REPORT ON
AES SPARROWS POINT PROJECT
AUGUST 2007 SEDIMENT SAMPLING AND RESULTS
SPARROWS POINT, MARYLAND

by

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Sparrows Point Project Sediment Sampling and Results

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Introduction

In August 2007, AES collected sediment samples from a floating barge using a Vibracore sampler to extract sediment samples from three depths identified as "shallow" (0 to two feet below the sediment surface), "intermediate" (two foot intervals at depths ranging from six to 16 feet), and "deep" (the two foot sample interval that corresponds with the proposed bottom elevation of the shipping channel and turning basin targeted at 45-feet below sea level (±3 feet)). Shallow and intermediate samples are representative of the sediment that would be removed during the course of the proposed channel dredging, and deep samples are representative of the channel and sediment surface that would be exposed to the benthic environment after the completion of dredging operations.

The sediment samples collected by AES in August 2007 were requested by the U.S. Army Corps of Engineers ("ACOE") in a letter to AES dated July 3, 2007. AES initially responded to the request for additional samples in correspondence dated July 21, 2007 wherein AES noted that it had gone well beyond the sampling required for issuance of the permit titled "CENAB-OP-RMN (BWI-SPARROWS POINT LLC/BULKHEAD & DREDGING) 04-64865-1," dated May 6, 2005 ("BWI Permit"). Specifically, the ACOE approved the BWI Permit based on three composite samples, with each composite sample consisting of sediment collected from three different core locations; nine core locations total. AES expanded the extent of analyses in its initial sampling performed in June 2006 based on the level of interest from the public and agencies as expressed at project and public meetings. Public comment posited a potential of vertical stratification of sediment quality; thus, AES chose to analyze samples from different depths in order to understand depth distribution. In addition, there was expressed interest in understanding the possible presence and concentration of compounds that may have been associated with the former shipyard usage; thus, tributyl tin and PCB analyses were added to the analyte list. Finally, elutriate testing was added in order to generate objective data to characterize potential effects on water quality during dredging. The results of the 15 locations cored by AES, 16 sediment samples analyzed, and elutriate testing were all compared to area data collected by various parties within the vicinity of the AES project and found to be consistent with or better than sediment quality in this area of the Port of Baltimore. In addition, depth stratification was found to be present with more contaminated sediment concentrated in the upper several feet of sediment, and sediments at depth being generally less contaminated or free of individual or categories of contaminants.

The adequacy of AES's sampling program was discussed at a meeting with AES, ACOE, the U.S. Environmental Protection Agency ("EPA"), the Federal Energy Regulatory Commission ("FERC"), and the Maryland Department of Environment ("MDE") on August 1, 2007. At that meeting it was agreed that the public and the environment would best be served by conducting additional sediment sampling due to refinements made by AES in its proposed dredge area. As explained by AES at that meeting, the refinements were made to (i) decrease the area of potential bottom impact by making use of the existing Pier 1 rather than constructing a new pier, (ii) take advantage of the deep draft area adjacent to Pier 1 that was formerly used by a floating dry dock, thus decreasing the total amount of dredge, and (iii) better allow for the consistent safe maneuvering of ships based on real-time simulations performed by licensed Maryland Pilots and

other maritime professionals at the Maritime Institute of Technology and Graduate Studies ("MITAGS") located in Linthicum Heights, Maryland.

In order to appreciate the thoroughness of its sampling program, AES requested that Haley & Aldrich compare ratios of the AES sampling program with the sampling program presented for review of the BWI Permit. The comparisons were requested based on a sample-to-volume basis and on a sample-to-area basis. This information is summarized in Table 1 of this report and shows that, excluding the data collected for the BWI Permit, which covered the same approximate area as proposed to be dredged by AES, and data collected by the Maryland Port Administration ("MPA") in late-2006[1], which was performed at the request of the LNG Opposition Team in the area proposed to be dredged by AES, and accounting only for the AES data collected in June 2006, there was one sample for every 231,000 cubic yards (five times better sample-to-volume ratio than required for the BWI Permit), and distributed over 117 acres (nine times better sample-to-area ratio than required for the BWI Permit due to 40 percent less acreage to be dredged than was allowed under the BWI Permit). The new data supplied with this document increases those comparisons to 13 times better on a sample-to-volume ratio and 20 times better on a sample-to-area ratio. See Table 1. Were one to compare all the data presented for consideration in evaluating the proposed dredge activity (BWI data, MPA data, AES June 2006 data, and AES August 2007 data), the comparison ratios would increase to 15 times better on a sample-to-volume basis and 30 times better on a sample-to-area basis. See Table 1.[2]

Core Sampling Locations

Locations of the Vibracore drilling and sampling associated with the most recent field work in August 2007 are shown on Figure 1. During the August 2007 sampling event, twelve locations were cored; the locations were requested by the ACOE and the EPA to be "randomly" determined with three Vibracore locations each apportioned to four areas subdivided from the overall dredge area footprint. The subdivision of these areas was as described in the ACOE letter to AES dated July 3, 2007. To identify a random distribution of the Vibracore locations, the proposed dredge area was divided into the four segments prescribed by ACOE:

- Outer approach channel
- Turning basin
- North side of Pier 1
- South side of Pier 1

A 100 foot by 100 foot grid was overlain on each of the four prescribed dredge segments. The ACOE comment directed that sample locations should be selected randomly within each segment.

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[1] MPA collected four samples composited from 12 cored sample locations (three core locations were composited for each individual sample submitted to the laboratory). These samples were analyzed for VOCs, SVOCs, metals, pesticides and PCBs, and water analyses were also performed. The results indicated detections of a wider variety of compounds, including organic compounds, than had originally been reported in the BWI Permit application; however, evaluation of the results by the MPA, summarized in an MPA memo dated November 7, 2006, concluded that the material to be dredged was consistent with sediment quality found elsewhere in the Port of Baltimore, and that dredging would not result in water quality impacts.

[2] For references purposes, Figure 1 shows the locations of all the samples taken by AES, BWI, and MPA. Figure 1 also shows the areas approved to be dredged under the BWI Permit and the area proposed to be dredged by AES.

To accomplish this, potential sample locations (nodes) were identified at the center of each 100 foot square; each node in each segment was labeled with a unique node number. For each segment, three separate sampling locations were selected by using random number generation to identify the three node numbers within each segment that would comprise the randomly-selected sample locations. Figure 1 shows the twelve randomly selected locations determined by this method. A meeting with ACOE and EPA was held on August 17, 2007 at which the sampling program was discussed and agreed to with those agencies. A tabular summary of the sampling program was subsequently prepared and conveyed to the ACOE and EPA by email on August 20, 2007 confirming the agreed-upon sampling program.

At the twelve Vibracore locations, bathymetry varies, therefore the amount of core actually needed to reach the target dredge depth of -45 feet also varied. In some locations, all three targeted sample intervals were represented (shallow, intermediate, and deep), and in other areas of greater water depth, only the bottom-most interval would be penetrated in the core sampling operation. In total, based on the site bathymetry 28 sediment samples were collected for off-site laboratory analysis; of these 28 samples twelve were collected in the shallow zone (or interval), four from the intermediate zone, and twelve from the deep zone, the Vibracore logs are provided in Appendix A of this report.

Sample Analyses – Protocol and Performance

Samples were collected via Vibracore sampling methods to recover representative, undisturbed sub-bottom sediment samples. Samples were collected within new, clean lexan liners within the Vibracore sample tubes. Upon recovery, the cores were examined by an experienced geoscientist, sample logs were prepared, and samples were selected from the appropriate sample intervals and placed in new, clean, laboratory-supplied sample jars. Samples were transported under approved chain-of-custody procedures to a Maryland-certified on shore laboratory, Caliber Analytical Services located in Towson, Maryland, for analysis using EPA analytical procedures appropriate to the analytes of interest. Specifically, VOCs were determined using EPA Method 8260B, semi-VOC concentrations were determined using EPA Method 8270C, and chlorinated pesticides were determined using EPA Method 8081A and PCBs were determined for shallow and intermediate samples using EPA Method 8082 while the PCBs for deep samples (representative of the proposed elevation) were determined utilizing the high resolution congener specific EPA Method 1668A for the NOAA 21 Congener List. Inorganic parameters including the priority pollutant metals and total cyanide which were analyzed in accordance with EPA Methods 6020A and 9012 respectively. Finally, additional parameters of analysis included tributyl tin by VIMS Method 338, Total Organic Carbon ("TOC") by ASTM Method D5373, and hexavalent chromium (Cr^{6+}) by EPA Method 7196A. Tributyl tin and hexavalent chromium, while not required analytes by ACOE Guidance for dredge material characterization, were analyzed based on community input received relative to sediment quality and industrial practices in the area.

Sediment Analytical Results

Table 2 presents a summary of the laboratory results for the shallow, intermediate, and deep interval samples. Results are also shown in a series of three figures attached, Figure 2a, Figure 2b, and Figure 2c for the shallow, intermediate, and deep samples, respectively. The sampling results obtained by AES were compared with NOAA screening values for chemical compounds in sediment that may result in an observable toxicity effect on marine biota. On Figures 2a, 2b, and 2c, the samples with detectable compounds are presented relative to Marine Sediment

Guidelines from the NOAA Quick Reference Tables ("SQUIRT") values.[3] See reference for Buchman 1999. The NOAA SQUIRT values are divided into three separate categories:

- **TEL** – Threshold Effects Level; represents the concentration below which adverse effects are expected to occur only rarely.
- **PEL** – Probable Effects Level; represents the concentration above which adverse effects are frequently expected.
- **AET –** Apparent Effects Threshold; represents the concentration above which adverse biological impacts would always be expected by the biological indicators

If a compound was both detected and exceeded a SQUIRT guideline, it is shown relative to its associated Vibracore boring location. The primary detected compounds are PAHs and metals.[4] By comparing the detected compounds for those that exceed the SQUIRT values, it is evident that both the concentration and number of PAH and metals detections diminish to a point of no SQUIRT exceedances in the deep sediments for PAH compounds and reduced levels of metals. With specific regard to PAHs, the concentrations detected tended to be in the part-per-billion to part-per-million range, which is consistent with data from this same area associated with past dredge sampling, and consistent with other areas in the Port of Baltimore area (see further discussion on this below).

In summary:

- VOCs and pesticides were not detected in any of the sediment samples collected.

- PAHs (included with the semi-volatile analyses) were detected in six of the twelve sediment samples collected from the shallow sampling interval (HA-117, HA-118, HA-120, HA-121, HA-123 and HA-124); however, PAHs were not detected in the intermediate sample interval and only one PAH criteria exceedance was detected in the deep sample interval at Vibracore location HA-126. The PAH compounds detected include Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene Benzo(b)fluoranthene, Benzo(k)fluoranthene, Bis(2-ethylhexl)phthalate, Dibenz(a,h)anthracene)Di-n-octyl phthalate, Fluoranthrene, Isophorone, Napthalene, Phenanthrene and Pyrene. The levels of PAHs detected ranged from 270 to 3400 parts per billion, actual values for each detection are presented in Table 2. PAH concentrations detected in the August 2007 Vibracore samples tended to be slightly higher than those reported for Baltimore Harbor Anchorages and Channels (ACOE, 1997), but consistent with or lower for several PAH compound concentrations documented in the MDE Baltimore Harbor/Patapsco River/Back River study (ACOE 1997), the sampling performed for the Sparrows Point Marine Channel (EA Engineering Science, 1985) and the sampling

[3] As stated in the NOAA SQUIRTs, the criteria were developed "for preliminary screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels." The SQUIRTs were developed for internal use by the Coastal Protection and Restoration Division of NOAA, which identifies potential impacts to coastal resources and habitats likely to be affected by contaminated sites.

[4] Polycyclic aromatic hydrocarbon ("PAH") are chemicals typically generated from the incomplete combustion of fossil fuels. The main source of PAHs is fossil fuels where they occur naturally. They can flow into the water during spills or be carried in by urban runoff, which collects oil and grease on roads. After combustion, PAHs attached to particles can enter the water directly through atmospheric deposition or indirectly through runoff. Metals are trace heavy metals found in sediments that can be the result of naturally occurring materials or the result of contamination from anthropogenic sources such as heavy industry.

performed during the June 2006 AES sediment sampling event. The PAH impacted sediments in the shallow sampling interval will be removed and the overall condition of the sediments in the turning basin and approach channel will improve.

- Concentrations of several metals were detected in each of the Vibracore locations at varying sampling intervals. Metals detected at concentrations in excess of the Apparent Effects Threshold included arsenic, barium, chromium, copper, lead mercury and selenium. As with the PAH trend, the concentrations of detected metals decreased with depth of sample (i.e., shallow results were higher than intermediate and deep results). The concentrations of metals detected tended to be in the part-per-million range, which is consistent with area data associated with historic dredge sampling and agency investigations of the Port of Baltimore (see further discussion on this below). The removal of the shallow and intermediate zones will result in removal of the majority of metal concentrations. The barium found at Vibracore locations HA-116, HA-117, HA-118, HA-119, HA-120 and HA-121 will remain as will the chromium found at Vibracore location HA-117; however, the majority of these metals will be reduced by over 30 percent at each location.

- PCBs in the form of Aroclor 1260 were detected at levels ranging from 0.15 to 0.22 mg/kg in the shallow interval of three Vibracore locations HA118, HA120, and HA122 which slightly exceed the NOAA Apparent Effects Threshold limit of 0.13 mg/kg. Note that PCBs in the shallow and intermediate intervals were analyzed using EPA Method 8082, appropriate for evaluation of PCB content for the dredge material to be removed. Removal of these materials as part of the proposed AES dredging program will help to improve the overall health of the Chesapeake Bay. (Baker, et al., 2001).

- Congener specific PCB analysis was performed on the deep samples utilizing EPA Method 1668A with ultra-low PCB detection limits for comparison to the NOAA SQUIRT criteria. PCB congeners were detected in each of the twelve deep samples that were analyzed. The concentrations were in the parts per trillion range for each PCB congener that was detected. Per NOAA Technical Memorandum NMFS-NE-157, the sum of concentrations of the 18 PCB congeners was multiplied by two to generate an approximation of "Aroclor-based" total PCB data for comparison with the SQUIRT criteria. The resulting total PCB congener values were in the parts per trillion range, all well below the Apparent Effects Threshold criteria of 3.6 parts per million.

- The results of the analyses conducted for dioxins are contained in Table 2 and 3. Concentrations detected were all low, in the part-per-trillion range, and are consistent with values reported in literature for the Baltimore and Chesapeake Bay area, and believed to be a result of atmospheric deposition (Derrick, et. al., 2001; Van den Burg, et al, 2006). The data have been listed by individual compound; however, aggregate toxicity is represented by calculating a single value for all dioxins combined in terms of the most toxic dioxin congener 2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) based on the World Health Organization Toxic Equivalency Factors for Fish (Van den Berg, et al 2006). Based on this comparison, no intermediate samples exceed the Apparent Effects Threshold included in the SQUIRT, the threshold where effects on marine biological organisms may be expected. See Buchman, 1999). Two samples one in Vibracore boring HA-120 shallow sampling interval and the other in HA 121 deep sampling interval (see Figure 1 for location) exceeded the Apparent Effects Threshold of 3.6 parts per billion. The total dioxin toxic equivalents detected at the HA-120 shallow sample interval was 4.96 parts per billion and the total dioxin toxic equivalents detected at the HA-121 deep sample was 3.67 parts per billion. This

indicates there will be a net positive improvement in dioxin concentrations in the proposed dredge area as a result of the removal.

- Analytical results for tributyl tin by VIMS Method 338 have not yet been received. AES expects receipt of the results on or before October 1, 2007. Tributyl tin are not required analytes by ACOE Guidance for dredge material characterization, but are being analyzed based on community input received relative to sediment quality and industrial practices in the area. When the results are received, AES will submit an addendum to this report.

Analytical Comparison

A comparison of the June 2006 and August 2007 Vibracore sampling event data shows that the data collected from the August 2007 event directly correlates to the information presented to the ACOE, MDNR, MDE, and FERC in the various permit application materials submitted to those agencies in January 2007. Specifically, the PAHs and metals detected during the August 2007 event are within the same range of those constituents detected during the June 2006 sampling event as well as other historical dredge projects conducted in the Chesapeake Bay Area as presented in Table 4. The additional sampling performed by AES at the request of the ACOE and EPA confirms and further substantiates that the original classification of the sediment quality by AES in the proposed dredge area is accurate and comprehensive.

The data illustrates that the highest concentrations of chemical constituents, primarily semi-volatile PAHs and heavy metals, are found in the shallow, fine-grained sediments with high organic carbon content that accumulate in low-energy depositional areas that tend to be close to the shore. Constituent concentrations generally decrease with depth at all locations, and decrease with distance from shore. The depth range of sediments with elevated constituent concentrations also appears to decrease further away from the shore, consistent with net import and deposition of fine-grained sediments close to the shore, rather than net scour and export of these sediments.

The results indicate that the removal of the shallow and some of the intermediate sediment during dredging operations will improve bottom sediment conditions in the areas where dredging is planned. Active remediation of contaminated sediments more effectively reduces toxic pollution than natural dissipation. This is true for both surface contaminant concentrations and buried contaminants that could be remobilized during an extreme event. Lessening the risk of an event-driven release of contaminants is one of the most valuable long-term benefits of dredging.

Elutriate Analytical Results

Additionally, as requested by ACOE and EPA, AES performed elutriate testing for each depth interval at each sampling area, resulting in a total of twenty-four elutriate samples. The sampling technique directly measures constituent concentrations in the elutriate water, more realistically reflecting conditions in the water column that may result from exposure of contaminant-containing sediments to the water color during dredging. VOCs were determined using EPA Method 8260B, semi-VOC concentrations were determined using EPA Method 8270C, and chlorinated pesticides were determined using EPA Method 8081A and PCBs were determined for shallow and intermediate samples using EPA Method 8082. Inorganic parameters including the priority pollutant metals and total cyanide were analyzed in accordance with EPA Methods 6020A and 9012, respectively. Additional parameters of analysis included tributyl tin by VIMS Method 338, TOC by ASTM Method D5373, and hexavalent chromium by EPA Method 7196A. Tributyl tin and hexavalent chromium, while not required analytes by ACOE Guidance for dredge

material characterization, were analyzed based on community input received relative to sediment quality and industrial practices in the area.

Elutriate data collected were generated for twenty-four sets of sediment composites (results reported in Table 3). When compared against both acute and chronic marine water quality criteria, the elutriate data indicate no compounds exceeded comparison criteria, and therefore no adverse impacts to water quality as a result of exposure of the sediment to the water column during dredging would be anticipated based on these results.

References

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TABLE 1
SUMMARY OF DREDGE AREAS AND SEDIMENT SAMPLES
AES SPARROWS POINT LNG
SPARROWS POINT, MARYLAND

DREDGE AREA	APPROX. DREDGE AREA (ac.)	APPROX. DREDGE VOLUME (cy)	CORRESPONDING SEDIMENT SAMPLING EVENT	NO. OF LOCATIONS	NO. OF SAMPLES	SAMPLE SOURCE	ACREAGE/ SAMPLE	CUBIC YARDS/ SAMPLE
APPROVED PHASE I	94	600,000	2004 GZA	24 vibracores	3	composed from 9 locations		
APPROVED PHASE II	101	2,600,000						
06 MAY 2005 ACOE PERMIT	195	3,200,000					**65**	**1,066,667**
PROPOSED AES LNG	117	3,700,000						
JUNE 2006 SAMPLING EVENT			*2006 AES*	*15 vibracores*	*16*	*discrete*	*7*	*231,250*
AUGUST 2007 SAMPLING EVENT			*2007 AES*	*12 vibracores*	*28*	*discrete*	*4*	*132,143*
TOTAL				***27 vibracores***	***44***	***discrete***	***3***	***84,091***
PRIOR TO PHASE I DREDGE	94	600,000	2006 MPA	12 shallow	4	composed from 12 locations	24	150,000
PROPOSED AES LNG CONSIDERING GZA DATA	117	3,700,000	2004 GZA 2006 AES 2007 AES	52 vibracores	47	44 discrete 3 composite	2	78,723
PROPOSED AES LNG CONSIDERING GZA & MPA DATA	117	3,700,000	2004 GZA 2006 MPA 2006 AES 2007 AES	52 vibracores 12 shallow	51	44 discrete 7 composite	2	72,549

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																			
	HA-116	HA-116	HA-117	HA-117	HA-118	HA-118	HA-118	HA-119	HA-119	HA-119	HA-120	HA-120	HA-120	HA-121	HA-121	HA-121	HA-122	HA-122	HA-123	HA-123
From MSL (ft)																				
From ToS (ft)	0.0-2.0	10.0-12.0	0.0-2.0	8.0-10.0	0.0-2.0	10.0-12.0	22.0-24.0	0.0-2.0	6.0-8.0	14.0-16.0	0.0-2.0	8.0-10.0	15.0-17.0	0.0-2.0	14.0-16.0	26.0-27.0	0.0-2.0	8.0-10.0	0.0-2.0	14.0-16.0
Chemical	Shall	Deep	Shall	Deep	Shall	Inter	Deep	Shall	Inter	Deep	Shall	Inter	Deep	Shall	Inter	Deep	Shall	Deep	Shall	Deep
Volatile Organics (ug/kg)																				
1,1,1-Trichloroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,1,2,2-Tetrachloroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,1,2-Trichloroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,1,2-Trichlorotrifluoroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,1-Dichloroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,1-Dichloroethene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,2,4-Trichlorobenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,2-Dibromo-3-chloropropane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,2-Dibromoethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,2-Dichlorobenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,2-Dichloroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,2-Dichloropropane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,3-Dichlorobenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
1,4-Dichlorobenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
2-Butanone (MEK)	<150	<86	<110	<58	<220	<99	<88	<100	<110	<64	<110	<110	<94	<150	<91	<97	<61	<59	<120	<57
2-Hexanone (MBK)	<31	<17	<22	<12	<45	<20	<18	<21	<22	<13	<23	<22	<19	<31	<18	<19	<12	<12	<25	<11
4-Methyl-2-pentanone (MIBK)	<31	<17	<22	<12	<45	<20	<18	<21	<22	<13	<23	<22	<19	<31	<18	<19	<12	<12	<25	<11
Acetone	<150	<100	<170	<58	<1600	<99	<110	<100	<110	<71	<230	<110	<130	<370	<120	<150	<110	<130	<410	<150
Benzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Bromodichloromethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Bromoform	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Bromomethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Carbon disulfide	<31	<17	<22	<12	<45	<20	<18	<21	<22	<13	<23	<22	<19	<31	<18	<19	<12	<12	<25	<11
Carbon tetrachloride	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Chlorobenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Chloroethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Chloroform	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Chloromethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
cis-1,2-Dichloroethene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
cis-1,3-Dichloropropene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Cyclohexane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Dibromochloromethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Dichlorodifluoromethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Diisopropyl ether (DIPE)	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Ethyl t-butyl ether (ETBE)	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Ethylbenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Isopropylbenzene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
m&p-Xylene	<31	<17	<22	<12	<45	<20	<18	<21	<22	<13	<23	<22	<19	<31	<18	<19	<12	<12	<25	<11
Methyl acetate	<77	<43	<54	<29	<110	<50	<44	<52	<55	<32	<57	<56	<47	<77	<46	<49	<30	<29	<62	<29
Methyl t-butyl ether (MTBE)	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Methylcyclohexane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Methylene chloride	<170	<120	<97	<75	<250	<120	<110	<100	<150	<77	<110	<130	<130	<170	<100	<140	<79	<83	<140	<80
o-Xylene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Styrene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
tert-Amyl alcohol (TAA)	<77	<43	<54	<29	<110	<50	<44	<52	<55	<32	<57	<56	<47	<77	<46	<49	<30	<29	<62	<29
tert-Amyl ethyl ether (TAEE)	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
tert-Amyl methyl ether (TAME)	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
tert-Butanol (TBA)	<77	<43	<54	<29	<110	<50	<44	<52	<55	<32	<57	<56	<47	<77	<46	<49	<30	<29	<62	<29
Tetrachloroethene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Toluene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
trans-1,2-Dichloroethene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
trans-1,3-Dichloropropene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Trichloroethene	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Trichlorofluoromethane	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6
Vinyl chloride	<15	<9	<11	<6	<22	<10	<9	<10	<11	<6	<11	<11	<9	<15	<9	<10	<6	<6	<12	<6

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																			
	HA-116	HA-116	HA-117	HA-117	HA-118	HA-118	HA-118	HA-119	HA-119	HA-119	HA-120	HA-120	HA-120	HA-121	HA-121	HA-121	HA-122	HA-122	HA-123	HA-123
From MSL (ft)																				
From ToS (ft)	0.0-2.0	10.0-12.0	0.0-2.0	8.0-10.0	0.0-2.0	10.0-12.0	22.0-24.0	0.0-2.0	6.0-8.0	14.0-16.0	0.0-2.0	8.0-10.0	15.0-17.0	0.0-2.0	14.0-16.0	26.0-27.0	0.0-2.0	8.0-10.0	0.0-2.0	14.0-16.0
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Semivolatile Organics (ug/kg)																				
1,1-Biphenyl	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2,4,5-Trichlorophenol	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
2,4,6-Trichlorophenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2,4-Dichlorophenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2,4-Dimethylphenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2,4-Dinitrophenol	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
2,4-Dinitrotoluene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2,6-Dinitrotoluene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2-Chloronaphthalene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2-Chlorophenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2-Methylnaphthalene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2-Methylphenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
2-Nitroaniline	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
2-Nitrophenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
3,3-Dichlorobenzidine	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
3-Nitroaniline	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
4,6-Dinitro-2-methylphenol	<750	<450	<490	<290	<930	<500	<460	<480	<490	<320	<610	<530	<500	<730	<520	<490	<360	<380	<1000	<390
4-Bromophenyl phenyl ether	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
4-Chloro-3-methylphenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
4-Chloroaniline	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
4-Chlorophenyl phenyl ether	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
4-Methylphenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
4-Nitroaniline	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
4-Nitrophenol	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
Acenaphthene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Acenaphthylene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Acetophenone	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Anthracene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	380	<230	<220	330	<230	<210	<160	<160	<440	<170
Atrazine	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Benzo[a]anthracene	<320	<200	<210	<120	1,300	<220	<200	<210	<210	<140	1,400	<230	<220	600	<230	<210	<160	<160	500	<170
Benzo[a]pyrene	<320	<200	<210	<120	1,200	<220	<200	<210	<210	<140	1,900	<230	<220	1,100	<230	<210	<160	<160	<440	<170
Benzo[b]fluoranthene	<320	<200	<210	<120	1,500	<220	<200	<210	<210	<140	2,300	<230	<220	1,200	<230	<210	<160	<160	760	<170
Benzo[g,h,i]perylene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	1,300	<230	<220	<320	<230	<210	<160	<160	<440	<170
Benzo[k]fluoranthene	<320	<200	<210	<120	770	<220	<200	<210	<210	<140	900	<230	<220	650	<230	<210	<160	<160	<440	<170
Bis (2-chloroethoxy) methane	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Bis (2-chloroethyl) ether	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Bis (2-chloroisopropyl) ether	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Bis (2-ethylhexyl) phthalate	<320	<200	270	<120	3,200	<220	<200	<210	<210	<140	1,900	<230	<220	470	<230	<210	<160	<160	6,000	<170
Butyl benzyl phthalate	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Caprolactam	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Carbazole	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Chrysene	<320	<200	<210	<120	1,200	<220	<200	<210	<210	<140	1,700	<230	<220	660	<230	<210	<160	<160	520	<170
Dibenz[a,h]anthracene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Dibenzofuran	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Diethyl phthalate	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Dimethyl phthalate	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Di-n-butyl phthalate	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Di-n-octyl phthalate	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Fluoranthene	<320	<200	<210	<120	2,500	<220	<200	<210	<210	<140	3,400	<230	<220	1,100	<230	<210	<160	<160	1,100	<170
Fluorene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Hexachlorobenzene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Hexachlorobutadiene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Hexachlorocyclopentadiene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Hexachloroethane	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																			
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**
From MSL (ft)																				
From ToS (ft)	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**22.0-24.0**	**0.0-2.0**	**6.0-8.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**15.0-17.0**	**0.0-2.0**	**14.0-16.0**	**26.0-27.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Indeno[1,2,3-cd]pyrene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	1,200	<230	<220	<320	<230	<210	<160	<160	<440	<170
Isophorone	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Naphthalene	<320	<200	390	<120	7,900	<220	<200	<210	<210	<140	3,000	<230	<220	2,200	<230	<210	<160	<160	850	<170
Nitrobenzene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
N-Nitroso-di-n-propylamine	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
N-Nitrosodiphenylamine	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Pentachlorophenol	<810	<490	<530	<310	<1000	<540	<500	<530	<530	<350	<660	<580	<550	<800	<570	<540	<400	<410	<1100	<420
Phenanthrene	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	540	<230	<220	460	<230	<210	<160	<160	<440	<170
Phenol	<320	<200	<210	<120	<400	<220	<200	<210	<210	<140	<270	<230	<220	<320	<230	<210	<160	<160	<440	<170
Pyrene	<320	<200	<210	<120	2,100	<220	<200	<210	<210	<140	3,100	<230	<220	1,300	<230	<210	<160	<160	1,100	<170
Pesticides (ug/kg)																				
4,4-DDD	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
4,4-DDE	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
4,4-DDT	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
a-BHC	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
a-Chlordane	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Aldrin	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
b-BHC	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
d-BHC	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Dieldrin	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Endosulfan I	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Endosulfan II	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Endosulfan Sulfate	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Endrin	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Endrin Aldehyde	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Endrin Ketone	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
g-BHC (Lindane)	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
g-Chlordane	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Heptachlor	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Heptachlor Epoxide	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Methoxychlor	<25	<20	<20	<13	<32	<21	<20	<23	<24	<15	<25	<26	<23	<30	<24	<23	<18	<18	<33	<18
Toxaphene	<250	<200	<200	<130	<320	<210	<190	<230	<240	<150	<250	<260	<230	<290	<240	<230	<180	<180	<330	<180
PCBs (mg/kg)																				
Aroclor 1016	<0.12	NA	<0.098	NA	<0.16	<0.11	NA	<0.11	<0.12	NA	<0.13	<0.13	NA	<0.15	<0.12	NA	<0.089	NA	<0.17	NA
Aroclor 1221	<0.12	NA	<0.098	NA	<0.16	<0.11	NA	<0.11	<0.12	NA	<0.13	<0.13	NA	<0.15	<0.12	NA	<0.089	NA	<0.17	NA
Aroclor 1232	<0.12	NA	<0.098	NA	<0.16	<0.11	NA	<0.11	<0.12	NA	<0.13	<0.13	NA	<0.15	<0.12	NA	<0.089	NA	<0.17	NA
Aroclor 1242	<0.12	NA	<0.098	NA	<0.16	<0.11	NA	<0.11	<0.12	NA	<0.13	<0.13	NA	<0.15	<0.12	NA	<0.089	NA	<0.17	NA
Aroclor 1248	<0.12	NA	<0.098	NA	<0.16	<0.11	NA	<0.11	<0.12	NA	<0.13	<0.13	NA	<0.15	<0.12	NA	<0.089	NA	<0.17	NA
Aroclor 1254	<0.12	NA	<0.098	NA	<0.16	<0.11	NA	<0.11	<0.12	NA	<0.13	<0.13	NA	<0.15	<0.12	NA	<0.089	NA	<0.17	NA
Aroclor 1260	<0.12	NA	<0.098	NA	0.19	<0.11	NA	<0.11	<0.12	NA	0.15	<0.13	NA	0.22	<0.12	NA	<0.089	NA	<0.17	NA
PCB Congeners (pg/g)																				
8-DiCB	NA	8.43	NA	8.57	NA	NA	9.23	NA	NA	13.6	NA	NA	9.38	NA	NA	9.51	NA	22	NA	9.74
18,30-TrCB	NA	5.76	NA	12	NA	NA	5.36	NA	NA	7.16	NA	NA	6.34	NA	NA	5.4	NA	51.9	NA	10.1
20,28-TrCB	NA	21.3	NA	20.8	NA	NA	26	NA	NA	37.8	NA	NA	25.2	NA	NA	20.4	NA	108	NA	33.3
44,47,65-TeCB	NA	4.57	NA	14	NA	NA	4.77	NA	NA	7.58	NA	NA	6.65	NA	NA	4.67	NA	127	NA	9.58
56-TeCB	NA	2.12	NA	6.75	NA	NA	2.97	NA	NA	4.91	NA	NA	4.87	NA	NA	2.25	NA	43.2	NA	4.41
66-TeCB	NA	4.66	NA	14	NA	NA	7.12	NA	NA	11.9	NA	NA	10.8	NA	NA	6.43	NA	107	NA	10.4
90,101,113-PeCB	NA	5.35	NA	10.7	NA	NA	5.19	NA	NA	8.1	NA	NA	7.69	NA	NA	6.92	NA	201	NA	14.1
105-PeCB	NA	ND	NA	3.26	NA	NA	1.14	NA	NA	2.15	NA	NA	1.66	NA	NA	1.45	NA	30.6	NA	3.96
118-PeCB	NA	3.12	NA	7.12	NA	NA	3.79	NA	NA	5.64	NA	NA	5.22	NA	NA	3.61	NA	91.8	NA	9.77
128,166-HxCB	NA	ND	NA	1.18	NA	NA	ND	NA	NA	0.793	NA	NA	ND	NA	NA	ND	NA	22.1	NA	1.77
129,138,163-HxCB	NA	4.95	NA	7.59	NA	NA	4.32	NA	NA	6.8	NA	NA	7.31	NA	NA	5.77	NA	197	NA	16.7
153,168-HxCB	NA	4.16	NA	6.86	NA	NA	3.45	NA	NA	5.79	NA	NA	7.08	NA	NA	5.69	NA	230	NA	16.2

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																			
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**
From MSL (ft)																				
From ToS (ft)	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**22.0-24.0**	**0.0-2.0**	**6.0-8.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**15.0-17.0**	**0.0-2.0**	**14.0-16.0**	**26.0-27.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
179-HpCB	NA	ND	NA	0.797	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	35.2	NA	2.43
180,193-HpCB	NA	1.31	NA	3	NA	NA	ND	NA	NA	2.39	NA	NA	3.23	NA	NA	2.45	NA	106	NA	8.28
187-HpCB	NA	1.49	NA	2.26	NA	NA	ND	NA	NA	2.04	NA	NA	2.58	NA	NA	1.99	NA	100	NA	6.21
195-OcCB	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	7.94	NA	ND
206-NoCB	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	33.2	NA	1.52
209-DeCB	NA	ND	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	61.9	NA	2.15
"Aroclor-based" total PCB data (mg/kg) (3)		0.00013444		0.000237774			0.00014668			0.000233306			0.00019602			0.00015308		0.00315168		0.00032124
Petroleum Hydrocarbons (mg/kg)																				
Diesel Range Organics	100	<20	120	<12	700	21	28	150	<23	<14	360	28	28	360	45	22	21	88	4,900	27
Oil & Grease	5,300	55	2,300	<30	21,000	<51	130	71	<60	130	10,000	<61	<56	12,000	<58	<56	<39	190	11,000	260
Gasoline Range Organics	<0.6	<0.39	<0.45	<0.19	4.1	<0.39	<0.37	<0.4	<0.47	<0.28	0.87	<0.48	<0.4	<0.67	<0.42	<0.44	<0.29	<0.23	2.5	<0.3
Dioxins (ng/kg)																				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	1.07	ND	ND	ND	ND	1.02	ND	0.213	0.41	ND
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	0.911	ND	ND	ND	ND	1.76	ND	ND	0.317	ND
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	6.19	ND	ND	0.538	0.183	3.15	ND	ND	1.38	ND
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	3.96	ND	ND	0.425	ND	9.03	ND	1.75	1.28	ND
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	NA	NA	NA	NA	NA	13.1	18.1	12.4	91.7	6.87	4.84	9.33	4.67	132	0.59	40.6	21.6	1.57
Octachlorodibenzo-p-dioxin (OCDD)	NA	NA	NA	NA	NA	NA	NA	585	642	443	1600	200	114	134	77.4	4220	12.2	1250	276	14.1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	2.49	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	1.02	ND	ND	0.518	ND	ND	ND	ND	1.26	ND
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	1.92	ND	ND	ND	ND	ND	ND	ND	1.56	ND
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	3.64	ND	ND	0.795	0.107	ND	ND	0.321	3.25	ND
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	1.32	ND	ND	0.196	ND	ND	ND	0.133	1.27	ND
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	2.03	ND	ND	ND	ND	ND	ND	ND	1.65	ND
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA	NA	NA	NA	0.589	ND	ND	23.4	ND	0.497	2.77	0.633	0.557	ND	1.34	8.42	0.324
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	2.09	ND	ND	0.485	ND	ND	ND	ND	1.29	ND
Octachlorodibenzofuran (OCDF)	NA	NA	NA	NA	NA	NA	NA	0.953	ND	ND	73.9	0.209	1.39	9.08	2.17	1.16	ND	3.16	18.1	1.12
Tetrachlorodibenzo-p-dioxins (TCDD), Total	NA	NA	NA	NA	NA	NA	NA	ND	0.926	0.923	7.65	ND	ND	ND	ND	14.2	ND	32.2	0.749	ND
Pentachlorodibenzo-p-dioxin (PeCDD), Total	NA	NA	NA	NA	NA	NA	NA	0.578	4.65	1.95	10	0.422	ND	ND	ND	38.9	ND	29	ND	ND
Hexachlorodibenzo-p-dioxins (HxCDD), Total	NA	NA	NA	NA	NA	NA	NA	8.95	26.1	15.5	82.4	8.31	3.96	6.19	3.11	209	0.592	285	14.3	0.242
Heptachlorodibenzo-p-dioxins (HpCDD), Total	NA	NA	NA	NA	NA	NA	NA	55.1	90	56.9	246	31.4	22.8	24.8	13.2	670	1.9	448	56.5	3.86
Tetrachlorodibenzofurans (TCDF), Total	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	21.2	0.199	ND	1.5	ND	0.391	ND	0.408	5.02	ND
Pentachlorodibenzofurans (PeCDF), Total	NA	NA	NA	NA	NA	NA	NA	0.269	ND	ND	28.3	ND	ND	0.79	ND	0.687	ND	0.501	11.5	ND
Hexachlorodibenzofurans (HxCDF), Total	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	29.5	0.123	0.21	3.68	0.771	0.681	1.35	0.863	14.8	ND
Heptachlorodibenzofurans (HpCDF), Total	NA	NA	NA	NA	NA	NA	NA	0.589	ND	ND	57.7	ND	ND	7.62	3.09	1.43	ND	2.66	19.1	0.324
Toxic Equivalents (4)	NA	NA	NA	NA	NA	NA	NA	0.077585	0.0823	0.0567	4.96399	0.026891	0.21349	0.510588	0.047957	3.677686	0.00181	0.612716	2.69761	0.006332
Metals (mg/kg)																				
Arsenic	30	5.6	36	5.2	130	8.6	9.1	15	11	4	35	9.1	7.9	31	8	6.2	6	3.3	41	6.9
Barium	91	40	91	16	140	52	56	52	57	30	95	54	54	96	49	46	80	110	200	67
Cadmium	<4.5	<2.9	<2.8	<2.4	8.5	<3.1	<2.9	<3.6	<3.2	<2.1	4.4	<3.4	<3.3	<4.5	<3.3	<3.1	<2.3	<2.4	<6.9	<2.4
Chromium	180	27	180	79	1,300	37	38	46	43	21	480	40	38	450	37	35	29	33	720	26
Copper	80	11	78	7.3	450	14	15	21	17	7.9	150	15	14	160	14	13	16	18	630	16
Iron	73,000	30,000	41,000	17,000	190,000	35,000	36,000	35,000	43,000	20,000	62,000	40,000	37,000	72,000	37,000	34,000	39,000	53,000	150,000	44,000
Lead	130	15	170	21	600	21	22	28	25	11	250	22	21	230	20	18	19	21	450	20
Mercury	<0.91	<0.59	0.6	<0.47	1.3	<0.62	<0.59	<0.72	<0.63	<0.41	<0.75	<0.69	<0.66	<0.91	<0.66	<0.62	<0.46	<0.48	<1.4	<0.47
Selenium	<4.5	<2.9	4.8	<2.4	20	<3.1	<2.9	<3.6	<3.2	<2.1	5.4	<3.4	<3.3	<4.5	<3.3	<3.1	<2.3	<2.4	<6.9	<2.4
Silver	<4.5	<2.9	<2.8	<2.4	<6	<3.1	<2.9	<3.6	<3.2	<2.1	<3.7	<3.4	<3.3	<4.5	<3.3	<3.1	<2.3	<2.4	<6.9	<2.4
Miscellaneous Parameters																				
Percent Solids (%)	28	49	42	84	22	49	51	46	41	69	35	41	45	27	43	45	63	63	21	61

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																			
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**
From MSL (ft)																				
From ToS (ft)	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**22.0-24.0**	**0.0-2.0**	**6.0-8.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**15.0-17.0**	**0.0-2.0**	**14.0-16.0**	**26.0-27.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Inter**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Total Cyanide (mg/kg)	3.53	<0.34	<0.38	<0.23	1.81	<0.37	<0.33	<0.37	<0.56	<0.33	<0.54	<0.56	<0.51	<0.77	<0.49	<0.47	<0.27	<0.3	2.43	<0.29
Total Kjeldahl Nitrogen (mg/kg)	4,200	1,900	2,000	<230	3,800	2,400	2,200	2,400	2,400	1,400	1,900	2,500	2,300	2,900	2,600	1,300	690	1,200	2,100	1,600
Phosphorus (mg/kg)	740	350	730	22	6,300	320	400	970	420	320	2,400	400	450	2,400	430	420	670	1,200	1,600	330
Total Organic Carbon (mg/kg)	<350	<200	<240	NA	<460	<200	<190	<220	<240	<140	<290	<240	<220	<370	<230	<220	<160	<160	<490	<160
pH	7.6	8.1	7.7	7.9	7.6	8.5	8.3	8.2	8.3	8.2	8.3	8.4	8.2	8.1	8.2	8.3	6.9	6.8	8.3	7.3

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

												Marine Sediment Guidelines[1]					
	HA-124	HA-124	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127									
From MSL (ft)																	
From ToS (ft)	0.0-2.0	14.0-16.0	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0									
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Min**	**Max**	**Sample with Max Concentration**	**TEL**	**ERL**	**ERM**	**PEL**	**AET**	**Lowest Guideline[2]**
Volatile Organics (ug/kg)																	
1,1,1-Trichloroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,1,2,2-Tetrachloroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,1,2-Trichloroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,1,2-Trichlorotrifluoroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,1-Dichloroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,1-Dichloroethene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,2,4-Trichlorobenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					4.8	4.8
1,2-Dibromo-3-chloropropane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,2-Dibromoethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,2-Dichlorobenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					13	13
1,2-Dichloroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,2-Dichloropropane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,3-Dichlorobenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
1,4-Dichlorobenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					110	110
2-Butanone (MEK)	<63	<54	<56	<74	<52	<61	<65	<55	0	0	N/A						
2-Hexanone (MBK)	<13	<11	<11	<15	<10	<12	<13	<11	0	0	N/A						
4-Methyl-2-pentanone (MIBK)	<13	<11	<11	<15	<10	<12	<13	<11	0	0	N/A						
Acetone	<320	<140	<320	<120	<180	<190	<310	<230	0	0	N/A						
Benzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Bromodichloromethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Bromoform	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Bromomethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Carbon disulfide	<13	<11	<11	<15	<10	<12	<13	<11	0	0	N/A						
Carbon tetrachloride	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Chlorobenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Chloroethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Chloroform	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Chloromethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
cis-1,2-Dichloroethene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
cis-1,3-Dichloropropene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Cyclohexane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Dibromochloromethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Dichlorodifluoromethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Diisopropyl ether (DIPE)	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Ethyl t-butyl ether (ETBE)	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Ethylbenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					4	4
Isopropylbenzene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
m&p-Xylene	<13	<11	<11	<15	<10	<12	<13	<11	0	0	N/A					4	4
Methyl acetate	<32	<27	<28	<37	<26	<30	<33	<27	0	0	N/A						
Methyl t-butyl ether (MTBE)	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Methylcyclohexane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Methylene chloride	<160	<82	<85	<82	<63	<79	<140	<140	0	0	N/A						
o-Xylene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					4	4
Styrene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
tert-Amyl alcohol (TAA)	<32	<27	<28	<37	<26	<30	<33	<27	0	0	N/A						
tert-Amyl ethyl ether (TAEE)	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
tert-Amyl methyl ether (TAME)	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
tert-Butanol (TBA)	<32	<27	<28	<37	<26	<30	<33	<27	0	0	N/A						
Tetrachloroethene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					57	57
Toluene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
trans-1,2-Dichloroethene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
trans-1,3-Dichloropropene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Trichloroethene	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A					41	41
Trichlorofluoromethane	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						
Vinyl chloride	<6	<5	<6	<7	<5	<6	<7	<5	0	0	N/A						

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

												Marine Sediment Guidelines[1]					
	HA-124	HA-124	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127									
From MSL (ft)																	
From ToS (ft)	0.0-2.0	14.0-16.0	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0									
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Min**	**Max**	**Sample with Max Concentration**	**TEL**	**ERL**	**ERM**	**PEL**	**AET**	**Lowest Guideline[2]**
Semivolatile Organics (ug/kg)																	
1,1-Biphenyl	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
2,4,5-Trichlorophenol	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A					3	3
2,4,6-Trichlorophenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					6	6
2,4-Dichlorophenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					5	5
2,4-Dimethylphenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					18	18
2,4-Dinitrophenol	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A						
2,4-Dinitrotoluene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
2,6-Dinitrotoluene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
2-Chloronaphthalene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
2-Chlorophenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					8	8
2-Methylnaphthalene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A	20.21	70	670	201.28	64	20.21
2-Methylphenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					8	8
2-Nitroaniline	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A						
2-Nitrophenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
3,3-Dichlorobenzidine	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
3-Nitroaniline	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A						
4,6-Dinitro-2-methylphenol	<430	<340	<390	<370	<350	<360	<410	<370	0	0	N/A						
4-Bromophenyl phenyl ether	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
4-Chloro-3-methylphenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
4-Chloroaniline	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
4-Chlorophenyl phenyl ether	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
4-Methylphenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					100	100
4-Nitroaniline	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A						
4-Nitrophenol	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A						
Acenaphthene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A	6.71	16	500	88.9	130	6.71
Acenaphthylene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A	5.87	44	640	127.87	71	5.87
Acetophenone	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Anthracene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A	46.85	85.3	1100	245	280	46.85
Atrazine	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Benzo[a]anthracene	<190	<150	<170	<160	<150	<160	<180	<160	500	1,400	HA-120 0-2'	74.83	261	1600	692.53	960	74.83
Benzo[a]pyrene	<190	<150	<170	<160	<150	<160	<180	<160	1,100	1,900	HA-120 0-2'	88.81	430	1600	763.22	1100	88.81
Benzo[b]fluoranthene	<190	<150	<170	<160	<150	<160	<180	<160	760	2,300	HA-120 0-2'					1800	1800
Benzo[g,h,i]perylene	<190	<150	<170	<160	<150	<160	<180	<160	1,300	1,300	HA-120 0-2'					670	670
Benzo[k]fluoranthene	<190	<150	<170	<160	<150	<160	<180	<160	650	900	HA-120 0-2'					1800	1800
Bis (2-chloroethoxy) methane	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Bis (2-chloroethyl) ether	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Bis (2-chloroisopropyl) ether	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Bis (2-ethylhexyl) phthalate	<190	<150	<170	<160	<150	<160	<180	<160	270	6,000	HA-123 0-2'	182.16			2646.51	1300	182.16
Butyl benzyl phthalate	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					63	63
Caprolactam	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Carbazole	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Chrysene	<190	<150	<170	<160	<150	<160	<180	<160	520	1,700	HA-120 0-2'	107.77	384	2800	845.98	950	107.77
Dibenz[a,h]anthracene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A	6.22	63.4	260	134.61	230	6.22
Dibenzofuran	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					110	110
Diethyl phthalate	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					6	6
Dimethyl phthalate	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					6	6
Di-n-butyl phthalate	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					58	58
Di-n-octyl phthalate	280	<150	<170	<160	<150	600	<180	<160	280	600	HA-126 14-16'					61	61
Fluoranthene	<190	<150	<170	<160	<150	<160	<180	<160	1,100	3,400	HA-120 0-2'	112.82	600	5100	1493.54	1300	112.82
Fluorene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A	21.17	19	540	144.35	120	19
Hexachlorobenzene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					6	6
Hexachlorobutadiene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					1.3	1.3
Hexachlorocyclopentadiene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Hexachloroethane	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					73	73

TABLE 2
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AES SPARROWS POINT, BALTIMORE, MD

												Marine Sediment Guidelines[1]					
	HA-124	HA-124	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127									
From MSL (ft)																	
From ToS (ft)	0.0-2.0	14.0-16.0	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0									
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Min**	**Max**	**Sample with Max Concentration**	**TEL**	**ERL**	**ERM**	**PEL**	**AET**	**Lowest Guideline[2]**
Indeno[1,2,3-cd]pyrene	<190	<150	<170	<160	<150	<160	<180	<160	1,200	1,200	HA-120 0-2'					600	600
Isophorone	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
Naphthalene	<190	<150	<170	<160	<150	<160	<180	<160	390	7,900	HA-118 0-2'	34.57	160	2100	390.64	230	34.57
Nitrobenzene	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					21	21
N-Nitroso-di-n-propylamine	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A						
N-Nitrosodiphenylamine	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					28	28
Pentachlorophenol	<470	<370	<420	<400	<380	<400	<440	<400	0	0	N/A					17	17
Phenanthrene	<190	<150	<170	<160	<150	<160	<180	<160	460	540	HA-120 0-2'	86.68	240	1500	543.53	660	86.68
Phenol	<190	<150	<170	<160	<150	<160	<180	<160	0	0	N/A					130	130
Pyrene	<190	<150	<170	<160	<150	<160	<180	<160	1,100	3,100	HA-120 0-2'	152.66	665	2600	1397.6	2400	152.66
Pesticides (ug/kg)																	
4,4-DDD	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A	1.22	2	20	7.81	16	1.22
4,4-DDE	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A	2.07	2.2	27	374.17	9	2.07
4,4-DDT	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A	1.19	1	7	4.77	12	1
a-BHC	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
a-Chlordane	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A	2.26	0.5	6	4.79	2.8	0.5
Aldrin	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A					9.5	9.5
b-BHC	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
d-BHC	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Dieldrin	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A	0.715	0.02	8	4.3	1.9	0.02
Endosulfan I	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Endosulfan II	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Endosulfan Sulfate	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Endrin	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Endrin Aldehyde	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Endrin Ketone	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
g-BHC (Lindane)	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
g-Chlordane	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A	2.26	0.5	6	4.79	2.8	0.5
Heptachlor	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A					0.3	0.3
Heptachlor Epoxide	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Methoxychlor	<20	<17	<19	<18	<16	<18	<19	<17	0	0	N/A						
Toxaphene	<200	<170	<190	<180	<160	<180	<190	<170	0	0	N/A						
PCBs (mg/kg)																	
Aroclor 1016	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0	0	N/A	0.02155	0.0227	0.18	0.18879	0.13	0.02155
Aroclor 1221	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0	0	N/A	0.02155	0.0227	0.18	0.18879	0.13	0.02155
Aroclor 1232	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0	0	N/A	0.02155	0.0227	0.18	0.18879	0.13	0.02155
Aroclor 1242	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0	0	N/A	0.02155	0.0227	0.18	0.18879	0.13	0.02155
Aroclor 1248	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0	0	N/A	0.02155	0.0227	0.18	0.18879	0.13	0.02155
Aroclor 1254	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0	0	N/A	0.02155	0.0227	0.18	0.18879	0.13	0.02155
Aroclor 1260	<0.099	NA	<0.094	NA	<0.082	NA	<0.095	NA	0.15	0.22	HA-121 0-2'	0.02155	0.0227	0.18	0.18879	0.13	0.02155
PCB Congeners (pg/g)																	
8-DiCB	NA	8.07	NA	6.46	NA	7.65	NA	8.02	6.46	22.0	HA-122 8-10'						
18,30-TrCB	NA	4.18	NA	4.54	NA	4.88	NA	5.28	4.18	51.9	HA-122 8-10'						
20,28-TrCB	NA	17.6	NA	15.9	NA	18.6	NA	20.7	15.9	108	HA-122 8-10'						
44,47,65-TeCB	NA	4.05	NA	3.32	NA	4.86	NA	4.3	3.32	127	HA-122 8-10'						
56-TeCB	NA	1.94	NA	ND	NA	1.91	NA	1.73	1.73	43.2	HA-122 8-10'						
66-TeCB	NA	5.31	NA	3.57	NA	5.02	NA	4.96	3.57	107	HA-122 8-10'						
90,101,113-PeCB	NA	4.72	NA	3.98	NA	6.05	NA	4.28	3.98	201	HA-122 8-10'						
105-PeCB	NA	0.847	NA	0.914	NA	1.74	NA	1.03	0.85	30.6	HA-122 8-10'						
118-PeCB	NA	2.35	NA	2.77	NA	3.58	NA	2.79	2.35	91.8	HA-122 8-10'						
128,166-HxCB	NA	ND	NA	ND	NA	ND	NA	ND	0.79	22.1	HA-122 8-10'						
129,138,163-HxCB	NA	3.58	NA	4.37	NA	6.71	NA	4.43	3.58	197	HA-122 8-10'						
153,168-HxCB	NA	2.95	NA	3.84	NA	5.63	NA	4.25	2.95	230	HA-122 8-10'						

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												Marine Sediment Guidelines[1]					
	HA-124	HA-124	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127									
From MSL (ft)																	
From ToS (ft)	0.0-2.0	14.0-16.0	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0									
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Min**	**Max**	**Sample with Max Concentration**	**TEL**	**ERL**	**ERM**	**PEL**	**AET**	**Lowest Guideline[2]**
179-HpCB	NA	0.625	NA	ND	NA	ND	NA	ND	0.63	35.2	HA-122 8-10'						
180,193-HpCB	NA	1.22	NA	ND	NA	2.6	NA	2.59	1.22	106	HA-122 8-10'						
187-HpCB	NA	0.679	NA	ND	NA	2.02	NA	1.71	0.68	100	HA-122 8-10'						
195-OcCB	NA	ND	NA	ND	NA	ND	NA	ND	7.94	7.94	HA-122 8-10'						
206-NoCB	NA	ND	NA	ND	NA	ND	NA	ND	1.52	33.2	HA-122 8-10'						
209-DeCB	NA	ND	NA	ND	NA	ND	NA	ND	2.15	61.9	HA-122 8-10'						
"Aroclor-based" total PCB data (mg/kg) [3]		0.000116242		0.000099328		0.0001425		0.00013214				0.02155	0.0227	0.18	0.18879	0.13	0.02155
Petroleum Hydrocarbons (mg/kg)																	
Diesel Range Organics	150	62	18	39	57	31	47	49	18	4,900	HA-123 0-2'						
Oil & Grease	340	70	320	230	150	530	150	110	55	21,000	HA-118 0-2'						
Gasoline Range Organics	<0.35	<0.27	<0.31	<0.3	<0.27	<0.3	<0.31	<0.27	0.87	4.1	HA-118 0-2'						
Dioxins (ng/kg)																	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ND	ND	ND	ND	ND	ND	ND	ND	0	0	N/A						
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ND	ND	ND	ND	ND	ND	ND	ND	0.213	1.07	HA-120 0-2'						
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ND	ND	ND	ND	ND	0.308	ND	ND	0.308	1.76	HA-121 26-27'						
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ND	ND	ND	ND	ND	0.666	ND	0.12	0.120	6.19	HA-120 0-2'						
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ND	ND	ND	ND	ND	2.74	ND	ND	0.425	9.03	HA-121 26-27'						
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	3.22	0.531	1.34	0.425	2.43	43.8	2.89	2.29	0.425	132	HA-121 26-27'						
Octachlorodibenzo-p-dioxin (OCDD)	39.4	8.62	20.5	7.01	29.8	1210	29.9	22.9	7.01	4,220	HA-121 26-27'						
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ND	ND	ND	ND	ND	ND	ND	ND	2.49	2.49	HA-120 0-2'						
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ND	ND	ND	ND	ND	ND	ND	ND	0.518	1.26	HA-123 0-2'						
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ND	ND	ND	ND	ND	ND	ND	ND	1.56	1.92	HA-120 0-2'						
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	ND	ND	0.107	3.64	HA-120 0-2'						
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	ND	ND	0.133	1.32	HA-120 0-2'						
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	ND	ND	0	0	N/A						
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	ND	ND	1.65	2.03	HA-120 0-2'						
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.45	ND	ND	ND	0.236	0.278	0.386	0.446	0.236	23.4	HA-120 0-2'						
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ND	ND	ND	ND	ND	ND	ND	ND	0.485	2.09	HA-120 0-2'						
Octachlorodibenzofuran (OCDF)	1.24	ND	ND	0.171	0.836	0.786	1.17	1.53	0.171	73.9	HA-120 0-2'						
Tetrachlorodibenzo-p-dioxins (TCDD), Total	0.741	ND	ND	ND	0.901	6.09	0.344	ND	0.344	32.2	HA-122 8-10'						
Pentachlorodibenzo-p-dioxin (PeCDD), Total	0.356	ND	0.238	ND	1.11	10	0.206	ND	0.206	38.9	HA-121 26-27'						
Hexachlorodibenzo-p-dioxins (HxCDD), Total	3.76	ND	3.97	ND	8.47	79.3	1.99	1.61	0.242	285	HA-122 8-10'						
Heptachlorodibenzo-p-dioxins (HpCDD), Total	12.5	2.63	7.46	2.45	13.5	279	9.77	5.01	1.90	670	HA-121 26-27'						
Tetrachlorodibenzofurans (TCDF), Total	ND	ND	ND	ND	ND	ND	ND	ND	0.199	21.2	HA-120 0-2'						
Pentachlorodibenzofurans (PeCDF), Total	ND	ND	ND	ND	ND	ND	ND	ND	0.269	28.3	HA-120 0-2'						
Hexachlorodibenzofurans (HxCDF), Total	ND	ND	ND	ND	ND	0.233	0.282	0.716	0.123	29.5	HA-120 0-2'						
Heptachlorodibenzofurans (HpCDF), Total	0.45	ND	ND	ND	ND	ND	1.51	1.17	0.324	57.7	HA-120 0-2'						
Toxic Equivalents [4]	0.011784	0.001393	0.00339	0.001143	0.007854	0.662259	0.009857	0.021193	0.001	4.96	HA-121 26-27'					3.6	3.6
Metals (mg/kg)																	
Arsenic	4.8	9.1	6.5	7.3	9	8.1	3.5	6.6	3.3	130	HA-118 0-2'	7.24	8.2	70	41.6	35	7.24
Barium	110	120	120	73	120	74	110	78	16	200	HA-123 0-2'					48	48
Cadmium	<2.8	<2.1	<2.9	<2.1	<2	<2.2	<2.6	<2.3	4.4	8.5	HA-118 0-2'	0.676	1.2	9.6	4.21	3	0.676
Chromium	41	25	37	29	36	29	32	26	21	1,300	HA-118 0-2'	52.3	81	370	160.4	62	52.3
Copper	24	13	20	18	17	18	19	14	7.3	630	HA-123 0-2'	18.7	34	270	108.2	390	18.7
Iron	42,000	41,000	61,000	52,000	30,000	49,000	35,000	44,000	17,000	190,000	HA-118 0-2'					220,000	220,000
Lead	24	18	29	24	17	23	18	20	11	600	HA-118 0-2'	30.24	46.7	218	112.18	400	30.24
Mercury	<0.55	<0.42	<0.59	<0.41	<0.41	<0.44	<0.52	<0.46	0.6	1.3	HA-118 0-2'	0.13	0.15	0.71	0.696	0.41	0.13
Selenium	<2.8	<2.1	<2.9	<2.1	<2	<2.2	<2.6	<2.3	4.8	20	HA-118 0-2'					1	1
Silver	<2.8	<2.1	<2.9	<2.1	<2	<2.2	<2.6	<2.3	0	0	N/A	0.73	1	3.7	1.77	3.1	0.73
Miscellaneous Parameters																	
Percent Solids (%)	57	69	61	65	70	63	59	65	21	84	HA-117 8-10'						

TABLE 2
SEDIMENT RESULTS AND COMPARISON TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

												Marine Sediment Guidelines[1]					
	HA-124	**HA-124**	**HA-125**	**HA-125**	**HA-126**	**HA-126**	**HA-127**	**HA-127**									
From MSL (ft)																	
From ToS (ft)	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**14.0-16.0**									
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**	**Min**	**Max**	**Sample with Max Concentration**	**TEL**	**ERL**	**ERM**	**PEL**	**AET**	**Lowest Guideline[2]**
Total Cyanide (mg/kg)	<0.33	<0.28	<0.31	<0.29	<0.26	<0.27	<0.27	<0.28	1.81	3.53	HA-116 0-2'						
Total Kjeldahl Nitrogen (mg/kg)	2,200	1,700	1,900	1,700	1,400	1,700	1,700	1,800	690	4,200	HA-116 0-2'						
Phosphorus (mg/kg)	460	300	290	280	210	280	300	380	22	6,300	HA-118 0-2'						
Total Organic Carbon (mg/kg)	<170	<140	<160	<150	<140	<160	<170	<150	0	0	N/A						
pH	7	8	6.8	7.1	6.7	7.2	6.4	7.7	6.4	8.5	HA-118 10-12'						

Notes:
- Nondetected results show the sample reporting limit preceded by a "<" symbol.
- Positive results with concentrations greater than the Lowest Guideline are shaded yellow.
- Nondetected results with detection limits greater than the Lowest Guideline are shaded gray.

Acronyms:
TEL = Threshold Effects Level
PEL = Probable Effect Level
ERL = Effects Range-Low
ERM = Effects Range-Median
AET = Apparent Effects Threshold
PCB = Polychlorinated Biphenyl
Min = Minimum sample concentration
Max = Maximum sample concentration
ND = Nondetect
NA = Not Analyzed/Will not be analyzed
N/A = Not Available/Not Applicable
MSL = Mean Sea Level
ToS = Top of Sediment

Footnotes:
(1) Values are from NOAA Screening Quick Reference Tables (Buchman, 1999).
(2) The lowest guideline was used for conservativeness.
(3) Per NOAA Technical Memorandum NMFS-NE-157 the sum of concentrations of 18 specific PCB congeners was multiplied by 2 to generate an approximation of “Aroclor-based” total PCB data for comparison with the historical total PCB data.
(4) Aggregate toxicity is represented by calculating a single value for all dioxins combined in terms of the most toxic dioxin congener 2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) based on the World Health Organization Toxic Equivalency Factors for Fish (Van den Berg, et al 2006)

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																	
	HA-116	HA-116	HA-117	HA-117	HA-118	HA-118	HA-119	HA-119	HA-120	HA-120	HA-121	HA-121	HA-122	HA-122	HA-123	HA-123	HA-124	HA-124
	0.0-2.0	10.0-12.0	0.0-2.0	8.0-10.0	0.0-2.0	10.0-12.0	0.0-2.0	6.0-8.0	0.0-2.0	8.0-10.0	0.0-2.0	14.0-16.0	0.0-2.0	8.0-10.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Volatile Organics (ug/L)																		
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
1,2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Hexanone (MBK)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone	<10	<50	<10	<15	<10	<20	<10	<20	<20	<40	<55	<25	<20	<20	<50	<80	<60	<70
Benzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon disulfide	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform	2	2	2	3	2	2	3	2	1	<1	1	<1	3	4	2	4	4	4
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Diisopropyl ether (DIPE)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethyl t-butyl ether (ETBE)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
m&p-Xylene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methyl acetate	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methyl t-butyl ether (MTBE)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methylcyclohexane	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene chloride	<50	<70	<40	<45	<40	<45	<35	<50	<50	<50	<55	<50	<100	<75	<50	<70	<70	<80
o-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
tert-Amyl alcohol (TAA)	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
tert-Amyl ethyl ether (TAEE)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
tert-Amyl methyl ether (TAME)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
tert-Butanol (TBA)	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																	
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**	**HA-124**	**HA-124**
	0.0-2.0	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**6.0-8.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Toluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Semivolatile Organics (ug/L)																		
1,1-Biphenyl	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2,4,5-Trichlorophenol	<43	<29	<33	<28	<29	<30	<27	<27	<29	<34	<30	<42	<28	<30	<27	<27	<27	<26
2,4,6-Trichlorophenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2,4-Dichlorophenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2,4-Dimethylphenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2,4-Dinitrophenol	<43	<29	<33	<28	<29	<30	<27	<27	<29	<34	<30	<42	<28	<30	<27	<27	<27	<26
2,4-Dinitrotoluene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2,6-Dinitrotoluene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2-Chloronaphthalene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2-Chlorophenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2-Methylnaphthalene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2-Methylphenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2-Nitroaniline	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
2-Nitrophenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
3,3-Dichlorobenzidine	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
3-Nitroaniline	<43	<29	<33	<28	<29	<30	<27	<27	<29	<34	<30	<42	<28	<30	<27	<27	<27	<26
4,6-Dinitro-2-methylphenol	<43	<29	<33	<28	<29	<30	<27	<27	<29	<34	<30	<42	<28	<30	<27	<27	<27	<26
4-Bromophenyl phenyl ether	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
4-Chloro-3-methylphenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
4-Chloroaniline	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
4-Chlorophenyl phenyl ether	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
4-Methylphenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
4-Nitroaniline	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
4-Nitrophenol	<43	<29	<33	<28	<29	<30	<27	<27	<29	<34	<30	<42	<28	<30	<27	<27	<27	<26
Acenaphthene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Acenaphthylene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Acetophenone	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Anthracene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Atrazine	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Benzo[a]anthracene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Benzo[a]pyrene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Benzo[b]fluoranthene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Benzo[g,h,i]perylene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Benzo[k]fluoranthene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Bis (2-chloroethoxy) methane	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Bis (2-chloroethyl) ether	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Bis (2-chloroisopropyl) ether	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Bis (2-ethylhexyl) phthalate	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Butyl benzyl phthalate	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Caprolactam	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Carbazole	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Chrysene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																	
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**	**HA-124**	**HA-124**
	0.0-2.0	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**6.0-8.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Dibenz[a,h]anthracene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Dibenzofuran	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Diethyl phthalate	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Dimethyl phthalate	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Di-n-butyl phthalate	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Di-n-octyl phthalate	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Fluoranthene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Fluorene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Hexachlorobenzene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Hexachlorobutadiene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Hexachlorocyclopentadiene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Hexachloroethane	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Indeno[1,2,3-cd]pyrene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Isophorone	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Naphthalene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Nitrobenzene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
N-Nitroso-di-n-propylamine	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
N-Nitrosodiphenylamine	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Pentachlorophenol	<43	<29	<33	<28	<29	<30	<27	<27	<29	<34	<30	<42	<28	<30	<27	<27	<27	<26
Phenanthrene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Phenol	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Pyrene	<17	<12	<13	<11	<11	<12	<11	<11	<12	<14	<12	<17	<11	<12	<11	<11	<11	<10
Pesticides (ug/L)																		
4,4-DDD	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
4,4-DDE	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
4,4-DDT	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
a-BHC	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
a-Chlordane	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Aldrin	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
b-BHC	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
d-BHC	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Dieldrin	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Endosulfan I	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Endosulfan II	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Endosulfan Sulfate	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Endrin	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Endrin Aldehyde	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Endrin Ketone	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
g-BHC (Lindane)	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
g-Chlordane	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Heptachlor	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Heptachlor Epoxide	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Methoxychlor	<0.1	<0.08	<0.1	<0.08	<0.09	<0.09	<0.08	<0.09	<0.09	<0.09	<0.09	<0.1	<0.1	<0.1	<0.09	<0.09	<0.1	<0.1
Toxaphene	<3	<2	<3	<2	<2	<2	<2	<2	<2	<2	<2	<3	<2	<2	<2	<2	<2	<3
PCBs (ug/L)																		
Aroclor 1016	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7
Aroclor 1221	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7
Aroclor 1232	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																	
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**	**HA-124**	**HA-124**
	0.0-2.0	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**6.0-8.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Aroclor 1242	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7
Aroclor 1248	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7
Aroclor 1254	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7
Aroclor 1260	<0.8	<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.6	<0.5	<0.6	<0.5	<0.7	<0.6	<0.6	<0.5	<0.6	<0.6	<0.7
Petroleum Hydrocarbons (mg/L)																		
Diesel Range Organics	<0.33	<0.21	<0.25	<0.21	<0.21	<0.22	<0.21	<0.23	<0.21	<0.23	<0.22	<0.28		<0.25	0.62	<0.24	<0.24	<0.3
Oil & Grease	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Gasoline Range Organics	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2
Dioxins (pg/L)																		
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	1.5	2.56
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	ND	ND	ND	ND	ND	ND	ND	10.4	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	5.38	ND	17.3	23.3	15.9	15.1	6.8	229	6.52	7.76	3.38	ND	17.5	3.84	63.8	113
Octachlorodibenzo-p-dioxin (OCDD)	NA	NA	185	36.1	305	1320	991	770	116	8950	123	317	125	53.1	195	27.2	938	1760
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.63	ND	ND	ND	1	1.46
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	NA	ND	ND	5.03	ND	ND	ND	1.09	0.943	1.37	ND	ND	ND	2.29	ND	6.78	12.6
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Octachlorodibenzofuran (OCDF)	NA	NA	2.2	2.18	9.93	ND	ND	ND	3.4	2.56	4.97	ND	ND	2.01	8.47	ND	38	78
Tetrachlorodibenzo-p-dioxins (TCDD), Total	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorodibenzo-p-dioxin (PeCDD), Total	NA	NA	ND	ND	ND	ND	ND	ND	ND	35.2	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorodibenzo-p-dioxins (HxCDD), Total	NA	NA	ND	ND	14.4	18.8	8.58	ND	1.7	278	2.19	6.32	ND	3.76	6.8	1.3	19.3	8.31
Heptachlorodibenzo-p-dioxins (HpCDD), Total	NA	NA	20.7	3.01	44	114	56	67.4	18.6	1190	17.6	41.1	12.3	ND	43.7	ND	159	275
Tetrachlorodibenzofurans (TCDF), Total	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorodibenzofurans (PeCDF), Total	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7	ND	ND	1.86
Hexachlorodibenzofurans (HxCDF), Total	NA	NA	ND	ND	3.19	ND	ND	ND	0.464	ND	ND	ND	ND	ND	3.3	ND	8.92	14.7
Heptachlorodibenzofurans (HpCDF), Total	NA	NA	ND	ND	11.7	ND	ND	ND	2.5	0.943	1.37	ND	ND	ND	ND	ND	31.9	61.1
Toxic Equivalents	NA	NA	0.241	0.0383	0.538	1.55	1.15	0.921	0.198	12.3	0.207	0.395	0.322	0.0551	0.541	0.0656	1.93	3.5
Metals (ug/L)																		
Arsenic	27	20	6.6	<5	19	23	16	8.2	15	8.7	15	13	<5	<5	11	<5	<5	<5
Barium	82	56	200	82	280	65	90	63	290	71	110	71	190	840	210	780	780	740
Cadmium	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chromium	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Copper	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Iron	1,000	410	1,500	<100	2,800	300	200	250	2,800	280	3,000	220	<100	670	3,200	280	1,900	340
Lead	5.4	<5	<5	<5	5.3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Mercury	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

	Sample ID/Depth																	
	HA-116	**HA-116**	**HA-117**	**HA-117**	**HA-118**	**HA-118**	**HA-119**	**HA-119**	**HA-120**	**HA-120**	**HA-121**	**HA-121**	**HA-122**	**HA-122**	**HA-123**	**HA-123**	**HA-124**	**HA-124**
	0.0-2.0	**10.0-12.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**10.0-12.0**	**0.0-2.0**	**6.0-8.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**8.0-10.0**	**0.0-2.0**	**14.0-16.0**	**0.0-2.0**	**14.0-16.0**
Chemical	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Inter**	**Shall**	**Deep**	**Shall**	**Deep**	**Shall**	**Deep**
Tributyltin (ng/L)																		
TBT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	18	43	ND	ND	ND
DBT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	1	1	5	ND	ND	ND
MBT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Miscellaneous Parameters																		
Total Cyanide (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen (mg/L)	28	42	18	8.5	17	21	13	19	31	22	22	9.8	7.4	19	26	14	31	24
Phosphorus (mg/L)	0.55	1.2	0.27	<0.2	0.33	2.2	0.83	2.3	2.5	0.53	2.8	0.51	<0.2	0.22	0.56	0.3	0.24	0.26
TOC (mg/L)	14	17	6.1	4	12	11	5.8	11	14	14	9.1	19	3.1	5.4	10	6.3	7.5	7
pH	8.1	8.2	7.8	7.5	7.5	8.1	8	8.3	7.9	8.3	7.9	8.4	7.2	7.1	7.4	7.1	6.4	7.3

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

Chemical	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127	Blank River Water	Min	Max	Sample with Max Concentration	Marine Ambient Water Quality Criteria[1]		Notes
							NA						
	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0	NA						
	Shall	Deep	Shall	Deep	Shall	Deep	NA				Acute	Chronic	
Volatile Organics (ug/L)													
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	31200		
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	9020		
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,1,2-Trichlorotrifluoroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,2,4-Trichlorobenzene	<2	<2	<2	<2	<2	<2	<2	0	0	N/A	160	129	
1,2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	1970	129	
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	113000		
1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	1970	129	
2-Butanone (MEK)	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
2-Hexanone (MBK)	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
4-Methyl-2-pentanone (MIBK)	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
Acetone	<40	<80	<65	<90	<80	<85	<10	0	0	N/A			
Benzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	5100	700	
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	12000	6400	
Bromoform	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Bromomethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Carbon disulfide	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
Carbon tetrachloride	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	50000		
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	160	129	
Chloroethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Chloroform	5	5	4	4	4	4	6	1	6	BLANK			
Chloromethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	224000		
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Cyclohexane	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	12000	6400	
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	12000	6400	
Diisopropyl ether (DIPE)	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Ethyl t-butyl ether (ETBE)	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	430		
Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
m&p-Xylene	<2	<2	<2	<2	<2	<2	<2	0	0	N/A			
Methyl acetate	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
Methyl t-butyl ether (MTBE)	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Methylcyclohexane	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
Methylene chloride	<75	<80	<60	<75	<60	<80	<10	0	0	N/A	12000	6400	
o-Xylene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Styrene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
tert-Amyl alcohol (TAA)	<25	<25	<25	<25	<25	<25	<25	0	0	N/A			
tert-Amyl ethyl ether (TAEE)	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
tert-Amyl methyl ether (TAME)	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
tert-Butanol (TBA)	<25	<25	<25	<25	<25	<25	<25	0	0	N/A			
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	10200	450	

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

Chemical	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127	Blank River Water	Min	Max	Sample with Max Concentration	Marine Ambient Water Quality Criteria[1]		Notes
							NA						
	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0	NA						
	Shall	Deep	Shall	Deep	Shall	Deep	NA				Acute	Chronic	
Toluene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	6300	5000	
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	224000		
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A			
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	2000		
Trichlorofluoromethane	<5	<5	<5	<5	<5	<5	<5	0	0	N/A	12000	6400	
Vinyl chloride	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	224000		
Semivolatile Organics (ug/L)													
1,1-Biphenyl	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2,4,5-Trichlorophenol	<27	<28	<27	<30	<27	<26	<27	0	0	N/A	240	11	
2,4,6-Trichlorophenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2,4-Dichlorophenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2,4-Dimethylphenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2,4-Dinitrophenol	<27	<28	<27	<30	<27	<26	<27	0	0	N/A			
2,4-Dinitrotoluene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	590	370	
2,6-Dinitrotoluene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2-Chloronaphthalene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	7.5		
2-Chlorophenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2-Methylnaphthalene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
2-Methylphenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2-Nitroaniline	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
2-Nitrophenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
3,3-Dichlorobenzidine	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
3-Nitroaniline	<27	<28	<27	<30	<27	<26	<27	0	0	N/A			
4,6-Dinitro-2-methylphenol	<27	<28	<27	<30	<27	<26	<27	0	0	N/A			
4-Bromophenyl phenyl ether	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
4-Chloro-3-methylphenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
4-Chloroaniline	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	160	129	
4-Chlorophenyl phenyl ether	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
4-Methylphenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
4-Nitroaniline	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
4-Nitrophenol	<27	<28	<27	<30	<27	<26	<27	0	0	N/A	4850		
Acenaphthene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	970	710	
Acenaphthylene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Acetophenone	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Anthracene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Atrazine	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Benzo[a]anthracene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Benzo[a]pyrene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Benzo[b]fluoranthene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Benzo[g,h,i]perylene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Benzo[k]fluoranthene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Bis (2-chloroethoxy) methane	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Bis (2-chloroethyl) ether	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Bis (2-chloroisopropyl) ether	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Bis (2-ethylhexyl) phthalate	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	400	360	
Butyl benzyl phthalate	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	2944	3.4	
Caprolactam	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Carbazole	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Chrysene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

Chemical	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127	Blank River Water	Min	Max	Sample with Max Concentration	Marine Ambient Water Quality Criteria[1]		Notes
							NA						
	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0	NA						
	Shall	Deep	Shall	Deep	Shall	Deep	NA				Acute	Chronic	
Dibenz[a,h]anthracene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Dibenzofuran	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
Diethyl phthalate	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	2944	3.4	
Dimethyl phthalate	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	2944	3.4	
Di-n-butyl phthalate	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	2944	3.4	
Di-n-octyl phthalate	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	2944	3.4	
Fluoranthene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	40	16	
Fluorene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Hexachlorobenzene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	160	129	
Hexachlorobutadiene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	32		
Hexachlorocyclopentadiene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	7		
Hexachloroethane	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	940		
Indeno[1,2,3-cd]pyrene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Isophorone	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	12900		
Naphthalene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	2350		
Nitrobenzene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	6680		
N-Nitroso-di-n-propylamine	<11	<11	<11	<12	<11	<11	<11	0	0	N/A			
N-Nitrosodiphenylamine	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	3300000		
Pentachlorophenol	<27	<28	<27	<30	<27	<26	<27	0	0	N/A	13	7.9	
Phenanthrene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	7.7	4.6	
Phenol	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	5800		
Pyrene	<11	<11	<11	<12	<11	<11	<11	0	0	N/A	300		
Pesticides (ug/L)													
4,4-DDD	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	3.6		
4,4-DDE	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	14		
4,4-DDT	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.065	0.0005	
a-BHC	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.34		
a-Chlordane	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.045	0.002	
Aldrin	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.65		
b-BHC	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.34		
d-BHC	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.34		
Dieldrin	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.355	0.00095	
Endosulfan I	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.017	0.00435	
Endosulfan II	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.017	0.00435	
Endosulfan Sulfate	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A			
Endrin	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.0185	0.00115	
Endrin Aldehyde	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A			
Endrin Ketone	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A			
g-BHC (Lindane)	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.08		
g-Chlordane	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.045	0.002	
Heptachlor	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.0265	0.0018	
Heptachlor Epoxide	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A	0.0265	0.0018	
Methoxychlor	<0.08	<0.1	<0.09	<0.1	<0.09	<0.09	<0.08	0	0	N/A		0.03	
Toxaphene	<2	<3	<2	<2	<2	<2	<2	0	0	N/A	0.21	0.0002	
PCBs (ug/L)													
Aroclor 1016	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	
Aroclor 1221	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	
Aroclor 1232	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

Chemical	HA-125	HA-125	HA-126	HA-126	HA-127	HA-127	Blank River Water	Min	Max	Sample with Max Concentration	Marine Ambient Water Quality Criteria[1]		Notes
							NA						
	0.0-2.0	10.0-12.0	0.0-2.0	14.0-16.0	0.0-2.0	14.0-16.0	NA						
	Shall	Deep	Shall	Deep	Shall	Deep	NA				Acute	Chronic	
Aroclor 1242	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	
Aroclor 1248	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	
Aroclor 1254	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	
Aroclor 1260	<0.5	<0.6	<0.5	<0.6	<0.5	<0.5	<0.5	0	0	N/A	10	0.03	
Petroleum Hydrocarbons (mg/L)													
Diesel Range Organics	<0.21	<0.26	0.22	<0.24	<0.21	<0.21	<0.2	0.22	0.62	HA-123 0-2'			
Oil & Grease	<5	<5	<5	<5	<5	<5	<5	0	0	N/A			
Gasoline Range Organics	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	HA-123 0-2'			
Dioxins (pg/L)													
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ND	ND	ND	ND	ND	ND	N/A	1.4	2.56	HA-124 14-16'			
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ND	ND	ND	ND	ND	ND	N/A	10.4	10.4	HA-120 8-10'			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ND	1.6	2.18	3.64	3.42	3.31	N/A	1.6	229	HA-120 8-10'			
Octachlorodibenzo-p-dioxin (OCDD)	25.1	28.8	17	41.2	33	42.3	N/A	17	8950	HA-120 8-10'			
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	N/A	1.00	1.63	HA-122 0-2'			
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ND	ND	ND	ND	ND	ND	N/A	0.943	12.6	HA-124 14-16'			
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ND	ND	ND	ND	4.68	ND	N/A	4.68	4.68	HA-127 0-2'			
Octachlorodibenzofuran (OCDF)	ND	ND	ND	ND	ND	ND	N/A	2.01	78.0	HA-124 14-16'			
Tetrachlorodibenzo-p-dioxins (TCDD), Total	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
Pentachlorodibenzo-p-dioxin (PeCDD), Total	ND	ND	ND	ND	ND	ND	N/A	35.2	35.2	HA-120 8-10'			
Hexachlorodibenzo-p-dioxins (HxCDD), Total	ND	1.39	3.68	2.66	2.39	2.3	N/A	1.30	278	HA-120 8-10'			
Heptachlorodibenzo-p-dioxins (HpCDD), Total	5.72	6.29	5.3	13.3	8.83	ND	N/A	3.01	1190	HA-120 8-10'			
Tetrachlorodibenzofurans (TCDF), Total	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
Pentachlorodibenzofurans (PeCDF), Total	ND	ND	ND	ND	ND	ND	N/A	1.70	1.86	HA-124 14-16'			
Hexachlorodibenzofurans (HxCDF), Total	ND	ND	ND	ND	ND	ND	N/A	0.464	14.7	HA-124 14-16'			
Heptachlorodibenzofurans (HpCDF), Total	ND	ND	ND	ND	ND	ND	N/A	0.943	61.1	HA-124 14-16'			
Toxic Equivalents	0.0251	0.0448	0.0388	0.0776	0.114	0.0754	N/A	0.0251	12.3	HA-120 8-10'			
Metals (ug/L)													
Arsenic	<5	<5	<5	<5	<5	<5	<5	6.6	27	HA-116 0-2'	2319		LOEL, not criterion
Barium	950	740	750	720	780	770	97	56	950	HA-125 0-2'			
Cadmium	<5	<5	<5	<5	<5	<5	<5	0	0	N/A	42	9.3	
Chromium	<5	<5	<5	<5	<5	<5	<5	0	0	N/A	1100	50	Hexavalent Cr
Copper	<5	<5	<5	<5	<5	<5	<5	0	0	N/A	4.8	3.1	
Iron	110	<100	2,300	390	3,600	190	<100	110	3,600	HA-127 0-2'			
Lead	<5	<5	<5	<5	<5	<5	<5	5.3	5.4	HA-116 0-2'	210	8.1	
Mercury	<1	<1	<1	<1	<1	<1	<1	0	0	N/A	1.8	0.94	
Selenium	<5	<5	<5	<5	<5	<5	<5	0	0	N/A	290	71	
Silver	<5	<5	<5	<5	<5	<5	<5	0	0	N/A	0.95		

TABLE 3
WATER RESULTS AND COMPARISON TO MARINE CRITERIA
AES SPARROWS POINT, BALTIMORE, MD

Chemical	HA-125 0.0-2.0 Shall	HA-125 10.0-12.0 Deep	HA-126 0.0-2.0 Shall	HA-126 14.0-16.0 Deep	HA-127 0.0-2.0 Shall	HA-127 14.0-16.0 Deep	Blank River Water NA NA NA	Min	Max	Sample with Max Concentration	Marine Ambient Water Quality Criteria(1) Acute	Chronic	Notes
Tributyltin (ng/L)													
TBT	ND	ND	ND	ND	ND	ND	N/A	4	43	HA-123 0-2'			
DBT	ND	ND	ND	ND	ND	ND	N/A	1	5	HA-123 0-2'			
MBT	ND	ND	ND	ND	ND	ND	N/A	0	0	N/A			
Miscellaneous Parameters													
Total Cyanide (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0	0	N/A			
Total Kjeldahl Nitrogen (mg/L)	16	21	14	18	15	20	6.8	6.8	42	HA-116 10-12'			
Phosphorus (mg/L)	0.32	<0.2	0.26	<0.2	0.26	0.21	0.39	0.21	2.8	HA-121 0-2'			
TOC (mg/L)	5	6.4	5.6	6.7	7	6.1	3.1	3.1	19	HA-121 14-16'			
pH	7.1	7.4	6.1	7.2	5.8	7	7	5.8	8.4	HA-121 14-16'			

Notes:
- Nondetected results show the sample reporting limit preceded by a "<" symbol.
- Nondetected results for dioxins are reported as "ND".

Acronyms:
PCB = Polychlorinated Biphenyl
Min = Minimum sample concentration
Max = Maximum sample concentration
ND = Nondetect
NA = Not Analyzed/Will not be analyzed
N/A = Not Available/Not Applicable
MSL = Mean Sea Level
ToS = Top of Sediment
LOEL = Lowest Observable Effect Level
TBT = Tributyltin
DBT = Dibutyltin
MBT = Monobutyltin

Footnotes:
(1) Values are from NOAA Screening Quick Reference Tables (Buchman, 1999).

TABLE 4
COMPARISON OF AES SEDIMENT RESULTS NAD HISTORICAL INFORMATION TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

Compounds	AVERAGE SEDIMENT CONCENTRATIONS[1]														
	AES Data (2006)			AES Data (2007)			AES Data (2006 & 2007)			Baltimore Harbor Anchorages & Channels (1997)[2]	Sparrows Point Marine Channel (1985)[3]	Baltimore Harbor/Patapsco River/Back River (1997)[4]			
	Shallow	Intermed	Deep	Shallow	Intermed	Deep	Shallow	Intermed	Deep			Overall Study Average	Old Road Bay	Patapsco River	Bear Creek
Semivolatile Organics (ug/kg)															
2-Methylnaphthalene	797	552	ND	126	ND	ND	413	300	ND	ND	N/A	578	363	329	372
Acenaphthene	450	378	ND	126	ND	ND	265	226	ND	N/A	252	92	97	110	79
Acenaphthylene	384	302	ND	126	ND	ND	237	193	ND	N/A	90	218	118	128	245
Anthracene	1337	785	ND	122	ND	ND	697	400	ND	ND	512	449	316	301	261
Benzo[a]anthracene	3027	2343	ND	383	ND	ND	1516	1068	ND	N/A	1800	960	772	461	707
Benzo[a]pyrene	2871	2177	ND	435	ND	ND	1479	996	ND	278	N/A	1258	1138	616	1025
Benzo[b]fluoranthene	5733	4457	ND	546	ND	ND	2769	1974	ND	N/A	N/A	1175	1194	612	1240
Benzo[g,h,i]perylene	871	685	ND	223	ND	ND	500	357	ND	N/A	N/A	761	836	407	862
Benzo[k]fluoranthene	2787	1850	ND	278	ND	ND	1353	856	ND	N/A	N/A	1028	854	446	838
Bis (2-ethylhexyl) phthalate	676	2885	ND	1044	ND	ND	886	1300	ND	373	N/A	N/A	N/A	N/A	N/A
Chrysene	2872	2253	ND	406	ND	ND	1463	1029	ND	N/A	1764	892	802	442	785
Fluoranthene	7853	6287	ND	741	ND	ND	3789	2758	ND	145	2900	131	796	797	1655
Fluorene	700	585	ND	126	ND	ND	372	314	ND	N/A	284	170.8	135	116	99
Indeno[1,2,3-cd]pyrene	875	685	ND	215	ND	ND	498	357	ND	N/A	N/A	1416	1190	625	1173
Phenanthrene	3139	2890	ND	185	ND	ND	1451	1302	ND	ND	1492	950	724	577	565
Pyrene	5194	6350	ND	700	ND	ND	2626	2785	ND	143	2428	1266	1067	762	1436
Metals (mg/kg)															
Arsenic	55	31	5	29	9	7	40	18	6	12.1	52.2	N/A	N/A	N/A	N/A
Cadmium	5	4	ND	3	2	1	4	2	1	0.39	6.02	0.37	0.62	0.11	6.88
Chromium	382	296	22	294	39	34	332	149	31	85.4	492	230.4	270	201	1103
Copper	178	115	9	139	15	14	155	58	12	58.2	24	79.7	102	64.8	210
Lead	856	251	10	164	22	20	460	120	17	46.7	420	125.1	224	63.2	225
Mercury	1	0	ND	0	0	0	1	0	0	0.27	0.79	0.41427	0.50	0.17	0.59
Nickel	37	27	11	N/A	N/A	N/A	N/A	N/A	N/A	32.3	N/A	71.5	57.5	45.7	64.3
Selenium	6	4	ND	4	2	1	5	3	1	0.56	1.83	N/A	N/A	N/A	N/A
Silver	2	2	ND	2	2	1	2	2	1	0.14	0.91	N/A	N/A	N/A	N/A
Zinc	1188	563	28	N/A	N/A	N/A	N/A	N/A	N/A	176	N/A	652.3	1072	324	1961

Footnotes:
(1) Average concentrations for AES 2006 and 2007 data are calculated using 1/2 the detection limit for nondetects. Average concentrations for historical data are calculated using zero for nondetects because detection limits were not available.
(2) Baltimore Harbor Anchorages and Channels, Maryland and Virginia. Integrated Feasibility Report and Environmental Impact Statement. U.S. Army Corps of Engineers, Baltimore District. March 1997.
(3) Registered Toxic Study. Chemical and Physical Analysis of Sediments from the Marine Channel and Associated Berths and Turning Basin. EA Engineering, Science, and Technology, Inc. February 1985.
(4) Registered Toxic Study. Spatial Mapping of Sedimentary Contaminants in the Baltimore Harbor/Patapsco River/ Back River System. Maryland Department of the Environment. August 1997.
(5) NOAA Screening Quick Reference Tables (SQUIRT), Buchman, 1999.

Notes:
ND = Nondetected result
N/A = Data Not Available

TABLE 4
COMPARISON OF AES SEDIMENT RESULTS NAD HISTORICAL INFORMATION TO SEDIMENT GUIDELINES
AES SPARROWS POINT, BALTIMORE, MD

Compounds	RANGES OF POSITIVE DETECTIONS																								Marine Sediment Guidelines[5]		
	AES Data (2006)						AES Data (2007)						AES Data (2006 & 2007)						Baltimore Harbor Anchorages & Channels (1997)[2]		Sparrows Point Marine Channel (1985)[3]		Baltimore Harbor/Patapsco River/Back River (1997)[4]				
	ShallMin	Shall Max	Inter Min	Inter Max	Deep Min	Deep Max	ShallMin	Shall Max	Inter Min	Inter Max	Deep Min	Deep Max	ShallMin	Shall Max	Inter Min	Inter Max	Deep Min	Deep Max	Min	Max	Min	Max	Min	Max	TEL	PEL	AET
Semivolatile Organics (ug/kg)																											
2-Methylnaphthalene	870	3300	1300	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	3300	ND	ND	ND	ND	ND	ND	N/A	N/A	331.4	293.6	N/A	N/A	N/A
Acenaphthene	620	1700	780	780	ND	ND	ND	ND	ND	ND	ND	ND	ND	1700	ND	ND	ND	ND	N/A	N/A	1260	1260	102.3	113.6	6.71	88.9	130
Acenaphthylene	570	760	550	550	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	ND	ND	ND	ND	N/A	N/A	450	450	101.6	75.3	5.87	127.87	71
Anthracene	520	3800	2000	2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	3800	ND	ND	ND	ND	ND	ND	500	1100	278.3	309.4	46.85	245	280
Benzo[a]anthracene	490	8800	500	6300	ND	ND	500	1400	ND	ND	ND	ND	490	8800	ND	ND	ND	ND	N/A	N/A	600	3100	610.6	875.9	74.83	692.53	960
Benzo[a]pyrene	620	8300	500	5800	ND	ND	1100	1900	ND	ND	ND	ND	620	8300	ND	ND	ND	ND	217	786	N/A	N/A	929.3	1410.9	88.81	763.22	1100
Benzo[b]fluoranthene	1200	15000	500	12000	ND	ND	760	2300	ND	ND	ND	ND	760	15000	ND	ND	ND	ND	N/A	N/A	N/A	N/A	982.1	1508.7	N/A	N/A	1800
Benzo[g,h,i]perylene	470	2700	1700	1700	ND	ND	1300	1300	ND	ND	ND	ND	470	2700	ND	ND	ND	ND	N/A	N/A	N/A	N/A	658	1114.7	N/A	N/A	670
Benzo[k]fluoranthene	660	7900	420	4900	ND	ND	650	900	ND	ND	ND	ND	650	7900	ND	ND	ND	ND	N/A	N/A	N/A	N/A	698.3	933	N/A	N/A	1800
Bis (2-ethylhexyl) phthalate	600	2900	8300	8300	ND	ND	270	6000	ND	ND	ND	ND	270	6000	ND	ND	ND	ND	177	1390	N/A	N/A	N/A	N/A	182.16	2646.51	1300
Chrysene	590	7900	530	6000	ND	ND	520	1700	ND	ND	ND	ND	520	7900	ND	ND	ND	ND	N/A	N/A	420	3500	632.6	964.8	107.77	845.98	950
Fluoranthene	980	22000	460	17000	ND	ND	1100	3400	ND	ND	ND	ND	980	22000	ND	ND	ND	ND	118	319	700	4800	971.2	1157.2	112.82	1493.54	1300
Fluorene	1300	2100	1400	1400	ND	ND	ND	ND	ND	ND	ND	ND	ND	2100	ND	ND	ND	ND	N/A	N/A	390	560	137.9	128.6	21.17	144.35	120
Indeno[1,2,3-cd]pyrene	480	2700	1700	1700	ND	ND	1200	1200	ND	ND	ND	ND	480	2700	ND	ND	ND	ND	N/A	N/A	N/A	N/A	766.2	1406.8	N/A	N/A	600
Phenanthrene	490	8700	640	7800	ND	ND	460	540	ND	ND	ND	ND	460	8700	ND	ND	ND	ND	ND	ND	960	2400	677	725.6	86.68	543.53	660
Pyrene	850	15000	820	18000	ND	ND	1100	3100	ND	ND	ND	ND	850	15000	ND	ND	ND	ND	194	369	640	4100	933.9	1136.5	152.66	1397.6	2400
Metals (mg/kg)																											
Arsenic	26	82	3.2	63	3.5	8.1	3.5	130	8	11	3.3	9.1	3.5	130	3.2	63	3.3	9.1	5.35	21.8	27	74	N/A	N/A	7.24	41.6	35
Cadmium	7.2	16	7.8	7.8	ND	ND	4.4	8.5	ND	ND	ND	ND	4.4	16	ND	7.8	ND	ND	1.55	1.6	1.8	12	0.44	0.6	0.676	4.21	3
Chromium	180	820	9.8	780	6.6	36	29	1300	37	43	21	79	29	1300	9.8	780	6.6	79	42.4	119	193	1110	270.4	285.2	52.3	160.4	62
Copper	100	320	7	290	9.3	13	16	630	14	17	7.3	18	16	630	7	290	7.3	18	23.4	140	15	36	85.7	94.2	18.7	108.2	390
Lead	210	3900	84	520	3.7	18	17	600	20	25	11	24	17	3900	20	520	3.7	24	10.4	106	183	804	260.4	265.9	30.24	112.18	400
Mercury	0.43	3.5	0.16	0.93	ND	ND	0.6	1.3	ND	ND	ND	ND	0.43	3.5	ND	0.93	ND	ND	0.12	0.85	0.36	1.36	0.56223	0.32	0.13	0.696	0.41
Nickel	24	58	2.9	51	1.9	23	N/A	N/A	N/A	N/A	N/A	N/A	24	58	2.9	51	1.9	23	19.3	37.7	N/A	N/A	61	49.6	15.9	42.8	110
Selenium	4.2	11	8.6	8.6	ND	ND	4.8	20	ND	ND	ND	ND	4.2	20	8.6	8.6	ND	ND	1.11	3.34	0.7	6.14	N/A	N/A	N/A	N/A	1
Silver	5.7	5.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	ND	ND	ND	ND	0.57	0.59	0.6	1.16	N/A	N/A	0.73	1.77	3.1
Zinc	520	3100	110	1400	5.7	58	N/A	N/A	N/A	N/A	N/A	N/A	520	3100	110	1400	5.7	58	60.9	238	N/A	N/A	1016.7	1204.1	124	271	410

Footnotes:
(1) Average concentrations for AES 2006 and 2007 data are calculated using 1/2 the detection limit for nondetects. Average concentrations for historical data are calculated using zero for nondetects because detection limits were not available.
(2) Baltimore Harbor Anchorages and Channels, Maryland and Virginia. Integrated Feasibility Report and Environmental Impact Statement. U.S. Army Corps of Engineers, Baltimore District. March 1997.
(3) Registered Toxic Study. Chemical and Physical Analysis of Sediments from the Marine Channel and Associated Berths and Turning Basin. EA Engineering, Science, and Technology, Inc. February 1985.
(4) Registered Toxic Study. Spatial Mapping of Sedimentary Contaminants in the Baltimore Harbor/Patapsco River/ Back River System. Maryland Department of the Environment. August 1997.
(5) NOAA Screening Quick Reference Tables (SQUIRT), Buchman, 1999.

Notes:
ND = Nondetected result
N/A = Data Not Available

FIGURES

APPENDIX A

VIBRACORE LOGS

VIBRACORE REPORT

Probe No. HA-116

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1- 0 - 19.33 ft	Black-dark gray, organic SILT (OL/OH) and lean CLAY (CL), slight odor. PP=0 TSF
1		
2		
3		-TALBOT FORMATION-
4		
5		Dark gray, elastic SILT (MH), no odor. PP=0.1 TSF
6		
7		
8		
9		Dark gray, fat CLAY (CH), no odor.
10		

Northing	562332
Easting	1450044
Elevation (ft.)	-39.6
Penetration (ft.)	19.3
Recovery (ft.)	18.0
Water depth	39.6
Bottom elevation	-58.93
Time	16:37:11

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Water Depth 39.6' - Free fall under weight of Vibracore Equipment to approximately 16.0 '

VIBRACORE REPORT

Probe No. HA-116

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Dark gray, fat CLAY (CH), no odor.
		PP=0
11		
12		
13		-TALBOT FORMATION-
14		
15		Same as above
16		
17		
18		
19		
		Bottom of exploration at 19.3 ft.
20		Note: PP= Pocket Penetrometer-value in tons per square foot. PVST= Pocket Vane Shear Test-value in kilograms per square centimeter.

Northing	562332
Easting	1450044
Elevation (ft.)	-39.6
Penetration (ft.)	19.3
Recovery (ft.)	18.0
Water depth	39.6
Bottom elevation	-58.93
Time	16:37:11

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-117

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 14.4	Black, organic SILT (OL/OH), strong odor PP=0 TSF
1		
2		Dark brown, lean CLAY (CL), slight odor. PP=0.1 TSF -TALBOT FORMATION-
4	4.4	Dark brown, silty SAND (SM), no odor.
5		Dark brown, sandy lean CLAY (CL), no odor. PP=0.1 TSF
6		
7		Light gray-tan, fat CLAY with sand (CH), no odor. PP=1.75 TSF
8		
9		Gray, clayey SAND (SC), no odor, low plasticity
10		

Northing	563745
Easting	1451148
Elevation (ft.)	-37.3
Penetration (ft.)	14.4
Recovery (ft.)	16.0
Water depth	37.3
Bottom elevation	-51.7
Time	15:45:12

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 37.3' - Slow advance from 8.5', indicating hard stratum to very hard stratum.

VIBRACORE REPORT

Probe No. HA-117

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Tan, poorly graded SAND with clay (SP-SC), no odor. PP=1 TSF
11		-TALBOT FORMATION-
12		
13		Tan, sandy lean CLAY (CL), no odor. PP=3.5 TSF
14		
15		
16		Bottom of exploration at 16.0 ft.
17		Note: PP= Pocket Penetrometer-value in tons per square foot. PVST= Pocket Vane Shear Test-value in kilograms per square centimeter.
18		
19		
20		

Northing	563745
Easting	1451148
Elevation (ft.)	-37.3
Penetration (ft.)	14.4
Recovery (ft.)	16.0
Water depth	37.3
Bottom elevation	-51.7
Time	15:45:12

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-118

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 24.6	Black, organic SILT (OL/OH), odor.
1		
2		
3		Combination of organic SILT (OL/OH), and dark lean CLAY (CL), slight odor. PP=0 TSF
4		
5		Gray, elastic SILT (MH), no odor. PP=0 TSF
6		
7		-TALBOT FORMATION-
8		
9		
10		

Northing	564355
Easting	1451373
Elevation (ft.)	-18.6
Penetration (ft.)	24.6
Recovery (ft.)	20.0
Water depth	18.6
Bottom elevation	-43.2
Time	10:51:14

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 18.6 ft. 1st Run (R1) Penetration 24.45 ft., 1st Run - Free fall under Vibracore equipment to 24.6. ft. (Rec= 20 ft.). Tube length for 1st Run was 20. ft, then 2nd Run (R2) performed. R1 & R2 overlap from 14.30 ft. Run R2 stopped at 21.13 ft. Counter broke - actual final depth according to Alpine= 30.ft. - (R2 recovery = 13.5 ft.) Counter wire snapped. For R2, tube jetted down to 14.30 ft. by water pump - sampled from there.

VIBRACORE REPORT

Probe No. HA-118

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Gray, lean CLAY (CL), no odor, shell pieces.
		PP=0 TSF
11		
		-TALBOT FORMATION-
12		
13		
14		
15	R2 - 15.0 - 30.0	Same as above
16		
17		
18		
19		
20		Same as above except dark gray

Northing	564355
Easting	1451373
Elevation (ft.)	-18.6
Penetration (ft.)	24.6
Recovery (ft.)	20.0
Water depth	18.6
Bottom elevation	-43.2
Time	10:51:14

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-118

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
20		Dark gray, lean CLAY (CL), no odor.
		PP=0.5 TSF
21		
22		
23		-TALBOT FORMATION-
24		
25		Same as above except PP=0 TSF
26		
27		
28		
29		Dark gray, fat CLAY (CH).
30		Bottom of exploration at 30.0 ft.

Northing	564355
Easting	1451373
Elevation (ft.)	-18.6
Penetration (ft.)	30.0
Recovery (ft.)	13.5
Water depth	18.6
Bottom elevation	-48.6
Time	11:16:46

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-119

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 20.0 Redid R1 - 0 - 20.1	Black, organic SILT (OL/OH), strong odor.
1		Dark gray, elastic SILT (MH), slight odor. PP=0 TSF PVST=0 Kg/cm2
2		
3		
4		
5		Same as above, except no odor PP=0 TSF PVST=0 Kg/cm2
6		
7		-TALBOT FORMATION-
8		
9		Dark gray, fat CLAY (CH).
10		

Northing	565094
Easting	1452715
Elevation (ft.)	-17.3
Penetration (ft.)	20.0
Recovery (ft.)	5.0
Water depth	17.3
Bottom elevation	-37.3
Time	12:13:40

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 17.3 ft. 1st Run (R1) counter little recovery. Redid Run1. This R1 stopped at 20.46 ft. R1 Recovery ~ 15 to 17 ft. . Second Run (R2) Jet to 16.81 ft., R2 from 16.81 ft. - 29.65 ft., R2 Recovery = 9 ft. Third Run (R3A) Jet to 20.45 ft and ended nd at 34.0 ft. with No Recovery, The next Run (R3B) Jet to 20.36 ft. and ended at 30.60 ft with No Recovery. The last Run (R3C) Jet to 20.39 ft. and ended at 29.67 ft. with No Recovery.

VIBRACORE REPORT

Probe No. HA-119

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Dark gray, fat CLAY (CH), no odor.
		PP=0 TSF PVST=0 Kg/cm2
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above
16		
17		
18		
19		
20	R3 - 20.0 - 30.5	

Northing	565094
Easting	1452715
Elevation (ft.)	-17.3
Penetration (ft.)	20.0
Recovery (ft.)	15.9
Water depth	17.3
Bottom elevation	-37.3
Time	12:50:27

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-119

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
20	R4 Redid R3 20.0 - 29.7	Dark gray, fat CLAY (CH), no odor. PP=0 TSF PVST=0 Kg/cm2
21		
22		
23		-TALBOT FORMATION-
24		
25		Same as above
26		
27		
28		
29		Note: PP= Pocket Penetrometer-value in tons per square foot. PVST= Pocket Vane Shear Test-value in kilograms per square centimeter.
30		Bottom of exploration at 29.67 ft.

Northing	565094
Easting	1452715
Elevation (ft.)	-17.3
Penetration (ft.)	29.7
Recovery (ft.)	0.0
Water depth	17.3
Bottom elevation	-46.79
Time	13:41:14

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

HALEY & ALDRICH

Probe No. HA-120

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 23.6	Black, organic SILT (OL/OH), strong odor.
1		Dark gray, elastic SILT (MH), slight odor. PP=0 TSF PVST=0 kg/cm2
2		
3		
		-TALBOT FORMATION-
4		
5		Same as above, except gray PP=0 TSF PVST=0 Kg/cm2
6		
7		Dark gray, fat CLAY (CH).
8		
9		
10		

Northing	565033
Easting	1452784
Elevation (ft.)	-18.3
Penetration (ft.)	23.55
Recovery (ft.)	15.0
Water depth	18.3
Bottom elevation	-41.85
Time	15:06:20

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 18.3 ft. First Run (R1A) penetrated 23.35 ft. with No Recovery. Free Fall for R1A under weight of Vibracore equipment. Second trial for R1 (R1B) penetrated to 21.68 ft, free fall for R1B under weight of Vibracore equipment, R1B Recovery = 17 ft. Second Run (R2) Jet to ~ 9.99 ft. with free fall from 9.99 to 30.60 under weight of Vibracore equipment. had No Recovery, Second trial for R2 (R2B) without Jetting, free fall from 0 to 29.65 ft. under weight of Vibracore equipment, R2B Recovery.

VIBRACORE REPORT

Probe No. HA-120

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Gray, fat CLAY (CH), no odor.
		PP=0 TSF PVST=0 Kg/cm2
11		
		-TALBOT FORMATION-
12		
13		
14		
15	R2 - 15.0 - 29.8	Same as above
16		
17		Bottom of exploration at 17.0 ft.
18		Note: PP= Pocket Penetrometer-value in tons per square foot. PVST= Pocket Vane Shear Test-value in kilograms per square centimeter.
19		
20		

Northing	565033
Easting	1452784
Elevation (ft.)	-18.3
Penetration (ft.)	29.77
Recovery (ft.)	none
Water depth	18.3
Bottom elevation	-48.07
Time	15:25:41

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-121

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 21.8	Black, organic SILT (OL/OH), strong odor.
1		
2		
3		
4		Black, organic SILT (OL/OH), and black elastic SILT (MH).
5		
		-TALBOT FORMATION-
6		
7		Gray, fat CLAY (CH), slight odor. PP=0 TSF PVST=0 Kg/cm2
8		
9		
10		

Northing	566048
Easting	1452961
Elevation (ft.)	-18.3
Penetration (ft.)	21.79
Recovery (ft.)	13.5
Water depth	18.3
Bottom elevation	-40.09
Time	17:08:11

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 18.3'- 1st Run (R1) pushed 20 ft, Recovery of 13.5 ft. Second Run (R2) pushed to 30 ft. under weight of Vibracore equipment with 14.0 ft. of Recovery

VIBRACORE REPORT

Probe No. HA-121

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10	R2 10.0 - 30.1	Dark gray, elastic SILT (MH), no odor.
		PP=0 TSF PVST=0 Kg/cm2
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above
16		
17		
18		
19		Dark gray, elastic SILT (MH), no odor.
20		

Northing	566048
Easting	1452961
Elevation (ft.)	-18.3
Penetration (ft.)	30.07
Recovery (ft.)	14.0
Water depth	18.3
Bottom elevation	-48.37
Time	17:39:25

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-121

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	24-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
20		Dark gray, fat CLAY (CH), no odor.
21		
22		
23		-TALBOT FORMATION-
24		
25		Same as above
26		
27		Bottom of exploration at 27.0 ft.
28		Note: PP= Pocket Penetrometer-value in tons per square foot. PVST= Pocket Vane Shear Test-value in kilograms per square centimeter.
29		
30		

Northing	566048
Easting	1452961
Elevation (ft.)	-18.3
Penetration (ft.)	30.07
Recovery (ft.)	14.0
Water depth	18.3
Bottom elevation	-48.37
Time	17:39:25

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-122

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 19.4	Dark gray, lean CLAY (CL), slight odor. PP=0 TSF
1		Dark gray, clayey SAND (SC), no odor.
2		
3		
4		Light gray, lean CLAY (CL), no odor. PP=0 TSF
5		-TALBOT FORMATION-
6		Dark gray silty SAND (SM), no odor 3.0 " diameter cobble
7		Gray, lean CLAY (CL), with layers of dark gray and black, organic at bottom, 1.0 feet apart.
8		
9		
10		

Northing	566048
Easting	1452961
Elevation (ft.)	-44.3
Penetration (ft.)	19.41
Recovery (ft.)	18.0
Water depth	44.3
Bottom elevation	-63.71
Time	13:47:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 44.3 ft.

VIBRACORE REPORT

Probe No. HA-122

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Dark gray, fat CLAY (CH), no odor.
		PP=0.7 TSF
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above PP=0.7 TSF
16		
17		
18		Bottom of exploration at 18.0 ft.
19		Note: PP= Pocket Penetrometer-value in tons per square foot. PVST= Pocket Vane Shear Test-value in kilograms per square centimeter.
20		

Northing	566048
Easting	1452961
Elevation (ft.)	-44.3
Penetration (ft.)	19.41
Recovery (ft.)	18.0
Water depth	44.3
Bottom elevation	-63.71
Time	13:47:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-123

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	21-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 20.0	Black, organic SILT (OL/OH), odor.
1		
2		
3		
		Gray, lean CLAY (CL), strong odor at top 0.5 ft., trace of shells.
4		
5		Same as above
		-TALBOT FORMATION-
6		PP=0.2 TSF
7		
8		
9		PP=0.2 TSF
10		Trace of shells

Northing	565974
Easting	1454192
Elevation (ft.)	-30.7
Penetration (ft.)	20
Recovery (ft.)	15.5
Water depth	30.7
Bottom elevation	-50.7
Time	9:38:27

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 30.7 ft.

VIBRACORE REPORT

Probe No. HA-123

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	21-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Gray, elastic SILT (MH). PP=0.2 TSF
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Gray, fat CLAY (CH).
16		
17		
18		
19		
20		Bottom of exploration at 20.0 ft.

Northing	565974
Easting	1454192
Elevation (ft.)	-30.7
Penetration (ft.)	20
Recovery (ft.)	15.5
Water depth	30.7
Bottom elevation	50.7
Time	9:38:27

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

The pipe that carries the Vibracore inside bent. There was a blow up in one of the hoses and it had to be replaced before resuming tomorrow.

VIBRACORE REPORT

Probe No. HA-124

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 17.4	Dark gray, sandy SILT (ML), slight odor. PP=0.5 TSF
1		
2		
3		
4		
5		Dark gray, sandy elastic SILT (MH), no odor. PP=0.7 TSF -TALBOT FORMATION-
6		
7		
8		
9		
10		

Northing	566056
Easting	1454512
Elevation (ft.)	-36.2
Penetration (ft.)	17.43
Recovery (ft.)	13.5
Water depth	36.2
Bottom elevation	-53.63
Time	14:36:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 36.2 ft. Up to 17.43 ft, very soft to soft soil

VIBRACORE REPORT

Probe No. HA-124

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Gray, fat CLAY (CH), no odor, traces of shell.
		PP=0.5 TSF
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above
16		
17		Bottom of exploration at 17.0 ft.
18		
19		
20		

Northing	566056
Easting	1454512
Elevation (ft.)	-36.2
Penetration (ft.)	17.43
Recovery (ft.)	13.5
Water depth	36.2
Bottom elevation	-53.63
Time	14:36:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-125

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 16.7	Dark gray, elastic SILT (MH), slight odor.
		PP=0.2 TSF
1		
2		
3		
4		
5		Same as above, no odor
		-TALBOT FORMATION-
6		
7		
8		
9		
10		

Northing	565600
Easting	1454149
Elevation (ft.)	-37.9
Penetration (ft.)	16.7
Recovery (ft.)	17.0
Water depth	37.9
Bottom elevation	-54.6
Time	13:08:11

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 37.9 ft.

VIBRACORE REPORT

Probe No. HA-125

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Dark gray, fat CLAY (CH), no odor.
		PP=0.3 TSF
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above
16		
17		Bottom of exploration at 16.7 ft.
18		
19		
20		

Northing	565600
Easting	1454149
Elevation (ft.)	-37.9
Penetration (ft.)	16.7
Recovery (ft.)	17.0
Water depth	37.9
Bottom elevation	-54.6
Time	13:08:11

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-126

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 19.3	Gray, elastic SILT (MH), slight odor. PP=0.3 TSF Trace of shells
1		
2		
3		
4		
5		Gray to dark brown, lean CLAY (CL), no odor, PP=0.5 TSF Trace of shells
6		-TALBOT FORMATION-
7		
8		
9		
10		

Northing	565456
Easting	1454533
Elevation (ft.)	-32.4
Penetration (ft.)	19.3
Recovery (ft.)	20.0
Water depth	32.4
Bottom elevation	-51.7
Time	11:59:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 32.4 ft. Stiff material from approximately 10.0 ft, stiffest at 18.0 ft

VIBRACORE REPORT

Probe No. HA-126

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Gray to dark elastic SILT (MH), no odor.
		PP=0.5 TSF
		Trace of shells
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above, except PP=0.2 TSF
16		
17		
18		
19		Bottom of exploration at 19.3 ft.
20		

Northing	565456
Easting	1454533
Elevation (ft.)	-32.4
Penetration (ft.)	19.3
Recovery (ft.)	20.0
Water depth	32.4
Bottom elevation	-51.7
Time	11:59:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1

VIBRACORE REPORT

Probe No. HA-127

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
0	R1 - 0 - 17.8	Dark gray, elastic SILT (MH), no odor.
		PP=0.3 TSF
1		
2		
3		
4		
5		Same as above PP=0.5 TSF Trace of shells
6		
		-TALBOT FORMATION-
7		
8		
9		
10		

Northing	565704
Easting	1454982
Elevation (ft.)	-18.6
Penetration (ft.)	17.89
Recovery (ft.)	20.0
Water depth	34.5
Bottom elevation	-52.39
Time	11:11:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

Depth to water 34.5 ft. No hard zones encountered to depth of 17.89 ft.

VIBRACORE REPORT

Probe No. HA-127

Project	AES-Sparrows Point	**H&A File No.**	32907-262
Location	Sparrows Point Shipyard, Baltimore, MD	**Project Mgr.**	F. Pons
Client	AES	**Field Rep.**	M. Pascal
Contractor	Alpine Ocean Seismic Survey, Inc.	**Date**	23-Aug-07
Equipment	Alpine Model 271 B Vibracore	**Checked by**	S. Safaai

Depth (ft.)	Sample No. & Depth (ft.)	Visual Description
10		Dark gray, fat CLAY (CH), no odor.
		PP=0.3 TSF
		Trace of decomposed shells
11		
		-TALBOT FORMATION-
12		
13		
14		
15		Same as above
		PP=0.2 TSF
16		
17		
18		
19		
20		Bottom of exploration at 20.0 ft.

Northing	565704
Easting	1454982
Elevation (ft.)	-18.6
Penetration (ft.)	17.89
Recovery (ft.)	20.0
Water depth	34.5
Bottom elevation	-52.39
Time	11:11:00

Notes:
Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

Remarks:

See remarks on Page 1