

**Table 1: Surface Water Chemistry Data Screened for the Protection of Environmental Receptors
2012 Sampling Event, Nanticoke River - Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No.	DNREC, SWQ Standards (4)			Chemical Analyses (5)							
		Fresh Acute	Fresh Chronic	Units	N-2		N-3A		N-5		Average	Units
PCBs (TOTAL DISSOLVED)												
TOTAL PCBs		NC	0.014	ug/L	0.00030		0.00021		0.00027		0.00026	ug/L
METALS (TOTAL DISSOLVED)												
ARSENIC	7440-38-2	340	150	ug/L	1	U	1	U	1	U	1	ug/L
CADMIUM (4)	7440-43-9	0.6	0.2	ug/L	0.5	U	0.5	U	0.5	U	0.5	ug/L
CHROMIUM (4)	7440-47-3	375	49	ug/L	1	U	1	U	1	U	1	ug/L
COPPER (4)	7440-50-8	8.3	5.8	ug/L	1.7		2.3		1.3		1.8	ug/L
LEAD (4)	7439-92-1	8.9	1.2	ug/L	0.5	U	0.5	U	0.5	U	0.5	ug/L
MERCURY	7439-97-6	1.4	0.077	ug/L	0.02	U	0.02	U	0.02	U	0.02	ug/L
ZINC (4)	7440-66-6	76	77	ug/L	16		12		16		15	ug/L
GENERAL CHEMISTRY					N-SW2 (2006)							
AMMONIA (AS NITROGEN)	Temp and pH dependent			mg/L	0.7						0.7	mg/L
NITROGEN, KJEDAHN (TOTAL)				mg/L	3	U					3	mg/L
PHOSPHORUS (TOTAL)				mg/L	0.17						0.17	mg/L
TOTAL SUSPENDED SOLIDS				mg/L	23.6						23.6	mg/L

FOOTNOTES:

(1) Data extracted from EnviroSystems Report No. 22282; 1 picogram = 0.001 nanograms; 1 picogram = 1 E-06 micrograms; 1 milligram = 1,000 micrograms

(2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria.

(3) Green indicates below limit of detection. Bolded values highlighted yellow exceed screening criteria. Bold AND italicised values exceed screening criteria due to RLs or blank contamination. Qualifiers: B = analyte is present in the method blank at a reportable level; J = compound was detected, but below the reporting limit (value is estimated); U = compound was analyzed for but not detected; NC = No Criteria

(4) DNREC, State of Delaware Surface Water Quality Standards, Table 1, Amended July 11, 2004, NC = No Criteria. For calculated values, hardness assumed to be 60 mg/L (USGS Water Quality information, <http://water.usgs.gov/owq/hardness-alkalinity.html>)

(5) Results for N-2 and N-3A are the average of three replicate analyses; N-5 is the average of 4 replicate analyses

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

**Table 2: Surface Water Chemistry Data Screened for the Protection of Human Receptors
2012 Sampling Event, Nanticoke River (2012) - Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No.	DNREC, SWQ Standards (4)					Chemical Analyses (5)							
		Systemic Toxicants		Human Carcinogens		Units								
		Ingest _{Fish}	Ingest _(Fish + Water)	Ingest _{Fish}	Ingest _(Fish + Water)		N-2		N-3A		N-5		Average	Units
PCBs (TOTAL DISSOLVED)														
TOTAL PCBs		NC	0.5 (MCL)	0.000064	0.000064	ug/L	0.00030		0.00021		0.00027		0.00026	ug/L
METALS (TOTAL DISSOLVED)														
ARSENIC	7440-38-2	NC	10 (MCL)	NC	NC	ug/L	1	U	1	U	1	U	1	ug/L
CADMIUM	7440-43-9	31	5 (MCL)	NC	NC	ug/L	0.5	U	0.5	U	0.5	U	0.5	ug/L
CHROMIUM	7440-47-3	NC	100 (MCL)	NC	NC	ug/L	1	U	1	U	1	U	1	ug/L
COPPER	7440-50-8	NC	1,300 (MCL)	NC	NC	ug/L	1.7		2.3		1.3		1.8	ug/L
LEAD	7439-92-1	NC	15 (MCL)	NC	NC	ug/L	0.5	U	0.5	U	0.5	U	0.5	ug/L
MERCURY	7439-97-6	NC	NC	NC	NC	ug/L	0.02	U	0.02	U	0.02	U	0.02	ug/L
ZINC	7440-66-6	26,000	7,400	NC	NC	ug/L	16		12		16		15	ug/L
GENERAL CHEMISTRY							N-SW2 (2006)							
AMMONIA (AS NITROGEN)		Temp and pH dependent				mg/L	0.7						0.7	mg/L
NITROGEN, KJEDAHN (TOTAL)						mg/L	3	U					3	mg/L
PHOSPHORUS (TOTAL)						mg/L	0.17						0.17	mg/L
TOTAL SUSPENDED SOLIDS						mg/L	23.6						23.6	mg/L

FOOTNOTES:

(1) Data extracted from EnviroSystems Report No. 22282; 1 picogram = 0.001 nanograms; 1 picogram = 1 E-06 micrograms; 1 milligram = 1,000 micrograms

(2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria

(3) Green indicates below limit of detection. Bolded values highlighted yellow exceed screening criteria. Bold AND italicised values exceed screening criteria due to RLs or blank contamination. Qualifiers: B = analyte is present in the method blank at a reportable level; J = compound was detected, but below the reporting limit (value is estimated); U = compound was analyzed for but not detected;

(4) DNREC, State of Delaware Surface Water Quality Standards, Table 2, Amended July 11, 2004.

(5) Results for N-2 and N-3A are the average of three replicate analyses; N-5 is the average of 4 replicate analyses

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

**Table 3: Elutriate Chemistry Data Screened for the Protection of Environmental Receptors
2012 Sampling Event, Nanticoke River (2012) - Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No.	DNREC, SWQ Standards (ug/L) (4)			Chemical Analyses							
		Fresh Acute	Fresh Chronic	Units	N-2		N-3A		N-5		Average	Units
PCBs (TOTAL DISSOLVED)												
TOTAL PCBs		NC	0.014	ug/L	0.0063		0.0055		0.0180		0.0099	ug/L
METALS (TOTAL DISSOLVED)												
ARSENIC	7440-38-2	340	150	ug/L	5.3		4.0		15.0		8.1	ug/L
CADMIUM	7440-43-9	0.6	0.2	ug/L	0.5	U	0.5	U	0.5	U	0.5	ug/L
CHROMIUM	7440-47-3	375	49	ug/L	2.3		2.0		2.0		2.1	ug/L
COPPER	7440-50-8	8.3	5.8	ug/L	12.7		9.9		16.0		12.9	ug/L
LEAD	7439-92-1	8.9	1.2	ug/L	6.0		4.1		6.5		5.5	ug/L
MERCURY	7439-97-6	1.4	0.077	ug/L	0.02	U	0.02	U	0.02	U	0.02	ug/L
ZINC	7440-66-6	76	77	ug/L	70		91		1057		406	ug/L
GENERAL CHEMISTRY (total)					N-2-MEL (2006)				N-5-MEL (2006)			
AMMONIA AS NITROGEN (Total)		x	x	mg/L	19.7				107		63.35	mg/L
SUSPENDED SOLIDS (Total)		x	x	mg/L	45,700				111,000		78,350	mg/L
TOTAL KJELDAHL NITROGEN (Total)		x	x	mg/L	34				105		69.5	mg/L
TOTAL PHOSPHORUS (Total)		x	x	mg/L	0.1	U			0.1	U	0.1	mg/L
GENERAL CHEMISTRY (dissolved)												
AMMONIA AS NITROGEN (Dissolved)		Temp/pH Dependent		mg/L	11.1				40.4		25.75	mg/L
TOTAL KJELDAHL NITROGEN (Dissolved)				mg/L	12.2				47.3		29.75	mg/L
TOTAL PHOSPHORUS (Dissolved)				mg/L	1				3.1		2.05	mg/L

FOOTNOTES:

(1) Data extracted from EnviroSystems Report No. 22282; 1 picogram = 0.001 nanograms; 1 picogram = 1 E-06 micrograms; 1 milligram = 1,000 micrograms

(2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria.

(3) Green indicates below limit of detection. Bolded values highlighted yellow exceed screening criteria. Bold AND italicised values exceed screening criteria due to RLs or blank contamination. Qualifiers: B = analyte is present in the method blank at a reportable level; J = compound was detected, but below the reporting limit (value is estimated); U = compound was analyzed for but not detected;

(4) DNREC, State of Delaware Surface Water Quality Standards, Table 1, Amended July 11, 2004, NC = No Criteria. For calculated values, hardness assumed to be 60 mg/L (USGS Water Quality information, <http://water.usgs.gov/owq/hardness-alkalinity.html>)

(5) Results for N-2 and N-3A are the average of three replicate analyses; N-5 is the average of 4 replicate analyses

NC = No Criteria

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

**Table 4: Elutriate Data Screened for the Protection of Human Receptors
2012 Resampling Event, Nanticoke River - Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No.	DNREC, SWQ Standards (ug/L) (4)					Chemical Analyses (5)							
		Systemic Toxicants		Human Carcinogens		Units								
		Ingest _{Fish}	Ingest _(Fish + Water)	Ingest _{Fish}	Ingest _(Fish + Water)		N-2		N-3A		N-5		Average	Units
PCBs (TOTAL DISSOLVED)														
TOTAL PCBs		NC	0.5 (MCL)	0.000064	0.000064	ug/L	0.0063		0.0055		0.0180		0.0099	ug/L
METALS (TOTAL DISSOLVED)														
ARSENIC	7440-38-2	NC	10 (MCL)	NC	NC	ug/L	5.3		4.0		15.0		8.1	ug/L
CADMIUM	7440-43-9	31	5 (MCL)	NC	NC	ug/L	0.5	U	0.5	U	0.5	U	0.5	ug/L
CHROMIUM	7440-47-3	NC	100 (MCL)	NC	NC	ug/L	2.3		2.0		2.0		2.1	ug/L
COPPER	7440-50-8	NC	1,300 (MCL)	NC	NC	ug/L	12.7		9.9		16.0		12.9	ug/L
LEAD	7439-92-1	NC	15 (MCL)	NC	NC	ug/L	6.0		4.1		6.5		5.5	ug/L
MERCURY	7439-97-6	NC	NC	NC	NC	ug/L	0.02	U	0.02	U	0.02	U	0.02	ug/L
ZINC	7440-66-6	26,000	7,400	NC	NC	ug/L	70		91		1057		406	ug/L
GENERAL CHEMISTRY (TOTAL)							N-2-MEL (2006)				N-5-MEL (2006)			
AMMONIA AS NITROGEN (Total)		x	x	x	x	x	19.7				107		19.7	mg/L
SUSPENDED SOLIDS (Total)		x	x	x	x	x	45,700				111,000		45,700	mg/L
TOTAL KJELDAHL NITROGEN (Total)		x	x	x	x	x	34				105		34	mg/L
TOTAL PHOSPHORUS (Total)		x	x	x	x	x	0.1	U			0.1	U	0.1	mg/L
GENERAL CHEMISTRY (DISSOLVED)														
AMMONIA AS NITROGEN (Dissolved)		Temp and pH dependent				x	11.1				40.4		11.1	mg/L
TOTAL KJELDAHL NITROGEN (Dissolved)		x	x	x	x	x	12.2				47.3		12.2	mg/L
TOTAL PHOSPHORUS (Dissolved)		x	x	x	x	x	1				3.1		1	mg/L

FOOTNOTES:

(1) Data extracted from EnviroSystems Report No. 22282; 1 picogram = 0.001 nanograms; 1 picogram = 1 E-06 micrograms; 1 milligram = 1,000 micrograms

(2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria

(3) Green indicates below limit of detection. Bolded values highlighted yellow exceed screening criteria. Bold AND italicised values exceed screening criteria due to RLs or blank contamination. Qualifiers: B = analyte is present in the method blank at a reportable level; J = compound was detected, but below the reporting limit (value is estimated); U = compound was analyzed for but not detected;

(4) DNREC, State of Delaware Surface Water Quality Standards, Table 2, Amended July 11, 2004.

(5) Results for N-2 and N-3A are the average of three replicate analyses; N-5 is the average of 4 replicate analyses

 Value is a non-detect at the reporting limit (RL)

 Value exceeds acute criteria

 Value exceeds chronic criteria

**Table 5: TCLP Chemistry Data Screening Against Criteria for Leaching Potential
Nanticoke River Sediment, Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No.	Standard (4)	Units	Chemical Analyses							
				N-3-SED		N-4-SED		N-5-SED		Average	
				Oct-06		Oct-06		Oct-06		Results	Units
VOCs											
1,1-DICHLOROETHENE	75-34-3	0.7	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
1,2-DICHLOROETHANE	106-93-4	0.5	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
2-BUTANONE (MEK)	78-93-3	200	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
BENZENE	71-43-2	0.5	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
CARBON TETRACHLORIDE	56-23-5	0.5	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
CHLOROBENZENE	108-90-7	100	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
CHLOROFORM	67-66-3	6	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
TETRACHLOROETHENE	127-18-4	0.7	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
TRICHLOROETHENE	79-01-6	0.5	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
VINYL CHLORIDE	75-01-4	0.2	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
SVOCs											
1,4-DICHLOROBENZENE	106-46-7	7.5	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
2,4,5-TRICHLOROPHENOL	95-95-4	400	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
2,4,6-TRICHLOROPHENOL	88-06-2	2	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
2,4-DINITROTOLUENE	121-14-2	0.1	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
CRESOLS (TOTAL)	1319-77-3	200	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
HEXACHLOROBENZENE	118-74-1	0.1	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
HEXACHLOROBUTADIENE	87-68-3	0.5	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
HEXACHLOROETHANE	67-72-1	3.0	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
NITROBENZENE	98-95-3	2.0	mg/L	0.05	U	0.05	U	0.05	U	0.05	mg/L
PENTACHLOROPHENOL	87-86-5	100	mg/L	0.25	U	0.25	U	0.25	U	0.25	mg/L
PYRIDINE	110-86-1	5	mg/L	0.1	U	0.1	U	0.1	U	0.1	mg/L
PESTICIDES											
2,4,5-TP (SILVEX)	93-72-1	1	mg/L	0.01	U	0.01	U	0.01	U	0.01	mg/L
2,4-D	94-75-7	10	mg/L	0.04	U	0.04	U	0.04	U	0.04	mg/L
CHLORDANE (TECHNICAL)	12789-03-6	0.03	mg/L	0.005	U	0.005	U	0.005	U	0.005	mg/L
ENDRIN	72-20-8	0.02	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	mg/L
GAMMA-BHC (LINDANE)	58-89-9	0.4	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	mg/L
HEPTACHLOR	76-44-8	0.008	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	mg/L
HEPTACHLOR EPOXIDE	1024-57-3	0.0	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	mg/L
METHOXYCHLOR	72-43-5	10	mg/L	0.001	U	0.001	U	0.001	U	0.001	mg/L
TOXAPHENE	81-35-2	0.5	mg/L	0.02	U	0.02	U	0.02	U	0.02	mg/L
METALS											
ARSENIC	7440-38-2	5	mg/L	0.18	B	0.18	B	0.19	B	0.1833	mg/L
BARIUM	7440-39-3	100	mg/L	1.7	B	1.7	B	2	B	1.8	mg/L
CADMIUM	7440-43-9	1	mg/L	0.0066	B	0.0043	B	0.0039	B	0.0049	mg/L
CHROMIUM	7440-47-3	5	mg/L	0.5	U	0.5	U	0.5	U	0.5	mg/L
LEAD	7439-92-1	5	mg/L	0.011	B	0.013	B	0.5	U	0.1747	mg/L
MERCURY	7439-97-6	0.2	mg/L	0.0002	U	0.0002	U	5E-05	B J	0.0002	mg/L
SELENIUM	7782-49-2	1	mg/L	0.25	U	0.25	U	0.25	U	0.25	mg/L
SILVER	7440-22-4	5	mg/L	0.5	U	0.5	U	0.5	U	0.5	mg/L

**Table 5: TCLP Chemistry Data Screening Against Criteria for Leaching Potential
Nanticoke River Sediment, Seaford, DE (1,2,3)**

FOOTNOTES:

(1) Data extracted from US ACE Report titled "Sediment Sampling at Nanticoke River, Seaford, Delaware. Prepared by EA Engineering, Nov 2006 and cross checked with the original Lab Report, STL Analytical Report Lot #: C6J060320

(2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria

(3) Green indicates below limit of detection. Bolded values highlighted yellow exceed screening criteria. Bold AND italicised values exceed screening criteria due to RLs or blank contamination. Qualifiers: B = analyte is present in the method blank at a reportable level; J = compound was detected, but below the reporting limit (value is estimated); U = compound was analyzed for but not detected; PG = the percent difference between the original and confirmation analysis is greater than 40%

(4) 40 CFR §261.24, Maximum Concentration of Contaminants for Toxicity Characteristics

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

Table 6: Bulk Sediment Chemistry Data Screened for Protection of Environmental Receptors
Nanticoke River Sediment, Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards			Chemical Analyses											
		DE Bkgd Remed Stand (4)	Screen Criteria (TEC) (5)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
					Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Oct-06	
VOCs																
1,1,1-TRICHLOROETHANE	71-55-6	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1,2,2-TETRACHLOROETHANE	79-34-5	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1,2-TRICHLOROETHANE	79-00-5	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1-DICHLOROETHANE	75-34-3	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1-DICHLOROETHENE	75-35-4	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,2-DICHLOROETHANE	106-93-4	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,2-DICHLOROPROPANE	78-87-5	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
2-CHLOROETHYL VINYL ETHER	110-75-8	x	x	ug/kg	20	U	22	U	30	U	29	U	26	U	25	ug/kg
ACROLEIN	107-02-8	x	x	ug/kg	200	U	220	U	300	U	290	U	260	U	254	ug/kg
ACRYLONITRILE	107-13-1	x	x	ug/kg	200	U	220	U	300	U	290	U	260	U	254	ug/kg
BENZENE	71-43-2	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMODICHLOROMETHANE	124-48-1	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMOFORM	75-25-2	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMOMETHANE	74-83-9	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CARBON TETRACHLORIDE	56-23-5	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROBENZENE	108-90-7	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROETHANE	75-00-3	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROFORM	67-66-3	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROMETHANE	74-87-3	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CIS-1,3-DICHLOROPROPENE	156-60-5	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
DIBROMOCHLOROMETHANE	124-48-1	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
ETHYLBENZENE	100-41-4	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
METHYLENE CHLORIDE	75-09-2	x	x	ug/kg	7.9	J B	9.4	J B	12	J B	11	J B	11	J B	10	ug/kg
TETRACHLOROETHENE	127-18-4	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TOLUENE	108-88-3	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRANS-1,2-DICHLOROETHENE	156-60-5	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRANS-1,3-DICHLOROPROPENE	542-75-6	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRICHLOROETHENE	79-01-6	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
VINYL CHLORIDE	75-01-4	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
SVOCs																
1,2,4-TRICHLOROBENZENE	120-82-1	x		ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,2-DICHLOROBENZENE	95-50-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,2-DIPHENYLHYDRAZINE	122-66-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,3-DICHLOROBENZENE	541-73-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,4-DICHLOROBENZENE	106-46-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4,6-TRICHLOROPHENOL	88-06-2	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4-DICHLOROPHENOL	120-83-2	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4-DIMETHYLPHENOL	105-67-9	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4-DINITROPHENOL	51-28-5	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
2,4-DINITROTOLUENE	121-14-2	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,6-DINITROTOLUENE	606-20-2	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2-CHLORONAPHTHALENE	91-58-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg

Table 6: Bulk Sediment Chemistry Data Screened for Protection of Environmental Receptors
Nanticoke River Sediment, Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards			Chemical Analyses											
		DE Bkgd Remed Stand (4)	Screen Criteria (TEC) (5)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
					Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
2-CHLOROPHENOL	95-57-8	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2-METHYL-4,6-DINITROPHENOL	534-52-1	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
2-NITROPHENOL	88-75-5	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
3,3'-DICHLOROBENZIDINE	9 1-94-1	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
4-BROMOPHENYL PHENYL ETHER	101-53-3	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
4-CHLORO-3-METHYLPHENOL	59-50-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
4-NITROPHENOL	100-02-7	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
BENZIDINE	92-87-5	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-CHLOROETHOXY)METHANE	111-91-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-CHLOROETHYL) ETHER	111-44-4	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-CHLOROISOPROPYL) ETHER	108-60-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BUTYL BENZYL PHTHALATE	85-68-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DIETHYL PHTHALATE	84-66-2	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DIMETHYL PHTHALATE	131-11-3	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DI-N-BUTYL PHTHALATE	84-74-2	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DI-N-OCTYL PHTHALATE	117-84-0	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
HEXACHLOROBENZENE	118-74-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
HEXACHLOROBUTADIENE	87-68-3	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
HEXACHLOROCYCLOPENTADIENE	77-47-7	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
HEXACHLOROETHANE	67-72-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
ISOPHORONE	78-59-1	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
NITROBENZENE	98-95-3	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
N-NITROSODIMETHYLAMINE	62-75-9	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
N-NITROSODI-N-PROPYLAMINE	621-64-7	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
N-NITROSODIPHENYLAMINE	86-30-6	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
PENTACHLOROPHENOL	87-86-5	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
PHENOL	108-95-2	x		ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
PAHs																
ACENAPHTHENE	83-32-9	x	x	ug/kg	660	U	840		1,000	U	950	U	870	U	864	ug/kg
ACENAPHTHYLENE	208-96-8	x	x	ug/kg	660	U	24	J	1,000	U	950	U	870	U	701	ug/kg
ANTHRACENE	120-12-7	x	57.2	ug/kg	24	J	52	J	23	J	950	U	870	U	384	ug/kg
BENZO(A)ANTHRACENE	56-55-3	x	108	ug/kg	71	J	130	J	77	J	51	J	53	J	76	ug/kg
BENZO(A)PYRENE	50-32-8	x	150	ug/kg	56	J	65	J	69	J	41	J	42	J	55	ug/kg
BENZO(B)FLUORANTHENE	205-99-2	x	x	ug/kg	82	J	88	J	86	J	56	J	870	U	236	ug/kg
BENZO(GHI)PERYLENE	191-24-2	x	x	ug/kg	41	J	40	J	56	J	950	U	870	U	391	ug/kg
BENZO(K)FLUORANTHENE	207-08-9	x	x	ug/kg	33	J	34	J	40	J	20	J	870	U	199	ug/kg
CHRYSENE	218-01-9	x	166	ug/kg	100	J	120	J	100	J	68	J	70	J	92	ug/kg

Table 6: Bulk Sediment Chemistry Data Screened for Protection of Environmental Receptors
Nanticoke River Sediment, Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards			Chemical Analyses											
		DE Bkgd Remed Stand (4)	Screen Criteria (TEC) (5)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
					Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
DIBENZO(A,H)ANTHRACENE	53-70-3	x	33	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
FLUORANTHENE	206-44-0	x	423	ug/kg	160	J	530	J	180	J	120	J	130	J	224	ug/kg
FLUORENE	86-73-7	x	77.4	ug/kg	660	U	43	J	1,000	U	950	U	870	U	705	ug/kg
INDENO(1,2,3-CD)PYRENE	193-39-5	x	x	ug/kg	19	J	730	U	55	J	30	J	35	J	174	ug/kg
NAPHTHALENE	91-20-3	x	176	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
PHENANTHRENE	85-01-5	x	204	ug/kg	75	J	230	J	83	J	51	J	62	J	100	ug/kg
PYRENE	129-00-0	x	195	ug/kg	140	J	370	J	160	J	110	J	120	J	180	ug/kg
TOTAL PAHs (6)		x	1,610	ug/kg	801		2,566		601		547		512		1005	ug/kg
PESTICIDES																
4,4'-DDD (7)	72-54-8	x	4.88	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
4,4'-DDE (7)	72-55-9	x	3.16	ug/kg	0.87	J	0.9	J	1.1	J	0.63	J	0.6	J	1	ug/kg
4,4'-DDT (7)	50-29-3	x	4.16	ug/kg	0.21	J PG	0.56	J PG	0.53	J PG	2.5	U	0.29	J PG	1	ug/kg
Total DDTs			5.28		2.78		3.36		4.23		5.63		3.19		3.84	
ALDRIN (8)	309-00-2	x	2	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ALPHA-BHC	319-84-6	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ALPHA-CHLORDANE	57-74-9	x	3.24	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
BETA-BHC	319-85-7	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
DELTA-BHC	319-86-8	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
DIELDRIN	60-57-1	x	1.9	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN I (8)	959-98-8	x	2.9	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN II (8)	33213-65-9	x	14	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN SULFATE (8)	1031-07-8	x	5.4	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDRIN (8)	72-20-8	x	2.22	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDRIN ALDEHYDE (8)	7421-93-4	x	x	ug/kg	0.38	J PG	1.9	U	0.7	J PG	2.5	U	2.3	U	2	ug/kg
ENDRIN KETONE (8)	53494-70-5	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
GAMMA-BHC (LINDANE)	58-89-9	x	2.37	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
GAMMA-CHLORDANE	57-74-9	x	3.24	ug/kg	0.22	J	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
HEPTACHLOR	76-44-8	x	68	ug/kg	0.38	J PG	0.26	J PG	0.49	J PG	0.44	J PG	0.5	J PG	0.41	ug/kg
HEPTACHLOR EPOXIDE	1024-57-3	x	2.47	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
METHOXYCHLOR	72-43-5	x	18.7	ug/kg	3.3	U	3.6	U	5	U	4.8	U	4.4	U	4	ug/kg
TOXAPHENE	81-35-2	x	0.1	ug/kg	67	U	74	U	100	U	97	U	89	U	85	ug/kg
PCBs																
TOTAL PCBs (9)		x	x	ug/kg	0.88		3.37		2.74		1.56		0		2	ug/kg
TOTAL PCBs (corrected) (9)		x	59.8	ug/kg	1.76		6.74		5.48		3.12		0		3.42	ug/kg
METALS																
ARSENIC	7440-38-2	0.4	9.79	mg/kg	5.9		6.0		13.1		13.1		15.3		11	mg/kg
CADMIUM	7440-43-9	1	0.99	mg/kg	0.67		0.74		1.7		1.2		1.3		1	mg/kg
CHROMIUM	7440-47-3	100	43.4	mg/kg	7.7		9.8		17.9		15.9		16.5		14	mg/kg
COPPER	7440-50-8	34	31.6	mg/kg	14.9		15.4		33.3		29.4		31.5		25	mg/kg
LEAD	7439-92-1	47	35.8	mg/kg	15		15.5		28.5		24.2		25		22	mg/kg
MERCURY	7439-97-6	0.2	0.18	mg/kg	0.079		0.1		0.16		0.15		0.13		0.12	mg/kg
ZINC	7440-66-6	150	121	mg/kg	91.1		104		224		181		183		157	mg/kg
GENERAL CHEMISTRY																
AMMONIA (AS NITROGEN)		x	x	mg/kg	78		294		727		736		1,070		581	mg/kg
NITROGEN, KJEDAHN (TOTAL)		x	x	mg/kg	1,430		2,350		3,000		3,680		3,950		2,882	mg/kg
ORGANIC CARBON (TOTAL)		x	x	mg/kg	30,100		51,500		50,800		51,700		61,500		49,120	mg/kg
PHOSPHORUS (TOTAL)		x	x	mg/kg	916		827		993		1,200		1,770		1,141	mg/kg

**Table 6: Bulk Sediment Chemistry Data Screened for Protection of Environmental Receptors
Nanticoke River Sediment, Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No	Standards			Chemical Analyses											
		DE Bkgd Remed Stand (4)	Screen Criteria (TEC) (5)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
					Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
MISCELLANEOUS																
GRAVEL		x	x	%	0.0		0.4		0.0		0.0		0.0		0.1	%
SAND		x	x	%	64.8		48.3		8.0		9.5		7.6		28	%
SAND - Coarse		x	x	%	0.1		0.5		0		0		0		0.1	%
SAND - Medium		x	x	%	17		12.7		1.1		0.9		1.5		7	%
SAND - Fine		x	x	%	47.8		35.1		7		8.7		6.1		21	%
SILT		x	x	%	22.5		37.6		69.2		59.5		61.3		50	%
CLAY		x	x	%	12.7		13.7		22.8		31		31.1		22	%
PERCENT SOLIDS		x	x	%	50.2		45.3		32.8		34.7		35		40	%

FOOTNOTES:

(1) Data extracted from US ACE Report titled "Sediment Sampling at Nanticoke River, Seaford, Delaware. Prepared by EA Engineering, Nov 2006 and cross checked with the original Lab Report, STL Analytical Report Lot #: C6J060320

(2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for

(4) DNRC, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act.Uniform-Risk-based Remediation Standards. Attachment 3. Revised Dec 1999. Critical Water Resource Area.

(4) DNRC, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act. Revised Dec 1999.

(5) Consensus-based TEC, MacDonald, Ingersoll and Berger. Arch. Environ. Contam Toxicol. 39, 20-31 (2000)

(6) PAHs Total = (Sum of concentrations above the RL + values qualified "J"). Values qualified "U" set equal to zero.

(7) Criteria for SumDDD, Sum DDE, Sum DDT

(8) ORNL RAIS Database, US EPA Region 3 BTAG Freshwater Sediment Screening Benchmarks (http://rais.ornl.gov/tools/eco_search.php). 2009

(9) PCBs corrected = (Sum of concentrations above RL + values qualified "J") *2. Values qualified "U" set equal to zero.

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

Table 7: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Terrestrial Environmental Receptors, Nanticoke River - Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards				Chemical Analyses											
		Typical DE Soil Conc (4)	Bench- mark (EcoSSL) (5a)	ORNL RAIS (5b)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
						Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
VOCs																	
1,1,1-TRICHLOROETHANE	71-55-6	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1,2,2-TETRACHLOROETHANE	79-34-5	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1,2-TRICHLOROETHANE	79-00-5	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1-DICHLOROETHANE	75-34-3	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1-DICHLOROETHENE	75-35-4	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,2-DICHLOROETHANE	106-93-4	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,2-DICHLOROPROPANE	78-87-5	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
2-CHLOROETHYL VINYL ETHER	110-75-8	x	x	x	ug/kg	20	U	22	U	30	U	29	U	26	U	27	ug/kg
ACROLEIN	107-02-8	x	x	x	ug/kg	200	U	220	U	300	U	290	U	260	U	268	ug/kg
ACRYLONITRILE	107-13-1	x	x	x	ug/kg	200	U	220	U	300	U	290	U	260	U	268	ug/kg
BENZENE	71-43-2	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMODICHLOROMETHANE	124-48-1	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMOFORM	75-25-2	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMOMETHANE	74-83-9	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CARBON TETRACHLORIDE	56-23-5	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROBENZENE	108-90-7	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROETHANE	75-00-3	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROFORM	67-66-3	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROMETHANE	74-87-3	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CIS-1,3-DICHLOROPROPENE	156-60-5	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
DIBROMOCHLOROMETHANE	124-48-1	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
ETHYLBENZENE	100-41-4	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
METHYLENE CHLORIDE	75-09-2	x	x	x	ug/kg	7.9	J B	9.4	J B	12	J B	11	J B	11	J B	11	ug/kg
TETRACHLOROETHENE	127-18-4	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TOLUENE	108-88-3	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRANS-1,2-DICHLOROETHENE	156-60-5	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRANS-1,3-DICHLOROPROPENE	542-75-6	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRICHLOROETHENE	79-01-6	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
VINYL CHLORIDE	75-01-4	x	x	x	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
SVOCs																	
1,2,4-TRICHLOROBENZENE	120-82-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
1,2-DICHLOROBENZENE	95-50-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
1,2-DIPHENYLHYDRAZINE	122-66-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
1,3-DICHLOROBENZENE	541-73-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
1,4-DICHLOROBENZENE	106-46-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2,4,6-TRICHLOROPHENOL	88-06-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2,4-DICHLOROPHENOL	120-83-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2,4-DIMETHYLPHENOL	105-67-9	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2,4-DINITROPHENOL	51-28-5	x	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4300	ug/kg

Table 7: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Terrestrial Environmental Receptors, Nanticoke River - Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards				Chemical Analyses											
		Typical DE Soil Conc (4)	Bench- mark (EcoSSL) (5a)	ORNL RAIS (5b)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
						Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
2,4-DINITROTOLUENE	121-14-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2,6-DINITROTOLUENE	606-20-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2-CHLORONAPHTHALENE	91-58-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2-CHLOROPHENOL	95-57-8	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
2-METHYL-4,6-DINITROPHENOL	534-52-1	x	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4300	ug/kg
2-NITROPHENOL	88-75-5	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
3,3'-DICHLOROBENZIDINE	9 1-94-1	x	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4300	ug/kg
4-BROMOPHENYL PHENYL ETHER	101-53-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
4-CHLORO-3-METHYLPHENOL	59-50-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
4-NITROPHENOL	100-02-7	x	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4300	ug/kg
BENZIDINE	92-87-5	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
BIS(2-CHLOROETHOXY)METHANE	111-91-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
BIS(2-CHLOROETHYL) ETHER	111-44-4	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
BIS(2-CHLOROISOPROPYL) ETHER	108-60-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
BUTYL BENZYL PHTHALATE	85-68-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
DIETHYL PHTHALATE	84-66-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
DIMETHYL PHTHALATE	131-11-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
DI-N-BUTYL PHTHALATE	84-74-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
DI-N-OCTYL PHTHALATE	117-84-0	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
HEXACHLOROBENZENE	118-74-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
HEXACHLOROBTADIENE	87-68-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
HEXACHLOROCYCLOPENTADIENE	77-47-7	x	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4300	ug/kg
HEXACHLOROETHANE	67-72-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
ISOPHORONE	78-59-1	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
NITROBENZENE	98-95-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
N-NITROSODIMETHYLAMINE	62-75-9	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
N-NITROSODI-N-PROPYLAMINE	621-64-7	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
N-NITROSODIPHENYLAMINE	86-30-6	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
PENTACHLOROPHENOL	87-86-5	x	x	x	ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4300	ug/kg
PHENOL	108-95-2	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
PAHs																	
ACENAPHTHENE	83-32-9	x	x	x	ug/kg	660	U	840		1,000	U	950	U	870	U	915	ug/kg
ACENAPHTHYLENE	208-96-8	x	x	x	ug/kg	660	U	24	J	1,000	U	950	U	870	U	711	ug/kg
ANTHRACENE	120-12-7	x	x	x	ug/kg	24	J	52	J	23	J	950	U	870	U	474	ug/kg
BENZO(A)ANTHRACENE	56-55-3	x	x	x	ug/kg	71	J	130	J	77	J	51	J	53	J	78	ug/kg
BENZO(A)PYRENE	50-32-8	x	x	x	ug/kg	56	J	65	J	69	J	41	J	42	J	54	ug/kg
BENZO(B)FLUORANTHENE	205-99-2	x	x	x	ug/kg	82	J	88	J	86	J	56	J	870	U	275	ug/kg
BENZO(GHI)PERYLENE	191-24-2	x	x	x	ug/kg	41	J	40	J	56	J	950	U	870	U	479	ug/kg

Table 7: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Terrestrial Environmental Receptors, Nanticoke River - Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards				Chemical Analyses											
		Typical DE Soil Conc (4)	Bench- mark (EcoSSL) (5a)	ORNL RAIS (5b)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
						Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
BENZO(K)FLUORANTHENE	207-08-9	x	x	x	ug/kg	33	J	34	J	40	J	20	J	870	U	241	ug/kg
CHRYSENE	218-01-9	x	x	x	ug/kg	100	J	120	J	100	J	68	J	70	J	90	ug/kg
DIBENZO(A,H)ANTHRACENE	53-70-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
FLUORANTHENE	206-44-0	x	x	x	ug/kg	160	J	530	J	180	J	120	J	130	J	240	ug/kg
FLUORENE	86-73-7	x	x	x	ug/kg	660	U	43	J	1,000	U	950	U	870	U	716	ug/kg
INDENO(1,2,3-CD)PYRENE	193-39-5	x	x	x	ug/kg	19	J	730	U	55	J	30	J	35	J	213	ug/kg
NAPHTHALENE	91-20-3	x	x	x	ug/kg	660	U	730	U	1,000	U	950	U	870	U	888	ug/kg
PHENANTHRENE	85-01-5	x	x	x	ug/kg	75	J	230	J	83	J	51	J	62	J	107	ug/kg
PYRENE	129-00-0	x	x	x	ug/kg	140	J	370	J	160	J	110	J	120	J	190	ug/kg
TOTAL PAHs (6)		x	1,100	x	ug/kg	801		2,566		601		547		512		1057	ug/kg
PESTICIDES																	
4,4'-DDD	72-54-8	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
4,4'-DDE	72-55-9	x	x	x	ug/kg	0.87	J	0.9	J	1.1	J	0.63	J	0.6	J	1	ug/kg
4,4'-DDT	50-29-3	x	x	x	ug/kg	0.21	J PG	0.56	J PG	0.53	J PG	2.5	U	0.29	J PG	1	ug/kg
Sum DDT and Metabolites		x	21	x	ug/kg	2.78		3.36		4.23		5.63		3.19		1	ug/kg
ALDRIN	309-00-2	x	x	2.50	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ALPHA-BHC	319-84-6	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ALPHA-CHLORDANE	57-74-9	x	x	224	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
BETA-BHC	319-85-7	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
DELTA-BHC	319-86-8	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
DIELDRIN	60-57-1	x	4.9	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN I	959-98-8	x	x	119	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN II	33213-65-9	x	x	119	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN SULFATE	1031-07-8	x	x	35.8	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDRIN	72-20-8	x	x	10.1	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDRIN ALDEHYDE	7421-93-4	x	x	10.5	ug/kg	0.38	J PG	1.9	U	0.7	J PG	2.5	U	2.3	U	2	ug/kg
ENDRIN KETONE	53494-70-5	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
GAMMA-BHC (LINDANE)	58-89-9	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
GAMMA-CHLORDANE	57-74-9	x	x	224	ug/kg	0.22	J	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
HEPTACHLOR	76-44-8	x	x	5.98	ug/kg	0.38	J PG	0.26	J PG	0.49	J PG	0.44	J PG	0.5	J PG	0	ug/kg
HEPTACHLOR EPOXIDE	1024-57-3	x	x	152	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
METHOXYCHLOR	72-43-5	x	x	19.9	ug/kg	3.3	U	3.6	U	5	U	4.8	U	4.4	U	4	ug/kg
TOXAPHENE	81-35-2	x	x	119	ug/kg	67	U	74 U	U	100	U	97	U	89	U	95	ug/kg
PCBs																	
TOTAL PCBs (7)		x	x	x	ug/kg	0.88		3.37		2.74		1.56		0		2	ug/kg
TOTAL PCBs (corrected) (7)		x	x	20	ug/kg	1.76		6.74		5.48		3.12		0		3.84	ug/kg
METALS																	
ARSENIC	7440-38-2	1 - 10	18	x	mg/kg	5.9		6.0		13.1		13.1		15.3		12	mg/kg
CADMIUM (8)	7440-43-9	1 - 3	0.36	x	mg/kg	0.67		0.74		1.7		1.2		1.3		1	mg/kg
CHROMIUM (9)	7440-47-3	5 - 30	26	x	mg/kg	7.7		9.8		17.9		15.9		16.5		15	mg/kg

Table 7: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Terrestrial Environmental Receptors, Nanticoke River - Seaford, DE (1,2,3)

Analysis Category and Chemical Name	CAS No	Standards				Chemcial Analyses											
		Typical DE Soil Conc (4)	Bench- mark (EcoSSL) (5a)	ORNL RAIS (5b)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
						Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
COPPER (10)	7440-50-8	15 - 40	28	x	mg/kg	14.9		15.4		33.3		29.4		31.5		27	mg/kg
LEAD (11)	7439-92-1	30 - 100	11	x	mg/kg	15		15.5		28.5		24.2		25		23	mg/kg
MERCURY	7439-97-6	0.1 - 0.3	x	0.10	mg/kg	0.079		0.1		0.16		0.15		0.13		0.14	mg/kg
ZINC (12)	7440-66-6	60 - 90	46	x	mg/kg	91.1		104		224		181		183		173	mg/kg
GENERAL CHEMISTRY																	
AMMONIA (AS NITROGEN)			x	x	mg/kg	78		294		727		736		1,070		707	mg/kg
NITROGEN, KJEDAHN (TOTAL)			x	x	mg/kg	1,430		2,350		3,000		3,680		3,950		3,245	mg/kg
ORGANIC CARBON (TOTAL)			x	x	mg/kg	30,100		51,500		50,800		51,700		61,500		53,875	mg/kg
PHOSPHORUS (TOTAL)			x	x	mg/kg	916		827		993		1,200		1,770		1,198	mg/kg
MISCELLANEOUS																	
GRAVEL			x	x	%	0.0		0.4		0.0		0.0		0.0		0	%
SAND			x	x	%	64.8		48.3		8.0		9.5		7.6		18	%
SAND - Coarse			x	x	%	0.1		0.5		0		0		0		0	%
SAND - Medium			x	x	%	17		12.7		1.1		0.9		1.5		4	%
SAND - Fine			x	x	%	47.8		35.1		7		8.7		6.1		14	%
SILT			x	x	%	22.5		37.6		69.2		59.5		61.3		57	%
CLAY			x	x	%	12.7		13.7		22.8		31		31.1		25	%
PERCENT SOLIDS			x	x	%	50.2		45.3		32.8		34.7		35		37	%

FOOTNOTES:

- (1) Data extracted from US ACE Report titled "Sediment Sampling at Nanticoke River, Seaford, Delaware. Prepared by EA Engineering, Nov 2006 and cross checked with the original Lab Report, STL Analytical Report Lot #: C6J060320
- (2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria
- (4) DNRC, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act. Revised Dec 1999.
- (5a) US EPAs Ecological Soil Screening Levels (EcoSSLs) <http://www.epa.gov/ecotox/ecoss/>. Updated 20Oct2010. Lowest value selected from presented values. (5b) ORNL RAIS Data Base (http://rais.ornl.gov/tools/eco_search.php)
- (6) PAHs Total = (Sum of concentrations above the RL + values qualified "J"). Values qualified "U" set equal to zero.
- (7) PCBs corrected = (Sum of concentrations above RL + values qualified "J") *2. Values qualified "U" set equal to zero.
- (8) Cadmium: Lowest value of 4 selected (plants = 32 mg/kg, soil inverts = 140 mg/kg, avian = 0.77 mg/kg, mammalian = 0.36 mg/kg)
- (9) Chromium: Lowest of 2 selected (avian = 26 mg/kg, mammalian = 34 mg.kg)
- (10) Copper: Lowest value of 4 selected (plants = 70 mg/kg, soil inverts = 80 mg/kg, avian = 28 mg/kg, mammalian = 49 mg/kg)
- (11) Lead: Lowest value of 4 selected (plants 120 mg/kg, soil inverts = 1,700 mg/kg, avian = 11 mg/kg, mammalian = 56 mg/kg)
- (12) Zinc: Lowest value of 4 selected (plants = 160 mg/kg, soil inverts = 120 mg/kg, avian = 46 mg/kg, mammalian = 79 mg/kg)
- (13) Mercury: Lowest value of ORNL values (plants - 0.3 mg/kg, inverts = 0.1 mg/kg)

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

**Table 8: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Human Health
Nanticoke River, Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No	Standards					Chemical Analyses											
		Typical DE Soil Conc (4)	DE Bkgd Remed Stand (4)	Unrestrict Use (4)	Restrict Use (4)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
							Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Oct-06	Result
VOCs																		
1,1,1-TRICHLOROETHANE	71-55-6	x	x	N o t S c r e e n e d	N o t S c r e e n e d	ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1,2,2-TETRACHLOROETHANE	79-34-5	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1,2-TRICHLOROETHANE	79-00-5	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1-DICHLOROETHANE	75-34-3	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,1-DICHLOROETHENE	75-35-4	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,2-DICHLOROETHANE	106-93-4	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
1,2-DICHLOROPROPANE	78-87-5	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
2-CHLOROETHYL VINYL ETHER	110-75-8	x	x			ug/kg	20	U	22	U	30	U	29	U	26	U	25	ug/kg
ACROLEIN	107-02-8	x	x			ug/kg	200	U	220	U	300	U	290	U	260	U	254	ug/kg
ACRYLONITRILE	107-13-1	x	x			ug/kg	200	U	220	U	300	U	290	U	260	U	254	ug/kg
BENZENE	71-43-2	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMODICHLOROMETHANE	124-48-1	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMOFORM	75-25-2	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
BROMOMETHANE	74-83-9	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CARBON TETRACHLORIDE	56-23-5	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROBENZENE	108-90-7	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROETHANE	75-00-3	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROFORM	67-66-3	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CHLOROMETHANE	74-87-3	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
CIS-1,3-DICHLOROPROPENE	156-60-5	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
DIBROMOCHLOROMETHANE	124-48-1	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
ETHYLBENZENE	100-41-4	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
METHYLENE CHLORIDE	75-09-2	x	x			ug/kg	7.9	J B	9.4	J B	12	J B	11	J B	11	J B	10	ug/kg
TETRACHLOROETHENE	127-18-4	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TOLUENE	108-88-3	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRANS-1,2-DICHLOROETHENE	156-60-5	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRANS-1,3-DICHLOROPROPENE	542-75-6	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
TRICHLOROETHENE	79-01-6	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
VINYL CHLORIDE	75-01-4	x	x			ug/kg	10	U	11	U	15	U	14	U	13	U	13	ug/kg
SVOCs																		
1,2,4-TRICHLOROBENZENE	120-82-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,2-DICHLOROBENZENE	95-50-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,2-DIPHENYLHYDRAZINE	122-66-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,3-DICHLOROBENZENE	541-73-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
1,4-DICHLOROBENZENE	106-46-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4,6-TRICHLOROPHENOL	88-06-2	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4-DICHLOROPHENOL	120-83-2	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4-DIMETHYLPHENOL	105-67-9	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2,4-DINITROPHENOL	51-28-5	x	x			ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
2,4-DINITROTOLUENE	121-14-2	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg

**Table 8: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Human Health
Nanticoke River, Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No	Standards					Chemical Analyses											
		Typical DE Soil Conc (4)	DE Bkgd Remed Stand (4)	Unrestrict Use (4)	Restrict Use (4)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
							Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
2,6-DINITROTOLUENE	606-20-2	x	x	N o t S c r e e n e d	N o t S c r e e n e d	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2-CHLORONAPHTHALENE	91-58-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2-CHLOROPHENOL	95-57-8	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
2-METHYL-4,6-DINITROPHENOL	534-52-1	x	x			ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
2-NITROPHENOL	88-75-5	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
3,3'-DICHLOROBENZIDINE	9 1-94-1	x	x			ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
4-BROMOPHENYL PHENYL ETHER	101-53-3	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
4-CHLORO-3-METHYLPHENOL	59-50-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
4-NITROPHENOL	100-02-7	x	x			ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
BENZIDINE	92-87-5	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-CHLOROETHOXY)METHANE	111-91-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-CHLOROETHYL) ETHER	111-44-4	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-CHLOROISOPROPYL) ETHER	108-60-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
BUTYL BENZYL PHTHALATE	85-68-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DIETHYL PHTHALATE	84-66-2	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DIMETHYL PHTHALATE	131-11-3	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DI-N-BUTYL PHTHALATE	84-74-2	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
DI-N-OCTYL PHTHALATE	117-84-0	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
HEXACHLOROBENZENE	118-74-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
HEXACHLOROBUTADIENE	87-68-3	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
HEXACHLOROCYCLOPENTADIENE	77-47-7	x	x			ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
HEXACHLOROETHANE	67-72-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
ISOPHORONE	78-59-1	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
NITROBENZENE	98-95-3	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
N-NITROSODIMETHYLAMINE	62-75-9	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
N-NITROSODI-N-PROPYLAMINE	621-64-7	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
N-NITROSODIPHENYLAMINE	86-30-6	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
PENTACHLOROPHENOL	87-86-5	x	x			ug/kg	3,200	U	3,500	U	4,900	U	4,600	U	4,200	U	4080	ug/kg
PHENOL	108-95-2	x	x			ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
PAHs																		
ACENAPHTHENE	83-32-9	x	x	270,000	270,000	ug/kg	660	U	840		1,000	U	950	U	870	U	864	ug/kg
ACENAPHTHYLENE	208-96-8	x	x	x	x	ug/kg	660	U	24	J	1,000	U	950	U	870	U	701	ug/kg
ANTHRACENE	120-12-7	x	x	1,000,000	5,000,000	ug/kg	24	J	52	J	23	J	950	U	870	U	384	ug/kg
BENZO(A)ANTHRACENE	56-55-3	x	x	900	8,000	ug/kg	71	J	130	J	77	J	51	J	53	J	76	ug/kg
BENZO(A)PYRENE	50-32-8	x	x	90	800	ug/kg	56	J	65	J	69	J	41	J	42	J	55	ug/kg
BENZO(B)FLUORANTHENE	205-99-2	x	x	900	8,000	ug/kg	82	J	88	J	86	J	56	J	870	U	236	ug/kg
BENZO(GHI)PERYLENE	191-24-2	x	x	x	x	ug/kg	41	J	40	J	56	J	950	U	870	U	391	ug/kg
BENZO(K)FLUORANTHENE	207-08-9	x	x	9,000	78,000	ug/kg	33	J	34	J	40	J	20	J	870	U	199	ug/kg
CHRYSENE	218-01-9	x	x	87,000	780,000	ug/kg	100	J	120	J	100	J	68	J	70	J	92	ug/kg

**Table 8: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Human Health
Nanticoke River, Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No	Standards					Chemical Analyses											
		Typical DE Soil Conc (4)	DE Bkgd Remed Stand (4)	Unrestrict Use (4)	Restrict Use (4)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
							Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Result	Units
DIBENZO(A,H)ANTHRACENE	53-70-3	x	x	90	800	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
FLUORANTHENE	206-44-0	x	x	310,000	1,800,000	ug/kg	160	J	530	J	180	J	120	J	130	J	224	ug/kg
FLUORENE	86-73-7	x	x	300,000	300,000	ug/kg	660	U	43	J	1,000	U	950	U	870	U	705	ug/kg
INDENO(1,2,3-CD)PYRENE	193-39-5	x	x	900	8,000	ug/kg	19	J	730	U	55	J	30	J	35	J	174	ug/kg
NAPHTHALENE	91-20-3	x	x	5,000	5,000	ug/kg	660	U	730	U	1,000	U	950	U	870	U	842	ug/kg
PHENANTHRENE	85-01-5	x	x	1,000,000	5,000,000	ug/kg	75	J	230	J	83	J	51	J	62	J	100	ug/kg
PYRENE	129-00-0	x	x	230,000	1,700,000	ug/kg	140	J	370	J	160	J	110	J	120	J	180	ug/kg
TOTAL PAHs (5)		x	x	x	x	ug/kg	801		2,566		601		547		512		1005	ug/kg
PESTICIDES																		
4,4'-DDD	72-54-8	x	x	3,000	3,000	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
4,4'-DDE	72-55-9	x	x	2,000	4,000	ug/kg	0.87	J	0.9	J	1.1	J	0.63	J	0.6	J	1	ug/kg
4,4'-DDT	50-29-3	x	x	2,000	12,000	ug/kg	0.21	J PG	0.56	J PG	0.53	J PG	2.5	U	0.29	J PG	1	ug/kg
ALDRIN	309-00-2	x	x	0.4	0.4	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ALPHA-BHC	319-84-6	x	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ALPHA-CHLORDANE (6)	57-74-9	x	x	2,000	16,000	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
BETA-BHC	319-85-7	x	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
DELTA-BHC	319-86-8	x	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
DIELDRIN	60-57-1	x	x	40	500,000	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN I (6)	959-98-8	x	x	47,000	110,000	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN II (6)	33213-65-9	x	x	47,000	110,000	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDOSULFAN SULFATE	1031-07-8	x	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDRIN	72-20-8	x	x	2,000	6,000	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
ENDRIN ALDEHYDE	7421-93-4	x	x	x	x	ug/kg	0.38	J PG	1.9	U	0.7	J PG	2.5	U	2.3	U	2	ug/kg
ENDRIN KETONE	53494-70-5	x	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
GAMMA-BHC (LINDANE)	58-89-9	x	x	x	x	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
GAMMA-CHLORDANE (6)	57-74-9	x	x	2	16	ug/kg	0.22	J	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
HEPTACHLOR	76-44-8	x	x	100	700	ug/kg	0.38	J PG	0.26	J PG	0.49	J PG	0.44	J PG	0.5	J PG	0	ug/kg
HEPTACHLOR EPOXIDE	1024-57-3	x	x	70	70	ug/kg	1.7	U	1.9	U	2.6	U	2.5	U	2.3	U	2	ug/kg
METHOXYCHLOR	72-43-5	x	x	39,000	630,000	ug/kg	3.3	U	3.6	U	5	U	4.8	U	4.4	U	4	ug/kg
TOXAPHENE	81-35-2	x	x	600	1,000	ug/kg	67	U	74 U	U	100	U	97	U	89	U	88	ug/kg
PCBs																		
TOTAL PCBs (7)		x	x	x	x	ug/kg	0.88		3.37		2.74		1.56		0		2	ug/kg
TOTAL PCBs (corrected) (7)		x	x	2	2	ug/kg	1.76		6.74		5.48		3.12		0		3.42	ug/kg
METALS																		
ARSENIC	7440-38-2	1 - 10	0.4	0.4	3	mg/kg	5.9		6.0		13.1		13.1		15.3		11	mg/kg
CADMIUM	7440-43-9	1 - 3	3	4	38	mg/kg	0.67		0.74		1.7		1.2		1.3		1	mg/kg
CHROMIUM	7440-47-3	5 - 30	0.4	12,000	310,000	mg/kg	7.7		9.8		17.9		15.9		16.5		14	mg/kg
COPPER	7440-50-8	15 - 40	50	310	8,200	mg/kg	14.9		15.4		33.3		29.4		31.5		25	mg/kg
LEAD	7439-92-1	30 - 100	41	400	1,000	mg/kg	15		15.5		28.5		24.2		25		22	mg/kg
MERCURY	7439-97-6	0.1 - 0.3	0.0005	10	10	mg/kg	0.079		0.1		0.16		0.15		0.13		0.12	mg/kg
ZINC	7440-66-6	60 - 90	8	2,000	2,300	mg/kg	91.1		104		224		181		183		157	mg/kg

**Table 8: Bulk Sediment Chemistry Data Screened Against Soil Criteria for the Protection of Human Health
Nanticoke River, Seaford, DE (1,2,3)**

Analysis Category and Chemical Name	CAS No	Standards					Chemical Analyses											
		Typical DE Soil Conc (4)	DE Bkgd Remed Stand (4)	Unrestrict Use (4)	Restrict Use (4)	Units	N-1-SED		N-2-SED		N-3-SED		N-4-SED		N-5-SED		Average	
							Oct-06		Oct-06		Oct-06		Oct-06		Oct-06		Oct-06	
GENERAL CHEMISTRY																		
AMMONIA (AS NITROGEN)			x	x	x	mg/kg	78		294		727		736		1,070		581	mg/kg
NITROGEN, KJEDAHL (TOTAL)			x	x	x	mg/kg	1,430		2,350		3,000		3,680		3,950		2,882	mg/kg
ORGANIC CARBON (TOTAL)			x	x	x	mg/kg	30,100		51,500		50,800		51,700		61,500		49,120	mg/kg
PHOSPHORUS (TOTAL)			x	x	x	mg/kg	916		827		993		1,200		1,770		1,141	mg/kg
MISCELLANEOUS																		
GRAVEL			x	x	x	%	0.0		0.4		0.0		0.0		0.0		0	%
SAND			x	x	x	%	64.8		48.3		8.0		9.5		7.6		28	%
SAND - Coarse			x	x	x	%	0.1		0.5		0		0		0		0	%
SAND - Medium			x	x	x	%	17		12.7		1.1		0.9		1.5		7	%
SAND - Fine			x	x	x	%	47.8		35.1		7		8.7		6.1		21	%
SILT			x	x	x	%	22.5		37.6		69.2		59.5		61.3		50	%
CLAY			x	x	x	%	12.7		13.7		22.8		31		31.1		22	%
PERCENT SOLIDS			x	x	x	%	50.2		45.3		32.8		34.7		35		40	%

FOOTNOTES:

- (1) Data extracted from US ACE Report titled "Sediment Sampling at Nanticoke River, Seaford, Delaware. Prepared by EA Engineering, Nov 2006 and cross checked with the original Lab Report, STL Analytical Report Lot #: C6J060320
- (2) Method Detection Limits (MDLs) and Reporting Limits (RLs) may be found in the laboratory reports. NA = Not Analyzed. Each Sample had its own RL and MDL. Bolded values represent exceedances for screening criteria
- (3) Green indicates below limit of detection. Bolded values highlighted yellow exceed screening criteria. Bold AND italicised values exceed screening criteria due to RLs or blank contamination. Qualifiers: B = analyte is present in the method blank at a reportable level; J = compound was detected, but below the reporting limit (value is estimated); U = compound was analyzed for but not detected; PG = the percent difference between the original and confirmation analysis is greater than 40%
- (4) DNRC, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act. Uniform-Risk-based Remediation Standards. Attachment 3. Revised Dec 1999. Critical Water Resource Area.
- (5) PAHs Total = (Sum of concentrations above the RL + values qualified "J"). Values qualified "U" set equal to zero.
- (6) DNRC value used for isomers, unless otherwise indicated.
- (7) PCBs corrected = (Sum of concentrations above RL + values qualified "J") *2. Values qualified "U" set equal to zero.

	Value is a non-detect at the reporting limit (RL)
	Value exceeds acute criteria
	Value exceeds chronic criteria

Table 9: Comparison of Physical Characteristics for Sediment Sampled in the Nanticoke River (DNREC, 1997 and US ACE Baltimore District, 2012)
Nanticoke River - Seaford, DE (1,2,3)

Parameter	DNREC - 1997 and the Delaware River				US Army Corps of Engineers - 2006			
	Statistics				Statistics			
	Min	Max	Mean	Median	Min	Max	Mean	Median
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TOC	43,400	71,200	59,360	62,500	30,100	61,500	49,617	51,600
Grain Size								
% Gravel	Classified as silts (grain particles ranged from 0.002 mm up to 0.075 mm) (5)				0	1.7	1	1
% Sand					9	47	31	31
% Silt					51	91	68	68
% Clay								
% Solids (4)	NA	NA	NA	NA	36	45	39	39

FOOTNOTES:

(1) DNREC (1997). Chemical Contaminants in Sediments of the Nanticoke River. Delaware Department of Natural Resources and Environmental Control. Division of Water Resources. Nov 1997.

(1) Data extracted from Envirosystems Report No. 22282

(3) Sample locations selected summarized in Table 7.

(4) NA = Not Analyzed

(5) MRI (1995). Analysis of Fish Tissue and Sediment Samples for PCDDs, PCDFs, Congener-Specific PCBs, Pesticides, PAHs, TOC, and Metals From Selected Delaware Stream Basins. Midwest Research Institute. Kansas City, MO. December 15, 1995.

Table 10: Comparison of Chemical Concentrations for Three Principal Analyte Groups in Nanticoke River Sediments (DNREC, 1997 and US ACE, 2006), Seaford, DE (1,2)

Analysis Category/ Chemical Name	CAS No.	Units	Screening TEC (3)	DNREC Nanticoke River Conc Range (5)		US ACE Nanticoke River Conc Range (5)	
				Min	Max	Min	Max
Total PAHs	x	ug/kg	1,610	1	2	512	2566
Total PCBs	x	ug/kg	59.8	5.66E-05	1.03E-04	0	7
METALS							
Arsenic	7440-38-2	mg/kg	9.79	11	18	6	15
Cadmium	7440-43-9	mg/kg	0.99	2	3	0.67	2
Chromium	7440-47-3	mg/kg	43.4	25	32	8	18
Copper	7440-50-8	mg/kg	31.6	29	42	15	33
Lead	7439-92-1	mg/kg	35.8	29	34	15	29
Mercury	7439-97-6	mg/kg	0.18	0.035	3	0.079	0.16
Zinc	7440-66-6	mg/kg	150 (4)	208	235	91	224

FOOTNOTES:

(1) DNREC (1997). Chemical Contaminants in Sediments of the Nanticoke River. Delaware Department of Natural Resources and Environmental Control. Division of Water Resources. Nov 1997. Rounded values.

(2) EA Engineering, Science and Technology (2006). *Draft* Sediment Sampling at Nanticoke River, Seaford, Delaware. EA Engineering, Science and Technology, Sparks, Maryland. Nov 2006.

(3) Consensus-based TEC, MacDonald, Ingersoll and Berger. Arch. Environ. Contam Toxicol. 39, 20-31 (2000).

(4) DNRC, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act. Sediment Background. Revised Dec 1999.

(5) Sample locations selected are summarized in Table 9; DNREC, Below Seaford; US ACE N-1-SED through N-5-SED.

PAHs/PDBs Total = (Sum of concentrations above the RL + values qualified "J"). Values qualified "U" set equal to zero.