

APPENDIX A

Biological Sample Collection and Analysis

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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 | | |

¹Two 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 | |

¹Two 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 |

¹Due to volume constraints, these samples were only analyzed for metals.

²Historic 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 |

¹Historic 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) | <i>Salvelinus malma</i> |
| Liberty | PBS | 04-PBS-01-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Liberty | PBS | 04-PBS-04-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Liberty | PBS | 04-PBS-08-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Liberty | L14 | 04-L14-01-CYP-T | Arctic Cod | <i>Boreogadus saida</i> |
| Liberty | L14 | 04-L14-02-CYP-T | Arctic Cod | <i>Boreogadus saida</i> |
| Liberty | L14 | 04-L14-04-CYP-T | Arctic Cod | <i>Boreogadus saida</i> |
| Liberty | PBS | 04-PBS-09-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-10-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-11-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-21-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-22-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-23-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-24-CYP-T | Broad Whitefish | <i>Coregonus nasus</i> |
| Liberty | PBS | 04-PBS-30-CYP-T | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Liberty | PBS | 04-PBS-19-CYP-T | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Liberty | PBS | 04-PBS-20-CYP-T | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Liberty | PBS | 04-PBS-27-CYP-T | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Liberty | PBS | 04-PBS-28-CYP-T | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Liberty | PBS | 04-PBS-29-CYP-T | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Liberty | PBS | 04-PBS-03-CYP-T | Least Cisco | <i>Coregonus sardinella</i> |
| Liberty | PBS | 04-PBS-05-CYP-T | Least Cisco | <i>Coregonus sardinella</i> |
| Liberty | PBS | 04-PBS-06-CYP-T | Least Cisco | <i>Coregonus sardinella</i> |
| Liberty | PBS | 04-PBS-12-CYP-T | Least Cisco | <i>Coregonus sardinella</i> |
| Liberty | PBS | 04-PBS-25-CYP-T | Least Cisco | <i>Coregonus sardinella</i> |
| Northstar | SIS | 04-SIS-02-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Northstar | SIS | 04-SIS-03-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Northstar | SIS | 04-SIS-04-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Northstar | SIS | 04-SIS-06-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Northstar | SIS | 04-SIS-08-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Northstar | SIS | 04-SIS-09-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Northstar | SIS | 04-SIS-10-CYP-T | Arctic Cisco | <i>Coregonus autumnalis</i> |

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

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

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 | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-02-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-03-CYP-T-F | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-04-CYP-T-F | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-05-CYP-T-F | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-06-CYP-T-F | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-07-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-08-CYP-T-F | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-09-CYP-T-F | Arctic Cisco | <i>Coregonus autumnalis</i> |
| Point Brower | 05-PB-10-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-11-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-12-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-13-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-14-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Point Brower | 05-PB-16-CYP-T-F | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Point Brower | 05-PB-17-CYP-T-F | Arctic Flounder | <i>Liopsetta glacialis</i> |
| Point Brower | 05-PB-18-CYP-T-F | Arctic Flounder | <i>Liopsetta glacialis</i> |
| Northstar | 05-SIS-01-CYP-T-F | Arctic Char | <i>Salvelinus alpinus</i> |
| Northstar | 05-SIS-02-CYP-T-F | Arctic Char | <i>Salvelinus alpinus</i> |
| Northstar | 05-SIS-03-CYP-T-F | Arctic Char | <i>Salvelinus alpinus</i> |
| Northstar | 05-SIS-04-CYP-T-F | Arctic Char | <i>Salvelinus alpinus</i> |
| Northstar | 05-SIS-05-CYP-T-F | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Northstar | 05-SIS-06-CYP-T-F | Four Horn Sculpin | <i>Myoxocephalus quadricornis</i> |
| Northstar | 05-SIS-07-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-08-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-09-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-10-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-11-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-13-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-14-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-15-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |
| Northstar | 05-SIS-16-CYP-T-F | Humpback Broad Whitefish | <i>Coregonus nasus</i> |

APPENDIX B

Summary of Analytical Methods

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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 conducted 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-d₁₀ and chrysene-d₁₂). 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 | <u>Surrogate Compounds</u> | |
| 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 | <u>Internal Standard</u> | |
| 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-d₁₂. 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 5 β (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 | |
| 13 β ,17 α -diacholestane-20S | Diacholestane | S4 |
| 13 β ,17 α -diacholestane-20R | Diacholestane | S5 |
| 5 α ,14 α ,17 α ,24-methylcholestane-20R | Methylcholestane | S24 |
| 5 α ,14 α ,17 α ,24-ethylcholestane-20S | Ethylcholestane | S25 |
| 5 α ,14 α ,17 α ,24-ethylcholestane-20R | Ethylcholestane | S28 |
| C ₂₃ diterpane | Diterpane | T4 |
| C ₂₉ tricyclictriterpane | Tricyclictriterpane | T9 |
| C ₂₉ tricyclictriterpane | Tricyclictriterpane | T10 |
| 18 α (H)-22,29,30-trisnorhopane-TS | Trisnorhopane (TS) | T11 |
| 17 α (H)-22,29,30-trisnorhopane-TM | Trisnorhopane (TM) | T12 |
| 17 α (H),21 β (H)-30-norhopane | Norhopane | T15 |
| 18 α (H)-oleanane | Oleanane | T18 |
| 17 α (H),21 β (H)-hopane | Hopane | T19 |
| 22S-17 α (H),21 β (H)-30-homohopane | Homohopane | T21 |
| 22R-17 α (H),21 β (H)-30-homohopane | Homohopane | T22 |
| *5 α , 14 α , 17 α -Cholestane | 5 α , 14 α , 17 α -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-C₉ through n-C₄₀ 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 (d₆₂-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 (HNO₃), hydrogen peroxide (H₂O₂), 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 (HNO₃) and sulfuric acid (H₂SO₄) 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 ($\mu\text{g}/\text{ml}$), or parts per million on a volume basis (or $\mu\text{g}/\text{g}$, 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 ($\mu\text{g}/\text{ml}$), or nanogram metabolites per microgram protein ($\text{ng}/\mu\text{g}$). 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 $\mu\text{g}/\text{ml}$ (or $\mu\text{g}/\text{g}$) 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°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 ($O \times I$) 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% H₂O₂ 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

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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) | | | | | | |
| <i>Fish</i> | | | | | | |
| PAH | 184 | 17 | 132 | 12 | 108 | 1 |
| <i>Mussels</i> | | | | | | |
| PAH | 60 | 1 | 60 | 5 | 48 | 1 |
| Biomarker | 13 | 0 | 15 | 2 | 15 | 0 |
| SHC | 30 | 0 | 28 | 0 | 48 | 1 |
| <i>Clam/Amphipod/Isopod/Mysid</i> | | | | | | |
| PAH | 72 | 0 | 136 | 2 | 191 | 4 |
| Biomarker | 17 | 2 | 34 | 2 | 70 | 0 |
| SHC | 36 | 0 | 64 | 0 | 37 | 0 |
| <i>SPMD</i> | | | | | | |
| 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 met 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-naphthalenes, C2-naphthalenes, C3-naphthalenes, 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; the associated field samples were “B” qualified for naphthalene and C1-naphthalenes.

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 |
| <i>PAHs</i> | | | | | | | | | | | | |
| 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-C29Tricyclitriterpane | NA | | NA | | 0 | ND | 0 | ND | 0 | ND | 0 | ND |
| T10-C29Tricyclitriterpane | 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 tricyclitriterpane (T9) | 0 | U | 0 | NDT | 0 | NDT | | 0 | ND | 0 | NDT | 0 | NDT |
| C29 tricyclitriterpane (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 | |

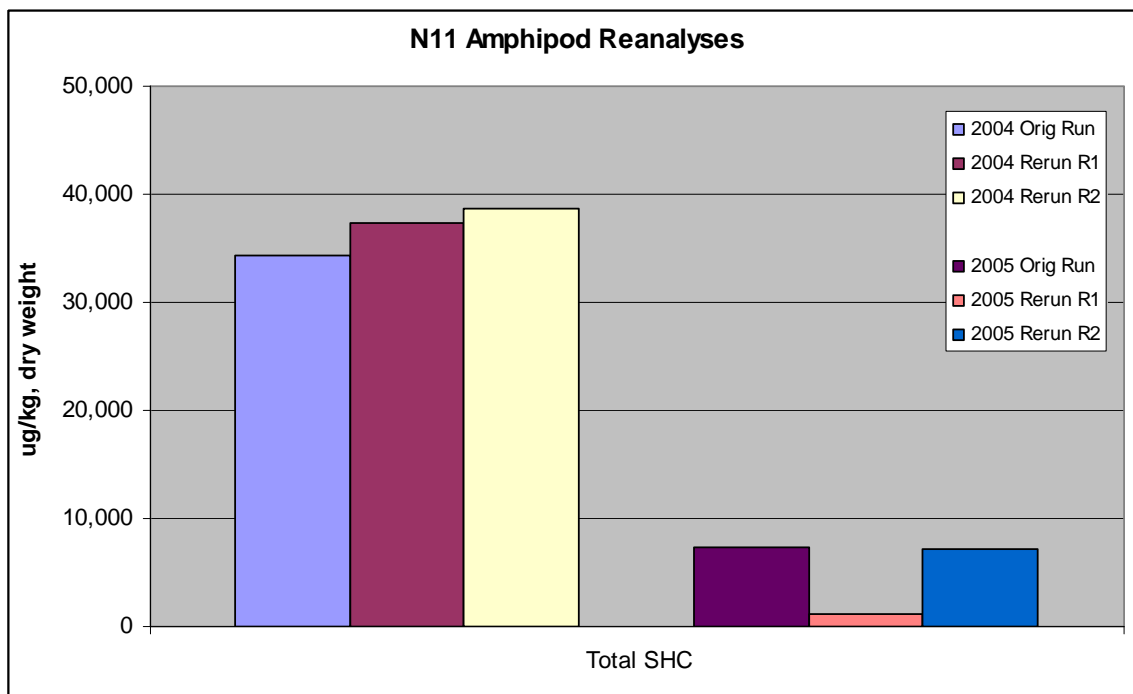
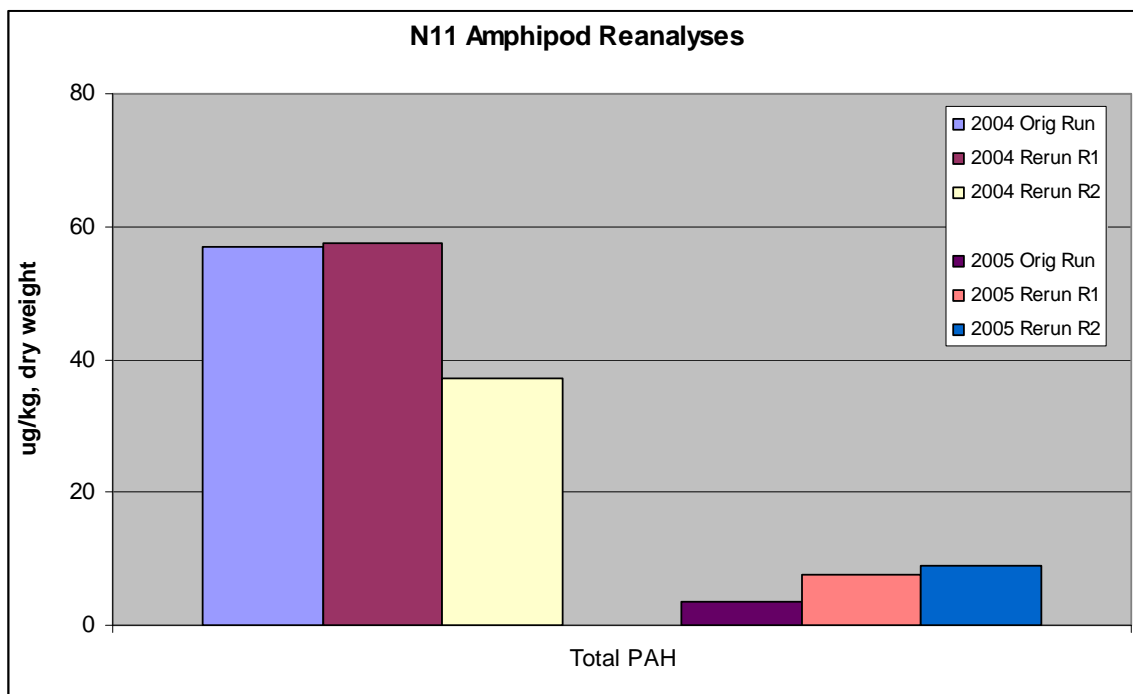


Figure C-1. Total PAH and Total SHC Concentrations in Amphipod Samples from N11 Originally Analyzed in 2004 and 2005 (Orig Run) and Re-Analyzed in 2006 (Rerun R1/R2)

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 parameters 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.

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APPENDIX D

Summary of Chemistry Data

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cANIMIDA Tissue Hydrocarbon Data

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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. |

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cANIMIDA Fish Tissue Hydrocarbon Data

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2004 Fish Tissue Hydrocarbon Data

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2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Field Sample Data

| 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

2004 Fish Tissue Organic Data - Quality Control Data

| 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 |

Surrogate Corrected

2004 Fish Tissue Organic Data - Quality Control Data

| | | | | | | | | |
|---------------------------------|----------------------|--------|------------|-----------|------------------|---------|------------|-----------|
| Laboratory Batch Number | 04-0446 | | | | 04-0447 | | | |
| | 041029-01: Clean Cod | | | | 041029-01: Clean | | | |
| Client ID | Fillet | | | | 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 | | | |

Surrogate Corrected

| Laboratory Batch Number | 05-0038 | | | | |
|---------------------------------|----------------------|--------|------------|-----------|--|
| Client ID | 041029-01: Clean Cod | | | | |
| Location | Fillet | | | | |
| 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 | | | | |

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 | 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 |
| Indeno(1,2,3-cd)pyrene | 12.21 | 3.77 - 4.41 | 100.0 | n |
| Dibenz(a,h)anthracene | | 9.30 - 15.10 | 1.0 | |
| Benzo(g,h,i)perylene | | | | ND |
| Total PAH (ug/kg dry) | 25.48 | 15.30 - 24.10 | 5.7 | |
| | 2407.77 | | | |
| Surrogate Recoveries (%) | | | | |
| Naphthalene-d8 | 48 | | | |
| Acenaphthene-d10 | 55 | | | |
| Phenanthrene-d10 | 61 | | | |
| Benzo(a)pyrene-d12 | 55 | | | |

Surrogate Corrected

2004 Fish Tissue Organic Data - Quality Control Data

| | | | | | | | | |
|---------------------------------|-------------------|---------|--------------|-----------|-------------------|---------|--------------|-----------|
| Laboratory Batch Number | 04-0446 | | | | 04-0447 | | | |
| | GG08: North Slope | | | | GG08: North Slope | | | |
| Client ID | Crude | | | | 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 | GG09: NorthSTAR |
| Location | Control Oil - cANIMIDA | Control Oil - cANIMIDA |
| 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 |

| | | | | |
|---------------------------------|----------------------|----------------------|-------|-----------|
| 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 | |

| | | | | |
|---------------------------------|---------------------|---------------------|------|-----------|
| 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 | | |

2005 Fish Tissue Hydrocarbon Data

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2005 Fish Tissue Organic Data - Quality Control Data

| | | | | |
|---------------------------------|--------------------|------------------|------------------|------------------|
| 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 |

2005 Fish Tissue Organic Data - Quality Control Data

| | | | | |
|---------------------------------|------------------|------------------|------------------|------------------|
| 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 |

2005 Fish Tissue Organic Data - Quality Control Data

| | | | | |
|---------------------------------|------------------|------------------|-------------------|-------------------|
| 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 |

2005 Fish Tissue Organic Data - Quality Control Data

| | | | | |
|---------------------------------|-------------------|-------------------|-------------------|-------------------|
| 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 |

2005 Fish Tissue Organic Data - Quality Control Data

| | | | | |
|---------------------------------|-------------------|-------------------|-------------------|-------------------|
| 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 |

2005 Fish Tissue Organic Data - Quality Control Data

| | |
|---------------------------------|------------------|
| Laboratory Batch Number | 05-0340 |
| Client ID | 05-PB-14-PHC-T-F |
| Location | Liberty |
| 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 | | |

2005 Fish Tissue Organic Data - Quality Control Data

| | | | | | | |
|---------------------------------|----------------|-------|------|------------------------|-----------------------|-----------|
| Laboratory Batch Number | 05-0339 | | | | | |
| Client ID | 050329-01: SRM | | | | | |
| Location/QC type | 2977 | | | | | |
| Battelle ID | BH124SRM-P | | | | | |
| Collection Date | 09/15/05 | | | | | |
| % Moisture | NA | | | | | |
| % Lipid | 49.39 | | | | | |
| Matrix | TISSUE | | | | | |
| Sample Size (g dry) | 2.03 | | | | | |
| Units | UG/KG_DRY | Value | +/- | Passing %Difference | Actual %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 | | | | | |

2005 Fish Tissue Organic Data - Quality Control Data

| | | | | | | |
|---------------------------------|----------------|-------|------|------------------------|-----------------------|-----------|
| 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 | | | | | |
| Units | UG/KG_DRY | Value | +/- | Passing %Difference | Actual %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 |
| 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 |
| C3-Dibenzothiophenes | 636.63 | 460.96 | 38.1 |
| 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 |
| C1-Chrysenes | 111.91 | 81.69 | 37.0 |
| C2-Chrysenes | 156.91 | 95.93 | 63.6 |
| 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 | | | |

2005 Fish Tissue Organic Data - Quality Control Data

| | | |
|---------------------------------|-----------------|-----------------|
| Laboratory Batch Number | 05-0339 | 05-0340 |
| | GG09: NorthSTAR | GG09: NorthSTAR |
| | Control Oil - | Control Oil - |
| | cANIMIDA | cANIMIDA |
| Client ID | | |
| 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

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2006 Fish Tissue Organics Data - Field Sample Data

| 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 |

2006 Fish Tissue Organics Data - Field Sample Data

| 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 |

2006 Fish Tissue Organics Data - Field Sample Data

| | | | | |
|---------------------------------|----------------|----------------|----------------|----------------|
| 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 |

2006 Fish Tissue Organics Data - Field Sample Data

| 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 |

2006 Fish Tissue Organics Data - Field Sample Data

| | | |
|---------------------------------|----------------|----------------|
| 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 |

2006 Fish Tissue Organics Data - Quality Control Data

| | | | | | |
|---------------------------------|------------------|--------------------|--------|------------|-----------|
| 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 | | | |

2006 Fish Tissue Organics Data - Quality Control Data

| | | | | | | |
|---------------------------------|----------------------|-------|------|------------------------|-----------------------|-----------|
| 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 | | | | | |
| Units | UG/KG_DRY | Value | +/- | Passing %Difference | Actual %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 | | | | | |

2006 Fish Tissue Organics Data - Quality Control Data

| | | | | | | |
|---------------------------------|-------------------------|---------|--------------|-----------|--|-------------------------------|
| Laboratory Batch Number | 06-0324 | | | | | 06-0324 |
| Client ID | GN62: North Slope Crude | | | | | GG09: NorthSTAR Control Oil - |
| Battelle ID | BJ451NSC-P | | | | | cANIMIDA |
| Collection Date | 10/03/06 | | | | | BJ467CO-P |
| % Moisture | NA | | | | | 10/03/06 |
| % Lipid | NA | | | | | NA |
| Matrix | OIL | | | | | NA |
| Sample Size (g dry) | 5.01 | | | | | OIL |
| Units | MG/KG_OIL | Target | % Difference | Qualifier | | 5.02 |
| PAHs: | | | | | | MG/KG_OIL |
| 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 |

2006 Fish Tissue Organics Data - Quality Control Data

| | | | | |
|---------------------------------|---------------------|---------------------|------|-----------|
| 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 | | |

2006 Fish Tissue Organics Data - Quality Control Data

| | | | | | |
|---------------------------------|------------------|------------------|------|-----------|--|
| 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 | | | |

cANIMIDA Indigenous Biota Tissue Hydrocarbon Data

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2004 Indigenous Biota Tissue Hydrocarbon Data

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2004 Clam Amphipod Tissue Organic Data - Field Sample Data

| | | | | |
|---------------------------------|----------------------|--------------------|---------------------|---------------------|
| 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

2004 Clam Amphipod Tissue Organic Data - Field Sample Data

| 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 | BSP | BSP | 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 tricyclitriterpane (T9) | ND | ND | ND | ND |
| C29 tricyclitriterpane (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

2004 Clam Amphipod Tissue Organic Data - Field Sample Data

| | | | | |
|---------------------------------|--------------------|--------------------|-------------------|--------------------|
| 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

2004 Clam Amphipod Tissue Organic Data - Field Sample Data

| 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 tricyclitriterpane (T9) | ND | ND | ND | ND |
| C29 tricyclitriterpane (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

2004 Clam Amphipod Tissue Organic Data - Field Sample Data

| | | | | |
|---------------------------------|----------------------|---------------------|-------------------|---------------------|
| 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

2004 Clam Amphipod Tissue Organic Data - Field Sample Data

| 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-Tetatriacontane | 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 tricyclitriterpane (T9) | ND | ND | ND | ND |
| C29 tricyclitriterpane (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

2004 Clam Amphipod Tissue Organic Data - Quality Control Data

| 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-Tetracontane | 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 tricyclitriterpane (T9) | ND | | | | |
| C29 tricyclitriterpane (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 | | | | |

| | | | | | |
|--|---------------------|-----------------|--------------|-----------|--|
| 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-Tetrtriacontane | 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 tricyclitriterpane (T9) | | | | | |
| C29 tricyclitriterpane (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 | | |

| 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-Tettratriacontane | 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 tricyclitriterpane (T9) | ND | ND | NA | |
| C29 tricyclitriterpane (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 | | | | |

| | | | | |
|--|-------------------------|-----------|--------------|-----------|
| 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-Tetrtriacontane | 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 tricyclitriterpane (T9) | 15.79 | | | |
| C29 tricyclitriterpane (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 (%) | | | | |
| 5b(H)-Cholane | 132 N | | | |

| | |
|---------------------------------|------------------------------|
| Laboratory Batch Number | 04-0469 |
| Client ID | GG09: NorthSTAR Control Oil- |
| Battelle ID | cANIMIDA |
| Collection Date | BF710CO-P |
| % Moisture | 01/12/05 |
| % Lipid | NA |
| Matrix | NA |
| Sample Size | TISSUE |
| Size Unit-Basis | 5.00 |
| Units | G_OIL |
| | 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 |

| | |
|--|------------------------------|
| Laboratory Batch Number | 04-0469 |
| Client ID | GG09: NorthSTAR Control Oil- |
| Battelle ID | cANIMIDA |
| Collection Date | BF710CO-P |
| % Moisture | 01/12/05 |
| % Lipid | NA |
| Matrix | NA |
| Sample Size | TISSUE |
| Size Unit-Basis | 5.00 |
| Units | G_OIL |
| | 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-Tettratriacontane | 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 tricyclitriterpane (T9) | 17.16 |
| C29 tricyclitriterpane (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 (%) | |
| 5b(H)-Cholane | 128 N |

2005 Indigenous Biota Tissue Hydrocarbon Data

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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-Tettraiacontane | 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 Tricyclitrierpane (T9) | ND | NDT | ND | ND |
| C29 Tricyclitriterpane (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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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) | 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND |
| C29 Tricyclitriterpane (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-Tetracontane | 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 Tricyclitrierpane (T9) | ND | ND |
| C29 Tricyclitriterpane (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

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

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

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

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-Tetracontane | 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 Tricyclitrierpane (T9) | ND |
| C29 Tricyclitriterpane (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

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

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

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

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-Tetracontane | 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 Tricyclitrierpane (T9) | ND |
| C29 Tricyclitriterpane (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)
BH107NSC (S/T)
Collection Date 9/12/2005
% Moisture NA
% Lipid NA
Matrix OIL
Sample Size (g dry) 5.014
Units UG/KG_OIL

| | 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

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)
BH107NSC (S/T)
Battelle ID 9/12/2005
Collection Date NA
% 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-Tetracontane | 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 Tricyclitrierpane (T9) | 13.94 | | | |
| C29 Tricyclitriterpane (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

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

Laboratory Batch Number

05-0330

Client ID

GJ53: North Slope Crude

Location

| | | | | | |
|---------------------------------|----------------|----------------|--------------|-----------|--|
| Battelle ID | BH169NSC (PAH) | BH171NSC | | | |
| Collection Date | (SHC) | BH173NSC (S/T) | | | |
| % Moisture | | 09/28/05 | | | |
| % Lipid | | NA | | | |
| Matrix | | NA | | | |
| Sample Size (g dry) | | OIL | | | |
| Units | | 5.01 | | | |
| | 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

2005 Clam, Amphipod
Isopod Organic Data - Field Sample Data

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-Tetraatriacontane | 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 Tricyclitrierpane (T9) | 21.64 | | |
| C29 Tricyclitriterpane (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 | | GG09: NorthSTAR | |
| Location | Oil - cANIMIDA | | Control Oil - cANIMIDA | |
| Battelle ID | BH113CO (PAH) | BH111CO | BH170CO (PAH) | |
| Collection Date | (SHC) | BH112CO (S/T) | BH172CO (SHC) | |
| % Moisture | | 9/12/2005 | BH174CO (S/T) | |
| % Lipid | | NA | 09/28/05 | |
| Matrix | | NA | | |
| Sample Size (g dry) | | NA | | |
| Units | | OIL | | |
| | | 5 | | 5.00 |
| | | 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 | | GG09: NorthSTAR | |
| Location | Oil - cANIMIDA | | Control Oil - cANIMIDA | |
| Battelle ID | BH113CO (PAH) | BH111CO | BH170CO (PAH) | |
| Collection Date | (SHC) | BH112CO (S/T) | BH172CO (SHC) | |
| % Moisture | | 9/12/2005 | BH174CO (S/T) | |
| % Lipid | | NA | 09/28/05 | |
| Matrix | | NA | NA | |
| Sample Size (g dry) | | NA | NA | |
| Units | | OIL | OIL | |
| | | 5 | 5.00 | |
| | | 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-Tettratriacontane | | 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 Tricyclitrierpane (T9) | | 13.38 | | 19.71 |
| C29 Tricyclitriterpane (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-Tettratriacontane | 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 Tricyclitrierpane (T9) | | ND | | ND | NA |
| C29 Tricyclitriterpane (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

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 | |
| 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-Tettraiacontane | 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 Tricyclitrierpane (T9) | NDT | NDT | NA | | |
| C29 Tricyclitriterpane (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-Tettriacontane | 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 Tricyclitrierpane (T9) | ND | ND | NA | |
| C29 Tricyclitriterpane (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-Tettratriacontane
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 Tricyclitrierpane (T9)
C29 Tricyclitriterpane (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-Tetracontane
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 Tricyclitrierpane (T9)
C29 Tricyclitriterpane (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

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2006 Mysid and Isopod Organic Data - Field Sample Data

| | | | |
|---------------------------------|-------------------|---------------------|----------------------|
| 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 |

2006 Mysid and Isopod Organic Data - Field Sample Data

| 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 |

2006 Mysid and Isopod Organic Data - Field Sample Data

| | | | |
|---------------------------------|-------------------|------------------|--------------------|
| 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND |
| 18a(H)-22,29,30-Trisnorheohopane -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 |

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-Tetracontane | 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 Tricyclitrierpane (T9) | ND |
| C29 Tricyclitriterpane (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-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-Tetracontane | | 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 Tricyclitrierpane (T9) | ND |
| C29 Tricyclitriterpane (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-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-Tetracontane
 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 Tricyclitriterpane (T9) | 5.58 | |
| C29 Tricyclitriterpane (T10) | 3.75 | |
| 18a(H)-22,29,30-Trisnorhopane -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 | |

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

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 | 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-Tetracontane
 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 Tricyclitrierpane (T9) | 4.99 | |
| C29 Tricyclitrierpane (T10) | 5.23 | |
| 18a(H)-22,29,30-Trisnorhopane -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 |
|---------------|----|

| | | |
|---------------------------------|---|--|
| 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 | MG/KG OIL |
| PAH: | Target % Difference Qualifier | |
| 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 | MG/KG OIL |
| SHC: | | |
| n-Nonane | 5847.32 | 4670.06 |
| n-Decane | 5179.6 | 4951.66 |
| n-Undecane | 5081.14 | 4506.16 |
| n-Dodecane | 3841.42 | 4576.43 |
| n-Tridecane | 6658.46 | 4189.33 |
| Isoprenoid RRT 1380 | 925.59 | 961.81 |
| n-Tetradecane | 4548.07 | 3919.50 |
| Isoprenoid RRT 1470 | 1873.43 | 1532.69 |
| n-Pentadecane | 4158.75 | 3990.56 |
| n-Hexadecane | 3849.76 | 3640.11 |
| Norpristane (1650) | 1091.71 | 1141.72 |
| n-Heptadecane | 3390.62 | 3078.38 |
| Pristane | 2419.61 | 2280.61 |
| n-Octadecane | 2851.76 | 2796.74 |
| Phytane | 1516.74 | 1659.88 |
| n-Nonadecane | 2536.89 | 2540.37 |
| n-Eicosane | 2745.65 | 2502.77 |
| n-Heneicosane | 2550.79 | 2419.45 |
| n-Docosane | 2436.82 | 2251.79 |
| n-Tricosane | 2110.77 | 2050.41 |
| n-Tetracosane | 2040.91 | 1948.20 |
| n-Pentacosane | 1735.29 | 1795.70 |
| n-Hexacosane | 1604.8 | 1639.60 |
| n-Heptacosane | 1296.07 | 1230.99 |
| n-Octacosane | 1004.78 | 1004.15 |
| n-Nonacosane | 813.1 | 872.21 |
| n-Triacontane | 700.83 | 669.33 |
| n-Hentriacontane | 634.08 | 606.82 |
| n-Dotriacontane | 457.07 | 465.97 |
| n-Tritriacontane | 354.53 | 399.05 |
| n-Tetracontane | 324.82 | 371.75 |
| n-Pentatriacontane | 328.76 | 378.11 |
| n-Hexatriacontane | 217.92 | 235.65 |
| n-Heptatriacontane | 189.12 | 210.06 |
| n-Octatriacontane | 171.95 | 205.75 |
| n-Nonatriacontane | 168.17 | 153.92 |
| n-Tetracontane | 146 | 161.64 |
| Total SHC | 591103.08 | 578973.63 |
| Surrogate Recoveries (%) | | |
| 5a-androstane | 97 | 97 |
| n-Tetracosane-d50 | 98 | 95 |
| S/T: | | |
| C23 diterpane (T4) | 59.83 | 47.76 |
| C29 Tricyclitrierpane (T9) | 17.34 | 14.70 |
| C29 Tricyclitrierpane (T10) | 18.09 | 14.64 |
| 18a(H)-22,29,30-Trisnorhopane -TS (T11) | 19.79 | 15.96 |
| 17a(H)-22,29,30-Trisnorhopane -TM (T12) | 28.32 | 24.82 |
| 17a(H),21b(H)-30-Norhopane (T15) | 88.44 | 69.58 |
| 18a(H)-Oleanane (T18) | ND | |
| 17a(H),21b(H)-hopane (T19) | 141.45 | 120.14 |
| 22S-17a(H),21b(H)-30-homohopane (T21) | 65.82 | 59.93 |
| 22R-17a(H),21b(H)-30-homohopane (T22) | 43.58 | 39.69 |
| 13b,17a-Diacholestane-20S (S4) | 44.67 | 44.18 |
| 13b,17a-Diacholestane-20R (S5) | 28.94 | 25.52 |
| 5a,14a,17a-methylcholestane-20R (S24) | 32.28 | 33.94 |
| 5a,14a,17a-Ethylcholestane-20S (S25) | 41.32 | 35.93 |
| 5a,14a,17a-Ethylcholestane-20R (S28) | 41.26 | 39.17 |
| 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 | | |

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-Tetatriacontane | 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 Tricyclitrierpane (T9) | | 14.70 | 15.0 |
| C29 Tricyclitriterpane (T10) | | 14.64 | 7.2 |
| 18a(H)-22,29,30-Trisnorhopane -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

2006 Clam and Amphipod Organic Data - Quality Control Data

| | | |
|---------------------------------|---|--|
| 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 |

2006 Clam and Amphipod Organic Data - Quality Control Data

| | | |
|---|---|--|
| 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-Tetracontane | 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 Tricyclitrierpane (T9) | 21.15 | 20.18 |
| C29 Tricyclitriterpane (T10) | 20.74 | 18.12 |
| 18a(H)-22,29,30-Trisnorhopane -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

2006 Clam and Amphipod Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|-----------------|-----------------|-------|-----------|--|
| 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-Tetrtriacontane | 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 Tricyclitrierpane (T9) | ND | ND | NA | | |
| C29 Tricyclitrierpane (T10) | ND | ND | NA | | |
| 18a(H)-22,29,30-Trisnorhopane -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 | | | |

| | | | | |
|---------------------------------|------------------------|------------------------|-------|-----------|
| 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-Tetracontane | 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 Tricyclitrierpane (T9) | NDT | NDT | NA | |
| C29 Tricyclitrierpane (T10) | NDT | NDT | NA | |
| 18a(H)-22,29,30-Trisnorhopane -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 | | |

| | | | | |
|---------------------------------|--------------------|--------------------|-------|-----------|
| 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 | |

| | | | | |
|---|--------------------|--------------------|------|-----------|
| 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-Tetatriacontane | 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 Tricyclitrierpane (T9) | NDT | NDT | NA | |
| C29 Tricyclitriterpane (T10) | NDT | NDT | NA | |
| 18a(H)-22,29,30-Trisnorhopane -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 | | |

2006 Clam and Amphipod Organic Data

| 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 |

2006 Clam and Amphipod Organic Data

| 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-Tettraiacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND | ND | ND |
| 18a(H)-22,29,30-Trisnorheohopane -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

2006 Clam and Amphipod Organic Data

| 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 |

2006 Clam and Amphipod Organic Data

| Laboratory Batch ID | 06-0326 | 06-0326 | 06-0326 | 06-0326 |
|---|------------------|------------------|-------------------|---------------------|
| | 06-L08-01-PHC-AS | 06-L03-01-PHC-AS | 06-WD01-02-PHC-AN | 06-N11N08-01-PHC-AM |
| Client ID | Liberty | Liberty | Other | Northstar |
| Location | R2176-P | R2177-P | R2395-P | R2398-P |
| Battelle ID | 07/29/06 | 07/29/06 | 08/08/06 | 08/10/06 |
| Collection Date | 87.31 | 86.65 | 76.87 | 77.57 |
| % Moisture | 1.24 | 1.31 | 2.05 | 2.05 |
| % Lipid | Clam | Clam | Amphipods | Amphipod |
| Matrix | 2.57 | 2.67 | 4.75 | 1.28 |
| Sample Size (g dry) | UG/KG_DRY | UG/KG_DRY | UG/KG_DRY | UG/KG_DRY |
| Units | | | | |
| 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-Tettraiacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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) | 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

2006 Clam and Amphipod Organic Data

| 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 |

2006 Clam and Amphipod Organic Data

| 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-Tetraatriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND | ND | ND |
| 18a(H)-22,29,30-Trisnorheohopane -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

2006 Clam and Amphipod Organic Data

| 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 |

2006 Clam and Amphipod Organic Data

| 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-Tettracontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND | ND | ND |
| 18a(H)-22,29,30-Trisnorhopane -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

2006 Clam and Amphipod Organic Data

| 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 |

2006 Clam and Amphipod Organic Data

| 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-Tetraatriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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) | 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

2006 Clam and Amphipod Organic Data

| Laboratory Batch ID | 06-0327 | 06-0327 | 06-0327 | 06-0327 |
|---------------------------------|------------------|------------------|------------------|------------------|
| | | 06-N2706-01-PHC- | | |
| Client ID | 06-N03-01-PHC-AN | 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 |

2006 Clam and Amphipod Organic Data

| Laboratory Batch ID | 06-0327 | 06-0327 | 06-0327 | 06-0327 |
|---|------------------|--------------------|------------------|------------------|
| | 06-N03-01-PHC-AN | 06-N2706-01-PHC-AN | 06-N28-01-PHC-AN | 06-N26-01-PHC-AN |
| 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-Tetraatriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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) | 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

2006 Clam and Amphipod Organic Data

| Laboratory Batch ID | 06-0327 | 06-0327 | 06-0327 |
|---------------------------------|------------------|--------------------|--------------------|
| | | 04-N11-01-PHC/MET- | |
| Client ID | 06-N26-02-PHC-AN | 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 |

2006 Clam and Amphipod Organic Data

| Laboratory Batch ID | 06-0327 | 06-0327 | 06-0327 |
|---|------------------|--------------------|--------------------|
| | | 04-N11-01-PHC/MET- | |
| Client ID | 06-N26-02-PHC-AN | 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | NDT | NDT |
| C29 Tricyclitriterpane (T10) | ND | NDT | NDT |
| 18a(H)-22,29,30-Trisnorhopane -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 |

| 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 | |
| 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 | | | |

N

| | | | | | | |
|---------------------------------|----------------------|-----------|------|-------------|-------------|-----------|
| 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 | | | | | |

2006 Isopod and Mysid Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|-------------------|---------|--------------|-----------|-------------------------|
| 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 |

2006 Isopod and Mysid Organic Data - Quality Control Data

| 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 | | |

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cANIMIDA Deployed Mussel Tissue Hydrocarbon Data

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2004 Deployed Mussel Tissue Hydrocarbon Data

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2004 Mussel Tissue Organic Data - Quality Control Data

| Laboratory Batch Number | 04-0445 | 04-0445 | 04-0445 | 04-0445 |
|---------------------------------|---------------------|---------------------|---------------------|----------------------|
| | 04-MZ-01-PHC/MET-T- | 04-MZ-03-PHC/MET-T- | 04-MZ-02-PHC/MET-T- | 04-L06-01-PHC/MET-T- |
| Client ID | MU | MU | MU | 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

2004 Mussel Tissue Organic Data - Quality Control Data

| | 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 | Reference Mussels | Reference Mussels | Reference Mussels | Liberty |
| Location | S3873-P | S3874-P | S3887-P | S4330-P |
| Battelle ID | 07/30/04 | 07/30/04 | 07/29/04 | 08/13/04 |
| Collection Date | 85.84 | 89.42 | 86.64 | 88.58 |
| % Moisture | 3.05 | 2.3 | 2.55 | 2.65 |
| % Lipid | MUSSELS | MUSSELS | MUSSELS | MUSSELS |
| Matrix | 2.18 | 1.60 | 2.47 | 2.29 |
| Sample Size (g dry) | UG/KG_DRY | UG/KG_DRY | UG/KG_DRY | UG/KG_DRY |
| Units | | | | |
| 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-Tettratriacontane | 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 tricyclitriterpane (T9) | ND | ND | ND | ND |
| C29 tricyclitriterpane (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 |

2004 Mussel Tissue Organic Data - Quality Control Data

| Laboratory Batch Number | 04-0445 | 04-0445 | 04-0445 | 04-0445 |
|---------------------------------|---------------------|---------------------|----------------------|----------------------|
| | 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 |
| 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

2004 Mussel Tissue Organic Data - Quality Control Data

| | 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-Tettratriacontane | 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 tricyclitriterpane (T9) | ND | ND | ND | ND |
| C29 tricyclitriterpane (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 |

| | |
|---------------------------------|----------------------|
| Laboratory Batch Number | 04-0445 |
| Client ID | 04-N25-01-PHC/MET-T- |
| Location | MU |
| Battelle ID | Northstar |
| Collection Date | S4347-P |
| % Moisture | 08/15/04 |
| % Lipid | 89.61 |
| Matrix | 2.57 |
| Sample Size (g dry) | MUSSELS |
| Units | 1.17 |
| | 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 |

| | |
|--|----------------------|
| | 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-Tettratriacontane | 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 tricyclitriterpane (T9) | ND |
| C29 tricyclitriterpane (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 |

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 |

| | |
|---------------------|------------------|
| 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-Tetatriacontane | 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 tricyclitriterpane (T9) | ND |
| C29 tricyclitriterpane (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 |
|---------------|----|

2004 Mussel Tissue Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|-----------------------------|--------|------------|-----------|--|
| 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 | | | | |

Surrogate Corrected

| 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-Tetatriacontane | 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 tricyclitriterpane (T9) | NA | | | | |
| C29 tricyclitriterpane (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 | | | | | |

2004 Mussel Tissue Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|---------------------|-----------------|--------------|-----------|--|
| 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 | | | | |

Surrogate Corrected

| | | | | |
|---------------------|---------------------|-----------------|--------------|-----------|
| 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-Tetatriacontane | 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 tricyclitriterpane (T9) | NA |
| C29 tricyclitriterpane (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 | |
|---------------|--|

2004 Mussel Tissue Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|-----------------------|-----------------------|------|-----------|--|
| 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 | | | |

2004 Mussel Tissue Organic Data - Quality Control Data

| | | | | |
|--|-----------------------|-----------------------|-------|-----------|
| 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-Tettratriacontane | 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 tricyclitriterpane (T9) | ND | ND | NA | |
| C29 tricyclitriterpane (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

2004 Mussel Tissue Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|-----------------------------|-------------------------|---------|--------------|-----------|
| Laboratory Batch Number | 04-0445 | 04-0445 | | | |
| Client ID | GG09: NorthSTAR Control Oil | GG08: North Slope Crude | | | |
| Battelle ID | - cANIMIDA | | | | |
| Location | BF668CO-P | BF667NSC-P | | | |
| 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

2004 Mussel Tissue Organic Data - Quality Control Data

| | | | | | |
|--|-----------------------------|-------------------------|-----------|--------------|-----------|
| Client ID | GG09: NorthSTAR Control Oil | GG08: North Slope Crude | | | |
| Battelle ID | - cANIMIDA | BF667NSC-P | | | |
| Location | BF668CO-P | | | | |
| 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-Tettracontane | 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 tricyclitriterpane (T9) | 31.15 | 46.06 | | | |
| C29 tricyclitriterpane (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

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2005 Deployed Mussel Organics Data - Quality Control Data

| 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

2005 Deployed Mussel Organics Data - Quality Control Data

| 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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) | 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

2005 Deployed Mussel Organics Data - Quality Control Data

| 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

2005 Deployed Mussel Organics Data - Quality Control Data

| 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-Tettraiacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (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) | 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

2005 Deployed Mussel Organics Data - Quality Control Data

| | |
|---------------------------------|-------------------|
| 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

2005 Deployed Mussel Organics Data - Quality Control Data

| | |
|---|-------------------|
| 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND |
| C29 Tricyclitrierpane (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-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

2005 Deployed Mussel Organics Data - Quality Control Data

| | | | | | |
|---------------------------------|------------------|--------------------|--------|------------|-----------|
| 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

2005 Deployed Mussel Organics Data - Quality Control Data

| | | | | | | |
|---|------------------|--------------------|---------|------------|-----------|--|
| 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | | | | |
| C29 Tricyclitrierpane (T10) | ND | ND | | | | |
| 18a(H)-22,29,30-Trisnorhopane -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

2005 Deployed Mussel Organics Data - Quality Control 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 | | | | | | |
| 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 Deployed Mussel Organics Data - Quality Control 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-Tetatriacontane
 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 Tricyclitrierpane (T9) | 4.4 J |
| C29 Tricyclitrierpane (T10) | 5.62 |
| 18a(H)-22,29,30-Trisnorhopane -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

2005 Deployed Mussel Organics Data - Quality Control Data

| | | | | | | |
|---------------------------------|-------------------|---------|--------------|-----------|--|-----------------|
| Laboratory Batch Number | 05-0329 | | | | | 05-0329 |
| | GJ53: North Slope | | | | | GG09: NorthSTAR |
| Client ID | Crude | | | | | Control Oil - |
| Location | | | | | | cANIMIDA |
| | BH108NSC (PAH) | | | | | BH113CO (PAH) |
| Battelle ID | BH106NSC (SHC) | | | | | BH111CO (SHC) |
| Collection Date | BH107NSC (S/T) | | | | | BH112CO (S/T) |
| % Moisture | 9/12/2005 | | | | | 9/12/2005 |
| % Lipid | NA | | | | | NA |
| Matrix | NA | | | | | NA |
| Sample Size (g dry) | OIL | | | | | OIL |
| Units | 5.014 | | | | | 5 |
| | 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

2005 Deployed Mussel Organics Data - Quality Control Data

| | | | | | | |
|---|-------------------|-----------|--------------|-----------|--|-----------------|
| Laboratory Batch Number | 05-0329 | | | | | 05-0329 |
| | GJ53: North Slope | | | | | GG09: NorthSTAR |
| Client ID | Crude | | | | | Control Oil - |
| Location | | | | | | cANIMIDA |
| | BH108NSC (PAH) | | | | | BH113CO (PAH) |
| Battelle ID | BH106NSC (SHC) | | | | | BH111CO (SHC) |
| Collection Date | BH107NSC (S/T) | | | | | BH112CO (S/T) |
| % Moisture | 9/12/2005 | | | | | 9/12/2005 |
| % Lipid | NA | | | | | NA |
| Matrix | NA | | | | | NA |
| Sample Size (g dry) | OIL | | | | | OIL |
| Units | 5.014 | | | | | 5 |
| | 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-Tetatriacontane | 285.19 | 342.44 | 16.7 | | | 352.53 |
| n-Pentatriacontane | 332.68 | 344.76 | 3.5 | | | 321.25 |
| n-Hexatriacontane | 225.45 | 217.69 | 3.6 | | | 188.2 |
| n-Heptatriacontane | 160.34 | 187.40 | 14.4 | | | 157.51 |
| n-Octatriacontane | 173.73 | 196.72 | 11.7 | | | 156.49 |
| n-Nonatriacontane | 143.55 | 135.00 | 6.3 | | | 107.31 |
| n-Tetracontane | 132.19 | 152.10 | 13.1 | | | 69.49 |
| 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 Tricyclitrierpane (T9) | 13.94 | | | | | 13.38 |
| C29 Tricyclitriterpane (T10) | 12.3 | | | | | 14.58 |
| 18a(H)-22,29,30-Trisnorhopane -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 |

Surrogate Corrected

2005 Deployed Mussel Organics Data - Quality Control Data

| | | | | | |
|---------------------------------|-----------------|-----------------|------|-----------|--|
| 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

2005 Deployed Mussel Organics Data - Quality Control Data

| | | | | |
|--|-----------------|-----------------|-------|-----------|
| 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-Tettratriacontane | 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 Tricyclitriterpane (T9) | ND | ND | NA | |
| C29 Tricyclitriterpane (T10) | ND | ND | NA | |
| 18a(H)-22,29,30-Trisnorheohopane -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

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2006 Deployed Mussel Organic Data - Field Sample Data

| 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 |
| Location | Port Chatham/Time | Port Chatham/Time | Port Chatham/Time |
| Battelle ID | Zero | Zero | Zero |
| Collection Date | R2641-P | R2386-P | R2387-P |
| % Moisture | 07/24/06 | 07/26/06 | 07/26/06 |
| % Lipid | 89.57 | 89.05 | 89.05 |
| Matrix | 0.94 | 1.92 | 1.79 |
| Sample Size (g dry) | TISSUE | TISSUE | TISSUE |
| Units | 2.10 | 0.99 | 0.85 |
| | 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 |

2006 Deployed Mussel Organic Data - Field Sample Data

| 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-Tettriacontane | 965.14 | 850.92 | 1127.3 |
| n-Pentatriacontane | 743.4 | 621.31 | 852.3 |
| n-Hextatriacontane | 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 Tricyclitriterpane (T9) | ND | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND | ND |
| 18a(H)-22,29,30-Trisnorheohopane -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

2006 Deployed Mussel Organic Data - Field Sample Data

| 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 |

2006 Deployed Mussel Organic Data - Field Sample Data

| 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND | ND | ND |
| 18a(H)-22,29,30-Trisnorheohopane -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

2006 Deployed Mussel Organic Data - Field Sample Data

| 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 |

2006 Deployed Mussel Organic Data - Field Sample Data

| 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-Tettratriacontane | 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 Tricyclitrierpane (T9) | ND | ND | ND | ND |
| C29 Tricyclitriterpane (T10) | ND | ND | ND | ND |
| 18a(H)-22,29,30-Trisnorheohopane -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 | | | |

2006 Deployed Mussel Organic Data - Quality Control Data

| | | | | | |
|--|------------------|--------------------|---------|------------|-----------|
| 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-Tetracontane | 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 Tricyclitrierpane (T9) | ND | ND | | | |
| C29 Tricyclitriterpane (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 | | | |

Surrogate Corrected

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

Units UG/KG DRY

Certified
Value

+/-

Passing
%DifferenceActual
%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

Units UG/KG DRY

Certified
Value

+/-

Passing
%DifferenceActual
%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-Tettratriacontane

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 Tricyclitrierpane (T9) 5.58

C29 Tricyclitriterpane (T10) 3.75

18a(H)-22,29,30-Trisnorhopane -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

| | | | | | | | |
|---------------------------------|---|---------|--------------|-----------|--|--|---|
| Laboratory Batch ID | 06-0326 | | | | | | |
| Client ID | GN62: North Slope Crude BJ460NSC (PAH), BJ780NSC (SHC), BJ778NSC(S/T) | | | | | GG09: NorthSTAR Control Oil - cANIMIDA | |
| Battelle ID | | | | | | 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 |

| | | | | | | | |
|---|---|-----------|--------------|-----------|--|--|----|
| Laboratory Batch ID | 06-0326 | | | | | | |
| Client ID | GN62: North Slope Crude BJ460NSC (PAH), BJ780NSC (SHC), BJ778NSC(S/T) | | | | | GG09: NorthSTAR Control Oil - cANIMIDA | |
| Battelle ID | | | | | | 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 | 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-Tetracontane | 324.82 | 371.75 | 12.6 | | | 415.14 | |
| n-Pentatriacontane | 328.76 | 378.11 | 13.1 | | | 361.49 | |
| n-Hexatriacontane | 217.92 | 235.65 | 7.5 | | | 222.51 | J |
| n-Heptatriacontane | 189.12 | 210.06 | 10.0 | | | 213.16 | J |
| n-Octatriacontane | 171.95 | 205.75 | 16.4 | | | 127.87 | J |
| n-Nonatriacontane | 168.17 | 153.92 | 9.3 | | | 110.49 | J |
| n-Tetracontane | 146 | 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 Tricyclitrierpane (T9) | 17.34 | 14.70 | 18.0 | | | 21.15 | |
| C29 Tricyclitriterpane (T10) | 18.09 | 14.64 | 23.6 | | | 20.74 | |
| 18a(H)-22,29,30-Trisnorhopane -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 | | | | | | |

2006 Deployed Mussel Organic Data - Quality Control Data

| | | | | |
|---------------------------------|-----------------|-----------------|-------|-----------|
| 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 | | |

2006 Deployed Mussel Organic Data - Quality Control Data

| | | | | |
|--|-----------------|-----------------|-------|-----------|
| 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-Tetraatriacontane | 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 Tricyclitrierpane (T9) | ND | ND | NA | |
| C29 Tricyclitriterpane (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

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2004 Deployed SPMD Hydrocarbon Data

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2004 SPMD Organic Data - Quality Control Data

| Laboratory Batch Number | 04-0053 | 04-0053 | 04-0053 | 04-0053 |
|---------------------------------|----------------------|----------------|-------------------|----------------|
| | 04-SPQC-01-PHC-SPMD- | 04-L06-01-PHC- | 04-5H-01-PHC-SPMD | 04-N04-01-PHC- |
| Client ID | TB | SPMD | SPMD | SPMD |
| Location | Trip Blak | 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

2004 SPMD Organic Data - Quality Control Data

| Laboratory Batch Number | 04-0053 | 04-0053 | 04-0053 | 04-0053 |
|---------------------------------|----------------|----------------|----------------|-------------------|
| | 04-N05-01-PHC- | 04-N06-01-PHC- | 04-N06-02-PHC- | 04-3A-01-PHC-SPMD |
| Client ID | SPMD | SPMD | SPMD | BSMP |
| 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 |

2004 SPMD Organic Data - Quality Control Data

| 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 | | | |
| Location | Sample Duplicate | | | |
| 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 |
| 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 | | | |

2004 SPMD Organic Data - Quality Control Data

| | | | | | |
|---------------------------------|-------------------|---------------------|-----------|---|-----------------|
| Laboratory Batch Number | 04-0053 | | | | 04-0053 |
| | GF66: North Slope | | | | GG09: NorthSTAR |
| Client ID | Crude | | | | Control Oil - |
| Location | | | | | cANIMIDA |
| 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 |
| Perylene | 0.66 | J | | | ND |
| Indeno(1,2,3-cd)pyrene | ND | | | | ND |
| Dibenz(a,h)anthracene | 1.11 | J | | | 0.71 |
| 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

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2004 Tissue Metals Data

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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 | " |

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 |
| SRM #1643d | - | - | - | (µg/L) | (µg/L) | - | - | - | - | - | - | - | - | - | (µg/L) | - | (µg/L) | (µg/L) | - |
| This Study | - | - | - | 508 | 12.38 | - | - | - | - | - | - | - | - | - | 54.9 | - | 7.46 | 34.9 | - |
| | - | - | - | 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 |

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 (Dolly Varden) | 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 |
| | 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 Cisco | 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 |
| | 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 Cod | 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 |
| | 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 Flounder | 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 |
| | 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 Whitefish | 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 |
| | 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 Sculpin | 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 |
| | 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 Cisco | 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 |
| | 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 |

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2005 Tissue Metals Data

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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 | " | |

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 | " |

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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 | " |

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 |
| SRM #1643d | - | - | - | (µg/L) | (µg/L) | - | - | - | - | - | - | - | - | - | (µg/L) | - | (µg/L) | (µg/L) | - |
| This Study | - | - | - | 502 | 12.63 | - | - | - | - | - | - | - | - | - | 54.0 | - | 7.36 | 34.8 | - |
| | - | - | - | 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 |

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

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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 |

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2006 Tissue Metals Data

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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 | " | |

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 |

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 | " |

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 | - ± 0.15 | 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 |
| SRM #1643d This Study | - - | - - | - - | (µg/L) 506.4 512.3 | (µg/L) 12.30 - | - - | - - | - - | - - | - - | - - | - - | - - | - - | (µg/L) 54.9 - | - - | (µg/L) 7.32 - | (µg/L) 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 |

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

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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 |

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

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2004 Tissue CYP1A Data

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| 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 | Occ | Int | Occ X Int | | |
| hepatocytes | 0 | 0 | 0 | 2 | 0.5 | 1 | 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 | 0 | 0 | 0 | | |
| bile duct | 0 | 0 | 0 | 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 | 0 | 0 | 0 | | |
| gill epithelium | 0 | 0 | 0 | 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 | 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 | 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 | 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 | | | | | | | | | | | | | | | | | | | | |

cAnimida CYP1A staining

| 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 |
| kidney tubules | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | lots of trichodinia | | | numerous cysts | | |
| 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 |
| 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 | | | | | | | | | | | | |

cAnimida CYP1A staining

| 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 |
| Notes | | | | | | | | | | | | | pharynx-no other dig tract present | | |

cAnimida CYP1A staining

| 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 | | | | | | | | | | | | | | | |

cAnimida CYP1A staining

| 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 |
| 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 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

cAnimida CYP1A staining

| 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 | | | | | | | | | | | | | | | | |

cAnimida CYP1A staining

| 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? | | | 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? | | | many cysts-myxosporids? | | | not in section | | | not in section | | | 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 | | | | | | | | | | | | | | | |

cAnimida CYP1A staining

| 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 vas 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 | 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 so

| 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

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| | | | 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 vasc 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 | | bile duct | | kidney | | kidney vasc endo | |
|-------------------|--------------|--------------------------|-------------------|-------------|-----------------|-------------|----------------|-------------|------------------|----------|
| | | | liver hepatocytes | | liver vasc endo | | kidney tubules | | | |
| 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 |

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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 | 0.25 | 0.05 |
| | | J | J | 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 |

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| | | | | |
|--|-----------------|-----------------|-----------------|-----------------|
| 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 | 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 |

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| | | | | |
|--|-----------------|-----------------|-----------------|---------------------|
| 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 | 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 |

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| 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 |

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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 |

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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 |

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| | | | |
|--|-----------------|---------------------|-------|
| 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 |

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| | | | |
|--|-----------------|---------------------|-------|
| 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 |

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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 | | | | | | |

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| | | | | | |
|--|----------------|---|----------------|---|----------------|
| 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 |
| Benzo(a)pyrene | 0.00 | J | 0.00 | J | 0.01 |
| Total Protein Content (ug/ml) | | | | | |
| | 1 | | N.D. | | N.D. |
| Protein Normalized Metabolite Concentration (ng/ug protein) | | | | | |
| Naphthalene | | | | | |
| Phenanthrene | | | | | |
| Benzo(a)pyrene | | | | | |

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| | | | |
|--|--------------------|--------------------|--------------------|
| 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 |

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| | | | | |
|--|-----------------|-----------------|-----------------|-----------------|
| 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 |

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| | | | | |
|--|-----------------|-----------------|-----------------|-----------------|
| 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 | 0.12 |
| | | | J | |
| 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 |

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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 | 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 |

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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 |

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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 |

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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 | |

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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 |

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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 |

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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 |

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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 |

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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 |

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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 | | | | | |

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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 |
| Benzo(a)pyrene | 0.00 | J | 0.00 | J | 0.01 |
| Total Protein Content (ug/ml) | | | | | |
| | N.D. | | N.D. | | N.D. |
| Protein Normalized Metabolite Concentration (ng/ug protein) | | | | | |
| Naphthalene | | | | | |
| Phenanthrene | | | | | |
| Benzo(a)pyrene | | | | | |

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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 |

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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 | 0.04 |
| | | | J | 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 |

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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 | 0.77 | 0.08 | 0.03 |
| 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 | 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 | 0.03 | 0.05 | 0.04 |
| 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 | 0.04 | 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 | -2 stdev | | | Value | Stdev |
| GERG Sample ID | Q950 | | | | | |
| 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 | | | | Value | Stdev |
| GERG Sample ID | Q951 | | | | | |
| Sample Delivery Group (SDG) | N/A | -2 stdev | | +2 stdev | | |
| 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 | | | | | | |

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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 | 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 | 0.0 | 0.2 |
| | | J | J | |
| 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 | | | | Value | Stdev |
| GERG Sample ID | Q1080 | -2 stdev | | +2 stdev | | |
| Sample Delivery Group (SDG) | | | | | | |
| Sample Type | Bile Ref II | | | | | |
| Collection Date | SRM | | | | | |
| 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 |

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Fish Bile Metabolites
SDG# F9251

| Sample ID | Bile Ref II | QC Acceptance Range | | | Calibrated | |
|--|----------------|---------------------|----|----------|------------|-------|
| Battelle Sample ID | SRM | | | | Value | Stdev |
| GERG Sample ID | Q1094 | -2 stdev | | +2 stdev | | |
| Sample Delivery Group (SDG) | | | | | | |
| Sample Type | Bile Ref II | | | | | |
| Collection Date | SRM | | | | | |
| 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 |

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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 | 19 | 0.6 | 0.6 | 0 |
| Phenanthrene | 3 | 3 | 0.1 | 0.1 | 6 |
| Benzo(a)pyrene | 0.2 | 0.3 | 0.1 | 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 |

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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 | 36 | 0.6 | 0.6 | 3 |
| Phenanthrene | 6 | 6 | 0.1 | 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 |

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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 | 19 | 0.6 | 0.6 | 0 |
| Phenanthrene | 3 | 3 | 0.1 | 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 | 0.6 | 2 |
| Phenanthrene | 9 | | 0.1 | 0.1 | 1 |
| Benzo(a)pyrene | 0.3 | | 0.1 | 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 | 26 | 0.6 | 0.6 | 8 |
| Phenanthrene | 4 | 4 | 0.1 | 0.1 | 3 |
| Benzo(a)pyrene | 0.2 | 0.2 | 0.1 | 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 | 0.00 | 0.00 |
| 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 |
| Benzo(a)pyrene | 0.00 | 0.00 | 0.01 |
| 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. |

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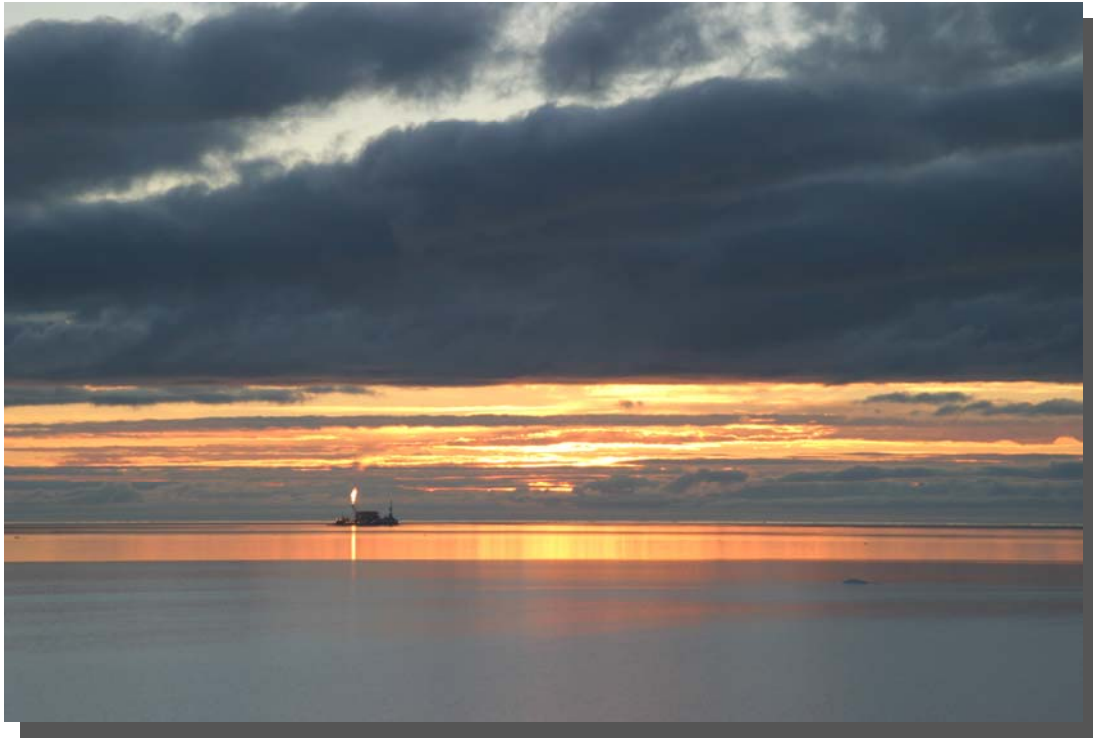
APPENDIX E

Field survey Reports for 2004, 2005 and 2006

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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

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Table 1: cANIMIDA Stations Sampled in the Summer 2004 Survey

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Figure 1: cANIMIDA Summer 2004 Sampling Stations

Figure 2: Schematic of the Mussel Cage and SPMD Mooring

List of Attachments

Attachment 1: Summer 2004 Daily Operation Logs

Attachment 2: Summer 2004 Station Logs

Attachment 3: Summer 2004 Fish Sampling Logs

Attachment 4: Summer 2004 Collection Permit and Fish Transfer Permit

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 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.



MMS Vessel 1273

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 Nynetex tube, two SPMD cages (four SPMDs, two in each cage), and an acoustic pinger (Figure 2).

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.



Deploying mussel/SPMD mooring w/acoustic pinger

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.

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 Infiltrax 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.



Surface water sample collection near flow ice

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 |

TOTALS¹ 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 | | | | | | | | Field Blanks |
|---------------|-------------|-------|----------|-----------|---------|-----------------|----------------------|------|--------------|
| | Sediment | Water | LV Water | Amphipods | Isopods | Bivalve (Clams) | Deployed Mussel SPMD | Fish | |
| 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. Opportunistic 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 | Opportunistic 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 |

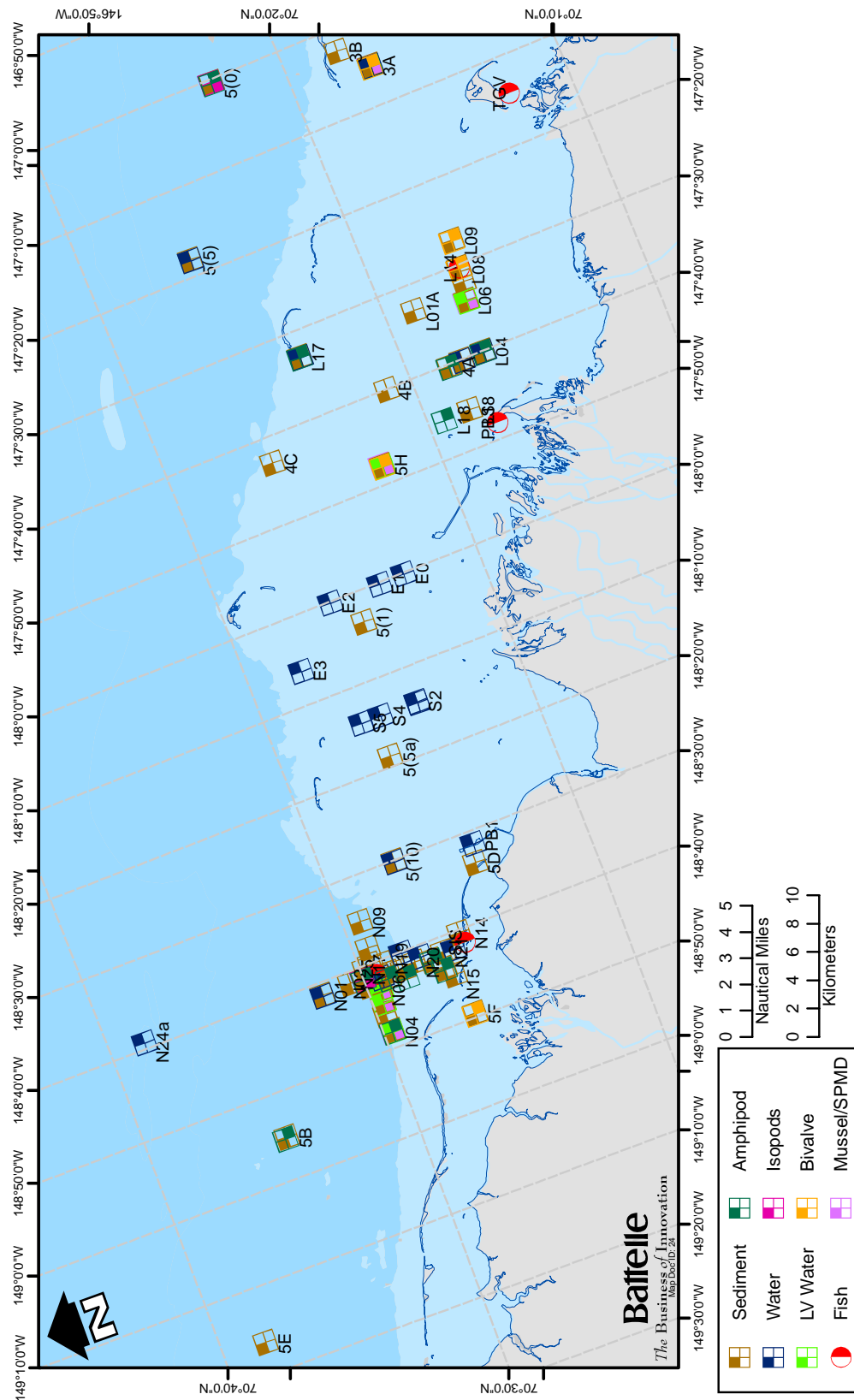


Figure 1. cANIMIDA Summer 2004 Sampling Stations
All Stations

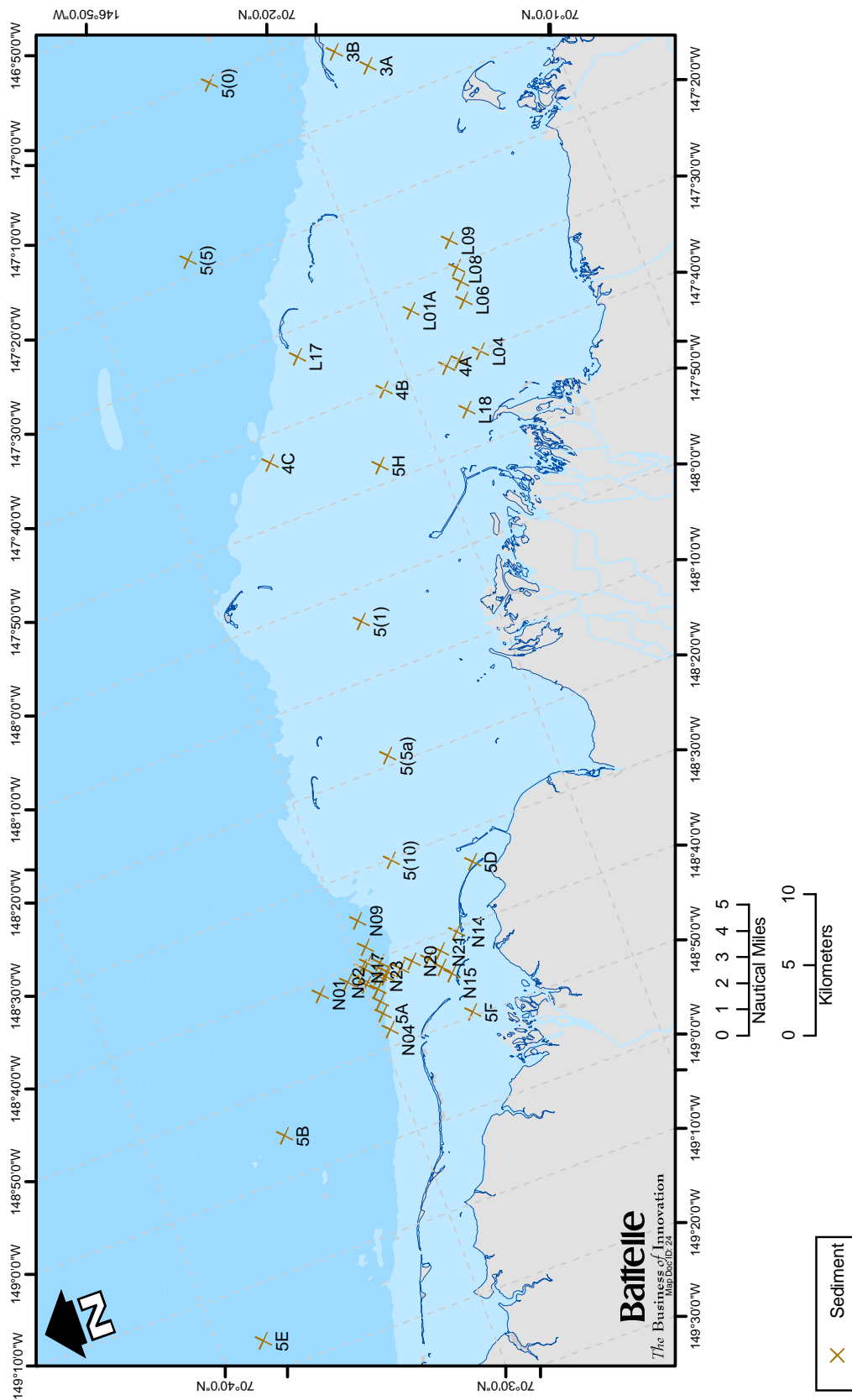


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations
Sediment Stations

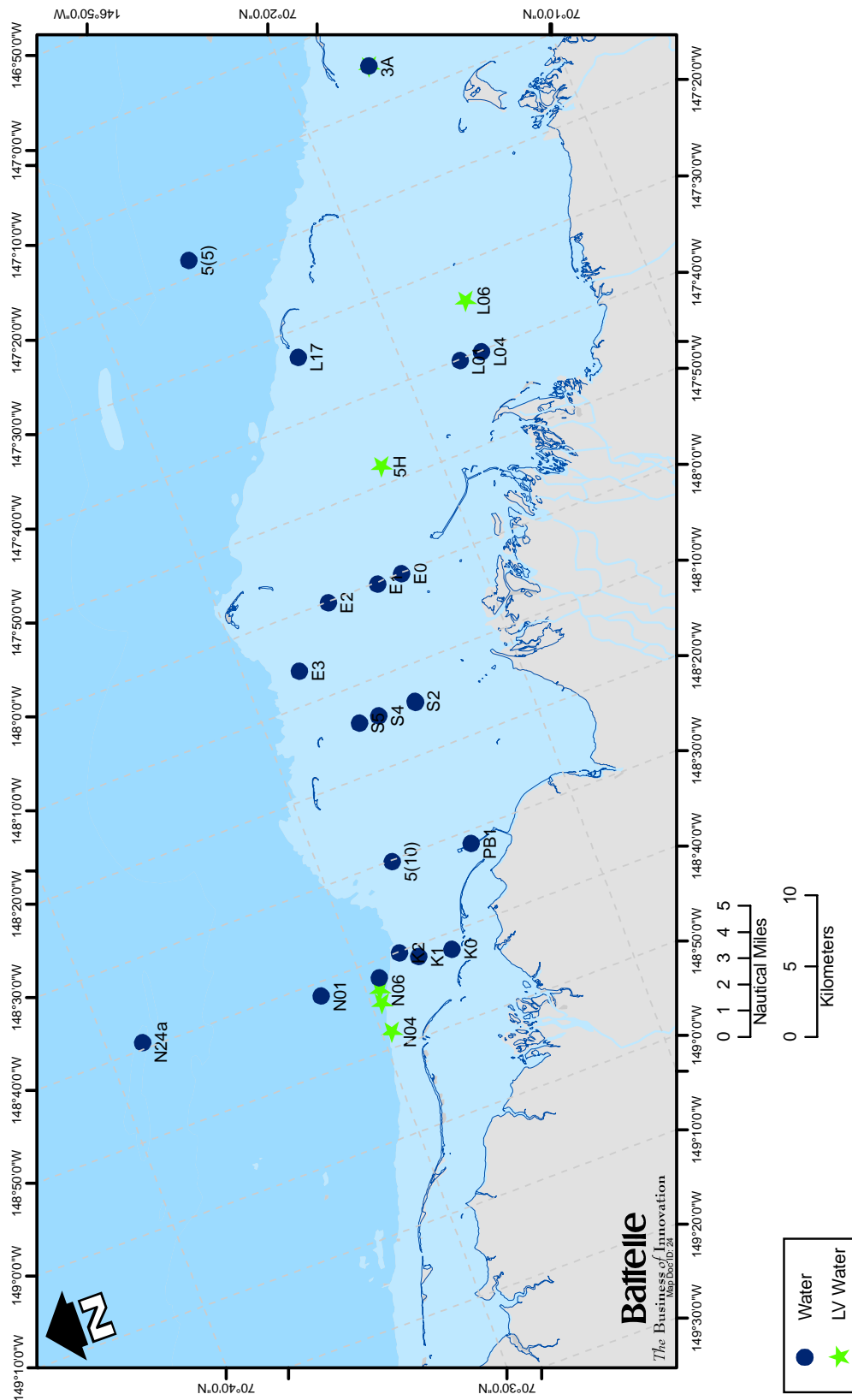


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations
Standard Water and Large Volume Water Stations

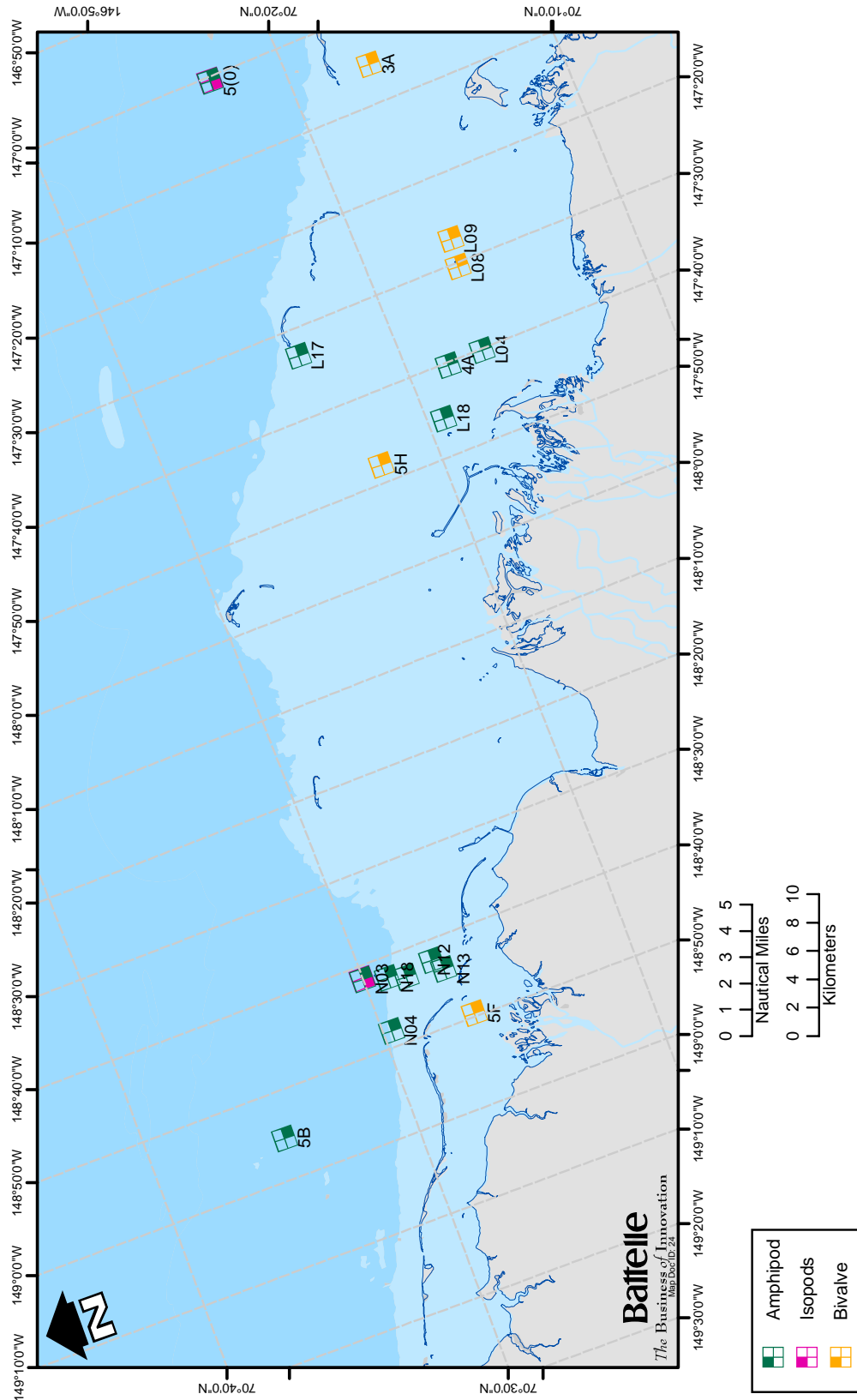


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations
Amphipod and Bivalve (clam) Stations

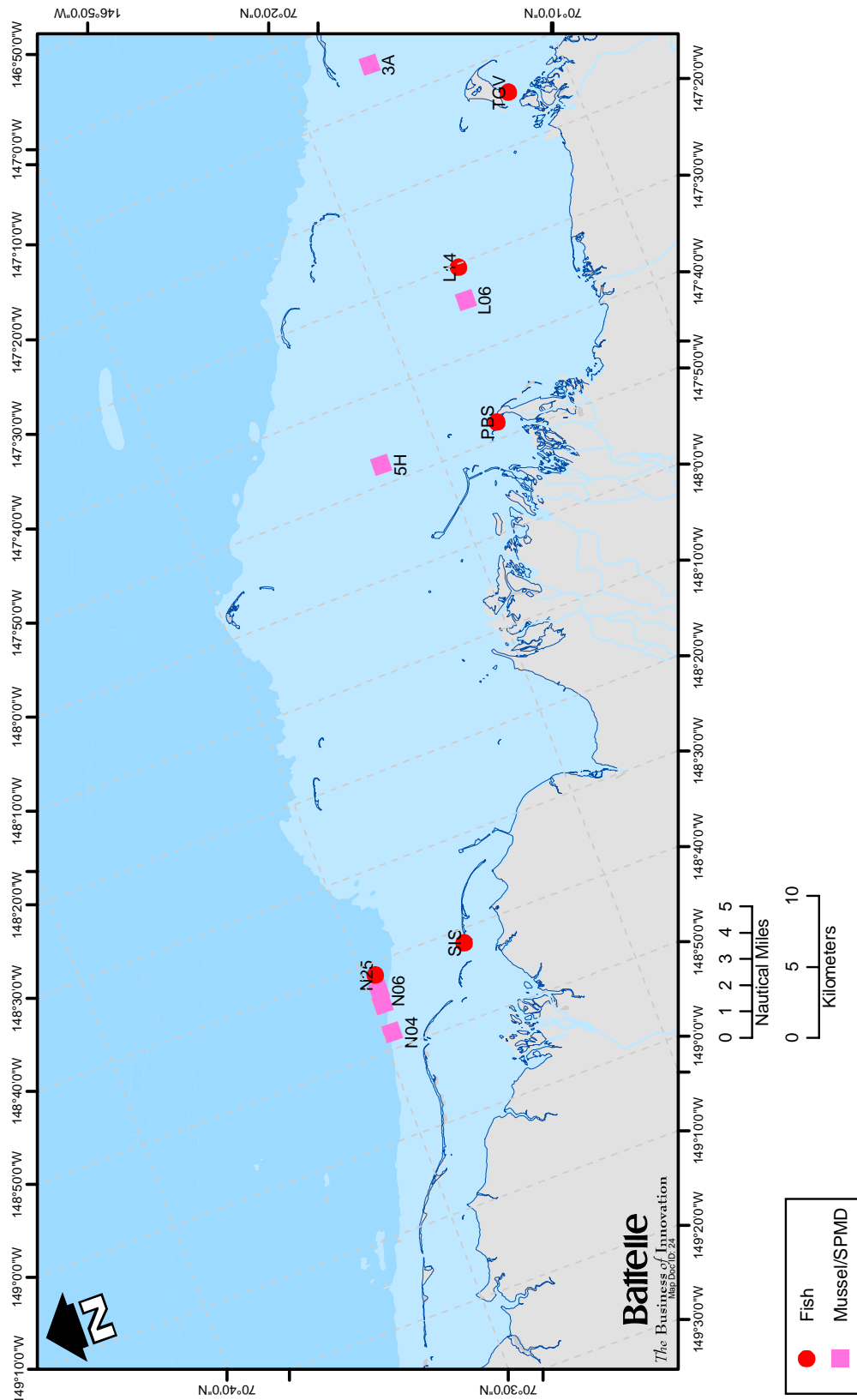


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations
Fish Collection and Mussel/SPMD Deployment Stations

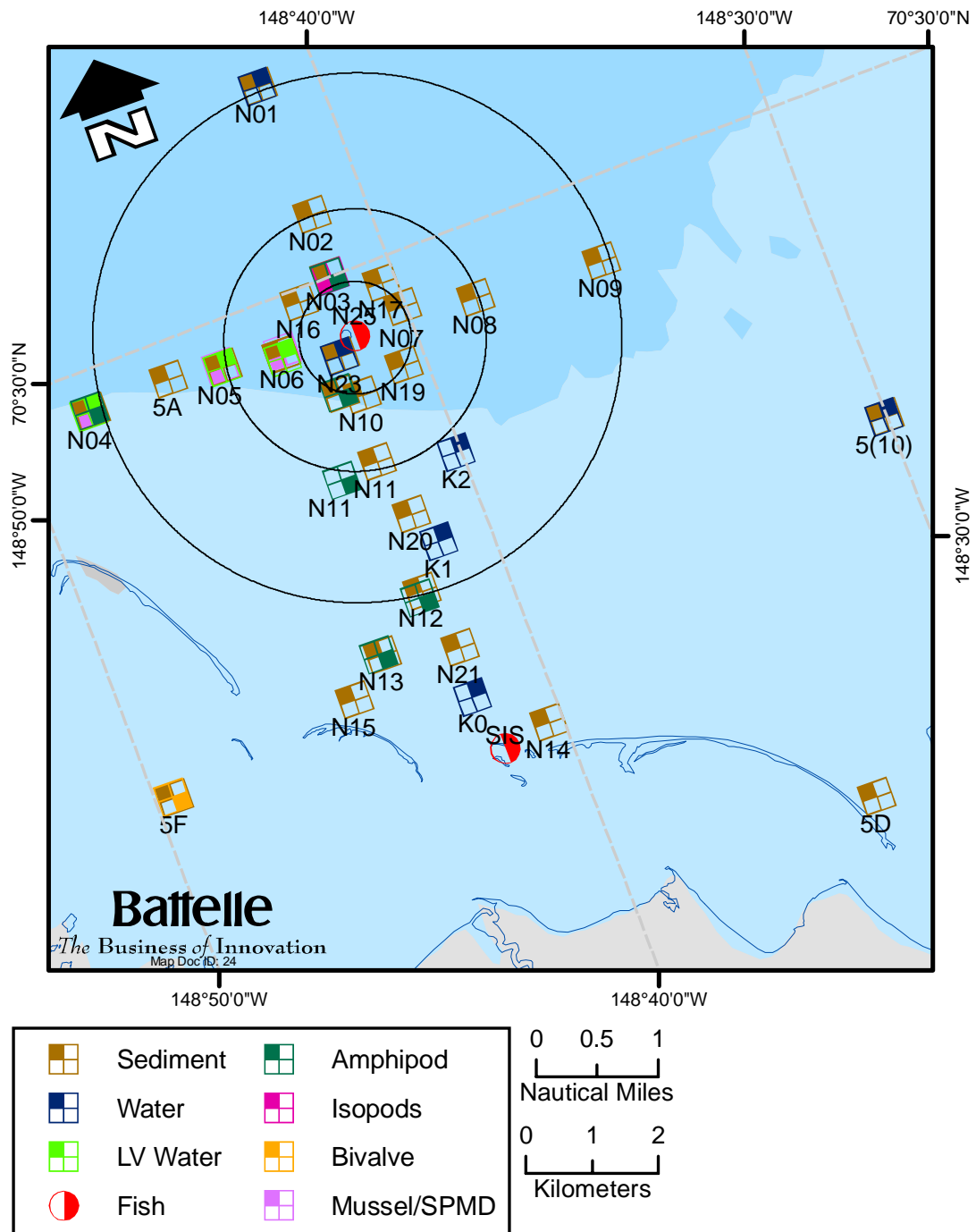
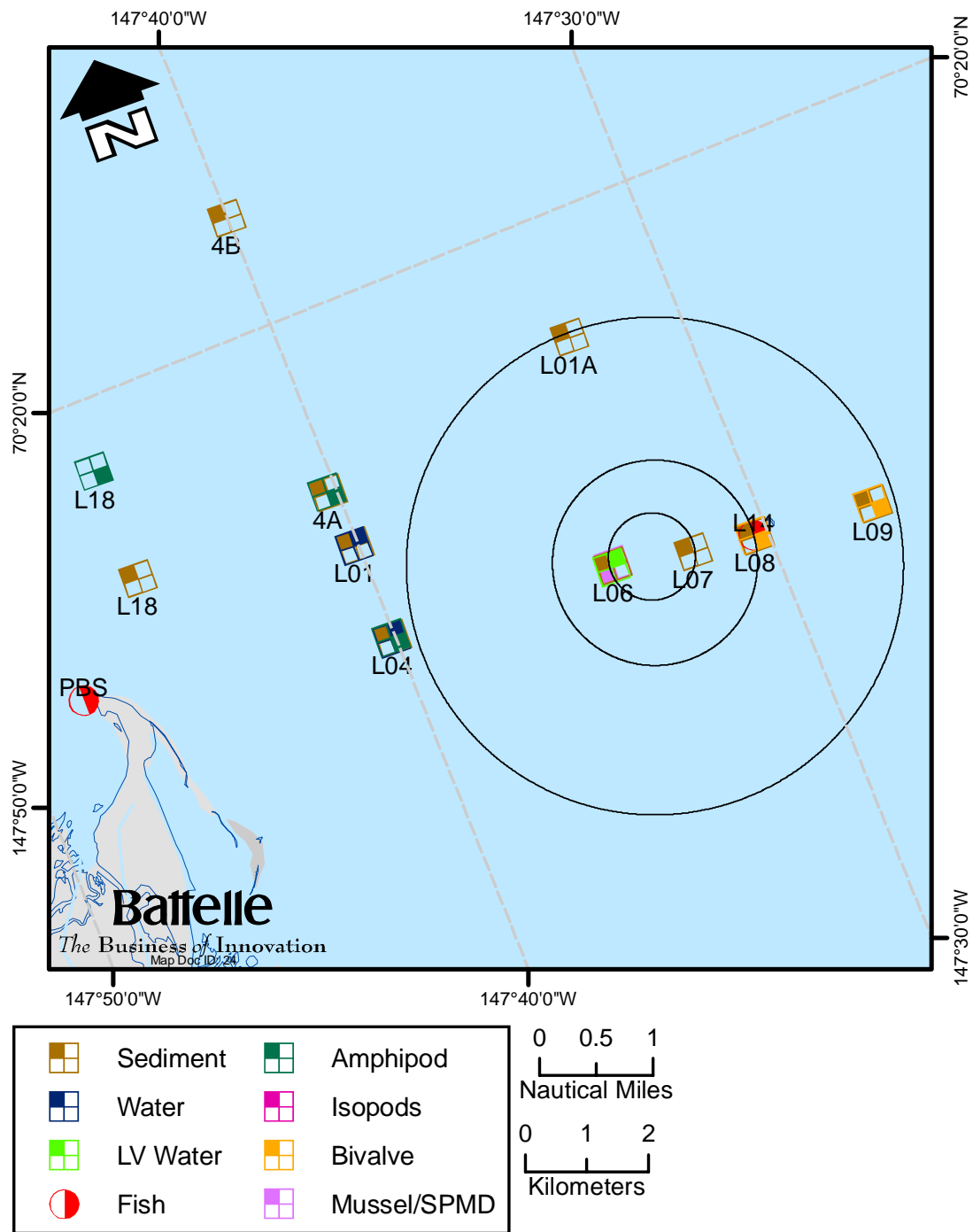


Figure 1 (cont.). cANIMIDA Summer 2004 Sampling Stations
Stations in the Northstar Area



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

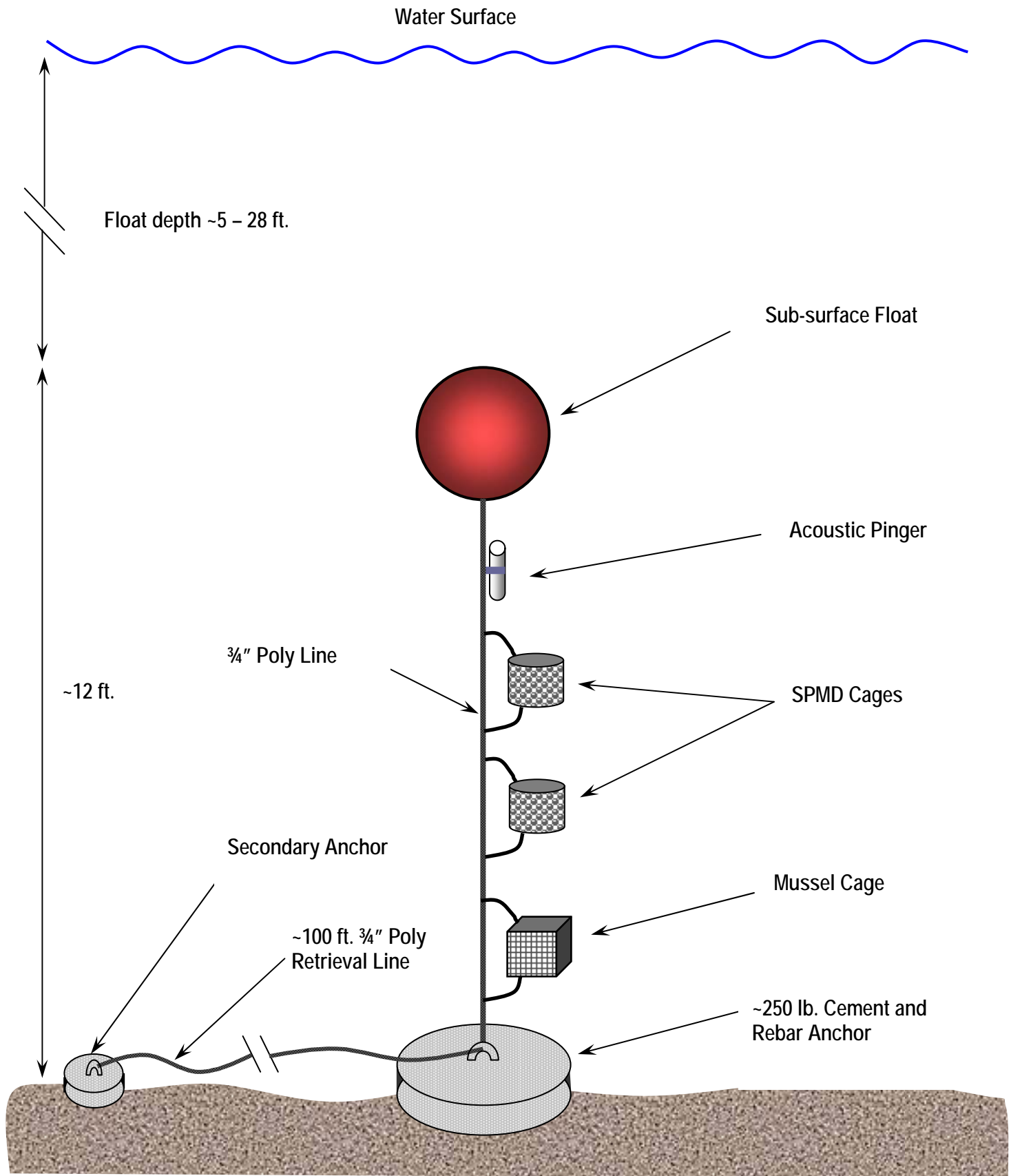


Figure 2. Schematic of the Mussel Cage and SPMD Mooring

**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

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Table 1: 2005 MMS cANIMIDA Sampling Summary

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List of Attachments

Attachment 1: 2005 Station Logs
 Section 1: Daily Operations Logs
 Section 2: Sediment Collection Logs
 Section 3: Fish Collection Logs
 Section 4: Mussel Collection Logs
 Section 5: Water, Plankton, and Indigenous Biota Collection Logs
Attachment 2: 2005 Collection Permit and Fish Transfer Permit

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 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,



MMS Vessel 1273

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 Pelosa 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).

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*



Mussel mooring w/acoustic pinger

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.

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.



Setting fyke near Point Brower

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)

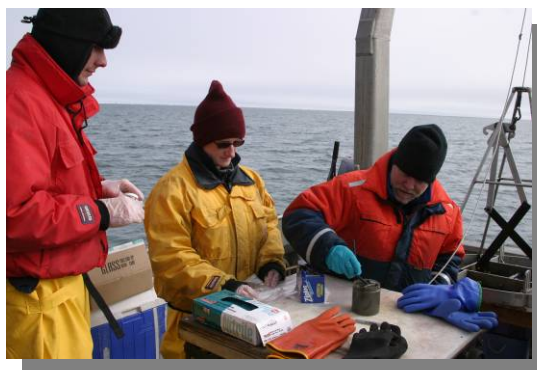
Collect one discrete water sample and CTD cast at BP01. Collect plankton samples from 4A, BP01, and L18. Battelle staff packs samples and retrieves fish sampling equipment from Endicott. Organize and prepare for eastern sampling trip. 1273 overnights at Endicott.

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.

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.



Core samples from L17B

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.

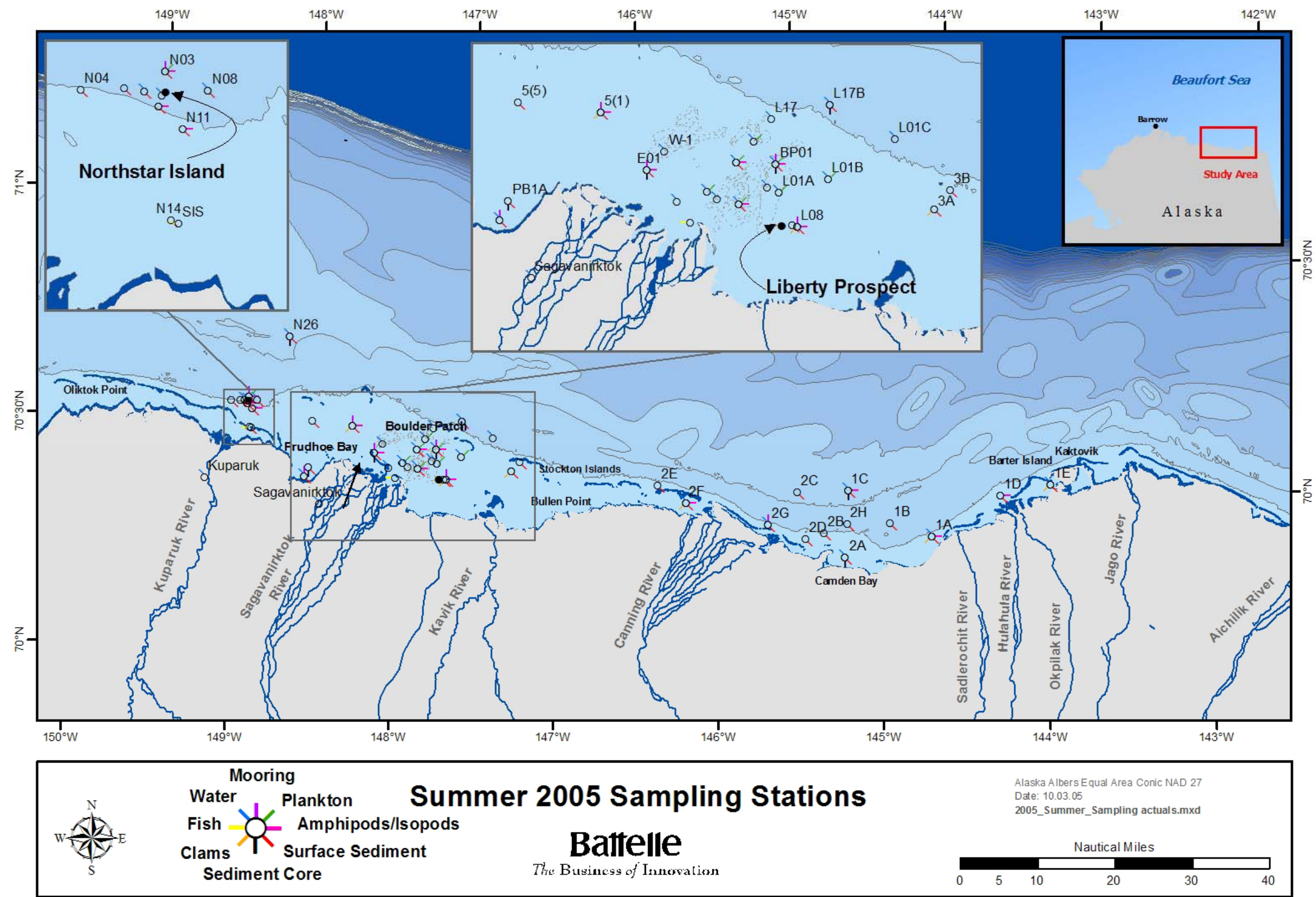


Figure 1. Summer 2005 cANIMIDA Sampling Locations.

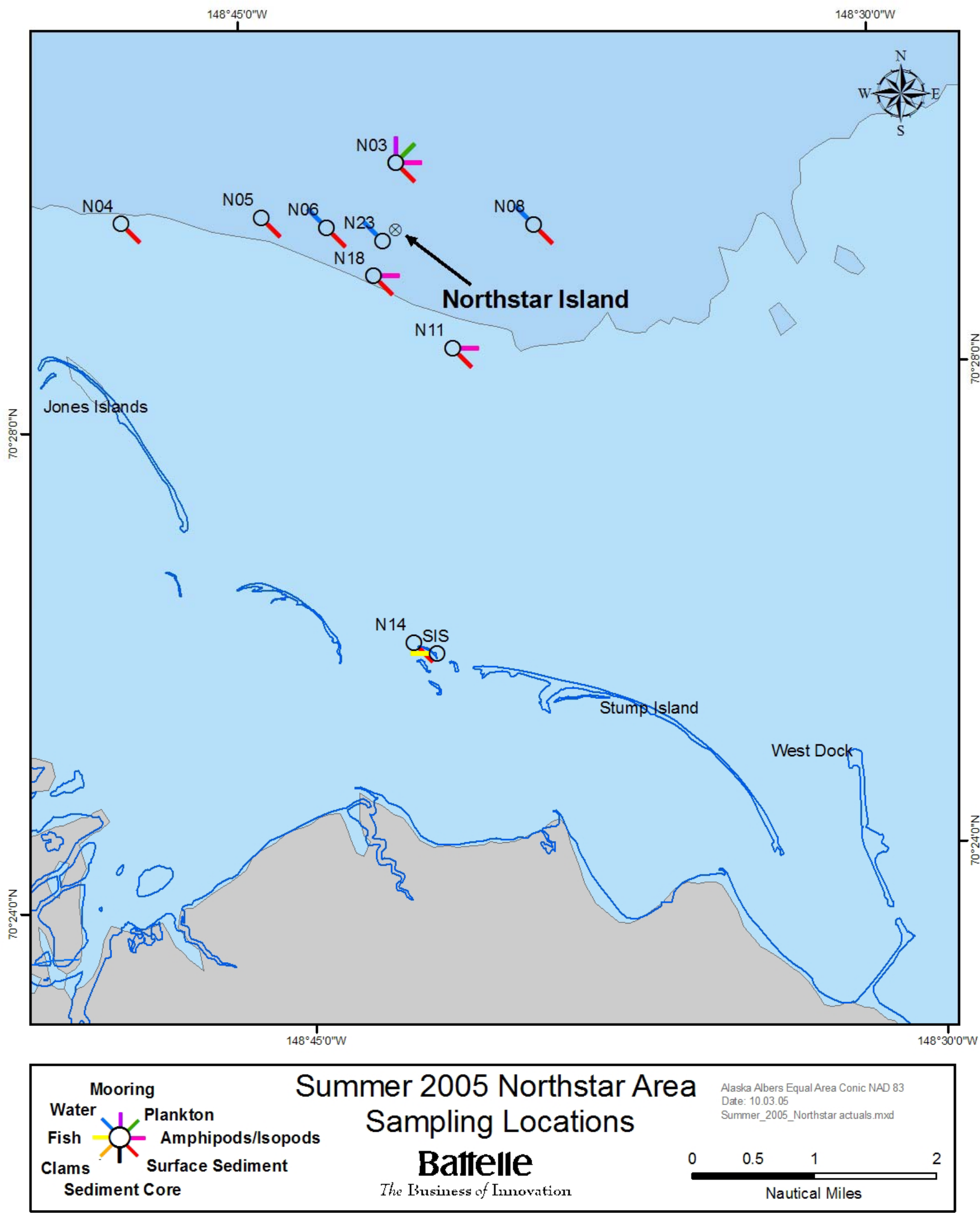


Figure 2. Northstar Sampling Locations, Summer 2005.

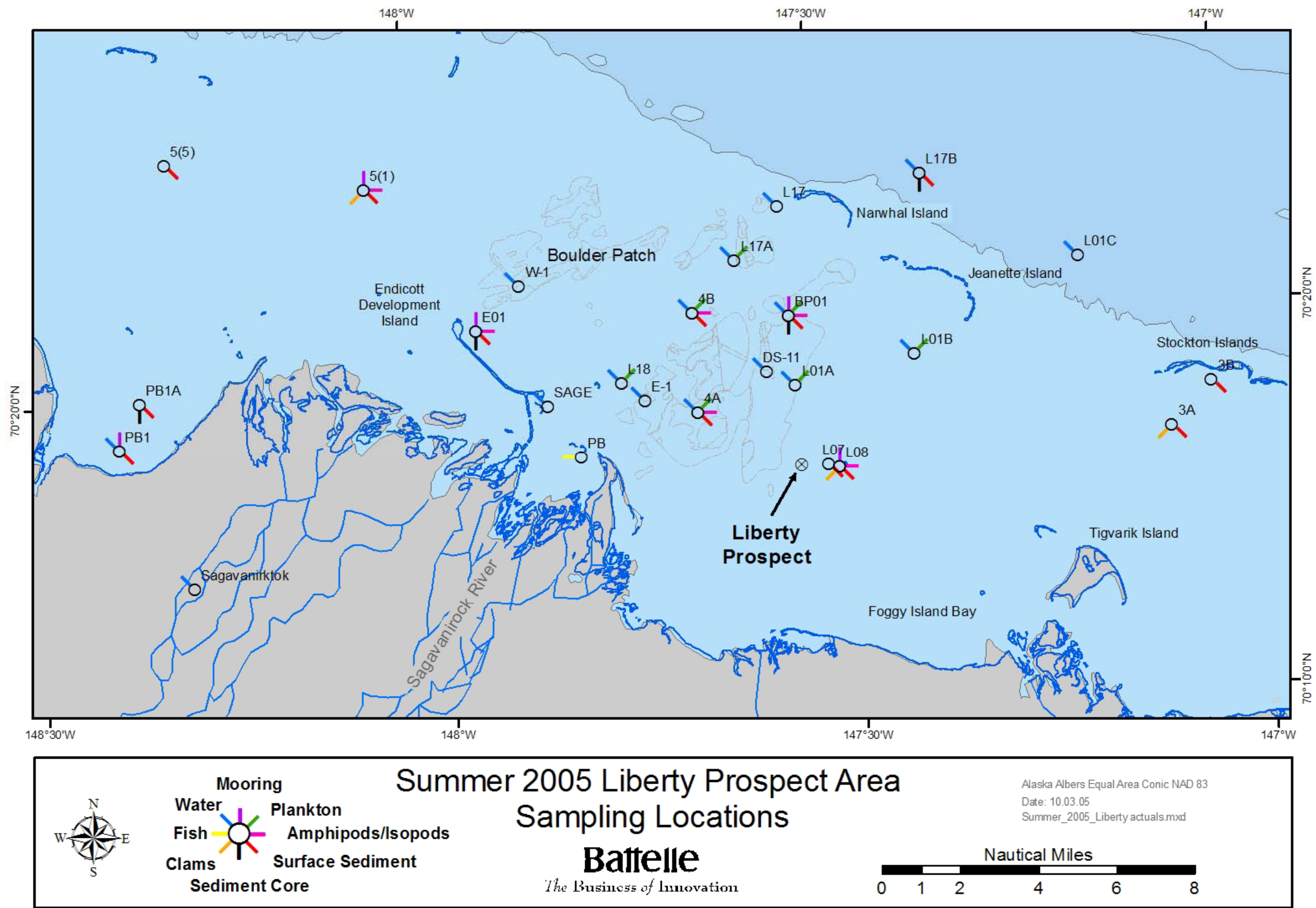


Figure 3. Liberty Sampling Locations, Summer 2005.

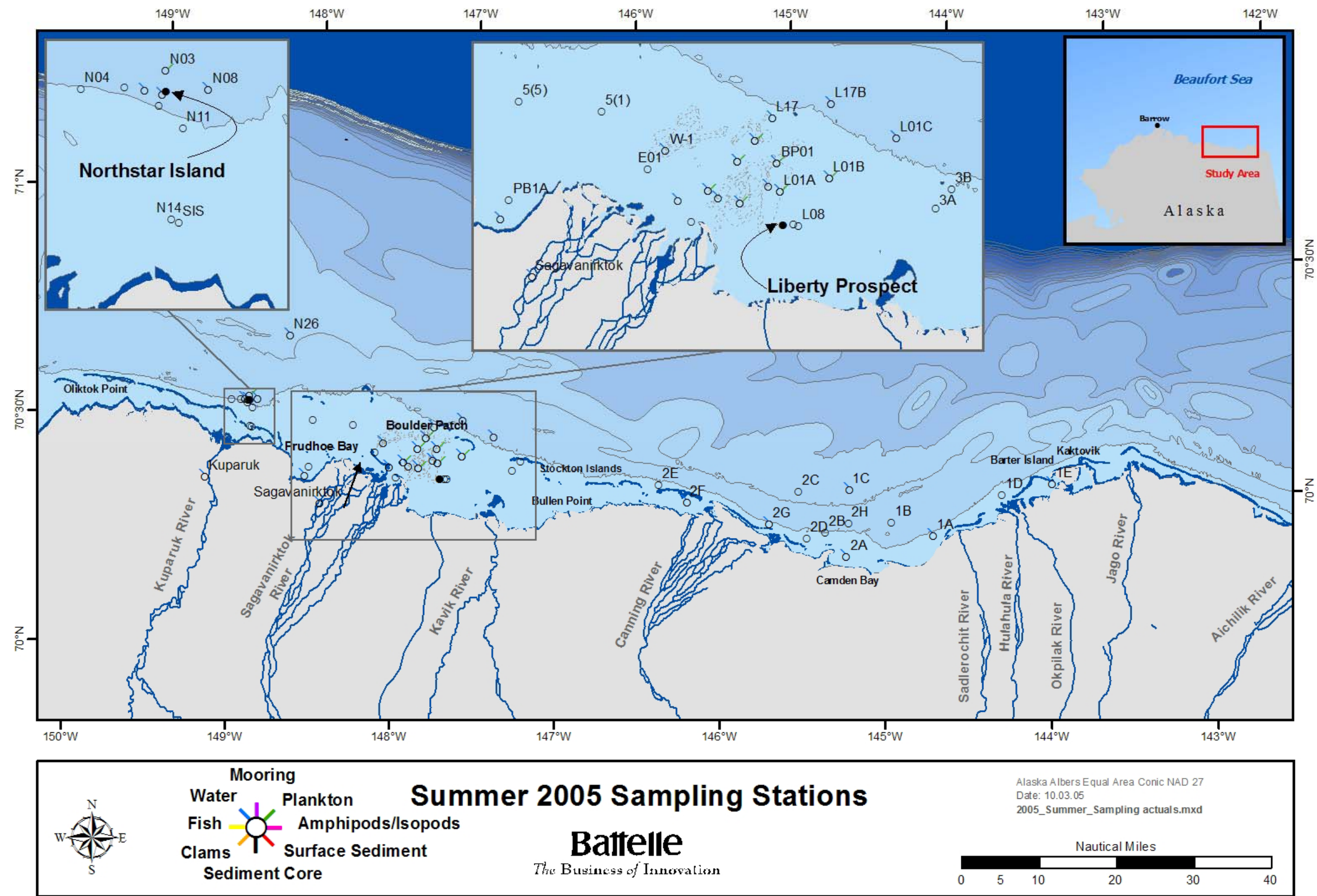


Figure 4. Water and Plankton Sampling Locations, Summer 2005.

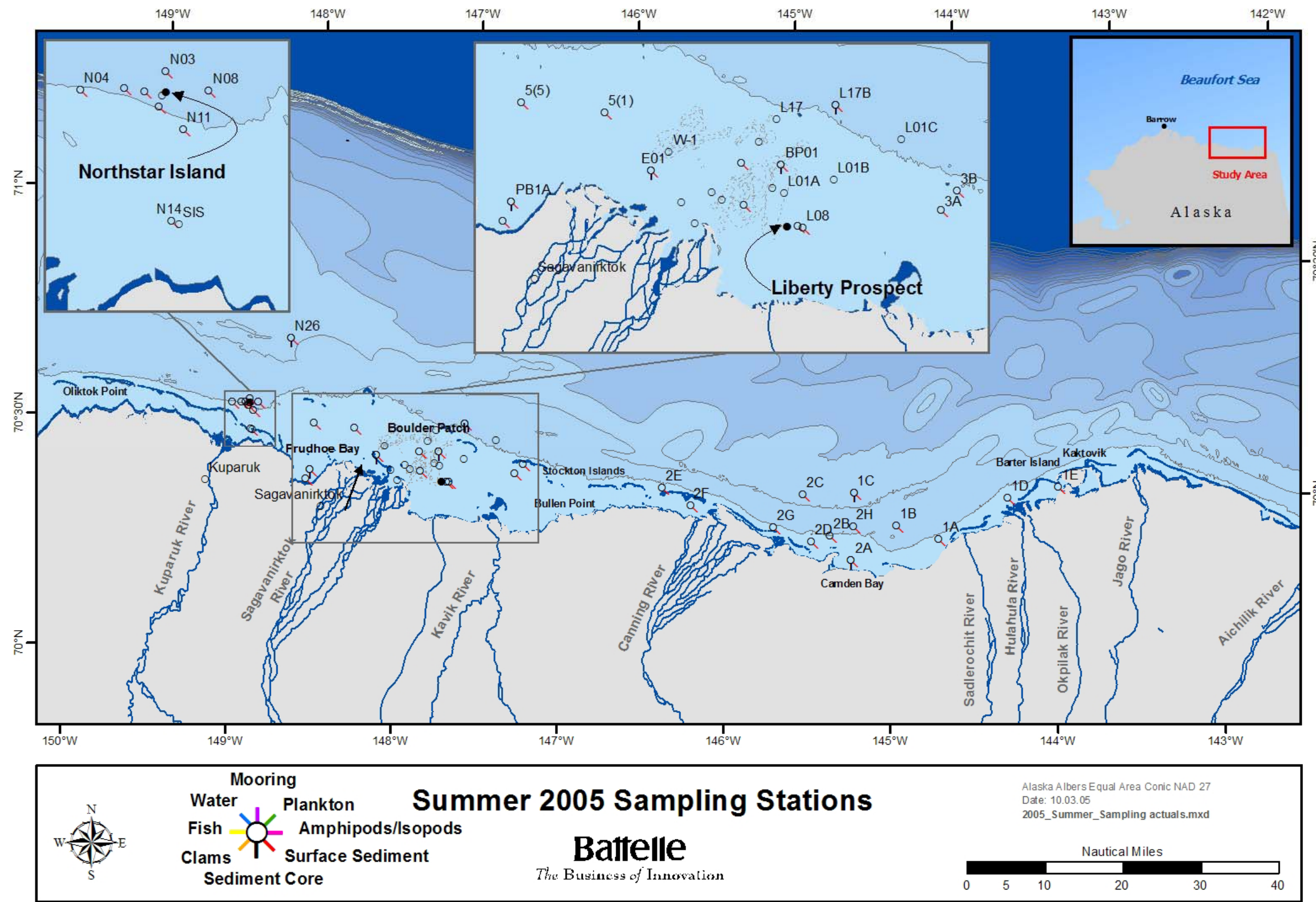


Figure 5. Sediment and Core Sampling Locations, Summer 2005.

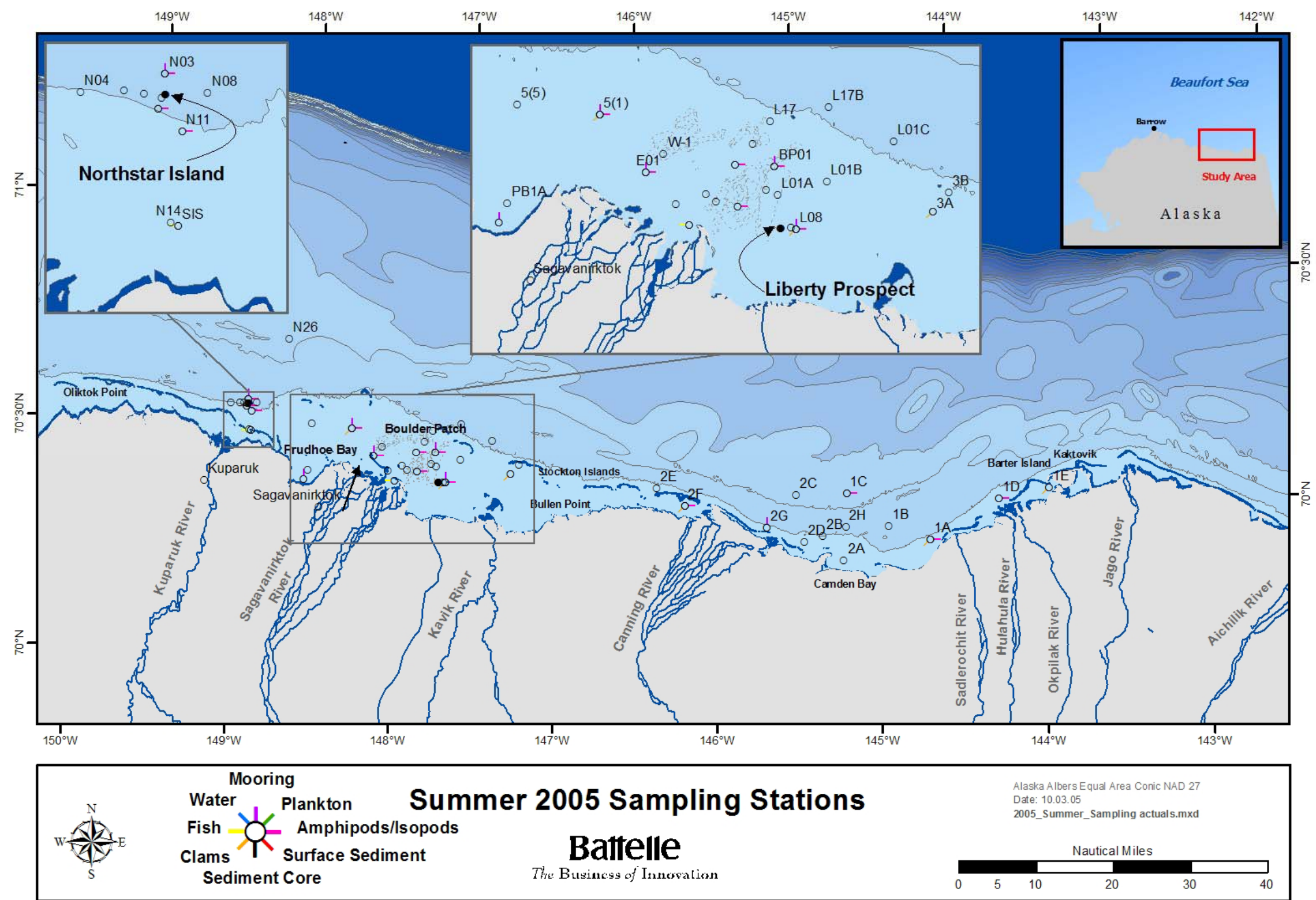


Figure 6. Mussel Moorings and Indigenous Biota Sampling Locations, Summer 2005.

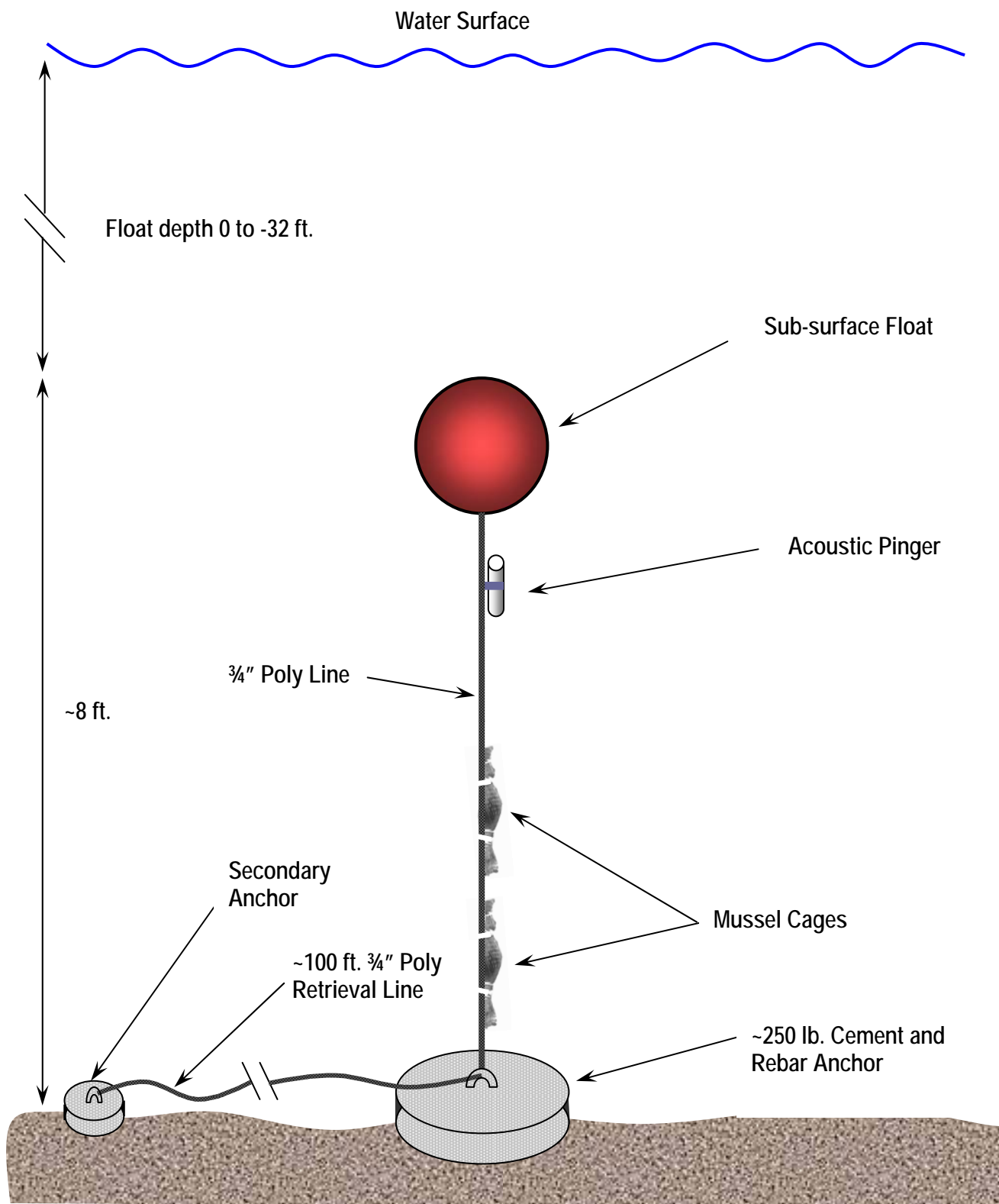


Figure 7. Schematic of the Mussel Cage and Mooring String

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 |

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| 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 | | | | | | | | | | |

cANIMIDA Summer 2005 Field Survey Report

| 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. |

cANIMIDA Summer 2005 Field Survey Report

| 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 | | | | | | | | | | |

cANIMIDA Summer 2005 Field Survey Report

| 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 | | |

cANIMIDA Summer 2005 Field Survey Report

| 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.


Division of Commercial Fisheries


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

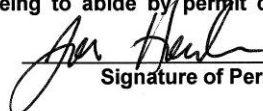
CF-05-074 continued (page 2 of 2)

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, 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 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

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List of Attachments

Attachment 1: 2006 Station Logs

Section 1: Daily Operations Logs

Section 2: Sediment Collection Logs

Section 3: Water, Plankton, and Indigenous Biota Collection Logs

Section 4: Mussel Collection Logs

Section 5: Fish Collection Logs

Attachment 2: 2006 Collection Permit and Fish Transfer Permit

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.
- 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.



Dr. J. Trefry collecting water sample

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 |

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| 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 | | | | | | | | | | |

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| 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 *I273* 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 *I273* overnights at Endicott.

July 28 (Friday)

The *I273* 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 discrete 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 *I273* overnights at Endicott.

July 29 (Saturday)

The *I273* 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 discrete 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 *I273* overnights at Endicott.



R. Trocine with dual gravity core samples

July 30 (Sunday)

The *I273* 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 discrete water samples are also collected at L22. Amphipod traps are deployed at 5(5).

The *I273* overnights at West Dock.

July 31 (Monday)

The *I273* 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 *I273* is re-fueled, water and provisions added in preparation for traveling west to Harrison Bay.

The *I273* overnights at West Dock.

August 1 (Tuesday)

Mobilization of the *I273* for the transit to Harrison Bay is conducted in the morning. Sediment and tissue samples are shipped to Duxbury, MA. The *I273* 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.



J. Hardin collecting amphipods

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

Richard Prentki returns to Anchorage.

I273 overnights at Oligtok Point.

August 2 (Wednesday)

The *I273* 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 *I273* overnights at Eskimo Island.

August 3 (Thursday)

The *I273* 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 *I273* overnights at Spy Island.

August 4 (Friday)

In the morning, the *I273* team collects amphipod traps from 6A and 6G (no sample was collected from 6G). The *I273* transits east toward Prudhoe Bay, stopping at Pingok Island to collect a peat sample. The *I273* arrives back at West Dock at 1310.

In the afternoon, the *I273* 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).



Flock of geese over Pingok Island

The *I273* overnights at West Dock.

August 5 (Saturday)

The *I273* 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 *I273* overnights at West Dock.

August 6 (Sunday)

The *I273* 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.

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.



Benthic sled on loan from Dr. Ken Dunton

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

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.



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

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.

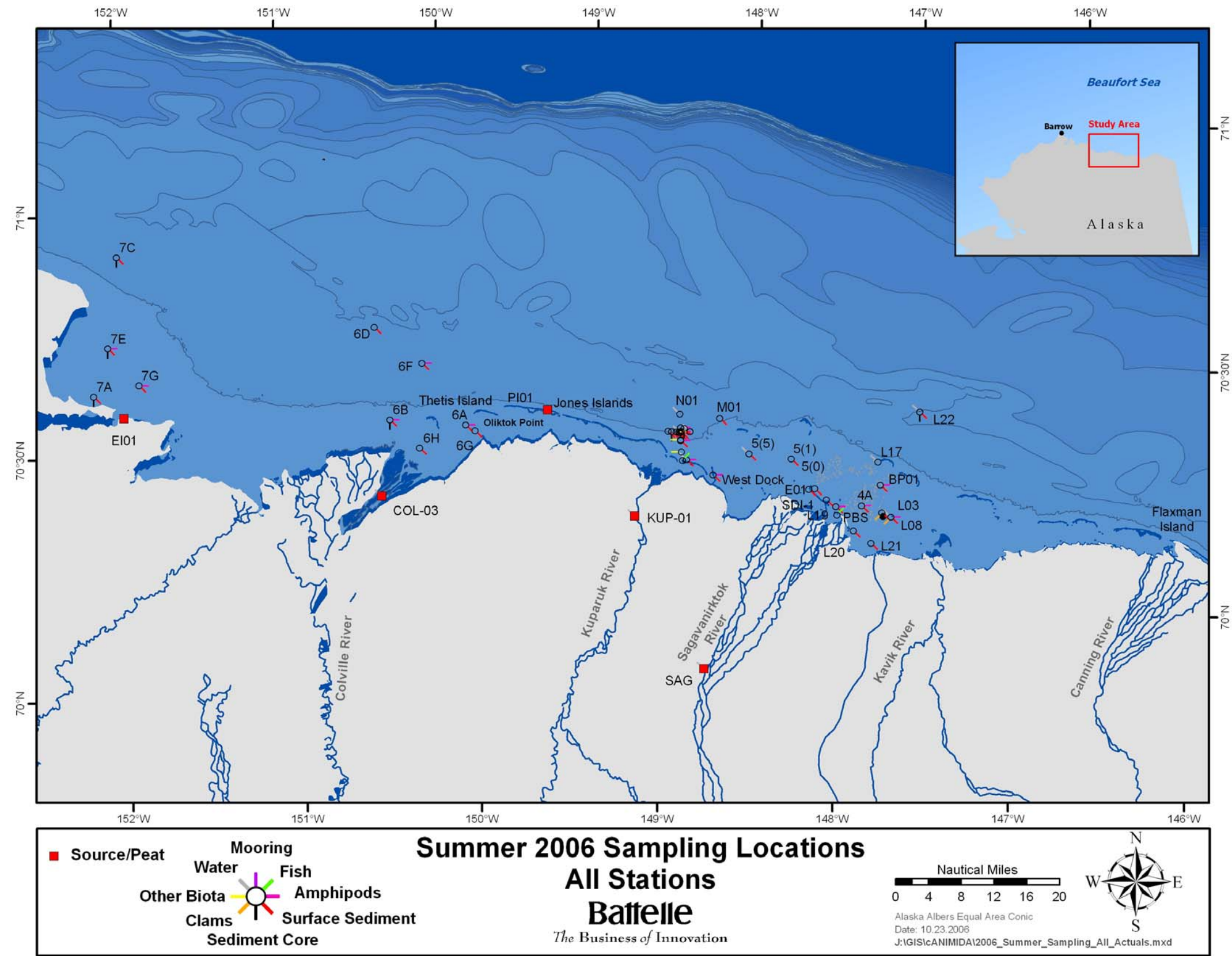


Figure 1. Summer 2006 cANIMIDA Sampling Locations.

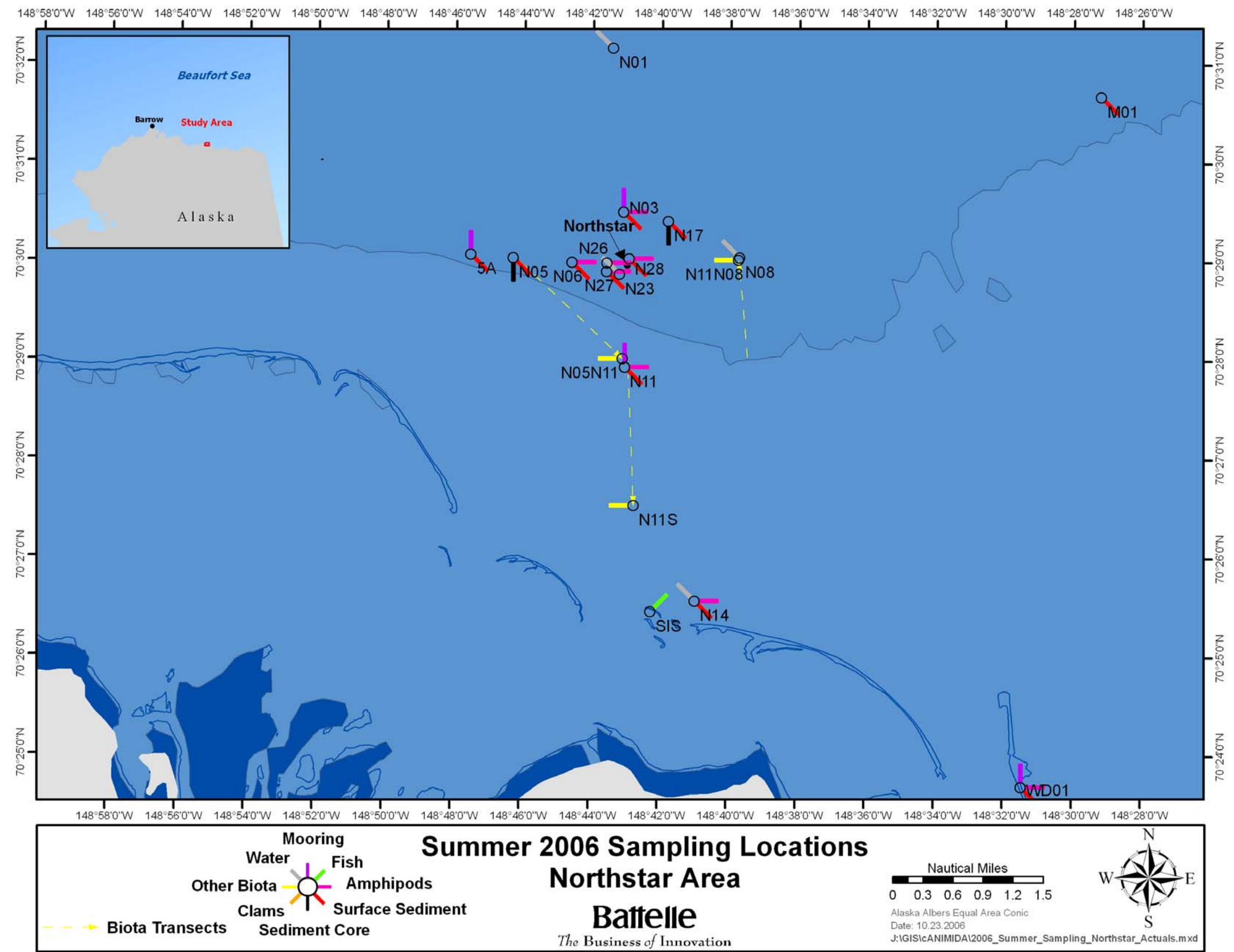


Figure 2. Northstar Area Sampling Locations, Summer 2006.

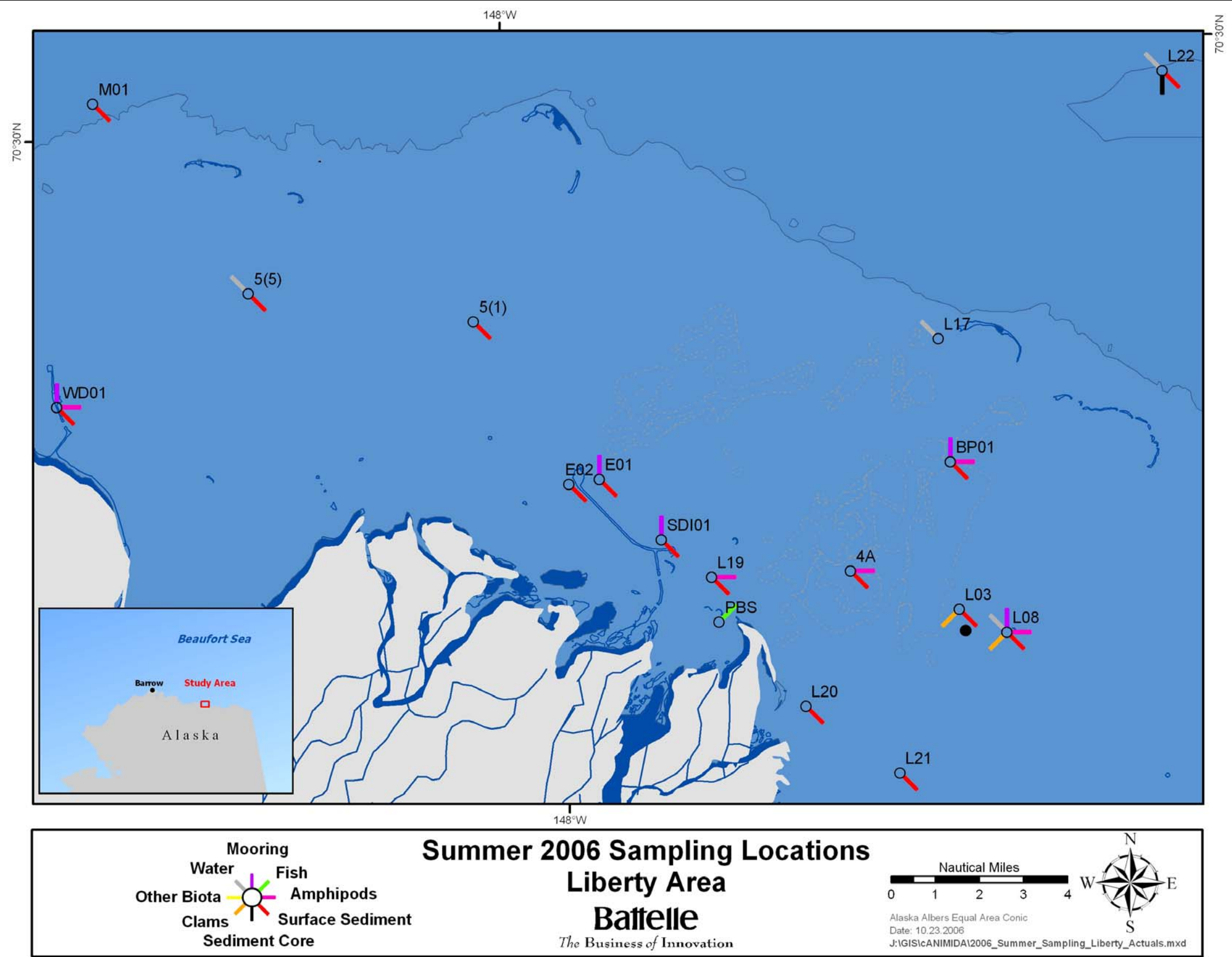


Figure 3. Liberty Area Sampling Locations, Summer 2006.

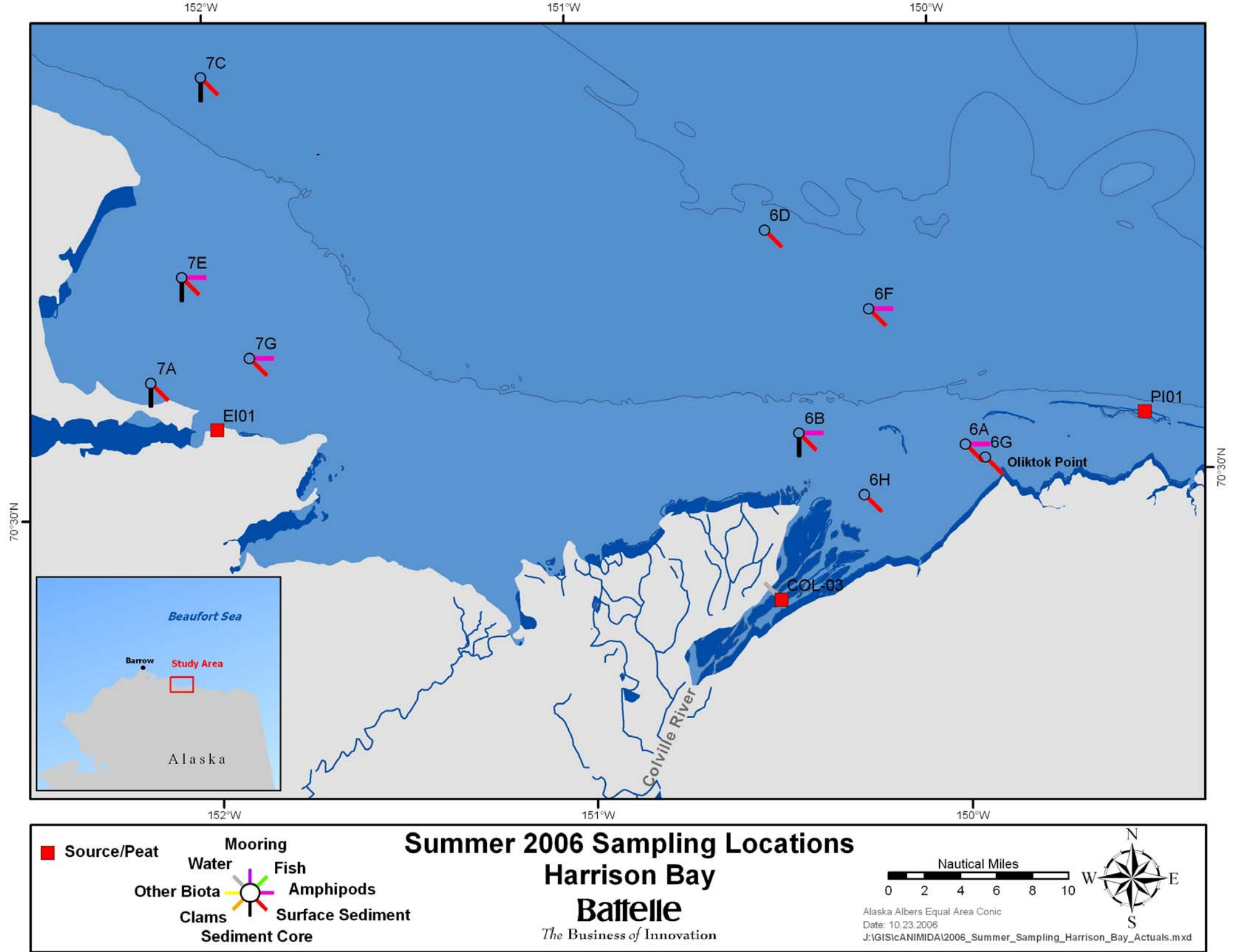


Figure 4. Harrison Bay Sampling Locations, Summer 2006.

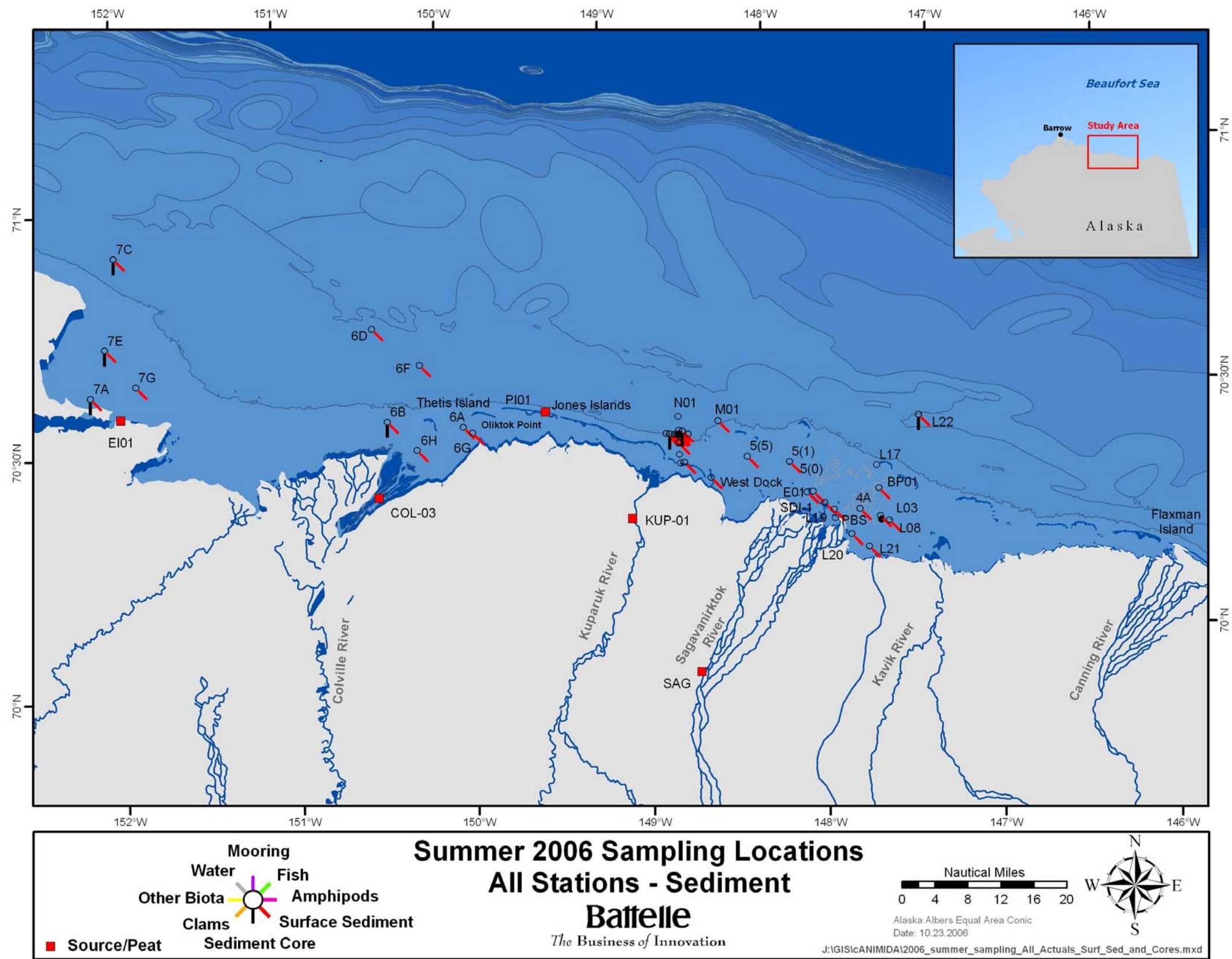


Figure 5. Sediment and Core Sampling Locations, Summer 2006.

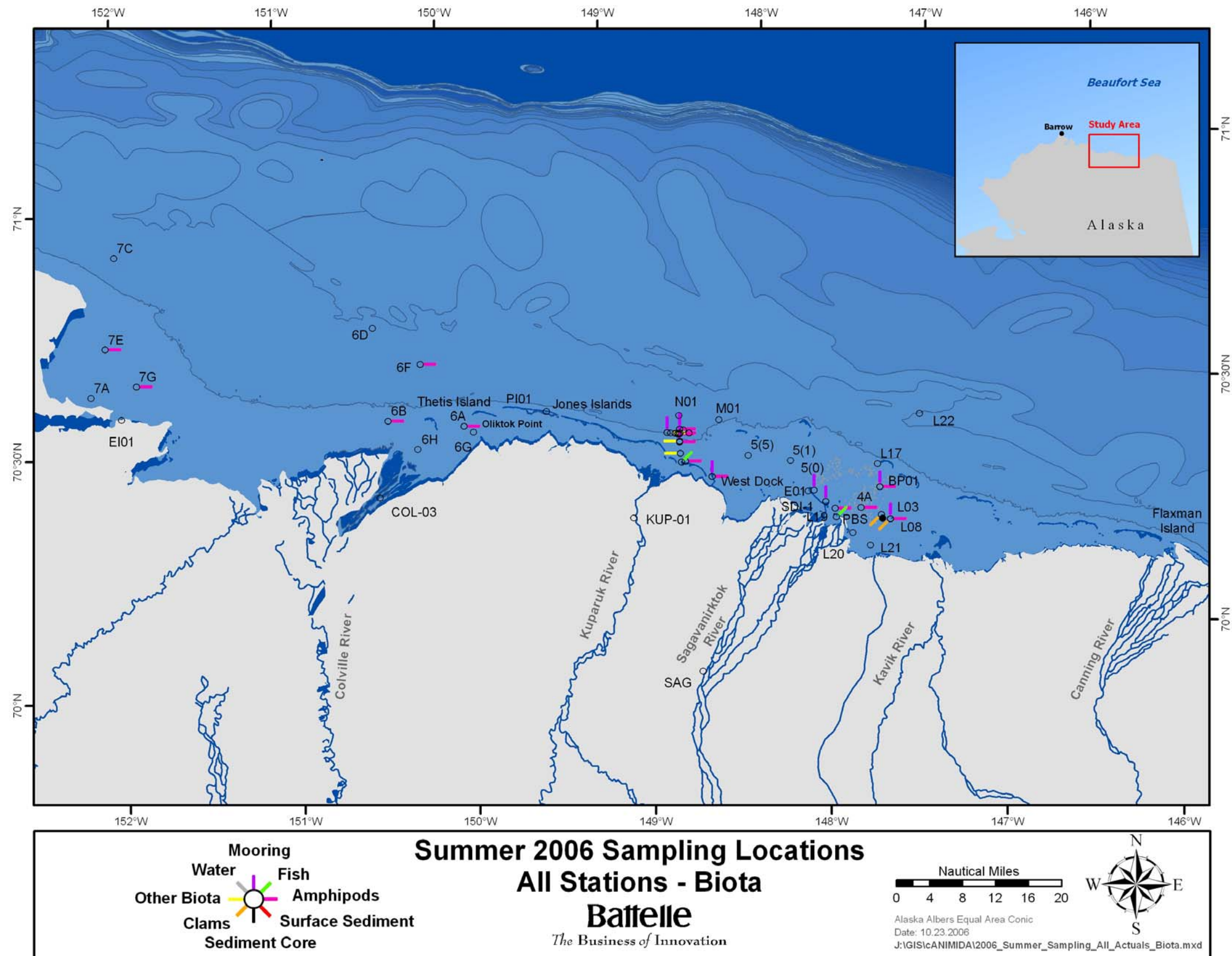


Figure 6. Mussel Moorings and Indigenous Biota Sampling Locations, Summer 2006.

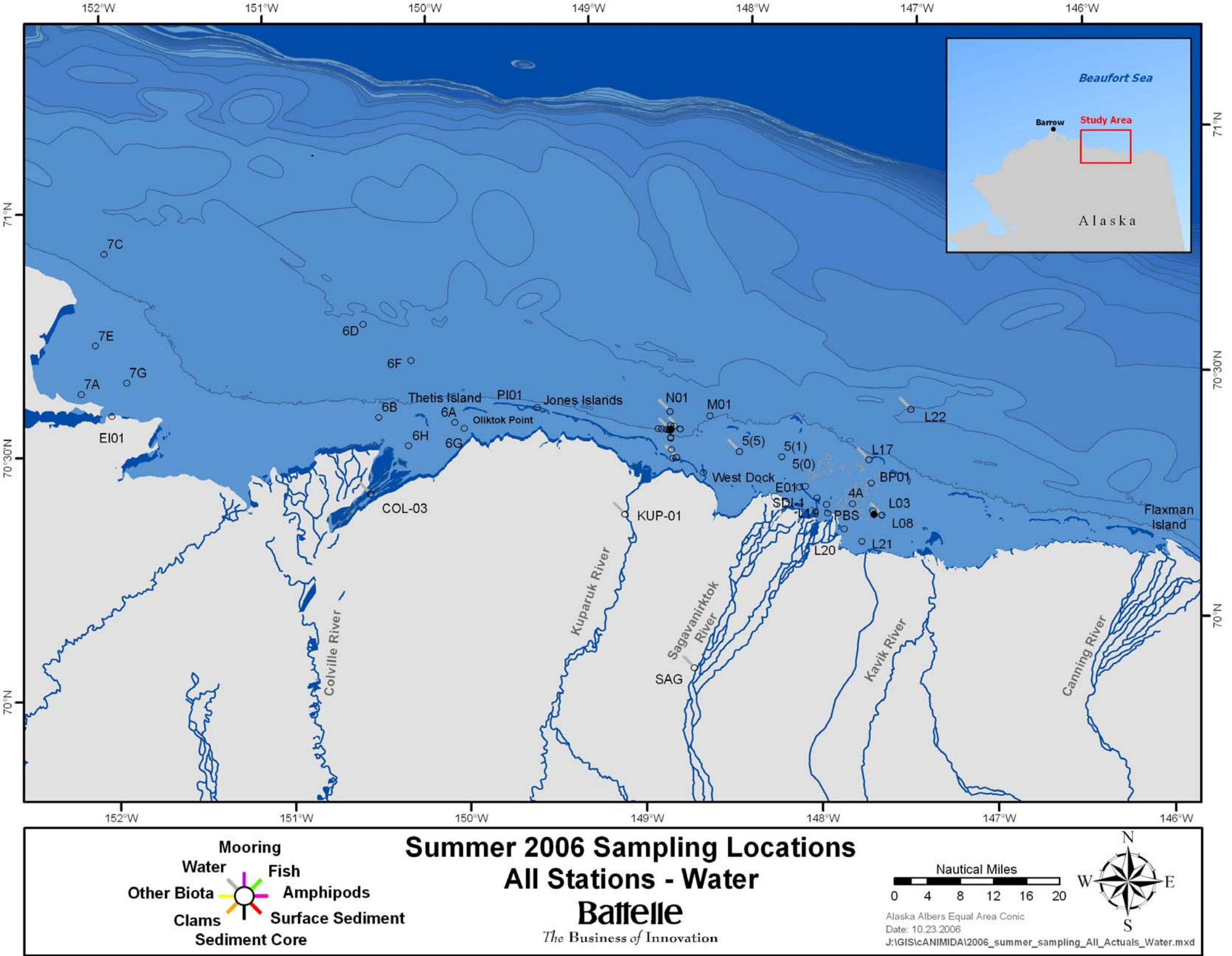


Figure 7. Water Sampling Locations, Summer 2006.

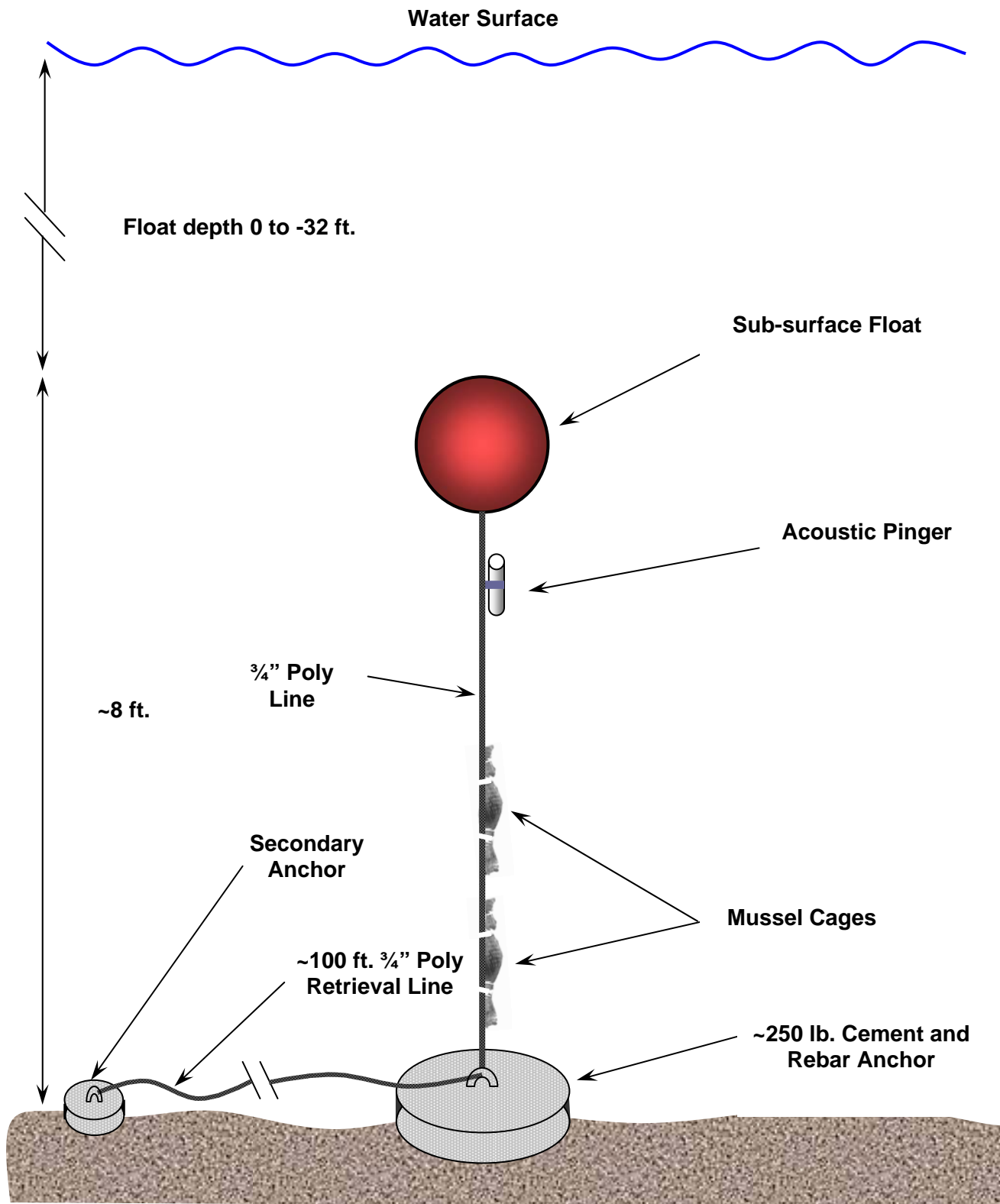


Figure 8. Schematic of the Mussel Cage and Mooring String

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.**


Division of Commercial Fisheries


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

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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” | <p>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?</p> <p>Objectives</p> <ol style="list-style-type: none"> 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. | <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> | <p>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.</p> | <ol style="list-style-type: none"> 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. |

