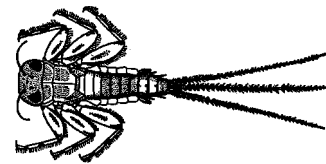
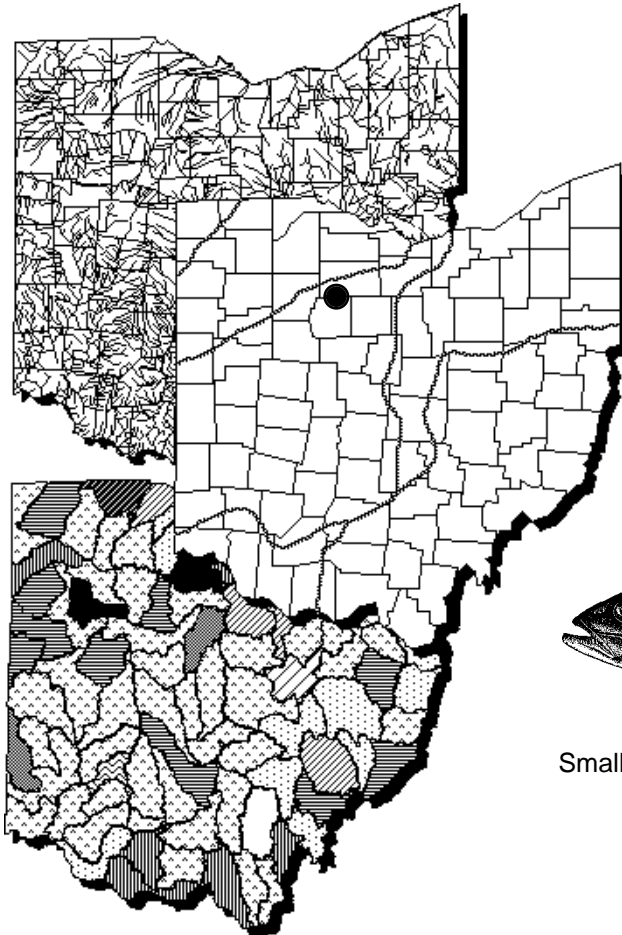
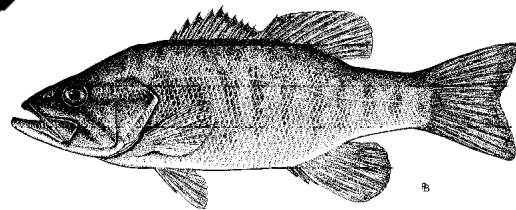


Biological and Water Quality Study of Sycamore Creek and the Sandusky River 1999

Wyandot and Seneca Counties, Ohio



Mayfly (*Stenonema*)



Smallmouth Bass (*Micropterus dolomieu*)

June 30, 2000

Bob Taft
Governor, State of Ohio

Chris Jones
Director, Ohio Environmental Protection Agency

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1999

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June 30, 2000

OEPA Technical Report EAS/2000-6-3

prepared for

State of Ohio Environmental Protection Agency
Division of Emergency and Remedial Response

prepared by

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NOTICE TO USERS

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) regulations in February 1990 (effective May 1990). These criteria consist of numeric values for the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), both of which are based on fish assemblage data, and the Invertebrate Community Index (ICI), which is based on macroinvertebrate assemblage data. Criteria for each index are specified for each of Ohio's five ecoregions (as described by Omernik 1987), and are further organized by organism group, index, site type, and aquatic life use designation. These criteria, along with the existing chemical and whole effluent toxicity evaluation methods and criteria, figure prominently in the monitoring and assessment of Ohio's surface water resources.

The following documents support the use of biological criteria by outlining the rationale for using biological information, the methods by which the biocriteria were derived and calculated, the field methods by which sampling must be conducted, and the process for evaluating results:

Ohio Environmental Protection Agency. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

Ohio Environmental Protection Agency. 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

Ohio Environmental Protection Agency. 1989b. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Plan. & Assess., Ecological Assessment Section, Columbus, Ohio.

Ohio Environmental Protection Agency. 1989c. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. Water Quality Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Ohio Environmental Protection Agency. 1990. The use of biological criteria in the Ohio EPA surface water monitoring and assessment program. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Since the publication of the preceding guidance documents new publications by Ohio EPA have become available. The following publications should also be consulted as they represent the latest information and analyses used by Ohio EPA to implement the biological criteria.

- DeShon, J.D. 1995. Development and application of the invertebrate community index (ICI), pp. 217-243. in W.S. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making*. Lewis Publishers, Boca Raton, FL.
- Rankin, E. T. 1995. The use of habitat assessments in water resource management programs, pp. 181-208. in W. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making*. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. and E.T. Rankin. 1995. Biological criteria program development and implementation in Ohio, pp. 109-144. in W. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making*. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. and E.T. Rankin. 1995. Biological response signatures and the area of degradation value: new tools for interpreting multimetric data, pp. 263-286. in W. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making*. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. 1995. Policy issues and management applications for biological criteria, pp. 327-344. in W. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making*. Lewis Publishers, Boca Raton, FL.
- Yoder, C.O. and E.T. Rankin. 1995. The role of biological criteria in water quality monitoring, assessment, and regulation. *Environmental Regulation in Ohio: How to Cope With the Regulatory Jungle*. Inst. of Business Law, Santa Monica, CA. 54 pp.

These documents and this report can be obtained by writing to:

Ohio EPA, Division of Surface Water
Ecological Assessment Section
4675 Homer Ohio Lane
Groveport, Ohio 43125
(614) 836-8777

FOREWORD

What is a Biological and Water Quality Survey?

A biological and water quality survey, or “biosurvey”, is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This effort may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. Each year Ohio EPA conducts biosurveys in 10-15 different study areas with an aggregate total of 250-300 sampling sites.

Ohio EPA employs biological, chemical, and physical monitoring and assessment techniques in biosurveys in order to meet three major objectives: 1) determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained; 2) determine if use designations assigned to a given water body are appropriate and attainable; and 3) determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices. The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. Each biological and water quality study contains a summary of major findings and recommendations for revisions to WQS, future monitoring needs, or other actions which may be needed to resolve existing impairment of designated uses. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns, are also addressed.

The findings and conclusions of a biological and water quality study may factor into regulatory actions taken by Ohio EPA (*e.g.*, NPDES permits, Director’s Orders, the Ohio Water Quality Standards [OAC 3745-1]), and are eventually incorporated into Water Quality Permit Support Documents (WQPSDs), State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the Ohio Water Resource Inventory (305[b] report).

Hierarchy of Indicators

A carefully conceived ambient monitoring approach, using cost-effective indicators comprised of ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. Ohio EPA relies on a tiered approach in attempting to link the results of administrative activities with true environmental measures. This integrated approach is outlined in Figure 1 and includes a hierarchical continuum from administrative to true environmental indicators. The six “levels” of indicators include: 1) actions taken by regulatory agencies (permitting, enforcement, grants); 2) responses by the regulated community (treatment works, pollution prevention); 3) changes in discharged quantities (pollutant loadings); 4) changes in ambient conditions (water quality, habitat); 5) changes in

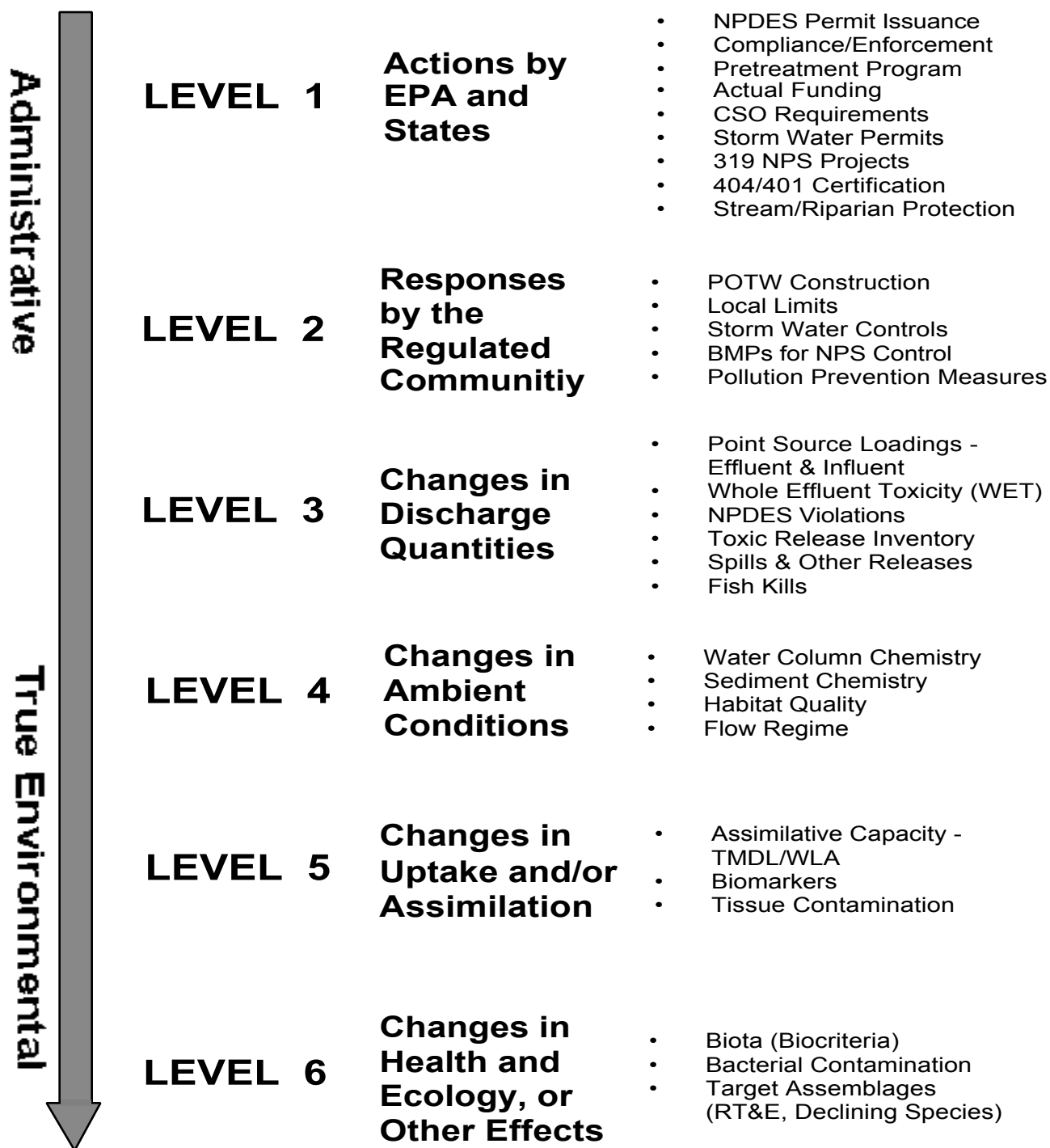


Figure 1. Hierarchy of administrative and environmental indicators which can be used for water quality management activities such as monitoring and assessment, reporting, and the evaluation of overall program effectiveness. This is patterned after a model developed by U.S. EPA (1995).

uptake and/or assimilation (tissue contamination, biomarkers, wasteload allocation); and, 6) changes in health, ecology, or other effects (ecological condition, pathogens). In this process the results of administrative activities (levels 1 and 2) can be linked to efforts to improve water quality (levels 3, 4, and 5) which should translate into the environmental “results” (level 6). Thus, the aggregate effect of billions of dollars spent on water pollution control since the early 1970s can now be determined with quantifiable measures of environmental condition.

Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators. *Stressor* indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. *Exposure* indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to a stressor or bioaccumulative agent. *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the more direct measures of community and population response that are represented here by the biological indices which comprise Ohio’s biological criteria. Other response indicators could include target assemblages, *i.e.*, rare, threatened, endangered, special status, and declining species or bacterial levels which serve as surrogates for the recreational uses. These indicators represent the essential technical elements for watershed-based management approaches. The key, however, is to use the different indicators *within* the roles which are most appropriate for each.

Describing the causes and sources associated with observed impairments revealed by the biological criteria and linking this with pollution sources involves an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators. The principal reporting venue for this process on a watershed or subbasin scale is a biological and water quality report. These reports then provide the foundation for aggregated assessments such as the Ohio Water Resource Inventory (305[b] report), the Ohio Nonpoint Source Assessment, and other technical bulletins.

Ohio Water Quality Standards: Designated Aquatic Life Uses

The Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) consist of designated uses and chemical, physical, and biological criteria designed to represent measurable properties of the environment that are consistent with the goals specified by each use designation. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. In applications of the Ohio WQS to the management of water resource issues in Ohio’s rivers and streams, the aquatic life use criteria frequently result in the most stringent protection and restoration requirements, hence their emphasis in biological and water quality reports. Also, an

emphasis on protecting for aquatic life generally results in water quality suitable for all uses. The five different aquatic life uses currently defined in the Ohio WQS are described as follows:

- 1) *Warmwater Habitat (WWH)* - this use designation defines the “typical” warmwater assemblage of aquatic organisms for Ohio rivers and streams; *this use represents the principal restoration target for the majority of water resource management efforts in Ohio.*
- 2) *Exceptional Warmwater Habitat (EWH)* - this use designation is reserved for waters which support “unusual and exceptional” assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (*i.e.*, declining species); *this designation represents a protection goal for water resource management efforts dealing with Ohio’s best water resources.*
- 3) *Coldwater Habitat (CWH)* - this use is intended for waters which support assemblages of cold water organisms and/or those which are stocked with salmonids with the intent of providing a put-and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic “runs” of salmonids during the spring, summer, and/or fall.
- 4) *Modified Warmwater Habitat (MWH)* - this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable *and where the activities have been sanctioned and permitted by state or federal law*; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat.
- 5) *Limited Resource Water (LRW)* - this use applies to small streams (usually <3 mi.² drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (*i.e.*, true ephemeral streams), or other irretrievably altered waterways.

Chemical, physical, and/or biological criteria are generally assigned to each use designation in accordance with the broad goals defined by each. As such the system of use designations employed in the Ohio WQS constitutes a “tiered” approach in that varying and graduated levels of protection are provided by each. This hierarchy is especially apparent for parameters such as dissolved oxygen, ammonia-nitrogen, temperature, and the biological criteria. For other

parameters such as heavy metals, the technology to construct an equally graduated set of criteria has been lacking, thus the same water quality criteria may apply to two or three different use designations.

Ohio Water Quality Standards: Non-Aquatic Life Uses

In addition to assessing the appropriateness and status of aquatic life uses, each biological and water quality survey also addresses non-aquatic life uses such as recreation, water supply, and human health concerns as appropriate. The recreation uses most applicable to rivers and streams are the Primary Contact Recreation (PCR) and Secondary Contact Recreation (SCR) uses. The criterion for designating the PCR use is simply having a water depth of at least one meter over an area of at least 100 square feet or where canoeing is a feasible activity. If a water body is too small and shallow to meet either criterion the SCR use applies. The attainment status of PCR and SCR is determined using bacterial indicators (*e.g.*, fecal coliforms, *E. coli*) and the criteria for each are specified in the Ohio WQS.

Water supply uses include Public Water Supply (PWS), Agricultural Water Supply (AWS), and Industrial Water Supply (IWS). Public Water Supplies are simply defined as segments within 500 yards of a potable water supply or food processing industry intake. The Agricultural Water Supply (AWS) and Industrial Water Supply (IWS) use designations generally apply to all waters unless it can be clearly shown that they are not applicable. An example of this would be an urban area where livestock watering or pasturing does not take place, thus the AWS use would not apply. Chemical criteria are specified in the Ohio WQS for each use and attainment status is based primarily on chemical-specific indicators. Human health concerns are additionally addressed with fish tissue data, but any consumption advisories are issued by the Ohio Department of Health are detailed in other documents.

ACKNOWLEDGEMENTS

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Coordinator - David Altfater

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Fish Data Analysis, Surface Water, Sediment - David Altfater

Macroinvertebrate Data Analysis - Bernie Counts

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Biological and Water Quality Study of Sycamore Creek and the Sandusky River

1999

(Wyandot and Seneca Counties, Ohio)

Ohio Environmental Protection Agency
Division of Surface Water
Ecological Assessment Section
4675 Homer Ohio Lane
Groveport, Ohio 43125

INTRODUCTION

Kirby's Tire Recycle, Inc. is an existing and unlicensed scrap tire storage and recovery facility located approximately 2.5 miles east of the town of Sycamore, Ohio. The site occupies an area of approximately 120 acres and contains an estimated 6-20 million tires. On August 21, 1999, a fire started in the southwestern portion of the 120 acre site. The initial response included spraying water and foam on non-burning tires, and spraying the burning tires to control the heat. During the second day of the fire, USEPA mobilized heavy equipment to bury about 17 acres of burning tires with soil. By August 25, the fire area was completely covered with soil. Hazardous substances characteristically present in large tire fires include BTEX (benzene, toluene, ethylbenzene, xylene), heavy metals, and polycyclic aromatic hydrocarbons (PAHs). Oil from the melting tires migrated into Sycamore Creek, south and west of the site, and wastewater from on-site treatment was discharged to the stream. Measures established in Sycamore Creek to control tire fire contaminant impacts included construction of low-head dams, placement of oil containment booms, and instream aeration systems. The study area included the lower nine miles of Sycamore Creek, the Sandusky River from just upstream of Sycamore Creek to the City of Tiffin, and the mouth of Kirby Tributary (an unnamed stream to the north of Kirby Tire).

Specific objectives of this evaluation were to:

- 1) determine the extent of tire fire chemical constituents in sediment and surface water of Sycamore Creek, Sandusky River, and Kirby Tributary,
- 2) establish the present biological use condition and aquatic life attainment status in Sycamore Creek and the Sandusky River,
- 3) identify the relative significance of hazardous waste contaminants on any demonstrated impairment of biological communities and potential risks to public health, and,
- 4) document the severity of any ecological damage caused by the release of deleterious substances from the tire site.

SUMMARY / CONCLUSIONS

A combined total of 30.4 miles of Sycamore Creek (9.6 miles) and the Sandusky River (20.8 miles) were assessed in 1999. Based on the performance of the biological communities, 15.8 miles of stream were in full attainment, 7.6 miles were in partial attainment, and 7.0 miles were in non attainment of aquatic life uses. Major causes of non and partial attainment included toxic contaminants from the Kirby Tire fire, depleted dissolved oxygen in Sycamore Creek associated with the tire fire, and impounded conditions in the Sandusky River. The biological condition of study area streams included good (13.6 miles), marginally good (2.2 miles), fair (7.6 miles), poor (4.7 miles) and very poor (2.3 miles) segments.

Sycamore Creek

Runoff, oil spills, and wastewater associated with the August 1999 tire fire at Kirby Tire Recycling caused severe degradation of biological resources in Sycamore Creek. Of the 9.6 miles of stream evaluated, 7.0 miles were in non-attainment of the warmwater habitat aquatic life use designation. The Ohio Department of Natural Resources, Division of Wildlife, reported 19,853 animals killed in Sycamore Creek as a result of the Kirby Tire fire. Wastewater discharged from Kirby Tire into Sycamore Creek during August 1999 included acutely toxic levels of anthracene, fluoranthene, naphthalene, copper and zinc, along with extremely high levels of biochemical oxygen demand and chemical oxygen demand. Acutely toxic conditions in the effluent was further confirmed by bioassay testing conducted in November and December, 1999, and February, 2000. Almost complete depletion of dissolved oxygen levels in Sycamore Creek occurred during August 25 -27, 1999 in the lower seven miles of stream. The oxygen depletion was associated with the initial spill plume.

Chemicals associated with tire fires were documented in Sycamore Creek sediments downstream from Kirby Tire. Surface water chemical analyses documented extreme conditions in Sycamore Creek for at least two miles downstream from Kirby Tire. Surface water results revealed anoxic conditions instream, with numerous D.O. values below 0.1 mg/l. Septic conditions in Sycamore Creek were apparent for at least one mile downstream from Kirby Tire. A number of chemicals associated with tire fires - zinc, naphthalene, benzene, toluene, and PAHs were documented at levels which represent an acute toxicity hazard in the surface water of Sycamore Creek. Exceedences of Ohio Water Quality Standards aquatic life maximum water quality criteria occurred in Sycamore Creek for naphthalene, zinc, benzene, toluene, acenaphthene, fluoranthene, copper, manganese, anthracene, oil & grease, fluorene, 2,4-dimethylphenol, 3&4-methylphenol, and pyrene. None of these chemical parameters either exceeded water quality criteria or were detected in Sycamore Creek upstream from Kirby Tire. As was noted in the Kirby Tire wastewater discharge, highly elevated levels of BOD and COD were recorded in Sycamore Creek downstream from the tire fire area. The substantial oxygen demand imposed by these high BOD and COD levels was corroborated by the low dissolved oxygen readings in Sycamore Creek. Other elevated surface water chemicals reported downstream from Kirby Tire included cyanide, caprolactum, phenanthrene, and 2-butanone.

Sandusky River

Of the 20.8 miles of the Sandusky River evaluated for this study, 13.6 miles were fully attaining the warmwater habitat aquatic life use designation, and 7.2 miles were in partial attainment. Monitoring of Sandusky River surface water during the downstream movement of the spill plume from Kirby Tire did indicate minor influences on water chemistry. However, as measured by aquatic biological

performance, chemical water quality impairment associated with the Kirby Tire fire was not evident in the Sandusky River. The main cause for reduced biological performance at some locations in the Sandusky River was the effects of low river current and habitat modification associated with impounded river segments. A noteworthy observation was the collection of the State Threatened greater redhorse at every location in the Sandusky River. Free flowing sections of the Sandusky River downstream from Sycamore Creek had fish communities at or near exceptional conditions. This was a substantial improvement from results reported in 1990 (Ohio EPA 1991).

Kirby Tributary

A limited amount of sediment and surface water sampling was conducted in Kirby Tributary during 1999. Results of the chemical sampling indicated good sediment and surface water conditions. No water quality criteria exceedences were observed.

RECOMMENDATIONS

Status of Aquatic Life Uses

Sycamore Creek was designated as a warmwater habitat aquatic life use in the 1978 Ohio WQS. The techniques used in 1978 did not include standardized approaches to the collection of instream biological data or numerical biological criteria. This study represents a first use of this type of biological data to evaluate and establish the appropriate aquatic life use designation for Sycamore Creek. Ohio EPA is under obligation by a 1981 public notice to review and evaluate all aquatic life use designations outside of the WWH use prior to basing any permitting actions on the existing, unverified use designations. Beneficial use designations are detailed in Table 1.

Sycamore Creek

The current Warmwater Habitat aquatic life use designation should be maintained for Sycamore Creek. The seven sampling locations in Sycamore Creek had physical habitat conditions which could support a warmwater biological community (average QHEI = 73.1). Natural channel conditions exist throughout the lower nine miles of Sycamore Creek, with cobble, gravel and bedrock substrates common.

Sandusky River

The current Warmwater Habitat aquatic life use designation should be maintained for the Sandusky River because of the limited length of river evaluated during 1999. However, fish community results from 1999 documented some areas of the Sandusky River currently achieving exceptional warmwater habitat biocriteria (IBI and MIwb).

Status of Non-Aquatic Life Uses

Sycamore Creek and the Sandusky River have sufficient water depth to support the Primary Contact Recreation use. The Public Water Supply use applies to the Sandusky River at RM 42.12, which is the location of the Tiffin water supply intake canal.

Other

A follow-up biological survey should be conducted in 2000 to assess the recovery of the fish and macroinvertebrate communities in Sycamore Creek. In addition, sediment areas in Sycamore Creek which release oil when disturbed, should be reassessed to determine their present condition.

Table 1. Existing and recommended beneficial use designations for Sycamore Creek and the Sandusky River. Recommendations are based on the results from the 1999 Sycamore Creek survey.

River/Stream Affected Segment	Beneficial Use Designations												
	Aquatic Life Habitat							Water Supply			Recreation		
	S R W	W W H	E W H	M W H	S S H	C W H	L R W	P W S	A W S	I W S	B W	P C R	S C R
Sandusky River													
Rt. 30N in Upper Sandusky to Roger Young Memorial Park in Fremont	*	*/+							*/+	*/+		*/+	
Fremont STP to confluence with Muskegon Creek		O							*	*		*	
RM 47.8 (upstream from Tiffin) to RM 19.0 (upstream of Fremont)	+	+							+	+		+	
Bucyrus STP to Mt. Zion Road		+							+	+		+	
All other segments		*							*	*		*	
RM 42.12													
Sycamore Creek													
Entire Length		*/+							*/+	*/+		*/+	

+ - Designated beneficial use based on the results of an integrated ambient biological assessment performed by Ohio EPA (verified).

* - Existing beneficial use based on the 1985 Ohio water quality standards.

- Designates new recommended use based on findings of this report.

O - Designated use based on justification other than the results of a biological field assessment performed by the Ohio EPA.

Table 2. Sampling locations in Sycamore Creek and the Sandusky River, 1999. Type of sampling included fish community (F), macroinvertebrate community (M), surface water (W), sediment (S), and dissolved oxygen monitoring (D).

<i>Stream/ River Mile</i>	Type of Sampling	Latitude	Longitude	Landmark	County	USGS 7.5 min. Quad. Map
<i>Sycamore Creek</i>						
9.13	S,W,F,M,D	40°55'54"	83°06'45"	County Line, Twp. Rd. 10a	Wyandot	Lykens, OH
7.65	D	40°56'23"	83°07'36"	500 meters ust. SR 231	Wyandot	Sycamore, OH
7.54	D	40°56'23"	83°07'44"	330 meters ust. SR 231	Wyandot	Sycamore, OH
7.48	D	40°56'24"	83°07'48"	230 meters ust. SR 231	Wyandot	Sycamore, OH
7.43	D	40°56'26"	83°07'49"	130 meters ust. SR 231	Wyandot	Sycamore, OH
7.40	D	40°56'29"	83°07'51"	90 meters ust. SR 231	Wyandot	Sycamore, OH
7.38	D	40°56'29"	83°07'52"	60 meters ust. SR 231	Wyandot	Sycamore, OH
7.36	W,D	40°56'30"	83°07'52"	30 meters ust. SR 231	Wyandot	Sycamore, OH
7.34	W,D	40°56'30"	83°07'54"	@ SR 231, S. of Kirby Tire	Wyandot	Sycamore, OH
7.32	S,W,D	40°56'29"	83°07'55"	30-40 meters dst. SR 231	Wyandot	Sycamore, OH
7.00	D	40°56'26"	83°08'11"	Between cut tile/ SR 231	Wyandot	Sycamore, OH
6.85	S,W,D	40°56'36"	83°08'11"	Cut tile, west corn field	Wyandot	Sycamore, OH
6.47	S,W,D	40°56'48"	83°08'19"	Adjacent Turtle Mound	Wyandot	Sycamore, OH
6.4	F	40°56'48"	83°08'23"	Dst. Kirby Tributary	Wyandot	Sycamore, OH
6.37	S,W	40°56'47"	83°08'25"	Dst. Turtle Mound, 12" tile	Wyandot	Sycamore, OH
6.3	F,M	40°56'43"	83°08'26"	Dst. Turtle Mound, 12" tile	Wyandot	Sycamore, OH
5.76	D	40°56'27"	83°08'42"	Ust. 136c dam and aerators	Wyandot	Sycamore, OH
5.74	S,W,D	40°56'28"	83°08'44"	Ust. 136c dam	Wyandot	Sycamore, OH
5.72	W,D	40°56'29"	83°08'46"	Dst. 136c dam	Wyandot	Sycamore, OH
5.40	D	40°56'44"	83°08'45"	Adjacent Twp.Rd. 136c	Wyandot	Sycamore, OH
5.12	D	40°56'58"	83°08'47"	Ust. 103 dam	Wyandot	Sycamore, OH
5.10	S,W,D	40°56'58"	83°08'48"	Dst. 103 dam	Wyandot	Sycamore, OH
5.09	W,D	40°56'59"	83°08'47"	@ SR 103	Wyandot	Sycamore, OH
5.08	D	40°57'00"	83°08'47"	25 meters dst. 103 dam	Wyandot	Sycamore, OH
5.02	S,W,F,M	40°57'03"	83°08'45"	Dst. SR 103, @ campground	Wyandot	Sycamore, OH
4.65	D	40°57'13"	83°09'07"	Road 136d	Wyandot	Sycamore, OH
3.6	F,M	40°57'21"	83°10'09"	Ust. SR 231/67; Sycamore Ave.	Wyandot	Sycamore, OH
3.54	S,W,D	40°57'22"	83°10'11"	Ust. SR 231/67	Wyandot	Sycamore, OH
3.52	D	40°57'23"	83°10'12"	Ust. SR 231/67	Wyandot	Sycamore, OH
3.47	W,D	40°57'24"	83°10'15"	SR 231/67	Wyandot	Sycamore, OH
2.61	S,W,F,M,D	40°57'51"	83°10'32"	County Road 16	Wyandot	Sycamore, OH
1.60	D	40°58'29"	83°10'52"	Twp. Road 13	Wyandot	Sycamore, OH
0.80	S	40°58'47"	83°11'25"	Log jam	Wyandot	Sycamore, OH
0.41	S,W,D	40°58'58"	83°11'43"	County Road 37	Wyandot	Sycamore, OH
0.3	F,M	40°59'01"	83°11'45"	Dst. Co. Rd. 37	Wyandot	Sycamore, OH
0.01	D	40°59'04"	83°12'03"	At the confluence	Wyandot	Sycamore, OH

Table 2. Continued.

<i>Stream/ River Mile</i>	Type of Sampling	Latitude	Longitude	Landmark	County	USGS 7.5 min. Quad. Map
<i>Sandusky River</i>						
61.1	M	40°58'42"	83°14'26"	SR 587	Wyandot	Sycamore, OH
57.95	S,W,F	40°59'07"	83°12'16"	Ust. Sycamore Cr.	Wyandot	Sycamore, OH
57.72	W,D	40°59'06"	83°12'07"	Ust. Sycamore Cr.	Wyandot	Sycamore, OH
57.70	D	40°59'07"	83°12'01"	Ust. Sycamore Cr.	Wyandot	Sycamore, OH
57.34	S,W,M,D	40°59'19"	83°12'13"	Mexico Rd./Co. Rd. 9	Wyandot	Sycamore, OH
56.7	F	40°59'42"	83°11'58"	Adj. Camp Pittenger	Seneca	Sycamore, OH
54.34	W	41°00'31"	83°11'41"	Heck Rd.	Seneca	Tiffin S., OH
52.57	S,W	41°00'56"	83°12'01"	Adjacent campground	Seneca	Tiffin S., OH
52.2	F	41°01'04"	83°11'38"	Adjacent campground	Seneca	Tiffin S., OH
47.8	M	41°02'39"	83°11'42"	County Road 90	Seneca	Tiffin S., OH
47.6	F	41°02'48"	83°11'45"	Dst. County Rd. 90	Seneca	Tiffin S., OH
43.0	F,M	41°05'36"	83°12'01"	Ust. US 224	Seneca	Tiffin S., OH
41.8	M	41°06'14"	83°11'11"	Ella St.	Seneca	Tiffin S., OH
41.3	F	41°06'40"	83°11'15"	0.5 miles dst. Ella St.	Seneca	Tiffin S., OH
<i>Kirby Tributary</i>						
0.01	S,W,D	40°56'48"	83°08'17"	Farm ford @ mouth	Wyandot	Sycamore, O

Table 3. Aquatic life use attainment status for Sycamore Creek and the Sandusky River based on data collected during August - October, 1999. All sampling locations are in the Eastern Corn Belt Plains ecoregion.

RIVER MILE Fish/Invert.	IBI	Modified Iwb	ICI^a	QHEI^b	Attainment Status^c	Comment
<i>Sycamore Creek</i>						
<i>WWH Use Designation (Existing)</i>						
9.1/ 9.1	38 ^{ns}	8.1 ^{ns}	VG	71.5	FULL	Background; intermittent flow
6.4/ -	<u>20*</u>	<u>5.2*</u>	-	72.0	(NON)	Dilution water from Kirby Tributary and farm tile
6.3/ 6.3	<u>12*</u>	<u>0.0*</u>	VP	68.0	NON	No fish, septic conditions
5.0/ 5.0	<u>29*</u>	<u>5.2*</u>	<u>12*</u>	73.5	NON	Dst. containment dam at SR 103
3.6/ 3.6	30*	<u>4.0*</u>	22*	75.5	NON	Ust. Sycamore WWTP
2.6/ 2.6	<u>15*</u>	<u>3.5*</u>	26*	75.5	NON	Dst. Sycamore WWTP
0.3/ 0.3	33*	7.7*	36	76.0	PARTIAL	Dst. instream aerators
<i>Sandusky River</i>						
<i>WWH Use Designation (Existing)</i>						
57.9/ 61.1	44	9.1	40	72.0	FULL	Upstream Sycamore Creek
56.7/ 57.3	48	8.9	18*	63.0	PARTIAL	Dst. Sycamore Creek, Upper end of impoundment, No current
52.2/ -	46	7.3*	-	56.5	(PARTIAL)	Impounded
47.6/ 47.8	55	10.5	38	66.0	FULL	Free-flowing
43.0/ 43.0	44	8.2 ^{ns}	-	52.5	(FULL)	Impounded
41.3/ 41.8	51	10.0	36	68.5	FULL	Free-flowing, boulders

Ecoregion Biocriteria: Eastern Corn Belt Plains (ECBP)
(OAC 3745-1-07, Table 7-14)

INDEX	WWH	EWH	MWH^d
IBI - Boat	42	48	24
IBI - Headwater/Wading	40	50	24
MIwb - Boat	8.5	9.6	5.8
Miwb - Wading	8.3	9.4	6.2
ICI	36	46	22

* - Significant departure from ecoregion biocriterion; poor and very poor results are underlined.

^{ns} - Nonsignificant departure from ecoregion biocriterion for WWH (4 IBI or ICI units; 0.5 MIwb units).

^a - Narrative evaluation used in lieu of ICI when scores not available (VG-very good, MG-marginally good, F-fair, P-poor).

^b - Qualitative Habitat Evaluation Index (QHEI) values are based on Rankin (1989).

^c - Attainment status based on one organism group is parenthetically expressed.

^d - Modified Warmwater Habitat for channel modified areas.

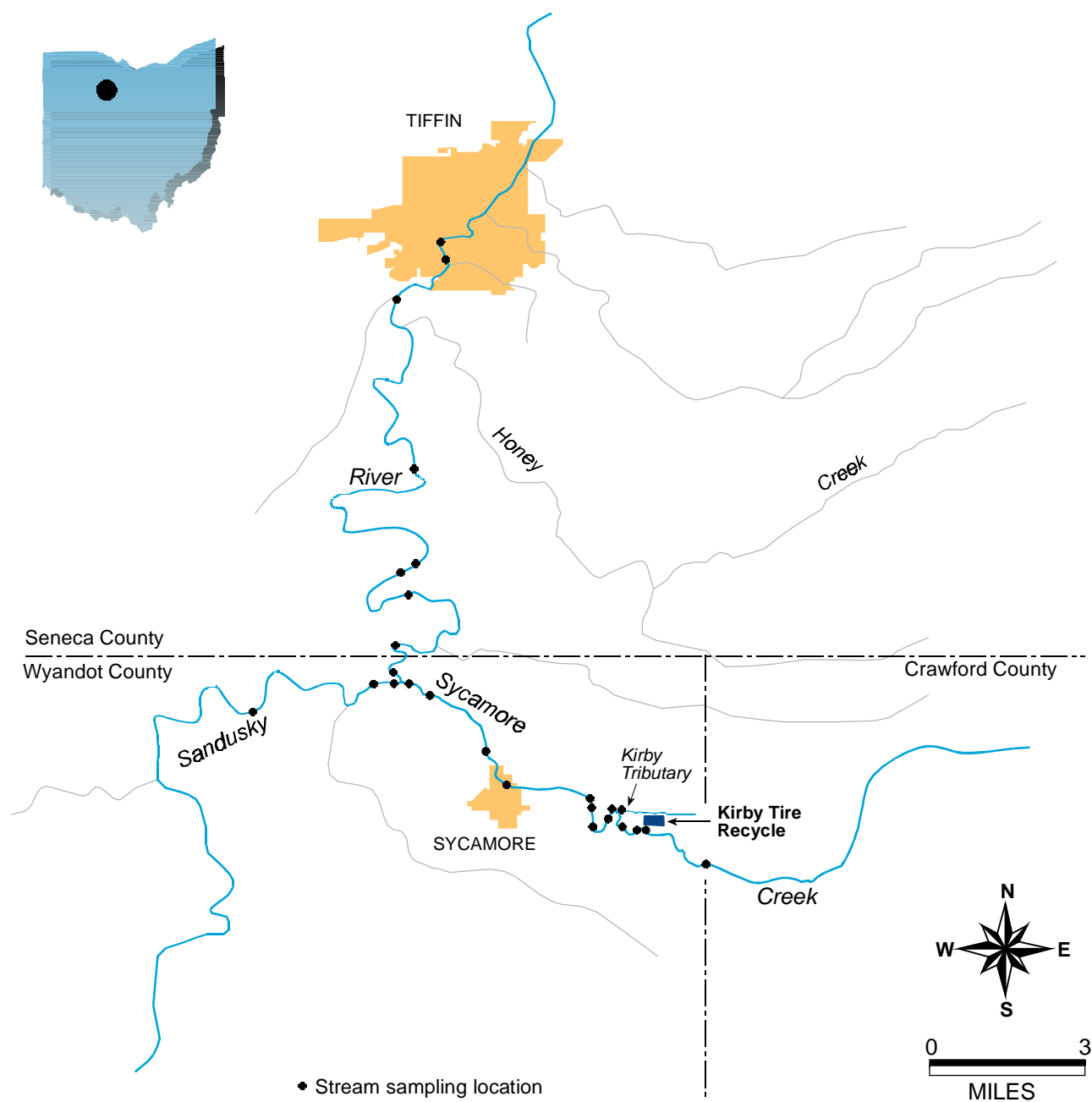


Figure 1. Map of the Sycamore Creek study area showing principal streams, landmarks, and Ohio EPA sampling locations, 1999.

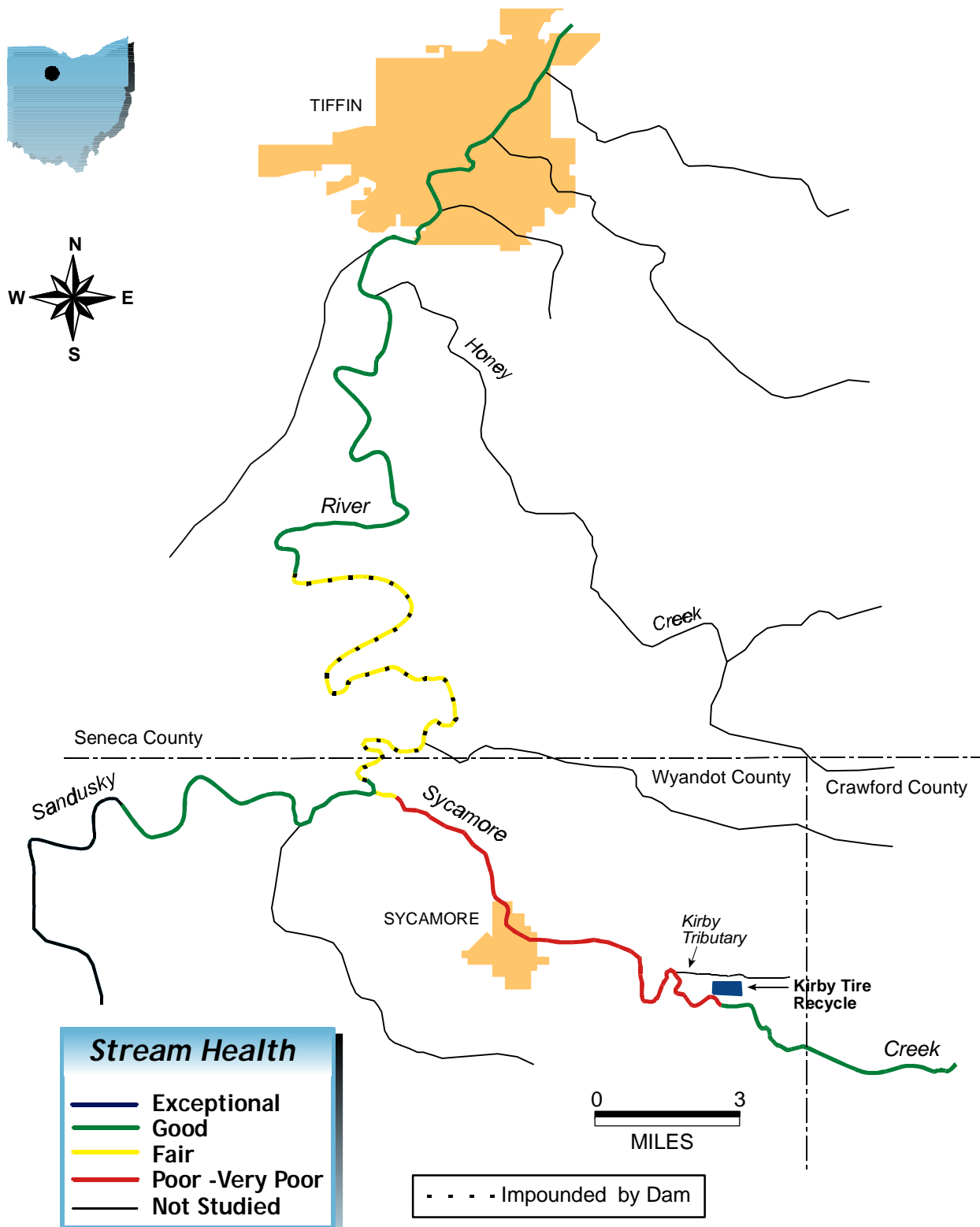


Figure 2. Biological performance of Sycamore Creek and the Sandusky River within the study area, 1999.



Plate 1 . Top photo - Natural habitat, unimpacted section of Sycamore Creek at RM 9.13
Bottom left photo - Kirby Tire wastewater treatment discharge area in Sycamore Creek.
Bottom right photo - Septic conditions in Sycamore Creek at RM 6.85.

METHODS

All chemical, physical, and biological field, laboratory, data processing, and data analysis methodologies and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio Environmental Protection Agency 1989a) and Biological Criteria for the Protection of Aquatic Life, Volumes I-III (Ohio Environmental Protection Agency 1987a, 1987b, 1989b, 1989c), and The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application (Rankin 1989) for aquatic habitat assessment. Fish and macroinvertebrate communities were sampled during the summer and fall of 1999 at seven locations in Sycamore Creek and six locations in the Sandusky River (Table 2, Figure 1). Sediment samples were collected by Ohio EPA at 12 locations in Sycamore Creek, three in the Sandusky River, and one in Kirby Tributary. Surface water samples were collected at 13 locations in Sycamore Creek, five in the Sandusky River, and one in Kirby Tributary.

Determining Use Attainment Status

The attainment status of aquatic life uses (*i.e.*, full, partial, and non) is determined by using the biological criteria codified in the Ohio Water Quality Standards (WQS; Ohio Administrative Code [OAC] 3745-1-07, Table 7-14). The biological community performance measures which are used include the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics. The IBI and ICI are multimetric indices patterned after an original IBI described by Karr (1981) and Fausch *et al.* (1984). The ICI was developed by Ohio EPA (1987b) and further described by DeShon (1995). The MIwb is a measure of fish community abundance and diversity using numbers and weight information and is a modification of the original Index of Well-Being originally applied to fish community information from the Wabash River (Gammon 1976; Gammon *et al.* 1981).

Performance expectations for the principal aquatic life uses in the Ohio WQS (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH]) were developed using the regional reference site approach (Hughes *et al.* 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of the aquatic life use is full if all three indices (or those available) meet the applicable biocriteria, partial if at least one of the indices does not attain and performance is at least fair, and non-attainment if all indices fail to attain or any index indicates poor or very poor performance. Partial and non-attainment indicate that the receiving water is impaired and does not meet the designated use criteria specified by the Ohio WQS.

Habitat Assessment

Physical habitat was evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995). Various attributes of the habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the metrics used to determine the QHEI score which generally ranges from 20 to 100. The QHEI is used to evaluate the characteristics of a stream

segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are *generally* conducive to the existence of warmwater faunas. Scores greater than 75 frequently typify habitat conditions which have the ability to support exceptional warmwater faunas.

Macroinvertebrate Community Assessment

Macroinvertebrates at nine locations were sampled quantitatively for a six-week period from August 30, 1999 to October 15, 1999 using multiple-plate, artificial substrate samplers (modified Hester/Dendy) in conjunction with a qualitative assessment of the available natural substrates collected at the time that artificial substrates were set and retrieved. Samples collected from two of the macroinvertebrate sites were sampled qualitatively only.

Fish Community Assessment

Fish were sampled using either the boat method pulsed DC electrofishing gear (Sandusky River) or the wading method pulsed DC electrofishing (Sycamore Creek), used at a frequency of one to two samples at each site. Fish collections were made at each site between August and October, with a sampling distance of 500 meters for each boat sampled site, and 180 to 200 meters for sites sampled using the wading method.

Sediment/ Surface Water Assessment

Fine grain sediment samples were collected in the upper 6 inches of bottom material at each location using decontaminated stainless steel scoops. Decontamination of sediment sampling equipment followed the procedures outlined in the Ohio EPA sediment sampling guidance manual (Ohio EPA 1996a). Sediment grab samples were homogenized in stainless steel pans (material for VOC analysis was not homogenized), transferred into glass jars with teflon lined lids, placed on ice (to maintain 40 C) in a cooler, and shipped to the Ohio EPA Environmental Services lab or to USEPA contract labs. Sediment data is reported on a dry weight basis. Surface water samples were collected directly into appropriate containers, preserved and delivered to the Ohio EPA Environmental Services lab and USEPA contract labs. Surface water samples were evaluated using comparisons to Ohio Water Quality Standards criteria, reference conditions and published literature. Sediment evaluations were conducted using guidelines established by the Ontario Ministry of the Environment (Persaud *et al.* 1993), reference conditions and published literature.

Causal Associations

Using the results, conclusions, and recommendations of this report requires an understanding of the methodology used to determine the use attainment status and assigning probable causes and sources of impairment. The identification of impairment in rivers and streams is straightforward - the numerical biological criteria are the principal arbiter of aquatic life use attainment and impairment (partial and non-attainment). The rationale for using the biological criteria in the role of principal arbiter within a weight of evidence framework has been extensively discussed elsewhere (Karr *et al.* 1986; Karr 1991; Ohio EPA 1987a,b; Yoder 1989; Miner and Borton 1991; Yoder 1991; Yoder 1995). Describing the causes and sources associated with observed impairments relies on an

interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and the biological response signatures (Yoder and Rankin 1995) within the biological data itself. Thus the assignment of principal causes and sources of impairment in this report do not represent a true “cause and effect” analysis, but rather represent the association of impairments (based on response indicators) with stressor and exposure indicators whose links with the biosurvey data are based on previous research or experience with analogous situations and impacts. The reliability of the identification of probable causes and sources is increased where many such prior associations have been identified. The process is similar to making a medical diagnosis in which a doctor relies on multiple lines of evidence concerning patient health. Such diagnoses are based on previous research which experimentally or statistically linked symptoms and test results to specific diseases or pathologies. Thus a doctor relies on previous experience in interpreting symptoms (*i.e.*, multiple lines from test results) to establish a diagnosis, potential causes and/or sources of the malady, a prognosis, and a strategy for alleviating the symptoms of the disease or condition. As in medical science, where the ultimate arbiter of success is the eventual recovery and the well-being of the patient, the ultimate measure of success in water resource management is restoration of lost or damaged ecosystem attributes including aquatic community structure and function. While there have been criticisms of misapplying the metaphor of ecosystem “health” compared to human patient “health” (Suter 1993) here we are referring to the process for identifying biological integrity and causes/sources associated with observed impairment, not whether human health and ecosystem health are analogous concepts.

Area of Degradation Value (ADV)

An Area of Degradation Value (ADV; Rankin and Yoder 1991; Yoder and Rankin 1995) was calculated for the study area based on the longitudinal performance of the biological community indices. The ADV portrays the length or “extent” of degradation to aquatic communities and is simply the distance that the biological index (IBI, MIwb, or ICI) departs from the applicable biocriterion or the upstream level of performance (Figure 3). The “magnitude” of impact refers to the vertical departure of each index below the biocriterion or the upstream level of performance. The total ADV is represented by the area beneath the biocriterion (or upstream level) when the results for each index are plotted against river mile. The results are expressed as ADV/mile to normalize comparisons between segments, sampling years, and other streams and rivers.

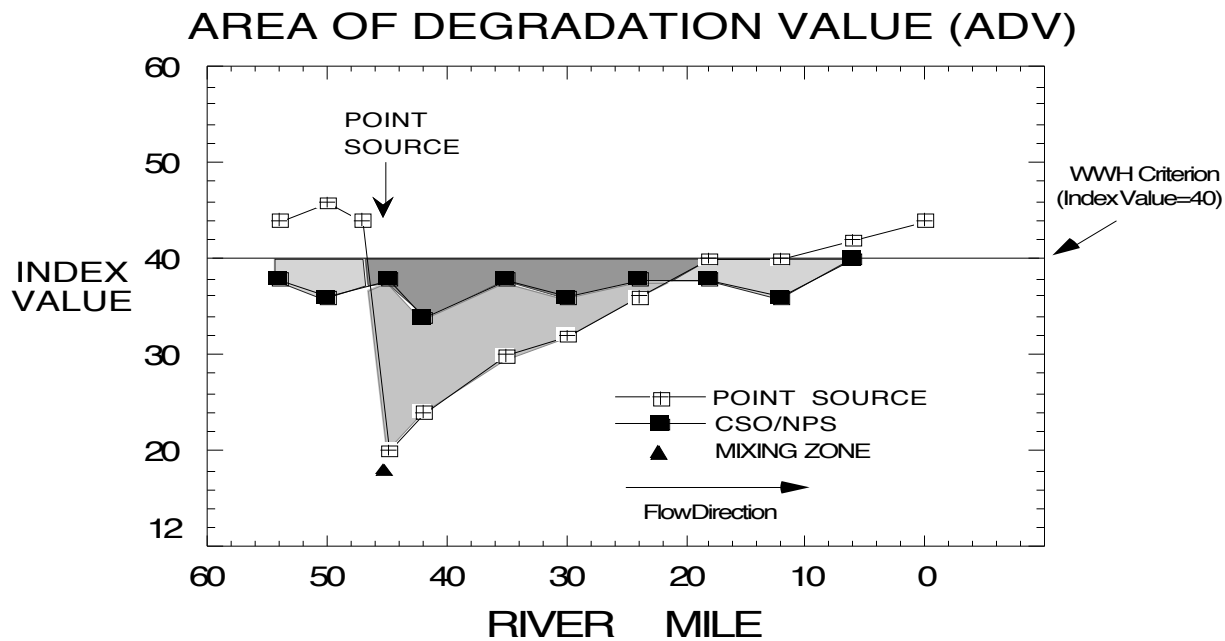


Figure 3. Graphic illustration of the Area of Degradation Value (ADV) based on the ecoregion biocriterion (WWH in this example). The index value trend line indicated by the unfilled boxes and solid shading (area of departure) represents a typical response to a point source impact (mixing zone appears as a solid triangle); the filled boxes and dashed shading (area of departure) represent a typical response to a nonpoint source or combined sewer overflow impact. The blended shading represents the overlapping impact of the point and nonpoint sources.

RESULTS AND DISCUSSION

Facility Descriptions/ Pollutant Loadings

Kirby Tire Fire - Wastewater Treatment

On August 21, 1999, a large tire fire started at the Kirby Tire Recycling facility and USEPA and Ohio EPA were notified of the fire emergency. USEPA and Ohio EPA initiated clean-up to contain the pyrolytic oils produced from the burning tires. By August 22, 1999, a subcontractor for USEPA was brought in to set up a wastewater treatment system to treat oily water collected as runoff from the local fire department activities. The fire departments sprayed water and foam on non-burning tires, and sprayed the burning tires to control the heat. Oil and runoff water were collected in a retention pond where the oils were vacuumed off and disposed of offsite; water was treated and discharged to Sycamore Creek at RM 7.35. The initial wastewater treatment system consisted of treating retention pond water prior to being discharged to Sycamore Creek. The treatment system consisted of the following sequence: a mix tank for addition of sodium hydroxide, a mix tank for addition of alum, a mix tank with a polymer feed, a clarifier which produced sludge for disposal offsite, 25 micron bagfilters, sand filter, 5 micron bagfilters, two carbon filters (one used for standby), and an effluent tank for addition of hydrogen peroxide. The wastewater treatment system installed on August 22 had breakthrough of the carbon unit on August 23, and the carbon was subsequently changed. The wastewater treatment facility, originally located along SR231, was moved onto the Kirby Tire property on August 27. On August 28, the USEPA contractor restarted operations of the wastewater treatment plant. On September 2, 1999, Ohio EPA agreed to assume temporary responsibility of the Kirby Tire site until the site owner develops and implements a site remediation plan in accordance with Ohio Administrative Code 3745-27-79, for the wastewater treatment and oil separation units, stream monitoring and tire removal. Because of the high chemical oxygen demand (COD) levels in the effluent, hydrogen peroxide was added to improve the dissolved oxygen levels in the effluent and reduce the oxygen demand in Sycamore Creek. In September, air strippers were added to the wastewater treatment system to improve removal of organics and lower the COD.

A drainage tile on the north side of Sycamore Creek adjacent to SR 231 was found to be discharging oil and water into the stream (August 22). Portions of Sycamore Creek were isolated with booms and berms to contain the oil until it could be removed. A second release from a different drainage tile was discovered in Sycamore Creek on August 23, and booms were deployed and two earthen dams were constructed to mitigate the downstream migration of product. On August 24, siphons were added to the dams, and aeration systems were installed in Sycamore Creek upstream from each dam. On August 25, the siphon dams were reinforced and the aeration systems were upgraded. Two additional aeration systems were added downstream from the siphon dams to help reduce dissolved oxygen depletion in Sycamore Creek.

Results of Kirby Tire effluent samples collected between August 22, 1999 and January 4, 2000 are presented in Table 4 and Figure 4, and the raw data are compiled in Appendix Table 9. Anthracene, fluoranthene, naphthalene, copper, and zinc were measured in the Kirby Tire effluent at levels exceeding *Inside Mixing Zone Maximum* criteria as detailed in the Ohio Water Quality Standards

(3745-1). The *Inside Mixing Zone Maximum* (IMZM) criteria are applied as maximum effluent limits in Ohio issued NPDES permits. All of the chemical values exceeding IMZM criteria occurred during the August, 1999 time period. Several other chemical parameters, although lacking Ohio water quality criteria, were extremely elevated in the effluent discharged from the Kirby Tire wastewater system. Five-day biochemical oxygen demand (BOD₅) and COD, two measures of oxygen demand in water, were extremely elevated in the Kirby Tire wastewater discharge. BOD₅ levels reached 3,700 mg/l in the effluent, and values remained elevated into mid-October (Appendix Table 9). For comparison, the typical advanced wastewater treatment plant in Ohio has a maximum limit of 15 mg/l CBOD₅ (approximately 20 mg/l when converted to BOD₅). COD levels reached 8,650 mg/l in the effluent, and all of the values measured in August and September were above 1,300 mg/l. An evaluation of six major municipal wastewater treatment plants in Ohio revealed that the highest COD level discharged was 80 mg/l (95th percentile) (Nygaard, personal communication). The extremely high BOD₅ and COD levels discharged by Kirby Tire during August and September substantially contributed to the near complete depletion of dissolved oxygen in a one mile section of Sycamore Creek. Benzoic acid, benzene, phenanthrene, methyl ethyl ketone, and acetone were discharged at elevated levels; these chemicals have been associated with tire fires (Peterson et al. 1986, Stofferahn and Simon 1987).

Static acute toxicity tests were conducted on the effluent from the Kirby Tire wastewater treatment system between November, 1999 and February, 2000 (Table 5). Results documented that the undiluted effluent was toxic in all samples tested on *Ceriodaphniadubia* organisms. Fathead minnow results revealed less of a toxic effect, with only one of four samples showing significant levels of acute toxicity. The toxicity tests conducted between December 7-11, 1999 included a dilutional series of tests of the effluent. *Ceriodaphniadubia* dilutional test results indicated that a 28% effluent concentration resulted in a 50 percent mortality rate.

Sycamore WWTP (2PB00000)

The Village of Sycamore operates an extended aeration wastewater plant with sand filters and a polishing lagoon. The effluent discharge has a maximum daily design flow of 0.530 million gallons per day (MGD). The final effluent from the plant enters Sycamore Creek at RM 3.45. The sewer system has separate sanitary and storm sewers, with no sanitary overflows or bypasses. The current permit includes summer 30-day average ammonia-N and CBOD₅ limits of 2.0 mg/l and 10 mg/l, respectively. Sycamore WWTP effluent quality for July - September of 1998 and 1999 is portrayed in Table 6. Results revealed that effluent quality for ammonia-N and CBOD₅ were within acceptable limits to maintain good water quality conditions in Sycamore Creek. During the 1998 and 1999 summer time period, neither of these parameters exceeded permit limits. Total phosphorus levels were elevated, with median concentrations above 2 mg/l.

Table 4. Effluent results for select parameters discharged from Kirby Tire to Sycamore Creek during August, 1999 to January, 2000.

Parameter	<u>August 1999</u>		<u>September 1999</u>		<u>Oct.1999 - Jan.2000</u>		IMZM ^a	Number Exceeding IMZM
	Min.	Max.	Min.	Max.	Min.	Max.		
Acetone (ug/l)	410	17,000	1,600	4,800	<25	750	-	-
Benzene (ug/l)	<5	670	8.4	110	<5	40	1,400	0
Ethylbenzene (ug/l)	<5	47	<5	13	<5	<10	1,100	0
Anthracene (ug/l)	<2	72	<20	<20	<2	<2	0.35	7
Benzoic acid (ug/l)	NA	NA	NA	NA	<10	1,100	-	-
Fluoranthene (ug/l)	<2	24	<20	<20	<2	<5	4.5	2
Naphthalene (ug/l)	<2	830	<20	<20	<2	<2	320	9
Phenanthrene (ug/l)	<2	220	<20	<20	<2	<2	-	-
BOD₅ (mg/l)	16	3,700	350	2,100	<4	340	20 ^b	29
COD (mg/l)	1,340	8,650	2,540	7,500	<20	1,480	-	-
Copper-T (ug/l)	53	420	<10	87	<10	<10	100 ^c	27
Zinc-T (ug/l)	440	3,500	23	240	<10	130	780 ^c	29

a - Inside Mixing Zone Maximum Ohio Water Quality Standard criteria.

b - 20 mg/l BOD₅ is the typical maximum effluent limit for advanced wastewater treatment plants in Ohio (the CBOD₅ limit of 15 mg/l was converted to BOD₅ using a 1.29 multiplier).

c - Criterion are based on a hardness of 400 mg/l.

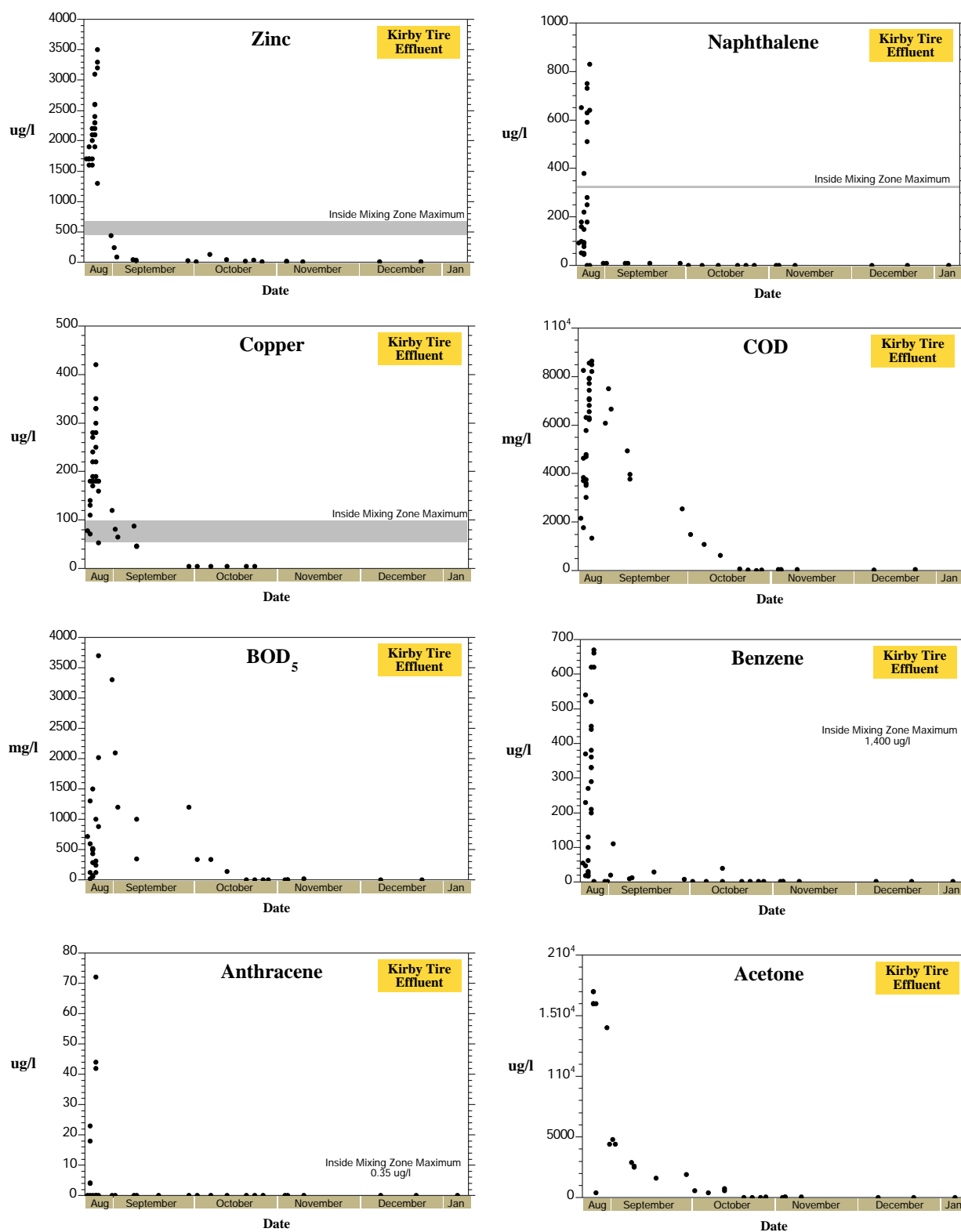


Figure 4. Scatter plots of effluent sample results collected from Kirby Tire, August, 1999 - January, 2000.

Table 5. Results of static acute toxicity tests conducted on the Kirby Tire effluent, November and December, 1999 and February, 2000.

Acute Toxicity Test Results - 100% Effluent					
Date	Fathead Minnow % Mortality	Test Duration	Ceriodaphnia % Mortality	Test Duration	Control % Mortality ^a
Nov.3-4, 1999	6.7	24 hours	50	24 hours	0/0
Nov. 4-5, 1999	86.7	24 hours	100	24 hours	0/0
Dec. 7-11, 1999	0	96 hours	100	48 hours	0/0
Feb. 2-3, 2000	20	24 hours	100	24 hours	0/0

^a - Fathead minnow/*Ceriodaphnia*.

Table 6. Third-quarter effluent loading and concentration data from the Sycamore WWTP, 1998 and 1999.

Parameter	50th %ile Concentration (mg/l)	95th %ile Concentration (mg/l)	50th %ile Loading (kg/day)	95th %ile Loading (kg/day)
<u>1999</u>				
Total Suspended Solids	0	8	0	0.73
Ammonia-N	0.07	0.3	0.006	0.028
CBOD ₅	1.2	4.2	0.10	0.40
Total Phosphorus	2.64	3.1	0.28	0.37
Conduit Flow (MGD)	0.027	0.037	-	-
Dissolved Oxygen	7.3	6.3 (5th %ile)	-	-
pH (S.U.)	7.3	7.5	-	-
<u>1998</u>				
Total Suspended Solids	5	15	0.29	1.53
Ammonia-N	0	0.2	0	0.02
CBOD ₅	2.7	6.4	0.29	1.23
Total Phosphorus	2.4	3.7	0.17	0.38
Conduit Flow (MGD)	0.03	0.084	-	-
Dissolved Oxygen	8.4	6.4 (5th %ile)	-	-
pH (S.U.)	7.3	7.5	-	-

Sediment Chemistry

Stream sediment samples were collected from 12 locations in Sycamore Creek, three in the Sandusky River, and one in Kirby Tributary. Summarized sediment data is compiled in Table 7 and raw chemical results are presented in Appendix Tables 7, 8 and 11. Sediment data were evaluated in part using guidelines established by the Ontario Ministry of the Environment (Persaud *et al.* 1993). The guidelines define two levels of ecotoxic effects and are based on the chronic, long term effects of contaminants on benthic organisms. A *Lowest Effect Level* is a level of sediment contamination that can be tolerated by the majority of benthic organisms, and a *Severe Effect Level* indicates a level at which pronounced disturbance of the sediment-dwelling community can be expected. The Severe Effect Level is the sediment concentration of a compound that would be detrimental to the majority of benthic species. When any parameters are at or above the Severe Effect Level guideline, the material tested is considered contaminated and will likely have a significant effect on benthic biological resources.

A review of sediment results collected from the Sycamore Creek study area during September and November, 1999 revealed relatively low concentrations for a number of parameters. Of the chemicals tested which have sediment guidelines, none of the values exceeded the Severe Effect Level. A number of metal parameters exceeded the Lowest Effect Level (arsenic, cadmium, copper, iron, nickel) at sites both upstream and downstream from the Kirby Tire site. Zinc, a site contaminant, was not detected in Sycamore Creek sediments above the Lowest Effect Level. Total PAH levels measured in both Sycamore Creek and the Sandusky River were far below the LEL of 4.0 mg/kg. Total toxicity equivalents (TEQ) values for dioxins/furans were measured at three locations in Sycamore Creek; upstream from Kirby Tire, immediately downstream from the Kirby Tire wastewater discharge, and in an area of visual oil contamination, and at the mouth of Kirby Tributary. All four dioxin/furan samples were considered background levels (John Estenik, personal communication). Dioxin/furan samples collected in Sycamore Creek downstream from Kirby Tire were lower than the upstream sample.

Elevated levels of caprolactum, benzoic acid, and ammonia were observed in Sycamore Creek sediments located downstream from the Kirby Tire site (Table 7). Caprolactum is found in tire manufacturing products (Peterson *et al.* 1986). Caprolactum, a water soluble compound, is a monomer for nylon-6 polyamide tires. Although sediment toxicity data is unavailable for caprolactum, a significant increase in caprolactum was noted in Sycamore Creek sediments immediately downstream from the Kirby Tire wastewater discharge. Elevated levels of caprolactum were recorded for at least one mile downstream from the Kirby Tire discharge. Benzoic acid is a vulcanization retarder used in the tire manufacturing process. Detectable levels of benzoic acid were documented in Sycamore Creek sediments at two sites downstream from the Kirby Tire discharge. Ammonia levels in Sycamore Creek sediments were elevated at the two locations immediately downstream from Kirby Tire. Limited testing for ammonia-nitrogen in the Kirby Tire wastewater discharge during 1999 indicated considerable concentrations, with values ranging between 2.84 and 10.6 mg/l.

As noted in Plate 2, a layer of black material penetrated the upper 2-3 inches of bottom substrate of Sycamore Creek at least from RM 6.9 to RM 6.3. In addition, sediments disturbed at RM 6.37 released enough oil to create a large oil sheen on the surface of Sycamore Creek. The disturbed sediments also had a strong organic odor consistent with the smell of burnt tires.

Table 7. Select chemical parameters measured in sediment samples collected by Ohio EPA from Sycamore Creek, Kirby Tributary, and the Sandusky River, 1999. Measurements marked with an asterisk exceed the Lowest Effect Level as detailed in Persaud *et al.* 1993. Parameters exceeding the Severe Effect Level are indicated by **bold** numbers. Parameters in *italics* do not have sediment guidelines established. J -values are estimated. ND - not detected. NJ - compound is tentatively identified and the result is estimated.

<u>Stream</u> River Mile	<u>SEDIMENT</u> (mg/kg)					<i>Dioxins/ Furans</i> Total TEQ ^b
	<i>Benzoic Acid</i>	<i>Caprolactam</i>	Total PAH ^a	Zinc	<i>Ammonia</i>	
<u>Sycamore Creek</u>						
9.13	-	ND	0.051J	70.3J	15.8	4.59
7.32	-	29	ND	76.1J	167	2.14
6.85	-	4.6	ND	53.8J	108	-
6.47	4NJ	7NJ	ND	49.7	-	-
6.37	-	1.2	0.914J	93.7J	31.8	3.53
5.74	2NJ	ND	ND	56.4	-	-
5.10	ND	ND	ND	84.7	-	-
5.02	-	ND	ND	98.4J	29.8	-
3.54	-	0.083J	0.454J	46.9J	22.6	-
2.61	-	ND	0.758J	93.7J	45.8	-
0.80	ND	ND	ND	71	-	-
0.41	-	ND	0.064J	53.8J	16.7	-
<u>Kirby Tributary</u>						
0.01	-	ND	ND	61.7J	17.3	3.70
<u>Sandusky River</u>						
57.95	-	ND	0.175J	105J	70.5	-
57.34	-	ND	ND	60J	15.9	-
52.57	-	ND	ND	76.4J	ND	-

^a - Total PAH is the sum of 16 PAH compounds: acenaphthene, acenaphthylene, anthracene, benzo(k)fluoranthene, benzo(b)fluorene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene.

^b - Toxicity equivalents presented in parts per trillion.

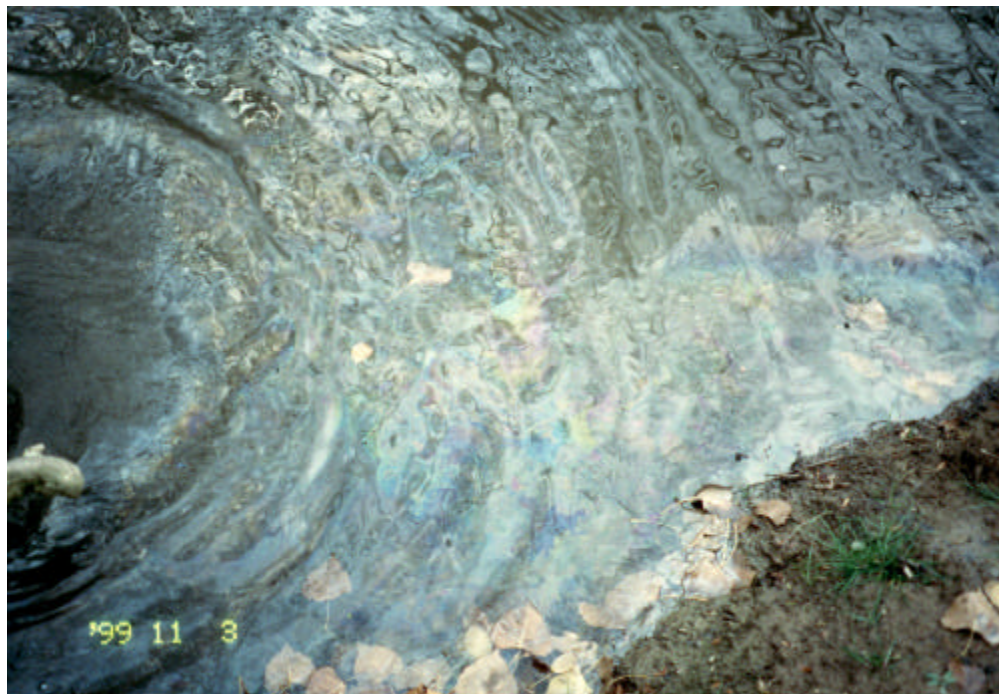


Plate 2. Top photo - oil band on overturned boulder from Sycamore Creek at RM 6.51.
Bottom photo - oil released from sediments in Sycamore Creek at RM 6.44.

Surface Water

Chemical analyses were conducted on surface water samples collected during 1999 from 16 locations in Sycamore Creek, 5 locations in the Sandusky River, and one location in Kirby Tributary. Surface water samples were tested for nutrients, metals, organochlorinated pesticides, semivolatile and volatile organic compounds, and PCB parameters (Appendix Tables 2-6, 10, and 16). Dissolved oxygen was measured at 31 locations in Sycamore Creek, four locations in the Sandusky River, and one location in Kirby Tributary to assess oxygen demand on the stream. Dissolved oxygen results are detailed in Appendix Tables 1 and 17. Parameters which were in exceedance of Ohio water quality criteria are reported in Table 8.

Sycamore Creek

Significant chemical impairment of Sycamore Creek occurred during and after the Kirby Tire fire incident beginning on August 21, 1999. Almost complete depletion of dissolved oxygen levels in Sycamore Creek occurred during August 25 -27, 1999 in the lower seven miles of stream. This depletion was associated with the initial spill plume. Continued dissolved oxygen depletion occurred during September and October at least within a 1.6 mile length of stream (Figure 5). Dissolved oxygen levels were at low enough levels to cause acute toxicity to the wildlife inhabiting Sycamore Creek (Ohio EPA 1996b). The most severe oxygen depletion occurred at RM 6.85, and visual and odor observations indicated septic conditions on a number of occasions during September and October, 1999. During this same time period, stream flows were extremely low, with intermittent flows observed on a number of days. Violations of the minimum WWH dissolved oxygen water quality criterion were recorded for 147 grab samples in Sycamore Creek adjacent to and downstream from Kirby Tire. Dissolved oxygen water quality criterion violations were not recorded in Sycamore Creek upstream from Kirby Tire (even under intermittent flow conditions) or in Kirby Tributary.

A number of chemicals associated with tire fires - zinc, naphthalene, benzene, toluene, PAHs (FEMA 1998) were documented at levels which represent an acute toxicity hazard in Sycamore Creek (Table 8). Exceedences of aquatic life maximum water quality criteria occurred in Sycamore Creek for naphthalene, zinc, benzene, acenaphthene, fluoranthene, copper, manganese, anthracene, oil & grease, fluorene, 2,4-dimethylphenol, 3&4-methylphenol, and pyrene. None of these chemical parameters exceeded water quality criteria in Sycamore Creek upstream from Kirby Tire. Other chemical parameters associated with the Kirby Tire fire which had water quality criteria exceedences (average aquatic life water quality criteria or human health nondrinking criteria) included toluene, ethylbenzene, benzo(a)pyrene, phenol, ammonia-N, bis(2-ethylhexyl)phthalate, and diethylphthalate. The majority of water quality criteria exceedences occurred in Sycamore Creek in the first 1.6 miles downstream from Kirby Tire (RM 7.36 - 5.72).

Substantial concentrations of many chemicals associated with tire fires, which do not have water quality criteria developed, were noted in Sycamore Creek downstream from Kirby Tire. Table 9 details some of these chemical parameters. During August, 1999 extremely high levels of 5-day biochemical oxygen demand (BOD₅) and chemical oxygen demand (COD) were recorded in Sycamore Creek (Table 9). These high levels were documented within the first mile downstream from the Kirby Tire site. Other parameters typically associated with tire fires, which were elevated above background levels in Sycamore Creek, included caprolactum, phenanthrene, 2-butanone, and

4-methyl-2-pentanone (Table 9). Measurements of total cyanide in surface water samples could not be compared directly to aquatic life water quality criteria because the criteria are based on free cyanide. However, two total cyanide estimated concentrations (2,440 ug/l and 1,480 ug/l) were far above the Outside Mixing Zone Maximum free cyanide criterion of 22 ug/l. Three additional T-cyanide concentrations (233, 188, and 112 ug/l) were also highly elevated above the free cyanide water quality maximum criterion. All of the elevated cyanide measurements occurred within 2.2 miles downstream of Kirby Tire.

Sandusky River

Two parameters, strontium and aroclor-1254, were the only chemicals measured in the Sandusky River which exceeded water quality criteria. Strontium exceedences occurred in the Sandusky River both upstream and downstream from the Sycamore Creek confluence, and were less than the 75th percentile of reference sites within the Eastern Corn Belt Plains ecoregion (Ohio EPA 1999). Aroclor-1254, measured at 0.41 ug/l, was an estimated value (concentration was below the lab quantitation limit). The detected level of aroclor-1254 was not associated with the Kirby Tire site. Nutrient levels in the Sandusky River, as represented by nitrate-N and total phosphorus, were below the 75th percentile values for reference sites within the ECBP ecoregion. Overall water chemistry quality of the Sandusky River during November and December was good. Monitoring of Sandusky River surface water during the downstream movement of the spill plume from Kirby Tire did indicate influences on water chemistry. One elevated COD value (378 mg/l), and the presence of water soluble and tire fire related chemicals caprolactum (9 ug/l and 3 ug/l) and benzoic acid (7 ug/l) were documented in the Sandusky River at RM 57.34, downstream from Sycamore Creek. Dissolved oxygen levels in the Sandusky River were not negatively impacted downstream from Sycamore Creek.

Kirby Tributary

None of the surface water samples collected in Kirby Tributary had chemical measurements exceeding water quality criteria. Dissolved oxygen measurements taken from September through November indicated conditions well within warmwater habitat criteria. Only two surface water chemical samples were collected in Kirby Tributary during the study period, occurring in November and December, 1999. Organics and metals results were generally low, with many parameters reported at or below lab detection limits.

Table 8. Exceedences of Ohio EPA water quality standards (OAC 3745-1) for chemical/physical parameters from the Sycamore Creek study area during 1999 based on grab water samples (units are µg/l for metals and organics, and mg/l for all other parameters listed).

Stream River Mile	Parameter (value)
<i>Sycamore Creek</i>	
9.13	beta-BHC (0.029J)††
7.65-7.43	None
7.43	D.O. (3.39)+
7.40	D.O. (1.9, 1.45, 1.43, 0.34, 0.55, 1.46)+
7.38	D.O. (0.77, 0.16, 0.17, 0.21, 0.17, 0.19, 0.15)+
7.36	D.O. (2.01, 0.29, 0.16, 0.18, 0.2, 0.25, 0.19, 0.2, 0.21, 3, 0.34, 0.36, 0.79, 0.18, 0.35, 0.17, 3.18)+ Benzene (220)*, Toluene (100)*, Naphthalene (2900)**, Copper (32)* Zinc (960)**
7.34	Naphthalene (76)* (4000, 2200)**; Benzene (330)* (940)**; Pyrene (9)*, Ethylbenzene (140)*; Toluene (150)* (700)**; Acenaphthene (23)* (49)**; Anthracene (69)**; Benzo(a)pyrene (8.6)††; Fluoranthene (2.7, 4.1)**; Fluorene (53)*; Copper (73, 100)**; Zinc (1800, 2900)**; Cobalt (53)*; Manganese (1700, 1900)**; Strontium (1800, 1700)*
7.32	D.O. (0.16, 0.16, 1.83, 0.16, 0.18, 0.11, 0.12, 0.16, 0.17, 0.2, 0.23, 0.27, 0.42, 0.21, 0.27, 0.21, 0.27, 0.14, 0.39)+ Benzene (420)*, Toluene (200)*, Acenaphthene (9.9)*, Anthracene (53)** Benzo(a)pyrene (4.9)††, Fluoranthene (5.7)**, Naphthalene (5600)** Pyrene (5.1)*, Copper (65)**, Zinc (1500)**
7.0	D.O. (0.32)+
6.85	D.O. (1.45, 0.17, 0.08, 0.08, 0.08, 0.06, 0.58, 0.35, 2.55, 0.55, 0.35, 2.24, 0.22, 0.42, 0.42, 0.70, 0.49, 0.59, 3.67))+ beta-BHC (0.016J)††, Benzene (620)*, Toluene (320)*, Anthracene (14)** Naphthalene (360)**; Zinc (490)**
6.47	Cobalt (88)*, Copper (51)* (42, 54)**; Manganese (2920, 3420)**; D.O. (1.82)+ Oil & Grease (17,000)**; Strontium (1440, 1570)*, Zinc (2700, 1620, 3050)** Naphthalene (620, 377, 9100, 10,000)**; Acenaphthene (4700)**; Benzo(a)pyrene (1000)††, Acenaphthylene (1900, 5200)††, Fluorene (6600)** Fluoranthene (270, 3700)**; Bis(2-ethylhexyl)phthalate (380)* Diethylphthalate (490)*, 2,4-Dimethylphenol (740)**; 3&4-Methylphenol (1000)** Anthracene (810, 3700)**; Phenol (3100, 5200)††, Pyrene (1100, 6200, 6300)**
6.37	None
5.76	D.O. (0.18, 0.23, 2.03, 0.38)+
5.74	D.O. (2.01, 2.78, 3.53, 1.88, 2.72, 2.2, 1.94, 1.91, 3.18, 3.14, 0.16, 0.1, 3, 0.16, 0.1)+ Manganese (1550, 1720)**; Strontium (1620, 1920)*, Zinc (264, 316)** 3&4-Methylphenol (120)*
5.72	D.O. (2.79, 2.60, 3.83, 2.97, 2.40, 2.71, 3.33, 3.52, 0.08, 0.2, 1.87, 3.36, 3.44, 3.29)+ Ammonia-N (12.9)*, Copper (21)*, Manganese (1670)**; Strontium (1540)* Zinc (350)**; Naphthalene (44, 21)*

Table 8. Continued.

Stream River Mile	Parameter (value)
<i>Sycamore Creek</i>	
5.40	D.O. (2.18, 1.37)+
5.12	D.O. (1.38, 2.21, 3.34, 2.88, 3.23, 2.66, 2.58, 3.02, 3.65, 3.43, 1.45, 3.96, 2.31, 3.25, 0.7, 0.9, 2.3)+
5.10	D.O. (2.94, 3.87, 2.83, 3.44, 1.37, 1.37, 2.44, 2.26, 2.41, 1.55, 2.29)+; Manganese (439, 977, 1000, 680)*; Strontium (2070, 1540, 1570)*
5.09	Naphthalene (23)*
5.08	None
5.02	None
4.65	D.O. (2.77)+
3.54	D.O. (0.08, 3.51, 1.77)+
3.52	D.O. (0.7)+
3.47	None
2.61	D.O. (1.75)+
1.60	None
0.45	D.O. (0.57)+
0.41	D.O. (1.6, 1.33, 1.53, 1.1)+; Strontium (6320, 6360)*
0.01	D.O. (2.92, 2.8)+
<i>Sandusky River</i>	
57.95	None
57.72	Strontium (4100)*
57.70	None
57.34	Strontium (4540, 3800, 3200, 3000)*
54.34	Strontium (4960)*
52.57	Aroclor-1254 (0.41J)††
<i>Kirby Tributary</i>	
0.01	None

* Exceedence of Outside Mixing Zone Average criteria (OMZA).

** Exceedence of Outside Mixing Zone Maximum criteria (OMZM).

†† Exceedence of Human Health nondrinking criteria.

+ Exceedence of the Outside Mixing Zone Minimum criteria.

Table 9. Select chemical results measured in Sycamore Creek between August and December, 1999.

Parameter	Sycamore Creek											
	Upstream				Near Kirby Tire				Downstream Dam			
	RM 9.13 - 7.41				RM 7.40 - 5.10				RM 5.09 - 0.0			
	Min.	Max.	Mean	(n)	Min.	Max.	Mean	(n)	Min.	Max.	Mean	(n)
BOD5 - (mg/l)	2.3	6	3.7	(4)	ND	1,600	148	(22)	ND	4.3	1.5	(12)
COD - (mg/l)	18	38	26	(4)	10	7,770	745	(22)	ND	314	40	(12)
Cyanide-T - (ug/l)	ND	3	1.5	(4)	ND	2,440	349	(13)	ND	4.7	2.4	(10)
Acetone - (ug/l)	ND	ND	ND	(3)	ND	1,900	561	(14)	ND	4	3.7	(9)
Caprolactum - (ug/l)	ND	ND	-	(1)	ND	10,000	990	(14)	ND	ND	ND	(8)
Phenanthrene - (ug/l)	ND	ND	ND	(5)	ND	11,000	603	(23)	ND	ND	ND	(14)
2-Butanone - (ug/l)	ND	8	4.5	(3)	ND	370	107	(13)	ND	ND	ND	(10)
4-Methyl-2-pentanone - (ug/l)	ND	ND	ND	(3)	ND	474	110	(13)	ND	ND	ND	(10)

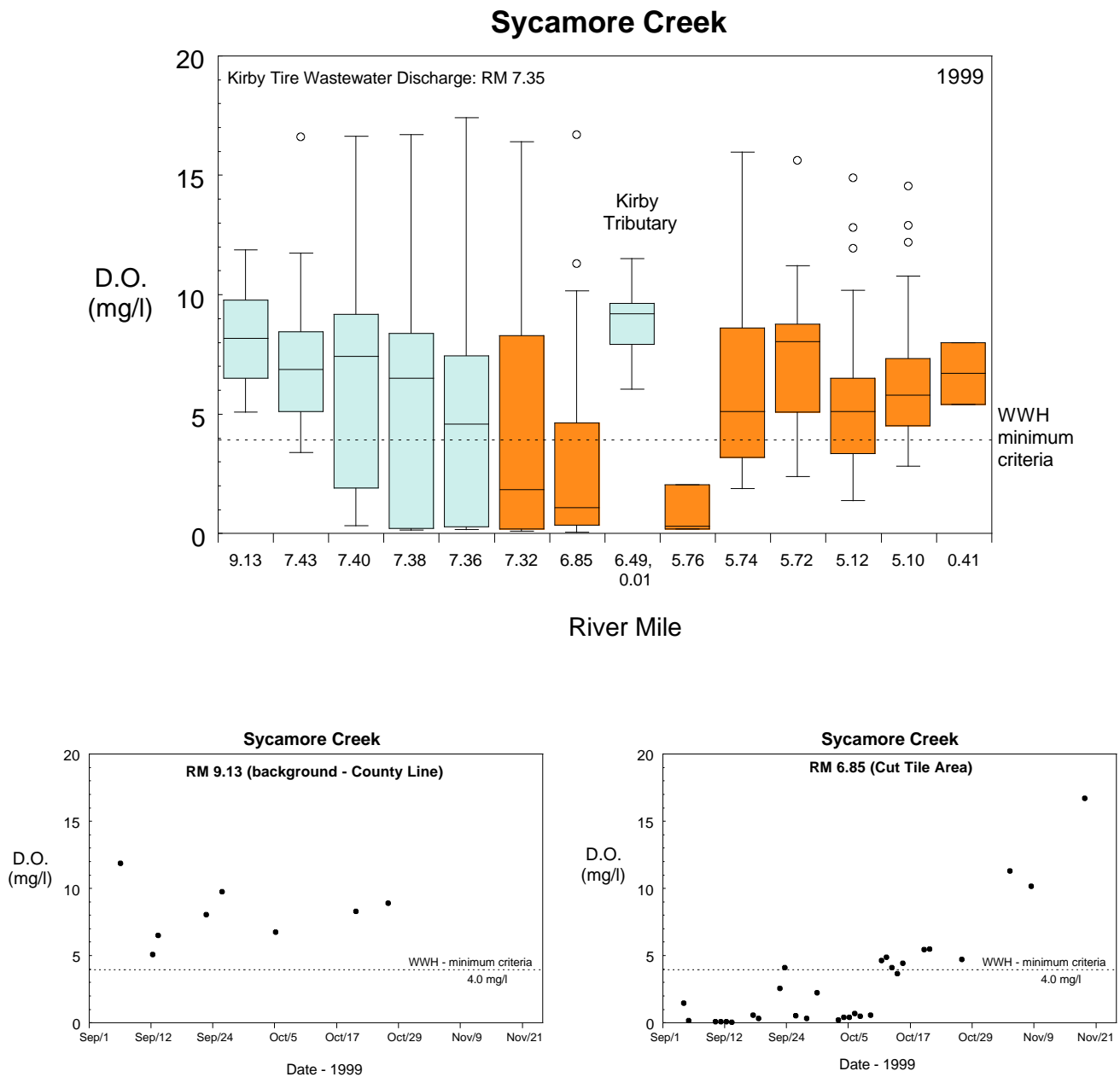


Figure 5. Box plots (top figure) and scatter plots (bottom figures) of dissolved oxygen data recorded for Sycamore Creek and Kirby Tributary, September - November, 1999.

Chemical Spills/ Wild Animal Kills

Lists of spills and wild animal kills are indications of possible impacts due to pollutant loadings. Reviews were conducted for discharges and kills to Sycamore Creek within the study area as reported by the Ohio EPA, Division of Emergency and Remedial Response and the Ohio DNR, Division of Wildlife Pollution Investigation Reports.

The only reported fish kill in Sycamore Creek between 1990 and 1999 occurred during August 1999, and was associated with the Kirby Tire Fire with its associated runoff and oil spills. The Ohio Division of Wildlife reported that 19,853 wild animals were killed over a length of 7.3 miles. Between 1990 and 1999, other than the Kirby Tire fire, no spills were reported in Sycamore Creek.

Physical Habitat for Aquatic Life

Physical habitat was evaluated in Sycamore Creek and the Sandusky River at each fish sampling location. Qualitative Habitat Evaluation Index (QHEI) scores are detailed in Table 10.

Sycamore Creek

Physical habitat conditions in Sycamore Creek were evaluated at seven locations during 1999. Cobble and gravel predominated the bottom substrates at nearly every location sampled, with lesser amounts of sand and bedrock. Natural channel conditions were complimented by a well established riparian corridor. Stream flows in Sycamore Creek adjacent to and upstream from Kirby Tire property were interstitial during the month of September, 1999, due to low precipitation levels in the area. Sampling sites located downstream from Kirby Tributary, although at low flow levels during the study period, did not become interstitial or intermittent. Sampling sites immediately within and downstream from the spill containment section of Sycamore Creek had heavy silt levels and extensive embeddedness of the bottom substrates. This condition was associated with the earthen dams which were constructed to contain the oil spill from the tire fire. QHEI scores for Sycamore Creek ranged between 76.0 and 68.0, with a mean value of 73.1. These scores are indicative of good to excellent stream and riparian habitat and reflect conditions which are capable of supporting warmwater habitat stream fish communities.

As noted in the sediment chemistry section, a layer of black material penetrated the upper 2-3 inches of bottom substrate of Sycamore Creek at least from RM 6.9 to RM 6.3. This material was associated with the tire fire oil spill.

Sandusky River

Physical habitat conditions were evaluated at six locations in the Sandusky River during 1999. Bottom substrates consisted primarily of gravel and sand at most sites. The stream bottom at RM 41.3 (within the City of Tiffin) was comprised of large boulders and cobble, with limestone bedrock present. The stream bottom was moderately to heavily covered with fine-grained silt. Several of the sampling locations were impounded by low-head dams, including RM 43.0 and RM 52.2. Sampling locations at RM 41.3 and RM 56.7, though impounded, were in the very upstream end of the impoundment. QHEI scores for the Sandusky River ranged between 72.0 and 52.5, with the lowest scores (52.5 and 56.5) recorded at the impounded locations. The QHEI scores in the free-flowing and upstream impounded segments were indicative of good to excellent stream habitat; impounded areas were representative of fair habitat conditions.

Table 10. Qualitative Habitat Evaluation Index (QHEI) matrix showing modified and warmwater habitat characteristics for Sycamore Creek and the Sandusky River, 1999.

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes									MWH Attributes										Total M.L. MWH Attributes	(MWH H.I.+1)/(MWH+1) Ratio	(MWH M.L.+1)/(MWH+1) Ratio					
			No Channelization or Recovered Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low-Normal Overall Embedment	Max Depth > 40 cm	Low-Normal Riffle Embeddedness	Total WWH Attributes	High Influence			Moderate Influence													
													Channelized or No Recovery Silt/Muck Substrates	No Sinuosity	Sparsely No Cover	Max Depth < 40 cm (W.D., HW)	Total H.I. MWH Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Eqal)	Exposed Substrate Origin				Fast/Fair Development	Low Sinuosity	Crit 1-2 Cover Types	Impaired/Fair/Food	No Fast Current
<div>Key</div> <div>QHEI</div> <div>Components</div>																													
(05-001) Sandusky River																													
Year: 1999																													
57.9	72.0	0.93	■	■	■	■				■	■	6			0		♦		♦	♦		♦	♦				5	0.14	0.86
56.7	63.0	0.10	■	■	■	■				■		5			0		♦		♦	♦		♦	♦		♦		6	0.17	1.17
52.2	56.5	0.10	■	■			■			■		4		●	1		♦		♦	♦		♦	♦		♦		6	0.40	1.60
47.6	66.0	1.72	■	■	■	■				■		5			0		♦		♦	♦		♦	♦		♦		6	0.17	1.17
43.0	52.5	0.10	■				■			■		3	●		1		♦		♦	♦		♦	♦		♦		6	0.50	2.00
41.3	68.5	0.10	■	■	■	■				■	■	6			0		♦		♦	♦		♦			♦		5	0.14	0.86
(05-021) Sycamore Creek																													
Year: 1999																													
9.1	71.5	13.33	■	■	■	■	■	■		■	■	8			0		♦				♦	♦					3	0.11	0.44
6.4	72.0	7.25	■	■	■	■				■		5			0		♦		♦		♦	♦	♦				5	0.17	1.00
6.3	68.0	7.25	■	■	■	■	■			■		6			0		♦		♦		♦	♦	♦				5	0.14	0.86
5.0	73.5	16.67	■	■	■	■	■			■	■	7			0		♦				♦	♦					3	0.13	0.50
3.6	75.5	19.23	■	■	■	■	■			■	■	8			0		♦		♦		♦	♦					4	0.11	0.56
2.6	75.5	11.90	■	■	■	■	■			■		7			0		♦				♦	♦	♦				4	0.13	0.63
0.3	76.0	11.36	■	■	■	■	■			■	■	8			0		♦				♦	♦					3	0.11	0.44

Biological Assessment - Macroinvertebrate Communities

In the fall 1999, macroinvertebrate communities were sampled in Sycamore Creek at six locations near Kirby Tire, and in the Sandusky River at four locations. The macroinvertebrate communities and subsequent ICI scores based on this sampling event may have been negatively influenced by the fact that the samples were collected after the established sampling index period (June 15 through September 30); this is the collection time frame for the reference site samples which were used to calibrate ICI scoring. Summarized results of the macroinvertebrate data are compiled in Tables 11 and 12. ICI metrics and scores and raw data tables by river mile are attached as Appendix Tables 14 and 15. Included in Table 11 are historical Ohio EPA Sandusky River macroinvertebrate data collected in 1990.

Sycamore Creek

Six sites were sampled in Sycamore Creek to evaluate the impact of runoff from the tire fire on the macroinvertebrate communities. The upstream background site, based on qualitative sampling due to the artificial substrate samplers being out of the water due to low flows, indicated very good to exceptional conditions. The first site downstream from Kirby Tire, also based on qualitative samples due to the artificial substrate samplers being vandalized, indicated very poor biological conditions with only four taxa collected on the first sampling pass and fifteen on the second pass. The community was made up of organisms highly tolerant of pollution with rat-tailed maggots and mosquito larva predominating. At RM 5.0, sampling indicated poor conditions with an ICI score of 12. The next two sites (RM 3.6 and 2.6) improved into the fair range with ICI scores of 22 and 26, respectively. The site at the mouth (RM 0.3) was in the good range with an ICI score of 36 achieving the WWH ecoregional biocriterion.

Sandusky River

The macroinvertebrate communities were sampled in the Sandusky River to help determine if runoff from the Kirby Tire fire into Sycamore Creek had any impact on the Sandusky River. The upstream site at RM 61.1 indicated good biological conditions and achieved the WWH ecoregional biocriterion. The site downstream from the confluence of Sycamore Creek was in the very upstream end of the St. John's dam pool with no detectable current, making the ICI score not comparable to the biocriterion. Both downstream sites with free flowing conditions achieved the applicable biocriterion with good macroinvertebrate communities.

Table 11. Summary of macroinvertebrate data collected from artificial substrates (quantitative sampling) and natural substrates (qualitative sampling) in the Sandusky River, 1990 and 1999 and Sycamore Creek, 1999.

Stream/ River Mile	Relative Density #/Ft. ²	Total Taxa	Quantitative Taxa	Qualitative Taxa	Qualitative EPT ^a	ICI	Narrative Evaluation
<i>Sandusky River (1999)</i>							
61.1	632	68	42	48	15	40	Good
57.3	411	44	31	22	1	18#*	Fair/Dam Pool
47.8	1,734	55	42	36	11	38	Good
41.8	3,557	62	40	49	12	36	Good
<i>Sandusky River (1990)</i>							
65.1	641	53	40	34	14	48	Exceptional
57.3	546	64	34	47	15	48	Exceptional
47.7	848	55	31	43	16	48	Exceptional
41.8	1,308	45	27	35	14	38	Good
<i>Sycamore Creek (1999)</i>							
5.0	534	31	21	22	1	<u>12</u> *	Poor
3.6	488	45	31	30	4	<u>22</u> *	Fair
2.6	1,204	68	48	44	7	<u>26</u> *	Fair
0.3	867	62	44	36	6	36	Good

Ecoregion Biocriteria: Eastern Corn Belt Plains (ECBP)
(from OAC 3745-1-07, Table 7-14)

<u>INDEX</u>	<u>WWH</u>	<u>EWB</u>	<u>MWH</u> ^b
ICI	36	46	22

a EPT= total Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) taxa richness.

b Modified Warmwater Habitat for channel modified areas.

* Significant departure from WWH biocriterion; poor and very poor results are underlined.

Dam pool conditions with no detectable current.

Table 12. Summary of qualitative macroinvertebrate data collected from natural substrates in Sycamore Creek, 1999.

Stream/ River Mile ^a	No. Qual Taxa	Qual EPT ^b	Relative Density ^c	Predominant Organism	Narrative Evaluation ^d
<i>Sycamore Creek (1999)</i>					
9.1A	45	18	Moderate	Mayflies/Caddisflies	Exceptional
9.1B	35	11	Low	Caddisflies/Beetles	Very Good
6.3A	4	1	Very Low	Beetles	Very Poor
6.3B	15	0	Very Low	Rat-tailed Maggots	Very Poor
5.0A	12	2	Low	Beetles	Poor
5.0B	22	1	Low	Snails	Poor
3.6A	26	5	Low	Beetles/Red midges	Fair
3.6B	30	4	Low	Midges/Craneflies	Fair
2.6A	22	2	Low	Beetles/Scuds	Poor
2.6B	44	7	Low	Aquatic Worms/Midges	Fair
0.3A	61	14	Moderate	Caddisflies/Beetles	Very Good
0.3B	36	6	Moderate	Caddisflies/Midges	Good

^a A - samples collected between August 31 and September 8, 1999.

B - samples collected from October 12-14, 1999.

^b EPT= total Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) taxa richness.

^c Based on field observations.

^d The qualitative narrative evaluation is based on best professional judgment utilizing sample attributes such as taxa richness, EPT richness, and predominant organisms.

Biological Assessment - Fish Communities

Summarized results from the 1999 fish community sampling are compiled in Table 13. Relative numbers and species collected per location are presented in Appendix Table 13, and IBI and MIwb results are presented in Appendix Table 12.

Sycamore Creek

The fish community in Sycamore Creek upstream from the Kirby Tire fire area achieved expectations for the WWH use designation as measured by the IBI and MIwb (Table 13). The biological criteria were met in spite of the intermittent flow conditions which occurred during part of September and October, 1999. The upstream, unimpacted area of Sycamore Creek supported a good population of smallmouth bass and rock bass as well as a substantial number of large suckers.

A large fish kill occurred in Sycamore Creek adjacent to and downstream from the Kirby Tire site. Fish were nearly completely absent from a 2.3 mile segment of stream (RMs 7.4 - 5.1). Water chemistry monitoring between RM 7.4 and RM 5.1 (from Kirby Tire to the most downstream dam) documented extremely low dissolved oxygen levels as well as a number of organic and metal parameters exceeding levels which represent an acute toxicity hazard to aquatic life. Based on fish community sampling by Ohio EPA, fish were absent from Sycamore Creek at RM 6.3 and severely depleted at RM 6.4. Surface water from Kirby Tributary and groundwater from a 12 inch drain tile supplied sufficient water to Sycamore Creek at RM 6.4 to provide a small refugia for some fish. Fish community results between RMs 5.0 and 0.4 were in the poor to very poor range, with low numbers of individuals and species collected. Some improvement in fish biotic integrity occurred near the mouth (RM 0.3), with improved numbers and species of fish. Conditions at RM 0.3 indicated fair biotic integrity. Sampling in Sycamore Creek revealed that upstream from the Kirby Tire fire, the fish community was achieving the WWH biocriteria. For 7.4 miles downstream from Kirby Tire, the fish community of Sycamore Creek was not achieving the WWH biocriteria.

Sandusky River

Fish communities in the Sandusky River were evaluated at six locations along a 16 mile section of river. Five of the six locations (RMs 57.9, 56.7, 47.6, 43.0, and 41.3) met the WWH biocriteria (Table 13). One site, located at RM 52.2, failed to fully achieve the WWH biocriteria. Impounded habitat conditions at RM 52.2 were the primary reason for a decline in the fish community. Three of the four sites with free-flowing current had fish communities at or near exceptional conditions. The State Threatened greater redhorse was collected at all six locations in the Sandusky River, with the largest number of individuals (25) documented at RM 47.6. River redhorse, a State Special Interest species, was collected at five of six locations. Chemical water quality impairment was not evident in the Sandusky River as measured by fish community performance.

Table 13. Fish community summaries based on pulsed D.C. electrofishing sampling conducted by Ohio EPA in Sycamore Creek and the Sandusky River from August - October, 1999. The number of samples collected at each location is listed with the sampling method. Relative number and weight are per 0.3 km for wading sites and per 1.0 km for boat sampling sites. Existing aquatic life uses are as noted.

<i>Stream</i> RM	Sampling Method	Mean # Species	Total # Species	Mean Relative Number	Mean Relative Weight(kg)	QHEI	Mean Modified Index of Well Being	Mean Index of Biotic Integrity	Narrative Evaluation ^a
<i>Sycamore Creek (1999) (WWH)</i>									
9.1	Wading-2	19.5	20	1,134	33.73	71.5	8.1 ^{ns}	38 ^{ns}	Marginally Good
6.4	Wading-1	-	9	84	0.69	72.0	<u>5.2*</u>	<u>20*</u>	Poor
6.3	Wading-2	0	0	0	0.0	68.0	<u>0.0*</u>	<u>12*</u>	Very Poor
5.0	Wading-2	10.5	14	240	1.61	73.5	<u>5.2*</u>	29*	Poor/ Fair
3.6	Wading-2	11.5	15	125	21.86	75.5	<u>4.0*</u>	30*	Very Poor/ Fair
2.6	Wading-2	4.5	7	66	0.46	75.5	<u>3.5*</u>	<u>15*</u>	Very Poor
0.3	Wading-2	18.5	22	1836	16.24	76.0	7.7*	33*	Fair
<i>Sycamore Creek (1995) (WWH)</i>									
7.6	Wading-1	-	22	2283	6.15	-	7.7*	42	Fair/Good
<i>Sandusky River (1999) (WWH)</i>									
57.9	Boat-2	18.0	22	343	70.11	72.0	9.1	44	Very Good
56.7	Boat-2	17.0	20	170	54.88	63.0	8.9	48	Good/ Exceptional
52.2	Boat-1	-	11	272	32.78	56.5	7.3*	46	Fair/ Very Good
47.6	Boat-2	23.0	25	542	142.90	66.0	10.5	55	Exceptional
43.0	Boat-2	15.5	20	282	90.03	52.5	8.2 ^{ns}	44	Good/ Marg. Good
41.3	Boat-2	22.0	26	412	161.35	68.5	10.0	51	Exceptional
<i>Sandusky River (1990) (WWH)</i>									
56.7	Boat-3	15.0	20	179	56.75	63.0	8.2 ^{ns}	36*	Marg. Good/Fair
47.6	Boat-3	18.7	23	212	31.28	76.0	8.4 ^{ns}	44	Marg. Good/Good
41.6	Boat-3	20.3	25	315	71.47	80.0	9.4	44	Very Good

Ecoregion Biocriteria: Eastern Corn Belt Plains (ECBP)
(from Ohio Administrative Code 3745-1-07, Table 7-14)

INDEX	WWH	EWH	MWH^b
IBI - Headwater/Wading	40	50	24
IBI - Boat	42	48	24
MIwb - Wading	8.3	9.4	6.2
MIwb - Boat	8.5	9.6	5.8

* Significant departure from ecoregional biocriteria (>4 IBI units, >0.5 MIwb units); poor and very poor results are underlined.

^{ns} Nonsignificant departure from WWH biocriterion (≤4 IBI units, 0.5 MIwb units).

^a Narrative evaluation is based on MIwb and IBI scores.

^b Modified Warmwater Habitat for channel modified areas.

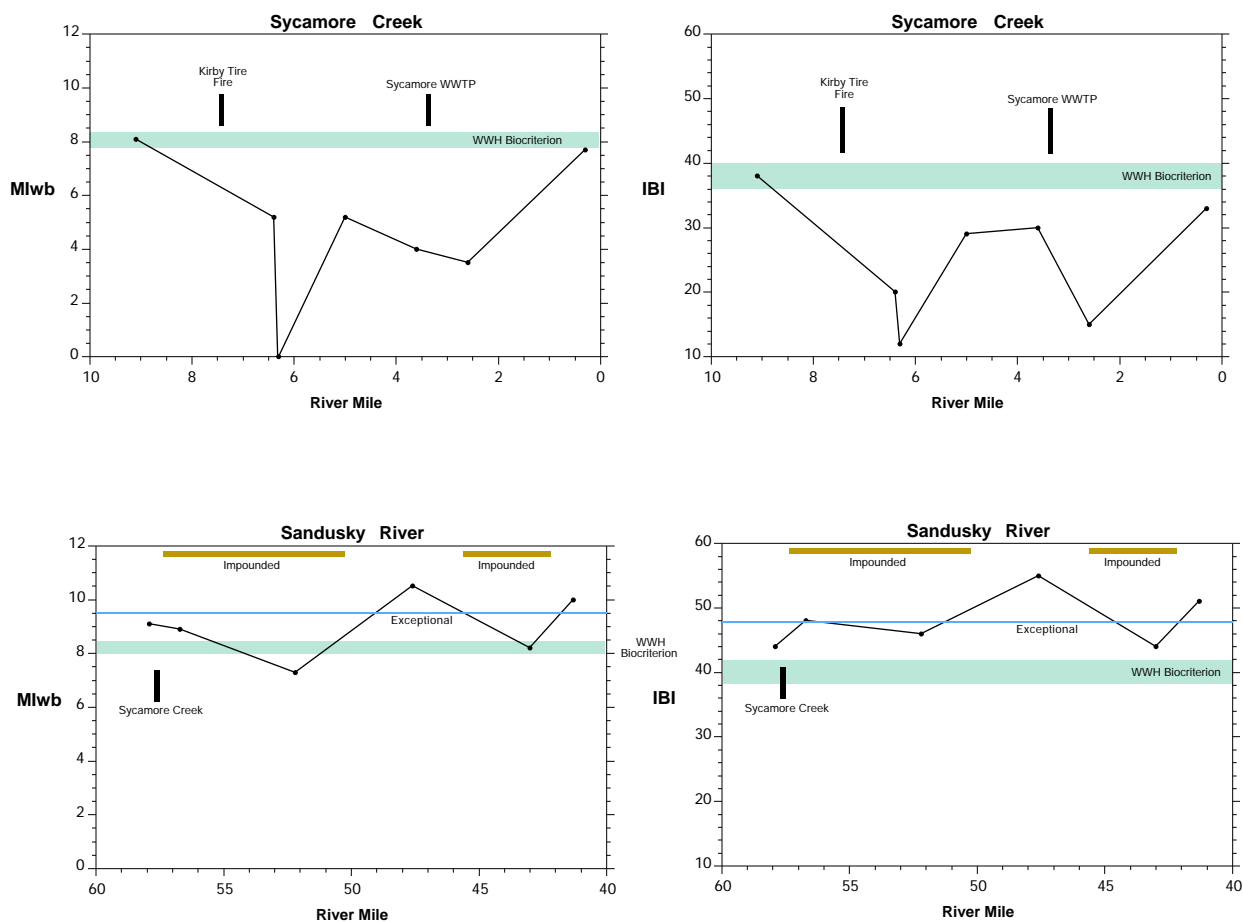


Figure 6. Longitudinal trend of the Index of Biotic Integrity (IBI) and the Modified Index of Well-Being (MIwb) in Sycamore Creek and the Sandusky River, 1999.

Trend Assessment

Macroinvertebrate Community Performance: 1990 to 1999

There was a general decline in the performance of the macroinvertebrate communities between 1990 and 1999 in the Sandusky River from Sycamore Creek to the City of Tiffin. In 1990, the Sandusky River macroinvertebrate communities ranged from good to exceptional, while in 1999 all sites were in the good range. River flows in 1990 were consistently elevated throughout the year as opposed to 1999, which was a drought year. These conditions could have contributed to the changes in the macroinvertebrate communities in that the decline in ICI scores was due mostly to increases in relative densities made up from large increases in nutrient tolerant organisms (the midges *Glyptotendipes* and *Polypedilum convictum*, *Hydra*, and flat worms). All sites in this reach of the Sandusky River met the applicable biocriterion.

Fish Community Performance: 1990 to 1999

Fish communities in Sycamore Creek were previously assessed at one location during 1995, and in the Sandusky River during 1990. Results from Sycamore Creek revealed similar conditions in IBI and MIwb performance between 1995 and 1999, at sites located 1.5 miles apart (RM 9.1 and RM 7.6). Sandusky River fish community results between 1990 and 1999 indicated an overall improvement in biological integrity. At comparable sampling locations between the two years (RMs 56.7, 47.6, and 41.3), IBI scores increased an average of 10 points and MIwb scores increased an average of 1.1 points. In free-flowing sections of the Sandusky River, the fish community improved from meeting warmwater criteria to achieving exceptional conditions.

Area of Degradation Values: 1987 to 1998

Area of Degradation Values (ADV) provide a relative measure of performance of the IBI, MIwb, and ICI indices (Table 14). ADV values were calculated for the sites located in the lower nine miles of Sycamore Creek and a 16 mile section of the Sandusky River. Results for Sycamore Creek indicated substantial degradation as noted in the high ADV/mile numbers for all three indices. Sandusky River ADV values reflect the improved condition of the fish communities and the negative influences of impounded conditions (little or no flow) on the macroinvertebrate communities during 1999. Between river miles 40 and 60, impounded areas were sampled during 1999, but not during 1990.

Table 14. Area of Degradation Values (ADV) statistics for Sycamore Creek and the Sandusky River. Values were calculated using Eastern Corn Belt Plains (ECBP) WWH biocriteria as the baseline for community performance.

Stream (Year)			Biological Index Values		ADV Statistics				Attainment Status		
Reach					Positive		Negative		(miles)		
Index	Upper RM	Lower RM	Mini- mum	Maxi- mum	ADV	ADV /Mile	ADV	ADV/ Mile	Full	Par- tial	Non
Sycamore Creek (1999)											
IBI			12	38	15	1.5	842	88.6			
MIwb	9.6	0.0	0.0	8.1	8	0.8	1210	127.3	2.2	0.4	7.0
ICI			12	36	24	4.5	441	81.7			
Sandusky River (1999)											
IBI			44	55	1836	104.3	0	0.0			
MIwb	61.6	40.8	7.3	10.5	759	43.1	80	11.1	13.6	7.2	0.0
ICI			18	40	182	12.6	652	45.0			
Sandusky River (1990)											
IBI			36	44	589	36.5	35	2.1			
MIwb	58.3	40.6	8.2	9.4	309	19.1	0	0.0	14.3	3.4	0.0
ICI			38	48	2287	138.6	0	0.0			

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Appendix Tables

Appendix Table 1. Dissolved oxygen and water temperature results (grab samples) measured by Oho EPA in Sycamore Creek during September - December, 1999. Sampling locations are indicated by river mile (RM).

[illegible]

Appendix Table 1. Continued.

River Mile	<u>September 8, 1999</u>				<u>September 9, 1999</u>				<u>September 10, 1999</u>				<u>September 11, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13															
7.65															
7.54															
7.48															
7.43															
7.40					10.6	02:45 PM	25.4		6.43	11:05 AM	15.5				
7.38															
7.36	4.14	10:10 AM	19.2		2.01	02:15 PM	23.4		0.29	11:14 AM	18.4		0.16	12:20 PM	19.8
7.32	0.16	10:15 AM	19.5		1.83	02:25 PM	24.9		0.16	11:22 AM	18		0.18	12:30 PM	17.9
6.85													0.08	01:00 PM	16.6
6.47															
5.76	0.23	10:45 AM	19.9		2.03	03:05 PM	21.7		0.38	12:00 PM	17.9				
5.74													2.01	01:10 PM	17.6
5.72	7.47	10:40 AM	20		7.58	03:00 PM	21		8.76	12:12 PM	19.9		8.77	01:15 PM	17.2
5.40															
5.12	1.38	10:55 AM	19.6		4.31	03:49 PM	22.7		2.21	12:26 PM	19.2		3.34	01:30 PM	18.3
5.10	2.94	11:00 AM	19.8		5.62	03:50 PM	23		5.16	12:36 PM	20		5.8	01:40 PM	20
5.09	4.06	11:10 AM	20.8												
5.08	6.78	11:05 AM	22.1												
3.47															
0.41															
<u>Kirby Tributary</u>															
6.49,0.01													7.88	12:50 PM	19.4

Appendix Table 1. Continued.

River Mile	September 12, 1999				September 13, 1999				September 14, 1999				September 15, 1999		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13					5.08	10:40 AM	20		6.5	12:09 PM	18.6				
7.65									4.65	11:25 AM	18.9				
7.54									6.83	11:13 AM	15.8				
7.48									5.61	11:06 AM	16.9				
7.43									4.01	11:59 AM	14.7				
7.40									1.9	11:52 AM	16.4				
7.38	0.77								0.16	11:47 AM	15.5				
7.36	0.18	11:15 AM	19.8		0.2	10:10 AM	19.2		0.25	10:36 AM	16.9		0.19	10:25 AM	14.5
7.32	0.11	11:35 AM	17.5		0.12	10:22 AM	18.6		0.16	10:31 AM	15.9		0.17	10:45 AM	15
6.85	0.08	11:55 AM	17.3		0.08	11:05 AM	18.3		0.06	01:16 PM	16				
6.47															
5.76															
5.74	2.78	12:10 PM	17.4		8.61	11:27 AM	18.8		8.54	01:03 PM	16.8		9.33	11:25 AM	15.1
5.72	8.65	12:15 PM	18		8.16	11:30 AM	19		8.2	01:06 PM	16.9		8.61	11:30 AM	15.4
5.40															
5.12	2.88	12:25 PM	18.3		3.23	11:37 AM	19.7		2.66	12:53 PM	17.2		2.58	11:35 AM	14.9
5.10	4.64	12:30 PM	19.2		3.87	11:41 AM	19.4		6.15	12:57 PM	18.8		4.24	11:40 AM	16.3
5.09															
5.08													8.36	11:45 AM	19.3
3.47															
0.41															

Kirby Tributary

6.49,0.01	7.7	11:45 AM	20.5		6.05	11:17 AM	19.1		7.93	01:25 PM	17.6				
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Appendix Table 1. Continued.

River Mile	<u>September 17, 1999</u>				<u>September 18, 1999</u>				<u>September 19, 1999</u>				<u>September 20, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13															
7.65															
7.54															
7.48															
7.43															
7.40															
7.38															
7.36	0.2	10:55 AM	13		0.21	11:20 AM	17		3	12:36 PM	16.6		0.34	02:00 PM	16.4
7.32	0.2	11:10 AM	13.8		0.23	11:30 AM	14.5		0.27	12:30 PM	16.4				
6.85					0.58	11:50 AM	14.6		0.35	01:21 PM	17.5				
6.47															
5.76															
5.74	9.39	11:35 AM	14.5		4.99	12:25 PM	15		9.45	12:48 PM	15.1		6.3	02:35 PM	15.8
5.72	8.79	11:42 AM	14.7		8.24	12:30 PM	14.8		9.36	12:51 PM	16		8.05	02:30 PM	16
5.40															
5.12	3.02	11:55 AM	14.3		5.12	12:05 PM	15.6		4.55	12:58 PM	16		4.73	02:40 PM	16.9
5.10	4.09	12:05 PM	15.3		4.52	12:10 PM	16		6.97	01:01 PM	18.1		4.26	02:45 PM	17
5.09															
5.08	10.94	12:15 PM	20												
3.47															
0.41															

Kirby Tributary

6.49,0.01					7.82	11:40 AM	15.3		10.4	01:08 PM	18.2				
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Appendix Table 1. Continued.

River Mile	<u>September 22, 1999</u>				<u>September 23, 1999</u>				<u>September 24, 1999</u>				<u>September 26, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13					8.05	10:25 AM	13.5						9.77		17.1
7.65															
7.54															
7.48															
7.43					4.37	10:43 AM	11.2		4.39	10:24 AM	13		3.39	11:20 AM	15.2
7.40					1.45	10:37 AM	12.2		1.43	10:36 AM	13.2		0.34	11:15 AM	16.2
7.38					0.17	10:54 AM	11.9		0.21	10:46 AM	13.3		0.17	11:10 AM	15.5
7.36	0.36	10:55 AM	11.5		0.79	11:00 AM	12.8						0.18	11:05 AM	16.1
7.32	0.42	11:10 AM	11.3		0.21	11:08 AM	13.4		0.27	10:56 AM	13.3		0.21	11:30 AM	16.9
6.85					2.55	11:45 AM	12.5		4.09	11:16 AM	12.3		0.55	11:50 AM	15.5
6.47															
5.76															
5.74	9.2	11:40 AM	12.3		9.7	12:03 PM	12.8		6.03	11:43 AM	13.1		5.11	12:00 PM	14.1
5.72	9.47	11:45 AM	12.5		9.3	12:06 PM	13.3		9.29	11:50 AM	13.3		8.86	12:10 PM	15.4
5.40															
5.12	3.65	12:05 PM	12.4		4.93	12:10 PM	12.5		5.72	12:00 PM	14		5.74	12:15 PM	15.4
5.10	6.25	12:10 PM	14.1		6.6	12:13 PM	14.9		5.81	12:05 PM	14.1		6.4	12:20 PM	16.6
5.09															
5.08															
3.47															
0.41															

Kirby Tributary

6.49,0.01					8.74	11:52 AM	13.4		8.78	11:26 AM	12.9		8.08	11:40 AM	17
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Appendix Table 1. Continued.

River Mile	<u>September 27, 1999</u>				<u>September 28, 1999</u>				<u>September 30, 1999</u>				<u>October 4, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13															
7.65															
7.54															
7.48															
7.43					5.57		24.6		5.1		15.8				
7.40					0.55		22.3		1.46		14.9				
7.38					0.19		22.6		0.15		14.5				
7.36	0.35	10:15 AM	16.9		0.17	01:45 PM	22.7		8.32	12:36 PM	15.4		4.58	05:30 PM	12.6
7.32	0.27	10:20 AM	16.6		0.14	02:30 PM	21.4		0.39	12:27 PM	16.5		5.54	05:40 PM	11.9
6.85					0.35	02:45 PM	22.1		2.24	02:20 PM	14.5		0.22	06:20 PM	11.2
6.47															
5.76															
5.74	3.53	10:35 AM	15.7		7.84	03:00 PM	20.1		8.05	02:00 PM	15.2		4.19	05:55 PM	12.5
5.72	8.76	10:30 AM	16.2		7.64	03:05 PM	20.3		8.06	02:05 PM	15.2		4.59	05:50 PM	12.9
5.40															
5.12	5.04	10:40 AM	16.9		5.5	03:10 PM	22.1		3.43	01:40 PM	14.6		4.7	06:00 PM	12.7
5.10	4.4	10:45 AM	16.7		9.87	03:15 PM	22.5		4.47	01:45 PM	14.5		5.31	06:05 PM	12.7
5.09															
5.08															
3.47															
0.41															

Kirby Tributary

6.49,0.01					7	02:55 PM	22.6		9.19	02:30 PM	16.5		9.14	06:10 PM	12.7
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Appendix Table 1. Continued.

River Mile	<u>October 5, 1999</u>				<u>October 6, 1999</u>				<u>October 7, 1999</u>				<u>October 8, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13					6.74	10:50 AM	10.7								
7.65															
7.54															
7.48															
7.43	7.69	04:05 PM	15.1		7.14	11:35 AM	10.8		8.53	02:35 PM	15.3		7.66	01:56 PM	12.7
7.40	8.11	04:00 PM	14.2		8.25	11:31 AM	11.2		10.15	02:30 PM	15.7		8.68	01:48 PM	12.8
7.38					6.5	11:25 AM	10.3		8.39	02:25 PM	13.1		5.14	01:34 PM	11.7
7.36	7.76	03:55 PM	14.2		3.18	11:18 AM	10.8		6.4	02:15 PM	11.4		9.11	02:10 PM	12.1
7.32	9.29	04:15 PM	13		7.97	11:12 AM	11.6		4.44	02:45 PM	13.4		4.32	02:16 PM	12
6.85	0.42	04:55 PM	11.9		0.42	11:50 AM	10.3		0.7	03:20 PM	11		0.49	02:59 PM	11.4
6.47															
5.76															
5.74	4.52	04:20 PM	11.5		4.31	12:12 PM	10.7		4.81	02:50 PM	10.7		4.99	02:24 PM	11
5.72	5.09	04:25 PM	11.4		5.9	12:15 PM	10.6		5.52	02:55 PM	11		5.99	02:28 PM	11.4
5.40															
5.12	9.09	04:30 PM	12.7		5.84	12:25 PM	10.3		7.01	03:05 PM	11.2		9.58	02:39 PM	11.5
5.10	8.99	04:35 PM	12.6		6.64	12:28 PM	11.1		8.24		12		9.35	02:44 PM	11.7
5.09															
5.08															
3.47															
0.41															

Kirby Tributary

6.49,0.01	9.77	04:45 PM	13.9		9.65	12:02 PM	11.7						6.11	02:48 PM	12.9
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Appendix Table 1. Continued.

River Mile	<u>October 10, 1999</u>				<u>October 12, 1999</u>				<u>October 13, 1999</u>				<u>October 14, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13															
7.65															
7.54															
7.48															
7.43	5.57	12:05 PM	15.2										6.49	03:19 PM	14.9
7.40	6.17	12:00 PM	15.3										6.67	03:16 PM	14.8
7.38	5.88	11:55 AM	15.3										6.75	03:12 PM	15.1
7.36	5.47	11:50 AM	15.2		6.89	06:45 PM	15.4		6.9	02:30 PM	16.8		6.79	03:00 PM	15.1
7.32	6.26	12:20 PM	15.5		6.87	06:55 PM	15.2		7.46	02:20 PM	16.4		6.58	03:07 PM	14.3
6.85	0.59	01:00 PM	14.7		4.63	07:15 PM	14		4.9	02:00 PM	15.5		4.13	04:05 PM	11.8
6.47															
5.76															
5.74	1.88	12:30 PM	14		2.72	07:05 PM	13		2.2	11:40 AM	13		1.94	03:30 PM	12.2
5.72	2.6	12:35 PM	13.9		3.83	07:07 PM	12.8		2.97	11:40 AM	13.2		2.4	03:35 PM	12.3
5.40															
5.12	5.13	12:40 PM	15		6.5	05:30 PM	14.2		1.45	11:30 AM	14.1		3.96	03:55 PM	13.6
5.10	5.49	12:45 PM	14.6		7.07	05:30 PM	13.8		2.83	11:30 AM	13.7		4.62	03:50 PM	13.4
5.09															
5.08															
3.47															
0.41															

Kirby Tributary

6.49,0.01	8.41	12:50 PM	15.1		9.53	07:25 PM	14.4		9.44	01:40 PM	16.8		9.59	04:10 PM	14.4
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Appendix Table 1. Continued.

River Mile	<u>October 15, 1999</u>				<u>October 16, 1999</u>				<u>October 20, 1999</u>				<u>October 21, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13													8.31	10:40 AM	5.1
7.65															
7.54															
7.48															
7.43	5.9	10:34 AM	10.7		6.58	11:25 AM	13.7		7.35	12:55 PM	11.7		7.84	10:56 AM	7.8
7.40	6.21	10:30 AM	10.6		6.94	11:20 AM	13.7		7.89	12:45 PM	12.1		8.35	10:52 AM	7.6
7.38	6.24	10:27 AM	10.6		6.98	11:15 AM	13.7		7.96	12:40 PM	11.5		8.02	10:49 AM	7.5
7.36	8.62	10:17 AM	10.7		6.78	11:15 AM	13.3		7.32	12:30 PM	10.1		7.43	11:03 AM	7.3
7.32	8.28	10:23 AM	10.6		8.31	11:35 AM	13.9		8.31	12:20 PM	10.0		10.06	11:08 AM	7.9
6.85	3.67	11:35 AM	10.5		4.43	11:50 AM	13.5		5.46	12:05 PM	9.2		5.50	11:28 AM	7.5
6.47															
5.76															
5.74	1.91	10:45 AM	10.4		3.18	12:10 PM	12.4		3.14	11:50 AM	8.8		4.47	12:00 PM	8.1
5.72	2.71	10:50 AM	10.6		3.33	12:00 PM	12.3		3.52	11:55 AM	8.8		5.21	12:03 PM	8.0
5.40															
5.12	2.31	11:05 AM	10.2		3.25	12:15 PM	13.1		6.04	11:35 AM	8.6		6.70	12:10 PM	7.5
5.10	3.44	11:10 AM	10.3		4.18	12:25 PM	13.2		5.58	11:40 AM	8.7		7.32	12:13 PM	8.1
5.09															
5.08															
3.47															
0.41															

Kirby Tributary

6.49,0.01	9.63	11:25 AM	10.2		9.25	11:45 AM	14.2		9.21	12:15 PM	9.5		10.30	11:20 AM	7.0
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Appendix Table 1. Continued.

River Mile	<u>October 22, 1999</u>				<u>October 27, 1999</u>				<u>November 5, 1999</u>				<u>November 9, 1999</u>		
	Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C		Dissolved Oxygen (mg/l)	Time	Water Temp. °C
9.13					8.9	10:18 AM	6.1								
7.65															
7.54															
7.48															
7.43	8.45	11:35 AM	10.0						11.75	02:33 PM	8.3		10.89	08:33 AM	7.3
7.40	9.18	11:32 AM	10.1						11.84	02:30 PM	8.3		11.14	08:29 AM	7.3
7.38	8.61	11:30 AM	10.1		8.71	10:34 AM	6.4		11.91	02:27 PM	8.3		11.40	08:25 AM	7.3
7.36	7.60	11:25 AM	9.7		8.01	10:31 AM	6.5		12.80	02:25 PM	8.4		10.74	08:40 AM	7.3
7.32	9.66	11:50 AM	10.4		10.36	10:40 AM	7.5		11.85	02:40 PM	8.3		10.80	08:44 AM	7.4
6.85					4.72	11:03 AM	6.6		11.31	01:05 PM	8.8		10.17	09:32 AM	7.8
6.47															
5.76															
5.74					7.73	11:33 AM	6.9		10.82	02:45 PM			10.14	08:55 AM	7.3
5.72					8.03	11:37 AM	7.3		11.22	02:50 PM	6.7		10.40	09:00 AM	7.4
5.40															
5.12					10.04		7.1		11.94	02:55 PM	8.5		10.18	09:08 AM	6.9
5.10					10.3		7.4		12.20	03:00 PM	8.4		10.53	09:12 AM	7.0
5.09															
5.08															
3.47															
0.41															
<u>Kirby Tributary</u>															
6.49,0.01					11.51	10:57 AM	6						11.10	09:20 AM	7.9

Appendix Table 1. Continued.

[illegible]

Kirby Tributary

[illegible]

Appendix Table 2. Results of inorganic chemical/ physical surface water sampling conducted by Ohio EPA in the Sycamore Creek study area during August, 1999.

River Mile	Sycamore Creek							
	9.13	9.13	9.13	7.34	6.47	6.47	6.47	5.74
Sample Number	24254	24259	24258	22080	22078	24261	24266	24263
Date Sampled	08/24/99	08/24/99	08/24/99	08/23/99	08/23/99	08/24/99	08/24/99	08/24/99
Time Sampled	11:45 AM	11:45 AM	11:45 AM	11:45 AM	02:15 PM	12:45 PM	12:45 PM	02:00 PM
Inorganic Analytes								
		Dupl.A	Dupl.B					
Alkalinity (mg/l)	NA	150	151	NA	NA	NA	203	NA
Aluminum (ug/l)	<200	<200	<200	NA	NA	405	383	<200
Ammonia-N (mg/l)	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (ug/l)	<5.0	2	2	9.0	8.6	5	5	<5.0
Barium (ug/l)	51	55	53	NA	NA	133	153	92
Beryllium (ug/l)	<5.0	NA	NA	<0.5	<0.5	<5.0	NA	<5.0
BOD ₅ (mg/l)	NA	3.9	2.8	32	60	NA	1,600	NA
COD (mg/l)	NA	21	18	1,450	7,770	1,610	NA	403
Cadmium (ug/l)	<5.0	NA	NA	<0.5	<0.5	<5.0	NA	<5.0
Calcium (mg/l)	53	57	57	NA	NA	74	82	67
Chromium (ug/l)	<30.0	<30.0	<30.0	<20	<20	<30.0	<30.0	<30.0
Cobalt (ug/l)	<50.0	NA	NA	NA	NA	88	NA	<50.0
Copper (ug/l)	<10.0	<10.0	<10.0	24	51	42	54	18
Cyanide, T (ug/l)	NA	<10.0	<10.0	NA	NA	2,440J	NA	1,480J
Dissolved Solids,T (mg/l)	NA	352	354	NA	NA	NA	820	NA
Hardness, T (mg/l)	206	229	229	NA	NA	271	299	250
Iron (ug/l)	249	443	431	NA	NA	835	1,270	409
Lead (ug/l)	<2.0	<2.0	<2.0	<2.0	7.4	6	6	<2.0
Magnesium (mg/l)	18	21	21	NA	NA	21	23	20
Manganese (ug/l)	151	161	162	NA	NA	2920	3,420	1,550
Nickel (ug/l)	<40.0	<40.0	<40.0	<20	27	<40.0	43	<40.0
Nitrate+nitrite (mg/l)	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease (mg/l)	NA	<2.0	<2.0	NA	NA	NA	17,000	NA
Potassium (mg/l)	5	5	6	NA	NA	8	9	7
Sodium (mg/l)	19	21	21	NA	NA	16	17	16
Strontium (ug/l)	383	444	449	NA	NA	1,440	1,570	1,620
Sulfate (mg/l)	NA	74	69	191	142	NA	124	NA
Sulfite (mg/l)	NA	NA	NA	1.9	5.4	NA	NA	NA
Suspended Solids,T (mg/l)	NA	9	9.5	NA	NA	NA	3,770	NA
TOC (mg/l)	NA	7.1	7.1	NA	NA	408	NA	127
Titanium (ug/l)	<50.0	NA	NA	NA	NA	<50.0	NA	<50.0
Vanadium (ug/l)	<50.0	NA	NA	NA	NA	<50.0	NA	<50.0
Zinc (ug/l)	<10.0	<10.0	<10.0	370	2,700	1,620J	3,050	264
Conductivity, Field (umhos/c)	500	500	500	NA	NA	NA	NA	600
Conductivity, Lab (umhos/c)	NA	562	563	NA	NA	NA	898 PQ	NA
D.O. (mg/l)	7.44	7.44	7.44	3.55	2	NA	NA	0.16
pH, Field (SU)	7.65	7.65	7.65	NA	NA	NA	NA	7.48
pH, Lab (SU)	NA	7.97	7.99	NA	NA	NA	7.36	NA
Water Temp. (°C)	21.6	21.6	21.6	NA	NA	NA	NA	20.3

Appendix Table 2. Continued.

River Mile	Sycamore Creek							
	5.74	5.72	5.72	5.10	5.10	5.10	5.10	5.10
Sample Number	24268	22079	24447	22076	24267	24262	24553	24555
Date Sampled	08/24/99	08/23/99	08/25/99	08/23/99	08/24/99	08/24/99	08/25/99	08/25/99
Time Sampled	02:00 PM	01:30 PM	09:45 AM	01:10 PM	01:20 PM	01:20 PM	10:30 AM	10:30 AM
Inorganic Analytes							Dupl.A	Dupl.B
Alkalinity (mg/l)	NA	NA	163	NA	251	NA	140	141
Aluminum (ug/l)	300	NA	274	NA	632	209	1,130	1,550
Ammonia-N (mg/l)	NA	NA	12.9	NA	NA	NA	1.37	1.39
Arsenic (ug/l)	3	6.6	<5.0	<3.0	3	<5.0	<5.0	<5.0
Barium (ug/l)	99	NA	93	NA	85	77	75	84
Beryllium (ug/l)	NA	<0.5	<5.0	<0.5	NA	<5.0	<5.0	<5.0
BOD ₅ (mg/l)	176	60	72	<4	5.5	NA	28	26
COD (mg/l)	NA	485	497	68	NA	87	93	81
Cadmium (ug/l)	NA	<0.5	<5.0	<0.5	NA	<5.0	<5.0	<5.0
Calcium (mg/l)	73	NA	64	NA	94	85	56	56
Chromium (ug/l)	<30.0	<20	<30.0	<20	<30.0	<30.0	<30.0	<30.0
Cobalt (ug/l)	NA	NA	<50.0	NA	NA	<50.0	<50.0	<50.0
Copper (ug/l)	19	19	21	12	<10.0	<10.0	<10.0	<10.0
Cyanide, T (ug/l)	NA	NA	233	NA	NA	13.1	188	112
Dissolved Solids,T (mg/l)	NA	NA	500	NA	474	NA	320	308
Hardness, T (mg/l)	273	NA	234	NA	354	315	210	214
Iron (ug/l)	681	NA	465	NA	1,350	435	1,430	1,490
Lead (ug/l)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Magnesium (mg/l)	22	NA	18	NA	29	25	17	18
Manganese (ug/l)	1720	NA	1,670	NA	496	439	977	1,000
Nickel (ug/l)	<40.0	20	<40.0	<20	<40.0	<40.0	<40.0	<40.0
Nitrate+nitrite (mg/l)	NA	NA	<0.10	NA	NA	NA	0.123	0.106
Oil and Grease (mg/l)	2.56	NA	3.72	NA	<2.0	NA	<2.0	NA
Potassium (mg/l)	8	NA	6	NA	5	4	5	5
Sodium (mg/l)	18	NA	14	NA	18	16	12	12
Strontium (ug/l)	1920	NA	1,540	NA	2,480	2,070	1,540	1,570
Sulfate (mg/l)	102	112	106	76	86	NA	66	66
Sulfite (mg/l)	NA	0.64	NA	0.64	NA	NA	NA	NA
Suspended Solids,T (mg/l)	12	NA	13	NA	20	NA	275	272
TOC (mg/l)	NA	NA	153	NA	NA	8.2	29	28
Titanium (ug/l)	NA	NA	<50.0	NA	NA	<50.0	<50.0	<50.0
Vanadium (ug/l)	NA	NA	<50.0	NA	NA	<50.0	<50.0	<50.0
Zinc (ug/l)	316	340	350	76	13	18	33	38
Conductivity, Field (umhos/c)	600	610	400	500	700	700	400	NA
Conductivity, Lab (umhos/c)	721	NA	644	NA	758	NA	463	463
D.O. (mg/l)	0.16	0.08	0.2	8.06	4.27	4.27	1.37	NA
pH, Field (SU)	7.48	7.24	7.32	7.71	7.31	7.31	7.33	NA
pH, Lab (SU)	7.53	NA	7.29	NA	7.8	NA	7.48	7.48
Water Temp. (°C)	20.3	19.8	19.5	19.8	21	21	19.3	NA

Appendix Table 2. Continued.

River Mile	Sycamore Creek				Sandusky River			
	0.41	0.41	0.41		57.72	57.34	57.34	57.34
Sample Number	22077	24265	24270		22644	22081	24269	24264
Date Sampled	08/23/99	08/24/99	08/24/99		08/28/99	08/23/99	08/24/99	08/24/99
Time Sampled	03:30 PM	03:00 PM	03:00 PM			04:00 PM	03:30 PM	03:30 PM
Inorganic Analytes								
Alkalinity (mg/l)	NA	NA	211		158	NA	179	NA
Aluminum (ug/l)	NA	239	1060		1000	NA	714	261
Ammonia-N (mg/l)	NA	NA	NA		0.09	NA	NA	NA
Arsenic (ug/l)	<3.0	<5.0	3		4.9	<3.0	2	<5.0
Barium (ug/l)	NA	56	65		66	NA	76	68
Beryllium (ug/l)	<0.5	<5.0	NA		<0.5	<0.5	NA	<5.0
BOD ₅ (mg/l)	<40.0	NA	<2.0		<4	<4	2.7	NA
COD (mg/l)	42	19	NA		25	378	NA	16
Cadmium (ug/l)	<0.5	<5.0	NA		<0.5	<0.5	NA	<5.0
Calcium (mg/l)	NA	87	97		100	NA	109	98
Chromium (ug/l)	<20	<30.0	<30.0		<20	<20	<30.0	<30.0
Cobalt (ug/l)	NA	<50.0	NA		10	NA	NA	<50.0
Copper (ug/l)	14	<10.0	<10.0		<10	15	<10.0	<10.0
Cyanide, T (ug/l)	NA	<10.0	NA		<5.0	NA	NA	<10.0
Dissolved Solids,T (mg/l)	NA	NA	624		687	NA	714	NA
Hardness, T (mg/l)	NA	332	378		392	NA	437	385
Iron (ug/l)	NA	548	1,990		1400	NA	1,120	384
Lead (ug/l)	<2.0	4	<2.0		4.3	<2.0	<2.0	3
Magnesium (mg/l)	NA	28	33		34	NA	40	34
Manganese (ug/l)	NA	103	149		86	NA	105	91
Nickel (ug/l)	<20	<40.0	<40.0		<20	<20	<40.0	<40.0
Nitrate+nitrite (mg/l)	NA	NA	NA		1.29	NA	NA	NA
Oil and Grease (mg/l)	NA	NA	<2.0		<5	NA	<2.0	NA
Potassium (mg/l)	NA	4	4		4.9	NA	6	5
Sodium (mg/l)	NA	38	42		31	NA	37	33
Strontium (ug/l)	NA	6,320	6,360		4100	NA	4,540	3,800
Sulfate (mg/l)	182	NA	140		340	280	213	NA
Sulfite (mg/l)	0.64	NA	NA		0.64	0.64	NA	NA
Suspended Solids,T (mg/l)	NA	NA	34		34	NA	25.5	NA
TOC (mg/l)	NA	4.9	NA		5.2	NA	NA	6.2
Titanium (ug/l)	NA	<50.0	NA		110	NA	NA	<50.0
Vanadium (ug/l)	NA	<50.0	NA		<20	NA	NA	<50.0
Zinc (ug/l)	87	10	12		15	26	14	<10.0
Conductivity, Field (umhos/c)	860	800	800		NA	890	900	NA
Conductivity, Lab (umhos/c)	NA	NA	912		1020	NA	985	NA
D.O. (mg/l)	8.4	7.94	7.94		NA	10.68	8.24	NA
pH, Field (SU)	7.92	7.9	7.9		NA	8.06	8.02	NA
pH, Lab (SU)	NA	NA	8.11		7.53	NA	8.19	NA
Water Temp. (°C)	19.8	19.5	19.5		NA	21.4	20.5	NA

Appendix Table 2. Continued.

River Mile	Sandusky River		
	57.34	57.34	54.34
Sample Number	22643	22645	24756
Date Sampled	08/27/99	08/27/99	08/31/99
Time Sampled	04:00 PM	04:00 PM	01:15 PM
Inorganic Analytes	Dupl.A	Dupl.B	
Alkalinity (mg/l)	177	175	165
Aluminum (ug/l)	610	510	434
Ammonia-N (mg/l)	0.30	0.29	0.087
Arsenic (ug/l)	3.0	<3.0	3
Barium (ug/l)	60	56	78
Beryllium (ug/l)	<0.5	<0.5	NA
BOD ₅ (mg/l)	4	<4	5.6
COD (mg/l)	42	36	17
Cadmium (ug/l)	<0.5	<0.5	<0.2
Calcium (mg/l)	89	84	114
Chromium (ug/l)	<20	<20	<30.0
Cobalt (ug/l)	<10	<10	NA
Copper (ug/l)	<10	<10	<10.0
Cyanide, T (ug/l)	25	<5.0	<10.0
Dissolved Solids,T (mg/l)	619	612	666
Hardness, T (mg/l)	353	333	445
Iron (ug/l)	820	780	554
Lead (ug/l)	<2.0	<2.0	<2.0
Magnesium (mg/l)	32	30	39
Manganese (ug/l)	141	134	170
Nickel (ug/l)	<20	<20	<40.0
Nitrate+nitrite (mg/l)	0.98	0.99	0.961
Oil and Grease (mg/l)	<5	<5	<2.0
Potassium (mg/l)	5.6	4.2	6
Sodium (mg/l)	34	31	34
Strontium (ug/l)	3200	3000	4,960
Sulfate (mg/l)	260	270	255
Sulfite (mg/l)	0.64	0.64	NA
Suspended Solids,T (mg/l)	26	22	16.5
TOC (mg/l)	8.3	8.3	7.4
Titanium (ug/l)	120	130	NA
Vanadium (ug/l)	<20	<20	NA
Zinc (ug/l)	17	17	<10.0
Conductivity, Field (umhos/c)	900	900	980
Conductivity, Lab (umhos/c)	941	940	1,110
D.O. (mg/l)	6.54	6.54	10.61
pH, Field (SU)	NA	NA	8.2
pH, Lab (SU)	7.61	7.53	8.13
Water Temp. (°C)	NA	NA	23

Appendix Table 3. Results of organic chemical surface water sampling conducted by Ohio EPA in the Sycamore Creek study area, August, 1999.

River Mile	Sycamore Creek							
	9.13	9.13	9.13	7.34	6.47	6.47	6.47	5.74
Sample Number	24276	24290	24284	13188	13186	24275	24289	24272
Date Sampled	08/24/99	08/24/99	08/24/99	08/23/99	08/23/99	08/24/99	08/24/99	08/24/99
Time Sampled	11:45 AM	11:45 AM	11:45 AM	11:45 AM	02:15 PM	12:45 PM	12:45 PM	02:00 PM
Volatile Organic Analytes (ug/l)	Dupl.A		Dupl.B					
Acetone	<5.00	NA	NA	NA	NA	1900	NA	728
Benzene	<0.500	<0.500	<0.500	27	87	44	36.8	54.2
Bromobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Bromochloromethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Bromodichloromethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Bromoform	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Bromomethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
2-Butanone	<1.00	NA	NA	NA	NA	306	NA	143
n-Butylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
sec-Butylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
tert-Butylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Carbon disulfide	<1.00	NA	NA	NA	NA	<50.0	NA	<1.00
Carbon tetrachloride	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Chlorobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Chloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Chloroform	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Chloromethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
2-Chlorotoluene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
4-Chlorotoluene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Dibromochloromethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2-Dibromo-3-chloropropane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2-Dibromoethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Dibromomethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2-Dichlorobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,3-Dichlorobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,4-Dichlorobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Dichlorodifluoromethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,1-Dichloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2-Dichloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,1-Dichloroethene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
cis-1,2-Dichloroethene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
trans-1,2-Dichloroethene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2-Dichloropropane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,3-Dichloropropane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
2,2-Dichloropropane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,1-Dichloropropene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
cis-1,3-Dichloropropene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
trans-1,3-Dichloropropene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Ethylbenzene	<0.500	<0.500	<0.500	12	13	<25.0	<10.0	4.85

Appendix Table 3. Continued.

River Mile	Sycamore Creek							
	9.13	9.13	9.13	7.34	6.47	6.47	6.47	5.74
Sample Number	24276	24290	24284	13188	13186	24275	24289	24272
Date Sampled	08/24/99	08/24/99	08/24/99	08/23/99	08/23/99	08/24/99	08/24/99	08/24/99
Time Sampled	11:45 AM	11:45 AM	11:45 AM	11:45 AM	02:15 PM	12:45 PM	12:45 PM	02:00 PM
Volatile Organic Analytes (ug/l)	Dupl.A		Dupl.B					
Hexachlorobutadiene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
2-Hexanone	<1.00	NA	NA	NA	NA	<50.0	NA	4.64
Isopropylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	0.54
4-Isopropyltoluene	<0.500	<0.500	<0.500	NA	NA	42.5	20.2	2.24
Methylene chloride	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
4-Methyl-2-pentanone	<1.00	NA	NA	NA	NA	474	NA	219
Naphthalene	<0.500	<0.500	<0.500	NA	NA	620	377	11.1
n-Propylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Styrene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	3.16
1,1,1,2-Tetrachloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,1,2,2-Tetrachloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Tetrachloroethene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Toluene	<0.500	<0.500	<0.500	36	48	<25.0	15	30.2
1,2,3-Trichlorobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2,4-Trichlorobenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,1,1-Trichloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,1,2-Trichloroethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Trichloroethene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Trichlorofluoromethane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2,3-Trichloropropane	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
1,2,4-Trimethylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	1.22
1,3,5-Trimethylbenzene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
Vinyl chloride	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	<0.500
o-Xylene	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	2.76
Total m&p-xylenes	<0.500	<0.500	<0.500	NA	NA	<25.0	<10.0	10.7
Total xylene	NA	NA	NA	27	40	NA	NA	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek							
	5.74	5.72	5.72	5.10	5.10	5.10	5.10	5.10
Sample Number	24286	13187	24455	13184	24288	24274	24450	24451
Date Sampled	08/24/99	08/23/99	08/25/99	08/23/99	08/24/99	08/24/99	08/25/99	08/25/99
Time Sampled	02:00 PM	01:30 PM	03:35 PM	01:10 PM	01:20 PM	01:20 PM	03:20 PM	03:20 PM
Volatile Organic Analytes (ug/l)							Dupl.A	Dupl.B
Acetone	NA	NA	1490	NA	NA	33.8	918	843
Benzene	50	99	50.8	3.7	<0.500	<0.500	21.2	24.8
Bromobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Bromochloromethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Bromodichloromethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Bromoform	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Bromomethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
2-Butanone	NA	NA	237	NA	NA	3.21	146	159
n-Butylbenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
sec-Butylbenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
tert-Butylbenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Carbon disulfide	NA	NA	<1.00	NA	NA	<1.00	<1.00	<1.00
Carbon tetrachloride	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Chlorobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Chloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Chloroform	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Chloromethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
2-Chlorotoluene	<0.500	NA	0.85	NA	<0.500	<0.500	<0.500	<0.500
4-Chlorotoluene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Dibromochloromethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2-Dibromo-3-chloropropane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2-Dibromoethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Dibromomethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2-Dichlorobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,3-Dichlorobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,4-Dichlorobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Dichlorodifluoromethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,1-Dichloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2-Dichloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,1-Dichloroethene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
cis-1,2-Dichloroethene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
trans-1,2-Dichloroethene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2-Dichloropropane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,3-Dichloropropane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
2,2-Dichloropropane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,1-Dichloropropene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
cis-1,3-Dichloropropene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
trans-1,3-Dichloropropene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Ethylbenzene	4.57	<10	2.95	<1.0	<0.500	<0.500	2.27	1.68

Appendix Table 3.

River Mile	Sycamore Creek							
	5.74	5.72	5.72	5.10	5.10	5.10	5.10	5.10
Sample Number	24286	13187	24455	13184	24288	24274	24450	24451
Date Sampled	08/24/99	08/23/99	08/25/99	08/23/99	08/24/99	08/24/99	08/25/99	08/25/99
Time Sampled	02:00 PM	01:30 PM	03:35 PM	01:10 PM	01:20 PM	01:20 PM	03:20 PM	03:20 PM
Volatile Organic Analytes (ug/l)							Dupl.A	Dupl.B
Hexachlorobutadiene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
2-Hexanone	NA	NA	2.23	NA	NA	<1.00	3.76	3.16
Isopropylbenzene	0.53	NA	1.2	NA	<0.500	<0.500	<0.500	<0.500
4-Isopropyltoluene	2.26	NA	8.65	NA	<0.500	<0.500	1.41	1.35
Methylene chloride	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
4-Methyl-2-pentanone	NA	NA	289	NA	NA	5.61	193	219
Naphthalene	12.1	NA	44	NA	<0.500	<0.500	12	13.2
n-Propylbenzene	<0.500	NA	0.96	NA	<0.500	<0.500	<0.500	<0.500
Styrene	3.09	NA	1.64	NA	<0.500	<0.500	1.5	1.09
1,1,1,2-Tetrachloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,1,2,2-Tetrachloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Tetrachloroethene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Toluene	27.2	57	14.2	2	<0.500	<0.500	14.1	10
1,2,3-Trichlorobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2,4-Trichlorobenzene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,1,1-Trichloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,1,2-Trichloroethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Trichloroethene	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
Trichlorofluoromethane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2,3-Trichloropropane	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
1,2,4-Trimethylbenzene	1.28	NA	2.72	NA	<0.500	<0.500	0.78	0.79
1,3,5-Trimethylbenzene	<0.500	NA	0.71	NA	<0.500	<0.500	<0.500	<0.500
Vinyl chloride	<0.500	NA	<0.500	NA	<0.500	<0.500	<0.500	<0.500
o-Xylene	2.66	NA	1.41	NA	<0.500	<0.500	1.28	0.92
Total m&p-xylenes	10.6	NA	5.29	NA	<0.500	<0.500	4.59	3.34
Total xylene	NA	23	NA	<2.0	NA	NA	NA	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek			Sandusky River				
	0.41	0.41	0.41	57.72	57.34	57.34	57.34	57.34
Sample Number	13185	24285	24271	13587	13189	24273	24287	13579
Date Sampled	08/23/99	08/24/99	08/24/99	08/28/99	08/23/99	08/24/99	08/24/99	08/27/99
Time Sampled	03:30 PM	03:00 PM	03:00 PM		04:00 PM	03:30 PM	03:30 PM	04:00 PM
Volatile Organic Analytes (ug/l)								Dupl.A
Acetone	NA	NA	<5.00	<5.0	NA	<5.00	NA	19
Benzene	<1.0	<0.500	<0.500	<1.0	<1.0	<0.500	<0.500	<1.0
Bromobenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Bromochloromethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Bromodichloromethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Bromoform	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Bromomethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
2-Butanone	NA	NA	<1.00	NA	NA	<1.00	NA	NA
n-Butylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
sec-Butylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
tert-Butylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Carbon disulfide	NA	NA	<1.00	<5.0	NA	<1.00	NA	<5.0
Carbon tetrachloride	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Chlorobenzene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Chloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Chloroform	NA	<0.500	<0.500	<0.5	NA	<0.500	<0.500	<0.5
Chloromethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
2-Chlorotoluene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
4-Chlorotoluene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Dibromochloromethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,2-Dibromo-3-chloropropane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,2-Dibromoethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Dibromomethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,2-Dichlorobenzene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,3-Dichlorobenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
1,4-Dichlorobenzene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Dichlorodifluoromethane	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
1,1-Dichloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,2-Dichloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,1-Dichloroethene	NA	<0.500	<0.500	<0.5	NA	<0.500	<0.500	<0.5
cis-1,2-Dichloroethene	NA	<0.500	<0.500	<0.5	NA	<0.500	<0.500	<0.5
trans-1,2-Dichloroethene	NA	<0.500	<0.500	<0.5	NA	<0.500	<0.500	<0.5
1,2-Dichloropropane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,3-Dichloropropane	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
2,2-Dichloropropane	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
1,1-Dichloropropene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
cis-1,3-Dichloropropene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
trans-1,3-Dichloropropene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Ethylbenzene	<1.0	<0.500	<0.500	<1.0	<1.0	<0.500	<0.500	<1.0

Appendix Table 3. Continued.

River Mile	Sycamore Creek			Sandusky River				
	0.41	0.41	0.41	57.72	57.34	57.34	57.34	57.34
Sample Number	13185	24285	24271	13587	13189	24273	24287	13579
Date Sampled	08/23/99	08/24/99	08/24/99	08/28/99	08/23/99	08/24/99	08/24/99	08/27/99
Time Sampled	03:30 PM	03:00 PM	03:00 PM		04:00 PM	03:30 PM	03:30 PM	04:00 PM
Volatile Organic Analytes (ug/l)								Dupl.A
Hexachlorobutadiene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
2-Hexanone	NA	<1.0	<1.00	<10	NA	<1.00	<0.500	<10
Isopropylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
4-Isopropyltoluene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Methylene chloride	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
4-Methyl-2-pentanone	NA	NA	<1.00	<20	NA	<1.00	<0.500	<20
Naphthalene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
n-Propylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Styrene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,1,1,2-Tetrachloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,1,2,2-Tetrachloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Tetrachloroethene	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Toluene	<1.0	<0.500	<0.500	<1.0	<1.0	<0.500	<0.500	<1.0
1,2,3-Trichlorobenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
1,2,4-Trichlorobenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
1,1,1-Trichloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,1,2-Trichloroethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
Trichloroethene	NA	<0.500	<0.500	<0.5	NA	<0.500	<0.500	<0.5
Trichlorofluoromethane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,2,3-Trichloropropane	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
1,2,4-Trimethylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
1,3,5-Trimethylbenzene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Vinyl chloride	NA	<0.500	<0.500	<1.0	NA	<0.500	<0.500	<1.0
o-Xylene	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Total m&p-xylenes	NA	<0.500	<0.500	NA	NA	<0.500	<0.500	NA
Total xylene	<2.0	NA	NA	<2.0	<2.0	NA	NA	<2.0

Appendix Table 3. Continued.

River Mile	Sandusky R.	
	57.34	54.34
Sample Number	13580	24757
Date Sampled	08/27/99	08/31/99
Time Sampled	04:00 PM	01:15 PM
Volatile Organic Analy. (ug/l)	Dupl.B	
Acetone	21	NA
Benzene	<1.0	<0.500
Bromobenzene	NA	<0.500
Bromochloromethane	<1.0	<0.500
Bromodichloromethane	<1.0	<0.500
Bromoform	<1.0	<0.500
Bromomethane	<1.0	<0.500
2-Butanone	NA	NA
n-Butylbenzene	NA	<0.500
sec-Butylbenzene	NA	<0.500
tert-Butylbenzene	NA	<0.500
Carbon disulfide	<5.0	NA
Carbon tetrachloride	<1.0	<0.500
Chlorobenzene	<1.0	<0.500
Chloroethane	<1.0	<0.500
Chloroform	<0.5	<0.500
Chloromethane	<1.0	<0.500
2-Chlorotoluene	NA	<0.500
4-Chlorotoluene	NA	<0.500
Dibromochloromethane	<1.0	<0.500
1,2-Dibromo-3-chloropropane	<1.0	<0.500
1,2-Dibromoethane	<1.0	<0.500
Dibromomethane	<1.0	<0.500
1,2-Dichlorobenzene	<1.0	<0.500
1,3-Dichlorobenzene	NA	<0.500
1,4-Dichlorobenzene	<1.0	<0.500
Dichlorodifluoromethane	NA	<0.500
1,1-Dichloroethane	<1.0	<0.500
1,2-Dichloroethane	<1.0	<0.500
1,1-Dichloroethene	<0.5	<0.500
cis-1,2-Dichloroethene	<0.5	<0.500
trans-1,2-Dichloroethene	<0.5	<0.500
1,2-Dichloropropane	<1.0	<0.500
1,3-Dichloropropane	NA	<0.500
2,2-Dichloropropane	NA	<0.500
1,1-Dichloropropene	NA	<0.500
cis-1,3-Dichloropropene	<1.0	<0.500
trans-1,3-Dichloropropene	<1.0	<0.500
Ethylbenzene	<1.0	<0.500

Appendix Table 3. Continued.

River Mile	Sandusky R.	
	57.34	54.34
Sample Number	13580	24757
Date Sampled	08/27/99	08/31/99
Time Sampled	04:00 PM	01:15 PM
Volatile Organic Analy. (ug/l)	Dupl.B	
Hexachlorobutadiene	NA	<0.500
2-Hexanone	<10	<0.500
Isopropylbenzene	NA	<0.500
4-Isopropyltoluene	NA	<0.500
Methylene chloride	<1.0	<0.500
4-Methyl-2-pentanone	<20	NA
Naphthalene	NA	<0.500
n-Propylbenzene	NA	<0.500
Styrene	<1.0	<0.500
1,1,1,2-Tetrachloroethane	<1.0	<0.500
1,1,2,2-Tetrachloroethane	<1.0	<0.500
Tetrachloroethene	<1.0	<0.500
Toluene	<1.0	<0.500
1,2,3-Trichlorobenzene	NA	<0.500
1,2,4-Trichlorobenzene	NA	<0.500
1,1,1-Trichloroethane	<1.0	<0.500
1,1,2-Trichloroethane	<1.0	<0.500
Trichloroethene	<0.5	<0.500
Trichlorofluoromethane	<1.0	<0.500
1,2,3-Trichloropropane	<1.0	<0.500
1,2,4-Trimethylbenzene	NA	<0.500
1,3,5-Trimethylbenzene	NA	<0.500
Vinyl chloride	<1.0	<0.500
o-Xylene	NA	<0.500
Total m&p-xylenes	NA	<0.500
Total xylene	<2.0	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek						
	9.13	9.13	9.13	9.13	7.34	6.47	6.47
Sample Number	24276	24290	24284	24291	13188	13186	24275
Date Sampled	08/24/99	08/24/99	08/24/99	08/24/99	08/23/99	08/23/99	08/24/99
Time Sampled	11:45 AM	11:45 AM	11:45 AM	11:45 AM	11:45 AM	02:15 PM	12:45 PM
Semi-Volatile Organic Analytes (ug/l)	Dupl.A		Dupl.B				
Acenaphthene	<2.0	<5.1	<5.1	<5.0	8.2	<2.0	4700
Acenaphthylene	<2.0	<5.1	<5.1	<5.0	20	1900	5200
Acetophenone	<2.0	NA	NA	NA	NA	NA	630
2-acetylaminofluorene	<2.0	NA	NA	NA	NA	NA	<200
4-aminobiphenyl	<2.0 R	NA	NA	NA	NA	NA	<200 R
Aniline	<2.0	NA	NA	NA	NA	NA	690
Anthracene	<2.0	<2.0	<2.0	<2.0	<2.0	810	3700
Benzo(a)anthracene	<2.0	<2.0	<2.0	<2.0	<3.0	<3.0	<200
Benzo(a)pyrene	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	1000
Benzo(b)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	820
Benzo(g,h,i)perylene	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	460
Benzo(k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	760
Benzyl alcohol	<2.0	NA	NA	NA	NA	NA	<200
bis(2-chloroethoxy)methane	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
bis(2-chloroethyl)ether	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
bis(2-chloroisopropyl)ether	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
bis(2-ethylhexyl)phthalate	<2.0	<10	<10	<10	NA	NA	380
4-bromophenyl-phenylether	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
Butylbenzylphthalate	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
4-chloro-3-methylphenol	<2.0	<10	<10	<10	NA	NA	<200
4-chloroaniline	<2.0 R	NA	NA	NA	NA	NA	<200 R
2-chloronaphthalene	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
2-chlorophenol	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
4-chlorophenol-phenylether	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Chrysene	<2.0	<2.0	<2.0	<2.0	<3.0	280	2300
Di-n-butylphthalate	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
Di-n-octylphthalate	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Dibenzo(a,h)anthracene	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<200
Dibenzofuran	<2.0	NA	NA	NA	NA	NA	<200
1,3-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
1,4-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
1,2-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
3,3'-dichlorobenzidine	<2.0	NA	NA	NA	NA	NA	<200
2,6-dichlorophenol	<2.0	NA	NA	NA	NA	NA	<200
2,4-dichlorophenol	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Diethylphthalate	<2.0	<2.0	<2.0	<2.0	NA	NA	490
p-dimethylaminoazobenzene	<2.0	NA	NA	NA	NA	NA	<200
7,12-dimethylbenz(a)anthracene	<2.0	NA	NA	NA	NA	NA	<200
3,3'-dimethylbenzidine	<2.0 R	NA	NA	NA	NA	NA	<200 R
2,4-dimethylphenol	<2.0	<2.0	<2.0	<2.0	NA	NA	740
Dimethylphthalate	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
4,6-Dinitro-2-methylphenol	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
1,3-dinitrobenzene	<2.0	NA	NA	NA	NA	NA	<200
2,4-dinitrophenol	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
2,6-dinitrotoluene	<2.0	NA	NA	NA	NA	NA	<200
2,4-dinitrotoluene	<2.0 UJ	<20	<20	<20	NA	NA	<200 UJ
Dinoseb	<2.0	NA	NA	NA	NA	NA	<200
Diphenylamine	<2.0	NA	NA	NA	NA	NA	<200

Appendix Table 3. Continued.

River Mile	Sycamore Creek						
	9.13	9.13	9.13	9.13	7.34	6.47	6.47
Sample Number	24276	24290	24284	24291	13188	13186	24275
Date Sampled	08/24/99	08/24/99	08/24/99	08/24/99	08/23/99	08/23/99	08/24/99
Time Sampled	11:45 AM	11:45 AM	11:45 AM	11:45 AM	11:45 AM	02:15 PM	12:45 PM
Semi-Volatile Organic Analytes (ug/l)	Dupl.A		Dupl.B				
Ethyl methanesulfonate	<2.0	NA	NA	NA	NA	NA	<200
Fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	270	3700
Fluorene	<2.0	<2.0	<2.0	<2.0	<3.0	<3.0	6600
Hexachlorobenzene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Hexachlorobutadiene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Hexachlorocyclopentadiene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Hexachloroethane	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
Hexachloropropene	<2.0	NA	NA	NA	NA	NA	<200
Ideno(1,2,3-cd)pyrene	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	320
Isophorone	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Methyl methanesulfonate	<2.0	NA	NA	NA	NA	NA	<200
3-methylcholanthrene	<2.0	NA	NA	NA	NA	NA	<200
2-methylnaphthalene	<2.0	NA	NA	NA	NA	NA	14000
3&4-methylphenol	<2.0	NA	NA	NA	NA	NA	1000
2-methylphenol	<2.0	NA	NA	NA	NA	NA	1900
N-nitroso-di-n-butylamine	<2.0	NA	NA	NA	NA	NA	<200
N-nitroso-di-n-propylamine	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
N-nitrodiphenylamine	NA	<5.1	<5.1	<5.0	NA	NA	NA
N-nitrosomorpholine	<2.0	NA	NA	NA	NA	NA	<200
N-nitrosopiperidine	<2.0	NA	NA	NA	NA	NA	<200
N-nitrosopyrrolidine	<2.0	NA	NA	NA	NA	NA	<200
Naphthalene	<2.0	<2.0	<2.0	<2.0	76	9100	10000
1,4-naphthoquinone	<2.0	NA	NA	NA	NA	NA	<200
1-naphthylamine	<2.0 R	NA	NA	NA	NA	NA	<200 R
2-naphthylamine	<2.0 R	NA	NA	NA	NA	NA	<200 R
5-nitro-o-toluidine	<2.0 R	NA	NA	NA	NA	NA	<200 R
2-nitroaniline	<2.0	NA	NA	NA	NA	NA	<200
3-nitroaniline	<2.0 R	NA	NA	NA	NA	NA	<200 R
4-nitroaniline	<2.0	NA	NA	NA	NA	NA	<200 R
Nitrobenzene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
4-nitrophenol	<2.0	<20	<20	<20	NA	NA	<200
2-nitrophenol	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
Pentachlorobenzene	<2.0	NA	NA	NA	NA	NA	<200
Pentachlorophenol	<2.0	<10	<10	<10	NA	NA	<200
Phenacetin	<2.0	NA	NA	NA	NA	NA	<200
Phenanthrene	<2.0	<2.0	<2.0	<2.0	82	2600	11000
Phenol	<2.0	<2.0	<2.0	<2.0	NA	NA	3100
2-picoline	<2.0	NA	NA	NA	NA	NA	240
Pronamide	<2.0	NA	NA	NA	NA	NA	<200
Pyrene	<2.0	<2.0	<2.0	<2.0	<3.0	1100	6200
Safrole	<2.0	NA	NA	NA	NA	NA	<200
1,2,4,5-tetrachlorobenzene	<2.0	NA	NA	NA	NA	NA	<200
2,3,4,6-tetrachlorophenol	<2.0	NA	NA	NA	NA	NA	<200
o-toluidine	<2.0	NA	NA	NA	NA	NA	<200
1,2,4-trichlorobenzene	<2.0	<2.0	<2.0	<2.0	NA	NA	<200
2,4,6-trichlorophenol	<2.0	<5.1	<5.1	<5.0	NA	NA	<200
2,4,5-trichlorophenol	<2.0	NA	NA	NA	NA	NA	<200

Appendix Table 3. Continued.

River Mile	Sycamore Creek						
	6.47	5.74	5.74	5.72	5.72	5.1	5.1
Sample Number	24289	24272	24286	13187	24452	13184	24288
Date Sampled	08/24/99	08/24/99	08/24/99	08/23/99	08/25/99	08/23/99	08/24/99
Time Sampled	12:45 PM	02:00 PM	02:00 PM	01:30 PM	09:45 AM	01:30 PM	01:30 PM
Semi-Volatile Organic Analytes (ug/l)							
Acenaphthene	3900 UJ	<2.0	<5.0	5.3	2.3	<2.0	<5.0
Acenaphthylene	4700 UJ	<2.0	<5.0	32	<2.0	<2.0	<5.0
Acetophenone	NA	94	NA	NA	120	NA	NA
2-acetylaminofluorene	NA	<2.0	NA	NA	<2.0	NA	NA
4-aminobiphenyl	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
Aniline	NA	870	NA	NA	1500	NA	NA
Anthracene	2900 UJ	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzo(a)anthracene	2300 UJ	<2.0	<2.0	<3.0	<2.0	<3.0	<2.0
Benzo(a)pyrene	1100 UJ	<2.0	<2.0	<4.0	<2.0	<4.0	<2.0
Benzo(b)fluoranthene	820 UJ	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzo(g,h,i)perylene	700 UJ	<2.0	<2.0	<5.0	<2.0	<5.0	<2.0
Benzo(k)fluoranthene	720 UJ	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzyl alcohol	NA	<2.0	NA	NA	<2.0	NA	NA
bis(2-chloroethoxy)methane	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
bis(2-chloroethyl)ether	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
bis(2-chloroisopropyl)ether	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
bis(2-ethylhexyl)phthalate	<2500 UJ	<2.0	<10	NA	<2.0	NA	<10
4-bromophenyl-phenylether	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
Butylbenzylphthalate	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
4-chloro-3-methylphenol	<2500	<2.0	<10 UJ	NA	<2.0	NA	<10
4-chloroaniline	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
2-chloronaphthalene	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
2-chlorophenol	<500	<2.0	<2.0 UJ	NA	<2.0	NA	<2.0
4-chlorophenol-phenylether	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
Chrysene	2100 UJ	<2.0	<2.0	<3.0	<2.0	<3.0	<2.0
Di-n-butylphthalate	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
Di-n-octylphthalate	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
Dibenzo(a,h)anthracene	<500 UJ	<2.0	<2.0	<5.0	<2.0	<5.0	<2.0
Dibenzofuran	NA	<2.0	NA	NA	<2.0	NA	NA
1,3-dichlorobenzene	<500 UJ	<2.0	<2.0	NA	<2.0 R	NA	<2.0
1,4-dichlorobenzene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
1,2-dichlorobenzene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
3,3'-dichlorobenzidine	NA	<2.0	NA	NA	<2.0	NA	NA
2,6-dichlorophenol	NA	<2.0	NA	NA	<2.0	NA	NA
2,4-dichlorophenol	<500	<2.0	<2.0 UJ	NA	<2.0	NA	<2.0
Diethylphthalate	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
p-dimethylaminoazobenzene	NA	<2.0	NA	NA	<2.0	NA	NA
7,12-dimethylbenz(a)anthracene	NA	<2.0	NA	NA	<2.0	NA	NA
3,3'-dimethylbenzidine	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
2,4-dimethylphenol	<2500	<2.0	<10 UJ	NA	<2.0	NA	<10
Dimethylphthalate	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
4,6-Dinitro-2-methylphenol	<1200	<2.0	<5.0 UJ	NA	<2.0	NA	<5.0
1,3-dinitrobenzene	NA	<2.0	NA	NA	<2.0	NA	NA
2,4-dinitrophenol	<5000	<2.0	<20 UJ	NA	<2.0	NA	<200
2,6-dinitrotoluene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
2,4-dinitrotoluene	<500 UJ	<2.0 UJ	<2.0	NA	<2.0	NA	<2.0
Dinoseb	NA	<2.0	NA	NA	<2.0	NA	NA
Diphenylamine	NA	<2.0	NA	NA	<2.0	NA	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek						
	6.47	5.74	5.74	5.72	5.72	5.1	5.1
Sample Number	24289	24272	24286	13187	24452	13184	24288
Date Sampled	08/24/99	08/24/99	08/24/99	08/23/99	08/25/99	08/23/99	08/24/99
Time Sampled	12:45 PM	02:00 PM	02:00 PM	01:30 PM	09:45 AM	01:30 PM	01:30 PM
Semi-Volatile Organic Analytes (ug/l)							
Ethyl methanesulfonate	NA	<2.0	NA	NA	<2.0	NA	NA
Fluoranthene	3900 UJ	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Fluorene	7600 UJ	<2.0	<2.0	<3.0	2.8	<3.0	<2.0
Hexachlorobenzene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
Hexachlorobutadiene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
Hexachlorocyclopentadiene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
Hexachloroethane	<1200 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
Hexachloropropene	NA	<2.0	NA	NA	<2.0	NA	NA
Ideno(1,2,3-cd)pyrene	<500 UJ	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0
Isophorone	<500 UJ	<2.0	<5.0	NA	<2.0	NA	<5.0
Methyl methanesulfonate	NA	<2.0	NA	NA	<2.0	NA	NA
3-methylcholanthrene	NA	<2.0	NA	NA	<2.0	NA	NA
2-methylnaphthalene	NA	<2.0	NA	NA	7.5	NA	NA
3&4-methylphenol	NA	120	NA	NA	<2.0	NA	NA
2-methylphenol	NA	400	NA	NA	610	NA	NA
N-nitroso-di-n-butylamine	NA	<2.0	NA	NA	<2.0	NA	NA
N-nitroso-di-n-propylamine	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
N-nitrodiphenylamine	<1200 UJ	NA	<5.0	NA		NA	NA
N-nitrosomorpholine	NA	<2.0	NA	NA	<2.0	NA	NA
N-nitrosopiperidine	NA	<2.0	NA	NA	<2.0	NA	NA
N-nitrosopyrrolidine	NA	<2.0	NA	NA	<2.0	NA	NA
Naphthalene	6800 UJ	6.2	7.1	21	13	<2.0	<2.0
1,4-naphthoquinone	NA	<2.0	NA	NA	<2.0	NA	NA
1-naphthylamine	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
2-naphthylamine	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
5-nitro-o-toluidine	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
2-nitroaniline	NA	<2.0	NA	NA	<2.0	NA	NA
3-nitroaniline	NA	<2.0 R	NA	NA	<2.0 R	NA	NA
4-nitroaniline	NA	<2.0	NA	NA	<2.0 R	NA	NA
Nitrobenzene	<500 UJ	<2.0	<2.0	NA	<2.0	NA	<2.0
4-nitrophenol	<5000	<2.0	<20 UJ	NA	<2.0	NA	<20
2-nitrophenol	<500	<2.0	<2.0 UJ	NA	<2.0	NA	<2.0
Pentachlorobenzene	NA	<2.0	NA	NA	<2.0	NA	NA
Pentachlorophenol	<2500	<2.0	<10 UJ	NA	<2.0	NA	<10
Phenacetin	NA	<2.0	NA	NA	<2.0	NA	NA
Phenanthrene	11000 UJ	<2.0	<2.0	34	3.1	<2.0	<2.0
Phenol	5200	920	1000	NA	1300	NA	<2.0
2-picoline	NA	110	NA	NA	130	NA	NA
Pronamide	NA	<2.0	NA	NA	<2.0	NA	NA
Pyrene	6300	<2.0	<2.0	<3.0	<2.0	<3.0	<2.0
Safrole	NA	<2.0	NA	NA	<2.0	NA	NA
1,2,4,5-tetrachlorobenzene	NA	<2.0	NA	NA	<2.0	NA	NA
2,3,4,6-tetrachlorophenol	NA	<2.0	NA	NA	<2.0	NA	NA
o-toluidine	NA	<2.0	NA	NA	<2.0	NA	NA
1,2,4-trichlorobenzene	<500	<2.0	<2.0	NA	<2.0	NA	<2.0
2,4,6-trichlorophenol	<1200	<2.0	<5.0 UJ	NA	<2.0	NA	<5.0
2,4,5-trichlorophenol	NA	<2.0	NA	NA	<2.0	NA	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek						
	6.47	5.74	5.74	5.72	5.72	5.1	5.1
Sample Number	24289	24272	24286	13187	24452	13184	24288
Date Sampled	08/24/99	08/24/99	08/24/99	08/23/99	08/25/99	08/23/99	08/24/99
Time Sampled	12:45 PM	02:00 PM	02:00 PM	01:30 PM	09:45 AM	01:30 PM	01:30 PM
Semi-Volatile Organic Analytes (ug/l) TICS							
Benzoic acid	NA	6000 NJ	NA	NA	2000 NJ	NA	NA
Benzonitrile	NA	0 NJ	200 NJ	NA	80 NJ	NA	NA
Benzothiazole	NA	300 NJ	200 NJ	NA	100 NJ	NA	20 NJ
Caprolactum	10000 NJ	0 NJ	NA	NA	NA	NA	100 NJ
1-methyl-naphthalene	10000 NJ	NA	NA	NA	NA	NA	NA
2-ethyl-naphthalene	10000 NJ	NA	NA	NA	NA	NA	NA
2,6-dimethyl-naphthalene	10000 NJ	NA	NA	NA	NA	NA	NA
1,4,6-trimethylnaphthalene	30000 NJ	NA	NA	NA	NA	NA	NA
2-methyl-naphthalene	20000 NJ	NA	NA	NA	NA	NA	NA
2,3,6-trimethyl-naphthalene	10000 NJ	NA	NA	NA	NA	NA	NA
Hexadecanenitrile	10000 NJ	NA	NA	NA	NA	NA	10 NJ
1-bromo-3-methyl-cyclohexan	20000 NJ	NA	NA	NA	NA	NA	NA
2,4,5,7-tetramethyl-phenanthr	20000 NJ	NA	NA	NA	NA	NA	NA
Cyclopentanone	NA	2000 NJ	800 NJ	NA	600 NJ	NA	100 NJ
Cyclohexanone	NA	200 NJ	100 NJ	NA	90 NJ	NA	NA
2-methyl-2-cyclopenten-1-one	NA	100 NJ	NA	NA	NA	NA	10 NJ
Isocyanobenzene	NA	200 NJ	NA	NA	NA	NA	NA
2-ethyl-hexanoic acid	NA	300 NJ	NA	NA	80 NJ	NA	NA
4-morpholineacetonitrile	NA	100 NJ	NA	NA	NA	NA	7 NJ
3-methylbenzoic acid	NA	3000 NJ	NA	NA	1000 NJ	NA	NA
Ethylbenzoic acid	NA	200 NJ	200 NJ	NA	NA	NA	NA
2-methylphenol	NA	NA	70 NJ	NA	NA	NA	NA
4-methylphenol	NA	NA	100 NJ	NA	NA	NA	NA
2-ethyl-heptonic acid	NA	NA	200 NJ	NA	NA	NA	NA
4-methylbenzoic acid	NA	NA	600 NJ	NA	NA	NA	NA
2,4-dimethylquinoline	NA	NA	100 NJ	NA	80 NJ	NA	NA
1,2-benzenedicarbonitrile	NA	NA	NA	NA	30 NJ	NA	NA
2(3H)-benzothiazole	NA	NA	NA	NA	200 NJ	NA	NA
2-methyl-(2-picolene)pyridine	NA	NA	NA	NA	0.4 NJ	NA	NA
1,3-butadiene	NA	NA	NA	NA	NA	NA	10 NJ
Acetophenone	NA	NA	NA	NA	NA	NA	4 NJ
N-phenyl-Acetamide	NA	NA	NA	NA	NA	NA	6 NJ

Appendix Table 3. Continued.

River Mile	Sycamore Creek					
	5.1	5.1	5.1	0.41	0.41	0.41
Sample Number	24274	24453	24454	24285	24271	13185
Date Sampled	08/24/99	08/25/99	08/28/99	08/24/99	08/24/99	08/23/99
Time Sampled	01:20 PM	10:30 AM	10:30 AM	03:00 PM	03:00 PM	03:30 PM
Semi-Volatile Organic Analytes (ug/l)	Dupl.A		Dupl.B			
Acenaphthene	<2.0	<2.0	<2.0	<5.1	<2.1	<2.0
Acenaphthylene	<2.0	<2.0	<2.0	<5.1	<2.1	<2.0
Acetophenone	3.6	19	19	NA	<2.1	NA
2-acetylaminofluorene	<2.0	<2.0	<2.0	NA	<2.1	NA
4-aminobiphenyl	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
Aniline	13	130	150	NA	<2.1	NA
Anthracene	<2.0	<2.0	<2.0	<2.0	<2.1	<2.0
Benzo(a)anthracene	<2.0	<2.0	<2.0	<2.0	<2.1	<3.0
Benzo(a)pyrene	<2.0	<2.0	<2.0	<2.0	<2.1	<4.0
Benzo(b)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.1	<2.0
Benzo(g,h,i)perylene	<2.0	<2.0	<2.0	<2.0	<2.1	<5.0
Benzo(k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Benzyl alcohol	<2.0	<2.0	<2.0	NA	<2.1	NA
bis(2-chloroethoxy)methane	<2.0	<2.0	<2.0	<5.1	<2.1	NA
bis(2-chloroethyl)ether	<2.0	<2.0	<2.0	<2.0	<2.1	NA
bis(2-chloroisopropyl)ether	<2.0	<2.0	<2.0	<2.0	<2.1	NA
bis(2-ethylhexyl)phthalate	<2.0	<2.0	<2.0	<10	<2.1	NA
4-bromophenyl-phenylether	<2.0	<2.0	<2.0	<5.1	<2.1	NA
Butylbenzylphthalate	<2.0	<2.0	<2.0	<2.0	<2.1	NA
4-chloro-3-methylphenol	<2.0	<2.0	<2.0	<10	<2.1	NA
4-chloroaniline	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
2-chloronaphthalene	<2.0	<2.0	<2.0	<5.1	<2.1	NA
2-chlorophenol	<2.0	<2.0	<2.0	<2.0	<2.1	NA
4-chlorophenol-phenylether	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Chrysene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Di-n-butylphthalate	<2.0	<2.0	<2.0	<5.1	<2.1	NA
Di-n-octylphthalate	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Dibenzo(a,h)anthracene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Dibenzofuran	<2.0	<2.0	<2.0	NA	<2.1	NA
1,3-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
1,4-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
1,2-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
3,3'-dichlorobenzidine	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
2,6-dichlorophenol	<2.0	<2.0	<2.0	NA	<2.1	NA
2,4-dichlorophenol	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Diethylphthlate	<2.0	<2.0	<2.0	<5.1	<2.1	NA
p-dimethylaminoazobenzene	<2.0	<2.0	<2.0	NA	<2.1	NA
7,12-dimethylbenz(a)anthracene	<2.0	<2.0	<2.0	NA	<2.1	NA
3,3'-dimethylbenzidine	<2.0 R	<2.0 R	<2.0 R	NA	<2.1	NA
2,4-dimethylphenol	<2.0	2.7	2.7	<10	<2.1	NA
Dimethylphthalate	<2.0	<2.0	<2.0	<5.1	<2.1	NA
4,6-Dinitro-2-methylphenol	<2.0	<2.0	<2.0	<5.1	<2.1	NA
1,3-dinitrobenzene	<2.0	<2.0	<2.0	NA	<2.1	NA
2,4-dinitrophenol	<2.0	<2.0	<2.0	<20	<2.1	NA
2,6-dinitrotoluene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
2,4-dinitrotoluene	<2.0 UJ	<2.0	<2.0	<2.0	<2.1 UJ	NA
Dinoseb	<2.0	<2.0	<2.0	NA	<2.1	NA
Diphenylamine	<2.0	<2.0	<2.0	NA	<2.1	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek					
	5.1	5.1	5.1	0.41	0.41	0.41
Sample Number	24274	24453	24454	24285	24271	13185
Date Sampled	08/24/99	08/25/99	08/28/99	08/24/99	08/24/99	08/23/99
Time Sampled	01:20 PM	10:30 AM	10:30 AM	03:00 PM	03:00 PM	03:30 PM
Semi-Volatile Organic Analytes (ug/l)	Dupl.A		Dupl.B			
Ethyl methanesulfonate	<2.0	<2.0	<2.0	NA	<2.1	NA
Fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.1	<2.0
Fluorene	<2.0	<2.0	<2.0	<2.0	<2.1	<3.0
Hexachlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Hexachlorobutadiene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Hexachlorocyclopentadiene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Hexachloroethane	<2.0	<2.0	<2.0	<5.1	<2.1	NA
Hexachloropropene	<2.0	<2.0	<2.0	NA	<2.1	NA
Ideno(1,2,3-cd)pyrene	<2.0	<2.0	<2.0	<2.0	<2.1	<5.0
Isophorone	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Methyl methanesulfonate	<2.0	<2.0	<2.0	NA	<2.1	NA
3-methylcholanthrene	<2.0	<2.0	<2.0	NA	<2.1	NA
2-methylnaphthalene	<2.0	<2.0	<2.0	NA	<2.1	NA
3&4-methylphenol	<2.0	<2.0	<2.0	NA	<2.1	NA
2-methylphenol	<2.0	46	46	NA	<2.1	NA
N-nitroso-di-n-butylamine	<2.0	<2.0	<2.0	NA	<2.1	NA
N-nitroso-di-n-propylamine	<2.0	<2.0	<2.0	<2.0	<2.1	NA
N-nitrodiphenylamine	NA	NA	NA	<5.1	NA	NA
N-nitrosomorpholine	<2.0	<2.0	<2.0	NA	<2.1	NA
N-nitrosopiperidine	<2.0	<2.0	<2.0	NA	<2.1	NA
N-nitrosopyrrolidine	<2.0	<2.0	<2.0	NA	<2.1	NA
Naphthalene	<2.0	<2.0	<2.0	<2.0	<2.1	<2.0
1,4-naphthoquinone	<2.0	<2.0	<2.0	NA	<2.1	NA
1-naphthylamine	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
2-naphthylamine	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
5-nitro-o-toluidine	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
2-nitroaniline	<2.0	<2.0	<2.0	NA	<2.1	NA
3-nitroaniline	<2.0 R	<2.0 R	<2.0 R	NA	<2.1 R	NA
4-nitroaniline	<2.0 R	<2.0 R	<2.0 R	NA	<2.1	NA
Nitrobenzene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
4-nitrophenol	<2.0	<2.0	<2.0	<20	<2.1	NA
2-nitrophenol	<2.0	<2.0	<2.0	<2.0	<2.1	NA
Pentachlorobenzene	<2.0	<2.0	<2.0	NA	<2.1	NA
Pentachlorophenol	<2.0	<2.0	<2.0	<10	<2.1	NA
Phenacetin	<2.0	<2.0	<2.0	NA	<2.1	NA
Phenanthrene	<2.0	<2.0	<2.0	<2.0	<2.1	<2.0
Phenol	<2.0	<2.0	<2.0	<2.0	<2.1	NA
2-picoline	4.7	24	24	NA	<2.1	NA
Pronamide	<2.0	<2.0	<2.0	NA	<2.1	NA
Pyrene	<2.0	<2.0	<2.0	<2.0	<2.1	<3.0
Safrole	<2.0	<2.0	<2.0	NA	<2.1	NA
1,2,4,5-tetrachlorobenzene	<2.0	<2.0	<2.0	NA	<2.1	NA
2,3,4,6-tetrachlorophenol	<2.0	<2.0	<2.0	NA	<2.1	NA
o-toluidine	<2.0	<2.0	<2.0	NA	<2.1	NA
1,2,4-trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.1	NA
2,4,6-trichlorophenol	<2.0	<2.0	<2.0	<5.1	<2.1	NA
2,4,5-trichlorophenol	<2.0	<2.0	<2.0	NA	<2.1	NA

Appendix Table 3. Continued.

River Mile	Sycamore Creek					
	6.47	5.1	5.1	0.41	0.41	0.41
Sample Number	24289	24453	24454	24285	24271	13185
Date Sampled	08/24/99	08/25/99	08/28/99	08/24/99	08/24/99	08/23/99
Time Sampled	12:45 PM	10:30 AM	10:30 AM	03:00 PM	03:00 PM	03:30 PM
Semi-Vol. Organic Analy. (ug/l) TICS	Dupl.A		Dupl.B			
Benzoic acid	0 NJ	0 NJ	0 NJ	NA	1 NJ	NA
Benzothiazole	20 NJ	50 NJ	60 NJ	NA	0 NJ	NA
Caprolactum	100 NJ	300 NJ	300 NJ	NA	0 NJ	NA
Hexadecanenitrile	7 NJ	20 NJ	20 NJ	NA	NA	NA
Cyclopentanone	100 NJ	300 NJ	300 NJ	NA	NA	NA
2-methyl-2-cyclopenten-1-one	10 NJ	40 NJ	40 NJ	NA	NA	NA
3-methyl-2-cyclopenten-1-one	NA	30 NJ	30 NJ	NA	NA	NA
3-methylbenzoic acid	50 NJ	NA	NA	NA	NA	NA
2,4-dimethylquinoline	3 NJ	NA	NA	NA	NA	NA
2(3H)-benzothiazole	6 NJ	30 NJ	20 NJ	NA	NA	NA
2,3-dihydro-1H-iden-1-one	4 NJ	NA	NA	NA	NA	NA
4-cyano-benzoic acid	3 NJ	NA	NA	NA	NA	NA
Cyclohexanol	20 NJ	20 NJ	NA	NA	NA	NA
2-(2-butoxyethoxy)-ethanol	NA	20 NJ	20 NJ	NA	NA	NA
4-butoxy-butanoic acid	NA	1000 NJ	1000 NJ	NA	NA	NA
2,3-dimethylcyclopent-2-en-1-	NA	NA	20 NJ	NA	NA	NA
3-(1-methyl-2-pyrrolidinyl)-py	NA	NA	NA	2 NJ	NA	NA
Diethyltoluamide	NA	NA	NA	5 NJ	NA	NA

Appendix Table 3. Continued.

River Mile	Sandusky River						
	54.34	57.34	57.34	57.34	57.34	57.34	57.72
Sample Number	24757	22643	13580	24273	24287	13189	13587
Date Sampled	08/31/99	08/27/99	08/27/99	08/24/99	08/24/99	08/23/99	08/28/99
Time Sampled	01:15 PM	04:00 PM	04:00 PM	03:30 PM	03:30 PM	04:00 PM	
Semi-Volatile Organic Analytes (ug/l)	Dupl.A	Dupl.B					
Acenaphthene	<5.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0
Acenaphthylene	<5.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0
Acetophenone	NA	NA	NA	<2.0	NA	NA	NA
2-acetylaminofluorene	NA	NA	NA	<2.0	NA	NA	NA
4-aminobiphenyl	NA	NA	NA	<2.0 R	NA	NA	NA
Aniline	NA	<4.0	<4.0	<2.0	NA	NA	<4.0
Anthracene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benidine	NA	<15	<15	NA	NA	NA	<15
Benzo(a)anthracene	<2.0	<3.0	<3.0	<2.0	<2.0	<3.0	<3.0
Benzo(a)pyrene	<2.0	<4.0	<4.0	<2.0	<2.0	<4.0	<4.0
Benzo(b)fluoranthene	<2.0	<4.0	<4.0	<2.0	<2.0	<2.0	<4.0
Benzo(g,h,i)perylene	<2.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0
Benzo(k)fluoranthene	<2.0	<4.0	<4.0	<2.0	<2.0	<2.0	<4.0
Benzoic acid	NA	<10	<10	NA	NA	NA	<10
Benzyl alcohol	NA	<5.0	<5.0	<2.0	NA	NA	<5.0
bis(2-chloroethoxy)methane	<5.0	<2.0	<2.0	<2.0	<5.0	NA	<2.0
bis(2-chloroethyl)ether	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
bis(2-chloroisopropyl)ether	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
bis(2-ethylhexyl)phthalate	<10	<2.0	<2.0	<2.0	<10	NA	<2.0
4-bromophenyl-phenylether	<5.0	<3.0	<3.0	<2.0	<5.0	NA	<3.0
Butylbenzylphthalate	<2.0	<5.0	<5.0	<2.0	<2.0	NA	<5.0
4-chloro-3-methylphenol	<10	<5.0	<5.0	<2.0	<10	NA	<5.0
4-chloroaniline	NA	<3.0	<3.0	<2.0 R	NA	NA	<3.0
2-chloronaphthalene	<5.0	<1.0	<1.0	<2.0	<5.0	NA	<1.0
2-chlorophenol	<2.0	<5.0	<5.0	<2.0	<2.0	NA	<5.0
4-chlorophenol-phenylether	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
Chrysene	<2.0	<3.0	<3.0	<2.0	<2.0	<3.0	<3.0
Di-n-butylphthalate	<5.0	<1.0	<1.0	<2.0	<5.0	NA	<1.0
Di-n-octylphthalate	<2.0	<1.0	<1.0	<2.0	<2.0	NA	<1.0
Dibenzo(a,h)anthracene	<2.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0
Dibenzofuran	NA	<2.0	<2.0	<2.0	NA	NA	<2.0
1,3-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
1,4-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
1,2-dichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
3,3'-dichlorobenzidine	NA	<15	<15	<2.0 R	NA	NA	<15
2,6-dichlorophenol	NA	NA	NA	<2.0	NA	NA	NA
2,4-dichlorophenol	<2.0	<3.0	<3.0	<2.0	<2.0	NA	<3.0
Diethylphthalate	<5.0	<1.0	<1.0	<2.0	<5.0	NA	<1.0
p-dimethylaminoazobenzene	NA	NA	NA	<2.0	NA	NA	NA
7,12-dimethylbenz(a)anthracene	NA	NA	NA	<2.0	NA	NA	NA
3,3'-dimethylbenzidine	NA	NA	NA	<2.0 R	NA	NA	NA
2,4-dimethylphenol	<10	<3.0	<3.0	<2.0	<10	NA	<3.0
Dimethylphthalate	<5.0	<1.0	<1.0	<2.0	<5.0	NA	<1.0
4,6-Dinitro-2-methylphenol	<5.0	NA	NA	<2.0	<5.0	NA	NA
1,3-dinitrobenzene	NA	NA	NA	<2.0	NA	NA	NA
2,4-dinitrophenol	<20	NA	NA	<2.0	<20	NA	NA
2,6-dinitrotoluene	<2.0	NA	NA	<2.0	<2.0	NA	NA
2,4-dinitrotoluene	<2.0	NA	NA	<2.0 UJ	<2.0	NA	NA
Dinoseb	NA	NA	NA	<2.0	NA	NA	NA
Diphenylamine	NA	NA	NA	<2.0	NA	NA	NA

Appendix Table 3. Continued.

River Mile	Sandusky River						
	54.34	57.34	57.34	57.34	57.34	57.34	57.72
Sample Number	24757	22643	13580	24273	24287	13189	13587
Date Sampled	08/31/99	08/27/99	08/27/99	08/24/99	08/24/99	08/23/99	08/28/99
Time Sampled	01:15 PM	04:00 PM	04:00 PM	03:30 PM	03:30 PM	04:00 PM	
Semi-Volatile Organic Analytes (ug/l)							
	Dupl.A	Dupl.B					
Ethyl methanesulfonate	NA	NA	NA	<2.0	NA	NA	NA
Fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Fluorene	<2.0	<3.0	<3.0	<2.0	<2.0	<3.0	<3.0
Hexachlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
Hexachlorobutadiene	<2.0 UJ	<3.0	<3.0	<2.0	<2.0	NA	<3.0
Hexachlorocyclopentadiene	<2.0	<5.0	<5.0	<2.0	<2.0	NA	<5.0
Hexachloroethane	<5.0	<3.0	<3.0	<2.0	<5.0	NA	<3.0
Hexachloropropene	NA	NA	NA	<2.0	NA	NA	NA
Ideno(1,2,3-cd)pyrene	<2.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0
Isophorone	<2.0	<1.0	<1.0	<2.0	<2.0	NA	<1.0
Methyl methanesulfonate	NA	NA	NA	<2.0	NA	NA	NA
3-methylcholanthrene	NA	NA	NA	<2.0	NA	NA	NA
2-methylnaphthalene	NA	<2.0	<2.0	<2.0	NA	NA	<2.0
3&4-methylphenol	NA	NA	NA	<2.0	NA	NA	NA
2-methylphenol	NA	<3.0	<3.0	<2.0	NA	NA	<3.0
N-nitroso-di-n-butylamine	NA	NA	NA	<2.0	NA	NA	NA
N-nitroso-di-n-propylamine	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
N-nitrosodimethylamine	NA	<10	<10	NA	NA	NA	<10
N-nitrodiphenylamine	<5.0	<2.0	<2.0	NA	<5.0	NA	<2.0
N-nitrosomorpholine	NA	NA	NA	<2.0	NA	NA	NA
N-nitrosopiperidine	NA	NA	NA	<2.0	NA	NA	NA
N-nitrosopyrrolidine	NA	NA	NA	<2.0	NA	NA	NA
Naphthalene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,4-naphthoquinone	NA	NA	NA	<2.0	NA	NA	NA
1-naphthylamine	NA	NA	NA	<2.0 R	NA	NA	NA
2-naphthylamine	NA	NA	NA	<2.0 R	NA	NA	NA
5-nitro-o-toluidine	NA	NA	NA	<2.0 R	NA	NA	NA
2-nitroaniline	NA	<5.0	<5.0	<2.0	NA	NA	<5.0
3-nitroaniline	NA	<5.0	<5.0	<2.0 R	NA	NA	<5.0
4-nitroaniline	NA	<5.0	<5.0	<2.0 R	NA	NA	<5.0
Nitrobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
4-nitrophenol	<20	<10	<10	<2.0	<20	NA	<10
2-nitrophenol	<2.0	<3.0	<3.0	<2.0	<2.0	NA	<3.0
Pentachlorobenzene	NA	NA	NA	<2.0	NA	NA	NA
Pentachlorophenol	<10	<10	<10	<2.0	<10	NA	<10
Phenacetin	NA	NA	NA	<2.0	NA	NA	NA
Phenanthrene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Phenol	<2.0	<3.0	<3.0	<2.0	<2.0	NA	<3.0
2-picoline	NA	NA	NA	<2.0	NA	NA	NA
Pronamide	NA	NA	NA	<2.0	NA	NA	NA
Pyrene	<2.0	<3.0	<3.0	<2.0	<2.0	<3.0	<3.0
Safrole	NA	NA	NA	<2.0	NA	NA	NA
1,2,4,5-tetrachlorobenzene	NA	NA	NA	<2.0	NA	NA	NA
2,3,4,6-tetrachlorophenol	NA	NA	NA	<2.0	NA	NA	NA
o-toluidine	NA	NA	NA	<2.0	NA	NA	NA
1,2,4-trichlorobenzene	<2.0	<2.0	<2.0	<2.0	<2.0	NA	<2.0
2,6-dinitrotoluene	NA	<4.0	<4.0	NA	NA	NA	<4.0
1,2-diphenylhydrazine	NA	<1.0	<1.0	NA	NA	NA	<1.0
4-methylphenol	NA	<3.0	<3.0	NA	NA	NA	<3.0

Appendix Table 3. Continued.

River Mile	Sandusky River						
	54.34	57.34	57.34	57.34	57.34	57.34	57.72
Sample Number	24757	22643	13580	24273	24287	13189	13587
Date Sampled	08/31/99	08/27/99	08/27/99	08/24/99	08/24/99	08/23/99	08/28/99
Time Sampled	01:15 PM	04:00 PM	04:00 PM	03:30 PM	03:30 PM	04:00 PM	
Semi-Vol. Organic Analytes (ug/l)/TICS							
		Dupl.A	Dupl.B				
Cyclopentanone	NA	NA	NA	4 NJ	NA	NA	NA
Azulene	NA	NA	NA	0 NJ	NA	NA	NA
Benzoic acid	NA	NA	NA	7 NJ	NA	NA	NA
Benzonitrile	NA	NA	NA	0 NJ	NA	NA	NA
Caprolactum	NA	NA	NA	9 NJ	3 NJ	NA	NA
2-cyclopenten-1-one	7 NJ	NA	NA	NA	NA	NA	NA
2,3-dimethylcyclopent-2-en-1-one	2 NJ	NA	NA	NA	NA	NA	NA
4-morpholineacetonitrile	2 NJ	NA	NA	NA	NA	NA	NA
Hexanedinitrile	6 NJ	NA	NA	NA	NA	NA	NA
Benzothiazole	4 NJ	NA	NA	0 NJ	NA	NA	NA
3-cyano-benzoic acid	3 NJ	NA	NA	NA	NA	NA	NA
2(3H)-benzothiazolone	2 NJ	NA	NA	NA	NA	NA	NA
tetradecyl ester-dodecanoic acid	4 NJ	NA	NA	NA	3 NJ	NA	NA
Squalene	6 NJ	NA	NA	NA	NA	NA	NA
1-(2-butoxyethoxy)-ethanol	NA	NA	NA	20 NJ	3 NJ	NA	NA
2-ethyltetrahydro-thiophene	NA	NA	NA	2 NJ	NA	NA	NA

R - The analyte result is unusable because quality control criteria was not met.

UJ - The analyte was not detected above the sample quantitation limit. However, the reported QJ is estimated.

NJ - Analysis indicated the presence of an analyte that has been tentatively identified and the result represents its approximate concentration.

NA - Not analyzed.

Appendix Table 4. Results of surface water sampling conducted by Ohio EPA in the Sycamore Creek study area during November, 1999.

	Sycamore Creek							
Sample Number :	EKT20	EKT21	EKT28	EKT22 / EKT26	EKT23	EKT24	EKT25	EKT27
Sampling Location/River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/99	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)					Dupl.			
Dichlorodifluoromethane	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Chloromethane	10 UJ	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Trichlorofluoromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10 UJ	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	10 J	16 U	10 U	10 UJ / 10 U	11 U	10 U	10 U	10 U
Carbon Disulfide	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Methyl Acetate	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Methylene Chloride	10 J	10 U	10 J	10 U / 10 J	10 J	10 U	10 J	10 J
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
tert-Butyl Methyl Ether	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Butanone	8 J	10 UJ	10 U	10 UJ / 10 U	10 U	10 UJ	10 UJ	10 U
Chloroform	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 UJ	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U

Appendix Table 4. Continued.

	Sycamore Creek							
Sample Number :	EKT20	EKT21	EKT28	EKT22 / EKT26	EKT23	EKT24	EKT25	EKT27
Sampling Location/River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)								
1,2-Dichloropropane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Toluene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Dibromochloromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Xylenes (total)	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 UJ	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
1,2,4-Trichlorobenzene	10 U	10 UJ	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ	10 UJ	10 U

Appendix Table 4. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT15	EKT18 / EKT 16	EKT17	EKT19
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)	Dupl.			
Dichlorodifluoromethane	10 UJ	10 U / 10 UJ	10 UJ	10 UJ
Chloromethane	10 U	10 UJ / 10 U	10 U	10 U
Vinyl Chloride	10 U	10 U /10 U	10 U	10 U
Bromomethane	10 U	10 U /10 U	10 U	10 U
Chloroethane	10 UJ	10 U / 10 UJ	10 UJ	10 UJ
Trichlorofluoromethane	10 U	10 U /10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U /10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ
Acetone	10 U	10 J /10 U	10 U	10 U
Carbon Disulfide	10 UJ	10 U / 10 UJ	10 UJ	10 UJ
Methyl Acetate	10 UJ	10 U / 10 UJ	10 U	10 UJ
Methylene Chloride	10 U	10 J / 10 J	10 J	10 U
trans-1,2-Dichloroethene	10 U	10 U /10 U	10 U	10 U
tert-Butyl Methyl Ether	10 U	10 U /10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U /10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U /10 U	10 U	10 U
2-Butanone	10 UJ	10 UJ /10 U	10 U	10 UJ
Chloroform	10 U	10 U /10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U /10 U	10 U	10 U
Cyclohexane	10 U	10 UJ /10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U /10 U	10 U	10 U
Benzene	10 U	10 U /10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U /10 U	10 U	10 U
Trichloroethene	10 U	10 U /10 U	10 U	10 U
Methylcyclohexane	10 U	10 U /10 U	10 U	10 U

Appendix Table 4. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT13	EKT18 / EKT 16	EKT17	EKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)	Dupl.			
1,2-Dichloropropane	10 U	10 U /10 U	10 U	10 U
Bromodichloromethane	10 U	10 U /10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U /10 U	10 U	10 U
4-Methyl-2-pentanone	10 UJ	10 U / 10 UJ	10 UJ	10 UJ
Toluene	10 U	10 U /10 U	10 UJ	10 UJ
trans-1,3-Dichloropropene	10 U	10 U /10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U /10 U	10 U	10 U
Tetrachloroethene	10 U	10 U /10 U	10 U	10 U
2-Hexanone	10 UJ	10 U / 10 UJ	10 UJ	10 UJ
Dibromochloromethane	10 U	10 U /10 U	10 UJ	10 UJ
1,2-Dibromoethane	10 U	10 U /10 U	10 U	10 U
Chlorobenzene	10 U	10 U /10 U	10 U	10 U
Ethylbenzene	10 U	10 U /10 U	10 U	10 U
Xylenes (total)	10 U	10 U /10 U	10 U	10 U
Styrene	10 U	10 U /10 U	10 U	10 U
Bromoform	10 U	10 U /10 U	10 U	10 U
Isopropylbenzene	10 U	10 U /10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U /10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U /10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U /10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U /10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 UJ	10 UJ / 10 UJ	10 UJ	10 UJ
1,2,4-Trichlorobenzene	10 UJ	10 U / 10 UJ	10 UJ	10 UJ

Appendix Table 4. Continued.

	Sycamore Creek							
Sample Number :	EKT20	EKT21	EKT28	EKT22 / EKT26	EKT23	EKT24	EKT25	EKT27
Sampling Location/River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)	Dupl.							
Benzaldehyde	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Phenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
bis-(2-Chloroethyl) ether	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2-Chlorophenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2-Methylphenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Acetophenone	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
4-Methylphenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Hexachloroethane	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Nitrobenzene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Isophorone	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2-Nitrophenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,4-Dimethylphenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,4-Dichlorophenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Naphthalene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
4-Chloroaniline	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Hexachlorobutadiene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 UJ	10 UJ	10 U
Caprolactam	10 R	0.4 J	0.4 J	10 U / 10 U	10 UJ	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2-Methylnaphthalene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,4,5-Trichlorophenol	26 R	25 U	25 U	25 U / 25 U	25 UJ	26 U	25 U	25 U
1,1'-Biphenyl	10 R	0.2 J	0.2 J	10 U / 0.1 J	10 UJ	10 U	0.2 J	0.1 J
2-Chloronaphthalene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2-Nitroaniline	26 R	25 U	25 U	25 U / 25 U	25 UJ	26 U	25 U	25 U
Dimethylphthalate	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,6-Dinitrotoluene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Acenaphthylene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
3-Nitroaniline	26 R	25 U	25 U	25 U / 25 U	25 UJ	26 U	25 U	25 U
Acenaphthene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U

Appendix Table 4. Continued.

	Sycamore Creek							
Sample Number :	EKT20	EKT21	EKT28	EKT22 / EKT26	EKT23	EKT24	EKT25	EKT27
Sampling Location/River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				Dupl.				
2,4-Dinitrophenol	26 R	25 U	25 U	25 U / 25 U	25 UJ	26 U	25 U	25 U
4-Nitrophenol	26 R	25 U	25 U	25 U / 25 U	25 UJ	26 U	25 U	25 U
Dibenzofuran	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
2,4-Dinitrotoluene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Diethylphthalate	10 R	0.7 J	10 U	10 U / 0.3 J	10 UJ	0.5 J	10 U	10 U
Fluorene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
4-Chlorophenyl-phenyl ether	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
4-Nitroaniline	26 R	25 U	25 U	25 U / 25 U	25 UJ	26 U	25 U	25 U
4,6-Dinitro-2-methylphenol	26 R	25 U	25 U	25 U / 25 U	10 UJ	26 U	25 U	25 U
N-Nitrosodiphenylamine	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Hexachlorobenzene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Atrazine	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Pentachlorophenol	26 R	25 U	25 U	25 U / 25 U	10 UJ	26 U	25 U	25 U
Phenanthrene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Anthracene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Carbazole	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Di-n-butylphthalate	10 R	10 U	10 U	10 U / 0.9 J	10 UJ	10 U	10 U	10 U
Fluoranthene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Pyrene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Butylbenzylphthalate	10 R	0.5 J	10 U	10 U / 0.3 J	10 UJ	10 U	10 U	0.3 J
3,3'-Dichlorobenzidine	10 R	10 U	10 UJ	10 UJ / 10 U	10 UJ	10 UJ	10 UJ	10 UJ
Benzo(a)anthracene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Chrysene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	0.5 J	10 U	10 U	2 J / 10 U	10 U	6 J	10 U	10 U
Di-n-octylphthalate	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(b)fluoranthene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(k)fluoranthene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(a)pyrene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 R	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U

Appendix Table 4. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT15	EKT18 / EKT 16	EKT17	EKT19
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				
		Dupl.		
Benzaldehyde	10 U	10 U / 10 U	10 U	10 U
Phenol	10 U	10 U / 10 U	10 U	10 U
bis-(2-Chloroethyl) ether	10 U	10 U / 10 U	10 U	10 U
2-Chlorophenol	10 U	10 U / 10 U	10 U	10 U
2-Methylphenol	10 U	10 U / 10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U / 10 U	10 U	10 U
Acetophenone	0.2 J	10 U / 10 U	10 U	10 U
4-Methylphenol	10 U	10 U / 10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U / 10 U	10 U	10 U
Hexachloroethane	10 U	10 U / 10 U	10 U	10 U
Nitrobenzene	10 U	10 U / 10 U	10 U	10 U
Isophorone	0.2 J	10 U / 10 U	10 U	10 U
2-Nitrophenol	10 U	10 U / 10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U / 10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U / 10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U / 10 U	10 U	10 U
Naphthalene	10 U	10 U / 10 U	10 U	10 U
4-Chloroaniline	10 U	10 U / 10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U / 10 U	10 U	10 U
Caprolactam	10 U	10 U / 10 U	10 U	0.4 J
4-Chloro-3-methylphenol	10 U	0.8 J / 10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U / 10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U / 10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U / 10 U	10 U	10 U
2,4,5-Trichlorophenol	25 U	25 U / 24 U	24 U	25 U
1,1'-Biphenyl	0.2 J	0.1 J / 10 U	10 U	0.1 J
2-Chloronaphthalene	10 U	10 U / 10 U	10 U	10 U
2-Nitroaniline	25 U	10 U / 10 U	24 U	25 U
Dimethylphthalate	10 U	10 U / 10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U / 10 U	10 U	10 U
Acenaphthylene	10 U	10 U / 10 U	10 U	10 U
3-Nitroaniline	25 U	25 U / 24 U	24 U	25 U
Acenaphthene	10 U	10 U / 10 U	10 U	10 U

Appendix Table 4. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT15	EKT18 / EKT 16	EKT17	EKT19
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				
		Dupl.		
2,4-Dinitrophenol	25 U	25 U / 24 U	24 U	25 U
4-Nitrophenol	25 U	25 U / 24 U	24 U	25 U
Dibenzofuran	10 U	10 U / 10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U / 10 U	10 U	10 U
Diethylphthalate	0.2 J	0.1 J / 10 U	10 U	10 U
Fluorene	10 U	10 U / 10 U	10 U	10 U
4-Chlorophenyl-phenyl ether	10 U	10 U / 10 U	10 U	10 U
4-Nitroaniline	25 U	25 U / 24 U	24 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U / 24 U	24 U	25 U
N-Nitrosodiphenylamine	10 U	10 U / 10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U / 10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U / 10 U	10 U	10 U
Atrazine	10 U	10 U / 10 U	10 U	10 U
Pentachlorophenol	25 U	25 U / 24 U	24 U	25 U
Phenanthrene	10 U	10 U / 10 U	10 U	10 U
Anthracene	10 U	10 U / 10 U	10 U	10 U
Carbazole	10 U	10 U / 10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U / 10 U	10 U	10 U
Fluoranthene	10 U	10 U / 10 U	10 U	10 U
Pyrene	10 U	10 U / 10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U / 10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U / 10 UJ	10 UJ	10 UJ
Benzo(a)anthracene	10 U	10 U / 10 U	10 U	10 U
Chrysene	10 U	10 U / 10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U / 3 J	2 J	3 J
Di-n-octylphthalate	10 U	10 U / 10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U / 10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U / 10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U / 10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U / 10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U / 10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U / 10 U	10 U	10 U

Appendix Table 4. Continued.

	Sycamore Creek							
Sample Number :	EKT20	EKT21	EKT28	EKT22 / EKT26	EKT23	EKT24	EKT25	EKT27
Sampling Location/ River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/99	11/03/1999	11/03/1999	11/03/1999	11/03/1999
PESTICIDES/PCBS COMPOUNDS (ug/l)				Dupl.				
alpha-BHC	0.049 U	0.056 U	0.050 U	0.048 U / 0.049 U	0.049 U	0.049 U	0.050 U	0.050 U
beta-BHC	0.029 J	0.056 U	0.016 J	0.048 U / 0.0050 J	0.049 U	0.049 U	0.010 J	0.050
delta-BHC	0.050 U	0.056 U	0.0050 J	0.048 U / 0.0060 J	0.049 U	0.0070 J	0.0040 J	0.050
gamma-BHC (Lindane)	0.019 J	0.0080 J	0.017 J	0.032 J / 0.026 J	0.049 U	0.049 U	0.050 U	0.0010 J
Heptachlor	0.049 U	0.056 U	0.050 U	0.048 U / 0.049 U	0.049 U	0.049 U	0.050 U	0.050 U
Aldrin	0.049 U	0.014 J	0.050 U	0.012 J / 0.049 U	0.032 J	0.0080 J	0.050 U	0.050 U
Heptachlor epoxide	0.049 U	0.056 U	0.050 U	0.048 U / 0.049 U	0.016 J	0.049 U	0.050 U	0.050 U
Endosulfan I	0.049 U	0.056 U	0.050 U	0.048 U / 0.049 U	0.049 U	0.049 U	0.050 U	0.050 U
Dieldrin	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
4,4'-DDE	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
Endrin	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
Endosulfan II	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
4,4'-DDD	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
Endosulfan sulfate	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
4,4'-DDT	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
Methoxychlor	0.49 U	0.56 U	0.50 U	0.48 U / 0.49 U	0.49 U	0.49 U	0.50 U	0.50 U
Endrin ketone	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
Endrin aldehyde	0.098 U	0.11 U	0.10 U	0.095 U / 0.098 U	0.098 U	0.098 U	0.10 U	0.10 U
alpha-Chlordane	0.049 U	0.056 U	0.050 U	0.048 U / 0.049 U	0.049 U	0.049 U	0.050 U	0.050 U
gamma-Chlordane	0.049 U	0.056 U	0.050 U	0.048 U / 0.049 U	0.049 U	0.049 U	0.050 U	0.050 U
Toxaphene	4.9 U	5.6 U	5.0 U	4.8 U / 4.9 U	4.9 U	4.9 U	5.0 U	5.0 U
Aroclor-1016	0.98 U	1.1 U	1.0 U	0.95 U / 0.98 U	0.98 U	0.98 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.2 U	2.0 U	1.9 U / 2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	0.98 U	1.1 U	1.0 U	0.95 U / 0.98 U	0.98 U	0.98 U	1.0 U	1.0 U
Aroclor-1242	0.98 U	1.1 U	1.0 U	0.95 U / 0.98 U	0.98 U	0.98 U	1.0 U	1.0 U
Aroclor-1248	0.98 U	1.1 U	1.0 U	0.95 U / 0.98 U	0.98 U	0.98 U	1.0 U	1.0 U
Aroclor-1254	0.98 U	1.1 U	1.0 U	0.95 U / 0.98 U	0.98 U	0.98 U	1.0 U	1.0 U
Aroclor-1260	0.98 U	1.1 U	1.0 U	0.95 U / 0.98 U	0.98 U	0.98 U	1.0 U	1.0 U

Appendix Table 4. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT15	EKT18 / EKT 16	EKT17	EKT19
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 6.49
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
PESTICIDES/PCBS COMPOUNDS (ug/l)				
		Dupl.		
alpha-BHC	0.050 U	0.050 U / 0.050 U	0.051 U	0.051 U
beta-BHC	0.050 U	0.050 U / 0.050 U	0.051 U	0.051 U
delta-BHC	0.050 U	0.050 U / 0.050 U	0.0080 J	0.051 U
gamma-BHC (Lindane)	0.0060 J	0.0070 J / 0.050 U	0.051 U	0.0070 J
Heptachlor	0.050 U	0.050 U / 0.050 U	0.051 U	0.051 U
Aldrin	0.050 U	0.050 U / 0.0060 J	0.051 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U / 0.0020 J	0.015 J	0.051 U
Endosulfan I	0.050 U	0.050 U / 0.050 U	0.051 U	0.051 U
Dieldrin	0.10 U	0.10 U / 0.099 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U / 0.099 U	0.0070 J	0.10 U
Endrin	0.10 U	0.10 U / 0.099 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U / 0.099 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U / 0.099 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U / 0.50 U	0.0030 J	0.10 U
4,4'-DDT	0.10 U	0.10 U / 0.099 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U / 0.50 U	0.51 U	0.51 U
Endrin ketone	0.10 U	0.10 U / 0.50 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U / 0.50 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U / 0.050 U	0.051 U	0.051 U
gamma-Chlordane	0.050 U	0.050 U / 0.050 U	0.051 U	0.051 U
Toxaphene	5.0 U	5.0 U / 5.0 U	5.1 U	5.1 U
Aroclor-1016	1.0 U	1.0 U / 0.99 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U / 0.99 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U / 0.99 U	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U / 0.99 U	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U / 0.99 U	0.41 J	1.0 U
Aroclor-1260	1.0 U	1.0 U / 0.99 U	1.0 U	1.0 U

Appendix Table 4. Continued

	Sycamore Creek								
Sample Number :	MEKT20	MEKT21	MEKT28	MEKT22 / MEKT 26	MEKT23	MEKT24	EKT25	MEKT27	
Sampling Location/River Mile:	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41	
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	
INORGANIC ANALYTE (ug/l)									
Aluminum	289	65.0	295	265	282	412	40.1	27.2	328
Antimony	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic	2.0 U	2.1	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Barium	57.7	64.8	61.8	64.1	41.9	58.3	66.6	61.2	63.5
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	1.0 U	1.0 U	2.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	68400	87600	79800	82100	54100	78400	92200	96100	80200
Chromium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cobalt	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Copper	3.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Iron	710	303	673	650	556	553	257	178	759
Lead	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Magnesium	21100	25800	25000	25300	16300	24800	28700	30200	24600
Manganese	73.5	42.5	85.8	84.5	54.9	80.5	24.3	18.1	83.4
Mercury	0.20 J	0.20 J	0.20 J	0.23 J	0.20 J	0.20 J	0.23 J	0.22 J	0.20 J
Nickel	3.2	2.3	3.3	2.6	2.1	2.8	2.3	1.9	2.9
Potassium	9130	8030	11000	10800	14400	11300	10100	5610	10600
Selenium	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Silver	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0	2.0
Sodium	24200	17500	19000	19800	495000	20600	28400	47300	19400
Thallium	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Vanadium	1.5	1.0 U	1.1	1.2	1.0 U	1.2	1.0 U	1.0 U	1.1
Zinc	8.6	4.8	10.0	5.9	7.1 U	5.7	4.4	4.5	5.7
Cyanide	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.7	2.0 U	2.0 U	2.0 U

Appendix Table 4. Continued

	Sandusky River			Kirby Tributary
Sample Number :	MEKT15	MEKT18 / MEKT 16	MEKT17	MEKT19
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
ANALYTE (ug/l)		Dupl.		
Aluminum	175	679 / 236	221	325
Antimony	3.0 U	3.0 U / 3.0 U	3.0 U	3.0 U
Arsenic	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
Barium	64.7	65.7 / 63.9	61.9	60.4
Beryllium	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
Cadmium	1.0 U	1.0 U / 1.0 U	1.0 U	1.6
Calcium	152000	140000 / 142000	128000	82500
Chromium	1.0 U	1.3 / 1.0 U	1.0 U	1.0 U
Cobalt	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
Copper	2.0 U	4.5 / 2.0 U	3.9	2.4
Iron	439	1240 / 624	507	977
Lead	1.0 U	1.2 / 1.0	1.0 U	1.0 U
Magnesium	46600	43900 / 44500	40600	22300
Manganese	112	115 / 111	137	81.8
Mercury	0.41 J	0.20 J / 0.21 J	0.20 J	0.25 J
Nickel	0.41 J	4.0 / 3.2	3.4	2.8
Potassium	7840	6840 / 6850	6560	8040
Selenium	3.0 UJ	3.0 UJ / 3.0 UJ	3.0 UJ	3.0 UJ
Silver	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
Sodium	37700	39200 / 38200	40400	28900
Thallium	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
Vanadium	1.0 U	1.9 / 1.0 U	1.0 U	1.1
Zinc	3.4	15.3 / 6.9	13.9	6.1
Cyanide	2.0 U	3.9 / 2.0 U	2.0 U	3.1

J - Value is estimated. The value is less than the CRQL but greater than zero

U - Compound was analyzed for but not detected.

UJ - Material not detected. Associated value is an estimate and may be inaccurate or imprecise.

R - Data are unusable.

Appendix Table 5. Results of chemical surface water sampling conducted by the Ohio EPA in the Sycamore Creek study area, December, 1999.

	Sycamore Creek							
Sample Number :	EKT43	EKT42	EKT36	EKT41 / EKT37	EKT40	EKT39	EKT38	EKT34
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)				Dupl.				
Dichlorodifluoromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Acetone	10 U	7 J	5 J	10 U / 2 J	2 J	4 J	4 J	2 J
Carbon Disulfide	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Methyl Acetate	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Methylene Chloride	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
tert-Butyl Methyl Ether	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U

Appendix Table 5. Continued.

	Sycamore Creek							
Sample Number :	EKT43	EKT42	EKT36	EKT41 / EKT37	EKT40	EKT39	EKT38	EKT34
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)								
1,2-Dichloropropane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Xylenes (total)	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U

Appendix Table 5. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT33	EKT32 / EKT30	EKT31	EKT35
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)				
		Dupl.		
Dichlorodifluoromethane	10 U	10 U / 10 U	10 U	10 U
Chloromethane	10 U	10 U / 10 U	10 U	10 U
Vinyl Chloride	10 U	10 U / 10 U	10 U	10 U
Bromomethane	10 U	10 U / 10 U	10 U	10 U
Chloroethane	10 U	10 U / 10 U	10 U	10 U
Trichlorofluoromethane	10 U	10 U / 10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U / 10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10 U	10 U / 10 U	10 U	10 U
Acetone	2 J	4 J / 10 U	4 J	3 J
Carbon Disulfide	10 U	10 U / 10 U	10 U	10 U
Methyl Acetate	10 U	10 U / 10 U	10 U	10 U
Methylene Chloride	10 U	10 U / 10 U	10 U	10 U
trans-1,2-Dichloroethene	10 U	10 U / 10 U	10 U	10 U
tert-Butyl Methyl Ether	10 U	10 U / 10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U / 10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U / 10 U	10 U	10 U
2-Butanone	10 U	10 U / 10 U	10 U	10 U
Chloroform	10 U	10 U / 10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U / 10 U	10 U	10 U
Cyclohexane	10 U	10 U / 10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U / 10 U	10 U	10 U
Benzene	10 U	10 U / 10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U / 10 U	10 U	10 U
Trichloroethene	10 U	10 U / 10 U	10 U	10 U
Methylcyclohexane	10 U	10 U / 10 U	10 U	10 U

Appendix Table 5. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT33	EKT32 / EKT30	EKT31	EKT35
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999
VOLATILE ORGANIC COMPOUNDS (ug/l)				
		Dupl.		
1,2-Dichloropropane	10 U	10 U / 10 U	10 U	10 U
Bromodichloromethane	10 U	10 U / 10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U / 10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U / 10 U	10 U	10 U
Toluene	10 U	10 U / 10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U / 10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U / 10 U	10 U	10 U
Tetrachloroethene	10 U	10 U / 10 U	10 U	10 U
2-Hexanone	10 U	10 U / 10 U	10 U	10 U
Dibromochloromethane	10 U	10 U / 10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U / 10 U	10 U	10 U
Chlorobenzene	10 U	10 U / 10 U	10 U	10 U
Ethylbenzene	10 U	10 U / 10 U	10 U	10 U
Xylenes (total)	10 U	10 U / 10 U	10 U	10 U
Styrene	10 U	10 U / 10 U	10 U	10 U
Bromoform	10 U	10 U / 10 U	10 U	10 U
Isopropylbenzene	10 U	10 U / 10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U / 10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U / 10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U / 10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U / 10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 U	10 U / 10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U / 10 U	10 U	10 U

Appendix Table 5. Continued.

	Sycamore Creek							
Sample Number :	EKT43	EKT42	EKT36	EKT41 / EKT37	EKT40	EKT39	EKT38	EKT34
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)				Dupl.				
Benzaldehyde	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
bis-(2-Chloroethyl) ether	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Acetophenone	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Caprolactam	10 U	14	29	13 / 14	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	2.5 U	25 U	25 U	25 U / 25 U	25 U	25 U	25 U	25 U
1,1'-Biphenyl	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	2.5 U	25 U	25 U	25 U / 25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	2.5 U	25 U	25 U	25 U / 25 U	25 U	25 U	25 U	25 U
Acenaphthene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U

Appendix Table 5. Continued.

	Sycamore Creek							
Sample Number :	EKT43	EKT42	EKT36	EKT41 / EKT37	EKT40	EKT39	EKT38	EKT34
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)				Dupl.				
2,4-Dinitrophenol	2.5 U	25 U	25 U	25 U / 25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	2.5 U	25 U	25 U	25 U / 25 U	25 U	25 U	25 U	25 U
Dibenzofuran	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenyl ether	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	2.5 U	25 U	25 U	25 U / 25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	2.5 U	25 U	25 U	25 U / 25 U	10 U	25 U	25 U	25 U
N-Nitrosodiphenylamine	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Atrazine	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	2.5 U	25 U	25 U	25 U / 25 U	10 U	25 U	25 U	25 U
Phenanthrene	10 R	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Anthracene	10 R	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Fluoranthene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U / 10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U / 10 U	10 UJ	10 U	10 U	10 U

Appendix Table 5. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT33	EKT32 / EKT30	EKT31	EKT35
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)				
		Dupl.		
Benzaldehyde	10 U	10 U / 10 U	10 U	10 U
Phenol	10 U	10 U / 10 U	10 U	10 U
bis-(2-Chloroethyl) ether	10 U	10 U / 10 U	10 U	10 U
2-Chlorophenol	10 U	10 U / 10 U	10 U	10 U
2-Methylphenol	10 U	10 U / 10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U / 10 U	10 U	10 U
Acetophenone	10 U	10 U / 10 U	10 U	10 U
4-Methylphenol	10 U	10 U / 10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U / 10 U	10 U	10 U
Hexachloroethane	10 U	10 U / 10 U	10 U	10 U
Nitrobenzene	10 U	10 U / 10 U	10 U	10 U
Isophorone	10 U	10 U / 10 U	10 U	10 U
2-Nitrophenol	10 U	10 U / 10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U / 10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U / 10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U / 10 U	10 U	10 U
Naphthalene	10 U	10 U / 10 U	10 U	10 U
4-Chloroaniline	10 U	10 U / 10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U / 10 U	10 U	10 U
Caprolactam	10 U	10 U / 10 U	10 U	0.4 J
4-Chloro-3-methylphenol	10 U	10 U / 10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U / 10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U / 10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U / 10 U	10 U	10 U
2,4,5-Trichlorophenol	25 U	25 U / 25 U	25 U	25 U
1,1'-Biphenyl	10 U	10 U / 10 U	10 U	0.1 J
2-Chloronaphthalene	10 U	10 U / 10 U	10 U	10 U
2-Nitroaniline	25 U	25 U / 25 U	25 U	25 U
Dimethylphthalate	10 U	10 U / 10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U / 10 U	10 U	10 U
Acenaphthylene	10 U	10 U / 10 U	10 U	10 U
3-Nitroaniline	25 U	25 U / 25 U	25 U	25 U
Acenaphthene	10 U	10 U / 10 U	10 U	10 U

Appendix Table 5. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT33	EKT32 / EKT30	EKT31	EKT35
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)				
		Dupl.		
2,4-Dinitrophenol	25 U	25 U / 25 U	25 U	25 U
4-Nitrophenol	25 U	25 U / 25 U	25 U	25 U
Dibenzofuran	10 U	10 U / 10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U / 10 U	10 U	10 U
Diethylphthalate	10 U	10 U / 10 U	10 U	10 U
Fluorene	10 U	10 U / 10 U	10 U	10 U
4-Chlorophenyl-phenyl ether	10 U	10 U / 10 U	10 U	10 U
4-Nitroaniline	25 U	25 U / 25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U / 25 U	25 U	25 U
N-Nitrosodiphenylamine	10 U	10 U / 10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U / 10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U / 10 U	10 U	10 U
Atrazine	10 U	10 U / 10 U	10 U	10 U
Pentachlorophenol	25 U	25 U / 25 U	25 U	25 U
Phenanthrene	10 U	10 U / 10 U	10 U	10 U
Anthracene	10 U	10 U / 10 U	10 U	10 U
Carbazole	10 U	10 U / 10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U / 10 U	10 U	10 U
Fluoranthene	10 U	10 U / 10 U	10 U	10 U
Pyrene	10 U	10 U / 10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U / 10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U / 10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U / 10 U	10 U	10 U
Chrysene	10 U	10 U / 10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U / 10 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U / 10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U / 10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U / 10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U / 10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U / 10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U / 10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U / 10 U	10 U	10 U

Appendix Table 5. Continued

	Sycamore Creek							
Sample Number :	EKT43	EKT42	EKT36	EKT41 / EKT37	EKT40	EKT39	EKT38	EKT34
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/99	12/07/1999	12/07/1999	12/07/1999	12/07/1999
PESTICIDES/PCBS COMPOUNDS (ug/l)	Dupl.							
alpha-BHC	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
Endrin	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U	NA / 0.50 U	NA	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	NA / 0.10 U	NA	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	NA / 0.050 U	NA	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	NA / 5.0 U	NA	5.0 U	5.0 U	5.0 U
Aroclor-1016	1.0 U	1.0 U	1.0 U	NA / 1.0 U	NA	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U	2.0 U	NA / 2.0 U	NA	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U	1.0 U	NA / 1.0 U	NA	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U	1.0 U	NA / 1.0 U	NA	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U	1.0 U	NA / 1.0 U	NA	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U	1.0 U	NA / 1.0 U	NA	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U	1.0 U	NA / 1.0 U	NA	1.0 U	1.0 U	1.0 U

Appendix Table 5. Continued

	Sandusky River			Kirby Tributary
Sample Number :	EKT33	EKT32 / EKT30	EKT31	EKT35
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999
PESTICIDES/PCBS COMPOUNDS (ug/l)				
		Dupl.		
alpha-BHC	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
beta-BHC	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
delta-BHC	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
gamma-BHC (Lindane)	0.050 U	0.050 U / 0.050 U	0.050 U	0.0070 J
Heptachlor	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
Aldrin	0.050 U	0.050 U / 0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
Endosulfan I	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
Dieldrin	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
Endrin	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U / 0.50 U	0.50 U	0.51 U
Endrin ketone	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
gamma-Chlordane	0.050 U	0.050 U / 0.050 U	0.050 U	0.051 U
Toxaphene	5.0 U	5.0 U / 5.0 U	5.0 U	5.1 U
Aroclor-1016	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U / 2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U / 1.0 U	1.0 U	1.0 U

Appendix Table 5. Continued.

	Sycamore Creek							
Sample Number :	MEKT43	MEKT42	MEKT36	MEKT41 / MEKT 37	MEKT40	MEKT39	MEKT38	MEKT34
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999	12/07/1999
INORGANIC ANALYTE (ug/l)				Dupl.				
Aluminum	247 J	125 J	67.5 J	75.8 J / 261 J	54.1 J	58.4 J	34.9 U	53.5 J
Antimony	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ / 2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ
Arsenic	2.2 U	2.2 U	2.2 U	2.2 U / 2.2 U	2.6 J	2.2 U	2.2 U	2.2 U
Barium	52.4 J	52.2 J	53 J	62.7 J / 55.6 J	55.4 J	59.3 J	50.5 J	53.6 J
Beryllium	0.10 U	0.10 U	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Cadmium	0.30 U	0.30 U	0.30 U	0.30 U / 0.30U	0.30 U	0.30 U	0.30 U	0.30 U
Calcium	70300 J	75800 J	80200 J	86400 J / 83500 J	84900 J	93300 J	91000 J	103000 J
Chromium	0.80 J	0.73 J	0.64 J	0.83 J / 0.74 J	0.70 J	0.48 J	0.30 U	0.30 U
Cobalt	0.60 U	0.73	0.60 U	0.60 U / 0.60 U	0.60 U	0.60 U	0.60 U	0.60 U
Copper	2.2 J	1.6 J	1.8 J	2.0 J / 1.9 J	2.2 J	23.9	2.6 J	6.2
Iron	478	278	296	376 / 663	311	321	162	302
Lead	1.1 U	1.1 U	1.1 U	1.1 U / 1.1 U	1.1	1.8	1.1 U	1.3
Magnesium	22300	25200	256	26400 / 26300	26300	30000	29500	33500
Manganese	31.4	81.8	36.1	52.5 / 58.5	48.5	21	13.2	36.9
Mercury	0.11	0.1	0.1	0.1 / 0.10 U	0.1	0.1	0.10 U	0.1
Nickel	2.2	1.3 U	2.1	2.2 / 3.0	2.1	1.3 U	2.3	4.8
Potassium	7050	6290	6690	5180 / 5950	4980	6260	4680	4230
Selenium	1.8 U	1.8 U	1.8 U	1.8 U / 1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Silver	0.40 U	0.40 U	0.40 U	0.46 J / 0.40 U	0.40 U	0.44 J	0.40 U	0.40 U
Sodium	30900	29600	20100	16700 / 17600	16100	32500	43600	39900
Thallium	2.4 J	2.1 U	2.1 U	2.1 U / 2.4 J	2.1 U	2.1 U	2.1 U	2.1 U
Vanadium	0.55 J	0.50 U	0.50 U	0.62 J / 0.92 J	0.50 U	0.50 U	0.50 U	0.50 U
Zinc	12.9 U	12.9 U	12.9 U	12.9 U / 12.9 U	12.9 U	12.9 U	12.9 U	12.9 U
Cyanide	3.0 J	2.7 J	1.8 J	1.7 J / 2.4 J	2.6 J	2.9 J	2.9 J	2.2 J

Appendix Table 5. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	MEKT33	MEKT32 / MEKT30	MEKT31	MEKT35
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	12/07/1999	12/07/1999	12/07/1999	12/07/1999
INORGANIC ANALYTE (ug/l)		Dupl.		
Aluminum	174 J	134 J / 158 J	86.1 J	98.8 J
Antimony	2.1 UJ	2.1 UJ / 2.1 UJ	2.1 UJ	2.1 UJ
Arsenic	2.5 J	2.2 U / 2.2 U	2.9 J	2.2 U
Barium	49 J	50.6 J / 49.6 J	47 J	55.5 J
Beryllium	0.10 U	0.10 U / 0.10 U	0.10 U	0.10 U
Cadmium	0.30 U	0.30 U / 0.30 U	0.30 U	0.30 U
Calcium	134000 J	134000 J / 134000 J	122000 J	98000 J
Chromium	0.31 J	0.30 U / 0.63 J	0.64 J	0.60 J
Cobalt	0.60 U	0.60 U / 0.60 U	0.60 U	0.60 U
Copper	2.0 J	3.9 / 2.1 J	4.1	2.9 J
Iron	415	386 / 420	312	574
Lead	3.3	1.1 U / 1.1 U	1.1 U	1.5
Magnesium	43400	43300 / 42900	40500	26400
Manganese	53.9	53.4 / 57.8	42.3	62
Mercury	0.1	0.10 U / 0.10	0.1	0.10 U
Nickel	2.2	2.8 / 2.6	3.5	1.3 U
Potassium	6590	6360 / 6360	6270	2910
Selenium	1.8 U	1.8 U / 1.8 U	1.8 U	1.8 U
Silver	0.40 U	0.40 U / 0.40 U	0.40 U	0.40 U
Sodium	36300	35900 / 35800	35300	13600
Thallium	2.1 U	2.1 UJ / 2.1 UJ	2.6 J	2.1 UJ
Vanadium	0.50 U	0.50 U / 0.50 U	0.54 J	0.50 U
Zinc	12.9 U	12.9 U / 12.9	12.9 U	12.9 U
Cyanide	3.7 J	1.7 J / 1.8 J	1.4 J	4.1 J

J - Value is estimated. The value is less than the CRQL but greater than zero.

U - Compound was analyzed for but not detected.

UJ - Material not detected. Associated value is an estimate and may be inaccurate or imprecise.

R - Data are unusable.

Appendix Table 6. Results of surface water sampling conducted by IT Corporation in Sycamore Creek during August, 1999.

River Mile	Sycamore Creek								
	7.36	7.36	7.34	7.34	7.32	6.85	5.09	5.09	3.47
Sample Number	13132	13124	13125	13135	13126	13128	13129	13136	13137
Date Sampled	08/21/99	08/21/99	08/21/99	08/22/99	08/22/99	08/21/99	08/21/99	08/22/99	08/22/99
Time Sampled	09:05 AM	01:54 PM	01:58 PM	09:51 AM	02:02 PM	02:48 PM	02:57 PM	11:40 AM	11:20 AM
Volatile Organic Analytes (ug/l)									
Benzene	<1.0	220	330	940	420	620	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	11	16	140	<50	33	<1.0	<1.0	<1.0
Toluene	<1.0	100	150	700	200	320	<1.0	<1.0	<1.0
Total xylene	<1.0	32	48	300	49	83	<2.0	<2.0	<2.0
Semi-Volatile Organic Analytes (ug/l)									
Acenaphthene	<2.0	<2.0	49	23	9.9	<2.0	<2.0	<2.0	<2.0
Acenaphthylene	<2.0	64	170	<2.0	<2.0	36	<2.0	<2.0	<2.0
Anthracene	<2.0	<2.0	69	<2.0	53	14	<2.0	<2.0	<2.0
Benzo(a)anthracene	<3.0	<3.0	<3.0	<3.0	11	<3.0	<3.0	<3.0	<2.0
Benzo(a)pyrene	<4.0	<4.0	8.6	<4.0	4.9	<4.0	<4.0	<4.0	<3.0
Benzo(b)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0
Benzo(ghi)perylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
Benzo(k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0
Chrysene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<2.0
Dibenzo(a,h)anthracene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<3.0
Fluoranthene	<2.0	<2.0	2.7	4.1	5.7	<2.0	<2.0	<2.0	<5.0
Fluorene	<3.0	<3.0	53	12	6.7	<3.0	<3.0	<3.0	<2.0
Ideno(1,2,3-cd)pyrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<3.0
Naphthalene	4.6	2900	4000	2200	5600	360	4	23	<2.0
Phenanthrene	<2.0	15	55	10	33	5	<2.0	<2.0	<2.0
Pyrene	<3.0	3.6	9	3.7	5.1	<3.0	<3.0	<3.0	<3.0
Inorganic Analytes (ug/l)									
Arsenic	NA	4.9	9.3	12	8.1	<3.0	<3.0	<3.0	<3.0
Beryllium	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BOD, 5 Day (mg/l)	NA	100	340	410	270	56	<4.0	<4.0	<4.0
Cadmium	NA	<0.5	0.7	1.1	0.6	<0.5	<0.5	<0.5	<0.5
Chromium	NA	<20	<20	<20	<20	<20	<20	<20	<20
COD (mg/l)	NA	463	741	1380	699	399	314	<20	<20
Copper	NA	32	73	100	65	16	<10	<10	<10
Lead	NA	8.6	8.2	12	3.7	<2.0	<2.0	<2.0	<2.0
Nickel	NA	2.3	4.9	42	24	<20	<20	<20	<20
Sulfate (mg/l)	NA	<20	<20	150	140	75	66	70	120
Sulfite (mg/l)	NA	6.4	140	3.2	<6.40	6.4	6.4	0.64	0.64
Zinc	NA	960	1800	2900	1500	490	<10	<10	24

Appendix Table 7. Results of sediment samples collected by Ohio EPA from Sycamore Creek during September, 1999.

River Mile	Sycamore Creek				
	6.47	5.74	5.1	0.8	0.8
Sample Number	24812	24811	24810	24808	24809
Date Sampled	09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Time Sampled	10:15 AM	10:40 AM	12:15 PM	02:00 PM	02:01 PM
Volatile Organic Analytes (mg/kg)			Dupl.A		Dupl.B
Acetone	0.197J	0.117UJ	0.0757UJ	<0.0854UJ	<0.0826UJ
Benzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Bromobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Bromochloromethane	<0.0522	<0.0616	<0.0605	<0.0683UJ	<0.0661
Bromodichloromethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Bromoform	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Bromomethane	<0.0522	<0.0616	<0.0605	<0.0683UJ	<0.0661
2-Butanone	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
n-Butylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
sec-Butylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
tert-Butylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Carbon disulfide	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Carbon tetrachloride	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Chlorobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Chloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Chloroform	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Chloromethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
2-Chlorotoluene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
4-Chlorotoluene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Dibromochloromethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2-Dibromo-3-chloropropane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2-Dibromoethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Dibromomethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2-Dichlorobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,3-Dichlorobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,4-Dichlorobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Dichlorodifluoromethane	<0.0522	<0.0616	<0.0605	<0.0683UJ	<0.0661
1,1-Dichloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2-Dichloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,1-Dichloroethene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
cis-1,2-Dichloroethene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
trans-1,2-Dichloroethene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2-Dichloropropane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,3-Dichloropropane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
2,2-Dichloropropane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,1-Dichloropropene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
cis-1,3-Dichloropropene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
trans-1,3-Dichloropropene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Ethylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Hexachlorobutadiene	<0.0522	<0.0616	<0.0605	<0.0683UJ	<0.0661
2-Hexanone	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Isopropylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
4-Isopropyltoluene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Methylene chloride	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
4-Methyl-2-pentanone	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Naphthalene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
n-Propylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661

Appendix Table 7. Continued.

River Mile	Sycamore Creek				
	6.47	5.74	5.1	0.8	0.8
Sample Number	24812	24811	24810	24808	24809
Date Sampled	09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Time Sampled	10:15 AM	10:40 AM	12:15 PM	02:00 PM	02:01 PM
Volatile Organic Analytes (mg/kg)			Dupl.A		Dupl.B
Styrene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,1,1,2-Tetrachloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,1,2,2-Tetrachloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Tetrachloroethene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Toluene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2,3-Trichlorobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2,4-Trichlorobenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,1,1-Trichloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,1,2-Trichloroethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Trichloroethene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Trichlorofluoromethane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2,3-Trichloropropane	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,2,4-Trimethylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
1,3,5-Trimethylbenzene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Vinyl chloride	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
o-Xylene	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Total m&p-xylenes	<0.0522	<0.0616	<0.0605	<0.0683	<0.0661
Semivolatile Organic Analytes (mg/kg)					
Acenaphthene	<0.60	<0.62	<0.61	<0.67	<0.67
Acenaphthylene	<0.60	<0.62	<0.61	<0.67	<0.67
Acetophenone	<0.60	<0.62	<0.61	<0.67	<0.67
2-Acetylaminofluorene	<0.60	<0.62	<0.61	<0.67	<0.67
4-Aminobiphenyl	<3.0R	<3.1R	<3.0R	<3.4R	<3.3R
Aniline	<3.0	<3.1	<3.0	<3.4	<3.3
Anthracene	<0.60	<0.62	<0.61	<0.67	<0.67
Benz[a]anthracene	<0.60	<0.62	<0.61	<0.67	<0.67
Benzo[a]pyrene	<0.60	<0.62	<0.61	<0.67	<0.67
Benzo[b]fluoranthene	<0.60	<0.62	<0.61	<0.67	<0.67
Benzo[g,h,i]perylene	<0.60	<0.62	<0.61	<0.67	<0.67
Benzo[k]fluoranthene	<0.60	<0.62	<0.61	<0.67	<0.67
Benzyl alcohol	<0.60	<0.62	<0.61	<0.67	<0.67
bis(2-Chloroethoxy)methane	<0.60	<0.62	<0.61	<0.67	<0.67
bis(2-Chloroethyl)ether	<0.60	<0.62	<0.61	<0.67	<0.67
bis(2-Chloroisopropyl)ether	<0.60	<0.62	<0.61	<0.67	<0.67
bis(2-Ethylhexyl)phthalate	<0.60	<0.62	<0.61	<0.67	1
4-Bromophenyl-phenylether	<0.60	<0.62	<0.61	<0.67	<0.67
Butylbenzylphthalate	<0.60	<0.62	<0.61	<0.67	<0.67
4-Chloro-3-methylphenol	<0.60	<0.62	<0.61	<0.67	<0.67
4-Chloroaniline	<0.60R	<0.62R	<0.61R	<0.67R	<0.67R
2-Chloronaphthalene	<0.60	<0.62	<0.61	<0.67	<0.67
2-Chlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
4-Chlorophenyl-phenylether	<0.60	<0.62	<0.61	<0.67	<0.67
Chrysene	<0.60	<0.62	<0.61	<0.67	<0.67
Di-n-butylphthalate	<0.60	<0.62	<0.61	<0.67	<0.67
Di-n-octylphthalate	<0.60	<0.62	<0.61	<0.67	<0.67
Dibenz[a,h]anthracene	<0.60	<0.62	<0.61	<0.67	<0.67
Dibenzofuran	<0.60	<0.62	<0.61	<0.67	<0.67
1,3-Dichlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67

Appendix Table 7. Continued.

River Mile Sample Number Date Sampled Time Sampled	Sycamore Creek				
	6.47 24812 09/01/99 10:15 AM	5.74 24811 09/01/99 10:40 AM	5.1 24810 09/01/99 12:15 PM	0.8 24808 09/01/99 02:00 PM	0.8 24809 09/01/99 02:01 PM
Semivolatile Organic Analytes (mg/kg)			Dupl.A		Dupl.B
1,4-Dichlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
1,2-Dichlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
3,3'-Dichlorobenzidine	<3.0	<3.1	<3.0	<3.4	<3.3
2,6-Dichlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
2,4-Dichlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
Diethylphthalate	<0.60	<0.62	<0.61	<0.67	<0.67
p-Dimethylaminoazobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
7,12-Dimethylbenz[a]anthracene	<3.0	<3.1	<3.0	<3.4	<3.3
3,3'-Dimethylbenzidine	<3.0R	<3.1R	<3.0	<3.4R	<3.3R
2,4-Dimethylphenol	<0.60	<0.62	<0.61	<0.67	<0.67
Dimethylphthalate	<0.60	<0.62	<0.61	<0.67	<0.67
4,6-Dinitro-2-methylphenol	<0.60	<0.62	<0.61	<0.67	<0.67
1,3-Dinitrobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
2,4-Dinitrophenol	<3.0	<3.1	<3.0	<3.4	<3.3
2,6-Dinitrotoluene	<0.60	<0.62	<0.61	<0.67	<0.67
2,4-Dinitrotoluene	<0.60	<0.62	<0.61	<0.67	<0.67
Dinoseb	<0.60	<0.62	<0.61	<0.67	<0.67
Diphenylamine	<0.60	<0.62	<0.61	<0.67	<0.67
Ethyl methanesulfonate	<0.60	<0.62	<0.61	<0.67	<0.67
Fluoranthene	<0.60	<0.62	<0.61	<0.67	<0.67
Fluorene	<0.60	<0.62	<0.61	<0.67	<0.67
Hexachlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
Hexachlorobutadiene	<0.60	<0.62	<0.61	<0.67	<0.67
Hexachlorocyclopentadiene	<0.60	<0.62	<0.61	<0.67	<0.67
Hexachloroethane	<0.60	<0.62	<0.61	<0.67	<0.67
Hexachloropropene	<0.60	<0.62	<0.61	<0.67	<0.67
Indeno[1,2,3-cd]pyrene	<0.60	<0.62	<0.61	<0.67	<0.67
Isophorone	<0.60	<0.62	<0.61	<0.67	<0.67
Methyl methanesulfonate	<0.60	<0.62	<0.61	<0.67	<0.67
3-Methylcholanthrene	<0.60	<0.62	<0.61	<0.67	<0.67
2-Methylnaphthalene	<0.60	<0.62	<0.61	<0.67	<0.67
3&4-Methylphenol	<0.60	<0.62	<0.61	<0.67	<0.67
2-Methylphenol	<0.60	<0.62	<0.61	<0.67	<0.67
N-Nitroso-di-n-butylamine	<0.60	<0.62	<0.61	<0.67	<0.67
N-Nitroso-di-n-propylamine	<0.60	<0.62	<0.61	<0.67	<0.67
N-Nitrosomorpholine	<0.60	<0.62	<0.61	<0.67	<0.67
N-Nitrosopiperidine	<0.60	<0.62	<0.61	<0.67	<0.67
N-Nitrosopyrrolidine	<0.60	<0.62	<0.61	<0.67	<0.67
Naphthalene	<0.60	<0.62	<0.61	<0.67	<0.67
1,4-Naphthoquinone	<0.60	<0.62	<0.61	<0.67	<0.67
1-Naphthylamine	<0.60R	<0.62R	<0.61R	<0.67R	<0.67R
2-Naphthylamine	<0.60R	<0.62R	<0.61R	<0.67R	<0.67R
5-Nitro-o-toluidine	<0.60R	<0.62R	<0.61R	<0.67R	<0.67R
2-Nitroaniline	<0.60	<0.62	<0.61	<0.67	<0.67
3-Nitroaniline	<0.60R	<0.62R	<0.61R	<0.67R	<0.67R
4-Nitroaniline	<0.60R	<0.62R	<0.61R	<0.67R	<0.67R
Nitrobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
4-Nitrophenol	<3.0	<3.1	<3.0	<3.4	<3.3

Appendix Table 7. Continued.

River Mile	Sycamore Creek				
	6.47	5.74	5.1	0.8	0.8
Sample Number	24812	24811	24810	24808	24809
Date Sampled	09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Time Sampled	10:15 AM	10:40 AM	12:15 PM	02:00 PM	02:01 PM
Semivolatile Organic Analytes (mg/kg)			Dupl.A		Dupl.B
2-Nitrophenol	<0.60	<0.62	<0.61	<0.67	<0.67
Pentachlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
Pentachlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
Phenacetin	<0.60	<0.62	<0.61	<0.67	<0.67
Phenanthrene	<0.60	<0.62	<0.61	<0.67	<0.67
Phenol	<0.60	<0.62	<0.61	<0.67	<0.67
2-Picoline	<0.60	<0.62	<0.61	<0.67	<0.67
Pronamide	<0.60	<0.62	<0.61	<0.67	<0.67
Pyrene	<0.60	<0.62	<0.61	<0.67	<0.67
Saffrole	<0.60	<0.62	<0.61	<0.67	<0.67
1,2,4,5-Tetrachlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
2,3,4,6-Tetrachlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
o-Toluidine	<3.0	<3.1	<3.0	<3.4	<3.3
1,2,4-Trichlorobenzene	<0.60	<0.62	<0.61	<0.67	<0.67
2,4,6-Trichlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
2,4,5-Trichlorophenol	<0.60	<0.62	<0.61	<0.67	<0.67
Benzoic Acid (TIC)	4NJ	2NJ	ND	ND	ND
Caprolactam (TIC)	7NJ	ND	ND	ND	ND
Pesticides/ PCBs (ug/kg)					
Aldrin	<5.96	<6.25	<5.93	<6.58	<6.58
a-BHC	<5.96	<6.25	<5.93	<6.58	<6.58
b-BHC	<5.96	<6.25	<5.93	<6.58	<6.58
d-BHC	<5.96	<6.25	<5.93	<6.58	<6.58
γ-BHC	<5.96	<6.25	<5.93	<6.58	<6.58
4,4'-DDD	<5.96	<6.25	<5.93	<6.58	<6.58
4,4'-DDE	<5.96	<6.25	<5.93	<6.58	<6.58
4,4'-DDT	<5.96	<6.25	<5.93	<6.58	<6.58
Dieldrin	<5.96	<6.25	<5.93	<6.58	<6.58
Endosulfan I	<5.96	<6.25	<5.93	<6.58	<6.58
Endosulfan II	<5.96	<6.25	<5.93	<6.58	<6.58
Endosulfan sulfate	<5.96	<6.25	<5.93	<6.58	<6.58
Endrin	<5.96	<6.25	<5.93	<6.58	<6.58
Endrin aldehyde	<5.96	<6.25	<5.93	<6.58	<6.58
Heptachlor	<5.96	<6.25	<5.93	<6.58	<6.58
Heptachlor epoxide	<5.96	<6.25	<5.93	<6.58	<6.58
Methoxychlor	<5.96	<6.25	<5.93	<6.58	<6.58
Mirex	<5.96	<6.25	<5.93	<6.58	<6.58
Hexachlorobenzene	<5.96	<6.25	<5.93	<6.58	<6.58
PCB-1016	<29.8	<31.2	<29.6	<32.9	<32.9
PCB-1221	<29.8	<31.2	<29.6	<32.9	<32.9
PCB-1232	<29.8	<31.2	<29.6	<32.9	<32.9
PCB-1242	<29.8	<31.2	<29.6	<32.9	<32.9
PCB-1248	<29.8	<31.2	<29.6	<32.9	<32.9
PCB-1254	<29.8	<31.2	<29.6	<32.9	<32.9
PCB-1260	<29.8	<31.2	<29.6	<32.9	<32.9

Appendix Table 7. Continued.

River Mile Sample Number Date Sampled Time Sampled	Sycamore Creek				
	6.47 24812 09/01/99 10:15 AM	5.74 24811 09/01/99 10:40 AM	5.1 24810 09/01/99 12:15 PM	0.8 24808 09/01/99 02:00 PM	0.8 24809 09/01/99 02:01 PM
Inorganic Analytes (mg/kg)				Dupl.A	Dupl.B
% Solids	64.6	66.4	63.1	60.4	59.5
Aluminum	4830	4480	7980	5290	5150
Arsenic	4.97	6.98	9.46	4.82	5.39
Barium	39.1	38.2	56.6	36.1	32.5
Beryllium	<2.54	<2.39	<2.60	<3.01	<2.67
Cadmium	0.208	0.182	0.358	0.283	0.251
Calcium	11200	16200	24400	31900	29300
Chromium	<15.2	<14.3	<15.6	<18.1	<16.0
Cobalt	<25.4	<23.9	<26.0	<30.1	<26.7
Copper	8.63	9.56	15.6	12	10.7
Iron	9550	12200	17300	11000	10300
Lead	<20.3	<19.1	<20.8	<24.1	<21.3
Magnesium	4060	6220	10900	10200	9600
Manganese	160	271	323	178	166
Nickel	<20.3	<19.1	<20.8	<24.1	<21.3
Potassium	1020	<956	1040	1200	1070
Selenium	<2.54	<2.39	<2.60	<3.01	<2.67
Sodium	<2540	<2390	<2600	<3010	<2670
Strontium	73.1	68.4	65.5	155	144
TOC	1.8	2.3	0.91	2.2	2.5
Titanium	29.9	<23.9	33.8	37.3	36.3
Vanadium	<25.4	<23.9	<26.0	<30.1	<26.7
Zinc	49.7	56.4	84.7	71	60.3
Mercury	<0.0340	NA	NA	<0.0344	<0.0367
Tin	<2.65	NA	NA	<2.68	<2.65
Particle Size					
Sand/Gravel (%)	6.5	7.9	15.2	72.3	72.8
Silt (%)	88.3	85.6	74.6	22.9	22.4
Clay (%)	5.2	6.5	10.2	4.8	4.8

J - The analyte was positively identified, the associated numerical value is estimated.

NA - Not analyzed.

UJ - The analyte was not detected above the sample quantitation limit. However, the reported QL is estimated.

R - Data are unusable because quality control criteria were not met.

ND - Not detected.

NJ - Analysis indicated the presence of an analyte that has been "tentatively identified" and the result is estimated.

Appendix Table 8. Results of sediment samples collected by Ohio EPA from the Sycamore Creek study area, December, 1999.

	Sycamore Creek							
Sample Number :	EKT09	EKT08	EKT01	EKT03 / EKT 07	EKT06	EKT05	EKT04	EKT02
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/kg)				Dupl.				
Dichlorodifluoromethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Chloromethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Vinyl Chloride	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Bromomethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Chloroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Trichlorofluoromethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,1-Dichloroethene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,1,2-Trichloro-1,2,2-trifluoroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Acetone	14 U	18 UJ	34 UJ	50 J / 65 J	48 UJ	43 UJ	32 UJ	24 UJ
Carbon Disulfide	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Methyl Acetate	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Methylene Chloride	15 U	18 U	17 U	16 U / 21 U	20 U	18 U	15 U	17 U
trans-1,2-Dichloroethene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
tert-Butyl Methyl Ether	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,1-Dichloroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
cis-1,2-Dichloroethene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
2-Butanone	10 J	18 U	14 J	18 / 32	16 J	10 J	15 U	17 U
Chloroform	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,1,1-Trichloroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Cyclohexane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Carbon Tetrachloride	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Benzene	14 U	18 U	17 U	16 U / 10 J	18 U	18 U	15 U	17 U
1,2-Dichloroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Trichloroethene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Methylcyclohexane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U

Appendix Table 8. Continued.

	Sycamore Creek							
Sample Number :	EKT09	EKT08	EKT01	EKT03 / EKT07	EKT06	EKT05	EKT04	EKT02
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/kg)				Dupl.				
1,2-Dichloropropane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Bromodichloromethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
cis-1,3-Dichloropropene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
4-Methyl-2-pentanone	14 U	18	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Toluene	14 U	2 J	6 J	2 J / 30 J	5 J	18 U	15 U	17 U
trans-1,3-Dichloropropene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,1,2-Trichloroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Tetrachloroethene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
2-Hexanone	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Dibromochloromethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,2-Dibromoethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Chlorobenzene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Ethylbenzene	14 U	18 U	2 J	16 U / 2 J	18 U	18 U	15 U	17 U
Xylenes (total)	14 U	18 U	5 J	16 U / 16 U	18 U	18 U	15 U	17 U
Styrene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Bromoform	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
Isopropylbenzene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,1,2,2-Tetrachloroethane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,3-Dichlorobenzene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,4-Dichlorobenzene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,2-Dichlorobenzene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,2-Dibromo-3-chloropropane	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U
1,2,4-Trichlorobenzene	14 U	18 U	17 U	16 U / 16 U	18 U	18 U	15 U	17 U

Appendix Table 8. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT13	EKT12 / EKT 10	EKT11	EKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/kg)				
		Dupl.		
Dichlorodifluoromethane	21 U	16 U / 16 U	14 U	11 U
Chloromethane	3 J	16 U / 16 U	14 U	11 U
Vinyl Chloride	21 U	16 U / 16 U	14 U	11 U
Bromomethane	21 U	16 U / 16 U	14 U	11 U
Chloroethane	21 U	16 U / 16 U	14 U	11 U
Trichlorofluoromethane	21 U	16 U / 16 U	14 U	11 U
1,1-Dichloroethene	21 U	16 U / 16 U	14 U	11 U
1,1,2-Trichloro-1,2,2-trifluoroethane	21 U	16 U / 16 U	14 U	11 U
Acetone	21 UJ	25 UJ / 19 UJ	30 UJ	28 UJ
Carbon Disulfide	21 U	16 U / 16 U	14 U	11 U
Methyl Acetate	5 J	16 U / 16 U	14 U	11 U
Methylene Chloride	26 U	16 U / 16 U	14 U	11 U
trans-1,2-Dichloroethene	21 U	16 U / 16 U	14 U	11 U
tert-Butyl Methyl Ether	21 U	16 U / 16 U	14 U	11 U
1,1-Dichloroethane	21 U	16 U / 16 U	14 U	11 U
cis-1,2-Dichloroethene	21 U	16 U / 16 U	14 U	11 U
2-Butanone	27	9 J / 7 J	12 J	13 U
Chloroform	21 U	16 U / 16 U	14 U	11 U
1,1,1-Trichloroethane	21 U	16 U / 16 U	14 U	11 U
Cyclohexane	21 U	16 U / 16 U	14 U	11 U
Carbon Tetrachloride	21 U	16 U / 16 U	14 U	11 U
Benzene	21 U	16 U / 16 U	14 U	11 U
1,2-Dichloroethane	21 U	16 U / 16 U	14 U	11 U
Trichloroethene	21 U	16 U / 16 U	14 U	11 U
Methylcyclohexane	21 U	16 U / 16 U	14 U	11 U

Appendix Table 8. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT13	EKT12 / EKT 10	EKT11	EKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
VOLATILE ORGANIC COMPOUNDS (ug/kg)				
		Dupl.		
1,2-Dichloropropane	21 U	16 U / 16 U	14 U	11 U
Bromodichloromethane	21 U	16 U / 16 U	14 U	11 U
cis-1,3-Dichloropropene	21 U	16 U / 16 U	14 U	11 U
4-Methyl-2-pentanone	21 U	16 U / 16 U	14 U	11 U
Toluene	28 J	16 U / 16 U	14 U	4 J
trans-1,3-Dichloropropene	21 U	16 U / 16 U	14 U	11 U
1,1,2-Trichloroethane	21 U	16 U / 16 U	14 U	11 U
Tetrachloroethene	21 U	16 U / 16 U	14 U	11 U
2-Hexanone	21 U	16 U / 16 U	14 U	11 U
Dibromochloromethane	21 U	16 U / 16 U	14 U	11 U
1,2-Dibromoethane	21 U	16 U / 16 U	14 U	11 U
Chlorobenzene	21 U	16 U / 16 U	14 U	11 U
Ethylbenzene	21 U	16 U / 16 U	14 U	11 U
Xylenes (total)	21 U	16 U / 16 U	14 U	11 U
Styrene	21 U	16 U / 16 U	14 U	11 U
Bromoform	21 U	16 U / 16 U	14 U	11 U
Isopropylbenzene	21 U	16 U / 16 U	14 U	11 U
1,1,2,2-Tetrachloroethane	21 U	16 U / 16 U	14 U	11 U
1,3-Dichlorobenzene	21 U	16 U / 16 U	14 U	11 U
1,4-Dichlorobenzene	21 U	16 U / 16 U	14 U	11 U
1,2-Dichlorobenzene	21 U	16 U / 16 U	14 U	11 U
1,2-Dibromo-3-chloropropane	21 U	16 U / 16 U	14 U	11 U
1,2,4-Trichlorobenzene	21 U	16 U / 16 U	14 U	11 U

Appendix Table 8. Continued.

	Sycamore Creek								
Sample Number :	EKT09	EKT08	EKT01	EKT03 / EKT07		EKT06	EKT05	EKT04	EKT02
Sampling Location/ River Mile	RM 9.13	RM 7.32	RM 6.85	RM 6.37		RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999		11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				Dupl.					
Benzaldehyde	460 U	70 J	550 U	520 U /	56 J	600 U	600 U	500 U	570 U
Phenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
bis-(2-Chloroethyl) ether	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2-Chlorophenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2-Methylphenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2,2'-oxybis(1-Chloropropane)	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Acetophenone	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
4-Methylphenol	460 U	390 J	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
N-Nitroso-di-n-propylamine	460 UJ	600 UJ	550 UJ	520 UJ/	520 UJ	600 UJ	600 UJ	500 UJ	570 UJ
Hexachloroethane	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Nitrobenzene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Isophorone	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2-Nitrophenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2,4-Dimethylphenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
bis(2-Chloroethoxy)methane	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2,4-Dichlorophenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Naphthalene	460 U	600 U	550 U	220 J /	210 J	600 U	600 U	500 U	570 U
4-Chloroaniline	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Hexachlorobutadiene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Caprolactam	460 U	29000	4600	1200 /	1100	600 U	83 J	500 U	570 U
4-Chloro-3-methylphenol	460 UJ	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2-Methylnaphthalene	460 U	600 U	550 U	240 J /	190 J	600 U	600 U	500 U	570 U
Hexachlorocyclopentadiene	460 UJ	600 UJ	550 UJ	520 UJ/	520 UJ	600 UJ	600 UJ	500 UJ	570 UJ
2,4,6-Trichlorophenol	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2,4,5-Trichlorophenol	1200 U	1500 U	1400 U	1300 U /	1300 U	1500 U	1500 U	1300 U	1400 U
1,1'-Biphenyl	460 U	600 U	550 U	130 J /	95 J	600 U	600 U	500 U	570 U
2-Chloronaphthalene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2-Nitroaniline	1200 U	1500 U	1400 U	1300 U /	1300 U	1500 U	1500 U	1300 U	1400 U
Dimethylphthalate	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2,6-Dinitrotoluene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Acenaphthylene	460 U	600 U	550 U	75 J /	520 U	600 U	600 U	500 U	570 U
3-Nitroaniline	1200 U	1500 U	1400 U	1300 U /	1300 U	1500 U	600 U	1300 U	1400 U
Acenaphthene	460 U	600 U	550 U	83 J /	58 J	600 U	600 U	500 U	570 U

Appendix Table 8. Continued.

	Sycamore Creek								
Sample Number :	EKT09	EKT08	EKT01	EKT03 / EKT07		EKT06	EKT05	EKT04	EKT02
Sampling Location/ River Mile	RM 9.13	RM 7.32	RM 6.85	RM 6.37		RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999		11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				Dupl.					
2,4-Dinitrophenol	1200 UJ	1500 UJ	1400 UJ	1300 UJ/	1300 UJ	1500 UJ	1500 UJ	1300 UJ	1400 UJ
4-Nitrophenol	1200 U	1500 U	1400 U	1300 U /	1300 U	1500 U	1500 U	1300 U	1400 U
Dibenzofuran	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
2,4-Dinitrotoluene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Diethylphthalate	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Fluorene	460 U	600 U	550 U	100 J /	68 J	600 U	600 U	500 U	570 U
4-Chlorophenyl-phenyl ether	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
4-Nitroaniline	1200 U	1500 U	1400 U	1300 U /	1300 U	1500 U	1500 U	1300 U	1400 U
4,6-Dinitro-2-methylphenol	1200 UJ	1500 UJ	1400 UJ	1300 UJ/	1300 UJ	1500 UJ	1500 UJ	1300 UJ	1400 UJ
N-Nitrosodiphenylamine	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
4-Bromophenyl-phenylether	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Hexachlorobenzene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Atrazine	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Pentachlorophenol	1200 U	1500 U	1400 U	1300 U /	1300 U	1500 U	1500 U	1300 U	1400 U
Phenanthrene	460 U	600 U	550 U	180 J /	140 J	600 U	85 J	89 J	570 U
Anthracene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Carbazole	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Di-n-butylphthalate	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Fluoranthene	51 J	600 U	550 U	77 J /	71 J	600 U	130 J	150 J	64 J
Pyrene	460 U	600 U	550 U	120 J /	97 J	600 U	99 J	120 J	570 U
Butylbenzylphthalate	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
3,3'-Dichlorobenzidine	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Benzo(a)anthracene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	57 J	570 U
Chrysene	460 U	600 U	550 U	59 J /	520 U	600 U	600 U	77 J	570 U
bis(2-Ethylhexyl)phthalate	270 J	96 J	540 J	1300 /	88 J	160 J	600 U	180 J	69 J
Di-n-octylphthalate	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Benzo(b)fluoranthene	460 U	600 U	550 U	520 U /	520 U	600 U	71 J	100 J	570 U
Benzo(k)fluoranthene	460 U	600 U	550 U	520 U /	520 U	600 U	69 J	98 J	570 U
Benzo(a)pyrene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	67 J	570 U
Indeno(1,2,3-cd)pyrene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Dibenzo(a,h)anthracene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U
Benzo(g,h,i)perylene	460 U	600 U	550 U	520 U /	520 U	600 U	600 U	500 U	570 U

Appendix Table 8. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT13	EKT12 / EKT 10	EKT11	EKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				
			Dupl.	
Benzaldehyde	690 UJ	540 UJ /	530 U	380 UJ
Phenol	690 U	540 U /	530 U	380 U
bis-(2-Chloroethyl) ether	690 U	540 U /	530 U	380 U
2-Chlorophenol	690 U	540 U /	530 U	380 U
2-Methylphenol	690 U	540 U /	530 U	380 U
2,2'-oxybis(1-Chloropropane)	690 U	540 U /	530 U	380 U
Acetophenone	690 U	540 U /	530 U	380 U
4-Methylphenol	690 U	540 U /	530 U	190 J
N-Nitroso-di-n-propylamine	690 UJ	540 UJ /	530 UJ	380 UJ
Hexachloroethane	690 U	540 U /	530 U	380 U
Nitrobenzene	690 U	540 U /	530 U	380 U
Isophorone	690 U	540 U /	530 U	380 U
2-Nitrophenol	690 U	540 U /	530 U	380 U
2,4-Dimethylphenol	690 U	540 U /	530 U	380 U
bis(2-Chloroethoxy)methane	690 U	540 U /	530 U	380 U
2,4-Dichlorophenol	690 U	540 U /	530 U	380 U
Naphthalene	690 U	540 U /	530 U	380 U
4-Chloroaniline	690 U	540 U /	530 U	380 U
Hexachlorobutadiene	690 U	540 U /	530 U	380 U
Caprolactam	690 U	540 U /	530 U	380 U
4-Chloro-3-methylphenol	690 U	540 U /	530 U	380 U
2-Methylnaphthalene	690 U	540 U /	530 U	380 U
Hexachlorocyclopentadiene	690 U	540 U /	530 UJ	380 U
2,4,6-Trichlorophenol	690 U	540 U /	530 U	380 U
2,4,5-Trichlorophenol	1700 U	1400 U /	1300 U	950 U
1,1'-Biphenyl	690 U	540 U /	530 U	380 U
2-Chloronaphthalene	690 U	540 U /	530 U	380 U
2-Nitroaniline	1700 U	1400 U /	1300 U	950 U
Dimethylphthalate	690 U	540 U /	530 U	380 U
2,6-Dinitrotoluene	690 U	540 U /	530 U	380 U
Acenaphthylene	690 U	540 U /	530 U	380 U
3-Nitroaniline	1700 U	1400 U /	1300 U	950 U
Acenaphthene	690 U	540 U /	530 U	380 U

Appendix Table 8. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT13	EKT12 / EKT 10	EKT11	EKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg)				
		Dupl.		
2,4-Dinitrophenol	1700 U	1400 U / 1300 UJ	1200 UJ	950 U
4-Nitrophenol	1700 U	1400 U / 1300 U	1200 U	950 U
Dibenzofuran	690 U	540 U / 530 U	460 U	380 U
2,4-Dinitrotoluene	690 U	540 U / 530 U	460 U	380 U
Diethylphthalate	690 U	540 U / 530 U	460 U	380 U
Fluorene	690 U	540 U / 530 U	460 U	380 U
4-Chlorophenyl-phenyl ether	690 U	540 U / 530 U	460 U	380 U
4-Nitroaniline	1700 U	1400 U / 1300 U	1200 U	950 U
4,6-Dinitro-2-methylphenol	1700 U	1400 U / 1300 UJ	1200 UJ	950 U
N-Nitrosodiphenylamine	690 U	540 U / 530 U	460 U	380 U
4-Bromophenyl-phenylether	690 U	540 U / 530 U	460 U	380 U
Hexachlorobenzene	690 U	540 U / 530 U	460 U	380 U
Atrazine	690 U	540 U / 530 U	460 U	380 U
Pentachlorophenol	1700 U	1400 U / 1300 U	1200 U	950 U
Phenanthrene	690 U	540 U / 530 U	460 U	380 U
Anthracene	690 U	540 U / 530 U	460 U	380 U
Carbazole	690 U	540 U / 530 U	460 U	380 U
Di-n-butylphthalate	690 U	540 U / 530 U	460 U	380 U
Fluoranthene	88 J	540 U / 530 U	460 U	380 U
Pyrene	87 J	540 U / 530 U	460 U	380 U
Butylbenzylphthalate	690 U	540 U / 530 U	460 U	380 U
3,3'-Dichlorobenzidine	690 U	540 U / 530 U	460 U	380 U
Benzo(a)anthracene	690 U	540 U / 530 U	460 U	380 U
Chrysene	690 U	540 U / 530 U	460 U	380 U
bis(2-Ethylhexyl)phthalate	390 J	540 U / 65 J	210 J	380 U
Di-n-octylphthalate	690 U	540 U / 530 U	460 U	380 U
Benzo(b)fluoranthene	690 U	540 U / 530 U	460 U	380 U
Benzo(k)fluoranthene	690 U	540 U / 530 U	460 U	380 U
Benzo(a)pyrene	690 U	540 U / 530 U	460 U	380 U
Indeno(1,2,3-cd)pyrene	690 U	540 U / 530 U	460 U	380 U
Dibenzo(a,h)anthracene	690 U	540 U / 530 U	460 U	380 U
Benzo(g,h,i)perylene	690 U	540 U / 530 U	460 U	380 U

Appendix Table 8. Continued.

Sycamore Creek								
Sample Number :	EKT09	EKT08	EKT01	EKT03 / EKT 07	EKT06	EKT05	EKT04	EKT02
Sampling Location/ River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999
PESTICIDES/PCBS COMPOUNDS (ug/kg)				Dupl.				
alpha-BHC	2.4 U	3.10 UJ	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 UJ
beta-BHC	2.4 U	3.4 J	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	3.1 J
delta-BHC	2.4 U	3.1 UJ	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 UJ
gamma-BHC (Lindane)	2.4 U	3.1 UJ	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 UJ
Heptachlor	2.4 R	3.1 U	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 U
Aldrin	0.63 J	3.1 U	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 U
Heptachlor epoxide	2.4 U	3.1 U	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 U
Endosulfan I	2.4 U	3.1 U	2.8 U	2.7 U / 0.29 J	3.1 U	3.1 U	2.6 U	2.9 U
Dieldrin	4.7 U	2.3 J	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	1.3 J	5.7 U
4,4'-DDE	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	0.65 J	5.7 U
Endrin	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	5.7 U
Endosulfan II	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	5.7 U
4,4'-DDD	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	5.7 U
Endosulfan sulfate	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	5.7 U
4,4'-DDT	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	1.5 J
Methoxychlor	24 U	3.1 U	28 U	27 U / 27 U	31 U	31 U	26 U	29 U
Endrin ketone	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	5.7 U
Endrin aldehyde	4.7 U	6.0 U	5.5 U	5.2 U / 5.2 U	6.0 U	6.0 U	5.0 U	5.7 U
alpha-Chlordane	2.4 U	3.1 U	2.8 U	2.7 U / 2.7 U	3.1 U	0.89 J	2.6 U	2.9 U
gamma-Chlordane	2.4 U	3.1 U	2.8 U	2.7 U / 2.7 U	3.1 U	3.1 U	2.6 U	2.9 U
Toxaphene	240 U	310 U	280 U	270 U / 270	310 U	310 U	260 U	290 U
Aroclor-1016	46 U	60 U	55 U	52 U / 52 U	60 U	60 U	50 U	57 U
Aroclor-1221	94 U	120 U	110 U	100 U / 100 U	120 U	120 U	100 U	120 U
Aroclor-1232	46 U	60 U	55 U	52 U / 52 U	60 U	60 U	50 U	57 U
Aroclor-1242	46 U	60 U	55 U	52 U / 52 U	60 U	60 U	50 U	57 U
Aroclor-1248	46 U	60 U	55 U	52 U / 52 U	60 U	60 U	50 U	57 U
Aroclor-1254	46 U	60 U	55 U	52 U / 52 U	60 U	60 U	50 U	57 U
Aroclor-1260	46 U	60 U	55 U	52 U / 52 U	60 U	60 U	50 U	57 U

Appendix Table 8. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	EKT13	EKT12 / EKT 10	EKT11	EKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
PESTICIDES/PCBS COMPOUNDS (ug/kg)				
		Dupl.		
alpha-BHC	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
beta-BHC	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
delta-BHC	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
gamma-BHC (Lindane)	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
Heptachlor	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
Aldrin	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
Heptachlor epoxide	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
Endosulfan I	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
Dieldrin	1.5 J	1.9 J / 5.4 U	0.31 J	1.5 J
4,4'-DDE	6.9 U	0.63 J / 5.4 U	4.7 U	3.8 U
Endrin	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
Endosulfan II	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
4,4'-DDD	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
Endosulfan sulfate	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
4,4'-DDT	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
Methoxychlor	35 U	27 U / 28 U	24 U	20 U
Endrin ketone	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
Endrin aldehyde	6.9 U	5.3 U / 5.4 U	4.7 U	3.8 U
alpha-Chlordane	6.9 U	0.50 J / 2.8 U	2.4 U	2.0 U
gamma-Chlordane	3.5 U	2.7 U / 2.8 U	2.4 U	2.0 U
Toxaphene	350 U	270 U / 280 U	240 U	200 U
Aroclor-1016	69 U	53 U / 54 U	46 U	38 U
Aroclor-1221	140 U	110 U / 110 U	94 U	77 U
Aroclor-1232	69 U	53 U / 54 U	46 U	38 U
Aroclor-1242	69 U	53 U / 54 U	46 U	38 U
Aroclor-1248	69 U	53 U / 54 U	46 U	38 U
Aroclor-1254	69 U	53 U / 54 U	46 U	38 U
Aroclor-1260	69 U	53 U / 54 U	46 U	38 U

Appendix Table 8. Continued.

	Sycamore Creek							
Sample Number :	MEKT09	MEKT08	MEKT01	MEKT03 / MEKT 07	MEKT06	MEKT05	EKT04	MEKT02
Sampling Location/River Mile :	RM 9.13	RM 7.32	RM 6.85	RM 6.37	RM 5.02	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/99	11/03/1999	11/03/1999	11/03/1999	11/03/1999
ANALYTE COMPOUNDS (mg/kg)				Dupl.				
Aluminum	5140	5540	10800	3890 / 4450	8860	3920	2710	4070
Antimony	1.3 UJ	1.0 UJ	1.0 UJ	0.89 UJ / 0.98 UJ	1.1 UJ	0.98 UJ	0.88 UJ	1.0 UJ
Arsenic	11.9	6.3	8.1	6.0 / 6.1	12.1	5.4	5.7	6.3
Barium	56.5	65.3	96.2	47.4 / 55.5	80.8	42.8	34.9	39.9
Beryllium	0.60	0.47	0.61	0.43 / 0.39	0.57	0.33 U	0.29 U	0.34
Cadmium	1.4 J	1.0 J	1.2 J	0.80 J / 0.85 J	1.2 J	0.76 J	0.80 J	0.81 J
Calcium	32200 J	11400 J	8550 J	10700 J / 11600 J	33500 J	35700 J	46600 J	49300 J
Chromium	9.4	9.2	14.5	6.6 / 7.5	13.4	6.6	5.1	6.7
Cobalt	7.7	9.1	10.4	5.8 / 7.6	10.8	5.6	4.5	5.8
Copper	21.8	19.0	20.7	13.3 / 15.5	27.7	14.1	11.6	15.9
Iron	24000	16800	21500	11600 / 13900	25900	12100	10600	13700
Lead	16.6	11.4	17.4	9.6 / 11.0	16.3	10.6	9.5	10.2
Magnesium	8350 J	6320 J	5210 J	4710 J / 5670 J	14900 J	12100 J	14500 J	23500 J
Manganese	313 J	250 J	522 J	247 J / 240 J	416 J	179 J	201 J	198 J
Mercury	0.18 U	0.17 U	0.13 U	0.15 U / 0.15 U	0.14 U	0.14 U	0.14 U	0.16 U
Nickel	19.7	21.7	15.5	12.0 / 17.4	28.7	13.7	12	15.5
Potassium	559	476	550	411 / 476	886	520	411	550
Selenium	1.3 U	1.4	1.0 U	0.88 U / 0.98 U	1.1 U	0.98 U	0.88 U	1.0 U
Silver	0.87 U	0.69 U	0.66 U	0.58 U / 0.65 U	0.72 U	0.65 U	0.58 U	0.66 U
Sodium	511	520	478	426 / 379	474	523	426	478
Thallium	1.8 J	0.98 J	1.6 J	0.76 J / 1.6 J	1.5 J	1.3 J	0.76 J	1.6 J
Vanadium	15.2	13.9	10.0	7.6 / 11.1	18.5	9.6	7.6	10
Zinc	70.3 J	76.1 J	53.8 J	93.7 J / 58.7 J	98.4 J	46.9 J	93.7 J	53.8 J
Cyanide	0.50 J	0.29 J	0.17 UJ	0.28 J / 0.30 J	0.30 J	0.16 UJ	0.28 J	0.17 UJ
Total Organic Carbon	11,000	9,500	15,000	12,000 / 12,000	7,800	16,000	9,500	11,000
Percent Gravel	4.3	5.3	5.8	7.1 / 5.7	3.6	4.8	3.1	7.5
Percent Sand	44	28.1	31	31.9 / 36.6	1.8	34.6	53.8	32.4
Percent Silt/Clay	51.7	66.6	63.2	61 / 57.7	94.6	60.6	43.1	60.1

Appendix Table 8. Continued.

	Sandusky River			Kirby Tributary
Sample Number :	MEKT13	MEKT12 / MEKT 10	MEKT11	MEKT14
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01
Date Sampled :	11/03/1999	11/03/1999	11/03/1999	11/03/1999
ANALYTE COMPOUNDS (mg/kg)		Dupl.		
Aluminum	12600	3950 / 5000	6750	4250
Antimony	1.2 UJ	0.89 UJ / 1.1 UJ	0.852 UJ	1.2 UJ
Arsenic	11.9	9.0 / 7.0	7.0	7.4
Barium	75.2	41.1 / 50.8	44.1	32.1
Beryllium	0.66	0.34 / 0.41	0.45	0.38 U
Cadmium	1.5 J	0.89 J / 1.0 J	1.0 J	0.93 J
Calcium	26600 J	12500 J / 28400 J	18600 J	35500 J
Chromium	17.5	6.4 / 8.9	10.8	7.8
Cobalt	11.7	6.3 / 7.9	8.1	7.4
Copper	26.6	16.3 / 20.4	20.6	17.6
Iron	26900	15500 / 17200	18300	15900
Lead	17.2	9.6 / 13.0	10.7	11.5
Magnesium	10500 J	3830 J / 11200 J	10900 J	13200 J
Manganese	440 J	306 J / 293 J	254 J	296 J
Mercury	0.20 U	0.14 U / 0.18 U	0.14 U	0.15 U
Nickel	28.2	15.9 / 19.4	20.9	17.7
Potassium	2110	499 / 692	912	620
Selenium	1.6	1.2 / 1.1 U	0.82 U	1.4
Silver	0.78 U	0.59 U / 0.76 U	0.54 U	0.77 U
Sodium	590	315 / 527	381	521
Thallium	3.2 J	1.5 J / 2.0 J	1.9 J	1.5 J
Vanadium	25.7	10.0 / 13.0	17.4	11.9
Zinc	105 J	60 J / 68.6 J	76.4 J	61.7 J
Cyanide	0.30 J	0.17 J / 0.31 J	0.14 UJ	0.32 J
Total Organic Carbon	11,000	12,000 / 11,000	5,100	9,100
Percent Gravel	2.5	1.6 / 3.4	3.9	4
Percent Sand	16.3	48.4 / 45.5	28	23
Percent Silt/Clay	81.2	50 / 51.1	68.1	73

J - Value is estimated. The value is less than the CRQL but greater than zero

U - Compound was analyzed for but not detected.

UJ - Material not detected. Associated value is an estimate and may be inaccurate or imprecise.

R - Data are unusable.

Appendix Table 9. Results of effluent discharged from the Kirby Tire site into Sycamore Creek at river mile 7.35 from August, 1999 to January, 2000.

System Effluent									
Sample Number	13146	13147	13148	13149	13150	13191	13192	13193	13194
Date Sampled	08/22/99	08/23/99	08/23/99	08/23/99	08/23/99	08/23/99	08/24/99	08/24/99	08/24/99
Time Sampled	10:10 PM	01:00 AM	03:37 AM	05:30 AM	07:30 AM	11:00 PM	01:00 AM	03:00 AM	05:00 AM
Volatile Organic Analytes (ug/l)									
Benzene	55	47	230	370	540	18	20	17	26
Ethylbenzene	<10	<10	<10	14	24	<5.0	<5.0	<5.0	<5.0
Toluene	<10	<10	50	92	160	<5.0	<5.0	<5.0	<5.0
Total xylene	<20	<20	<20	32	54	<10	<10	<10	<10
Semi-Volatile Organic Analytes (ug/l)									
Acenaphthene	26	21	37	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acenaphthylene	13	10	7.3	3.2	<2.0	40	<2.0	24	45
Anthracene	<2.0	4	4.2	18	23	<2.0	<2.0	<2.0	<2.0
Benzo(a)anthracene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Benzo(a)pyrene	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(b)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzo(ghi)perylene	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzo(k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chrysene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Dibenzo(a,h)anthracene	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Fluoranthene	<2.0	<2.0	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Fluorene	8.5	25	<3.0	7.3	12	<3.0	<3.0	<3.0	<3.0
Ideno(1,2,3-cd)pyrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene	93	100	160	53	650	180	150	96	46
Phenanthrene	<2.0	13	44	75	120	<2.0	7.5	<2.0	15
Pyrene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	9.8	11
Inorganic Analytes (ug/l)									
Arsenic	28	32	30	29	31	59	64	63	65
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BOD, 5 Day (mg/l)	720	600	120	>1300	1300	16	1500	430	290
Cadmium	1.4	2.5	1.4	1.2	1.2	0.8	0.8	0.8	0.8
Chromium	<20	<20	<20	<20	<20	<20	<20	<20	<20
COD (mg/l)	2170	1770	3840	8250	4630	3710	3520	3610	3030
Copper	78	71	140	110	130	180	170	180	180
Lead	15	29	14	26	14	14	13	17	20
Nickel	77	57	76	110	120	96	88	110	91
Sulfate (mg/l)	230	250	250	260	270	310	330	330	330
Sulfite (mg/l)	19.2	16	26.2	26.9	38.4	28.4	38.4	38.4	32
Zinc	1700	1600	1700	1700	1900	1700	1700	1700	1600

Appendix Table 9. Continued

System Effluent

Sample Number	13195	13256	13259	13269	13270	13271	13272	13273	13274
Date Sampled	08/24/99	08/24/99	08/24/99	08/24/99	08/24/99	08/25/99	08/25/99	05/25/99	08/25/99
Time Sampled	07:00 AM			06:00 PM	11:00 PM	01:00 AM	03:00 AM	05:00 AM	07:00 AM
Volatile Organic Analytes (ug/l)									
Benzene	30	62	100	130	270	200	290	330	210
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	5	<5.0	7.9	10	24
Toluene	<5.0	5	8.2	13	27	23	38	47	71
Total xylene	<10	13	14	16	20	19	22	25	50
Semi-Volatile Organic Analytes (ug/l)									
Acenaphthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acenaphthylene	42	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Anthracene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	44	<2.0
Benzo(a)anthracene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Benzo(a)pyrene	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(b)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzo(ghi)perylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzo(k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chrysene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Dibenzo(a,h)anthracene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Fluorene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Ideno(1,2,3-cd)pyrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	70	170
Naphthalene	78	51	380	91	220	250	590	630	510
Phenanthrene	<2.0	<2.0	<2.0	44	56	61	51	60	150
Pyrene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Inorganic Analytes (ug/l)									
Arsenic	53	42	44	45	45	43	42	42	40
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3
BOD, 5 Day (mg/l)	510	520	75	52	490	240	310	NA	120
Cadmium	0.7	0.7	0.8	0.7	0.7	0.6	0.5	0.5	0.7
Chromium	<20	<20	<20	<20	<20	<20	<20	<20	<20
COD (mg/l)	3760	4700	4790	5780	6320	6240	6540	6300	6810
Copper	190	220	240	270	280	300	350	330	420
Lead	16	11	13	14	13	13	13	13	15
Nickel	120	150	150	180	190	190	190	190	210
Sulfate (mg/l)	270	290	310	230	250	230	250	NA	240
Sulfite (mg/l)	38.4	44.8	38.4	44.8	51.2	38.4	44.8	NA	38.4
Zinc	1600	2000	2100	2200	2200	2100	2100	2200	2300

Appendix Table 9. Continued

System Effluent									
Sample Number	13275	13276	13356	13357	13358	13361	13362	13363	13364
Date Sampled	08/25/99	08/25/99	08/25/99	08/25/99	08/25/99	08/25/99	08/25/99	08/26/99	08/26/99
Time Sampled	09:00 AM	09:00 AM	11:00 AM	01:00 PM	03:00 PM	05:00 PM	04:15 AM	06:00 AM	08:00 AM
Volatile Organic Analytes (ug/l)									
Acetone	NA	NA	17000	16000	16000	17000	16000	16000	16000
Benzene	380	360	330	450	520	440	620	670	660
Ethylbenzene	43	41	35	47	43	32	34	35	35
Toluene	150	150	120	180	180	130	150	150	170
Total xylene	84	81	77	97	92	71	66	61	67
Semi-Volatile Organic Analytes (ug/l)									
Acenaphthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA	<2.0
Acenaphthylene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA	<2.0
Anthracene	<2.0	72	<2.0	<2.0	<2.0	42	NA	NA	<2.0
Benzo(a)anthracene	<3.0	97	<3.0	58	<3.0	<3.0	NA	NA	<3.0
Benzo(a)pyrene	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	NA	NA	<4.0
Benzo(b)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA	<2.0
Benzo(ghi)perylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA	<5.0
Benzo(k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA	<2.0
Chrysene	<3.0	<3.0	<3.0	33	<3.0	<3.0	NA	NA	<3.0
Dibenzo(a,h)anthracene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA	<5.0
Fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA	24
Fluorene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA	NA	<3.0
Ideno(1,2,3-cd)pyrene	<5.0	54	<5.0	<5.0	<5.0	<5.0	NA	NA	<5.0
Naphthalene	280	730	180	750	<2.0	<2.0	NA	NA	640
Phenanthrene	140	200	110	220	200	83	NA	NA	130
Pyrene	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA	NA	<3.0
Inorganic Analytes (ug/l)									
Arsenic	42	42	34	33	36	41	43	43	44
Beryllium	<3.0	<3.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BOD, 5 Day (mg/l)	NA	NA	NA	NA	>1000	NA	NA	NA	>2020
Cadmium	<0.5	<0.5	0.7	0.6	0.7	0.7	0.8	0.8	0.7
Chromium	<20	<20	<20	<20	<20	<20	<20	<20	<20
COD (mg/l)	7050	7090	7440	7710	7930	7910	8560	8650	8490
Copper	330	280	280	220	190	250	180	180	160
Lead	14	14	24	22	15	27	15	15	13
Nickel	190	170	160	140	150	160	140	130	120
Sulfate (mg/l)	NA	NA	NA	NA	330	NA	NA	NA	340
Sulfite (mg/l)	NA	NA	NA	NA	32	NA	NA	NA	38.4
Zinc	2600	2400	1900	2100	2600	2300	3100	3500	3200

Appendix Table 9. Continued

System Effluent									
Sample Number	13365	13518	13609	13697	13826	13901	14121	14123	14125
Date Sampled	08/26/99	08/26/99	08/30/99	08/31/99	09/01/99	09/02/99	09/09/99	09/09/99	09/08/99
Time Sampled	08:00 AM	12:00 PM	10:40 AM	02:00 PM	02:30 PM	02:25 PM	04:00 PM	04:00 PM	02:30 PM
Volatile Organic Analytes (ug/l)									
Acetone	16000	410	14000	4400	4800	4400	2600	2500	2900
Benzene	620	<5.0	<5.0	<5.0	20	110	13	13	9.6
Bromochloromethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	<25	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
chlorobenzene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Trans-1,4-dichloro-2-butene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
Cis-1,2-Dichloroethene	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
Trans-1,2-Dichloroethene	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Cis-1,3-Dichloropropene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Trans-1,3-Dichloropropene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Ethylbenzene	29	<5.0	<5.0	8.5	<20	13	6.9	8.7	11
2-Hexanone	NA	NA	<50	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	NA	NA	3100	NA	NA	NA	NA	NA	NA
Methyl iodide	NA	NA	<50	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone(MIBK)	NA	NA	950	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Toluene	150	<5.0	<5.0	<5.0	<20	<10	<5.0	<20	<5.0
1,1,1-Trichloroethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	<2.5	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	<50	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	<5.0	NA	NA	NA	NA	NA	NA
Total xylene	57	<10	<10	11	<40	<20	9.2	12	15

Appendix Table 9. Continued

System Effluent									
Sample Number	13365	13518	13609	13697	13826	13901	14121	14123	14125
Date Sampled	08/26/99	08/26/99	08/30/99	08/31/99	09/01/99	09/02/99	09/09/99	09/09/99	09/08/99
Time Sampled	08:00 AM	12:00 PM	10:40 AM	02:00 PM	02:30 PM	02:25 PM	04:00 PM	04:00 PM	02:30 PM
Semi-Volatile Organic Analytes (ug/l)									
Acenaphthene	<2.0	<2.0	NA	<20	<20	<2000	<20	<20	<20
Acenaphthylene	<2.0	<2.0	NA	<20	<20	<2000	<20	<20	<20
Anthracene	<2.0	<2.0	NA	<20	<20	<2000	<20	<20	<20
Benzo(a)anthracene	<3.0	11	NA	<30	<30	<3000	<30	<30	<30
Benzo(a)pyrene	<4.0	23	NA	<40	<40	<4000	<40	<40	<40
Benzo(b)fluoranthene	<2.0	<2.0	NA	<40	<40	<4000	<40	<40	<40
Benzo(ghi)perylene	<5.0	<5.0	NA	<50	<50	<5000	<50	<50	<50
Benzo(k)fluoranthene	<2.0	<2.0	NA	<40	<40	<4000	<40	<40	<40
Chrysene	<3.0	<3.0	NA	<30	<30	<3000	<30	<30	<30
Dibenzo(a,h)anthracene	<5.0	<5.0	NA	<50	<50	<5000	<50	<50	<50
Dibenzofuran	NA	NA	NA	<20	<20	<2000	<20	<20	<20
Fluoranthene	<2.0	18	NA	<20	<20	<2000	<20	<20	<20
Fluorene	<3.0	<3.0	NA	<30	<30	NA	<30	<30	<30
Ideno(1,2,3-cd)pyrene	<5.0	<5.0	NA	<50	<50	NA	<50	<50	<50
2-methylnaphthalene	NA	NA	NA	<20	<20	NA	<20	<20	<20
Naphthalene	830	<2.0	NA	<20	<20	NA	<20	<20	<20
Phenanthrene	170	<2.0	NA	<20	<20	NA	<20	<20	<20
Pyrene	<3.0	<3.0	NA	<30	<30	NA	<30	<30	<30
Inorganic Analytes (ug/l)									
Arsenic	40	76	NA	75	50	50	25	27	34
Beryllium	<0.5	<0.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BOD, 5 Day (mg/l)	>880	3700	NA	3300	2100	1200	350	1000	NA
Cadmium	0.7	1.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	<20	<20	NA	<20	<20	<20	<20	<20	<20
COD (mg/l)	8200	1340	NA	6070	7500	6650	3960	3780	4930
Copper	180	53	NA	120	81	65	47	45	87
Lead	12	16	NA	2.7	<2.0	<2.0	<2.0	<2.0	24
Nickel	140	27	NA	120	89	71	24	<20	36
Sulfate (mg/l)	330	420	NA	500	1100	510	430	400	NA
Sulfite (mg/l)	38.4	32	NA	32	25.6	23.6	16	10.2	NA
Zinc	3300	1300	NA	440	240	87	27	31	43

Appendix Table 9. Continued

System Effluent								
Sample Number	14838	15434	15788	16002	16631	16717	17288	17613
Date Sampled	09/17/99	09/28/99	10/01/99	10/06/99	10/12/99	10/12/99	10/19/99	10/22/99
Time Sampled	04:00 PM	02:50 PM	10:55 PM	10:20 PM	06:00 PM	08:50 AM	02:30 PM	01:00 PM
Semi-Volatile Organic Analytes (ug/l)								
Acenaphthene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acenaphthylene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Aniline	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzidine	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	<30	<30	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Benzo(a)pyrene	<40	<40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(b)fluoranthene	<40	<40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(ghi)perylene	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzo(k)fluoranthene	<40	<40	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Benzoic acid	NA	NA	NA	NA	NA	NA	1100	1100
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy) methane	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	<30	<30	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dibenzofuran	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-DSichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-o-cresol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Diphenylhydrazine	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Fluorene	<30	<30	<2.0	<3.0	<3.0	<3.0	<2.0	<2.0
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Ideno(1,2,3-cd)pyrene	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isophrone	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA

Appendix Table 9. Continued

System Effluent								
Sample Number	14838	15434	15788	16002	16631	16717	17288	17613
Date Sampled	09/17/99	09/28/99	10/01/99	10/06/99	10/12/99	10/12/99	10/19/99	10/22/99
Time Sampled	04:00 PM	02:50 PM	10:55 PM	10:20 PM	06:00 PM	08:50 AM	02:30 PM	01:00 PM
Semi-Volatile Organic Analytes (ug/l)								
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	<20	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Phenol	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	<30	<30	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Inorganic Analytes (ug/l)								
Arsenic	NA	27	11	6.7	NA	7.3	8.4	8.2
Beryllium	NA	<0.5	<0.5	<0.5	NA	<0.5	<0.5	<0.5
BOD, 5 Day (mg/l)	NA	1200	340	340	NA	140	<4.0	6
Chromium	NA	<20	<20	<20	NA	<20	<10	<20
COD (mg/l)	NA	2540	1480	1090	NA	623	73	34
Copper	NA	<10	<10	<10	NA	<10	<10	<10
Total cyanide (mg/l)	NA	0.122	0.092	0.019	NA	0.082	0.207	0.012
Lead	NA	<2.0	<2.0	<2.0	NA	<2.0	<2.0	<2.0
Nickel	NA	<20	<20	<20	NA	<20	<10	<20
Sulfate (mg/l)	NA	270	200	200	NA	160	220	150
Sulfite (mg/l)	NA	21.1	1.28	1.28	NA	1.28	0.64	0.64
Zinc	NA	23	<10	130	NA	41	19	30

Appendix Table 9. Continued

System Effluent									
Sample Number	17766	17878	18241	30171	18274	30176	18326	30404	18671
Date Sampled	10/25/99	10/27/99	11/02/99	11/03/99	11/03/99	11/02/99	11/03/99	11/03/99	11/09/99
Time Sampled	10:00 AM		03:30 PM	03:30 PM	02:00 PM	02:00 PM	01:30 PM	01:30 PM	04:00 PM
Volatile Organic Analytes (ug/l)									
Acetone	<25	58	36	NA	34	NA	48	NA	50
Benzene	<5.0	<5.0	<5.0	NA	<5.0	NA	<5.0	NA	<10
n-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	<25
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	<25
Bromochloromethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	<25	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	<5.0	NA	NA	NA	NA	NA	NA	NA	<10
2-Chlorotoluene	NA	NA	NA	NA	NA	NA	NA	NA	<25
Chloroethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Trans-1,4-dichloro-2-butene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
Cis-1,2-Dichloroethene	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
Trans-1,2-Dichloroethene	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Cis-1,3-Dichloropropene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Trans-1,3-Dichloropropene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	<5.0	<5.0	<5.0	NA	<5.0	NA	<5.0	NA	<10
2-Hexanone	<50	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	<10
p-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	NA	<10
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	<25
n-Propylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	<10
Methyl ethyl ketone	<50	<50	<50	NA	<5.0	NA	<5.0	NA	<100
Methyl iodide	<50	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone(MIBK)	<100	<100	NA	NA	<100	NA	NA	NA	<100
Methylene Chloride	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	<5.0	<5.0	<5.0	NA	<100	NA	<5.0	NA	<10
1,1,1,2-Tetrachloroethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	<5.0	<5.0	<5.0	NA	<5.0	NA	<5.0	NA	<10
1,1,1-Trichloroethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	<50	NA	NA	NA	NA	NA	NA	NA	NA

Appendix Table 9. Continued

System Effluent									
Sample Number	17766	17878	18241	30171	18274	30176	18326	30404	18671
Date Sampled	10/25/99	10/27/99	11/02/99	11/03/99	11/03/99	11/02/99	11/03/99	11/03/99	11/09/99
Time Sampled	10:00 AM		03:30 PM	03:30 PM	02:00 PM	02:00 PM	01:30 PM	01:30 PM	04:00 PM
Volatile Organic Analytes (ug/l)									
Vinyl chloride	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Total xylene	<10	<10	<10	NA	<10	NA	<10	NA	NA
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	<10
m&p Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	<10
1,2,4-Trimethylbenzene	NA	NA	<5.0	NA	NA	NA	<5.0	NA	<10
1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	<10
1,3-Butadiene	NA	NA	<5.0	NA	NA	NA	<10	NA	<25
Semi-Volatile Organic Analytes (ug/l)									
Acenaphthene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Acenaphthylene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Aniline	<4.0	NA	<4.0	NA	NA	NA	<4.0	NA	<4.0
Anthracene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Benzidine	<15	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	<3.0	NA	<3.0	NA	NA	NA	<3.0	NA	<3.0
Benzo(a)pyrene	<4.0	NA	<4.0	NA	NA	NA	<4.0	NA	<4.0
Benzo(b)fluoranthene	<4.0	NA	<4.0	NA	NA	NA	<4.0	NA	<4.0
Benzo(ghi)perylene	<5.0	NA	<5.0	NA	NA	NA	<5.0	NA	<5.0
Benzo(k)fluoranthene	<4.0	NA	<4.0	NA	NA	NA	<4.0	NA	<4.0
Benzoic acid	<10	46	26	NA	92	NA	420	NA	870
Benzyl alcohol	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	<3.0	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	<3.0	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy) methane	<2.0	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	<2.0	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	<2.0	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	<1.0	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	<5.0	NA	<5.0	NA	NA	NA	<50	NA	<50
4-Chlorophenyl phenyl ether	<2.0	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	<3.0	NA	<3.0	NA	NA	NA	<3.0	NA	<3.0
Di-n-butyl phthalate	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA	<1.0
Di-n-octyl phthalate	<1.0	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	<5.0	NA	<5.0	NA	NA	NA	<5.0	NA	<5.0
Dibenzofuran	<2.0	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
1,3-Dichlorobenzene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
1,4-Dichlorobenzene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
3,3'-Dichlorobenzidine	<15	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
Diethyl phthalate	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA	<1.0
Dimethyl phthalate	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA	<1.0
2,4-Dimethylphenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
4,6-Dinitro-o-cresol	<10	NA	<10	NA	NA	NA	<100	NA	<10
2,4-Dinitrophenol	<10	NA	<10	NA	NA	NA	<100	NA	<100
2,4-Dinitrotoluene	<4.0	NA	<4.0	NA	NA	NA	<4.0	NA	<4.0
2,6-Dinitrotoluene	<4.0	NA	<4.0	NA	NA	NA	<4.0	NA	<4.0
1,2-Diphenylhydrazine	<1.0	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Fluoranthene	<2.0	NA	<5.0	NA	NA	NA	<2.0	NA	<2.0
Fluorene	<3.0	NA	<3.0	NA	NA	NA	<3.0	NA	<3.0

Appendix Table 9. Continued

System Effluent									
Sample Number	17766	17878	18241	30171	18274	30176	18326	30404	18671
Date Sampled	10/25/99	10/27/99	11/02/99	11/03/99	11/02/99	11/02/99	11/03/99	11/03/99	11/09/99
Time Sampled	10:00 AM		03:30 PM	03:30 PM	02:00 PM	02:00 PM	01:30 PM	01:30 PM	04:00 PM
Semi-Volatile Organic Analytes (ug/l)									
Hexachlorobenzene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Hexachlorobutadiene	<3.0	NA	<3.0	NA	NA	NA	<3.0	NA	<3.0
Hexachlorocyclopentadiene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	<3.0	NA	<3.0	NA	NA	NA	<3.0	NA	<3.0
Ideno(1,2,3-cd)pyrene	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Isophrone	<1.0	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	<2.0	NA	NA	NA	NA	NA	NA	NA	<2.0
2-Methylphenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
4-Methylphenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
Naphthalene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
2-Nitroaniline	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	<5.0	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
2-Nitrophenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
4-Nitrophenol	<10	NA	<10	NA	NA	NA	<100	NA	<100
N-Nitrosodi-n-propylamine	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
N-Nitrosodimethylamine	<10	NA	<10	NA	NA	NA	<10	NA	<10
N-Nitrosodiphenylamine	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Pentachlorophenol	<10	NA	<10	NA	NA	NA	<100	NA	<100
Phenanthrene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
Phenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
Pyrene	<3.0	NA	<3.0	NA	NA	NA	<3.0	NA	<3.0
1,2,4-Trichlorobenzene	<2.0	NA	<2.0	NA	NA	NA	<2.0	NA	<2.0
2,4,5-Trichlorophenol	<3.0	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	<3.0	NA	<3.0	NA	NA	NA	<30	NA	<30
Chlorobenzene	NA	NA	0	NA	NA	NA	0	NA	NA
3-Methylphenol	NA	NA	0	NA	NA	NA	<30	NA	NA
Inorganic Analytes (ug/l)									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA
BOD, 5 Day (mg/l)	<4.0	6	NA	5	NA	7	NA	<4.0	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
COD (mg/l)	<20	31	NA	35	NA	42	NA	42	NA
Nitrogen,Ammonia, N	NA	NA	NA	10.6	NA	NA	NA	2.84	NA
Oil / Grease	NA	NA	NA	<5.0	NA	NA	NA	6	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total cyanide (mg/l)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	36	NA	NA	120	NA	NA	NA	150	NA
Sulfite (mg/l)	0.64	NA	NA	0.07	NA	NA	NA	<0.05	NA
Zinc	<10	NA	NA	14	NA	NA	NA	<10	NA

Appendix Table 9. Continued

System Effluent							
Sample Number	31274	18332	20170	33560	21047	35017	72
Date Sampled	11/09/99	11/03/99	12/07/99	12/07/99	12/20/99	12/22/99	01/04/00
Time Sampled	04:00 PM	02:00 PM	11:00 AM	11:00 AM	03:00 PM	03:00 PM	03:30 PM
Volatile Organic Analytes (ug/l)							
Acetone	NA	41	<25	NA	<25	NA	<25
Benzene	NA	<5.0	<5.0	NA	<5.0	NA	<5.0
n-Butylbenzene	NA	NA	<5.0	NA	NA	NA	NA
sec-Butylbenzene	NA	NA	<5.0	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	<5.0	NA	<5.0	NA	<5.0
2-Chlorotoluene	NA	NA	<5.0	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
Trans-1,4-dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
Cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
Trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA
Cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA
Trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	<5.0	<5.0	NA	<5.0	NA	<5.0
2-Hexanone	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	<5.0	NA	NA	NA	NA
p-Isopropyltoluene	NA	NA	<5.0	NA	NA	NA	NA
Naphthalene	NA	NA	<5.0	NA	NA	NA	<5.0
n-Propylbenzene	NA	NA	<5.0	NA	NA	NA	NA
Methyl ethyl ketone	NA	<50	<25	NA	<25	NA	<25
Methyl iodide	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone(MIBK)	NA	<100	<25	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	<5.0	<5.0	NA	<5.0	NA	<5.0
1,1,1,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	<5.0	<5.0	NA	<5.0	NA	<5.0
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA

Appendix Table 9. Continued

System Effluent							
Sample Number	31274	18332	20170	33560	21047	35017	72
Date Sampled	11/09/99	11/03/99	12/07/99	12/07/99	12/20/99	12/22/99	01/04/00
Time Sampled	04:00 PM	02:00 PM	11:00 AM	11:00 AM	03:00 PM	03:00 PM	03:30 PM
Volatile Organic Analytes (ug/l)							
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA
Total xylene	NA	<10	<10	NA	<10	NA	<10
o-Xylene	NA	NA	NA	NA	NA	NA	NA
m&p Xylenes	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA	NA	<5.0	NA	<5.0	NA	<5.0
1,3,5-Trimethylbenzene	NA	NA	<5.0	NA	NA	NA	NA
1,3-Butadiene	NA	NA	<5.0	NA	<5.0	NA	<5.0
Semi-Volatile Organic Analytes (ug/l)							
Acenaphthene	NA	NA	<2.0	NA	<2.0	NA	<2.0
Acenaphthylene	NA	NA	<2.0	NA	<2.0	NA	<2.0
Aniline	NA	NA	<4.0	NA	<4.0	NA	<4.0
Anthracene	NA	NA	<2.0	NA	<2.0	NA	<2.0
Benzidine	NA	NA	NA	NA	<15	NA	NA
Benzo(a)anthracene	NA	NA	<3.0	NA	<3.0	NA	<3.0
Benzo(a)pyrene	NA	NA	<4.0	NA	<4.0	NA	<4.0
Benzo(b)fluoranthene	NA	NA	<4.0	NA	<4.0	NA	<4.0
Benzo(ghi)perylene	NA	NA	<5.0	NA	<5.0	NA	<5.0
Benzo(k)fluoranthene	NA	NA	<4.0	NA	<4.0	NA	<4.0
Benzoic acid	NA	660	290	NA	<10	NA	<10
Benzyl alcohol	NA	NA	NA	NA	<5.0	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	<3.0	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	<5.0	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	<5.0	NA	NA
4-Chloroaniline	NA	NA	NA	NA	<3.0	NA	NA
Bis(2-chloroethoxy) methane	NA	NA	NA	NA	<2.0	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	<2.0	NA	NA
Bis(2-chloroisopropyl)ether	NA	NA	NA	NA	<2.0	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	<1.0	NA	NA
2-Chlorophenol	NA	NA	<10	NA	<5.0	NA	<5.0
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	<2.0	NA	NA
Chrysene	NA	NA	<3.0	NA	<3.0	NA	<3.0
Di-n-butyl phthalate	NA	NA	<1.0	NA	<1.0	NA	<1.0
Di-n-octyl phthalate	NA	NA	NA	NA	<1.0	NA	NA
Dibenzo(a,h)anthracene	NA	NA	<5.0	NA	<5.0	NA	<5.0
Dibenzofuran	NA	NA	NA	NA	<2.0	NA	NA
1,2-Dichlorobenzene	NA	NA	<2.0	NA	<2.0	NA	<2.0
1,3-Dichlorobenzene	NA	NA	<2.0	NA	<2.0	NA	<2.0
1,4-Dichlorobenzene	NA	NA	<2.0	NA	<2.0	NA	<2.0
3,3'-Dichlorobenzidine	NA	NA	NA	NA	<15	NA	NA
2,4-Dichlorophenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
Diethyl phthalate	NA	NA	<1.0	NA	<1.0	NA	<1.0
Dimethyl phthalate	NA	NA	<1.0	NA	<1.0	NA	<1.0
2,4-Dimethylphenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
4,6-Dinitro-o-cresol	NA	NA	<10	NA	<10	NA	<10
2,4-Dinitrophenol	NA	NA	<20	NA	<10	NA	<10
2,4-Dinitrotoluene	NA	NA	<4.0	NA	<4.0	NA	<4.0
2,6-Dinitrotoluene	NA	NA	<4.0	NA	<4.0	NA	<4.0
1,2-Diphenylhydrazine	NA	NA	NA	NA	<1.0	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	<2.0	NA	<2.0	NA	<2.0
Fluoranthene	NA	NA	<2.0	NA	<2.0	NA	<2.0
Fluorene	NA	NA	<3.0	NA	<3.0	NA	<3.0

Appendix Table 9. Continued

System Effluent							
Sample Number	31274	18332	20170	33560	21047	35017	72
Date Sampled	11/09/99	11/03/99	12/07/99	12/07/99	12/20/99	12/22/99	01/04/00
Time Sampled	04:00 PM	02:00 PM	11:00 AM	11:00 AM	03:00 PM	03:00 PM	03:30 PM
Semi-Volatile Organic Analytes (ug/l)							
Hexachlorobenzene	NA	NA	<2.0	NA	<2.0	NA	<2.0
Hexachlorobutadiene	NA	NA	<3.0	NA	<3.0	NA	<3.0
Hexachlorocyclopentadiene	NA	NA	NA	NA	<5.0	NA	NA
Hexachloroethane	NA	NA	<3.0	NA	<3.0	NA	<3.0
Ideno(1,2,3-cd)pyrene	NA	NA	NA	NA	<5.0	NA	NA
Isophrone	NA	NA	NA	NA	<1.0	NA	NA
2-Methylnaphthalene	NA	NA	<2.0	NA	<2.0	NA	NA
2-Methylphenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
4-Methylphenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
Naphthalene	NA	NA	<2.0	NA	<2.0	NA	<2.0
2-Nitroaniline	NA	NA	NA	NA	<5.0	NA	NA
3-Nitroaniline	NA	NA	NA	NA	<5.0	NA	NA
4-Nitroaniline	NA	NA	NA	NA	<5.0	NA	NA
Nitrobenzene	NA	NA	<2.0	NA	<2.0	NA	<2.0
2-Nitrophenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
4-Nitrophenol	NA	NA	<20	NA	<10	NA	<10
N-Nitrosodi-n-propylamine	NA	NA	<2.0	NA	<2.0	NA	<2.0
N-Nitrosodimethylamine	NA	NA	<10	NA	<10	NA	<10
N-Nitrosodiphenylamine	NA	NA	<2.0	NA	<2.0	NA	<2.0
Pentachlorophenol	NA	NA	<20	NA	<10	NA	<10
Phenanthrene	NA	NA	<2.0	NA	<2.0	NA	<2.0
Phenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
Pyrene	NA	NA	<3.0	NA	<3.0	NA	<3.0
1,2,4-Trichlorobenzene	NA	NA	<2.0	NA	<2.0	NA	<2.0
2,4,5-Trichlorophenol	NA	NA	NA	NA	<3.0	NA	NA
2,4,6-Trichlorophenol	NA	NA	<6.0	NA	<3.0	NA	<3.0
3-Methylphenol	NA	NA	NA	NA	NA	NA	0
Inorganic Analytes (ug/l)							
Arsenic	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA
BOD, 5 Day (mg/l)	16	<4.0	NA	<4.0	NA	<4.0	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
COD (mg/l)	58	<42	NA	25	NA	43	NA
Nitrogen,Ammonia, N	3.53	NA	NA	6.12	NA	4.59	NA
Oil / Grease	<5	NA	NA	NA	NA	<5.0	NA
Copper	NA	NA	NA	NA	NA	NA	NA
Total cyanide (mg/l)	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Phenols	NA	NA	NA	NA	NA	<0.01	NA
Sulfate (mg/l)	140	NA	NA	130	NA	110	NA
Sulfite (mg/l)	<0.05	NA	NA	<0.05	NA	<0.05	NA
Zinc	<10	NA	NA	<10	NA	<10	NA

Appendix Table 10. Results of surface water samples collected by Ohio EPA in Sycamore Creek during September and October, 1999

	Sycamore Creek				
SAMPLE NO.	KT-SW-U231	KT-SW-E231		KT-SW-103 Dam	KT-SW-103D
DATE SAMPLE COLLECTED	09/28/99	09/28/99		10/14/99	10/14/99
Sampling Location/ River Mile	7.34	7.34		5.1	5.1
		Duplicate			Duplicate
VOLATILE ORGANIC COMPOUNDS (ug/l)					
acetone	1900	2000		14 J	15 J
acetonitrile	ND	ND		ND	ND
acrolein	ND	ND		ND	ND
acrylonitrile	ND	ND		ND	ND
benzene	ND	ND		ND	ND
bromodichloromethane	ND	ND		ND	ND
bromoform	ND	ND		ND	ND
bromomethane	ND	ND		ND	ND
carbon disulfide	ND	ND		ND	ND
carbon tetrachloride	ND	ND		ND	ND
chlorobenzene	ND	ND		ND	ND
chloroprene	ND	ND		ND	ND
dibromochloromethane	ND	ND		ND	ND
1,2 dibromo-3-chloropropane	ND	ND		ND	ND
chloroethane	ND	ND		ND	ND
chloroform	ND	ND		ND	ND
chloromethane	ND	ND		ND	ND
allyl chloride	ND	ND		ND	ND
dibromomethane	ND	ND		ND	ND
trans-1,4-dichloro-2-butene	ND	ND		ND	ND
dichlorodifluoromethane	ND	ND		ND	ND
1,1 dichloroethane	ND	ND		ND	ND
1,2 dichloroethane	ND	ND		ND	ND
1,1 dichloroethene	ND	ND		ND	ND
trans-1,2 dichloroethene	ND	ND		ND	ND
1,2 dichloropropane	ND	ND		ND	ND
cis-1,3 dichloropropene	ND	ND		ND	ND
trans-1,3-dichloropropene	ND	ND		ND	ND
1,4 dioxane	ND	ND		48 J	ND
ethyl benzene	ND	ND		ND	ND
ethyl methacrylate	ND	ND		ND	ND
trichlorofluoromethane	ND	ND		ND	ND
2 hexanone	ND	ND		ND	ND
iodomethane	ND	ND		ND	ND

Appendix Table 10. Continued.

SAMPLE NO. DATE SAMPLE COLLECTED Sampling Location/ River Mile	Sycamore Creek				
	KT-SW-U231 09/28/99 7.34	KT-SW-E231 09/28/99 7.34 Duplicate		KT-SW-103 Dam 10/14/99 5.1	KT-SW-103D 10/14/99 5.1 Duplicate
VOLATILE ORGANIC COMPOUNDS (ug/l)					
isobutyl alcohol	ND	ND		ND	ND
p-isopropyltoluene	ND	ND		ND	ND
methacrylonitrile	ND	ND		ND	ND
methylene chloride	21 JB	22 JB		1.0 JB	2.4 JB
methyl methacrylate	ND	ND		ND	ND
naphthalene	ND	ND		ND	ND
prioponitrile	ND	ND		ND	ND
styrene	ND	ND		ND	ND
1,1,1,2 tetrachloroethane	ND	ND		ND	ND
1,1,2,2 tetrachloroethane	ND	ND		ND	ND
tetrachloroethene	ND	ND		ND	ND
toluene	ND	ND		ND	ND
1,1,1 trichloroethane	ND	ND		ND	ND
1,1,2 trichloroethane	ND	ND		ND	ND
trichloroethene	ND	ND		ND	ND
1,2,3 trichloropropane	ND	ND		ND	ND
vinyl acetate	ND	ND		ND	ND
xylenes (total)	ND	ND		ND	ND
1,2 dibromoethane (EDB)	ND	ND		ND	ND
2 butanone (MEK)	370 J	ND		ND	ND
4 methyl -2-pentanone (MIBK)	ND	ND		ND	ND
Tentatively Identified Compounds (ug/l)					
cyclopentanone	ND	ND		2.0 NJ	ND
1-ethyl-3-methylbenzene	ND	ND		ND	ND
1-ethyl-2-methylbenzene	ND	ND		ND	ND
1-methyl-4-(1-methyl)cyclohexene	ND	ND		ND	ND
1,2,3-trimethylbenzene	ND	ND		ND	ND
benzonitrile	ND	ND		ND	ND
indane	ND	ND		ND	ND
1-methyl-indan	ND	ND		ND	ND
1,2,4-trimethylbenzene	ND	ND		ND	ND
4-isopropyltoluene	ND	ND		ND	ND

Appendix Table 10. Continued.

SAMPLE NO. DATE SAMPLE COLLECTED Sampling Location/ River Mile	Sycamore Creek				
	KT-SW-U231	KT-SW-E231		KT-SW-103 Dam	KT-SW-103D
	09/28/99	09/28/99		10/14/99	10/14/99
	7.34	7.34 Duplicate		5.1	5.1 Duplicate
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)					
1,2,4,5-tetrachlorobenzene	ND	ND		ND	ND
1,2,4-trichlorobenzene	ND	ND		ND	ND
1,2-dichlorobenzene	ND	ND		ND	ND
1,3,5-trinitrobenzene	ND	ND		ND	ND
1,3-dichlorobenzene	ND	ND		ND	ND
1,3-dinitrobenzene	ND	ND		ND	ND
1,4-dichlorobenzene	ND	ND		ND	ND
1,4-naphthoquinone	ND	ND		ND	ND
1-naphthylamine	ND	ND		ND	ND
2,3,4,6-tetrachlorophenol	ND	ND		ND	ND
2,4,5-trichlorophenol	ND	ND		ND	ND
2,4,6-trichlorophenol	ND	ND		ND	ND
2,4-dichlorophenol	ND	ND		ND	ND
2,4-dimethylphenol	ND	ND		ND	ND
2,4- dinitrophenol	ND	ND		ND	ND
2,4-dinitrotoluene	ND	ND		ND	ND
2,6-dichlorophenol	ND	ND		ND	ND
2,6-dinitrotoluene	ND	ND		ND	ND
2-acetylaminofluorene	ND	ND		ND	ND
2-chloronapthalene	ND	ND		ND	ND
2-chlorophenol	ND	ND		ND	ND
o-toluidine	ND	ND		ND	ND
2-methylnapthalene	ND	ND		ND	ND
2-methylphenol	ND	ND		ND	ND
2-naphthylamine	ND	ND		ND	ND
2-nitroaniline	ND	ND		ND	ND
2-nitrophenol	ND	ND		ND	ND
2-picoline	ND	ND		ND	ND
3,3'-dichlorobenzidine	ND	ND		ND	ND
3,3'-dimethylbenzidine	ND	ND		ND	ND
3-methylcholanthrene	ND	ND		ND	ND
3-methylphenol	ND	ND		ND	ND
3-nitroaniline	ND	ND		ND	ND
4,6-dinitro 2-methylphenol	ND	ND		ND	ND
4-aminobiphenyl	ND	ND		ND	ND

Appendix Table 10. Continued.

SAMPLE NO. DATE SAMPLE COLLECTED Sampling Location/ River Mile	Sycamore Creek				
	KT-SW-U231	KT-SW-E231		KT-SW-103 Dam	KT-SW-103D
	09/28/99	09/28/99		10/14/99	10/14/99
	7.34	7.34 Duplicate		5.1	5.1 Duplicate
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)					
4-bromophenyl phenyl ether	ND	ND		ND	ND
4-chloro-3-methylphenol	ND	ND		ND	ND
4-chloroaniline	ND	ND		ND	ND
4-chlorophenyl phenyl ether	ND	ND		ND	ND
4-methylphenol	ND	ND		ND	ND
4-nitroaniline	ND	ND		ND	ND
4-nitrophenol	ND	ND		ND	ND
4-nitroquinoline-1-oxide	ND	ND		ND	ND
7,12-dimethylbenz(a)-anthracene	ND	ND		ND	ND
acenaphthene	ND	ND		ND	ND
acenaphthylene	ND	ND		ND	ND
acetophenone	ND	ND		ND	ND
a,a-dimethylphenethylamine	ND	ND		ND	ND
aniline	ND	ND		ND	ND
anthracene	ND	ND		ND	ND
aramite	ND	ND		ND	ND
benzo (a) anthracene	ND	ND		ND	ND
benzo (a) pyrene	ND	ND		ND	ND
benzo(b)fluoranthene	ND	ND		ND	ND
benzo (g,h,i) perylene	ND	ND		ND	ND
benzo (k) fluoroanthene	ND	ND		ND	ND
benzyl alcohol	ND	ND		ND	ND
bis (2-chloroethoxy) methane	ND	ND		ND	ND
bis (2-chlorethyl) ether	ND	ND		ND	ND
bis (2-chloro-1-methylethyl) ether	ND	ND		ND	ND
bis (2-ethylhexyl) phthalate	ND	ND		ND	ND
butyl benzyl phthalate	ND	ND		ND	ND
chrysene	ND	ND		ND	ND
di-n-butyl phthalate	ND	ND		ND	ND
di-n-octyl phthalate	ND	ND		ND	ND
diallate	ND	ND		ND	ND
dibenz (a,h) anthracene	ND	ND		ND	ND
dibenzofuran	ND	ND		ND	ND
diethyl phthalate	ND	ND		ND	ND
dimethoate	ND	ND		ND	ND

Appendix Table 10. Continued.

SAMPLE NO. DATE SAMPLE COLLECTED Sampling Location/ River Mile	Sycamore Creek				
	KT-SW-U231	KT-SW-E231		KT-SW-103 Dam	KT-SW-103D
	09/28/99	09/28/99		10/14/99	10/14/99
	7.34	7.34 Duplicate		5.1	5.1 Duplicate
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)					
dimethyl phthalate	ND	ND		ND	ND
2-sec-butyl-4,6-dinitrophenol	ND	ND		ND	ND
diphenylamine	ND	ND		ND	ND
disulfotone	ND	ND		ND	ND
ethyl methanesulfonate	ND	ND		ND	ND
famphur	ND	ND		ND	ND
fluoranthene	ND	ND		ND	ND
fluorene	ND	ND		ND	ND
hexachlorocyclopentadiene	ND	ND		ND	ND
hexachlorobenzene	ND	ND		ND	ND
hexachlorobutadiene	ND	ND		ND	ND
hexachloroethane	ND	ND		ND	ND
hexachloropropene	ND	ND		ND	ND
indeno (1,2,3-cd) pyrene	ND	ND		ND	ND
isophorone	ND	ND		ND	ND
isosafole	ND	ND		ND	ND
methapyrilene	ND	ND		ND	ND
methyl methanesulfonate	ND	ND		ND	ND
5-nitro-o-toluidine	ND	ND		ND	ND
n-nitrosodi-n-butylamine	ND	ND		ND	ND
n-nirtosodi-n-propylamine	ND	ND		ND	ND
n-nitrosodiethylamine	ND	ND		ND	ND
n-nitrosodimethylamine	ND	ND		ND	ND
n-nitrosodiphenylamine	ND	ND		ND	ND
n-nitrosomethylethylamine	ND	ND		ND	ND
n-nitrosomorpholine	ND	ND		ND	ND
n-nitrosopiperidine	ND	ND		ND	ND
n-nitrosopyrrolidine	ND	ND		ND	ND
naphthalene	ND	ND		ND	ND
nitrobenzene	ND	ND		ND	ND
O,O,O-triethylphosphorothioate	ND	ND		ND	ND
thionazin	ND	ND		ND	ND
chlorobenzilate	ND	ND		ND	ND
p-dimethylaminoazobenzene	ND	ND		ND	ND
p-phenylene diamine	ND	ND		ND	ND

Appendix Table 10. Continued.

SAMPLE NO. DATE SAMPLE COLLECTED Sampling Location/ River Mile	Sycamore Creek				
	KT-SW-U231 09/28/99 7.34	KT-SW-E231 09/28/99 7.34 Duplicate		KT-SW-103 Dam 10/14/99 5.1	KT-SW-103D 10/14/99 5.1 Duplicate
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/l)					
pentachlorobenzene	ND	ND		ND	ND
pentachloroethane	ND	ND		ND	ND
pentachloronitrobenzene	ND	ND		ND	ND
pentachlorophenol	ND	ND		ND	ND
phenacetin	ND	ND		ND	ND
phenanthrene	ND	ND		ND	ND
phenol	1400 J	1100 J		ND	ND
phorate	ND	ND		ND	ND
pronamide	ND	ND		ND	ND
pyrene	ND	ND		ND	ND
pyridine	ND	ND		ND	ND
safrole	ND	ND		ND	ND
tetraethyldithiopyrophosphate	ND	ND		ND	ND
Tentatively Identified Compounds (ug/l)					
caprolactum	ND	ND		3000 NJ	3300 NJ
benzoic acid	100000 NJ	100000 NJ		ND	ND
benzothiazole	ND	ND		ND	ND
1,2-benzenedicarbonitrile	ND	ND		ND	ND

Appendix Table 10. Continued.

SAMPLE NO. DATE SAMPLE COLLECTED Sampling Location/ River Mile	Sycamore Creek				
	KT-SW-U231	KT-SW-E231		KT-SW-103 Dam	KT-SW-103D
	09/28/99	09/28/99		10/14/99	10/14/99
	7.34	7.34		5.1	5.1
		Duplicate			Duplicate
TAL METALS/CYANIDE (mg/l)					
aluminum	0.55	0.51		0.25	0.23
arsenic	0.013	0.015		0.0057 B	0.0052 B
lead	0.0025 B	ND		ND	ND
antimony	ND	ND		ND	ND
barium	0.17 B	0.2		0.076 B	0.075 B
selenium	ND	0.0049 B		ND	ND
beryllium	ND	ND		ND	ND
thallium	ND	ND		0.0064 B	ND
cadmium	ND	ND		ND	ND
calcium	77.8	87.7		79.2	79.4
chromium	ND	ND		ND	ND
cobalt	0.048 B	0.053		ND	ND
copper	ND	ND		ND	ND
iron	1.8	2		0.79	0.72
magnesium	34.3	38.4		23.8	23.7
manganese	1.7	1.9		0.68	0.68
nickel	ND	ND		ND	ND
potassium	12	13.6		7.8	7.7
silver	ND	ND		ND	ND
sodium	195	215		32.6	32.6
vanadium	ND	ND		ND	ND
zinc	0.036	0.033		ND	0.036
mercury	0.00017 B	0.00014 B		ND	ND
strontium	1.8	1.7		NA	NA
cyanide (total)	NA	0.067		ND	ND

ND - Not detected.

NA - Not analyzed.

JB - Method blank contamination and an estimated result.

J - Estimated result. Result is less than the RL. (organics)

B - Estimated result. Result is less than the RL (inorganics)

NJ - Analysis indicates the presence of an analyte that has been "tentatively identified" and the result is estimated.

Appendix Table 11. Results of dioxins and furans measured in sediment collected by Ohio EPA from Sycamore Creek and Kirby Tributary, December, 1999.

	Sycamore Creek				Kirby Tributary			
Sample Number :	SC-SD-RM 9.1		SC-SD-RM7.34		SC-SD-RM6.3		SC-SD-UTSC	
Sampling Location/River Mile :	RM 9.13		RM 7.32		RM 6.37		RM 0.01	
Date Sampled :	12/07/99		12/07/99		12/07/99		12/07/99	
Dioxins/ Furans (pg/g or PPT)	TEQ Conc.		TEQ Conc.		TEQ Conc.		TEQ Conc.	
2,3,7,8-TCDD	1.2 J	1.16	ND	0.44	1.1 J	1.12	1.1 J	1.12
Total TCDD	1.2		ND		1.1		1.1	
1,2,3,7,8-PeCDD	ND	0.16	ND	0.05	ND	0.12	ND	0.1
Total PeCDD	ND		ND		ND		ND	
1,2,3,4,7,8-HxCDD	ND	0.03	ND	0.03	ND	0.02	ND	0.03
1,2,3,6,7,8-HxCDD	ND	0.09	ND	0.04	ND	0.02	ND	0.04
1,2,3,7,8,9-HxCDD	ND	0.05	ND	0.03	ND	0.02	ND	0.03
Total HxCDD	5.7		2.5		ND		4.9	
1,2,3,4,6,7,8-HpCDD	46	0.46	20	0.2	31	0.31	33	0.32
Total HpCDD	100		45		75		78	
OCDD	2,500	2.48	1,200	1.19	1,800	1.79	1,900	1.89
2,3,7,8-TCDF	ND	0.02	ND	0.01	ND	0.03	ND	0.03
Total TCDF	ND		ND		ND		ND	
1,2,3,7,8-PeCDF	ND	0.01	ND	0.01	ND	0	ND	0
2,3,4,7,8-PeCDF	ND	0.05	ND	0.06	ND	0.04	ND	0.06
Total PeCDF	ND		ND		ND		ND	
1,2,3,4,7,8-HxCDF	ND	0.02	ND	0.01	ND	0.01	ND	0.01
1,2,3,6,7,8-HxCDF	ND	0.02	ND	0.01	ND	0.01	ND	0.01
2,3,4,6,7,8-HxCDF	ND	0.02	ND	0.02	ND	0.01	ND	0.02
1,2,3,7,8,9-HxCDF	ND	0.02	ND	0.02	ND	0.01	ND	0.02
Total HxCDF	ND		ND		ND		0.93	
1,2,3,4,6,7,8-HpCDF	ND	0.01	ND	0	ND	0	1.1	0.01
1,2,3,4,7,8,9-HpCDF	ND	0	ND	0	ND	0	ND	0
Total HpCDF	ND		0.75		ND		1.1	
OCDF	ND	0	ND	0	ND	0	ND	0
Total TEQ Concentration		4.59		2.14		3.53		3.7

J- Estimated result. Result is less than the reporting limit.

ND - Not detected.

Appendix Table 12. Index of Biotic Integrity (IBI) metrics and scores, and Modified Index of Well-being (MIwb) scores by river mile in the Sycamore Creek study area, 1999.

River Mile	Type	Date	Drainage area (sq mi)	Number of				Percent of Individuals							Rel.No. minus tolerants /(1.0 km)	IBI	Modified Iwb
				Total species	Sunfish species	Sucker species	Intolerant species	Rnd-bodied suckers	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies			
Sandusky River - (05-001)																	
Year: 1999																	
57.90	A	08/31/1999	693	19(3)	3(3)	8(5)	3(3)	44(5)	49(5)	30(1)	29(1)	6(3)	59(5)	1.8(3)	268(3)	40	9.3
57.90	A	10/13/1999	693	15(3)	3(3)	6(5)	1(1)	54(5)	57(5)	17(3)	13(5)	11(5)	68(5)	0.0(5)	252(3)	48	9.0
56.70	A	08/31/1999	761	16(3)	2(3)	9(5)	3(3)	55(5)	60(5)	15(3)	14(5)	15(5)	66(5)	1.4(3)	124(1) *	46	9.0
56.70	A	10/13/1999	761	16(3)	5(5)	6(5)	2(3)	45(5)	45(3)	13(5)	10(5)	11(5)	65(5)	1.0(5)	168(1) *	50	8.9
52.20	A	10/15/1999	771	10(3)	3(3)	5(3)	2(3)	46(5)	46(3)	5(5)	5(5)	9(3)	85(5)	0.0(5)	258(3)	46	7.3
47.60	A	09/02/1999	774	21(5)	5(5)	9(5)	3(3)	35(3)	43(3)	10(5)	7(5)	24(5)	66(5)	0.3(5)	528(5)	54	10.4
47.60	A	10/14/1999	774	23(5)	5(5)	9(5)	3(3)	43(5)	46(3)	13(5)	11(5)	18(5)	67(5)	0.0(5)	432(5)	56	10.6
43.00	A	09/01/1999	957	15(3)	4(5)	6(5)	3(3)	39(5)	42(3)	21(3)	15(5)	9(3)	74(5)	3.6(1)	184(1)	42	8.2
43.00	A	10/14/1999	957	14(3)	5(5)	5(3)	2(3)	27(3)	27(3)	13(5)	7(5)	16(5)	76(5)	0.6(3)	288(3)	46	8.2
41.30	A	09/01/1999	963	22(5)	5(5)	*(5)	3(3)	40(5)	48(5)	15(5)	10(5)	35(5)	53(3)	0.5(5)	388(3)	54	10.2
41.30	A	10/14/1999	963	20(3)	3(3)	9(5)	3(3)	42(5)	45(5)	16(3)	9(5)	37(5)	54(5)	1.7(3)	312(3)	48	9.9

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

05/18/2000

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals						Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni- vores	Top carnivores	Insect- ivores	DELT anomalies			
Sycamore Creek - (05021)																	
Year: 1999																	
9.10	E	09/03/1999	51	19(3)	2(3)	3(3)	0(1)	4(3)	26(3)	23(5)	14(5)	3.1(3)	24(1)	0.0(5)	1028(5)	40	8.2
9.10	E	10/15/1999	51	20(3)	3(3)	3(3)	0(1)	4(3)	28(3)	34(3)	20(3)	2.3(3)	28(3)	0.0(5)	615(3)	36	8.0
6.40	E	10/15/1999	55	9(1)	1(1)	1(1)	0(1)	0(1)	20(3)	45(1)	29(3)	1.8(1)	13(1)	0.0(5)	47(1) *	20 ♦	5.2
6.30	E	09/03/1999	55	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0.0(1)	0(1)	0.0(1)	0(1) * *	12	0.0
6.30	E	10/15/1999	55	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0.0(1)	0(1)	0.0(1)	0(1) * *	12	0.0
5.00	E	09/03/1999	56	11(3)	2(3)	1(1)	0(1)	2(1)	9(1)	7(5)	2(5)	2.0(3)	13(1)	0.0(5)	278(3)	32	5.6
5.00	E	10/15/1999	56	10(1)	1(1)	1(1)	0(1)	3(3)	9(1)	8(5)	1(5)	0.0(1)	17(1)	0.0(5)	167(1) *	26	4.7
3.60	E	09/03/1999	57	9(1)	1(1)	1(1)	0(1)	1(1)	16(1)	14(5)	8(3)	1.1(1)	20(1)	1.1(3)	119(1) *	20 ♦	3.8
3.60	E	10/15/1999	57	12(3)	2(3)	2(3)	0(1)	2(1)	24(3)	15(5)	9(5)	1.3(3)	28(3)	0.0(5)	96(1) *	36	4.2
2.60	E	09/03/1999	58	5(1)	0(1)	0(1)	0(1)	1(1)	3(1)	7(5)	5(1)	0.0(1)	3(1)	0.0(3)	81(1) *	18 ♦	3.5
2.60	E	10/11/1999	58	4(1)	1(1)	1(1)	0(1)	0(1)	3(1)	13(1)	3(1)	0.0(1)	3(1)	0.0(1)	39(1) * *	12	3.5
0.30	E	09/02/1999	67	16(3)	2(3)	3(3)	0(1)	2(1)	11(1)	13(5)	2(5)	1.6(3)	18(1)	0.0(5)	1527(5)	36	7.6
0.30	E	10/12/1999	67	21(3)	3(3)	3(3)	0(1)	4(3)	12(1)	55(1)	51(1)	1.1(3)	30(3)	0.2(3)	872(5)	30	7.9

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 13. Summary of relative numbers and weight of fish and species collected at each location by river mile sampled in the Sycamore Creek study area, 1999. Relative numbers and weight are per 1.0 km for boat sites (Sandusky River) and per 0.3 km for wading sites (Sycamore Creek).

Species List

Page 1

River Code: 05-001	Stream: Sandusky River	Sample Date: 1999
River Mile: 57.90	Basin: Sandusky River	Date Range: 08/31/1999
	Time Fished: 3721 sec	Thru: 10/13/1999
	Drain Area: 693.0 sq mi	Sampler Type: A
	Dist Fished: 1.00 km	No of Passes: 2

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Silver Redhorse	R	I	S	M	28	28.00	8.16	18.77	26.78	670.43
Black Redhorse	R	I	S	I	14	14.00	4.08	2.83	4.04	202.36
Golden Redhorse	R	I	S	M	44	44.00	12.83	7.95	11.34	180.61
Greater Redhorse [T]	R	I	S	R	1	1.00	0.29	1.25	1.78	1,250.00
River Redhorse [S]	R	I	S	I	3	3.00	0.87	3.75	5.35	1,250.00
Northern Hog Sucker	R	I	S	M	9	9.00	2.62	0.93	1.32	102.89
White Sucker	W	O	S	T	12	12.00	3.50	2.28	3.24	189.58
Spotted Sucker	R	I	S		66	66.00	19.24	3.67	5.24	55.65
Common Carp	G	O	M	T	11	11.00	3.21	13.96	19.92	1,269.45
Creek Chub	N	G	N	T	1	1.00	0.29	0.03	0.04	26.00
Striped Shiner	N	I	S		2	2.00	0.58	0.03	0.04	15.50
Spotfin Shiner	N	I	M		37	37.00	10.79	0.12	0.16	3.11
Bluntnose Minnow	N	O	C	T	52	52.00	15.16	0.17	0.24	3.27
Central Stoneroller	N	H	N		7	7.00	2.04	0.03	0.04	4.43
Channel Catfish	F		C		17	17.00	4.96	9.92	14.15	583.47
White Crappie	S	I	C		1	1.00	0.29	0.01	0.01	6.00
Rock Bass	S	C	C		13	13.00	3.79	1.26	1.80	97.08
Smallmouth Bass	F	C	C	M	11	11.00	3.21	2.46	3.51	224.00
Largemouth Bass	F	C	C		4	4.00	1.17	0.43	0.61	106.50
Green Sunfish	S	I	C	T	7	7.00	2.04	0.18	0.25	25.43
Bluegill Sunfish	S	I	C	P	2	2.00	0.58	0.09	0.13	44.00
Blackside Darter	D	I	S		1	1.00	0.29	0.00	0.01	4.00
<i>Mile Total</i>					343	343.00		70.11		
<i>Number of Species</i>					22					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-001	Stream: Sandusky River	Sample Date: 1999
River Mile: 56.70	Basin: Sandusky River	Date Range: 08/31/1999
	Time Fished: 3596 sec	Thru: 10/13/1999
	Drain Area: 761.0 sq mi	Sampler Type: A
	Dist Fished: 1.00 km	No of Passes: 2

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback Carpsucker	C	O	M		1	1.00	0.59	0.28	0.51	278.00
Silver Redhorse	R	I	S	M	11	11.00	6.47	10.45	19.04	949.64
Black Redhorse	R	I	S	I	17	17.00	10.00	4.55	8.29	267.71
Golden Redhorse	R	I	S	M	10	10.00	5.88	2.55	4.65	255.00
Greater Redhorse [T]	R	I	S	R	6	6.00	3.53	7.88	14.35	1,312.50
River Redhorse [S]	R	I	S	I	4	4.00	2.35	5.10	9.29	1,275.00
Northern Hog Sucker	R	I	S	M	4	4.00	2.35	0.89	1.62	222.25
White Sucker	W	O	S	T	4	4.00	2.35	1.07	1.96	268.25
Spotted Sucker	R	I	S		32	32.00	18.82	0.30	0.54	9.31
Common Carp	G	O	M	T	6	6.00	3.53	10.65	19.41	1,775.00
Spotfin Shiner	N	I	M		8	8.00	4.71	0.02	0.04	2.50
Bluntnose Minnow	N	O	C	T	9	9.00	5.29	0.03	0.06	3.56
Channel Catfish	F		C		16	16.00	9.41	7.55	13.76	472.00
White Crappie	S	I	C		6	6.00	3.53	0.28	0.51	46.33
Rock Bass	S	C	C		11	11.00	6.47	1.67	3.05	152.09
Smallmouth Bass	F	C	C	M	6	6.00	3.53	0.55	1.00	91.33
Largemouth Bass	F	C	C		5	5.00	2.94	0.53	0.97	106.80
Green Sunfish	S	I	C	T	5	5.00	2.94	0.18	0.33	35.80
Bluegill Sunfish	S	I	C	P	7	7.00	4.12	0.30	0.55	43.14
Orangespotted Sunfish	S	I	C		1	1.00	0.59	0.01	0.01	5.00
Green Sf X Bluegill					1	1.00	0.59	0.04	0.08	42.00
<i>Mile Total</i>					170	170.00		54.88		
<i>Number of Species</i>					20					
<i>Number of Hybrids</i>					1					

Species List

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River Code: 05-001	Stream: Sandusky River	Sample Date: 1999
River Mile: 52.20	Basin: Sandusky River	Date Range: 10/15/1999
	Time Fished: 1431 sec	Drain Area: 771.0 sq mi
	Dist Fished: 0.50 km	No of Passes: 1
		Sampler Type: A

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback Carpsucker	C	O	M		2	4.00	1.47	5.15	15.71	1,287.50
Black Redhorse	R	I	S	I	2	4.00	1.47	0.79	2.40	197.00
Golden Redhorse	R	I	S	M	4	8.00	2.94	0.99	3.02	123.75
Greater Redhorse [T]	R	I	S	R	1	2.00	0.74	0.01	0.04	7.00
Spotted Sucker	R	I	S		55	110.00	40.44	7.95	24.26	72.30
Common Carp	G	O	M	T	5	10.00	3.68	14.45	44.08	1,445.00
Channel Catfish	F		C		1	2.00	0.74	0.88	2.68	439.00
Largemouth Bass	F	C	C		12	24.00	8.82	1.63	4.97	67.92
Green Sunfish	S	I	C	T	2	4.00	1.47	0.04	0.13	10.50
Bluegill Sunfish	S	I	C	P	50	100.00	36.76	0.87	2.65	8.70
Orangespotted Sunfish	S	I	C		2	4.00	1.47	0.01	0.04	3.50
<i>Mile Total</i>					136	272.00		32.78		
<i>Number of Species</i>					11					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-001	Stream: Sandusky River	Sample Date: 1999
River Mile: 47.60	Basin: Sandusky River	Date Range: 09/02/1999
	Time Fished: 4221 sec	Thru: 10/14/1999
	Drain Area: 774.0 sq mi	Sampler Type: A
	Dist Fished: 1.00 km	No of Passes: 2

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Silver Redhorse	R	I	S	M	16	16.00	2.95	8.95	6.26	559.31
Black Redhorse	R	I	S	I	32	32.00	5.90	5.45	3.81	170.31
Golden Redhorse	R	I	S	M	32	32.00	5.90	10.82	7.57	338.14
Shorthead Redhorse	R	I	S	M	2	2.00	0.37	0.33	0.23	163.50
Greater Redhorse [T]	R	I	S	R	25	25.00	4.61	22.43	15.69	897.00
River Redhorse [S]	R	I	S	I	37	37.00	6.83	27.32	19.12	738.41
Northern Hog Sucker	R	I	S	M	21	21.00	3.87	5.47	3.83	260.43
White Sucker	W	O	S	T	3	3.00	0.55	0.71	0.49	235.67
Spotted Sucker	R	I	S		45	45.00	8.30	1.98	1.38	43.91
Common Carp	G	O	M	T	15	15.00	2.77	21.78	15.24	1,451.87
Redfin Shiner	N	I	N		5	5.00	0.92	0.01	0.00	1.40
Spotfin Shiner	N	I	M		79	79.00	14.58	0.28	0.20	3.54
Sand Shiner	N	I	M	M	3	3.00	0.55	0.01	0.00	2.00
Bluntnose Minnow	N	O	C	T	30	30.00	5.54	0.12	0.08	4.03
Channel Catfish	F		C		18	18.00	3.32	15.06	10.54	836.61
Yellow Bullhead		I	C	T	1	1.00	0.18	0.04	0.03	39.00
White Crappie	S	I	C		7	7.00	1.29	0.65	0.45	92.43
Rock Bass	S	C	C		31	31.00	5.72	3.73	2.61	120.37
Smallmouth Bass	F	C	C	M	73	73.00	13.47	16.41	11.48	224.79
Largemouth Bass	F	C	C		12	12.00	2.21	0.52	0.36	43.08
Green Sunfish	S	I	C	T	13	13.00	2.40	0.33	0.23	25.15
Bluegill Sunfish	S	I	C	P	9	9.00	1.66	0.23	0.16	25.78
Orangespotted Sunfish	S	I	C		7	7.00	1.29	0.06	0.04	7.86
Blackside Darter	D	I	S		2	2.00	0.37	0.01	0.00	3.00
Logperch	D	I	S	M	24	24.00	4.43	0.24	0.17	9.96
<i>Mile Total</i>					542	542.00		142.90		
<i>Number of Species</i>					25					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-001	Stream: Sandusky River	Sample Date: 1999
River Mile: 43.00	Basin: Sandusky River	Date Range: 09/01/1999
	Time Fished: 3835 sec	Thru: 10/14/1999
	Drain Area: 957.0 sq mi	Sampler Type: A
	Dist Fished: 1.00 km	No of Passes: 2

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback Carpsucker	C	O	M		1	1.00	0.35	1.01	1.12	1,010.00
Silver Redhorse	R	I	S	M	5	5.00	1.77	4.35	4.83	869.40
Black Redhorse	R	I	S	I	3	3.00	1.06	0.62	0.69	205.67
Golden Redhorse	R	I	S	M	6	6.00	2.13	1.98	2.20	329.50
Greater Redhorse [T]	R	I	S	R	13	13.00	4.61	5.70	6.33	438.62
River Redhorse [S]	R	I	S	I	4	4.00	1.42	4.11	4.57	1,028.25
Spotted Sucker	R	I	S		59	59.00	20.92	15.51	17.23	262.85
Common Carp	G	O	M	T	29	29.00	10.28	48.00	53.32	1,655.19
Golden Shiner	N	I	M	T	2	2.00	0.71	0.01	0.01	3.00
Yellow Bullhead		I	C	T	1	1.00	0.35	0.09	0.10	88.00
Brown Bullhead		I	C	T	2	2.00	0.71	0.25	0.28	126.00
White Crappie	S	I	C		7	7.00	2.48	0.42	0.47	60.43
Rock Bass	S	C	C		2	2.00	0.71	0.04	0.05	21.00
Smallmouth Bass	F	C	C	M	1	1.00	0.35	0.01	0.01	8.00
Largemouth Bass	F	C	C		34	34.00	12.06	3.94	4.38	115.99
Green Sunfish	S	I	C	T	12	12.00	4.26	0.47	0.52	39.17
Bluegill Sunfish	S	I	C	P	83	83.00	29.43	3.17	3.53	38.24
Orangespotted Sunfish	S	I	C		11	11.00	3.90	0.03	0.04	2.91
Green Sf X Bluegill					3	3.00	1.06	0.29	0.33	98.00
Logperch	D	I	S	M	3	3.00	1.06	0.01	0.02	4.67
Freshwater Drum			M	P	1	1.00	0.35	0.01	0.01	10.00
<i>Mile Total</i>					282	282.00		90.03		
<i>Number of Species</i>					20					
<i>Number of Hybrids</i>					1					

Species List

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River Code: 05-001	Stream: Sandusky River	Sample Date: 1999
River Mile: 41.30	Basin: Sandusky River	Date Range: 09/01/1999
	Time Fished: 3852 sec	Thru: 10/14/1999
	Drain Area: 963.0 sq mi	Sampler Type: A
	Dist Fished: 1.00 km	No of Passes: 2

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback Carpsucker	C	O	M		3	3.00	0.73	1.28	0.79	425.33
Silver Redhorse	R	I	S	M	8	8.00	1.94	7.91	4.90	989.13
Black Redhorse	R	I	S	I	54	54.00	13.11	15.31	9.49	283.47
Golden Redhorse	R	I	S	M	37	37.00	8.98	13.45	8.33	363.39
Shorthead Redhorse	R	I	S	M	2	2.00	0.49	0.22	0.13	107.50
Greater Redhorse [T]	R	I	S	R	12	12.00	2.91	14.51	8.99	1,209.08
River Redhorse [S]	R	I	S	I	11	11.00	2.67	13.37	8.29	1,215.36
Northern Hog Sucker	R	I	S	M	22	22.00	5.34	7.01	4.34	318.44
White Sucker	W	O	S	T	11	11.00	2.67	2.42	1.50	219.91
Spotted Sucker	R	I	S		22	22.00	5.34	2.17	1.34	98.42
Common Carp	G	O	M	T	24	24.00	5.83	50.80	31.48	2,116.63
Golden Shiner	N	I	M	T	8	8.00	1.94	0.17	0.11	21.75
Spotfin Shiner	N	I	M		5	5.00	1.21	0.02	0.01	4.20
Bluntnose Minnow	N	O	C	T	1	1.00	0.24	0.01	0.00	7.00
Channel Catfish	F		C		4	4.00	0.97	7.45	4.61	1,861.25
Yellow Bullhead		I	C	T	1	1.00	0.24	0.15	0.09	148.00
White Crappie	S	I	C		1	1.00	0.24	0.14	0.08	137.00
Rock Bass	S	C	C		80	80.00	19.42	13.55	8.40	169.37
Smallmouth Bass	F	C	C	M	66	66.00	16.02	9.71	6.02	147.08
Largemouth Bass	F	C	C		2	2.00	0.49	1.14	0.70	567.50
Green Sunfish	S	I	C	T	17	17.00	4.13	0.35	0.22	20.41
Bluegill Sunfish	S	I	C	P	7	7.00	1.70	0.03	0.02	4.00
Orangespotted Sunfish	S	I	C		1	1.00	0.24	0.00	0.00	2.00
Blackside Darter	D	I	S		1	1.00	0.24	0.00	0.00	4.00
Logperch	D	I	S	M	11	11.00	2.67	0.22	0.14	19.82
Greenside Darter	D	I	S	M	1	1.00	0.24	0.00	0.00	3.00
<i>Mile Total</i>					412	412.00		161.35		
<i>Number of Species</i>					26					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-021	Stream: Sycamore Creek	Sample Date: 1999
River Mile: 9.10	Basin: Sandusky River	Date Range: 09/03/1999
	Time Fished: 5890 sec	Thru: 10/15/1999
	Drain Area: 51.0 sq mi	Sampler Type: E
	Dist Fished: 0.40 km	No of Passes: 2

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	10	7.50	0.66	2.29	6.80	305.90
Northern Hog Sucker	R	I	S	M	24	18.00	1.59	2.20	6.51	121.96
White Sucker	W	O	S	T	153	114.75	10.12	20.08	59.53	174.96
Creek Chub	N	G	N	T	129	96.75	8.53	2.08	6.17	21.50
Redfin Shiner	N	I	N		9	6.75	0.60	0.01	0.03	1.51
Striped Shiner	N	I	S		27	20.25	1.79	0.40	1.18	19.68
Common Shiner	N	I	S		66	49.50	4.37	0.41	1.21	8.26
Bluntnose Minnow	N	O	C	T	93	69.75	6.15	0.16	0.49	2.35
Central Stoneroller	N	H	N		708	531.00	46.83	1.83	5.41	3.44
Yellow Bullhead		I	C	T	16	12.00	1.06	1.10	3.25	91.44
White Crappie	S	I	C		1	0.75	0.07	0.02	0.04	20.00
Rock Bass	S	C	C		24	18.00	1.59	1.55	4.59	86.00
Smallmouth Bass	F	C	C	M	11	8.25	0.73	0.69	2.06	84.09
Largemouth Bass	F	C	C		7	5.25	0.46	0.17	0.52	33.14
Green Sunfish	S	I	C	T	26	19.50	1.72	0.46	1.37	23.62
Johnny Darter	D	I	C		66	49.50	4.37	0.05	0.15	1.02
Greenside Darter	D	I	S	M	20	15.00	1.32	0.05	0.15	3.25
Rainbow Darter	D	I	S	M	101	75.75	6.68	0.11	0.33	1.46
Fantail Darter	D	I	C		7	5.25	0.46	0.01	0.03	2.14
Mottled Sculpin		I	C		14	10.50	0.93	0.06	0.19	5.91
<i>Mile Total</i>					1,512	1,134.00		33.73		
<i>Number of Species</i>					20					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-021	Stream: Sycamore Creek	Sample Date: 1999
River Mile: 6.40	Basin: Sandusky River	Date Range: 10/15/1999
	Time Fished: 1213 sec	Drain Area: 55.0 sq mi
	Dist Fished: 0.20 km	No of Passes: 1
		Sampler Type: E

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	7	10.50	12.50	0.05	7.71	5.00
Blacknose Dace	N	G	S	T	3	4.50	5.36	0.01	1.60	2.33
Creek Chub	N	G	N	T	6	9.00	10.71	0.23	33.48	25.50
Striped Shiner	N	I	S		1	1.50	1.79	0.01	1.60	7.00
Spotfin Shiner	N	I	M		4	6.00	7.14	0.02	2.62	3.00
Bluntnose Minnow	N	O	C	T	9	13.50	16.07	0.06	8.73	4.44
Central Stoneroller	N	H	N		23	34.50	41.07	0.29	41.48	8.26
Rock Bass	S	C	C		1	1.50	1.79	0.01	1.16	5.00
Mottled Sculpin		I	C		2	3.00	3.57	0.01	2.04	4.50
<i>Mile Total</i>					56	84.00		0.69		
<i>Number of Species</i>					9					
<i>Number of Hybrids</i>					0					

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Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
No Fish				0	0.00	0			
				0					
				0					
				0					

Species List

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River Code: 05-021	Stream: Sycamore Creek	Sample Date: 1999
River Mile: 5.00	Basin: Sandusky River	Date Range: 09/03/1999
	Time Fished: 3331 sec	Thru: 10/15/1999
	Drain Area: 56.0 sq mi	Sampler Type: E
	Dist Fished: 0.40 km	No of Passes: 2

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	1	0.75	0.31	0.00	0.28	6.00
White Sucker	W	O	S	T	1	0.75	0.31	0.00	0.16	3.00
Creek Chub	N	G	N	T	13	9.75	4.06	0.16	9.97	16.46
Striped Shiner	N	I	S		9	6.75	2.81	0.11	6.71	16.00
Bluntnose Minnow	N	O	C	T	3	2.25	0.94	0.00	0.28	2.00
Central Stoneroller	N	H	N		254	190.50	79.38	0.78	48.60	4.11
Yellow Bullhead		I	C	T	1	0.75	0.31	0.05	2.89	62.00
Rock Bass	S	C	C		2	1.50	0.63	0.09	5.40	58.00
Smallmouth Bass	F	C	C	M	2	1.50	0.63	0.11	6.89	74.00
Green Sunfish	S	I	C	T	6	4.50	1.88	0.28	17.48	62.50
Johnny Darter	D	I	C		4	3.00	1.25	0.00	0.25	1.33
Rainbow Darter	D	I	S	M	18	13.50	5.63	0.01	0.59	0.67
Fantail Darter	D	I	C		5	3.75	1.56	0.01	0.47	2.00
Mottled Sculpin		I	C		1	0.75	0.31	0.00	0.09	2.00
<i>Mile Total</i>					320	240.00		1.61		
<i>Number of Species</i>					14					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-021	Stream: Sycamore Creek	Sample Date: 1999
River Mile: 3.60	Basin: Sandusky River	Date Range: 09/03/1999
	Time Fished: 3473 sec	Thru: 10/15/1999
	Drain Area: 57.0 sq mi	Sampler Type: E
	Dist Fished: 0.40 km	No of Passes: 2

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	6	4.50	3.59	0.03	0.15	7.33
White Sucker	W	O	S	T	1	0.75	0.60	0.01	0.03	8.00
Common Carp	G	O	M	T	9	6.75	5.39	21.06	96.34	3,119.44
Creek Chub	N	G	N	T	6	4.50	3.59	0.19	0.87	42.00
Striped Shiner	N	I	S		17	12.75	10.18	0.08	0.36	6.12
Spotfin Shiner	N	I	M		1	0.75	0.60	0.00	0.01	3.00
Bluntnose Minnow	N	O	C	T	4	3.00	2.40	0.01	0.04	3.00
Central Stoneroller	N	H	N		106	79.50	63.47	0.19	0.89	2.44
Yellow Bullhead		I	C	T	1	0.75	0.60	0.08	0.35	103.00
Rock Bass	S	C	C		1	0.75	0.60	0.11	0.52	151.00
Smallmouth Bass	F	C	C	M	1	0.75	0.60	0.01	0.03	9.00
Green Sunfish	S	I	C	T	3	2.25	1.80	0.08	0.36	35.00
Johnny Darter	D	I	C		1	0.75	0.60	0.00	0.01	2.00
Rainbow Darter	D	I	S	M	9	6.75	5.39	0.01	0.04	1.27
Mottled Sculpin		I	C		1	0.75	0.60	0.00	0.01	3.00
<i>Mile Total</i>					167	125.25		21.86		
<i>Number of Species</i>					15					
<i>Number of Hybrids</i>					0					

Species List

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River Code: 05-021	Stream: Sycamore Creek	Sample Date: 1999
River Mile: 2.60	Basin: Sandusky River	Date Range: 09/03/1999
	Time Fished: 3184 sec	Thru: 10/11/1999
	Drain Area: 58.0 sq mi	Sampler Type: E
	Dist Fished: 0.40 km	No of Passes: 2

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	1	0.75	1.14	0.12	25.55	156.00
Creek Chub	N	G	N	T	3	2.25	3.41	0.14	31.55	64.00
Striped Shiner	N	I	S		1	0.75	1.14	0.01	1.31	8.00
Bluntnose Minnow	N	O	C	T	3	2.25	3.41	0.01	1.64	3.33
Central Stoneroller	N	H	N		78	58.50	88.64	0.18	39.19	3.07
Green Sunfish	S	I	C	T	1	0.75	1.14	0.00	0.66	4.00
Rainbow Darter	D	I	S	M	1	0.75	1.14	0.00	0.22	1.00
<i>Mile Total</i>					88	66.00		0.46		
<i>Number of Species</i>					7					
<i>Number of Hybrids</i>					0					

Species List

Page 7

River Code: 05-021	Stream: Sycamore Creek	Sample Date: 1999
River Mile: 0.30	Basin: Sandusky River	Date Range: 09/02/1999
	Time Fished: 7254 sec	Thru: 10/12/1999
	Drain Area: 67.5 sq mi	Sampler Type: E
	Dist Fished: 0.40 km	No of Passes: 2

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	3	2.25	0.12	0.47	2.89	208.67
Northern Hog Sucker	R	I	S	M	49	36.75	2.00	0.63	3.90	17.25
White Sucker	W	O	S	T	48	36.00	1.96	6.06	37.29	168.19
Blacknose Dace	N	G	S	T	15	11.25	0.61	0.03	0.20	2.87
Creek Chub	N	G	N	T	74	55.50	3.02	1.33	8.19	23.94
Suckermouth Minnow	N	I	S		9	6.75	0.37	0.04	0.25	5.89
Redfin Shiner	N	I	N		18	13.50	0.74	0.03	0.21	2.47
Striped Shiner	N	I	S		53	39.75	2.17	0.44	2.73	11.13
Spotfin Shiner	N	I	M		248	186.00	10.13	0.32	1.94	1.69
Silverjaw Minnow	N	I	M		3	2.25	0.12	0.00	0.02	1.67
Bluntnose Minnow	N	O	C	T	630	472.50	25.74	0.71	4.37	1.50
Central Stoneroller	N	H	N		1,054	790.50	43.06	3.63	22.38	4.60
Yellow Bullhead		I	C	T	2	1.50	0.08	0.14	0.88	95.00
Rock Bass	S	C	C		29	21.75	1.18	1.80	11.10	82.86
Smallmouth Bass	F	C	C	M	3	2.25	0.12	0.17	1.03	74.33
Green Sunfish	S	I	C	T	80	60.00	3.27	0.29	1.79	4.84
Bluegill Sunfish	S	I	C	P	2	1.50	0.08	0.02	0.10	11.00
Blackside Darter	D	I	S		2	1.50	0.08	0.01	0.04	4.50
Johnny Darter	D	I	C		13	9.75	0.53	0.01	0.08	1.32
Rainbow Darter	D	I	S	M	110	82.50	4.49	0.09	0.55	1.08
Fantail Darter	D	I	C		1	0.75	0.04	0.00	0.01	2.00
Mottled Sculpin		I	C		2	1.50	0.08	0.01	0.07	8.00
<i>Mile Total</i>					2,448	1,836.00		16.24		
<i>Number of Species</i>					22					
<i>Number of Hybrids</i>					0					

Appendix Table 14. Raw macroinvertebrate data by river mile for the Sycamore Creek study area, 1999.

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/01/1999 River Code: 05-001 River: Sandusky River

RM: 61.10 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
02600	<i>Nematomorpha</i>	+	83300	<i>Glyptotendipes (G.) sp</i>	+
06201	<i>Hyalella azteca</i>	+	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	85500	<i>Paratanytarsus sp</i>	+
11120	<i>Baetis flavistriga</i>	+	85615	<i>Rheotanytarsus distinctissimus group</i>	+
11200	<i>Callibaetis sp</i>	+	85814	<i>Tanytarsus glabrescens group</i>	+
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	93900	<i>Elimia sp</i>	+
11670	<i>Procloeon irrubrum</i>	+	95100	<i>Physella sp</i>	+
12200	<i>Isonychia sp</i>	+	96900	<i>Ferrissia sp</i>	+
13000	<i>Leucrocuta sp</i>	+	97601	<i>Corbicula fluminea</i>	+
13400	<i>Stenacron sp</i>	+	99180	<i>Strophitus undulatus undulatus</i>	+
13561	<i>Stenonema pulchellum</i>	+	99600	<i>Actinonaias ligamentina carinata</i>	+
13570	<i>Stenonema terminatum</i>	+			
16700	<i>Tricorythodes sp</i>	+			
17200	<i>Caenis sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 54
18100	<i>Anthopotamus sp</i>	+	No. Qualitative Taxa: 54		ICI:
18600	<i>Ephemera sp</i>	+	Number of Organisms: 0		Qual EPT: 19
21200	<i>Calopteryx sp</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
24900	<i>Gomphus sp</i>	+			
43300	<i>Ranatra sp</i>	+			
45100	<i>Palmacorixa sp</i>	+			
47600	<i>Sialis sp</i>	+			
48410	<i>Corydalus cornutus</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
53400	<i>Protoptila sp</i>	+			
57400	<i>Neophylax sp</i>	+			
59400	<i>Nectopsyche sp</i>	+			
59970	<i>Petrophila sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78450	<i>Nilotanytus fimbriatus</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83050	<i>Dicrotendipes lucifer</i>	+			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/14/1999 River Code: 05-001 River: Sandusky River

RM: 61.10 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	61		<i>norena</i>	
03360	<i>Plumatella sp</i>	+	77800	<i>Helopelopia sp</i>	+
03600	<i>Oligochaeta</i>	77 +	80370	<i>Corynoneura lobata</i>	165
06201	<i>Hyaella azteca</i>	+	80420	<i>Cricotopus (C.) bicinctus</i>	21 +
06700	<i>Crangonyx sp</i>	+	80430	<i>Cricotopus (C.) tremulus group</i>	10
08601	<i>Hydracarina</i>	9	81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	10
11020	<i>Acerpenna pygmaeus</i>	31 +	81460	<i>Orthocladius (O.) sp</i>	303 +
11130	<i>Baetis intercalaris</i>	10 +	81471	<i>Orthocladius (O.) oliveri</i>	10
12200	<i>Isonychia sp</i>	71 +	81631	<i>Parakiefferiella n.sp 1</i>	21
13400	<i>Stenacron sp</i>	461 +	82101	<i>Thienemanniella n.sp 1</i>	31
13521	<i>Stenonema femoratum</i>	+	82141	<i>Thienemanniella xena</i>	84
13561	<i>Stenonema pulchellum</i>	128 +	83040	<i>Dicrotendipes neomodestus</i>	31
13570	<i>Stenonema terminatum</i>	491 +	83300	<i>Glyptotendipes (G.) sp</i>	84 +
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	21 +
16700	<i>Tricorythodes sp</i>	147 +	84300	<i>Phaenopsectra obediens group</i>	21 +
18100	<i>Anthopotamus sp</i>	+	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	21 +
18700	<i>Hexagenia sp</i>	1 +	84460	<i>Polypedilum (P.) fallax group</i>	10
21200	<i>Calopteryx sp</i>	1	84520	<i>Polypedilum (Tripodura) halterale group</i>	21
22300	<i>Argia sp</i>	7 +	84790	<i>Tribelos fuscicorne</i>	+
23909	<i>Boyeria vinosa</i>	+	85625	<i>Rheotanytarsus exiguus group</i>	10
31800	<i>Taeniopteryx sp</i>	194	85821	<i>Tanytarsus glabrescens group sp 7</i>	21
42700	<i>Belostoma sp</i>	+	85840	<i>Tanytarsus guerlus group</i>	10
43300	<i>Ranatra sp</i>	+	93900	<i>Elimia sp</i>	2 +
45400	<i>Trichocorixa sp</i>	+	95100	<i>Physella sp</i>	+
45900	<i>Notonecta sp</i>	+	96900	<i>Ferrissia sp</i>	+
47600	<i>Sialis sp</i>	+	97601	<i>Corbicula fluminea</i>	+
50315	<i>Chimarra obscura</i>	+			
51206	<i>Cyrnellus fraternus</i>	1			
51600	<i>Polycentropus sp</i>	8			
52200	<i>Cheumatopsyche sp</i>	268 +			
52430	<i>Ceratopsyche morosa group</i>	+			
52560	<i>Hydropsyche orris</i>	2			
52570	<i>Hydropsyche simulans</i>	21 +			
67700	<i>Paracymus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68201	<i>Scirtidae</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	11 +			
69400	<i>Stenelmis sp</i>	1 +			
71100	<i>Hexatoma sp</i>	+			
74100	<i>Simulium sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia</i>	251 +			
			No. Quantitative Taxa: 42 Total Taxa: 68 No. Qualitative Taxa: 48 ICI: 40 Number of Organisms: 3159 Qual EPT: 15		

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/31/1999 River Code: 05-001 River: Sandusky River

RM: 57.30 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00401	<i>Spongillidae</i>	+			
03360	<i>Plumatella sp</i>	+			
06201	<i>Hyaella azteca</i>	+			
11670	<i>Procladius irroratus</i>	+			
13400	<i>Stenonema sp</i>	+			
16700	<i>Tricorythodes sp</i>	+			
18700	<i>Hexagenia sp</i>	+			
22300	<i>Argia sp</i>	+			
26700	<i>Macromia sp</i>	+			
43300	<i>Ranatra sp</i>	+			
45100	<i>Palmacorixa sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
47600	<i>Sialis sp</i>	+			
51206	<i>Cyrnellus fraternus</i>	+			
51600	<i>Polycentropus sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
60300	<i>Dineutus sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78655	<i>Procladius (Holotanytus) sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83050	<i>Dicrotendipes lucifer</i>	+			
83300	<i>Glyptotendipes (G.) sp</i>	+			
84020	<i>Parachironomus carinatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
85814	<i>Tanytarsus glabrescens group</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
No. Quantitative Taxa: 0		Total Taxa: 35			
No. Qualitative Taxa: 35		ICI:			
Number of Organisms: 0		Qual EPT: 7			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/14/1999 River Code: 05-001 River: Sandusky River

RM: 57.30 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	22	95100	<i>Physella sp</i>	4 +
03360	<i>Plumatella sp</i>	13 +	96900	<i>Ferrissia sp</i>	16
03600	<i>Oligochaeta</i>	432			
06201	<i>Hyalella azteca</i>	1 +	No. Quantitative Taxa: 31		Total Taxa: 44
06700	<i>Crangonyx sp</i>	+	No. Qualitative Taxa: 22		ICI: 18
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	Number of Organisms: 2056		Qual EPT: 1
13400	<i>Stenacron sp</i>	34			
15000	<i>Paraleptophlebia sp</i>	1			
16700	<i>Tricorythodes sp</i>	7			
17200	<i>Caenis sp</i>	20			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	20 +			
24900	<i>Gomphus sp</i>	+			
43300	<i>Ranatra sp</i>	+			
44501	<i>Corixidae</i>	4			
45100	<i>Palmacorixa sp</i>	+			
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
47600	<i>Sialis sp</i>	2 +			
51206	<i>Cyrnellus fraternus</i>	8			
51600	<i>Polycentropus sp</i>	4			
52200	<i>Cheumatopsyche sp</i>	+			
59001	<i>Leptoceridae</i>	4			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	4 +			
68901	<i>Macronychus glabratus</i>	+			
74501	<i>Ceratopogonidae</i>	4			
77115	<i>Ablabesmyia janta</i>	15			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	120 +			
78655	<i>Procladius (Holotanypus) sp</i>	15			
80370	<i>Corynoneura lobata</i>	4			
80430	<i>Cricotopus (C.) tremulus group</i>	15			
81460	<i>Orthocladius (O.) sp</i>	+			
81632	<i>Parakiefferiella n.sp 2</i>	15			
83040	<i>Dicrotendipes neomodestus</i>	15			
83050	<i>Dicrotendipes lucifer</i>	120			
83300	<i>Glyptotendipes (G.) sp</i>	777 +			
83840	<i>Microtendipes pedellus group</i>	15			
84300	<i>Phaenopsectra obediens group</i>	224			
84790	<i>Tribelos fuscicorne</i>	120 +			
86100	<i>Chrysops sp</i>	+			
93900	<i>Elimia sp</i>	1			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 08/31/1999 River Code: 05-001 River: Sandusky River

RM: 47.80 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	80410	<i>Cricotopus (C.) sp</i>	+
03360	<i>Plumatella sp</i>	+	81240	<i>Nanocladius (N.) distinctus</i>	+
03600	<i>Oligochaeta</i>	+	81250	<i>Nanocladius (N.) minimus</i>	+
08601	<i>Hydracarina</i>	+	83040	<i>Dicrotendipes neomodestus</i>	+
11130	<i>Baetis intercalaris</i>	+	83300	<i>Glyptotendipes (G.) sp</i>	+
11650	<i>Procladius sp (w/ hindwing pads)</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	+
12200	<i>Isonychia sp</i>	+	83840	<i>Microtendipes pedellus group</i>	+
13000	<i>Leucrocota sp</i>	+	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+
13400	<i>Stenacron sp</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
13561	<i>Stenonema pulchellum</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
13570	<i>Stenonema terminatum</i>	+	84700	<i>Stenochironomus sp</i>	+
16700	<i>Tricorythodes sp</i>	+	84960	<i>Pseudochironomus sp</i>	+
17200	<i>Caenis sp</i>	+	85625	<i>Rheotanytarsus exiguus group</i>	+
18100	<i>Anthopotamus sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
22001	<i>Coenagrionidae</i>	+	93900	<i>Elimia sp</i>	+
22300	<i>Argia sp</i>	+	95100	<i>Physella sp</i>	+
34700	<i>Agnetina capitata complex</i>	+	96900	<i>Ferrissia sp</i>	+
43300	<i>Ranatra sp</i>	+	97601	<i>Corbicula fluminea</i>	+
45100	<i>Palmacorixa sp</i>	+	98600	<i>Sphaerium sp</i>	+
48410	<i>Corydalis cornutus</i>	+	99180	<i>Strophitus undulatus undulatus</i>	+
51600	<i>Polycentropus sp</i>	+	99200	<i>Alasmidonta marginata</i>	+
52200	<i>Cheumatopsyche sp</i>	+	99280	<i>Lasmigona costata</i>	+
52430	<i>Ceratopsyche morosa group</i>	+	99600	<i>Actinonaias ligamentina carinata</i>	+
52520	<i>Hydropsyche bidens</i>	+			
52570	<i>Hydropsyche simulans</i>	+			
52801	<i>Potamyia flava</i>	+			
53400	<i>Protophila sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 65
53800	<i>Hydroptila sp</i>	+	No. Qualitative Taxa: 65		ICI:
57400	<i>Neophylax sp</i>	+	Number of Organisms: 0		Qual EPT: 24
57900	<i>Pycnopsyche sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
59100	<i>Ceraclea sp</i>	+			
59570	<i>Oecetis nocturna</i>	+			
59970	<i>Petrophila sp</i>	+			
60300	<i>Dineutus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/14/1999 River Code: 05-001 River: Sandusky River

RM: 47.80 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01200	<i>Cordylophora lacustris</i>	1	83040	<i>Dicrotendipes neomodestus</i>	175 +
01320	<i>Hydra sp</i>	128	83300	<i>Glyptotendipes (G.) sp</i>	1166 +
01801	<i>Turbellaria</i>	173 +	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	233 +
03360	<i>Plumatella sp</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
03600	<i>Oligochaeta</i>	74 +	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	1341 +
06201	<i>Hyalella azteca</i>	+	85615	<i>Rheotanytarsus distinctissimus group</i>	58
08601	<i>Hydracarina</i>	120	85625	<i>Rheotanytarsus exiguus group</i>	350 +
11130	<i>Baetis intercalaris</i>	3	87540	<i>Hemerodromia sp</i>	2
12200	<i>Isonychia sp</i>	6 +	93900	<i>Elimia sp</i>	+
13000	<i>Leucrocuta sp</i>	2	95100	<i>Physella sp</i>	+
13400	<i>Stenacron sp</i>	502 +	96900	<i>Ferrissia sp</i>	2 +
13550	<i>Stenonema mexicanum integrum</i>	2	97601	<i>Corbicula fluminea</i>	34 +
13561	<i>Stenonema pulchellum</i>	187 +	98600	<i>Sphaerium sp</i>	3 +
13570	<i>Stenonema terminatum</i>	88 +			
16700	<i>Tricorythodes sp</i>	59 +			
18600	<i>Ephemera sp</i>	+			
22300	<i>Argia sp</i>	+	No. Quantitative Taxa: 42		Total Taxa: 55
31800	<i>Taeniopteryx sp</i>	22	No. Qualitative Taxa: 36		ICI: 38
45100	<i>Palmacorixa sp</i>	+	Number of Organisms: 8868		Qual EPT: 11
45400	<i>Trichocorixa sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	1868 +			
52430	<i>Ceratopsyche morosa group</i>	285 +			
52520	<i>Hydropsyche bidens</i>	92 +			
52540	<i>Hydropsyche dicantha</i>	5			
52560	<i>Hydropsyche orris</i>	12			
52801	<i>Potamyia flava</i>	8			
53800	<i>Hydroptila sp</i>	9			
59001	<i>Leptoceridae</i>	8			
59970	<i>Petrophila sp</i>	3 +			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	1 +			
69400	<i>Stenelmis sp</i>	21 +			
71100	<i>Hexatoma sp</i>	+			
72420	<i>Chaoborus sp</i>	19			
77750	<i>Hayesomyia senata</i> or <i>Thienemannimyia norena</i>	582 +			
80410	<i>Cricotopus (C.) sp</i>	291			
80420	<i>Cricotopus (C.) bicinctus</i>	175			
80430	<i>Cricotopus (C.) tremulus group</i>	233			
81200	<i>Nanocladius sp</i>	117			
81460	<i>Orthocladius (O.) sp</i>	408 +			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/08/1999 River Code: 05-001 River: Sandusky River

RM: 43.00

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01200	<i>Cordylophora lacustris</i>	8			
01320	<i>Hydra sp</i>	8			
01801	<i>Turbellaria</i>	388 +			
03221	<i>Pectinatella magnifica</i>	3			
03360	<i>Plumatella sp</i>	35 +			
03451	<i>Urnatella gracilis</i>	43			
03600	<i>Oligochaeta</i>	1498			
04664	<i>Helobdella stagnalis</i>	+			
06201	<i>Hyaella azteca</i>	+			
06700	<i>Crangonyx sp</i>	+			
17200	<i>Caenis sp</i>	24			
22300	<i>Argia sp</i>	48 +			
51206	<i>Cyrnellus fraternus</i>	51			
60900	<i>Peltodytes sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	1 +			
69400	<i>Stenelmis sp</i>	1 +			
83300	<i>Glyptotendipes (G.) sp</i>	3105 +			
84020	<i>Parachironomus carinatus</i>	31			
94400	<i>Fossaria sp</i>	+			
95100	<i>Physella sp</i>	36			
96110	<i>Menetus (Micromenetus) brogniartianus</i>	91			
96930	<i>Laevapex fuscus</i>	70 +			

No. Quantitative Taxa: 17 Total Taxa: 23

No. Qualitative Taxa: 13 ICI: 4

Number of Organisms: 5441 Qual EPT: 0

Collection Date: 08/31/1999 River Code: 05-001 River: Sandusky River RM: 41.80 A

RM: 41.80 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00401	<i>Spongillidae</i>	+	83040	<i>Dicrotendipes neomodestus</i>	+
01801	<i>Turbellaria</i>	+	84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	+
03600	<i>Oligochaeta</i>	+	84300	<i>Phaenopsectra obediens</i> group	+
06201	<i>Hyalella azteca</i>	+	84450	<i>Polypedilum</i> (<i>P.</i>) " <i>convictum</i> " (<i>sensu</i> Simpson and Bode, 1980)	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	84888	<i>Xenochironomus xenolabis</i>	+
11120	<i>Baetis flavistriga</i>	+	85625	<i>Rheotanytarsus exiguus</i> group	+
11130	<i>Baetis intercalaris</i>	+	85821	<i>Tanytarsus glabrescens</i> group sp 7	+
11650	<i>Procloeon</i> sp (w/ hindwing pads)	+	87540	<i>Hemerodromia</i> sp	+
13000	<i>Leucrocuta</i> sp	+	93900	<i>Elimia</i> sp	+
13400	<i>Stenacron</i> sp	+	96900	<i>Ferrissia</i> sp	+
13521	<i>Stenonema femoratum</i>	+	98600	<i>Sphaerium</i> sp	+
13561	<i>Stenonema pulchellum</i>	+	99280	<i>Lasmigona costata</i>	+
13570	<i>Stenonema terminatum</i>	+	99600	<i>Actinonaias ligamentina carinata</i>	+
16700	<i>Tricorythodes</i> sp	+	99860	<i>Lampsilis radiata luteola</i>	+
17200	<i>Caenis</i> sp	+			
18100	<i>Anthopotamus</i> sp	+			
22300	<i>Argia</i> sp	+	No. Quantitative Taxa: 0	Total Taxa: 56	
43300	<i>Ranatra</i> sp	+	No. Qualitative Taxa: 56	ICI:	
45100	<i>Palmacorixa</i> sp	+	Number of Organisms: 0	Qual EPT: 18	
47600	<i>Sialis</i> sp	+			
48410	<i>Corydalus cornutus</i>	+			
49200	<i>Climacia</i> sp	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus</i> sp	+			
52200	<i>Cheumatopsyche</i> sp	+			
52430	<i>Ceratopsyche morosa</i> group	+			
52520	<i>Hydropsyche bidens</i>	+			
57900	<i>Pycnopsyche</i> sp	+			
58505	<i>Helicopsyche borealis</i>	+			
59970	<i>Petrophila</i> sp	+			
68075	<i>Psephenus herricki</i>	+			
68702	<i>Dubiraphia bivittata</i>	+			
68708	<i>Dubiraphia vittata</i> group	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis</i> sp	+			
71100	<i>Hexatoma</i> sp	+			
74100	<i>Simulium</i> sp	+			
78140	<i>Labrundinia pilosella</i>	+			
78750	<i>Rheopelopia paramaculipennis</i>	+			
81231	<i>Nanocladius</i> (<i>N.</i>) <i>crassicornus</i> or <i>N.</i> (<i>N.</i>) " <i>rectinervis</i> "	+			
82730	<i>Chironomus</i> (<i>C.</i>) <i>decorus</i> group	+			
82820	<i>Cryptochironomus</i> sp	+			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/14/1999 River Code: 05-001 River: Sandusky River

RM: 41.80 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00653	<i>Eunapius fragilis</i>	+	80420	<i>Cricotopus (C.) bicinctus</i>	+
01320	<i>Hydra sp</i>	1192	81231	<i>Nanocladius (N.) crassicornus</i> or <i>N. (N.) "rectinervis"</i>	123 +
01801	<i>Turbellaria</i>	94 +	81240	<i>Nanocladius (N.) distinctus</i>	123
03360	<i>Plumatella sp</i>	4 +	81460	<i>Orthocladius (O.) sp</i>	617 +
03600	<i>Oligochaeta</i>	1160 +	82101	<i>Thienemanniella n.sp 1</i>	192 +
06201	<i>Hyalella azteca</i>	+	82820	<i>Cryptochironomus sp</i>	+
06700	<i>Crangonyx sp</i>	+	83040	<i>Dicrotendipes neomodestus</i>	617 +
11130	<i>Baetis intercalaris</i>	1 +	83300	<i>Glyptotendipes (G.) sp</i>	123 +
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	83840	<i>Microtendipes pedellus group</i>	123 +
13400	<i>Stenacron sp</i>	622 +	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	3578 +
13561	<i>Stenonema pulchellum</i>	93 +	84888	<i>Xenochironomus xenolabis</i>	+
13570	<i>Stenonema terminatum</i>	57 +	85625	<i>Rheotanytarsus exiguus group</i>	4812 +
16700	<i>Tricorythodes sp</i>	98	85814	<i>Tanytarsus glabrescens group</i>	123
17200	<i>Caenis sp</i>	9 +	87540	<i>Hemerodromia sp</i>	16
18100	<i>Anthopotamus sp</i>	2	93900	<i>Elimia sp</i>	+
22001	<i>Coenagrionidae</i>	+	95100	<i>Physella sp</i>	3 +
22300	<i>Argia sp</i>	+	96900	<i>Ferrissia sp</i>	+
31800	<i>Taeniopteryx sp</i>	129	98001	<i>Sphaeriidae</i>	8
45400	<i>Trichocorixa sp</i>	+	98200	<i>Pisidium sp</i>	+
47600	<i>Sialis sp</i>	+	98600	<i>Sphaerium sp</i>	+
49200	<i>Climacia sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
51206	<i>Cyrnellus fraternus</i>	1			
51600	<i>Polycentropus sp</i>	6			
52200	<i>Cheumatopsyche sp</i>	1363 +			
52430	<i>Ceratopsyche morosa group</i>	584 +			
52510	<i>Hydropsyche aerata</i>	5 +			
52520	<i>Hydropsyche bidens</i>	102			
52590	<i>Hydropsyche venularis</i>	10 +			
53800	<i>Hydroptila sp</i>	32			
58505	<i>Helicopsyche borealis</i>	8 +			
59970	<i>Petrophila sp</i>	3 +			
60900	<i>Peltodytes sp</i>	+			
66700	<i>Helochaeres maculicollis</i>	+			
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
69400	<i>Stenelmis sp</i>	24 +			
71900	<i>Tipula sp</i>	+			
74100	<i>Simulium sp</i>	1 +			
77750	<i>Hayesomyia senata</i> or <i>Thienemannimyia norena</i>	987 +			
79085	<i>Telopelopia okoboji</i>	370 +			
80410	<i>Cricotopus (C.) sp</i>	370			
			No. Quantitative Taxa: 40 Total Taxa: 62 No. Qualitative Taxa: 49 ICI: 36 Number of Organisms: 17785 Qual EPT: 12		

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/01/1999 River Code: 05-021 River: Sycamore Creek

RM: 9.10 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	95100	<i>Physella sp</i>	+
04666	<i>Helobdella triserialis</i>	+	96264	<i>Planorbella (Pierosoma) pilsbryi</i>	+
06201	<i>Hyaella azteca</i>	+	96900	<i>Ferrissia sp</i>	+
11120	<i>Baetis flavistriga</i>	+			
11130	<i>Baetis intercalaris</i>	+	No. Quantitative Taxa: 0		Total Taxa: 45
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	No. Qualitative Taxa: 45		ICI:
12200	<i>Isonychia sp</i>	+	Number of Organisms: 0		Qual EPT: 18
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
23909	<i>Boyeria vinosa</i>	+			
24900	<i>Gomphus sp</i>	+			
45100	<i>Palmacorixa sp</i>	+			
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
47600	<i>Sialis sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
57400	<i>Neophylax sp</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
59310	<i>Mystacides sepulchralis</i>	+			
59500	<i>Oecetis sp</i>	+			
59970	<i>Petrophila sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
65800	<i>Berosus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
82300	<i>Xylotopus par</i>	+			
83158	<i>Endochironomus nigricans</i>	+			
84060	<i>Parachironomus pectinatellae</i>	+			
84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	+			
84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+			
85625	<i>Rheotanytarsus exiguus group</i>	+			
86200	<i>Tabanus sp</i>	+			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/13/1999 River Code: 05-021 River: Sycamore Creek

RM: 9.10 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03360	<i>Plumatella sp</i>	+			
03600	<i>Oligochaeta</i>	+			
06201	<i>Hyalella azteca</i>	+			
11130	<i>Baetis intercalaris</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+			
17200	<i>Caenis sp</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
44501	<i>Corixidae</i>	+			
47600	<i>Sialis sp</i>	+			
48410	<i>Corydalus cornutus</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53400	<i>Protophila sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
68075	<i>Psephenus herricki</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
71900	<i>Tipula sp</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+			
84750	<i>Stictochironomus sp</i>	+			
86900	<i>Myxosargus sp</i>	+			
94400	<i>Fossaria sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 35
No. Qualitative Taxa: 35	ICI:
Number of Organisms: 0	Qual EPT: 11

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/01/1999 River Code: 05-021 River: Sycamore Creek

RM: 6.30 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
07860	<i>Cambarus (Puncticambarus) robustus</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 4
No. Qualitative Taxa: 4	ICI:
Number of Organisms: 0	Qual EPT: 1

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/13/1999 River Code: 05-021 River: Sycamore Creek

RM: 6.30 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
07860	<i>Cambarus (Puncticambarus) robustus</i>	+			
60900	<i>Peltodytes sp</i>	+			
63300	<i>Hydroporus sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
81460	<i>Orthocladius (O.) sp</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
82770	<i>Chironomus (C.) riparius group</i>	+			
83590	<i>Kiefferulus sp</i>	+			
84800	<i>Tribelos jucundum</i>	+			
87800	<i>Eristalis sp</i>	+			
89501	<i>Ephydriidae</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0

Total Taxa: 15

No. Qualitative Taxa: 15

ICI:

Number of Organisms: 0

Qual EPT: 0

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/03/1999 River Code: 05-021 River: Sycamore Creek

RM: 5.00 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
08601	<i>Hydracarina</i>	+			
47600	<i>Sialis sp</i>	+			
57400	<i>Neophylax sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
60900	<i>Peltodytes sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
69400	<i>Stenelmis sp</i>	+			
78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+			
93900	<i>Elimia sp</i>	+			
98200	<i>Pisidium sp</i>	+			

No. Quantitative Taxa: 0

Total Taxa: 12

No. Qualitative Taxa: 12

ICI:

Number of Organisms: 0

Qual EPT: 2

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/13/1999 River Code: 05-021 River: Sycamore Creek

RM: 5.00 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	1418			
01801	<i>Turbellaria</i>	1 +			
03600	<i>Oligochaeta</i>	32 +			
04685	<i>Placobdella ornata</i>	+			
05800	<i>Caecidotea sp</i>	+			
08601	<i>Hydracarina</i>	8			
11200	<i>Callibaetis sp</i>	+			
42700	<i>Belostoma sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
69400	<i>Stenelmis sp</i>	12 +			
71900	<i>Tipula sp</i>	4 +			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	4 +			
77500	<i>Conchapelopia sp</i>	46			
77800	<i>Helopelopia sp</i>	+			
81460	<i>Orthocladius (O.) sp</i>	31 +			
82730	<i>Chironomus (C.) decorus group</i>	246 +			
83040	<i>Dicrotendipes neomodestus</i>	277 +			
83300	<i>Glyptotendipes (G.) sp</i>	31			
83590	<i>Kiefferulus sp</i>	46 +			
83840	<i>Microtendipes pedellus group</i>	31			
84300	<i>Phaenopsectra obediens group</i>	154			
84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+			
84460	<i>Polypedilum (P.) fallax group</i>	31			
84750	<i>Stictochironomus sp</i>	185 +			
85800	<i>Tanytarsus sp</i>	15			
85814	<i>Tanytarsus glabrescens group</i>	92			
89501	<i>Ephydridae</i>	+			
93900	<i>Elimia sp</i>	1 +			
95100	<i>Physella sp</i>	4 +			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 21 Total Taxa: 31

No. Qualitative Taxa: 22 ICI: 12

Number of Organisms: 2669 Qual EPT: 1

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/03/1999 River Code: 05-021 River: Sycamore Creek

RM: 3.60 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
04962	<i>Mooreobdella fervida</i>	+			
05800	<i>Caecidotea sp</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
47600	<i>Sialis sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
52540	<i>Hydropsyche dicantha</i>	+			
57400	<i>Neophylax sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
68075	<i>Psephenus herricki</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
78680	<i>Procladius (Psilotanypus) bellus</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
93900	<i>Elimia sp</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0 Total Taxa: 26

No. Qualitative Taxa: 26 ICI:

Number of Organisms: 0 Qual EPT: 5

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/12/1999 River Code: 05-021 River: Sycamore Creek

RM: 3.60 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	48	87540	<i>Hemerodromia sp</i>	16
01801	<i>Turbellaria</i>	32 +	93900	<i>Elimia sp</i>	+
02600	<i>Nematomorpha</i>	8	95100	<i>Physella sp</i>	16 +
03600	<i>Oligochaeta</i>	16 +			
05800	<i>Caecidotea sp</i>	8 +	No. Quantitative Taxa: 31		Total Taxa: 45
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	No. Qualitative Taxa: 30		ICI: 22
08601	<i>Hydracarina</i>	8 +	Number of Organisms: 2438		Qual EPT: 4
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	8 +			
22300	<i>Argia sp</i>	24 +			
23909	<i>Boyeria vinosa</i>	+			
30000	<i>Plecoptera</i>	8			
47600	<i>Sialis sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
52200	<i>Cheumatopsyche sp</i>	18 +			
52530	<i>Hydropsyche depravata group</i>	3 +			
52540	<i>Hydropsyche dicantha</i>	1			
58505	<i>Helicopsyche borealis</i>	+			
60900	<i>Peltodytes sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	8 +			
70600	<i>Antocha sp</i>	80			
71900	<i>Tipula sp</i>	8 +			
71910	<i>Tipula abdominalis</i>	+			
74100	<i>Simulium sp</i>	8 +			
77800	<i>Helopelopia sp</i>	181 +			
80420	<i>Cricotopus (C.) bicinctus</i>	20 +			
81270	<i>Nanocladius (N.) spinipennis</i>	80			
81460	<i>Orthocladius (O.) sp</i>	161 +			
81632	<i>Parakiefferiella n.sp 2</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	20			
82141	<i>Thienemanniella xena</i>	40			
83040	<i>Dicrotendipes neomodestus</i>	20			
83840	<i>Microtendipes pedellus group</i>	1348 +			
84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+			
85615	<i>Rheotanytarsus distinctissimus group</i>	20			
85625	<i>Rheotanytarsus exiguus group</i>	101			
85720	<i>Stempellinella n.sp nr. flavidula</i>	20			
85814	<i>Tanytarsus glabrescens group</i>	101			
86001	<i>Tabanidae</i>	8			

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 09/03/1999 River Code: 05-021 River: Sycamore Creek

RM: 2.60 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
06201	<i>Hyalella azteca</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
22001	<i>Coenagrionidae</i>	+			
23909	<i>Boyeria vinosa</i>	+			
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
57400	<i>Neophylax sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
63300	<i>Hydroporus sp</i>	+			
65800	<i>Berosus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
84750	<i>Stictochironomus sp</i>	+			
86100	<i>Chrysops sp</i>	+			
93900	<i>Elimia sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			

No. Quantitative Taxa: 0

Total Taxa: 22

No. Qualitative Taxa: 22

ICI:

Number of Organisms: 0

Qual EPT: 2

Ohio EPA/DSW Monitoring and Assessment Section
Macroinvertebrate Collection

Collection Date: 10/12/1999 River Code: 05-021 River: Sycamore Creek

RM: 2.60 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	424		<i>norena</i>	
01801	<i>Turbellaria</i>	204 +	77800	<i>Helopelopia sp</i>	128 +
02600	<i>Nematomorpha</i>	8	79085	<i>Telopelopia okoboji</i>	21
03360	<i>Plumatella sp</i>	1	80370	<i>Corynoneura lobata</i>	21
03600	<i>Oligochaeta</i>	2864 +	80420	<i>Cricotopus (C.) bicinctus</i>	64
05800	<i>Caecidotea sp</i>	+	80430	<i>Cricotopus (C.) tremulus group</i>	+
06201	<i>Hyaella azteca</i>	46 +	80510	<i>Cricotopus (Isocladius) sylvestris group</i>	21
06700	<i>Crangonyx sp</i>	21 +	81270	<i>Nanocladius (N.) spinipennis</i>	128
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	81460	<i>Orthocladius (O.) sp</i>	404 +
08601	<i>Hydracarina</i>	8 +	81632	<i>Parakiefferiella n.sp 2</i>	21 +
11651	<i>Procladius sp (w/o hindwing pads)</i>	+	82141	<i>Thienemanniella xena</i>	21
12501	<i>Heptageniidae</i>	4	83040	<i>Dicrotendipes neomodestus</i>	128 +
22001	<i>Coenagrionidae</i>	+	83300	<i>Glyptotendipes (G.) sp</i>	85
22300	<i>Argia sp</i>	9 +	83840	<i>Microtendipes pedellus group</i>	319 +
23909	<i>Boyeria vinosa</i>	2	84300	<i>Phaenopsectra obediens group</i>	21
27610	<i>Epitheca (Tetragoneuria) cynosura</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	21
30000	<i>Plecoptera</i>	12	84750	<i>Stictochironomus sp</i>	+
44501	<i>Corixidae</i>	+	85500	<i>Paratanytarsus sp</i>	85 +
47600	<i>Sialis sp</i>	+	85800	<i>Tanytarsus sp</i>	575 +
50301	<i>Chimarra aterrima</i>	+	85814	<i>Tanytarsus glabrescens group</i>	64
50315	<i>Chimarra obscura</i>	4 +	93900	<i>Elimia sp</i>	+
51600	<i>Polycentropus sp</i>	16 +	94400	<i>Fossaria sp</i>	5
52200	<i>Cheumatopsyche sp</i>	4 +	95100	<i>Physella sp</i>	52 +
53800	<i>Hydroptila sp</i>	16 +	96900	<i>Ferrissia sp</i>	+
58505	<i>Helicopsyche borealis</i>	1 +	98200	<i>Pisidium sp</i>	+
59300	<i>Mystacides sp</i>	4	98600	<i>Sphaerium sp</i>	+
59500	<i>Oecetis sp</i>	4			
60900	<i>Peltodytes sp</i>	+	No. Quantitative Taxa: 48		Total Taxa: 68
63900	<i>Laccophilus sp</i>	+	No. Qualitative Taxa: 44		ICI: 26
65800	<i>Berosus sp</i>	79 +	Number of Organisms: 6022		Qual EPT: 7
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68201	<i>Scirtidae</i>	+			
68601	<i>Ancyronyx variegata</i>	12			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	9			
69400	<i>Stenelmis sp</i>	1 +			
71900	<i>Tipula sp</i>	5 +			
74100	<i>Simulium sp</i>	4 +			
74501	<i>Ceratopogonidae</i>	8 +			
74673	<i>Atrichopogon websteri</i>	4			
77500	<i>Conchapelopia sp</i>	21			
77750	<i>Hayesomyia senata or Thienemannimyia</i>	43			

RM: 0.30 A

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	78450	<i>Nilotanypus fimbriatus</i>	+
02600	<i>Nematomorpha</i>	+	81270	<i>Nanocladius (N.) spiniplenus</i>	+
03600	<i>Oligochaeta</i>	+	83040	<i>Dicrotendipes neomodestus</i>	+
05800	<i>Caecidotea sp</i>	+	83300	<i>Glyptotendipes (G.) sp</i>	+
06201	<i>Hyalella azteca</i>	+	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	+
06700	<i>Crangonyx sp</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	84750	<i>Stictochironomus sp</i>	+
13400	<i>Stenacron sp</i>	+	85201	<i>Cladotanytarsus species group A</i>	+
16700	<i>Tricorythodes sp</i>	+	85500	<i>Paratanytarsus sp</i>	+
17200	<i>Caenis sp</i>	+	85720	<i>Stempellinella n.sp nr. flavidula</i>	+
18600	<i>Ephemera sp</i>	+	85800	<i>Tanytarsus sp</i>	+
21200	<i>Calopteryx sp</i>	+	85814	<i>Tanytarsus glabrescens group</i>	+
22001	<i>Coenagrionidae</i>	+	86100	<i>Chrysops sp</i>	+
22300	<i>Argia sp</i>	+	93900	<i>Elimia sp</i>	+
23909	<i>Boyeria vinosa</i>	+	95100	<i>Physella sp</i>	+
28516	<i>Libellula pulchella</i>	+	96900	<i>Ferrissia sp</i>	+
28955	<i>Libellula lydia</i>	+	98200	<i>Pisidium sp</i>	+
34700	<i>Agnetina capitata complex</i>	+	99540	<i>Elliptio dilatata</i>	+
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
48410	<i>Corydalus cornutus</i>	+	No. Quantitative Taxa: 0	Total Taxa: 61	
50906	<i>Psychomyia flavida</i>	+	No. Qualitative Taxa: 61	ICI:	
52200	<i>Cheumatopsyche sp</i>	+	Number of Organisms: 0	Qual EPT: 14	
52530	<i>Hydropsyche depravata group</i>	+			
52540	<i>Hydropsyche dicantha</i>	+			
53400	<i>Protoptila sp</i>	+			
53501	<i>Hydroptilidae</i>	+			
57400	<i>Neophylax sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
59300	<i>Mystacides sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
65800	<i>Berosus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77800	<i>Helopelopia sp</i>	+			

RM: 0.30 B

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	45	81460	<i>Orthocladius (O.) sp</i>	491 +
01801	<i>Turbellaria</i>	23 +	81632	<i>Parakiefferiella n.sp 2</i>	164
03360	<i>Plumatella sp</i>	1	82141	<i>Thienemanniella xena</i>	32 +
03600	<i>Oligochaeta</i>	97 +	83040	<i>Dicrotendipes neomodestus</i>	196
05800	<i>Caecidotea sp</i>	1	83300	<i>Glyptotendipes (G.) sp</i>	164
06201	<i>Hyaella azteca</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	33
06700	<i>Crangonyx sp</i>	1	83840	<i>Microtendipes pedellus group</i>	822
11020	<i>Acerpenna pygmaeus</i>	19	84450	<i>Polypedilum (P.) "convictum" (sensu Simpson and Bode, 1980)</i>	262 +
11130	<i>Baetis intercalaris</i>	3	84750	<i>Stictochironomus sp</i>	98 +
11200	<i>Callibaetis sp</i>	1	85500	<i>Paratanytarsus sp</i>	198 +
13400	<i>Stenacron sp</i>	83	85625	<i>Rheotanytarsus exiguus group</i>	131
21200	<i>Calopteryx sp</i>	+	85752	<i>Sublettea coffmani</i>	33
22001	<i>Coenagrionidae</i>	+	85800	<i>Tanytarsus sp</i>	165
22300	<i>Argia sp</i>	3 +	85814	<i>Tanytarsus glabrescens group</i>	428
23909	<i>Boyeria vinosa</i>	+	87540	<i>Hemerodromia sp</i>	17
31800	<i>Taeniopteryx sp</i>	18	93900	<i>Elimia sp</i>	+
34700	<i>Agnetina capitata complex</i>	+	94400	<i>Fossaria sp</i>	+
45400	<i>Trichocorixa sp</i>	+	95100	<i>Physella sp</i>	147 +
47600	<i>Sialis sp</i>	+	96900	<i>Ferrissia sp</i>	3 +
51600	<i>Polycentropus sp</i>	33	98600	<i>Sphaerium sp</i>	+
52200	<i>Cheumatopsyche sp</i>	76 +	99540	<i>Elliptio dilatata</i>	+
52430	<i>Ceratopsyche morosa group</i>	5 +			
52530	<i>Hydropsyche depravata group</i>	1 +			
52540	<i>Hydropsyche dicantha</i>	+			
58505	<i>Helicopsyche borealis</i>	+	No. Quantitative Taxa: 44	Total Taxa: 62	
59310	<i>Mystacides sepulchralis</i>	3	No. Qualitative Taxa: 36	ICI: 36	
60900	<i>Peltodytes sp</i>	+	Number of Organisms: 4334	Qual EPT: 6	
68075	<i>Psephenus herricki</i>	+			
68901	<i>Macronychus glabratus</i>	22 +			
69400	<i>Stenelmis sp</i>	3 +			
70600	<i>Antocha sp</i>	1			
71100	<i>Hexatoma sp</i>	+			
71910	<i>Tipula abdominalis</i>	1			
74100	<i>Simulium sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	98			
77800	<i>Helopelopia sp</i>	132 +			
80370	<i>Corynoneura lobata</i>	148 +			
80870	<i>Hydrobaenus sp</i>	+			
81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	33 +			
81250	<i>Nanocladius (N.) minimus</i>	33			
81270	<i>Nanocladius (N.) spiniplenus</i>	66			

Appendix Table 15. Invertebrate Community Index (ICI) metrics and scores for sampling sites in the Sycamore Creek study area, 1999.

Kirby Tire Fire sampling: Sycamore Creek and Sandusky River

River Mile	Drainage Area (sq mi)	Number of				Percent:					Qual. EPT	Eco- region	ICI
		Total Taxa	Mayfly Taxa	Caddisfly Taxa	Dipteran Taxa	Mayflies	Caddis- flies	Tany- tarsini	Other Dipt/NI	Tolerant Organisms			
Sandusky River (05-001)													
Year: 1999													
61.10 B	659.0	42(6)	8(4)	5(4)	20(6)	42.4(6)	9.5(2)	1.3(2)	40.0(2)	3.4(4)	15(4)	5	40
57.30 B	761.0	31(4)	4(2)	3(4)	13(6)	3.0(2)	0.8(0)	0.0(0)	94.7(0)	22.0(0)	1(0)	5	18
47.80 B	774.0	42(6)	8(6)	8(6)	14(6)	9.6(2)	25.8(4)	4.6(2)	59.5(0)	2.8(4)	11(2)	5	38
43.00	957.0	17(2)	1(0)	1(0)	2(0)	0.4(2)	0.9(0)	0.0(0)	97.7(0)	28.2(0)	0(0)	5	4
41.80 B	962.0	40(6)	7(4)	9(6)	15(6)	5.0(2)	11.9(2)	27.7(6)	54.5(0)	7.2(0)	12(4)	5	36
Sycamore Creek (05-021)													
Year: 1999													
5.00 B	56.0	21(2)	0(0)	0(0)	14(4)	0.0(0)	0.0(0)	4.0(2)	95.5(0)	11.7(4)	1(0)	5	12
3.60 B	57.0	31(4)	0(0)	3(4)	17(4)	0.0(0)	0.9(2)	9.9(2)	87.2(0)	2.1(6)	4(0)	5	22
2.60 B	58.0	48(6)	1(0)	7(6)	23(6)	0.1(2)	0.8(2)	12.0(2)	85.0(0)	49.8(0)	7(2)	5	26
0.30 B	67.5	44(6)	4(2)	5(6)	23(6)	2.4(2)	2.7(2)	22.0(4)	71.7(0)	5.7(6)	6(2)	5	36

Appendix Table 16. Results of surface water sampling conducted by Ohio EPA in the Sycamore Creek study area during November and December, 1999.

Sycamore Creek								
Sampling Location/River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 5.02	RM 6.37	RM 3.54	RM 2.61	RM 0.41
Date Sampled :	11/03/99	11/03/99	11/03/99	11/03/99	11/03/99	11/03/99	11/03/99	11/03/99
Duplicate								
Parameter								
BOD5	6 mg/L	5.8 mg/L	7 mg/L	4.3 mg/L / 6.1 mg/L	5.6 mg/L	3 mg/L	<2.00 mg/L	2.1 mg/L
Total Dissolved Solids	404 mg/L	430 mg/L	420 mg/L	432 mg/L / 438 mg/L	430 mg/L	520 mg/L	540 mg/L	608 mg/L
Total Suspended Solids	78 mg/L	9.5 mg/L	22 mg/L	14 mg/L / 39.5 mg/L	13 mg/L	<5.00 mg/L	<5.00 mg/L	8.5 mg/L
Cadmium-T	<0.20 ug/L	<0.2 ug/L	<0.2 ug/L	<0.2 ug/L / <0.2 ug/L	<0.2 ug/L	<0.2 ug/L	<0.2 ug/L	<0.2 ug/L
Total Hardness	236 mg/L	268 mg/L	274 mg/L	297 mg/L / 301 mg/L	273 mg/L	317 mg/L	319 mg/L	357 mg/L
COD	38 mg/L	38 mg/L	38 mg/L	19 mg/L / 29 mg/L	41 mg/L	25 mg/L	13 mg/L	<10 mg/L
Ammonia-N	<0.05mg/L	0.151 mg/L	0.095 mg/L	<0.05 mg/L / <0.05 mg/L	0.134 mg/L	<0.05 mg/L	<0.05 mg/L	<0.05 mg/L
Nitrate+nitrite	7.79 mg/L	1.13 mg/L	0.749 mg/L	0.255 mg/L / 0.261 mg/L	1.26 mg/L	0.257 mg/L	0.633 mg/L	1.6 mg/L
Nitrite	0.06 mg/L	0.04 mg/L	0.04 mg/L	0.02 mg/L / 0.02 mg/L	0.05 mg/L	0.03 mg/L	<0.02 mg/L	<0.02 mg/L
TKN	1.3 mg/L	1 mg/L	0.95 mg/L	0.75 mg/L / 0.74 mg/L	0.92 mg/L	0.85 mg/L	0.41 mg/L	0.52 mg/L
Total Phosphorus	0.2 mg/L	0.11 mg/L	0.13 mg/L	0.11 mg/L / 0.11 mg/L	0.14 mg/L	0.11 mg/L	0.14 mg/L	0.1 mg/L
Sandusky River					Kirby Tributary			
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57	RM 0.01				
Date Sampled :	11/03/99	11/03/99	11/03/99	11/03/99				
Duplicate								
Parameter								
BOD5	4.4 mg/L	3.9 mg/L / 3.8 mg/L	<2.00 mg/L			5.1 mg/L		
Total Dissolved Solids	818 mg/L	802 mg/L / 809 mg/L	736 mg/L			384 mg/L		
Total Suspended Solids	10 mg/L	38.5 mg/L / 38 mg/L	16.5 mg/L			10.5 mg/L		
Cadmium-T	<0.2 ug/L	<0.2 ug/L / <0.2 ug/L	<0.2 ug/L			<0.2 ug/L		
Total Hardness	476 mg/L	480 mg/L / 483 mg/L	440 mg/L			272 mg/L		
COD	19 mg/L	24 mg/L / 19 mg/L	16 mg/L			32 mg/L		
Ammonia-N	<0.05 mg/L	<0.05 mg/L / <0.05 mg/L	<0.05 mg/L			0.335 mg/L		
Nitrate+nitrite	2.27 mg/L	2.45 mg/L / 2.26 mg/L	0.493 mg/L			3.73 mg/L		
Nitrite	0.03 mg/L	0.03 mg/L / 0.03 mg/L	<0.2 mg/L			0.11 mg/L		
TKN	0.67 mg/L	0.52 mg/L / 0.72 mg/L	0.36 mg/L			1.29 mg/L		
Total Phosphorus	0.1 mg/L	0.09 mg/L / 0.11 mg/L	0.09 mg/L			0.18 mg/L		

Appendix Table 16. Continued.

Sycamore Creek									
Sampling Location/River Mile :	RM 9.13	RM 7.34	RM 6.85	RM 5.0	RM 6.37	RM 3.54	RM 2.61	RM 0.41	
Date Sampled :	12/07/99	12/07/99	12/07/99	12/07/99	12/07/99	12/07/99	12/07/99	12/07/99	12/07/99
Duplicate									
Parameter									
BOD5	2.3 mg/L	<2.0 mg/L	2 mg/L	2 mg/L	/ <2.0 mg/L	<2.0 mg/L	<2.0 mg/L	<2.00 mg/L	<2.00 mg/L
Total Dissolved Solids	452 mg/L	452 mg/L	442 mg/L	454 mg/L	/ 464 mg/L	444 mg/L	558 mg/L	570 mg/L	618 mg/L
Total Suspended Solids	22 mg/L	5 mg/L	28 mg/L	7 mg/L	/ 5 mg/L	5 mg/L	8.5 mg/L	<7 mg/L	<5.00 mg/L
Cadmium-T	<0.2 ug/L	0.3 ug/L	0.2 ug/L	<0.5 ug/L	/ <0.2 ug/L	0.2 ug/L	<5.0 ug/L	<0.3 ug/L	<5.00 ug/L
Total Hardness	275 mg/L	284 mg/L	296 mg/L	324 mg/L	/ 333 mg/L	308 mg/L	361 mg/L	352 mg/L	398 mg/L
COD	29 mg/L	13 mg/L	20 mg/L	17 mg/L	/ 13 mg/L	10 mg/L	10 mg/L	10 mg/L	<10 mg/L
Ammonia -N	<0.05 mg/L	0.725 mg/L	<0.05 mg/L	<0.05 mg/L	/ <0.05 mg/L	<0.05 mg/L	<0.05 mg/L	<0.05 mg/L	<0.0500 mg/L
Nitrate+nitrite	1.74 mg/L	<0.100 mg/L	0.176 mg/L	0.105 mg/L	/ <0.1 mg/L	0.155 mg/L	<0.1 mg/L	0.774 mg/L	1.01 mg/L
Nitrite	0.02 mg/L	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L	/ <0.02 mg/L	<0.02 mg/L	<0.02 mg/L	<0.02 mg/L	<0.02000 mg/L
TKN	0.745 mg/L	1.03 mg/L	0.49 mg/L	0.47 mg/L	/ 0.46 mg/L	0.41 mg/L	0.38 mg/L	0.38 mg/L	0.35 mg/L
Total Phosphorus	0.07 mg/L	0.07 mg/L	0.05 mg/L	0.07 mg/L	/ 0.05 mg/L	0.05 mg/L	0.06 mg/L	0.12 mg/L	0.08 mg/L
Sandusky River					Kirby Tributary				
Sampling Location/River Mile :	RM 57.95	RM 57.34	RM 52.57		RM 0.01				
Date Sampled :	12/07/99	12/07/99	12/07/99		12/07/99				
Duplicate									
Parameter									
BOD5	<2.00 mg/L	<2.00 mg/L / <2.00 mg/L	<2.00 mg/L		<2.00 mg/L				
Total Dissolved Solids	804 mg/L	NA / 802 mg/L	751 mg/L		506 mg/L				
Total Suspended Solids	7.5 mg/L	NA / 7.5 mg/L	<5.00 mg/L		9.5 mg/L				
Cadmium-T	<0.2 ug/L	0.2 ug/L / 0.3ug/L	0.3ug/L		0.3ug/L				
Total Hardness	520 mg/L	520 mg/L / 511 mg/L	493 mg/L		368 mg/L				
COD	<10 mg/L	10 mg/L / <10 mg/L	32 mg/L		<10 mg/L				
Ammonia-N	0.064 mg/L	0.107 mg/L / 0.096 mg/L	<0.05 mg/L		<0.05 mg/L				
Nitrate+nitrite	1.55 mg/L	1.62 mg/L / 1.53 mg/L	0.949 mg/L		0.13 mg/L				
Nitrite	0.02 mg/L	0.02 mg/L / 0.02 mg/L	<0.2 mg/L		<0.2 mg/L				
TKN	0.44 mg/L	0.44 mg/L / 0.39 mg/L	0.29 mg/L		<0.2mg/L				
Total Phosphorus	0.08 mg/L	0.08 mg/L / 0.06 mg/L	0.11 mg/L		0.28 mg/L				

Appendix Table 17. Dissolved oxygen grab sample measurements taken by Ohio EPA from Sycamore Creek and the Sandusky River, August 25-27, 1999.

River Mile	August 25, 1999		August 26, 1999		August 27, 1999	
	Dissolved Oxygen (mg/l)	Time	Dissolved Oxygen (mg/l)	Time	Dissolved Oxygen (mg/l)	Time
<u>Sycamore Creek</u>						
7.36			6.84	10:10 AM		
7.36			7.1	11:45 AM		
7.34			6.16	10:15 AM		
7.34			6.96	11:50 AM		
7.32			6.59	10:15 AM		
7.32			7.11	11:50 AM		
7.00			0.32	10:45 AM		
6.47			1.82	10:40 AM		
5.74	0.1	12:35 PM	3	11:50 PM	0.1	12:09 PM
5.74			0.16	01:15 PM		
5.72	1.87	12:35 PM	3.36	11:50 PM	3.29	12:09 PM
5.72			3.44	01:10 PM		
5.12	0.7	10:30 AM	0.9	12:00 AM		
5.12			2.3	01:00 PM		
5.10	1.37	10:30 AM	1.55	12:00 AM		
5.10	2.44	03:10 PM	2.29	01:05 PM		
5.10	2.26	04:15 PM				
5.10	2.41	06:00 PM				
4.65	9.16	11:50 AM				
4.65	7.66	02:20 PM				
4.65	2.77	04:25 PM				
3.55			0.08	12:40 PM		
3.54	6.99	11:35 AM	3.51	04:30 PM		
3.54	9.39	05:00 PM	1.77	12:45 PM		
3.54	8.8	06:50 PM				
3.52			0.7	12:45 PM		
2.61	7.95	11:30 AM	1.75	09:15 AM		
1.6	6.84	11:20 AM	6.35	04:40 PM		
1.6			7.77	12:25 PM		
1.6			7.25	02:45 PM		
0.45					0.57	12:56 PM
0.41	7.17	11:00 AM	7.74	09:10 AM	1.6	08:55 AM
0.41					1.33	12:12 PM
0.41					1.53	12:46 PM
0.41					1.1	06:10 PM
0.01					2.92	09:23 AM
0.01					2.8	05:35 PM
<u>Sandusky River</u>						
57.72					6.85	05:40 PM
57.71					5.8	05:43 PM
57.7					4.75	09:25 AM
57.34					5.7	08:45 AM
57.34					5.7	12:02 PM
57.34					5.13	12:37 PM
57.34					6.37	05:25 PM