Ancillary Surface Water Parameters
March, April and May Results
Phase I System Characterization
Ecological Study

| Sample | Hardness (mg/L as $CaCO_3$) | | | Sulfate (mg/L) | | | Total $NO_3/NO_2$ (mg/L) | | | Total P as $PO_4$ (mg/L) | | | Total Organic Carbon (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | March | April[1] | May[1] | March | April | May | March | April | May | March | April | May | March | April | May |
| SR-01 | 96 | 115 | 69 | 9.4 | 8.8 | 8.1 | 0.8 | 0.6 | 0.5 | <0.25 | <0.25 | 0.1 | -- | 2.0 | 1.0 |
| RRM-0.6 | 114 | 95 | 93 | 9.1 | 8.0 | 8.2 | 0.9 | 0.8 | 0.6 | <0.25 | <0.25 | 0.1 | 1.4 | 1.9 | 1.0 |
| RRM-2.0 | 102 | -- | -- | 9.1 | 8.0 | 8.9 | 1.4 | 1.4 | 1.3 | <0.25 | 0.4 | 0.1 | 2.0 | 2.5 | 2.2 |
| RRM-3.0 | 115 | 100 | 91 | 9.4 | 8.8 | 8.8 | 1.3 | 1.5 | 1.3 | <0.25 | 0.4 | 0.1 | 1.7 | 2.6 | 1.0 |
| RRM-4.2 | 110 | -- | -- | 9.4 | 7.6 | 8.8 | 1.3 | 1.2 | 1.2 | <0.25 | <0.25 | 0.1 | 1.4 | 2.1 | 1.0 |
| RRM-5.2 | 108 | -- | -- | 9.0 | 7.6 | 8.2 | 1.2 | 1.2 | 0.9 | <0.25 | <0.25 | 0.1 | 1.4 | 2.4 | 1.0 |
| RRM-7.1 | 106 | 99 | 82 | 8.8 | 7.9 | 8.5 | 1.3 | 1.2 | 1.1 | <0.25 | <0.25 | 0.1 | 1.6 | 2.2 | 1.0 |
| RRM-8.7 | 108 | 100 | 79 | 8.9 | 8.3 | 8.2 | 1.3 | 1.5 | 1.1 | <0.25 | <0.25 | 0.1 | 1.7 | 2.2 | 1.0 |
| RRM-11.8 | 108 | -- | -- | 9.3 | 7.7 | 8.1 | 1.0 | 1.3 | 1.1 | <0.25 | <0.25 | 0.1 | 1.8 | 2.5 | 1.0 |
| RRM-13.1 | 107 | -- | -- | 9.2 | 49 | 8 | 1.2 | 1.4 | 1.1 | <0.25 | <0.25 | 0.1 | 1.9 | 2.4 | 1.1 |
| RRM-14.6 | 108 | -- | -- | 9.4 | 7.6 | 8.1 | 1.2 | 1.2 | 1.0 | <0.25 | <0.25 | 0.1 | 2.0 | 2.5 | 1.0 |
| RRM-19.0 | 109 | -- | -- | 11.2 | 7.8 | 7.8 | 1.1 | 1.1 | 0.8 | <0.25 | <0.25 | 0.1 | 1.8 | 2.4 | 2.2 |
| RRM-22.4 | 113 | -- | -- | 8.8 | 7.7 | 8.1 | 1.1 | 1.3 | 1.0 | <0.25 | <0.25 | 0.1 | 1.8 | 2.4 | 2.5 |
| SFS-01 | 158 | 89 | 116 | 13.1 | 8.0 | 10.3 | 1.9 | 1.0 | 1.0 | <0.25 | <0.25 | 0.1 | 2.0 | 2.2 | 1.4 |
| NR-01 | 117 | 42 | 53 | 9.7 | 6.7 | 7.3 | 2.1 | 0.8 | 0.9 | <0.25 | <0.25 | 0.1 | 1.7 | 1.6 | 1.0 |
| NR-02 | 130 | 53 | 66 | 14.6 | 8.6 | 9.5 | 2.8 | 1.1 | 1.3 | <0.25 | <0.25 | 0.1 | 2.0 | 2.1 | 1.0 |

**Note:**
--: Not collected
[1] Hardness collected at areas sampled for metals.

**Sediment Detections:**
**Metals March, April and May**
**Phase I System Characterization**
**Ecological Study**

| Analyte | Units | Screening Criteria TEL | Screening Criteria PEL | Number of Detections/Number of Samples | Number of Exceedances (TEL) | Location of Maximum Detected | Number of Detections/Number of Samples | Maximum Detected (mg/kg) | Number of Exceedances (TEL) | Location of Maximum Detected | Number of Detections/Number of Samples | Maximum Detected (mg/kg) | Number of Exceedances (TEL) | Location of Maximum Detected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | March | | | April | | | | May | | | |
| CADMIUM | ug/kg | 0.596 | 3.53 | 8/8 | 0 | RRM-0.6 | 8/8 | 0.515 | 0 | RRM-8.7 | 8/8 | 6.965 | 8 | RRM-3.0 |
| CHROMIUM | ug/kg | 37.3 | 90 | 8/8 | 7 | RRM-8.7 | Not Available Laboratory will provide updated results. | | | | 8/8 | 91.97 | 8 | RRM-8.7 |
| COPPER | ug/kg | 35.7 | 197 | 8/8 | 4 | RRM-8.7 | | | | | 8/8 | 80.43 | 8 | RRM-8.7 |
| LEAD | ug/kg | 35 | 91.3 | 8/8 | 1 | RRM-0.6 | 8/8 | 46.16 | 4 | RRM-0.6 | 8/8 | 50.59 | 3 | RRM-0.6 |
| SELENIUM | ug/kg | NA | NA | 1/8 | -- | RRM-0.6 | 0/8 | -- | -- | -- | 0/8 | -- | -- | -- |
| ZINC | ug/kg | 123.1 | 315 | 8/8 | 5 | RRM-0.6 | 8/8 | 244 | 7 | RRM-0.6 | 8/8 | 174.2 | 3 | RRM-0.6 |

Note:
NA - Not Available
TEL - Threshold Effects Level
PEL - Probable Effects Level
Screening Criteria source - NOAA 1999
Screening criteria are reported in mg/kg.

**Surface Water Detections:**
**Metals March, April and May**
**Phase I System Characterization**
**Ecological Study**

| Analyte | units | Total (T)/ Diss. (D) | Minimum Screening Criteria (VAWQC)1 | Number of Detections/ Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection | Minimum Screening Criteria (VAWQC)1 | Maximum Detected | Number of Exceedances | Location of Maximum Detection | Minimum Screening Criteria (VAWQC)1 | Number of Detections/ Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | March | | | | | April | | | | May | | | | |
| Cadmium | ug/l | D | 1.1 | 7/8 | 0.03 | 0 | -- | 0.58 | 0.03 | 0 | RRM-0.6, RRM-7.1 & RRM-8.7 | 0.68 | 6/8 | 0.025 | 0 | RRM-0.6 |
| Chromium | ug/l | D | 72 | 8/8 | 0.38 | 0 | -- | 36 | 0.21 | 0 | RRM-0.6 | 44 | 2/8 | 0.06 | 0 | RRM-3.0 |
| Copper | ug/l | D | 8.7 | 8/8 | 1.7 | 0 | -- | 4.3 | 1.4 | 0 | RRM-3.0 | 5.2 | 6/8 | 1.17 | 0 | RRM-3.0 |
| Lead | ug/l | D | 13 | 8/8 | 0.33 | 0 | -- | 4.5 | 0.09 | 0 | NR-02 | 5.9 | 8/8 | 0.56 | 0 | NR-01 |
| Selenium | ug/l | D | 5.0 | 0/8 | -- | 0 | -- | 5.0 | -- | 0 | -- | 5.0 | 4/8 | 0.18 | 0 | RRM-0.6 |
| Zinc | ug/l | D | 114 | 8/8 | 6.6 | 0 | -- | 57 | 3.7 | 0 | NR-02 | 68 | 8/8 | 3.85 | 0 | RRM-3.0 |

Note:
Chronic freshwater values were used as the VAWQC screening criteria
Screening criteria reported in ug/l
VAWQC - Virginia Ambient Water Quality Criteria (2006)
1 Values for all metals with the exception of selenium are adjusted for location specific hardness.

**Crayfish Detections:**
**Metals March, April and May**
**Phase I System Characterization**
**Ecological Study**

| Analyte | Units | Number of Detections/ Number of Samples | Minimum Detected | Maximum Detected | Location of Maximum Detected | Number of Detections/ Number of Samples | Minimum Detected | Maximum Detected | Location of Maximum Detected | Number of Detections/ Number of Samples | Minimum Detected | Maximum Detected | Location of Maximum Detected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | March | | | | April | | | | May | | | |
| CADMIUM | mg/kg | 9/9 | 0.023 | 0.17 | SR-01 | 8/8 | 0.024 | 0.141 | RRM-3.0 | 8/8 | 0.009 | 0.039 | RRM-3.0 |
| CHROMIUM | mg/kg | 7/9 | 0.13 | 0.66 | RRM-0.6 & RRM-22.4 | 6/8 | 0.22 | 1.81 | RRM-3.0 | 2/8 | 0.12 | 0.17 | RRM-8.7 |
| COPPER | mg/kg | 9/9 | 18.47 | 53.78 | RRM-8.7 | 8/8 | 10.47 | 72.32 | RRM-0.6 | 8/8 | 7.16 | 49.57 | RRM-8.7 |
| LEAD | mg/kg | 9/9 | 0.16 | 0.47 | RRM-0.6 & RRM-3.0 | 8/8 | 0.03 | 0.64 | RRM-3.0 | 8/8 | 0.08 | 0.22 | RRM-0.6 |
| SELENIUM | mg/kg | 9/9 | 0.46 | 0.86 | RRM-0.6 | 8/8 | 0.14 | 0.44 | RRM-8.7 | 8/8 | 0.22 | 1.27 | RRM-8.7 |
| ZINC | mg/kg | 9/9 | 22.12 | 31.29 | RRM-8.7 | 8/8 | 11.14 | 23.02 | SFS-01 | 8/8 | 6.09 | 21.84 | RRM-0.6 |

**Sediment Detections:**
**SVOCs March, April, May and June**
**Phase I System Characterization**
**Ecological Study**

| Analyte | Units | Screening Criteria | | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances (TEL) | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances (TEL) | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances (TEL) | Location of Maximum Detection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TEL | PEL | MARCH | | | | APRIL | | | | MAY | | | |
| ANTHRACENE | ug/kg | NA | NA | -- | -- | -- | -- | 1/7 | 350 | -- | RRM-3.0 | 1/7 | 170 | -- | RRM-0.6 |
| BENZO(A)ANTHRACENE | ug/kg | 31.7 | 385 | 1/7 | 2000 | 1 | RRM-3.0 | 2/7 | 2500 | 2 | RRM-3.0 | 3/7 | 1400 | 3 | RRM-0.6 |
| BENZO(A)PYRENE | ug/kg | 31.9 | 782 | 1/7 | 1900 | 1 | RRM-3.0 | 2/7 | 2200 | 2 | RRM-3.0 | 3/7 | 1700 | 3 | RRM-0.6 |
| BENZO(B)FLUORANTHENE | ug/kg | NA | NA | 1/7 | 3400 | -- | RRM-3.0 | 3/7 | 3100 | -- | RRM-3.0 | 3/7 | 3200 | -- | RRM-0.6 |
| BENZO(G,H,I)PERYLENE | ug/kg | NA | NA | 1/7 | 1600 | -- | RRM-3.0 | 3/7 | 1200 | -- | RRM-3.0 | 3/7 | 1600 | -- | RRM-0.6 |
| BENZO(K)FLUORANTHENE | ug/kg | NA | NA | 1/7 | 1400 | -- | RRM-3.0 | 2/7 | 1100 | -- | RRM-3.0 | 2/7 | 1100 | -- | RRM-0.6 |
| CHRYSENE | ug/kg | 57.1 | 862 | 1/7 | 2600 | 1 | RRM-3.0 | 3/7 | 2900 | 3 | RRM-3.0 | 3/7 | 2300 | 3 | RRM-0.6 |
| DIBENZ(A,H)ANTHRACENE | ug/kg | NA | NA | -- | -- | -- | -- | 2/7 | 410 | -- | RRM-3.0 | 1/7 | 380 | -- | RRM-0.6 |
| FLUORANTHENE | ug/kg | 111 | 2355 | 1/7 | 3800 | 1 | RRM-3.0 | 3/7 | 2900 | 3 | RRM-3.0 | 4/7 | 3900 | 3 | RRM-0.6 |
| INDENO(1,2,3-CD)PYRENE | ug/kg | NA | NA | 1/7 | 1500 | -- | RRM-3.0 | 2/7 | 1000 | -- | RRM-3.0 | 3/7 | 1500 | -- | RRM-0.6 |
| PHENANTHRENE | ug/kg | 41.9 | 515 | 1/7 | 1900 | 1 | RRM-3.0 | 2/7 | 1800 | 2 | RRM-3.0 | 3/7 | 1600 | 3 | RRM-0.6 |
| PYRENE | ug/kg | 53 | 875 | 1/7 | 3300 | 1 | RRM-3.0 | 3/7 | 3600 | 3 | RRM-3.0 | 3/7 | 3600 | 3 | RRM-0.6 |

| Analyte | Units | Screening Criteria | | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances (TEL) | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances (TEL) | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances (TEL) | Location of Maximum Detection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TEL | PEL | JUNE | | | | JULY | | | | AUGUST | | | |
| ANTHRACENE | ug/kg | NA | NA | -- | -- | -- | -- | Data Not Available | | | | Data Not Available | | | |
| BENZO(A)ANTHRACENE | ug/kg | 31.7 | 385 | 2/6 | 760 | 2 | RRM-0.6 | | | | | | | | |
| BENZO(A)PYRENE | ug/kg | 31.9 | 782 | 2/6 | 990 | 2 | RRM-0.6 | | | | | | | | |
| BENZO(B)FLUORANTHENE | ug/kg | NA | NA | 3/6 | 1700 | 3 | RRM-0.6 | | | | | | | | |
| BENZO(G,H,I)PERYLENE | ug/kg | NA | NA | 2/6 | 840 | 2 | RRM-0.6 | | | | | | | | |
| BENZO(K)FLUORANTHENE | ug/kg | NA | NA | 2/6 | 600 | 2 | RRM-0.6 | | | | | | | | |
| CHRYSENE | ug/kg | 57.1 | 862 | 3/6 | 1400 | 3 | RRM-0.6 | | | | | | | | |
| DIBENZ(A,H)ANTHRACENE | ug/kg | NA | NA | 1/6 | 180 | -- | RRM-0.6 | | | | | | | | |
| FLUORANTHENE | ug/kg | 111 | 2355 | 3/6 | 1900 | 3 | RRM-0.6 | | | | | | | | |
| INDENO(1,2,3-CD)PYRENE | ug/kg | NA | NA | 2/6 | 760 | -- | RRM-0.6 | | | | | | | | |
| PHENANTHRENE | ug/kg | 41.9 | 515 | 2/6 | 830 | 2 | RRM-0.6 | | | | | | | | |
| PYRENE | ug/kg | 53 | 875 | 3/6 | 2200 | 3 | RRM-0.6 | | | | | | | | |

Note:
NA - Not available
Screening criteria reported in ug/kg.
TEL - Threshold Effects Level
PEL - Probable Effects Level
Screening Criteria source - NOAA 1999

**Surface Water Detections:**
**SVOCs and OCPs March, April, May, and June**
**Phase I System Characterization**
**Ecological Study**

| Analyte | Units | Total (T) or Dissolved (D) | Screening Criteria (VAWQC) | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MARCH | | | | APRIL | | | | MAY | | | |
| GAMMA BHC - LINDANE | ug/l | T | NA | 2/7 | 0.0025 | -- | RRM-3.0 | 2/7 | 0.0033 | -- | RRM-3.0 | 4/7 | 0.0032 | -- | RRM-0.6 |
| HEPTACHLOR | ug/l | T | 0.0038 | 1/7 | 0.0034 | 0 | RRM-8.7 | 1/7 | 0.0034 | -- | RRM-3.0 | 1/7 | 0.0047 | 1 | RRM-8.7 |

| Analyte | Units | Total (T) or Dissolved (D) | Screening Criteria (VAWQC) | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection | Number of Detections/Number of Samples | Maximum Detected | Number of Exceedances | Location of Maximum Detection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | JUNE | | | | JULY | | | | AUGUST | | | |
| GAMMA BHC - LINDANE | ug/l | T | NA | 4/7 | 0.0041 | -- | RRM-8.7 | DATA NOT AVAILABLE | | | | DATA NOT AVAILABLE | | | |
| HEPTACHLOR | ug/l | T | 0.0038 | -- | -- | -- | -- | | | | | | | | |

Note:
Chronic freshwater values were used for VAWQC screening criteria.
Screening criteria reported in ug/l.
VAWQC - Virginia Ambient Water Quality Criteria (2006)
NA - Not available

**Crayfish Tissue Detections:**
**SVOCs March, April and May**
**Phase I System Characterization**
**Ecological Study**

| Analyte | Units | Number of Detections/ Number of Samples | Maximum Detected | Location of Maximum Detected | Number of Detections/ Number of Samples | Maximum Detected | Location of Maximum Detected | Number of Detections/ Number of Samples | Maximum Detected | Location of Maximum Detected |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MARCH | | | APRIL | | | MAY | | |
| ACENAPHTHENE | ug/kg | -- | -- | -- | 2/7 | 17 | RRM-3.0 | 0/7 | -- | -- |
| ACENAPHTHYLENE | ug/kg | 1/7 | 12 | NR-01 | 2/7 | 20 | RRM-3.0 | 0/7 | -- | -- |
| ANTHRACENE | ug/kg | 1/7 | 150 | NR-01 | 6/7 | 130 | RRM-3.0 | 0/7 | -- | -- |
| BENZO(A)ANTHRACENE | ug/kg | 1/7 | 150 | NR-01 | 4/7 | 180 | RRM-3.0 | 0/7 | -- | -- |
| BENZO(A)PYRENE | ug/kg | 1/7 | 140 | NR-01 | 5/7 | 160 | RRM-3.0 | 0/7 | -- | -- |
| BENZO(B)FLUORANTHENE | ug/kg | 1/7 | 150 | NR-01 | 3/7 | 170 | RRM-3.0 | 0/7 | -- | -- |
| BENZO(G,H,I)PERYLENE | ug/kg | 1/7 | 150 | NR-01 | 4/7 | 150 | RRM-3.0 | 0/7 | -- | -- |
| BENZO(K)FLUORANTHENE | ug/kg | 1/7 | 150 | NR-01 | 3/7 | 160 | RRM-3.0 | 0/7 | -- | -- |
| CHRYSENE | ug/kg | 2/7 | 160 | NR-01 | 6/7 | 170 | RRM-3.0 | 0/7 | -- | -- |
| DIBENZ(A,H)ANTHRACENE | ug/kg | 1/7 | 140 | NR-01 | 4/7 | 130 | RRM-3.0 | 0/7 | -- | -- |
| FLUORANTHENE | ug/kg | 1/7 | 150 | NR-01 | 5/7 | 170 | RRM-3.0 | 0/7 | -- | -- |
| FLUORENE | ug/kg | 1/7 | 51 | NR-01 | 3/7 | 54 | RRM-3.0 | 0/7 | -- | -- |
| INDENO(1,2,3-CD)PYRENE | ug/kg | 1/7 | 150 | NR-01 | 4/7 | 140 | RRM-3.0 | 0/7 | -- | -- |
| NAPHTHALENE | ug/kg | -- | -- | -- | 1/7 | 11 | NR-01 | 0/7 | -- | -- |
| PHENANTHRENE | ug/kg | 1/7 | 130 | NR-01 | 5/7 | 120 | RRM-3.0 | 0/7 | -- | -- |
| PYRENE | ug/kg | 1/7 | 150 | NR-01 | 7/7 | 200 | RRM-3.0 | 0/7 | -- | -- |

Note:
NA - Not available
Screening criteria reported in ug/kg.