four Horn Sculpin	646	0	0	0	0	0	0	0	0	0	0				
S4658	TGV	Four Horn Sculpin	658	1.5	0	0	0	0	0			0	0				
S4659	TGV	Four Horn Sculpin	659	3	0	0	2	0	0			0	0				
S4660	TGV	Four Horn Sculpin	660	4.5	0	0	0	0	0	0	0	0	0				
S4661	TGV	Four Horn Sculpin	661	0	0	0	2	0	0			0	0				
S4662	TGV	Four Horn Sculpin	662	0	0	0	0	0	0	0	0	0	0				
S4711	TGV	Four Horn Sculpin	711	0	0	0	0	0	0	1.5	0	0	0				
S4722	TGV	Four Horn Sculpin	722	1.5	0	0	0	0	0	0	0	0	0				
S4663	PBS	Least Cisco	663	0	0	0	0	0	0	0	0						
S4665	PBS	Least Cisco	665	1.5	0	0	0	0	0	0	0	0	0				
S4666	PBS	Least Cisco	666	1.5	0	0	0	0	0	1	0	0	0				
S4672	PBS	Least Cisco	672	0	0	0	0	0	0	0	0	0	0				
S4683	PBS	Least Cisco	683	0	0	0	0	0	0	0	0	0	0				
S4645	SIS	Least Cisco	645	0	0	0	0	0	0	0	0	0	0				
S4689	SIS	Least Cisco	689	0	0	0	0	0	0	0	0	0	0				
S4693	SIS	Least Cisco	693	0	0	0	0	0	0	0	0	0	0				
S4695	SIS	Least Cisco	695	0	0	0	0	0	0	0	0	0	0				
S4699	SIS	Least Cisco	699	0	0	0	0	0	0	0	0	0	0				
S4703	SIS	Least Cisco	703	0	0	0	0	0	0	0	0	0	0				
S4706	SIS	Least Cisco	706	0	0	0	0	0	0	0	0	0	0				
S4708	SIS	Least Cisco	708	0	0	0	0	0	0	0	0	0	0				
S4634	TGV	Least Cisco	634	0	0	0	0	0	0	0	0	0	0				
S4635	TGV	Least Cisco	635	0	0	0	0	0	0	0	0	0	0				
S4650	TGV	Least Cisco	650	0	0	0	0	0	0	0.5	0	0	0				
S4651	TGV	Least Cisco	652	0	0	0	0	0	0	0	0	0	0				
S4652	TGV	Least Cisco	654	0	0	0	0	0	0	0	0	0	0				
S4712	TGV	Least Cisco	712	0	0	0	0	0	0	1	0	0	0				
S4713	TGV	Least Cisco	713	0	0	0	0	0	0	0	0	0	0				

2005 Tissue CYP1A Data

This page left intentionally blank.

			liver				kidney			gill		
Battelle sample #	**site**	**species**	**liver hepatocytes**	**liver vasc endo**	**bile duct**		**kidney tubules**	**kidney vasc endo**		**gill epithelium**	**gill pillar cells**	**gill vas endo**
S8909	Northstar	Arctic Char	4.5	2	0		0	2		0	2	0
S8910	Northstar	Arctic Char	0	1	0		0	0		0	0	0
S8911	Northstar	Arctic Char	0	0	0		0	0		0	0	0
S8912	Northstar	Arctic Char	0	4.5	0		0	0		0	0	0
S8926	Point Brower	Arctic Cisco	3	0	0		3.75	0		0	0	0
S8928	Point Brower	Arctic Cisco	1.5	0	0		3.75	0		0	0	0
S8929	Point Brower	Arctic Cisco	4.5	0	0		3.75	0		0	0	0
S8930	Point Brower	Arctic Cisco	0	0	0		0	0		0	0	0
S8931	Point Brower	Arctic Cisco	0	0	0		1.5	0		0	0	0
S8933	Point Brower	Arctic Cisco	0	0	0		1.5	0		0	0	0
S8934	Point Brower	Arctic Cisco	0	0	0		3	0		0	0	0
S8942	Point Brower	Arctic Flounder	0	0	0		0	0		0	0	0
S8943	Point Brower	Arctic Flounder	0	0	0		0	0		0	0	0
S8913	Northstar	Four Horn Sculpin	0	0	0		NP*	NP		NP	NP	NP
S8914	Northstar	Four Horn Sculpin	3	0	0		NP	NP		NP	NP	NP
S8941	Point Brower	Four Horn Sculpin	3	0	0		NP	NP		NP	NP	NP
S8915	Northstar	Humpback Broad Whitefish	0	0	0		NP	0		0	0	0
S8916	Northstar	Humpback Broad Whitefish	3	0	0		NP	0		0	0	0
S8917	Northstar	Humpback Broad Whitefish	3	0	0		1	0		0	0	0
S8918	Northstar	Humpback Broad Whitefish	3	0	0		3	0		0	0	0
S8919	Northstar	Humpback Broad Whitefish	0	0	0		NP	0		0	0	0
S8921	Northstar	Humpback Broad Whitefish	1.5	0	0		NP	0		0	0	0
S8922	Northstar	Humpback Broad Whitefish	1.5	0	0		1.5	0		0	0	0
S8923	Northstar	Humpback Broad Whitefish	1.5	0	0		0.5	0		0	0	0
S8924	Northstar	Humpback Broad Whitefish	0	1	0		2	0		0	0	0
S8927	Point Brower	Humpback Broad Whitefish	0	0	0		1	0		0	0	0
S8932	Point Brower	Humpback Broad Whitefish	0	0	0		0	0		0	0	0
S8935	Point Brower	Humpback Broad Whitefish	0	0	0		0	0		0	0	0
S8936	Point Brower	Humpback Broad Whitefish	0	0	0		2.25	0		0	0	0
S8937	Point Brower	Humpback Broad Whitefish	0	0	0		1.5	0		0	0	0
S8938	Point Brower	Humpback Broad Whitefish	0	0	0		2.25	0		0	0	0
S8939	Point Brower	Humpback Broad Whitefish	1.5	0	0		1.5	0		0	0	0
			* NP=not present									

tissue/cell type data ordered by species and subsorted by site

Battelle sample #	site	species	liver liver hepatocytes		liver vasc endo		bile duct	kidney kidney tubules	kidney vasc endo	
58909	Northstar	Arctic Char	4.5		2		0	0	2	
58910	Northstar	Arctic Char	0		1		0	0	0	
58911	Northstar	Arctic Char	0		0		0	0	0	
58912	Northstar	Arctic Char	0		4.5		0	0	0	
		mean	1.125	1.948557159	1.875	1.67238602			0.5	0.866025
58926	Point Brower	Arctic Cisco	3		0		0	3.75	0	
58928	Point Brower	Arctic Cisco	1.5		0		0	3.75	0	
58929	Point Brower	Arctic Cisco	4.5		0		0	3.75	0	
58930	Point Brower	Arctic Cisco	0		0		0	0	0	
58931	Point Brower	Arctic Cisco	0		0		0	1.5	0	
58933	Point Brower	Arctic Cisco	0		0		0	1.5	0	
58934	Point Brower	Arctic Cisco	0		0		0	3	0	
			1.285714286	1.687287402				2.464285714	1.372098051	
58942	Point Brower	Arctic Flounder	0		0		0	0	0	
58943	Point Brower	Arctic Flounder	0		0		0	0	0	
			0							
58913	Northstar	Four Horn Sculpin	0		0		0	NP*	NP	
58914	Northstar	Four Horn Sculpin	3		0		0	NP	NP	
			1.5	1.5						
58941	Point Brower	Four Horn Sculpin	3		0		0	NP	NP	
				1.243734296						
58915	Northstar	Humpback Broad Whitefish	0		0		0		0	
58916	Northstar	Humpback Broad Whitefish	3		0		0		0	
58917	Northstar	Humpback Broad Whitefish	3		0		0	1	0	
58918	Northstar	Humpback Broad Whitefish	3		0		0	3	0	
58919	Northstar	Humpback Broad Whitefish	0		0		0		0	
58921	Northstar	Humpback Broad Whitefish	1.5		0		0		0	
58922	Northstar	Humpback Broad Whitefish	1.5		0		0	1.5	0	
58923	Northstar	Humpback Broad Whitefish	1.5		0		0	0.5	0	
58924	Northstar	Humpback Broad Whitefish	0		1		0	2	0	
			1.5	1.170937125	0.111111111	0.314269681		1.6	0.860232527	
58927	Point Brower	Humpback Broad Whitefish	0		0		0	1	0	
58932	Point Brower	Humpback Broad Whitefish	0		0		0	0	0	
58935	Point Brower	Humpback Broad Whitefish	0		0		0	0	0	
58936	Point Brower	Humpback Broad Whitefish	0		0		0	2.25	0	
58937	Point Brower	Humpback Broad Whitefish	0		0		0	1.5	0	
58938	Point Brower	Humpback Broad Whitefish	0		0		0	2.25	0	
58939	Point Brower	Humpback Broad Whitefish	1.5		0		0	1.5	0	
			0.214285714	0.524890659				1.214285714	0.870432686	

cANIMIDA Bile PAH Metabolite Data

2004 PAH Metabolite Data

cANIMIDA Sample Inventory and Dilutions

File Number	Battelle ID	Sample Descriptor	Sample Volume (uL)	Dilution Factor	Comments
C45083	S4126	04-SIS-01-FAC-B	12.0	5	
C45084	S4127	04-SIS-02-FAC-B	30.0	2	
C45085	S4128	04-SIS-03-FAC-B	34.5	2	
C45086	S4129	04-SIS-04-FAC-B	>50	1	
C45087	S4130	04-SIS-05-FAC-B	>50	1	
C45088	S4131	04-SIS-06-FAC-B	>50	1	
C45089	S4132	04-SIS-07-FAC-B	>50	1	
C45090	S4134	04-SIS-09-FAC-B	>50	1	
C45091	S4135	04-SIS-10-FAC-B	8.0	10	
C45092	S4138	04-SIS-13-FAC-B	1.5	50	Very Small Amount of Sample
C45093	S4140	04-SIS-19-FAC-B	>50	1	
C45094	S4141	04-SIS-20-FAC-B	1.5	50	Very Small Amount of Sample
C45095	S4142	04-SIS-21-FAC-B	>50	1	
C45096	S4143	04-SIS-22-FAC-B	>50	1	
C45097	S4144	04-SIS-23-FAC-B	>50	1	
C45098	S4146	04-SIS-25-FAC-B	>50	1	
C45099	S4147	04-SIS-26-FAC-B	>50	1	
C45100	S4148	04-SIS-28-FAC-B	22.0	3	
C45101	S4151	04-PBS-27-FAC-B	>50	1	
C45102	S4152	04-PBS-26-FAC-B	2.0	25	Very Small Amount of Sample
C45103	S4153	04-PBS-25-FAC-B	>50	1	
C45104	S4155	04-PBS-23-FAC-B	>50	1	
C45105	S4156	04-PBS-22-FAC-B	>50	1	
C45106	S4157	04-PBS-21-FAC-B	>50	1	
C45107	S4158	04-PBS-19-FAC-B	>50	1	
C45108	S4159	04-PBS-18-FAC-B	33.0	2	
C45109	S4160	04-PBS-17-FAC-B	35.0	2	
C45110	S4161	04-PBS-13-FAC-B	30.0	4	
C45111	S4164	04-PBS-12-FAC-B	>50	1	
C45112	S4165	04-PBS-11-FAC-B	19.0	4	
C45113	S4166	04-PBS-09-FAC-B	22.0	1	
C45114	S4167	04-PBS-08-FAC-B	>50	1	
C45115	S4168	04-PBS-06-FAC-B	>50	1	
C45116	S4169	04-PBS-05-FAC-B	>50	1	
C45117	S4170	04-PBS-04-FAC-B	18.0	4	
C45118	S4314	04-TGV-04-FAC-B	>50	1	
C45119	S4315	04-TGV-21-FAC-B	10.0	8	
C45120	S4316	04-TGV-26-FAC-B	>50	1	
C45121	S4317	04-TGV-05-FAC-B	>50	1	
C45122	S4318	04-TGV-08-FAC-B	1.0	50	Very Small Amount of Sample
C45123	S4319	04-TGV-27-FAC-B	>50	1	
C45124	S4320	04-TGV-30-FAC-B	>50	1	
C45125	S4322	04-TGV-06-FAC-B	1.0	50	Very Small Amount of Sample
C45126	S4323	04-TGV-24-FAC-B	>50	1	
C45127	S4324	04-TGV-29-FAC-B	>50	1	
C45128	S4325	04-TGV-03-FAC-B	>50	1	
C45129	S4326	04-TGV-02-FAC-B	>50	1	
C45130	S4327	04-TGV-23-FAC-B	>50	1	
C45131	S4328	04-TGV-07-FAC-B	12.0	5	
C45132	S4329	04-TGV-01-FAC-B	>50	1	
C45133	S4136	04-SIS-11-FAC-B	20.0	4	
C45134	S4137	04-SIS-12-FAC-B	>50	1	
C45135	S4145	04-SIS-24-FAC-B	>50	1	
C45136	S4149	04-SIS-27-FAC-B	>50	1	
C45137	S4154	04-PBS-24-FAC-B	25.0	3	
C45138	S4162	04-PBS-14-FAC-B	>50	1	

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-01-FAC-B	04-SIS-02-FAC-B	04-SIS-03-FAC-B	04-SIS-04-FAC-B
Battelle Sample ID	S4126	S4127	S4128	S4129
GERG Sample ID	C45083	C45084	C45085	C45086
Sample Delivery Group (SDG)	E9151	E9151	E9151	E9151
Sample Type	SAMP	SAMP	SAMP	SAMP
Collection Date	08/08/2004	08/08/2004	08/08/2004	08/08/2004
Collection Time	10:42	10:47	10:47	10:47
Receipt Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	11/2/2004	11/2/2004	11/2/2004	11/2/2004
Phenanthrene	11/2/2004	11/2/2004	11/2/2004	11/2/2004
Benzo(a)pyrene	11/1/2004	11/1/2004	11/1/2004	11/1/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	5	2	2	1
Analysis Batch	B1155	B1155	B1155	B1155
Bile Metabolites (ug/gram)				
Naphthalene	36	27	22	31
Phenanthrene	11	5	4	4
Benzo(a)pyrene	0.26	0.11	0.11	0.07
Total Protein Content (ug/ml)	1175	1480	1055	921
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	30.6	18.2	20.8	33.7
Phenanthrene	9.4	3.1	3.4	4.8
Benzo(a)pyrene	0.22	0.07	0.10	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-05-FAC-B	04-SIS-06-FAC-B	04-SIS-07-FAC-B	04-SIS-07-FAC-B DUP
Battelle Sample ID	S4130	S4131	S4132	S4132
GERG Sample ID	C45087	C45088	C45089	C45089D
Sample Delivery Group (SDG)	E9151	E9151	E9151	E9151
Sample Type	SAMP	SAMP	SAMP	DUP
Collection Date	08/08/2004	08/08/2004	08/08/2004	08/08/2004
Collection Time	11:16	11:16	11:16	11:16
Receipt Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	11/2/2004	11/2/2004	11/2/2004	11/2/2004
Phenanthrene	11/2/2004	11/2/2004	11/2/2004	11/2/2004
Benzo(a)pyrene	11/1/2004	11/1/2004	11/1/2004	11/1/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1	1
Analysis Batch	B1155	B1155	B1155	B1155
Bile Metabolites (ug/gram)				
Naphthalene	19	24	20	19
Phenanthrene	4	3	4	3
Benzo(a)pyrene	0.10	0.07	0.10	0.11
Total Protein Content (ug/ml)	1244	1126	1261	1224
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	15.3	21.3	15.9	15.5
Phenanthrene	3.2	3.0	2.9	2.8
Benzo(a)pyrene	0.08	0.06	0.08	0.09

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-09-FAC-B		04-SIS-10-FAC-B		04-SIS-13-FAC-B		04-SIS-19-FAC-B	
Battelle Sample ID	S4134		S4135		S4138		S4140	
GERG Sample ID	C45090		C45091		C45092		C45093	
Sample Delivery Group (SDG)	E9151		E9151		E9151		E9151	
Sample Type	SAMP		SAMP		SAMP		SAMP	
Collection Date	08/08/2004		08/08/2004		08/08/2004		09/08/2004	
Collection Time	11:40		11:40		11:57		13:12	
Receipt Date	9/14/2004		9/14/2004		9/14/2004		9/14/2004	
Matrix	Tissue		Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates								
Naphthalene	11/2/2004		11/2/2004		11/2/2004		11/2/2004	
Phenanthrene	11/2/2004		11/2/2004		11/2/2004		11/2/2004	
Benzo(a)pyrene	11/1/2004		11/1/2004		11/1/2004		11/2/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram		microgram/gram	
Dilution	1		10		50		1	
Analysis Batch	B1155		B1155		B1155		B1155	
Bile Metabolites (ug/gram)								
Naphthalene	38		56		150		13	
Phenanthrene	6		8		10		2	
Benzo(a)pyrene	0.14		0.11	J	0.25	J	0.05	J
Total Protein Content (ug/ml)	1758		1472		2671		546	
Protein Normalized Metabolite Concentration (ng/ug protein)								
Naphthalene	21.6		38.1		56.2		23.8	
Phenanthrene	3.5		5.2		3.7		3.5	
Benzo(a)pyrene	0.08		0.07		0.09		0.09	

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-20-FAC-B		04-SIS-21-FAC-B	04-SIS-22-FAC-B	04-SIS-23-FAC-B
Battelle Sample ID	S4141		S4142	S4143	S4144
GERG Sample ID	C45094		C45095	C45096	C45097
Sample Delivery Group (SDG)	E9151		E9151	E9151	E9151
Sample Type	SAMP		SAMP	SAMP	SAMP
Collection Date	09/08/2004		09/08/2004	09/08/2004	09/08/2004
Collection Time	13:12		13:12	13:12	13:39
Receipt Date	9/14/2004		9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue		Tissue	Tissue	Tissue
Method	HPLC/FL		HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene	11/3/2004		11/3/2004	11/3/2004	11/3/2004
Phenanthrene	11/3/2004		11/3/2004	11/3/2004	11/3/2004
Benzo(a)pyrene	11/2/2004		11/2/2004	11/2/2004	11/2/2004
Conc Units	microgram/gram		microgram/gram	microgram/gram	microgram/gram
Dilution	50		1	1	1
Analysis Batch	B1155		B1155	B1155	B1155
Bile Metabolites (ug/gram)					
Naphthalene	140		15	1	23
Phenanthrene	20		2	0	4
Benzo(a)pyrene	0.52	J	0.07	0.05	0.08
Total Protein Content (ug/ml)	13014		919	511	912
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	10.8		16.3	1.9	25.2
Phenanthrene	1.5		2.6	0.1	4.3
Benzo(a)pyrene	0.04		0.07	0.10	0.09

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-25-FAC-B	04-SIS-26-FAC-B	04-SIS-28-FAC-B		04-SIS-23-FAC-B DUP
Battelle Sample ID	S4146	S4147	S4148		S4148
GERG Sample ID	C45098	C45099	C45100		C45097D
Sample Delivery Group (SDG)	E9151	E9151	E9151		E9151
Sample Type	SAMP	SAMP	SAMP		DUP
Collection Date	09/08/2004	09/08/2004	09/08/2004		09/08/2004
Collection Time	13:39	13:39	14:02		14:02
Receipt Date	9/14/2004	9/14/2004	9/14/2004		9/14/2004
Matrix	Tissue	Tissue	Tissue		Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL		HPLC/FL
Analysis Dates					
Naphthalene	11/3/2004	11/3/2004	11/3/2004		11/3/2004
Phenanthrene	11/3/2004	11/3/2004	11/3/2004		11/3/2004
Benzo(a)pyrene	11/2/2004	11/2/2004	11/2/2004		11/2/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram		microgram/gram
Dilution	1	1	3		1
Analysis Batch	B1155	B1155	B1155		B1155
Bile Metabolites (ug/gram)					
Naphthalene	24	31	18		26
Phenanthrene	5	6	3		4
Benzo(a)pyrene	0.07	0.09	0.06	J	0.10
Total Protein Content (ug/ml)					
	1064	1136	659		1000
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	22.6	27.3	27.3		26.0
Phenanthrene	4.2	5.3	4.1		4.2
Benzo(a)pyrene	0.07	0.08	0.10		0.10

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	Bile Reference II	QC Acceptance Range			Calibrated	
Battelle Sample ID	N/A					
GERG Sample ID	Q914	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)	N/A					
Sample Type	SRM					
Collection Date	N/A					
Collection Time	N/A					
Receipt Date	N/A					
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	11/2/2004					
Phenanthrene	11/2/2004					
Benzo(a)pyrene	11/1/2004					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1155					
Bile Metabolites (ug/gram)						
Naphthalene	400	318	to	442	380	31
Phenanthrene	130	75	to	145	110	18
Benzo(a)pyrene	1.50	1.2	to	2.4	1.80	0.32
Total Protein Content (ug/ml)						
	4379	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	91.4	65.9	to	91.5	79	6
Phenanthrene	29.7	15.5	to	30.0	23	4
Benzo(a)pyrene	0.34	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	Bile Reference II DUP	QC Acceptance Range			Calibrated	
Battelle Sample ID	N/A					
GERG Sample ID	Q915	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)	N/A					
Sample Type	SRM					
Collection Date	N/A					
Collection Time	N/A					
Receipt Date	N/A					
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	11/2/2004					
Phenanthrene	11/2/2004					
Benzo(a)pyrene	11/1/2004					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1155					
Bile Metabolites (ug/gram)						
Naphthalene	400	318	to	442	380	31
Phenanthrene	130	75	to	145	110	18
Benzo(a)pyrene	1.5	1.2	to	2.4	1.80	0.32
Total Protein Content (ug/ml)						
	4622	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	86.5	65.9	to	91.5	79	6
Phenanthrene	28.1	15.5	to	30.0	23	4
Benzo(a)pyrene	0.32	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	Bile Reference II	Bile Reference II DUP	
Battelle Sample ID	N/A	N/A	
GERG Sample ID	Q914	Q915	
Sample Delivery Group (SDG)	N/A	N/A	
Sample Type	0	SAMP	
Collection Date	SRM	SRM DUP	
Collection Time	N/A	N/A	
Receipt Date	N/A	N/A	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/2/2004	11/2/2004	
Phenanthrene	11/2/2004	11/2/2004	
Benzo(a)pyrene	11/1/2004	11/1/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1155	B1155	
Bile Metabolites (ug/gram)			
Naphthalene	400	400	0.0
Phenanthrene	130	130	0.0
Benzo(a)pyrene	1.5	1.5	0.0
Total Protein Content (ug/ml)			
	4379	4622	5.4
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	91.4	86.5	5.4
Phenanthrene	29.7	28.1	5.4
Benzo(a)pyrene	0.34	0.32	5.4

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-07-FAC-B	04-SIS-07-FAC-B DUP	
Battelle Sample ID	S4132	S4132	
GERG Sample ID	C45089	C45089D	
Sample Delivery Group (SDG)	E9151	E9151	
Sample Type	SAMP	SAMP	
Collection Date	08/08/2004	08/08/2004	
Collection Time	11:16	11:16	
Receipt Date	9/14/2004	9/14/2004	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/2/2004	11/2/2004	
Phenanthrene	11/2/2004	11/2/2004	
Benzo(a)pyrene	11/1/2004	11/1/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1155	B1155	
Bile Metabolites (ug/gram)			
Naphthalene	20	19	5.1
Phenanthrene	4	3	5.7
Benzo(a)pyrene	0.10	0.11	9.5
Total Protein Content (ug/ml)			
	1261	1224	3.0
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	15.9	15.5	2.1
Phenanthrene	2.9	2.8	2.7
Benzo(a)pyrene	0.08	0.09	12.5

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	04-SIS-23-FAC-B	04-SIS-23-FAC-B DUP	
Battelle Sample ID	S4148	S4148	
GERG Sample ID	C45097	C45097D	
Sample Delivery Group (SDG)	E9151	E9151	
Sample Type	SAMP	DUP	
Collection Date	09/08/2004	09/08/2004	
Collection Time	14:02	14:02	
Receipt Date	9/14/2004	9/14/2004	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/3/2004	11/3/2004	
Phenanthrene	11/3/2004	11/3/2004	
Benzo(a)pyrene	11/2/2004	11/2/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1155	B1155	
Bile Metabolites (ug/gram)			
Naphthalene	23	26	12.2
Phenanthrene	4	4	7.4
Benzo(a)pyrene	0.08	0.10	18.4
Total Protein Content (ug/ml)			
	912	1000	9.2
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	25.2	26.0	3.1
Phenanthrene	4.3	4.2	1.8
Benzo(a)pyrene	0.09	0.10	9.2

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	N/A		N/A		N/A	
GERG Sample ID	Q907		Q908		Q909	
Sample Delivery Group (SDG)	N/A		N/A		N/A	
Sample Type	BLANK		BLANK		BLANK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/2/2004		11/2/2004		11/2/2004	
Phenanthrene	11/2/2004		11/2/2004		11/2/2004	
Benzo(a)pyrene	11/1/2004		11/1/2004		11/1/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1155		B1155		B1155	
Bile Metabolites (ug/gram)						
Naphthalene	0.70		0.72		0.70	
Phenanthrene	0.06	J	0.06	J	0.05	J
Benzo(a)pyrene	0.00	J	0.00	J	0.00	J
Total Protein Content (ug/ml)	N.D.		N.D.		N.D.	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene						
Phenanthrene						
Benzo(a)pyrene						

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	N/A		N/A		N/A	
GERG Sample ID	Q916		Q918		Q923	
Sample Delivery Group (SDG)	N/A		N/A		N/A	
Sample Type	BLANK		BLANK		BLANK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/2/2004		11/3/2004		11/3/2004	
Phenanthrene	11/2/2004		11/3/2004		11/3/2004	
Benzo(a)pyrene	11/1/2004		11/2/2004		11/2/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1155		B1155		B1155	
Bile Metabolites (ug/gram)						
Naphthalene	0.70		0.69		0.69	
Phenanthrene	0.05	J	0.05	J	0.05	J
Benzo(a)pyrene	0.00	J	0.00	J	0.01	J
Total Protein Content (ug/ml)	1		N.D.		N.D.	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene						
Phenanthrene						
Benzo(a)pyrene						

cANIMIDA
Fish Bile Metabolites
Analytical Set 1
SDG# E9151

Sample ID	Bile Reference III	Bile Reference III	Bile Reference III
Battelle Sample ID	N/A	N/A	N/A
GERG Sample ID	Q920	Q921	Q922
Sample Delivery Group (SDG)	N/A	N/A	N/A
Sample Type	SRM NEW	SRM NEW	SRM NEW
Collection Date	N/A	N/A	N/A
Collection Time	N/A	N/A	N/A
Receipt Date	N/A	N/A	N/A
Matrix	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates			
Naphthalene	11/3/2004	11/3/2004	11/3/2004
Phenanthrene	11/3/2004	11/3/2004	11/3/2004
Benzo(a)pyrene	11/2/2004	11/2/2004	11/2/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1
Analysis Batch	B1155	B1155	B1155
Bile Metabolites (ug/gram)			
Naphthalene	150	160	160
Phenanthrene	74	78	74
Benzo(a)pyrene	6.40	6.80	6.80
Total Protein Content (ug/ml)	2213	2336	2374
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	67.8	68.5	67.4
Phenanthrene	33.4	33.4	31.2
Benzo(a)pyrene	2.89	2.91	2.86

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-PBS-27-FAC-B	04-PBS-26-FAC-B		04-PBS-25-FAC-B	04-PBS-23-FAC-B
Battelle Sample ID	S4151	S4152		S4153	S4155
GERG Sample ID	C45101	C45102		C45103	C45104
Sample Delivery Group (SDG)	E9151	E9151		E9151	E9151
Sample Type	SAMP	SAMP		SAMP	SAMP
Collection Date	07/08/2004	07/08/2004		07/08/2004	07/08/2004
Collection Time	18:46	18:46		18:46	18:16
Receipt Date	9/14/2004	9/14/2004		9/14/2004	9/14/2004
Matrix	Tissue	Tissue		Tissue	Tissue
Method	HPLC/FL	HPLC/FL		HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene	11/3/2004	11/3/2004		11/3/2004	11/3/2004
Phenanthrene	11/3/2004	11/3/2004		11/3/2004	11/3/2004
Benzo(a)pyrene	11/4/2004	11/4/2004		11/4/2004	11/4/2004
Conc Units	microgram/gram	microgram/gram		microgram/gram	microgram/gram
Dilution	1	25		1	1
Analysis Batch	B1156	B1156		B1156	B1156
Bile Metabolites (ug/gram)					
Naphthalene	30	30		66	52
Phenanthrene	9	210		8	14
Benzo(a)pyrene	0.12	0.10	J	0.35	0.24
Total Protein Content (ug/ml)	887	2731		2948	2265
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	33.8	11.0		22.4	23.0
Phenanthrene	9.9	76.9		2.8	6.2
Benzo(a)pyrene	0.14	0.04		0.12	0.11

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-PBS-22-FAC-B	04-PBS-21-FAC-B	04-PBS-19-FAC-B		04-PBS-18-FAC-B
Battelle Sample ID	S4156	S4157	S4158		S4159
GERG Sample ID	C45105	C45106	C45107		C45108
Sample Delivery Group (SDG)	E9151	E9151	E9151		E9151
Sample Type	SAMP	SAMP	SAMP		SAMP
Collection Date	07/08/2004	07/08/2004	06/08/2004		06/08/2004
Collection Time	18:16	18:16	19:55		19:55
Receipt Date	9/14/2004	9/14/2004	9/14/2004		9/14/2004
Matrix	Tissue	Tissue	Tissue		Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL		HPLC/FL
Analysis Dates					
Naphthalene	11/3/2004	11/3/2004	11/3/2004		11/3/2004
Phenanthrene	11/3/2004	11/3/2004	11/3/2004		11/3/2004
Benzo(a)pyrene	11/4/2004	11/4/2004	11/4/2004		11/4/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram		microgram/gram
Dilution	1	1	1		2
Analysis Batch	B1156	B1156	B1156		B1156
Bile Metabolites (ug/gram)					
Naphthalene	48	77	6		37
Phenanthrene	8	14	1		7
Benzo(a)pyrene	0.32	0.25	0.03	J	0.12
Total Protein Content (ug/ml)	3050	3323	293		903
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	15.7	23.2	19.8		41.0
Phenanthrene	2.7	4.2	2.9		7.2
Benzo(a)pyrene	0.10	0.08	0.11		0.13

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-PBS-19-FAC-B		04-PBS-17-FAC-B	04-PBS-13-FAC-B	04-PBS-12-FAC-B
Battelle Sample ID	S4158		S4160	S4161	S4164
GERG Sample ID	C45107D		C45109	C45110	C45111
Sample Delivery Group (SDG)	E9151		E9151	E9151	E9151
Sample Type	DUP		SAMP	SAMP	SAMP
Collection Date	06/08/2004		06/08/2004	06/08/2004	06/08/2004
Collection Time	19:55		19:55	19:41	18:43
Receipt Date	9/14/2004		9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue		Tissue	Tissue	Tissue
Method	HPLC/FL		HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene	11/3/2004		11/3/2004	11/3/2004	11/3/2004
Phenanthrene	11/3/2004		11/3/2004	11/3/2004	11/3/2004
Benzo(a)pyrene	11/4/2004		11/4/2004	11/4/2004	11/4/2004
Conc Units	microgram/gram		microgram/gram	microgram/gram	microgram/gram
Dilution	1		2	4	1
Analysis Batch	B1156		B1156	B1156	B1156
Bile Metabolites (ug/gram)					
Naphthalene	6		38	120	49
Phenanthrene	1		9	18	8
Benzo(a)pyrene	0.03	J	0.17	0.32	0.16
Total Protein Content (ug/ml)					
	298		893	2359	2160
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	19.8		42.6	50.9	22.7
Phenanthrene	3.1		10.3	7.6	3.6
Benzo(a)pyrene	0.11		0.19	0.14	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-PBS-11-FAC-B	04-PBS-09-FAC-B	04-PBS-08-FAC-B	04-PBS-06-FAC-B
Battelle Sample ID	S4165	S4166	S4167	S4168
GERG Sample ID	C45112	C45113	C45114	C45115
Sample Delivery Group (SDG)	E9151	E9151	E9151	E9151
Sample Type	SAMP	SAMP	SAMP	SAMP
Collection Date	06/08/2004	06/08/2004	06/08/2004	06/08/2004
Collection Time	18:43	18:43	17:50	17:50
Receipt Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	11/4/2004	11/4/2004	11/4/2004	11/4/2004
Phenanthrene	11/4/2004	11/4/2004	11/4/2004	11/4/2004
Benzo(a)pyrene	11/5/2004	11/5/2004	11/5/2004	11/5/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	4	1	1	1
Analysis Batch	B1156	B1156	B1156	B1156
Bile Metabolites (ug/gram)				
Naphthalene	70	52	60	51
Phenanthrene	10	8	9	8
Benzo(a)pyrene	0.23	0.14	0.14	0.19
Total Protein Content (ug/ml)	2623	5359	1213	1769
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	26.7	9.7	49.5	28.8
Phenanthrene	3.8	1.5	7.5	4.4
Benzo(a)pyrene	0.09	0.03	0.12	0.11

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-PBS-05-FAC-B	04-PBS-04-FAC-B	04-TGV-04-FAC-B	04-TGV-04-FAC-B
Battelle Sample ID	S4169	S4170	S4314	S4314
GERG Sample ID	C45116	C45117	C45118	C45118D
Sample Delivery Group (SDG)	E9151	E9151	E9151	E9151
Sample Type	SAMP	SAMP	SAMP	DUP
Collection Date	06/08/2004	06/08/2004	12/08/2004	12/08/2004
Collection Time	17:50	17:20	11:05	11:05
Receipt Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	11/4/2004	11/4/2004	11/4/2004	11/4/2004
Phenanthrene	11/4/2004	11/4/2004	11/4/2004	11/4/2004
Benzo(a)pyrene	11/5/2004	11/5/2004	11/5/2004	11/5/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	1	4	1	1
Analysis Batch	B1156	B1156	B1156	B1156
Bile Metabolites (ug/gram)				
Naphthalene	79	58	9	9
Phenanthrene	10	11	1	1
Benzo(a)pyrene	0.24	0.21	0.07	0.06
Total Protein Content (ug/ml)	2526	1418	1766	1850
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	31.3	40.9	4.8	4.6
Phenanthrene	4.0	7.8	0.7	0.6
Benzo(a)pyrene	0.10	0.15	0.04	0.03

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-TGV-21-FAC-B	
Battelle Sample ID	S4315	
GERG Sample ID	C45119	
Sample Delivery Group (SDG)	E9151	
Sample Type	SAMP	
Collection Date	12/08/2004	
Collection Time	18:40	
Receipt Date	9/14/2004	
Matrix	Tissue	
Method	HPLC/FL	
Analysis Dates		
Naphthalene	11/4/2004	
Phenanthrene	11/4/2004	
Benzo(a)pyrene	11/5/2004	
Conc Units	microgram/gram	
Dilution	8	
Analysis Batch	B1156	
Bile Metabolites (ug/gram)		
Naphthalene	54	
Phenanthrene	5	
Benzo(a)pyrene	0.08	J
Total Protein Content (ug/ml)		
	2006	
Protein Normalized Metabolite Concentration (ng/ug protein)		
Naphthalene	26.9	
Phenanthrene	2.7	
Benzo(a)pyrene	0.04	

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	Bile Reference II	QC Acceptance Range			Calibrated	
Battelle Sample ID	N/A					
GERG Sample ID	Q932	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)	N/A					
Sample Type	SRM					
Collection Date	N/A					
Collection Time	N/A					
Receipt Date	N/A					
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	11/3/2004					
Phenanthrene	11/3/2004					
Benzo(a)pyrene	11/4/2004					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1156					
Bile Metabolites (ug/gram)						
Naphthalene	370	318	to	442	380	31
Phenanthrene	110	75	to	145	110	18
Benzo(a)pyrene	1.30	1.2	to	2.4	1.80	0.32
Total Protein Content (ug/ml)						
	4051	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	91.3	65.9	to	91.5	79	6
Phenanthrene	27.2	15.5	to	30.0	23	4
Benzo(a)pyrene	0.32	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	Bile Reference II DUP	QC Acceptance Range			Calibrated	
Battelle Sample ID	N/A					
GERG Sample ID	Q933	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)	N/A					
Sample Type	SRM					
Collection Date	N/A					
Collection Time	N/A					
Receipt Date	N/A					
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	11/3/2004					
Phenanthrene	11/3/2004					
Benzo(a)pyrene	11/4/2004					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1156					
Bile Metabolites (ug/gram)						
Naphthalene	360	318	to	442	380	31
Phenanthrene	100	75	to	145	110	18
Benzo(a)pyrene	1.30	1.2	to	2.4	1.80	0.32
Total Protein Content (ug/ml)						
	3978	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	90.5	65.9	to	91.5	79	6
Phenanthrene	25.1	15.5	to	30.0	23	4
Benzo(a)pyrene	0.33	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	Bile Reference II	Bile Reference II DUP	
Battelle Sample ID	N/A	N/A	
GERG Sample ID	Q932	Q933	
Sample Delivery Group (SDG)	N/A	N/A	
Sample Type	0	SAMP	
Collection Date	SRM	SRM DUP	
Collection Time	N/A	N/A	
Receipt Date	N/A	N/A	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/3/2004	11/3/2004	
Phenanthrene	11/3/2004	11/3/2004	
Benzo(a)pyrene	11/4/2004	11/4/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1156	B1156	
Bile Metabolites (ug/gram)			
Naphthalene	370	360	2.7
Phenanthrene	110	100	9.5
Benzo(a)pyrene	1.30	1.30	0.0
Total Protein Content (ug/ml)			
	4051	3978	1.8
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	91.3	90.5	0.9
Phenanthrene	27.2	25.1	7.7
Benzo(a)pyrene	0.32	0.33	1.8

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-PBS-19-FAC-B	04-PBS-19-FAC-B	
Battelle Sample ID	S4158	S4158	
GERG Sample ID	C45107	C45107D	
Sample Delivery Group (SDG)	E9151	E9151	
Sample Type	SAMP	SAMP	
Collection Date	06/08/2004	06/08/2004	
Collection Time	19:55	19:55	
Receipt Date	9/14/2004	9/14/2004	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/3/2004	11/3/2004	
Phenanthrene	11/3/2004	11/3/2004	
Benzo(a)pyrene	11/4/2004	11/4/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1156	B1156	
Bile Metabolites (ug/gram)			
Naphthalene	6	6	1.7
Phenanthrene	1	1	6.7
Benzo(a)pyrene	0.03	0.03	3.1
Total Protein Content (ug/ml)			
	293	298	1.7
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	19.8	19.8	0.0
Phenanthrene	2.9	3.1	5.1
Benzo(a)pyrene	0.11	0.11	4.7

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	04-TGV-04-FAC-B	04-TGV-04-FAC-B	
Battelle Sample ID	S4314	S4314	
GERG Sample ID	C45118	C45118D	
Sample Delivery Group (SDG)	E9151	E9151	
Sample Type	SAMP	DUP	
Collection Date	12/08/2004	12/08/2004	
Collection Time	11:05	11:05	
Receipt Date	9/14/2004	9/14/2004	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/4/2004	11/4/2004	
Phenanthrene	11/4/2004	11/4/2004	
Benzo(a)pyrene	11/5/2004	11/5/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1156	B1156	
Bile Metabolites (ug/gram)			
Naphthalene	9	9	1.2
Phenanthrene	1	1	8.0
Benzo(a)pyrene	0.07	0.06	17.1
Total Protein Content (ug/ml)			
	1766	1850	4.6
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	4.8	4.6	3.4
Phenanthrene	0.7	0.6	12.6
Benzo(a)pyrene	0.04	0.03	21.6

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	N/A		N/A		N/A	
GERG Sample ID	Q925		Q926		Q927	
Sample Delivery Group (SDG)	N/A		N/A		N/A	
Sample Type	BLANK		BLANK		BLANK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/3/2004		11/3/2004		11/3/2004	
Phenanthrene	11/3/2004		11/3/2004		11/3/2004	
Benzo(a)pyrene	11/4/2004		11/4/2004		11/4/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1156		B1156		B1156	
Bile Metabolites (ug/gram)						
Naphthalene	0.70		0.68		0.69	
Phenanthrene	0.05	J	0.05	J	0.05	J
Benzo(a)pyrene	0.00	J	0.00	J	0.00	J
Total Protein Content (ug/ml)	N.D.		3		N.D.	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene						
Phenanthrene						
Benzo(a)pyrene						

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	N/A		N/A		N/A	
GERG Sample ID	Q934		Q936		Q941	
Sample Delivery Group (SDG)	N/A		N/A		N/A	
Sample Type	BLANK		BLANK		BLANK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/3/2004		11/4/2004		11/4/2004	
Phenanthrene	11/3/2004		11/4/2004		11/4/2004	
Benzo(a)pyrene	11/4/2004		11/5/2004		11/5/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1156		B1156		B1156	
Bile Metabolites (ug/gram)						
Naphthalene	0.69		0.66		0.67	
Phenanthrene	0.05	J	0.05	J	0.05	J
Benzo(a)pyrene	0.00	J	0.00	J	0.01	J
Total Protein Content (ug/ml)	N.D.		N.D.		N.D.	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene						
Phenanthrene						
Benzo(a)pyrene						

cANIMIDA
Fish Bile Metabolites
Analytical Set 2
SDG# E9151

Sample ID	Bile Reference III	Bile Reference III	Bile Reference III
Battelle Sample ID	N/A	N/A	N/A
GERG Sample ID	Q938	Q939	Q940
Sample Delivery Group (SDG)	N/A	N/A	N/A
Sample Type	SRM NEW	SRM NEW	SRM NEW
Collection Date	N/A	N/A	N/A
Collection Time	N/A	N/A	N/A
Receipt Date	N/A	N/A	N/A
Matrix	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates			
Naphthalene	11/4/2004	11/4/2004	11/4/2004
Phenanthrene	11/4/2004	11/4/2004	11/4/2004
Benzo(a)pyrene	11/5/2004	11/5/2004	11/5/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1
Analysis Batch	B1156	B1156	B1156
Bile Metabolites (ug/gram)			
Naphthalene	210	210	210
Phenanthrene	73	73	71
Benzo(a)pyrene	6.4	6.5	6.3
Total Protein Content (ug/ml)	2534	2540	2508
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	82.9	82.7	83.7
Phenanthrene	28.8	28.7	28.3
Benzo(a)pyrene	2.53	2.56	2.51

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-TGV-26-FAC-B	04-TGV-05-FAC-B	04-TGV-08-FAC-B		04-TGV-27-FAC-B	
Battelle Sample ID	S4316	S4317	S4318		S4319	
GERG Sample ID	C45120	C45121	C45122		C45123	
Sample Delivery Group (SDG)	E9151	E9151	E9151		E9151	
Sample Type	SAMP	SAMP	SAMP		SAMP	
Collection Date	12/08/2004	12/08/2004	12/08/2004		12/08/2004	
Collection Time	18:56	11:51	11:51		18:56	
Receipt Date	9/14/2004	9/14/2004	9/14/2004		9/14/2004	
Matrix	Tissue	Tissue	Tissue		Tissue	
Method	HPLC/FL	HPLC/FL	HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/5/2004	11/5/2004	11/5/2004		11/5/2004	
Phenanthrene	11/5/2004	11/5/2004	11/5/2004		11/5/2004	
Benzo(a)pyrene	11/6/2004	11/6/2004	11/6/2004		11/6/2004	
Conc Units	microgram/gram	microgram/gram	microgram/gram		microgram/gram	
Dilution	1	1	50		1	
Analysis Batch	B1157	B1157	B1157		B1157	
Bile Metabolites (ug/gram)						
Naphthalene	30	49	190		12	
Phenanthrene	6	6	31		2	
Benzo(a)pyrene	0.13	0.21	0.22	J	0.04	J
Total Protein Content (ug/ml)	2036	1108	N.D.		446	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	14.7	44.2			26.9	
Phenanthrene	2.7	5.0			3.4	
Benzo(a)pyrene	0.06	0.19			0.10	

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-TGV-30-FAC-B		04-TGV-06-FAC-B		04-TGV-24-FAC-B	04-TGV-29-FAC-B	
Battelle Sample ID	S4320		S4322		S4323	S4324	
GERG Sample ID	C45124		C45125		C45126	C45127	
Sample Delivery Group (SDG)	E9151		E9151		E9151	E9151	
Sample Type	SAMP		SAMP		SAMP	SAMP	
Collection Date	12/08/2004		12/08/2004		12/08/2004	12/08/2004	
Collection Time	19:18		11:51		18:40	19:18	
Receipt Date	9/14/2004		9/14/2004		9/14/2004	9/14/2004	
Matrix	Tissue		Tissue		Tissue	Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	HPLC/FL	
Analysis Dates							
Naphthalene	11/5/2004		11/5/2004		11/5/2004	11/5/2004	
Phenanthrene	11/5/2004		11/5/2004		11/5/2004	11/5/2004	
Benzo(a)pyrene	11/6/2004		11/6/2004		11/6/2004	11/7/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	microgram/gram	
Dilution	1		50		1	1	
Analysis Batch	B1157		B1157		B1157	B1157	
Bile Metabolites (ug/gram)							
Naphthalene	12		180		23	7	
Phenanthrene	2		22		4	1	
Benzo(a)pyrene	0.03	J	0.77	J	0.08	0.03	J
Total Protein Content (ug/ml)	935		N.D.		1195	1213	
Protein Normalized Metabolite Concentration (ng/ug protein)							
Naphthalene	12.8				19.2	5.5	
Phenanthrene	1.9				3.0	0.9	
Benzo(a)pyrene	0.04				0.07	0.03	

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-TGV-29-FAC-B		04-TGV-03-FAC-B	04-TGV-02-FAC-B	04-TGV-23-FAC-B
Battelle Sample ID	S4324		S4325	S4326	S4327
GERG Sample ID	C45127D		C45128	C45129	C45130
Sample Delivery Group (SDG)	E9151		E9151	E9151	E9151
Sample Type	DUP		SAMP	SAMP	SAMP
Collection Date	12/08/2004		12/08/2004	12/08/2004	12/08/2004
Collection Time	19:18		11:05	11:05	18:40
Receipt Date	9/14/2004		9/14/2004	9/14/2004	9/14/2004
Matrix	Tissue		Tissue	Tissue	Tissue
Method	HPLC/FL		HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene	11/5/2004		11/5/2004	11/5/2004	11/6/2004
Phenanthrene	11/5/2004		11/5/2004	11/5/2004	11/6/2004
Benzo(a)pyrene	11/7/2004		11/7/2004	11/7/2004	11/7/2004
Conc Units	microgram/gram		microgram/gram	microgram/gram	microgram/gram
Dilution	1		1	1	1
Analysis Batch	B1157		B1157	B1157	B1157
Bile Metabolites (ug/gram)					
Naphthalene	6		22	4	25
Phenanthrene	1		3	1	4
Benzo(a)pyrene	0.03	J	0.10	0.07	0.09
Total Protein Content (ug/ml)	1247		1178	1543	1355
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	4.6		18.7	2.8	18.4
Phenanthrene	0.8		2.9	0.8	2.7
Benzo(a)pyrene	0.03		0.08	0.05	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-TGV-07-FAC-B		04-TGV-01-FAC-B		04-SIS-11-FAC-B		04-SIS-12-FAC-B	
Battelle Sample ID	S4328		S4329		S4136		S4137	
GERG Sample ID	C45131		C45132		C45133		C45134	
Sample Delivery Group (SDG)	E9151		E9151		E9151		E9151	
Sample Type	SAMP		SAMP		SAMP		SAMP	
Collection Date	12/08/2004		12/08/2004		08/08/2004		08/08/2004	
Collection Time	11:51		11:05		11:40		11:40	
Receipt Date	9/14/2004		9/14/2004		9/14/2004		9/14/2004	
Matrix	Tissue		Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates								
Naphthalene	11/6/2004		11/6/2004		11/6/2004		11/6/2004	
Phenanthrene	11/6/2004		11/6/2004		11/6/2004		11/6/2004	
Benzo(a)pyrene	11/7/2004		11/7/2004		11/7/2004		11/7/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram		microgram/gram	
Dilution	5		1		4		1	
Analysis Batch	B1157		B1157		B1157		B1157	
Bile Metabolites (ug/gram)								
Naphthalene	21		16		32		21	
Phenanthrene	2		2		4		3	
Benzo(a)pyrene	0.03	J	0.03	J	0.05	J	0.04	J
Total Protein Content (ug/ml)	2627		754		6257		1387	
Protein Normalized Metabolite Concentration (ng/ug protein)								
Naphthalene	8.0		21.2		5.1		15.1	
Phenanthrene	0.9		2.9		0.6		1.8	
Benzo(a)pyrene	0.01		0.04		0.01		0.03	

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-SIS-24-FAC-B		04-SIS-27-FAC-B		04-PBS-24-FAC-B	04-PBS-14-FAC-B
Battelle Sample ID	S4145		S4149		S4154	S4162
GERG Sample ID	C45135		C45136		C45137	C45138
Sample Delivery Group (SDG)	E9151		E9151		E9151	E9151
Sample Type	SAMP		SAMP		SAMP	SAMP
Collection Date	09/08/2004		09/08/2004		07/08/2004	06/08/2004
Collection Time	13:39		14:02		18:16	19:41
Receipt Date	9/14/2004		9/14/2004		9/14/2004	9/14/2004
Matrix	Tissue		Tissue		Tissue	Tissue
Method	HPLC/FL		HPLC/FL		HPLC/FL	HPLC/FL
Analysis Dates						
Naphthalene	11/6/2004		11/6/2004		11/6/2004	11/6/2004
Phenanthrene	11/6/2004		11/6/2004		11/6/2004	11/6/2004
Benzo(a)pyrene	11/7/2004		11/7/2004		11/7/2004	11/7/2004
Conc Units	microgram/gram		microgram/gram		microgram/gram	microgram/gram
Dilution	1		1		3	1
Analysis Batch	B1157		B1157		B1157	B1157
Bile Metabolites (ug/gram)						
Naphthalene	12		12		65	14
Phenanthrene	2		2		10	2
Benzo(a)pyrene	0.05	J	0.04	J	0.26	0.05
Total Protein Content (ug/ml)	758		629		1132	4671
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	15.8		19.1		57.4	3.0
Phenanthrene	2.2		2.5		8.8	0.5
Benzo(a)pyrene	0.06		0.07		0.23	0.01

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-SIS-24-FAC-B
Battelle Sample ID	S4145
GERG Sample ID	C45135D
Sample Delivery Group (SDG)	E9151
Sample Type	DUP
Collection Date	09/08/2004
Collection Time	13:39
Receipt Date	9/14/2004
Matrix	Tissue
Method	HPLC/FL
Analysis Dates	
Naphthalene	11/6/2004
Phenanthrene	11/6/2004
Benzo(a)pyrene	11/7/2004
Conc Units	microgram/gram
Dilution	1
Analysis Batch	B1157
Bile Metabolites (ug/gram)	
Naphthalene	12
Phenanthrene	2
Benzo(a)pyrene	0.06
Total Protein Content (ug/ml)	
	660
Protein Normalized Metabolite Concentration (ng/ug protein)	
Naphthalene	18.2
Phenanthrene	3.0
Benzo(a)pyrene	0.09

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	Bile Reference II	QC Acceptance Range			Calibrated	
Battelle Sample ID	N/A					
GERG Sample ID	Q950	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)	N/A					
Sample Type	SRM					
Collection Date	N/A					
Collection Time	N/A					
Receipt Date	N/A					
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	11/5/2004					
Phenanthrene	11/5/2004					
Benzo(a)pyrene	11/6/2004					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1157					
Bile Metabolites (ug/gram)						
Naphthalene	350	318	to	442	380	31
Phenanthrene	110	75	to	145	110	18
Benzo(a)pyrene	1.40	1.2	to	2.4	1.80	0.32
Total Protein Content (ug/ml)						
	4067	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	86.1	65.9	to	91.5	79	6
Phenanthrene	27.0	15.5	to	30.0	23	4
Benzo(a)pyrene	0.34	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	Bile Reference II DUP	QC Acceptance Range			Calibrated	
Battelle Sample ID	N/A					
GERG Sample ID	Q951	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)	N/A					
Sample Type	SRM					
Collection Date	N/A					
Collection Time	N/A					
Receipt Date	N/A					
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	11/5/2004					
Phenanthrene	11/5/2004					
Benzo(a)pyrene	11/6/2004					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1157					
Bile Metabolites (ug/gram)						
Naphthalene	340	318	to	442	380	31
Phenanthrene	100	75	to	145	110	18
Benzo(a)pyrene	1.3	1.2	to	2.4	1.80	0.32
Total Protein Content (ug/ml)						
	4060	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	83.7	65.9	to	91.5	79	6
Phenanthrene	24.6	15.5	to	30.0	23	4
Benzo(a)pyrene	0.32	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	Bile Reference II	Bile Reference II DUP	
Battelle Sample ID	N/A	N/A	
GERG Sample ID	Q950	Q951	
Sample Delivery Group (SDG)	N/A	N/A	
Sample Type	0	SAMP	
Collection Date	SRM	SRM DUP	
Collection Time	N/A	N/A	
Receipt Date	N/A	N/A	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/5/2004	11/5/2004	
Phenanthrene	11/5/2004	11/5/2004	
Benzo(a)pyrene	11/6/2004	11/6/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1157	B1157	
Bile Metabolites (ug/gram)			
Naphthalene	350	340	2.9
Phenanthrene	110	100	9.5
Benzo(a)pyrene	1.4	1.3	7.4
Total Protein Content (ug/ml)			
	4067	4060	0.2
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	86.1	83.7	2.7
Phenanthrene	27.0	24.6	9.3
Benzo(a)pyrene	0.34	0.32	7.2

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-TGV-29-FAC-B	04-TGV-29-FAC-B	
Battelle Sample ID	S4324	S4324	
GERG Sample ID	C45127	C45127D	
Sample Delivery Group (SDG)	E9151	E9151	
Sample Type	SAMP	SAMP	
Collection Date	12/08/2004	12/08/2004	
Collection Time	19:18	19:18	
Receipt Date	9/14/2004	9/14/2004	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/5/2004	11/5/2004	
Phenanthrene	11/5/2004	11/5/2004	
Benzo(a)pyrene	11/7/2004	11/7/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1157	B1157	
Bile Metabolites (ug/gram)			
Naphthalene	7	6	14.4
Phenanthrene	1	1	9.5
Benzo(a)pyrene	0.03	0.03	6.1
Total Protein Content (ug/ml)			
	1213	1247	2.8
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	5.5	4.6	17.2
Phenanthrene	0.9	0.8	12.3
Benzo(a)pyrene	0.03	0.03	3.2

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	04-SIS-24-FAC-B	04-SIS-24-FAC-B	
Battelle Sample ID	S4145	S4145	
GERG Sample ID	C45135	C45135D	
Sample Delivery Group (SDG)	E9151	E9151	
Sample Type	SAMP	DUP	
Collection Date	09/08/2004	09/08/2004	
Collection Time	13:39	13:39	
Receipt Date	9/14/2004	9/14/2004	
Matrix	Tissue	Tissue	
Method	HPLC/FL	HPLC/FL	
Analysis Dates			
Naphthalene	11/6/2004	11/6/2004	
Phenanthrene	11/6/2004	11/6/2004	
Benzo(a)pyrene	11/7/2004	11/7/2004	
Conc Units	microgram/gram	microgram/gram	% RPD
Dilution	1	1	
Analysis Batch	B1157	B1157	
Bile Metabolites (ug/gram)			
Naphthalene	12	12	0.0
Phenanthrene	2	2	16.2
Benzo(a)pyrene	0.05	0.06	17.1
Total Protein Content (ug/ml)			
	758	660	13.7
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	15.8	18.2	13.7
Phenanthrene	2.2	3.0	29.7
Benzo(a)pyrene	0.06	0.09	30.7

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	N/A		N/A		N/A	
GERG Sample ID	Q943		Q944		Q945	
Sample Delivery Group (SDG)	N/A		N/A		N/A	
Sample Type	BLANK		BLANK		BLANK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/5/2004		11/5/2004		11/5/2004	
Phenanthrene	11/5/2004		11/5/2004		11/5/2004	
Benzo(a)pyrene	11/6/2004		11/6/2004		11/6/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1157		B1157		B1157	
Bile Metabolites (ug/gram)						
Naphthalene	0.58	J	0.58	J	0.61	
Phenanthrene	0.05	J	0.05	J	0.05	J
Benzo(a)pyrene	0.00	J	0.00	J	0.00	J
Total Protein Content (ug/ml)	N.D.		N.D.		N.D.	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene						
Phenanthrene						
Benzo(a)pyrene						

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	N/A		N/A		N/A	
GERG Sample ID	Q952		Q954		Q959	
Sample Delivery Group (SDG)	N/A		N/A		N/A	
Sample Type	BLANK		BLANK		BLANK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	11/5/2004		11/6/2004		11/6/2004	
Phenanthrene	11/5/2004		11/6/2004		11/6/2004	
Benzo(a)pyrene	11/7/2004		11/7/2004		11/7/2004	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1157		B1157		B1157	
Bile Metabolites (ug/gram)						
Naphthalene	0.62		0.63		0.60	
Phenanthrene	0.06	J	0.05	J	0.05	J
Benzo(a)pyrene	0.00	J	0.00	J	0.01	J
Total Protein Content (ug/ml)	N.D.		N.D.		N.D.	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene						
Phenanthrene						
Benzo(a)pyrene						

This page left intentionally blank.

2005 PAH Metabolite Data

cANIMIDA Sample Inventory and Dilutions

File Number	Battelle ID	Sample Descriptor	Sample Volume (uL)	Dilution Factor	Comments
C46762	S8814	05-PB-01-FACS-B	>50	1	
C46763	S8813	05-PB-02-FACS-B	>50	1	
C46764	S8812	05-PB-03-FACS-B	>50	1	
C46765	S8815	05-PB-05-FACS-B	>50	1	
C46766	S8816	05-PB-05-FACS-B	>50	1	
C46767	S8817	05-PB-06-FACS-B	>50	1	
C46768	S8818	05-PB-07-FACS-B	>50	1	
C46769	S8819	05-PB-08-FACS-B	>50	1	
C46770	S8820	05-PB-09-FACS-B	>50	1	
C46771	S8821	05-PB-10-FACS-B	>50	1	
C46772	S8822	05-PB-11-FACS-11	>50	1	
C46773	S8823	05-PB-12-FACS-B	>50	1	
C46774	S8824	05-PB-13-FACS-B	>50	1	
C46775	S8825	05-PB-14-FACS-B	>50	1	
C46776	S8828	05-PB-18-FACS-B	14.0	4	
C46777	S8829	05-SIS-01-FACS-B	30.0	2	
C46778	S8830	05-SIS-02-FACS-B	>50	1	
C46779	S8831	05-SIS-03-FACS-B	30.0	2	
C46780	S8832	05-SIS-04-FACS-B	>50	1	
C46781	S8833	05-SIS-05-FACS-B	>50	1	
C46782	S8834	05-SIS-06-FACS-B	>50	1	
C46783	S8835	05-SIS-07-FACS-B	>50	1	
C46784	S8836	05-SIS-08-FACS-B	>50	1	
C46785	S8837	05-SIS-09-FACS-B	>50	1	
C46786	S8838	05-SIS-10-FACS-B	>50	1	
C46787	S8839	05-SIS-11-FACS-B	>50	1	
C46788	S8841	05-SIS-13-FACS-B	>50	1	
C46789	S8842	05-SIS-14-FACS-B	>50	1	
C46790	S8843	05-SIS-15-FACS-B	>50	1	
C46791	S8845	05-SIS-17-FACS-B	>50	1	

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID		05-PB-01-FACS-B	05-PB-02-FACS-B	05-PB-03-FACS-B	05-PB-04-FACS-B
Battelle Sample ID		S8814	S8813	S8812	S8815
GERG Sample ID		C46762	C46763	C46764	C46765
Sample Delivery Group (SDG)		F9251	F9251	F9251	F9251
Sample Type		SAMP	SAMP	SAMP	SAMP
Collection Date		08/04/2005	08/04/2005	08/04/2005	08/04/2005
Collection Time		19:50	19:50	19:50	19:50
Receipt Date		09/07/2005	09/07/2005	09/07/2005	09/07/2005
Matrix		Tissue	Tissue	Tissue	Tissue
Method		HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene		10/12/2005	10/12/2005	10/13/2005	10/13/2005
Phenanthrene		10/12/2005	10/12/2005	10/13/2005	10/13/2005
Benzo(a)pyrene		10/14/2005	10/14/2005	10/14/2005	10/14/2005
Conc Units		microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution		1	1	1	1
Analysis Batch		B1163	B1163	B1163	B1163
Bile Metabolites (ug/gram)	**DL**				
Naphthalene	0.60	32	37	21	19
Phenanthrene	0.10	4	7	2	3
Benzo(a)pyrene	0.05	0.5	0.3	0.2	0.2
Total Protein Content (ug/ml)		2148	1932	1842	1517
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene		14.9	19.2	11.4	12.5
Phenanthrene		1.6	3.4	1.2	2.2
Benzo(a)pyrene		0.22	0.16	0.13	0.15

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-PB-04-FACS-B DUP	05-PB-05-FACS-B	05-PB-06-FACS-B	05-PB-07-FACS-B
Battelle Sample ID	S8815	S8816	S8817	S8818
GERG Sample ID	C46765D	C46766	C46767	C46768
Sample Delivery Group (SDG)	F9251	F9251	F9251	F9251
Sample Type	DUP	SAMP	SAMP	SAMP
Collection Date	08/04/2005	08/04/2005	08/04/2005	08/04/2005
Collection Time	19:50	19:50	19:50	19:50
Receipt Date	09/07/2005	09/07/2005	09/07/2005	09/07/2005
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Phenanthrene	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Benzo(a)pyrene	10/14/2005	10/14/2005	10/14/2005	10/14/2005
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1	1
Analysis Batch	B1163	B1163	B1163	B1163
Bile Metabolites (ug/gram)				
Naphthalene	19	20	29	54
Phenanthrene	3	3	4	7
Benzo(a)pyrene	0.3	0.3	0.3	0.3
Total Protein Content (ug/ml)	1439	6287	2239	3332
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	13.2	3.2	13.0	16.2
Phenanthrene	2.2	0.4	1.6	2.1
Benzo(a)pyrene	0.17	0.05	0.12	0.08

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-PB-08-FACS-B	05-PB-09-FACS-B	05-PB-10-FACS-B	05-PB-11-FACS-11
Battelle Sample ID	S8819	S8820	S8821	S8822
GERG Sample ID	C46769	C46770	C46771	C46772
Sample Delivery Group (SDG)	F9251	F9251	F9251	F9251
Sample Type	SAMP	SAMP	SAMP	SAMP
Collection Date	08/04/2005	08/04/2005	08/04/2005	08/04/2005
Collection Time	19:50	19:50	19:50	19:50
Receipt Date	09/07/2005	09/07/2005	09/07/2005	09/07/2005
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Phenanthrene	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Benzo(a)pyrene	10/14/2005	10/14/2005	10/15/2005	10/15/2005
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1	1
Analysis Batch	B1163	B1163	B1163	B1163
Bile Metabolites (ug/gram)				
Naphthalene	7	1	46	95
Phenanthrene	1	0.2	10	11
Benzo(a)pyrene	0.3	0.2	0.3	0.4
Total Protein Content (ug/ml)	1550	1450	2618	2676
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	4.8	0.8	17.6	35.5
Phenanthrene	0.6	0.1	3.8	4.1
Benzo(a)pyrene	0.20	0.14	0.11	0.13

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-PB-12-FACS-B	05-PB-13-FACS-B	05-PB-14-FACS-B	05-PB-18-FACS-B
Battelle Sample ID	S8823	S8824	S8825	S8828
GERG Sample ID	C46773	C46774	C46775	C46776
Sample Delivery Group (SDG)	F9251	F9251	F9251	F9251
Sample Type	SAMP	SAMP	SAMP	SAMP
Collection Date	08/04/2005	08/04/2005	08/04/2005	08/04/2005
Collection Time	19:50	19:50	19:50	19:50
Receipt Date	09/07/2005	09/07/2005	09/07/2005	09/07/2005
Matrix	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates				
Naphthalene	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Phenanthrene	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Benzo(a)pyrene	10/15/2005	10/15/2005	10/15/2005	10/15/2005
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1	4
Analysis Batch	B1163	B1163	B1163	B1163
Bile Metabolites (ug/gram)				
Naphthalene	65	27	58	26
Phenanthrene	13	5	12	6
Benzo(a)pyrene	0.5	0.3	0.4	0.8
Total Protein Content (ug/ml)	2955	1339	2537	2042
Protein Normalized Metabolite Concentration (ng/ug protein)				
Naphthalene	22.0	20.2	22.9	12.7
Phenanthrene	4.4	3.4	4.7	2.8
Benzo(a)pyrene	0.16	0.25	0.15	0.37

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-01-FACS-B		05-SIS-02-FACS-B	05-SIS-02-FACS-B DUP	05-SIS-03-FACS-B
Battelle Sample ID	S8829		S8830	S8830	S8831
GERG Sample ID	C46777		C46778	C46778D	C46779
Sample Delivery Group (SDG)	F9251		F9251	F9251	F9251
Sample Type	SAMP		SAMP	DUP	SAMP
Collection Date	08/01/2005		08/01/2005	08/01/2005	08/01/2005
Collection Time	21:40		21:40	21:40	21:40
Receipt Date	09/07/2005		09/07/2005	09/07/2005	09/07/2005
Matrix	Tissue		Tissue	Tissue	Tissue
Method	HPLC/FL		HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene	10/13/2005		10/13/2005	10/13/2005	10/13/2005
Phenanthrene	10/13/2005		10/18/2005	10/13/2005	10/13/2005
Benzo(a)pyrene	10/15/2005		10/15/2005	10/15/2005	10/15/2005
Conc Units	microgram/gram		microgram/gram	microgram/gram	microgram/gram
Dilution	2		1	1	2
Analysis Batch	B1163		B1163	B1163	B1163
Bile Metabolites (ug/gram)					
Naphthalene	37		35	36	150
Phenanthrene	5		6	6	23
Benzo(a)pyrene	0.1	J	0.3	0.3	0.2
Total Protein Content (ug/ml)	1021		2688	2757	9149
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	36.2		13.0	13.1	16.4
Phenanthrene	5.0		2.1	2.1	2.5
Benzo(a)pyrene	0.09		0.10	0.09	0.03

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-04-FACS-B	05-SIS-04-FACS-B DUP		05-SIS-05-FACS-B		05-SIS-06-FACS-B
Battelle Sample ID	S8832	S8832		S8833		S8834
GERG Sample ID	C46780	C46780D		C46781		C46782
Sample Delivery Group (SDG)	F9251	F9251		F9251		F9251
Sample Type	SAMP	DUP		SAMP		SAMP
Collection Date	08/01/2005	08/01/2005		08/01/2005		08/01/2005
Collection Time	21:40	21:40		21:40		21:40
Receipt Date	09/07/2005	09/07/2005		09/07/2005		09/07/2005
Matrix	Tissue	Tissue		Tissue		Tissue
Method	HPLC/FL	HPLC/FL		HPLC/FL		HPLC/FL
Analysis Dates						
Naphthalene	10/13/2005	10/13/2005		10/13/2005		10/13/2005
Phenanthrene	10/13/2005	10/13/2005		10/13/2005		10/13/2005
Benzo(a)pyrene	10/15/2005	10/15/2005		10/15/2005		10/15/2005
Conc Units	microgram/gram	microgram/gram		microgram/gram		microgram/gram
Dilution	1	1		1		1
Analysis Batch	B1163	B1163		B1163		B1163
Bile Metabolites (ug/gram)						
Naphthalene	19	19		5		38
Phenanthrene	3	3		1		6
Benzo(a)pyrene	0.1	0.1	J	0.0	J	0.2
Total Protein Content (ug/ml)	1328	1328		554		2607
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	14.3	14.3		9.4		14.6
Phenanthrene	2.1	2.1		2.2		2.2
Benzo(a)pyrene	0.07	0.07		0.05		0.06

cANIMIDA
Fish Bile Metabolites
Analytical Set 3
SDG# E9151

Sample ID	Bile Reference III	Bile Reference III	Bile Reference III
Battelle Sample ID	N/A	N/A	N/A
GERG Sample ID	Q938	Q939	Q940
Sample Delivery Group (SDG)	N/A	N/A	N/A
Sample Type	SRM NEW	SRM NEW	SRM NEW
Collection Date	N/A	N/A	N/A
Collection Time	N/A	N/A	N/A
Receipt Date	N/A	N/A	N/A
Matrix	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates			
Naphthalene	11/6/2004	11/6/2004	11/6/2004
Phenanthrene	11/6/2004	11/6/2004	11/6/2004
Benzo(a)pyrene	11/7/2004	11/7/2004	11/7/2004
Conc Units	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1
Analysis Batch	B1157	B1157	B1157
Bile Metabolites (ug/gram)			
Naphthalene	190	190	190
Phenanthrene	68	66	64
Benzo(a)pyrene	6.0	6.0	6.2
Total Protein Content (ug/ml)	2523	2544	2561
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	75.3	74.7	74.2
Phenanthrene	27.0	25.9	25.0
Benzo(a)pyrene	2.38	2.36	2.42

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-07-FACS-B	05-SIS-08-FACS-B	05-SIS-09-FACS-B	05-SIS-09-FACS-B DUP	05-SIS-10-FACS-B
Battelle Sample ID	S8835	S8836	S8837	S8837	S8838
GERG Sample ID	C46783	C46784	C46785	C46785D	C46786
Sample Delivery Group (SDG)	F9251	F9251	F9251	F9251	F9251
Sample Type	SAMP	SAMP	SAMP	DUP	SAMP
Collection Date	08/01/2005	08/01/2005	08/01/2005	08/01/2005	08/01/2005
Collection Time	21:40	21:40	21:40	21:40	21:40
Receipt Date	09/07/2005	09/07/2005	09/07/2005	09/07/2005	09/07/2005
Matrix	Tissue	Tissue	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene	10/13/2005	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Phenanthrene	10/13/2005	10/13/2005	10/13/2005	10/13/2005	10/13/2005
Benzo(a)pyrene	10/15/2005	10/15/2005	10/15/2005	10/15/2005	10/15/2005
Conc Units	microgram/gram	microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1	1	1
Analysis Batch	B1163	B1163	B1163	B1163	B1163
Bile Metabolites (ug/gram)					
Naphthalene	76	45	52	51	13
Phenanthrene	11	7	9	9	3
Benzo(a)pyrene	0.3	0.3	0.3	0.3	0.1
Total Protein Content (ug/ml)	2734	1483	1898	1898	770
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	27.8	30.3	27.4	26.9	16.9
Phenanthrene	4.0	4.6	4.8	4.7	3.8
Benzo(a)pyrene	0.10	0.18	0.16	0.16	0.09

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID		05-SIS-11-FACS-B	05-SIS-13-FACS-B	05-SIS-14-FACS-B	05-SIS-15-FACS-B
Battelle Sample ID		S8839	S8841	S8842	S8843
GERG Sample ID		C46787	C46788	C46789	C46790
Sample Delivery Group (SDG)		F9251	F9251	F9251	F9251
Sample Type		SAMP	SAMP	SAMP	SAMP
Collection Date		08/01/2005	08/01/2005	08/01/2005	08/01/2005
Collection Time		21:40	21:40	21:40	21:40
Receipt Date		09/07/2005	09/07/2005	09/07/2005	09/07/2005
Matrix		Tissue	Tissue	Tissue	Tissue
Method		HPLC/FL	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates					
Naphthalene		10/13/2005	10/13/2005	10/13/2005	10/14/2005
Phenanthrene		10/13/2005	10/13/2005	10/13/2005	10/14/2005
Benzo(a)pyrene		10/15/2005	10/13/2005	10/13/2005	10/14/2005
Conc Units		microgram/gram	microgram/gram	microgram/gram	microgram/gram
Dilution		1	1	1	1
Analysis Batch		B1163	B1163	B1163	B1163
Bile Metabolites (ug/gram)					
Naphthalene		22	45	40	24
Phenanthrene		5	7	7	4
Benzo(a)pyrene	J	0.4	0.2	0.2	0.2
Total Protein Content (ug/ml)		1130	1628	1417	1229
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene		19.5	27.6	28.2	19.5
Phenanthrene		4.0	4.1	5.2	3.1
Benzo(a)pyrene		0.38	0.14	0.13	0.15

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-15-FACS-B DUP	05-SIS-17-FACS-B
Battelle Sample ID	S8843	S8845
GERG Sample ID	C46790D	C46791
Sample Delivery Group (SDG)	F9251	F9251
Sample Type	DUP	SAMP
Collection Date	08/01/2005	08/01/2005
Collection Time	21:40	21:40
Receipt Date	09/07/2005	09/07/2005
Matrix	Tissue	Tissue
Method	HPLC/FL	HPLC/FL
Analysis Dates		
Naphthalene	10/14/2005	10/14/2005
Phenanthrene	10/14/2005	10/14/2005
Benzo(a)pyrene	10/14/2005	10/14/2005
Conc Units	microgram/gram	microgram/gram
Dilution	1	1
Analysis Batch	B1163	B1163
Bile Metabolites (ug/gram)		
Naphthalene	26	94
Phenanthrene	4	13
Benzo(a)pyrene	0.2	0.4
Total Protein Content (ug/ml)		
	1163	3344
Protein Normalized Metabolite Concentration (ng/ug protein)		
Naphthalene	22.4	28.1
Phenanthrene	3.4	3.9
Benzo(a)pyrene	0.16	0.13

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	Bile Ref II	QC Acceptance Range			Calibrated	
Battelle Sample ID	SRM					
GERG Sample ID	Q1080	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)						
	Bile Ref II					
Sample Type	SRM					
Collection Date						
Collection Time						
Receipt Date						
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	10/12/2005					
Phenanthrene	10/12/2005					
Benzo(a)pyrene	10/14/2005					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1163					
Bile Metabolites (ug/gram)						
Naphthalene	330	318	to	442	380	31
Phenanthrene	110	75	to	145	110	18
Benzo(a)pyrene	1.6	1.2	to	2.4	1.8	0.32
Total Protein Content (ug/ml)						
	4354	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	75.8	65.9	to	91.5	79	6
Phenanthrene	25.3	15.5	to	30.0	23	4
Benzo(a)pyrene	0.37	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	Bile Ref II	QC Acceptance Range			Calibrated	
Battelle Sample ID	SRM					
GERG Sample ID	Q1094	-2 stdev		+2 stdev	Value	Stdev
Sample Delivery Group (SDG)						
	Bile Ref II					
Sample Type	SRM					
Collection Date						
Collection Time						
Receipt Date						
Matrix	Tissue					
Method	HPLC/FL					
Analysis Dates						
Naphthalene	10/14/2005					
Phenanthrene	10/14/2005					
Benzo(a)pyrene	10/15/2005					
Conc Units	microgram/gram					
Dilution	1					
Analysis Batch	B1163					
Bile Metabolites (ug/gram)						
Naphthalene	340	318	to	442	380	31
Phenanthrene	130	75	to	145	110	18
Benzo(a)pyrene	1.5	1.2	to	2.4	1.8	0.32
Total Protein Content (ug/ml)						
	4354	3910.5	to	5747.8	4829	459
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	78.1	65.9	to	91.5	79	6
Phenanthrene	29.9	15.5	to	30.0	23	4
Benzo(a)pyrene	0.34	0.2	to	0.5	0.37	0.07

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-PB-04-FACS-B		05-PB-04-FACS-B DUP		
Battelle Sample ID	SAMP		DUP		
GERG Sample ID	C46765		C46765D		
Sample Delivery Group (SDG)	F9251		F9251		
Sample Type	SAMP		DUP		
Collection Date	08/04/2005		08/04/2005		
Collection Time	19:50		19:50		
Receipt Date	09/07/2005		09/07/2005		
Matrix	Tissue		Tissue		
Method	HPLC/FL		HPLC/FL		
Analysis Dates					
Naphthalene	10/13/2005		10/13/2005		
Phenanthrene	10/13/2005		10/13/2005		
Benzo(a)pyrene	10/14/2005		10/14/2005		
Conc Units	microgram/gram		microgram/gram		% RPD
Dilution	1		1		
Analysis Batch	B1163		B1163		
Bile Metabolites (ug/gram)		**DL**		**DL**	
Naphthalene	19	0.6	19	0.6	0
Phenanthrene	3	0.1	3	0.1	6
Benzo(a)pyrene	0.2	0.1	0.3	0.1	8
Total Protein Content (ug/ml)	1517		1439		5
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	12.5		13.2		5
Phenanthrene	2.2		2.2		1
Benzo(a)pyrene	0.15		0.17		14

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-02-FACS-B		05-SIS-02-FACS-B DUP		
Battelle Sample ID	SAMP		DUP		
GERG Sample ID	C46778		C46778D		
Sample Delivery Group (SDG)	F9251		F9251		
Sample Type	SAMP		DUP		
Collection Date	08/01/2005		08/01/2005		
Collection Time	11:16		11:16		
Receipt Date	09/07/2005		09/07/2005		
Matrix	Tissue		Tissue		
Method	HPLC/FL		HPLC/FL		
Analysis Dates					
Naphthalene	10/13/2005		10/13/2005		
Phenanthrene	10/18/2005		10/13/2005		
Benzo(a)pyrene	10/15/2005		10/15/2005		
Conc Units	microgram/gram		microgram/gram		% RPD
Dilution	1		1		
Analysis Batch	B1163		B1163		
Bile Metabolites (ug/gram)		**DL**		**DL**	
Naphthalene	35	0.6	36	0.6	3
Phenanthrene	6	0.1	6	0.1	2
Benzo(a)pyrene	0.1	0.1	0.1	0.1	10
Total Protein Content (ug/ml)	2688		2757		3
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	13.0		13.1		0
Phenanthrene	2.1		2.1		1
Benzo(a)pyrene	0.04		0.04		7

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-04-FACS-B		05-SIS-04-FACS-B DUP		
Battelle Sample ID	SAMP		DUP		
GERG Sample ID	C46780		C46780D		
Sample Delivery Group (SDG)	F9251		F9251		
Sample Type	SAMP		DUP		
Collection Date	08/01/2005		08/01/2005		
Collection Time	21:40		21:40		
Receipt Date	09/07/2005		09/07/2005		
Matrix	Tissue		Tissue		
Method	HPLC/FL		HPLC/FL		
Analysis Dates					
Naphthalene	10/13/2005		10/13/2005		
Phenanthrene	10/13/2005		10/13/2005		
Benzo(a)pyrene	10/15/2005		10/15/2005		
Conc Units	microgram/gram		microgram/gram		% RPD
Dilution	1		1		
Analysis Batch	B1163		B1163		
Bile Metabolites (ug/gram)		**DL**		**DL**	
Naphthalene	19	0.6	19	0.6	0
Phenanthrene	3	0.1	3	0.1	0
Benzo(a)pyrene	0.1	0.1	0.1	0.1	18
Total Protein Content (ug/ml)	1328		1328		0
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	14.3		14.3		0
Phenanthrene	2.1		2.1		0
Benzo(a)pyrene	0.06		0.07		18

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-09-FACS-B		05-SIS-09-FACS-B DUP		
Battelle Sample ID	SAMP		DUP		
GERG Sample ID	C46785		C46785D		
Sample Delivery Group (SDG)	F9251		F9251		
Sample Type	SAMP		DUP		
Collection Date	08/01/2005		08/01/2005		
Collection Time	21:40		21:40		
Receipt Date	09/07/2005		09/07/2005		
Matrix	Tissue		Tissue		
Method	HPLC/FL		HPLC/FL		
Analysis Dates					
Naphthalene	10/13/2005		10/13/2005		
Phenanthrene	10/13/2005		10/13/2005		
Benzo(a)pyrene	10/15/2005		10/15/2005		
Conc Units	microgram/gram		microgram/gram		% RPD
Dilution	1		1		
Analysis Batch	B1163		B1163		
Bile Metabolites (ug/gram)		**DL**		**DL**	
Naphthalene	52	0.6	51	0.6	2
Phenanthrene	9	0.1	9	0.1	1
Benzo(a)pyrene	0.3	0.1	0.3	0.1	3
Total Protein Content (ug/ml)	1898		1898		0
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	27.4		26.9		2
Phenanthrene	4.8		4.7		1
Benzo(a)pyrene	0.16		0.16		3

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	05-SIS-15-FACS-B		05-SIS-15-FACS-B DUP		
Battelle Sample ID	SAMP		DUP		
GERG Sample ID	C46790		C46790D		
Sample Delivery Group (SDG)	F9251		F9251		
Sample Type	SAMP		DUP		
Collection Date	08/01/2005		08/01/2005		
Collection Time	14:02		14:02		
Receipt Date	09/07/2005		09/07/2005		
Matrix	Tissue		Tissue		
Method	HPLC/FL		HPLC/FL		
Analysis Dates					
Naphthalene	10/14/2005		10/14/2005		
Phenanthrene	10/14/2005		10/14/2005		
Benzo(a)pyrene	10/14/2005		10/14/2005		
Conc Units	microgram/gram		microgram/gram		% RPD
Dilution	1		1		
Analysis Batch	B1163		B1163		
Bile Metabolites (ug/gram)		**DL**		**DL**	
Naphthalene	24	0.6	26	0.6	8
Phenanthrene	4	0.1	4	0.1	3
Benzo(a)pyrene	0.2	0.1	0.2	0.1	0
Total Protein Content (ug/ml)	1229		1163		6
Protein Normalized Metabolite Concentration (ng/ug protein)					
Naphthalene	19.5		22.4		14
Phenanthrene	3.1		3.4		8
Benzo(a)pyrene	0.15		0.16		6

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	Bile Reference III	Bile Reference III	Bile Reference III
Battelle Sample ID	SRM	SRM	SRM
GERG Sample ID	Q1095	Q1096	Q1097
Sample Delivery Group (SDG)			
	Bile Ref III	Bile Ref III	Bile Ref III
Sample Type	SRM	SRM	SRM
Collection Date	N/A	N/A	N/A
Collection Time	N/A	N/A	N/A
Receipt Date	N/A	N/A	N/A
Matrix	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates			
Naphthalene	10/12/2005	10/12/2005	10/12/2005
Phenanthrene	10/12/2005	10/12/2005	10/12/2005
Benzo(a)pyrene	10/14/2005	10/14/2005	10/14/2005
Conc Units	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1
Analysis Batch	B1163	B1163	B1163
Bile Metabolites (ug/gram)			
Naphthalene	140.00	140.00	130.00
Phenanthrene	49.00	50.00	50.00
Benzo(a)pyrene	5.90	5.90	5.90
Total Protein Content (ug/ml)			
	2148	2227	2307
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	65.2	62.9	56.3
Phenanthrene	22.8	22.4	21.7
Benzo(a)pyrene	2.75	2.65	2.56

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	Bile Reference III	Bile Reference III	Bile Reference III
Battelle Sample ID	SRM	SRM	SRM
GERG Sample ID	Q1098	Q1099	Q1100
Sample Delivery Group (SDG)			
	Bile Ref III	Bile Ref III	Bile Ref III
Sample Type	SRM	SRM	SRM
Collection Date	N/A	N/A	N/A
Collection Time	N/A	N/A	N/A
Receipt Date	N/A	N/A	N/A
Matrix	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates			
Naphthalene	10/12/2005	10/14/2005	10/14/2005
Phenanthrene	10/12/2005	10/14/2005	10/14/2005
Benzo(a)pyrene	10/14/2005	10/16/2005	10/16/2005
Conc Units	microgram/gram	microgram/gram	microgram/gram
Dilution	1	1	1
Analysis Batch	B1163	B1163	B1163
Bile Metabolites (ug/gram)			
Naphthalene	140.00	140.00	140.00
Phenanthrene	50.00	51.00	50.00
Benzo(a)pyrene	5.90	5.80	5.80
Total Protein Content (ug/ml)			
	2296	2079	2182
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	61.0	67.3	64.2
Phenanthrene	21.8	24.5	22.9
Benzo(a)pyrene	2.57	2.79	2.66

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	Bile Reference III		
Battelle Sample ID	SRM	SRM	SRM
GERG Sample ID	Q1101		
Sample Delivery Group (SDG)			
	Bile Ref III	Bile Ref III	Bile Ref III
Sample Type	SRM	SRM	SRM
Collection Date	N/A		
Collection Time	N/A		
Receipt Date	N/A		
Matrix	Tissue	Tissue	Tissue
Method	HPLC/FL	HPLC/FL	HPLC/FL
Analysis Dates			
Naphthalene	10/14/2005		
Phenanthrene	10/14/2005	Average	Std. Dev
Benzo(a)pyrene	10/16/2005		
Conc Units	microgram/gram	microgram/gram	microgram/gram
Dilution	1		
Analysis Batch	B1163		
Bile Metabolites (ug/gram)			
Naphthalene	140	138.6	3.8
Phenanthrene	51	50.1	0.7
Benzo(a)pyrene	5.9	5.9	0.0
Total Protein Content (ug/ml)			
	2273	2216.1	84.3
Protein Normalized Metabolite Concentration (ng/ug protein)			
Naphthalene	61.6	62.6	3.5
Phenanthrene	22.4	22.7	1.0
Benzo(a)pyrene	2.6	2.7	0.1

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	BLK		BLK		BLK	
GERG Sample ID	Q1078		Q1081		Q1086	
Sample Delivery Group (SDG)						
Sample Type	BLK		BLK		BLK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	10/14/2005		10/14/2005		10/14/2005	
Phenanthrene	10/14/2005		10/14/2005		10/14/2005	
Benzo(a)pyrene	10/16/2005		10/16/2005		10/16/2005	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1163		B1163		B1163	
Bile Metabolites (ug/gram)						
Naphthalene	0.75		0.69		0.67	
Phenanthrene	0.12		0.17		0.19	
Benzo(a)pyrene	0.00	J	0.00	J	0.00	J
Total Protein Content (ug/ml)	N.D.		N.D.		0	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	N.D.		N.D.		N.D.	
Phenanthrene	N.D.		N.D.		N.D.	
Benzo(a)pyrene	N.D.		N.D.		N.D.	

cANIMIDA
Fish Bile Metabolites
SDG# F9251

Sample ID	BLANK		BLANK		BLANK	
Battelle Sample ID	BLK		BLK		BLK	
GERG Sample ID	Q1088		Q1092		Q1102	
Sample Delivery Group (SDG)						
Sample Type	BLK		BLK		BLK	
Collection Date	N/A		N/A		N/A	
Collection Time	N/A		N/A		N/A	
Receipt Date	N/A		N/A		N/A	
Matrix	Tissue		Tissue		Tissue	
Method	HPLC/FL		HPLC/FL		HPLC/FL	
Analysis Dates						
Naphthalene	10/14/2005		10/14/2005		10/14/2005	
Phenanthrene	10/14/2005		10/14/2005		10/14/2005	
Benzo(a)pyrene	10/16/2005		10/16/2005		10/16/2005	
Conc Units	microgram/gram		microgram/gram		microgram/gram	
Dilution	1		1		1	
Analysis Batch	B1163		B1163		B1163	
Bile Metabolites (ug/gram)						
Naphthalene	0.67		0.66		0.67	
Phenanthrene	0.17		0.14		0.08	J
Benzo(a)pyrene	0.00	J	0.00	J	0.01	J
Total Protein Content (ug/ml)	N.D.		N.D.		2	
Protein Normalized Metabolite Concentration (ng/ug protein)						
Naphthalene	N.D.		N.D.		N.D.	
Phenanthrene	N.D.		N.D.		N.D.	
Benzo(a)pyrene	N.D.		N.D.		N.D.	

This page intentionally left blank

APPENDIX E

Field survey Reports for 2004, 2005 and 2006

This page intentionally left blank

Continuation of Arctic Nearshore Impact Monitoring in the Development Area (cANIMIDA)

Summer 2004 Field Survey Report

Report to

Minerals Management Service
Anchorage, AK

Report by

John Hardin and Greg Durell
Battelle
397 Washington Street
Duxbury, MA 02367

November 12, 2004

Battelle
The Business of Innovation

Table of Contents

List of Tables

List of Figures

List of Attachments

1.0 Introduction

MMS Vessel 1273

As part of the Minerals Management Service (MMS) program entitled "Continuation of Arctic Nearshore Impact Monitoring in the Development Area" (cANIMIDA), the first summer-season field survey of this program (fifth summer survey overall, including ANIMIDA) was conducted from July 28, 2004 to August 17, 2004. The scientific crew, on board the MMS Vessel 1273, collected water, sediment, and tissue samples for physical and chemical analyses. Work also included deployment and retrieval of moorings with caged mussels and semi-permeable membrane devices (SPMDs), setting fish traps, trawling, and collection of shoreline coordinates from the program study area. This report summarizes the field activities and samples collected during the 2004 cANIMIDA summer field survey.

The following bulleted items describe components successfully completed during the 2004 cANIMIDA summer sampling survey:

- Collected 51 surface sediment samples (0 to 1 cm) for hydrocarbon and metals chemistry from 47 offshore stations. Stations were comprised of 16 historic Beaufort Sea Monitoring Program (BSMP) stations, 22 historic Northstar island and Northstar pipeline stations, seven historic Liberty stations, and two new Liberty locations. Samples included triplicates at 2 stations, and additional samples at two stations with coordinate location discrepancies.
- Collected current and turbidity profiles at 20 stations (18 offshore and 2 river locations). Collected 109 suspended sediment samples from one to eight depth strata at the same 20 locations.
- Collected six large volume water samples for organic contaminant analysis; three from Northstar, two from the BSMP, and one from the Liberty area.
- Deployed and retrieved six moorings, three adjacent to Northstar, one in the Liberty area, and two in the BSMP area. Each mooring had single mussel cages and paired semi-permeable membrane device (SPMD) systems.
- Collected 19 bivalve/amphipod/isopod samples. For amphipods, six samples were collected from the Northstar area, four from the BSMP (includes two replicates at one location), and two from the Liberty area. For bivalves, three samples were collected from the BSMP and two from the Liberty area. For isopods, one sample was collected from the BSMP and one from the Northstar area.
- Collected one crude oil source sample from Northstar.
- Delivered all field samples to analytical laboratories for appropriate analyses.

2.0 Schedule

The summer 2004 cruise was conducted from July 28 to August 17, 2002. There were three days lost in the first week, and a half day lost in the final week, due to high winds and seas causing unsafe working conditions. Ice conditions during the survey were favorable, and did not impact sampling efforts. Members of the field team arrived in Prudhoe Bay, Alaska during July 26-28. Initial "check-out" of MMS Vessel 1273 was performed on July 26 and 27 by ship captain Mark Mertz of TEG Oceanographic Services (TEG). Field sampling personnel was comprised of seven staff from three organizations; two staff from Battelle, four from the Florida Institute of Technology (FIT), and one from Kinnetic Laboratories (KLI). The scientific team and ship's captain conducted the work on a 12 to 20 hours/day basis, depending on operating conditions and logistic considerations.

3.0 Cruise Operations and Samples Collected

The MMS Vessel 1273 served as the survey platform for the summer 2004 field work. The MMS Vessel 1273 underwent extensive maintenance and retrofit of electronic equipment during the winter of 2003-2004. The vessel was delivered to Prudhoe Bay, Alaska by MMS prior to the survey and launched after inspection by MMS and TEG representatives. The MMS Vessel 1273 was also used to retrieve current meters for the MMS University of Alaska Coastal Marine Institute (CMI) program at the end of the cANIMIDA survey. A complete list of the sampling stations that were targeted and sampled in the study area is included in Table 1. Table 1 also provides the station type, latitude and longitude, depth, date and time of sampling, and the type of sample (sample matrix). Figure 1 shows the locations of the 2004 sampling stations in the cANIMIDA study area on a series of maps. Additional daily survey and sampling station information is included in the Daily Operations Logs (Attachment 1), Station Logs (Attachment 2), and Fish Sampling Logs (Attachment 3). The following narrative summarizes the field survey timeline.

Mussels in holding container with aeration prior to deployment

July 26 (Monday)

The ship's Captain (Mark Mertz) arrives at Deadhorse, AK, inspects MMS Vessel 1273, and takes custody of the vessel after inspection.

July 27 (Tuesday)

Vessel 1273 maintenance and shakedown cruise is performed in Prudhoe Bay. The captain familiarizes himself with the new electronic equipment, and remedied several minor issues remaining from the winter repairs and truck transport to Prudhoe Bay.

Field team members John Trefry, Bob Trocine, Matt Alkire (FIT) and Gary Lawley (KLI) arrive at Deadhorse, AK. The team mobilizes field and laboratory equipment/supplies at the British Petroleum (BP) Seawater Treatment Plant (STP) Facility.

Field team members John Hardin, Mike Walsh (Battelle) and Greg Delfosse (FIT) receive North Slope safety training in Anchorage.

July 28 (Wednesday)

Field team members Hardin, Walsh and Delfosse acquire BP badges in the morning, and travel to Deadhorse in the afternoon.

The field team at STP mobilizes the vessels (1273 and two inflatables) and sets up water processing laboratory at STP.

July 29 (Thursday)

Amphipod traps are deployed and retrieved at three locations within the Northstar area. Three subsurface moorings are deployed at Northstar. Each mooring is comprised of one mussel cage with ~40 mussels in a Nytex tube, two SPMD cages (four SPMDs, two in each cage), and an acoustic pinger (Figure 2).

Deploying mussel/SPMD mooring w/acoustic pinger

July 30 (Friday)

Three moorings are deployed (one at Liberty, two at BSMP locations). "Zero time" (not deployed) mussels (three samples), one SPMD field blank, and one hydraulic fluid QC sample are collected. Hydraulic fluid leak at the remote steering station (where equipment and supplies were stored) was repaired during the day. Sediment samples are collected at two BSMP locations. Anchor 1273 at West Dock.

July 31 - August 1 (Saturday – Sunday)

Winds of 25 – 50 kts prevail. Sea conditions are unsafe for sampling. Attempt was made to sample on 1 August, but team abandons attempt. River shoreline mapping for erosion studies is completed along the Sagavanirktok ('Sag') River.

August 2 (Monday)

Sediment samples are collected from seven locations within the Liberty and BSMP areas. Water is collected from two Liberty locations and one transect location (E0). One amphipod and three clam samples are collected from Liberty and BSMP areas.

August 3 (Tuesday)

Sediment samples are collected from seven locations within Liberty and BSMP areas. Water is collected from two locations (one Liberty, one BSMP). Amphipods are collected from two BSMP stations. Anchor is lost under moving iceberg during water sampling. The anchor was replaced the same day by John Tremont of MMS and shipped via airfreight from Anchorage to Deadhorse.

August 4 (Wednesday)

Winds of 25 – 40 kts and rough seas prevail; conditions are again unsafe for sampling. Sediment and tissue samples are shipped to the Battelle Duxbury laboratory.

August 5 (Thursday)

Sampling team split into two groups.

The water/sediment team collects water from seven locations (six transect and one BSMP location). Sediment is collected from one BSMP location.

The fish team deploys fyke net at Point Brower.

Van Veen grab with sediment sample

August 6 (Friday)

The water/sediment team collects sediment samples from 11 Northstar locations, and samples water at four locations (three on transect K and one at Northstar).

The fish team collects fish from the fyke net set at Point Brower. Fish are processed for tissue chemistry, estrogen-mediated suppression of cytochrome P4501A (CYP1A), and bile is removed for metabolites of fluorescent aromatic compounds (FACs) at the STP Conex building.

Dick Prentki, MMS' Contracting Officer's Technical Representative (COTR), arrives at Deadhorse.

August 7 (Sunday)

The water/sediment team collects water from two transect locations and sediment from five Northstar locations.

The fish team collects fish from Point Brower, removes net from Point Brower, and processes fish at STP. The fyke net is set at Stump Island in the afternoon.

August 8 (Monday)

The water/sediment team sets two minnow traps baited with sardines close to Northstar Island to test an alternative fish collection method. Water is collected from one BSMP, one transect, and two Northstar locations. Sediment is collected from one Northstar and three BSMP locations. Amphipods are collected from one Northstar location.

The FIT team completes their water sampling, processes their final samples, and begins packing samples and equipment.

The fish team collects fish in the morning from Stump Island net, re-sets the net, and processes samples at STP. Fish are then collected in the afternoon, the net is re-set, and the second batch of fish is processed in the evening.

August 9 (Tuesday)

The water/sediment team retrieves minnow traps from Northstar. No fish were caught, only isopods and a few amphipods. Larger traps than the minnow traps with live bait, such as isopods, might be more suitable to catch small bottom fish such as sculpin and flatfish/sand dabs and could be considered for future surveys.

Surface water sample collection near flow ice

The water/sediment team collects sediment from five Northstar locations and five BSMP locations. Amphipods are collected from one Northstar location, and clams from one BSMP location. One large volume water sample is collected from Northstar and filtered using the Infiltrex unit at STP in the evening.

The fish team collects fish from Stump Island, removes fyke net, and processes fish samples at STP.

FIT team completes de-mobilization of equipment and supplies. Three FIT staff depart Deadhorse, John Trefry remains.

August 10 (Wednesday)

Sediment, tissue and fish samples are shipped to Battelle Duxbury in the morning. Re-fueled 1273 with 200 gallons of diesel fuel and fill water tanks.

One large volume water sample was collected in the afternoon from Northstar and the sample was filtered in the evening.

August 11 (Thursday)

The single water/sediment/fish team transits to Tigvariak Island. One large volume water sample was collected from a BSMP station on the way to Tigvariak. The water sample was filtered on the 1273. Fyke net was deployed at Tigvariak. A second large volume water sample was collected from a BSMP station, and the sample was filtered while anchored at Tigvariak Island.

John Trefry departs Deadhorse.

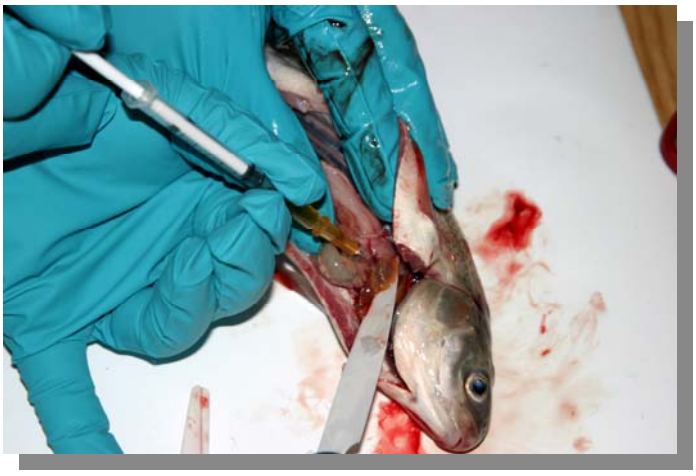
Collecting fish from fyke net at Tigvariak

August 12 (Friday)

Fish were collected from the fyke net in the morning, the net was re-set, and the samples were process on the 1273. Clams were collected from a BSMP location in the afternoon. The fyke net was re-sampled in the evening and removed, and the samples were processed. Returned to anchor at Tigvariak Island.

August 13 (Saturday)

Two mussel/SPMD moorings (one Liberty and one BSMP location) were retrieved. Amphipod traps were set at two Liberty locations and fish were collected by trawling at Liberty. Amphipods were retrieved from one location. One large volume water sample was collected from Liberty and processed. Returned early to Endicott Island due to building winds and seas.



Collecting bile sample for FACS analysis

August 14 (Sunday)

Mussel/SPMD mooring was retrieved from a BSMP location. The amphipod trap set on 13 August was retrieved, but there were not enough organisms to keep the sample. A too long of a deployment appears to cause amphipods to lose interest in the Nytex™ wrapped bait (i.e., the bait is not available to eat, so the amphipods leave). Returned to West Dock.

August 15 (Monday)

Moorings were retrieved from three Northstar locations. Fish were collected by trawling at Northstar. A large volume water sample was collected from Northstar and the sample was filtered at STP in the evening.

The field sampling was completed for the 2004 cANIMIDA summer season.

August 16 (Tuesday)

De-mobilized equipment and supplies, and shipped samples.
Re-fueled 1273 with 200 gallons of diesel, and re-filled the water tanks.

August 17 (Wednesday)

Equipment and gear were shipped in the morning.

A Northstar crude sample was received and shipped in the evening. This is the one source sample that was collected on this trip.

Battelle and KLI staff depart Deadhorse. Mark Mertz remains to captain 1273 for the University of Alaska (UA) survey.

August 18 (Thursday) – 2 September (Thursday)

UA staff arrived on 19 August. UA equipment arrives by 21 August. The UA mooring deployment efforts were affected by several weather days, but the work was successfully completed. Mark Mertz supervises the removing of the 1273 from the water and prepares the vessel for the winter. Mertz returns to California on 2 September.

4.0 Sampling Procedures

The sampling procedures that were used were consistent with those used during the Summer 2002 program (MMS 2002), and were described in the Summer 2004 Field Logistics and Sampling Plan for the Minerals Management Service ANIMIDA Program (MMS, 2004). One additional sample type, filtered large volume (100L) water samples for organic analytes, was added to the cANIMIDA 2004 survey, and such water samples were collected from six locations.

Sampling procedures included:

- water conductivity, temperature, and depth (CTD) measurements
- water current measurements with the CTD/Doppler current meter

Sieving sediment for clams

- water sample collection via pump system from offshore suspended sediment stations, and via hand at shoreline river stations
- surface sediment grab sample collection using a modified Van-Veen grab (for sediments and bivalves)
- deployment and retrieval of amphipod traps
- deployment and retrieval of mussel cages and SPMDs from six fixed moorings
- collection of fish samples by fyke net at three locations, and by trawling at two locations
- collection of large volume water samples at six locations
- DGPS measurements of shoreline sections

Photo documentation, station logs, and field notes were recorded during the field survey. The daily operations logs are included in Attachment 1, the station logs for each sampling station are included in Attachment 2, and the fish sampling logs are included in Attachment 3. The station logs include a description of the sampling location, observations, number and type(s) of samples collected, and comments.

5.0 Technical Issues

There were no significant technical difficulties during this survey. The sampling went smoothly, with a normal amount of weather days (3.5). As expected, collecting sufficient fish offshore with a small otter trawl was difficult and returned a minimal amount of fish for analysis. Other approaches for collecting fish should be considered for future surveys. There were no permit problems with mussel collection and transport, partly because of lessons learned as part of the 2002 survey.

6.0 References

Minerals Management Service. 2002. Summer 2002 Field Sampling and Logistics Plan. July 2002.

Minerals Management Service. 2004. Summer 2004 Field Sampling and Logistics Plan. July 22, 2004.

Table 1. cANIMIDA Stations Sampled in the Summer 2004 Survey

Station ID	Station Type	Latitude[1] (WGS84)	Longitude[1] (WGS84)	Date
3A	BSMP	70° 16.9327	147° 05.4570	30-Jul; 11,12,13-Aug
3B	BSMP	70° 17.9035	147° 02.5445	30-Jul
4A	BSMP	70° 18.4539	147° 40.2372	3-Aug
4B	BSMP	70° 21.0155	147° 40.0320	3-Aug
4C	BSMP	70° 26.0898	147° 42.9757	3-Aug
5(0)	BSMP	70° 22.7435	147° 00.3850	3-Aug
5(1)	BSMP	70° 25.0763	148° 03.5628	5-Aug
5(10)	BSMP	70° 27.3238	148° 30.0676	8-Aug
5(5)	BSMP	70° 26.0820	147° 18.0805	3-Aug
5(5) - L1	BSMP	-	-	
5(5a)	BSMP	70° 26.0079	148° 18.8205	8-Aug
5A	BSMP	70° 29.6986	148° 46.0600	9-Aug
5B	BSMP	70° 34.8745	148° 55.1429	9-Aug
5D	BSMP	70° 24.4578	148° 33.5676	8-Aug
5E	BSMP	70° 38.3621	149° 16.3576	9-Aug
5F	BSMP	70° 26.4946	148° 49.5346	9-Aug
5H	BSMP	70° 22.2280	147° 47.8581	2,11,14-Aug
E0	Other	70° 23.0036	148° 00.0271	2-Aug
E1	Other	70° 23.9972	148° 00.1264	5-Aug
E2	Other	70° 26.0057	148° 00.0680	5-Aug
E3	Other	70° 27.9779	148° 06.1030	5-Aug
K0	Other	70° 26.3959	148° 41.8500	7-Aug
K1	Other	70° 27.6797	148° 41.2676	6-Aug
K2	Other	70° 28.3053	148° 40.1109	6-Aug
K3	Other	70° 28.9968	148° 38.8059	6-Aug
K4	Other	-	-	
K5	Other	-	-	
L01	Liberty	70° 17.9321	148° 40.0906	2-Aug
L01A	Liberty	70° 18.9281	147° 33.9044	11-Aug
L04	Liberty	70° 17.0604	147° 40.0976	2-Aug
L06	Liberty	70° 16.9242	147° 34.0839	2,13-Aug
L07	Liberty	70° 16.7760	147° 32.0016	2-Aug
L08	Liberty	70° 16.7007	147° 30.3426	2-Aug
L09	Liberty	70° 16.5705	147° 27.2041	2-Aug
L14	Liberty	70° 17.0095	147° 34.744	13-Aug
L17	Liberty	70° 23.6088	147° 32.9282	3,13-Aug
L18	Liberty	70° 18.3738	147° 45.6664	3,13-Aug
MZ	QA/QC	NA	NA	30-Jul
N01	Northstar	70° 31.6679	148° 41.4653	8-Aug
N02	Northstar	70° 30.5390	148° 41.3394	7-Aug
N03	Northstar	70° 30.0202	148° 41.4901	7,8-Aug
N04	Northstar	70° 29.6787	148° 48.0977	9,15-Aug
N05	Northstar	70° 29.6337	148° 44.6996	7,10,15-Aug
N06	Northstar	70° 29.5591	148° 43.2685	7,9,15-Aug
N07	Northstar	70° 29.5703	148° 40.0925	6-Aug
N08	Northstar	70° 29.4281	148° 38.3250	6-Aug
N09	Northstar	70° 29.3405	148° 35.1494	6-Aug
N10	Northstar	70° 29.0187	148° 41.7696	6-Aug
N11	Northstar	70° 28.4650	148° 42.0122	29-Jul; 6-Aug
N12	Northstar	70° 27.3503	148° 42.1061	29-Jul; 6-Aug
N13	Northstar	70° 26.9832	148° 43.5749	29-Jul; 9-Aug
N14	Northstar	70° 25.9829	148° 40.3584	9-Aug
N15	Northstar	70° 26.7197	148° 44.5858	9-Aug
N16	Northstar	70° 29.9089	148° 42.3907	7-Aug
N17	Northstar	70° 29.8177	148° 40.3584	6-Aug
N18	Northstar	70° 29.0908	148° 42.2610	6,7-Aug
N19	Northstar	70° 29.1251	148° 40.5610	6-Aug
N20	Northstar	70° 27.9697	148° 41.6865	6-Aug
N21	Northstar	70° 26.8124	148° 41.7302	9-Aug
N23	Northstar	70° 29.3749	148° 41.9297	6-Aug
N24a	Northstar	70° 38.6646	148° 39.1849	8-Aug
N25	Northstar	70° 29.7314	148° 43.9868	15-Aug
PB1	Other	70° 24.2655	148° 31.3879	7-Aug
PBS	Liberty	70° 17.5583	147° 48.1414	7-Aug
S2	Other	70° 24.3032	148° 14.1992	5,8-Aug
S4	Other	70° 25.7847	148° 14.1101	5-Aug
S5	Other	70° 26.5846	148° 14.0971	5-Aug
SIS	Northstar	70° 25.9079	148° 41.5673	8-Aug
SK1	Other	-	-	
SK2	Other	-	-	
SK4	Other	-	-	
SK6	Other	-	-	
SK7	Other	-	-	
SK8	Other	-	-	
TGV	Tigvariak Island	70° 12.4541	147° 14.2344	12-Aug
TOTALS				

[1] Only one coordinate provided per station, even when multiple visits or trawls were made

Table 1 (cont.). cANIMIDA Stations Sampled in the 2004 Summer Survey

Station ID	Sample Type								
	Sediment	Water	LV Water	Amphipods	Isopods	Bivalve (Clams)	Deployed Mussel_ SPMD	Fish	Field Blanks
3A	1		1			1	1		
3B	1								
4A	1			1					
4B	1								
4C	1	0							
5(0)	1			2	1				
5(1)	1	1							
5(10)	1								
5(5)	1	1							
5(5) - L1		0							
5(5a)	1								
5A	1								
5B	1			1					
5D	1								
5E	1								
5F	1					1			
5H	1		1			1	1		
E0		1							
E1		1							
E2		1							
E3		1							
K0		1							
K1		1							
K2		1							
K3		1							
K4		0							
K5		0							
L01	1	1							
L01A	1								4
L04	1	1		1					
L06	3		1				1		
L07	1								
L08	1					1			
L09	1					1			
L14								5	
L17	1	1							
L18	1			1					
MZ							3		
N01	1	1							
N02	1								
N03	1			1	1				
N04	1		1	1			1		2
N05	1		1				1		
N06	3		1				1		
N07	1								
N08	1								
N09	1								
N10	1								
N11	1			1					
N12	1			1					
N13	1			1					
N14	1								
N15	1								
N16	1								
N17	1								
N18	1			1					
N19	1								
N20	1								
N21	1								1
N23	1	1							
N24a		1							
N25								5	
PB1		1							
PBS								78	
S2		2							
S4		1							
S5		1							
SIS								83	
SK1		0							
SK2		0							
SK4		0							
SK6		0							
SK7		0							
SK8		0							
TGV								66	
TOTALS	51	21	6	12	2	5	9	237	7

KEY	
1	Indicates number of samples collected
1	Indicates samples collected at unplanned location
0	Indicates proposed sample not collected.

Table 1 (cont.). cANIMIDA Stations Sampled in the 2004 Summer Survey

Station ID	Comments
3A	Two SPMDs samples and one container of mussels.
3B	
4A	
4B	
4C	Water samples not collected, site beyond influence of suspended solids from rivers.
5(0)	Extra amphipod sample collected. Oportunistic isopod sample collected.
5(1)	Water station added within area containing suspended solids from rivers.
5(10)	
5(5)	
5(5) - L1	Water samples not collected, site beyond influence of suspended solids from rivers.
5(5a)	Error in coordinates for 5(5). 5(5a) added at correct location.
5A	
5B	
5D	
5E	
5F	
5H	Two SPMDs samples and one container of mussels.
E0	
E1	
E2	
E3	
K0	Water station added within area containing suspended solids from rivers.
K1	
K2	
K3	
K4	Water samples not collected, site beyond influence of suspended solids from rivers.
K5	Water samples not collected, site beyond influence of suspended solids from rivers.
L01	
L01A	Error in coordinates for L01. L01A added at correct intended location for L01.
L04	
L06	Two SPMDs samples and one container of mussels.
L07	
L08	
L09	
L14	5 total samples (from 10 fish) (2 PHC/MET, 3 CYP1A) Multiple fish/jar.
L17	New station added in Liberty area.
L18	New station added in Liberty area.
MZ	Zero time Mussels
N01	Water station added within area containing suspended solids from rivers.
N02	
N03	Oportunistic isopod sample collected.
N04	
N05	
N06	
N07	
N08	
N09	
N10	
N11	
N12	
N13	
N14	
N15	
N16	
N17	
N18	
N19	
N20	
N21	
N23	Water station added within area containing suspended solids from rivers.
N24a	Water station added within area containing suspended solids from rivers.
N25	5 total samples (from 19 fish) (3 PHC/MET, 2 CYP1A) Multiple fish/jar.
PB1	
PBS	78 total samples (25 PHC/MET, 32 CYP1A, and 21 bile)
S2	Two samples collected, one Aug 5 and one on Aug 8 to assess temporal changes.
S4	
S5	
SIS	83 total samples (28 PHC?MET, 31 CYP1A, 24 bile)
SK1	Water samples not collected, site beyond influence of suspended solids from rivers.
SK2	Water samples not collected, site beyond influence of suspended solids from rivers.
SK4	Water samples not collected, site beyond influence of suspended solids from rivers.
SK6	Water samples not collected, site beyond influence of suspended solids from rivers.
SK7	Water samples not collected, site beyond influence of suspended solids from rivers.
SK8	Water samples not collected, site beyond influence of suspended solids from rivers.
TGV	66 total samples (20 PHC/MET, 30 CYP1A, 16 Bile)
TOTALS	

Additional Blanks/Source material samples
SPMD Trip Blanks
Absorbent pad wipe of hydraulic fluid
Absorbent pad wipe of diesel fuel
Northstar composite crude oil

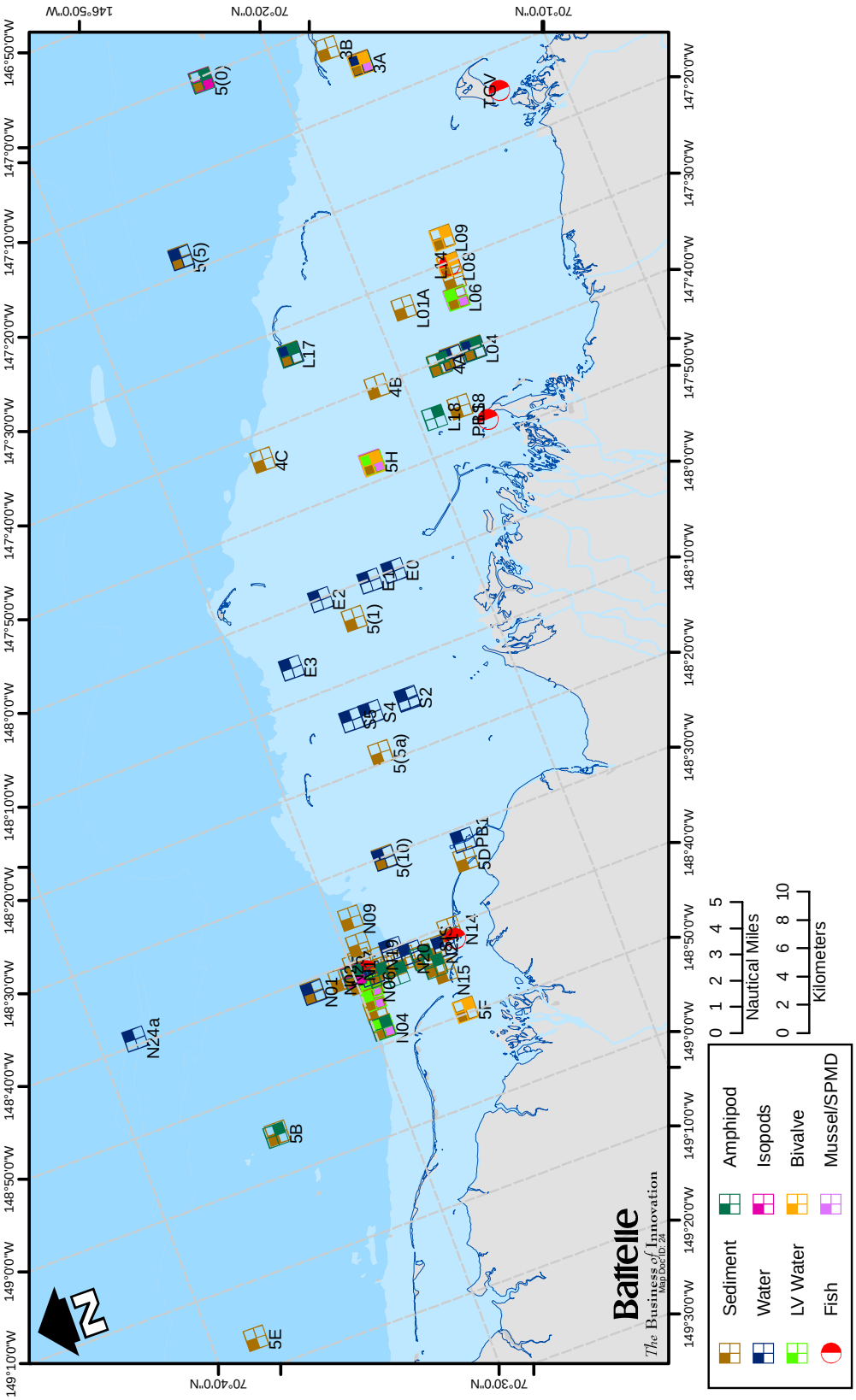


Figure 1. cANIMIDA Summer 2004 Sampling Stations
All Stations

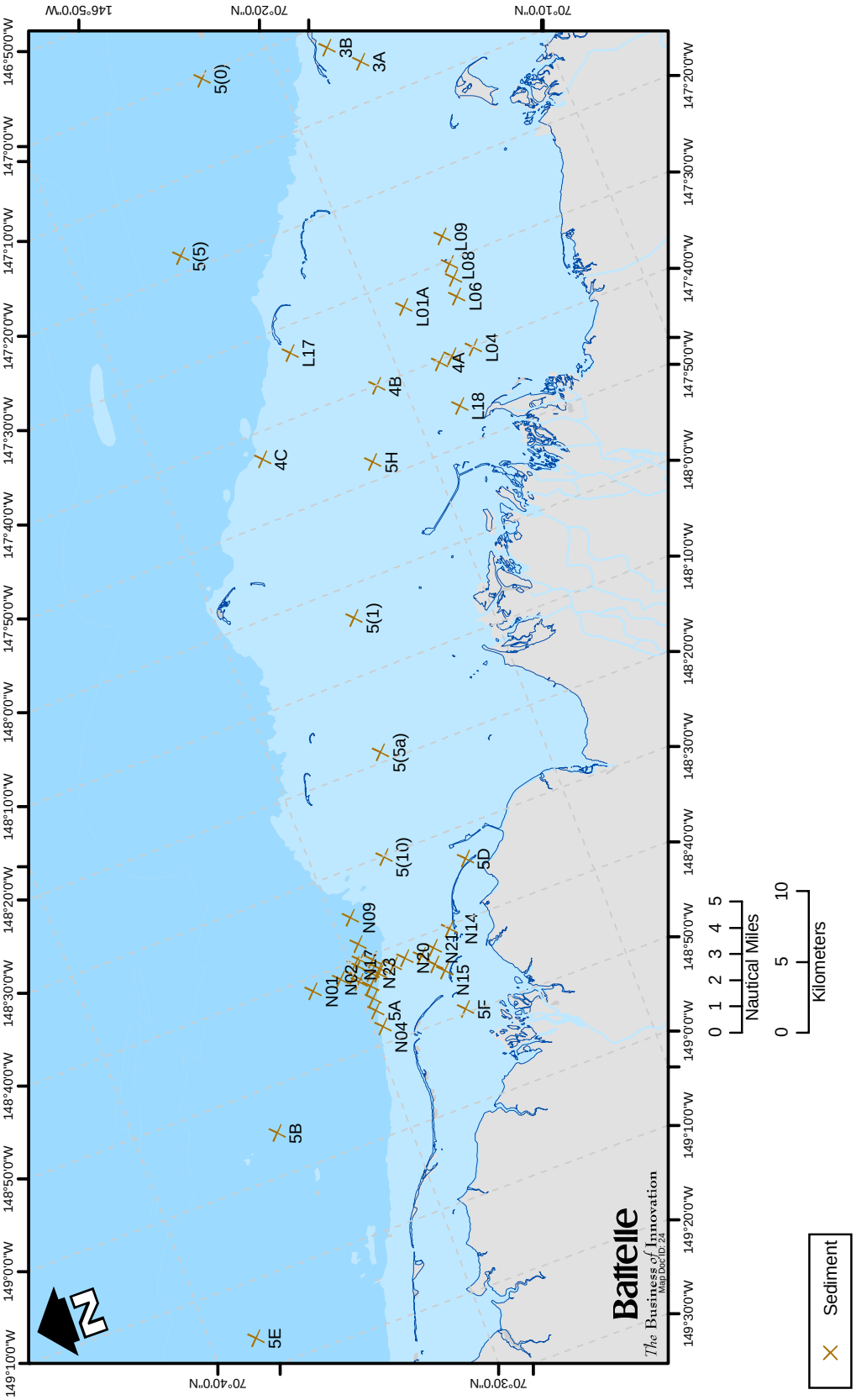


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations Sediment Stations

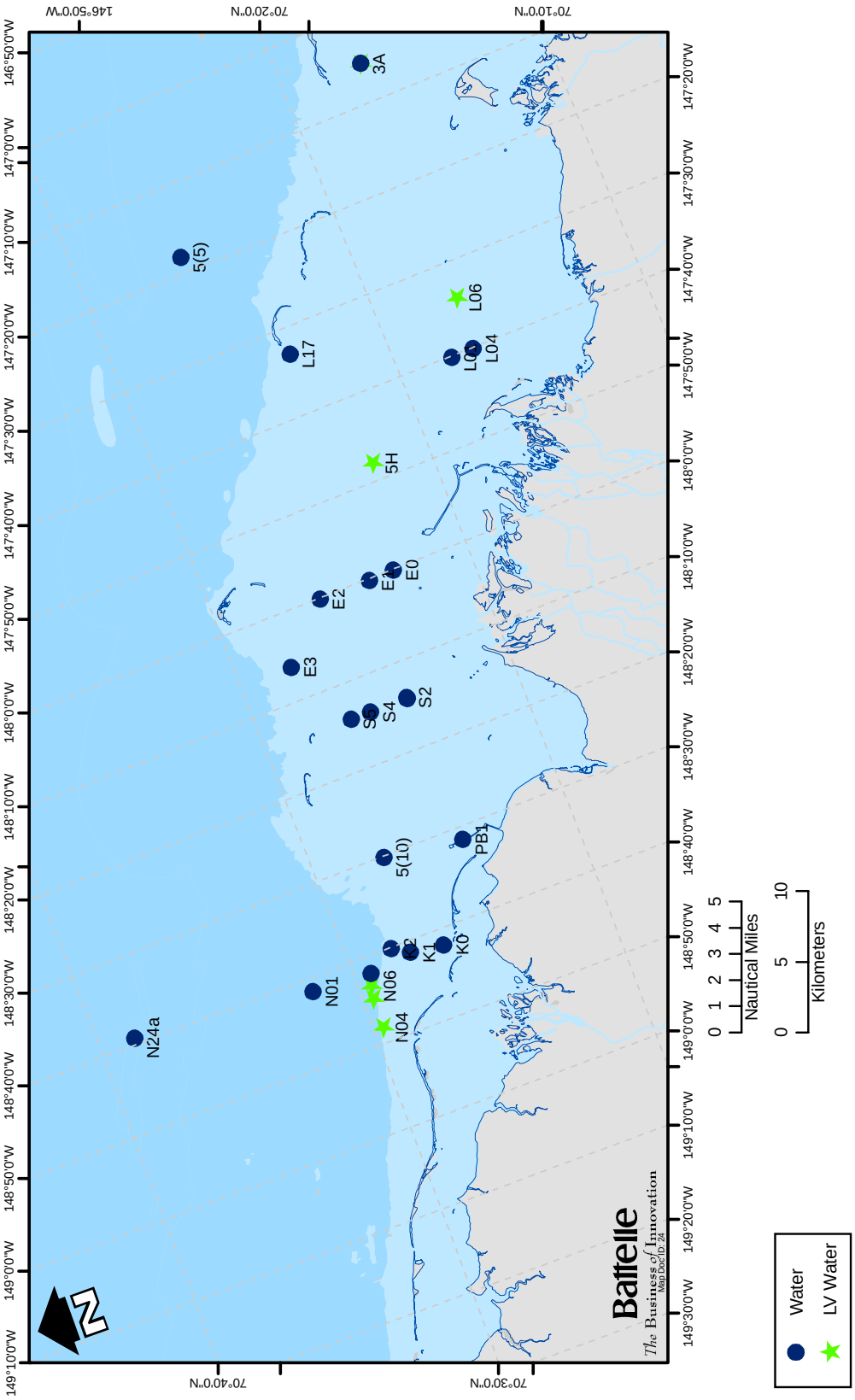


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations Standard Water and Large Volume Water Stations

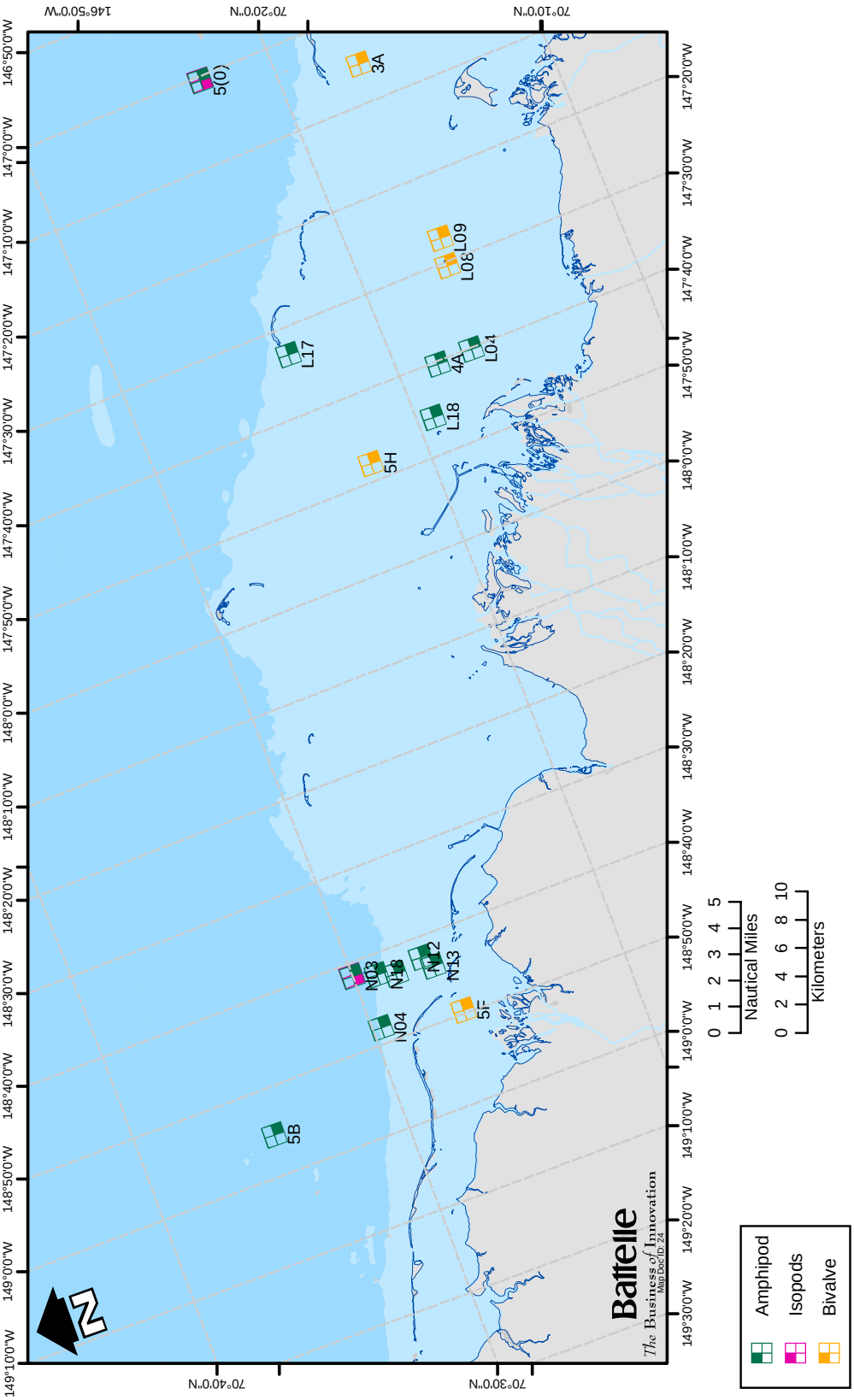


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations Amphipod and Bivalve (clam) Stations

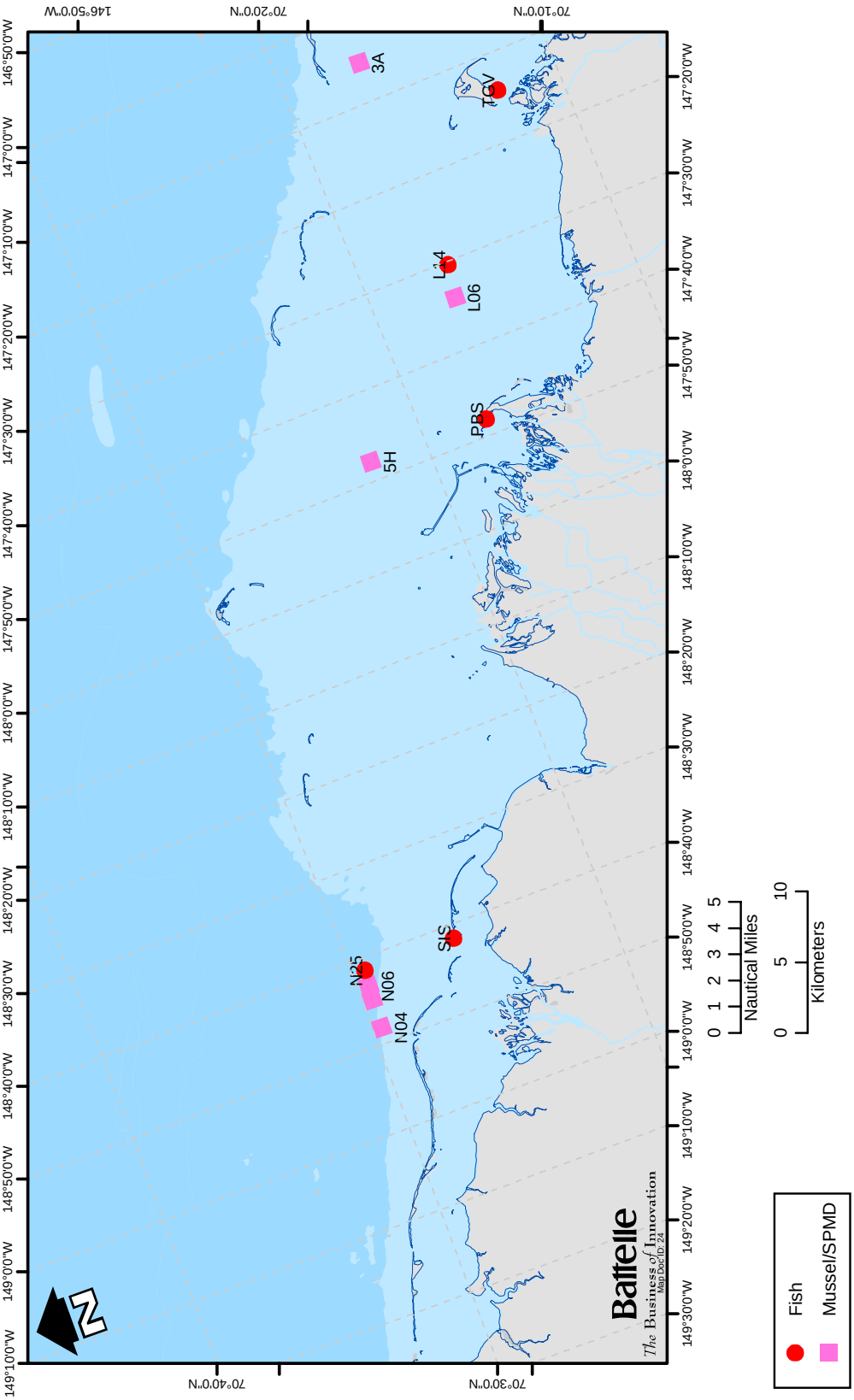


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations Fish Collection and Mussel/SPMD Deployment Stations

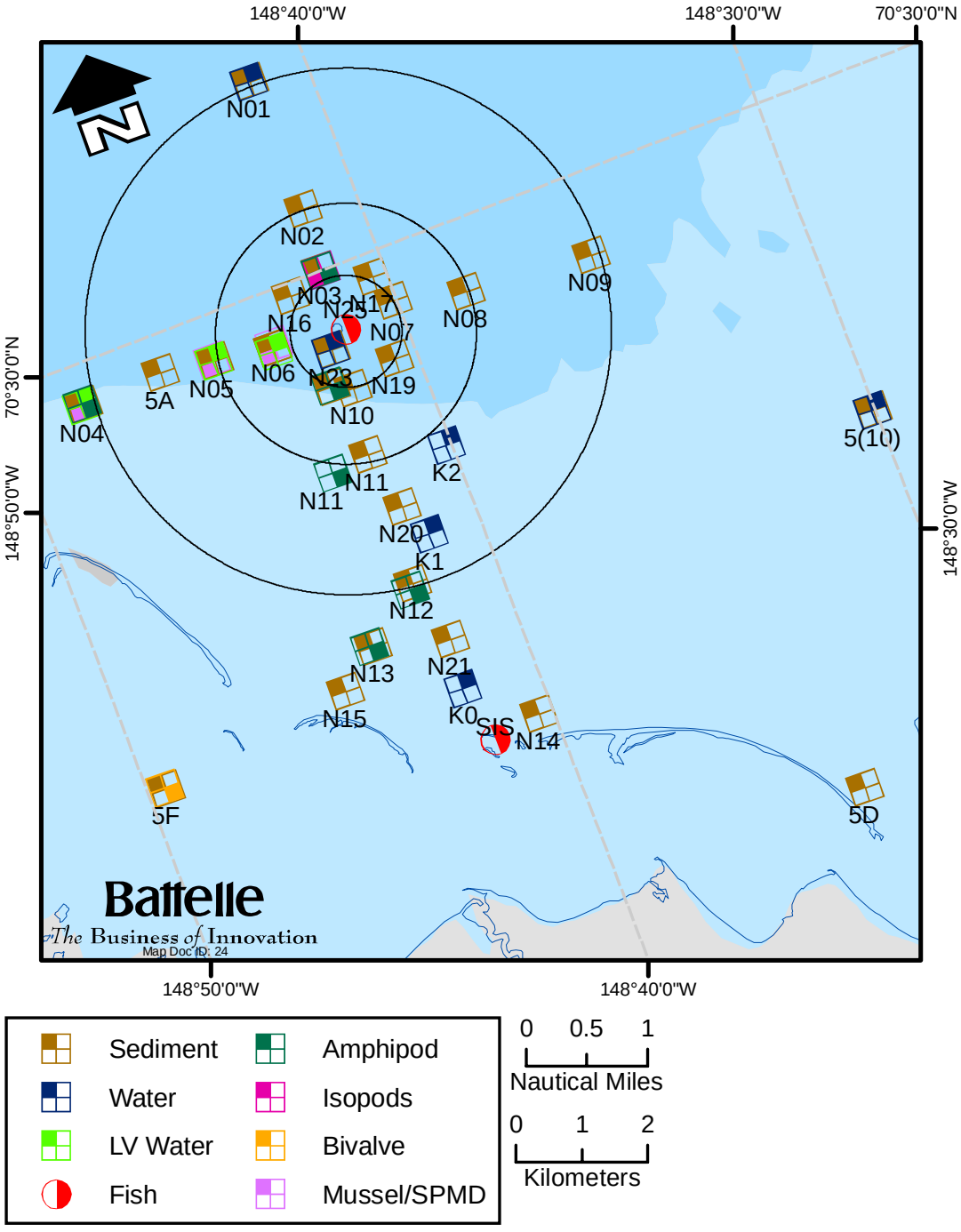


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations
Stations in the Northstar Area

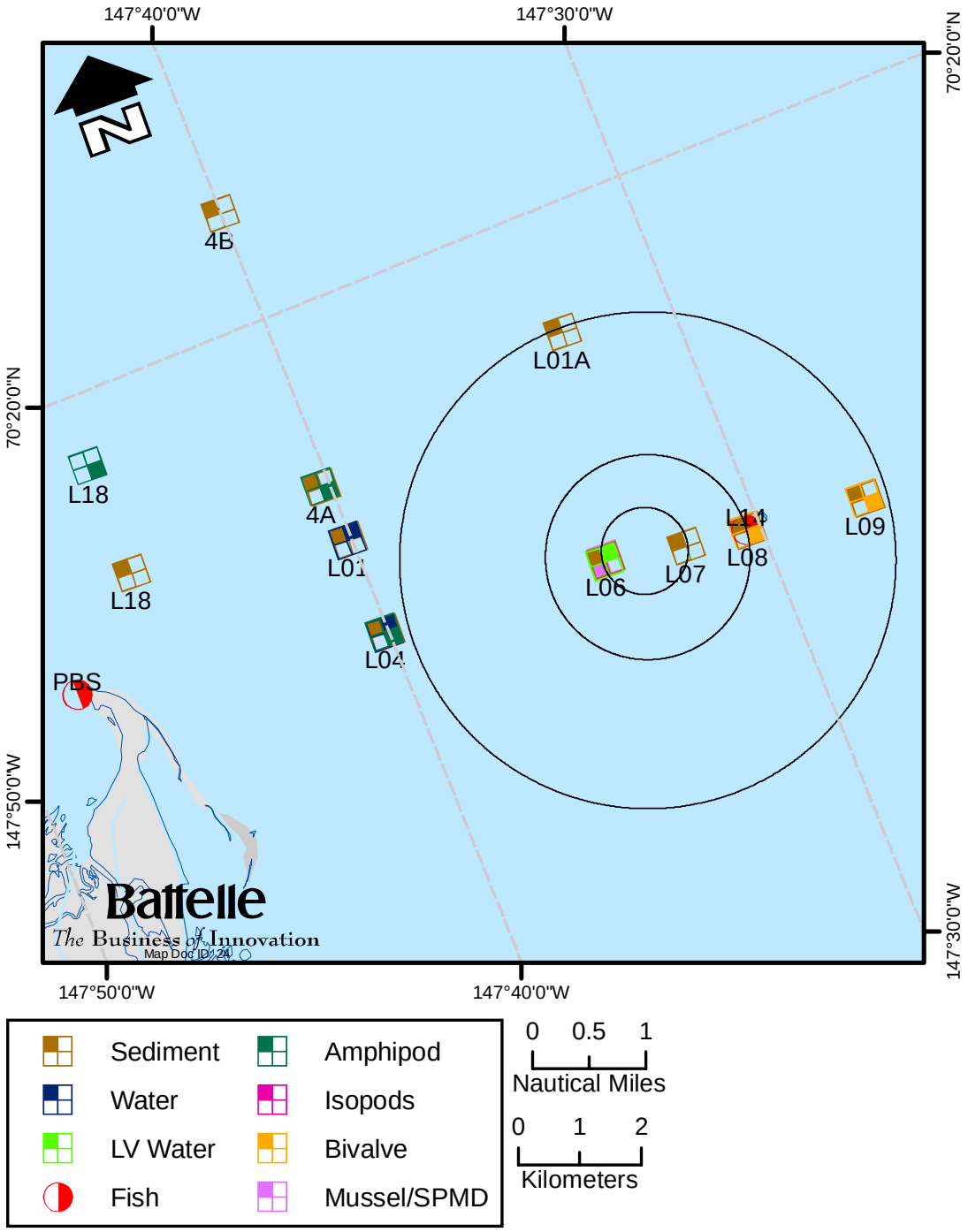


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations Stations in the Liberty Area

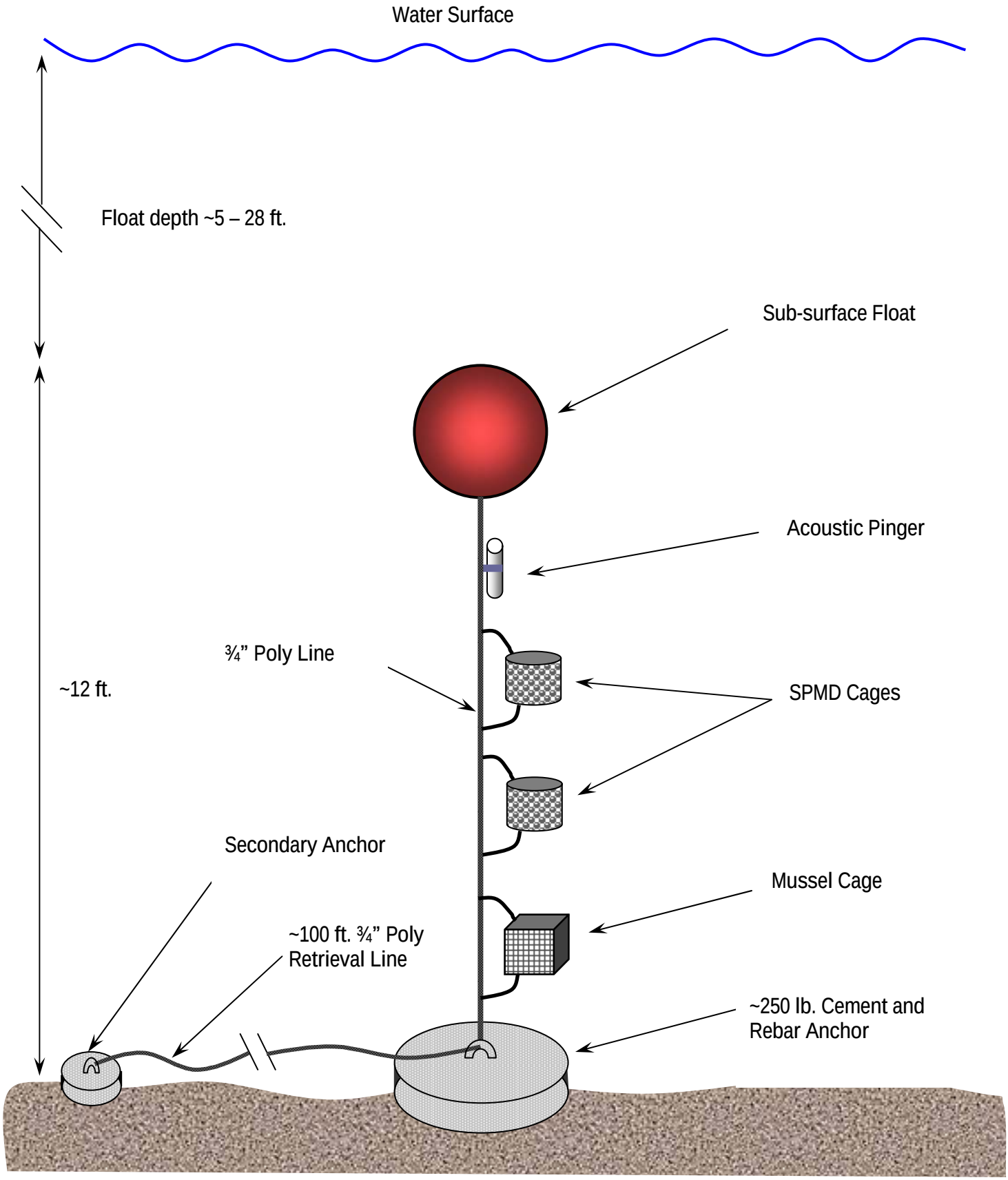


Figure 2. Schematic of the Mussel Cage and SPMD Mooring

Continuation of Arctic Nearshore Impact Monitoring in the Development Area (cANIMIDA)

Summer 2005 Field Survey Report

Report to:

Dr. Richard T. Prentki
Minerals Management Service
Anchorage, AK

Report from:

John Hardin
Battelle
Duxbury, MA

25 October 2005

Battelle
The Business of Innovation

Table of Contents

List of Tables

List of Figures

List of Attachments

1.0 Introduction

MMS Vessel 1273

As part of the Minerals Management Service (MMS) program entitled "Continuation of Arctic Nearshore Impact Monitoring in the Development Area" (cANIMIDA), the second summer field survey of this program (sixth survey overall) was conducted from July 26 to August 14, 2005. The scientific crew collected water, sediment, tissue, and plankton samples for physical and chemical analyses. Work was conducted from shore, inflatable boats, and the MMS Vessel 1273, and included deployment and retrieval of moorings, gravity cores, fish collection using fyke nets, and plankton tows. This report summarizes the field activities and samples collected during the 2005 summer field survey.

The following bulleted items describe components successfully completed during the 2005 cANIMIDA summer sampling survey:

- Collected 36 surface sediment samples (0 to 1 cm) for hydrocarbon and metals chemistry from 35 offshore stations.

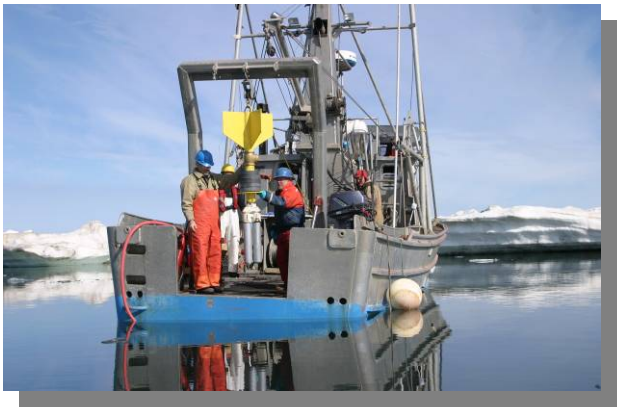
Area	Total Sediment Stations	Historical	New
BSMP	19	18	1
Northstar	9	8	1
Liberty	3	2	1
Prudhoe Bay	2	1	1
Endicott	1	1	
Boulder Patch	1		1
Totals	**35**	**30**	**5**

- Collected 14 sediment gravity cores from seven locations.
- Collected 23 CTD profiles at 18 offshore stations.

- Collected 65 discrete water samples from one to eight depth strata from 26 locations, including two rivers (Sagavanirktok and Kuparuk) and the Port Chatham Mussel Collection site.
- Deployed eight moorings with mussels and retrieved seven moorings. Each mooring had two mussel cages with at least 20 mussels per cage. One mooring (2E) was lost to ice and the mooring at 5(1) was moved by ice ~800 meters east-southeast from the deployment location. Moorings were deployed as follows:
  - One adjacent to Northstar
  - Two in the Liberty area
  - Two were between Northstar and Liberty (one in Prudhoe Bay and one at 5(1))
  - One was deployed next to Endicott in the Sagavanirktok River delta
  - Two were deployed to the east.
- A total of 22 indigenous bivalve, amphipod, or isopod samples were collected. Amphipod samples were collected from the BSMP area (5 samples), the Northstar Area (3 samples), the Boulder Patch (1 sample), and from near Endicott (1 sample). Bivalves were collected in the BSMP area (5 samples) and the Liberty Area (1 sample). Isopods were collected from the BSMP area (4 samples) and the Liberty area (2 samples). The amphipod trap at 5(1) was drug 1.6 km east-southeast by ice.
- Collected fish with fyke nets from Stump Island (17 fish) and Point Brower (19 fish). We were unable to collect enough fish from the Boulder Patch due to time constraints on the divers resulting from poor conditions prior to our arrival.
- Collected three kelp plants with the aid of Ken Dunton for metal analysis.
- Assisted Anne Hickey from the University of Colorado in deploying and retrieving two water auto-samplers. Water samples were collected once a day for 14 days to be analyzed for Total Suspended Solids in support of a study to ground truth satellite data.
- Delivered all field samples to analytical laboratories for appropriate analyses.

2.0 Schedule

The summer 2005 cruise was conducted from July 26 to August 14, 2005. There was one day lost (27 July) to weather due to high winds and seas. Ice conditions during the survey were mostly favorable; close in ice combined with poor weather forecasts did cause the team to forego sampling the 9(A), 9(B), and 9 (C) locations east of Barter Island. Members of the field team arrived in Prudhoe Bay, Alaska, July 26-27.



Gravity core sampler deployment

Initial "check-out" of MMS Vessel 1273 was performed on July 27 by ship captain Mark Mertz of TEG Oceanographic Services (TEG) and John Tremont of MMS. Field sampling personnel was comprised of seven staff from three organizations; two staff from Battelle, four from the Florida Institute of Technology (FIT), and one from Kinnetic Laboratories (KLI). The scientific team and ship's captain conducted the work on a 12 to 20 hours/day basis, depending on operating conditions and logistical considerations.

3.0 Cruise Operations and Samples Collected

The MMS Vessel 1273 served as the survey platform for the bulk of summer 2005 field work. The MMS Vessel 1273 was launched after inspection by MMS representatives and performed an abbreviated cruise working to calibrate the Coastal Ocean Dynamics Applications Radar (CODAR) system. The MMS Vessel 1273 was also used to retrieve current meters for the MMS University of Alaska Coastal Marine Institute (CMI) program at the end of the cANIMIDA survey using an alternate captain from KLI. Table 1 provides a complete list of the sampling stations that were targeted and sampled in the study area as well as station type, latitude and longitude, depth, date and time of sampling, and the type of chemical analysis for each sample. Figures 1 through 6 illustrate the locations of the 2005 sampling stations. Additional daily survey and sampling station information is included in the 2005 Station Logs (Attachment 1). The following narrative summarizes the field survey timeline.

July 24 (Sunday)

Field staff arrive at Anchorage, AK during the day and evening

July 25 (Monday)

Field team members John Hardin, Mike Walsh (Battelle), John Trefry, Bob Trocine, Matt Alkire, and Carrie Semmler (FIT), Gary Lawley (KLI) and Mark Mertz (TEG) receive Smith System Defensive Driver training in Anchorage during the afternoon. The field team and Dick Prentki (MMS Contracting Officer Technical Representative (COTR)) meet at dinner.

July 26 (Tuesday)

Mark Savoie (KLI) collects mussels from Port Chatham, AK. Collects zero time collection site samples of mussels and water.

Seven of the eight field staff (Hardin, Walsh, Trefry, Trocine, Alkire, Lawley, and Mertz) travel to Deadhorse, AK. Winds are high (>30 knots) and MMS is unable to launch the 1273, delaying the CODAR cruise. The field team collects equipment and supplies from shipping agents and begins the mobilization

North Slope, South of Deadhorse

process at the British Petroleum (BP) Seawater Treatment Plant (STP) Facility.

July 27 (Wednesday)

Winds remain high in the morning. The 1273 is inspected and launched in the afternoon by John Tremont and MMS staff after the wind recedes below 20 kts. 1273 performs an abbreviated CODAR cruise during the afternoon in rough seas. Mark Mertz inspects MMS Vessel 1273 in the evening, and takes custody of the vessel after inspection. 1273 overnights at West Dock.

Hardin and Trefry meet with Amy Peloza from BP at the Prudhoe Bay Operations Center (PBOC) to discuss the Health and Safety Plan as well as unique aspects of field sampling on the North Slope.

Field team member Carrie Semmler arrives at Deadhorse with mussels from Anchorage.

Hardin, Trefry and Semmler meet with Ken Dunton and discuss coordination of field sampling.

Dick Prentki and Anne Hickey arrive at Deadhorse. Field team, Prentki and Hickey meet at STP at 1630 and discuss project and TSS sampler logistics.

Mobilization of equipment, supplies, vessels (1273 and two inflatable boats) and water processing laboratory at STP is completed.

July 28 (Thursday)

Deploy subsurface moorings at three locations, Northstar, Prudhoe Bay, and between Northstar and Liberty (N03, PB1, and 5(1)).
Each mooring is comprised of two mussel cages, each containing ~20 mussels, and an acoustic pinger (see Figure 7).
Perform salinity gradient sampling transect in the Sagavanirktok River (includes 19 discrete samples). 1273 overnights at West Dock.
Deploy two automated TSS sample collectors, one at STP and one at the Endicott Satellite Drilling Island (SDI).

Mussel mooring w/acoustic pinger

July 29 (Friday)

Deploy three moorings: one near Endicott, one in the Boulder Patch, and one at Liberty (E01, BP01, and L08). 1273 overnights at Endicott.

July 30 (Saturday)

Collect sediment at 3A, 3B, 4A, 4B, L07, and L08. Deploy amphipod traps at 3A, 4A, and L08. No success with amphipod traps, reset traps at 4A and L08. Collect *Astarte*

clams at 3A. Collect water with Dunton from three locations in the Boulder Patch. Anne Hickey departs Deadhorse. 1273 overnights at Endicott.

July 31 (Sunday)

Mobilize fyke net and deploy at Stump Island in the afternoon. Collect water along one Liberty/Boulder Patch transect (stations L17, L17A, L17B, and 4B). Nineteen discrete water samples, four plankton samples, and CTD data are collected. Amphipods collected from traps at 4A. Dick Prentki leaves Deadhorse. 1273 overnights at Endicott.

August 1 (Monday)

Collect surface sediment and gravity core samples from E01 and BP01. Collect isopods (no amphipods) and *Astarte* clams from L08. Set amphipod traps at BP01. Collect fish and remove net from Stump Island in the afternoon, process fish in the evening. 1273 overnights at Endicott.

August 2 (Tuesday)

Collect surface sediment and core samples offshore at L17B. Collect amphipods from E01 and BP01. Deploy amphipod traps at 5(1). 1273 overnights at Endicott.

August 3 (Wednesday)

Collect water along second Liberty/Boulder Patch transect. Eighteen discrete samples, four plankton samples, and 5 CTD profiles are collected. Set fyke net near Point Brower in morning. Pick up two new 55gal drums and fill four drums with diesel for 1273. 1273 overnights at West Dock.

Setting fyke near Point Brower

Coordinate with Dunton and deploy mussel moorings at 2E and 2G (new location) using his staff and Boston Whaler. Unable to reach target location 1A due to ice near 2F extending the route to avoid the ice; high winds and seas in Camden Bay slowing the transit speed; and fuel capacity concern (exacerbated by the first two factors). Ice was thick near 2E, and likely to move/damage mooring.

August 4 (Thursday)

Refuel and fill water tank on 1273 in morning. Collect sediments from N04, N05, N06, N08, N11, N14, and N18. Collect water samples from N06 (12 discrete and CTD), N08 (six discrete and CTD), and N23 (one discrete). Gravity cores attempted at N04 and N05 were unsuccessful. Collect fish from Point Brower. 1273 overnights at West Dock.

August 5 (Friday)

Collect one discrete water sample and CTD cast at BP01. Collect plankton samples from 4A, BP01, and L18. Battelle staff packs samples and retrieves fish sampling equipment from Endicott. Organize and prepare for eastern sampling trip. 1273 overnights at Endicott.

August 6 (Saturday)

Mobilize for 1273 eastern trip in the morning. Collect surface sediment from 2E and 2F. Collect *Cyrtodaria* clams and water from 2F. Search for mooring at 2E; no evidence found, area highly scoured by ice. 1273 overnights adjacent to Flaxman Island and Leffingwell's cabin.

August 7 (Sunday)

Collect sediment surface samples from 1A, 1B, 1C, 1D, 1E and 2C. Collect sediment core from 1C. Collect amphipods and isopods from 2F. Collect *Astarte* clams from 1A and 1D, and *Cyrtodaria* clams from 1E. Collect discrete surface water samples from 1A, 1C, and 1E. Set amphipod traps at 1A, 1C, 1D, and 1E. 1273 overnights at Barter Island/Kaktovik.

Homogenizing sediment collected from Van Veen grab

August 8 (Monday)

FIT transfers crew (Trocine flies to Deadhorse and Trefry flies to Kaktovik). Collect sediment core at 2A and surface sediments at 2A, 2B, 2D, 2G, and 2H. Collect discrete water samples and CTD data at 2A and 2G. Collect amphipods at 1C, and isopods at 1A, 1D. No amphipods were collected from traps set overnight 1A, 1D, and 1E.

1273 overnights at Flaxman Island.

August 9 (Tuesday)

Collect surface sediment at 5(1) and 5(5). Collect *Astarte* clams at 5(1). Set amphipod traps at 5(1) and 5(5). Amphipod trap at 5(5) drug by ice soon after deployment and lost. 1273 overnights at West Dock.

August 10 (Wednesday)

Refuel and add water to 1273. Retrieve mussel mooring from PB1. Collect sediment cores at PB1A and N26. Unsuccessful core attempt performed at PB1. Collect surface sediment at N03, N26, PB1, and PB1A. Collect water and CTD data from N26. Deploy amphipod traps at N03, N11, and N18.

Deploying plankton nets

Attempts to collect clams are unsuccessful at PB1, PB1A and N03. Alkire leaves Deadhorse. 1273 overnights at West Dock.

August 11 (Thursday)

Retrieve mussel moorings from N03, 5(1), and E01. Mussel mooring at 5(1) was drug 817 meters east-southeast by ice. Collect amphipods from 5(1), N03, N11 and N18. One trap deployed at 5(1) was drug 1.6 km east-southeast by ice but found and recovered. A second trap deployed at 5(1) was lost. Collect plankton from Northstar area. Deploy amphipod traps at 4B, BP01, L07, and L08. 1273 overnights at West Dock.

August 12 (Friday)

Retrieve mussel moorings at BP1, and L08. Collect amphipods at 4B and BP01. Collect isopods from 4B, L08, no organisms are collected from L07. Field sampling completed for the 2005 cANIMIDA summer season. Return to West Dock. Begin demobilization, pack equipment and supplies for storage and shipment. Trefry, Trocine, and Semmler leave Deadhorse. UAF team arrives at Deadhorse. 1273 overnights at West Dock.

August 13 (Saturday)

Complete demobilization and pack and ship samples and equipment. Mertz takes UAF team to recover Dinkum Sands area mooring (offshore of Prudhoe Bay). 1273 overnights at West Dock.

Amphipods (*Anonyx* spp.)

August 14 (Sunday)

Hardin, Walsh, and Lawley leave Deadhorse. Ken Kronschnabl (KLI, 1273 Captain) arrives in Deadhorse, Mertz meets with Kronschnabl, discusses 1273 status, and transfers information.

August 15 (Monday)

John Tremont arrives in Deadhorse. Mertz transfers 1273 to Tremont and MMS. Tremont and MMS transfers 1273 to Kronschnabl. Mertz leaves Deadhorse.

August 16 (Tuesday)

Refueling and mobilization, travel to Flaxman Island and anchor for the night.

August 17 (Wednesday)

Retrieve Camden Bay mooring and replaced it with serviced mooring from Dinkum Sands. Retrieve mussel mooring 2G. The surface float was not present. Pinger and good coordinates used for retrieval with grapnel hook. 1273 overnights at Flaxman Island.

August 18 (Thursday)

Transit to West Dock.

August 19 (Friday)

Service Camden mooring, refuel, add water, mobilize.

August 20 (Saturday)

Transit to Pignok Bay, overnight.

August 21 (Sunday)

Transit to Smith Bay. Retrieve damaged mooring. All instruments were retrieved, but some of were significantly damaged. ADCP data indicates the mooring was taken out by ice on July 5 (probably during breakup). Smith Bay mooring is not replaced. Transit east to Theitis Island and overnight.

August 22 (Monday)

Transit to West Dock during the morning and demobilized. 1273 overnights at West Dock.

Core samples from L17B

August 23 (Tuesday)

Service moorings, refuel 1273, add water, and mobilize moorings.

August 24 (Wednesday)

Deploy moorings at Dinkum Sands and Reindeer Island. Demobilize 1273. 1273 overnights at West Dock.

August 25 (Thursday)

Haul 1273 out of the water. Transfer 1273 to MMS

August 25 (Thursday)

Demobilize 1273, ship equipment and supplies. Kronschnabl leaves Deadhorse.

4.0 Sampling Procedures

Sampling procedures followed at each sampling station were consistent with those performed during the ANIMIDA Summer 2002 program (MMS 2002), and are described in the Summer 2005 Field Logistics and Sampling Plan for the Minerals Management Service ANIMIDA Program (MMS, 2005). Typical sampling procedures included:

- conductivity, temperature, and depth (CTD) measurements
- water sample collection via pump system from offshore suspended sediment stations, and by hand at shoreline river stations
- surface sediment grab sample collection using a modified Van-Veen grab (for sediments and bivalves – as appropriate)
- core sampling with a gravity coring device equipped with a double barrel.
- deployment and retrieval of amphipod traps (as required)
- deployment of mussel cages at eight fixed moorings; seven recovered
- collection of fish samples by fyke net at two locations

Photo documentation, station logs, and field notes were recorded during the field survey. The station logs for each sampling station are included in Attachment 1. Each station log includes a description of the sampling location, observations, number and type(s) of samples collected, and comments.

5.0 Technical Issues

There were no significant technical difficulties during this survey. Amphipod and clam populations were patchy, as has been observed in previous studies, and the target number of samples were not collected. Amphipod collections were similar between collection times at sites where multiple attempts were made, indicating steady resident populations over the short time frame of sampling, and indicating additional effort(s) yield minimal return. One mussel mooring was lost to ice movement, also not unexpected in the Arctic environment. Sampling went smoothly, with only one weather day. There were no permit or local logistic problems of significance.

6.0 References

Minerals Management Service. 2002. Summer 2002 Field Sampling and Logistics Plan. July 2002.

Minerals Management Service. 2005. Summer 2005 Field Sampling and Logistics Plan. July 22, 2005.

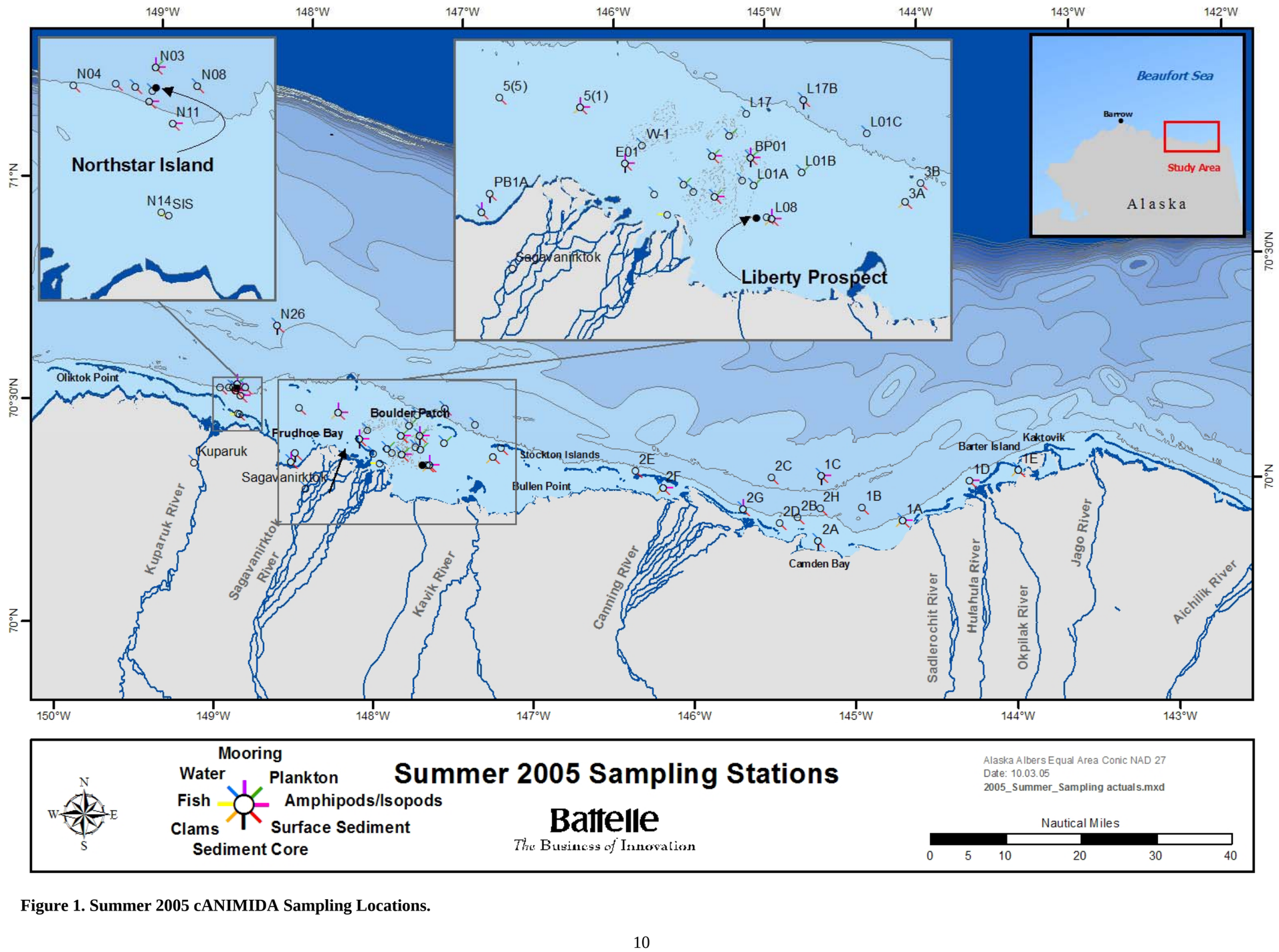


Figure 1. Summer 2005 cANIMIDA Sampling Locations.

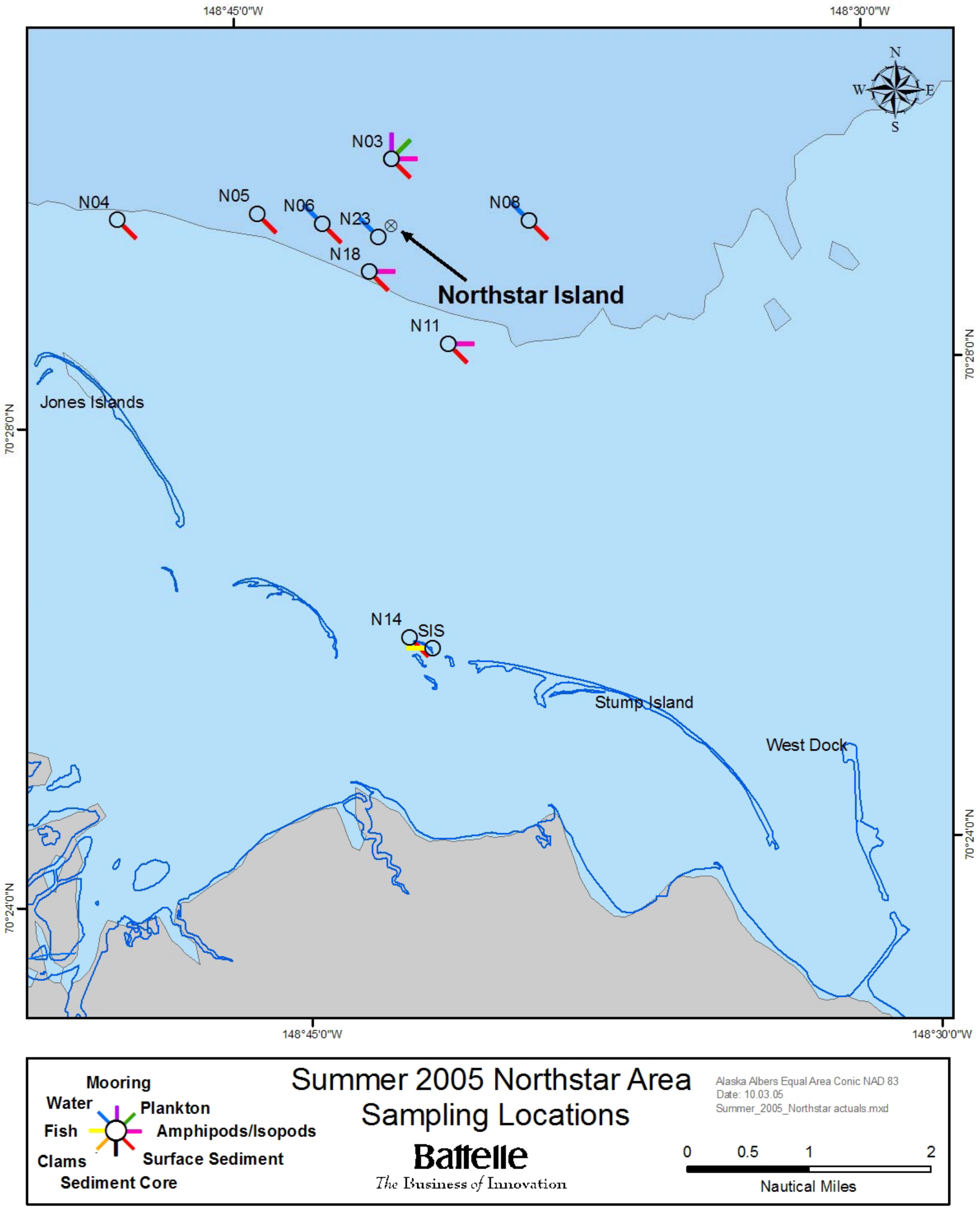


Figure 2. Northstar Sampling Locations, Summer 2005.

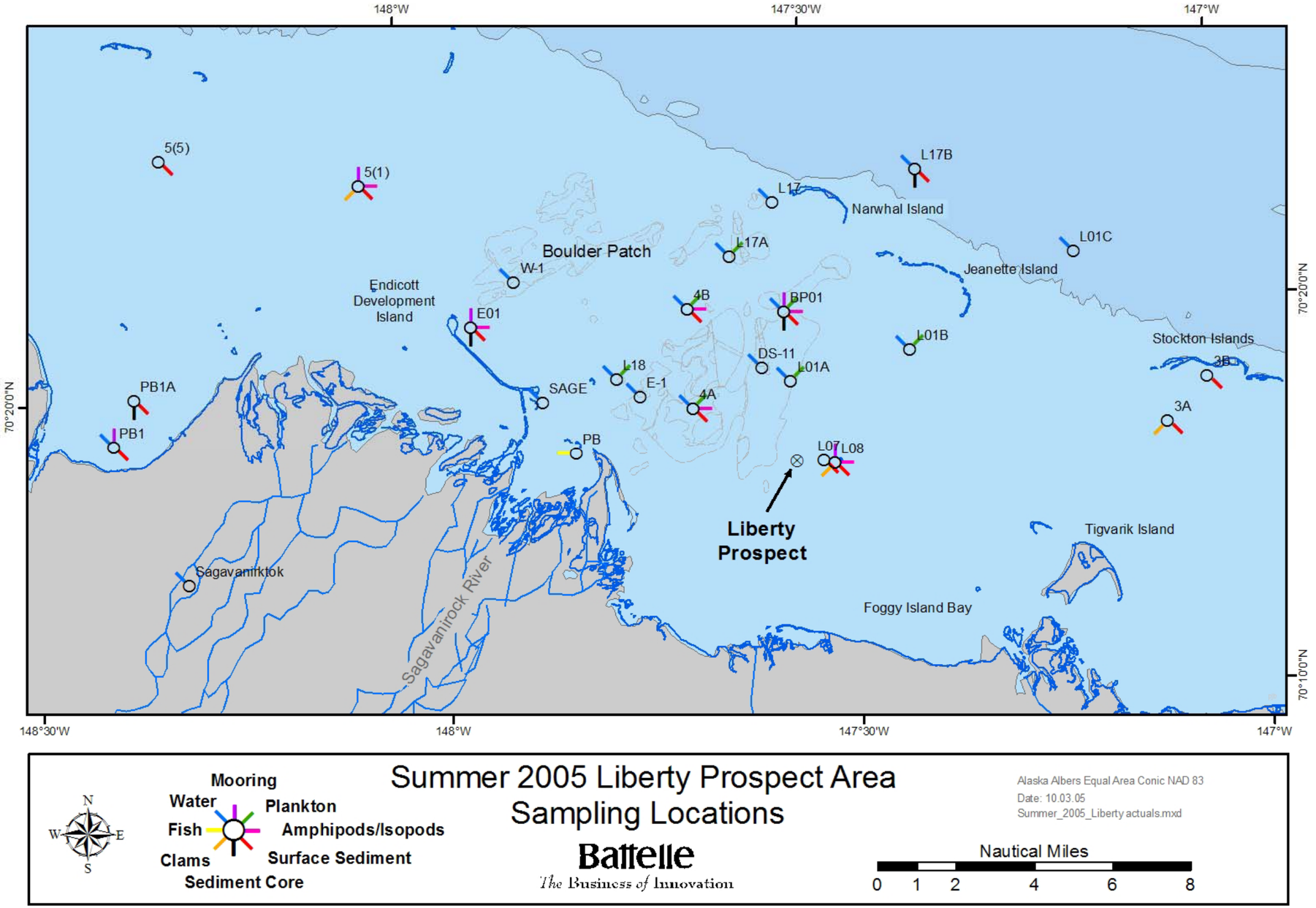


Figure 3. Liberty Sampling Locations, Summer 2005.

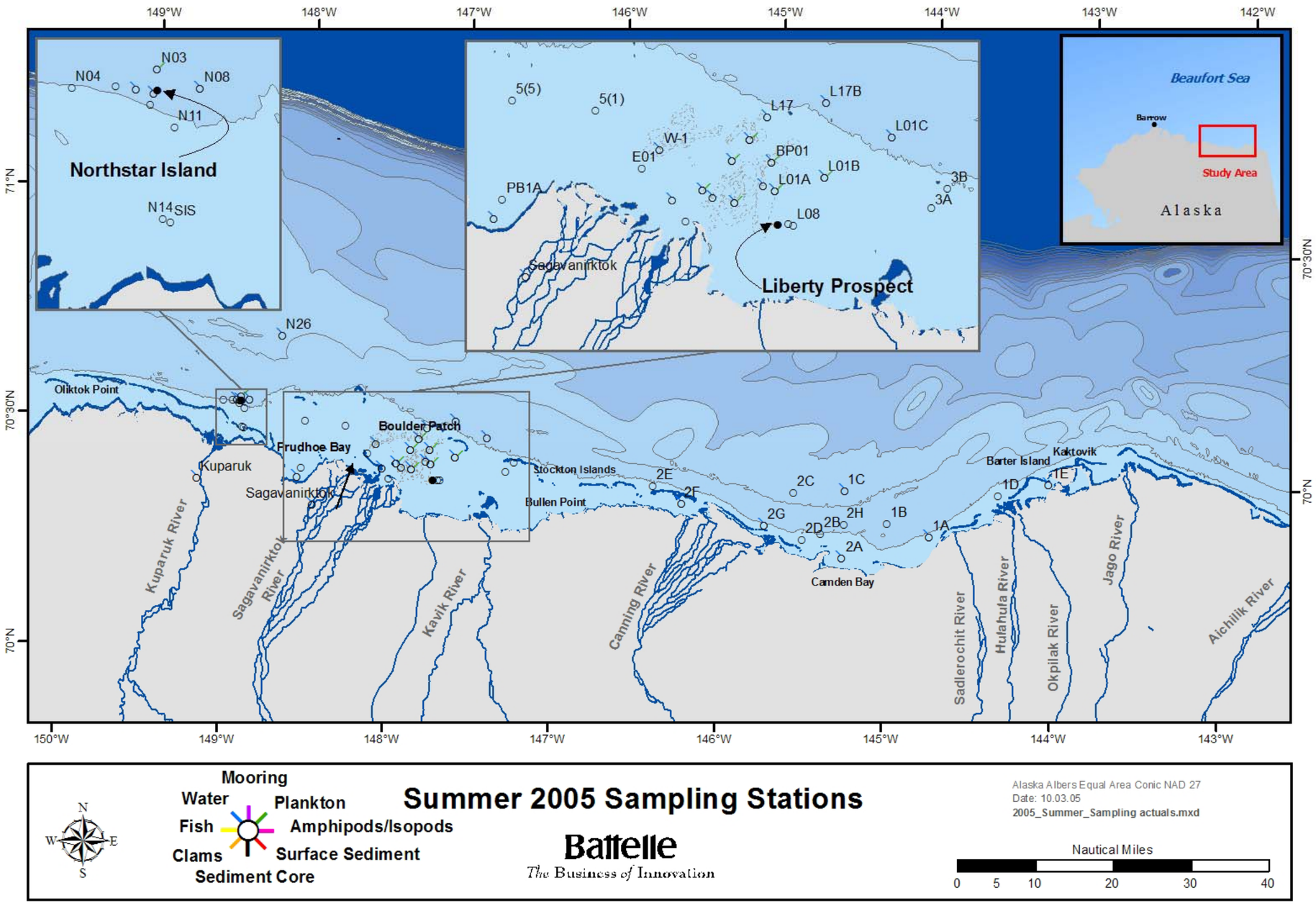


Figure 4. Water and Plankton Sampling Locations, Summer 2005.

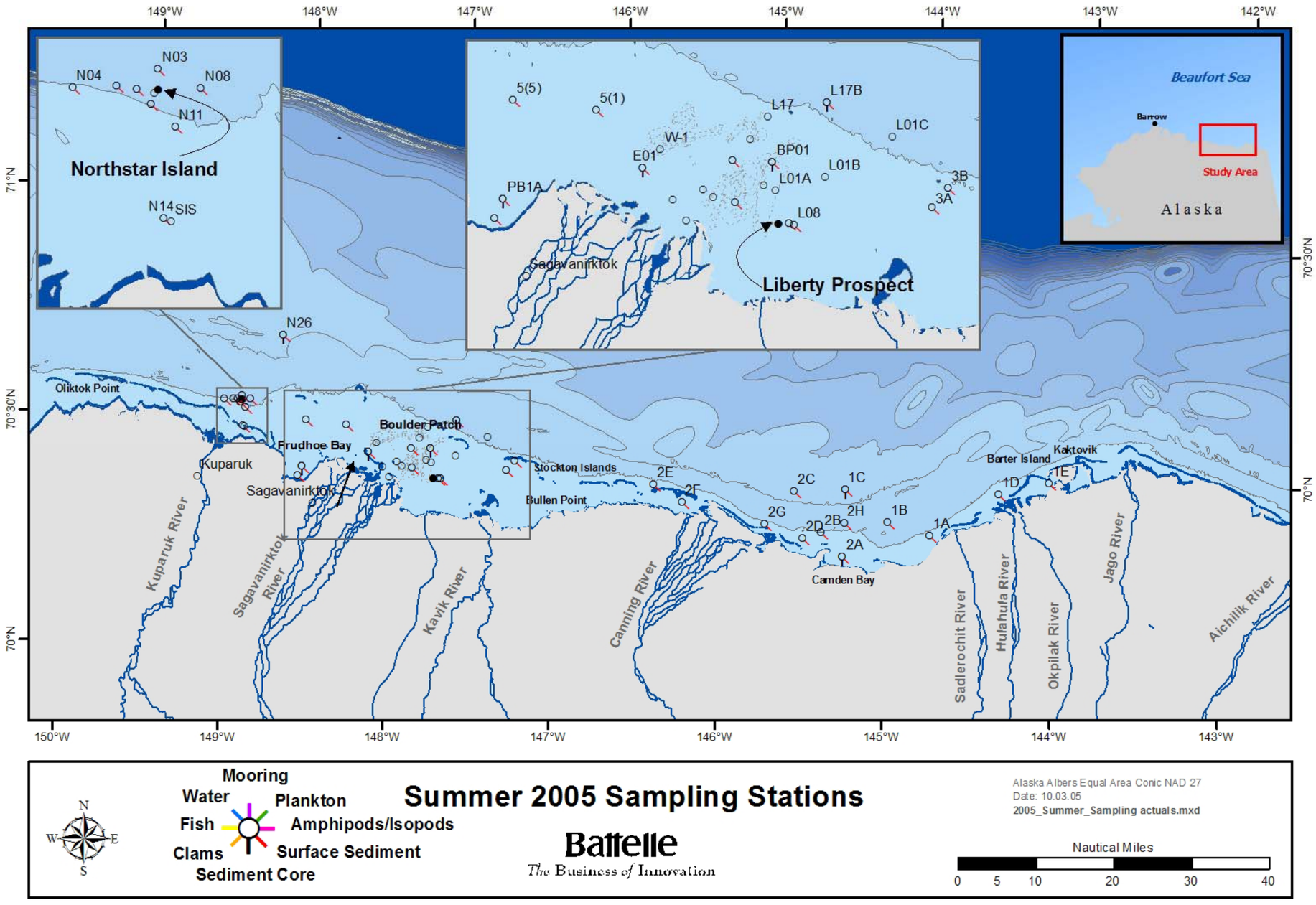


Figure 5. Sediment and Core Sampling Locations, Summer 2005.

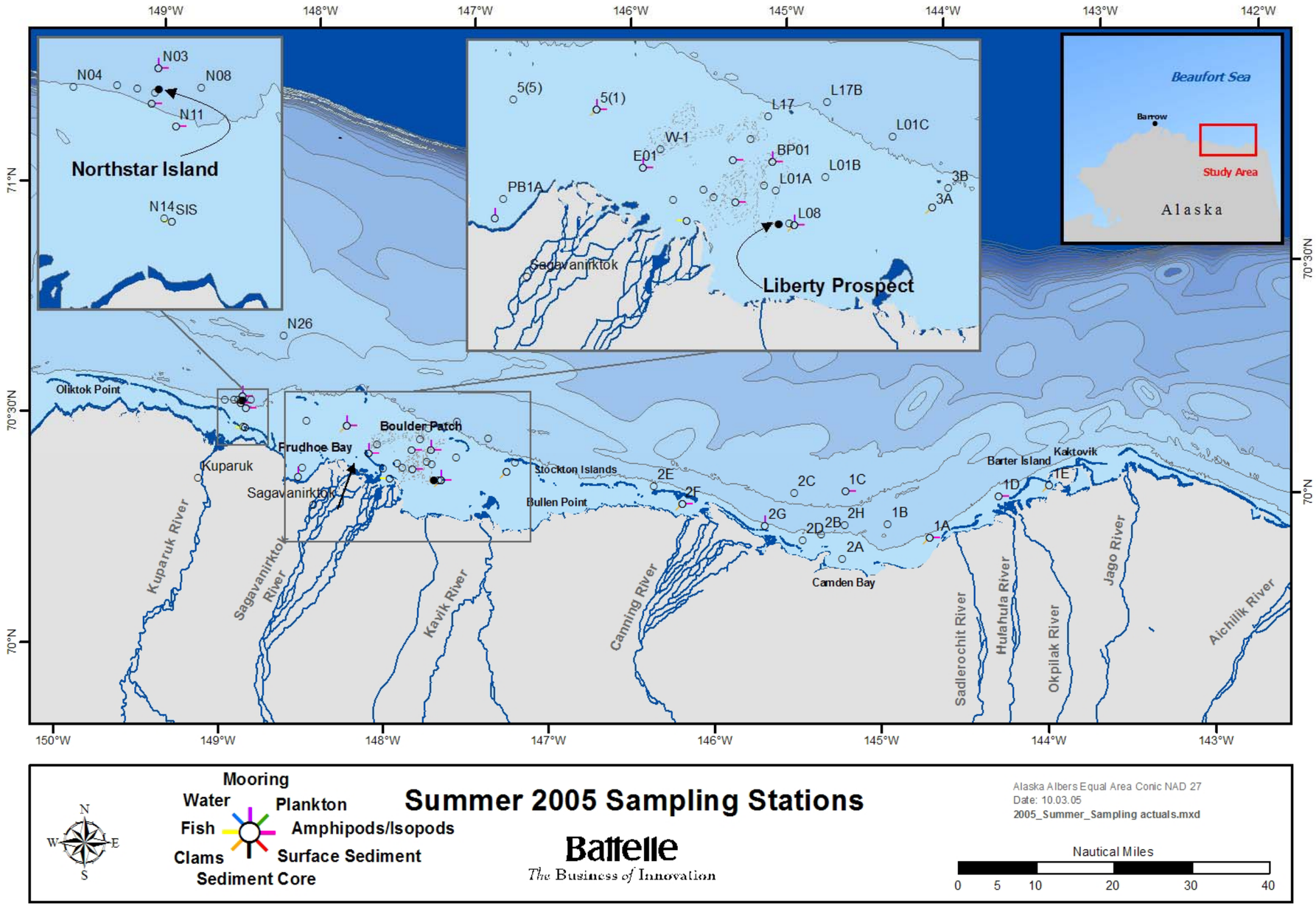


Figure 6. Mussel Moorings and Indigenous Biota Sampling Locations, Summer 2005.

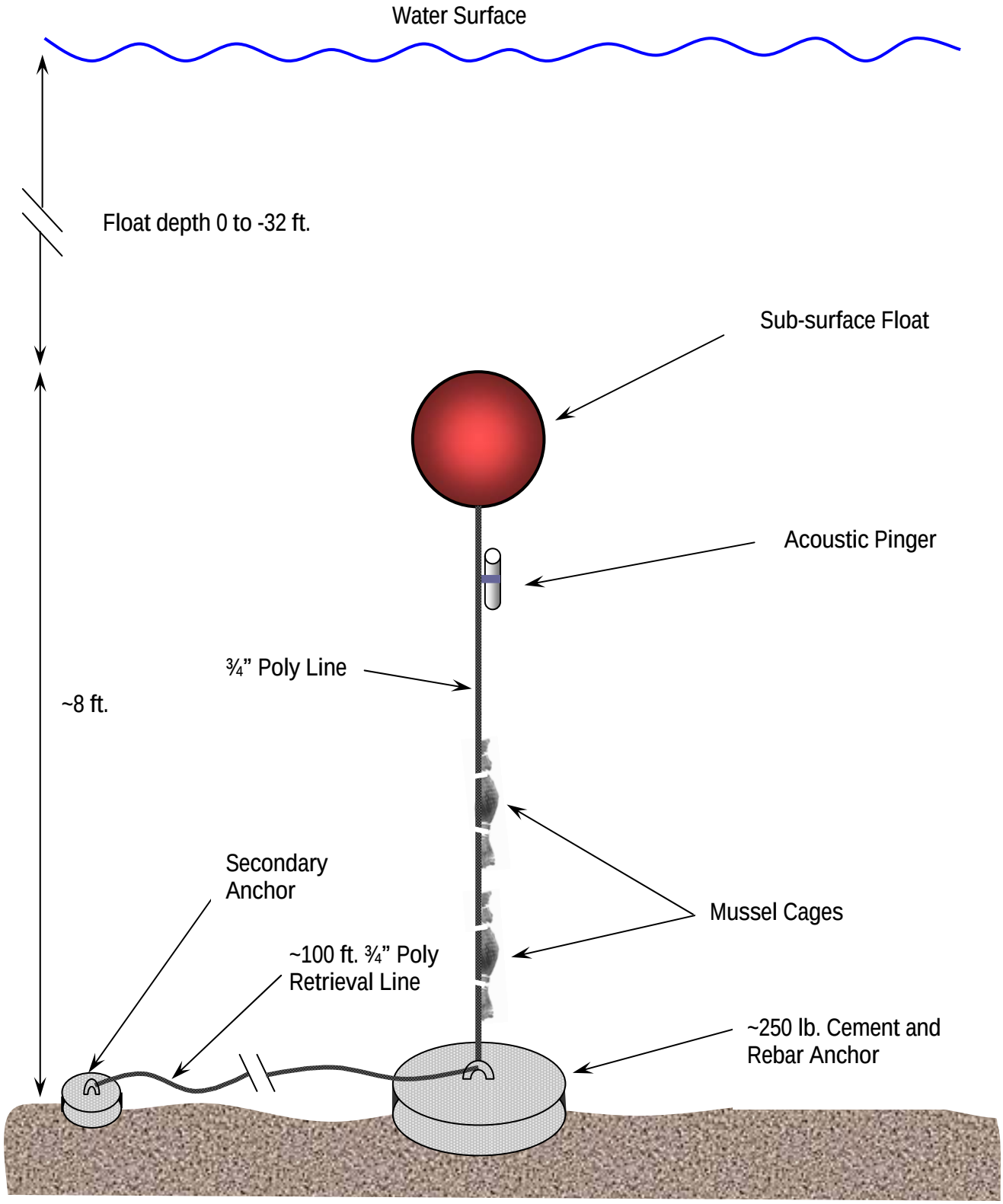


Figure 7. Schematic of the Mussel Cage and Mooring String

Table 1. 2005 MMS cANIMIDA Sampling Summary

Station ID	Station Type	Latitude (N; WGS84)		Longitude (W; WGS84)		Date(s)
1A	BSMP	70°	1.6023	144°	32.8494	7, 8 Aug
1B	BSMP	70°	4.1803	144°	47.5640	7 Aug
1C	BSMP	70°	9.1850	145°	1.3962	7, 8 Aug
1D	BSMP	70°	5.6494	144°	5.3693	7, 8 Aug
1E	BSMP	70°	6.1382	143°	46.5326	7, 8 Aug
2A	BSMP	70°	0.5031	145°	5.7580	8 Aug
2B	BSMP	70°	4.0493	145°	12.3790	8 Aug
2C	BSMP	70°	9.8125	145°	20.1312	7 Aug
2D	BSMP	70°	3.6074	145°	19.3016	8 Aug
2E	BSMP	70°	12.9076	146°	11.7098	6 Aug
2F	BSMP	70°	10.2610	146°	2.0765	6, 7 Aug
2G (CB01)	BSMP	70°	6.0654	145°	32.5651	8, 17 Aug
2H (CB02)	BSMP	70°	4.8725	145°	3.4209	8 Aug
3A	BSMP	70°	16.9268	147°	5.4828	30 Jul
3B	BSMP	70°	17.9819	147°	2.2393	30 Jul
4A	BSMP	70°	18.4483	147°	40.3106	30, 31 Jul 3, 5 Aug
4B	BSMP	70°	21.0517	147°	40.0062	30, 31 Jul 5, 11, 12 Aug
5(1)	BSMP	70°	25.0151	148°	3.4548	2, 9, 11 Aug
5(5)	BSMP	70°	18.8060	148°	23.2290	9 Aug
5B	BSMP	-	-	-	-	
9A	BSMP	-	-	-	-	
9B	BSMP	-	-	-	-	
9C	BSMP	-	-	-	-	
BP01	Boulder Patch	70°	20.7485	147°	32.9140	1, 5, 11, 12 Aug
L01A	Liberty	70°	18.9364	147°	32.9043	3 Aug
L01B	Liberty	70°	19.4442	147°	23.8834	3 Aug
L01C	Liberty	70°	21.5603	147°	11.1208	3 Aug
L01D	Liberty	-	-	-	-	
L04	Liberty	-	-	-	-	
L07	Liberty	70°	16.7876	147°	31.0398	30 Jul 11, 12 Aug
L08	Liberty	70°	16.6976	147°	30.2128	30 Jul 1, 11, 12 Aug
L17	Liberty	70°	23.5985	147°	32.9632	31 Jul
L17A	Liberty	70°	22.2986	147°	36.5152	31 Jul
L17B	Liberty	70°	24.1088	147°	22.2281	31 Jul 2 Aug
L17C	Liberty	-	-	-	-	
L18	Liberty	70°	19.3907	147°	45.7100	3, 5 Aug

Station ID	Station Type	Latitude (N; WGS84)		Longitude (W; WGS84)		Date(s)
L19	Liberty (offshore-deep)	-	-	-	-	
N01	Northstar	-	-	-	-	
N03	Northstar	70°	30.0139	148°	41.4768	10, 11 Aug
N04	Northstar	70°	29.6879	148°	48.1382	4 Aug
N05	Northstar	70°	26.0958	148°	18.1056	4 Aug
N06	Northstar	70°	29.5199	148°	43.2428	4 Aug
N08	Northstar	70°	29.4106	148°	38.3036	4 Aug
N11	Northstar	70°	28.4375	148°	41.9479	4, 10, 11 Aug
N14	Northstar	70°	26.0127	148°	40.4733	4 Aug
N18	Northstar	70°	29.0884	148°	42.2224	4, 10, 11 Aug
N23	Northstar	70°	29.3749	148°	41.9297	4 Aug
N26	Northstar (offshore-deep)	70°	37.4202	148°	24.1883	10 Aug
PB1	Prudhoe	70°	18.7944	148°	23.1992	10 Aug
PB1A	Prudhoe	70°	19.9592	148°	21.3937	10 Aug
E01	Sag - near mouth	70°	21.1003	147°	56.0895	1, 2, 11 Aug
SIS	Northstar	70°	25.9061	148°	41.4242	1 Aug
PB	Point Brower	70°	17.5666	147°	49.1731	4 Aug
SAGE	Sag - Endicott Transect	70°	18.9750	147°	51.3250	28 Jul
E-1	Dunton Boulder Patch	70°	18.8790	147°	44.0750	30 Jul
W-1	Dunton Boulder Patch	70°	22.1660	147°	52.6070	30 Jul
DS-11	Dunton Boulder Patch	70°	19.3360	147°	34.9030	30 Jul
Kuparuk	Kuparuk River	70°	19.8120	149°	0.5270	29 Jul 9 Aug
Sagavanirktok	Sagavanirktok River	70°	15.0330	148°	18.4840	29 Jul 9 Aug
PC	Port Chatham Mussel Collection	59°	12.920	151°	45.405	26 Jul

Table 1 (cont.). 2005 MMS cANIMIDA Sampling Summary

Station ID	Surface Sediment	Sediment Core	Discrete Water	CTD	Plankton	Amphipods	Isopods	Clams	Mussels	Fish	Comments
1A	1		1			0	1	1	0		Mooring could not be accessed due to fuel and ice limitations. Insufficient amphipods captured.
1B	1										
1C	1	27	1			1					
1D	1						1				Insufficient amphipods and clams captured; alternate location attempted and isopods captured.
1E	1		1			0		1			Unable to capture amphipods; alternate location attempted.
2A	1	19	1								
2B	1										
2C	1										
2D	1					0					
2E	1								0		Mooring lost to ice.
2F	1		1			1	1	1			
2G (CB01)	1		1						2		Alternate location for mooring 1A; as far east as possible based on time, weather, and fuel.
2H (CB02)	1										
3A	1					0		1			Unable to capture amphipods. No alternate locations nearby; several attempts made in Boulder Patch.
3B	1										

Station ID	Surface Sediment	Sediment Core	Discrete Water	CTD	Plankton	Amphipods	Isopods	Clams	Mussels	Fish	Comments
4A	1		10	2	2	1					
4B	1		10	2	2	1	1				Alternate location for amphipods. Isopods co-collected.
5(1)	1					1		1	2		
5(5)	1		0		0	0					Water and plankton not collected. Amphipod trap lost to ice, was not reset due to time constraints.
5B	0					0					Did not sample west of Northstar Island. Plan to sample westward in 2006.
9A	0										Did not sample based on ice, fuel concerns, and predictions of poor weather.
9B	0		0		0						Did not sample based on ice, fuel concerns, and predictions of poor weather.
9C	0	0									Did not sample based on ice, fuel concerns, and predictions of poor weather.
BP01	1	6	1	1	2	1			2	0	Unable to collect fish with divers due to poor weather influencing the Dunton dive team's schedule.
L01A			5	1	2						
L01B			6	1	2						
L01C			7	1	0						In field decision not to sample due to time constraints and ice.
L01D			0								Unable to collect water samples due to flow ice at station.
L04			0	0	0						In field decision not to sample. Coverage was adequate with 4A.
L07	1					0					Unable to capture amphipods at alternate location.

Station ID	Surface Sediment	Sediment Core	Discrete Water	CTD	Plankton	Amphipods	Isopods	Clams	Mussels	Fish	Comments
L08	1					0	2	1	2		Unable to capture amphipods; isopods collected as alternative.
L17			1	1	0						Flow ice prevents plankton sampling.
L17A			1	1	2						
L17B	1	11	1	1	0						Flow ice prevents plankton sampling
L17C			0								Flow ice at station prevents water sampling.
L18			2	2	2						
L19		0	0								Flow ice at station prevented water and sediment sampling. L17B was substituted.
N01			0								Not Sampled
N03	1				2	1		0	2		Collect plankton near Northstar as alternate location to N04, N06, and N08.
N04	1	0			0						Core unsuccessful due to refusal and inadequate recovery.
N05	1	0									Core unsuccessful at alternate location due to refusal and inadequate recovery.
N06	1		1	1	0						Field decision made to not sample plankton. Samples collected from N03 considered sufficient.
N08	1		1	1	0						Field decision made to not sample plankton. Samples collected from N03 considered sufficient.
N11	1					1					
N14	1										

Station ID	Surface Sediment	Sediment Core	Discrete Water	CTD	Plankton	Amphipods	Isopods	Clams	Mussels	Fish	Comments
N18	1					1					
N23	0		1								
N26	1	12	1								
PB1	1	0	1			0		0	2		Core unsuccessful due to refusal and inadequate recovery. Unable to capture amphipods/isopods.
PB1A	1	16						0			Moved to this deeper location after attempts at PB1 were not successful; no clams captured.
E01	1	9	0			1			2		In field decision made to not collect water samples. Sufficient water collected along transects.
SIS										17	17 Fish collected.
PB										18	19 Fish collected.
SAGE			1	1							19 samples collected.
E-1			1	1							
W-1			1	1							
DS-11			1	1							
Kuparuk			2	2							
Sagavanirktok			2	2							
PC			1						2		

Station ID	Surface Sediment	Sediment Core	Discrete Water	CTD	Plankton	Amphipods	Isopods	Clams	Mussels	Fish	Comments
TOTAL No. Stations	35	10	29	18	8	19	5	6	7	2	Includes unsuccessful attempts
TOTAL No. Samples	35	100	65	23	16	10	6	6	14	35	Plus 2 Mussel QC samples from Port Chatham
TARGET No. Samples	30	30	27	27	15	16	0	7	6	30	

KEY	
1	Indicates number of samples collected at proposed location.
0	Indicates proposed sample not collected.
1	Indicates number of samples collected at alternative location
0	Indicates alternative sample attempted but unsuccessful.

Attachment 2: 2005 Collection Permit and Fish Transfer Permit

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
P.O. Box 25526
JUNEAU, ALASKA 99802-5526

Permit No. CF-05-074

Expires 12/31/2005

FISH RESOURCE PERMIT
(For Scientific/Educational Purposes)

This permit authorizes **John Hardin** *(whose signature is required on page 2 for permit validation)*
person
of **Battelle Memorial Institute** at **703 Palomar Airport Rd, Suite 350, Carlsbad, CA 92009**
agency or organization address

to conduct the following activities from **July 1, 2005** to **December 31, 2005** in accordance with AS 16.05.930 and AS 16.05.340(b).

Purpose: To collect target species of shellfish and amphipods for tissue analysis of petroleum hydrocarbons and trace metals in order to evaluate concentration levels of hydrocarbons in the near-shore biota of the Beaufort Sea; to examine the potential bioaccumulation of organic compounds in the water column by deploying caged mussels and analyzing them for organics and metals, and to collect target species of fish for tissue analysis of petroleum hydrocarbons, trace metals, biomarker CYP1A, and biomarker bile FAC in order to evaluate contaminant exposure of fish in the near-shore Beaufort Sea.

Location: Nearshore Beaufort Sea, 12-20 stations from Stockton Island to Griffin Point, concentrating around the Northstar Production Island and Liberty Development Area.

Species Collected: **Collect & Sacrifice:** 300 Astarte clams, 600 Cyrtodaria clams, 5000 amphipods, 10 Dolly Varden, 20 Arctic cisco, 10 broad whitefish, 20 least cisco, 10 humpback whitefish, 40 four horn sculpin, 10 Arctic cod, 10 Arctic flounder, 20 snailfish
Collect, transport, caged release & sacrifice: 380 blue mussels (see **Contingencies**).

REPORT DUE January 31, 2006. The report shall include species, numbers, dates, and locations of collection and disposition, and if applicable, sex, age, and breeding condition, and lengths and weights of fish. The report shall also include other information as may be required under the contingencies section.

GENERAL CONDITIONS, EXCEPTIONS AND RESTRICTIONS

1. This permit must be carried by person(s) specified during approved activities who shall show it on request to persons authorized to enforce Alaska's fish and game laws. This permit is nontransferable and will be revoked or renewal denied by the Commissioner of Fish and Game if the permittee violates any of its conditions, exceptions or restrictions. No redelegation of authority may be allowed under this permit unless specifically noted.
2. No specimens taken under authority hereof may be sold or bartered. All specimens must be deposited in a public museum or a public scientific or educational institution unless otherwise stated herein. Subpermittees shall not retain possession of live animals or other specimens.
3. The permittee shall keep records of all activities conducted under authority of this permit, available for inspection at all reasonable hours upon request of any authorized state enforcement officer.
4. Permits will not be renewed until detailed reports, as specified above, have been received by the department.
5. UNLESS SPECIFICALLY STATED HEREIN, THIS PERMIT DOES NOT AUTHORIZE the exportation of specimens or the taking of specimens in areas otherwise closed to hunting and fishing; without appropriate licenses required by state regulations; during closed seasons; or in any manner, by any means, at any time not permitted by those regulations.

Craig Farrington
Division of Commercial Fisheries

Geron Bruce
Deputy Director
Division of Commercial Fisheries
Alaska Department of Fish and Game

CF-05-074 ***continued (page 2 of 2)***

Authorized Personnel: The following personnel may participate in collecting activities under terms of this permit:

John Hardin, Dick Prentki, John Trefry, Mark Savioe, Bob Trocine, Gary Lawley, Rob Rember, Mike Walsh, Carrie Semmler, Mark Mertz, Matt Alkire, Other KLI field personnel (TBA).

Contingencies:

1) **Fred Bue** (Division of Commercial Fisheries, Fa irbanks, 907-459-7217) must be contacted **prior** to you engaging in collecting activities. Division of Commercial Fish Area Management Biologists have the right to specify methods for collecting, as well as limiting the collections of any species, and the number of specimens collected by time and area.

2) All unattended collecting gear must be labeled with the permittee's name, telephone number, and permit number.

3) Invertebrates, especially sessile invertebrates, should be collected over a broad geographical area to avoid local depletion and disruption of local ecosystems.

4) Permits will indicate the number of specimens that may be taken, by species and life stage. Sampling or collecting activities must stop when the maximum allowable number of specimens is obtained. All live fish, shellfish, and aquatic plants collected in excess of the number specified on the permit must be released immediately and unharmed at the capture location, unless otherwise specified in the permit.

5) All bycatch incidentally captured during sampling will be identified, recorded and released unharmed if possible. Bycatch data should be included in the collection report.

6) This permit will fulfill the requirements of 5AAC 41.005 – 41.060 pertaining to fish transport permits (FTP's), with the condition that the transported species BE DESTROYED AND NOT BE RELEASED.

7) *A copy of this permit, including any amendments, must be made available at all field collection sites and project sites for inspection upon request by a representative of the department or a law enforcement officer.*

8) Issuance of this permit does not absolve the permittee from compliance in full with any and all other applicable federal, state, or local laws regulations, or ordinances.

9) **A report of activities, referenced to this fish resource permit number, must be submitted to the Alaska Department of Fish and Game, Division of Commercial Fish, PO Box 25526, Juneau, AK 99802-5526, attention Sara Larsen (465-4724; sara_larsen@fishgame.state.ak.us), within 30 days after the expiration of this permit**. This report must summarize the number of fish captured by location and by species, and the fate of those fish. A report is required whether or not collecting activities were undertaken. A report must also be sent to the Biologist(s) listed under number 1 in this Contingencies section.

10) **PERMIT VALIDATION requires permittee's signature agreeing to abide by permit conditions before beginning collecting activities:**

Signature of Permittee

cc: Bonnie Borba
Fred Bue
Ted Meyers
Gene Sandone
CF Division Files
Alaska Bureau of Wildlife Enforcement-Coldfoot

Continuation of Arctic Nearshore Impact Monitoring in the Development Area (cANIMIDA)

Summer 2006 Field Survey Report

Report to:

Dr. Richard T. Prentki
Minerals Management Service
Anchorage, AK

Report from:

John Hardin
Battelle
Duxbury, MA

26 October 2006

Table of Contents

List of Tables

List of Figures

List of Attachments

1.0 Introduction

As part of the Minerals Management Service (MMS) program entitled "Continuation of Arctic Nearshore Impact Monitoring in the Development Area" (cANIMIDA), the third and final summer field survey of this program (seventh survey overall) was conducted from July 24 to August 12, 2006. The scientific crew collected water, sediment, and biota samples for physical and chemical analyses. Work was conducted from shore, inflatable boats, as well as using the MMS Vessel *1273*. Sample collection activities included deployment and retrieval of mussel moorings, gravity cores, fish collection using fyke nets, towed benthic sled, small traps, and plankton tows. This report summarizes the field activities and samples collected during the 2006 summer field survey.

MMS Vessel 1273

The following bulleted items describe components successfully completed during the 2006 cANIMIDA summer sampling survey:

- Collected 34 surface sediment samples (0 to 1 cm) for hydrocarbon and metals chemistry from 34 offshore stations.

Area	Total Sediment Stations	Historical	New
BSMP	14	13	1
Northstar	8	6	2
McCovey	1	0	1
West Dock	1	0	1
Liberty	6	2	4
Endicott/SDI	3	2	1
Boulder Patch	1	1	0
Totals	**34**	**24**	**10**

- Collected 14 sediment gravity cores from seven locations.
- Collected five source/peat material samples.

- Collected seven CTD profiles from seven offshore stations.
- Collected 53 discrete water samples comprised of 23 surface samples and 30 subsurface samples from up to seven depth strata from 23 locations including 11 samples along a transect in the Sagavanirktok River and the Port Chatham Mussel Collection site.
- Deployed and retrieved eight moorings with mussels. Each mooring had two mussel cages with 20 mussels per cage. Moorings were deployed as follows:
  - Two near Northstar
  - Two in the Liberty area
  - One between Northstar and Liberty
  - One at West Dock
  - Two deployed adjacent to Endicott (one by Endicott, one by the SDI)
- A total of 34 indigenous tissue samples were collected from the following groups of organisms: amphipod (23); isopod (6); mysid (3); and bivalves (2). Amphipod samples were collected from the BSMP area (7 samples), the Northstar area (10), the Liberty Area (2), the Boulder Patch (2), and from West Dock (2 samples). Isopods were collected from the Northstar area (3 samples), the Liberty area (1), the BSMP area (1), and West Dock (1). Bivalves were collected in the Liberty area (2 samples).
- Collected fish with fyke nets from Stump Island (19 fish) and Point Brower (20 fish). Similar to 2005, we were unable to collect fish from the Boulder Patch area due to time constraints on the divers resulting from poor diving conditions prior to our arrival.

Dr. J. Trefry collecting water sample

- Collected three kelp plants with the aid of Ken Dunton (University of Texas Marine Science Institute; cANIMIDA Task 6 PI) for metal analysis.
- Delivered all field samples to analytical laboratories for appropriate analyses.

2.0 Schedule

Summer 2006 field sampling was conducted from July 24 to August 12, 2006. There was one travel day lost (11 August) at the end of the survey due to fog. Ice conditions during

the survey were favorable for field operations. Members of the field team arrived in Prudhoe Bay, Alaska, July 24-25. Initial "check-out" of MMS Vessel *1273* was performed on July 24 by ship captain Mark Mertz of TEG Oceanographic Services (TEG) and Dee Williams of MMS. Field sampling personnel consisted of five staff from three organizations: two staff from Battelle, two from the Florida Institute of Technology (FIT), and one from Kinnetic Laboratories Inc. (KLI). The scientific team and ship's captain conducted the work on a 12 to 18 hours/day basis, depending on operating conditions and logistical considerations.

3.0 Cruise Operations and Samples Collected

The MMS Vessel *1273* served as the survey platform for the bulk of summer 2006 field work. The MMS Vessel *1273* was launched on 24 July after inspection by MMS representatives. The MMS Vessel *1273* was also used to retrieve and re-deploy current meters for the MMS University of Alaska Coastal Marine Institute (CMI) program at the end of the cANIMIDA survey using an alternate captain (Ken Kronschnabl) from KLI.

Table 1 provides information on station id, station type, location (latitude and longitude), depth, and date(s) the station was sampled. Table 2 provides a list of the sample stations (actual and target) and the types of samples collected. Figures 1 through 7 illustrate the locations of the 2006 sampling stations. Additional daily survey and sampling station information is included in the 2006 Station Logs (Attachment 1). Following Tables 1 and 2 is a narrative summarizing the field survey operations by day.

Juvenile arctic fox (*Alopex lagopus*)

Table 1. 2006 MMS cANIMIDA Station Locations, Water Depth, and Dates

Station ID	Station Type	Latitude (N; WGS84)	Longitude (W; WGS84)	Dept (ft)	Date(s)
4A	BSMP	70° 18.4578	147° 40.1781	14.7	28, 29 Jul
5(1)	BSMP	70° 24.9899	148° 03.4663	18.9	27 Jul
5(5)	BSMP	70° 26.0927	148° 18.1566	21.2	31 Jul
5A	BSMP	70° 29.6996	148° 46.1128	35.8	6, 7 Aug
6A	BSMP	70° 32.2000	149° 57.7200	9.1	3, 4 Aug
6B	BSMP	70° 33.3611	150° 24.6255	18.0	1, 2, 3 Aug
6D	BSMP	70° 44.9300	150° 28.5100	60.5	3 Aug
6F	BSMP	70° 40.1641	151° 12.1239	40.8	2, 3 Aug
6G	BSMP	70° 31.4000	149° 54.6000	6.3	3 Aug
6H	BSMP	70° 29.6753	150° 14.5986	5.5	1 Aug
7A	BSMP	70° 37.6525	152° 09.8789	7.0	2 Aug
7C	BSMP	70° 54.8501	152° 00.3010	45.2	2 Aug
7E	BSMP	70° 43.5819	152° 04.3662	8.7	2 Aug
7G	BSMP	70° 38.9050	151° 53.6441	6.5	2, 3 Aug
BP01	Boulder Patch	70° 20.7490	147° 32.9140	22.7	28, 29 Jul; 9 Aug
COL-03	Other	70° 23.9847	150° 28.9083	+2	3 Aug
E01	Other	70° 21.1034	147° 56.1035	11.2	27 Jul; 9 Aug
E02	Other	70° 21.0539	147° 58.2819	3.0	28 Jul
EI01	Other	70° 34.8687	151° 59.2539	+10	2 Aug
Kup	Other	70° 19.5355	149° 00.1299	+8	28 Jul
L03	Liberty	70° 17.3384	147° 33.2819	21.7	28, 29 Jul
L08	Liberty	70° 16.7030	147° 30.2990	20.5	28, 29 Jul; 9 Aug
L17	Liberty	70° 23.6088	147° 32.9282	22.8	29-Jul-06
L19	Liberty	70° 18.6216	147° 49.3156	7.1	27, 28 Jul
L20	Liberty	70° 15.4461	147° 43.9446	6.7	27 Jul
L21	Liberty	70° 13.7169	147° 38.2051	5.9	27 Jul
L22	Liberty	70° 29.2491	147° 16.4027	95.7	30 Jul
M01	McCovey	70° 30.7602	148° 27.3847	36.7	31-Jul-06
N01	Northstar	70° 31.6702	148° 41.4848	39.5	4 Aug
N03	Northstar	70° 30.0020	148° 41.5700	40.8	5, 6, 7 Aug
N05	Northstar	70° 29.6281	148° 44.8917	36.9	31 Jul; 6 Aug
N05N11	Northstar	70° 28.5194	148° 41.9535	28.1	10 Aug
N06	Northstar	70° 29.5360	148° 43.1940	36.7	05-Aug-06

Station ID	Station Type	Latitude (N; WGS84)		Longitude (W; WGS84)		Dept (ft)	Date(s)
N08	Northstar	70°	29.4407	148°	38.2989	36.0	04-Aug-06
N11	Northstar	70°	28.4295	148°	41.9090	27.4	5, 6, 7 Aug
N11N08	Northstar	70°	29.4192	148°	38.3415	36	10 Aug
N11S	Northstar	70°	27.0240	148°	41.9833	15	10 Aug
N14	Northstar	70°	26.0060	148°	40.4290	9.2	4, 5, 6 Aug
N17	Northstar	70°	29.8717	148°	40.2850	38.9	31 Jul
N23	Northstar	70°	29.3732	148°	41.8366	36.3	4 Aug
N26	Northstar	70°	29.4989	148°	42.1752	36.1	7 Aug
N27	Northstar	70°	29.4133	148°	42.2011	36.9	5, 6 Aug
N28	Northstar	70°	29.5230	148°	41.5252	37.8	5, 6 Aug
PC	Port Chatham	59°	12.9200	151°	45.4050	~+2-+8	24, 26 Jul
PI01	Other (Pingok Island)	70°	33.3634	149°	28.2316	+6	4 Aug
Sag	Other (Sagavanirktok River)	70°	0.0748	148°	40.0873	+1, 2.0	28 Jul
Sag	Other (Sagavanirktok River)	70°	0.0748	148°	40.0873	2.0	28 Jul
SDI01	Other (SDI)	70°	19.586	147°	52.3960	7.3	27 Jul; 9 Aug
WD01	Other (West Dock)	70°	23.847	148°	31.4233	8.0	6, 8 Aug

Table 2. 2006 MMS cANIMIDA Station Sampling Summary

Station ID	Surficial Sediment	Sediment Core	Discrete Water	Plankton	Amphipod	Isopods	Bivalves	Mussels	Fish	Other Biota	Source / Peat	Comments
4A	1				1		0					
5(1)	1				0		0					
5(5)	1		5		0		0			0		
5A	1	0			0			2				
6A	1	0			1		0					
6B	1	22		0	2	1	0			0		
6D	1				0		0					
6F	1				1		0					
6G	1				0		0					
6H	1				0		0					
7A	1	9			0		0					
7C	1	18			0		0					
7E	1	16		0	1		0			0		
7G	1	0			1		0					
BP01	1			0	2			2				
COL-03			1								1	Coleville River
DS-11			0							0		
E01	1				0		0	2				
E02	1											
EI01											1	Eskimo Island
KUP-01			1								1	Kuparuk River
L03	1		0		0		1					
L08	1		5		1	1	1	2		0		
L17			5									Plankton attempted but unsuccessful.
L19	1				1							
L20	1				0					0		
L21	1				0							
L22	1	14	7									
M01	1	0	0									
N01			6	0								
N03	1		0		1		0	2		0		
N05	1	7			0							
N06	1				1		0					
N08			6									
N11	1				2		0	2				
N14	1		3		1		0					
N17	1	22										

Station ID	Surficial Sediment	Sediment Core	Discrete Water	Plankton	Amphipod	Isopods	Bivalves	Mussels	Fish	Other Biota	Source / Peat	Comments
N23			1									
N25	0	0	0									
N26	0		0		2							
N27	1				1							
N28	1		0		1		0					
N05N11										2		1 Isopod; 1 Mysid sample
N08N02										0		
N11N08										3		1 Isopod; 1 Mysid; 1 Amphipod sample
N11S										2		1 Isopod; 1 Mysid sample
PBS									20			
PI01											1	Pingok Island, one of the Jones Islands
Sag			1								1	Sagavanirktok River
SAGE			11									
SDI-1	1		0					2				
SIS									19			
W-1			0									
WD01	1		0	0	2	1		2				West Dock
Port Chatham			1					3				QA/QC Zero Time samples
TOTAL No. Stations	34	7	13	0	17	3	2	9	2	3	5	
TOTAL No. Samples	34	108	53	0	22	3	2	19	39	7	5	Mussels include three zero time samples
TARGET No. Samples	32	28	19	5	26	0	12	8	30	6	4	
KEY												
1	Indicates number of samples collected at proposed location.											
0	Indicates proposed sample not collected.											
1	Indicates number of samples collected at alternative location.											
0	Indicates alternative sample attempted but unsuccessful.											

July 23 (Sunday)

Battelle field staff and vessel captain arrive at Anchorage, AK and meet for dinner with KLI staff (Mark Savoie).

July 24 (Monday)

Field team members John Hardin and Mike Walsh (Battelle); Gary Lawley (KLI); and Mark Mertz (TEG) travel to Prudhoe Bay. John Trefry and Bob Trocine (FIT) travel to Anchorage. The field team collects equipment and supplies from shipping agents and begins the mobilization process at the British Petroleum (BP) Seawater Treatment Plant (STP) Facility (laboratory and field storage) and Base Operations Center (BOC; housing). Begin mobilizing MMS Vessel *1273.*

Mark Savoie (KLI) collects mussels from Port Chatham, AK. Collects zero time (reference) samples of mussels and water.

Dee Williams transfers MMS Vessel *1273* responsibility to Mark Mertz in the afternoon.

July 25 (Tuesday)

John Trefry and Bob Trocine travel to Prudhoe Bay.

Field team completes mobilization of equipment, supplies, vessels (*1273* and two inflatable boats). Team deploys mussel moorings at 5(A), N03, and N11. Each mooring is comprised of two mussel cages, each containing 20 mussels, and an acoustic pinger (see Figure 8).

1273 overnights at West Dock.

July 26 (Wednesday)

Team deploys mussel moorings at West Dock (secured to the bow of the Crowley Barge), SDI, E01, L08, and BP01. Tow benthic dredge for clams at 4A without success.

Trefry and Trocine set up water processing laboratory at STP.

1273 overnights at Endicott.

Surficial sediment collected with Van-Veen sampler

July 27 (Thursday)

Hardin and Trefry meet with Ken Dunton and discuss coordination of field sampling.

The shore team deploys the fyke net at Point Brower and then performs a salinity gradient sampling transect along the Sagavanirktok River (includes 11 discrete samples). Water samples are processed at the STP.

The team on the *1273* collects sediment at 5(1), E01, SDI01, L19, L20, and L21. Amphipod traps are deployed at 5(1), E01 and L19. The clam dredge is towed at 5(1) and E01 (twice) without success.

The *1273* overnights at Endicott.

July 28 (Friday)

The *1273* team collects sediment from 4A, BP01, L03, L08, and E02. Amphipod traps are recovered at 5(1) (no sample), E01 (no sample), and L19. Amphipod traps are deployed at BP01 and L08. A CTD profile is performed and five discreet water samples are collected at L08. The clam dredge is towed twice at L08 without success.

The shore team tends the fyke net at Point Brower. High water fouled the net, no fish are collected. The net is cleaned and re-set. Water and peat samples are collected from the Sagavanirktok and Kuparuk rivers. Water samples are processed at the STP.

The cANIMIDA Contracting Officer's Technical Representative (COTR) Dr. Richard (Dick) Prentki travels to Prudhoe Bay from Anchorage.

The *1273* overnights at Endicott.

July 29 (Saturday)

The *1273* team retrieves amphipod traps from L08 (two samples), and BP01. *Astarte* clams are collected from L08 and L03. A CTD profile is performed and five discreet water samples are collected at L17. A double plankton tow with one meter diameter nets is performed at L17 for approximately one hour. The minimal sample mass recovered is not adequate for sample analysis. A highly stratified water column (salinity and temperature) suggests that upwelling of nutrients is minimal, phytoplankton productivity is low, and subsequent zooplankton populations are limited. The water mass remained stratified throughout the survey and no plankton blooms were observed. No further attempts at plankton collection were made.

The shore team collects fish from the fyke net at Point Brower and processes them at the STP.

The *1273* overnights at Endicott.

R. Trocine with dual gravity core samples

July 30 (Sunday)

The *1273* team transits ~16 NM Northeast from Endicott into thick flow ice to a water depth of 95.7 feet and collects surface sediment and two gravity core samples from L22.

A CTD profile is performed and seven discreet water samples are also collected at L22. Amphipod traps are deployed at 5(5).

The *1273* overnights at West Dock.

July 31 (Monday)

The *1273* team collects surface sediment and gravity cores from N05 and N17. Surface sediment is collected from M01 (McCovey exploration well area) but multiple gravity core attempts are unsuccessful at M01 and 5(A) due to stiff sediments limiting penetration. Amphipod traps are retrieved from 5(5), but no sample is collected.

The shore team prepares samples for shipment and processes water samples.

During the evening, the *1273* is re-fueled, water and provisions added in preparation for traveling west to Harrison Bay.

The *1273* overnights at West Dock.

J. Hardin collecting amphipods

August 1 (Tuesday)

Mobilization of the *1273* for the transit to Harrison Bay is conducted in the morning. Sediment and tissue samples are shipped to Duxbury, MA. The *1273* team transits to Oligtok Point on the eastern side of Harrison Bay during the afternoon and evening.

Surface sediment samples are collected from 6B and 6H. Gravity core samples are collected from 6B. Amphipod traps are deployed at 6B and 6H.

The shore team processes water samples and delivers delayed food shipment to Harrison Bay.

Richard Prentki returns to Anchorage.

1273 overnights at Oligtok Point.

August 2 (Wednesday)

The *1273* team collects surface sediment samples from 6F, 7A, 7C, 7E, and 7G. Collect gravity cores from 7A, 7C, and 7E. Gravity core attempt at 7G is unsuccessful due to stiff sediment. Collect amphipod traps from 6B, 6H (no sample), 7A (no sample) and 7E. Attempt clam collection at all sediment stations (6F, 7A, 7C, 7E, and 7G) without success. Collect peat sample from Eskimo Island.

The shore team processes water samples at STP and attends to errands/logistics in Prudhoe Bay.

The *1273* overnights at Eskimo Island.

August 3 (Thursday)

The *1273* team collects sediment samples from 6A, 6D, and 6G. Clam collections are attempted at 6A, 6D, and 6G without success. Amphipods traps are collected from 6B, 6F and 7G. All three have amphipod samples and one isopod sample is collected from 6B.

The shore team travels up the Colville River in the inflatable boat as far as fuel allows and collects peat and water samples at COL-03.

The *1273* overnights at Spy Island.

August 4 (Friday)

In the morning, the *1273* team collects amphipod traps from 6A and 6G (no sample was collected from 6G). The *1273* transits east toward Prudhoe Bay, stopping at Pingok Island to collect a peat sample. The *1273* arrives back at West Dock at 1310.

Flock of geese over Pingok Island

In the afternoon, the *1273* team collects surface water samples from N01 and N23. CTD casts, surface and subsurface water samples are collected at N08 (six discrete samples) and N14 (three discrete samples).

The *1273* overnights at West Dock.

August 5 (Saturday)

The *1273* team collects sediment samples at N03, N05, N06, N11, N14, N27, and N28. Amphipod traps are also deployed at N03, N05, N06, N11, N14, N27, and N28.

The shore team processes water samples.

The *1273* overnights at West Dock.

August 6 (Sunday)

The *1273* team collects sediment samples from West Dock, and 5A. Amphipod traps are collected with adequate mass for analysis at N03, N06, N11 (2 samples), N14, N27, and N28. The trap at N27 was drug by flow ice and strong winds to near N06 where it was recovered and a sample was collected. The traps at N05 were also drug by flow ice and winds and were not recovered, no sample was collected. Field equipment blank sample is collected at West Dock.

The shore team deploys the fyke net at Stump Island, deploys amphipod traps at West Dock, and completes water sample processing. FIT packs equipment and supplies.

The *1273* overnights at West Dock.

August 7 (Monday)

The *1273* team recovers mussel moorings from 5A, N03, and N11, with excellent recovery in all six samples. Amphipod traps are collected at N26 (2 samples). A field blank for amphipod collection equipment is collected at N26.

Shore team collects five fish from the fyke net at Stump Island, the net is re-set.

FIT completes shipment of equipment and supplies and departs Prudhoe Bay.

1273 overnights at West Dock.

August 8 (Tuesday)

Winds are too high to transit to Endicott and recover mussel moorings. Shore team collects fish from the Stump Island fyke net, remove the net, and process samples at STP. The shore team collects mussels and amphipods from West Dock (2 amphipod and 1 isopod samples).

Demobilize some equipment and supplies from the 1273. Pack samples for shipping to Duxbury laboratory.

The 1273 overnights at West Dock.

Benthic sled on loan from Dr. Ken Dunton

August 9 (Wednesday)

Battelle staff ship samples in the morning.

The *1273* team retrieves moorings from BP01, L08, SDI01, and E01. The mussels have excellent survival at all four locations. Deploy and retrieve amphipod traps at BP01. QA/QC sample for airborne contamination collected at SDI01.

The *1273* overnights at West Dock.

August 10 (Thursday)

The *1273* team performs four epibenthic tows in the Northstar area, collecting small volumes in seven samples. Tow N11-N08 provides amphipod, mysids, and isopod samples; tow N05-N11 collects mysids and isopods; and tow N11S collects mysids and isopods. The tow in deeper water, N08-N02, is not successful.

The *1273* is demobilized in the afternoon; samples and equipment are packed for transit in the evening.

The *1273* overnights at West Dock.

August 11 (Friday)

Battelle and KLI staff ship equipment and supplies. Departure flights are canceled due to fog.

Seth Danielson and the UAF team arrive at Prudhoe Bay. However, their gear is delayed.

The UAF team spends the night on the *1273* at West Dock due to housing shortages on the North Slope.

August 12 (Saturday)

Poor visibility continues in the afternoon but the flight is moved from Deadhorse to the Kuparuk gravel airstrip and departs in the evening.

Mark Mertz meets with UAF team again and makes some minor repairs on the *1273*.

The *1273* overnights at West Dock.

August 13 (Sunday)

The UAF team and Mark Mertz continue to organize and prepare for mooring recovery. Some UAF gear fails to arrive on time.

The *1273* overnights at West Dock

M. Walsh and G. Lawley collect fish at Stump Island

August 14 (Monday)

Captain Mertz takes UAF team to recover Dinkum Sands area mooring (offshore of Prudhoe Bay). The mooring is recovered using divers due to acoustic release failure. The team attempts to recover the Reindeer Island mooring, but the release does not work.

The *1273* overnights at West Dock.

August 15 (Tuesday)

The *1273* team returns to Reindeer Island and use an alternate set of coordinates that prove more accurate. The acoustic release functions when the *1273* gets within ~25 meters and the mooring is recovered intact.

Ken Kronschnabl (KLI, *1273* Captain) arrives in Prudhoe Bay in the evening. Mark Mertz and Ken Kronschnabl meet to discuss the *1273* status and transfer project information.

The *1273* overnights at West Dock.

August 16 (Wednesday)

Mertz transfers responsibility for the *1273* to Kronschnabl. UAF and Kronschnabl prepare the *1273* and service mooring for trip to Camden Bay.

The *1273* overnights at West Dock.

August 17 (Thursday)

The *1273* team transits toward Camden Bay.

August 18 (Friday)

Retrieve Camden mooring, replace with serviced mooring.

August 19 (Saturday)

Transit back to Prudhoe Bay.

August 20 (Sunday)

The UAF team services the moorings.
1273 overnights at West Dock.

August 21 (Monday)

The *1273* team deploys one mooring at Dinkum Island and one mooring offshore of Dinkum Island in 55 feet of water.

The *1273* overnights at West Dock.

August 22 (Tuesday)

The *1273* is pulled from the water and winterized. Ken Kronschnabl transfers responsibility of the vessel to Dee Williams of MMS.

August 23 (Wednesday)

Ken Kronschnabl leaves Prudhoe Bay.

1273 Captain M. Mertz

4.0 Sampling Procedures

Sampling procedures followed at each station were consistent with those performed during the ANIMIDA Summer 2002 program (MMS, 2002), 2004 and 2005 cANIMIDA summer surveys, and are described in the Summer 2006 Field Logistics and Sampling Plan for the Minerals Management Service ANIMIDA Program (MMS, 2006). Typical sampling procedures included:

- Conductivity, temperature, and depth (CTD) measurements
- Water sample collection via pump system from offshore suspended sediment stations, and by hand at shoreline river stations

- Surface sediment grab sample collection using a modified Van-Veen grab (for sediments and bivalves – as appropriate)
- Core sampling with a gravity coring device equipped with twin four inch diameter barrels.
- Deployment and retrieval of amphipod traps
- Deployment of mussel cages at eight fixed moorings; seven recovered
- Collection of fish samples by fyke net at two locations
- Collection of epibenthic fauna with a benthic sled provided by Dr. Ken Dunton.

Photo documentation, station logs, and field notes were recorded during the field survey. The station logs for each sampling station are included in Attachment 1. Each station log includes a description of the sampling location, observations, number and type(s) of samples collected, and comments.

5.0 Technical Issues

There were no significant technical difficulties during this survey. Due to the patchy nature of amphipod and clam populations, as encountered in previous studies, the exact target types and numbers of samples were not collected. When multiple attempts at a station occurred, the mass of amphipods recovered was similar between attempts. This pattern was also observed in 2005 and indicates that resident populations are relatively stable over the short sampling time frame. This indicates that additional effort(s) yield minimal additional return. Sampling went smoothly, with only one weather day occurring on the final travel day of the cANIMIDA portion of the survey. There were no significant administrative or local logistic problems. British Petroleum did an outstanding job of supporting the field staff and providing room and board during an unusually busy summer season.

6.0 References

Minerals Management Service. 2002. Summer 2002 Field Sampling and Logistics Plan. July 2002.

Minerals Management Service. 2006. Summer 2006 Field Sampling and Logistics Plan. July 22, 2006.

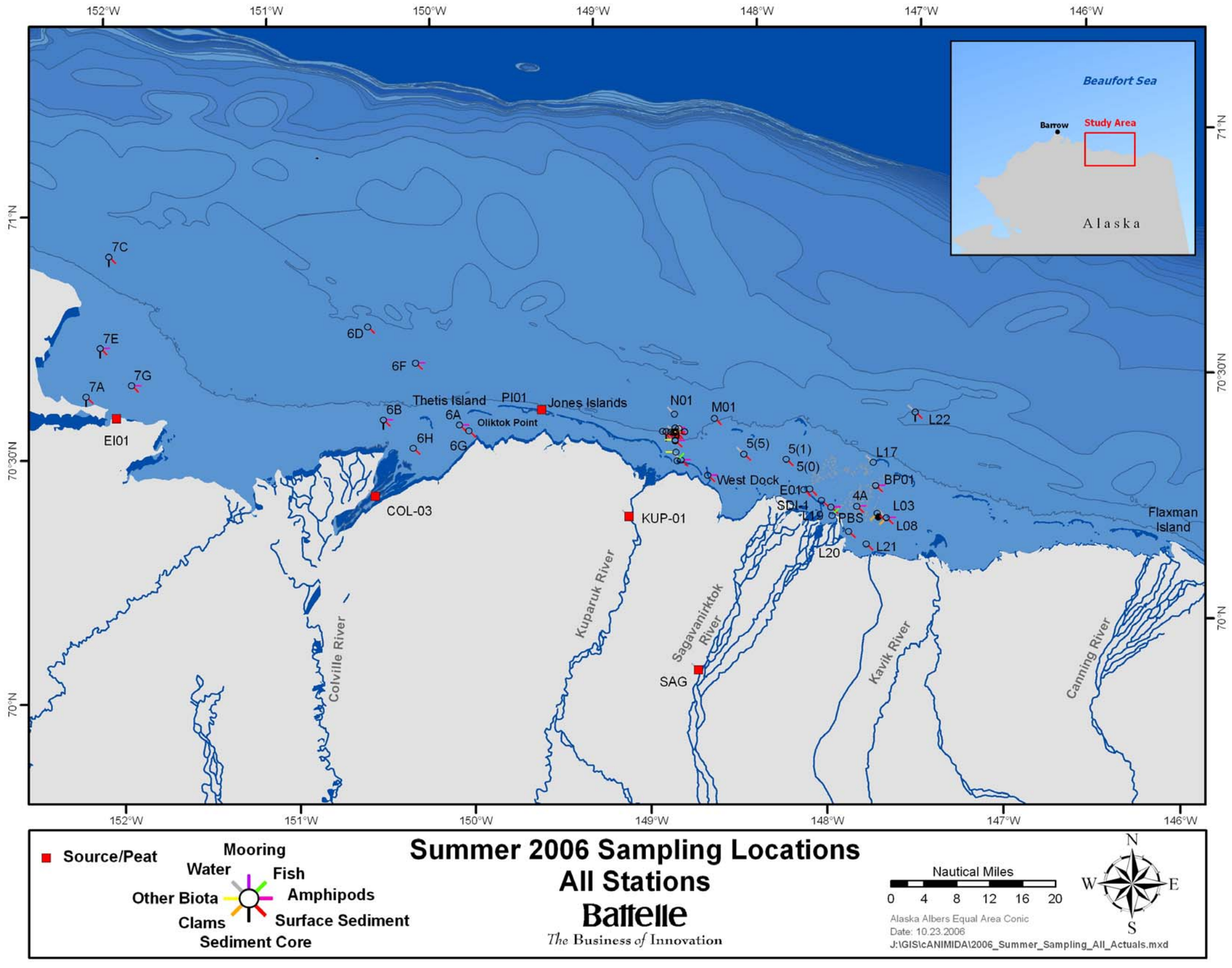


Figure 1. Summer 2006 cANIMIDA Sampling Locations.

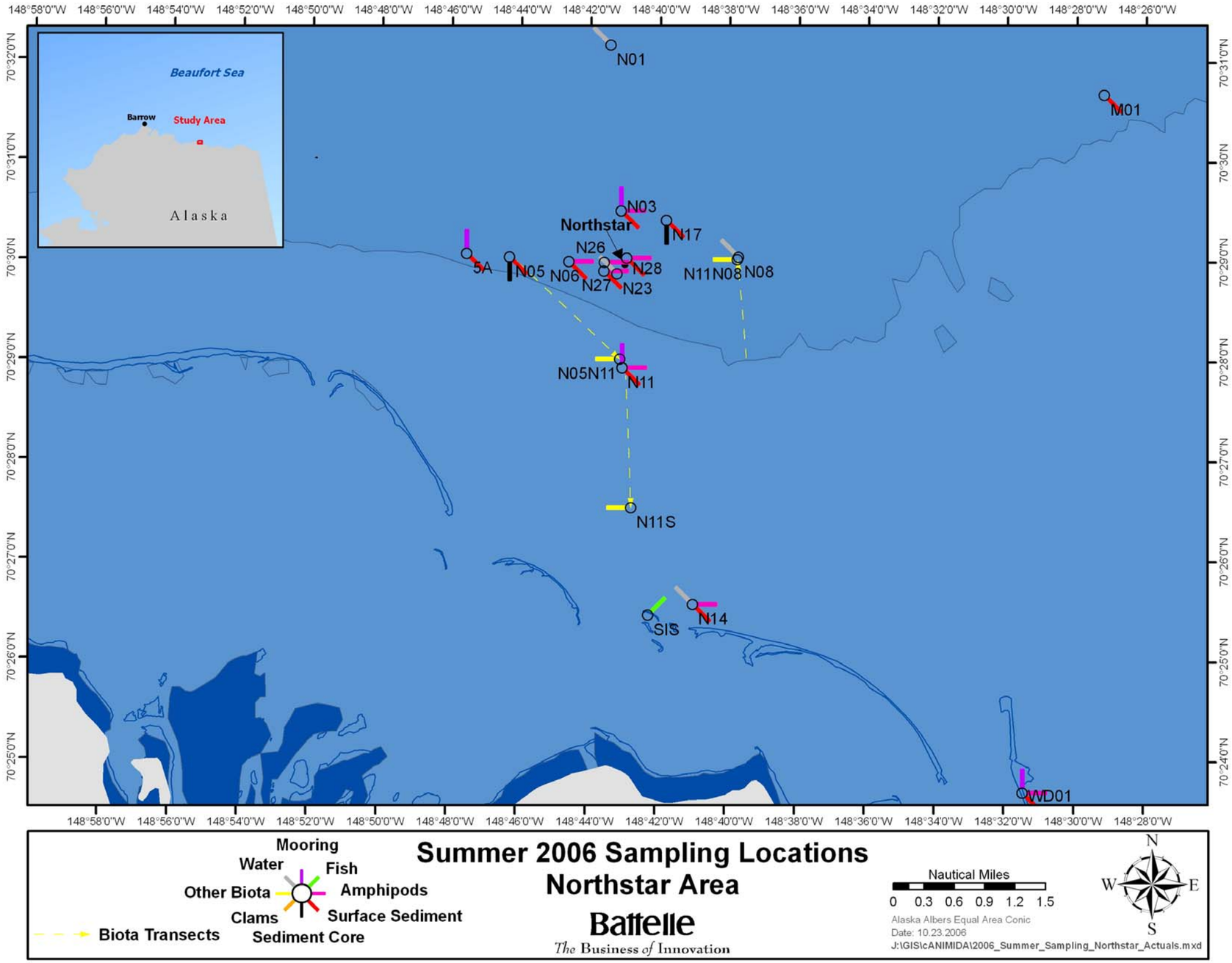


Figure 2. Northstar Area Sampling Locations, Summer 2006.

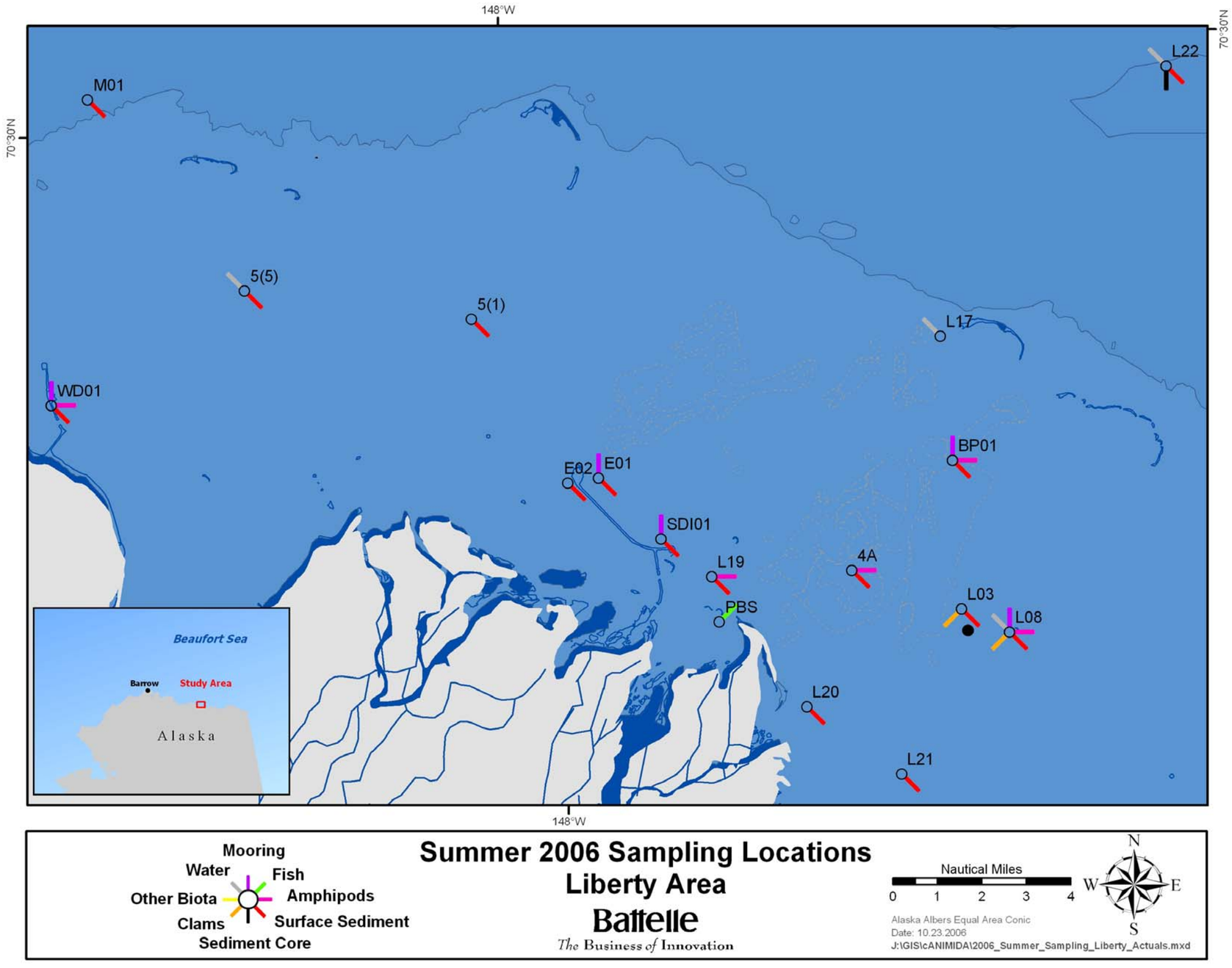


Figure 3. Liberty Area Sampling Locations, Summer 2006.

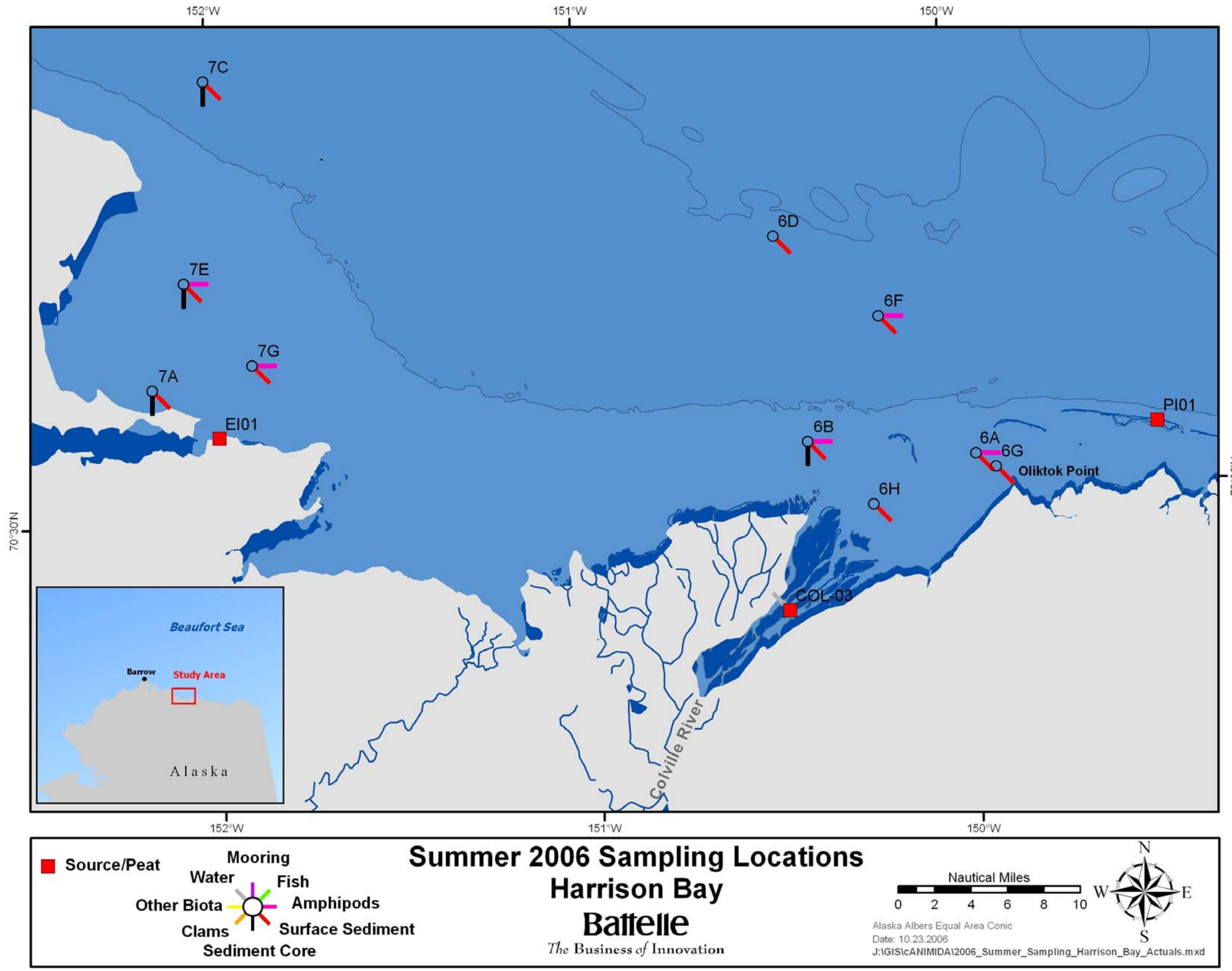


Figure 4. Harrison Bay Sampling Locations, Summer 2006.

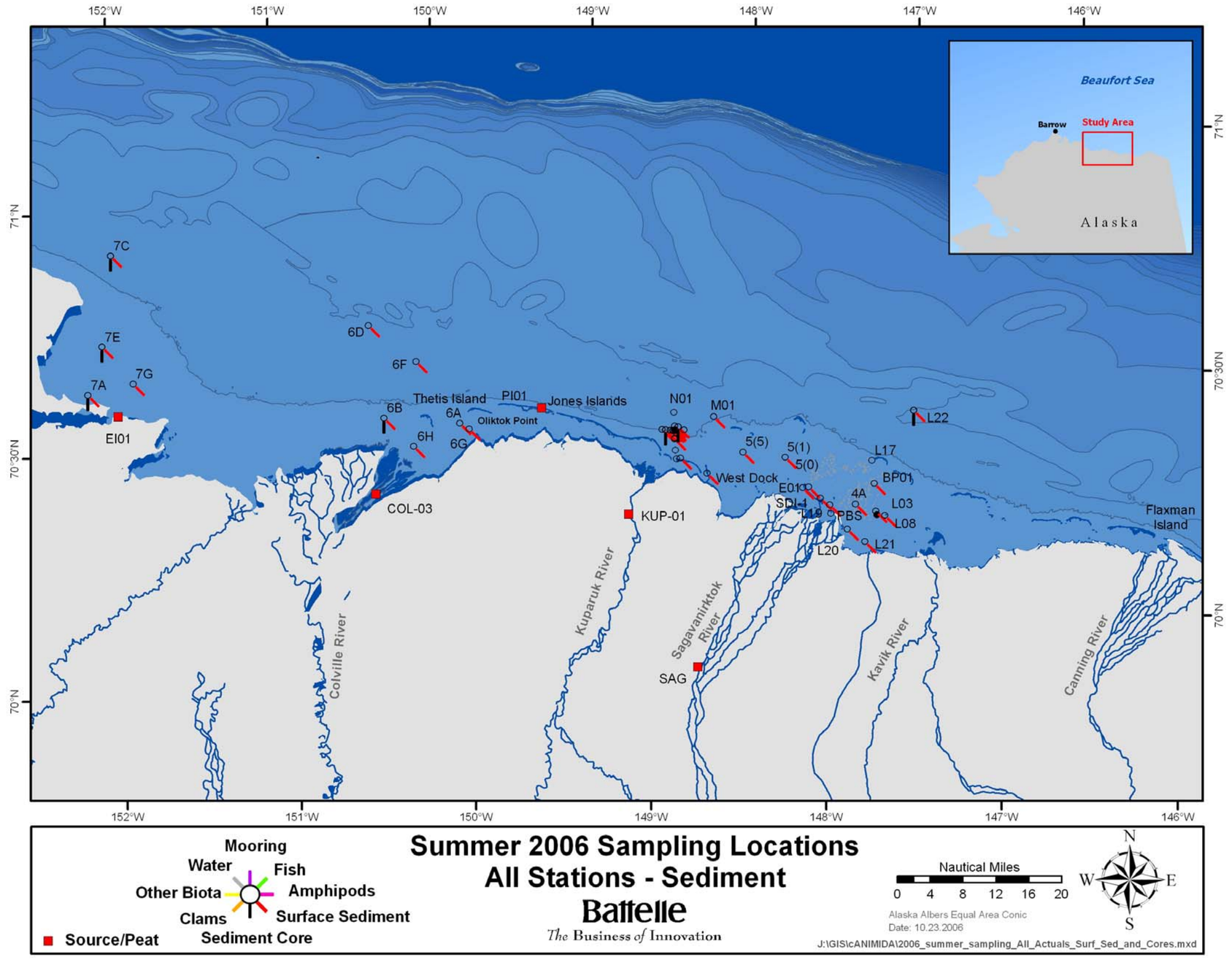


Figure 5. Sediment and Core Sampling Locations, Summer 2006.

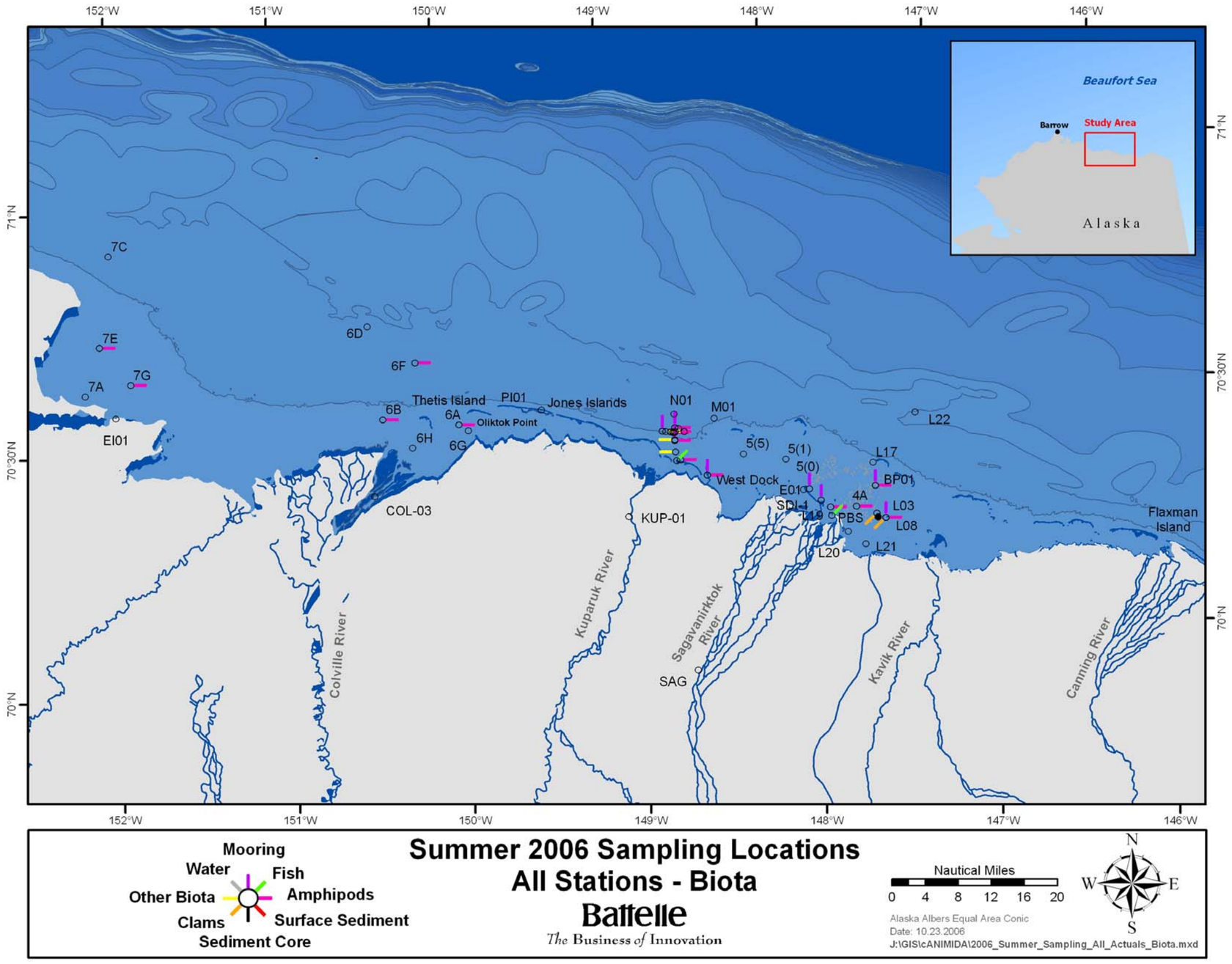


Figure 6. Mussel Moorings and Indigenous Biota Sampling Locations, Summer 2006.

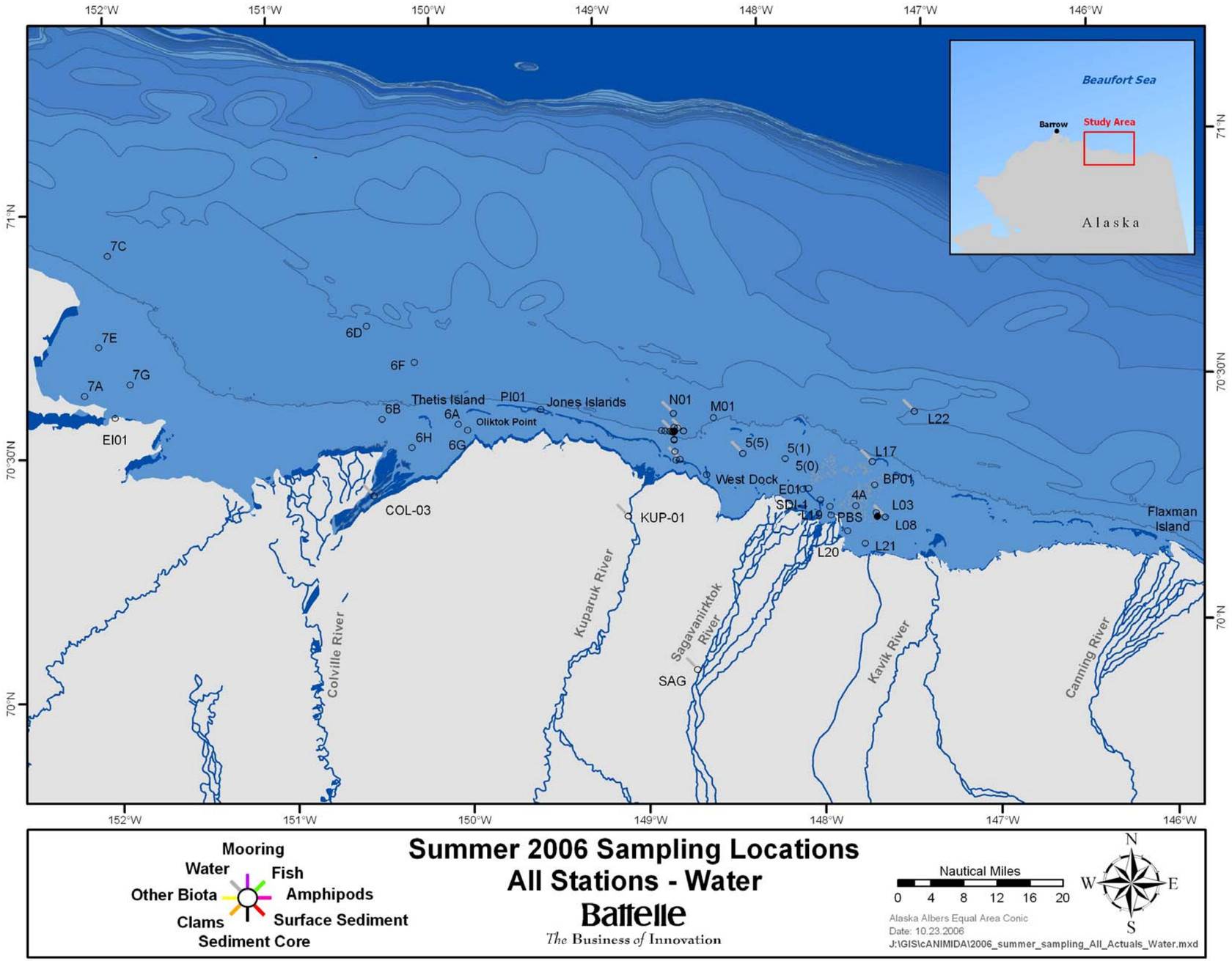


Figure 7. Water Sampling Locations, Summer 2006.

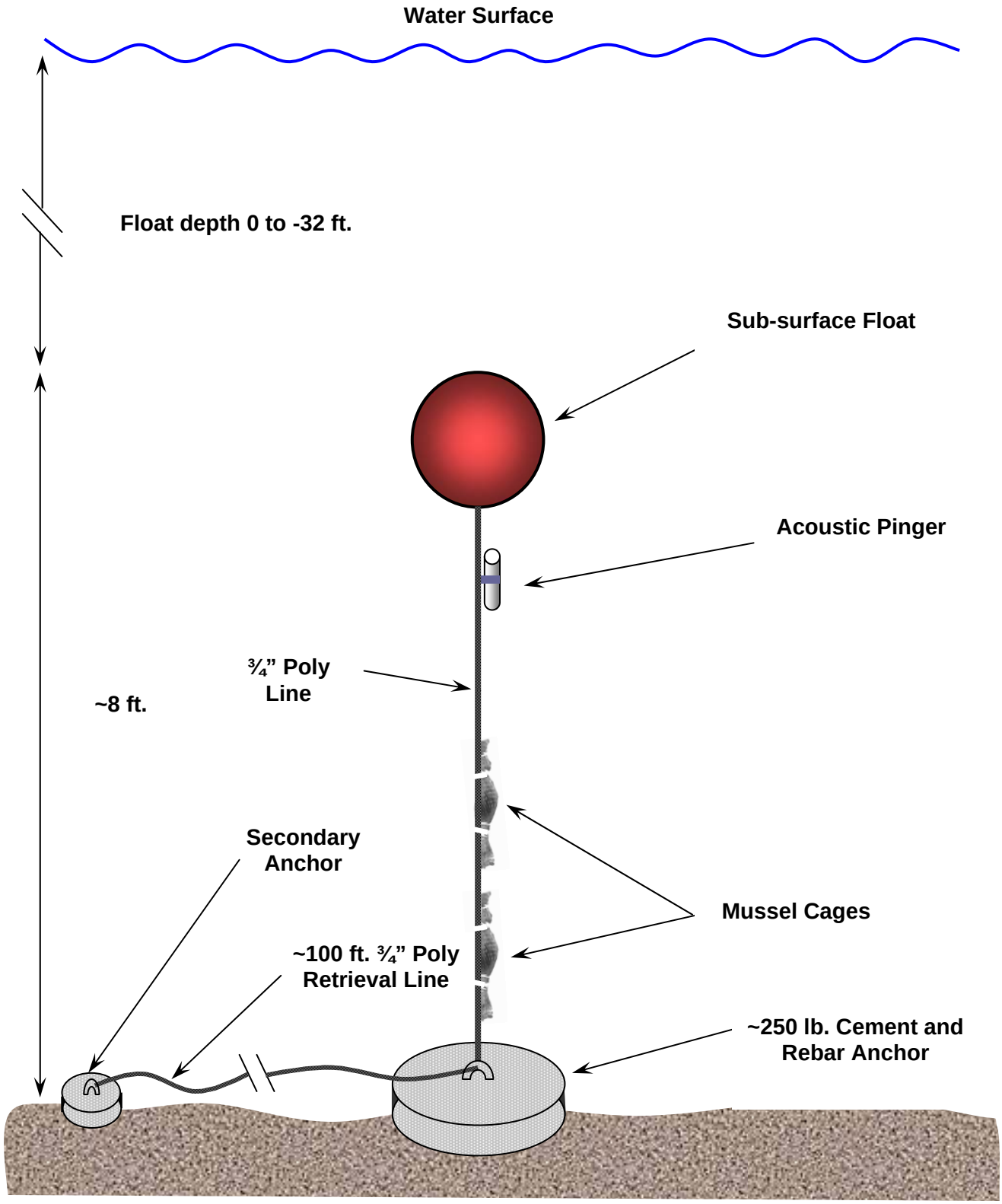


Figure 8. Schematic of the Mussel Cage and Mooring String

Attachment 2: 2006 Collection Permit and Fish Transfer Permit

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
P.O. Box 25526
JUNEAU, ALASKA 99802-5526

Permit No. CF-06-074

Expires 08/31/2006

FISH RESOURCE PERMIT
(For Scientific/Educational Purposes)

This permit authorizes **John Hardin** *(whose signature is required on page 2 for permit validation)*
person
of **Battelle Memorial Institute** at **703 Palomar Airport Rd, Suite 350, Carlsbad, CA 92009**
agency or organization address

to conduct the following activities from **July 1, 2006** to **August 31, 2006** in accordance with AS 16.05.930 and AS 16.05.340(b).

Purpose: To collect target species of shellfish and amphipods for tissue analysis of petroleum hydrocarbons and trace metals in order to evaluate concentration levels of hydrocarbons in the near-shore biota of the Beaufort Sea; to examine the potential bioaccumulation of organic compounds in the water column by deploying caged mussels and analyzing them for organics and metals, and to collect target species of fish for tissue analysis of petroleum hydrocarbons, trace metals, biomarker CYP1A, and biomarker bile FAC in order to evaluate contaminant exposure of fish in the near-shore Beaufort Sea.

Location: Nearshore Beaufort Sea, 12-20 stations from Bulletin Point to Western Harrison Bay, concentrating around the Northstar Production Island and Liberty Development Area.

Species Collected: **Collect & Sacrifice:** 300 astarte clams, 600 cyrtodaria clams, 600 mysids, 5000 amphipods, 10 Dolly Varden, 20 Arctic cisco, 10 broad whitefish, 20 least cisco, 10 humpback whitefish, 40 four horn sculpin, 10 Arctic cod, 10 Arctic flounder, 20 snailfish.
Collect, transport, caged release & sacrifice: 380 blue mussels (see **Contingencies**).

REPORT DUE September 30, 2006. The report shall include species, numbers, dates, and locations of collection and disposition, and if applicable, sex, age, and breeding condition, and lengths and weights of fish. The report shall also include other information as may be required under the contingencies section.

GENERAL CONDITIONS, EXCEPTIONS AND RESTRICTIONS

1. This permit must be carried by person(s) specified during approved activities who shall show it on request to persons authorized to enforce Alaska's fish and game laws. This permit is nontransferable and will be revoked or renewal denied by the Commissioner of Fish and Game if the permittee violates any of its conditions, exceptions or restrictions. No redelegation of authority may be allowed under this permit unless specifically noted.
2. No specimens taken under authority hereof may be sold or bartered. All specimens must be deposited in a public museum or a public scientific or educational institution unless otherwise stated herein. Subpermittees shall not retain possession of live animals or other specimens.
3. The permittee shall keep records of all activities conducted under authority of this permit, available for inspection at all reasonable hours upon request of any authorized state enforcement officer.
4. Permits will not be renewed until detailed reports, as specified above, have been received by the department.
5. UNLESS SPECIFICALLY STATED HEREIN, THIS PERMIT DOES NOT AUTHORIZE the exportation of specimens or the taking of specimens in areas otherwise closed to hunting and fishing; without appropriate licenses required by state regulations; during closed seasons; or in any manner, by any means, at any time not permitted by those regulations.

Craig Farrington
Division of Commercial Fisheries

Patrick Nelson
Deputy Director
Division of Commercial Fisheries
Alaska Department of Fish and Game

CF-06-074 ***continued (page 2 of 2)***

Authorized Personnel: The following personnel may participate in collecting activities under terms of this permit:

John Hardin, Dick Prentki, John Trefry, Mark Savioe, Bob Trocine, Gary Lawley, Rob Rember, Mike Walsh, Carrie Semmler, Mark Mertz, Matt Alkire, Other KLI field personnel (TBA).

Contingencies:

1) **Fred Bue** (Division of Commercial Fisheries, Fairbanks, 907-459-7217) must be contacted **prior** to you engaging in collecting activities. Division of Commercial Fish Area Management Biologists have the right to specify methods for collecting, as well as limiting the collections of any species, and the number of specimens collected by time and area.

2) All unattended collecting gear must be labeled with the permittee's name, telephone number, and permit number.

3) Invertebrates, especially sessile invertebrates, should be collected over a broad geographical area to avoid local depletion and disruption of local ecosystems.

4) Permits will indicate the number of specimens that may be taken, by species and life stage. Sampling or collecting activities must stop when the maximum allowable number of specimens is obtained. All live fish, shellfish, and aquatic plants collected in excess of the number specified on the permit must be released immediately and unharmed at the capture location, unless otherwise specified in the permit.

5) All bycatch incidentally captured during sampling will be identified, recorded and released unharmed if possible. Bycatch data should be included in the collection report.

6) This permit will fulfill the requirements of 5AAC 41.005 – 41.060 pertaining to fish transport permits (FTP's), with the condition that the transported species BE DESTROYED AND NOT BE RELEASED.

7) *A copy of this permit, including any amendments, must be made available at all field collection sites and project sites for inspection upon request by a representative of the department or a law enforcement officer.*

8) Issuance of this permit does not absolve the permittee from compliance in full with any and all other applicable federal, state, or local laws regulations, or ordinances.

9) **A report of activities, referenced to this fish resource permit number, must be submitted to the Alaska Department of Fish and Game, Division of Commercial Fish, PO Box 115526, Juneau, AK 99811-5526, attention Sara Larsen (465-4724; sara_larsen@fishgame.state.ak.us), within 30 days after the expiration of this permit.** This report must summarize the number of fish captured by location and by species, and the fate of those fish. A report is required whether or not collecting activities were undertaken. A report must also be sent to the Biologist(s) listed under number 1 in this Contingencies section.

10) **PERMIT VALIDATION requires permittee's signature agreeing to abide by permit conditions before beginning collecting activities:**

Signature of Permittee

cc: Bonnie Borba
Fred Bue
Ted Meyers
Gene Sandone
CF Division Files
Alaska Bureau of Wildlife Enforcement-Coldfoot

APPENDIX F

cANIMIDA Indicator Matrix for Decision Making

This page intentionally left blank

Task 5 cANIMIDA Indicator Matrix for Decision Making

Task Order	MMS Issue Addressed	Monitoring Hypotheses	Methods	Key Monitoring Result or Parameter for Decision Making
005 – "Integrated Biomonitoring and Bioaccumulation of Contaminants in Biota of the cANIMIDA Study Area"	Will offshore oil development and production at Northstar and planed development at Liberty result in increased or chronic pollution from industrial sources of petroleum or metals? **Objectives** 1. Improve and validate the Contractor's proposed conceptual model of bioaccumulation and trophic interaction in cANIMIDA biota. 2. Measure bioaccumulation in selected species by co-collection and analysis of indigenous bivalves, benthic amphipods, and fish, and deployment, retrieval, and analysis of caged bivalves and SPMDs. 3. Compare bioaccumulation data to published results for the same or similar species outside the cANIMIDA area. 4. Develop a strategy for longer-term upper trophic level contaminant monitoring. 5. Develop a strategy and rationale for future Boulder Patch contaminant monitoring in conjunction with Task 6.	H1: Baseline concentrations of PAH, metals, and exposure/response biomarkers in biota from the Northstar and Liberty areas of the Beaufort Sea are not a result of oil and gas industry activities. H2: Oil and gas industry activities in the Northstar production area and the Liberty prospect will not result in an increase in tissue concentrations of PAH, metals and exposure/ response biomarkers in biota from the Northstar and Liberty areas. H3: Concentrations of metals and PAH in tissues of indigenous benthic invertebrates and demersal fish from the Northstar and Liberty areas are not different from the regional background, which reflects concentrations of bioavailable contaminants from natural and anthropogenic sources. H4**:** Concentrations of metals and PAH in caged mussels and of PAH in SPMDS following a minimum 21-day deployment near Northstar oil and gas activities will not be different from the regional background and will reflect concentrations of regional contaminants in the water column of the Beaufort Sea.	Summer sampling in 2004, 2005, and 2006 of indigenous bivalve mollusks, crustaceans, and fish and deployed caged mussels and SPMDs, from Northstar, Liberty, and historic Beaufort Sea Monitoring Program (BSMP) sites for analysis for the following parameters: bile FAC, CYP1A, PAH, SHC, S/T and 19 metals.	1. Annual interpretative report with tabulated data of chemical and immunohistochemical analyses were submitted in 2005 and 2009, with statistical tests of potential interannual significant differences. 2. Tissue residues of metals, hydrocarbons, and exposure biomarkers in bivalves, crustaceans, and fish from the Study Area were compared to those in the same or similar species from other areas. 3. A conceptual food web model for the Beaufort Sea was constructed from the scientific literature and integrated with the results of the chemical analyses in this task. 4. Contaminant concentrations were monitored is selected fauna from the Boulder Patch. 5. The conceptual food web model identified the need for upper trophic level monitoring, but no progress was made in developing a strategy to accomplish this goal.