Technical Memorandum

Summary of 2001 St. Clair River Sediment Core Data

Mary Thorburn
Camelia Rusmir
Duncan Boyd

Environmental Monitoring and Reporting Branch

March 2003

BACKGROUND AND OBJECTIVES

Based on 1990 study results, the Sediment and Habitat Task Team Subcommittee of the St. Clair River Remedial Action Plan identified three distinct "sediment impact zones" along the Ontario shoreline of the upper river (minutes of April 26, 1993 meeting). The six Priority 1 stations distributed among three zones were characterized by sediment contaminant concentrations exceeding the Ministry SEL, a degraded benthos, and greater than 80% toxicity to laboratory test species. Other, less impacted stations defined as Priority 2 (with SEL exceedences and impaired benthos), and Priority 3 (with SEL exceedences only) were also identified within these zones. As part of their RAP Stage 2 sediment remediation decision process, the Task Team identified the need to collect further detailed information, which will permit a comprehensive characterization of each of the three sub-areas.

During 1994-1995, the Ministry undertook an intensive study of Zone 1, the most upstream of the three zones. Sediment, benthic community and water sampling as well as biomonitoring were conducted along the Esso-Bayer-Dow shorelines (Kauss, in prep.). The Lambton Industrial Society (recently renamed the Sarnia-Lambton Environmental Association), through their consultant Pollutech Enviroquatics, conducted an assessment of the sediments within all three zones during the period 1994-1996, but with a lower density of sampling stations. In 2001, Dow Chemical Canada updated the intensive Zone 1 work for the area adjacent to their property (URS Corporation 2001).

The MOE 2001 work was intended to complete the Ministry investigations begun in 1994 by providing information on stations within the area previously described as Zones1, 2 and 3, located adjacent to and downstream of Suncor and along the mainland shore opposite Stag Island, respectively. It is important to note that the 2001 stations are not identical to the ones chosen previously within zones 1, 2 and 3. The intent in 2001 was to provide higher resolution coverage of the river south of the Dow property line (displayed with approximation in Figure 1) including the previously unsampled areas in Zones 1, 2, and 3. In this report, we have attempted to simplify presentation of the 2001 MOE data by grouping upstream results (covering the portion of Zone 1 south of the Dow property line) and the remaining downstream results from the Talford Creek and Stag Island reaches of the river. We have referred to the upstream area as "Zone A" and the downstream area as "Zone B" (Figure 1). The 2001 sampling stations are displayed in Figures 2 and 3.

This report maps the 2001 MOE data for surficial (0-5 cm core section) sediment concentrations of Hg, OCS, HCB, and HCBD since these have emerged as being the contaminants of greatest concern in the upper St. Clair River. This mapping of the extent (area) and severity of contamination is intended to provide useful background information for assessment of sediment management options. A complete listing of all sediment core results is also included in a data appendix.

METHODS

To better define the extent and severity of sediment contamination, sediment sampling - both surficial and with depth was conducted at up to 25 station transects, each comprised of three sampling locations at increasing distances from shore, resulting in a total of up to 75 sampling locations. Preference for sampling locations was given to areas of soft sediments along the nearshore. To ensure comparability with previous Ministry studies (OME, 1977; Griffiths, 1989; Pope, 1993), sampling took place at the same time of year (May-June).

At each of the sampling stations three replicate sediment cores were obtained, usually by a diver, at each of three sampling locations along the transects using a clean, 6.7 cm ID diameter plastic core tube

of ~0.5 m length. If a diver was not available, a Benthos corer was used. Individual cores were sectioned at the following intervals: 0-5 cm; and thereafter at 10 cm. increments (e.g., 5-15 cm, 15-25 cm, etc., unless there were notable differences in sediment colour or texture). At all but three of the station transects, the corresponding core intervals from the three replicates obtained at each station were composited and homogenized before submitting for analysis. The 3 replicates from each core increment were thoroughly homogenized with a clean, solvent-rinsed (hexane) stainless steel spoon in a solvent-rinsed glass tray. After a known subsample of the homogenized material was weighed (e.g., using an ointment jar of known volume) and the field (wet) weight recorded, the remaining material was distributed among the required sample jars/containers and preserved as required (OME, 1989 and updates).

At the remaining three station transects (randomly selected), nine replicate cores were obtained at each of the three sampling locations; corresponding section increments were composited in threes to permit submission of three replicates for analysis. The replicate core sections from 9 randomly selected sampling locations were submitted as discrete samples to provide data on within-station sediment chemistry variability (heterogeneity). At the same 9 sampling locations, enough extra surficial sediment (top 5 cm) was collected to submit, after homogenization, blind triplicate (split) samples for all of the analytical requests. This provided information on sample handling/preservation and transport effects, in combination with analytical reproducibility.

Ponar grab samples or Phleger cores were collected at 5-10 metre intervals along each proposed transect, beginning at ~5 metres from shore and extending perpendicular from shore to a distance of 40-60 metres offshore (i.e., as far as the beginning of the shipping channel and/or deeper water). For each sampling location, a visual record was taken with an underwater camera and the sediment characteristics were recorded, i.e., presence of macro-fauna, and fullness of the grab(s) and the GPS "fix". The 25 transects and associated 3 sampling locations per transect were determined from this preliminary sampling.

The above information was then used to select the location of three discrete sampling stations along each transect, resulting in ~75 stations in all. These included an "Inner" (close to shore), "Middle" (approximate transect mid-point), and "Outer" (furthest offshore, but still remaining on the nearshore shelf) sampling location.

Sediment, biological and water samples were submitted to the Ministry laboratories in Etobicoke and analyzed according to documented procedures (OME, 1990; OME, 1992; OMEE, 1994a-d; OMEE, 1995a-f, OMEE, 1996; OMEE, 1997a-b).

Surficial sediment chemistry data were compared to the Ontario Aquatic Sediment Quality Guidelines (Persaud *et al*., 1993) however the MOE-recommended sediment "cleanup targets" (Kauss *et al*., 2001) were used to produce sediment quality maps for the 2001 MOE data.

The mean area weighted concentrations were computed using the following equation:

$$\frac{A1c1 + A2c2 + ... + Ancn}{Atotal},$$

Where A = polygon area, c = concentration of pollutant, Atotal = total area of zone A or B

RESULTS AND DISCUSSION

This section presents results on 2001 MOE sediment contaminant concentrations and highlights the areas where contaminant concentrations exceed the MOE-recommended sediment cleanup targets (Kauss *et al.* 2001). These targets were 2 mg/kg for Hg; 220 µg/kg for HCB; 3500 µg/kg for HCBD; 20 µg/kg for OCS (Table 2). For Hg, an additional threshold value of 10 µg/kg has also been identified since this was the provisional value proposed by Dow Chemical Canada Inc. as an action level for dredging in the upstream zone adjacent to their property.

Surface (0-5 cm) sediment contaminant concentrations for the MOE 2001 data are shown in Table 1 and Figures 4 – 11. Results for all sediment cores (including surficial sediment) are presented in Appendix 1. Tables 2 and 3 display the polygon areas associated with contaminant concentrations and the area-weighted concentrations.

Contaminant distribution

The total assessed area within Zone A is approximately 34,200 m^2 while the total assessed area within Zone B is approximately 267,570 m^2. Based on the area of polygons corresponding to the various threshold criteria the following estimates have been made (Table 2). Approximately 5% of zone A had surficial mercury (Hg) concentrations greater than 10 mg/kg and 39% had concentrations ranging between 2 mg/kg and 10 mg/kg. The remaining 56% of zone A had Hg concentrations < 2 mg/kg (MOE Provincial Sediment Quality Guideline Severe Effect Level). Within zone B, Hg concentrations were found to be < 2 mg/kg within 70% of this area. The remaining 30% of the area had Hg concentrations ranging from 2 to 9.30 mg/kg.

Hexacholorobenzene (HCB) concentrations exceeded the recommended target of 220 µg/kg over approximately 43% of Zone A and about 4% of Zone B. Hexacholorobutadiene (HCBD) concentrations were found to be much lower than the established criteria of 3500 µg/kg within both assessed zones. Their values ranged from 52 to 1600 µg/kg within zone A, and from 7 to 610 µg/kg within zone B. Octachlorostyrene (OCS) concentrations exceeded the 20 µg/kg target throughout 91% of Zone A, and about 80% of Zone B. OCS concentrations ranged from 14 to 160 µg/kg within zone A and from 3 to 150 µg/kg within zone B.

The area-weighted concentrations computed for zones A and B are shown in tables 2 and 3. Area-weighted mean concentrations of Hg and OCS exceeded their target criteria within zone A, with values of 3.8 mg/kg and 81.5µg/kg, respectively (although the variance term is high). The area-weighted OCS concentration also exceeded its target within zone B with 37.2 µg/kg while Hg fell below with a concentration of 1.5 mg/kg (Table 3).

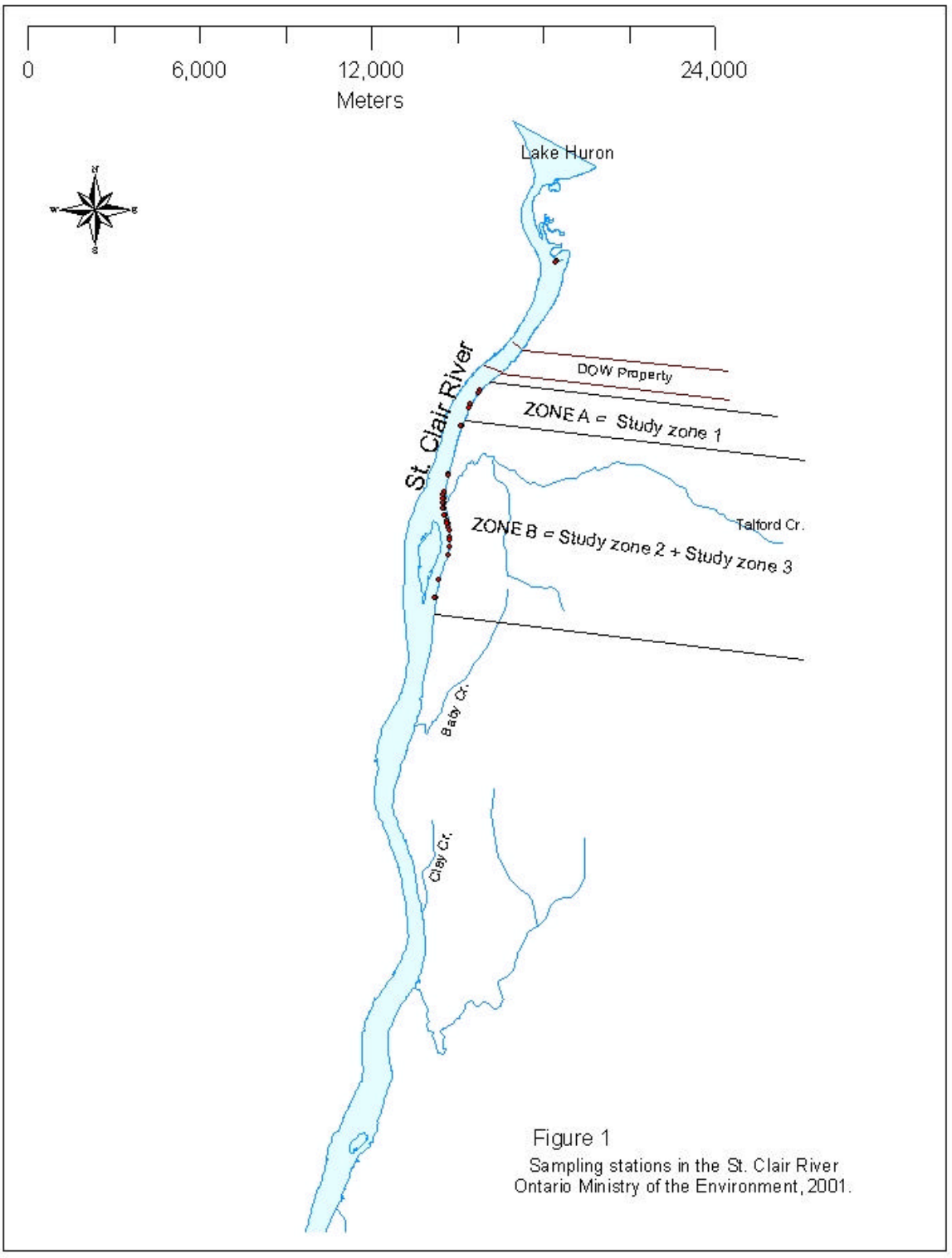
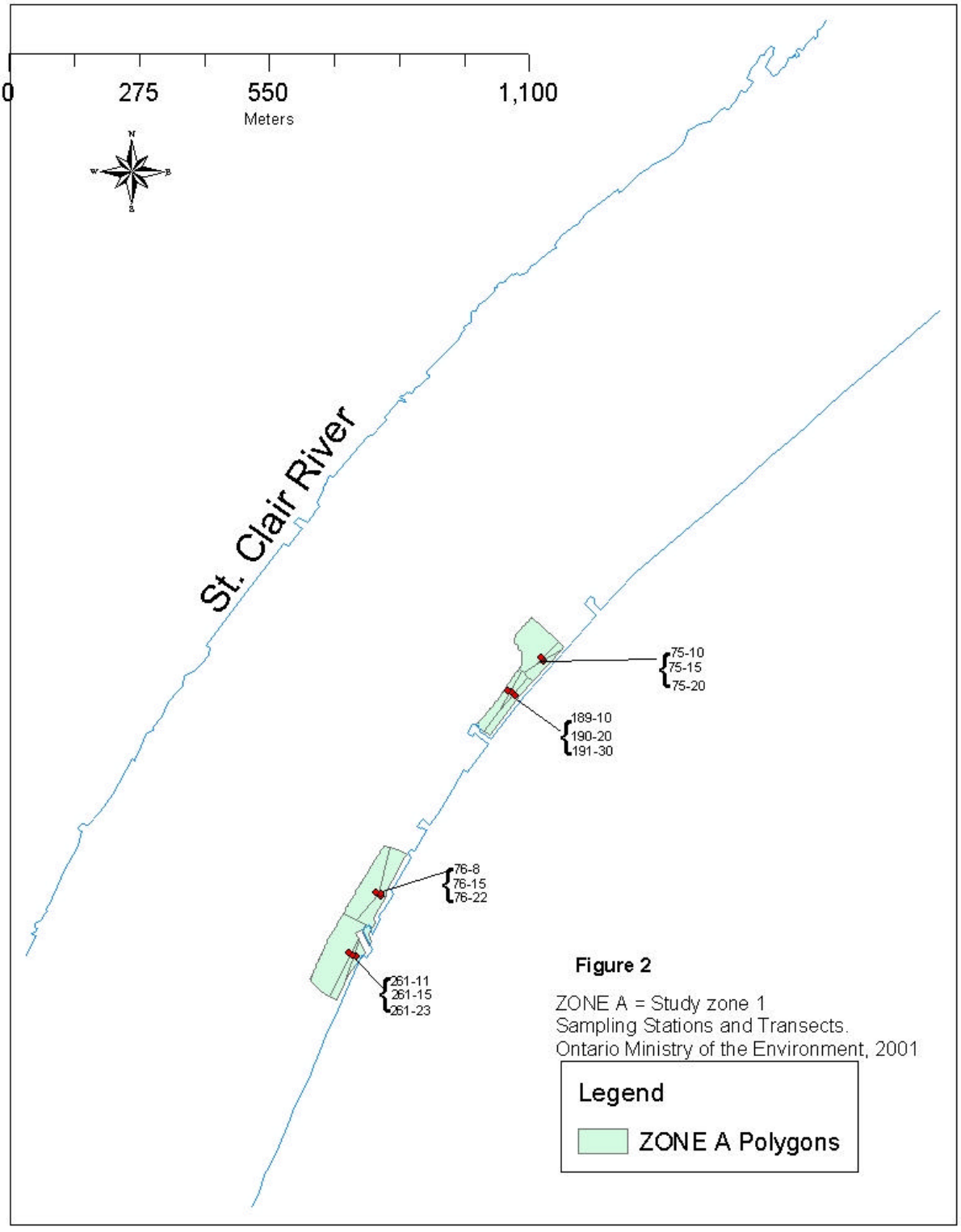
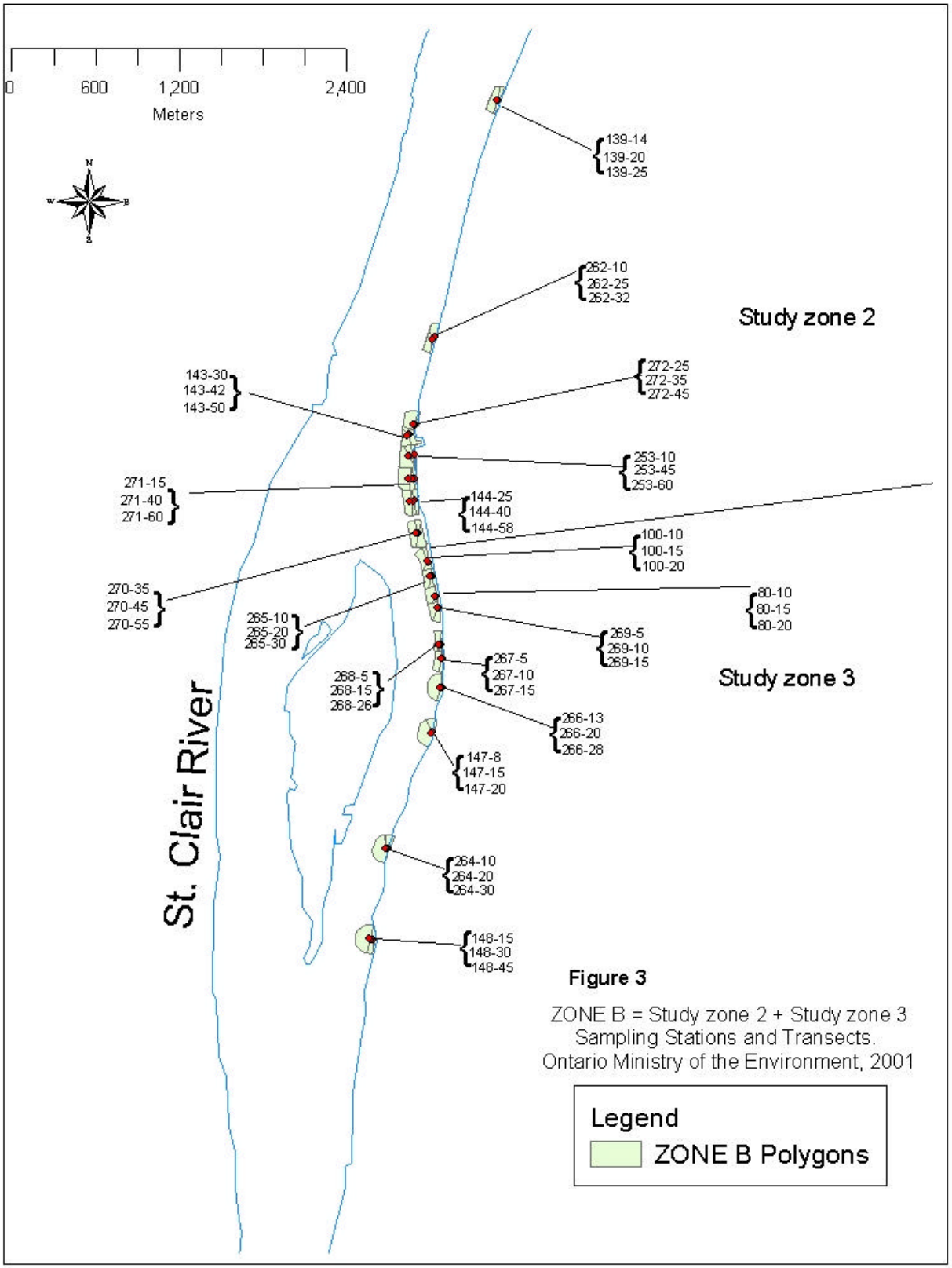
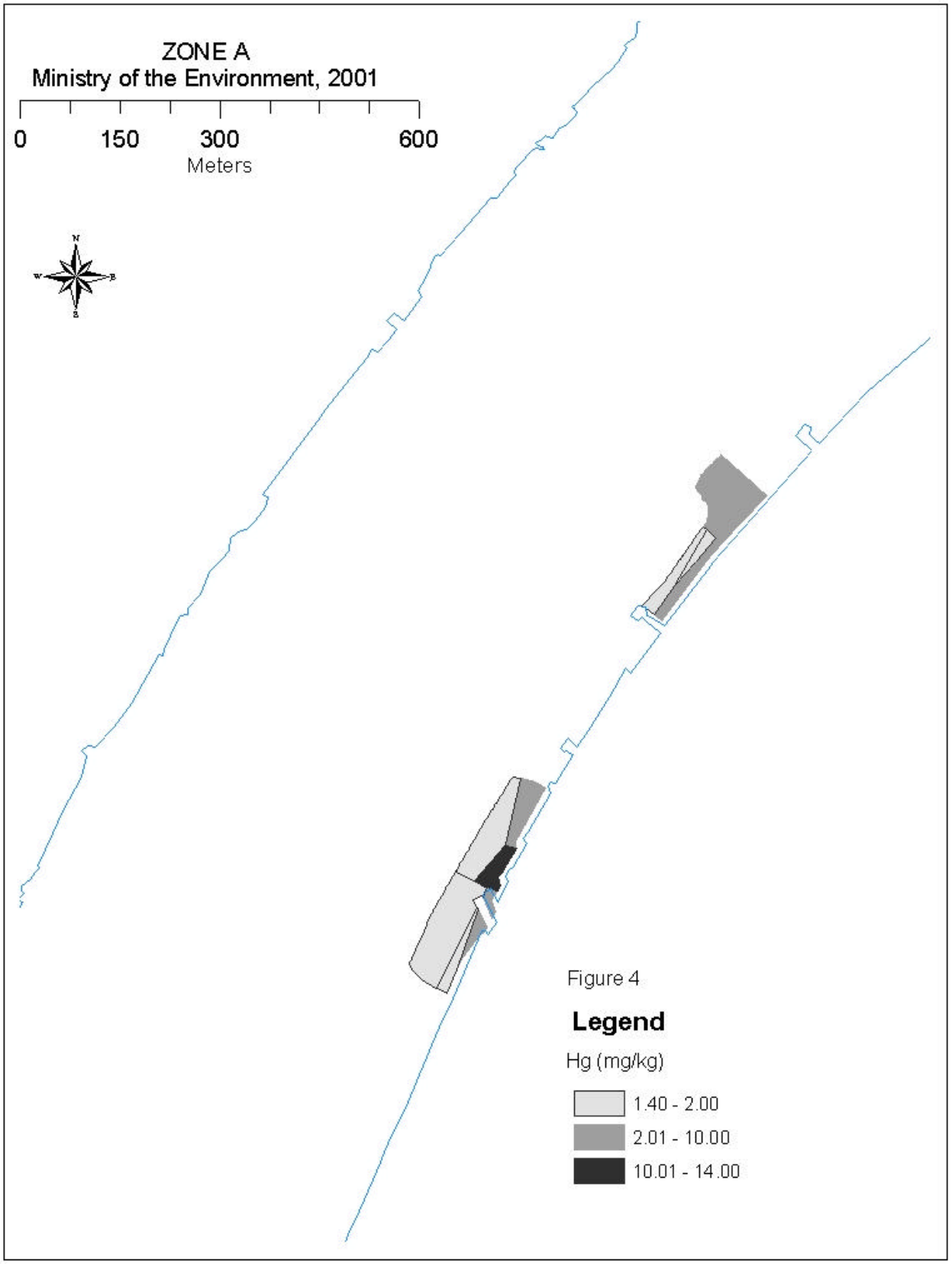
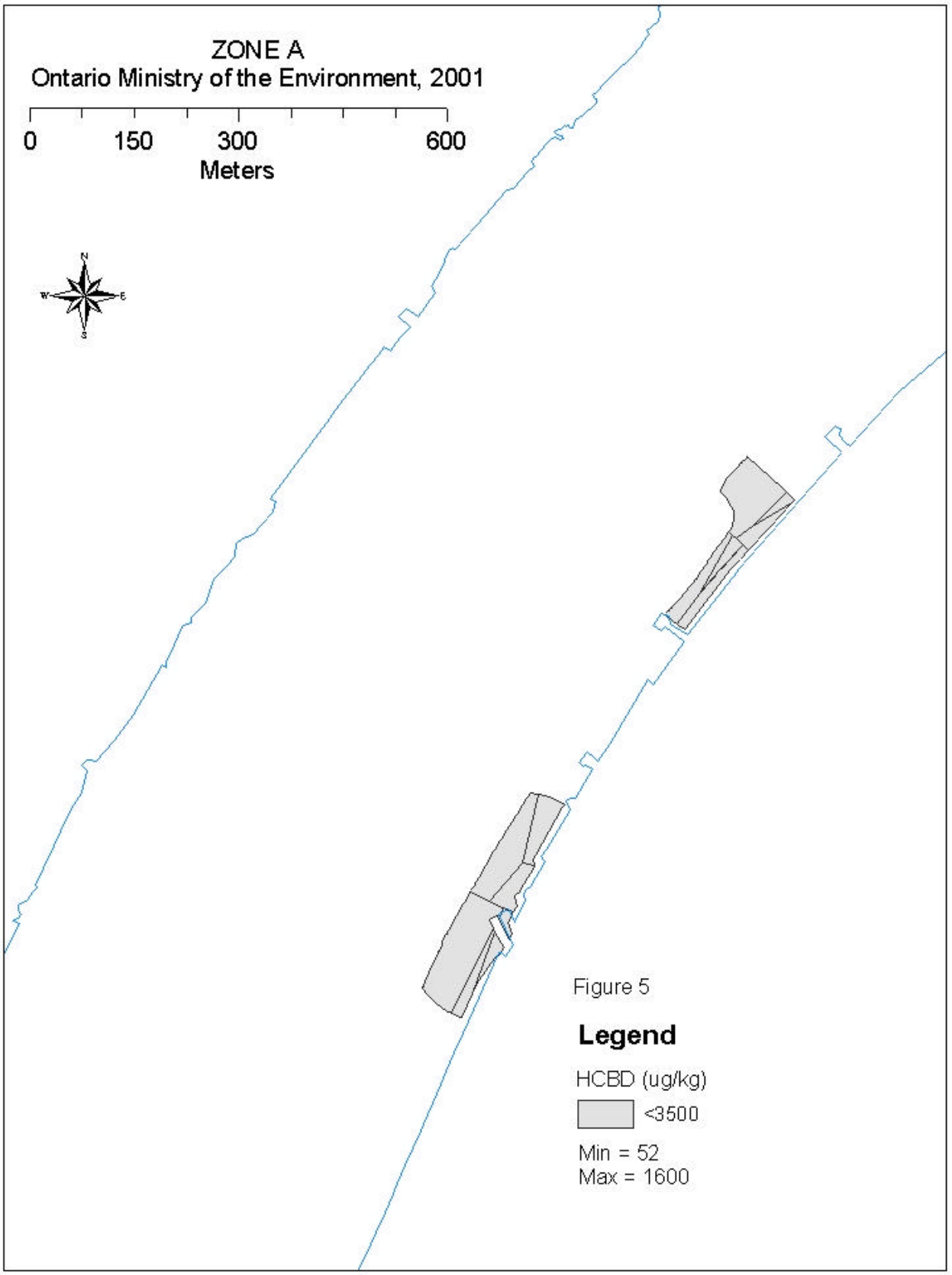


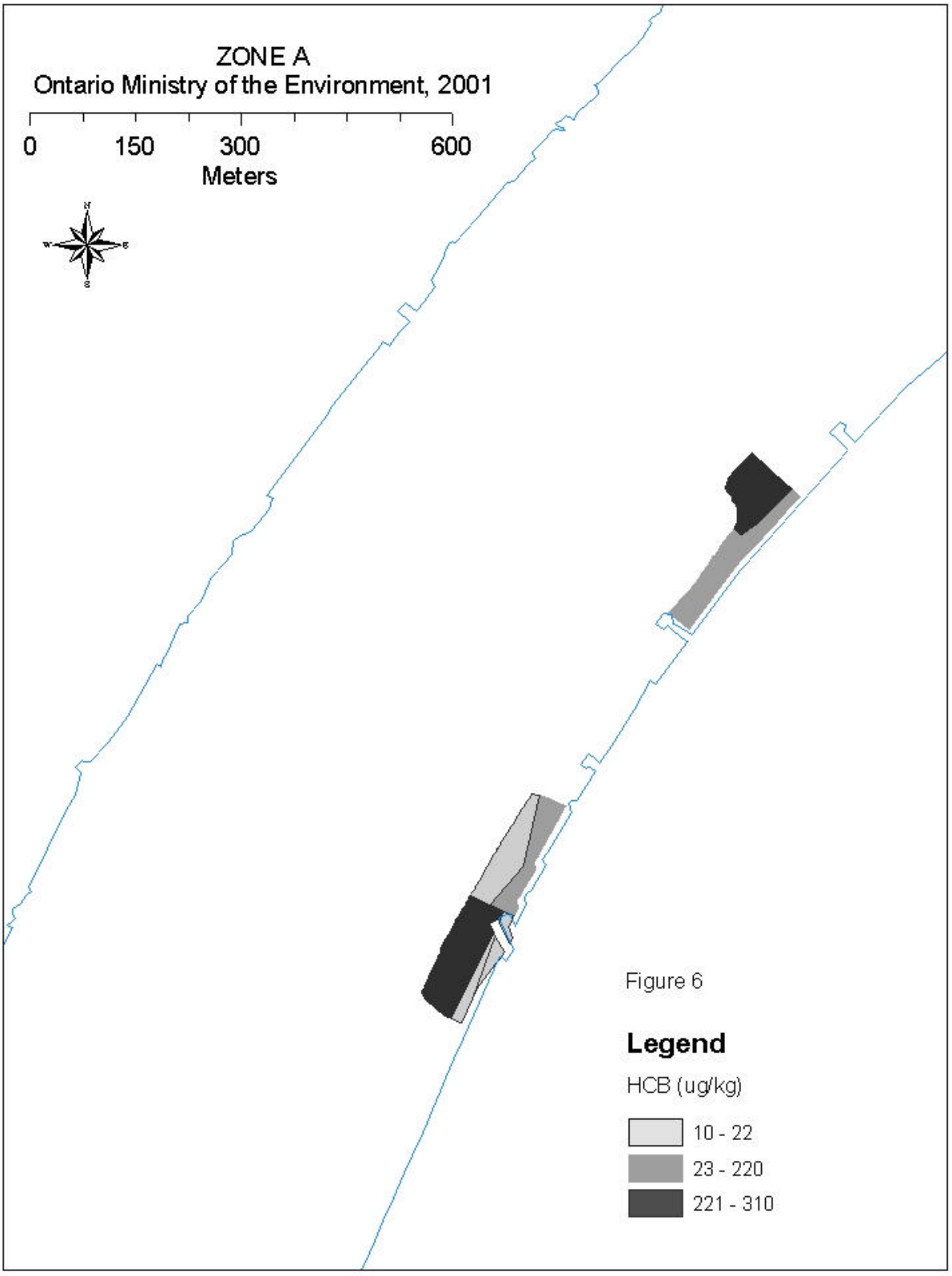
Figure 1
Sampling stations in the St. Clair River
Ontario Ministry of the Environment, 2001.

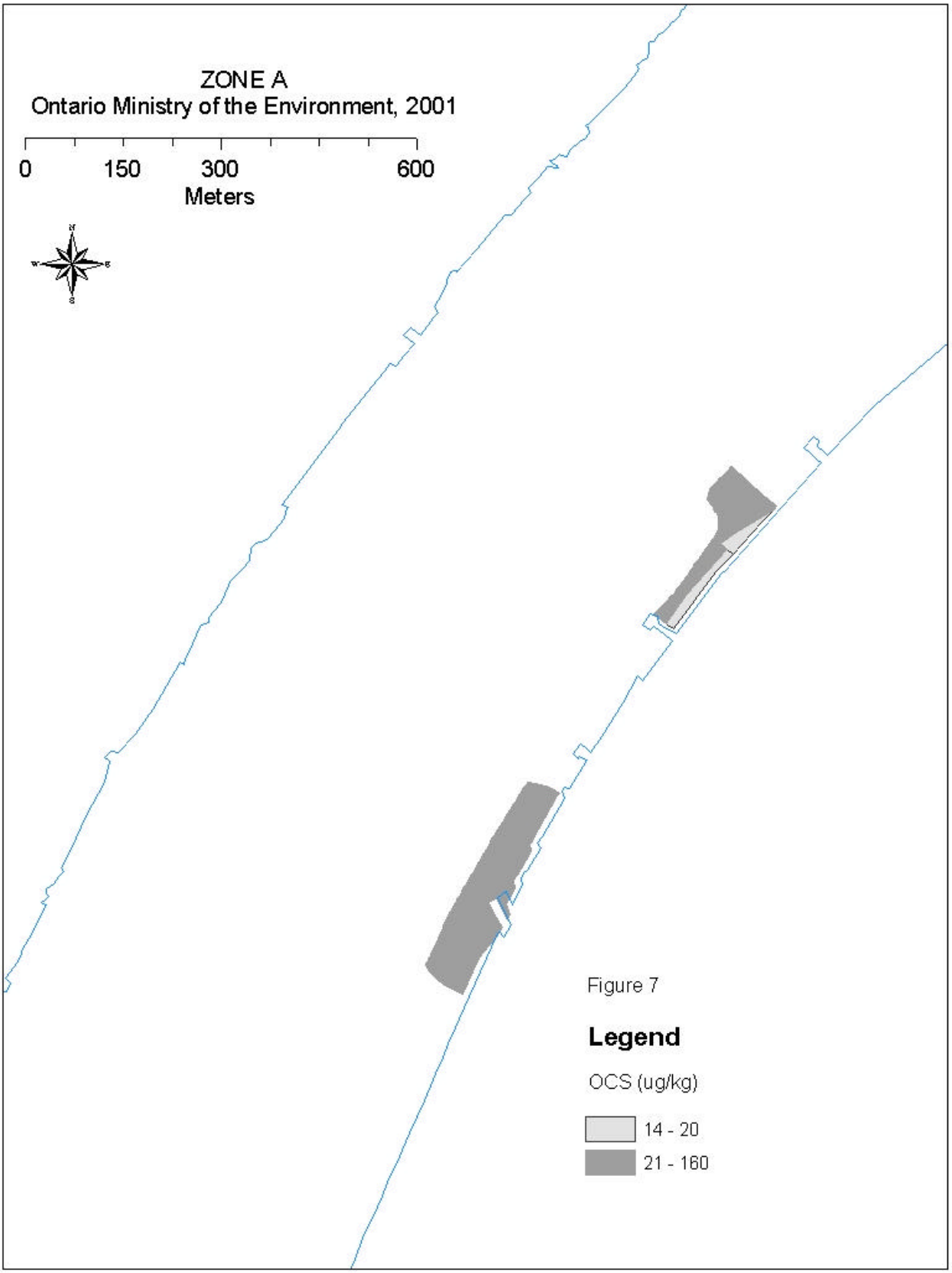

0
275
550
1,100
Meters
St. Clair River
75-10
75-15
75-20
189-10
190-20
191-30
76-8
76-15
76-22
261-11
261-15
261-23
Figure 2
ZONE A = Study zone 1
Sampling Stations and Transects.
Ontario Ministry of the Environment, 2001
Legend
ZONE A Polygons

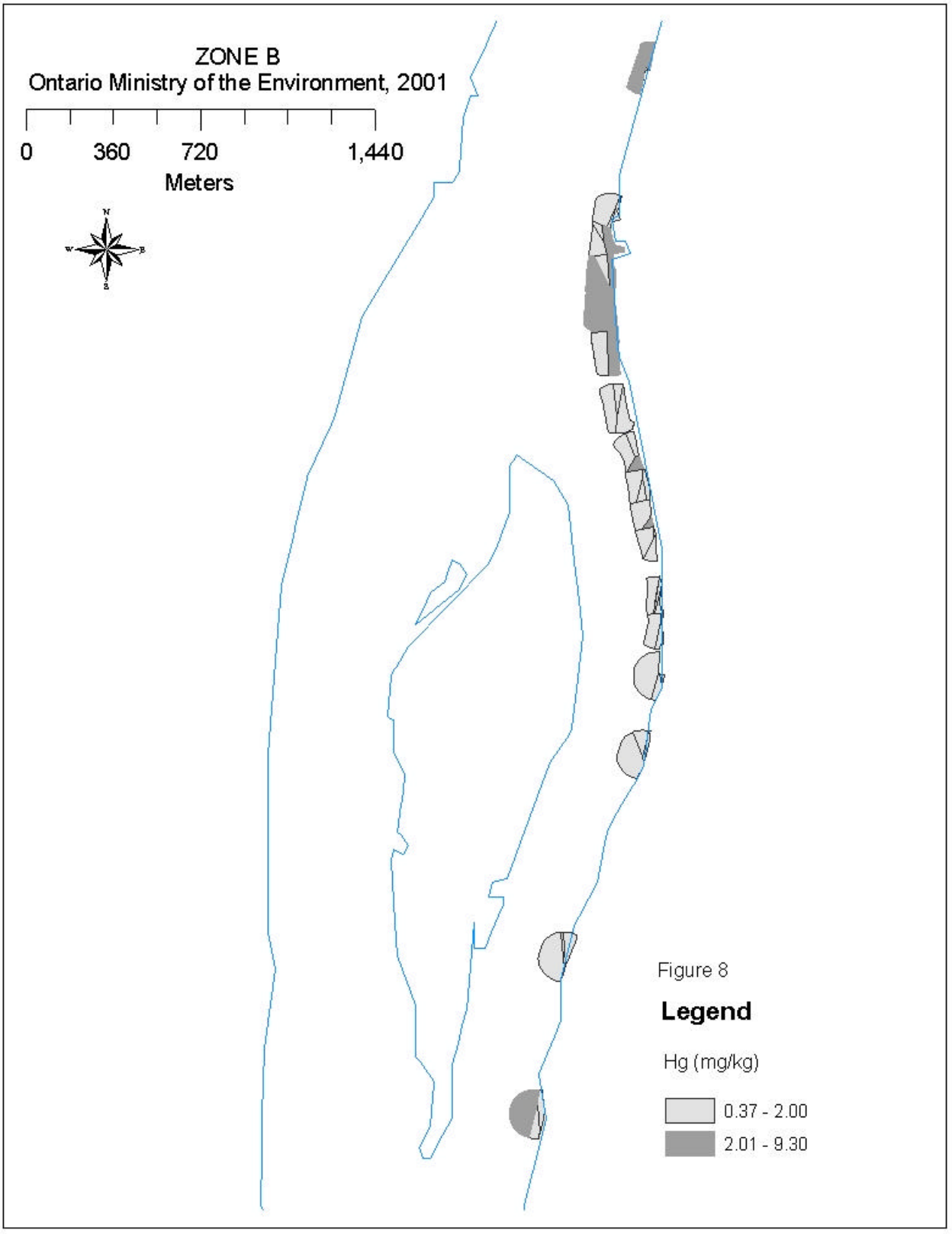

0
600
1,200
2,400
Meters
N
W
E
S
139-14
139-20
139-25
262-10
262-25
262-32
Study zone 2
143-30
143-42
143-50
272-25
272-35
272-45
253-10
253-45
253-60
271-15
271-40
271-60
144-25
144-40
144-58
100-10
100-15
100-20
270-35
270-45
270-55
80-10
80-15
80-20
265-10
265-20
265-30
269-5
269-10
269-15
Study zone 3
268-5
268-15
268-26
267-5
267-10
267-15
266-13
266-20
266-28
147-8
147-15
147-20
264-10
264-20
264-30
148-15
148-30
148-45
St. Clair River
Figure 3
ZONE B = Study zone 2 + Study zone 3
Sampling Stations and Transects.
Ontario Ministry of the Environment, 2001
Legend
ZONE B Polygons

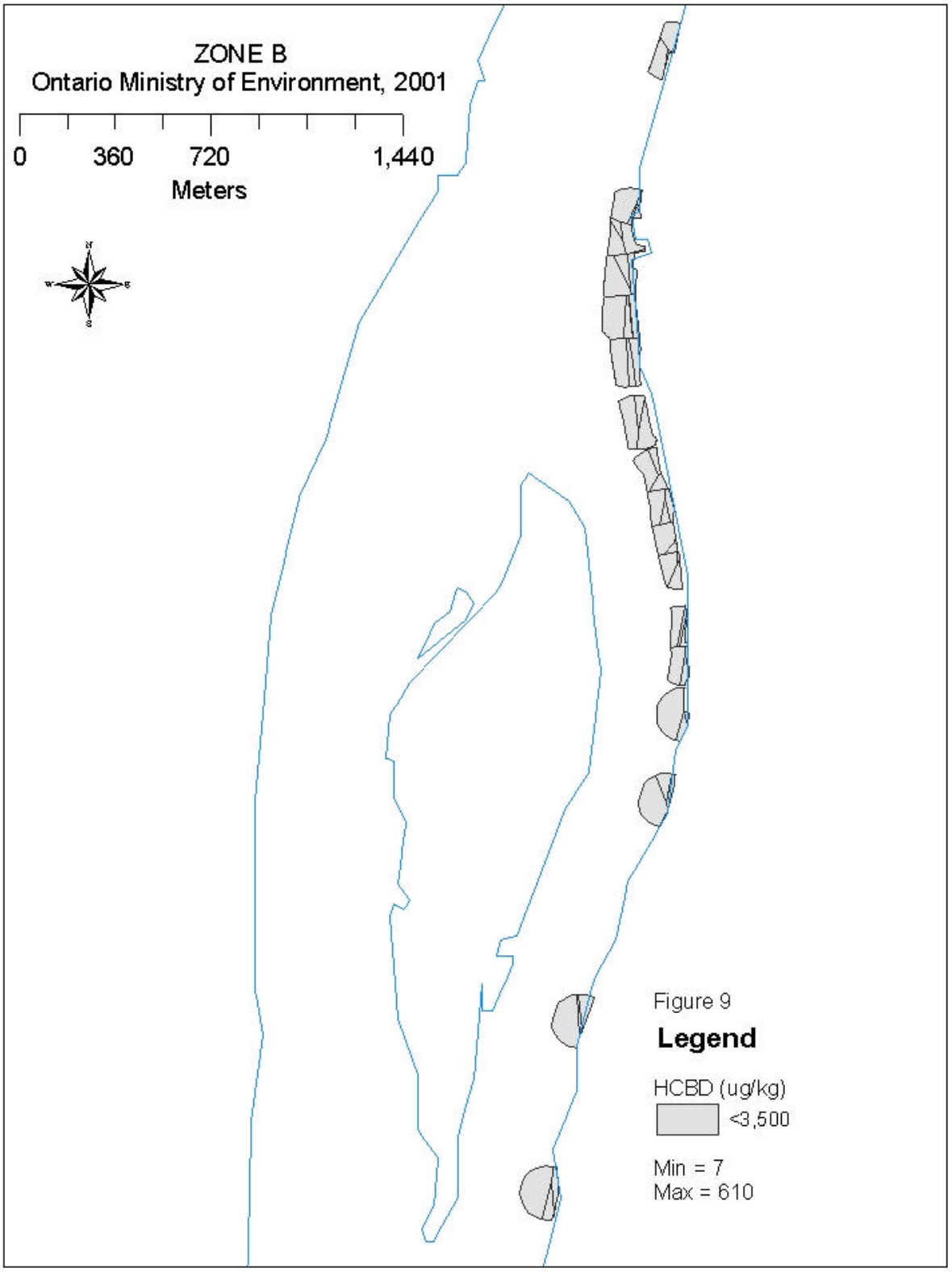

ZONE A
Ministry of the Environment, 2001
0
150
300
600
Meters
N
W
E
S
Figure 4
Legend
Hg (mg/kg)
1.40 - 2.00
2.01 - 10.00
10.01 - 14.00

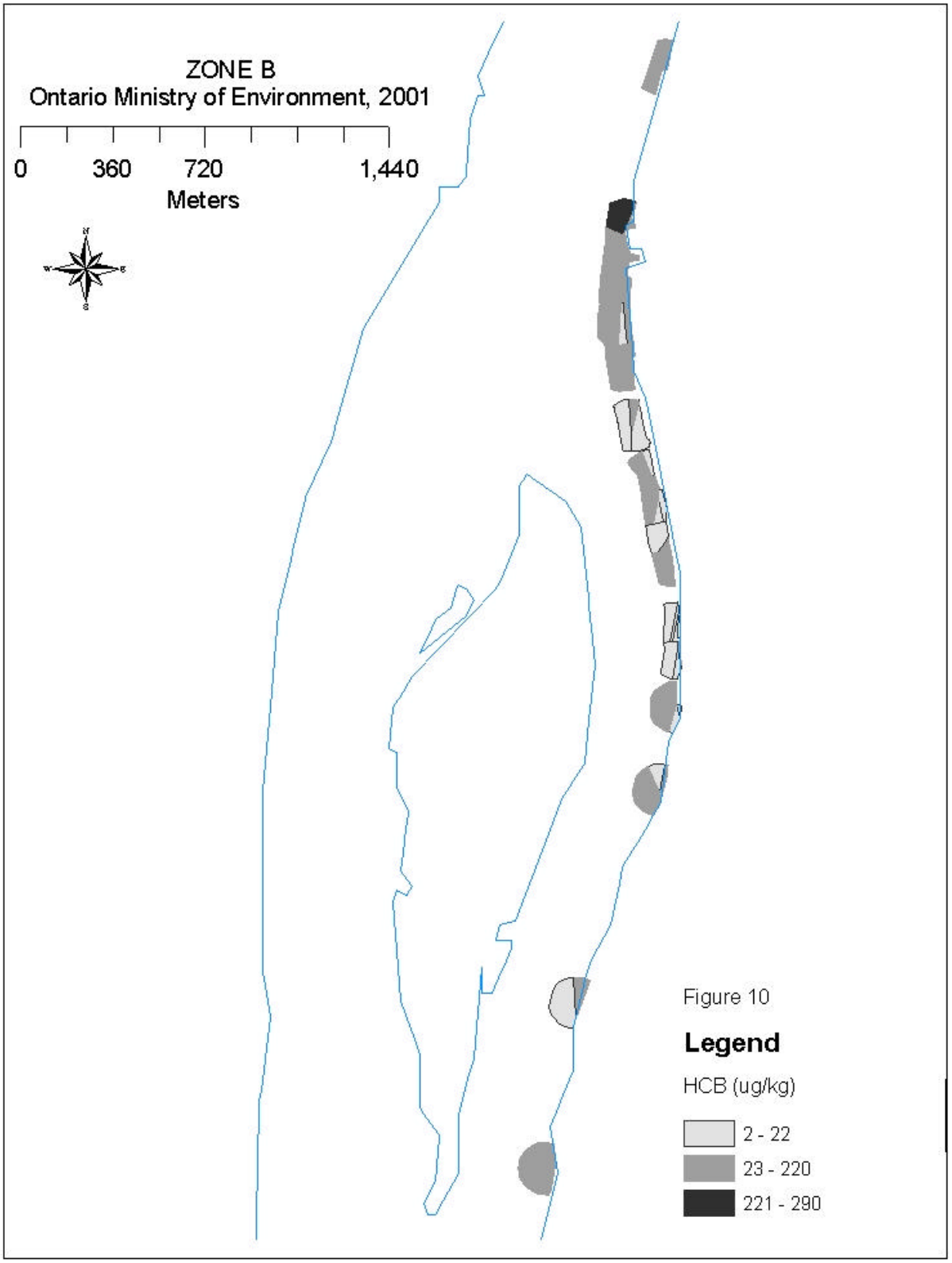

ZONE A
Ontario Ministry of the Environment, 2001
0
150
300
600
Meters
N
W
E
S
Figure 5
Legend
HCBD (ug/kg)
<3500
Min = 52
Max = 1600

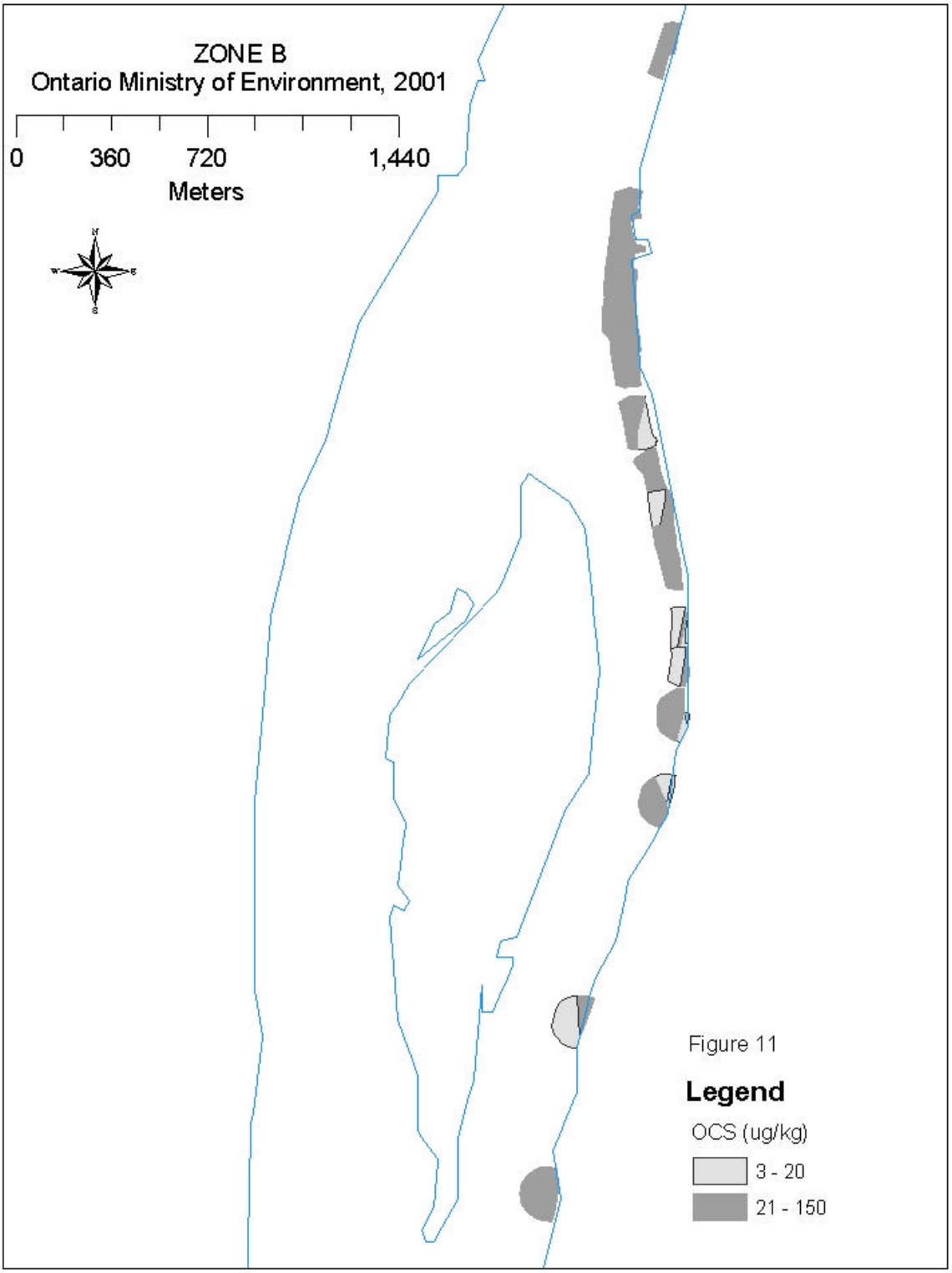

ZONE A
Ontario Ministry of the Environment, 2001
0
150
300
600
Meters
Figure 6
Legend
HCB (ug/kg)
10 - 22
23 - 220
221 - 310


ZONE A
Ontario Ministry of the Environment, 2001
0
150
300
600
Meters
Figure 7
Legend
OCS (ug/kg)
14 - 20
21 - 160


ZONE B
Ontario Ministry of the Environment, 2001
0
360
720
1,440
Meters
N
W
E
S
Figure 8
Legend
Hg (mg/kg)
0.37 - 2.00
2.01 - 9.30


ZONE B
Ontario Ministry of Environment, 2001
0
360
720
1,440
Meters
Figure 9
Legend
HCBD (ug/kg)
<3,500
Min = 7
Max = 610


ZONE B
Ontario Ministry of Environment, 2001
0
360
720
1,440
Meters
Figure 10
Legend
HCB (ug/kg)
2 - 22
23 - 220
221 - 290


ZONE B
Ontario Ministry of Environment, 2001
0
360
720
1,440
Meters
Figure 11
Legend
OCS (ug/kg)
3 - 20
21 - 150

Transect #	m from shore	Core section (cm)	Hg (mg/kg)	HCBD (ug/kg)	HCB (ug/kg)	OCS (ug/kg)	PCB (ug/kg)	Easting(m)	Northing (m)
263	50	0-5	0.02	1	1	1	40	384923	4759401
263	110	0-5	0.01	1	1	1	40	384865	4759386
263	135	0-5	0.01	1	1	1	20	384853	4759359
75	10	0-4	2.20	79	24	14	60	382224	4754873
75	15	0-4	6.30	79	24	27	140	382221	4754878
75	20	0-5	8.90	1600	280	61	120	382218	4754881
189	10	0-4	2.70	77	42	17	100	382163	4754799
190	20	0-5	1.60	250	68	30	80	382155	4754806
191	30	0-5	1.60	1000	100	68	320	382148	4754810
76	8	0-5	14.00	130	210	130	320	381878	4754375
76	15	0-5	4.20	260	29	41	40	381879	4754380
76	22	0-5	1.70	790	10	63	120	381870	4754382
261	11	0-5	2.50	52	18	22	60	381826	4754247
261	15	0-5	1.90	240	18	33	60	381818	4754250
261	23	0-5	1.40	520	310	160	120	381812	4754253
139	14	0-5	0.71	230	12	20	20	381555	4753629
139	20	0-5	0.95	280	41	42	40	381549	4753629
139	25	0-5	0.89	610	28	21	120	381543	4753631
262	10	0-5	3.30	590	210	150	340	381102	4751929
262	25	0-5	1.60	200	87	90	140	381086	4751912
262	32	0-5	9.30	320	170	75	80	381079	4751913
272	25	0-5	1.80	120	100	43	80	380959	4751298
272	35	0-5	1.30	80	160	30	40	380951	4751300
272	45	0-5	1.30	85	290	71	60	380942	4751304
143	30	0-2	5.90	100	180	100	100	380919	4751230
143	42	0-5	1.10	170	35	38	60	380906	4751229
143	50	0-5	0.77	180	30	23	60	380900	4751225
253	10	0-5	2.20	72	23	42	80	380956	4751083
253	45	0-5	1.50	130	62	42	60	380919	4751080
253	60	0-5	2.30	44	25	41	80	380908	4751074
271	15	0-5	3.82	130	68	35	130	380956	4750918
271	40	0-2	3.60	100	20	21	40	380932	4750916
271	60	0-5	2.60	73	25	39	80	380912	4750917
144	25	0-5	3.60	87	100	31	40	380955	4750756
144	40	0-3	2.40	77	30	29	80	380942	4750917

Table 1. Contd.

Transect #	m from shore	Core depth (cm)	Hg (mg/kg)	HCBD (ug/kg)	HCB (ug/kg)	OCS (ug/kg)	PCB (ug/kg)	Easting(m)	Northing (m)
144	58	0-5	0.56	120	27	42	40	380922	4750756
270	35	0-2	1.10	38	14	15	40	380982	4750754
270	45	0-3	0.88	54	49	30	140	380972	4750753
270	55	0-3	0.76	84	15	22	20	380961	4750519
100	10	0-5	3.60	190	89	80	60	381053	4750521
100	15	0-5	1.60	79	8	74	60	381046	4750520
100	20	0-5	1.20	190	89	80	80	381041	4750317
265	10	0-5	1.20	95	22	29	100	381084	4750326
265	20	0-5	1.00	110	15	30	40	381074	4750324
265	30	0-5	0.77	36	23	17	40	381065	4750213
80	10	0-5	2.20	32	25	39	40	381108	4750211
80	15	0-5	2.30	53	120	72	40	381109	4750213
80	20	0-5	1.20	120	2	23	60	381103	4750067
269	5	0-5	0.99	28	73	21	80	381125	4750069
269	10	0-5	1.10	100	60	51	40	381121	4750071
269	15	0-5	1.40	150	35	35	60	381118	4749989
268	5	0-3	0.42	14	6	5	200	381144	4749992
268	15	0-3	0.91	80	22	23	60	381135	4749992
268	26	0-2	0.89	160	19	11	40	381124	4749724
267	5	0-5	1.30	52	26	44	60	381155	4749726
267	10	0-5	0.37	36	21	29	40	381149	4749728
267	15	0-5	0.71	81	22	16	80	381144	4749628
266	13	0-5	0.48	7	6	3	60	381152	4749627
266	20	0-5	0.75	8	5	3	40	381144	4749628
266	28	0-5	0.85	120	26	21	20	381137	4749418
147	8	0-5	1.30	83	41	19	40	381083	4749416
147	15	0-5	0.76	31	14	11	60	381078	4749418
147	22	0-5	1.70	38	25	23	80	381071	4749095
264	10	0-4	1.80	31	34	54	40	380761	4749096
264	20	0-4	0.99	96	28	28	40	380752	4749093
264	30	0-3	1.00	67	14	14	80	380745	4748263
148	15	0-5	1.26	58	26	25	60	380656	4748263
148	30	0-5	1.43	50	46	30	90	380641	4747612
148	45	0-5	2.10	58	46	34	67	380626	4747616

ZONE A
ZONE B

Table 2. Contaminant concentrations ranges and corresponding polygon areas

ZONE A

Contaminant	Concentration	Severe Effect level	Area (m^2)	Area (%)	WT Mean	STD	95% CI
Hg (mg/kg)	1.40-2.00	2.00	19009	55.58	1.56	1.25	1.10
	2.01-10		13418	39.23	5.73	8.47	6.78
	10.01-14.00		1773	5.19	8.71*		
HCB (ug/kg)	10-22	220	8225	24.05	12.70	6.21	7.03
	23-220		11251	32.90	75.97	80.21	59.41
	221-310		14725	43.05	298.21	113.36	157.11
HCBD (ug/kg)	< 3500	3500	34201	100	648.88	998.48	564.93
OCS (ug/kg)	14-20	20	3195	9.34	15.82	6.74	9.34
	21-160		31005	90.66	88.28	138.09	85.59

ZONE B

Contaminant	Concentration	Severe Effect level	Area (m^2)	Area (%)	WT Mean	STD	95% CI
Hg (mg/kg)	0.37-2.00	2.00	186229	69.60	1.27	1.24	0.39
	2.01-9.30		81343	30.40	2.32	3.19	1.67
HCB (ug/kg)	7-22	220	65324	24.41	13.59	12.12	5.76
	23-220		180471	67.45	57.29	69.69	22.46
	221-290		10341	3.86	218.80*		
HCBD (ug/kg)	<3500	3500	267572	100.00	122.62	214.92	57.32
OCS (ug/kg)	3-20	20	54071	20.21	10.59	8.64	5.36
	21-150		213501	79.79	43.98	50.96	15.23

WT Mean= area weighted concentration
STD= standard deviation
95% CI= 95% confidence interval
* = computed for one polygon

Table 3. Zone description and average contaminant concentrations

Description	Area	Hg (mg/kg)			HCB (ug/kg)			HCBD (ug/kg)			OCS (ug/kg)		
	(m^2)	WT Mean	STD	95%CI	WT Mean	STD	95%CI	WT Mean	STD	95%CI	WT Mean	STD	95%CI
Zone A	34201	3.84	4.99	2.82	156.48	302.30	171.04	648.88	998.48	564.93	81.51	140.06	79.25
Zone B	267572	1.54	1.96	0.52	46.72	65.81	17.55	122.62	214.92	57.32	37.18	47.49	12.67

WT Mean= area weighted concentration
STD= standard deviation
95% CI= 95% confidence interval

Reference:

Griffiths, R.W., 1989. Environmental Quality Assessment of the St. Clair River as Reflected by the 1985 Distribution of Benthic Invertebrates. Aquatic Ecostudies Limited (Kitchener, Ont.) report for the Ontario Ministry of the Environment, Southwestern Region and Water Resources Branch. London and Toronto, Ontario. 41 pp. + appendices.

Kauss, P., Boyd, D., Jaagumagi, R. and M. Wilson, 2001. Biologically Based Sediment Cleanup Targets for Contaminated Sediments in the Upper St. Clair River, Technical Memorandum to MOE SW Region, 23 April, 2001.

OME (Ontario Ministry of the Environment), 1977. St. Clair River Organics Study Biological Surveys. Southwestern Region. London, Ontario. 90 pp.

OME (Ontario Ministry of the Environment), 1990. The Determination of Arsenic, Selenium and Antimony in Vegetation, Soil and Sediments by Hydride-Flameless Atomic Absorption Spectrophotometry (HYD-FAAS). Laboratory Services Branch. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1994a. The Determination of Trace Metals in Sediments by the Spectro Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES). HMARSOIL-E3062A. Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1994b. The Determination of Organic Solvent
Extractable Materials in Solids by Soxhlet Extraction. SXTS-E3241A. Laboratory Services Branch, Quality
Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1994c. The Determination of Polynuclear Aromatic Hydrocarbons in Soil and Sediments by Gel Permeation Chromatography-high Performance Liquid
Chromatography (PC-HPLC). PSAPAH-E3350A. Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1994d. The Determination of Polychlorinated Biphenyls (PCBs), Organochlorines (OCs) and Chlorobenzenes (CBs) in Soil and Sediments by Gas Liquid Chromatography-Electron Capture Detection (GLC-ECD). PSAOC-E3270A. Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1995a. The Determination of Total Carbon in Soil and Sediments by the Leco Carbon Analyzer. CARBONTC-E3142A. Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1995b. The Determination of Moisture Content, RST, RSTA, and LOI in Sediments by Gravimetry. PHYSOLID-E3139A Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1995c. The Determination of Total Carbonate-Carbon in Soil and Sediments by Coulometry (PHYSOLID-E3012A). Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy),1995d. The Determination of Total Kjeldahl Nitrogen and Total Phosphorus in Soil and Sediments by Colourimetry (NPSED-E3116A). Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1996. The Determination of Volatile Organohalides and Hydrocarbons in Sediments, Sludges and Kiln Dust by Headspace Capillary Gas Chromatography (GC). LFHS/S-E3254A. Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1997a. The Determination of Polychlorinated Biphenyls (PCB), Organochlorines (OC) and Chlorobenzenes (CB) in Fish and Clams by Gas/Liquid Chromatography-Electron Capture Detection (GLC-ECD). Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

OMEE (Ontario Ministry of Environment and Energy), 1997b. The Determination of Polynuclear Aromatic Hydrocarbons (PAH) in Biomaterials by Gas Chromatography-Mass Spectrometry (GC-MS). Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

Biphenyls (PCBs), Organochlorines (OCs) and Chlorobenzenes (CBs) in Soil and Sediments by Gas Liquid Chromatography-Electron Capture Detection (GLC-ECD). PSAOC-E3270A. Laboratory Services Branch, Quality Management Office. Etobicoke, ON.

Pope, R.J., 1993. Assessment of 1990 St. Clair River Benthic-Macroinvertebrate Communities Relative to Sediment Quality. Tarandus Associates Limited (Brampton, Ont.) report for the Ontario Ministry of Environment and Energy's Southwestern Region, Detroit, St. Clair and St. Marys Rivers Improvement Team, and Water Resources Branch. London, Sarnia and Toronto, Ontario. 124 pp.

URS Corporation, 2001. Characterization of St. Clair River Sediments in Dow Outfall Area, Sarnia, Ontario, Dow Chemical Canada Inc., Draft Report, Project No. 01097-152-312.

APPENDIX 1

Contaminants, silt and clay and TOC concentrations in 2001 St. Clair River sediment samples.
All concentrations on dry weight basis.

Transect Number	metres from CDN shore	Core Section cm - cm	Sample Date	Sample Number	Silt & Clay %	Total Organic Carbon g/kg	Mercury mg/kg	Hexa-chloro-butadiene ug/kg	Hexa-chloro-benzene ug/kg	Octa-chloro-styrene ug/kg	Total PCBs ug/kg	Tetra-chloro-etene ug/kg	Carbon – chloride ug/kg	Toluene ug/kg	m-& p-Xylene ug/kg	o-Xylene ug/kg	Ethyl-benzene ug/kg
263	50	0-5	11-12 June	12137			0.02 <T	1 =W	1 <=W	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12138			0.04 <T	1 =W	3 <T	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12139			0.05	1 =W	5 <T	1 <=W	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	25-35	"	12140			0.05	1 =W	1 <=W	1 <=W	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	35-45	"	12141			0.03 <T	1 =W	2 <T	1 <=W	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	45-55	"	12142			0.02 <T	1 =W	2 <T	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	55-67	"	12143			0.04 <T	1 =W	1 <=W	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	110	0-5	"	12144			0.01 <=W	1 =W	1 <=W	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12145			0.01 <=W	1 =W	2 <T	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-30	"	12146			0.02 <T	1 =W	2 <T	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	135	0-5	"	12147			0.01 <=W	1 =W	1 <=W	1 <=W	20	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12148			0.01 <=W	1 =W	1 <=W	1 <=W	20	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12149			0.01 <=W	1 =W	1 <=W	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	25-35	"	12150			0.02 <T	1 =W	2 <T	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	35-45	"	12151			0.01 <=W	1 =W	1 <=W	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	45-58	"	12152			0.02 <T	1 =W	1 <=W	1 <=W	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
75	10	0-4	4-8 June	12097	31.5	7	***2.2***	79	24	14	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	15	0-4	"	12096	17.5	7	***6.3***	79	24	27	140	10 <=W	10 <=W	20 <T	10 <=W	10 <=W	10 <=W
"	20	0-5	"	12095	12.7	11	***8.9***	1600	280	61	120	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
189	10	0-4	"	12121	5.3 <T	5	***2.7***	77	42	17	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
190	20	0-5	"	12122	17.8	7	1.6	250	68	30	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
191	30	0-5	"	12123	45.5	16	1.6	1000	100	68	320	10 <=W	10 <=W	30 <T	10 <=W	10 <=W	10 <=W
76	8	0-5	"	12090	57.2	42	***14***	130	210	130	320	10 <=W	10 <=W	300	1600	470	700
"	"	5-15	"	12091	84.1	58	***32***	70	160	160	320	10 <=W	10 <=W	770	3100	1300	2600
"	"	15-25	"	12092	81.8	47	***6.7***	8 <T	6 <T	1 <=W	80	10 <=W	10 <=W	510	4100	1600	1200
"	"	25-35	"	12093	80.1	60	1.8	11	5 <T		40	10 <=W	10 <=W	700	6300	2500	1600

"	15	0-5	31-May	12079	36.8	18	***4.2***	260	29	41	40	10 <=W	10 <=W	310	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12080	22.7	35	***3.6***	150	66	47	60	10 <=W	10 <=W	240	430	320	230
"	"	15-25	"	12081	25.6	34	***7.0***	480	150	71	180	10 <=W	10 <=W	500	2600	1100	1400
"	"	25-35	"	12082	37.7	35	***5.7***	240	130	150	220	10 <=W	10 <=W	570	3000	1400	1400
"	"	35-48	"	12083	72.4	33	***8.8***	41	71	110	200	10 <=W	10 <=W	890	4500	1300	1600
"	22	0-5	"	12084	37.6	29	1.7	790	10	63	120	10 <=W	10 <=W	210	10 <=W	10 <=W	10 <=W
"	"	5-20	"	12085	10.6	15	***6.3***	540	160	230	160	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	20-30	"	12086	32.1	31	***41***	440	1100	600	780	10 <=W	10 <=W	340	2600	1200	2100
"	"	30-40	"	12087	25.0	19	***23***	100	320	130	600	10 <=W	10 <=W	190	1200	610	2400
"	"	40-50	"	12088	46.8	40	***26***	9400	790	250	720	10 <=W	10 <=W	200	2600	1200	4300
"	"	50-61	"	12089	99.5	48	1.0	280	33	5	60	10 <=W	10 <=W	40 <T	200	60 <T	110
271	15	0-5	18-21 June	12254		4 <T	***3.8***	260	82	41	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12255		7	***3.4***	69	38	29	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12256		7	***3.8***	160	45	33	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12257		7	***3.7***	81	130	38	400	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12258		8	***3.3***	120	52	96	200	10 <=W	10 <=W	10 <=W	20 <T	10 <=W	10 <=W
"	"	15-25	"	12259		20	***12***	100	110	370	380	10 <=W	10 <=W	100	520	230	10 <=W
"	"	25-35	"	12260		37	***37***	110	88	530	500	10 <=W	10 <=W	150	840	340	10 <=W
"	"	35-45	"	12261		32	***30***	340	530	190	740	10 <=W	10 <=W	120	190	140	10 <=W
"	"	45-56	"	12262		--	–	67	220	58	260	10 <=W	10 <=W	20 <T	190	140	10 <=W
"	15	0-5	"	12263		7	***4.2***	100	49	42	120	10 <=W	10 <=W	20 <T	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12264		9	***4.0***	53	50	40	200	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12265		21	***3.7***	160	370	230	640	10 <=W	10 <=W	130	390	200	10 <=W
"	"	25-34	"	12266		--	–	680	76	170	500	10 <=W	10 <=W	50 <T	200	210	10 <=W
"	15	0-5	"	12267		6	***4.0***	110	64	29	60	180	10 <=W	10 <=W	20 <T	10 <=W	10 <=W
"	"	5-21	"	12268		7	***4.2***	16	17	33	60	10 <=W	10 <=W	10 <=W	20 <T	10 <=W	10 <=W
"	40	0-2	"	12269		1 <=W	***3.6***	100	20	21	40	10 <=W	10 <=W	20 <T	20 <T	10 <=W	10 <=W
"	60	0-5	"	12270		6	***2.6***	73	25	39	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12271		28	***48***	860	150	180	900	10 <=W	10 <=W	10 <=W	1400	630	10 <=W
"	"	15-25	"	12272		13	***5.8***	19	840	56	160	10 <=W	10 <=W	20 <T	110	60 <T	10 <=W
261	11	0-5	31-May	12076	15.3	7	***2.5***	52	18	22	60	10 <=W	10 <=W	30 <T	10 <=W	10 <=W	10 <=W
"	15	0-5	"	12077	35.0	11	1.9	240	18	33	60	10 <=W	10 <=W	20 <T	10 <=W	10 <=W	10 <=W
"	23	0-5	"	12078	51.8	19	1.4	520	310	160	120	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
139	14	0-5	4-8 June	12094	20.0	11	0.71	230	12	20	20	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	20	0-5	"	12133	38.7	7	0.95	280	41	42	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	25	0-5	"	12132	19.6	9	0.89	610	28	21	120	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W

262	10	0-5	4-8 June	12134	50.2	11	***3.3***	590	210	150	340	10 <=W	10 <=W	10 <=W	60 <T	20 <T	20 <T
"	"	5-15	"	12135	72.8	19	***31***	130	260	650	500	10 <=W	10 <=W	10 <=W	900	400	510
"	"	15-25	"	12136	99.2	21	***33***	57	140	490	400	10 <=W	10 <=W	10 <=W	500	220	440
"	25	0-5	"	12124	55.4	15	1.6	200	87	90	140	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12125	54.4	15	1.5	280	91	110	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12126	38.0	11	***2.2***	1000	410	130	200	10 <=W	10 <=W	10 <=W	20 <T	10 <=W	10 <=W
"	"	25-35	"	12127	68.6	22	***7.3***	210	160	150	260	10 <=W	10 <=W	10 <=W	560	450	10 <=W
"	"	35-49	"	12128	93.5	19	1.6	40	150	130	160	10 <=W	10 <=W	10 <=W	10 <=W	120	10 <=W
"	32	0-5	"	12129	41.2	15	***9.3***	320	170	75	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12130	89.5	17	0.94	75	56	410	220	10 <=W	10 <=W	10 <=W	160	60 <T	110
"	"	15-25	"	12131	99.7	15	***10***	42	38	330	120	10 <=W	10 <=W	10 <=W	110	60 <T	120
272	25	0-5	18-21 June	12276		13	1.8	120	100	43	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12277		19	1.9	240	190	180	200	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12278		18	***5.0***	93	530	140	300	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	25-35	"	12279		17	***2.6***	160	150	160	340	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	35-45	"	12280		23	***2.8***	110	220	220	340	10 <=W	10 <=W	90 <T	410	220	10 <=W
"	"	45-55	"	12281		23	***10***	2900	1600	810	3900	10 <=W	10 <=W	70 <T	520	280	10 <=W
"	"	55-65	"	12282		37	***20***	330	720	1200	1600	10 <=W	10 <=W	650	2400	1300	10 <=W
"	"	65-75	"	12283		55	***49***	88	1100	1100	1600	10 <=W	10 <=W	460	1400	710	10 <=W
"	"	75-85	"	12284		40	***86***	550	740	3200	1900	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	85-101	"	12285		56	***130***	810	840	4900	1600	10 <=W	10 <=W	20 <T	90 <T	50 <T	10 <=W
"	35	0-5	"	12286		14	1.3	80	160	30	40	10 <=W	10 <=W	70 <T	160	80 <T	10 <=W
"	"	5-15	"	12287		16	***2.2***	300	190	140	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12288		16	***3.5***	140	110	160	180	10 <=W	10 <=W	20 <T	40 <T	20 <T	10 <=W
"	"	25-35	"	12289		12	1.7	240	150	74	100	10 <=W	10 <=W	20 <T	40 <T	20 <T	10 <=W
"	"	35-45	"	12290		20	***2.2***	240	130	170	140	10 <=W	10 <=W	50 <T	20 <T	30 <T	10 <=W
"	"	45-55	"	12291		23	1.7	120	360	220	560	10 <=W	10 <=W	10 <=W	90 <T	50 <T	10 <=W
"	"	55-65	"	12292		19	***3.0***	230	2200	240	400	10 <=W	10 <=W	80 <T	390	220	10 <=W
"	"	65-75	"	12293		25	***6.1***	110	240	370	780	10 <=W	10 <=W	120	620	320	10 <=W
"	"	75-85	"	12294		39	***25***	850	930	1600	1600	10 <=W	10 <=W	190	1100	570	10 <=W
"	"	85-95	"	12295		67	***190***	600	510	5300	1300	10 <=W	10 <=W	270	740	420	10 <=W
"	45	0-5	"	12296		11	1.3	85	290	71	60	10 <=W	10 <=W	20 <T	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12297		13	1.1	59	56	45	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12298		15	***5.0***	140	110	250	220	10 <=W	10 <=W	60 <T	260	140 <=W	10 <=W
"	"	25-35	18-21 June	12299		20	***8.7***	63	570	560	580	10 <=W	10 <=W	10 <=W	90 <T	40 <T	10 <=W

"	"	35-45	"	12300	19	***5.6***	500	170	490	580	10	<=W	10	<=W	10	<=W	530	260	10	<=W
"	"	45-55	"	12301	25	***11***	75	340	680	1100	10	<=W	10	<=W	60	<T	980	480	10	<=W
"	"	55-65	"	12302	30	***48***	130	560	1600	1700	10	<=W	10	<=W	220		2000	950	10	<=W
"	"	65-75	"	12303	39	***100***	110	680	2600	980	10	<=W	10	<=W	10	<=W	1800	10 <=W	10	<=W
"	"	75-86	"	12304	49	***110***	270	580	4000	1200	10	<=W	10	<=W	10	<=W	1600	10 <=W	10	<=W
143	30	0-2	"	12216	13	***5.9***	100	180	100	100	10	<=W	10	<=W	20	<T	180	60 <T	80	<T
"	42	0-5	"	12217	15	1.1	170	35	38	60	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	5-15	"	12218	13	0.88	90	610	47	80	10	<=W	10	<=W	310		20 <T	10 <=W	10	<=W
"	"	15-23	"	12219	10	0.96	110	61	53	40	10	<=W	10	<=W	10	<=W	30 <T	10 <=W	10	<=W
"	50	0-5	"	12226	8	0.77	180	30	23	60	10	<=W	10	<=W	30	<T	10 <=W	10 <=W	10	<=W
"	"	5-15	"	12227	10	***2.1***	160	120	55	100	10	<=W	10	<=W	10	<=W	30 <T	10 <=W	10	<=W
253	10	0-5	"	12228	25	***2.2***	72	23	42	80	10	<=W	10	<=W	30	<T	20 <T	10 <=W	10	<=W
"	"	5-15	"	12229	27	1.4	98	42	38	80	10	<=W	10	<=W	20	<T	10 <=W	10 <=W	10	<=W
"	"	15-25	"	12230	28	1.5	25	28	55	80	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	25-35	"	12231	26	1.2	34	29	75	100	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	35-45	"	12232	25	1.5	44	41	83	140	10	<=W	10	<=W	10	<=W	20 <T	10 <=W	10	<=W
"	"	45-55	"	12233	24	***2.1***	30	32	85	120	10	<=W	10	<=W	10	<=W	70 <T	10 <=W	10	<=W
"	"	55-65	"	12234	25	***2.0***	27	49	120	160	10	<=W	10	<=W	300		3100	1600	10	<=W
"	"	65-75	"	12235	32	1.4	16	79	160	240	10	<=W	10	<=W	240		1800	730	10	<=W
"	"	75-88	"	12236	34	1.6	170	250	170	220	10	<=W	10	<=W	760		4200	1300	10	<=W
"	45	0-5	"	12237	22	1.5	130	62	42	60	10	<=W	10	<=W	370		10 <=W	10 <=W	10	<=W
"	"	5-15	"	12238	31	0.90	45	230	53	120	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	15-25	"	12239	25	0.79	43	84	46	80	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	25-35	"	12240	33	1.2	160	1500	79	60	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	35-45	"	12241	31	1.5	85	45	140	100	10	<=W	10	<=W	10	<=W	20 <T	10 <=W	10	<=W
"	"	45-55	"	12242	25	***2.4***	49	120	77	160	10	<=W	10	<=W	10	<=W	60 <T	20 <T	10	<=W
"	"	55-65	"	12243	27	1.6	26	51	91	180	10	<=W	10	<=W	10	<=W	490	220	10	<=W
"	"	65-75	"	12244	27	***2.0***	96	140	140	160	10	<=W	10	<=W	10	<=W	640	650	10	<=W
"	"	75-85	"	12245	34	1.3	39	100	220	240	10	<=W	10	<=W	10	<=W	2800	1100	10	<=W
"	"	85-100	"	12246	34	1.8	38	27	44	120	10	<=W	10	<=W	10	<=W	3900	1600	10	<=W
"	60	0-5	"	12247	27	***2.3***	44	25	41	80	10	<=W	10	<=W	820		40 <T	20 <T	10	<=W
"	"	5-15	"	12248	33	1.1	43	34	53	180	10	<=W	10	<=W	110		10 <=W	10 <=W	10	<=W
"	"	15-25	"	12249	30	0.75	69	71	100	100	10	<=W	10	<=W	10	<=W	10 <=W	10 <=W	10	<=W
"	"	25-35	"	12250	26	1.2	130	120	120	100	10	<=W	10	<=W	40	<T	40 <T	10 <=W	10	<=W
"	"	35-45	"	12251	25	1.1	180	170	73	140	10	<=W	10	<=W	40	<T	40 <T	10 <=W	10	<=W
"	"	45-55	18-21 June	12252	29	1.2	43	90	79	160	10	<=W	10	<=W	10	<=W	40 <T	20 <T	10	<=W

"	"	55-65	"	12253		24	1.6		60	190		120	160		10	<=W	10	<=W	10	<=W	280		120	<=W	10	<=W
144	25	0-5	"	12273		7	***3.6***		87	100		31	40		10	<=W	10	<=W	10	<=W	20	<T	10	<=W	10	<=W
"	40	0-3	"	12274		6	***2.4***		77	30		29	40		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	58	0-5	"	12275		9	0.56		120	27		42	140		10	<=W	10	<=W	10	<=W	20	<T	20	<T	10	<=W
270	35	0-2	"	12213		4	<T 1.1		38	14		15	20		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	45	0-3	"	12214		11	0.88		54	49		30	60		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	55	0-3	"	12215		10	0.76		84	15		22	60		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
100	10	0-5	4-8 June	12117	32.1	11	***3.6***		190	89		80	80		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	15	0-5	"	12112	61.4	18	1.6		79	8	<T	74	100		10	<=W	10	<=W	80	<T	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12113	32.0	15	1.4		29	7	<T	52	40		10	<=W	10	<=W	20	<T	10	<=W	10	<=W	10	<=W
"	"	15-25	"	12114	41.0	11	0.68		22	9	<T	23	40		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	25-35	"	12115	45.4	8	0.01	<=W	1	=W		1	<=W	1	<=W	20	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	35-48	"	12116	51.0	10	0.01	<=W	1	=W		1	<=W	1	<=W	20	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	20	0-5	?	12118	39.8	17	1.2		190	89		80	40		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12119	27.0	15	1.4		82	50		48	100		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-24	"	12120	36.2	13	***2.0***		1	=W		83	150		200		10	<=W	10	<=W	10	<=W	360		100		10	<=W
265	10	0-5	11-12 June	12168			1.2		95	22		29	40		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	20	0-5	"	12169			1.0		110	15		30	40		10	<=W	10	<=W	20	<T	10	<=W	10	<=W	10	<=W
"	"	5-18	"	12170			0.98		140	38		57	160		10	<=W	10	<=W	10	<=W	30	<T	20	<T	20	<T
"	30	0-5	"	12171			0.77		36	23		17	40		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12172			0.55		160	170		28	60		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-28	"	12173			1.0		180	94		6	<T 120		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
80	10	0-5	4-8 June	12098	32.6	8	***2.2***		32	25		39	60		10	<=W	10	<=W	20	<T	290		150		10	<=W
"	"	5-15	"	12099	72.5	27	***19***		65	180		870	800		10	<=W	10	<=W	10	<=W	90	<T	400		10	<=W
"	"	15-25	"	12100	92.7	33	***35***		120	140		1500	1300		10	<=W	10	<=W	30	<T	720		390		520	
"	"	25-35	"	12101	86.3	45	***70***		190	200		1400	1800		10	<=W	10	<=W	40	<T	100		60	<T	80	<T
"	"	35-45	"	12102	88.0	41	***52***		80	230		1100	980		10	<=W	10	<=W	40	<T	1300		700		810	
"	"	45-55	"	12103	81.8	38	***36***		52	180		580	680		10	<=W	10	<=W	180		1100		590		600	
"	15	0-5	"	12104	67.5	20	***2.3***		53	120		72	80		10	<=W	10	<=W	20	<T	120		60	<T	40	<T
"	"	5-15	"	12105	71.9	23	***2.2***		41	71		86	80		10	<=W	10	<=W	20	<T	150		80	<T	60	<T
"	"	15-25	"	12106	73.6	33	***37***		23	21		100	160		10	<=W	10	<=W	10	<=W	840		550		10	<=W
"	"	25-35	"	12107	70.5	26	0.26		1	=W		1	<=W	2	<T	20	<=W	10	<=W	10	<=W	10	<=W	720		290		10	<=W
"	"	35-45	"	12108	77.3	22	0.07		1	=W		1	<=W	1	<=W	20	<=W	10	<=W	10	<=W	10	<=W	1900		390		10	<=W
"	"	45-55	"	12109	88.3	21	0.16		1	=W		1	<=W	2	<T	20	<=W	10	<=W	10	<=W	10	<=W	1400		280		10	<=W
"	"	55-68	"	12110	70.8	16	0.12		1	=W		1	<=W	1	<=W	20	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	20	0-5	4-8 June	12111	21.8	10	1.2		120			2	<T	23		40		10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W

269	5	0-5	13-15 June	12211			0.99		28		73		21		60	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-17	"	12212			0.73		21		19		20		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	10	0-5	"	12220		12	1.1		100		60		51		200	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12221		13	1.6		56		71		69		60	10	<=W	10	<=W	10	<=W	20	<T	10	<=W	10	<=W
"	"	15-28	"	12222		18	***12***		45		75		410		240	10	<=W	10	<=W	10	<=W	260		110		10	<=W
"	15	0-5	"	12223		9	1.4		150		35		35		60	10	<=W	10	<=W	230		10	<=W	10	<=W	10	<=W
"	"	5-15	"	12224		41	1.6		210		190		140		120	10	<=W	10	<=W	420		20	<T	10	<=W	10	<=W
"	"	15-21	"	12225	--	--	--		570		1100		250		200	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
268	5	0-3	"	12208			0.42		14		6	<T	5	<T	40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	15	0-3	"	12209			0.91		80		22		23		60	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	26	0-2	"	12210			0.89		160		19		11		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
267	5	0-5	"	12199			1.3		52		26		44		80	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12200			1.1		43		91		70		180	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-25	"	12201			1.6		50		370		92		260	10	<=W	10	<=W	10	<=W	40	<T	10	<=W	10	<=W
"	"	25-35	"	12202			0.97		48		160		87		220	10	<=W	10	<=W	10	<=W	20	<T	10	<=W	10	<=W
"	"	35-40	"	–																							
"	10	0-5	"	12203			0.37		36		21		29		60	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12204			0.01	<=W	2	<T	3	<T	1	<=W	40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-24	"	–																							
"	15	0-5	"	12205			0.71		81		22		16		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12206			0.68		21		12		11		60	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-25	"	12207			0.12		20		16		4	<T	40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	25-32	"	–																							
266	13	0-5	"	12195			0.48		7	<T	6	<T	3	<T	20	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	20	0-5	"	12193			0.75		8	<T	5	<T	3	<T	40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12194			0.03	<T	1	=W	2	<T	1	<=W	40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-29	"	–																							
"	28	0-5	"	12196			0.85		120		26		21		60	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12197			0.42		57		120		29		60	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-25	"	12198			0.20		9	<T	3	<T	3	<T	40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	25-31	"	–																							
147	8	0-5	"	12186			1.3		83		41		19		80	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	5-15	"	12187			0.71		53		53		24		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	"	15-25	"	12188			0.28		20		26		10		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	15	0-5	"	12189			0.76		31		14		11		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W
"	22	0-5	13-15 June	12190			1.7		38		25		23		40	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W	10	<=W

"	"	5-15	"	12191	0.47	11	12	11	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12192	0.57	14	14	11	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
264	10	0-4	11-12 June	12165	1.8	31	34	54	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	20	0-4	"	12166	0.99	96	28	28	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	30	0-3	"	12167	1.0	67	14	14	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
148	15	0-5	"	12153	***2.2***	62	43	64	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5		12154	***2.4***	110	90	42	300	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5		12155	***2.3***	80	250	37	280	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	15	0-5	"	12156	***2.2***	40	58	42	120	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12157	***5.5***	44	96	210	200	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	15-25	"	12158	***3.5***	27	44	120	140	10 <=W	10 <=W	10 <=W	30 <T	20 <T	10 <=W
"	"	25-33	"	12159	--	38	150	120	180	10 <=W	10 <=W	10 <=W	30 <T	20 <T	10 <=W
"	15	0-5	"	12160	***2.4***	42	42	77	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12161	***3.1***	23	57	120	160	10 <=W	10 <=W	10 <=W	40 <T	20 <T	10 <=W
"	"	15-23	"	12162	1.4	14	23	59	80	10 <=W	10 <=W	10 <=W	50 <T	30 <T	10 <=W
"	15	0-5	"	12163	***3.2***	45	24	98	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12164	***9.9***	60	40	110	360	10 <=W	10 <=W	10 <=W	90 <T	50 <T	20 <T
"	30	0-5	13-15 June	12174	1.3	33	1 <=W	21	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12175	1.7	75	45	22	140	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12176	1.2	38	62	33	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12177	1.6	36	39	42	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12178	1.3	77	81	29	160	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12179	1.5	41	49	35	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	45	0-5	"	12180	***2.4***	62	67	37	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12181	***2.0***	73	39	28	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	0-5	"	12182	1.9	40	31	36	40	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12183	***2.3***	66	41	36	60	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12184	***2.2***	67	39	33	80	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W
"	"	5-15	"	12185	***2.1***	49	34	34	100	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W	10 <=W

'NOTES: blank or "--" indicates that data is not available for this parameter or sample.

"<T" = a measurable trace amount: interpret with caution.

"<TE" = a measurable trace after extra diln/concn: caution.

"<W" or "<WE" = no measurable response (zero): less than reported value.

"<WE" = no measurable response (diln/conc): less than reported value.

"P40" = PCB resembled mixture of Aroclor 1254 and 1260.

"P54" = PCB resembled Aroclor 1254.

"PS1" = PCB resembled mixture of Aroclor 1248, 1254 and 1260.

underlined values within shaded cells exceed Provincial Sediment Quality Guideline Lowest Effect level.

Ontario Ministry of the Environment 2001St. Clair River Sediment Impact Zone Characterization study - sediment sample notes.

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
263	50	2.7	01/06/11	67,45,52	0 - 5	12137	organic ooze, sparse light-brown sand near 5 cm; abundant plant detritus; moderate sulphur odour			17
"	"	"	"	"	5-15	12138	dark grey sandy silt; sparse plant detritus; no sheen; slight organic odour			
"	"	"	"	"	15-25	12139	dark grey sandy silt; sparse plant detritus; mild organic odour			
"	"	"	"	"	25-35	12140	dark grey sandy silt; sparse detritus; slight organic odour			
"	"	"	"	"	35-45	12141	dark grey silty sand (more sand); no sheen; very slight organic odour			
"	"	"	"	"	45-55	12142	sand, some silt; no odour,			
"	"	"	"	"	55-67	12143	sand with a small amount of grey colour, darker mixed colours; light sheen; very slight (diesel?) odour; very different from other sections			
"	110	2.5	01/06/11	17,16,30	0-5	12144	medium to dark grey silty sand; sparse plant detritus; no sheen; slight organic odour		abundant chironomids	18
"	"	"	"	"	5-15	12145	dark grey sand; opaque plant detritus; no sheen; slight organic odour			
"	"	"	"	"	15-30	12146	light grey sand, very dry			
"	135	4.4	01/06/11	55,52,58	0-5	12147	medium grey sand, sloppy with tiny amount of sand near 5 cm.; trace of detritus; medium organic odour			
"	"	"	"	"	5-15	12148	medium grey sandy silt; slight plant detritus; slight organic odour.			
"	"	"	"	"	15-25	12149	medium to dark grey silty sand; sparse detritus; very slight organic odour			
"	"	"	"	"	25-35	12150	dark grey silty sand; sparse detritus; very slight organic odour.			
"	"	"	"	"	35-45	12151	dark grey sand with a small amount of silt, somewhat smooth with dark fibres; no odour			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	45-58	12152	dark grey sand, small amount of silt medium grain and dry; slight organic odour			
75	10	0.9	01/06/05	Shipek	0-3	12097	brown silty sand over black sandy silt; sheen		chironomids, bacterial slime?	
"	15	2.3	"	"	0-4	12096	brown silty sand over black sandy silt + stones; sheen		chironomids, bacterial slime?	
"	20	3.4	"	"	0-5	12095	brown silty sand over black sandy silt; sheen		chironomids, bacterial slime?	
189	10	0.8	01/06/06	Shipek	0-4	12121	brown silty sand, some gravel and stones		slight bacterial slime	
190	20	3.5	"	"	0-5	12122	brown silty sand, some gravel and stones; sheen			
191	30	5.0	"	"	0-5	12123	"			
76	8	1.0	01/05/31	28,32,35	0-5	12090	stones, sandy silt, pasty; dark oily sheen			49
"	"	"	"	"	5-15	12091	silty sand; sheen; snail shells; strong petrochemical odour			
"	"	"	"	"	15-25	12092	silt & very fine sand; rubbery fibres; petroleum odour			
"	"	"	"	"	25-35	12093	dark sandy silt; rubbery fibres; strong petroleum odour			
"	15	3.2	"	"	0-5	12079				
"	"	"	"	"	5-15	12080	sandy silt; zebra mussel shell; heavy sheen; strong petroleum odour.			42-44
"	"	"	"	"	15-25	12081	sand and clay, rocks; zebra mussel shell; heavy sheen; petroleum odour.			
"	"	"	"	"	25-35	12082	pasty sand - ooze; sheen; petroleum odour			
"	"	"	"	"	35-48	12083	pastry ooze; sheen; petroleum odour.			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	22	5.3	"	61,51,61	0-5	12084	sandy silt; heavy sheen; some petroleum odour; "perc" globules		chironomids, oligochaetes & amphipods	46-48
"	"	"	"	"	5-20	12085	some silt, coarse black sand; strong petroleum odour		chironomids	
"	"	"	"	"	20-30	12086	grey silty sand; sheen; strong petroleum odour			
"	"	"	"	"	30-40	12087	lighter grey silty sand; sheen; slight odour			
"	"	"	"	"	40-50	12088	dark sandy silt; sheen; petroleum odour			
"	"	"	"	"	50-61	12089	clay & stones; no odour.			
271	15	0.8	01/06/20	Shipek	0-5	12254				
"	"	"	"	41,56,46	0-5	12257	sand; no sheen or odour	sparse macrophytes		18
"	"	"	"	"	5-15	12258	dark grey sand & gravel; no sheen or odour			
"	"	"	"	"	15-25	12259	silty sand, 20% clay, rocks & pebbles; slght sheen; moderate petroleum odour			
"	"	"	"	"	25-35	12260	dark grey silt and glacial clay; heavy sheen; strong petroleum odour			
"	"	"	"	"	35-45	12261	33% clay, 67% sandy silt; snail shells; heavy sheen; strong petroleum odour			
"	"	"	"	"	45-56	12262	clay & silt (50:50); snail shells; heavy sheen; strong petroleum odour			
"	15	0.8	"	29,25,34	0-5	12263	medium brown sand; no sheen; seaweed odour	sparse shoots		20
"	"	"	"	"	5-15	12264	dark brown sand; snail shells; no sheen or odour.	macrophytes		
"	"	"	"	"	15-25	12265	dark grey silty sand; snail shells; heavy sheen; petroleum odour			
"	"	"	"	"	25-34	12266	dark grey, sandy silt, ~ 5% clay; heavy sheen; strong petroleum odour			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	15	0.8	"	13,21,14	0-5	12267	medium brown sand; coarse detritus; snail shells; no sheen or odour,			21
"	"	"	"	"	5-21	12268	brown sand; snail shells; no sheen,	macrophyte shoots & roots		
"	40	0.6	01/06/21	Shipek	0-2	12269	sand, very little silt, coarse gravel, few stones; sparse fine detritus; no visible sheen; fishy odour			
"	60	0.9	"	16,31,10	0-5	12270	medium brown-grey sand & sparse silt; slight sheen; no odour	macrophytes		
"	"	"	"	"	5-15	12271	very dry silty sand, <5% clay; plant detritus; no sheen; strong petroleum odour	macrophytes	chironomids	
"	"	"	"	"	15-25	12272	light grey 25 % sandy silt, 75 % glacial clay; light sheen; strong petroleum odour light sheen,			
261	11	0.8	01/05/31	Shipek	0-5	12076	brown silty sand over dark silty sand; slight sheen; petroleum odour			
"	15	1.4	"	"	0-5	12077	brown silty sand over dark silty sand; no sheen; slight petroleum odour	*Elodea*		
"	23	3.4	"	"	0-5	12078	light brown sandy silt over dark silt-ooze	*Elodea*		
139	14	2.3	01/06/04	Shipek	0-3	12094	silty light brown sand over dark silt over clay; heavy sheen		chironomids	
"	"	3.4	01/06/05	"	0-3	12095	"			
"	"	2.3	"	"	0-5	12096	"		sea lamprey ammocoete	
"	20	4.0	01/06/07	"	0-4	12133	dark brown silty sand; slight sheen		bacterial slime	
"	25	5.4	"	"	0-5	12132	light brown silty sand over dark silty sand; sheen	*Vallisneria* & fiamentous algae	bacterial slime	
262	10	0.7	01/06/07 "	45,43,??	0-5	12134	dark silty sand; slight sheen; petroleum odour			16
"	"	"	"	"	5-15	12135	grey sandy clay; slight sheen; petrochemical odour			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	15-25	12136	dark sandy clay; slight sheen; petrochemical odour			
"	25	1.4	01/06/07	49,41,36	0-5	12124	dark silty sand			11
"	"	"	"	"	5-15	12125	dark grey sandy silt; sheen			
"	"	"	"	"	15-25	12126	dark sandy silt; green fibres; sheen; petrochemical odour			
"	"	"	"	"	25-35	12127	dark sandy silt; sheen; petrochemical odour			
"	"	"	"	"	35-49	12128	grey silty sand; gravel and cobbles; green fibres; sheen			
"	32	2.5	"	26,18,34	0-5	12129	dark silty sand			12
"	"	"	"	"	5-15	12130	dark grey sandy silt; sweet petrochemical odour.			
"	"	"	"	"	15-25	12131	grey sticky, glacial clay			
272	25	1.1	01/06/21	101,66,76	0-5	12276	medium grey sandy silt; sparse detritus; moderate sheen; no odour		chironomids	25, 26
"	"	"	"	"	5-15	12277	dark grey sandy silt; plant detritus; sheen; slight petroleum odour			
"	"	"	"	"	15-25	12278	dark grey sandy silt; sparse detritus; slight sheen; petroleum odour			
"	"	"	"	"	25-35	12279	dark grey sandy silt; fine plant detritus; heavy sheen; petroleum odour			
"	"	"	"	"	35-45	12280	dark grey silty sand; heavy petroleum odour & sheen			
"	"	"	"	"	45-55	12281	grey silty sand; heavy petroleum odour and sheen			
"	"	"	"	"	55-65	12282	very thick, dark grey sparse sand; coarse plant detritus; heavy sheen; petrochemical odour			
"	"	"	"	"	65-75	12283	thick cohesive silt/clay; light grey with dark streaks; coarse plant detritus; heavy sheen; strong petrochemical odour			
"	"	"	"	"	75-85	12284	thick cohesive silt/clay; light grey with dark streaks; heavy sheen; strong petrochemical odour			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	85-101	12285	"			
"	35	1.2	01/06/21	95,70,79	0-5	12286	grey sandy silt; light sheen; no odour	macrophytes		
"	"	"	"	"	5-15	12287	grey sandy silt, moderate sheen light petroleum odour			
"	"	"	"	"	15-25	12288	dark grey sandy silt; fine plant detritus; moderate sheen; light petroleum odour			
"	"	"	"	"	25-35	12289	silty sand, dark bleach streaks; sparse fine plant detritus			
"	"	"	"	"	35-45	12290	dark grey sandy silt; fine plant detritus; moderate sheen; light petroleum odour			
"	"	"	"	"	45-55	12291	dense sand and oily silt (50:50 sand & dark brown silt; heavy sheen; strong petrochemical odour			
"	"	"	"	"	55-65	12292	silty sand with ~5% clay; fine plant detritus; moderate sheen; slight petrochemical odour			
"	"	"	"	"	65-75	12293	medium-grey sandy silt; fine plant detritus; snail shells; heavy sheen; strong petrochemical odour			
"	"	"	"	"	75-85	12294	similar to above but stronger petrochemical odour			
"	"	"	"	"	85-95	12295	very cohesive silt/clay, dark grey with black streaks; coarse plant detritus & "peanut" detritus; heavy sheen; heavy petroleum odour			
"	45	1.2	01/06/21	70,86,68	0-5	12296	dark grey silty sand; snail shells; sheen & organic odour	macrophytes	oligochaetes	28
"	"	"	"	"	5-15	12297	cohesive dark grey silty sand; plant detritus; zebra mussel shells; light sheen; slight petrochemical odour	macrophytes		
"	"	"	"	"	15-25	12298	silty sand, light to medium grey colour; sanil shells; heavy sheen, organic/petrochemical odour	macrophytes		
"	"	"	"	"	25-35	12299	dark grey sandy silt; heavy sheen; petroleum odour			
"	"	"	"	"	35-45	12300	light grey sandy silt with black streaks throughout; heavy sheen; petroleum odour	fibrous detritus		
"	"	"	"	"	45-55	12301	light grey sandy silt; heavy sheen; strong petrochemical odour			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	55-65	12302	"			
"	"	"	"	"	65-75	12303	"			
"	"	"	"	"	75-86	12304	"			
143	30	3.2	01/06/19	Shipek	0-2	12216	sand, very little silt; sparse coal, stones; zebra musslel shells; moderate sheen; slight petrochemical odour		chironomids	3
"	42	3.2	"	12,18,23	0-5	12217	sandy silt; slight sheen; slight petrochemical odour	sparse macrophytes		4, 5
"	"	"	"	"	5-15	12218	sandy silt; sparse plant detritus; moderate sheen,			
"	"	"	"	"	15-23	12219	silty sand medium dry; slight sheen; faint petroleum and organic odour			
"	50	5.2	01/06/19	15,11,10	0-5	12226	medium brown sand, little silt; fine plant detritus; slight sheen		sparse chironomids	12
"	"	"	"	"	5-15	12227	grey-brown sand; slight sheen; moderate petrochemical odour			
253	10	2.0	01/06/20	88,82,71	0-5	12228	dark brown silty ooze; moderate sheen; organic odour			13
"	"	"	"	"	5-15	12229	dark brown ooze; plant detritus; moderate sheen; organic odour			
"	"	"	"	"	15-25	12230	grey ooze; sparse detritus; moderate sheen; slight petrochemical odour			
"	"	"	"	"	25-35	12231	grey ooze; sparse plant detritus; slight sheen; slight organic odour			
"	"	"	"	"	35-45	12232	thicker medium grey sandy silt; sparse detritus; slight sheen and organic odour			
"	"	"	"	"	45-55	12233	thick ooze, some sand, thick and cohesive with gas pockets; moderate sheen & petrochemical odour			
"	"	"	"	"	55-65	12234	thick sandy silt, black streaks, sparse detritus; light sheen, <5% clay; light sheen; moderate petrochemical odour			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	65-75	12235	dark grey mud; sparse detritus; resinous gold flakes at 70 cm.; moderate sheen & petrochemical odour			
"	"	"	"	"	75-88	12236	medium grey silt; moderate sheen; strong diesel fuel odour.			
"	45	2.3	"	73,82,100	0-5	12237	light brown-grey silt; plant detritus; moderate sheen; slight organic odour			15, 16
"	"	"	"	"	5-15	12238	dark grey silt; plant detritus; moderate sheen; slight organic odour.			
"	"	"	"	"	15-25	12239	medium grey silt, cohesive; sparse plant detritus; moderate sheen; slight organic odour			
"	"	"	"	"	25-35	12240	sandy silt, fine and coarse detritus; moderate sheen; organic & petrochemical odours			
"	"	"	"	"	35-45	12241	dense dark grey silt; fine & coarse plant detritus; moderate sheen; strong diesel fuel odour			
"	"	"	"	"	45-55	12242	dark grey silt with sparse sand; abundant fine plant detritus; moderate sheen; organic & petrochemical odours			
"	"	"	"	"	55-65	12243	dark grey silt, little sand; sparse detritus; moderate sheen; slight petrochemical odour			
"	"	"	"	"	65-75	12244	cohesive, sandy silt; moderate sheen; organic odour.			
"	"	"	"	"	75-85	12245	sandy silt, black and brown patches; moderate plant detritus; heavy sheen; strong petrochemical odour			
"	"	"	"	"	85-100	12246	dark grey sandy silt or dense silt over clay (25%)			
"	60	2.4	"	51,46,65	0-5	12247	medium grey ooze little sand; coarse detritus; moderate sheen			17
"	"	"	"	"	5-15	12248	dark grey ooze, small amount of sand; coarse detritus; light sheen; slight organic odour			
"	"	"	"	"	15-25	12249	dark grey silt; heavy detritus; light sheen, moderate organic odour.			
"	"	"	"	"	25-35	12250	sandy silt; fine & coarse plant detritus; moderate sheen; organic & slight petrochemical odours			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	35-45	12251	dark grey sand, silt; abundant detritus; light sheen; no odour			
"	"	"	"	"	45-55	12252	silt with some sand; abundant coarse & fine plant detritus; moderate sheen; slight organic & petrochemical odours			
"	"	"	"	"	55-65	12253	silt - dry & cohesive; heavy sheen; no odour.			
144	25	0.8	01/06/21	Shipek	0-5	12273	silty sand over clay, coarse sand & gravel mixed with clay, few stones; light sheen; no odour	sparse macrophyte shoots		
"	"	"	"	"	0-3	12274	silty sand; sparse plant detritus; heavy sheen; no odour.			
"	"	"	"	"	0-5	12275	sandy silt over clay (5%), gravel & small rocks; moderate sheen; no odour	macrophytes		
270	35	1.0	01/06/18	Shipek	0-2	12213	sand, very little silt; very slight sheen & organic odour,	plant roots & shoots	abundant chironomids	
"	45	2.0	"	"	0-3	12214	silty sand; moderate oil sheen.	sparse macrophyte roots & shoots	chironomids	
"	55	5.0	"	"	0-3	12215	silty sand, zebra mussel shells, small stones; moderate sheen; no odour	macrophyte roots & shoots	chironomids	
100	10	1.0	01/06/05	Shipek	0-5	12117	brown sand silt; slight sheen.			
"	15	1.7	"	13,19,48,15	0-5	12112	dark sandy silt; moderate sheen; no odour.			6
"	"	"	"	"	5-15	12113	"			
"	"	"	"	"	15-25	12114	dark sandy silt; no sheen or odour.			
"	"	"	"	"	25-35	12115	"			
"	"	"	"	"	35-48	12116	"			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	20	2.8	"	24,17,19	0-5	12118	dark sandy silt; moderate sheen; no odour.			8
"	"	"	"	"	5-15	12119	dark sandy silt; slight sheen; no odour.			
"	"	"	"	"	15-19	12120	dry silty sand with some clay, green non-organic fibrous material; no sheen or odour			
265	10	0.9	01/06/12	Shipek	0-5	12168	medium grey silty sand; sparse plant detritus abundant sanil shells; slight sheen; slight organic odour	sparse macrophytes	abundant amphipods	
"	20	3.6	"	17,18,15	0-5	12169	medium grey silty sand; moderate sheen; slight petrochemical odour,	sparse plant roots		
"	"	"	"	"	5-18	12170	gray sand; light sheen; no odour.			
"	30	5.3	"	22,28,18	0-5	12171	dark brown silty sand with black streaks; sparse plant detritus; shells; organic odour		chironomids	
"	"	"	"	"	5-15	12172	dry silty sand, small stones; no sheen; slight organic odour			
"	"	"	"	"	15-28	12173	very dry sand with dark streaks, few cobbles; no sheen			
80	10	1.0	01/06/05	38,49,32,58	0-5	12098	black sandy ooze; oily; petrochemical odour.			1
"	"	"	"	"	5-15	12099	black silty sand; oily; petrochemical odour.			
"	"	"	"	"	15-25	12100	sandy clay, oily; sparse plant detritus & shells; strong petrochemical odour; latex			
"	"	"	"	"	25-35	12101	"			
"	"	"	"	"	35-45	12102	"			
"	"	"	"	"	45-55	12103	sandy clay; very strong petrochemical odour			
"	15	1.7	"	70,56,52	0-5	12104	black sandy ooze; oily; petrochemical odour			2
"	"	"	"	"	5-15	12105	sandy clay; strong oily, petrochemical smell; latex			
"	"	"	"	"	15-25	12106	"			

Transect Number	Distance from CDN shore, m.	Water Depth, m.	Sample Date	Core Lengths, cm.	Core Section cm. - cm.	Sample Number	Sediment Characteristics	Flora	Fauna	Picture Number
"	"	"	"	"	25-35	12107	"			

"	"	"	"	"	35-45	12108	"			
"	"	"	"	"	45-55	12109	"			
"	"	"	"	"	55-68	12110	"			
"	20	3.9	"	Shipek	0-5	12110	brown sandy silt; slight sheen.			
269	5	0.4	01/06/15	14,10,10,17	0-5	12211	silty sand over clay, stones & gravel; moderate sheen; mild organic odour		chironomids & sea lamprey ammocoete,	40
"	"	"	"		5-17	12212	light grey sand over clay (50:50); moderate sheen; no odour		chironomids	
"	10	0.9	01/06/19	28,21,23	0-5	12220	dark grey silty sand; no sheen or odour	macrophytes & roots		6
"	"	"	"		5-15	12221	dark grey silty sand; plant detritus; moderate sheen; slight organic odour		oligochaetes	
"	"	"	"		15-28	12222	silty sand over clay; few stones & gravel; slight coal; slight sheen; moderate petrochemical odour,			
"	15	2.8	"	21,18,18	0-5	12223	dark grey sand/silt mixture; abundant plant detritus; slight sheen.	abundant macrophytes	chironomids	
"	"	"	"		5-15	12224	silty sand mixture with gold-colored crytstalline material @~10-15 cm.; moderate sheen; strong chemical sulphur-like odour			
"	"	"	"		15-21	12225	silty sand, gold-coloured crystals; oily liquid; chemical odour			
268	5	1.8	01/06/14	Shipek	0-3	12208	sand, stones & gravel; moderate sheen; strong petrochemical odour			
"	15	4.9	"	"	0-3	12209	sand & small stones; light sheen; no odour		chironomids	
"	26	7.5	"	"	0-2	12210	sand & abundant stones, trace silt, gravel; no sheen or odour		chironomids	
267	5	1.5	01/06/14	29,28,40	0-5	12199	silty sand, small stones; moderate sheen.			36, 38
"	"	1.5	"		5-15	12200	dark grey sandy silt; sparse plant detritus; light sheen; petrochemical odour.			
"	"	"	"		15-25	12201	brown grey silty sand, small stones; sparse detritus; light sheen; moderate petrochemical odour			
"	"	"	"		25-35	12202	sand over clay, small stones; no sheen.			
"	"	"	"		35-40	--	discarded glacial clay			

"	10	2.5	"	24,21,20	0-5	12203	sandy silt, hard clay @45 cm; fine plant detritus; light sheen; no odour		chironomids	37
"	"	"	"		5-15	12204	hard packed clay, 1 plant root penetrates to bottom.			
"	"	"	"		15-24	--	discarded glacial clay.			
"	15	2.5	"	20,32,25	0-5	12205	medium brown silty sand, gravel; light sheen; moderate organic odour		abundant chironomids	39
"	"	"	"		5-15	12206	gravel mixed in discrete layers throughout hard light grey clay; slag & coal; no sheen or odour			
"	"	"	"		15-25	12207	clay, small trace layer of sand; snail shells; no sheen or odour			
"	"	"	"		25-32	--	glacial clay; discarded			
266	13	0.5	01/06/14	Shipek	0-5	12195	sand over hard packed clay, few stones; no odour			
"	20	1.0	"	29,24,11	0-5	12193	light grey (3-5 cm) hard packed, silty sand (0-3 cm), sparse gravel; no sheen or odour	sparse macrophytes		33,34
"	"	"	"		5-15	12194	light grey hard glacial clay; no odour.			
"	"	"	"		15-29	--	light grey hard glacial clay; no odour, not submitted.			
"	28	2.9	"	31,28,25	0-5	12196	dark grey silty sand over a small amount of clay; sparse plant detritus; zebra mussel shells; light sheen; very slight petrochemical odour	sparse macrophytes	chironomids	35
"	"	"	"		5-15	12197	dark grey silty sand over glacial clay; sparse plant detritus; no sheen or odour			
"	"	"	"		15-25	12198	medium grey clay, minute amount of organic material; no sheen or odour			
"	"	"	"		25-31	--	hard clay; discarded.			
147	8	0.5	01/06/13	25,20,19	0-5	12186	50:50 sand/silt mix; coarse plant detritus; sight organic & petrochemical odours			32
"	"	"	"		5-15	12187	hard, dry, packed, pink glacial clay & coal particles (50:50)			
"	"	"	"		15-25	12188	hard packed pink dry clay; no odour.			
"	15	0.6	"		0-5	12189	light grey silty sand (~1 cm) over hard packed clay, rocks; sparse plant detritus; no sheen			
"	22	1.7	"	18,23,25	0-5	12190	dark grey silty sand; sparse plant detritus; moderate sheen; no odour		chironomids	
"	"	"	"		5-15	12191	light grey sandy silt over clay, pebbles, rocks; no sheen			

"	"	"	"		15-25	12192	silty clay, small amount of sand; sparse coal; no odour			
264	10	0.7	01/06/12	Shipek	0-4	12165	dark grey silty sand; sparse plant detritus; slight sheen; no odour.			26
"	20	0.9	"	"	0-4	12166	dark grey, mostly silt with some sand; sparse plant detritus; light sheen; no odour			
"	30	3.0	"	"	0-3	12167	medium grey sand with some silt, pebbles; sparse plant detritus; moderate sheen; slight organic odour	sparse macrophytes	chironomids	
148	15	0.8	01/06/12	Shipek	0-5	12153				
"	"	"	"	"	"	12154				
"	"	"	"	"	"	12155				
"	15	0.8	"	15, 24, 33	0-5	12156	medium-dark grey; organic detritus; slight sheen; very slight petrochemical odour,		mayflies & chironomids	24
"	"	"	"		5-15	12157	sandy silt with grey clay; slight sheen & petrochemical odour,			
"	"	"	"		15-25	12158	2 differing fractions: sandy clay mixture with some fibre + compact glacial clay with light brown layer mixed throughout; slight diesel fuel odour			
"	"	"	"		25-33	12159	dark grey sandy clay mixture; no odour.			
"	"	0.8	"	20, 23	0-5	12160	medium dark grey; slight sheen; very slight petrochemical odour			
"	"	"	"		5-15	12161	sandy silt with grey clay; slight sheen & petrochemical odour,			
"	"	"	"		15-23	12162	2 differing fractions: sandy clay mixture with some fibre + compact glacial clay with light brown layer mixed throughout; slight diesel fuel odour			
"	15	0.8	"	14, 15	0-5	12163	medium dark grey; slight sheen; very slight petrochemical odour			
"	"	"	"		5-15	12164	sandy silt with grey clay; slight sheen & petrochemical odour			
"	30	0.8	01/06/13	Shipek	0-5	12174	silty sand over clay, some stones; sparse fine detritus; slight sheen	sparse macrophytes	chironomids	
"	"	"	"	"	"	12175	"	"	"	
"	"	"	"	"	"	12176	"	"	"	
"	45	1.2	"	Shipek	0-5	12180	small amount of silt, fine sand, some small stones & coarse gravel @~5 cm; sparse fine & coarse plant detritus; light oil sheen; slight organic odour	sparse plant shoots	chironomids	
"	"	"	"	"	"	12181	"	"	"	