RAI #14 Attachment

TABLE 1: STREAM AND POND SAMPLING LOCATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT

Goldstein Branch

- **GB-01** Middle Zone – Backpack electrofish a 75 meter zone
  Dip net benthos in 75 meter zone
  In situ water quality parameters
  One analytical sample for water quality parameters in Fall 2006
  One wet weather and one dry weather sample for water quality parameters in Spring 2007

John's Creek

- **JCDS-01** Lower Zone – Backpack electrofish a 75 meter zone
  Dip net benthos in 75 meter zone
  In situ water quality parameters
  One analytical sample for water quality parameters in Fall 2006
  One wet weather and one dry weather sample for water quality parameters in Spring 2007

  Middle Zone – No stream sampling conducted because site was emergent wetland without a defined channel

- **JCUS-01** Upper Zone – Backpack electrofish a 75 meter zone
  Dip net benthos in 75 meter zone
  In situ water quality parameters
  One analytical sample for water quality parameters

Lake Canoy **LC-01, LC-02, LC-03**

- Electrofish 75 meter shoreline zone at three locations
- One benthic petite ponar grab locations (three replicates) off shore of fish survey zones
- Dip net shore zone (qualitative)
- In situ water quality—surface, mid-depth, bottom
- One composite analytical water quality sample at each station

Pond #1 **P-01**

- Electrofish one 75 meter shoreline zone
- One benthic petite ponar grab location (three replicates) off shore
- Dip net shore zone (qualitative)
- In situ water quality—surface, mid-depth, bottom
- One analytical water quality sample

Pond #2 **P-02**

- Electrofish entire shoreline zone
- One benthic petite ponar grab location (three replicates) off shore
- Dip net shore zone (qualitative)
- In situ water quality
- One analytical water quality sample

Lake Davies **LD-01, LD-02, LD-03**

- Electrofish 75 meter shoreline zone at three locations
- Three benthic petite ponar grab locations (three replicates) off shore of fish survey zones
- Dip net shore zones (qualitative)
- In situ water quality—surface, mid-depth, bottom
- One composite analytical water quality sample at each station

TABLE 2-1 FALL 2006 WATER QUALITY IN STREAMS AND PONDS
CALVERT CLIFFS NUCLEAR POWER PLANT

Water Body		Johns Creek		Goldstein Branch	Lake Canoy				Lake Davies			Pond 1	Pond 2
Parameter	**Units**	**JCUS-01**	**JCDS-01**	**GB-01**	**LC-01**	**LC-02**	**LC-02 DUP**	**LC-03**	**LD-01**	**LD-02**	**LD-03**	**P-01**	**P-02**
Temperature	Centigrade	18	15.5	16.9	24.9	21.29	NA	21.16	20	20.5	20.7	18.42	17.33
Dissolved Oxygen	ppm	6.4	6	6.7	7.6	6.1	NA	6.16	3.4	3.4	4	3.21	0.99
pH	units	6.4	7.63	7.4	7.8	7.72	NA	7.3	7.5	7.7	7.7	6.7	6.39
Conductivity	uS/cm	50	484	737	66	63	NA	62	1566	1592	1591	109	135
Alkalinity	mg/L	3.5	76	100	14	8.5	4.5	4.5	330	280	270	30	56
BOD	mg/L	<2.0	3.2	5.9	6.3	6.9	<2.	4.5	9.8	7.2	9.1	18	14
Ammonia-N	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrate plus Nitrite-N	mg/l	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus Dis -P	mg/L	0.021	0.018	0.011	<0.01	0.021	<0.01	0.011	0.22	0.19	0.21	0.011	<0.01
Phosphorus Total-P	mg/L	0.029	0.032	0.079	0.17	0.038	0.067	0.035	0.36	0.31	0.29	0.18	0.095
Total Dissolved Solids	mg/L	30	280	440	35	67	20	48	980	950	980	41	51
Total Kjeldahl Nitrogen	mg/L	2	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	1.8	1.7	3.1	1.4
Total Organic Carbon	mg/L	5.5	4	3.9	6.1	5.8	5.6	5.7	15	16	16	6.3	6.4
Total Suspended Solids	mg/L	4	5	7	27	<5.0	<5.0	150	6	6.5	8	56	11

TABLE 2-2 FALL 2006
SURFACE, MID-DEPTH AND BOTTOM IN SITU WATER QUALITY DATA FOR LAKE CANOY AND LAKE DAVIES
CALVERT CLIFFS NUCLEAR POWER PLANT

Water Body		Lake Canoy			Lake Davies		
Parameter--Surface	**Units**	**LC-01**	**LC-02**	**LC-03**	**LD-01**	**LD-02**	**LD-03**
Temperature	Centigrade	24.9	21.3	21.2	20.0	20.5	20.7
Dissolved Oxygen	ppm	7.6	6.1	6.2	3.4	3.4	4.0
pH	units	7.8	7.7	7.3	7.5	7.7	7.7
Conductivity	uS/cm	66	63	62	1566	1592	1591
Parameter--MidDepth							
Temperature	Centigrade	NA	NA	21.2	20.0	20.2	20.3
Dissolved Oxygen	ppm	NA	NA	5.7	3.1	2.5	2.5
pH	units	NA	NA	7.1	7.6	7.6	7.7
Conductivity	uS/cm	NA	NA	63	1581	1612	1581
Parameter--Bottom							
Temperature	Centigrade	25.3	21.3	21.2	19.9	20.2	19.9
Dissolved Oxygen	ppm	6.7	5.9	5.1	2.2	2.6	2.2
pH	units	7.5	7.4	6.8	7.5	7.6	7.7
Conductivity	uS/cm	65	62	62	1563	1608	1576

TABLE 3-1 SPRING 2007 WATER QUALITY IN STREAMS AND PONDS
CALVERT CLIFFS NUCLEAR POWER PLANT

Water Body		Johns Creek			Goldstein Branch		Lake Canoy			Lake Davies			Pond 1	Pond 2
Parameter	**Units**	**JCUS-01**	**JCDS-01 (Dry)**	**JCDS-01 (Wet)**	**GB-01(Dry)**	**GB-01(Wet)**	**LC-01**	**LC-02**	**LC-03**	**LD-01**	**LD-02**	**LD-03**	**P-01**	**P-02**
Conductivity	µS/cm	37	297	---	460	---	61	56	57	1209	1197	1202	79	89
Dissolved Oxygen	mg/L	11.1	12.1	---	13.4	---	11.6	12.8	13.4	18.8	18.6	17.4	11.8	11.5
Odor (Observation)	NA	None	None	None	None	None	None	None	None	None	None	None	None	None
pH	units	6.6	7.5	---	7.3	---	8.1	8.1	7.9	8.3	8.3	8.3	7.5	7.5
Temperature	Centigrade	6.6	13.0	---	11.1	---	14.2	11.8	12.4	11.0	10.9	10.6	9.0	9.9
Turbidity	NTU	4.1	9.9	---	8.1	---	2.4	3.3	3	3.1	3.3	2.8	18.3	10.3
Water Depth	feet	1	---	---	1	1	2	2	3.5	3	4	3	3	1.5
Alkalinity	mg/L	8.5	43	33	62	42	6.5	12	9.5	180	190	190	25	24
BOD	mg/L	<3.0	<3.0	5.6	<3.0	7.3	<3.0	<3.0	<3.0	4.1	4.1	9.1	<3.0	<3.0
Carbon, Total	mg/L	3.4	13.3	12.6	21.7	15.1	5.0	4.1	2.8	8.3	8.4	6.6	9.9	3.8
Carbon, Total Organic	mg/L	2.6	5	5.8	3.7	6.8	2.4	4.2	5.6	8.8	9.7	9.8	4.9	3.3
Chemical Oxygen Demand	mg/L	<10	21	32	<10	35	<10	23	25	37	33	23	28	28
Chloride (Titrimetric, Mercuric Nitrate)	mg/L	6.5	46	46	50	29	7.5	7.0	7.5	120	120	120	7	7.0
Chlorophyll-A	mg/M3	2.9	1.8	2.4	5.4	6.5	2.3	0.89	0.91	4.8	1.4	5.4	4.2	0.89
Color, True	color units	20	25	30	15	35	10	15	25	25	20	15	30	25
Fecal Coliform	MPN/100ml	<2.0*	<2.0*	1600	8*	500*	<2.0*	<2.0*	<2.0*	<2.0*	<2.0*	<2.0*	<2.0*	80*
Fecal Streptococcus	MPN/100ml	<2.0*	12*	90	4*	140*	<2.0*	<2.0*	<2.0*	<2.0*	<2.0*	<2.0*	33*	6.0*
Hardness, Total	mg/L	160	250	190	310	220	180	130	160	580	620	640	180	190
Nitrogen-Ammonia	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrogen, Total Kjeldahl	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrogen, Nitrate-Nitrite	mg/L	0.053	0.15	0.21	0.33	0.26	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.062	<0.050
Petroleum Hydrocarbons, Total	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Phosphorus, Dissolved	mg/L	<0.010	<0.010	0.013	<0.010	0.02	<0.010	<0.010	0.023	0.043	<0.010	<0.010	<0.010	0.013
Phosphorus, Ortho	mg/L	<0.010	<0.010	0.067	<0.010	0.024	0.010	0.010	0.030	0.031	0.040	0.077	<0.010	0.015
Phosphorus, Total	mg/L	0.044	0.034	0.19	0.077	0.21	0.024	0.054	0.086	0.070	0.063	0.014	0.073	0.037
Solids, Total Dissolved	mg/L	49	180	120	320	180	47	61	46	860	900	980	32	63
Solids, Total Suspended	mg/L	<5.0	<5.0	20	<5.0	120	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.5	11
Sulfate	mg/L	11	45	30	130	73	13	15	14	360	520	520	13	14

* Sample analyzed past recommended holding time. Data are relevant for intra-study comparison but should not be used as the basis of management decisions for water use for primary contact recreation.

TABLE 3-2 SPRING 2007 SURFACE, MID-DEPTH AND BOTTOM IN SITU WATER QUALITY DATA FOR LAKE CANOY AND LAKE DAVIES CALVERT CLIFFS NUCLEAR POWER PLANT

Water Body		Lake Canoy			Lake Davies		
Parameter	**Units**	**LC-01**	**LC-02**	**LC-03**	**LD-01**	**LD-02**	**LD-03**
Surface							
Temperature	Centigrade	NA	NA	12.4	11.0	10.9	10.6
Dissolved Oxygen	ppm	NA	NA	13.4	18.8	18.6	17.4
pH	units	NA	NA	7.9	8.3	8.3	8.3
Conductivity	µS/cm	NA	NA	57.0	1209.0	1197.0	1202.0
Turbidity	NTU	NA	NA	3.0	3.1	3.3	2.8
MidDepth							
Temperature	Centigrade	14.2	11.8	NA	11.0	11.0	10.6
Dissolved Oxygen	ppm	11.6	12.8	NA	19.3	18.8	17.5
pH	units	8.1	8.1	NA	8.3	8.3	8.3
Conductivity	µS/cm	61.0	56.0	NA	1208.0	1197.0	1201.0
Turbidity	NTU	2.4	3.3	NA	3.0	3.1	3.0
Bottom							
Temperature	Centigrade	NA	NA	10.3	11.0	10.9	10.2
Dissolved Oxygen	ppm	NA	NA	14.1	19.3	18.8	17.6
pH	units	NA	NA	7.8	8.3	8.3	8.3
Conductivity	µS/cm	NA	NA	54.0	1206.0	1194.0	1195.0
Turbidity	NTU	NA	NA	3.9	3.2	3.2	3.3

TABLE 3-3 SPRING 2007 METALS IN STREAMS AND PONDS
CALVERT CLIFFS NUCLEAR POWER PLANT

Water Body		Johns Creek			Goldstein Branch		Lake Canoy			Lake Davies			Pond 1	Pond 2
Parameter	**Units**	**JCUS-01**	**JCDS-01 (Dry)**	**JCDS-01 (Wet)**	**GB-01 (Dry)**	**GB-01 (Wet)**	**LC-01**	**LC-02**	**LC-03**	**LD-01**	**LD-02**	**LD-03**	**P-01**	**P-02**
Arsenic	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0028	0.0024	0.0027	<0.0020	<0.0020
Barium	mg/L	0.023	0.027	0.066	0.030	0.04	0.016	0.016	0.016	0.015	0.014	0.015	0.012	0.0088
Cadmium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Calcium	mg/L	0.98	22	14	52	33	1.9	1.8	1.8	84	84	85	8.7	11
Chromium	mg/L	<0.0025	<0.0025	<0.0025	<0.0025	0.0027	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Lead	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.003	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Magnesium	mg/L	1.5	7.1	4.7	16	10	2.6	2.5	2.5	62	62	62	2.7	2.7
Mercury	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Potassium	mg/L	0.83	1.8	1.9	2.8	2.5	1.0	1.0	0.99	17	17	17	0.78	0.87
Selenium	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silver	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sodium	mg/L	4.1	30	30	31	20	5.3	5.3	5.4	170	170	170	5.2	5.3

TABLE 3-4 SPRING 2007 POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS) IN STREAMS
CALVERT CLIFFS NUCLEAR POWER PLANT

Water Body		Johns Creek		Goldstein Branch	
Parameter	Units	JCDS-01(Dry)	JCDS-01 (Wet)	GB-01 (Dry)	GB-01 (Wet)
Acenaphthene	µg/L	<10	<10	<10	<10
Acenaphthylene	µg/L	<10	<10	<10	<10
Anthracene	µg/L	<10	<10	<10	<10
Benz(a)anthracene	µg/L	<10	<10	<10	<10
Benzo(a)pyrene	µg/L	<10	<10	<10	<10
Benzo(b)fluoranthene	µg/L	<10	<10	<10	<10
Benzo(g,h,i)perylene	µg/L	<10	<10	<10	<10
Benzo(k)fluoranthene	µg/L	<10	<10	<10	<10
Chrysene	µg/L	<10	<10	<10	<10
Dibenz(a,h)anthracene	µg/L	<10	<10	<10	<10
Florene	µg/L	<10	<10	<10	<10
Fluoranthene	µg/L	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	µg/L	<10	<10	<10	<10
Naphthalene	µg/L	<10	<10	<10	<10
Phenanthrene	µg/L	<10	<10	<10	<10
Pyrene	µg/L	<10	<10	<10	<10

TABLE 4 COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED DURING FALL 2006 AND SPRING 2007 SURVEYS AT CALVERT CLIFFS NUCLEAR POWER PLANT

Common Name	Scientific Name
Lampreys	Petromyzontidae
Least brook lamprey	*Lampetra aepyptera*
Eels	Anguillidae
American eel	*Anguilla rostrata*
Suckers	Catostomidae
Creek chubsucker	*Erimyzon oblongus*
Catfishes	Ictaluridae
Brown bullhead	*Ameiurus nebulosus*
Carps and Minnows	Cyprinidae
Blacknose dace	*Rhinichthys atratulus*
Golden shiner	*Notemigonus crysoleucas*
Pikes	Esocidae
Redfin pickerel	*Esox americanus*
Mudminnows	Umbridae
Eastern mud minnow	*Umbra pygmaea*
Livebearers	Poeciliidae
Eastern mosquitofish	*Gambusia affinis*
Perches	Percidae
Tessellated darter	*Etheostoma olmstedi*
Sunfishes	Centrarchidae
White crappie	*Pomoxis annularis*
Black crappie	*Pomoxis nigromaculatus*
Green sunfish	*Lepomis cyanellus*
Pumpkinseed	*Lepomis gibbosus*
Bluegill	*Lepomis macrochirus*
Sunfish hybrid	*Lepomis* sp.
Largemouth bass	*Micropterus salmoides*

TABLE 5: FALL 2006 ABUNDANCE AND DISTRIBUTION OF FISHES COLLECTED FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT

	John's Creek		Goldstein Branch	Lake Canoy			Pond #1	Pond #2	Lake Davies		
Species	**JCUS-01**	**JCDS-01**	**GB-01**	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Lampreys											
Least brook lamprey		1									
Eels											
American eel		13	11	1		1	4	2			
Suckers											
Creek chubsucker		30	2								
Carps and Minnows											
Blacknose dace			8								
Golden shiner		13									
Pikes											
Redfin pickerel		4									
Mudminnows											
Eastern mud minnow	4		9								
Livebearers											
Eastern mosquitofish		4	1		19	17	30	1	25	20	36
Darters											
Tessellated darter		12	32								
Sunfishes											
White crappie				1		1					
Green sunfish						3	17	4			
Lepomis hybrid							1				
Pumpkinseed		28	2								
Bluegill				46	65	57	4	1			
Largemouth bass				2							
Total Specimens	4	105	65	50	84	79	56	8	25	20	36
Total Species	1	8	7	4	2	5	5	4	1	1	1

TABLE 6 SPRING 2007 ABUNDANCE AND DISTRIBUTION OF FISHES COLLECTED FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT

	John's Creek		Goldstein Branch	Lake Canoy			Pond #1	Pond #2	Lake Davies		
Species	JCUS-01	JCDS-01	GB-01	LC-01	LC-02	LC-03	P-01	P-02	LD-01	LD-02	LD-03
Lampreys											
Least brook lamprey	11		3								
Eels											
American eel		45	27	1		3	19	10			
Suckers											
Creek chubsucker		14	4								
Catfishes											
Brown bullhead		1	1								
Carps and Minnows											
Blacknose dace			25								
Golden shiner		1									
Pikes											
Redfin pickerel		2									
Mudminnows											
Eastern mudminnow	4	7									
Livebearers											
Eastern mosquitofish			1				1	3			
Darters											
Tessellated darter		15	45								
Sunfishes											
Black crappie				1							
Green sunfish				1	1	5	15	19			
Pumpkinseed		13	1								
Bluegill				33	7	31					
Largemouth bass					1	2					
Total Specimens	15	98	107	36	9	41	35	32	0	0	0
Total Species	2	8	8	4	3	4	3	3	0	0	0

TABLE 7-1 ABUNDANCE AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT SEPTEMBER 2006

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	JCUS01	JCDS01	GB-01	LC-01	LC-02	LC-03	P-01	P-02	LD-01	LD-02	LD-03
Oligochaeta (aquatic worms)											
Lumbriculidae	196	9	--	84	9	--	--	24	--	--	--
Naididae	--	--	--	--	--	--	--	--	28	--	--
Tubificidae	--	56	--	182	158	42	1624	516	--	--	--
Lumbricidae	--	--	195	--	--	--	--	--	--	--	--
Crustacea											
Caecidotea	28	--	--	--	--	--	--	--	--	--	--
Gammarus	28	716	195	--	--	--	--	12	--	--	--
Cambarus	--	--	--	--	--	--	1	--	--	--	--
Orconectes	--	--	--	--	--	--	--	5	--	--	--
Hydracarina (water mites)											
Hydracarina	14	--	--	42	9	14	56	60	--	--	--
Collembola											
Collembola	--	9	9	--	--	--	--	--	--	--	--
Ephemeroptera (mayflies)											
Centroptilum	--	--	--	42	--	28	--	--	--	--	--
Callibaetis	--	--	--	--	47	--	28	60	56	114	7
Leptophlebiidae	56	46	--	--	--	--	--	--	--	--	--
Odonata (damselflies, dragonflies)											
Calopteryx	--	9	--	--	--	--	--	--	--	--	--
Calopteryx maculata	42	--	37	--	--	--	--	--	--	--	--
Chromagrion	--	--	--	--	9	--	--	--	--	--	--
Enallagma	--	9	--	14	9	--	--	--	--	--	--
Nehelenia	--	--	--	--	--	--	28	--	--	--	--
Nehelenia gracilis	--	--	--	--	--	--	--	--	--	--	7
Boyeria vinosa	1	--	--	--	--	--	--	--	--	--	--
Cordulegaster maculata	2	--	1	--	--	--	--	--	--	--	--
Gomphus lividus	--	--	1	--	--	--	--	--	--	--	--
Gomphus	--	2	--	--	--	--	--	--	--	--	--
Cordulia	--	--	--	--	19	--	28	--	28	31	7
Dorocordulia	--	--	--	--	--	--	--	36	--	--	--
Libellula	--	--	--	42	--	--	--	1	--	--	--
Libellula pulchella	--	--	--	--	--	15	--	--	--	--	--
Ladona	--	--	--	1	--	--	--	--	--	--	--
Ladona deplanata	--	--	--	--	--	--	1	--	--	--	--
Erythemis simplicicollis	--	--	--	--	--	28	--	--	--	--	--
Plecoptera (stoneflies)											
Leuctra	56	--	--	--	--	--	--	--	--	--	--
Hemiptera											
Belostoma	--	--	--	--	--	--	--	--	--	--	7
Abedus	--	--	--	--	--	--	--	--	--	--	7
Corixidae	--	9	--	--	--	--	--	--	--	--	--
Megaloptera (dobsonflies, alderflies)											
Saldidae	--	--	--	14	--	--	28	12	--	--	--
Nigronia serricornis	--	9	9	--	--	--	--	--	--	--	--
Sialis	--	--	9	--	--	--	--	--	--	--	--
Trichoptera (caddisflies)											
Chimarra	--	28	9	--	--	--	--	--	--	--	--
Polycentropus	--	9	19	--	--	--	--	--	--	--	--
Cheumatopsyche	--	28	9	--	--	--	--	--	--	--	--
Oxyethira	--	--	--	--	--	14	--	--	--	--	--
Neophylax	--	9	--	--	--	--	--	--	--	--	--
Oecetis	--	--	--	--	9	--	--	--	--	--	--
Ptilostomis	28	--	9	--	--	--	--	--	--	--	--

TABLE 7-1 ABUNDANCE AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT SEPTEMBER 2006

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	JCUS01	JCDS01	GB-01	LC-01	LC-02	LC-03	P-01	P-02	LD-01	LD-02	LD-03
Coleoptera (beeetles)											
Cybister frimbriolatus	--	--	--	--	--	--	1	--	--	--	--
Dineutus	--	1	--	--	--	--	--	--	--	--	--
Peltodytes sexamaculatus	14	--	--	--	--	--	--	--	--	--	--
Haliplus	--	--	--	14	--	--	--	--	--	--	--
Ancyronyx variegata	--	9	--	--	--	--	--	--	--	--	--
Dubiraphia	--	--	56	--	--	--	--	--	--	--	--
Macronychus glabratus	--	--	56	--	--	--	--	--	--	--	--
Scirtidae	14	--	--	--	--	--	--	--	--	--	--
Diptera (true flies)											
Ephydridae	--	--	--	--	--	--	--	--	85	225	14
Ceratopogonidae	70	28	--	28	19	--	--	36	56	2	28
Chironomidae (midges)											
Chironomidae	--	--	--	--	--	--	--	--	--	2	--
Tanypus punctipennis	--	--	--	14	--	--	--	--	--	--	--
Natarsia	--	10	--	14	--	--	--	--	--	466	105
Procladius	--	--	--	--	28	60	--	13	--	--	--
Natarsia sp. A	120	--	--	--	--	--	--	--	287	--	--
Procladius (Holotanypus)	--	--	--	--	--	--	30	--	--	--	--
Clinotanypus	15	60	19	--	28	15	--	--	--	--	--
Ablabesmyia janta	--	--	--	58	--	15	--	--	--	--	--
Ablabesmyia mallochi	45	--	9	--	47	30	--	--	--	--	--
Nilotanypus	--	--	--	29	19	30	--	--	--	--	--
Thienemannimyia grp.	120	--	58	--	--	15	--	--	--	--	42
Corynoneura lobata	15	--	--	--	--	--	--	--	--	--	--
Cricotopus bicinctus grp.	15	--	9	--	--	--	--	--	--	--	--
Cricotopus bicinctus	--	10	--	--	--	--	--	--	--	--	--
Nanocladius	--	--	--	--	9	--	--	--	--	--	--
Nanocladius distinctus	--	--	--	14	--	--	--	--	--	--	--
Parakiefferiella	--	20	--	29	9	15	--	--	--	--	--
Parametriocnemus	135	--	--	--	--	--	--	--	--	--	--
Psectrocladius	15	--	--	--	--	--	--	--	--	--	--
Chironomus	--	--	--	--	19	--	30	--	236	292	21
Cladopelma	--	--	--	--	--	45	--	13	--	--	--
Cryptochironomus	--	--	--	29	9	15	--	--	--	--	--
Dicrotendipes fumidus	--	10	--	--	--	--	--	--	--	--	--
Dicrotendipes simpsoni	--	--	--	--	--	--	--	13	--	--	--
Dicrotendipes nervosus	--	--	--	14	--	--	30	--	--	--	--
Goeldichironomus holoprasinus	--	--	--	--	66	15	269	241	1436	2974	154
Kiefferulus dux	--	--	--	--	--	--	90	13	--	--	--
Microtendipes	--	49	212	14	--	--	--	--	--	--	--
Nilothauma	--	--	--	29	9	74	--	--	--	--	--
Parachironomus	--	--	--	--	--	--	--	--	57	204	7
Paralauterborniella	--	--	--	--	19	--	--	--	--	--	--
Polypedilum braseniae	--	20	--	--	--	--	--	--	--	--	--
Polypedilum flavum	--	20	--	14	--	--	--	--	--	--	--
Polypedilum illinoense	30	20	19	14	--	--	--	--	--	--	--
Polypedilum tritum	--	--	--	--	--	30	--	--	--	--	--
Polypedilum trigonus	--	--	--	--	--	30	--	40	2356	1021	336
Stenochironomus	--	10	--	--	--	--	--	--	--	--	--
Stictochironomus	--	--	--	--	--	15	--	--	--	--	--
Tribelos fuscicorne	15	--	--	--	--	--	--	--	--	--	--
Cladotanytarsus	--	--	--	44	--	--	--	--	--	--	--
Paratanytarsus	--	--	--	279	190	268	--	--	--	--	--
Rheotanytarsus	60	30	--	--	--	--	--	--	--	--	--
Stempellinella	75	40	--	--	--	--	--	--	--	--	--
Tanytarsus	--	--	--	497	--	477	--	13	--	--	--
Tanytarsus curticornis grp.	180	91	--	--	142	--	--	--	--	--	--
Zavreliella	--	10	--	--	--	--	--	--	--	--	--

TABLE 7-1 ABUNDANCE AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT SEPTEMBER 2006

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	**JCUS01**	**JCDS01**	**GB-01**	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Diptera (true flies)											
Anopheles	--	--	--	14	--	--	56	--	--	--	--
Culex	--	--	--	--	--	--	112	12	--	--	--
Simulium	210	19	9	--	--	--	--	--	--	--	--
Limonia	28	--	--	--	--	--	--	--	--	--	--
Hexatoma	1	--	--	--	--	--	--	--	--	--	--
Odontomyia	--	--	--	--	--	--	--	--	--	--	21
Chrysops	--	--	--	14	--	--	28	--	--	--	--
Muscidae	--	--	19	--	--	--	--	--	--	--	--
Gastropoda (snails)											
Cipangopaludina japonica	--	--	--	--	--	1	--	--	--	--	--
Campeloma decisum	--	--	--	3	3	--	--	--	--	--	--
Pseudosuccinea columella	--	--	--	--	--	--	--	12	--	--	--
Physa	--	--	224	42	--	--	476	180	--	--	--
Planorbella	--	--	--	142	1	70	--	--	--	--	--
Ferrissia	--	--	--	--	--	--	28	--	--	--	--
Bivalvia (clams/mussels)											
Musculium	--	9	46	140	--	--	28	505	--	--	--
Total	**1,628**	**1,414**	**1,238**	**1,910**	**886**	**1,361**	**2,972**	**1,817**	**4,625**	**5,331**	**763**
Number of Taxa	**29**	**33**	**24**	**31**	**24**	**24**	**20**	**21**	**10**	**10**	**14**

TABLE 7-2 METRICS, INDEX OF BIOTIC INTEGRITY (IBI) SCORES, HILSENHOFF BIOTIC INDEX (HBI) OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT SEPTEMBER 2006

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Metrics	**JCUS01**	**JCDS01**	**GB-01**	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Number of Taxa	29	33	24	31	24	24	20	21	10	10	14
Number of EPT Taxa	3	5	4	1	2	2	1	1	1	1	1
Number of Ephemeroptera Taxa	1	1	0	1	1	1	1	1	1	1	1
%Intolerant Urban[a]	8.78	6.72	3.15	5.18	11.63	8.60	4.81	6.93	1.82	2.72	1.83
%Ephemeroptera	3.44	3.25	0.00	2.20	5.30	2.06	0.94	3.30	1.21	2.14	0.92
Number of Scrapers	0	2	3	3	2	2	2	1	0	0	0
%Climbers	23.59	14.78	5.25	36.39	17.16	45.63	1.88	3.58	50.94	19.15	45.87
IBI	3.00	3.86	2.71	NA	NA	NA	NA	NA	NA	NA	NA
IBI Rating	Fair	Fair	Poor	NA	NA	NA	NA	NA	NA	NA	NA
HBI[b]	5.56	5.76	6.17	NA	NA	NA	NA	NA	NA	NA	NA

NA =Not Applicable

EPT = Ephemeroptera, Pleocoptera and Trichoptera.

[a]Taxa with tolerance values between 0 and 3.

[b]The Hilsenhoff Biotic Index (HBI) is not included in the IBI calulation.

TABLE 8-1 ABUNDANCE AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	**JCUS01**	**JCDS01**	**GB-01**	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Turbellaria (flatworms)											
Turbellaria	--	1	21	--	--	--	--	--	--	--	--
Nematoda (round worms)											
Nematoda	--	--	--	--	--	24	--	168	--	--	--
Oligochaeta (aquatic worms)											
Naididae	22	3	14	238	60	176	3530	306	48	180	168
Tubificidae	118	10	7	182	156	120	--	6	--	--	12
Lumbricidae	--	--	--	1	12	9	--	12	--	--	--
Hirudinea (leeches)											
Erpobdella punctata coastalis	--	--	--	--	2	3	--	--	--	--	--
Crustacea											
Ostracoda	--	58	7	70	36	8	--	42	--	--	--
Caecidotea	17	5	7	--	--	--	--	--	--	--	--
Gammarus	--	67	267	--	--	--	--	--	--	--	--
Crangonyx	22	--	--	1	--	--	56	6	--	--	--
Procambarus	--	--	--	1	--	--	--	--	--	--	--
Hydracarina (water mites)											
Hydracarina	--	1	--	--	24	--	84	6	--	48	--
Collembola (springtails)											
Collembola	--	--	--	--	--	--	--	36	--	--	--
Ephemeroptera (mayflies)	--	--	--	--	--	--	--	--	--	--	--
Siphlonurus	--	31	--	--	--	--	--	--	--	--	--
Callibaetis	--	--	7	--	--	--	28	--	144	240	276
Leptophlebia	6	12	--	--	--	--	--	--	--	--	--
Odonata (damselflies, dragonflies)											
Calopteryx	--	--	7	--	--	--	--	--	--	--	--
Enallagma	--	--	--	--	24	--	--	--	--	36	84
Boyeria vinosa	--	--	2	--	--	--	--	--	--	--	--
Gomphus	--	--	2	--	--	--	--	--	--	--	--
Tetragoneuria	--	--	--	1	--	1	1	--	--	--	--
Ladona	--	--	--	1	1	3	--	--	--	--	--
Celithemis fasciata	--	--	--	--	2	--	--	--	--	--	--
Erythemis simplicicollis	--	--	--	--	--	--	--	--	3	1	1
Leuctridae	62	--	--	--	--	--	--	--	--	--	--
Plecoptera (stoneflies)											
Amphinemura	--	--	7	--	--	--	--	--	--	--	--
Hemiptera (true bugs)											
Palmacorixa	--	2	--	--	--	--	--	--	--	--	--
Corisella	--	--	--	--	--	--	--	--	--	--	25
Ranatra	--	--	--	--	--	1	--	--	--	--	--
Pelocoris	--	--	--	--	--	--	--	--	--	--	2
Trichoptera (caddisflies)											
Chimarra	--	--	1	--	--	--	--	--	--	--	--
Lype diversa	--	--	7	--	--	--	--	--	--	--	--
Diplectrona modesta	6	--	--	--	--	--	--	--	--	--	--
Cheumatopsyche	--	1	--	--	--	--	--	--	--	--	--
Oecetis	--	--	7	14	--	--	--	--	--	--	--
Coleoptera (beetles)											
Agabus	--	--	--	--	--	--	--	--	--	24	97
Ilybius	--	--	--	--	--	--	1	--	25	--	--
Neoporus	--	--	--	--	--	--	28	24	--	--	--
Dineutus	--	1	--	--	--	--	--	--	--	--	--
Peltodytes	--	--	--	14	--	--	--	6	--	--	--
Haliplus	--	--	--	--	--	8	--	--	--	--	--
Dubiraphia	--	--	14	--	--	--	--	--	--	--	--
Macronychus glabratus	--	4	42	--	--	--	--	--	--	--	--
Stenelmis	6	--	--	--	--	--	--	--	--	--	--
Diptera (true flies)											
Ceratopogonidae	50	--	--	14	24	48	--	--	72	12	--
Ceratopogon	--	2	--	--	--	--	--	--	--	--	--

TABLE 8-1 ABUNDANCE AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	JCUS01	JCDS01	GB-01	LC-01	LC-02	LC-03	P-01	P-02	LD-01	LD-02	LD-03
Chironomidae (midges)											
Tanypus	--	--	--	42	--	8	56	--	--	--	--
Apsectrotanypus	11	--	--	--	--	--	--	--	--	--	--
Procladius	--	--	--	14	24	72	--	--	--	--	--
Natarsia sp. A	--	--	--	--	--	32	--	--	2184	1044	828
Clinotanypus	--	1	--	28	96	24	--	--	--	--	--
Ablabesmyia mallochi	28	2	--	--	24	8	--	--	--	--	--
Nilotanypus	--	--	--	--	--	8	--	--	--	--	--
Thienemannimyia grp.	28	--	28	--	--	--	--	--	--	--	--
Zavrelimyia	--	1	--	28	--	--	--	--	--	--	--
Orthocladiinae	--	2	--	--	--	--	--	--	--	--	--
Corynoneura	17	--	--	--	--	--	--	--	--	--	--
Corynoneura lobata	--	5	70	--	--	--	--	--	--	--	--
Chaetocladius	--	--	--	112	--	40	--	--	--	--	--
Cricotopus tremulus grp.	--	--	7	--	--	8	--	--	--	--	--
Cricotopus bicinctus grp.	--	--	7	--	--	--	--	--	--	--	--
Cricotopus sylvestris grp.	--	--	--	--	--	--	28	6	216	60	432
Diplocladius	--	2	77	--	--	--	--	--	--	--	--
Orthocladius (Symposiocladius) lignicola	11	--	--	--	--	--	--	--	--	--	--
Nanocladius	--	--	--	--	24	8	--	--	--	--	--
Parakiefferiella	--	4	--	--	36	16	--	--	--	--	--
Parametriocnemus	56	2	28	--	--	--	--	--	--	--	--
Psectrocladius	--	--	--	--	--	--	--	--	72	--	--
Chironomus	--	--	--	--	--	--	--	--	508	--	--
Chironomus (Chironomus)	--	--	--	--	--	--	--	--	--	60	121
Cryptochironomus	--	--	7	84	36	16	--	--	--	--	--
Cryptotendipes	--	--	--	28	--	8	--	--	--	--	--
Dicrotendipes modestus	--	1	--	--	12	--	--	--	--	--	--
Dicrotendipes fumidus	--	--	--	14	--	--	--	--	--	--	--
Dicrotendipes simpsoni	--	--	--	--	--	--	224	12	--	--	--
Endochironomus nigricans	--	--	--	--	--	--	28	--	--	--	--
Glyptotendipes	--	--	--	--	--	--	28	42	--	--	--
Microtendipes	--	5	--	--	--	--	--	--	--	--	--
Pagastiella	--	--	--	14	216	32	--	--	--	--	--
Parachironomus	--	--	--	--	--	--	--	--	72	--	--
Paralauterborniella	--	--	--	14	--	--	--	--	--	--	--
Paratendipes	6	--	--	--	24	24	--	--	--	--	--
Phaenopsectra punctipes	6	--	--	--	--	--	--	--	--	--	--
Polypedilum fallax grp.	--	--	7	--	--	--	--	--	--	--	--
Polypedilum flavum	--	--	28	28	--	--	--	--	72	60	--
Polypedilum halterale grp.	--	--	--	--	24	--	--	--	--	--	--
Polypedilum illinoense	6	--	--	--	--	8	--	--	216	228	--
Polypedilum nubifer	--	--	7	--	--	--	--	--	--	--	--
Polypedilum scalaenum grp.	6	--	--	--	--	8	--	--	--	--	--
Polypedilum trigonus	--	--	--	--	--	--	28	--	9408	1368	2436
Pseudochironomus	--	--	--	14	--	8	--	--	--	--	--
Tribelos fuscicorne	--	1	--	--	--	--	--	--	--	--	--
Cladotanytarsus mancus grp.	--	--	--	14	12	16	--	--	--	--	--
Paratanytarsus	--	--	49	588	360	296	--	--	--	--	--
Rheotanytarsus	--	--	7	--	--	--	--	--	--	--	--
Stempellina	--	4	7	--	--	--	--	--	--	--	--
Tanytarsus	--	--	7	--	60	16	28	--	360	84	--
Tanytarsus curticornis grp.	73	1	--	--	--	--	--	--	--	--	--
Tanytarsus glabrescens grp.	--	--	--	112	48	8	--	6	--	--	--

TABLE 8-1 ABUNDANCE AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	**JCUS01**	**JCDS01**	**GB-01**	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Bivalvia (clams/mussels)											
Simulium	17	3	--	--	--	--	--	--	--	--	--
Tipula	--	--	2	--	--	--	--	--	--	--	--
Chelifera	--	1	--	--	--	--	--	--	--	--	--
Odontomyia	--	--	--	--	--	--	--	--	25	12	24
Tabanus	--	--	--	--	1	--	--	--	--	--	--
Muscidae	6	--	--	--	--	--	--	--	--	--	--
Gastropoda (snails)											
Cipangopaludina japonica	--	--	--	1	1	1	--	--	--	--	--
Fossaria	--	--	1	--	--	--	--	6	--	--	--
Pseudosuccinea columella	--	--	--	3	--	--	--	--	--	--	--
Physa	--	1	59	--	--	--	3	34	--	--	--
Gyraulus	--	--	--	--	--	--	--	--	--	132	24
Helisoma	--	1	--	13	2	--	--	30	--	--	--
Bivalvia (clams/mussels)											
Musculium	--	--	--	--	--	--	2	37	--	--	--
Pisidium	11	12	28	98	--	24	28	--	--	--	--
Total	**591**	**247**	**845**	**1,786**	**1,341**	**1,090**	**4,181**	**785**	**13,425**	**3,589**	**4,530**
Number of Taxa	**23**	**32**	**34**	**30**	**27**	**34**	**17**	**18**	**15**	**16**	**14**

TABLE 8-2 METRICS, INDEX OF BIOTIC INTEGRITY (IBI) SCORES, HILSENHOFF BIOTIC INDEX (HBI) OF MACROINVERTEBRATES COLLECTED (DIP NET) FROM STREAM/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	John's Creek		Goldstein Branch	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Metrics	**JCUS01**	**JCDS01**	**GB-01**	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Number of Taxa	23	32	34	30	27	34	17	18	15	16	14
Number of EPT Taxa	3	3	5	1	0	0	1	0	1	1	1
Number of Ephemeroptera Taxa	1	2	1	0	0	0	1	0	1	1	1
%Intolerant Urban[a]	15.40	9.31	2.72	0.84	4.55	8.07	0.67	0.00	1.07	6.69	6.09
%Ephemeroptera	1.02	17.41	0.83	0.00	0.00	0.00	0.67	0.00	1.07	6.69	6.09
Number of Scrapers	1	3	5	2	2	1	1	3	0	1	1
%Climbers	13.37	0.40	5.21	1.74	6.26	2.94	1.34	0.00	74.91	49.48	55.63
IBI	3.57	3.57	3.57	NA	NA	NA	NA	NA	NA	NA	NA
IBI Rating	Fair	Fair	Fair	NA	NA	NA	NA	NA	NA	NA	NA
HBI[b]	5.69	6.33	6.09	NA	NA	NA	NA	NA	NA	NA	NA

NA =Not Applicable

EPT = Ephemeroptera, Pleocoptera and Trichoptera.

[a]Taxa with tolerance values between 0 and 3.

[b]The Hilsenhoff Biotic Index (HBI) is not included in the IBI calulation.

TABLE 9-1 ABUNDANCE (#/M^2) AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (PONAR) FROM LAKE/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT SEPTEMBER 2006

Water Body	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Turbellaria (flatworms)								
Turbellaria	--	82	--	--	--	--	--	--
Nemertea (ribbon worms)								
Prostoma	--	163	--	--	--	--	--	--
Nematoda (round worms)								
Nematoda	--	20	20	--	61	61	--	82
Oligochaeta (aquatic worms)	--	--	--	--	--	--	--	--
Lumbriculidae	--	61	163	143	184	--	--	--
Tubificidae	1428	408	245	2101	469	--	--	--
Crustacea								
Ostracoda	--	--	--	41	--	--	--	--
Collembola								
Collembola	--	--	--	--	82	--	--	--
Ephemeroptera (mayflies)								
Caenis	--	20	--	--	--	--	--	--
Odonata (damselflies, dragonflies)								
Enallagma	--	--	20	--	--	--	--	--
Anisoptera	41	--	--	--	--	--	--	--
Libellula pulchella	--	61	20	--	--	--	--	--
Ladona deplanata	--	--	20	--	--	--	--	--
Trichoptera (caddisflies)								
Oecetis	--	20	--	--	--	--	--	--
Diptera (true flies)								
Ceratopogonidae	1571	143	122	224	20	--	--	--
Chaoborus	--	--	--	--	1163	--	--	--
Chironomidae (midges)								
Procladius	41	61	184	82	102	--	--	--
Clinotanypus	5386	--	326	--	--	--	--	--
Ablabesmyia mallochi	245	61	20	--	--	--	--	--
Nilotanypus	102	61	--	--	--	--	--	--
Nanocladius distinctus	--	20	--	--	--	--	--	--
Parakiefferiella	41	20	20	--	--	--	--	--
Chironomus	--	--	--	82	41	--	--	--
Cryptochironomus	41	143	122	--	--	--	--	--
Dicrotendipes nervosus	--	--	--	--	20	--	--	--
Einfeldia natchitocheae	245	--	--	286	184	--	--	--
Glyptotendipes	--	--	--	--	184	--	--	--
Goeldichironomus holoprasinus	--	--	--	490	82	--	--	82
Nilothauma	--	--	20	--	--	--	--	--
Pagastiella	--	102	20	--	--	--	--	--
Polypedilum flavum	--	--	41	--	--	--	--	--
Polypedilum tritum	41	--	41	--	--	--	--	--
Polypedilum trigonus	--	--	--	--	--	--	82	245
Pseudochironomus	--	163	102	--	--	--	--	--
Clinotanytarsus	--	61	--	--	--	--	--	--
Paratanytarsus	102	347	102	--	--	--	--	--
Stempellinella	--	20	--	--	--	--	--	--
Tanytarsus	245	592	265	--	--	--	--	--
Gastropoda (snails)	--	--	--	--	--	--	--	--
Planorbella	--	--	20	--	--	--	--	--
Bivalvia (clams/mussels)	--	--	--	--	--	--	--	--
Musculium	41	--	--	143	224	--	--	--
Total	**9,570**	**2,629**	**1,893**	**3,592**	**2,816**	**61**	**82**	**409**
Number of Taxa	**14**	**21**	**20**	**9**	**13**	**1**	**1**	**3**

TABLE 9-2 SELECTED METRICS OF MACROINVERTEBRATES COLLECTED (PONAR) FROM LAKE/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT SEPTEMBER 2006

Water Body	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Metrics	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Taxa Richness	14	21	20	9	13	1	1	3
Abundance (#/M^2)	9,570	2,629	1,893	3,592	2,816	61	82	409
%Tolerant Taxa[a]	18.98	45.74	30.11	59.66	17.39	0.00	0.00	0.00
%Intolerant Taxa[b]	0.85	3.88	10.75	2.27	3.62	0.00	0.00	0.00
%Dominant Taxa[c]	67.80	62.79	66.67	80.00	33.00	100.00	100.00	80.00

[a]Taxa with tolerance values between 7 and 10.

[b]Taxa with tolerance values between 0 and 3.

[c]Chironomidae was the dominant taxa at LC-01, LC-02, LC-03, LD-02 and LD-03; Nematoda at LD01, Diptera at P-02 and Oligochaeta at P-01.

TABLE 10-1 ABUNDANCE (#/M^2) AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (PONAR) FROM LAKE/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	LC-01	LC-02	LC-03	P-01	P-02	LD-01	LD-02	LD-03
Nematoda (round worms)								
Nematoda	--	82	--	--	367	61	--	--
Oligochaeta (aquatic worms)								
Lumbriculidae	41	--	245	--	--	--	--	--
Naididae	61	61	61	490	82	20	--	--
Tubificidae	20	143	286	9221	2326	--	--	--
Crustacea								
Ostracoda	41	755	--	--	41	20	--	--
Crangonyx	20	--	--	--	--	--	20	--
Hydracarina (water mites)								
Hydracarina	20	20	--	--	--	--	--	--
Collembola (springtails)								
Collembola	--	20	--	--	--	--	--	--
Ephemeroptera (mayflies)								
Callibaetis	--	20	--	--	--	--	--	--
Odonata (damselflies, dragonflies)								
Celithemis fasciata	--	--	61	--	--	--	--	--
Erythemis simplicicollis	--	--	--	--	--	41	--	--
Trichoptera (caddisflies)	--	--	--	--	--	--	--	--
Oecetis	--	41	245	--	--	--	--	--
Coleoptera (beeetles)								
Ilybius	--	--	--	--	--	20	--	--
Diptera (true flies)	--	--	--	--	--	--	--	--
Ceratopogonidae	347	408	490	326	82	61	--	1958
Chaoborus	--	--	--	--	204	--	--	--
Chironomidae (midges)								
Tanypus	--	--	--	--	41	--	--	--
Paramerina	102	--	--	--	--	--	--	--
Procladius	61	--	612	571	82	--	--	--
Natarsia sp. A	41	--	--	--	--	877	163	--
Clinotanypus	204	163	428	--	41	--	--	--
Ablabesmyia mallochi	143	61	61	--	--	20	--	1958
Nilotanypus	--	--	61	--	--	--	--	--
Thienemannimyia grp.	--	--	--	--	82	--	--	--
Chaetocladius	41	--	--	--	--	--	--	--
Cricotopus sylvestris grp.	--	--	--	--	--	20	--	--
Parakiefferiella	--	20	--	--	--	--	--	--
Chironomus	--	--	--	82	245	1081	796	61
Cladopelma	--	--	--	--	41	--	--	--
Cryptochironomus	--	82	122	--	--	--	--	--
Cryptotendipes	61	--	--	--	41	--	--	--
Dicrotendipes fumidus	41	--	--	--	--	20	--	--
Glyptotendipes	--	--	--	--	82	--	--	--
Goeldichironomus holoprasinus	--	--	--	--	--	--	20	--
Pagastiella	306	286	428	--	--	--	--	--
Paralauterborniella	61	--	--	--	--	--	--	--
Paratendipes	41	--	--	--	--	--	--	--
Polypedilum	--	--	--	--	--	--	82	--
Polypedilum flavum	--	--	122	--	--	--	--	--
Polypedilum halterale grp.	--	--	122	--	204	--	--	--
Polypedilum illinoense	--	--	61	--	--	20	--	--
Polypedilum trigonus	306	20	612	--	--	388	326	3917

TABLE 10-1 ABUNDANCE (#/M^2) AND DISTRIBUTION OF MACROINVERTEBRATES COLLECTED (PONAR) FROM LAKE/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Taxon	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Pseudochironomus	--	--	61	--	--	--	--	--
Stenochironomus	41	--	--	--	--	--	--	--
Cladotanytarsus mancus grp.	41	20	61	--	--	--	--	--
Paratanytarsus	1448	1816	2142	--	--	20	--	--
Tanytarsus	102	306	796	163	41	367	163	--
Diptera (true flies)								
Tabanus	20	--	--	--	--	--	--	--
Gastropoda (snails)								
Physa	--	--	61	--	20	--	--	--
Helisoma	--	--	61	--	--	--	--	--
Bivalvia (clams/mussels)								
Musculium	--	--	--	--	449	--	--	--
Total	**3,611**	**4,325**	**7,324**	**10,853**	**4,468**	**3,040**	**1,571**	**7,895**
Number of Taxa	**24**	**18**	**22**	**6**	**18**	**15**	**7**	**4**

TABLE 10-2 SELECTED METRICS OF MACROINVERTEBRATES COLLECTED (PONAR) FROM LAKE/POND STATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT MARCH 2007

Water Body	Lake Canoy			Pond 1	Pond 2	Lake Davies		
Metrics	**LC-01**	**LC-02**	**LC-03**	**P-01**	**P-02**	**LD-01**	**LD-02**	**LD-03**
Taxa Richness	24	18	22	6	18	15	7	4
Abundance (#/M^2)	3,611	4,325	7,324	10,853	4,468	3,040	1,571	7,895
%Tolerant Taxa[a]	50.85	67.45	40.67	89.47	57.08	5.37	0.00	24.81
%Intolerant Taxa[b]	2.26	0.94	8.36	5.26	1.83	0.00	0.00	0.00
%Dominant Taxa[c]	40.11	41.98	29.25	84.96	52.05	35.57	50.65	49.61

[a]Taxa with tolerance values between 7 and 10.

[b]Taxa with tolerance values between 0 and 3.

[c]Chironomidae was the dominant taxa at LC-01, LC-02, LC-03, LD01, LD-02 and LD-03, and Oligochaeta at P-01 and P-02.

TABLE 11 SUMMARY OF HABITAT QUALITY EVALUATED AT STREAM LOCATIONS, CALVERT CLIFFS NUCLEAR POWER PLANT, FALL 2006 AND SPRING 2007

		Fall 2006			Spring 2007		
		Stream Name, Station Number, Scores			Stream Name, Station Number, Scores		
		John's Creek	John's Creek	Goldstein Branch	John's Creek	John's Creek	Goldstein Branch
Habitat Parameter	**Scale**	**JCUS-01**	**JCDS-01**	**GB-01**	**JCUS-01**	**JCDS-01**	**GB-01**
Epifaunal Substrate/Available Cover	0-20	10	19	12	11	18	10
Pool Substrate Characterization	0-20	13	16	12	13	14	11
Pool Variability	0-20	5	13	5	4	13	5
Sediment Deposition	0-20	11	10	10	11	10	8
Channel Flow Status	0-20	18	16	17	18	16	17
Channel Alteration	0-20	19	20	17	19	19	17
Chanel Sinuosity	0-20	13	15	18	13	15	18
Bank Stability (left bank)	0-10	9	9	9	9	9	9
Bank Stability (right bank)	0-10	9	9	9	9	9	9
Vegetative Protection (left bank)	0-10	10	10	10	10	10	10
Vegetative Protection (right bank)	0-10	10	10	10	10	10	10
Riparian Vegetative Zone Width (left bank)	0-10	10	10	10	10	10	10
Riparian Vegetative Zone Width (right bank)	0-10	10	10	10	10	10	10
Total		147	167	149	147	163	144

Key to Ranges:

	Optimal	Sub-Optimal	Marginal	Poor
Epifaunal Substrate/Available Cover	16-20	11-15	6-10	0-5
Pool Substrate Characterization	16-20	11-15	6-10	0-5
Pool Variability	16-20	11-15	6-10	0-5
Sediment Deposition	16-20	11-15	6-10	0-5
Channel Flow Status	16-20	11-15	6-10	0-5
Channel Alteration	16-20	11-15	6-10	0-5
Chanel Sinuosity	16-20	11-15	6-10	0-5
Bank Stability	9-10	6-8	3-5	0-2
Vegetative Protection	9-10	6-8	3-5	0-2
Riparian Vegetative Zone Width	9-10	6-8	3-5	0-2
Total Habitat Score Ranges	139-170	95-129	51-85	0-41

Source: EPA Rapid Bioassessment Protocols for Use In Wadeable Streams and Rivers (1999)

TABLE 12-1. GENERAL CHEMISTRY PARAMETERS IN SEDIMENT
CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT, SEPTEMBER 2006

ANALYTE	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
AMMONIA AS NITROGEN	MG/KG	7.00	**6.1 B**	**6.8 B**	**4.9 B**
TOTAL KJELDAHL NITROGEN	MG/KG	210.0	**186 B**	**316**	ND
TOTAL ORGANIC CARBON	MG/KG	752.0	**23,600**	**30,700**	**24,100**
TOTAL PHOSPHORUS	MG/KG	140.0	**1080**	**1110**	**615**

NOTE: Bolded values represent detected concentrations.
RL = average reporting limit
B = compound was detected, but below the reporting limit (value is estimated)
ND= Not Detected

TABLE 12-2. METAL CONCENTRATIONS (MG/KG) IN SEDIMENT
CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	TEL*	PEL*	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
ARSENIC	7.24	41.6	MG/KG	0.98	**1.2**	**1.1**	**0.95 B**
CADMIUM	0.676	4.21	MG/KG	0.49	**0.17 B**	**0.20 B**	**0.18 B**
CHROMIUM	52.3	160.4	MG/KG	0.49	**3.7**	**4.3**	**3.4**
COPPER	18.7	108.2	MG/KG	2.4	**1.2 B**	**1.2 B**	**1.3 B**
LEAD	30.24	112.18	MG/KG	0.29	**1.1**	**1.4**	**1.2**
MERCURY	0.13	0.696	MG/KG	0.33	ND	ND	ND
ZINC	124	271	MG/KG	2.00	**7.5**	**9.4**	**9.3**

**Source*: Buchman 1999

NOTE: Bolded values represent detected concentrations. Shaded and bold values represent exceedences.
RL = average reporting limit
TEL = threshold effects level
PEL = probable effects level
B= compound was detected, but below the reporting limit (value is estimated)
ND=Not Detected

TABLE 12-3. PAH CONCENTRATIONS (UG/KG) IN SEDIMENT
CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	TEL*	PEL*	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
ACENAPHTHENE	6.71	88.9	UG/KG	640	ND	ND	ND
ACENAPHTHYLENE	5.87	127.87	UG/KG	640	ND	ND	ND
ANTHRACENE	46.85	245	UG/KG	640	ND	ND	ND
BENZO(A)ANTHRACENE	74.83	692.53	UG/KG	640	ND	ND	ND
BENZO(A)PYRENE	88.81	763.22	UG/KG	640	ND	ND	ND
BENZO(B)FLUORANTHENE	--	--	UG/KG	640	ND	ND	ND
BENZO(GHI)PERYLENE	--	--	UG/KG	640	ND	ND	ND
BENZO(K)FLUORANTHENE	--	--	UG/KG	640	ND	ND	ND
CHRYSENE	107.77	845.98	UG/KG	640	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	6.22	134.61	UG/KG	640	ND	ND	ND
FLUORANTHENE	112.82	1493.54	UG/KG	640	ND	ND	ND
FLUORENE	21.17	144.35	UG/KG	640	ND	ND	ND
NAPHTHALENE	34.57	390.64	UG/KG	640	ND	ND	ND
PHENANTHRENE	86.68	543.53	UG/KG	640	ND	ND	ND
PYRENE	152.66	1397.6	UG/KG	640	ND	ND	ND

**Source*: Buchman 1999

NOTE: Bolded values represent detected concentrations. Shaded and bold values represent exceedences.
RL = average reporting limit
TEL = threshold effects level
PEL = probable effects level
ND =Not Detected

TABLE 12-4. PCB CONGENER CONCENTRATIONS (UG/KG) IN SEDIMENT CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
PCB 90 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 8 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 18 (BZ)	UG/KG	0.24	**0.18 J, PG**	**0.2 J, PG**	**0.27**
PCB 28 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 44 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 49 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 52 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 66 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 77 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 87 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 101 (BZ)	UG/KG	0.24	ND	ND	**0.058 J, PG**
PCB 105 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 118 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 126 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 128 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 138 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 153 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 156 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 169 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 170 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 180 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 183 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 184 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 187 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 195 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 206 (BZ)	UG/KG	0.24	ND	ND	ND
PCB 209 (BZ)	UG/KG	0.24	ND	ND	ND

*PCB congeners used for Total PCB summation, as per Table 9-3 of the ITM (USEPA/USACE 1998)

NOTE: Bolded values represent detected concentrations.
RL = average reporting limit
J = compound was detected, but below the reporting limit (value is estimated)
PG = the percent difference between the original and confirmation analysis is greater than 40%
ND=Not detected

TABLE 12-5 CHLORINATED PESTICIDE CONCENTRATIONS (UG/KG) IN SEDIMENT CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	TEL*	PEL*	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
4,4'-DDD	1.22	7.81	UG/KG	1.70	ND	ND	ND
4,4'-DDE	2.07	374.17	UG/KG	1.70	ND	ND	ND
4,4'-DDT	1.19	4.77	UG/KG	1.70	ND	ND	**0.18 J, PG**
ALDRIN	--	--	UG/KG	1.70	ND	ND	ND
ALPHA-BHC	--	--	UG/KG	1.70	**0.15 J, PG**	**0.17 J, PG**	**0.17 J, PG**
ALPHA-CHLORDANE	--	--	UG/KG	1.70	ND	ND	ND
BETA-BHC	--	--	UG/KG	1.70	ND	ND	ND
DELTA-BHC	--	--	UG/KG	1.70	ND	ND	ND
DIELDRIN	0.715	4.3	UG/KG	1.70	ND	ND	ND
ENDOSULFAN I	--	--	UG/KG	1.70	ND	ND	ND
ENDOSULFAN II	--	--	UG/KG	1.70	ND	ND	ND
ENDOSULFAN SULFATE	--	--	UG/KG	1.70	ND	ND	ND
ENDRIN	--	--	UG/KG	1.70	ND	ND	ND
ENDRIN ALDEHYDE	--	--	UG/KG	1.70	ND	**0.41 J, PG**	ND
ENDRIN KETONE	--	--	UG/KG	1.70	ND	ND	ND
GAMMA-BHC (LINDANE)	0.32	0.99	UG/KG	1.70	ND	ND	ND
GAMMA-CHLORDANE	--	--	UG/KG	1.70	ND	ND	ND
HEPTACHLOR	--	--	UG/KG	1.70	**0.29 J, PG**	**0.52 J**	**0.63 J**
HEPTACHLOR EPOXIDE	0.6	2.74	UG/KG	1.70	ND	ND	ND
METHOXYCHLOR	--	--	UG/KG	3.20	ND	ND	ND
TOXAPHENE	--	--	UG/KG	66.00	ND	ND	ND

**Source*: Buchman 1999

NOTE: Bolded values represent detected concentrations. Shaded and bold values represent exceedences.

RL = average reporting limit

TEL = threshold effects level

PEL = probable effects level

J = compound was detected, but below the reporting limit (value is estimated)

ND = compound was analyzed but not detected

PG = the percent difference between the original and confirmation analysis is greater than 40%

TABLE 12-6. SVOC CONCENTRATIONS (UG/KG) IN SEDIMENT
CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
1,2,4-TRICHLOROBENZENE	UG/KG	640	ND	ND	ND
1,2-DICHLOROBENZENE	UG/KG	640	ND	ND	ND
1,2-DIPHENYLHYDRAZINE	UG/KG	640	ND	ND	ND
1,3-DICHLOROBENZENE	UG/KG	640	ND	ND	ND
1,4-DICHLOROBENZENE	UG/KG	640	ND	ND	ND
2,4,6-TRICHLOROPHENOL	UG/KG	640	ND	ND	ND
2,4-DICHLOROPHENOL	UG/KG	640	ND	ND	ND
2,4-DIMETHYLPHENOL	UG/KG	640	ND	ND	ND
2,4-DINITROPHENOL	UG/KG	3100	ND	ND	ND
2,4-DINITROTOLUENE	UG/KG	640	ND	ND	ND
2,6-DINITROTOLUENE	UG/KG	640	ND	ND	ND
2-CHLORONAPHTHALENE	UG/KG	640	ND	ND	ND
2-CHLOROPHENOL	UG/KG	640	ND	ND	ND
2-METHYL-4,6-DINITROPHENOL	UG/KG	3100	ND	ND	ND
2-NITROPHENOL	UG/KG	640	ND	ND	ND
3,3'-DICHLOROBENZIDINE	UG/KG	3100	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER	UG/KG	640	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	UG/KG	640	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER	UG/KG	640	ND	ND	ND
4-NITROPHENOL	UG/KG	3100	ND	ND	ND
BENZIDINE	UG/KG	640	ND	ND	ND
BIS(2-CHLOROETHOXY)METHANE	UG/KG	640	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER	UG/KG	640	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER	UG/KG	640	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	640	ND	ND	ND
BUTYL BENZYL PHTHALATE	UG/KG	640	ND	ND	ND
DIETHYL PHTHALATE	UG/KG	640	ND	ND	ND
DIMETHYL PHTHALATE	UG/KG	640	ND	ND	ND
DI-N-BUTYL PHTHALATE	UG/KG	640	ND	ND	ND
DI-N-OCTYL PHTHALATE	UG/KG	640	ND	ND	ND
HEXACHLOROBENZENE	UG/KG	640	ND	ND	ND
HEXACHLOROBUTADIENE	UG/KG	640	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE	UG/KG	3100	ND	ND	ND
HEXACHLOROETHANE	UG/KG	640	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	UG/KG	640	ND	ND	ND
ISOPHORONE	UG/KG	640	ND	ND	ND
NITROBENZENE	UG/KG	640	ND	ND	ND
N-NITROSODIMETHYLAMINE	UG/KG	640	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE	UG/KG	640	ND	ND	ND
N-NITROSODIPHENYLAMINE	UG/KG	640	ND	ND	ND
PENTACHLOROPHENOL	UG/KG	3100	ND	ND	ND
PHENOL	UG/KG	640	ND	ND	ND

RL = average reporting limit
ND = compound was analyzed but not detected

TABLE 12-7. VOC CONCENTRATIONS (UG/KG) IN SEDIMENT
CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	UNITS	RL	CCNPP-1	CCNPP-2	CCNPP-3
1,1,1-TRICHLOROETHANE	UG/KG	7.00	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	UG/KG	7.00	ND	ND	ND
1,1,2-TRICHLOROETHANE	UG/KG	7.00	ND	ND	ND
1,1-DICHLOROETHANE	UG/KG	7.00	ND	ND	ND
1,1-DICHLOROETHENE	UG/KG	7.00	ND	ND	ND
1,2-DICHLOROETHANE	UG/KG	7.00	ND	ND	ND
1,2-DICHLOROPROPANE	UG/KG	7.00	ND	ND	ND
2-CHLOROETHYL VINYL ETHER	UG/KG	14.0	ND	ND	ND
ACROLEIN	UG/KG	140.0	ND	ND	ND
ACRYLONITRILE	UG/KG	140.0	ND	ND	ND
BENZENE	UG/KG	7.00	ND	ND	ND
BROMODICHLOROMETHANE	UG/KG	7.00	ND	ND	ND
BROMOFORM	UG/KG	7.00	ND	ND	ND
BROMOMETHANE	UG/KG	7.00	ND	ND	ND
CARBON TETRACHLORIDE	UG/KG	7.00	ND	ND	ND
CHLOROBENZENE	UG/KG	7.00	ND	ND	ND
CHLOROETHANE	UG/KG	7.00	ND	ND	ND
CHLOROFORM	UG/KG	7.00	ND	ND	ND
CHLOROMETHANE	UG/KG	7.00	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	UG/KG	7.00	ND	ND	ND
DIBROMOCHLOROMETHANE	UG/KG	7.00	ND	ND	ND
ETHYLBENZENE	UG/KG	7.00	ND	ND	ND
METHYLENE CHLORIDE	UG/KG	7.00	**4.5 J**	**5.0 J**	**4.5 J**
TETRACHLOROETHENE	UG/KG	7.00	ND	ND	ND
TOLUENE	UG/KG	7.00	ND	ND	ND
TRANS-1,2-DICHLOROETHENE	UG/KG	7.00	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	UG/KG	7.00	ND	ND	ND
TRICHLOROETHENE	UG/KG	7.00	ND	ND	ND
VINYL CHLORIDE	UG/KG	7.00	ND	ND	ND

NOTE: Bolded values represent detected concentrations.
RL = average reporting limit
J = compound was detected, but below the reporting limit (value is estimated)
ND = compound was analyzed but not detected

TABLE 12-8. PHYSICAL PROPERTIES MEASURED IN SEDIMENT CHESAPEAKE BAY, CALVERT CLIFFS NUCLEAR POWER PLANT

ANALYTE	UNITS	CCNPP-1	CCNPP-2	CCNPP-3
GRAVEL	%	5.1	4.6	1.5
SAND	%	93.9	93.5	96
SILT	%	-	-	0.2
CLAY	%	2.7	2.1	2.3
SPECIFIC GRAVITY		2.681	2.667	2.679
PERCENT SOLIDS	%	71.6	67.3	73.4

TABLE 13 -1 BENTHIC MACROINVERTEBRATES IN CHESAPEAKE BAY STATION 1 CALVERT CLIFFS NUCLEAR POWER PLANT

SIEVE SIZE = 0.5mm
COLLECTION GEAR = Ponar ($0.05m^2$)

TAXA	REP A	REP B	REP C	MEAN
ANNELIDA				
Neanthes succinea	22	21	1	14.7
Streblospio benedicti	5	5	9	6.3
Heteromastus filiformis	5	1	2	2.7
Polydora cornuta	3	2	0	1.7
Glycinde solitaria	2	0	2	1.3
Eteone heteropoda	2	1	0	1.0
GASTROPODA				
Doridella obscura	0	2	0	0.7
Sayella chesapeakea	0	0	1	0.3
BIVALVIA				
Gemma gemma	33	31	23	29.0
Macoma mitchelli	1	0	2	1.0
Mulinia lateralis	1	1	0	0.7
CRUSTACEA				
Paracereis caudata	4	6	4	4.7
Edotea triloba	3	2	0	1.7
Balanus improvisus	3	1	0	1.3
Apocorophium lacustre	0	3	0	1.0
Hargeria rapax	1	1	0	0.7
Melita nitida	0	0	1	0.3
TOTAL NUMBER OF TAXA	13	13	9	
TOTAL NUMBER OF INDIVIDUALS	85	77	45	
SHANNON-WEINER DIVERSITY	1.882	1.790	1.549	
SIMPSON'S DOMINANCE INDEX	0.232	0.251	0.317	
SPECIES RICHNESS	2.70	2.76	2.10	
EVENNESS	0.73	0.70	0.70	

TOTAL STATION STATISTICS

TOTAL NUMBER OF TAXA	17
MEAN NUMBER OF INDIVIDUALS	69.0
SHANNON-WEINER DIVERSITY	1.923
SIMPSON'S DOMINANCE INDEX	0.239
SPECIES RICHNESS	3.00
EVENNESS	0.68

TABLE 13-2 BENTHIC MACROINVERTEBRATES IN CHESAPEAKE BAY STATION 2 CALVERT CLIFFS NUCLEAR POWER PLANT

SIEVE SIZE = 0.5mm
COLLECTION GEAR = Ponar ($0.05m^2$)

TAXA	REP A	REP B	REP C	MEAN
PLATYHELMINTHES				
Stylochus ellipticus	3	0	0	1.0
NEMERTINEA				
Micrura leidyi	1	7	6	4.7
ANNELIDA				
Glycinde solitaria	4	8	5	5.7
Streblospio benedicti	1	9	6	5.3
Heteromastus filiformis	1	6	4	3.7
Neanthes succinea	0	3	2	1.7
Paraprionospio pinnata	0	2	0	0.7
Eteone heteropoda	0	1	0	0.3
GASTROPODA				
Acteocina canaliculata	1	0	2	1.0
BIVALVIA				
Gemma gemma	26	32	25	27.7
Macoma mitchelli	1	4	5	3.3
Mulinia lateralis	1	3	4	2.7
Mya arenaria	0	1	0	0.3
CRUSTACEA				
Ameroculodes spp. complex	0	0	5	1.7
Edotea triloba	1	1	1	1.0
Apocorophium lacustre	1	0	0	0.3
TOTAL NUMBER OF TAXA	11	12	11	
TOTAL NUMBER OF INDIVIDUALS	41	77	65	
SHANNON-WEINER DIVERSITY	1.432	1.938	2.021	
SIMPSON'S DOMINANCE INDEX	0.422	0.218	0.192	
SPECIES RICHNESS	2.69	2.53	2.40	
EVENNESS	0.60	0.78	0.84	

TOTAL STATION STATISTICS

TOTAL NUMBER OF TAXA	16
MEAN NUMBER OF INDIVIDUALS	61.0
SHANNON-WEINER DIVERSITY	1.987
SIMPSON'S DOMINANCE INDEX	0.239
SPECIES RICHNESS	2.88
EVENNESS	0.72

TABLE 13 -3 BENTHIC MACROINVERTEBRATES IN CHESAPEAKE BAY STATION 3 CALVERT CLIFFS NUCLEAR POWER PLANT

SIEVE SIZE = 0.5mm
COLLECTION GEAR = Ponar ($0.05m^2$)

TAXA	REP A	REP B	REP C	MEAN
NEMERTINEA				
Micrura leidyi	3	4	5	4.0
ANNELIDA				
Streblospio benedicti	16	14	17	15.7
Heteromastus filiformis	12	1	9	7.3
Neanthes succinea	4	7	1	4.0
Tubificoides spp.	5	1	3	3.0
Leitoscoloplos robustus	1	0	0	0.3
Glycinde solitaria	1	0	0	0.3
GASTROPODA				
Nassarius vibex	0	0	1	0.3
Haminoea solitaria	0	1	0	0.3
BIVALVIA				
Gemma gemma	6	2	5	4.3
Mulinia lateralis	6	1	3	3.3
Mya arenaria	1	0	0	0.3
Macoma mitchelli	0	1	0	0.3
Macoma balthica	1	0	0	0.3
CRUSTACEA				
Edotea triloba	2	0	1	1.0
Ameroculodes spp. complex	2	0	0	0.7
TOTAL NUMBER OF TAXA	13	9	9	
TOTAL NUMBER OF INDIVIDUALS	60	32	45	
SHANNON-WEINER DIVERSITY	2.172	1.669	1.793	
SIMPSON'S DOMINANCE INDEX	0.148	0.264	0.218	
SPECIES RICHNESS	2.93	2.31	2.10	
EVENNESS	0.85	0.76	0.82	

TOTAL STATION STATISTICS

TOTAL NUMBER OF TAXA	16
MEAN NUMBER OF INDIVIDUALS	45.7
SHANNON-WEINER DIVERSITY	2.077
SIMPSON'S DOMINANCE INDEX	0.179
SPECIES RICHNESS	3.05
EVENNESS	0.75

TABLE 14. SUMMARY OF BENTHIC COMMUNITY METRICS AND SCORES USED TO CALCULATE THE CHESAPEAKE BAY B-IBI CALVERT CLIFFS NUCLEAR POWER PLANT

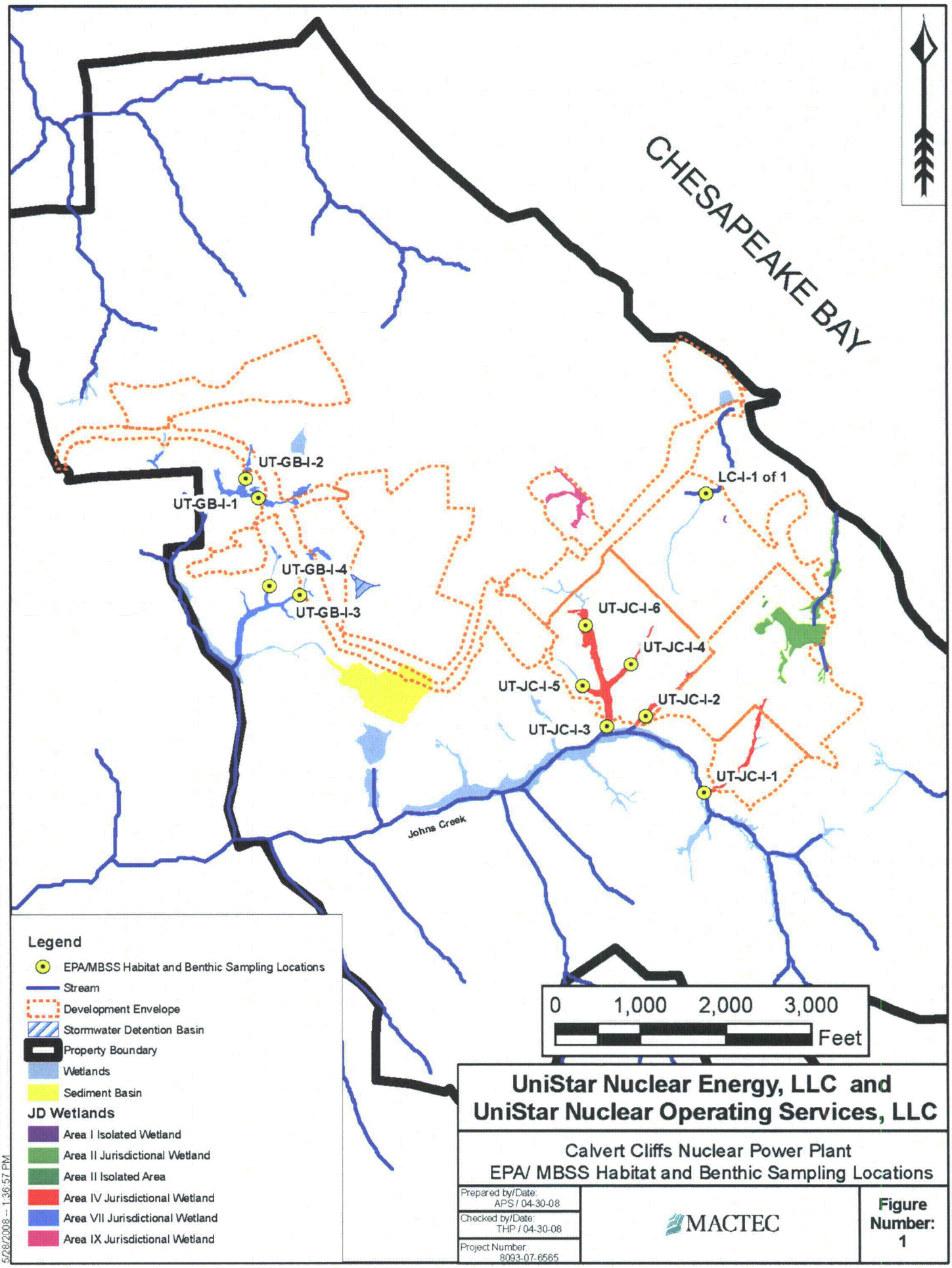
Metric	Metric Values		
	1	2	3
Abundance (#/m^2)	1,258.0	1,217.2	931.6
Shannon-Wiener Diversity	1.48	1.71	1.88
Pollution-Sensitive Taxa Abundance (%)	3.78	11.99	5.00
Pollution–Indicative Taxa Abundance (%)	14.40	13.42	42.66
Carnivore/Omnivore Abundance (%)	27.83	23.17	23.98

Metric	B-IBI Scores		
	1	2	3
Abundance (#/m^2)	3	3	1
Shannon-Wiener Diversity	1	1	1
Pollution-Sensitive Taxa Abundance (%)	1	3	1
Pollution–Indicative Taxa Abundance (%)	3	3	1
Carnivore/Omnivore Abundance (%)	3	3	3
B-IBI[(a)(b)]	2.2	2.6	1.4

NOTE: Shaded and bold value indicates that the sample meets the Chesapeake Bay B-IBI Restoration Goal.

(a) Mean of the metric scores.

(b) B-IBI Scores: ≥ 3.0 = meets restoration goals; 2.7-2.9 = marginal; 2.1-2.6 = degraded; ≤ 2.0 = severely degraded



UniStar Nuclear Energy, LLC and UniStar Nuclear Operating Services, LLC

Calvert Cliffs Nuclear Power Plant
EPA/ MBSS Habitat and Benthic Sampling Locations

Prepared by/Date: APS / 04-30-08	MACTEC	Figure Number: 1
Checked by/Date: THP / 04-30-08		
Project Number: 8093-07-6565		

Map Document: (G:\Calvert Cliffs\frozen_5_1_08\MXDs\Master_Plan\FIG_Benthic_Survey_8X11.mxd)
5/28/2008 -- 1:36:57 PM

Attachment

Project: CCNPP
Sample #: LC - M1
Date: April 14, 2008

Taxon	Number	Voucher	Comments
Turbellaria	1		
Limnodrilus hoffmeisteri	1		
Amphipoda	158		early instar
Gammarus	72		
Calopteryx	2		
Nigronia rastricornis	3		
Agabus	7	x	larvae
Hemerodromia	2	x	
Tipula	1	x	
Thienemannimyia gp	3		
Cricotopus/Orthocladius	34		
Eukiefferiella	2		
Parametriocnemus	6		
Psectrocladius	2		
Paracladopelma	4		
Polypedilum illinoense gp	2		
Physidae	2	x	
Total	302		

Project: CCNPP
Sample #: UTGB - I3
Date: April 15, 2008

Taxon	Number	Voucher	Comments
Amphipoda	124		early instar
Gammarus	9		
Calopteryx	1		
Cordulegaster	2		
Ironoquia	2	x	
Pycnopsyche	2		
Ceratopogonidae	1		pupa
Total	141		

Project: CCNPP
Sample #: WB - M1
Date: April 15, 2008

Taxon	Number	Voucher	Comments
Limnodrilus hoffmeisteri	3		
Caecidotea	5		
Cambaridae	5	x	
Crangonyx	3		
Ameletus	1	x	
Siphlonurus	144		
Cordulegaster	2		
Amphinemura	26		
Nemouridae (not Amphinemura)	61	x	
Ironoquia	37		
Helichus	1		adult
Limonia	1		
Simuliidae (not Prosimulium)	7		
Tabanidae	1		early instar
Tipula	1		
Zavrelimyia	3		
Lymnaeidae	10		
Sphaeriidae	5		
Total	316		

Project: CCNPP
Sample #: UTJC - M5
Date: April 16, 2008

Taxon	Number	Voucher	Comments
Enchytraeidae	1		
Limnodrilus hoffmeisteri	1		
Naididae	2		
Nais	3		
Tubificidae w/out hair chaetae	3		
Caecidotea	5		
Hydracarina	1		
Habrophlebia	2	x	
Leptophlebiidae	13		early instar or gill-less
Calopteryx	4		
Cordulegaster	2	x	
Gomphidae	1		early instar, not H. brevistylus
Hagenius brevistylus	1	x	
Eccoptura	3	x	
Leuctridae/Capniidae	29		early instar
Leuctridae	16	x	cf Paraleuctra
Microvelia	2	x	
Diplectrona	1	x	
Lepidostoma	2	x	
Polycentropus	4	x	
Pycnopsyche	5	x	
Dineutus	1	x	adult
Dixella	1	x	
Hexatoma	1	x	
Pseudolimnophila	3	x	2 slide mounted
Simuliidae (not Prosimulium)	3	x	
Ablabesmyia mallochi	7		
Apsectrotanypus	1		
Clinotanypus	2		
Natarsia	3		
Paramerina	1		
Thienemannimyia gp	19		
Trissopelopia	8		
Corynoneura	1		
Parametriocnemus	1		

Rheocricotopus robacki	2
Tvetenia	9
Unniella	1
Phaenopsectra punctipes gp	2
Polypedilum illinoense gp	21
Polypedilum cf laetum	1
Rheotanytarsus	12
Stempellinella	44
Tanytarsus	49
Sphaeriidae	6
Total	300

Project: CCNPP
Sample #: UTJC - I1
Date: April 14, 2008

Taxon	Number	Voucher	Comments
Lumbriculidae	6		
Tubificidae w/ hair chaetae	1		cf Spirosperma nikolskyi
Caecidotea	18		
Leptophlebia	4		
Calopteryx	2		
Cordulegaster	1		
Amphinemura	1		
Leuctridae	234		cf Paraleuctra
Ptilostomis	1		
Wormaldia	1		
cf Carabidae	1		adult
Dytiscidae	1		early instar
Simuliidae (not Prosimulium)	6		
Tabanidae	1		early instar
Apsectrotanypus	3		
Thienemannimyia gp	5		
Heterotrissocladius	27		
Rheocricotopus cf unidentatus	3		
Micropsectra	7		
Total	323		

Project: CCNPP
Sample #: UTGB - I1
Date: April 15, 2008

Taxon	Number	Voucher	Comments
Enchytraeidae	1		
Limnodrilus hoffmeisteri	4		
Tubificidae w/out hair chaetae	3		
Amphipoda	40		
Caecidotea	1		
Gammarus	21		
Cordulegaster	14		
Sialis	1	x	
Ironoquia	1		
Pycnopsyche	2		
Scirtidae	1	x	larvae
Staphylinidae	1	x	adult
Hexatoma	2		
Pseudolimnophila	8		2 mounted
Tabanidae	1		early instar
Thienemannimyia gp	4		
Zavrelimyia	7		
Heterotrissocladius	4		
Paraphaenocladius	1		
Phaenopsectra punctipes gp	1		
Polypedilum illinoense gp	1		
Lymnaeidae	2	x	
Sphaeriidae	18		
Total	139		

Project: CCNPP
Sample #: UTJC - I03
Date: April 16, 2008

Taxon	Number	Voucher	Comments
Limnodrilus hoffmeisteri	1		
Amphipoda	73		
Caecidotea	1		
Gammarus	10		
Siphlonurus	1		
Cordulegaster	3		
Amphinemura	119		
Leuctridae	34		
Microvelia	1		
Nigronia serricornis	1	x	
Ptilostomis	1		
Pycnopsyche	3		
Wormaldia	13		
Dineutus	1		adult
Ceratopogoninae	1		
Hexatoma	8		
Pseudolimnophila	1		
Simuliidae (not Prosimulium)	13		
Apsectrotanypus	1		
Natarsia	2		
Procladius	1		
Thienemannimyia gp	14		
Zavrelimyia	6		
Heterotrissocladius	2		
Parametriocnemus	3		
Rheocricotopus cf unidentatus	4		
Paratendipes cf albimanus	2		
Polypedilum cf laetum	3		
Stenochironomus	1		
Tanytarsus	1		
Total	325		

Project: CCNPP
Sample #: LC - I01
Date: April 14, 2008

Taxon	Number	Voucher	Comments
Turbellaria	45		
Enchytraeidae	6		
Tubificidae w/ hair chaetae	1		
Tubificidae w/out hair chaetae	5		
Amphipoda	89		
Gammarus	29		
Siphlonurus	1		
Amphinemura	1		
Hesperocorixa	1	x	
Cheumatopsyche	2	x	
Agabus	24	x	23 larvae; 1 adult (v)
Celina	1	x	adult
Dytiscidae	24		early instar larvae
Peltodytes	4	x	adults
Hemerodromia	3		
Limonia	1	x	
Pseudolimnophila	1		
Tipula	1		
Thienemannimyia gp	2		
Zavrelimyia	2		
Cricotopus/Orthocladius	30		
Eukiefferiella	12		
Limnophyes	1	x	
Orthocladius (Euortho) w/ 13 teeth	1		
Parametriocnemus	25		
Paracladopelma	2		
Lymnaeidae	3		
Physidae	3		
Sphaeriidae	7		
Total	327		

Project: CCNPP
Sample #: JC - M4
Date: April 16, 2008

Taxon	Number	Voucher	Comments
Limnodrilus hoffmeisteri	5		
Lumbriculidae	2		
Naididae	1		
Tubificidae w/out hair chaetae	3		
Amphipoda	76		
Crangonyx	1	x	
Gammarus	16		
Leptophlebia	2	x	
Siphlonurus	4		
Boyeria	2	x	
Calopteryx	3		
Cordulegaster	5		
Amphinemura	56		
Eccoptura	1		
Leuctridae	43		
Corixidae	2		cf Sigara
Ironoquia	2		
Pycnopsyche	1		
Wormaldia	6		
Dytiscidae	1		early instar larva
Helichus	2	x	adults
Eriopterini	1	x	
Hexatoma	1		
Simuliidae (not Prosimulium)	14		2 mounted - Simulium
Tabanidae	1		early instar
Tipula	2		
Apsectrotanypus	1		
Natarsia	1		
Procladius	1		
Thienemannimyia gp	5		
Zavrelimyia	2		
Odontomesa	1		
Hydrobaenus	1		not "O"
Parametriocnemus	4		
Rheocricotopus cf unidentatus	1		

Paratendipes cf albimanus	1
Polypedilum halterale gp	1
Polypedilum cf laetum	1
Tribelos cf jucundum	1
Micropsectra	1
Stempellinella	3
Tanytarsus	4
Sphaeriidae	18
Total	300

Project: CCNPP
Sample #: WB - M2
Date: April 15, 2008

Taxon	Number	Voucher	Comments
Turbellaria	1	x	
Limnodrilus hoffmeisteri	8		
Tubificidae w/out hair chaetae	9		
Amphipoda	98		
Caecidotea	7	x	
Gammarus	22	x	
cf Stygobromus	2	x	
Siphlonurus	49	x	
Calopteryx	2	x	
Libellulidae	2		early instar
Amphinemura	1	x	
Corixidae	2	x	cf Sigara
Nigronia rastricornis	1	x	
Ptilostomis	1	x	
Wormaldia	1	x	
cf Enochrus	3	x	adults
Hydroporus	6	x	larvae
Bittacomorpha	1	x	
Tabanidae	1	x	early instar
Natarsia	10		
Thienemannimyia gp	1		
Zavrelimyia	64	x	
Heterotrissocladius	22		
Orthocladius (Euortho) w/ 19 teeth	1	x	
Orthocladius (Symposiocladius)	1	x	
Parametriocnemus	1		
Polypedilum cf aviceps	3	x	
Polypedilum illinoense gp	3		
Sphaeriidae	3	x	
Total	326		

Project: CCNPP
Sample #: UTJC - I2
Date: April 14, 2008

Taxon	Number	Voucher	Comments
Lumbricidae	1		
Tubificidae w/ hair chaetae	1		cf Spirosperma nikolskyi
Tubificidae w/out hair chaetae	1		
Caecidotea	2		
Crangonyx	11		
Leptophlebiidae	2		
Siphlonurus	5		no gills, prob Leptophlebia
Calopteryx	4		
Cordulegaster	4		
Leuctridae	122		cf Paraleuctra
Nigronia rastricornis	2		
Phryganeidae	2		early instar
Wormaldia	7		
Dytiscidae	1		larva, cf Agabus but w/ short cerci
Ceratopogoninae	1	x	
Hexatoma	1		
Pseudolimnophila	14		
Simuliidae (not Prosimulium)	2		
Tabanidae	8		early instar
Tipula	2		
Apsectrotanypus	20		
Natarsia	3		
Thienemannimyia gp	37		
Trissopelopia	11		
Zavrelimyia	11		
Heterotrissocladius	14		
Parametriocnemus	10		
Paracladopelma	1		
Paralauterborniella	1		
Tanytarsus	1		
Sphaeriidae	18		
Total	320		

Table XX. Taxonomic composition and abundance in macroinvertebrate samples collected from streams near CCNPP, April 14 - 16, 2008.

	Sampling Location										
Taxon	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Turbellaria (flatworms)											
Turbellaria							1			45	1
Oligochaeta (aquatic worms)											
Enchytraeidae				1				1		6	
Limnodrilus hoffmeisteri			1	1	5	3	8	4			1
Lumbricidae		1									
Lumbriculidae	6				2						
Naididae				2	1						
Nais				3							
Tubificidae w/ hair chaetae	1	1								1	
Tubificidae w/out hair chaetae		1		3	3		9	3		5	
Crustacea											
Amphipoda			73		76		98	40	124	89	158
Caecidotea	18	2	1	5		5	7	1			
Cambaridae						5					
Crangonyx		11			1	3					
Gammarus			10		16		22	21	9	29	72
cf Stygobromus							2				
Hydracarina (water mites)											
Hydracarina				1							
Ephemeroptera (mayflies)											
Ameletus						1					
Habrophlebia				2							
Leptophlebia	4				2						
Leptophlebiidae		2		13							
Siphlonurus		5	1		4	144	49			1	
Odonata (damselflies/dragonflies)											
Boyeria					2						
Calopteryx	2	4		4	3		2		1		2
Cordulegaster	1	4	3	2	5	2		14	2		
Gomphidae				1							
Hagenius brevistylus				1							
Libellulidae							2				

Taxon	Sampling Location										
	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Plecoptera (stoneflies)											
Amphinemura	1		119		56	26	1			1	
Eccoptera				3	1						
Leuctridae	234	122	34	45	43						
Nemouridae (not Amphinemura)						61					
Hemiptera (aquatic true bugs)											
Corixidae					2		2				
Hesperocorixa										1	
Microvelia			1	2							
Megaloptera (alderflies/dobsonflies)											
Nigronia rastricornis		2					1				3
Nigronia serricornis			1								
Sialis								1			
Trichoptera (caddisflies)											
Cheumatopsyche										2	
Diplectrona				1							
Ironoquia					2	37		1	2		
Lepidostoma				2							
Phryganeidae		2									
Polycentropus				4							
Ptilostomis	1		1				1				
Pycnopsyche			3	5	1			2	2		
Wormaldia	1	7	13		6		1				
Coleoptera (beetles)											
Agabus										24	7
cf Carabidae	1										
Celina										1	
Dineutus			1	1							
Dytiscidae	1	1			1					24	
cf Enochrus							3				
Helichus					2	1					
Hydroporus							6				
Peltodytes										4	
Scirtidae								1			
Staphylinidae								1			
Diptera (true flies) - excluding Chironomidae											

Taxon	Sampling Location										
	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Bittacomorpha							1				
Ceratopogoninae		1	1						1		
Dixella				1							
Eriopterini					1						
Hemerodromia										3	2
Hexatoma		1	8	1	1			2			
Limonia						1				1	
Pseudolimnophila		14	1	3				8		1	
Simuliidae (not Prosimulium)	6	2	13	3	14	7					
Tabanidae	1	8			1	1	1	1			
Tipula		2			2	1				1	1
Chironomidae (non-biting midges)											
Ablabesmyia mallochi				7							
Apsectrotanypus	3	20	1	1	1						
Clinotanypus				2							
Natarsia		3	2	3	1		10				
Paramerina				1							
Procladius			1		1						
Thienemannimyia gp	5	37	14	19	5		1	4		2	3
Trissopelopia		11		8							
Zavrelimyia		11	6		2	3	64	7		2	
Odontomesa					1						
Corynoneura				1							
Cricotopus/Orthocladius										30	34
Eukiefferiella										12	2
Heterotrissocladius	27	14	2				22	4			
Hydrobaenus					1						
Limnophyes										1	
Orthocladius (Euorthocladius) w/ 13 teeth										1	
Orthocladius (Euorthocladius) w/ 19 teeth							1				
Orthocladius (Symposiocladius)							1				
Parametriocnemus		10	3	1	4		1			25	6
Paraphaenocladius								1			
Psectrocladius											2
Rheocricotopus cf robacki				2							
Rheocricotopus cf unidentatus	3		4		1						
Tvetenia				9							
Unniella				1							
Paracladopelma		1								2	4
Paralauterborniella		1									

Taxon	Sampling Location										
	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Paratendipes cf albimanus			2		1						
Phaenopsectra punctipes gp				2				1			
Polypedilum cf aviceps							3				
Polypedilum halterale gp					1						
Polypedilum illinoense gp				21			3	1			2
Polypedilum cf laetum			3	1	1						
Stenochironomus			1								
Tribelos cf jucundum					1						
Micropsectra	7				1						
Rheotanytarsus				12							
Stempellinella				44	3						
Tanytarsus		1	1	49	4						
Gastropoda (snails)											
Lymnaeidae						10		2		3	
Physidae										3	2
Bivalvia (clams, mussels)											
Sphaeriidae		18		6	18	5	3	18		7	
Number of individuals	323	320	325	300	300	316	326	139	141	327	302

Table XX. Metrics, Index of Biotic Integrity (IBI) scores, and Hilsenhoff Biotic Index (HBI) values of macroinvertebrate samples collected from CCNPP streams, April 14 - 16, 2008.

	Sampling Location										
Community metric	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-M1	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Total taxa	19	31	29	41	41	18	27	21	6	27	16
MBSS metric score (Coastal Plain)	**3**	**5**	**5**	**5**	**5**	**3**	**5**	**3**	**1**	**5**	**3**
EPT taxa	5	5	6	7	8	5	4	2	2	3	0
MBSS metric score (Coastal Plain)	**5**	**5**	**5**	**5**	**5**	**5**	**3**	**3**	**3**	**3**	**1**
Number of Ephemeroptera taxa	1	2	1	1	2	2	1	0	0	1	0
MBSS metric score (Coastal Plain)	**3**	**5**	**3**	**3**	**5**	**5**	**3**	**1**	**1**	**3**	**1**
Percent intolerant (tol val </=3) urban	91.02	55.00	56.31	27.67	39.00	31.96	10.12	22.30	1.42	0.61	0.99
MBSS metric score (Coastal Plain)	**5**	**5**	**5**	**3**	**5**	**5**	**3**	**3**	**1**	**1**	**1**
Percent Ephemeroptera	1.24	2.19	0.31	5.00	2.00	45.89	15.03	0.00	0.00	0.31	0.00
MBSS metric score (Coastal Plain)	**3**	**3**	**1**	**3**	**3**	**5**	**5**	**1**	**1**	**1**	**1**
Number of scrapers	0	0	0	0	2	2	0	1	0	2	1
MBSS metric score (Coastal Plain)	**1**	**1**	**1**	**1**	**5**	**5**	**1**	**3**	**1**	**5**	**3**
Percent climbers	0.31	2.81	1.85	2.33	1.67	49.05	15.64	3.60	1.42	3.36	1.66
MBSS metric score (Coastal Plain)	**1**	**3**	**3**	**3**	**3**	**5**	**5**	**3**	**3**	**3**	**3**
MBSS IBI score	3.00	3.86	3.29	3.29	4.43	4.71	3.57	2.43	1.57	3.00	1.86
Rating	Fair	Fair	Fair	Fair	Good	Good	Fair	Poor	Very poor	Fair	Very poor
Hilsenhoff biotic index	1.54	3.60	3.96	4.16	4.17	5.22	5.89	2.36	2.59	6.63	5.95

CCNPP macroinvertebrate information

Taxon	Tolerance value	FFG	Habit	Voucher
Turbellaria (flatworms)				
Turbellaria	8.4	pr		WB-M2
Oligochaeta (aquatic worms)				
Enchytraeidae	9.1	co		
Limnodrilus hoffmeisteri	8.6	co		
Lumbricidae		co		
Lumbriculidae	6.6	co		
Naididae	8.5	co		
Nais	8.5	co		
Tubificidae w/ hair chaetae	8.4	co		
Tubificidae w/out hair chaetae	8.4	co		
Crustacea				
Amphipoda	6	co		--
Caecidotea	2.6	co		WB-M2
Cambaridae	2.8	sh		WB-M1
Crangonyx	6.7	co		JC-M4
Gammarus	6.7	sh		WB-M2
cf Stygobromus	9.3	sh		WB-M2
Hydracarina (water mites)				
Hydracarina				
Ephemeroptera (mayflies)				
Ameletus	2.6	co	climber	WB-M1
Habrophlebia	1.7	co		UTJC-M5
Leptophlebia	1.8	co		JC-M4
Leptophlebiidae	1.7	co		--
Siphlonurus	7	co	climber	WB-M2
Odonata (damselflies/dragonflies)				
Boyeria	6.3	pr		JC-M4
Calopteryx	8.3	pr		WB-M2
Cordulegaster	2.4	pr		UTJC-M5
Gomphidae	2.2	pr		--
Hagenius brevistylus	2.2	pr		UTJC-M5
Libellulidae	9	pr		
Plecoptera (stoneflies)				
Amphinemura	3	sh		WB-M2
Eccoptera	0.6	pr		UTJC-M5
Leuctridae	0.8	sh		UTJC-M5
Nemouridae (not Amphinemura)	2.9	sh		WB-M1
Hemiptera (aquatic true bugs)				
Corixidae	5.6	pr		WB-M2
Hesperocorixa	5.6	pr		LC-I01

Microvelia	6	pr		UTJC-M5
Megaloptera (alderflies/dobsonflies)				
Nigronia rastricornis	1.4	pr	climber	WB-M2
Nigronia serricornis	1.4	pr	climber	
Sialis	1.9	pr	climber	UTGB-I1
Trichoptera (caddisflies)				
Cheumatopsyche	6.5	fi		LC-I01
Diplectrona	2.7	fi		UTJC-M5
Ironoquia	4.9	sh		UTGB-I3
Lepidostoma	0	sh	climber	UTJC-M5
Phryganeidae	4.3	sh	climber	--
Polycentropus	1.1	fi		UTJC-M5
Ptilostomis	4.3	sh	climber	WB-M2
Pycnopsyche	3.1	sh	climber	UTJC-M5
Wormaldia	1.8	fi		WB-M2
Coleoptera (beetles)				
Agabus	5.4	pr		LC-M1
cf Carabidae				UTJC-I1
Celina	5.4	pr		LC-I01
Dineutus	4	pr		UTJC-M5
Dytiscidae	5.4	pr		--
cf Enochrus	4.1	co		WB-M2
Helichus	6.4	scraper		JC-M4
Hydroporus	4.6	pr		WB-M2
Peltodytes	8.9	sh	climber	LC-I01
Scirtidae	4	co	climber	UTGB-I1
Staphylinidae				UTGB-I1
Diptera (true flies) - excluding Chironomidae				
Bittacomorpha	4	co		WB-M2
Ceratopogoninae	3.6	pr		UTJC-I2
Dixella	5.8	co		UTJC-M5
Eriopterini	4.8	co		JC-M4
Hemerodromia	7.9	pr		LC-M1
Hexatoma	1.5	pr		UTJC-M5
Limonia	4.8	sh		LC-I01
Pseudolimnophila	2.8	pr		UTJC-M5
Simuliidae (not Prosimulium)	3.2	fi		UTJC-M5
Tabanidae	2.8	pr		WB-M2
Tipula	6.7	sh		LC-M1
Chironomidae (non-biting midges)				
Ablabesmyia mallochi	8.1	pr		
Apsectrotanypus	6.6	pr		
Clinotanypus	6.6	pr		
Natarsia	6.6	pr		
Paramerina	6.6	pr		
Procladius	1.2	pr		
Thienemannimyia gp	8.2	pr		

Trissopelopia	4.1	pr		
Zavrelimyia	5.3	pr		
Odontomesa	6.6	co		
Corynoneura	4.1	co		
Cricotopus/Orthocladius	7.7	sh		
Eukiefferiella	6.1	co		
Heterotrissocladius	2	co		
Hydrobaenus	7.2	scraper		
Limnophyes	8.6	co		
Orthocladius (Euorthocladius) w/ 13 teeth	7.7			
Orthocladius (Euorthocladius) w/ 19 teeth	7.7			
Orthocladius (Symposiocladius)	4.8	pr		
Parametriocnemus	4.6	co		
Paraphaenocladius	4	co		
Psectrocladius	6.6	sh		
Rheocricotopus cf robacki	6.2	co		
Rheocricotopus cf unidentatus	6.2	co		
Tvetenia	5.1	co		
Unniella	6.6	co		
Paracladopelma	6.6	co		
Paralauterborniella	6.6	co		
Paratendipes cf albimanus	6.6	co		
Phaenopsectra punctipes gp	8.7	co		
Polypedilum cf aviceps	6.3	sh		
Polypedilum halterale gp	6.3	sh		
Polypedilum illinoense gp	6.3	sh		
Polypedilum cf laetum	6.3	sh		
Stenochironomus	7.9	sh		
Tribelos cf jucundum	7	co		
Micropsectra	2.1	co		
Rheotanytarsus	7.2	fi		
Stempellinella	4.2	co		
Tanytarsus	4.9	fi		
Gastropoda (snails)				
Lymnaeidae	6.9	scraper	climber	UTGB-I1
Physidae	7	scraper	climber	LC-M1
Bivalvia (clams, mussels)				
Sphaeriidae	6.5	fi		WB-M2

Table XX. Taxonomic composition and abundance in macroinvertebrate samples collected from streams and ponds near CCNPP, April 14 - 16, 2008.

Taxon	Sampling Location												Hilsenhoff biotic index scores										
	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1		UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Turbellaria (flatworms)																							
Turbellaria							1			45	1	8.4	0	0	0	0	0	0	0.026006	0	0	1.170279	0.026006
Oligochaeta (aquatic worms)																							
Enchytraeidae				1				1		6		9.1	0	0	0	0.028173	0	0	0	0.028173	0	0.16904	0
Limnodrilus hoffmeisteri			1	1	5	3	8	4			1	8.6	0	0	0.026625	0.026625	0.133127	0.079876	0.213003	0.106502	0	0	0.026625
Lumbricidae		1										5	0	0.01548	0	0	0	0	0	0	0	0	0
Lumbriculidae	6				2							6.6	0.122601	0	0	0	0.040867	0	0	0	0	0	0
Naididae				2	1							8.5	0	0	0	0.052632	0.026316	0	0	0	0	0	0
Nais				3								8.5	0	0	0	0.078947	0	0	0	0	0	0	0
Tubificidae w/ hair chaetae	1	1								1		8.4	0.026006	0.026006	0	0	0	0	0	0	0	0.026006	0
Tubificidae w/out hair chaetae		1		3	3		9	3		5		8.4	0	0.026006	0	0.078019	0.078019	0	0.234056	0.078019	0	0.130031	0
													0	0	0	0	0	0	0	0	0	0	0
Crustacea																							
Amphipoda			73		76		98	40	124	89	158	6	0	0	1.356037	0	1.411765	0	1.820433	0.743034	2.303406	1.653251	2.934985
Caecidotea	18	2	1	5		5	7	1				2.6	0.144892	0.016099	0.00805	0.040248	0	0.040248	0.056347	0.00805	0	0	0
Cambaridae						5						2.8	0	0	0	0	0	0.043344	0	0	0	0	0
Crangonyx		11			1	3						6.7	0	0.228173	0	0	0.020743	0.062229	0	0	0	0	0
Gammarus			10		16		22	21	9	29	72	6.7	0	0	0.20743	0	0.331889	0	0.456347	0.435604	0.186687	0.601548	1.493498
cf Stygobromus							2					9.3	0	0	0	0	0	0	0.057585	0	0	0	0
Hydracarina (water mites)																							
Hydracarina				1								5	0	0	0	0.01548	0	0	0	0	0	0	0
Ephemeroptera (mayflies)																							
Ameletus						1						2.6	0	0	0	0	0	0.00805	0	0	0	0	0
Habrophlebia				2								1.7	0	0	0	0.010526	0	0	0	0	0	0	0
Leptophlebia	4				2							1.8	0.022291	0	0	0	0.011146	0	0	0	0	0	0
Leptophlebiidae		2		13								1.7	0	0.010526	0	0.068421	0	0	0	0	0	0	0
Siphlonurus		5	1		4	144	49			1		7	0	0.108359	0.021672	0	0.086687	3.120743	1.06192	0	0	0.021672	0
Odonata (damselflies/dragonflies)																							
Boyeria					2							6.3	0	0	0	0	0.039009	0	0	0	0	0	0
Calopteryx	2	4		4	3		2		1		2	8.3	0.051393	0.102786	0	0.102786	0.07709	0	0.051393	0	0.025697	0	0.051393
Cordulegaster	1	4	3	2	5	2		14	2			2.4	0.00743	0.029721	0.022291	0.014861	0.037152	0.014861	0	0.104025	0.014861	0	0
Gomphidae				1								2.2	0	0	0	0.006811	0	0	0	0	0	0	0
Hagenius brevistylus				1								2.2	0	0	0	0.006811	0	0	0	0	0	0	0
Libellulidae							2					9	0	0	0	0	0	0	0.055728	0	0	0	0
Plecoptera (stoneflies)																							
Amphinemura	1		119		56	26	1			1		3	0.009288	0	1.105263	0	0.520124	0.241486	0.009288	0	0	0.009288	0
Eccoptera				3	1							0.6	0	0	0	0.005573	0.001858	0	0	0	0	0	0
Leuctridae	234	122	34	45	43							0.8	0.579567	0.302167	0.084211	0.111455	0.106502	0	0	0	0	0	0
Nemouridae (not Amphinemura)						61						2.9	0	0	0	0	0	0.547678	0	0	0	0	0
Hemiptera (aquatic true bugs)																							
Corixidae					2		2					5.6	0	0	0	0	0.034675	0	0.034675	0	0	0	0
Hesperocorixa										1		5.6	0	0	0	0	0	0	0	0	0	0.017337	0
Microvelia			1	2								6	0	0	0.018576	0.037152	0	0	0	0	0	0	0
Megaloptera (alderflies/dobsonflies)																							
Nigronia rastricornis		2					1				3	1.4	0	0.008669	0	0	0	0	0.004334	0	0	0	0.013003
Nigronia serricornis			1									1.4	0	0	0.004334	0	0	0	0	0	0	0	0
Sialis								1				1.9	0	0	0	0	0	0	0	0.005882	0	0	0
Trichoptera (caddisflies)																							
Cheumatopsyche										2		6.5	0	0	0	0	0	0	0	0	0	0.040248	0
Diplectrona				1								2.7	0	0	0	0.008359	0	0	0	0	0	0	0
Ironoquia					2	37		1	2			4.9	0	0	0	0	0.030341	0.5613	0	0.01517	0.030341	0	0
Lepidostoma				2								0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae		2										4.3	0	0.026625	0	0	0	0	0	0	0	0	0
Polycentropus				4								1.1	0	0	0	0.013622	0	0	0	0	0	0	0
Ptilostomis	1		1				1					4.3	0.013313	0	0.013313	0	0	0	0.013313	0	0	0	0
Pycnopsyche			3	5	1			2	2			3.1	0	0	0.028793	0.047988	0.009598	0	0	0.019195	0.019195	0	0
Wormaldia	1	7	13		6		1					1.8	0.005573	0.039009	0.072446	0	0.033437	0	0.005573	0	0	0	0
Coleoptera (beetles)																							
Agabus										24	7	5.4	0	0	0	0	0	0	0	0	0	0.401238	0.117028
cf Carabidae	1											5	0.01548	0	0	0	0	0	0	0	0	0	0
Celina										1		5.4	0	0	0	0	0	0	0	0	0	0.016718	0
Dineutus			1	1								4	0	0	0.012384	0.012384	0	0	0	0	0	0	0
Dytiscidae	1	1			1					24		5.4	0.016718	0.016718	0	0	0.016718	0	0	0	0	0.401238	0
cf Enochrus							3					4.1	0	0	0	0	0	0	0.03808	0	0	0	0

Taxon	Sampling Location												Hilsenhoff biotic index scores										
	UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1		UTJC-I1	UTJC-I2	UTJCI03	UTJC-M5	JC-M4	WB-MI	WB-M2	UTGB-I1	UTGB-I3	LC-I01	LC-M1
Helichus					2	1						6.4	0	0	0	0	0.039628	0.019814	0	0	0	0	0
Hydroporus							6					4.6	0	0	0	0	0	0	0.085449	0	0	0	0
Peltodytes										4		8.9	0	0	0	0	0	0	0	0	0	0.110217	0
Scirtidae								1				4	0	0	0	0	0	0	0	0.012384	0	0	0
Staphylinidae								1				5	0	0	0	0	0	0	0	0.01548	0	0	0
Diptera (true flies) - excluding Chironomidae																							
Bittacomorpha							1					4	0	0	0	0	0	0	0.012384	0	0	0	0
Ceratopogoninae		1	1						1			3.6	0	0.011146	0.011146	0	0	0	0	0	0.011146	0	0
Dixella				1								5.8	0	0	0	0.017957	0	0	0	0	0	0	0
Eriopterini					1							4.8	0	0	0	0	0.014861	0	0	0	0	0	0
Hemerodromia										3	2	7.9	0	0	0	0	0	0	0	0	0	0.073375	0.048916
Hexatoma		1	8	1	1			2				1.5	0	0.004644	0.037152	0.004644	0.004644	0	0	0.009288	0	0	0
Limonia						1				1		4.8	0	0	0	0	0	0.014861	0	0	0	0.014861	0
Pseudolimnophila		14	1	3				8		1		2.8	0	0.121362	0.008669	0.026006	0	0	0	0.06935	0	0.008669	0
Simuliidae (not Prosimulium)	6	2	13	3	14	7						3.2	0.059443	0.019814	0.128793	0.029721	0.1387	0.06935	0	0	0	0	0
Tabanidae	1	8			1	1	1	1				2.8	0.008669	0.06935	0	0	0.008669	0.008669	0.008669	0.008669	0	0	0
Tipula		2			2	1				1	1	6.7	0	0.041486	0	0	0.041486	0.020743	0	0	0	0.020743	0.020743
Chironomidae (non-biting midges)																							
Ablabesmyia mallochi				7								8.1	0	0	0	0.175542	0	0	0	0	0	0	0
Apsectrotanypus	3	20	1	1	1							6.6	0.0613	0.408669	0.020433	0.020433	0.020433	0	0	0	0	0	0
Clinotanypus				2								6.6	0	0	0	0.040867	0	0	0	0	0	0	0
Natarsia		3	2	3	1		10					6.6	0	0.0613	0.040867	0.0613	0.020433	0	0.204334	0	0	0	0
Paramerina				1								6.6	0	0	0	0.020433	0	0	0	0	0	0	0
Procladius			1		1							1.2	0	0	0.003715	0	0.003715	0	0	0	0	0	0
Thienemannimyia gp	5	37	14	19	5		1	4		2	3	8.2	0.126935	0.939319	0.355418	0.482353	0.126935	0	0.025387	0.101548	0	0.050774	0.076161
Trissopelopia		11		8								4.1	0	0.139628	0	0.101548	0	0	0	0	0	0	0
Zavrelimyia		11	6		2	3	64	7		2		5.3	0	0.180495	0.098452	0	0.032817	0.049226	1.050155	0.114861	0	0.032817	0
Odontomesa					1							6.6	0	0	0	0	0.020433	0	0	0	0	0	0
Corynoneura				1								4.1	0	0	0	0.012693	0	0	0	0	0	0	0
Cricotopus/Orthocladius										30	34	7.7	0	0	0	0	0	0	0	0	0	0.71517	0.810526
Eukiefferiella										12	2	6.1	0	0	0	0	0	0	0	0	0	0.226625	0.037771
Heterotrissocladius	27	14	2				22	4				2	0.167183	0.086687	0.012384	0	0	0	0.136223	0.024768	0	0	0
Hydrobaenus					1							7.2	0	0	0	0	0.022291	0	0	0	0	0	0
Limnophyes										1		8.6	0	0	0	0	0	0	0	0	0	0.026625	0
Orthocladius (Euorthocladius) w/ 13 teeth										1		7.7	0	0	0	0	0	0	0	0	0	0.023839	0
Orthocladius (Euorthocladius) w/ 19 teeth							1					7.7	0	0	0	0	0	0	0.023839	0	0	0	0
Orthocladius (Symposiocladius)							1					4.8	0	0	0	0	0	0	0.014861	0	0	0	0
Parametriocnemus		10	3	1	4		1			25	6	4.6	0	0.142415	0.042724	0.014241	0.056966	0	0.014241	0	0	0.356037	0.085449
Paraphaenocladius								1				4	0	0	0	0	0	0	0	0.012384	0	0	0
Psectrocladius											2	6.6	0	0	0	0	0	0	0	0	0	0	0.040867
Rheocricotopus cf robacki				2								6.2	0	0	0	0.03839	0	0	0	0	0	0	0
Rheocricotopus cf unidentatus	3		4		1							6.2	0.057585	0	0.07678	0	0.019195	0	0	0	0	0	0
Tvetenia				9								5.1	0	0	0	0.142105	0	0	0	0	0	0	0
Unniella				1								6.6	0	0	0	0.020433	0	0	0	0	0	0	0
Paracladopelma		1								2	4	6.6	0	0.020433	0	0	0	0	0	0	0	0.040867	0.081734
Paralauterborniella		1										6.6	0	0.020433	0	0	0	0	0	0	0	0	0
Paratendipes cf albimanus			2		1							6.6	0	0	0.040867	0	0.020433	0	0	0	0	0	0
Phaenopsectra punctipes gp				2				1				8.7	0	0	0	0.05387	0	0	0	0.026935	0	0	0
Polypedilum cf aviceps							3					6.3	0	0	0	0	0	0	0.058514	0	0	0	0
Polypedilum halterale gp					1							6.3	0	0	0	0	0.019505	0	0	0	0	0	0
Polypedilum illinoense gp				21			3	1			2	6.3	0	0	0	0.409598	0	0	0.058514	0.019505	0	0	0.039009
Polypedilum cf laetum			3	1	1							6.3	0	0	0.058514	0.019505	0.019505	0	0	0	0	0	0
Stenochironomus			1									7.9	0	0	0.024458	0	0	0	0	0	0	0	0
Tribelos cf jucundum					1							7	0	0	0	0	0.021672	0	0	0	0	0	0
Micropsectra	7				1							2.1	0.045511	0	0	0	0.006502	0	0	0	0	0	0
Rheotanytarsus				12								7.2	0	0	0	0.267492	0	0	0	0	0	0	0
Stempellinella				44	3							4.2	0	0	0	0.572136	0.039009	0	0	0	0	0	0
Tanytarsus		1	1	49	4							4.9	0	0.01517	0.01517	0.743344	0.060681	0	0	0	0	0	0
Gastropoda (snails)																							
Lymnaeidae						10		2		3		6.9	0	0	0	0	0	0.213622	0	0.042724	0	0.064087	0
Physidae										3	2	7	0	0	0	0	0	0	0	0	0	0.065015	0.043344
Bivalvia (clams, mussels)																							
Sphaeriidae		18		6	18	5	3	18		7		6.5	0	0.362229	0	0.120743	0.362229	0.100619	0.060372	0.362229	0	0.140867	0
Number of individuals	323	320	325	300	300	316	326	139	141	327	302		1.54	3.60	3.96	4.16	4.17	5.22	5.89	2.36	2.59	6.63	5.95
													1.53	3.59	3.96	4.15	4.17	5.22	5.89	2.35	2.59	6.63	5.95