SITE ASSESSMENT FOR PROPOSED COKE POINT DREDGED MATERIAL CONTAINMENT FACILITY AT SPARROWS POINT

BALTIMORE COUNTY, MARYLAND

APPENDIX B

Analytical Methods

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APPENDIX B. SAMPLE MANAGEMENT

Soil, sediment, and site water were collected during the field sampling for the Sparrows Point Site Assessment. This appendix discusses the sample management during sample collection and analytical processing.

B.1 *IN-SITU* WATER QUALITY MEASUREMENTS

Water quality measurements were recorded *in situ* at sampling locations using a YSI water quality probe. Measurements were recorded at the surface, mid-depth, and bottom (one foot from the sediment / water interface) of the water column for the site water, surface sediment, and subsurface sediment phases. The following parameters were recorded in the field log book:

- Sampling location number
- Sampling date and time
- Water depth
- Water temperature (degrees Celsius)
- Salinity (parts per thousand)
- pH
- Dissolved oxygen (milligrams per liter)
- Turbidity (nephalometric turbidity units [NTUs])

The water quality measurements for the site water sampling are presented in **Table B-1**. Water quality measurement taken during surface and subsurface sediment sampling are presented in **Table B-2** and **B-3**, respectively. A copy of the project logbook with the raw data is located in **Appendix A**.

B.2 SITE WATER COLLECTION

Site water for chemical analysis was collected at the surface, mid-depth, and bottom (one foot from the sediment / water interface) of the water column at 18 sampling locations. Water was collected using an ISCO pump with dedicated Tygon tubing from EA's 28-ft work vessel. Water for analytical testing was stored in certified cleaned, laboratory-prepared containers with appropriate preservatives. Water samples were shipped via overnight delivery to TestAmerica–Pittsburgh on the day of collection.

Water samples were analyzed for VOCs and PAHs. Holding times for the site water began when the samples were collected and placed into the appropriate sample containers. Sample containers, preservation techniques, and holding time requirements for site water and equipment blanks are provided in **Table B-4**.

B.3 SURFACE SEDIMENT COLLECTION

Surface sediment samples were collected at 19 sampling locations to approximately 1-ft below the sediment surface using a stainless steel Van Veen grab sampler. Surface sediment samples were analyzed for metals (including mercury), VOCs, PAHs, cyanide, total organic carbon

(TOC), total solids, grain size, and moisture content. VOC samples were collected using Terra Cores. VOC samples were collected from the grab sample immediately after collection, prior to sample homogenization.

After VOC samples were collected, the remaining sediment was thoroughly homogenized, placed into appropriate laboratory-cleaned containers using stainless steel spoons, and shipped via overnight delivery to TestAmerica–Pittsburgh on the day of collection. At one location (BH-SED-03A) an additional sediment sample was collected for PAH fingerprinting analysis. Sediment samples collected during each workday were stored in cooled, insulated containers onboard the work boat.

The sample containers, preservation techniques, and holding time requirements for sediment samples are provided in **Table B-4**. Because the surface sediment was not collected in a core liner, the holding time was initiated at sample collection.

B.4 SUBSURFACE SEDIMENT AND SOIL COLLECTION

Subsurface sediment samples were initially collected at a total of 24 locations around the Peninsula. Subsurface sediment samples were collected with a hollow stem auger (HSA). A SPT split spoon device was used to collect samples and rigid plastic core liners were placed inside the SPT to obtain sediment samples. Target depths for the subsurface samples were 30 ft below the sediment/water interface or to native material.

Three soil samples were collected from each of the 10 initial boreholes drilled within the Benzol Processing Area and Coal Tar Storage Area. One to three soil samples were collected in the six additional boreholes drilled in the Benzol Processing Area for LNAPL delineation. Soil samples were also collected with a HSA.

Soils and sediments were divided into two-foot intervals during the boring and boring logs were recorded. Each two foot interval was screened with a PID and select samples were tested for the presence of NAPL with the Sudan IV shaker test. Based on the results of the field screening and visual observation, soil and sediment samples from impacted intervals were chosen for analytical testing.

Sediment and soil samples chosen were analyzed for metals (including mercury), VOCs, PAHs, and cyanide. Sediment samples were also tested for TOC, total solids, grain size, and moisture content. Cores were sampled for VOC analysis using the Terra Core sampling method. VOC samples were collected from the core sample as soon as possible after collection, prior to sample homogenization. Samples were than thoroughly homogenized, placed into appropriate laboratory-cleaned containers, and shipped via overnight delivery to TestAmerica–Pittsburgh on the day of collection. Samples for PAH and MAH fingerprinting were also shipped on the day of collection via overnight delivery to META Environmental, Inc. (META). The sample containers, preservation techniques, and holding time requirements for soil and sediment samples are provided in **Table B-4**. Because the subsurface sediment and the soil were processed in the field, the holding time was initiated at sample collection.

B.5 CHAIN-OF-CUSTODY RECORDS

Samples collected in the field were documented on a COC sheet that included the date and time the sample was collected, the analyses requested, and the signatures of the personnel who collected and relinquished the samples. This COC accompanied all samples shipped for sample analyses. Copies of COCs for the onshore and offshore phases of the Sparrows Point Site Assessment are located in **Appendix B**.

B.6 ANALYTICAL TESTING PROGRAM

Analytical testing of soil, sediment, site water, and NAPL was conducted by three laboratories: META Environmental, Inc. (META), PTS Laboratories, Inc. (PTS), and TestAmerica. META Environmental performed polycyclic aromatic hydrocarbon (PAH) and monocyclic aromatic hydrocarbon (MAH) fingerprinting and compound-specific stable carbon isotope ratios (CSIR) with support from Oklahoma University. PTS performed the physical NAPL analyses to determine potential mobility of the NAPL. TestAmerica-Pittsburgh performed the metals, VOCs, PAHs, cyanide, TOC and toxicity characteristic leaching procedure (TCLP), with support from TestAmerica-Burlington (grain size).

Soils and sediments were tested for the following target compounds:

- volatile organic compounds (VOCs),
- polycyclic aromatic hydrocarbons (PAHs),
- metals,
- cyanide,
- total organic carbon (TOC) (sediment only),
- grain size (sediment only),
- moisture content (sediment only),
- PAH and MAH fingerprinting (sediment only), and
- Compound-specific stable carbon isotope ratios (CSIR) (sediment only).

Water samples and NAPL samples were tested for the following target compounds:

- VOCs and
- PAHs.

NAPL samples were also tested for the following physical characteristics:

- specific gravity,
- interfacial tension,
- surface tension, and
- wettability index (only selected NAPL samples).

TCLP analysis was performed on investigation derived wastes (IDW) which were contained in drums both onshore and offshore on the barge where soil and sediment processing occurred. TCLP analysis determines how a drum with IDW can be disposed and the results of the TCLP

analysis are available in **Attachment I**. As part of the TCLP, the concentrations of eight metals, nine pesticides and herbicides, eleven SVOCs, and ten VOCs were determined.

Target analytes, target detection limits, analytical methodologies, and sample holding times were derived from the following guidance documents:

- USEPA/USACE, 1998 (EPA-823-B-98-004). *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.-Testing Manual (Inland Testing Manual).*
- USACE, 2003. (ERDC/EL TR-03-1). *Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Testing Manual*. (*Upland Testing Manual*).
- USEPA/USACE, 1995 (EPA-823-B-95-001). *QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations*.
- USEPA, 2001. *Methods for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual.*
- USEPA, 1997. *Test Methods for Evaluating Solid Waste. Physical/Chemical Methods.* EPA SW 846, 3rd edition, including Final Update III. USEPA, Washington, D.C. June.

The analytical program for this project is described in detail in the work plan (EA 2008). The work plan was reviewed and approved by MES and the Maryland Port Administration (MPA) prior to initiation of the analytical testing program. The analytical methods, detection limits, and laboratory quality control programs are presented below for META Environmental, PTS and TestAmerica laboratories (where available). Sediment sample weights were adjusted for percent moisture (up to 50 percent moisture) prior to analysis to achieve the lowest possible detection limits. Analytical results are reported on a dry weight basis. Definitions of inorganic and organic data qualifiers are presented in **Tables B-5** and **B-6**, respectively.

Following analysis the data from TestAmerica and META were validated according to the guidance document: USEPA, 1995. *Innovative Approaches to Data Validation.* USEPA-Region III. June. Any data that did not meet the validation requirements ("R" qualified) was not presented in this report. The data validation qualifiers for inorganic, organic, and metals are presented in **Tables B-7 to B-9**, respectively.

B.7 META ENVIRONMENTAL

Seven sediment samples and five soil samples were submitted to META for characterization. Seven of the sediment samples were collected in the vicinity of Sparrows Point and one sediment sample was a reference sample to represent offsite background conditions. Of the soil samples submitted to META for characterization, three were in the Benzol Processing Area and two were

in the Coal Tar Storage Area. The following samples were submitted for PAH fingerprint analysis:

Samples Submitted for PAH Fingerprint Analysis

Location	Sample ID
Benzol Processing Area	BP-SO-B03-18
	BP-SO-05-6
	BP-SO-02S
Coal Tar Storage Area	CT-SO-B01-20
	CT-SO-B05-20
Offshore	BH-SED-03A-00
	BH-SED-03A-12
	BH-SED-03E-2
	BH-SED-05-4
	BH-SED-10-2
	BH-SED-13C-6
	REFERENCE

B.7.1 Analytical Methods

Two analyses were performed by META, PAH and MAH fingerprinting and CSIR. The analyses were performed following the methods below.

PAH and MAH Fingerprinting

For PAH and MAH fingerprinting, the sediment samples were prepared by solvent extraction (USEPA 3570) using dichloromethane (DCM). The extracts were spiked with internal standards and analyzed by gas chromatography / flame ionization detection (GC/FID) (USEPA 8100M) for fingerprinting and GC / Mass Spectrometry (MS) / Selected Ion Monitoring (SIM) (USEPA 8270M) for PAHs and MAHs, alkyl PAH homologues and other selected compounds. Once the chromatograms are produced using the GC/MS the chemist might go "peak-by-peak" looking for similarities and differences, comparing peak ratios, and looking for indicator compounds [as described in American Society for Testing and Materials (ASTM) Method D 5739-95].

Compound-Specific Stable Carbon Isotope Ratios (CSIR)

CSIR was performed at Oklahoma University where samples were analyzed by GC / isotope ratio mass spectrometer (IRMS) for stable carbon isotope ratios of PAHs and other semivolatile compounds. Samples were prepared by an appropriate extraction and concentration technique, such as USEPA Methods 3510, 3540C and 3545. The extracts were analyzed using a GC coupled with an IRMS via a combustion furnace heated at 1,050°C and a water trap. A similar capillary GC column is used to imitate standard GC/MS conditions. There are no standard methods for GC/IRMS.

The isotopic composition of carbon is expressed relative to a references standard that can be traced to the Peedee belemnite (PDB) standard of the University of Chicago. The results are expressed in parts per thousand (‰).

B.7.2 Detection Limits

The detection limit is a statistical concept that corresponds to the minimum concentration of an analyte above which the net analyte signal can be distinguished with a specified probability from the signal because of the noise inherent in the analytical system. The method detection limit (MDL) was developed by USEPA, and is defined as "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero" (40 CFR 136, Appendix B). Method detection limits for PAH and MAH fingerprinting are listed in **Table B-10**.

B.7.3 Laboratory Quality Control Samples

Laboratory quality control samples are analyzed according to the META's *Laboratory Quality Assurance Plan* (META 2006) and were analyzed at a minimum at the frequency stated in the following table.

QC Sample	Frequency
Surrogate Spikes	Added to every sample, blank and spike just prior to extraction
Method (Extraction) Blanks	1 per analytical batch
Blank Spikes	1 per analytical batch
Duplicate Samples	A minimum of 1 per 20 samples, per extraction method
Internal Standards	Many methods require the addition of internal standards to every sample, blank and spike extracts.
Matrix Spike/Matrix Spike Duplicate	1 per analytical batch of 1-20 samples, per extraction method.

PAH and MAH Surrogate Spikes

Extraction surrogates were added to all the samples, blanks and spikes prior to extraction to monitor the extraction procedure. Surrogates recovered within the range of 50 to 120 percent were considered acceptable.

PAH and MAH Method Blanks

The method (reagent) blank is used to monitor laboratory contamination. The method blank is usually a sample of laboratory reagent water processed through the same analytical procedure as the sample (i.e., digested, extracted, distilled). Four blanks were analyzed during the PAH and MAH fingerprinting.

PAH and MAH Blank Spikes

A blank spike sample is a method blank spiked with a known concentration of various compounds added to it and then processed through the same analytical procedure as the samples. Blank spikes were analyzed to ensure that each of the spiked compounds was recovered within the criteria. Spiked compound recovery criteria are specific to each method, but are approximately 60 to 120 percent. Four blank spikes were run during the PAH and MAH fingerprinting.

PAH and MAH Duplicate Samples

A duplicate sample is a second aliquot of a field sample that is analyzed to monitor analytical precision associated with that particular sample. Four of the eight samples were analyzed in duplicate.

PAH and MAH Internal Standards

Internal standards are required for most methods and are added to every sample, spike and blank after extraction. Internal standard recovery criteria are specific to each method, but generally for GC/MS analysis the internal standard area must be 50 to 200 percent of the most recent, previous internal standard area and must be within 15 percent of the most recent previous continuing calibration internal standard area.

Isotope Standards

Standard mixtures at known concentrations and with known isotope ratios were analyzed prior to sample analysis and periodically after to demonstrate the performance and the stability of the IRMS. If samples analysis occurs over several days, the precision of the isotope values in the standard mix was used to estimate the variability in the analysis due to instrumental parameters.

Isotope Spikes

The accuracy of the data was monitored with a set of standard compounds of known isotopic composition (fully denatured n-alkanes C9, C10, C16, C19, C24, and C32) which were added to the SVOC samples. Each sample was analyzed at least two times and the standard deviations of the replicates were calculated for each internal spike and each PAH compound to estimate reproducibility. Analytes that showed unexpectedly high standard deviations (greater than 0.5) were examined for coelutions and their isotopic values determined from a portion of the peak with minimum interference.

B.8 PTS LABORATORIES

The physical properties of NAPL including specific gravity, interfacial tension, and surface tension were analyzed according to the following methods: ASTM D445, ASTM D1481 and ASTM D971. The wettability index of selected NAPL samples was analyzed using the United States Bureau of Mines (USBM) method.

B.9 TESTAMERICA

B.9.1 Analytical Methods

All inorganic and organic compounds analyzed for this project by TestAmerica were determined using the methods listed in **Table B-11**, as described in the laboratory's analytical standard operating procedures (SOPs). To meet program-specific regulatory requirements for chemicals of concern, all TestAmerica methods/SOPs were followed as stated with some specific requirements noted below:

Total Organic Carbon (TOC)
TOC in sediments was determined using the 1988 USEPA-Region II combustion oxidation procedure (the Lloyd Kahn procedure).

Polycyclic Aromatic Hydrocarbons (PAHs)
To achieve the target detection limits (TDLs) referenced in *QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations* (EPA 823-B-95-001, April 1995), the PAHs were determined utilizing SW846 Method 8270C using Selective Ion Monitoring (SIM).

Metals
Because of potential matrix interferences, metals were determined utilizing Inductively Coupled Plasma/ Mass Spectrometry (ICP/MS) according to the methodology specified, except for mercury. For mercury, samples were analyzed by Cold Vapor Atomic Absorption (CVAA) method (SW846 7471A).

Cyanide
Total cyanide was determined by method SW846 9012A. The laboratory reporting limit (RL) using this method is higher than the requested target detection limit, however, this method represents the best available technology for total cyanide determination and, therefore, the lowest possible reporting limit.

Toxicity Characteristic Leaching Procedure (TCLP)
The sediment composites were extracted following the TCLP methods specified in SW846 Method 1311. The resultant leachates were analyzed for metals, VOCs, SVOCs, chlorinated pesticides and herbicides.

B.9.2 Detection Limits

Quantitation limits applicable to this project are listed in **Tables B-12** through **B-14** for soil/sediment, aqueous, and TCLP samples, respectively. These tables include the Target Detection Limits (TDLs) referenced in the *QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations* (EPA 823-B-95-001, April 1995). All analytical parameters, except grain size analyses and wet chemistry parameters were quantified to the MDL. All detected values greater than or equal to

the MDL, but less than the laboratory reporting limit (RL), were qualified as estimated. Wet chemistry parameters were quantified to the RL.

MDL values used for soil/sediment, site water, and TCLP analyses are listed in **Tables B-12** through **B-14**, respectively. For sediment analyses, sample weights were adjusted for percent moisture (up to 50% moisture), when appropriate, prior to extraction/digestion to achieve the lowest possible reporting limits.

B.9.3 Laboratory Quality Control Samples

Quality control samples specified in the ITM were analyzed at the frequency stated in the following table. Standard Reference Materials (SRMs) were obtained from the National Institute of Standards and Technology (NIST) or a comparable source, if available. Acceptance criteria used are standard for the laboratory and can be provided upon request.

QC Sample	Frequency
Standard Reference Material	1 per analytical batch of 1-20 samples, where available
Method Blanks	1 per analytical batch of 1-20 samples
Laboratory Control Sample	1 per analytical batch of 1-20 samples
Surrogates	Spiked into all field and QC samples (Organic Analyses)
Sample Duplicates	1 per analytical batch of 1-20 samples (Inorganic Analyses)
Matrix Spike/Matrix Spike Duplicate	1 per analytical batch of 1-20 samples

Standard Reference Material

Standard reference materials (SRMs) represent performance-based QA/QC. A standard reference material is a soil/solution with a certified concentration that is analyzed as a sample and is used to monitor analytical accuracy.

SRMs were analyzed for the following matrix/fractions:

- **Soil**: metals, PAHs
- **Water**: PAHs
- **Sediment**: metals, PAHs

Control criteria apply only to those analytes having SRM true values greater than 10 times the MDL established for the method. Results of the SRMs analyses can be found in Attachment I, II and III for soils, site water, and sediments respectively.

Method Blanks

The method (reagent) blank is used to monitor laboratory contamination. The method blank is usually a sample of laboratory reagent water processed through the same analytical procedure as

the sample (i.e., digested, extracted, distilled). One method blank was analyzed at a frequency of one per every analytical preparation batch of 20 or fewer samples.

Laboratory Control Sample

The Laboratory Control Sample (LCS) is a fortified method blank consisting of reagent water or solid fortified with the analytes of interest for single-analyte methods and selected analytes for multi-analyte methods according to the appropriate analytical method. LCS's were prepared and analyzed with each analytical batch, and analyte recoveries were used to monitor analytical accuracy and precision.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

A fortified sample (matrix spike) is an aliquot of a field sample that is fortified with the analyte(s) of interest and analyzed to monitor matrix effects associated with a particular sample. Samples to be spiked were chosen at random. The final spiked concentration of each analyte in the sample was at least 10 times the calculated MDL. A duplicate-fortified sample (matrix spike duplicate) was analyzed for every batch of 20 or fewer samples.

Sample Duplicates

A sample duplicate is a second aliquot of a field sample that is analyzed to monitor analytical precision associated with that particular sample. Sample duplicates were performed for every batch of 20 or fewer samples for those analytes that did not have MS/MSD analyses.

Surrogates

Surrogates are organic compounds that are similar to analytes of interest in chemical composition, extraction, and chromatography, but are not normally found in environmental samples. These compounds were spiked into all blank, standards, samples, and spiked samples prior to analysis for organic parameters. Generally, surrogates are not used for inorganic analyses. Percent recoveries were calculated for each surrogate. Surrogates were spiked into samples according to the requirements of the reference analytical method. Surrogate spike recoveries were evaluated against standard limits used by the laboratory, and were used to assess method performance and sample measurement bias. If sample dilution caused the surrogate concentration to fall below the quantitation limit, surrogate recoveries were not calculated.

Table B-1. *In-Situ* Water Quality Measurements at Site Water Sampling Locations

Sparrows Point Site Assessment (2009)

Location	Depth (ft MLW)	Date	Time	Depth Interval	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
BH-W-01	21.2	2/2/2009	1126	Surface	3.58	9.71	12.1	8.44	6.6
				Mid-Depth	1.84	13.0	12.2	8.36	5.3
				Bottom	2.10	13.3	12.0	7.95	4.8
BH-W-02	7.2	2/2/2009	1203	Surface	3.07	9.53	14.0	8.38	5.3
				Mid-Depth	2.67	9.75	14.1	8.41	6.7
				Bottom	2.41	11.4	14.0	8.38	7.5
BH-W-03A	2.2	2/2/2009	1236	Surface	3.26	9.53	14.4	8.4	8.0
				Mid-Depth	3.00	9.65	14.5	8.38	6.7
				Bottom	2.46	10.0	14.8	8.44	4.0
BH-W-03B	10.8	2/2/2009	1336	Surface	2.65	9.28	14.3	8.43	4.3
				Mid-Depth	2.62	9.41	14.3	8.47	3.8
				Bottom	2.14	11.0	14.1	8.37	7.9
BH-W-03C	13.4	2/2/2009	1405	Surface	2.66	9.35	13.9	8.52	5.0
				Mid-Depth	2.28	10.5	13.9	8.47	4.5
				Bottom	1.91	11.3	13.8	8.41	5.0
BH-W-04	9.6	2/2/2009	1443	Surface	2.78	9.34	14.0	8.43	4.5
				Mid-Depth	2.60	9.45	13.7	8.56	4.8
				Bottom	2.18	10.3	13.6	8.60	8.0
BH-W-05	3.7	2/2/2009	1555	Surface	2.8	9.39	14.3	8.57	7.1
				Mid-Depth	2.82	9.38	13.8	8.61	7.1
				Bottom	2.74	9.44	13.8	8.61	6.9
BH-W-06	13.1	2/3/2009	1007	Surface	2.11	10.9	12.8	8.39	5.8
				Mid-Depth	2.10	11.0	12.8	8.45	5.9
				Bottom	2.21	13.2	12.4	8.26	7.5
BH-W-07	12.4	2/3/2009	1035	Surface	2.09	10.9	13.2	8.41	6.0
				Mid-Depth	2.08	11.0	13.1	8.44	6.5
				Bottom	2.11	11.3	12.9	8.39	7.3
BH-W-08	12.5	2/3/2009	1108	Surface	2.18	10.8	13.1	8.43	6.2
				Mid-Depth	2.19	11.0	13.0	8.43	8.6
				Bottom	2.18	11.1	13.2	8.44	9.1
BH-W-09	9.1	2/3/2009	1141	Surface	2.2	11.1	12.9	8.39	7.2
				Mid-Depth	2.2	11.1	12.9	8.44	7.1
				Bottom	2.19	11.3	12.8	8.46	9.0
BH-W-10	7.1	2/3/2009	1232	Surface	2.12	10.4	13.1	8.41	5.5
				Mid-Depth	2.11	10.5	13.1	8.5	5.4
				Bottom	2.13	10.7	13.0	8.5	6.0
BH-W-11	12.6	2/3/2009	1300	Surface	2.17	10.5	13.8	8.41	5.0
				Mid-Depth	2.22	10.8	13.7	8.44	5.5
				Bottom	2.28	11.3	13.5	8.41	6.3
BH-W-12	18.1	2/3/2009	1325	Surface	2.21	10.8	13.6	8.37	11.1
				Mid-Depth	2.17	11.0	13.6	8.48	7.0
				Bottom	2.18	13.1	13.1	8.23	6.3
BH-W-13A	6.0	2/3/2009	1349	Surface	2.25	10.9	13.8	8.31	10
				Mid-Depth	2.19	10.9	13.7	8.52	6.8
				Bottom	2.17	10.9	13.7	8.55	8.8

Table B-1. (continued)

Location	Depth (ft MLW)	Date	Time	Depth Interval	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
BH-W-13B	19.2	2/3/2009	1419	Surface	2.17	10.9	13.7	8.41	5.7
				Mid-Depth	2.14	11.5	13.4	8.32	5.6
				Bottom	2.19	13.1	12.6	8.08	5.7
BH-W-13C	31.8	2/3/2009	1446	Surface	2.18	11.0	13.1	8.53	14.2
				Mid-Depth	2.10	13.6	12.9	8.24	5.4
				Bottom	2.62	15.1	10.5	7.73	8.1
BH-W-14	23.9	2/3/2009	1515	Surface	2.26	11.0	13.4	8.55	6.4
				Mid-Depth	2.15	11.7	13.2	8.34	5.8
				Bottom	2.27	14.0	12.8	8.01	6.9

Table B-2. *In-Situ* Water Quality Measurements at Surface Sediment Sampling Locations

Sparrows Point Site Assessment (2009)

Location	Depth (ft MLW)	Date	Time	Depth Interval	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
BH-SED-01	23.5	2/6/2009	1050	Surface	3.07	12.5	13.9	8.03	7.3
				Mid-Depth	2.08	14.9	13.3	7.88	9.2
				Bottom	2.21	15.6	11.8	7.74	42.8
BH-SED-02	8.3	2/6/2009	1123	Surface	1.86	13.7	13.1	7.90	6.0
				Mid-Depth	1.66	14.7	12.9	8.04	7.1
				Bottom	1.66	14.9	12.9	8.03	7.1
BH-SED-03A	10.0	2/6/2009	1226	Surface	1.55	14.6	13.4	7.99	6.3
				Mid-Depth	1.49	14.6	13.3	8.06	6.9
				Bottom	1.41	14.5	13.2	8.07	6.9
BH-SED-03B	13.4	2/6/2009	1258	Surface	1.60	14.6	13.6	8.21	6.7
				Mid-Depth	1.49	14.7	13.6	8.21	7.0
				Bottom	1.44	14.9	13.5	8.13	7.3
BH-SED-03C	14.4	2/6/2009	1334	Surface	1.75	14.8	13.9	8.3	6.7
				Mid-Depth	1.58	14.6	13.8	8.19	7.3
				Bottom	1.57	14.6	13.4	8.19	7.2
BH-SED-04	8.7	2/6/2009	1402	Surface	1.85	14.8	14.2	8.27	7.3
				Mid-Depth	1.82	14.6	14.1	8.26	8.5
				Bottom	1.72	14.9	13.8	8.14	9.7
BH-SED-05	4.8	2/6/2009	1434	Surface	1.65	14.7	14.3	8.28	8.9
				Mid-Depth	1.59	14.7	14.1	8.32	8.5
				Bottom	1.48	14.7	14.1	8.32	8.5
BH-SED-06	12.7	2/9/2009	1023	Surface	2.00	9.7	14.2	8.42	5.2
				Mid-Depth	2.00	11.2	14.6	8.41	5.4
				Bottom	2.04	11.4	14.2	8.41	7.5
BH-SED-07	11.0	2/9/2009	1049	Surface	2.17	9.57	14.2	8.42	5.3
				Mid-Depth	2.09	10.3	14.2	8.50	5.4
				Bottom	2.19	13.3	14.0	8.33	8.1
BH-SED-08	12.6	2/9/2009	1112	Surface	2.08	9.00	14.2	8.56	4.7
				Mid-Depth	2.03	9.56	14.2	8.81	5.4
				Bottom	2.08	11.0	14.1	8.74	7.5
BH-SED-09	9.9	2/9/2009	1153	Surface	2.26	8.88	14.5	8.60	4.5
				Mid-Depth	2.08	9.97	14.7	8.55	6.3
				Bottom	2.01	10.6	14.8	8.54	7.3
BH-SED-10	8.1	2/9/2009	1217	Surface	2.45	9.14	14.4	8.76	5.0
				Mid-Depth	2.06	9.86	14.4	8.60	5.4
				Bottom	2.02	10.1	14.4	8.58	6.6
BH-SED-11	12.8	2/9/2009	1243	Surface	2.27	8.80	14.4	8.59	4.4
				Mid-Depth	2.13	9.12	14.4	8.59	4.9
				Bottom	2.04	14.2	14.0	8.17	10.5
BH-SED-12	16.4	2/9/2009	1305	Surface	2.33	8.74	14.4	8.55	4.5
				Mid-Depth	1.98	11.0	14.4	8.56	5.9
				Bottom	1.94	14.1	13.5	8.19	9.1
BH-SED-13A	10.6	2/9/2009	1421	Surface	2.95	8.87	14.6	8.62	4.3
				Mid-Depth	2.67	9.01	14.8	8.57	4.5
				Bottom	1.93	11.6	14.7	8.51	8.2

Table B-2. (continued)

Location	Depth (ft MLW)	Date	Time	Depth Interval	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
BH-SED-13B	22.4	2/9/2009	1438	Surface	2.71	8.84	14.6	8.60	4.5
				Mid-Depth	1.91	13.9	14.3	8.36	6.2
				Bottom	2.07	15.3	13.0	7.89	9.0
BH-SED-13C	29.2	2/9/2009	1503	Surface	2.81	8.84	14.6	8.58	4.5
				Mid-Depth	2.03	14.4	13.6	8.05	9.6
				Bottom	2.38	16.1	10.3	7.60	14.5
BH-SED-14	24.6	2/9/2009	1530	Surface	2.85	9.03	14.5	8.58	4.9
				Mid-Depth	2.38	10.9	14.5	8.43	7.4
				Bottom	2.07	14.8	12.3	8.02	10.6
REFERENCE	17.1	2/9/2009	1602	Surface	3.11	10.9	14.3	8.51	3.7
				Mid-Depth	2.88	13.4	14.6	8.45	4.9
				Bottom	2.47	14.8	13.7	7.06	16.2

Table B-3. *In-Situ* Water Quality Measurements at Subsurface Sediment Locations

Sparrows Point Site Assessment (2009)

Location	Depth (MLW ft)	Date	Time	Depth Interval	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
BH-SED-01	21.9	2/16/2009	1315	Surface	10.2	12.1	12.7	8.37	7.0
				Mid-Depth	4.58	13.3	13.7	8.27	5.9
				Bottom	4.26	13.3	13.5	8.11	15.0
BH-SED-02*	8.4	-	-	Surface	-	-	-	-	-
				Mid-Depth	-	-	-	-	-
				Bottom	-	-	-	-	-
BH-SED-03A	5.5	2/25/2009	1120	Surface	2.60	9.91	15.6	8.58	6.2
				Mid-Depth	-	-	-	-	-
				Bottom	2.75	11.4	15.7	8.59	9.8
BH-SED-03B	10.9	2/17/2009	1230	Surface	6.20	13.0	13.4	8.41	6.0
				Mid-Depth	4.34	13.3	13.9	8.40	8.7
				Bottom	4.22	13.2	13.9	8.38	7.9
BH-SED-03C	14.8	2/17/2009	1015	Surface	4.72	12.9	14.1	8.44	6.6
				Mid-Depth	4.13	13.2	14.2	8.45	7.3
				Bottom	4.13	13.5	14.0	8.37	8.1
BH-SED-03D	15.8	3/11/2009	1305	Surface	5.93	7.25	9.5	8.65	4.9
				Mid-Depth	5.72	7.73	9.3	8.58	4.7
				Bottom	5.26	8.54	7.7	8.26	6.7
BH-SED-03E	17.6	3/9/2009	1050	Surface	5.46	6.45	9.9	8.73	4.8
				Mid-Depth	4.99	7.02	10.1	8.71	4.5
				Bottom	4.56	8.76	9.3	8.47	5.0
BH-SED-04	12	3/4/2009	1605	Surface	3.48	11.3	12.8	8.59	6.7
				Mid-Depth	2.57	11.4	12.9	8.59	10.2
				Bottom	2.39	11.5	12.1	8.41	9.5
BH-SED-05	6.9	3/4/2009	1354	Surface	2.95	11.2	13.9	8.32	14.4
				Mid-Depth	2.42	11.6	13.4	8.20	8.6
				Bottom	2.41	11.5	13.0	8.16	8.3
BH-SED-06	14.6	2/17/2009	1458	Surface	5.24	9.93	14.6	8.62	3.4
				Mid-Depth	5.18	10.0	14.7	8.60	3.3
				Bottom	4.56	13.0	14.7	8.49	5.1
BH-SED-07	13.4	3/5/2009	1035	Surface	2.10	7.6	14.5	8.46	6.3
				Mid-Depth	2.57	10.2	13.7	8.40	6.5
				Bottom	2.56	10.6	13.5	8.39	7.5
BH-SED-08*	9.7	-	-	Surface	-	-	-	-	-
				Mid-Depth	-	-	-	-	-
				Bottom	-	-	-	-	-
BH-SED-09	10.8	2/26/2009	1555	Surface	3.59	5.59	15.7	8.82	7.0
				Mid-Depth	3.65	5.61	15.7	8.83	7.4
				Bottom	3.05	8.61	15.3	8.59	10.9
BH-SED-10	9.1	2/24/2009	1324	Surface	2.97	13.7	15.6	8.67	11.1
				Mid-Depth	2.94	14.2	15.7	8.68	11.7
				Bottom	2.90	13.8	15.7	8.65	10.9
BH-SED-11	13.1	2/24/2009	1555	Surface	2.97	13.4	15.6	8.53	13.2
				Mid-Depth	2.92	13.8	15.6	8.48	22.8
				Bottom	2.68	13.8	15.3	8.33	15.4

*No data were collected because of weather conditions

Table B-3. (continued)

Location	Depth (MLW ft)	Date	Time	Depth Interval	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
BH-SED-12	14.1	2/13/2009	1337	Surface	4.26	12.3	13.4	8.35	7.6
				Mid-Depth	4.10	12.4	13.5	8.34	7.0
				Bottom	3.88	12.6	13.3	8.24	7.2
BH-SED-13A	9.4	2/25/2009	1415	Surface	2.96	5.82	15.5	8.83	8.7
				Mid-Depth	2.47	6.32	15.3	8.78	7.9
				Bottom	2.66	13.5	15.0	8.54	9.4
BH-SED-13B	17.9	2/26/2009	1111	Surface	2.59	5.81	17.4	8.77	8.4
				Mid-Depth	2.75	13.3	16.6	8.44	8.6
				Bottom	2.97	13.8	13.5	8.00	9.6
BH-SED-13C	12.6	3/4/2009	1113	Surface	2.72	13.5	-	8.36	10.0
				Mid-Depth	2.20	11.5	-	8.37	13.1
				Bottom	2.45	11.7	-	8.35	10.6
BH-SED-14	24.5	2/26/2009	1318	Surface	3.12	5.74	15.7	8.75	6.6
				Mid-Depth	3.15	13.4	15.2	8.32	5.9
				Bottom	3.00	13.5	13.8	7.87	10.7
BH-SED-15	20.1	3/11/2009	1056	Surface	5.75	6.42	9.1	8.76	7.3
				Mid-Depth	5.38	7.58	9.0	8.72	6.9
				Bottom	3.40	13.1	5.9	7.80	15.0
BH-SED-16	15.9	3/12/2009	1020	Surface	5.68	8.33	8.1	8.53	18.1
				Mid-Depth	5.24	9.22	7.9	8.32	14.5
				Bottom	4.93	9.82	7.1	8.07	13.0
BH-SED-17	16.6	3/10/2009	1045	Surface	5.42	8.28	9.0	8.54	5.9
				Mid-Depth	5.05	8.60	8.8	8.47	5.6
				Bottom	4.39	9.76	7.9	8.22	7.6
BH-SED-18	18.2	3/10/2009	1233	Surface	5.34	8.02	9.8	8.63	5.5
				Mid-Depth	5.26	8.22	9.5	8.61	5.5
				Bottom	4.26	10.2	8.3	8.22	8.5

*No data were collected due to weather conditions

Table B-4. Sample Containers, Preservation Techniques, and Holding Times
Sparrows Point Site Assessment (2009)

Parameter	Analytical Method	Container	Preservation	Holding Time
ONSHORE SOILS AND OFFSHORE SEDIMENTS				
Volatile Organic Compounds	SW846 5035A/8260B	2 – Terra Cores	4±2°C	48 hours (prep) 14 days (analysis)
PAHs	SW846 8270C SIM	8 oz. wide-mouth glass, Teflon-lined cap	4±2°C	14 days (extraction) 40 days (analysis)
Metals	SW846 6010B and 7471A	8 oz. wide-mouth glass, Teflon-lined cap	4±2°C	180 days 28 days (Hg)
Cyanide	SW846 9012A	8 oz. wide-mouth glass, Teflon-lined cap	4±2°C	14 days
ONSHORE NAPL				
Volatile Organic Compounds	SW846 5035A/8260B	2 – 40 ml glass vials	4±2°C	14 days
PAHs	SW846 8270C SIM	2 – 40 ml glass vials	4±2°C	14 days (extraction) 40 days (analysis)
OFFSHORE SEDIMENTS ONLY				
Grain Size	ASTM D422	32 oz. glass	4±2°C	6 months
Moisture	D2216-90	4 oz. wide-mouth glass, Teflon-lined cap	4±2°C	NA
Total Organic Carbon	Lloyd Kahn	Same as 32 oz. Jar for grain size	4±2°C	14 days
PAH and Monocyclic Aromatic Hydrocarbon (MAH) Fingerprinting	EPA 8100M, EPA 8270M, ASTM D 5739-95	4 oz. wide-mouth glass, Teflon-lined cap	4±2°C	14 days (extraction) 40 days (analysis)
OFFSHORE SITE WATER				
Volatile Organic Compounds	SW846 8260B	3 – 40 ml glass vials	4±2°C HCl pH <2	14 days
PAHs	SW846 8270C SIM	2 – 1 liter amber glass	4±2°C	7 days (extraction) 40 days (analysis)
TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)				
Metals (including mercury)	SW846 1311, 6010B and 7470A	2 – 4 oz. wide-mouth glass, Teflon-lined cap	4°C	180 days (metals extraction) 28 days (mercury extraction) 28 days (analysis)
Volatile Organic Compounds	SW846 1311, 8260B	4 oz. wide-mouth glass, Teflon-lined cap	4°C (no headspace)	14 days (extraction) 14 days (analysis)
Semivolatiles, Pesticides, Herbicides	SW846 1311, 8270C/8081A/ 8151A	32 oz. wide-mouth glass, Teflon-lined cap	4°C	14 days (extraction) 7 days (preparative extraction) 40 days (analysis)

NA – Not Applicable

Table B-5. Inorganic Data Qualifiers

C ***(Concentration) qualifiers:***

B Estimated result; reported value is less than the project-specified Reporting Limit (RL), but greater than the method-specified Instrument Detection Limit (IDL) or Method Detection Limit (MDL).

U Analyte analyzed for but not detected (concentration is less than the method-specified Instrument Detection Limit (IDL) or MDL.

Q ***(Quality control) qualifiers:***

E Matrix interference; the serial dilution was outside of the percent difference control limits.

J Method blank contamination. This qualifier is used when the analyte is found in the associated method blank as well as in the sample. It indicates possible/probable blank contamination. For Gas Chromatography/ Mass Spectrophotometry (GC/MS) analyses, this qualifier is used for a Tentatively Identified Compound (TIC), as well as, for a positively identified target compound.

M Duplicate injection precision not met.

N Spiked sample recovery is not within control limits.

S Reported value is determined by the method of standard additions (MSA).

W Postdigestion spike for furnace Atomic Absorption Spectrophotometric (AAS) AAS analysis is out of control limits (85-115%) and sample absorbance is less than 50% of spike absorbance.

***** Duplicate analyses and/or relative percent difference (RPD) is not within control limits.

+ Correlation coefficient for MSA is less than 0.995.

Table B-6. Organic Data Qualifiers

C ***(Concentration) qualifiers:***

COL There was more than 40% difference between initial and confirmation results. The lower result was reported. (PCBs only)

EST PCB congeners flagged with "EST" indicate that the value is estimated because of coelution with another PCB congener

G Elevated reporting limit, reporting limit elevated because of matrix interference.

I Matrix interference

J Estimated result; reported value is less than the project-specified Reporting Limit (RL), but greater than the method-specified Instrument Detection Limit (IDL) or Method Detection Limit (MDL).

PG Compound was detected, but the percent difference between the original and confirmation analyses between the two GC columns is greater than 40%. The highest value is presented

Q Compound was detected, but as an estimated maximum possible concentration (EMPC).

U Analyte analyzed but not detected (concentration is less than the method-specified Instrument Detection Limit (IDL) or MDL.

Q ***(Quality control) qualifiers:***

A Tentatively identified compound is a suspected aldol condensation

B Method blank contamination. This qualifier is used when the analyte is found in the associated method blank as well as in the sample. It indicates possible/probable blank contamination

D Compound analyzed at a secondary dilution factor

E Compound was over the calibration range

M Duplicate injection precision not met.

N Identification of tentatively identified compound is based on a mass spectral library search

***** Duplicate analysis is not within control limits.

+ Correlation coefficient for MSA is less than 0.995.

Table B-7. Inorganic Validation Qualifiers

(NO CODE)	Confirmed identification
B	Not detected substantially above the level reported in laboratory or field blanks.
J	The analyte is present. The reported value may not be accurate or precise.
K	The analyte is present. The reported value may be biased high. The actual value is expected to be lower than reported.
L	The analyte is present. The reported value may be biased low. The actual value is expected to be higher than reported.
R	Unreliable result. Analyte may or may not be present in the samples. Supporting data are necessary to confirm result.
U	The analyte was analyzed for, but was not detected. The associated number indicates the approximate sample concentration necessary to be detected.
UJ	The analyte was analyzed for, but was not detected. The associated quantitation limit is an estimate and may be inaccurate or imprecise.
UL	The analyte was not detected, and the reported quantitation limit is probably higher than reported.

Table B-8. Organic Validation Qualifiers

(NO CODE)	Confirmed identification
B	Not detected substantially above the level reported in laboratory or field blanks.
J	The analyte is present. The reported value may not be accurate or precise.
K	The analyte is present. The reported value may be biased high. The actual value is expected to be lower than reported.
L	The analyte is present. The reported value may be biased low. The actual value is expected to be higher than reported.
N	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
NJ	Quantitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
Q	No analytical result.
R	Unreliable result. Analyte may or may not be present in the samples. Supporting data are necessary to confirm result.
U	The analyte was analyzed for, but was not detected. The associated number indicates the approximate sample concentration necessary to be detected.
UJ	The analyte was analyzed for, but was not detected. The associated quantitation limit is an estimate and may be inaccurate or imprecise.
UL	The analyte was not detected, and the reported quantitation limit is probably higher than reported.

Table B-9. Metals Validation Qualifiers

J	The associated value is an estimated quantity.
K	The analyte is present. The reported value may be biased high. The actual value is expected to be lower than reported.
L	The analyte is present. The reported value may be biased low. The actual value is expected to be higher than reported.
R	The data are unusable. (Note: The analyte may or may not be present.)
U	The analyte was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
UJ	The analyte was analyzed for, but was not detected. The associated detection limit is an estimate and may be inaccurate or imprecise.
UL	The analyte was not detected, and the reported quantitation limit is probably higher than reported.

Table B-10. Analytical Method Detection Limits From META Environmental For Soil and Sediment Samples

Parameter	Units	Laboratory MDL
Acenaphthene	µg/kg	0.543
Acenaphthylene	µg/kg	0.52
Anthracene	µg/kg	0.471
Benzene	µg/kg	0.832
Benzo[a]anthracene	µg/kg	0.803
Benzo[a]pyrene	µg/kg	1.21
Benzo[b]fluoranthene	µg/kg	0.908
Benzo[e]pyrene	µg/kg	0.606
Benzo[ghi]perylene	µg/kg	0.774
Benzo[k]fluoranthene	µg/kg	1.13
n-Butylbenzene	µg/kg	1.57
sec-Butylbenzene	µg/kg	0.517
Chrysene	µg/kg	0.638
Dibenzo[a,h]anthracene	µg/kg	1.36
Dibenzofuran	µg/kg	0.797
Dibenzothiophene	µg/kg	0.41
Ethylbenzene	µg/kg	0.65
Fluoranthene	µg/kg	0.702
Fluorene	µg/kg	0.715
Indeno[1,2,3-cd]pyrene	µg/kg	1.16
Isopropylbenzene	µg/kg	0.34
p-Isopropyltoluene	µg/kg	0.874
1-Methylnaphthalene	µg/kg	0.524
2-Methylnaphthalene	µg/kg	1.42
Naphthalene	µg/kg	1.48
Phenanthrene	µg/kg	0.546
n-Propylbenzene	µg/kg	0.625
Pyrene	µg/kg	0.66
Styrene	µg/kg	0.906
Toluene	µg/kg	0.796
1,2,4-Trimethylbenzene	µg/kg	0.767
1,3,5-Trimethylbenzene	µg/kg	0.422
m/p-Xylenes	µg/kg	2.74
o-Xylene	µg/kg	0.722

Table B-11. Analytical Methods

PARAMETER	METHOD	METHOD #	MATRIX	REFERENCE
ORGANICS – EXTRACTION CLEANUP				
Sulfuric Acid Cleanup	Liquid-liquid Partitioning	3665A	S	USEPA 1997
Sulfur Cleanup	Treatment with copper or mercury or TBA	3660A/B	S	USEPA 1997
ORGANICS				
Volatile Organic Compounds (VOC)	Gas Chromatography/Mass Spectrometry	8260B	S,W,N,L	USEPA 1997
Semivolatile Organic Compounds (SVOC)	Gas Chromatography/Mass Spectrometry	8270C	L	USEPA 1997
Polycyclic Aromatic Hydrocarbons (PAH)	Gas Chromatography/Mass Spectrometry-SIM	8270C SIM	S,W,N	USEPA 1997
Organochlorine Pesticides	Gas Chromatography – ECD	8081A	L	USEPA 1997
Herbicides	Gas Chromatography – ECD	8151A	L	USEPA 1997
METALS				
Antimony	Atomic Emission – ICP/MS	6020	S	USEPA 1997
Arsenic	Atomic Emission – ICP/MS	6020	S,L	USEPA 1997
Barium	Atomic Emission – ICP/MS	6020	L	USEPA 1997
Beryllium	Atomic Emission – ICP/MS	6020	S	USEPA 1997
Cadmium	Atomic Emission – ICP/MS	6020	S,L	USEPA 1997
Chromium	Atomic Emission – ICP/MS	6020	S,L	USEPA 1997
Copper	Atomic Emission – ICP/MS	6020	S	USEPA 1997
Lead	Atomic Emission – ICP/MS	6020	S,L	USEPA 1997
Mercury	Atomic Absorption - Cold Vapor	7471A	S,L	USEPA 1997
Nickel	Atomic Emission – ICP/MS	6020	S	USEPA 1997
Selenium	Atomic Emission – ICP/MS	6020	S,L	USEPA 1997
Silver	Atomic Emission – ICP/MS	6020	S,L	USEPA 1997
Thallium	Atomic Emission – ICP/MS	6020	S	USEPA 1997
Zinc	Atomic Emission – ICP/MS	6020	S	USEPA 1997
INORGANIC NONMETALS				
Cyanide, Total	Colorimetric - Automated	9012A	S	USEPA 1997
Total Organic Carbon	Combustion Oxidation	Lloyd Kahn	S	USEPA 1988
PHYSICAL PROPERTIES				
Grain Size (Sieve and Hydrometer)	----------	D422	S	ASTM 1995
Moisture Content	----------	D2216-90	S	ASTM 1990
TCLP				
TCLP Sample Creation	Leaching Procedure	1311	S	USEPA 1997

References:

American Society for Testing and Materials (ASTM). 1995. *Annual Book of ASTM Standards*. Volume 4.08. ASTM, Philadelphia, PA.

American Society for Testing and Materials (ASTM), 1990. *Standard method for laboratory determination of water (moisture) content of soil and rock.* Annual Book of ASTM Standards, D 2216-90 (revision of 2216-63, 2216-80).

United States Environmental Protection Agency (USEPA). 1997. *Test Methods for Evaluating Solid Waste*. Physical/Chemical Methods. EPA SW-846, 3rd Edition, including Final Update III. U.S. EPA, Washington, D.C. June.

United States Environmental Protection Agency (USEPA). 1988. *Determination of Total Organic Carbon in Sediment.* USEPA Region II. Edison, N.J.

ECD = Electron Capture Detector FPD = Flame Photometric Detector ICP = Inductively Coupled Plasma
MS = Mass Spectrometry SIM = Selected Ion Monitoring
Matrix Codes: S=Soil/Sediment; W=Water; L=TCLP Leachate; N=NAPL

Table B-12. Analytical Project Limits from TestAmerica for Soil and Sediment Samples

Parameter	Units	Laboratory RL (MDL)[(a)]	Recommended TDL [(b)]
Volatile Organic Compounds - Gas Chromatography / Mass Spectrometry (SW846 8260B)			
Acrolein	µg/kg	100	-
Acrylonitrile	µg/kg	100	-
Benzene	µg/kg	5	10
Bromodichloromethane	µg/kg	5	-
Bromoform	µg/kg	5	-
Bromomethane	µg/kg	5	-
2-Butanone (MEK)	µg/kg	5	20
Carbon tetrachloride	µg/kg	5	-
Chloroethane	µg/kg	5	-
2-Chloroethyl vinyl ether	µg/kg	10	-
Chloroform	µg/kg	5	-
Chloromethane	µg/kg	5	-
Dibromochloromethane	µg/kg	5	-
1,2-Dichlorobenzene	µg/kg	5	20
1,3-Dichlorobenzene	µg/kg	5	20
1,4-Dichlorobenzene	µg/kg	5	20
trans-1,2-Dichloroethene	µg/kg	5	-
Dichlorodifluoromethane	µg/kg	5	-
1,1-Dichloroethane	µg/kg	5	-
1,2-Dichloroethane	µg/kg	5	-
1,1-Dichloroethene	µg/kg	5	-
1,2-Dichloropropane	µg/kg	5	-
cis-1,3-Dichloropropene	µg/kg	5	-
trans-1,3-Dichloropropene	µg/kg	5	-
Ethylbenzene	µg/kg	5	10
Methylene chloride	µg/kg	5	-
1,1,2,2-Tetrachloroethane	µg/kg	5	-
Tetrachloroethene	µg/kg	5	10
Toluene	µg/kg	5	10
1,1,1-Trichloroethane	µg/kg	5	-
1,1,2-Trichloroethane	µg/kg	5	-
Trichloroethene	µg/kg	5	10
Trichlorofluoromethane	µg/kg	5	-
Vinyl chloride	µg/kg	5	-
Polynuclear Aromatic Hydrocarbons (PAHs) – Gas Chromatography / Mass Spectrometry – Selected Ion Monitoring (SW846 8270C SIM)			
Acenaphthene	µg/kg	6.7	20
Acenaphthylene	µg/kg	6.7 (1.93)	20
Anthracene	µg/kg	6.7	20
Benzo[a]anthracene	µg/kg	6.7	20
Benzo[b]fluoranthene	µg/kg	6.7	20
Benzo[k]fluoranthene	µg/kg	6.7	20
Benzo[a]pyrene	µg/kg	6.7	20
Benzo[ghi]perylene	µg/kg	6.7	20
Chrysene	µg/kg	6.7	20
Dibenzo[a,h]anthracene	µg/kg	6.7 (2.11)	20
Fluoranthene	µg/kg	6.7	20
Fluorene	µg/kg	6.7	20
Indeno[1,2,3-cd]pyrene	µg/kg	6.7	20
1-Methylnaphthalene	µg/kg	6.7	20
2-Methylnaphthalene	µg/kg	6.7	20
Naphthalene	µg/kg	6.7	20
Phenanthrene	µg/kg	6.7	20
Pyrene	µg/kg	6.7	20

(a) RL=Reporting Limit, MDL = Method Detection Limit. MDLs are provided if RL is > TDL. Values ≥ MDL and < RL will be qualified as estimated. MDLs are required to be updated periodically, and are subject to change.

(b) Target Detection Limit (TDL) from the QA/QC Guidance Document (USEPA, April 1995).

Table B-12. Analytical Project Limits for Soil and Sediment Samples (continued)

Parameter	Units	Laboratory RL (MDL)[(a)]	Recommended TDL [(b)]
Wet Chemistry Parameters			
TOC (Lloyd Kahn)	mg/kg	500	1000
Cyanide (SW846 9012A)	mg/kg	0.50	2.0
Metals - Cold Vapor (USEPA 245.6)			
Mercury	mg/kg	0.033	0.2
Metals – Inductively Coupled Plasma (SW846 6010B/7471A)			
Antimony	mg/kg	0.2	2.5
Arsenic	mg/kg	0.1	5.0
Beryllium	mg/kg	0.1	2.5
Cadmium	mg/kg	0.1	0.3
Chromium	mg/kg	0.2	5.0
Copper	mg/kg	0.2	5.0
Lead	mg/kg	0.1	5.0
Nickel	mg/kg	1.0	5.0
Selenium	mg/kg	0.5	1.0
Silver	mg/kg	0.1	0.2
Thallium	mg/kg	0.1	0.2
Zinc	mg/kg	0.5	15

(a) RL=Reporting Limit, MDL = Method Detection Limit. MDLs are provided if RL is > TDL. Values ≥ MDL and < RL will be qualified as estimated. MDLs are required to be updated periodically, and are subject to change.

(b) Target Detection Limit (TDL) from the QA/QC Guidance Document (USEPA, April 1995).

Table B-13. Analytical Project Limits from TestAmerica for Aqueous Samples

Parameter	Units	Laboratory RL[(a)]	Recommended TDL [(b)]
Volatile Organic Compounds - Gas Chromatography / Mass Spectrometry (SW846 8260B)			
Acrolein	µg/L	100	-
Acrylonitrile	µg/L	100	-
Benzene	µg/L	5	5
Bromodichloromethane	µg/L	5	-
Bromoform	µg/L	5	-
Bromomethane	µg/L	5	-
2-Butanone (MEK)	µg/L	5	-
Carbon tetrachloride	µg/L	5	-
Chloroethane	µg/L	5	-
2-Chloroethyl vinyl ether	µg/L	10	-
Chloroform	µg/L	5	5
Chloromethane	µg/L	5	-
Dibromochloromethane	µg/L	5	-
1,2-Dichlorobenzene	µg/L	5	-
1,3-Dichlorobenzene	µg/L	5	-
1,4-Dichlorobenzene	µg/L	5	-
trans-1,2-Dichloroethene	µg/L	5	-
Dichlorodifluoromethane	µg/L	5	-
1,1-Dichloroethane	µg/L	5	-
1,2-Dichloroethane	µg/L	5	-
1,1-Dichloroethene	µg/L	5	-
1,2-Dichloropropane	µg/L	5	-
cis-1,3-Dichloropropene	µg/L	5	-
trans-1,3-Dichloropropene	µg/L	5	-
Ethylbenzene	µg/L	5	5
Methylene chloride	µg/L	5	-
1,1,2,2-Tetrachloroethane	µg/L	5	-
Tetrachloroethene	µg/L	5	5
Toluene	µg/L	5	5
1,1,1-Trichloroethane	µg/L	5	-
1,1,2-Trichloroethane	µg/L	5	-
Trichloroethene	µg/L	5	5
Trichlorofluoromethane	µg/L	5	-
Vinyl chloride	µg/L	5	-
Polynuclear Aromatic Hydrocarbons (PAHs) – Gas Chromatography / Mass Spectrometry - Selected Ion Monitoring - (SW846 8270C SIM)			
Acenaphthene	µg/L	0.20	10
Acenaphthylene	µg/L	0.20	10
Anthracene	µg/L	0.20	10
Benzo[a]anthracene	µg/L	0.20	10
Benzo[b]fluoranthene	µg/L	0.20	10
Benzo[k]fluoranthene	µg/L	0.20	10
Benzo[a]pyrene	µg/L	0.20	10
Benzo[ghi]perylene	µg/L	0.20	10
Chrysene	µg/L	0.20	10
Dibenzo[a,h]anthracene	µg/L	0.20	10
Fluoranthene	µg/L	0.20	10
Fluorene	µg/L	0.20	10
Indeno[1,2,3-cd]pyrene	µg/L	0.20	10
1-Methylnaphthalene	µg/L	0.20	10
2-Methylnaphthalene	µg/L	0.20	10
Naphthalene	µg/L	0.20	10
Phenanthrene	µg/L	0.20	10
Pyrene	µg/L	0.20	10

(a) RL=Reporting Limit, MDL = Method Detection Limit. Values ≥ MDL and < RL will be qualified as estimated.
(b) Target Detection Limit (TDL) from the QA/QC Guidance Document (EPA, April 1995).

Table B-14. Project Limits from TestAmerica for TCLP Samples

Parameter	Units	Laboratory RL (MDL) [(a)]	Recommended TDL[(b)]
Metals - Cold Vapor (SW846 1311/7470A)			
Mercury	mg/L	0.0002	0.2
Metals - Atomic Emission Inductively Coupled Plasma/Mass Spectrometry - (SW846 1311/6010B)			
Arsenic	mg/L	0.50	5.0
Barium	mg/L	10	100
Cadmium	mg/L	0.10	1.0
Chromium	mg/L	0.50	5.0
Lead	mg/L	0.5	5.0
Selenium	mg/L	0.25	1.0
Silver	mg/L	0.25	5.0
Volatile Organics - Gas Chromatography/Mass Spectrometry - (SW846 1311/8260B)			
Benzene	mg/L	0.050	0.50
2-Butanone (Methyl Ethyl Ketone)	mg/L	0.050	200
Carbon tetrachloride	mg/L	0.050	0.50
Chlorobenzene	mg/L	0.050	100
Chloroform	mg/L	0.050	6.0
1,2-Dichloroethane	mg/L	0.050	0.50
1,1-Dichloroethene	mg/L	0.050	0.70
Tetrachloroethene	mg/L	0.050	0.50
Trichloroethene	mg/L	0.050	0.70
Vinyl Chloride	mg/L	0.050	0.20
Semivolatile Organics - Gas Chromatography/Mass Spectrometry - (SW846 1311/8270C)			
Cresols (total)	mg/L	0.050	200
1,4-Dichlorobenzene	mg/L	0.010	7.5
2,4-Dinitrotoluene	mg/L	0.050	0.13
Hexachlorobenzene	mg/L	0.010	0.13
Hexachlorobutadiene	mg/L	0.01	0.50
Hexachloroethane	mg/L	0.050	3.0
Nitrobenzene	mg/L	0.01	2.0
Pentachlorophenol	mg/L	0.05	100
Pyridine	mg/L	0.05	5.0
2,4,5-Trichlorophenol	mg/L	0.050	400
2,4,6-Trichlorophenol	mg/L	0.050	2.0
Organochlorine Pesticides - Gas Chromatography/ Electron Capture Detector - (SW846 1311/8081A) (2 ml final extract volume)			
Gamma-BHC (Lindane)	mg/L	0.0005	0.40
Chlordane (technical)	mg/L	0.005	0.030
Endrin	mg/L	0.0005	0.020
Heptachlor	mg/L	0.0005	0.0080
Heptachlor epoxide	mg/L	0.0005	0.0080
Methoxychlor	mg/L	0.001	10
Toxaphene	mg/L	0.02	0.50
Chlorophenoxy Acid Herbicides - Gas Chromatography/ Electron Capture Detector - (SW846 1311/8151A)			
2,4-D	mg/L	0.04	10
2,4,5-TP (Silvex)	mg/L	0.01	1.0

(a) RL=Reporting Limit, MDL= Method Detection Limit. MDLs are provided if RL is >TDL. Values $\geq$ MDL and < RL will be qualified as estimated. MDLs are required to be updated periodically, and are subject to change.

(b) Target Detection Limit (TDL) from the QA/QC Guidance Document (USEPA/USACE, April 1995). The TDL for TCLP parameters are the Toxicity Characteristic Rule's Regulatory Level (40 CFR 261.24)

OFFSHORE INVESTIGATION
CHAIN-OF-CUSTODY DOCUMENTATION

C9B030207

Client:	Project Manager:	Parameters/Method Numbers for Analysis	Chain of Custody Record
EA Engineering Science, and Technology, Inc.	**Frank Barranco**		Laboratory:
	Phone: **410-329-5137**		**TestAmerica - Pittsburgh**
15 Loveton Circle	Field Contact:		**301 Alpha Drive, RIDC Park**
Sparks, MD 21152	**Todd Ward**		**Pittsburgh, PA 15238**
	Phone: **410-746-1250**		**phone: 412-963-2428**
Project Name: Sparrows Point Offshore Areas			**fax: 412-963-2468**
Project#: 14534.06			**ATTN: Carrie Gamber**
Page 1 of 2	**Site Water**		

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Volatile Organic Compounds 8260B	PAHs 8270C SIM	Remarks
2/2/09	1105	X		BH-W-01-S	5	X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1110			BH-W-01-M				
	1115			BH-W-01-D				
	1150			BH-W-02-S				
	1155			BH-W-02-M				
	1200			BH-W-02-D				
	1225			BH-W-03A-S				
	1230			BH-W-03A-M				
	1235			BH-W-03A-D				
	1330			BH-W-03B-S				
	1335			BH-W-03B-M				
	1340			BH-W-03B-D				
	1400			BH-W-03C-S				
	1405			BH-W-03C-M				
	1410			BH-W-03C-D				
	1440			BH-W-04-S				
	1445			BH-W-04-M				
↓	1450	↓		BH-W-04-D	↓	↓	↓	

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	
Todd Ward	2/2/09 1520	Todd Ward	2/2/09 1900	**SITE WATER**
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	
		Jim Vicini	2/3/09 1045	

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(1-129)

C9B030207

Client:	Project Manager:	Parameters/Method Numbers for Analysis	Chain of Custody Record
EA Engineering Science, and Technology, Inc.	**Frank Barranco**		Laboratory: **TestAmerica - Pittsburgh**
	Phone: **410-329-5137**		**301 Alpha Drive, RIDC Park**
15 Loveton Circle	Field Contact:		**Pittsburgh, PA 15238**
Sparks, MD 21152	**Todd Ward**		**phone: 412-963-2428**
	Phone: **410-746-1250**		**fax: 412-963-2468**
Project Name: Sparrows Point Offshore Areas			**ATTN: Carrie Gamber**
Project#: 14534.06			
Page 2 of 2	**Site Water**		

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Volatile Organic Compounds 8260B	PAHs 8270C SIM	Remarks
2/2/09	1510	X		BH-W-05-S	5	X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1510			BH-W-05-S MS				
	1510			BH-W-05-S MSD				
	1515			BH-W-05-M				
	1515			BH-W-05-M MS				
	1515			BH-W-05-M MSD				
	1520			BH-W-05-D				
	1520			BH-W-05-D MS				
	1520			BH-W-05-D MSD				
				DUP-1				
				DUP-2				
				DUP-3				

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	
Todd Ward	2/2/09 1520	Todd Ward	2/2/09 1900	**SITE WATER**
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	
		Jim Clennie	2/3/09 1045	

7

(1-129)

C9B040153

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: 410-329-5137
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: 410-746-1250

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of

Site Water

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Volatile Organic Compounds 8260B	PAHs 8270C SIM
2/3/09	1000	X		BH-W-06-S	5	X	X
	1005			BH-W-06-M			
	1010			BH-W-06-D			
	1030			BH-W-07-S			
	1035			BH-W-07-M			
	1040			BH-W-07-D			
	1100			BH-W-08-S			
	1105			BH-W-08-M			
	1110			BH-W-08-D			
	1130			BH-W-09-S			
	1135			BH-W-09-M			
	1140			BH-W-09-D			
	1225			BH-W-10-S			
	1230			BH-W-10-M			
	1235			BH-W-10-D			
	1300			BH-W-11-S			
	1305			BH-W-11-M			
	1310			BH-W-11-D			

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/3/09 1520	Todd Ward	2/3/09 1830
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Patrick R Dawn	2/4/09 0950

SITE WATER

7

(1 - 187)

C9B040153

Client:	Project Manager:	Parameters/Method Numbers for Analysis	Chain of Custody Record
EA Engineering Science, and Technology, Inc.	**Frank Barranco**		Laboratory: **TestAmerica - Pittsburgh**
	Phone: **410-329-5137**		**301 Alpha Drive, RIDC Park**
15 Loveton Circle	Field Contact:		**Pittsburgh, PA 15238**
Sparks, MD 21152	**Todd Ward**		**phone: 412-963-2428**
	Phone: **410-746-1250**		**fax: 412-963-2468**
Project Name: Sparrows Point Offshore Areas			**ATTN: Carrie Gamber**
Project#: 14534.06			
Page 2 of	**Site Water**		

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Volatile Organic Compounds 8260B	PAHs 8270C SIM	Remarks
2/3/09	1320	X		BH-W-12-S	5	X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1325			BH-W-12-M				
	1330			BH-W-12-D				
	1345			BH-W-13A-S				
	1350			BH-W-13A-M				
	1355			BH-W-13A-D				
	1405			BH-W-13B-S				
	1410			BH-W-13B-M				
	1415			BH-W-13B-D				
	1445			BH-W-13C-S				
	1450			BH-W-13C-M				
	1455			BH-W-13C-D				
	1510			BH-W-14-S				
	1515			BH-W-14-M				
	1520			BH-W-14-D				
				DUP-4				
				DUP-5				
		↓		DUP-6	↓	↓	↓	

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	
Todd Ward	2/3/09 1520	Todd Ward	2/3/09 1830	**SITE WATER**
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	
		Patrick L Faust	2/4/09 0950	

8

(1 - 187)

C9B070192

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/6/09	1015		X	BH-SED-01-00	6 8	X	X	X	X	X	X	X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1115			BH-SED-02-00										
	1200			BH-SED-03A-00										
	1300			BH-SED-03B-00										
	1330			BH-SED-03C-00										
	1400			BH-SED-04-00										
	1400			BH-SED-04-00 MS										
	1400			BH-SED-04-00 MSD										
	1430			BH-SED-05-00										
↓			↓	DUP-1	↓	↓	↓	↓	↓	↓	↓	↓	↓	

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/6/09 1430	Todd Ward	2/6/09 1730
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
			2-7-09 0950

SEDIMENT

8

(1 - 135)

C9B100188

Client:
EA Engineering Science, and Technology, Inc.

15 Loveton Circle
Sparks, MD 21152

Project Manager:
Frank Barranco

Phone: **410-329-5137**

Field Contact:
Todd Ward
Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/9/09	1015		X	BH-SED-06-00	6 TW 4	X	X	X	X	X	X	X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1045			BH-SED-07-00	6									
	1110			BH-SED-08-00										
	1155			BH-SED-09-00										
	1215			BH-SED-10-00										
	1240			BH-SED-11-00										
	1305			BH-SED-12-00										
	1355			BH-SED-13A-00										
	1440			BH-SED-13B-00										
	1505			BH-SED-13C-00										
	1525			BH-SED-14-00										
↓			↓	DUP-2	↓	↓	↓	↓	↓	↓	↓	↓	↓	

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/9/09 1525	Todd Ward	2/9/09 1800
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Natasha Daunt	2/10/09 0930

SEDIMENT

7

(1 - 150)

CHAIN OF CUSTODY RECORD

PROJECT SPARROWS POINT
CONTACT DR. FRANK BARRANCO
COMPANY EA ENGINEERING
ADDRESS 15 LOVETON CIRCLE, SPARKS, MD 21152
EMAIL fbarranco@sgcst.com
PHONE 410-329-5137 **FAX** 410-771-4204

SAMPLED BY
Print Name TODD WARD Sign Todd Ward
Print Name _____ Sign _____

Turn Around Time
Standard ☒
If Authorized *
1 Week ☐
Other ☐ _____

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: EPA 8100M - GC/FID	EPA 8270M GC/MS	EPA 8270M CARBON CLNUP PAHS							Comments
1	2/6/09	1200	BH-SED-03A-00	4oz			X	1	SED.	NONE	X	X	X						TA	~~EA09024-01~~ KS 2/12/09
2	2/9/09	1610	REFERENCE	↓			X	1	SED.	NONE	X	X	X						TA	~~EA09024-02~~ KS 2/12/09

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
Todd Ward	2/9/09 1820				
Received by	**Date & Time**	**Received by**	**Date & Time**	**Received by**	**Date & Time**
	2/11/09 10:50				

Shipping Info.

Remarks

Temp °C 1.4°2

* Surcharges may apply

C9B140124

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/13/09	1410		X	BH-SED-12-4 6		X	X	X	X	X	X	X	X	**SEE PROJECT SPECIFIC ANALYTE LIST**

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/13/09 1410	Todd Ward	2/13/ 1410
Relinquished by: (Signature)	**Date/Time**	**Received by Laboratory: (Signature)**	**Date/Time**
		Jim Vienne	2/14/09 0930

SEDIMENT

7

(1-67)

C9B170199

Client:	Project Manager:	Parameters/Method Numbers for Analysis	Chain of Custody Record
EA Engineering Science, and Technology, Inc.	**Frank Barranco**		Laboratory:
	Phone: **410-329-5137**		**TestAmerica - Pittsburgh**
15 Loveton Circle	Field Contact:		**301 Alpha Drive, RIDC Park**
Sparks, MD 21152	**Todd Ward**		**Pittsburgh, PA 15238**
	Phone: **410-746-1250**		**phone: 412-963-2428**
Project Name: Sparrows Point Offshore Areas			**fax: 412-963-2468**
Project#: 14534.06			**ATTN: Carrie Gamber**
Page 1 of 1	**Sediment Samples**		

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/16/09	1630		X	BH-SED-01-8	6 ~~8~~	X	X	X	X	X	X	X	X	**SEE PROJECT SPECIFIC ANALYTE LIST**

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	
Todd Ward	2/16/09 1630	Todd Ward	2/16/09 1830	**SEDIMENT**
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	
		Patricia Hamel	2/17/09 0920	

7

(1 - 68)

C9B180150

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/17/09	1030		X	BH-SED-13C-02	6	X	X	X	X	X	X	X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1250		X	BH-SED-13B-2	↓	↓	↓	↓	↓	↓	↓	↓	↓	
↓	1450		X	BH-SED-06-6	↓	↓	↓	↓	↓	↓	↓	↓	↓	

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	
Todd Ward	2/17/09 1450	Todd Ward	2/17/09 1715	**SEDIMENT**
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	
		Patricia R Daunt	2/18/09 1000	

7

(1 - 88)

C9B200184

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/19/09	1150		X	BH-SED-02-4	5	X	X	X	X	X		X	X	**SEE PROJECT SPECIFIC ANALYTE LIST**
2/19/09	1155		X	BH-SED-02-TOC	1						X			

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/19/09 1155	Todd Ward	2/19/09 1700
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
			2/20/9 950

SEDIMENT

7

(1 - 68)

C9B250192

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/24/09	1320		X	BH-SED-10-2	5	X	X	X	X	X		X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1300		X	BH-SED-10-TOC	1						X			
	1515		X	BH-SED-11-TOC	1						X			
	1600		X	BH-SED-11-2	5	X	X	X	X	X		X	X	

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/24/09 1600	Todd Ward	2/24/09 1840
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Patricia R Faust	2/25/09 0945

SEDIMENT

C9B260261

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
2/25/09	1106		X	BH-SED-03A-12	5	X	X	X	X	X		X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1105			BH-SED-03A-TOC	1						X			
	1346			BH-SED-13A-TOC	1						X			
↓	1415		↓	BH-SED-13A-6	5	X	X	X	X	X	X	X	X	

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/25/09 1415	Todd Ward	2/25/09 1700
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Patricia A. Janosik	2/26/09 1000

SEDIMENT

3

(1-17)

CHAIN OF CUSTODY RECORD

PROJECT SPARROWS POINT RCRA INVESTIGATION
CONTACT FRANK BARRANCO
COMPANY EA ENGINEERING
ADDRESS 15 LOVETON CIRCLE, SPARKS, MD 21152
EMAIL
PHONE 410-329-5137 **FAX** 410-771-4204
SAMPLED BY
Print Name TODD WARD Sign Todd Ward
Print Name Sign

Turn Around Time
Standard ☒
If Authorized *
1 Week ☐
Other ☐ ____

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: EPA 8100M - GC/FID	Parameters: EPA 8270M	Comments
1	2/24/09	1320	BH-SED-10-2	4oz	G		X	2	SED.	-	X	X	TA ~~EA-09~~ ~~EA090209~~
2	2/25/09	1100	BH-SED-03A-12	4oz	G		X	2	SED.	-	X	X	↓ 02

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
Todd Ward	2/25/09 1700				
Received by	**Date & Time**	**Received by**	**Date & Time**	**Received by**	**Date & Time**
Rafael Flores	2/26/09 11:50				

Shipping Info.
Remarks
Temp °C 6.5
* Surcharges may apply

C9B270261

Client:
EA Engineering Science, and Technology, Inc.

15 Loveton Circle
Sparks, MD 21152

Project Manager:
Frank Barranco

Phone: **410-329-5137**

Field Contact:
Todd Ward
Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids
2/26/09	1105		X	BH-SED-13B-S	5	X	X	X	X	X		X	X
	1110			BH-SED-13B-TOC	1						X		
	1310			BH-SED-14-S	5	X	X	X	X	X		X	X
	1315			BH-SED-14-TOC	1						X		
	1530			BH-SED-09-12	5	X	X	X	X	X		X	X
	1550			BH-SED-09-TOC	1						X		

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

5-DAY EXPEDITED TURN-AROUND REQUESTED

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	2/26/09 1550	Todd Ward	2/26/09 1740
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Jim Vicini	2/27/09 1040

SEDIMENT

7

(1 - 66)

C9C050210

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids
3/4/09	1045		X	BH-SED-13C-6	5 TW	X	X	X	X	X		X	X
	1050			BH-SED-13C-TOC	1						X		
	1050			BH-SED-13C MS	1						X		
	1050			BH-SED-13C MSD	1						X		
	1340			BH-SED-05-6	5	X	X	X	X	X		X	X
	1340			BH-SED-05-6 MS	4	X	X			X		X	X
	1340			BH-SED-05-6 MSD	4	X	X			X		X	X
	1345			BH-SED-05-TOC	1						X		
	1555			BH-SED-04-8	5	X	X	X	X	X		X	X
	1600			BH-SED-04-TOC	1						X		
↓			↓	DUP-1	6	X	X	X	X	X	X	X	X

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

5-day expedited turn around requested

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward 3/4/09 ~~1600~~ TW	3/4/09 1600	Todd Ward	3/4/09 1825
Relinquished by: (Signature)	**Date/Time**	**Received by Laboratory: (Signature)**	**Date/Time**
		Patricia A Young	3/5/09 0945

SEDIMENT

7

(1-83)

CHAIN OF CUSTODY RECORD

PROJECT SPARROWS POINT RCRA INVESTIGATION
CONTACT FRANK BARRANCO
COMPANY EA ENGINEERING
ADDRESS 15 LOVETON CIRCLE, SPARKS, MD 21152
EMAIL fbarranco@eaest.com
PHONE 410-329-5130 (?) **FAX** 410-771-4204

SAMPLED BY
Print Name TODD WARD Sign Todd Ward
Print Name _____ Sign _____

Turn Around Time
Standard ☒
If Authorized *
1 Week ☐
Other ☐ _____

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: EPA 8100M - GC/FID	Parameters: EPA 8270M	Comments
1	3/4/09	1045	BH-SED-13C-6	4oz	G		X	1	SED	–	X	X	TA090305-01
2	3/4/09	1340	BH-SED-05-6	4oz	G		X	2	SED	–	X	X	-02a,b

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
Todd Ward	3/4/09 1815				
Received by	**Date & Time**	**Received by**	**Date & Time**	**Received by**	**Date & Time**
[illegible]	3/5/09 10:45				

Shipping Info.

Remarks

Temp °C 3.3

* Surcharges may apply

C9C060295

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 2 of 2

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
3/5/09	1025		X	BH-SED-07-6	5	X	X	X	X	X		X	X	SEE PROJECT SPECIFIC ANALYTE LIST
	1030		X	BH-SED-07-TOC	1						X			
	1300		X	BH-SED-08-16	5	X	X	X	X	X		X	X	5-day expedited turn
	1305		X	BH-SED-08-TOC	1						X			around requested.
			X	DUP-2	6	X	X	X	X	X	X	X	X	

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	3/5/09 1305	Todd Ward	3/5/09 1700
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Rebecca K Daust	3/6/09 0940

SEDIMENT

3

(1-19)

C9C100191

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
3/9/09	1030		X	BH-SED-03E-2	5	X	X	X	X	X		X	X	**SEE PROJECT SPECIFIC ANALYTE LIST**
3/9/09	1035		X	BH-SED-03E-TOC	1						X			

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	3/9/09 1035	Todd Ward	3/9/09 1700
Relinquished by: (Signature)	**Date/Time**	**Received by Laboratory: (Signature)**	**Date/Time**
		Patrick R Jarrett	3/10/09 0940

SEDIMENT

7

(1 - 57)

C9C110188

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids
3/10/09	1020		X	BH-SED-17-0	5 Tot	X	X	X	X	X		X	X
	1030		X	BH-SED-17-TOC	1						X		
	1250		X	BH-SED-18-0	5	X	X	X	X	X		X	X
	1305		X	BH-SED-18-TOC	1						X		

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

expedited
5-day turn around requested

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	3/10/09 1305	Todd Ward	3/10/09 1700
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
			3/11/9 10°°

SEDIMENT

7

(1-62)

C9C120252

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 2

Sediment Samples

	Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids	Remarks
TW	~~H00~~			X											SEE PROJECT SPECIFIC ANALYTE LIST
	3/11/09	1100		X	BH-SED-15-2	5	X	X	X	X	X		X	X	
		1100		X	BH-SED-15-2 MS	5	X	X	X	X	X		X	X	5 day expedited turn
		1100		X	BH-SED-15-2 MSD	5	X	X	X	X	X		X	X	around requested
		1105		X	BH-SED-15-TOC	1						X			
		1105		X	BH-SED-15-TOC MS	1						X			
		1105		X	BH-SED-15-TOC MSD	1						X			
		1300		X	BH-SED-03D-2	5	X	X	X	X	X		X	X	
		1305		X	BH-SED-03D-TOC	1						X			
	↓				DUP-1	6	X	X	X	X	X	X	X	X	

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	
Todd Ward	3/11/09 1305	Todd Ward	3/11/09 1700	**SEDIMENT**
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	
		Patrick R Daniel	3/12/09 1000	

7

(1 - 85)

C9C130178

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Frank Barranco**
	Phone: **410-329-5137**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Todd Ward**
	Phone: **410-746-1250**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	Metals 6010B/7471A	Cyanide 9012A	Grain Size ASTM D422	Moisture Content ASTM D2216-90	Volatile Organic Cmpds 5035A/8260B	Total Organic Carbon (Lloyd Kahn)	PAHs 8270C	Total Solids
3/12/09	1005		X	BH-SED-16-0	5	X	X	X	X	X		X	X
3/12/09	1010		X	BH-SED-16-TOC	1						X		

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

5 day expedited turn around time requested

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
Todd Ward	3/12/09 1010	Todd Ward	3/12/09 1700
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
		Jim Vennie	3/13/09 0950

SEDIMENT

7

(1 - 56)

C9D270163

Client:	Project Manager:
EA Engineering Science, and Technology, Inc.	**Karin Olsen**
	Phone: **410-329-5112**
15 Loveton Circle	Field Contact:
Sparks, MD 21152	**Karin Olsen**
	Phone: **443.465.9783**

Project Name: Sparrows Point Offshore Areas

Project#: 14534.06 Quote # 18001868

Page 1 of 1

Sediment Samples

Date	Time	Water	Sediment	Sample Identification	No. of Containers	TCLP EPA 1311
4/2/09	1500		X	SP09-IDW-TCLP	2	X

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

*Bill to MES contract
Karin

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
	4/2/09 1530		4/2/09 1630
Relinquished by: (Signature)	**Date/Time**	**Received by Laboratory: (Signature)**	**Date/Time**
			4/24/09 800

[redacted]

ONSHORE INVESTIGATION
CHAIN-OF-CUSTODY DOCUMENTATION

COC #01

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen** Phone: 410-329-5112
MES Contact: **Megan Simon** Phone: 410-729-8334	EA Field Contact: **Steve Yankay** Phone: 717-487-6632
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs
5/29/09	1410		X	RP-SO-B03-4	3	X	X	X	X	
5/29/09	1520		X	RP-SO-B03-12	3	X	X	X	X	
—	—		—	TRIP BLANK				X		

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

Run SRMs on metals, PAHs

5 day turn-around -time for all samples

Sampled by: (Signature)	Date/Time 5/14/09 1604	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 5209 930

C9E200178

7

(1 - 76)

CHAIN OF CUSTODY RECORD

PROJECT Sparrows Point RCRA Sampling - Onshore
CONTACT Tara Martz
COMPANY TestAmerica
ADDRESS 301 Alpha Drive, Pittsburgh, PA 15238
EMAIL tara.martz@testamericainc.com
PHONE 412-963-2430 **FAX** 412-963-2468
SAMPLED BY
Print Name STEVEN YANKAY Sign
Print Name Sign

Turn Around Time	
Standard	✓
If Authorized *	
1 Week	
Other	

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: 8100M PAH Fingerprinting	Parameters: 8270M PAHs	Comments
1	5/19/09	1545	BP-SO-B03-18	4oz			X	2	Soil	—	X	X	TA090570-09

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
	5/19/09 1613				
Received by	**Date & Time**	**Received by**	**Date & Time**	**Received by**	**Date & Time**
	5/20/09 10:30				

Shipping Info.

Remarks

Temp °C 0

* Surcharges may apply

COC #02

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen** Phone: **410-329-5112**
MES Contact: **Megan Simon** Phone: 410-729-8334	EA Field Contact: **Steve Yankay** Phone: **717-487-6632**
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
20/MAY/09	1120		X	BP-SO-B03-32	5	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
"	—		X	BP-SO-DUP1	5	X	X	X	X		
"	1580		X	BP-SO-B01-8	5	X	X	X	X		Run SRMs on metals, PAHs
	—			TRIP BLANK				X			
											5 day turn-around -time for all samples

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 5/20/09 1544	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 5 21 9 950

C9E210170

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(1 - 76)

COC #03

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen**
	Phone: **410-329-5112**
MES Contact:	EA Field Contact:
Megan Simon	**Steve Yankay**
Phone: 410-729-8334	Phone: **717-487-6632**
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
5/21/09	900		X	BP-SO-B01-14	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	900		X	BP-SO-B01-14 MS	8	X	X	X	X		
	900		X	BP-SO-B01-14 MSD	8	X	X	X	X		Run SRMs on metals, PAHs
	930		X	BP-SO-B01-20	8	X	X	X	X		
	1230		X	BP-SO-B04-10	8	X	X	X	X		5 day turn-around -time for all samples
	1510		X	BP-SO-B04-16	8	X	X	X	X		
	—			TRIP BLANK	1			X			

Sampled by: (Signature)	Date/Time 5/21/09 1545	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 5/22/09 1015

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

C9E220334

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(1 - 87)

C9E240103

COC #04

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen**
	Phone: **410-329-5112**
MES Contact:	EA Field Contact:
Megan Simon	**Steve Yankay**
Phone: 410-729-8334	Phone: **717-487-6632**

Project Name: Sparrows Point - RCRA Onshore Sampling

Project#: 14534.06 Quote Number 18001868

Page 1 of 1

Soil Samples

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)		NAPL - VOCs and PAHs							
5/22/09	0820		X	BP-SO-B04-24	10	X	X	X	X		X							
	1245		X	BP-SO-B02-08	10	X	X	X	X		X							
	1345		X	BP-SO-B02-14	10	X	X	X	X		X							
	1410		X	BP-SO-B02-20	10	X	X	X	X		X							
				TB	1			X										

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

Run SRMs on metals, PAHs

5 day turn-around -time for all samples

Sampled by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time
	5/22/09 1600		
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time
			5/23/9 955

7

(1 - 81)

C9E280323

COC #05

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen**
	Phone: **410-329-5112**
MES Contact:	EA Field Contact:
Megan Simon	**Steve Yankay**
Phone: 410-729-8334	Phone: **717-487-6632**
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
5/27/09	0945		X	BP-SO-B05-8	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
"	1050		"	BP-SO-B05-14	8	X	X	X	X		
"	1045		"	BP-SO-B05-20	8	X	X	X	X		Run SRMs on metals, PAHs
											5 day turn-around -time for all samples

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 5/27/09 1530	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 5 28 9 950

SOM

6

(1 - 68)

CHAIN OF CUSTODY RECORD

PROJECT Sparrows Point RCRA Sampling - Onshore
CONTACT Tara Martz
COMPANY TestAmerica
ADDRESS 301 Alpha Drive, Pittsburgh, PA 15238
EMAIL tara.martz@testamericainc.com
PHONE 412-963-2430 **FAX** 412-963-2468

SAMPLED BY
Print Name Steve YanKay Sign
Print Name Sign

Turn Around Time	
Standard	X
If Authorized *	
1 Week	
Other	

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: SIOM PAH Fingerprinting	Parameters: SIOM PAHs	Comments
	5/27/09	0920	BP-SO-B05-06	4oz	G		X	2	Soil	None	X	X	TA090528-07

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
[signature]	5/27/09 1530				
Received by	Date & Time	Received by	Date & Time	Received by	Date & Time
[signature]	5/28/09 10:56				

Shipping Info.

Remarks

Temp °C 0°C

* Surcharges may apply

CHAIN OF CUSTODY RECORD

PROJECT Sparrows Point RCRA Sampling - Onshore
CONTACT Tara Martz
COMPANY TestAmerica
ADDRESS 301 Alpha Drive, Pittsburgh, PA 15238
EMAIL tara.martz@testamericainc.com
PHONE 412-963-2430 **FAX** 412-963-2468
SAMPLED BY
Print Name STEVEN YANKAY Sign
Print Name Sign

Turn Around Time
Standard ✓
If Authorized *
1 Week
Other

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: 8100 m PAH Fingerprinting	Parameters: 8270m PAHs	Comments
1	5/28/09	0930	BP-SO-B025-8	4 oz			X	2	SOIL	ICE	X	X	TA090529-01

Relinquished by: Date & Time 5/28/09 1630
Received by: Fed Ex Date & Time 5/28/09 1630
5/29/09 1560
Relinquished by / Date & Time / Received by / Date & Time / Relinquished by / Date & Time / Received by / Date & Time
Shipping Info.
Remarks
Temp °C 0°C
* Surcharges may apply

C9E300194

COC #06

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen**
	Phone: **410-329-5112**
MES Contact:	EA Field Contact:
Megan Simon	**Steve Yankay**
Phone: 410-729-8334	Phone: **717-487-6632**

Project Name: Sparrows Point - RCRA Onshore Sampling

Project#: 14534.06 Quote Number 18001868

Page 1 of 1

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
				Soil Samples							
5/29/09	1300		X	CT-SO-B03-10	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	—		X	CT-SO-DUP1	8	X	X	X	X		
	1430		X	CT-SO-B03-20	8	X	X	X	X		Run SRMs on metals, PAHs
	1500		X	CT-SO-B03-22	8	X	X	X	1		
											5 day turn-around -time for all samples

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 5/29/09	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 5/30/09 1005

SOU

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(1 - 77)

C9F030296

COC #07

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen**
	Phone: **410-329-5112**
MES Contact:	EA Field Contact:
Megan Simon	**Steve Yankay**
Phone: 410-729-8334	Phone: **717-487-6632**

Project Name: Sparrows Point - RCRA Onshore Sampling

Project#: 14534.06 Quote Number 18001868

Page 1 of 1

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
				Soil Samples							
6/2/09	915		X	CT-SO-B01-10	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	—		—	TRIP BLANK	2			X			
	1030		X	CT-SO-B01-18 (MS/MSD)	24	X	X	X	X		Run SRMs on metals, PAHs
	1100		X	CT-SO-B01-14	8	X	X	X	X		
											5 day turn-around -time for all samples

Sampled by: (Signature)	Date/Time 6/2/09 1500	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 6 3 9 950

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

7

(1 - 72)

CHAIN OF CUSTODY RECORD

PROJECT Sparrows Point RCRA Sampling - Onshore
CONTACT Tara Martz
COMPANY TestAmerica
ADDRESS 301 Alpha Drive, Pittsburgh, PA 15238
EMAIL tara.martz@testamericainc.com
PHONE 412-963-2430 **FAX** 412-963-2468
SAMPLED BY
Print Name Steve YanKay Sign
Print Name Sign

Turn Around Time	
Standard	X
If Authorized *	
1 Week	
Other	

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: 8260m PAH Fingerprinting	Parameters: 8270m PAHs	Parameters: SCL	Comments
~~5/28/09~~	~~0930~~	~~BP-SO-0025-8~~		4oz	G		X	2	So	None	X	X		
	6/2/09	1030	CT-SO-B01-20	4oz	G		X	2	So:1	None	X	X		TA0910603-01

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
[signature]	6/2/09 1630 (SCL ~~5/28/09 1630~~)				
Received by	**Date & Time**	**Received by**	**Date & Time**	**Received by**	**Date & Time**
FedEx	6/2/09 1630	[signature]	6/3/09 11:20		

Shipping Info.

Remarks

Temp °C 0

* Surcharges may apply

C9F050380

COC #08

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen** **Phone: 410-329-5112**
MES Contact: **Megan Simon** Phone: 410-729-8334	EA Field Contact: **Steve Yankay** **Phone: 717-487-6632**
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
6/4/09	1110		X	CT-SO-B04-10	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	1210		X	CT-SO-B04-18	8	X	X	X	X		
	1230		X	CT-SO-B04-14	8	X	X	X	X		Run SRMs on metals, PAHs
	—			TRIP BLANK	2			X			
											5 day turn-around -time for all samples

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 6/4/09	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 6/5/09 0950

7

(1 - 72)

COC#09

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen** Phone: **410-329-5112**
MES Contact: **Megan Simon** Phone: 410-729-8334	EA Field Contact: **Steve Yankay** Phone: **717-487-6632**
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
6/8/09	1320		X	CT-SO-B02-12	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	1400		X	CT-SO-B02-16	8	X	X	X	X		
	1420		X	CT-SO-B02-20	8	X	X	X	X		Run SRMs on metals, PAHs
	—			TRIP BLANK	2			X			
											5 day turn-around -time for all samples

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 1430 6/8/09	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature) Patricia Lawrence	Date/Time 6/9/09 10 0950

PRC 6/9/09

C9F090183

7

(1 - 72)

COC #10

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen** Phone: **410-329-5112**
MES Contact: **Megan Simon** Phone: 410-729-8334	EA Field Contact: **Steve Yankay** Phone: **717-487-6632**
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	**Soil Samples**

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
6/9/09	1120		X	CT-SO-B05-8	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	1215		X	CT-SO-B05-16	8	X	X	X	X		
	1230		X	CT-SO-B05-20	8	X	X	X	X		Run SRMs on metals, PAHs
	—			TRIP BLANK				X			
											5 day turn-around -time for all samples

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 6/9/09 1330	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 6/10/09 940

SDL

C9F100297

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(1 - 69)

CHAIN OF CUSTODY RECORD

PROJECT Sparrows Point RCRA Sampling - Onshore
CONTACT Tara Martz
COMPANY TestAmerica
ADDRESS 301 Alpha Drive, Pittsburgh, PA 15238
EMAIL tara.martz@testamericainc.com
PHONE 412-963-2430 **FAX** 412-963-2468
SAMPLED BY
Print Name STEVEN YANKAY Sign
Print Name Sign

Turn Around Time
Standard [✓]
If Authorized *
1 Week [ ]
Other [ ]

META Environmental, Inc.
49 Clarendon St. - Watertown, Massachusetts - 02472
Tel (617) 923-4662 - Fax (617) 923-4610 - www.metaenv.com

Samp #	Date	Time	Field Sample ID	Container Size	Container G/P	Grab	Composite	# of Containers	Matrix	Preserv.	Parameters: B100M PAHs incl perylene	Parameters: B270M PAHs	Comments
1	6/9/09	1230	CT-SO-B05-20	4oz	G	X		2	SOIL	ICE	X	X	TA090610-09

Relinquished by	Date & Time	Relinquished by	Date & Time	Relinquished by	Date & Time
	6/9/09 1300				
Received by	**Date & Time**	**Received by**	**Date & Time**	**Received by**	**Date & Time**
Rahel Sorel	6/10/09 13:00				

Shipping Info.

Remarks

Temp °C 0

* Surcharges may apply

C9F120311

Client: Maryland Environmental Service	EA Project Manager: Karin Olsen Phone: 410-329-5112
MES Contact: Megan Simon Phone: 410-729-8334	EA Field Contact: Steve Yankay Phone: 717-487-6632
Project Name: Sparrows Point - RCRA Onshore Sampling	
Project#: 14534.06	Quote Number 18001868
Page 1 of 1	Soil Samples

Date	Time	NAPL	Soil	Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCS (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs
6/11/09	0815		X	BP-SO-B06-8	6	X	X	X	X	
	0900		X	BP-SO-B06-12	6	X	X	X	X	
	0940		X	BP-SO-B06-16	6	X	X	X	X	
	1330		X	BP-SO-B07-12	6	X	X	X	X	
	—		X	BP-SO-DUP-2	6	X	X	X	X	
↓	—			Trip blank	2			X		

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Remarks

SEE PROJECT SPECIFIC ANALYTE LIST

Run SRMs on metals, PAHs

5 day turn-around -time for all samples

Sampled by: (Signature)	Date/Time 6/11/09 / 1600	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature) Jim Vicinie	Date/Time 6/12/09 0958

SOIL

C9F160238

Client:	EA Project Manager:
Maryland Environmental Service	**Karin Olsen**
	Phone: 410-329-5112
MES Contact:	EA Field Contact:
Megan Simon	**Steve Yankay**
Phone: 410-729-8334	Phone: 717-487-6632

Project Name: Sparrows Point - RCRA Onshore Sampling

Project#: 14534.06 Quote Number 18001868

Page 1 of 1

Date	Time	NAPL	Soil	Soil Samples: Sample Identification	No. of Containers	SVOC and PAHs 8270C (low level)	Metals (PPL) and Mercury 6020/7471A	VOCs (8260B)	Cyanide (9012A)	NAPL - VOCs and PAHs	Remarks
6/15/09	0900		X	BP-50-B08-C	8	X	X	X	X		SEE PROJECT SPECIFIC ANALYTE LIST
	0950			BP-50-B08-10	8	X	X	X	X		
	1030			BP-50-B08-16	8	X	X	X	X		Run SRMs on metals, PAHs
	1230			BP-50-B09-8	8	X	X	X	X		
	1330			BP-50-B09-14	8	X	X	X	X		5 day turn-around -time for all samples
	1400			BP-50-B09-18	8	X	X	X	X		
	1020			BP-50-B08-16 MS	8	X	X	X	X		
	1020			BP-50-B08-16 MSD	8	X	X	X	X		
↓	—			Trip Blank	2			X			

Parameters/Method Numbers for Analysis

Chain of Custody Record

Laboratory:
TestAmerica - Pittsburgh
301 Alpha Drive, RIDC Park
Pittsburgh, PA 15238

phone: 412-963-2428
fax: 412-963-2468

ATTN: Carrie Gamber

Sampled by: (Signature)	Date/Time 6/15/09 1600	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 6/16/09 1000

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(1 - 100)

C9F200206

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: EA Engineering	Project Manager: Karin Olsen	Date: 6/19/09	Chain of Custody Number: 113732
Address: 15 Loveton Circle	Telephone Number (Area Code)/Fax Number: 410-771-4950 / 410-771-4904	Lab Number:	Page 1 of 1
City: Sparks; State: MD; Zip Code: 21152	Site Contact: Joseph Sawicki	Lab Contact:	
Project Name and Location (State): Sparrows Point, MD	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: 145340600001.0004B			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	methanol	Analysis: VOC	SVOC	Cyanide	Metals	PAH	Special Instructions/ Conditions of Receipt
BP-SO-B10-4	6/19/09	1020				X	X						X	X	X	X	X	X	
~~BP-SO-B10-12~~		1300				X	X						X	X	X	X	X	X JES	
~~BP-SO-B10-16~~		1330				X	X						X	X	X	X	X	X JES	
Trip Blank	↓	—																	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: [signature]	6/19/09	1600	1. Received By: Fed Ex	6/19/09	1600
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By: [signature]	6-20-09	0905

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

7

(1 - 61)

C9F230278

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
EA Engineering	Karin Olsen	6/22/09	113754
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
15 Loveton Circle	410-771-4950 / 410-771-4204		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Sparks / MD / 21152	Joseph Sawicki		
Project Name and Location (State)	**Carrier/Waybill Number**		
Sparrows Point, MD			
Contract/Purchase Order/Quote No.			
145406.0001.0004B			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Methanol	Analysis: VOC	SVOC	Cyanide	Metals	PAH
BP-SO-B11-4	6/22/09	1330				X	X						X	X	X	X	X	X
Trip Blank	6/22/09	—		X						X				X				

Analysis (Attach list if more space is needed)

Special Instructions/ Conditions of Receipt

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: John Zink	6/22/09	1600	1. Received By: Fed Ex	6/22/09	1600
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By: Robert R Daust	6/23/09	0925

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Client: EA Engineering Science, and Technology, Inc.	Project Manager: Karin Olsen Phone: 410-329-5112	Chain of Custody Record
15 Loveton Circle Sparks, MD 21152	Field Contact: Karin Olsen Phone: 443.465.9783	Laboratory: TestAmerica - Pittsburgh 301 Alpha Drive, RIDC Park Pittsburgh, PA 15238 phone: 412-963-2428 fax: 412-963-2468 ATTN: Carrie Gamber
Project Name: Sparrows Point ~~Offshore~~ Areas Project#: 14534.06	Onshore (KAO) 7/17/09	
Page 1 of 1	Soil and NAPL (KAO) 7/17/09 ~~Sediment~~ Samples	

Date	Time	Water / NAPL	Soil	Sample Identification	No. of Containers	TCLP EPA 1311	NAPL - VOCs + PAHs	TOC - Lloyd Kahn	VOCs	Remarks
6/24/09	1115		X	SP-ONSHORE1-TCLP	2	X				SEE PROJECT SPECIFIC ANALYTE LIST
			X	~~SP-ONSHORE2-TCLP~~	2	X				
6/23/09	1140	X		BP-MW-8	2		X			
6/23/09	1090	X		BP-MW-5			X			
6/25/09	1330	X		C013-PZ1-008	1		X			Insufficient volume for sample
6/23/09	1200		X	BP-HSA-5 0-2	1			X		
6/24/09	—	—		Trip Blank	2				X	

Sampled by: (Signature)	Date/Time 6/25/09 1200	Relinquished by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time 6/26/09 0958