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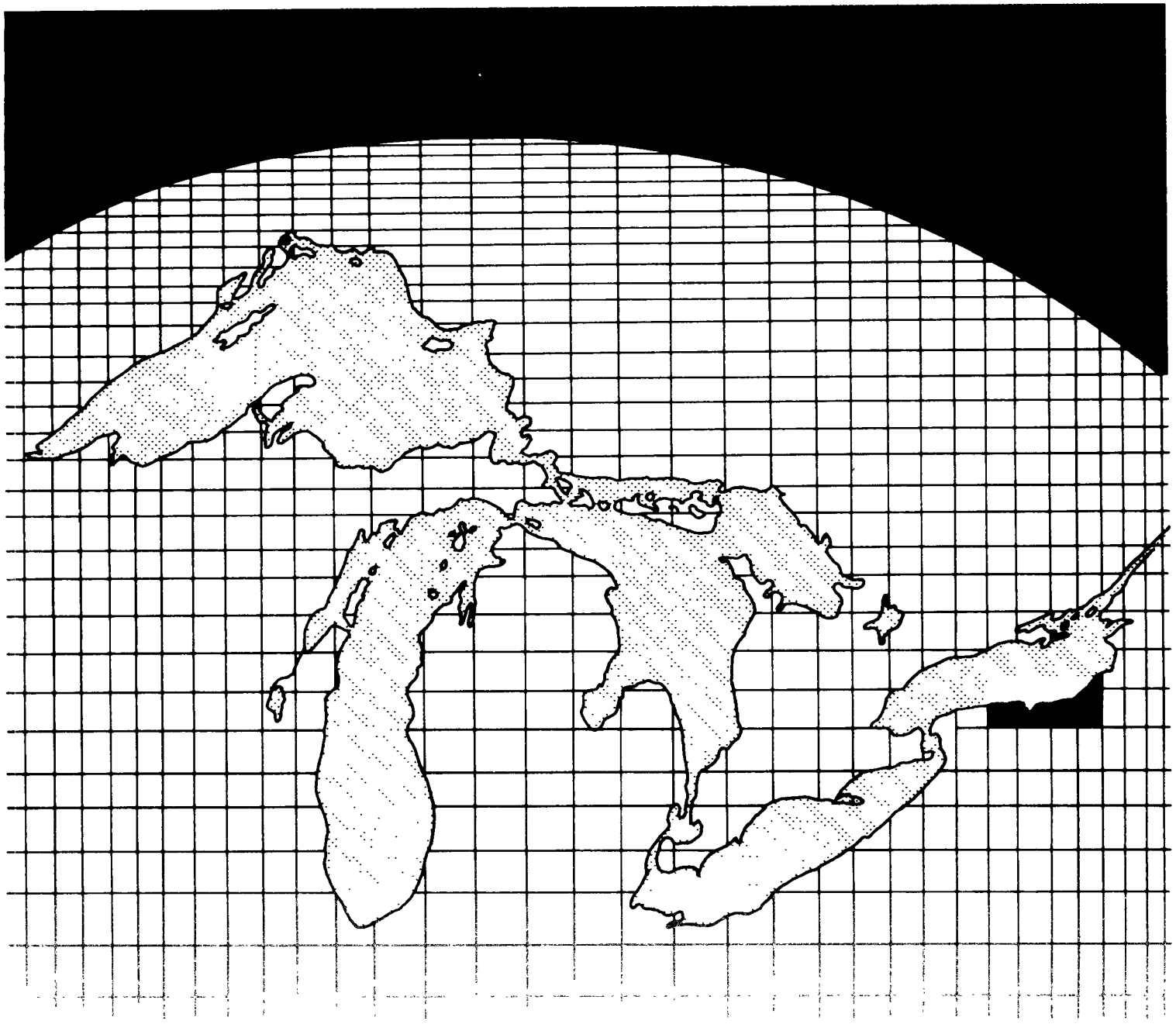
Great Lakes National Program Office Harbor Sediment Program Lake Ontario 1981:

Rochester, New York, Oswego, New York, Olcott, New York



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GREAT LAKES NATIONAL PROGRAM OFFICE HARBOR SEDIMENT PROGRAM LAKE ONTARIO 1981: ROCHESTER, NEW YORK OSWEGO, NEW YORK OLCOTT, NEW YORK

by

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FOREWORD

The Great Lakes National Program Office (GLNPO) of the United States Environmental Protection Agency was established in Region V, Chicago, to focus attention on the significant and complex natural resource represented by the Great Lakes.

GLNPO implements a multi-media environmental management program drawing on a wide range of expertise represented by universities, private firms, State, Federal, and Canadian governmental agencies, and the International Joint Commission. The goal of the GLNPO program is to develop programs, practices and technology necessary for a better understanding of the Great Lakes Basin ecosystem and to eliminate or reduce to the maximum extent practicable the discharge of pollutants into the Great Lakes system. GLNPO also coordinates U.S. actions in fulfillment of the Great Lakes Water Quality Agreement of 1978 betweeen Canada and the United States of America.

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Acknowledgements

A great deal of credit goes to our colleagues within the Great Lakes National Program Office for support in planning, site selection, collection of sediments, compilation of data, data management, and interpretation of results. In particular David DeVault, Rossetta McPherson, Michael Pandya and Stanely Witt deserve special mention for their efforts in this project.

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The chemical analysis of the sediments has been undertaken by Central Regional Laboratory, USEPA Region V, via contract to BIONETICS. Ms. Andrea Jirka provided the information on analytical methodology.

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Introduction

This report contains sediment chemistry data from three areas on Lake Ontario that were sampled in 1981 under the Great Lakes National Program Office (GLNPO) Harbor Sediment Program: Rochester, New York; Oswego, New York; and Olcott, New York.

Background

Harbor Sediment Program

Toxic substances are being introduced into the environment from many sources. Secondary compounds from these toxicants are often found in the environment. Some of these secondary compounds are more hazardous than the primary chemicals from which they came (i.e., dioxins vs. pentachlorophenol, respectively).

Sediments serve as a sink as well as a potential source for toxic and conventional pollutants. Even if discharges of pollutants are completely eliminated, contaminated sediments can serve as a source of pollution to aquatic life, the Great Lakes, and the populations using the water bodies for drinking water supplies for many years to come. If one names the toxic substances problem areas around the Great Lakes: Waukegan, Illinois; Indiana Harbor Canal/Grand Calumet River, Indiana; Ashtabula, Ohio; Saginaw River and Bay, Michigan; Sheboygan River, Green Bay, and Milwaukee, Wisconsin; Buffalo and Niagara, New York the "problem" is invariably linked with toxics in the sediments.

Some 10 million cubic meters of sediments are dredged annually to maintain navigation in Great Lakes' ports (ref.). Many of these ports contain sediment contaminated with toxic substances. Environmentally safe dredging and disposal is necessary to protect the lakes, wildlife, and the public while maintaining the economic viability of water borne commerce.

Due to the relatively recent identification of in-place pollutants as major remaining sources of contaminants and availability of the analytical capability to allow the measurement of toxic organics, only a very limited and disjointed data base exists for organic contaminant levels in sediments. To fill the void, GLNPO has embarked on a multi-year effort to determine the level of toxic substances in Great Lakes river and harbor sediments. Sampling priorities are being determined by examining fish flesh contaminant data, locations of likely industrial sources, and by review of USEPA and other agency data.

Nineteen surveys were completed in 1981 including the Buffalo and Niagara River area. This report summarizes the results from the three surveys in the Lake Ontario Basin.

The information generated by this program will be used in making regulatory decisions on dredging and disposal and to identify environmental "hot spots" requiring further remedial activity including identification and control of sources. Chemicals monitored in the sediments will form a new information data base for the Great Lakes. Selected samples will be scanned for organics and metals using best available methods. Gas chromatography mass spectrometry (GC/MS) organic scans involve acid, base and neutral extractions of volatile and non-volatile substances. Quantification is routinely done by gas chromatograph electron capture technology (GC/EC) for PCBs and some 30 pesticides.

Sampling Methodology

Sediment samples were collected in the manner described in the Methods Manual for Bottom Sediment Sample Collection (USEPA, 1982). This Manual provides detailed procedures for survey planning, sample collection, document preparation and quality assurance for sediment sampling surveys.

Each site survey is designed by determining and plotting on a large scale map the location of sewage treatment plant discharges, combined sewer discharges (particularly those carrying industrial waste), industrial discharges and any other feature that might result in contaminated sediments. To this is added any data on sedimentation patterns that may exist from dredging records, and existing data on sediment quality. This information is used to identify locations where contaminated sediments are most likely to be found. Because sample sites are chosen to find worst-case conditions, the analytical data do not necessarily represent the ambient sediment contaminant levels in the area.

Two categories of sampling sites are selected. Primary sites are sites that are most likely to be contaminated and are scanned and run for specific compounds which are known to be used in the area or have been found in fish from the area. Secondary sites are sites which will be run if the primary sites indicate significant contamination exists and will be used to define the extent of the contamination. Secondary samples would only be analyzed for the specifc compounds indicated as significant contaminants at primary sites.

In general, the finer and more polluted sediments will deposit along the edges of a navigation channel, on the inside edge of a curve in a river, on the down drift side of the littoral drift beach zone, or on deltas off of river mouths. Samples are, therefore, generally collected in these areas rather than mid-

channel. Sounding charts are extremely helpful for sample site selection since they show the areas requiring the most dredging and, therefore, where the shoal material is depositing. On a straight channel, lacking sounding information, a good approach is to select sites on alternating sides of the channel.

Areas likely to show the pollutional effects of man's activity are sampled. Therefore, when applicable, sample sites are located in the vicinity of marinas, loading docks, and industrial or municipal outfalls.

Due to laboratory resource constraints not all primary sites could be analyzed. Based upon field evaluations of the quality of sediments, benthos, and potential sources, those sites which appeared to be the "worst" were selected for analysis. Samples from the remaining sites were logged, preserved, and stored for future analysis should additional data be required.

Sampling Equipment

Grab samples were retrieved using a Ponar dredge. Core samples were taken using a Wildco brass core tube 20" long with a 2" inner diameter and clear Lexan plastic liner tube. The sediments were preserved by refrigeration at 4°C. Multiple grabs or core samples had to be composited at some sites to obtain sufficient volumes. Duplicate samples were collected on at least ten percent of the sample sites.

Analytical Methodology

Prior to non-volatile organic analysis, the sediment samples were allowed to thaw to 15-25°C. Each sample was manually mixed and allowed to air dry. All samples were ground with a mortar and pestle. Any sample requiring further homogenization (discretion of analyst) was then passed through a 20 mesh polypropylene sieve. The percent solids of the sample was determined on a separate aliquot dried at 103-105°C.

The presence of a broad range of volatile and non-volatile organic contaminants was determined by GC/MS scans. The non-volative organics were removed from the sediments by Soxhlet extraction with a 1:1 mixture of acetone and hexane. A portion of the extract was passed through florisil and silica gel columns for PCB and pesticide separation and analyzed by GC/EC. The organic extracts were then injected into a Hewlett-Packard 5985 Gas Ghromotograph/Mass Spectrometer. Volatile organic analysis was done on wet sediment diluted with organic-free water. Concentration is later corrected for percent solids and reported on a dry weight basis. The sediment and dilution water was purged with helium and the volative organics were trapped on Tenax. The trap was desorbed onto the GC column of a Hewlett-Packard 5985 GC/MS. All GC/MS scans and specific GC analyses followed USEPA standard procedures for dealing with priority pollutants. (Methods 608, 624, 625 Federal Register December 3, 1979).

Quantification of PCBs and pesticides was determined by subjecting the sediment extracts to gas chromatography with electron capture detector (GC/EC). Samples were air dried and sieved. Organic components were removed from 20 grams of sample using Soxhlet extraction of 16 hours with a solvent consisting of a 1:1 acetone/hexane (V:V) mixture. The extract was concentrated and partitioned through florisil for the elimination of interferences and separation of various pesticide mixtures. Further separation of PCBs from pesticide components was done with silica gel. Quantitative determination and confirmation was done using dual-column GC/EC on the extracts. The GC/EC extracts were also analyzed by GC/MS for additional confirmation.

Heavy metals were determined by first digesting the sediment samples in a mixture of concentrated nitric and sulfuric acids. The acid extracts were analyzed for arsenic, mercury, and selenium using standard USEPA flameless atomic absorption spectrometry. In addition, a scan for over 20 metals was made using Inductively Coupled Argon Plasma (ICAP) techniques. All metals and organic contaminants were reported as milligrams per kilogram (ppm) dry weight.

The following seven determinations of conventional pollutants were run on all sediments.

Chemical Oxygen Demand (COD). COD was determined based on a catalyzed reaction with potassium dichromate. A homogenized, acidified wet sediment sample was mixed with standarized potassium dichromate, silver sulfate-sulfuric acid and mercuric oxide and refluxed for 2 hours. The COD of the sample is proportional to the amount of dichromate chemically reduced during the procedure. Values are reported as mg/kg COD.

Cyanide. Cyanide is converted to HCN by means of a refux-distillation catalyzed by copper chloride which decomposes metallic cyanide complexes. Cyanide is determined spectrophotometrically as the cyanide is absorbed in a 0.2 N NaOH solution. Cyanide concentrations are reported as mg CN^- /kg dry sediment.

Phenol. Manual distillation of phenolic compounds was used to remove interferences. The distillate reacts with buffered ferri-cyanide and 4 aminoantipyrine spectrophotometrically at 505 nm. Phenol concentrations in the sediment are reported as mg/kg dry sediment.

Phosphorus (total). Phosphorus was determined using a Technicon II Auto Analyzer after block digestion of the sample. A 0.5 g dry weight sample was suspended in an HgO-K_5O_4-H_2SO_4 solution and digested at 200°C for 1 hour and at 370°C for 1 hour. Phosphate in the digestate was quantified using the Automated Ascorbic Acid procedure. Phosphorus concentrations were reported as mg/kg dry sediment.

%Solids. A known weight of homogenized, moist sediment was dried at 105°C. The total solids are calculated as:

$$\%\text{Solids} = \frac{\text{dry weight g}}{\text{wet weight g}} \quad x\ (100\%)$$

Volatile Solids. Volatile solids were determined by igniting the residue from the total solids determination at 550°C to a constant weight. Volatile solids were expressed as a percentage of the total solids in the sample.

Total Kjeldahl Nitrogen (TKN). TKN was determined on the HgO-K_2SO_4-H_2SO_4 sediment digest analyzed for total phosphorus. Nitrogen was quantified as ammonia using the alkaline phenol-hypochlorite procedure.

Quality assurance procedures set variance limits for reference samples, sample splits, and spike samples. Any results obtained outside USEPA acceptance limits were flagged as out-of-control and the samples rerun, if possible.

More detailed descriptions of the methodology for sediment analysis can be obtained from USEPA, Region V, Central Regional Laboratory, 536 S. Clark Street, Chicago, Illinois 60605.

RESULTS

Rochester, New York

Sediment samples were collected at 14 locations on the Genessee River at Rochester, New York on May 3, 1981 (see Figure 1 and Table 1). All samples were analyzed.

The conventional pollutants and metals analyses of the sediments (Table 2) generally show low* to moderate levels of pollution at most sites. Sediments from the Riverview Yacht Basin (sample site ROC81-03 and 03B) had high levels of most guidelines parameters. Sediments at this site had high total volatile solids and COD levels. These sediments would be expected to have high pollutant levels due to the affinity of pollutants to organic matter. Sediments from site ROC81-08 had moderate to high metals levels and low organic (COD, TVS) levels. This site is right at an Eastman Kodak Company outfall.

PCBs and pesticides levels (Table 3) were at trace to low levels at all sites. Levels were highest in the sample from the Riverview Yacht Basin site (ROC81-03).

Table 4 lists the organic compounds sought in the samples by the GC/MS method and their maximum detection limits. Table 5 shows the organic compounds identified in the sediment samples by the GC/MS method. Most detected organics were present at low levels. The sample from site ROC81-02 had the greatest variety of organics and is located near the sewage treatment plant outfall.

*The terms low, moderate, high used in this report are derived by comparison of the observed sediment concentrations to the USEPA Guidelines for the Pollutional Classification of Great Lakes Harbor Sediments (Appendix A) for the parameters covered by the guidelines. For the parameters for which guidelines have not been published, the terms are defined by comparing the concentrations qualitatively to concentrations observed by the authors in other Great Lakes harbor and river sediments.

Table 6 contains the data for organic compounds that were tentatively identified by GC/MS. This means the compounds had a high similarity ratio to the library mass spectra of the listed compound, but they were not confirmed or quantified accurately by being run against actual standards of the tentatively identified compound. The samples from sites ROC81-12 and 14 had the greatest variety of tentatively identified compounds. Triphenyl phosphate was tentatively identified in the samples from sites ROC81-07 and 08, off of an Eastman Kodak Company outfall. This compound is used as a plasticizer for cellulose acetate and nitrocellulose.

Conclusions

In summary, sediments in the Genessee River at Rochester, New York were found to have low to moderate levels of pollutants. Sediments in the Riverside Yacht Basin had high levels of conventional pollutants and metals and were organic in nature. From the perspective of sediment contamination there appears to be evidence of the influence of the Eastman Kodak Company discharges on the river sediments as evidenced by the limited extent of triphenyl phosphate. This impact does not appear to be severe and seems to affect only a small part of the river near the discharges. Although there is a wide variety of organic contaminants, there is no clearly defined source(s) in the area of the river which was sampled. The widest variety of organic contaminants was found at a site near the sewage treatment plant outfall. The contaminant concentration levels found were low when compared with levels found in the Buffalo, New York Sediment Survey (Rockwell et al 1984).

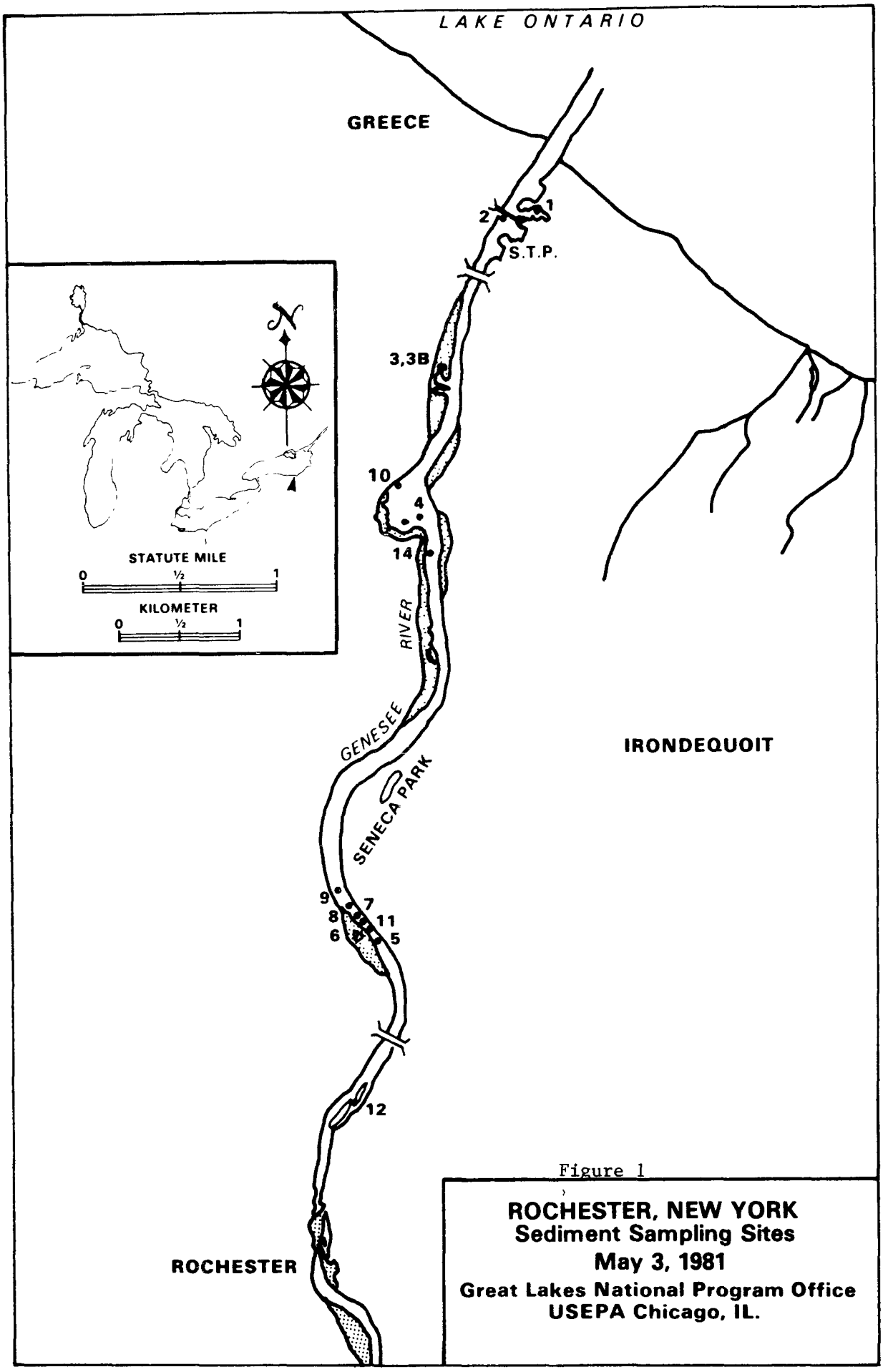

Figure 1

ROCHESTER, NEW YORK
Sediment Sampling Sites
May 3, 1981
Great Lakes National Program Office
USEPA Chicago, IL.

Table 1
Field Observations: Rochester, New York
May 3, 1981

Sample Site	Sample Site and Sediment Description
STORET Station No.	
ROC81-01	Rochester Yacht Club Harbor - no benthos or odor.
ROC81-02	Near storm sewer - blood midges and leeches - west bank of Genessee River.
ROC81-03 and 03B	Riverview Yacht Basin-taken with corer-some oligochaetes and midge (blood red) larvae.
ROC81-04	Genesee Dock west side of River - silty clay. Oligochaetes, midge larvae, clams.
ROC81-05	Kodak Treatment Plant - upstream - sandy
ROC81-06	Kodak Treatment Plant - upstream - muddy, organic odor
ROC81-07	Off outfall from Kodak-muddy, organic chlorinated chemical smell.
ROC81-08	Right at outfall pipe of sample site ROC81-07.
ROC81-09	Just downstream from Kodak Plant.
ROC81-10	Sample in marsh area at north end of Rattlesnake Pt. in Genessee River.
ROC81-11	Sandy material-chlorinated chemical odor from outfall of Kodak Treatment Plant. Site was right at the end of the pipe.
ROC81-12	At end of small island just off Seneca Park in Genessee River.
ROC81-14	Sample at Portland Cement dock in Genessee River.

Table 2

Sediment Concentrations of Some Conventional Pollutants and Metals
Rochester, New York
May 3, 1981
(All values are mg/kg dry weight unless otherwise noted)

Parameter	Location Sample Site Number													
	ROC 81 01	ROC 81 02	ROC 81 03	ROC 81 03 B	ROC 81 04	ROC 81 05	ROC 81 06	ROC 81 07	ROC 81 08	ROC 81 09	ROC 81 10	ROC 81 11	ROC 81 12	ROC 81 14
Tot. Solids (%)	62.2	65.3	37.6	41.6	63.4	77.2	66.1	66.0	62.5	67.7	56.8	66.5	67.5	59.0
Tot. Volatile Solids (%)	3.19	3.91	12.0	6.65	3.06	1.29	2.74	2.54	2.36	2.42	2.88	1.83	1.40	2.36
Tot. Kjeldah Nitrogen	1200	1300	3200	2100	1200	170	620	750	270	650	990	550	180	1000
Tot. Phosphorus	650	770	1400	970	720	440	500	560	530	550	670	560	470	680
COD (mg/g)	32	36	16	150	28	9	2.8	22	15	19	25	13	15	25
Mercury	0.1	0.3	0.5	0.3	0.4	0.1W	0.1	0.1	0.4	0.2	0.2	K0.1	0.2	0.2
Silver	4.8	14	23	5.8	8.5	2.1	4.4	9.2	30	4.7	11	2.7	0.4	6.6
Boron	8.0W	8.0W	8.0W	8.0W	8.0W	8.0W	8.0W	8.0W	19	8.0W	8.0W	8.0W	8.0W	8.0W
Barium	82	100	410	140	86	32	45	64	240	48	86	49	30	72
Cadmium	1.0	4.1	29	6.5	2.3	0.2W	0.5	4.2	9.1	0.9	3.1	0.6	0.4	1.5
Cobalt	10	9.0	14	14	9.2	5.9	7.6	7.5	18	7.1	9.1	7.1	6.2	8.5
Chromium	20	24	65	38	19	11	14	16	37	13	21	12	11	17
Copper	30	51	98	58	28	15	27	28	73	21	28	16	17	25
Lithium	26	24	35	40	23	14	17	18	21	17	23	18	13	22
Manganese	580	390	470	510	440	240	300	330	230	330	380	320	190	410
Molybdenum	1.0W	1.2	1.6	1.0W	1.0W	1.0W	1.0W	1.0W	1.0W	1.1	1.0W	1.0W	1.0W	1.1
Nickel	25	23	37	36	24	16	20	19	24	18	23	17	14	21
Lead	24	67	250	170	31	15	34	39	130	24	34	14	31	27
Tin	4.0W	4.7	4.0W	4.0W	4.0W	4.0W	4.0W	4.0W	5.9	4.0W	4.0W	4.0W	4.0W	4.0W
Strontium	36	39	73	53	35	16	20	23	200	27	35	20	17	35
Vanadium	15	16	25	27	14	9	10	11	24	10	14	11	8.9	12
Yttrium	12	10	14	15	9.8	6.6	7.1	7.7	13	7.9	9.6	8.2	6.5	9.3
Zinc	100	170	780	280	120	51	80	95	220	76	140	62	55	99
Calcium (mg/g)	12	13	17	17	12	6	7.2	8.2	91	9.0	12	7.2	6.5	1
Potassium (mg/g)	0.9	0.9	1.4	1.9	0.7	0.5	0.5	0.5	0.8	0.5	0.6	0.7	0.5	0.6
Magnesium (mg/g)	7.0	7.0	12	13	6.8	3.9	4.7	5.1	17	5.1	6.9	4.8	3.9	6.8
Sodium (mg/g)	0.1W	0.1W	0.2	0.2	0.1W	0.1W	0.1W	0.1W	0.6	0.3	0.1W	0.1W	0.1W	0.1W
Aluminum (mg/g)	10	9	15	17	8.8	5.5	6.7	7.2	9.2	6.6	8.6	7.0	5.2	8.3
Iron (mg/g)	23	21	31	32	20	14	16	17	23	16	19	15	12	19

Reporting Codes:

A "W" notation means the concentration was below the stated level, which was the minimum instrument response level.
A "K" notation means the chemical was present but below the stated concentration, which is the normal limit of quantification.
A "T" notation means the chemical was present above the method detection limit but below the limit of quantification.
A "ND" notation means there was no instrument response at all.

Table 3
Sediment Concentrations of PCBs and Pesticides by the GC/EC Method:
Rochester, New York
May 3, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameters	Location Sample Site Number														
	ROC 81 01	ROC 81 01-DUP	ROC 81 02	ROC 81 03	ROC 81 04	ROC 81 05	ROC 81 06	ROC 81 07	ROC 81 08	ROC 81 09	ROC 81 09-DUP	ROC 81 10	ROC 81 11	ROC 81 12	ROC 81 14
Aroclor 1242	.02W	.02W	.02W	.02W	.02W	.02W	.02W	.02W	.02W	ND	ND	ND	ND	ND	ND
Aroclor 1248	.02	.04	.046	.22	.03	.025	.02	.03	.06	.009	.008	.032	.027	.025	.017
Aroclor 1254	.013	.02	.05	.31	.025	.016	.029	.026	.18	.028	.017	.023	.011	.021	.009
Aroclor 1260	.007	.015	.025	.19	.022	.011	.035	.022	.07	.006	.008	.015	.005	.007	.005
o,p-DDE	.001	.002	.007	.033	.003	.001	.003	.003	.004	.003	.002	.001	.001	.002	.002
p,p'-DDE	.001	.001	.004	.019	.002	.001W	.001	.001	.004	.004	.002	.001W	.001W	.002	.001
o,p-DDD	.001W	.001W	.003	.088	ND	ND	ND	.002	.004	ND	.002	ND	ND	ND	.001W
p,p'-DDD	.001	.002	ND	.049	ND	ND	ND	ND	.007	.005	ND	ND	ND	ND	ND
o,p-DDT	ND	ND	.006	.009	.002	.001W	.002	.002	.001W	.001	.001W	ND	ND	.001	.001
p,p'-DDT	.003	.003	.011	.016	.004	.003	.002	.002	.004	.006	.005	.002	.003	.041	.002
g-Chlordane	.001	.001	.006	.023	.002	.001	.002	.003	ND	ND	ND	ND	ND	.002	.002
Oxychlordane	ND	ND	.01	ND	ND	ND	ND	.001	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	ND	ND	.002	ND	ND	ND	ND	.001W	ND	.004	.002	ND	ND	ND	ND
Zytron	.004	.003	.012	.053	.006	ND	.007	.009	.015	.005	.005	.004	.004	.007	.004
b-BHC	.001W	.001W	.001	.005	ND	ND	ND	ND	.001W	.002	.003	.001W	.001W	.001	.001W
g-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	.001W	.001W	.002	.001	.001	.001W	.001W	.001W	.005	.001W	.001W	.001W	.001W	.001W	.001W
Trifluralin	ND	ND	ND	ND	.013	ND	.013	.011	ND	ND	ND	ND	ND	ND	ND
Aldrin	ND	.001	.002	.016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptaclor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxyclor	ND	ND	.013	ND	ND	ND	ND	ND	.012	ND	ND	ND	ND	ND	.021
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DCPA	ND	.001W	.005	.003	.001W	.001W	.002	.002	ND	.001	.002	.002	.001W	.001	.001W
Endosulfan I	ND	ND	.001W	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	.001	ND	ND	ND	ND	ND	.001	.002	.003	.001W	.003	.002
Dieldrin	.001W	.001W	.002	.004	.001W	.001W	.001	.001	.002	.001	.001W	ND	.001W	.001W	.001W
Di-n-butyl phthalate	.065	.085	.173	.134	.075	.096	.275	.454	.168	.125	.113	.152	.476	.139	.050

Reporting Codes: A "W" notation means the concentration was below the stated level, which was the minimum instrument reponse level.
A "K" notation means the chemical was present but below the stated concentration, which is the normal limit of quantifications.
A "T" notation means the chemical was present above the method detection limit but below the limit of quantification.
A "ND" notation means there was no instrument response at all.
a=alpha; b=beta; d=delta; g=gamma

Table 4
Organic Compounds Sought in Sediments by the GC/MS Method and Maximum Detection Limits: Rochester, New York, May 3, 1981

(Actual detection limits for individual samples may vary as a function of interferences present, aliquot size, degree of pre-concentration, etc). (All values are mg/kg dry weight unless otherwise noted).

Semi Volatiles

Compound	B/N/A Mixtures	Maximum Detection Limit
Chlorinated Aliphatics		
Hexachloroethane		.22
Hexachlorobutadiene		.11
Chlorinated Aromatics		
1,2-Dichlorobenzene		.08
1,3-Dichlorobenzene		.23
1,4-Dichlorobenzene		.23
1,2,4-Trichlorobenzene		.11
Hexachlorobenzene		.07
2-Chloronaphthalene		.04
Chlorinated Phenolics		
2-Chlorophenol		.16
2,4-Dichlorophenol		.12
2,4,6-Trichlorophenol		.33
Pentachlorophenol		.32
p-Chloro-m-cresol		.09
Halogenated Ethers		
bis(2-Chloroethyl) ether		.08
4-bromophenylphenylether		.10
bis(2-chloroethoxy)methane		43.47
Phenolics		
Phenol		.08
2,4-Dimethylphenol		.31
p-t-butylphenol		.06

Table 4 Con't

Nitro Aromatics	
Nitrobenzene	.87
2-Nitrophenol	.31
4-Nitrophenol	8.69
4,6-Dinitro-o-cresol	.94
2,4-Dinitrotoluene	.22
2,6-Dinitrotoluene	.14
Polynuclear Aromatic Hydrocarbons	
Naphthalene	.02
Acenaphthene	.03
Acenaphthylene	.03
Fluorene	.04
Anthracene/Phenanthrene	.18
Pyrene	.05
Benzo(b)fluoranthene	.24
Benzo(a)pyrene	.44
Indeno(1,2,3-cd)pyrene	.15
Perylene	.32
Benzo(g,h,i)perylene	1.36
Phthalate Esters	
Dimethyl phthalate	.03
Diethyl phthalate	.05
Di-n-butyl phthalate	.06
Nitrosamines	
N-Nitrosodipropylamine	.13
N-Nitrosodiphenylamine	.08
Miscellaneous	
Isophorone	.04
1,2-Diphenylhydrazine	.74

Table 4 Con't

Pesticides

Triflan(Trifluralin)	.21
g-BHC (lindane)	.57
Hexachlorobenzene	.07
2,4-D, Isopropyl Ester	.67
b-BHC	2.89
a-BHC	4.06
Heptachlor	.97
Zytron	.31
Aldrin	.71
DCPA	.16
Isodrin	.60
Heptachlor Epoxide	.47
Oxychlordane	1.81
g-Chlordane	.39
o,p-DDE	.22
Endosulfan-I	4.78
p,p'-DDE	.18
Dieldrin	.72
o,p-DDD	.16
Endrin	.69
Chlorobenzilate	.27
Endosulfan-II	5.48
o,p-DDT & p,p-DDD	.20
Kepone(Chlordecone)	.97
p,p'-DDT	1.07
Methoxychlor	.90
Tetradifon	1.23
Mirex	.50

PCB's

Monochlorobiphenyl	.39
Dichlorobiphenyl(1)	.30
Dichlorobiphenyl(2)	1.82
Trichlorobiphenyl(1)	.62
Trichlorobiphenyl(2)	.06
Trichlorobiphenyl(3)	3.86
Trichlorobiphenyl(4)	.49
Tetrachlorobiphenyl(1)	.27
Tetrachlorobiphenyl(2)	.27
Tetrachlorobiphenyl(3)	.70
Tetrachlorobiphenyl(4)	.28
Tetrachlorobiphenyl(5)	.23
Tetrachlorobiphenyl(6)	2.62
Tetrachlorobiphenyl(7)	4.32
Pentachlorobiphenyl(1)	.24
Pentachlorobiphenyl(2)	8.20
Pentachlorobiphenyl(3)	5.97
Pentachlorobiphenyl(4)	1.46
Pentachlorobiphenyl(5)	2.26
Pentachlorobiphenyl(6)	.09
Hexachlorobiphenyl(1)	.22
Hexachlorobiphenyl(2)	.20
Hexachlorobiphenyl(3)	.17
Hexachlorobiphenyl(4)	.14
Heptachlorobiphenyl(1)	.09
Heptachlorobiphenyl(2)	.10
Heptachlorobiphenyl(3)	.10
Heptachlorobiphenyl(4)	.12
Heptachlorobiphenyl(5)	.15

Table 4 Con't

VOLATILES

Halomethanes	
Dichloromethane	.0099
Trichloromethane	.0026
Tetrachloromethane	.0053
Tribromomethane	.0023
Dibromochloromethane	.0022
Bromodichloromethane	.0024
Trichlorofluoromethane	.0258
Chlorinated Ethanes	
1,1-Dichloroethane	.0119
1,2-Dichloroethane	.0060
1,1,1-Trichloroethane	.0043
1,1,2-Trichloroethane	.0054
1,1,2,2-Tetrachloroethane	.0031
Chlorinated Ethylenes	
1,1-Dichloroethylene	.0305
1,2-Dichloroethylene	.0049
Trichloroethylene	.0030
Tetrachloroethylene	.0032
Chlorinated Propanes and Propenes	
1,2-Dichloropropane	.0051
cis-1,3-Dichloro-1-propene	.0030
trans-1,3-Dichloro-1-propene	.0031
Aromatics	
Benzene	.0016
Methylbenzene	.0011
Ethylbenzene	.0010
1,3-Dimethylbenzene	.0013
1,2- and 1,4-Dimethylbenzene	.0012
Chlorobenzene	.0015

Table 5
Organic Compounds Identified in Sediments by the GC/MS Method:
Rochester, New York, May 3, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameter	Location Sample Site Number								
	ROC 81 -01	ROC 81 -01 DUP	ROC 81 -02	ROC 81 -03	ROC 81 -04	ROC 81 -05	ROC 81 -06	ROC 81 -07	ROC 81 -08
Chlorinated Aliphatics									
Hexachlorobutadiene	.04		.10						
Chlorinated Aromatics									
1,2,4-Trichlorobenzene			.16						
Hexachlorobenzene			.15						
Phenolics									
p-t-Butylphenol			1.0				3.15	3.16	
2,4-Dimethylphenol				.06					
Polynuclear Aromatic Hydrocarbons									
Naphthalene		.04	.23	.06					
Acenaphthene		.01	.22	.02					
Phenanthrene/Anthracene	.02	.03	.221	.63	.24	.21	.4	.54	.08
Fluorene	.04		.04	.05					
Fluoranthene	.02	.17	.90	.40	.20	.25	.5	.42	.15
Pyrene	.16	.10	.60	.24	.18	.20	.41	.31	.20
Benzo(a)Pyrene			1.4						
Chrysene/Benzo(a)anthracene	.42	.30	2.30	.59	.47	.46	.82	.74	.53
Phthalate Esters									
Diethyl phthalate	.04	.03	.04	.05					
Di-n-butyl phthalate	.07	.07	0.6	.13	.07-11	.11-.14		.07	.11-.13
bis(2-Ethylhexyl) phthalate	.49	.23	.04	.38	1.0	1.12	.75	.62	.34
butyl benzyl phthalate	.04	.04	.10						
Dimethyl phthalate								3.07	1.99

Table 5
Organic Compounds Identified in Sediments by the GC/MS Method:
Rochester, New York, May 3, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameter	Location Sample Site Number					
	ROC 81 -09	ROC 81 -09 Dup	ROC 81 -10	ROC 81 -11	ROC 81 -12	ROC 81 -14
	Semivolatiles (B/N/A) Analysis					
Phenolics						
p-t-Butylphenol	0.50	0.60	.14		.03	.15
Phenol	0.60	0.55	.14			
Polynuclear Aromatic Hydrocarbons						
Naphthalene	0.1	0.35	.05	.04	.02	.06
Acenaphthene	0.04	0.02	.01		.01	.01
Phenanthrene/Anthracene	0.48	0.4	.12	.10	.13	.16
Fluorene	0.05	0.04		.01	.01	.02
Fluoranthene	0.63	0.43	.18	.08	.20	.25
Pyrene	0.51	0.33	.19	.08	.19	.21
Benzo(a)pyrene			2.09	.85	2.22	2.44
Chrysene/Benzo(a)anthracene	1.67	1.12	.64	.26	.14-.2	.33-.41
Benzo(b)fluoanthene			1.21	.47	1.11	1.35
Acenaphthylene					.009	.01
Phthalate Esters						
Diethyl phthalate			.03	.02		
Di-n-Butyl phthalate	0.17	0.08	.07	.05	.04	.07
bis(2-ethylhexy) phthalate	0.33	0.38	.41	.22	.35	.58
Butyl benzyl phthalate			.08	.07	.09	.05

Table 6
Organic Compounds Tentatively Identified in Sediments by the GC/MS Method:
Rochester, New York, May 3, 1981

(i.e., compounds with high similarity to library mass spectra of the compound, but not run against actual standards of the compound)

Parameter	Location Sample Site Number								
	ROC 81 -01	ROC 81 -01DUP	ROC 81 -02	ROC 81 -03	ROC 81 -04	ROC 81 -05	ROC 81 -06	ROC 81 -07	ROC 81 -08
Phenolics			Semivolatiles (B/N/A) Analysis						
2-Ethyl-p-cresol								*	
5-Ethyl-o-cresol								*	
2,4-diisopropylphenol								*	
Ethers									
Diphenyl ether								*	
2-Phenoxy-1,1-biphenyl									*
Phtcyclic Esters									
Methylvinyl terephthalate									*
Polycyclic Aromatic Hydrocarons and Derivations									
4H-Cyclopenta(d,e,f) phenathene				*					
Methylnaphthalene				*					
Methylphenanthrene	*	*							
Dimethylphenanthrene	*	*							
Miscellaneous									
3,5-Dimethyl-2-cycohexen -1-one				*					
Triphenyl phosphate								*	*
Hydrocarbons	*	*		*	*	*	*	*	
			Volatiles						
Diethylether	*	*			*	*			
3,4-Dimethyl-1-hexane							*		
Heptane							*		

*Compound tentatively identified in sample from this site.

Table 6 Con't
Organic Compounds Tentatively Identified in Sediments by the GC/MS Method:
Rochester, New York, May 3, 1981

(i.e., compounds with high similarity to library mass spectra of the compound, but not run against actual standards of the compound)

Parameter	Location Sample Site Number ROC 81 -09	ROC 81 -09DUP	ROC 81 -10	ROC 81 -11	ROC 81 -12	ROC 81 -14
Phenolics						
Cresol						*
o-Cresol	*	*	*		*	
o-Isopropylphenol	*	*				
Polycyclic Aromatic Hydrocarbons and Derivative						
Benzo(c)phenanthrene						
Benzo(g,h,i)fluoranthene					*	
11H-Benzo(a)fluorene						*
11H-Benzo(a)fluorene-1-methylpyrene			*		*	
11H-Benzo(d,e,f)fluorene					*	
4H-cyclopenta(d,e,f)phenanthrene					*	*
Methylnaphthalene,Total	*	*	*	*	*	*
Methylphenanthrene	*	*	*	*	*	*
Dimethylnaphthalene	*	*	*	*	*	*
Trimethylnaphthalene	*	*				
Pentamethylnaphthalene						
Phenylnaphthalene						
Dimethylphenanthrene						
Trimethylphenanthrene						
Methylfluoranthene					*	*
Methylpyrene					*	*
Dimethylpyrene						
Methylbenz(a)anthrene						*
Methyldibenzothiephene						*
1-Chloro-2,3-dihydro-1H-indene	*	*				
Ketones						
3-Hexen-2-one				*	*	
3,5-Dimethyl-2-cyclohexen-1-one	*	*	*			*
Dimethyl-2-cyclohexen-1-one						*
Trimethyl-2-cyclohexen-1-one					*	*
Phthalate Esters						
Dimethyl isophthalate	*	*	*	*		*
Miscellaneous						
Methyltoluate						*
1,1-Biphenyl						*
Methyl-1,1-biphenyl		*	*			*
Hydrocarbons			*	*		*
			VOLATILES			
Diethyl ether					*	
2-(2-methoxyothoxy)ethanol					*	*
Dibromomethane					*	

*Compound tentativley identified in sample from this site.

Oswego, New York

Sediment samples were collected at 4 locations on Wine Creek at Oswego, New York (see Figure 2 and Table 7) on April 28, 1981. Samples from three of the sites (OSW81-01, 02, and 04) were analyzed. Wine Creek was sampled to assess the impact (as measured by sediment contamination) of a former hazardous waste incinerator run by Polllution Abatement Services, Inc which was located along the creek. This hazardous waste site has resulted in groundwater and soils contamination in the area and was the object of an EPA clean up in 1977 (Scrudato, et al, 1980).

Levels of conventional pollutants and metals (Table 8) were low at sites OSW81-01 and 04 when compared to the USEPA Great Lakes sediment guidelines (USEPA, 1977). Pollutant levels were high at site OSW81-02. This sample was taken in a swampy area to the east of Wine Creek. The sample was very organic (high total volatile solids, COD, nutrients). Thus, the elevated levels of metals are not unexpected.

Sediment concentrations of PCBs and pesticides (Table 9) were trace to low at the sites analyzed except for PCBs at site OSW81-02. PCBs at that site (2.39 mg/kg total PCBs) were elevated above the typical "background" levels found in Great Lakes sediments which are generally less than 1 mg/kg. Of the three sites analyzed in this survey of Wine Creek, pesticides were most frequently detected at site OSW81-02.

Table 10 lists the organic compounds sought by GC/MS and their maximum detection limits for this set of samples. Table 11 contains the data for the organic compounds that were identified by the GC/MS method. The greatest number of compounds detected were found in the sample from site OSW81-02. Levels were not very high, however. Of the compounds identified, most were from the polynuclear aromatic hydrocarbon group.

Table 12 contains data on organic compounds that were tentatively identified in the samples (i.e., had a high similarity to a library mass spectra, but which were not confirmed against actual standards). Of the three sites analyzed, the sample from site OSW81-02 had the greatest variety of compounds tentatively identified.

Conclusion

Sediments in Wine Creek did not show severe contamination from the Pollution Abatement Services site. Some possible PCB contamination was detected in the sample from a swampy area (OSW81-02) near the former hazardous waste facility.

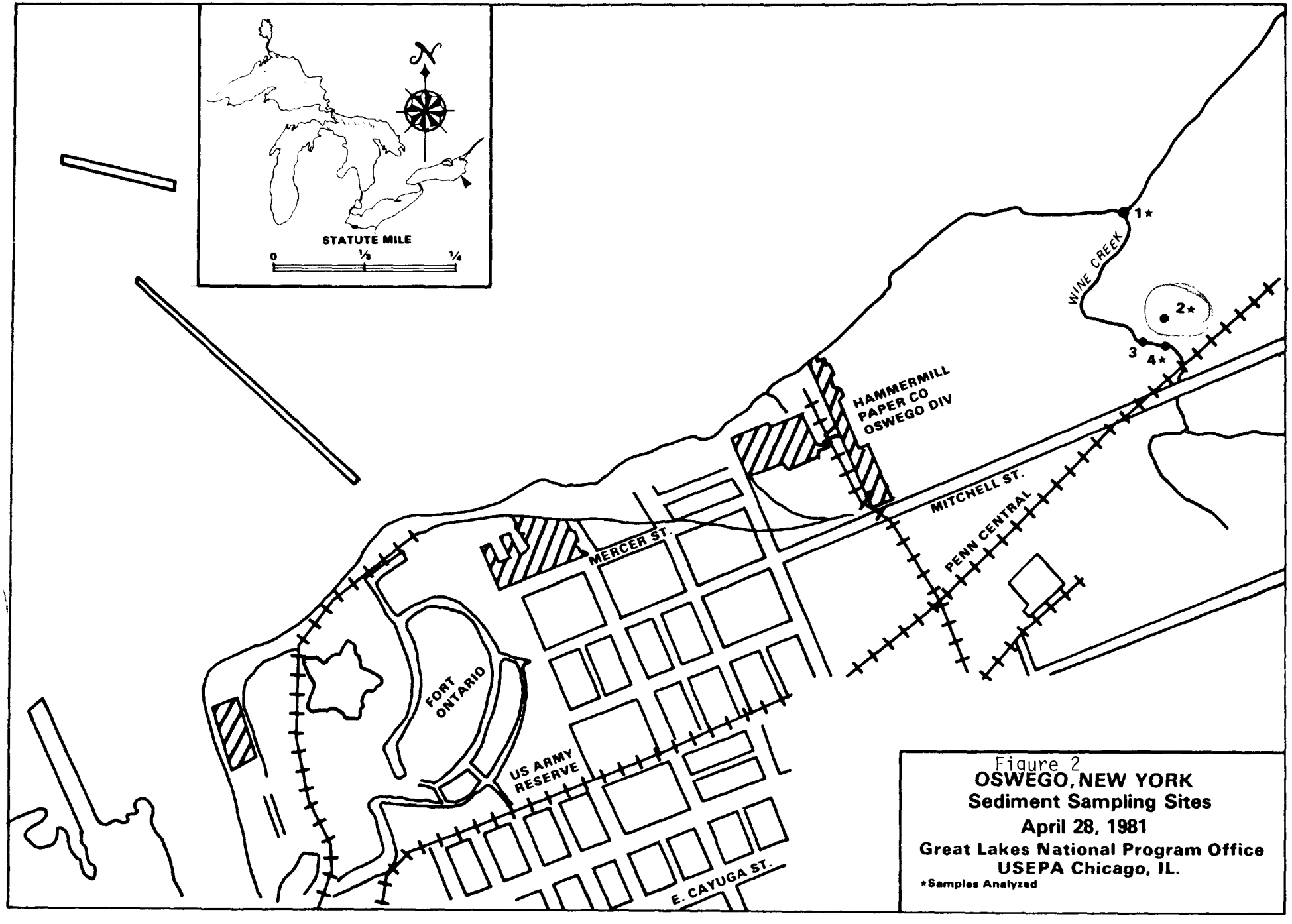

Figure 2
OSWEGO, NEW YORK
Sediment Sampling Sites
April 28, 1981
Great Lakes National Program Office
USEPA Chicago, IL.
*Samples Analyzed

Table 7
Field Observations:
Oswego, New York, April 28, 1981

Sample Site	Sample Site and Sediment Description
STORET Station No.	
OSW81-01	Wine Creek Downstream of Pollution Abatement Services, Inc. Site - sample at Mouth of Creek and Lake Ontario.
OSW81-02	Wetland swampy area draining to Wine Creek about 1/4 Mile South of Lake Ontario.
OSW81-03	Wine Creek about 20 yards South (upstream) of wet land drainage.
OSW81-04	Oil slick on bank of Wine Creek just upstream of wet land drainage.
	NOTE: The Wine Creek junction of Lake Ontario was littered with dead fish, including Coho, N. Pike, Drum, Shad, Carp.

Table 8
Sediment Concentrations of Some Conventional Pollutants and Metals:
Oswego, New York, April 28, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameter	Location Sample Site Number OSW81 01	OSW81 02	OSW81 04
Total Solids (%)	73.6	12.3	54.3
Volatile Solids (%)	0.87	19.4	3.70
Total Kjeldahl Nitrogen	130	3800	1500
Total Phosphorus	330	850	860
COD (mg/g)	26	190	52
Phenol	0.1T	2.1	0.3
Total Mercury	0.1W	0.5	0.1W
Silver	0.3W	0.3W	0.3W
Boron	8.0W	10	8.0W
Barium	36	90	62
Cadmium	0.2W	11	0.3
Cobalt	4.1	7.2	2.6
Chromium	8.3	18	5.0
Copper	16	49	7.3
Lithium	18	20	5.6
Manganese	860	330	340
Molybdenum	1.0W	2.0	1.0W
Nickel	9.6	44	5.9
Lead	42	83	9.2
Tin	4.0W	7.5	4.2
Strontium	77	42	6.8
Vanadium	10	39	7.7
Yttrium	10	11	3.3
Zinc	33	150	39
Calcium (mg/g)	53	20	1.3
Potassium (mg/g)	0.46	0.9	0.2
Magnesium (mg/g)	11	12	1.1
Sodium (mg/g)	0.1	0.3	0.1W
Aluminum (mg/g)	5.7	8.5	2.9
Iron (mg/g)	14	18	7.2

Reporting Codes:

A "W" notation means the concentration was below the stated level, which was the minimum instrument response level.
A "K" notation means the chemical was present but below the stated concentration which is the normal limit of quantification.
A "T" notation means the chemical was present above the method detection limit but below the limit of quantification.
A "ND" notation means there was no instrument response at all.

Table 9
Sediment Concentrations of PCBs and Pesticides by the GC/EC Method:
Oswego, New York, April 28, 1981

(All values are mg/kg dry weight unless otherwise noted)

	Location Sample Site Number			
Parameters	OSW81 -01	OSW81 -01 DUP	OSW81 -02	OSW81 -04
Aroclor 1242	ND	ND	ND	ND
Aroclor 1248	.019	.010	1.07	.446
Aroclor 1254	.012	.009	1.09	0.26
Aroclor 1260	.004	.004	.227	.065
o,p-DDE	ND	ND	ND	.007
p,p'-DDE	ND	ND	.005	.001W
o,p-DDD	ND	ND	.004	ND
p,p'-DDD	ND	ND	.032	ND
o,p-DDT	ND	ND	.023	.001
p,p'-DDT	ND	ND	.01	.049
g-Chlordane	ND	ND	.005	.005
Oxychlordane	ND	ND	ND	ND
Heptachlor epoxide	ND	ND	ND	ND
Zytron	ND	.005	.067	ND
b-BHC	ND	.001	.015	.002
g-BHC	ND	ND	ND	ND
Hexachlorobenzene	.001W	ND	.012	.005
Trifluralin	ND	ND	ND	ND
Aldrin	ND	ND	ND	ND
Heptaclor	ND	ND	ND	ND
Methoxychlor	ND	ND	.04	ND
Edrin	ND	ND	.004	ND
DCPR	.001W	.001W	.013	.001W
Endosulfan I	ND	ND	ND	ND
Endosulfan II	.003	.001W	.013	.002
Dieldrin	.001W	.001W	.006	.005
Di-n-butyl phthalate	.072	.123	.938	.087

Report Codes:

A "W" notation means the concentration was below the stated level, which was the minimum instrument response level.
A "K" notation means the chemical was present but below the state concentration which is the normal limit of quantification.
A"T" notation means the chemical was present above the method detection limit but below the limit of quantification.
A "ND" notation means there was no instrument response at all.

Table 10
Organic Compounds Sought in Sediments by the GC/MS Method and Maximum Detection Limits:
Oswego, New York, April 28, 1981

(Actual detection limits for individual samples may vary as a function of interferences present, aliquot size, degree of pre-concentration, etc).

(All values are mg/kg dry weight unless otherwise noted)

Semi - Volatiles
B/N/A Analysis

Chlorinated Aliphatics	
Hexachloroethane	.06
Hexachlorobutadiene	2.11
Chlorinated Aromatics	
1,2-Dichlorobenzene	.02
1,3-Dichlorobenzene	.02
1,4-Dichlorobenzene	.03
1,2,4-Trichlorobenzene	.02
Hexachlorobenezene	.03
2-Chloronaphthalene	.01
Chlorinated Phenolics	
2-Chlorophenol	.02
2,4-Dichlorophenol	.02
2,4,6-Trichlorophenol	.05
Pentachlorophenol	.18
p-chloro-m-cresol	.03
Halogenated Ethers	
bis(2-Chloroesthyl) ether	.16
4-Bromophenylphenyl ether	.04
bis(2-Chloroethoxy)methane	.02
Phenolics	
Phenol	.03
2,4-Dimethylphenol	.03
p-t-Butylphenol	.02
Nitro Aromatics	
Nitrobenzene	.38
2-Nitrophenol	.05
4-Nitrophenol	2.38
4,6-Dinitro-o-cresol	1.06
2,4-Dinitrotoluene	.05
2,6-Dinitrotoluene	.04

Table 10 Con't

Polynuclear Aromatic Hydrocarbons	
Naphthalene	.005
Acenaphthene	.005
Acenaphthylene	.005
Fluorene	.005
Fluoranthene	.01
Pyrene	.94
Chrysene/Benzo(a)anthracene	.08
Benzo(b)fluoranthene	.02
Benzo(a)pyrene	.05
Indeno(1,2,3-cd)pyrene	.07
Perylene	.14
Benzo(g,h,i)perylene	.59
Phthalate Esters	
Di-n-butyl phthalate	.01
Di-n-octyl phthalate	.08
Butylbenzyl phthalate	.02
bis 2-Ethylhexyl phthalate	.03
Nitrosamines	
N-Nitrosodipropylamine	.03
N-Nitrosodiphenylamine	.03
Miscellaneous	
Isophorone	.06
1,2-Diphenylhydrazine	.02
Dibromobiphenyl	.05

PCBs	Table 10 Con't
Monochlorobiphenyl	.14
Dichlorobiphenyl (1)	.13
Dichlorobiphenyl (2)	.76
Trichlorobiphenyl(1)	.33
Trichlorobiphenyl(2)	2.71
Trichlorobiphenyl(3)	1.90
Trichlorobiphenyl(4)	.07
Tetrachlorobiphenyl (1)	.22
Tetrachlorobiphenyl (2)	.22
Tetrachlorobiphenyl (3)	.59
Tetrachlorobiphenyl (4)	1.90
Tetrachlorobiphenyl (5)	.44
Tetrachlorobiphenyl (6)	1.06
Tetrachlorobiphenyl (7)	.38
Pentachlorobiphenyl (1)	.25
Pentachlorobiphenyl (2)	9.50
Pentachlorobiphenyl (3)	1.06
Pentachlorobiphenyl (4)	1.27
Pentachlorobiphenyl (5)	.90
Pentachlorobiphenyl (6)	.42
Hexachlorobiphenyl (1)	.61
Hexachlorobiphenyl (2)	1.00
Hexachlorobiphenyl (3)	.61
Hexachlorobiphenyl (4)	.68
Heptachlorobiphenyl (1)	.27
Heptachlorobiphenyl (2)	.40
Heptachlorobiphenyl (3)	.30
Heptachlorobiphenyl (4)	.49
Heptachlorobiphenyl (5)	.07
PESTICIDES	
Triflan(Trifluralin)	.08
Gamma-BHC (Indane)	.13
Hexachlorobenzene	.04
2,4-D, Isopropyl ester	.19
b-BHC	1.12
a-BHC	.35
Heptachlor	1.36
Zytron	.20
Aldrin	.22
DCPA	.08
Isodrin	.46
Heptachlor Epoxide	.21
Oxychlordane	1.00
g-Chlordane	.19
o,p-DDE	.09
Endosulfan I	1.58
p,p'-DDE	.13
Dieldrin	.73
o,p-DDD	.11
Endrin	1.90
Chlorbenzilate	.22
Endosulfan II	3.17
o,p-DDT [& p,p'-DDD]	.61&[.66]
Kepone (Chlorodecone)	.06
p,p'-DDT	1.06
Methoxychlor	.42
Tetradifon	1.73
Mirex	.35

Table 10 Con't

Volatile Organics

alomethanes	
ichloromethane	.0073
richloromethane	.0016
etrachloromethane	.0018
ribromomethane	.0047
ibromochloromethane	.0054
romodichloromethane	.0016
richlorofluoromethane	.0068
hlorinated Ethanes	
,1-Dichloroethane	.0136
,2-Dichloroethane	.0039
,1,1-Trichloroethane	.0014
,1,2-Trichloroethane	.0079
,1,2,2-Tetrachloroethane	.0064
hlorinated Ethylenes	
.,1-Dichloroethylene	.0056
[,2-Dichloroethylene	.0038
[richloroethylene	.0023
[etrachloroethylene	.0024
Chlorinated Propanes and Propenes	
1,2-Dichloropropane	.0059
cis-1,3-Dichloro-1-propene	.0036
trans-1,3-Dichloro-1-propene	.0038
Aromatics	
Ethylbenzene	.0007
1,3-Dimethylbenzene	.0008
1,2-and 1,4-Dimethylbenzene	.0009
Chlorobenzene	.0014

Table 11
Organic Compounds Identified in Sediments by the GC/MS Method:
Oswego, New York, April 28, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameter	Location Sample Site Number OSW 81 01	OSW 81 01-Dup	OSW 81 02	OSW 81 04
	Semi Volatile Base Neutral Acid			
Polynuclear Aromatic Hydrocarbons				
Acenaphthene			.05	
Acenaphthylene			.03	
Naphthalene	.01		.26	.02
Anthracene/Phenanthrene	.01	.03	1.15	.02
Fluorene	.01		.06	
Fluoranthene		.01	1.64	
Chrysene/Benzo(a)anthracene			6.18	
Benzo(b)fluoranthene			1.04	
Pyrene		.01	1.36	
Benzo(a)pyrene			1.09	
Phthalate Esters				
Dimethyl phthalate		.03	.03	
Diethyl phthalate		.01	.27	.04
Di-n-butyl phthalate		.06	.56	.06
Butylbenzyl phthalate			.41	
bis(2-Ethylhexyl)phthalate			1.11	
		PCB's		
Tetrachlorobiphenyl (6)			.44	
		Volatile	Organics	
Benzene	.012	.015	.015	.020
Toluene	.005	.003	.006	.012

Table 12
Organic Compounds Tentatively Identified in Sediments by the GC/MS Methods:
Oswego, New York, April 28, 1981

(i.e., compounds with high similarity to library mass spectra of the compound, but not run agains actual standards of the compound).

Parameter	Location Sample Site Number OSW 81 01	OSW 81 01-DUP	OSW 81 02	OSW 81 04
	Semi Volatile Organics Acid Base Neutral			
Phenolics				
p-cresol	*	*	*	*
Ketones				
*4-Methyl-3-penten-2-one	*	*		
*4-Methyl-4-hydrexy-2-pentanone	*	*		
3,5-Dimethyl-2-cyclohexen-1-one			*	*
Trimethyl-2-cyclohexen-1-one			*	
*SUSPECTED LABORATORY CONTAMINANTS				
Polynuclear Aromatic Hydrocarbons and Derivatives				
Benzo(c)phenanthrene			*	
11H-benzo(a)fluorene			*	
4H-Cyclopenta(d,e,f)phenathrane			*	
Dibenzofuran			*	
1,2-Benzothiazole			*	
Dibenzothiophene			*	
Benzo(b)naphtho(1,2-d)thiophene			*	
Methylnaphthalene	*	*	*	
Dimethylnaphthalene			*	
Trimethylnaphthalene			*	
Methylphenanthrene			*	
Dimethylphenanthrene			*	
Methylfluoranthene			*	
Methylpyrene			*	
3-Methyl-1H-Indole	*	*		
Methyldibenzothiophene			*	
Phthalate Esters				
Di-n-butyl phthalate			*	
Miscellaneous				
2,3-Dimethyl-2-pentene				*
3-Cyclohexen-1-methanol				*
VOLATILE ORGANICS				
Benzaldehyde			*	*

*Compound tentatively identified in sample from this site.

Olcott, New York

Sediment samples were collected at 5 locations along Eighteen Mile Creek at Olcott, New York on August 30, 1981 (See Figure 3 and Table 13). Four of the samples (sites OLC81-01, 02, 03 and 04) were analyzed. The sample from site OLC81-01 was a sample of a slick of floating mud, clay, and oil. A dredge was in the harbor but was not operating at the time of sampling.

Levels of conventional pollutants and metals (Table 14) were low in the upstream most sample (OLC81-02), and moderate to high downstream of that site when compared to the USEPA Great Lakes sediment guidelines (USEPA, 1977). All samples were highly organic (high total volatile solids, COD, nutrients). Metals, including mercury, copper, lead and zinc were present in high concentrations.

PCBs and pesticides (Table 15) were present in trace amounts in the sample from OLC81-01. They were not detected at the other sites.

Table 16 lists the organic compounds sought by the GC/MS method and their maximum detection limits for this set of samples. Table 17 contains the data for the organic compounds that were identified by GC/MS. The greatest variety of compounds identified were in the sample from OLC81-03. The compounds that were identified in the samples from Olcott were all at trace to low levels.

Data for compounds that were tentatively identified by the GC/MS method (high similarity with a library mass spectra but not confirmed with an actual standard of the compound) is presented in Table 18. Out of the four sites, the greatest variety and highest levels of such compounds was in the sample of floating material (OLC81-01). These compounds (listed under "Miscellaneous") in Table 18 are non-toxic and can be expected to bio-degrade readily.

Conclusions

Sediments from the lower end of Eighteen Mile Creek were found to be highly polluted with conventional pollutants and metals.

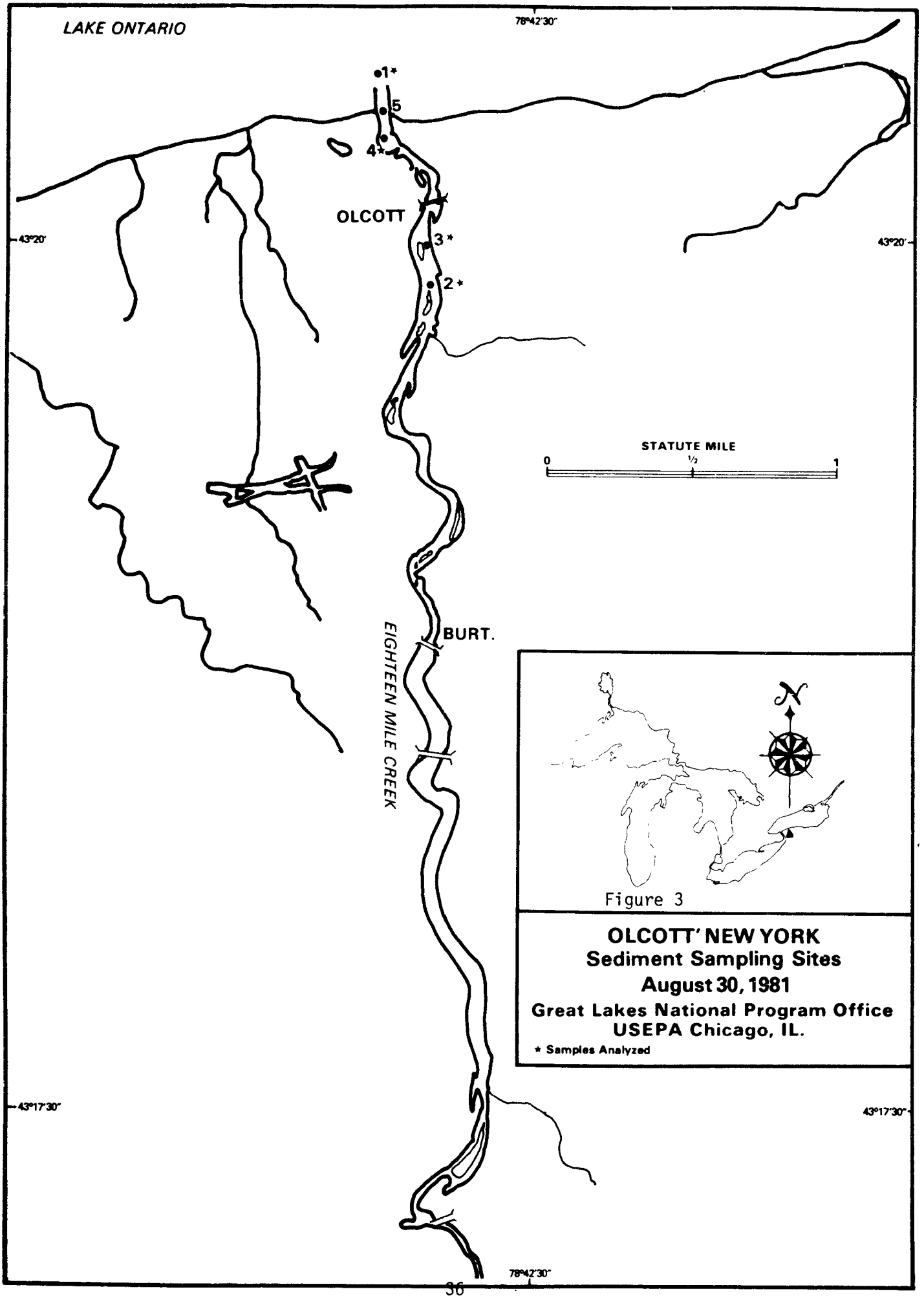
LAKE ONTARIO
78°42'30"
1*
5
4*
OLCOTT
3*
2*
43°20'
43°20'
STATUTE MILE
0
½
1
BURT.
EIGHTEEN MILE CREEK
43°17'30"
43°17'30"
78°42'30"
OLCOTT' NEW YORK
Sediment Sampling Sites
August 30, 1981
Great Lakes National Program Office
USEPA Chicago, IL.
* Samples Analyzed

Figure 3

Table 13
Field Observations:
Olcott, New York, August 30, 1981

Sample Site	Sample Site and Sediment Description
STORET Station No.	
OLC81-01	Sample taken from floating mud-clay-oil slick about 100 yards North of pier head. Dredge in harbor but not operating. Slick covers area of about 50x50 yards.
OLC81-02	Sample in 3' of water. Mostly mud, some gravel.
OLC81-03	Sample in 5' of water mostly mud and some gravel. Oily.
OLC81-04	Primary sample in 15' of water 25 yards from shore. Sample mud-organic clay with oil evident. No benthos.
OLC81-05	Sample midway in channel at pier head. Sample consists of clay-mud with oil evident. No benthos.

Table 14
Sediment Concentrations of Some Conventional Pollutants and Metals:
Olcott, New York, August 30, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameter	Location Sample Site Number			
	OLC 81 01	OLC 81 02	OLC 81 03	OLC 81 04
Total Solids (%)	11.7	50.5	50.2	47.1
Volatile Solids (%)	15	11	10	9.5
Total Kjeldahl Nitrogen	9300	1900	2700	2500
Total Phosphorus	1200	570	850	1100
COD (mg/g)	180	170	160	120
Mercury	W0.1	W0.1	3.0	1.9
Silver	W0.3	W0.3	0.8	0.7
Boron	9.1	W8.0	W8.0	W8.0
Barium	88	44	330	290
Cadmium	0.9	W0.2	0.3	0.4
Cobalt	9.1	11	13	11
Chromium	30	15	88	60
Copper	49	13	130	110
Lithium	29	32	36	30
Manganese	680	240	260	400
Molybdenum	W1.0	W1.0	W1.0	W1.0
Nickel	37	28	32	25
Lead	43	W7.0	290	230
Tin	W4.0	W4.0	11	13
Strontium	140	70	35	44
Vanadium	19	18	21	18
Yttrium	13	14	15	14
Zinc	190	66	350	320
Calcium (mg/g)	79	3.6	3.7	11
Potassium (mg/g)	1.5	1.1	1.2	1.0
Magnesium (mg/g)	9.3	5.4	6.5	8.2
Sodium (mg/g)	0.2	0.6	0.2	0.1
Aluminun (mg/g)	9.4	8.9	13	11
Iron (mg/g)	16	16	21	19
Phenols	7.1	1.4	1.4	1.5
Cyanide	3.5	1.2	1.2	4.1

Reporting Codes:

A "W" notation means the concentration was below the stated level, which was the minimum instrument response level.
A "K" notation means the chemical was present but below the stated concentration, which is the normal limit of quantification.
A "T" notation means the chemical was present above the method detection limit but below the limit of quantification.
A "ND" notation means there was no instrument response at all.

Table 15
Sediment Concentrations of PCBs and Pesticides by the GC/EC Method:
Olcott, New York, August 30, 1981

(All values are mg/kg dry weight unless otherwise noted)

Parameters	Location Sample Site Numbers				
	OLC 81 01	OLC 81 01-DUP	OLC 81 02	OLC 81 03	OLC 81 04
Aroclor 1242					
Aroclor 1248	0.118	0.128			
Aroclor 1254					
Aroclor 1260					
o,p-DDE					
p,p'-DDE	0.012	0.015			
o,p-DDD					
p,p'-DDD					
o,p-DDT					
p,p'-DDT					
g-Chlordane					
Oxychlordane					
Heptachlor epoxide					
Zytron					
b-BHC	0.033	0.036			
g-BHC	T0.001				
Hexachlorobenzene	0.003	0.003			
Trifluralin					
Aldrin					
Heptaclor					
Methoxychlor					
Endrin					
DCPR					
Endosulfan I	0.006	0.004			
Endosulfan II	0.003	0.003			
Dieldrin					
Di-n-Butyl phthalate					

BLANK = ND = NOT DETECTED

Reporting Codes:

A "W" notation means the concentration was below the stated level, which was the minimum instrument response level.
A "K" notation means the chemical was present but below the stated concentration, which is the normal limit of quantification.
A "T" notation means the chemical was present above the method detection limit but below the limit of quantification.
A "ND" notation means there was no instrument response at all.

Table 16
Organic Compounds Sought in Sediments
by the
GC/MS Method and Maximum Detection Limits:
Olcott, New York, August 30, 1981

(Actual detection limits for individual samples may vary as a function of inteferences present, aliquot size, degree of pre-concentration, etc).

(All values are mg/kg dry weight unless otherwise noted)

	Semi Volatile B/N/A
Chlorinated Alilphatics	
Hexachloroethane	.4
Hexachlorobutadiene	.5
Chlorinated Aromatics	
1,2-Dichlorobenzene	.2
1,3-Dichlorobenzene	.1
1,4-Dichlorobenzene	.1
1,2,4-Trichlorobenzene	.2
Hexachlorobenzene	.4
2-Chloronaphthalene	.1
Chlorinated Phenolics	
2-Chlorophenol	.2
2,4-Dichlorophenol	.1
2,4,6-Trichlorophenol	.2
Pentachlorophenol	.8
p-Chloro-m-cresol	.1
Halogenated Ethers	
bis(2-Chloroethyl) ether	.2
4-Bromophenylphenyl ether	.3
bis(2-Chloroethoxy)methane	.1
Phenolics	
Phenol	.5
2,4-Dimethylphenol	.1
p-t-butylphenol	.1
Nitro Aromatics	
Nitrobenzene	
2-Nitrophenol	.2
4-Nitrophenol	.1
4,6-Dinitro-o-cresol	.6
2,4-Dinitrotoluene	.4
2,6-Dinitrotoluene	.2

Table 16 Con't

Polynuclear Aromatic Hydrocarbons	
Naphthalene	
Acenaphthene	.1
Acenaphthylene	.1
Fluorene	.1
Anthracene/Phenanthrene	.02
Fluoranthene	.1
Pyrene	.1
Chrysene/Benz(a)anthracene	.2
Benzo(b)fluoranthene	.1
Benzo(a)pyrene	.4
Indeno(1,2,3-cd)pyrene	.5
Benzo(g,h,i)perylene	.4
Phthalate Esters	
Dimethyl phthalte	.1
Butylbenzyl phthalate	.04
Nitrosamines	
N-Nitrosodipropylamine	.2
N-Nitrosodiphenylamine	.1
Miscellaneous	
Isophorone	100.4
1,2-Diphenylhydrazine	.1
Dibromobiphenyl	.3

Table 16 Con't

PCBs

Monchlorobiphenyl	.4
Dichlorobiphenyl	.4
Trichlorobiphenyl (1)	.6
Trichlorobiphenyl (2)	.5
Trichlorobiphenyl (3)	.3
Tetrachlorobiphenyl (1)	.7
Tetrachlorobiphenyl (2)	.6
Tetrachlorobiphenyl (3)	.6
Tetrachlorobiphenyl (4)	.6
Tetrachlorobiphenyl (5)	.5
Pentachlorobiphenyl (1)	.6
Pentachlorobiphenyl (2)	.4
Pentachlorobiphenyl (3)	.4
Pentachlorobiphenyl (4)	.4
Hexachlorobiphenyl (1)	.4
Hexachlorobiphenyl (2)	.5
Hexachlorobiphenyl (3)	.5
Heptachlorobiphenyl (1)	.8
Heptachlorobiphenyl (2)	.6
Heptachlorobiphenyl (3)	.5
Heptachlorobiphenyl (4)	.4
Heptachlorobiphenyl (5)	.6

PESTICIDES

Triflan(Trifluralin)	.4
g-BHC	2.1
Hexachlorobenzene	.4
2,4-D,Isopropyl ester	.6
b-BHC & a-BHC	.8
Heptachlor	.7
Zytron	.6
Aldrin	1.0
DCPA	.3
Isodrin	.7
Heptachlor Epoxide	1.1
Oxychlorodane	5.0
g-Chlordane	.9
o,p-DDE	.3
Endosulfan I	5.6
p,p'-DD	.5
Dieldrin	4.4
o,p-DDD	.3
Endrin	1.4
Chlorobenzilate	.4
Endosulfan II	10.0
o,p-DDT & p,p'-DDD	.4
Kepone(Chlordecone)	1.2
p,p'-DDT	.5
Methoxychlor	.4
Tetradifon	.4
Mirex	4.6

Table 16 Con't

Volatile Organics

Halomethanes	
Dichloromethane	4.0
Tetrachloromethane	4.2
Tribromomethane	7.2
Dibromochloromethane	4.6
Bromodichloromethane	3.0
Chlorinated Ethanes	
1,1-Dichloroethane	2.1
1,2-Dichloroethane	7.4
1,1,1-Trichloroethane	4.0
1,1,2-Trichloroethane	5.5
1,1,2,2-Tetrachloroethane	0.9
Chlorinated Ethylenes	
1,1-Dichloroethylene	3.6
1,2-Dichloroethylene	2.7
Tetrachloroethylene	2.6
Chlorinated Propanes and Propenes	
1,2-Dichloropropane	2.6
cis-1,3-Dichloro-1-propene	7.2
trans-1,3-Dichloro-1-propene	2.1
Aromatics	
Benzene	1.2
Methylbenzene	1.1
Ethylbenzene	1.0
1,3-Dimethylbenzene	1.3
1,2-and 1,4-Dimethylbenzene	1.3
Chlorobenzene	1.7

Table 17
Organic Compounds Identified in Sediments by the GC/MS Method:
Olcott, New York, August 30, 1981

(All values are mg/kg dry weight unless otherwise noted)

	Location Sample Site Number				
Parameter	OLC 81 -01	OLC 81 -01D	OLC 81 -02	OLC 81 -03	OLC 81 -04
	B/N/A Mixtures - Semi Volatiles				
Polynuclear Aromatics Hydrocarbons					
Naphthalene	0.17	0.2	0.06	0.06	0.12
Anthracene/Phenanthrene	0.4	0.4		0.14	0.3
Fluorene					0.04
Fluorenthene				0.1	0.28
Chrysene/Benzo(a)anthracene				0.18	0.5
Pyrene				0.08	0.24
Phthalate Esters					
Diethyl phthalate	0.6	0.7	0.1	0.04	0.04
Di-n-butyl phthalate	1.7	2.3	0.66	0.2	0.62
Butylbenzyl phthaate	0.49	0.7	0.18		
bis(2-Ethylhexyl) phthalate	0.8	0.8	0.28	0.12	0.46
	VOLATILES				
Halomethanes					
Dichloromethane	.0147	.0082	.0066	.0149	
Trichloromethane	.0167	.0145	.0295	.0382	.0228
Tribromomethane				.0544	
Chlorinated Ethanes					
1,1,2,2-Tetrachloroethane				.1026	.0272
Chlorinated Ethylenes					
Trichloroethene	.0226	.0187	.0199	.0847	.0511
Aromatics					
Toluene	.0146	.0120			
Ethylbenzene	.0026	.0043	.0032	.004	

Table 18
Organic Compounds Tentatively Identified in Sediments by the GC/MS Method:
Olcott, New York, August 30, 1981

(i.e., compounds with high similarity to library mass spectra of the compound, but not run against actual standards of the compound)

	Location Sample Site Number				
Parameter	OLC 81 -01	OLC 81 -01D	OLC 81 -02	OLC 81 -03	OLC 81 -04
	Semi - Volatile Organics				
Polynuclear Aromatic Hydrocarbons and Derivatives					
Methylnaphthalene				*	*
Tetramethylphenanthrene					*
Miscellaneous					
Trimethylpentadecanone			*		
Pentacosane	*	*			
Cholestan-3-ol	*	*			
Cholest-5-en-3-ol	*	*			
1-(2-butoxyethoxy)ethanol	*	*	*	*	*
Hydrocarbons (3)	*	*			
Hydrocarbons (5)					*
Hydrocarbons (6)			*	*	
Volatile Organics					
Ethane, Dibromo				*	

*Compound tentatively identified in sample from this site.

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GUIDELINES FOR THE POLLUTIONAL CLASSIFICATION OF GREAT LAKES HARBOR SEDIMENTS

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION V

CHICAGO, ILLINOIS

April, 1977

Guidelines for the evaluation of Great Lakes harbor sediments, based on bulk sediment analysis, have been developed by Region V of the U.S. Environmental Protection Agency. These guidelines, developed under the pressure of the need to make immediate decisions regarding the disposal of dredged material, have not been adequately related to the impact of the sediments on the lakes and are considered interim guidelines until more scientifically sound guidelines are developed.

The guidelines are based on the following facts and assumptions:

1. Sediments that have been severely altered by the activities of man are most likely to have adverse environmental impacts.

2. The variability of the sampling and analytical techniques is such that the assessment of any sample must be based on all factors and not on any single parameter with the exception of mercury and polychlorinated biphenyls (PCB's).

3. Due to the documented bioaccumulation of mercury and PCB's, rigid limitations are used which override all other considerations.

Sediments are classified as heavily polluted, moderately polluted, or nonpolluted by evaluating each parameter measured against the scales shown below. The overall classification of the sample is based on the most predominant classification of the individual parameters. Additional factors such as elutriate test results, source of contamination, particle size distribution, benthic macroinvertebrate populations, color, and odor are also considered. These factors are interrelated in a complex manner and their interpretation is necessarily somewhat subjective.

The following ranges used to classify sediments from Great Lakes harbors are based on compilations of data from over 100 different harbors since 1967.

	NONPOLLUTED	MODERATELY POLLUTED	HEAVILY POLLUTED
Volatile Solids (%)	<5	5 - 8	>8
COD (mg/kg dry weight)	<40,000	40,000-80,000	>80,000
TKN " " "	<1,000	1,000-2,000	>2,000
Oil and Grease (Hexane Solubles) (mg/kg dry weight)	<1,000	1,000-2,000	>2,000
Lead (mg/kg dry weight)	<40	40-60	>60
Zinc " " "	<90	90-200	>200

The following supplementary ranges used to classify sediments from Great Lakes harbors have been developed to the point where they are usable but are still subject to modification by the addition of new data. These ranges are based on 260 samples from 34 harbors sampled during 1974 and 1975.

	NONPOLLUTED	MODERATELY POLLUTED	HEAVILY POLLUTED
Ammonia (mg/kg dry weight)	<75	75-200	>200
Cyanide " " "	<0.10	0.10-0.25	>0.25
Phosphorus " " "	<420	420-650	>650
Iron " " "	<17,000	17,000-25,000	>25,000
Nickel " " "	<20	20-50	>50
Manganese " " "	<300	300-500	>500
Arsenic " " "	<3	3-8	>8
Cadmium " " "	*	*	>6
Chromium " " "	<25	25-75	>75
Barium " " "	<20	20-60	>60
Copper " " "	<25	25-50	>50

*Lower limits not established

The guidelines stated below for mercury and PCB's are based upon the best available information and are subject to revision as new information becomes available.

Methylation of mercury at levels $\geq$ 1 mg/kg has been documented (1,2). Methyl mercury is directly available for bioaccumulation in the food chain.

Elevated PCB levels in large fish have been found in all of the Great Lakes. The accumulation pathways are not well understood. However, bioaccumulation of PCB's at levels $\geq$ 10 mg/kg in fathead minnows has been documented (3).

Because of the known bioaccumulation of these toxic compounds, a rigid limitation is used. If the guideline values are exceeded, the sediments are classified as polluted and unacceptable for open lake disposal no matter what the other data indicate.

	POLLUTED
Mercury	$\geq$ 1 mg/kg dry weight
Total PCB's	$\geq$ 10 mg/kg dry weight

The pollutional classification of sediments with total PCB concentrations between 1.0 mg/kg and 10.0 mg/kg dry weight will be determined on a case-by-case basis.

a. Elutriate test results.

The elutriate test was designed to simulate the dredging and disposal process. In the test, sediment and dredging site water are mixed in the ratio of 1:4 by volume. The mixture is shaken for 30 minutes, allowed to settle for 1 hour, centrifuged, and filtered through a 0.45 μ filter. The filtered water (elutriate water) is then chemically analyzed.

A sample of the dredging site water used in the elutriate test is filtered through a 0.45 μ filter and chemically analyzed.

A comparison of the elutriate water with the filtered dredging site water for like constituents indicates whether a constituent was or was not released in the test.

The value of elutriate test results are limited for overall pollutional classification because they reflect only immediate release to the water column under aerobic and near neutral pH conditions. However, elutriate test results can be used to confirm releases of toxic materials and to influence decisions where bulk sediment results are marginal between two classifications. If there is release or non-release, particularly of a more toxic constituent, the elutriate test results can shift the classification toward the more polluted or the less polluted range, respectively.

b. Source of sediment contamination.

In many cases the sources of sediment contamination are readily apparent. Sediments reflect the inputs of paper mills, steel mills, sewage discharges, and heavy industry very faithfully. Many sediments may have moderate or high concentrations of TKN, COD, and volatile solids yet exhibit no evidence of man made pollution. This usually occurs when drainage from a swampy area reaches the channel or harbor, or when the project itself is located in a low lying wetland area. Pollution in these projects may be considered natural and some leeway may be given in the range values for TKN, COD, and volatile solids provided that toxic materials are not also present.

c. Field observations.

Experience has shown that field observations are a most reliable indicator of sediment condition. Important factors are color, texture, odor, presence of detritus, and presence of oily material.

Color. A general guideline is the lighter the color the cleaner the sediment. There are exceptions to this rule when natural deposits have a darker color. These conditions are usually apparent to the sediment sampler during the survey.

Texture. A general rule is the finer the material the more polluted it is. Sands and gravels usually have low concentrations of pollutants while silts usually have higher concentrations. Silts are frequently carried from polluted upstream areas, whereas, sand usually comes from lateral drift along the shore of the lake. Once again, this general rule can have exceptions and it must be applied with care.

Odor. This is the odor noted by the sampler when the sample is collected. These odors can vary widely with temperature and observer and must be used carefully. Lack of odor, a beach odor, or a fishy odor tends to denote cleaner samples.

Detritus. Detritus may cause higher values for the organic parameters COD, TKN, and volatile solids. It usually denotes pollution from natural sources. Note: The determination of the "naturalness" of a sediment depends upon the establishment of a natural organic source and a lack of man made pollution sources with low values for metals and oil and grease. The presence of detritus is not decisive in itself.

Oily material. This almost always comes from industry or shipping activities. Samples showing visible oil are usually highly contaminated. If chemical results are marginal, a notation of oil is grounds for declaring the sediment to be polluted.

d. Benthos.

Classical biological evaluation of benthos is not applicable to harbor or channel sediments because these areas very seldom support a well balanced population. Very high concentrations of tolerant organisms indicate organic contamination but do not necessarily preclude open lake disposal of the sediments. A moderate concentration of oligochaetes or other tolerant organisms frequently characterizes an acceptable sample. The worst case exists when there is a complete lack or very limited number of organisms. This may indicate a toxic condition.

In addition, biological results must be interpreted in light of the habitat provided in the harbor or channel. Drifting sand can be a very harsh habitat which may support only a few organisms. Silty material, on the other hand, usually provides a good habitat for sludgeworms, leeches, fingernail clams, and perhaps, amphipods. Material that is frequently disturbed by ship's propellers provides a poor habitat.

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TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3 RECIPIENT'S ACCESSION NO
EPA-905/4-84-002		

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GLNPO Harbor Sediment Program Lake Ontario 1981: Rochester, New York, Oswego, New York and Olcott, New York	April 1984 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Anthony G. Kizlauskas, David C. Rockwell, Roger E. Claff	**8 PERFORMING ORGANIZATION REPORT NO.**
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15. SUPPLEMENTARY NOTES

Undertaken as part of the Great Lakes National Program Office Harbor Sediment Program.

16. ABSTRACT

This report presents sediment chemistry data from three L. Ontario harbors sampled in 1981:

- Fourteen locations on the Genesee River at Rochester, N.Y. were sampled May 3, 1981 and analyzed. Low to moderate levels of conventional pollutants and metals, trace to low levels of PCB's and pesticides, and low levels of some organic pollutants were found at most sites. Exceptions include high conventional pollutants and metals at the Riverview Yacht Basin, triphenyl phosphate and other organic contaminants at the Eastman Kodak Company outfall, and a wide variety of organic contaminants found near the sewage treatment plant outfall.

- Sediment samples from three of four locations on Wine Creek at Oswego, NY taken April 28, 1981 were analyzed. Severe contamination from the Pollution Abatement Services waste site was not evident. However, possible PCB contamination in a swampy area near the former hazardous waste facility was detected.

- Four of five sediment samples taken August 30, 1981 in Eighteen Mile Creek at Olcott, NY were analyzed. The sediments near the mouth of the creek were heavily contaminated with conventional pollutants and metals.

17. KEY WORDS AND DOCUMENT ANALYSIS

a DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Sediment, Conventional Pollutants, Organic Contaminants, Metals, Pesticides, PCB, Rochester, NY Oswego, NY Olcott, NY	Pollution Abatement Services Waste Site, Genesee River Wine Creek Eighteen Mile Creek	

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