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Maumee River REMEDIAL ACTION PLAN

Stage I Investigation Report

October 1990

Maumee River Remedial Action Plan Advisory Committee

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LOWER MAUMEE RIVER
REMEDIAL ACTION PLAN
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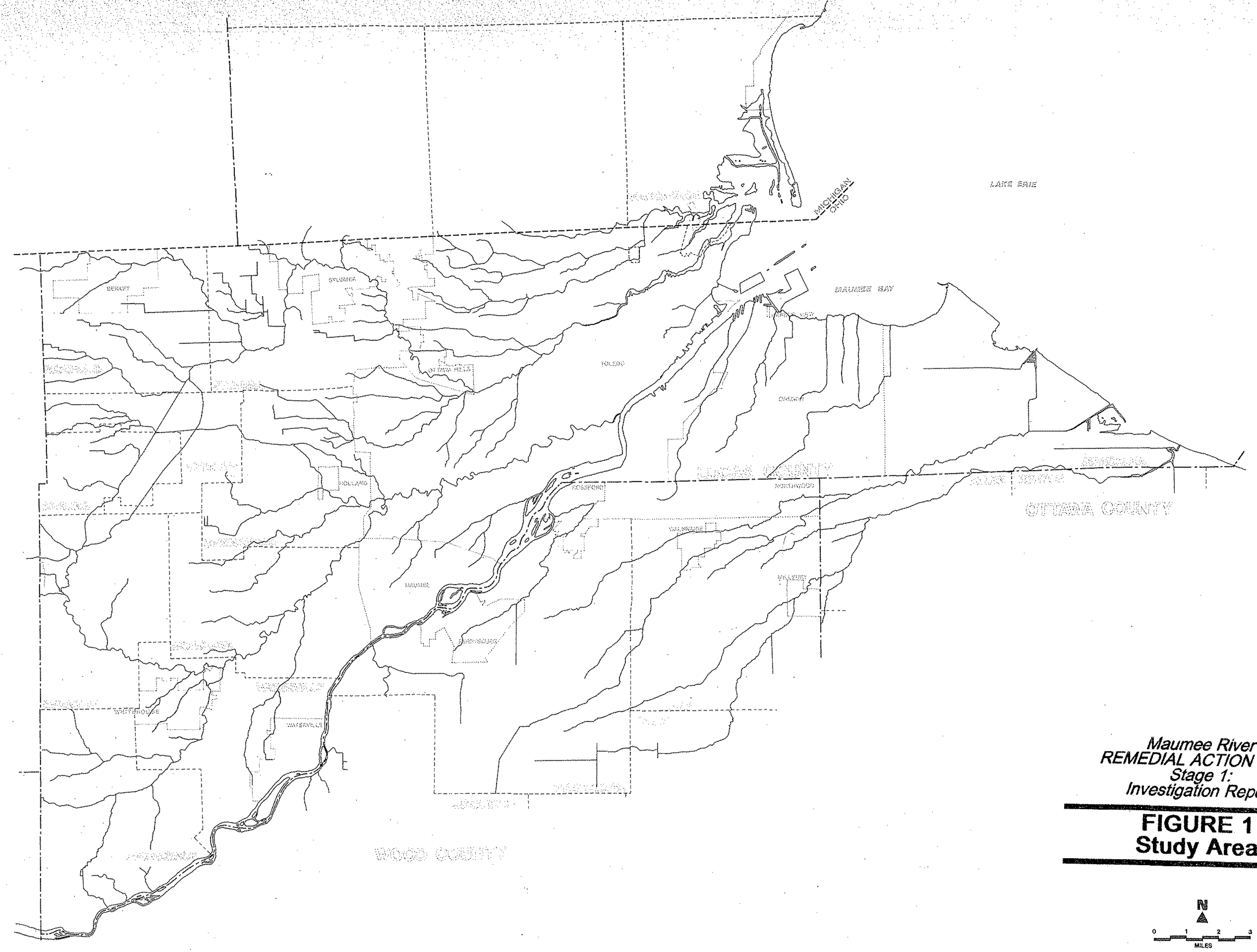


Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 1
Study Area

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN
STAGE 1: INVESTIGATION REPORT

INTRODUCTION

The Lower Maumee River area around Toledo, Ohio has a wide variety of pollution problems. Although there have been dramatic water quality improvements over the past decade, serious problems still exist that affect not only water quality itself, but also the area's fish, wildlife, wetlands and public uses. These problems are being caused by excess sediments, nutrients and toxics entering the system. The result has been the need to issue fish consumption advisories, curtailment of body contact water use, and increased stress for all species, especially those endangered. Problems in the Lower Maumee River area contribute to problems in Lake Erie and the Great Lakes, affecting both the United States and Canada.

A binational organization, the International Joint Commission (IJC), was established by the Boundary Waters Treaty in 1909 to advise the Governments of the United States and Canada on preventing or resolving problems along their common border. This includes addressing the pollution problems of the Great Lakes. To provide a coordinated cleanup effort on phosphorus and the resultant eutrophication of the Great Lakes, the Great Lakes Water Quality Agreement was signed by the two governments in 1972. This Agreement was later revised in 1978 in order to focus on toxics and on an ecosystem approach, as well as to further define phosphorus control.

In 1985, based on the recommendations of the states and provinces, the Commission's Water Quality Board identified forty-two Areas of Concern (AOC) in the Great Lakes basin. An AOC is an area where water uses are impaired or where objectives of the Great Lakes Water Quality Agreement or local environmental standards are not being achieved. Four AOCs are located in Ohio: Ashtabula, Cuyahoga, Black and Maumee rivers. Heavy metals and organic chemical sediment contamination has led to the Lower Maumee River being classified as an Area of Concern (Great Lakes Water Quality Board, 1985). Also, the Maumee River contributes the largest tributary load of suspended sediments and phosphorus to the Maumee Bay and the Western Basin of Lake Erie.

The 1987 Great Lakes Water Quality Agreement revisions were signed in Toledo at the 1987 Biennial meeting of the IJC. The revised agreement re-emphasized the ecosystem approach and required the development of specific programs to achieve the goals previously listed in the 1978 agreeement. It specifically presented guidelines for preparation of Remedial Action Plans (RAPs) to address the problems in the AOCs and restore beneficial uses. The RAP is an agreement among responsible federal, state and local governments with the support of area citizens to restore the water quality and beneficial uses in each AOC (Great Lakes Water Quality Agreement, 1978).

The Maumee Basin AOC addressed in this document, has been identified as the area extending from the Bowling Green water intake along the Maumee River at River Mile (RM) 22.8 downstream to Maumee Bay, including the entire bay and nearshore waters from the Michigan state line to Crane Creek State Park in Ohio. The area includes direct drainage into these waters that are within Lucas, Ottawa and Wood Counties. This includes Swan Creek, Ottawa River (Ten Mile Creek), Duck Creek, Otter Creek, Cedar Creek, Grassy Creek, and Crane Creek. Figure 1 is a map of the area.

As required by Annex II of the 1987 agreement, an Investigation Report of the Remedial Action Plan for the Lower Maumee River Basin is the supporting documentation that identifies the environmental problems. It also identifies the known sources of the pollutants and the water and related uses that are impaired as a result of the problems. This document is known as Stage I, the first of three stages in the development of the complete RAP.

The Ohio EPA is the lead agency for the RAP effort in Ohio. The Toledo Metropolitan Area Council of Governments (TMACOG), prepared the Investigation Report for the Lower Maumee River Area of Concern which addresses both nonpoint and point source pollution. From this Investigation Report, the Ohio EPA drafted Stage I of the RAP.

Stages II and III will follow this document. Stage II will evaluate existing remedial actions to correct problems in the AOC, pose alternative measures, select actions and identify the entities or individuals responsible for implementing these actions. The effectiveness of the implementation of these actions, the surveillance and monitoring to affirm their effectiveness, and the confirmation of the the restoration of the beneficial uses will be discussed in the Stage III report.

This Stage I report is organized to first discuss the environmental setting, and the existing beneficial water uses including current water biological and sediment quality data. It also describes intensive or short-term monitoring surveys which have occurred in the RAP area along with an analysis of the water biolgical and sediment quality data.

Secondly, this report describes water pollution sources within the RAP area and the impacts of each of these sources on the beneficial uses. These include phosphorus sources, NPDES permitted wastewater dischargers for the industrial and municipal sectors, package sewage treatment plants, agricultural runoff, open water disposal of dredged materials, urban stormwater, home sewage disposal, active and closed landfills/dumpsites and pits, ponds and lagoons, and atmospheric deposition related to acid rain. Maps in each source section indicate the level of degradation in the individual, smaller watersheds within the AOC.

Key tables and maps are included with this document to assist the reader in reviewing the information. A glossary is included which defines various terms and agencies found within this document. The data appendices have been printed as a separate document and are available upon request.

More than a hundred persons have had input into the preparation of this Stage I document. The 74 member Remedial Action Plan Advisory Committee subdivided itself into seven major subcommittees, bringing other persons into the process. These subcommittees included: Water Quality and Water Uses, Dredge Disposal, Agricultural Runoff, Home Sewage Disposal, Landfills and Dumps, Public and Industrial Dischargers, and Fish and Wildlife.

Efforts to address phosphorus pollution and the resultant water quality impairment of Lake Erie include Ohio EPA's work with a task force of interested individuals, farmers and representatives of many organizations to produce the State of Ohio Lake Erie Phosphorus Reduction Strategy (Ohio EPA, 1989a). In March 1988, Ohio adopted a phosphorus limitation for detergent loads in the 35 counties of northern Ohio draining into Lake Erie. In the mid-seventies, the U.S. Army Corps of Engineers conducted the Lake Erie Wastewater Management Study and the International Joint Commission undertook a study of land use activities in the Great Lakes. Additionally, the Soil Conservation Service yearly undertakes the Conservation Tillage Tracking Survey to estimate Lake Erie acreage under conservation tillage. This survey is an important component of the Lake Erie Phosphorus Reduction Strategy. Because there has been such extensive research and field investigations in the Maumee Basin, information for the AOC and the Maumee River basin is very complete in Ohio.

GENERAL DESCRIPTION OF THE PROBLEM

The Maumee River contributes the largest tributary load of suspended sediments and phosphorus to Lake Erie. Phosphorus is considered the critical nutrient contributing to the cultural eutrophication of Lake Erie. The major source is agricultural runoff upstream of the Lower Maumee River Area of Concern's boundaries.

The most prevalent nonpoint source pollutant by volume is sediment, which is a result of soil erosion. The problem stems from the predominance of agricultural land use, the extensive use of row crop agricultural systems, and the soil characteristics of the Maumee River basin. In spite of a low per acre erosion rate, the 1.2 million metric tons eroded annually cause a significant water quality problem.

Sediment pollutant levels in the Maumee River are classified as either moderately or heavily polluted for heavy metals from a point at Rossford (RM 9.4) to the Maumee Bay, with the highest concentrations of most metals in the sediment found at or slightly above the mouth near Toledo's Wastewater Treatment Plant to River Mile 2 (vicinity of Norfolk Southern Railroad Bridge). Metals of concern include: chromium, copper, lead, nickel, zinc, manganese and arsenic.

Nitrate concentrations have exceeded water quality standards on the Maumee River, causing both Waterville and Bowling Green to have drinking water advisories issued during late winter, spring and early summer. Nitrogen is an essential plant nutrient that is applied to cropland as a fertilizer. Nitrates are soluble and are carried to waterways with the runoff water, rather than with the sediment. Field tile effluent often carries nitrates to waterways.

The aquatic life habitat use designation listed in the Ohio Water Quality Standards for the Maumee River is Warmwater Habitat. The habitat conditions of this designation are not being attained in the Maumee River from Rossford at RM 9.4 to Maumee Bay. Arsenic seems to be the most significant industrial problem at RM 7.4. High levels of arsenic have been detected at the South Avenue Dump, and although this site is downstream from RM 7.4 it is still within the seiche effect area. The combined sewer overflows begin at RM 4.7 (area of Portside) and become a real problem after the confluence with Swan Creek. Below the Martin Luther King Bridge (also known as the Cherry Street Bridge) at RM 4.7, the dissolved oxygen is very low. Ammonia and nitrites are elevated starting at the Norfolk Southern Railroad Bridge (approximately RM 2.1). Zinc is elevated above the mouth.

Documented investigation of fish species for the Maumee River show a 50% decline since 1981. Fish community composite and quality values drop 2 points from the Grand Rapids dam to the mouth. It is thought that the upstream movement of the Toledo WWTP plume and the numerous combined sewer overflow discharges are the cause of the low community values. The lowest fish community values occur in the area between the Toledo WWTP into the Maumee Bay area of the Toledo Edison intake channel. Loss of habitat for these communities is also a problem.

Organic pollutants of concern include polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and phthalates. These toxic chemicals, as well as the heavy metals, are known to biomagnify, bioaccumulate, or are suspected of causing cancer and are acutely toxic to aquatic organisms. PAHs and phthalates have been found at detectable levels in the Maumee shipping channel. Studies of Toledo Harbor sediments have not shown sediment bound pesticides at levels high enough to arouse concern. Dioxins and furans, however, have not been studied. The PAH concentrations are at the lower end of the range of values found at other sites in Ohio displaying cancer epizootics and posing a potential problem.

Bottom dwelling organisms avoid or cannot exist in areas which are highly contaminated with toxic compounds. They may, however, survive in areas where low levels of toxicants are found. This means that they are exposed to these contaminants constantly throughout their life spans. After accumulating toxicants, these organisms, if eaten, are the starting point for toxicants to move up the food chain to fish, then onto fish-eating birds and/or humans where they can accumulate.

Impacting water quality on the Ottawa River are the abandoned dumps sited in the floodplains which leak solvents, conventional pollutants and organic priority pollutants. The Dura Dump leachate, for example, contains high BOD, COD and organics, including PCBs. The City of Toledo has posted the area advising persons to avoid contact with the water, sediments and fish.

The degradation of Otter Creek is directly related to arsenic leaking from settling ponds created over thirty years ago. This creek has been a known "industrial sewer" for over twenty years, with oil soaked banks, and nickel and cyanide being detected in its waters. Swan Creek has poor water quality from its mouth to four miles upstream. Heavy metals, with the greatest impact between Hawley Street and Collingwood Boulevard, have helped to cause a 50 percent decline of fish species since 1981.

The AOC can be viewed as an area of adverse water quality impacts. In some cases, however, the sources of these impacts are outside of the Lower Maumee River AOC's boundaries. This is particularly true of the agricultural sources. Therefore, implementation of the RAP must not be limited to the AOC's boundaries if significant water quality improvements are to be achieved. The focus of this document is on the Lower Maumee River Basin. Since the pollution sources causing the water quality problems in Maumee Bay begin far upstream from the harbor mouth, remedial actions designed to help control nonpoint source pollution must be implemented upstream of the Maumee Bay.

A complete summary of the environmental problems for the Lower Maumee River, as related to the 14 beneficial uses listed in the Great Lakes Water Quality Agreement (GLWQA), is presented in Table 1.

ENVIRONMENTAL SETTING

Description

The Maumee River basin drains a total area of 6,586.3 square miles--4,856.3 square miles are in Ohio, 1,260.0 square miles are in Indiana and 470.1 square miles are in Michigan (ODNR, 1960). The Ohio portion of the Maumee River basin is located in all or large areas of fourteen counties and parts of three others. The Area of Concern is in Lucas and Wood counties. Crane and Cedar creeks drain 54.0 and 49.9 square miles, respectively, with Halfway Creek (Silver and Shantee creeks) draining 18.8 square miles from Ohio only. Otter, Wolf, Cedar and Crane creeks drain 7.6, 15.5, 49.9 and 54.0 square miles, respectively. Finally, the Ottawa River watershed (including Ten Mile Creek) covers 178.5 square miles; 45.2 of which are in Michigan.

The mainstem of the Maumee River is approximately 130 miles in total length with 105 miles in Ohio. It begins in Ft. Wayne, Indiana at the confluence of the St. Joseph and St. Marys rivers (Ohio EPA, 1979). Other major tributaries include the Tiffin River and the Auglaize River. The Maumee River flows northeasterly while the majority of its tributaries generally flow north and south into it. The river's mouth is at Toledo where it enters Maumee Bay and the rich sport fishery of Lake Erie's Western Basin.

The highest elevations of 1,100 feet above mean sea level occur in the Michigan portion of the watershed. At the Ohio/Indiana border the elevation of the Maumee River is 707 feet above mean sea level. While at its mouth in Toledo's Maumee Bay, the river is 573 feet above mean sea level, dropping at and average of 1.3 feet per mile (ODNR, 1960).

Most of the basin once was largely covered by the Great Black Swamp, an extensive area of swamp forest with poorly drained soils. Because of the swamp, the Maumee River basin was one of the last large areas of the State to have its swamp forests cleared, then drained. Now, the Maumee River basin leads the State in the number of acres devoted to farming which is the major industry (Ohio EPA, 1979). According to the 1987 Ohio Agricultural Statistics District 10, which wholly encompasses by and represents the majority of the basin, this area was third in the State in corn production, first in soybean production, and first in wheat production (USDA, 1987).

TABLE I: Summary of Environmental Problems for Lower Maumee River

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Restrictions on Fish and Wildlife Consumption	When contaminant levels in fish or wildlife populations exceed current standards, objectives or guidelines and public health advisories are in effect for human consumption of fish or wildlife. Contaminant levels in fish and wildlife must be due to contaminant input from the watershed (i.e., lipid-weight, contaminant concentrations in fish and wildlife will exceed lakewide or regional levels).	---- Dura Avenue Landfill	Fish consumption advisory for carp and catfish in all Lake Erie waters due to PCBs. Fish consumption advisory for all species due to PCBs in Ottawa River from RM 5.7 to mouth. Fish consumption advisory for all species due to PCBs in Hecklinger Pond.
Tainting of Fish and Wildlife Flavor	When effluent limits necessary to achieve ambient water quality standards for the anthropogenic substance(s) causing tainting are being exceeded and survey results have identified tainting of fish or wildlife flavor.	-----	None reported.

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Degraded Fish and Wildlife Populations	When fish and wildlife personnel have identified degraded fish or wildlife populations due to a cause within the watershed as part of fish and wildlife management programs.	Toledo WWTP, CSOs	Fish community status in free flowing section of Maumee River is good to fair dropping to fair to poor below the Grand Rapids dam pool.
		CSOs, NPS, contaminated sediment	The fish community status in the lower ten miles of Swan Creek is poor to very poor.
		Industrial discharges, landfill leachate, CSOs, organic enrichment	The fish community status of the Ottawa River is poor to very poor.
		Landfill leachate, industrial discharges, water treatment plant sludge charges, water treatment plant sludge	The fish community status of Otter and Duck creeks is very poor.

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Fish Tumors or Other Deformities	One would expect a zero liver tumor incidence rate in fishes from clean locations. However, due to uncertainty in fish movement, other possible causes and experience with field data, a site will be be listed as an Area of Concern when the incidence of neoplastic or pre-neoplastic liver tumors exceeds 2% in bullheads or 3.5% in suckers. A similar approach should be developed for other deformities.	CSOs & WWTP discharge	Elevated frequency of external anomalies observed in Lower Maumee River Mainstem downstream of Swan Creek, in the lower 5 miles of Swan Creek, in the lower 9 miles of the Ottawa River and near the mouth of Otter Creek.
Bird or Animal Deformities or Reproductive Problems	Use of incidence rates of cross-bill syndrome and reproductive failure in populations of colonial birds has not received as much attention as chemical objectives. The incidence rates of cross-bill syndrome and congenital malformations in sentinel wildlife species can be statistically compared between unimpacted control populations and impacted control populations in Areas of Concern (e.g. Green Bay and Saginaw Bay.) A site will be listed as an Area of Concern when incidence rates of cross-bill syndrome, reproductive failure, etc. are significantly (95% probability level) higher than incidence rates at control sites. Further a site will be listed when bald eagle reproduction is less than one eaglet per active nest.	-----	None reported

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Degradation of Benthos	When the benthic macroinvertebrate community structure significantly diverges from unimpacted control sites of comparable physical and chemical characteristics. Benthic invertebrate community structure and composition are good integrators of ecosystem status. Three examples of utility include: 1) developing an end point using species diversity; 2) quantifying divergence from an expected community, given quantifiable physical and chemical habitat descriptors; and 3) developing an ecosystem objective using benthic community structure. Further, benthic invertebrates are effective for bioassessment of sediment-associated contaminants. It is recommended that both field and laboratory bioassay data and historical information be used to define endpoints for toxicity and bio-availability of of sediment-associated contaminants. A site will be listed when toxicity or bioavailability of sediment-associated contaminants is significantly (95% probability level) higher than controls.	Toledo WWTP, CSOs	The macroinvertebrate community status in the free flowing section of the Maumee River is exceptional to marginally good dropping to only fair below the Grand Rapids dam pool.
		CSOs	The macroinvertebrate community status in the lower ten miles of Swan Creek is fair to poor.
		Industrial discharges, landfill leachate, CSOs	The macroinvertebrate community status in the Ottawa River is fair to poor.
		Landfill leachate, industrial discharges, water treatment plant sludge	The macroinvertebrate community status of Otter and Duck creeks is very poor.
Restrictions on Dredging Activities	When contaminants in sediment exceed standards, guidelines or objectives, and there are restrictions on the disposal of dredged materials. The Great Lakes States have individual policies based on a case-by-case consideration of contaminant levels and deep-water placements. U.S. EPA's criteria for sediment classification are used to help make a determination.		800,000 to 1,000,000 cubic yards of material dredged annually. Sixty percent open lake disposed--the remainder is placed in a CDF.

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Eutrophication or Undesirable Algae	When there are persistent water quality problems (e.g., dissolved oxygen depletion of bottom waters, nuisance algal accumulation on bathing beaches, nuisance algal blooms, decreased water clarity, etc.) attributed to accelerated or cultural eutrophication or the area is contributing to the lack of achievement of the Great Lakes phosphorus target loads identified in Annex 3 of the Agreement.	Agricultural land uses, waste water treatment plants, urban runoff, package treatment plants, CSOs and on-site wastewater treatment systems	The Maumee River is the largest single tributary source of phosphorus to Lake Erie from Ohio comprising over 40% of the total annual load.
Restrictions on Drinking Water Consumption or Taste and Odor Problems	The primary concern is public health and potable water supply. Thus, any waters (intended for human consumption) that contain disease-causing organisms or hazardous concentrations of toxic chemicals or radioactive substances in exceedance of standards, objectives, or guidelines will be listed as an Area of Concern. Numerical water quality objectives and standards have been established to protect human health (e.g., ten of the 44 Agreement objectives have human health considerations; if required objectives are not available, priority must be given to establishment of drinking water objectives). Further, a site will be listed as an Area of Concern when taste and odor problems are present (e.g. taste and odor problems due to blue-green algae or phenolic compounds).	Agricultural land uses	Advisories are issued seasonally for elevated nitrate concentrations in communities that utilize the Maumee River as a public drinking supply. Occasional taste and odor problems at Toledo and Oregon water intakes due to blue-green algae blooms.

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Beach Closings	When there are persistent beach closings due to contamination from bacteria, fungi or viruses that may produce enteric disorders or eye, ear, nose, throat and skin infections or other human diseases and infections. For example, the State of Ohio has established the following water quality standards for designated bathing waters: 1) the geometric mean fecal coliform content series of not less than five samples within a 30-day period shall not exceed 200 colonies per 100 ml and shall not exceed 400 colonies per 100 ml in more than ten percent of the examples taken during any 30-day period, or 2) the geometric means C. coli content of a series of not less than five samples within a 30-day period shall not exceed 126 colonies per 100 ml and shall not exceed 235 colonies per 100 ml in more than ten percent of the samples taken during any 30-day period.	-----	
Degradation of Aesthetics	When debris, oil, scum or any substance produces a persistent objectionable deposit, unnatural color or turbidity, or unnatural odor.	Agricultural land use, CSOs, urban runoff	Debris and highly turbid water after rainstorms.
Added Costs to Agriculture or Industry	When there are additional costs required to treat the water prior to use for agricultural purposes (i.e. including, but not limited to livestock watering, irrigation and crop-spraying) or industrial purposes (i.e. intended for commercial or industrial applications and non-contact food processing).	-----	None reported.

Potential Use Impairment	IJC Criteria For Listing as an "Area of Concern"	Sources/Causes	Significance to the Maumee River RAP
Degradation of Phytoplankton and Zooplankton Populations	When phytoplankton or zooplankton community structure significantly diverges from unimpacted control sites of comparable physicochemical characteristics. Phytoplankton and zooplankton populations should also be used to assess the effects of contaminants. Greater emphasis must be placed on ecological toxicology, including use of bioassays and field data. A site will be listed as an Area of Concern when phytoplankton or zooplankton bioassays (e.g., <u>Ceriodaphnia</u>; algal fractionation bioassays) confirm toxicity (significant at the 95% probability level).	-----	Unknown.
Loss of Fish and Wildlife Habitat	When fish and wildlife personnel have identified loss of fish and wildlife habitat due to water quality contamination as part of fish and wildlife management program.	-----	The fish communities are influenced by habitat modifications such as the addition of riprap and channel straightening, but not to a great extent.

The Maumee River basin contains over 320 stream segments which have designated uses published in the State of Ohio Water Quality Standards (Chapter 3745-OAC). Except for one segment of the Auglaize, all rivers and streams in the Maumee River basin are designated as Warmwater Habitat (Ohio EPA, 1990a). Warmwater Habitats are capable of supporting reproducing populations of bass, crappies, sunfish, perch, catfish and other warmwater fish species, as well as associated invertebrates and plants. The segment of the Auglaize River (between State Route 117 and 114) is designated as an Exceptional Warmwater Habitat. This Habitat is able to support outstanding or unusual communities of warmwater fish and associated invertebrates and plants, and to have water quality that also may be particularly good (Ohio EPA 1990a). Two segments are designated State Resource Waters. These are the Tiffin River bordering Goll Woods Preserve and the Maumee River from the Ohio/Indiana border to the Perrysburg bridge. Virtually all stream segments are designated as agricultural and industrial water supplies, and the majority of stream segments are designated for primary contact such as swimming or canoeing. Several segments are designated for secondary contact, where only limited body contact (wading) is recommended. Primary and secondary contact designations are based solely on water depths.

The basin contains 3,942 stream miles (over 41 percent of all Ohio stream miles in the Lake Erie basin), and, because of monitoring and modeling efforts for the State of Ohio Phosphorus Reduction Strategy for Lake Erie (Ohio EPA, 1989a), all stream miles have been assessed for nonpoint source pollution. Additional biological and chemical water quality monitoring efforts are needed, however, to track phosphorus reduction efforts.

There are 39 public lakes of five surface acres or larger in the Maumee River basin. Almost all lakes are an integral part of the river/stream network. Six lakes are of special concern because they are water supply sources in the Maumee River basin. Several lakes have been constructed for wildlife water supplies, and these are concentrated in the Toussaint Creek Wildlife Area, the Ottawa National Wildlife Refuge (both in Ottawa County). Six lakes (Nettle Lake, Metzger Reservoir, Harrison Lake, Wauseon Reservoir #1, Fulton Pond and Swanton Reservoir) are in the Maumee River basin.

Ecoregions

The publication entitled "Ecoregions of the Upper Midwest States" generally is used to describe the natural and man-altered conditions in Ohio (USEPA, 1988). The Eastern Corn Belt Plains and the Huron/Erie Lake Plain ecoregions are representative of most of the basin. The Lower Maumee River AOC is within the Huron/Erie Lake Plain ecoregion (Ohio EPA, 1990b).

The Huron/Erie Lake Plain ecoregion is characterized as a broad, almost level lake plain with some low moraines and beach ridges. There is very little local relief. The stream density is 0.5 miles/square mile. Soils are poorly to very poorly drained. Forested wetlands from the former Black Swamp once covered much of this ecoregion but, historically, have been cleared and drained for agriculture. Cash crop farming is the predominant land use. Other noteworthy land uses are pasture land, wood lots and urban development. The few lakes and reservoirs usually are small. Half of the streams are intermittent and extensively channelized. Channelization reduces the amount of available habitat for biota. Stream water quality problems can be expected from farm chemicals, livestock manure and erosion induced by livestock (USEPA, 1988).

The Eastern Corn Belt Plains ecoregion is distinguished by a gently rolling glacial till plain with moraines, kames and outwash plains. Local relief is usually less than 50 feet. Half of the streams are perennial and many are channelized. The stream density is 0.5 miles/square mile. There are few reservoirs and natural lakes. Seventy-five percent of the area of this ecoregion is used for cropland. Pasture, wood lots and urban are other noteworthy land uses. The soils mainly are from glacial till and tend to be light in color and acidic. Water quality problems can be expected from herbicides, insecticides, fertilizers and manure which can be delivered more quickly to streams via artificial drainage. Channelization reduces the diversity of habitat for stream biota.

Land Use and Nonpoint Source Pollution

A wide variety of land uses contribute an equivalent amount of nonpoint and point source pollutants which affect the surface and ground water resources in the basin, and, ultimately, the water quality of Lake Erie. The Maumee River basin has the most homogeneous land use pattern of any basin in Ohio, as row crop agriculture is distributed almost evenly across the landscape outside urbanized areas. Urban nonpoint source pollution effects are distributed evenly between the surface runoff, construction sites, storm sewers, and sanitary sewer subcategories. Streams usually receive pollutants from more than one major nonpoint source pollution category. Also, many stream segments receive nonpoint source pollutants from several subcategories of each contributing major category.

Agriculture, especially crop production, impairs more stream miles in the basin than any other type of nonpoint source pollution category. Agriculture and hydromodification are spread throughout the Maumee River basin in a homogeneous fashion. Sediment, nutrients and pesticides are nonpoint source pollutants associated with crop production in the basin, and one nutrient, phosphorus, is of particular concern. Phosphorus promotes eutrophication in Lake Erie, and the Maumee River basin contributes more phosphorus to the Lake than all other nonpoint sources in Ohio combined (Ohio EPA, 1989a).

Land disposal, in-place pollutants, urban and silviculture nonpoint pollution source categories also affect a significant amount of stream miles, while the resource extraction category impairs comparatively few stream miles. Urban nonpoint sources are scattered throughout the basin. Various manufacturing industries, scattered throughout the Region and centered in Toledo, also are important to the regional and State economy.

Hydromodification, done to enhance crop production, is the second most pervasive nonpoint source pollution category in the basin. Channelization is by far the most significant source. Stream segments affected by hydromodification are closely associated with stream segments affected by agriculture. These two nonpoint source pollution categories are closely associated because artificial drainage is a necessary component of the intensive agriculture practiced on the poorly drained and level soils of the basin.

Land disposal is the third most significant nonpoint source pollution category in the basin. On-site wastewater treatment is the only significant land disposal subcategory.

Silviculture, resource extraction and in-place pollutants affect comparatively few stream miles. Although not affecting a great number of miles, these source categories may have significant local effects. For example, in-place pollutants, i.e., heavily polluted sediments, are a major problem near the mouth of the Maumee River. These sediments are one of the many reasons the International Joint Commission of the United States and Canada has designated the Maumee River an "area of concern," unable to fulfill potential uses or support beneficial aquatic life.

Soils, Geology and Ground Water

The Maumee River basin has extensive ground water resources, available from unconsolidated glacial sand and gravel deposits or underlying carbonate bedrock aquifers. In the far northwest corner of the basin, in Williams County and western Fulton and Defiance counties, ground water wells may yield 500 gallons per minute (gpm) from widespread sand and gravel deposits. Wells in the area immediately adjacent to these deposits in eastern Fulton and Defiance counties and western Henry and Lucas counties often yield between 100 to 500 gpm. The quality of ground water varies, although water is often high in dissolved solids (especially sulfur) over most of the basin (Ohio EPA, 1990b).

The basin's soils are developed in glacial till, outwash or lacustrine materials and are some of the most productive agricultural soils in Ohio. Most of these soils are very poor to moderately drained due to the medium to high clay content. Conventional tillage practices, which subject the soil to erosion, are employed on about 80 percent of the fields.

Due to the complexity and expense of ground water data collection, the amount and quality of ground water data available for the basin is less than it is for surface water resources. In spite of these problems, it is known that agricultural activities, on-site wastewater treatment systems and landfills are the primary nonpoint source categories impacting ground water in the Maumee River basin (Ohio EPA, 1990b).

Nonpoint source pollution impact private wells in twelve counties in the Maumee River basin. Nitrates, the most common suspected problem pollutant, impact ground water areas throughout the basin. Though seldom listed, agricultural activities are probably the main source of nitrate pollutants (Ohio EPA, 1990b). Nitrates impact private wells more often because of improper well construction than actual ground water contamination.

On-site wastewater treatment, urban sources and oil and gas extraction are reported also to have impacted ground water in some areas in the basin. These sources contribute a wide array of pollutants, including metals and brines, pathogens and organic materials. A sanitary landfill is impacting an aquifer under Sylvania Township in Lucas County. In Lucas County, three areas that yield ground water underlying the adjoining townships of Monclova, Spencer and Springfield are impacted by on-site wastewater treatment contributing pathogens, which are a frequent problem.

Various ground water areas scattered throughout the basin are suspected to be affected by on-site wastewater treatment and landfills, but nitrate problems outnumber these problem areas (Ohio EPA, 1990b).

WATER USES

STREAM SEGMENTS OF THE MAUMEE RIVER RAP AREA

The Lower Maumee River and its tributaries are divided into a number of segments, according to their drainage areas. Each stream segment is classified as being a part of a major drainage basin. In the Maumee RAP Area, the basin is generally the Maumee River. A few streams in the RAP Area actually flow directly into the Maumee Bay/Lake Erie and are not tributary to the Maumee River. Within each basin, stream segments may be classified as part of a subbasin. Each segment drains one or more watersheds.

There are three systems in use for classifying watersheds. These are:

1. Ohio EPA uses the Planning and Engineering Data Management System for Ohio (PEMSO) system. Each stream segment has a unique PEMSO number.
2. TMACOG uses smaller watersheds, which are generally a subset of the PEMSO watersheds.
3. The third system is Land Resources Information System (LRIS), developed for the 208 program, and further defined for the Lake Erie Wastewater Management Study (LEWMS) (USCOE, 1973). LRIS watersheds are usually, but not always, the same as TMACOG's.

Stream segments are also categorized by their uses. They are assigned aquatic life use designations by the Ohio EPA, and each stream's water quality standards are based on its' use designations. All of the Maumee RAP Area streams are classified Warmwater Habitat (WWH), Agricultural and Industrial Water Supply, and Primary Contact Recreation (PCR). Any portions of the AOC that are within 500 yards of an existing public water supply intake are designated Public Water Supply.

A listing of RAP Area stream segments and their classifications is given in Table 2. The stream reaches are shown in Figure 2.

TABLE 2

RAP AREA STREAM SEGMENTS AND USE DESIGNATIONS

STREAM, BASIN, AND SUB-BASIN	WATERSHED NUMBERS	STREAM SEGMENT USES	LENGTH (Miles)
Ai Creek BASIN: Maumee SUBBASIN: Swan NOTES: Swan Creek, West Fork RAP? Yes	TMACOG: 007 LRIS: 007 PEMSO: 410102	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	9.10
Ayres Creek BASIN: Lake Erie SUBBASIN: Crane Creek NOTES: RAP? Yes	TMACOG: 033 LRIS: 033 PEMSO: 1610302	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	0.60
Blue Creek BASIN: Maumee SUBBASIN: Swan NOTES: RAP? Yes	TMACOG: 038, 040 LRIS: 038, 040 PEMSO: 410103	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	11.90
Cairl Creek BASIN: Maumee SUBBASIN: Swan/Wolf NOTES: RAP? Yes	TMACOG: 042 LRIS: 042 PEMSO: 410132	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	7.40
Cedar Creek BASIN: Lake Erie SUBBASIN: Cedar NOTES: RAP? Yes	TMACOG: 032 LRIS: 032 PEMSO: 1610303	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	8.50
Crane Creek BASIN: Lake Erie SUBBASIN: Crane NOTES: RAP? Yes	TMACOG: 033 LRIS: 033 PEMSO: 1610302	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	12.70
Delaware Creek BASIN: Maumee SUBBASIN: Maumee River NOTES: RAP? Yes	TMACOG: 013 LRIS: 013 PEMSO: 410133	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	2.50
Dry Creek BASIN: Lake Erie SUBBASIN: Cedar Creek NOTES: RAP? Yes	TMACOG: 032 LRIS: 032 PEMSO: 1610303	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	11.50

TABLE 2 (continued)
RAP AREA STREAM SEGMENTS AND USE DESIGNATIONS

STREAM, BASIN, AND SUBBASIN	WATERSHED NUMBERS	STREAM SEGMENT USES	LENGTH (Miles)
Duck Creek	TMACOG: 015	HABITAT: WWH	3.00
BASIN: Maumee	LRIS: 015	WATER SUPPLY: AI	
SUBBASIN: Maumee River	PEMSO: 410133	RECREATIONAL: PCR	
NOTES:		STATE RESOURCE? No	
RAP? Yes			
Gail Run	TMACOG: 008	HABITAT: WWH	4.70
BASIN: Maumee	LRIS: 008	WATER SUPPLY: AI	
SUBBASIN: Swan	PEMSO: 410101	RECREATIONAL: PCR	
NOTES:		STATE RESOURCE? No	
RAP? Yes			
Grassy Creek	TMACOG: 046,045	HABITAT: WWH	2.50
BASIN: Maumee	LRIS: 046,045	WATER SUPPLY: AI	
SUBBASIN: Maumee River	PEMSO: 410133	RECREATIONAL: PCR	
NOTES:		STATE RESOURCE? No	
RAP? Yes			
Halfway Creek	TMACOG: 025,022,021	HABITAT: WWH	3.50
BASIN: Maumee	LRIS: 025,022,021	WATER SUPPLY: AI	
SUBBASIN: North Maumee Bay	PEMSO: 410302	RECREATIONAL: PCR	
NOTES:		STATE RESOURCE? No	
RAP? Yes			
Harris Ditch	TMACOG: 075	HABITAT: WWH	5.60
BASIN: Maumee	LRIS: 075	WATER SUPPLY: AI	
SUBBASIN: Swan/Blue	PEMSO: 410103	RECREATIONAL: PCR	
NOTES: Swan Creek, South Fork		STATE RESOURCE? No	
RAP? Yes			
Henry Creek	TMACOG: 033	HABITAT: WWH	9.00
BASIN: Lake Erie	LRIS: 033	WATER SUPPLY: AI	
SUBBASIN: Crane Creek	PEMSO: 1610302	RECREATIONAL: PCR	
NOTES:		STATE RESOURCE? No	
RAP? Yes			
Hill Ditch	TMACOG: 202	HABITAT:	4.75
BASIN: Maumee	LRIS: 202	WATER SUPPLY:	
SUBBASIN: Ottawa	PEMSO: 411331	RECREATIONAL:	
NOTES:		STATE RESOURCE? No	
RAP? Yes			
Lake Erie Watershed #1	TMACOG: 030	HABITAT:	
BASIN: Maumee	LRIS: 030	WATER SUPPLY:	
SUBBASIN: Ottawa	PEMSO: 411133	RECREATIONAL:	
NOTES:		STATE RESOURCE? No	
RAP? Yes			

TABLE 2 (continued)
RAP AREA STREAM SEGMENTS AND USE DESIGNATIONS

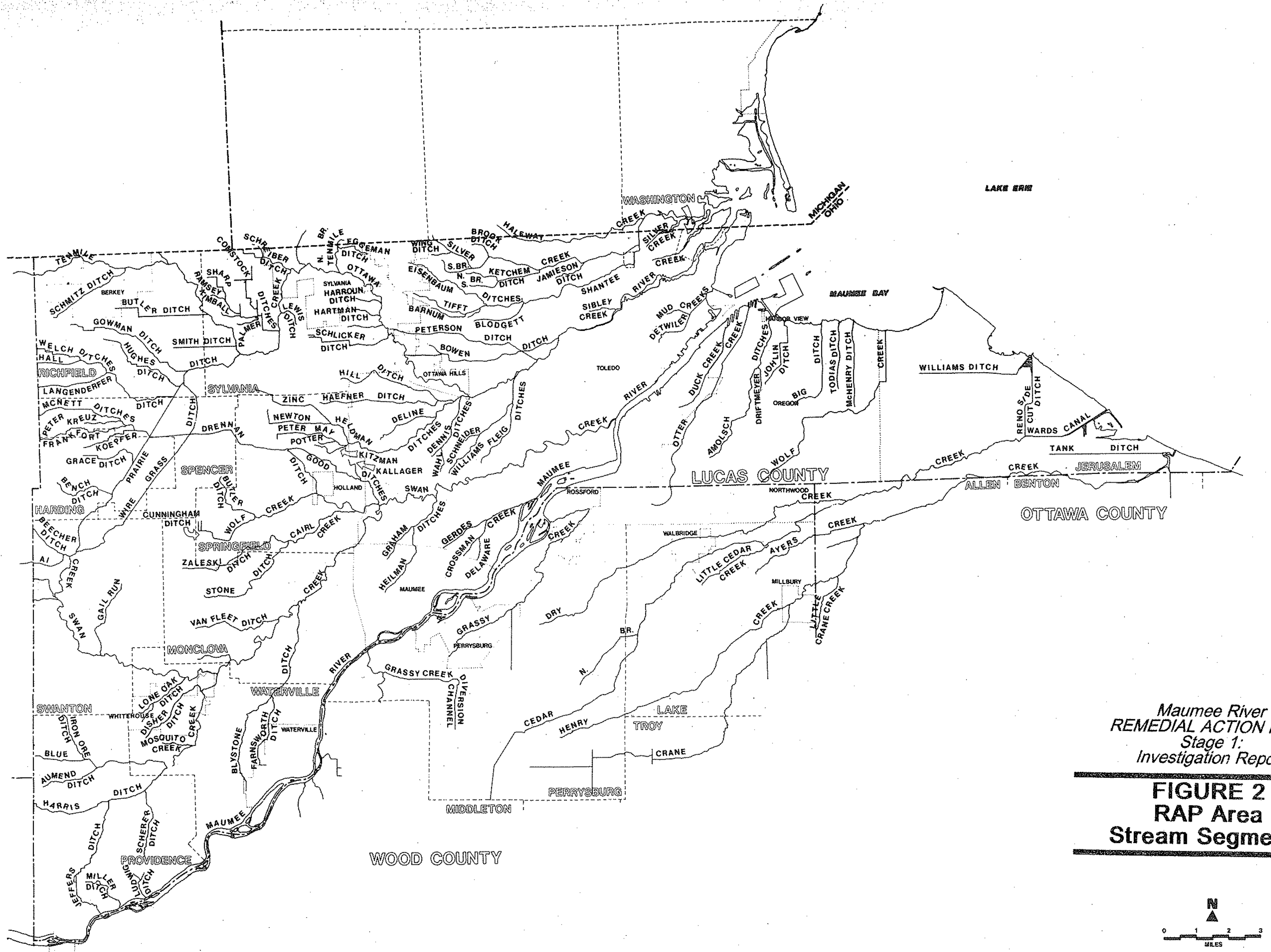
STREAM, BASIN, AND SUBBASIN	WATERSHED NUMBERS	STREAM SEGMENT USES	LENGTH (Miles)
Lake Erie Watershed #2 BASIN: Maumee SUBBASIN: Ottawa NOTES: RAP? Yes	TMACOG: 031 LRIS: 031 PEMSO: 411364	HABITAT: WATER SUPPLY: RECREATIONAL: STATE RESOURCE? No	
Lake Erie Watershed #3 BASIN: Maumee SUBBASIN: Ottawa NOTES: RAP? Yes	TMACOG: 034 LRIS: 034 PEMSO: 411363	HABITAT: WATER SUPPLY: RECREATIONAL: STATE RESOURCE? No	
Little Cedar Creek BASIN: Lake Erie SUBBASIN: Cedar Creek NOTES: RAP? Yes	TMACOG: 032 LRIS: 032 PEMSO: 1610303	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	2.50
Little Crane Creek BASIN: Lake Erie SUBBASIN: Crane Creek NOTES: RAP? Yes	TMACOG: 033 LRIS: 033 PEMSO: 1610302	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	3.50
Maumee River, Mouth-Perrysburg BASIN: Maumee SUBBASIN: Maumee River NOTES: RAP? Yes	TMACOG: 013,014, 15,47 LRIS: 013,14, 015,047 PEMSO: 410133	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? Yes	6.90
Maumee River, Perrysburg-Waterville BASIN: Maumee SUBBASIN: Maumee River NOTES: RAP? Yes	TMACOG: 079, 044 LRIS: 079, 044 PEMSO: 410133	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE: Yes	
Maumee River, Waterville-BG Water Intake BASIN: Maumee SUBBASIN: Maumee River NOTES: RAP? Yes	TMACOG: 078, 043 LRIS: 043 PEMSO: 410235	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? Yes	3.50
Mosquito Creek BASIN: Maumee SUBBASIN: Swan/Blue NOTES: RAP? Yes	TMACOG: 040 LRIS: 040 PEMSO: 410103	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	0.80

TABLE 2 (continued)
RAP AREA STREAM SEGMENTS AND USE DESIGNATIONS

STREAM, BASIN, AND SUBBASIN	WATERSHED NUMBERS	STREAM SEGMENT USES	LENGTH (Miles)
Ottawa River at Toledo (Berdan to UT) BASIN: Maumee SUBBASIN: Ottawa NOTES: RAP? Yes	TMACOG: 005 LRIS: 005 PEMSO: 411331	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	3.50
Ottawa River at Toledo (Mouth to Berdan) BASIN: Maumee SUBBASIN: Ottawa NOTES: RAP? Yes	TMACOG: 005 LRIS: 005 PEMSO: 411331	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	7.40
Ottawa River at Toledo (UT to N. Br) BASIN: Maumee SUBBASIN: Ottawa NOTES: RAP? Yes	TMACOG: 005,004 LRIS: 005,004 PEMSO: 411331	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	8.61
Otter Creek BASIN: Maumee SUBBASIN: Maumee Bay NOTES: RAP? Yes	TMACOG: 028 LRIS: 028 PEMSO: 1610364	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	6.00
Prairie Ditch BASIN: Maumee SUBBASIN: Ottawa River NOTES: RAP? Yes	TMACOG: 002 LRIS: 002 PEMSO: 410301	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	5.90
Reitz Road Ditch BASIN: Maumee SUBBASIN: NOTES: RAP? Yes	TMACOG: 078 LRIS: 078 PEMSO: 411235	HABITAT: WATER SUPPLY: RECREATIONAL: STATE RESOURCE? No	
Shantee Creek BASIN: Maumee SUBBASIN: North Maumee Bay NOTES: RAP? Yes	TMACOG: 020 LRIS: 020 PEMSO: 410302	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	4.60
Sibley Creek BASIN: Maumee SUBBASIN: Ottawa NOTES: RAP? Yes	TMACOG: 005 LRIS: 005 PEMSO: 411331	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	5.20

TABLE 2 (continued)
RAP AREA STREAM SEGMENTS AND USE DESIGNATIONS

STREAM, BASIN, AND SUBBASIN	WATERSHED NUMBERS	STREAM SEGMENT USES	LENGTH (Miles)
<u>Silver Creek</u> BASIN: Maumee SUBBASIN: North Maumee Bay NOTES: RAP? Yes	TMACOG: 023 LRIS: 023 PEMSO: 410302	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	7.30
<u>Swan Creek</u> <u>(Mouth to Blue Creek)</u> BASIN: Maumee SUBBASIN: Swan Creek NOTES: RAP? Yes	TMACOG: 012,010,041 LRIS: 012,010,041 PEMSO: 410132	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	22.20
<u>Swan Creek above Ai Creek</u> BASIN: Maumee SUBBASIN: Swan Creek NOTES: RAP? Yes	TMACOG: 008 LRIS: 008 PEMSO: 410101	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	7.93
<u>Swan Creek above Blue Creek</u> BASIN: Maumee SUBBASIN: Swan Creek NOTES: RAP? Yes	TMACOG: 039 LRIS: 039 PEMSO: 410131	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	8.40
<u>Tenmile Creek</u> <u>above North Branch</u> BASIN: Maumee SUBBASIN: Ottawa River NOTES: RAP? Yes	TMACOG: 001,003 LRIS: 001,003 PEMSO: 410301	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	34.80
<u>Tenmile Creek, North Branch</u> BASIN: Maumee SUBBASIN: Ottawa River NOTES: RAP? Yes	TMACOG: 006 LRIS: 006 PEMSO: 410301	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	6.50
<u>Wolf Creek</u> BASIN: Maumee SUBBASIN: Swan NOTES: RAP? Yes	TMACOG: 011 LRIS: 011 PEMSO: 410132	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	7.00
<u>Wolf Creek</u> BASIN: Maumee SUBBASIN: Maumee Bay NOTES: RAP? Yes	TMACOG: 029 LRIS: 029 PEMSO: 1610364	HABITAT: WWH WATER SUPPLY: AI RECREATIONAL: PCR STATE RESOURCE? No	2.80



Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 2
RAP Area
Stream Segments

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

EXISTING WATER USES

PUBLIC WATER SUPPLY

One of the surface water uses in the Lower Maumee River AOC is water supply. The primary use is for public water supply. Several industries use surface waters for industrial water supply as well.

As far as public water supply is concerned, two surface water bodies in the AOC are the sources of four public water supply systems. The Maumee River is the public water source for both the City of Bowling Green and the Village of Waterville. Lake Erie is the source for both the City of Oregon and the City of Toledo. According to 1980 population estimates, these four systems service a combined population of just over 524,000.

Three of the four public water supply systems are located in Lucas County. Most of the county is serviced by these systems except for Jerusalem, Richfield, Harding and Providence Townships and portions of Spencer and Swanton Townships. The three lower townships of Monroe County, Michigan and the northern portion of Wood County, Ohio are also serviced by these water supply systems. The Village of Whitehouse uses ground water as its public water supply source.

Oregon

The City of Oregon obtains its water supply directly from Lake Erie. The water is pumped from the low service pumping station in Jerusalem Township to the Water Treatment Plant (WTP) where approximately 8.0 million gallons per day (mgd) are purified and softened.

After treatment, a portion of the water is stored at the water treatment plant in a 1.5 million gallon (MG) reservoir and a 1.0 MG elevated tank at Coy Road. The rest is distributed to approximately 7,000 customers and serves a total population of 25,000 in Oregon and parts of Lucas, Wood and Ottawa Counties. Specifically, Oregon supplies water to the City of Oregon, the Village of Harbor View, the Village of Genoa and a portion of the City of Northwood.

Overall, the Oregon WTP has been able to maintain good water quality. Basically, the raw lake water is softened, disinfected and clarified before it is suitable for public use.

The three major water quality problems which cause the treatment plant the most trouble are sediments, turbidity and phosphates. Sediments and turbidity are problematic in the treatment process because they must be removed from the water. Therefore, the greater the amount of suspended sediment and turbidity, the greater the effort and cost required to remove them.

Phosphates create problems for the WTP because they stimulate algae growth. Algae blooms cause taste and odor problems in potable water. When water containing increased numbers of algal cells or their metabolic and decay products (or other organic matter) is chlorinated for disinfection purposes, increased levels of trihalomethane result (ODNR, 1985b; TMACOG, 1983b; Merrill, 1988).

Toledo

The City of Toledo obtains its water directly from Lake Erie. The water is pumped from the low service pumping station in Jerusalem Township to the Collins Park Water Treatment Plant (WTP) in East Toledo. The Collins Park WTP purifies and softens approximately 120 mgd of lake water.

The Toledo water system constitutes the largest physical plant in the region for supplying treated water. Toledo supplies water to the entire county except Jerusalem, Richfield, Harding and Providence Townships, parts of Spencer and Swanton Townships and those areas serviced by the Oregon WTP. It also supplies water to portions of northern Wood County and the lower Townships of Monroe County, Michigan. Specifically, the Cities of Toledo, Sylvania, Maumee, Perrysburg, Rossford, Luna Pier and a portion of the City of Northwood receive their water from Toledo. In addition, the Villages of Holland, Ottawa Hills and Walbridge are served by Toledo. Toledo supplies water to just under 120,000 service connections and services a total population of approximately 464,000.

Overall, Collins Park WTP has been able to maintain good water quality. The lake water is softened, clarified and disinfected before it is distributed as public supply. The water quality problems that give the treatment plant the most trouble are the same as those already mentioned with regard to the Oregon WTP, sediments, turbidity and phosphates. Occasional taste and odor problems stemming from excessive algae growth have been the primary problems for the treatment plant (ODNR, 1985b; TMACOG, 1983b; Merrill, 1988).

Bowling Green

The Bowling Green Water System is the only public water supply system in the AOC which is located in Wood County. Approximately 90% of the public water used in Wood County is provided by surface water. Of that 90%, 80% is supplied by the Maumee River.

Bowling Green obtains its supply directly from the Maumee River. The City of Bowling Green WTP has the capacity to soften and purify 6.0 mgd.

After treatment, the water is distributed to just over 5,000 service connections and serves a population of approximately 30,000 in Wood County. Specifically, the City of Bowling Green and the surrounding area of Wood County, the Villages of Haskins, Tontogany, Portage and the Miltonville area along River Road are supplied by the Bowling Green water system.

The river water is softened, disinfected and clarified before it is distributed. The Bowling Green Water System has recognized water quality problems which are related to the water quality of the Maumee River. Sediment, turbidity, phosphates, nitrates and herbicides are the most problematic.

High levels of turbidity require great efforts for removal of sediments. Turbidity units can reach very high levels in the Maumee River, especially in the spring, fall and during storm events.

Nitrates and herbicides present a difficult problem for treatment because they cannot be removed from the water with current installed treatment technologies. The best that can be done by the WTP is to dilute the water to reduce the concentrations of these substances. Therefore, there are times when the Bowling Green water supply contains high levels of nitrates and herbicides. This occurs at those times when the Maumee River has high levels of these substances which normally happens in the spring. The City has built a reservoir which helps dilute high nitrate water and provide greater reserve capacity in the event of a chemical spill on the river or abnormally low flow preventing the plant from pumping from the river.

Bowling Green occasionally has trouble with trihalomethanes. This usually occurs when there are increased amounts of algae present in the Maumee River. Algae cause increased amounts of organic matter in water. Chlorination of this organic matter during the disinfection process increases the formation of trihalomethane (ODNR, 1985b; TMACOG, 1983b; Merrill, 1988).

Waterville

The Village of Waterville obtains its water supply directly from the Maumee River. The river water is pumped to the water treatment facilities where it is softened and purified. The WTP treats about 0.8 mgd.

The treated water is distributed to approximately 1,500 service connections serving a population of approximately 5,300 in the Village of Waterville and Lucas County. Specifically, portions of Monclova and Waterville Townships are serviced by this system in addition to the Village of Waterville. The current facilities will probably not be able to meet future needs without expansion. Therefore, the system may eventually be replaced by the Toledo system.

The river water is softened, disinfected and clarified before distribution. Generally, the water quality maintained by the treatment facility has been good. However, there have been cases, usually in the spring, when nitrate and trihalomethane levels have exceeded drinking water standards. The water quality problems which cause the most trouble for the WTP are sediment, turbidity, phosphates, nitrates and herbicides. These problems were discussed previously in the section on the City of Bowling Green WTP (ODNR, 1985b; TMACOG, 1983b; Merrill, 1988).

Summary

Generally speaking, the problems experienced by each of the public water supply systems can be attributed to sediment, nutrient and phosphorus loadings to the Maumee River. Nonpoint sources of pollution primarily are responsible for these loadings. These nonpoint sources include agricultural runoff and urban storm-water runoff. A summary table which outlines the various characteristics of each public water systems has been provided (Table 3).

TABLE 3

SUMMARY OF PUBLIC WATER SUPPLY SYSTEMS IN THE RAP AREA

CHARACTERISTICS	OREGON	TOLEDO	WATERVILLE	BOWLING GREEN	TOTAL
Source of Supply	Lake Erie	Lake Erie	Maumee River	Maumee River	
Est. Pop. Served	25,000	463,940	5,255	30,000	524,195
Customers Served	6,800	118,585	1,500	5,287	132,172
Area Served	Oregon,Harbor View, Genoa,Northwood*, Wood County*, Lucas County*, Ottawa County*	Toledo,Sylvania, Holland,Perrysburg, Ottawa Hills,Maumee, Walbridge,Rossford, Northwood*,Monroe County*,Wood County*, Lucas County*	Waterville, Monclova Township*, Waterville Township*	Bowling Green, Haskins,Tontogany, Wood County*, Miltonville Area#	
Type of Treatment	Softening & Disinfection	Softening & Disinfection	Softening & Disinfection	Softening & Disinfection	
Water Quality Problems	Turbidity, Sediments & Phosphates	Turbidity, Sediments & Phosphates	Turbidity, Nitrates, Sediments & Herbicides	Turbidity, Nitrates, Sediments & Herbicides	

TABLE 3 (Continued)

SUMMARY OF PUBLIC WATER SUPPLY SYSTEMS IN THE RAP AREA

CHARACTERISTICS	OREGON	TOLEDO	WATERVILLE	BOWLING GREEN	TOTAL
Source of Supply	Lake Erie	Lake Erie	Maumee River	Maumee River	
TREATMENT PROCESS					
Coagulation/ Recarbonization	Alum, Lime, Soda Ash	(Hydraulic Mixing) Alum, Lime, Soda Ash	Alum, Lime	Ferric Chloride, Lime	
Flocculation	Slow Mechanical Mix	Slow Mechanical Mix	Slow Mechanical Mix	Slow Mechanical Mix	
Filtration	Rapid Sand Filters	Rapid Sand Filters	Rapid Sand Filters	Rapid Sand Filters	
Taste & Order Control	Activated Carbon, Chlorine Dioxide	Activated Carbon, Chlorine Dioxide	Activated Carbon, Chlorine Dioxide	Potassium Permangenate, Chlorine Dioxide, Activated Carbon	
Corrosion Control & Stabilization	Phosphate Compounds	Phosphate Compounds, Carbon Dioxide	@	Carbon Dioxide	
Fluoridation	Sodium Silicofluoride	Sodium Silicofluoride	Sodium Fluoride	Hydroflusilicic Acid	
Disinfection	Chlorine	Chlorine	Chlorine	Chlorine	

* = Portions of
\# = Area along River Road
@ = Unspecified

Source: TMACOG Report, "Water Supply Systems in the Toledo Metropolitan Area," June, 1983.

SPORT AND COMMERCIAL FISHING

The surface waters in the Area of Concern are used for sport and commercial fishing. The primary areas for sport fishing are the Maumee River and Maumee Bay, however, sport fishing occurs throughout the Area of Concern. Commercial fishing has been limited to the Bay.

Data on sport fishing in the Maumee River are collected by the Ohio Department of Natural Resources, Division of Wildlife. Spring Creel Surveys are taken periodically. A summary of these surveys from 1975 to 1987 has been provided (Table 4). The increase of walleye caught in 1987 probably reflects the good year of spawning experienced in 1982.

Walleye and white bass are the principle sport fish in the Maumee River. The spring walleye run is an important sport fishing event which has drawn people from as far away as Alaska. Other fish which can be found in the Maumee include yellow perch, channel catfish, smallmouth bass, sauger and white perch.

The ODNR, Division of Wildlife does not take creel surveys for other streams in the AOC, therefore, it would be difficult to estimate the number of sport fish caught in this area, but sport fishing is widespread throughout the AOC. The selection of a fishing site is only limited by the sport fisherman's experience and imagination. Limited fishing occurs in the Ottawa River and Swan Creek. Sport fishermen are commonly found at private ponds and small lakes such as Evergreen Lake in the Oak Openings Metropark.

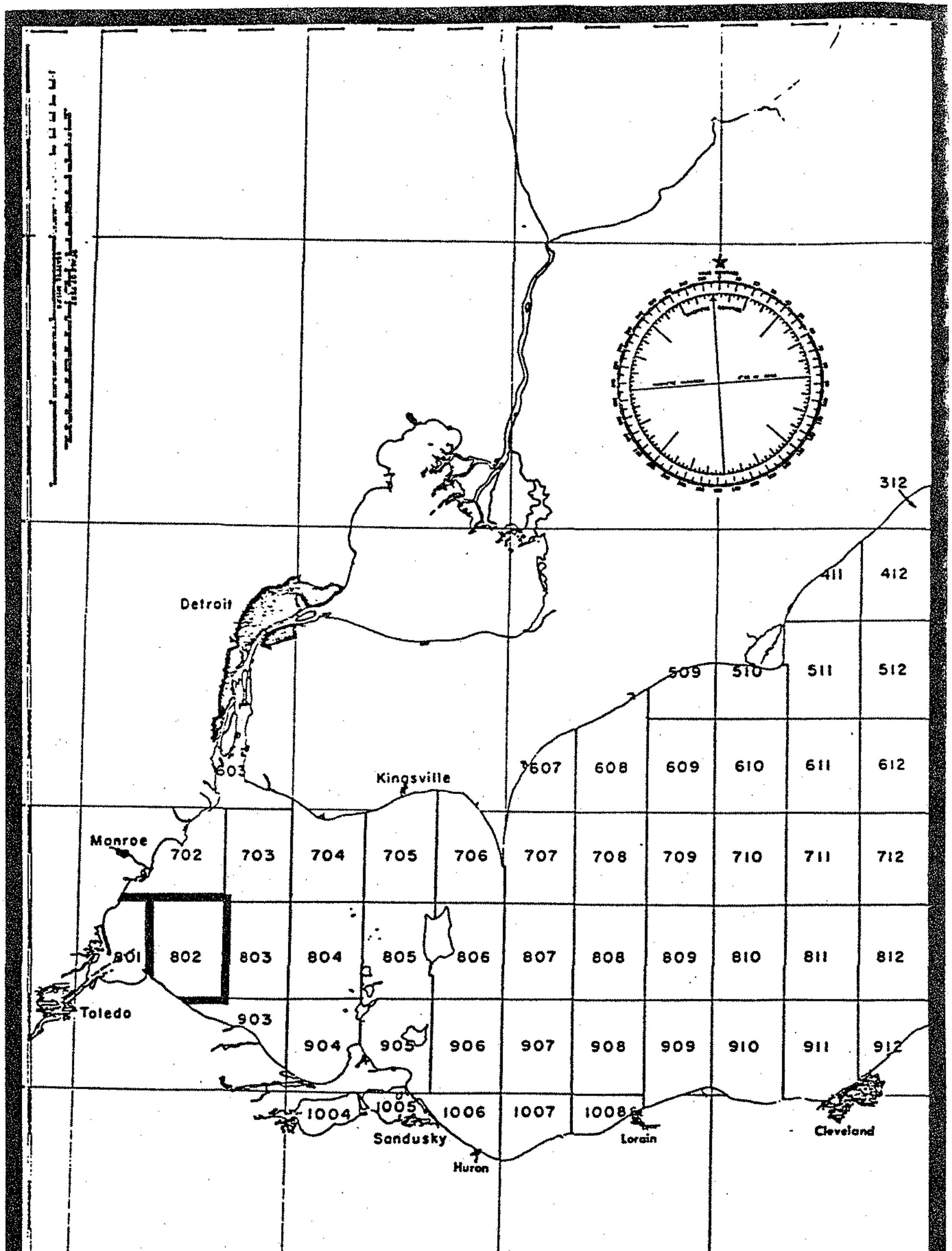
Both sport and commercial fishing occur in the Maumee Bay. The Western Basin of Lake Erie is considered one of the best fishing locations on the Great Lakes. It is well known for its walleye fisheries, being called the walleye capital of the world. Although the walleye fisheries had declined in the early 1970's, they have made a comeback since 1975. The ODNR, Division of Wildlife, collects sport and commercial fishing data for Maumee Bay and Lake Erie. ODNR grids 801 and 802 are at least partially located in the Area of Concern (Figure 3). Summary data on sport boat angler hours and harvest from 1980 to 1987 have been provided (Table 5). A summary of commercial harvest has also been provided (Table 6). Yearly variations are largely due to the number of surveys taken in a given year.

An indication of the importance of fishing as a water use in the Area of Concern might be obtained by looking at the number of fishing related organizations. To date, 8 sportsmen organizations and 11 charter boat services have been identified and it is likely that more exist.

A public health advisory was issued in 1987 and 1988, against consumption of carp and channel catfish taken from Lake Erie, which affects Maumee Bay and the estuarine portion of the Maumee River. PCB levels have been detected in these species which frequently exceed the U.S. Food and Drug Administration's (USFDA) tolerance limit of two parts per million in the edible portions. While compliance with the advisory is voluntary for sport fishermen, USFDA has charged commercial fisheries with ensuring that fish which may enter interstate commerce fall within federal tolerance limits for contaminants.

Fish kills are investigated by the ODNR Division of Wildlife. An annual report, Water Pollution, Fish Kill, and Stream Litter Investigations, is published, which summarizes the fish kills for the year. In the 1987 report, Table 2 ("Wild Animal Kills Resulting from Water Pollution Incidents Investigated in 1987) notes that 2,227 fish and invertebrates were killed in Swan Creek on July 30, 1987. The suspected pollutant was sewage.

Ohio Department of Natural Resources Wildlife Grid FIGURE 3



Source: Ohio Department of Natural Resources, Division of Wildlife.

TABLE 4

SUMMARY OF ANGLER HOURS, CATCH AND CATCH RATES IN THE SPRING CREEL SURVEYS: MAUMEE RIVER FROM 1975-1987

	ANGLER HOURS			WALLEYE		WHITE BASS	
Year	Walleye*	White Bass@	TOTAL	Catch*	CPUE$	Catch@	CPUE$
1975	112,500	43,800	214,100	15,475	.14	36,731	.84
1976	36,700	81,600	186,800	5,336	.15	124,235	1.52
1977	41,600	40,800	125,700	6,163	.15	79,995	2.00
1978#	73,900	---	---	22,747	.29	---	---
1979#	184,800	---	---	33,614	.18	---	---
1980	155,800	46,700	230,800	38,442	.23	87,700	1.34
1981	161,700	93,200	298,200	21,415	.11	165,500	1.48
1982	201,400	133,100	368,900	37,300	.16	172,372	1.05
1983+	---	---	---	---	---	---	---
1984	143,200	59,900	210,100	28,899	.17	137,091	1.56
1985+	---	---	---	---	---	---	---
1986+	---	---	---	---	---	---	---
1987	247,000	56,100	339,500	69,871	.25	66,633	.75
TOTAL	1,358,600	555,200	1,974,100	279,262		870,257	

* Anglers Seeking Walleye.
@ Anglers Seeking White Bass.
# Walleye Fishery Only Surveyed.
+ No River Surveys were Conducted.
$ Catch Per Unit of Effort

Source: Unpublished data. Ohio Department of Natural Resources, Division of Wildlife.

TABLE 5

SPORT BOAT ANGLER HOURS AND HARVEST 1980-87
GRIDS 801 & 802: MAUMEE BAY AND LAKE ERIE

Year	Angler Hours	Yellow Perch	Walleye	White Bass	Freshwater Drum	Channel Catfish	Smallmouth Bass	Other Fish	TOTAL HARVEST
1980	1,006,855	2,526,620	314,388	6,968	17,221	4,034	0	244	2,869,475
1981	4,313	2,702	0	4	65	71	0	124	2,966
1982	960,900	2,158,666	179,764	4,946	11,870	6,014	0	3,555	2,364,815
1983	223,234	248,315	31,826	43,778	1,276	1,942	0	0	327,137
1984	680,364	958,563	464,837	19,029	2,215	2,500	71	58	1,447,273
1985	283,056	503,427	126,506	1,472	2,392	3,658	0	2,364	639,819
1986	487,839	734,629	161,162	4,308	9,070	6,141	0	15,023	930,333
1987	362,893	406,745	149,886	24,757	5,539	4,415	0	0	591,342
TOTAL	4,009,454	7,539,667	1,428,369	105,262	49,648	28,775	71	21,368	9,173,160

Source: Unpublished data. Ohio Department of Natural Resources, Division of Wildlife.

TABLE 6

COMMERCIAL HARVEST IN POUNDS 1983-86

GRIDS 801 & 802: MAUMEE BAY AND LAKE ERIE

Type of Fish	1983	1984	1985	1986	Total
Yellow Perch	12,245	2,358	6,104	26,504	47,211
Carp	128,080	116,960	301,606	64,291	610,937
White Bass	143,692	212,768	250,007	84,661	691,128
Channel Catfish	14,656	19,166	34,841	13,897	82,560
Drum	45,304	13,025	19,189	23,218	100,736
Bullhead	9,815	12,901	16,859	14,822	54,397
Buffalo	3,654	5,991	7,450	4,261	21,356
Goldfish	0	414	1,011	295	1,720
Suckers	14,949	3,171	6,573	3,300	27,993
Quillback	12,205	13,101	10,904	9,416	45,626
Gizzard Shad	125	0	2,424	0	2,549
White Perch	14,755	42,208	38,019	28,533	123,515
Total	399,480	442,063	694,987	273,198	1,809,728

Source: Unpublished data. Ohio Department of Natural Resources, Division of Wildlife.

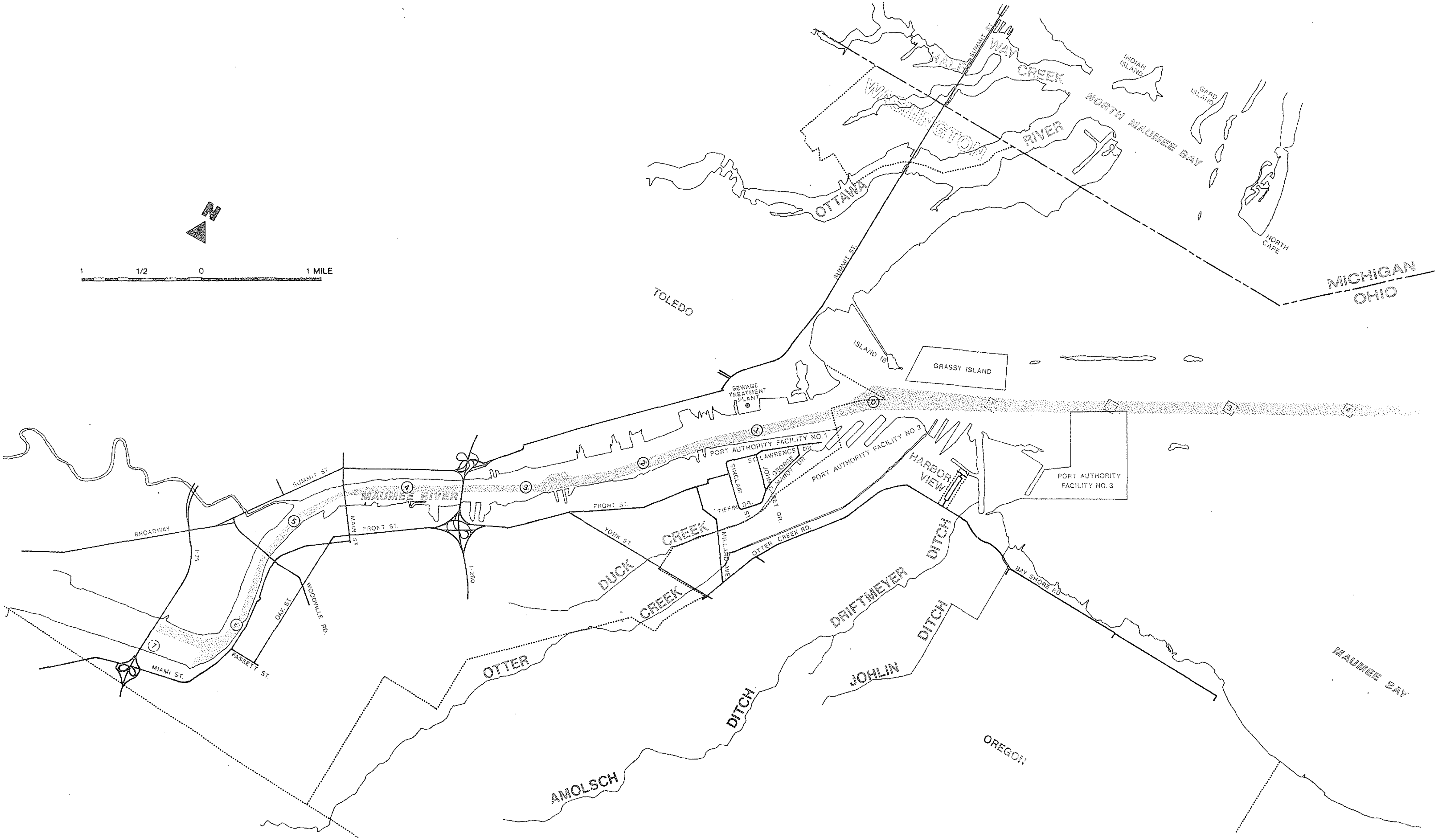
COMMERCIAL NAVIGATION

One of the most important uses of the Maumee River and Bay is commercial navigation. The Toledo shipping channel which begins at river mile (RM) 7.0 near the I-75 bridge and extends out into the Maumee Bay to lake mile (LM) 18 is vitally important to the economic well being of the region and is the only commercial navigation route in the AOC (Figure 4). Toledo is the third largest port on the Great Lakes (Hull Consulting, 1987). Its location makes it a logical turn around point for St. Lawrence Seaway traffic and it serves one of the largest rail centers in the nation. (Horowitz, et al, 1975). Various goods are shipped to and received from domestic, Canadian and overseas locations. Summaries of domestic and Canadian and over-seas cargo shipped from the port from 1976 to 1986 have been provided (Tables 7 & 8).

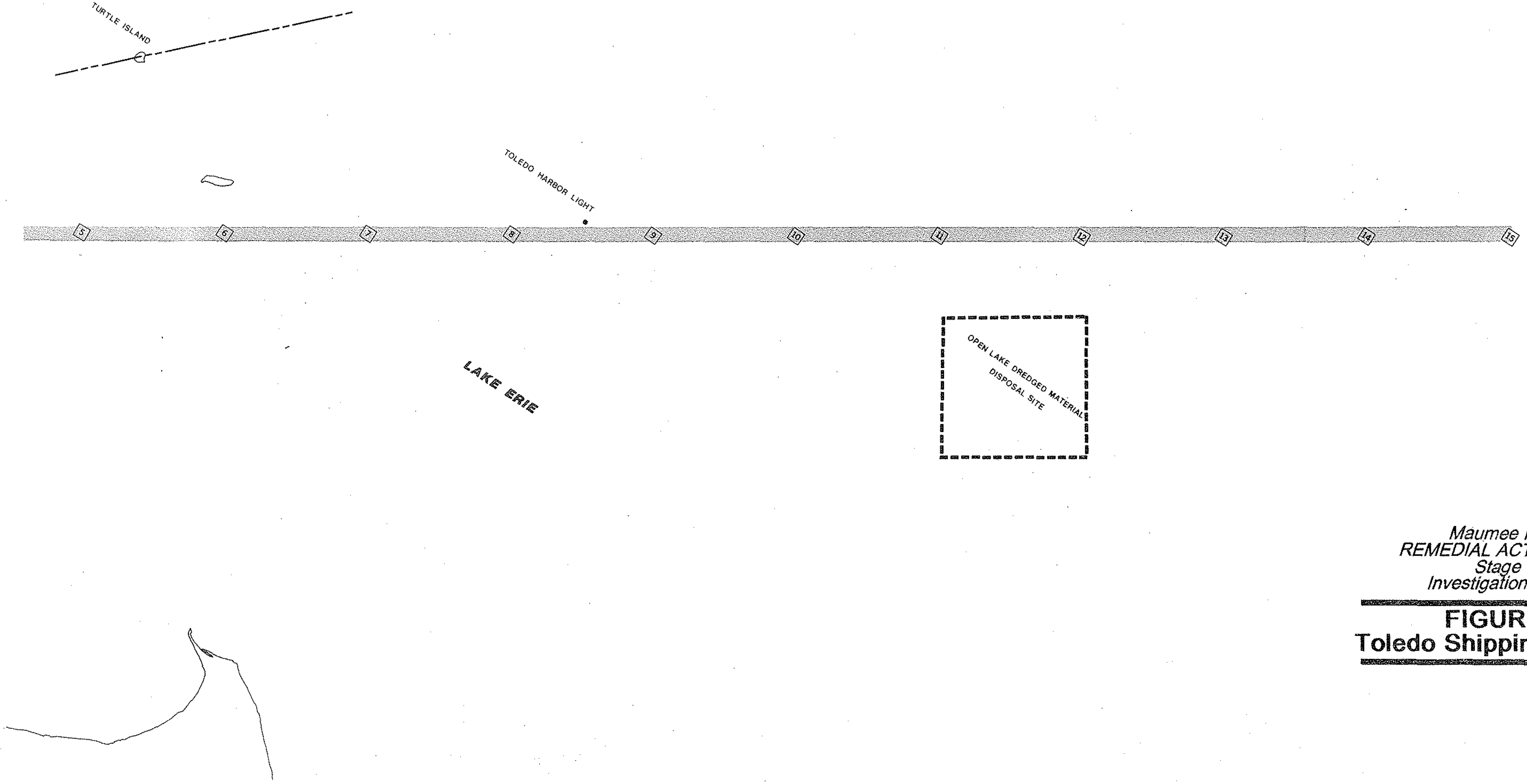
The channel is 18 miles long, 500 feet wide and 28 feet deep in the Maumee Bay. The Maumee River channel is 7 miles long, 400 feet wide and 27 feet deep (Hull Consulting, 1987). Those depths are maintained by the U.S. Army Corps of Engineers (COE) through frequent channel dredging. Due to the heavy sediment loading to the Maumee River and the shallowness of the Western Lake Erie Basin (25 foot average) (Hull Consulting, 1987), sedimentation is the primary obstacle for navigation on the Maumee River and Bay.

The COE dredges approximately one million cubic yards of materials from the channel each year. Prior to 1975, those materials were disposed of in confined disposal facilities (CDF) or by open lake disposal. From 1975 to 1985, dredge spoils were placed in the currently active CDF, Facility #3, to protect the environment from contaminated sediments. In 1985, U.S. EPA approved open lake disposal of materials dredged from less polluted areas of the channel if chemical analysis showed that the materials to be disposed of were similar to sediment in certain areas of the Western Basin where disposal had occurred in the past.

Open lake disposal requires 401 certification from the Ohio EPA. The 1987 401 Certification stated that it is the intention of the Ohio EPA to condition future 401 certifications to eventually phase out open lake disposal. However, it is the responsibility of the City of Toledo and the Toledo-Lucas County Port Authority to develop reuse alternatives for dredged materials.



MAUMEE RIVER SHIPPING CHANNEL



Maumee River
REMEDIAL ACTION PLAN
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FIGURE 4
Toledo Shipping Channel

TABLE 7

SEAPORT STATISTICS: 1976-1986, FOR SEASON THROUGH DECEMBER 31

TOLEDO HARBOR DOMESTIC & CANADIAN CARGO (Short Tons)

Commodity	1976 Season	1977 Season	1978 Season	1979 Season	1980 Season	1981 Season
Coal	14,542,037	13,393,777	14,194,776	14,570,580	12,588,982	12,159,605
Iron Ore	4,804,137	3,541,824	5,649,765	5,331,354	2,784,646	3,956,278
Newsprint	48,024	56,324	44,307	47,923	37,900	38,820
Pig Iron	57,328	18,818	46,851	12,541	19,901	34,015
Salt	264,052	325,312	266,089	261,988	159,438	70,465
Cement	88,645	104,874	—	—	—	—
Grain	1,936,632	1,872,738	2,547,278	2,592,774	3,766,650	3,353,742
Petro.Prod.	862,398	804,733	793,179	879,412	609,794	390,143
Oth.Dry Bulk	116,609	122,100	211,677	260,231	548,089	854,121
Oth.Liq.Bulk	8,294	—	—	—	—	—
Gen. Cargo	—	—	—	—	—	—
TOTAL	22,728,156	20,240,500	23,753,922	23,956,803	20,515,400	20,857,189

Commodity	1982 Season	1983 Season	1984 Season	1985 Season	1986 Season	TOTAL
Coal	8,803,621	11,155,130	12,042,839	10,498,225	10,675,904	134,625,476
Iron Ore	2,653,474	2,889,808	3,559,609	2,940,010	3,178,676	41,289,581
Newsprint	—	—	31,434	21,050	12,880	338,662
Pig Iron	6,353	16,024	18,498	25,436	14,010	269,775
Salt	192,965	23,721	257,955	215,582	203,952	2,241,519
Cement	—	—	—	—	—	193,519
Grain	2,410,340	1,052,130	1,471,378	1,602,664	916,678	23,523,004
Petro.Prod.	339,636	575,059	384,677	420,874	206,382	6,266,287
Oth.Dry Bulk	740,966	703,250	890,556	951,027	899,262	6,297,888
Oth.Liq.Bulk	—	—	—	—	6,506	14,800
Gen. Cargo	—	—	1,259	—	—	1,259
TOTAL	15,147,355	16,415,122	18,658,205	16,674,868	16,114,250	215,061,770

Source: Toledo-Lucas County Port Authority 1977-1982 Annual Reports

TABLE 8

SEAPORT STATISTICS: 1976-1986, FOR SEASON THROUGH DECEMBER 31
TOLEDO HARBOR OVERSEAS CARGO (Short Tons)

Commodity	1976 Season	1977 Season	1978 Season	1979 Season	1980 Season	1981 Season
Direct Grain Shipments	11,535,384	2,128,653	2,316,088	1,630,622	1,018,702	---
Dry Bulk	24,145	74,469	480,745	111,911	---	---
Fertilizer	---	---	---	---	66,966	---
Oth. Dry Bulk	---	---	---	---	149,439	---
Gen.& Misc. Cargo	494,102 (Fac.#1)	763,895 (Fac.#1)	532,416 (Fac.#1)	441,732 (Fac.#1)	181,189	---
Coal	---	---	---	---	---	---
Petrol. Prod.	---	---	1,013	---	---	---
Liquid Bulk	24,806 (Fac.#1)	30,195 (Fac.#1)	29,025 (Fac.#1)	27,385 (Fac.#1)	30,204	---
Military Cargo	---	---	---	---	---	---
TOTAL	12,078,437	2,997,212	3,359,287	2,211,650	1,446,500	

Commodity	1982 Season	1983 Season	1984 Season	1985 Season	1986 Season	TOTAL
Direct Grain Shipments	945,220	623,178	1,143,852	1,023,168	1,224,506	23,589,373
Dry Bulk	---	---	---	---	---	691,270
Fertilizer	85,435	52,808	61,062	71,678	82,519	420,468
Oth. Dry Bulk	59,153	9,769	6,208	12,761	67,495	304,825
Gen.& Misc. Cargo	135,120	248,713	285,900	226,044	300,246	3,609,357
Coal	---	---	23,659	21,959	69,663	115,281
Petrol. Prod.	---	---	---	---	---	1,013
Liquid Bulk	30,295	36,796	15,423	34,450	55,440	314,019
Military Cargo	---	---	---	---	4,673	4,673
TOTAL	1,255,223	971,264	1,536,104	1,390,060	1,804,542	29,050,279

Source: Toledo-Lucas County Port Authority 1977-1982 Annual Reports.

RECREATION

The use of surface waters for recreation is widespread throughout the AOC. According to state studies, Lake Erie is the number one location for water recreation in the area, as it is for the state (Commission on Ohioans Outdoors, 1986; ODNR, 1980b; ODNR, 1984). In addition, the Maumee River and the Ottawa River are utilized for their recreational potential as well.

Water-based recreation activities play an important role in outdoor recreation in the AOC as does the aesthetic quality of the waters. Water based recreation is divided into two categories, contact and non-contact activity. Contact activity has been defined as any water recreation activity which results in frequent or continuous body contact with the water. Such activities would include swimming, water skiing and sail boarding. Non-contact activity has been defined as any water recreation activity which does not result in coming into frequent or continuous body contact with the water. Sailing and power boating are examples of non-contact activities.

The principle water-based recreational activities in the AOC have been sailing, canoeing, power boating, fishing, swimming, sail boarding, jet skiing, waterfowl hunting, birding, and water skiing. According to the Ohio Water Quality Standards, all of the surface waters in the AOC have a primary contact use designation. Therefore, any of these water-based recreational activities could be performed on any surface water body in the area, assuming that it was large enough to handle the activity. Due to size alone, many activities have been limited to Maumee Bay and Lake Erie, the Maumee River and the Ottawa River.

The importance of the scenic value of the area's waters should not be overlooked. Two state parks and five metroparks are directly linked to the surface waters in the AOC. The state parks are located in the eastern portion of Lucas County along the shore of Maumee Bay and Lake Erie. The metroparks are located along the Maumee River, the Ottawa River and Swan Creek.

The Toledo area, based on current and projected recreation pressure, has been identified in the Lake Erie Access Study, ODNR, as a priority area for launch ramp projects, ODNR or public agency acquisition of boat access sites and shore based fishing projects (ODNR, 1984). The public has demonstrated a strong desire to use the waters in the AOC for recreation.

Natural Areas

The Maumee River watershed in the AOC provides a great diversity of vital habitats for at least one thousand species of plants and thousands of species of animal life ranging from the white tail deer to rare insects. This variety results from landforms which range from dry sand dunes to damp prairies and swamp woodlands. It is also a corridor for migrating birds. Eagle and osprey sightings occur in the area. Over 80 plants are listed as endangered or threatened species in the State of Ohio within the AOC. The future of their existence depends directly upon improvements in water and air quality in the area.

This wildlife habitat is under the stewardship of the following organizations: The Nature Conservancy, Metropark District of the Toledo Area, various municipal parks, and several divisions of the Ohio Department of Natural Resources.

A number of research projects by the Ohio State University and the Ohio Department of Natural Resources have shown the Maumee River to be an important spawning and nursery area for many species of game and forage fishes. Large numbers of walleye from both Lake Erie and Lake St. Clair congregate in the riffles between Perrysburg and Waterville to spawn every April. This same river section is used during May by a large spawning stock of white bass. The estuarine portion of the river is used as a spawning area by gizzard shad and freshwater drum from Lake Erie and is also an important nursery area for young white bass, gizzard shad and freshwater drum. Several studies have suggested that the Maumee River may be the single most important production area on Lake Erie for gizzard shad, which are critical forage for many commercial and sport fish species.

The decline of wetland habitat in the AOC is significant historically beginning in the late 1800s and continuing up to the present. Early accounts reported vast marshes along the Lake Erie shoreline stretching for miles inland. South of the Maumee River was a wet forest called the Great Black Swamp. Large wet prairies existed south of the river and north in west central Lucas County.

These wetland habitats served as natural storage areas for rainfall, allowing water to filter through soil maintaining the water table at a higher level than it is today. Broad marshes allowed water to evaporate back into the atmosphere or to slowly flow in streams and rivers to Lake Erie. The affects of precipitation were moderated because water spread out over a large area of wet prairies, swamp forest and marshes.

With settlement came the clearing and draining of wetlands. The underlying soil was crisscrossed with drain tiles and ditches which carried the runoff to streams and rivers. With the introduction of agriculture into the area excess water needed to be quickly drained away to streams to prevent flooded crops in fields.

The natural area has been drastically altered by agriculture and development. Removal of trees and draining and filling of wetlands have reduced the time water is allowed to remain in an area.

The effect of this alteration is that more water enters streams at a faster rate carrying with it sediment. Frequent downstream flooding and increased erosion can be expected with further development. The brownish color of water in the rivers and streams of the AOC is caused by fine soil particles in suspension, resulting from erosion from agricultural run-off and developmental storm drainage sewers.

Natural areas and resources have historically provided for basic human needs and life itself. The value of preserving plants and natural areas, in general, is both for what we know about them and for what we may learn from them in future years.

Lake Erie and Maumee Bay

Water-based recreational activities on Maumee Bay and Lake Erie consist of sailing, power boating, fishing, swimming, sail boarding, jet skiing and water skiing. The primary water quality problems have been sediment and nutrient loading which increase turbidity and algae growth. Boating and fishing are probably the most important recreational activities occurring on the Lake and Bay.

Maumee Bay State Park is located along the south shore of Maumee Bay adjacent to the City of Oregon. Camping and hiking are the principle activities at the park at this time. Shoreline fishing is another recreation activity which occurs at the park. There are plans to create a beach at the park which would facilitate swimming and related activities, although some concern over the water quality in the Bay has been expressed. The problem of suspended sediments has been the primary concern.

Crane Creek State Park is located at the extreme eastern corner of Lucas County and marks the eastern most limit of the AOC. The primary recreational activities at Crane Creek State Park are swimming, boating and related activities. Activities at the park are centered around the beach. The adjacent bird trail at Magee Marsh annually attracts thousands of visitors from many states.

Maumee River

Water-based recreational activities on the Maumee River are the same as those on the Bay and include canoeing. Certain stream segments are more appropriate for one activity than another. As described under sport and commercial fishing, fishing on the River normally occurs upstream from the Maumee-Perrysburg Bridge. Sailing and power boating occur from Perrysburg to the mouth of the Maumee River, as do the other water-based activities. Canoeing is popular both upstream and downstream from the Maumee-Perrysburg Bridge, with the upstream area being the most important. The lower portion of the River (RM 7) including areas just below RM 5, at the Swan Creek confluence near Portside, is considered polluted. This also happens to be one of the areas most impacted by combined sewer overflows (CSO). Despite the pollution, people swim, ski and sailboard in this area.

The Maumee River, upstream from the Maumee-Perrysburg Bridge, is a State Resource Water and a Scenic River. The Side Cut Metropark is located in this stream segment along the banks of the Maumee River south of the City of Maumee. The principle activities at the park include canoeing, wildlife observation, hiking and fishing. Blue Grass Island can be reached from the park which is an area often used for nature exploration and is world famous for walleye fishing. The park is also an important source of historical information on the Maumee River and its impact on the development of the region.

Farnsworth Metropark is also located in this stream segment southwest of the Village of Waterville. Farnsworth is an important area for canoeing, wildlife watching and summer shore bird watching. The area around Farnsworth is important for duck hunting.

Ottawa River

Like the Maumee River, the Ottawa River is important for non-contact recreation such as sailing and power boating. Boating is mostly restricted to the area downstream from Suder Avenue due to the difficulty of getting large boats past that point. Smaller boats can make it upstream as far as Stickney Avenue and just beyond. The primary boating lanes are downstream from Suder Avenue to the Bay. The Ottawa River was one of the most important water skiing areas in the region, however, water skiing and other contact activities no longer occur to any large extent due to severe water pollution. The City of Toledo has posted the area near the Dura Landfill advising persons to avoid contact with the water, sediment and fish.

Farther upstream, the Ottawa River flows through the Wildwood Preserve Metropark north of the Village of Ottawa Hills. The major activities at the park include wildlife observation and hiking. The park also serves as an important wildlife corridor for animals such as deer.

Other recreational areas along the Ottawa River include the Ottawa Municipal Park and Camp Miakonda Boy Scout Reservation.

Swan Creek

Due to water pollution problems and the physical characteristics of Swan Creek, contact and non-contact recreational use of Swan Creek is uncommon. The upper reaches of Swan Creek however do have important aesthetic values. The Swan Creek Preserve Metropark is located in the western portion of the City of Toledo in a rapidly developing urban area. Swan Creek flows through this park and is its primary natural feature. The park is an important resource for the area not only because of its location, but also because it is probably the best example of flood plain habitat in the region.

Swan Creek also flows through the Oak Openings Preserve Metropark in western Lucas County.

Coastal and Estuarine Marshes

The Maumee Bay lies at the mouth of the Maumee River and is formed by Little Cedar Point on the east and Woodtick Peninsula on the west. These two sand spits provide the shelter necessary for wetland development on their landward side. The former lies within the Cedar Point National Wildlife Refuge (administered as part of the Ottawa National Wildlife Refuge) and the latter lies partially within the Erie State Game Area (administered by the Michigan Department of National Resources). The Cedar Point marshes extend westward along the south shore of the bay to Maumee Bay State Park. Estuarine wetlands also occur along the Maumee River valley, between Rossford and the first bedrock riffles at Perrysburg, and in the lower reaches of the Ottawa River (Herdendorf, 1987).

The marshes in the bay are protected by dikes and are managed for waterfowl. The estuarine wetlands are less disturbed wherein the water level is not controlled. At one time the Ohio shoreline of western Lake Erie in its natural state was generally a marsh area fronted by low barrier beaches. Today there are some 23 square miles of coastal and estuarine marshes remaining which are depicted in Figure 5. These eight marshes as numbered on the map are described in Table 9 (Herdendorf, 1987).

The major plant species thriving in the Maumee Bay marshes include narrow-leaf cattail, broad-leaved cattail, jewelweeds, swamp rosemallow, blue-joint grass and swamp milkweed. In the transition zone between open water and the cattail stands, soft-stem bulrush and three-square bulrush are the dominant species (Herdendorf, 1987).

Maumee River
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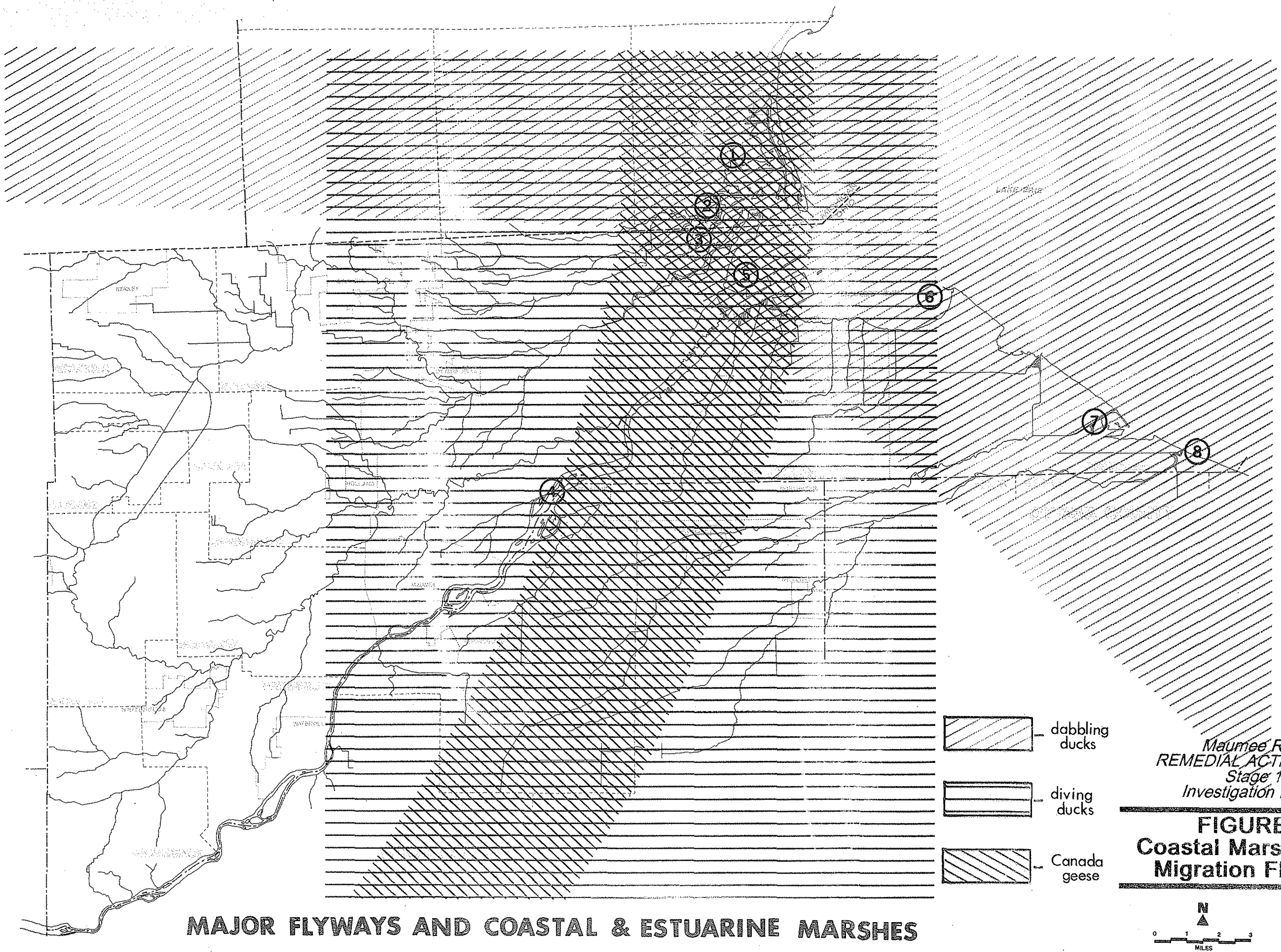
FIGURE 5
Coastal Marshes and Migration Flyways



MAJOR FLYWAYS AND COASTAL & ESTUARINE MARSHES

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

tmacog

TABLE 9

COASTAL AND ESTUARINE MARSHES

Map No.	Name	Ownership	Size	Water Level Control
1	Woodtick Peninsula Marsh	SC/PM	L	Diked/Uncontrolled
2	North Maumee Bay Marsh	C/PM	L	Diked/Uncontrolled
3	Ottawa River Estuary	PM	S	Uncontrolled
4	Maumee River Estuary	PM	L	Uncontrolled
5	Toledo Harbor Wetlands (spoil area)	F/M PS	S	Diked
6	Cedar Point Marsh	F	L	Diked
7	Metzger Marsh	S	S	Diked
8	Ottawa Marsh	F	L	Diked

SC = Shooting Club
PM = Private, multiple owners
F/M = Federal/Municipal
F = Federal
S = State
PS = Private, single owner
L = Over 1,235.5 Acres (500 ha)
S = Under 1,235.5 Acres (500 ha)

Source: Adapted from Herdendorf, 1987 Appendix B, The Ecology of the Coastal Marshes of Western Lake Erie: a Community Profile, Biological Report 85(7.9), Fish found in the Maumee Bay wetlands include: bowfin, carp, yellow perch, largemouth bass, white bass, green sunfish, yellow bullhead, gizzard shad and walleye (Herdendorf, 1987).

The most common waterfowl are mallard, black duck, green-winged teal, blue-winged teal, northern shoveler, and American coot. Tundra swans and snow geese also utilize the area for resting during spring migration. The historical occurrence of the rare Foster's tern has been reported for these wetlands. A bald eagle nest is active on Little Cedar Point (Herdendorf, 1987).

These wetlands are also a part of two major flyways, the Atlantic and the Mississippi (see Figure 5). Western Lake Erie marshes attract large numbers of migratory waterfowl, causing a crossing point of these two flyways, as shown on Figure 5. Basically, there are four distinctive flyways identified for North America. Each flyway has its own individual population of birds making the semiannual flights between breeding grounds and wintering grounds (Herdendorf, 1987).

Canada geese and diving ducks, including canvasbacks, redheads and scaup, come from their breeding grounds on the great northern plains of central Canada on the Atlantic flyway to winter over in the Chesapeake and Delaware Bays. The dabbling ducks such as mallards, black ducks and bluewinged teals that have gathered in southern Ontario during the fall, cross western Lake Erie and proceed southwest to the Mississippi delta and the Gulf of Mexico coasts (Herdendorf, 1987).

Coastal marshes and stream mouths commonly attract migrating dabbling ducks, with the diving ducks concentrating on the open water shorelines. Canada geese and mallards also feed heavily on waste grains in agricultural fields (Herdendorf, 1987).

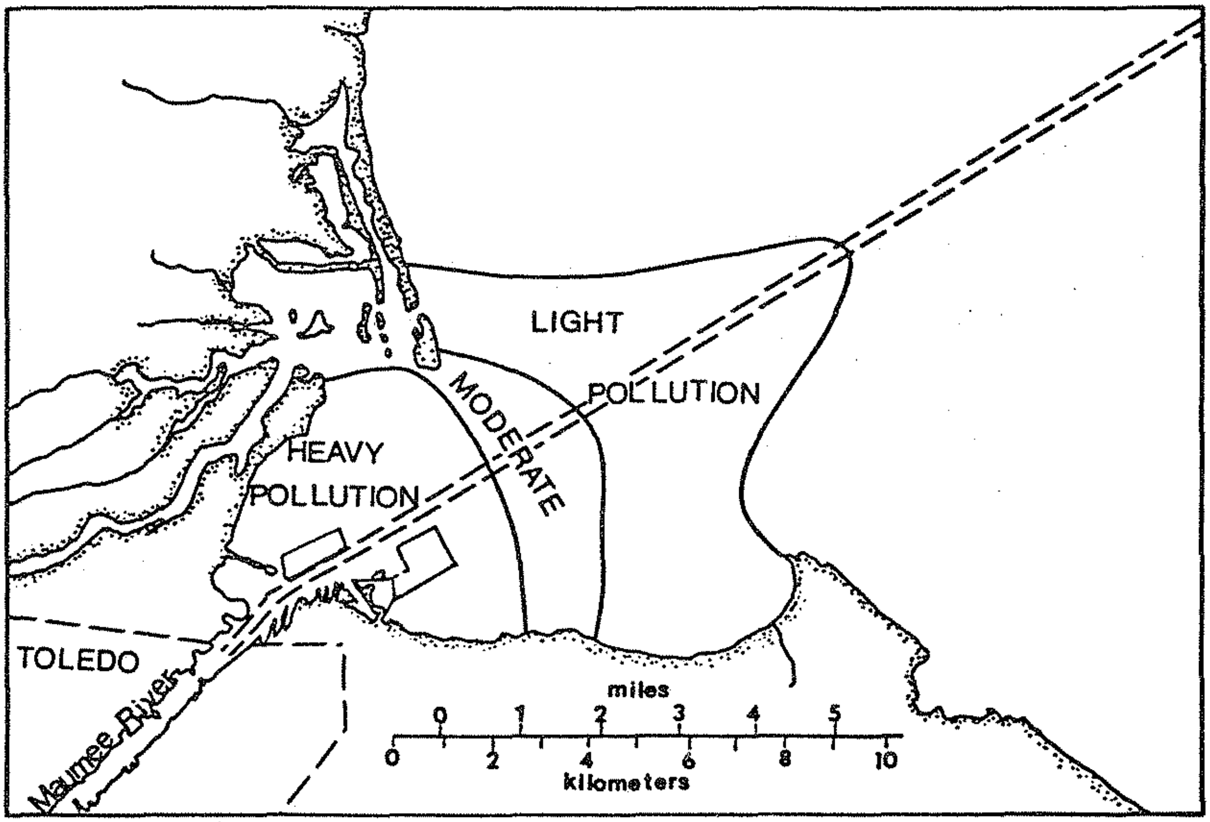
Wading birds such as herons and egrets arrive in the western Lake Erie region in early March and migrate southward in October. Upon their arrival, courtships and nest building begin immediately. They usually forage on the shorelines of the tributary streams and coastal marshes, feeding upon fish and insects (Herdendorf, 1987).

Gulls and terns also use these coastal marshes, but the ring-billed gull are becoming more common and are now known to use the Toledo-Lucas County Port Authority Facility No. 3 (dredge disposal facility). Terns also use the diked spoil areas near the Toledo Harbor. Herring gulls are also prevalent and feed on dead fish, refuse and other organic debris along the shoreline, including landfills as their food supply (Herdendorf, 1987).

The estuarine and coastal marshes of Western Lake Erie serve as sinks for many of pollutants. Maumee Bay exhibits elevated numbers of tubificid worms, an indication of high organic pollution. Note Figure 6 which displays pollution zones in the Maumee Bay as indicated by concentration of tubificids (sludge worms) in the bottom sediments. Turbidity throughout Maumee Bay and many of the estuarine and coastal marshes is high. The average concentration of suspended solids in Maumee Bay is 37 milligrams per liter (mg/l), but nearshore levels are generally over 50 mg/l (Herdendorf, 1987).

FIGURE 6

POLLUTION IN MAUMEE BAY AS INDICATED BY CONCENTRATION OF TUBIFICIDS
(SLUDGE WORMS) IN THE BOTTOM SEDIMENTS.
(WRIGHT 1955; PINSAK AND MEYER 1976).



LIGHT = 100 - 999 Tubificidae per square meter

MODERATE = 1,000 - 5,000

HEAVY = more than 5,000

Source: Maumee River Basin Level B Study.

WATER QUALITY STANDARDS

Most of the streams in the Maumee Basin RAP Area are designated as Warmwater Habitat and Agricultural Water Supply. The reaches of the Maumee in the immediate vicinity of the Bowling Green and Waterville intakes are designated as Public Water Supply. There are standards that apply for many water quality parameters depending on the stream reach's designation for aquatic life habitat, water supply, and recreational contact type. Table 10 gives the water quality standards that apply to most streams in the RAP Area. For an exhaustive listing of all water quality standards, refer to the Water Quality Standards in the Ohio Revised Code (Ohio EPA, 1990a).

TABLE 10

WATER QUALITY STANDARDS

WARMWATER HABITAT PARAMETERS

Water Quality Parameter	Average*	Maximum
Free CN, ug/l	12.	46.
DO, mg/l (minimum values)	5.0	4.0
TDS, mg/l	1500	--
Fe, total recoverable, mg/l	1.0	--
MBAS, mg/l		0.5
Cl, residual, ug/l	11.	19
Cr, hex., dissolved, ug/l	10	15
Hg, total recoverable, ug/l	0.2	1.1
Oil & Grease, mg/ll		10
Phenol, ug/l	370.	53,000
Phosphorus	(see note below)	
Polychlorinated biphenyls, (PCBs) ug/l		0.001
Ag, total recoverable, ug/l	1.3	Depends on $CaCO_3$
pH	6.5 (Minimum)	9.0 (Maximum)

STANDARDS THAT DEPEND ON HARDNESS

	@ 200 ppm AS CaCO3	@ 400 ppm as CaC3
Cu, total recoverable, ug/l	22	72
Ag, total recoverable, ug/l	1.3**	17
Zn, total recoverable, ug/l	190	380
Pb, total recoverable, ug/l	17	780

* 30-day average unless otherwise indicated
** Average is not hardness dependent

(continued)

TABLE 10
(continued)

WATER QUALITY STANDARDS

AGRICULTURAL WATER SUPPLY PARAMETERS

Water Quality Parameter	Average
Arsenic, As, total recoverable, ug/l	100
Beryllium, Be, total recoverable, ug/l	100
Cadmium, Cd, total recoverable, ug/l	50
Chromium, Cr, total recoverable, ug/l	100
Nickel, Ni, total recoverable, ug/l	200
Selenium, Se, total recoverable, ug/l	50

PHOSPHORUS

There is no specific water quality standard for phosphorus. Ohio's Water Quality Standards state: "Total phosphorus as P shall be limited to the extent necessary to prevent nuisance growths of algae, weeds, and slimes that result in a violation of the water quality criteria ... or, for public water supplies, that result in taste or odor problems. In areas where such nuisance growths exist, phosphorus discharges from point sources determined significant by the Ohio EPA shall not exceed a daily average of 1.0 ppm ... or such stricter requirements as may be imposed by OEPA ...". The IJC has proposed an objective of 15 mg/l for the Western Basin.

AMMONMIA (NH_3)

NH_3 water quality standards depend on the temperature of the water, its pH, and what time of year it is. Related note: No NO_3 standard is given here, but Ohio EPA requires the community to issue a drinking water warning when NO_3 level rises above 10 ppm.

	Average		Maximum
	Dec.-Feb.	March-Nov	March-Nov.
@ pH 7.0 and 25°C	--	1.6	13.0 ppm
@ pH 8.0 and 10°C	3.3	1.4	9.5 ppm
@ pH 8.0 and 25°C	--	1.0	9.1 ppm
@ pH 7.5 and 25°C	--	1.6	13.0 ppm

These are examples of average NH_3 standards. Ohio Water Quality Standards contain full information in its Table 7-3 and Table 7-6.

NITRATE AND NITRITE: (NO_3+NO_2)

For most stream reaches in the AOC, the Agricultural Water Supply standard of 100 ppm would apply. For the reaches that are used for public water supply, the standard is 10 ppm.

(continued)

TABLE 10
(continued)

WATER QUALITY STANDARDS

BACTERIAL STANDARDS

	Fecal Coliform #/100 ml		E. Coli #/100 ml	
	Avg	Max	Avg	Max
Bacterial:				
Bathing waters	200	400	126	235
Primary Contactl	1,000	2,000	126	298
Secondary Contact	---	5,000		576

SEDIMENT QUALITY GUIDELINES

Metal	Non-Elevated	Slightly Elevated	Elevated	Highly Elevated	Extreme Elevated
As	< 13	> 13	> 18	> 28	> 47
Cd	< 0.38	> 0.38	> 0.60	> 1.03	> 1.90
Cr	< 9	> 9	> 11	> 16	> 24
Cu	< 15	> 15	> 19	> 27	> 44
Fe	< 27,724	> 27,724	> 36,112	> 52,887	> 86,439
Pb	< 21	> 21	> 28	> 43	> 73
Zn	< 83	> 83	> 108	> 156	> 253

NOTE: Sediment metal guidelines are in units of are mg/kg.

Kelly and Hite, 1984.

(continued)

TABLE 10
(continued)

WATER QUALITY STANDARDS

PESTICIDES

Public Water Pesticide	Public Water Supply[a], ug/l	Aquatic Life Habitat, mg/l
Aldrin[b]	0.000074[c]	0.01
Benzene Hexachloride	--	0.1
Chlordane	0.0046[c]	0.01
Chlorophenoxy herbicides		
2,4-D	100.0	--
2,4,5-TP (Silvex)[b]	10.0	--
Ciodrin	--	0.1
Coumaphos	--	0.001
Dalapon	--	110.0
DDT[b]	0.00024[c]	0.001
Demeton	--	0.1
Diazinon	--	0.009
Dicamba	--	200.0
Dichlorvos	--	0.001
Dieldrin[b]	0.00071[c]	0.005
Diquat	--	0.5
Dursban	--	0.001
Endosulfan	0.93	0.003
Endrin	0.2	0.002
Guthion	--	0.005
Heptachlor[b]	0.00028[c]	0.001
Heptachlor Epoxide	0.1	--
Lindane	0.19[c]	0.01
Malathion	--	0.1
Methoxychlor	100.0	0.005
Mirex	--	0.001
Naled	--	0.004
Parathion	--	0.008
Phosphamidon	--	0.03
Simazine	--	10.0
TEPP	--	0.4
Toxaphene	0.0071[c]	0.005

---

a = Pesticides are not to exceed the concentrations in this table, or the Safe Drinking Water Act, whichever is more stringent.

b = Use has been banned.

c = For protection of human health from the potential carcinogenic effects, at a 10^6 incremental increase of cancer risk over the lifetime, due to exposure through ingestion of contaminated water and contaminated aquatic organisms.

EXISTING WATER QUALITY DATA: A SUMMARY

The TMACOG Inventory of Water Quality Monitoring Sites and Sampling Programs (TMACOG, 1988) lists a large number of sampling sites in the Maumee River Areas of Concern. The major monitoring programs are summarized below.

ONGOING MONITORING PROGRAMS

Toledo Environmental Services Division (TESD)

The most substantial body of water quality data for the Toledo area is that collected by TESD. Water is sampled and analyzed approximately monthly, resulting in nine to eleven samples per year. Parameters include conventional pollutants: BOD_5, P, NO_2, NO_3, NH_3, DO, Cl-, SS and bacterial counts.

TESD Monitoring Sites

* Maumee River:	8 stations from mouth to Waterville
Otter Creek	1 station
Delaware Creek	1 station
Grassy Creek	1 station
* Ottawa River	8 stations from Summit St. to Sylvania Ave.
Hill Ditch	1 station
* Swan Creek	4 stations from St. Clair St. to Eastgate Rd.
Heilman Ditch	1 station
* Silver Creek	1 station
* Shantee Creek	1 station

TESD data are published in six-year intervals (Moline et al, 1987) and are not reprinted in this report. Figures 7-14 summarize the 1981-1986 data. There are four sets of graphs: Swan Creek, Tenmile Creek/Ottawa River, Maumee River, and other tributaries. There are two graphs in each group. For Swan Creek (Figures 7 and 8), the graphs display the 1981-86 average nutrients (BOD_5, DO, NH_3 and P).

These data are then displayed for Ottawa River (Figures 9-10) and the Maumee River (Figures 11-12), applying the same format as used for Swan Creek. The graphs (Figures 13-14) display these same data for Otter Creek, Delaware Creek, Grassy Creek, Hill Ditch, Silver Creek, Shantee Creek and Heilman Ditch.

Figure 7: Average Nutrient Parameters TESD DATA, 1981-1988: SWAN CREEK

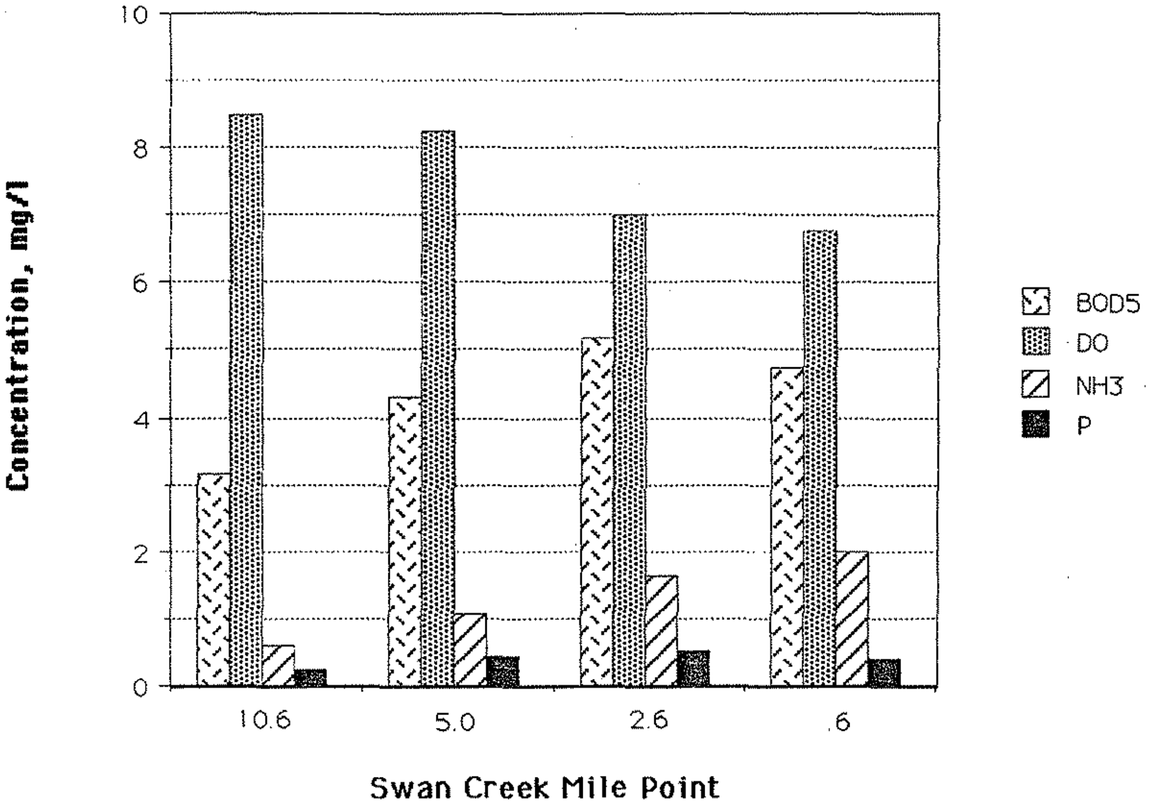


Figure 8: Average Bacteriological Parameters TESD DATA, 1981-1988: SWAN CREEK

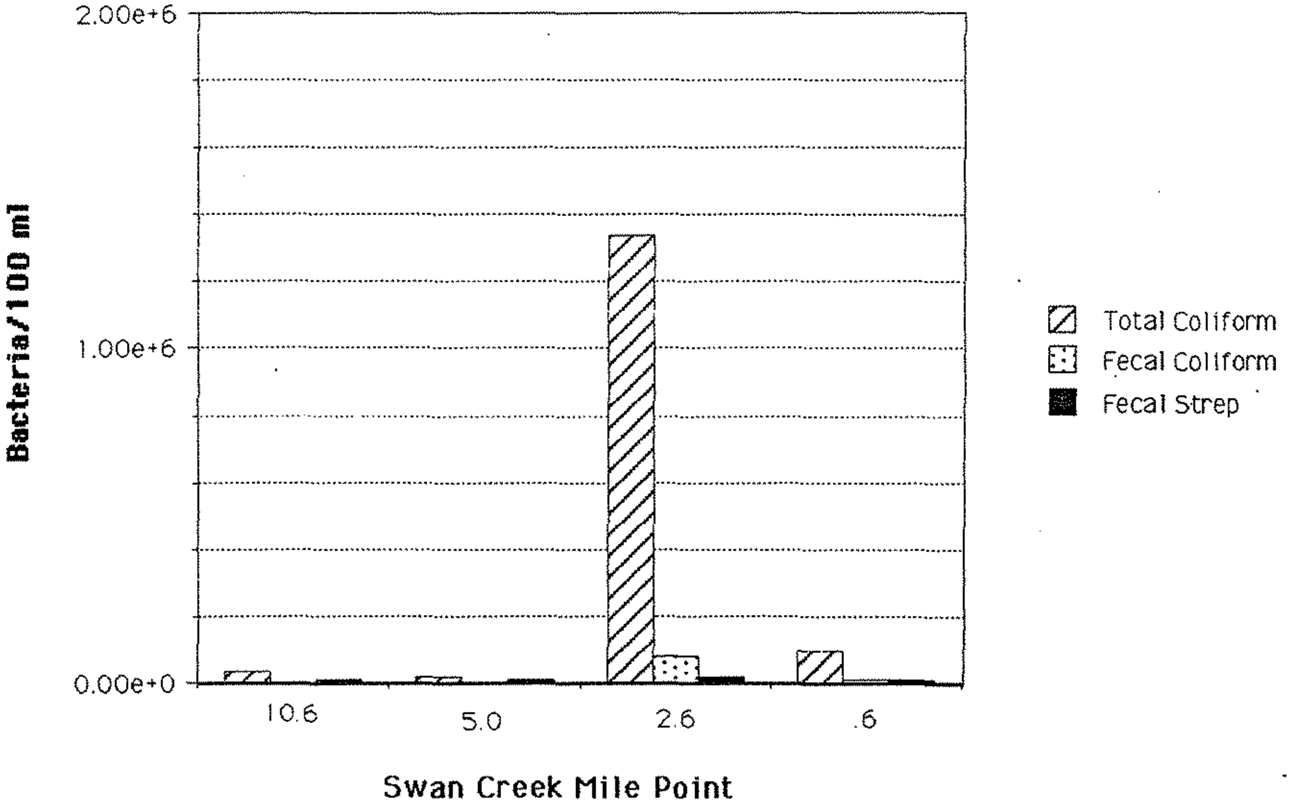


Figure 9: Average Nutrient Parameters TESD DATA, 1981-1988: OTTAWA RIVER

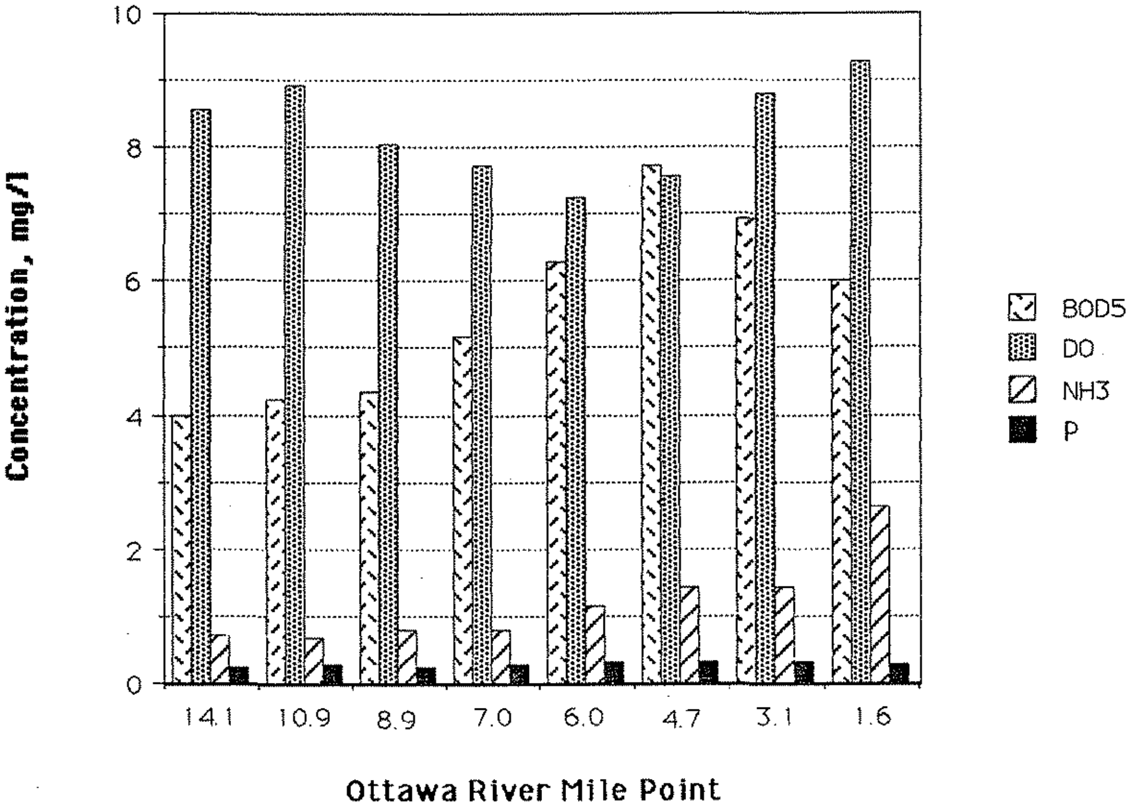


Figure 10: Average Bacteriological Parameters TESD DATA, 1981-1988: OTTAWA RIVER

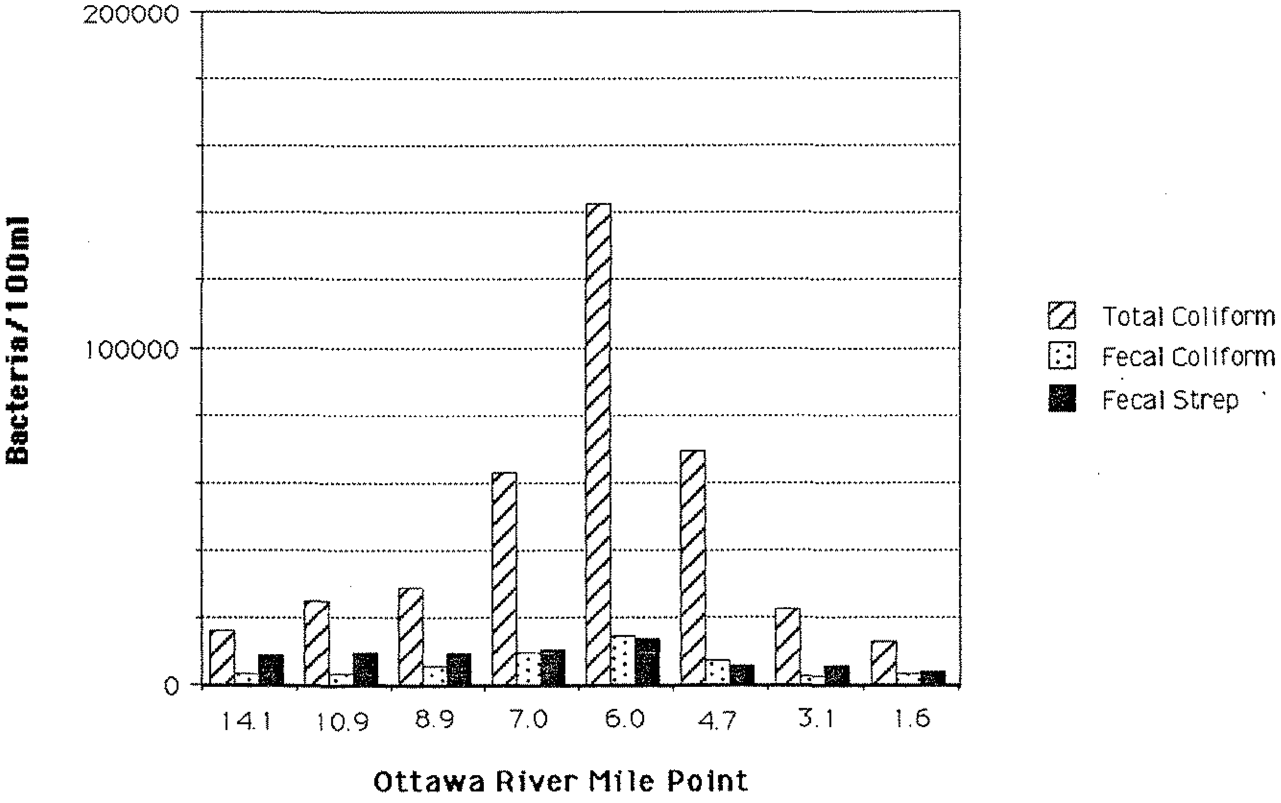


Figure 11: Average Nutrient Parameters TESD DATA, 1981-1988: MAUMEE RIVER

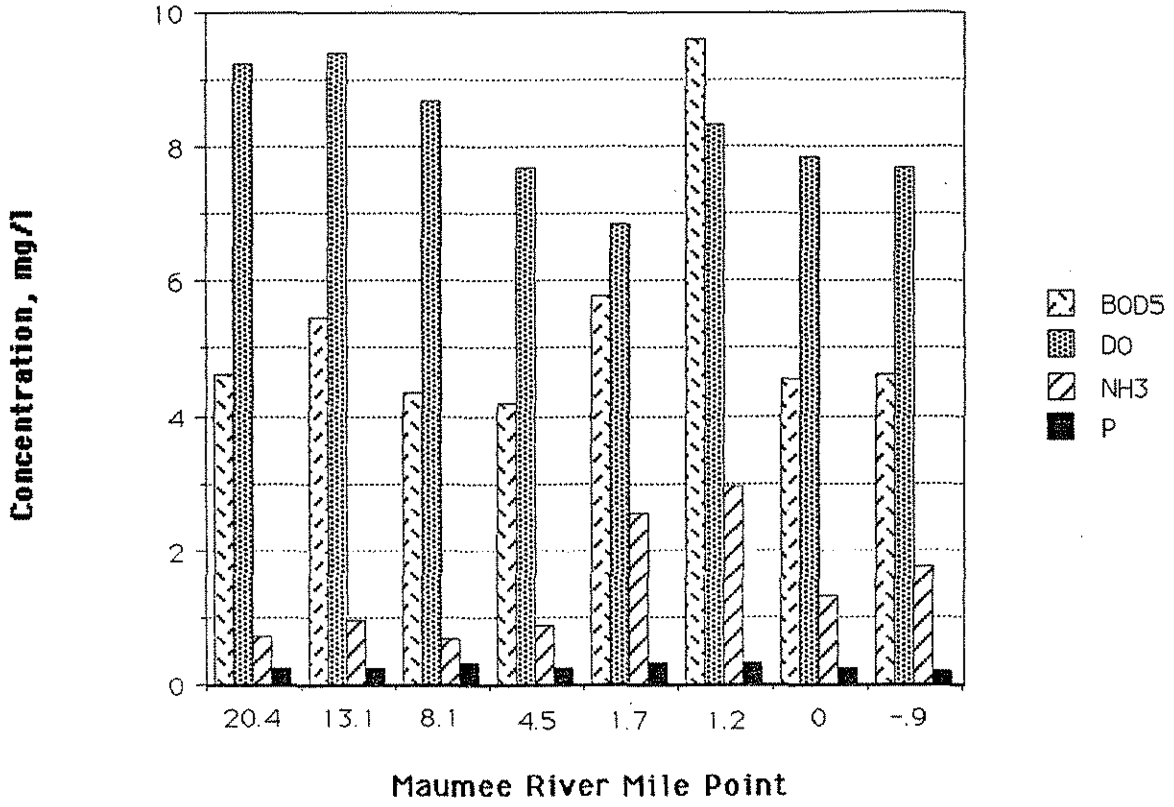


Figure 12: Average Bacteriological Parameters TESD DATA, 1981-1988: MAUMEE RIVER

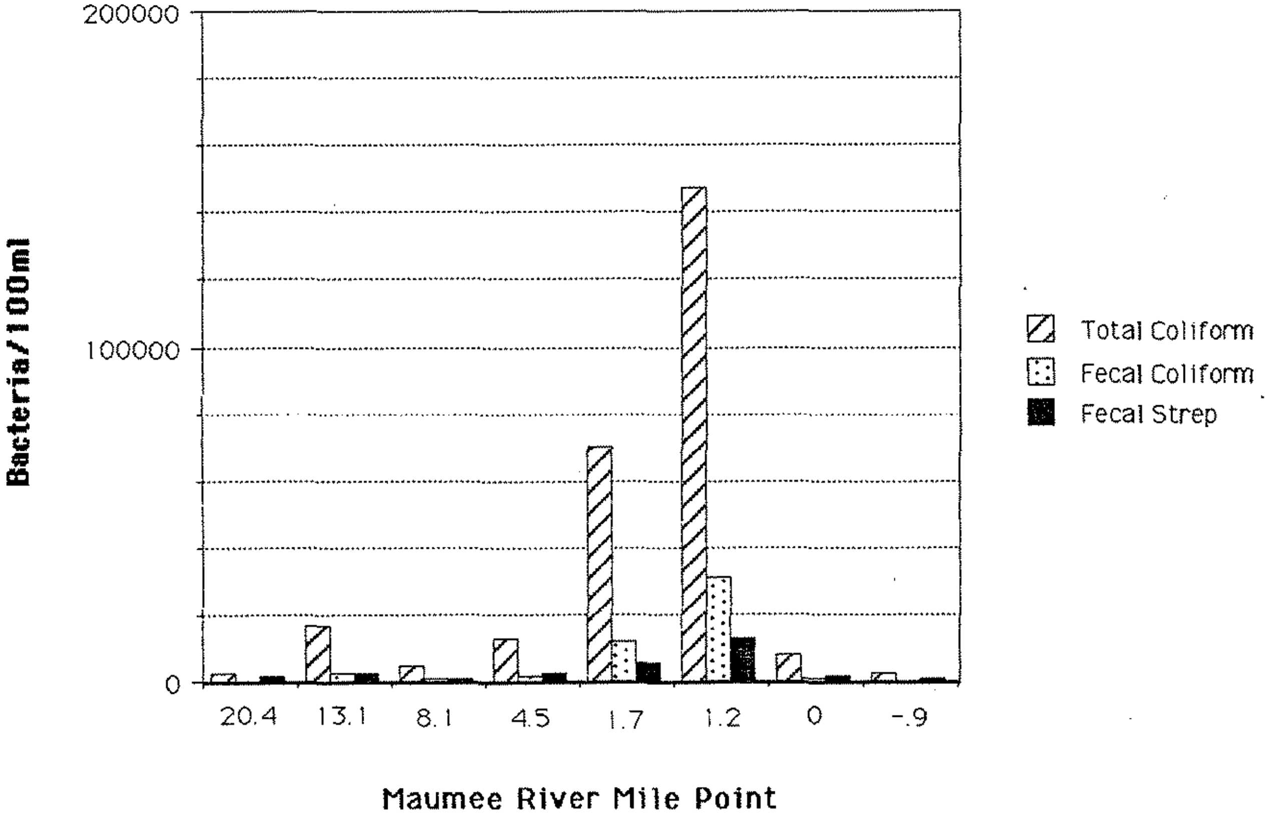


**Figure 13: Average Nutrient Parameters
TESD DATA, 1981-1988: Tributary Stream**

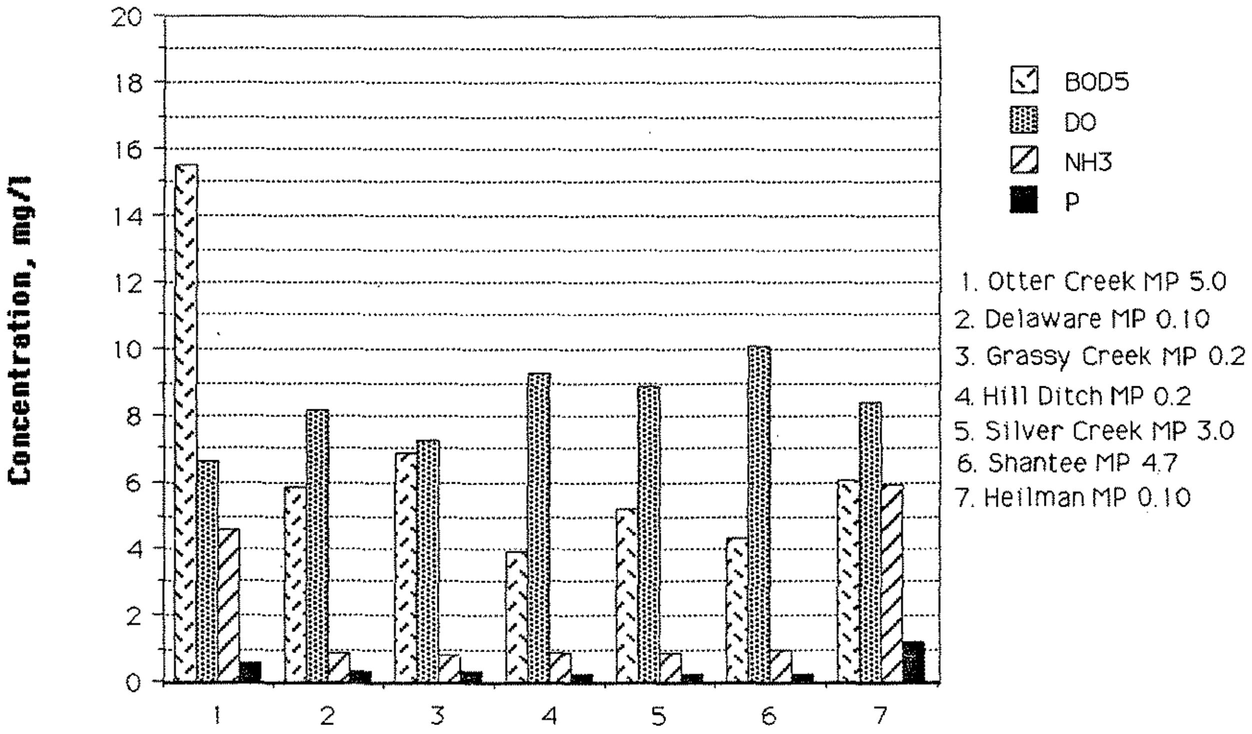
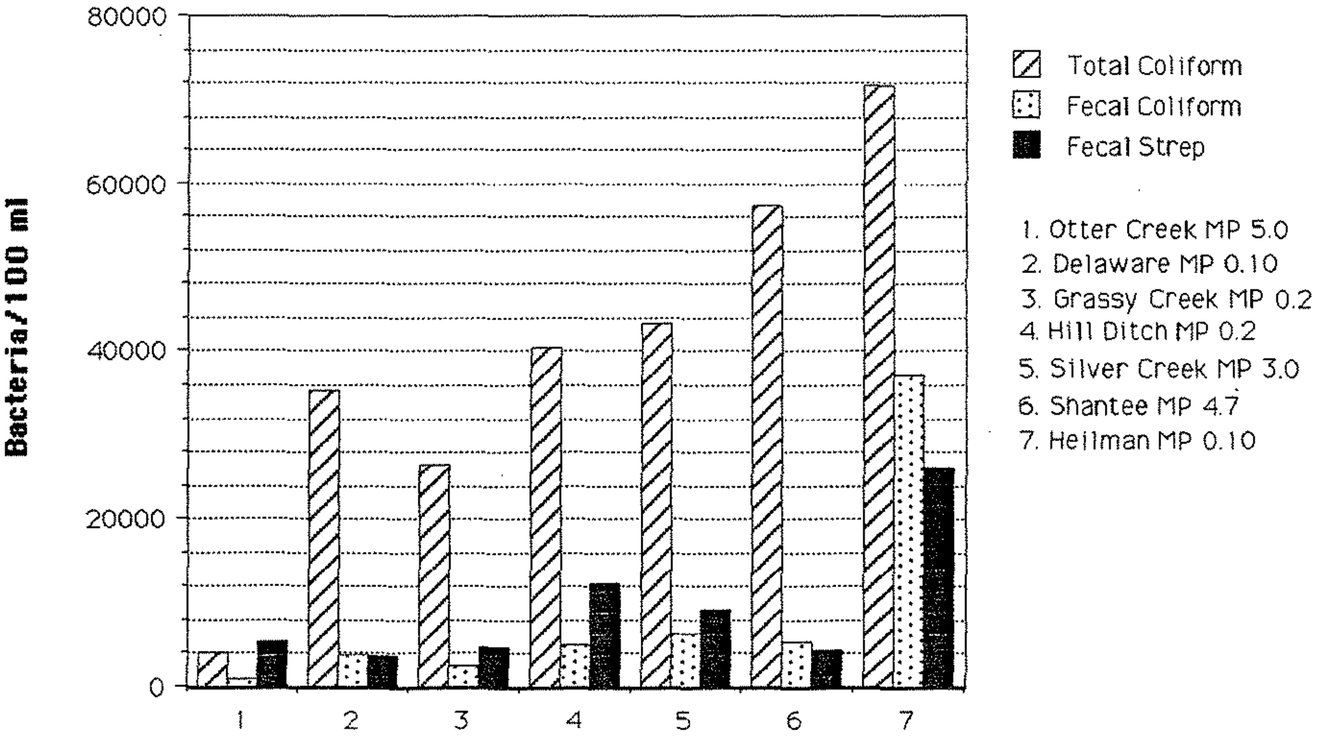


**Figure 14: Average Bacteriological Parameters
TESD DATA, 1981-1988 Tributary Stream**



United States Geological Survey (USGS)

USGS has an on-going sampling network, although the number of sites and amount of monitoring done has decreased. Monitoring stations in the Maumee RAP Area include:

* Maumee River	Mile point 22.8 above Waterville, mile point 20.8 at Waterville and the mouth of the Maumee (discontinued 1975),
* Ottawa River	Mile point 10.8 at U.T. bridge (1977 only),
* Crane Creek	Near Curtice in Ottawa County; sampled semi-annually from 1980-82. Parameters: DO, Ca, Mg, Na, K, SO_4, Cl, F, TDS, TKN, NH_3, NO_3+NO_2, P, Fe, Mn,
* Cedar Creek	Mile point 6.9 at Curtice in Lucas County. Same monitoring details as Crane Creek site.

Only conductance, pH, temperature, and DO are sampled above Waterville. Conventional pollutants and metals (As, Ba, Cd, Cr, Cu, Fe Pb, Mn, Hg, Se, Ag, Zn) are monitored at the Waterville site; these parameters were also sampled at the two other discontinued sites.

Ohio State University Center for Lake Erie Area Research (CLEAR)

CLEAR does primarily open-lake and near-shore water quality studies. Their most intensive period of monitoring activity within the Maumee RAP Area was in 1975. Sampling that year included many sites in Maumee Bay and in the river itself as far upstream as Perrysburg (mile point 12). Sampling included conventional pollutants, and fecal coliform. It is no longer an on-going program.

Ohio EPA 305b Water Resource Inventories

Ohio EPA publishes a biannual water resource inventory describing the water quality status of the various stream reaches in Ohio. The purpose of this report is to summarize the quality of surface waters and to indicate whether they are meeting the "fishable, swimmable" criteria of the Clean Water Act (CWA). The 1990 Ohio Water Resource Inventory's assessment of aquatic life use for the lower Maumee/Ottawa River Basin is shown in Table 11. The subbasins included in this table are the Upper Middle Maumee River, the Lower Middle Maumee River, and the Lower Maumee River (and Ottawa River).

TABLE 11

1990 Aquatic Life Use Attainment

	Total Length Miles	Full	Partial	None	Not Assessed	Not Fishable
Upper Middle Maumee River	103.4	10.9	15.5	66.5	10.5	82.0
Lower Middle Maumee River	61.0	28.2	1.0	24.8	7.0	25.8
Lower Maumee River (and Ottawa River)	169.5	19.1	3.0	67.9	79.5	72.2

Source (Ohio EPA, 1990c)

The area covered by the biennial report includes the Maumee basin in Ohio which is substantially larger than the RAP Area. It includes all of Fulton, Henry, Defiance, Paulding, Putnam, Van Wert, and Allen counties, and large portions of Lucas, Wood, Hancock, Auglaize, and Mercer counties. The Ottawa River mentioned refers to the Ottawa River that flows through Lima, not the Ottawa River in Lucas County known locally as Tenmile Creek.

The 305b study summarizes the conditions of stream segments in the RAP area. These summaries are shown in Table 12 by stream reach and includes the stream designations and the Clean Water Act (CWA) use attainment. Cedar and Crane creeks, which the 305b classifies as being in the Portage River basin, were not evaluated.

TABLE 12

1990 Ohio Water Resource Inventory

STREAM	MILE POINTS	REACH	COND.	CWA	DESG
Maumee R.	14.1-37.7	Maumee-Perrysburg Bridge-Napoleon	Good	Yes	WWH
Maumee R.	7.2-14.1	Estuary reach	Fair	Part.	WWH
Maumee R.	0.0-7.2	Ship channel	Fair	Part.	WWH
Maumee Bay	-----	-----	Fair	Part.	EWH
Swan Creek	14.0-41.2	I-475 to headwaters	Fair	Part.	WWH
Swan Creek	0.0-14.0	Mouth to I-475	Poor	No	WWH

WWH = Warmwater Habitat
EWH = Exceptional Warmwater Habitat

Heidelberg College River Studies Laboratory

The Water Quality Laboratory at Heidelberg College has contributed significant research on the movement and loadings of sediment, nutrients, and more recently pesticides in the Maumee River basin. Utilizing the data available from the U.S. Geological Survey at the Waterville Survey Station and data collected by the Water Quality Laboratory (US COE, 1973), they have analyzed sediment, phosphorus, nitrogen, chlorides, and 19 different pesticides. These data provide a record of water quality conditions in the Maumee River and have been collected continuously throughout the years which allows for the development of loading data. These data have been used extensively in the Agricultural Pollution Abatement section of this report. Major reports of these data are included in several documents available from the Water Quality Laboratory (USEPA, 1983; USEPA, 1984; USEPA, 1987).

INTENSIVE OR SHORT-TERM MONITORING SURVEYS

There has been a substantial body of water quality data collected since 1970 through various one-time sampling programs.

Lower Maumee River Technical Support Document (TSD)

Ohio EPA has established five different evaluation classes for its biological criteria for determining water quality use designations and attainment of the Clean Water Act (CWA) goals. Class I (Exceptional) and Class II (Good) meets CWA goals. Class III (Fair), Class IV (Poor) and Class V (Very Poor) do not meet CWA goals. Attainment/non-attainment of aquatic life uses is determined by using biological criteria. The biological community performance measures that are used include the Index of Biotic Integrity (IBI) and the Modified Index of Well-Being (Iwb), both of which are based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics.

An aquatic life use is fully attained if all three indices (or those available) meet the applicable criteria. Partial attainment is reached if one or more indices attain and at least one does not attain. A site is considered to be in non-attainment if all three indices (or those available) fail to meet the applicable criteria. This also applies if one of the two organism groups (fish or macroinvertebrates) indicates poor or very poor performance even if the other group is attaining the applicable criteria.

As a part of its Technical Support Document, Ohio EPA analyzed sediments for heavy metal concentrations in 1986 at eleven stations on the Maumee River (Grand Rapids Dam, Eagle Point Colony, Cherry Street Bridge and Toledo WWTP), Swan Creek (Collingwood Blvd.), Ottawa River (Lagrange Street and Stickney Avenue), Otter Creek (Oakdale Avenue, Wheeling Street, and Millard Avenue), and Duck Creek (York Street).

A summary of the biological and sediment quality data collected for the TSD is presented in Table 13. The Invertebrate Community Index (ICI) and Macroinvertebrate Densities get to the heart of measuring a stream's water quality. They indicate the ability of the stream to sustain life. High values for these indices indicate good water quality. The sediment metal data is a measure of accumulated metals at the bottom of the stream. The metals tested are toxic, so low values indicate a good environment for bottom-dwelling animals.

TABLE 13

LOWER MAUMEE RIVER TECHNICAL SUPPORT DOCUMENT

							Sediment Concentration (mg/kg dry weights)						
STREAM	LOCATION	RATING	BANK	MILE	ICI	DENSITY	Cd	Cr	Cu	Pb	Ni	Zn	As
Maumee River Subwatershed													
Maumee	Grand Rapids Dam	Good		32.1	42	1697	0.24	5.9	5.3	15.3	4.8	24.5	—
Maumee	Woodcock Island	Exceptional		25.1	52	1384	—	—	—	—	—	—	—
Maumee	SR 64	Exceptional		20.9	54	1627	—	—	—	—	—	—	—
Maumee	US 20	Marginally Good		15.0	24	544	—	—	—	—	—	—	—
Maumee	Maple St. Boat Launch	Marginally Good	S	13.6	20	405	—	—	—	—	—	—	—
Maumee	Carey St. Boat Launch	Fair	N	13.3	14	467	—	—	—	—	—	—	—
Maumee	Eagle Point			9.4	—	—	0.95	43.2	36.3	52.3	44.8	178.0	21.5
Maumee	Walbridge Park	Fair	N	8.8	18	913	—	—	—	—	—	—	—
Maumee	Libbey-Owens-Ford	Fair	S	7.3	12	688	—	—	—	—	—	—	—
Maumee	I-75	Marginally Fair	N	7.2	8	440	—	—	—	—	—	—	—
Maumee	Cherry St. Bridge	Marginally Fair	N	4.7	8	544	1.52	33.4	65.3	108.0	34.4	190.0	10.1
Maumee	Consaul St.	Fair	S	3.6	14	706	—	—	—	—	—	—	—
Maumee	Riverside Park	Marginally Fair	N	3.1	10	387	—	—	—	—	—	—	—
Maumee	Harrison Marina	Marginally Fair	N	1.5	6	579	—	—	—	—	—	—	—
Maumee	Bay View Park	Marginally Good	N	0.7	16	1166	1.46	57.2	45.5	52.5	46.2	384.0	12.9
Duck Creek	Wheeling Road	Very poor		3.0	4	145	—	—	—	—	—	—	—
Duck Creek	York Street	Poor		2.1	10	190	0.6	14.0	21.2	72.8	14.0	115.0	13.9
Duck Creek	Port Authority	Poor		0.4	10	43	—	—	—	—	—	—	—
Otter Creek	East Broadway	Fair		7.2	—	—	—	—	—	—	—	—	—
Otter Creek	Oakdale Ave.	Very poor		6.0	0	0	0.52	32.0	30.0	49.0	22.0	170.0	26.1
Otter Creek	Wheeling Road	Very poor		4.0	0	166	0.66	149.0	46.0	142.0	26.0	163.0	14.4
Otter Creek	Millard Ave.	Very poor		2.0	0	1623	0.53	54.0	71.0	68.0	19.0	129.0	7.7
Otter Creek	Mouth	Very poor		0.3	2	299	—	—	—	—	—	—	—

TABLE 13 (Continued)

LOWER MAUMEE RIVER TECHNICAL SUPPORT DOCUMENT

STREAM	LOCATION	RATING	BANK	MILE	ICI	DENSITY	Cd	Cr	Cu	Pb	Ni	Zn	As
Swan Creek Subwatershed													
Swan Creek	Eastgate Road	Fair		10.2	24	369	—	—	—	—	—	—	—
Swan Creek	Detroit Ave.	Fair		4.9	16	199	—	—	—	—	—	—	—
Swan Creek	Champion St.	Poor		3.9	8	602	—	—	—	—	—	—	—
Swan Creek	Hawley St.	Poor		2.6	6	602	—	—	—	—	—	—	—
Swan Creek	Collingwood Blvd.	Poor		1.2	8	489	1.39	27.2	18.6	165.0	29.8	285.0	13.5
Swan Creek	Mouth	Poor		0.6	12	748	—	—	—	—	—	—	—
Ottawa River Subwatershed													
Tenmile Creek	Centennial Road	Fair/marg. good		5.1	28	—	—	—	—	—	—	—	—
Tenmile Creek	Sylvania Ave.	Fair/marg. good		4.1	35	—	—	—	—	—	—	—	—
Tenmile Creek	Old Post Road	Marginally Good		1.0	36	—	—	—	—	—	—	—	—
Ottawa River	Sturbridge Road	Fair		18.5	24	382	—	—	—	—	—	—	—
Ottawa River	Centennial Hall, UT	Fair		11.0	14	297	—	—	—	—	—	—	—
Ottawa River	South Cove Blvd.	Poor		9.0	10	272	—	—	—	—	—	—	—
Ottawa River	Berdan Ave.	Poor		7.4	10	365	—	—	—	—	—	—	—
Ottawa River	Lagrange St.	Poor		6.9	10	551	1.77	72.2	71.4	195.0	53.4	333.0	1.2
Ottawa River	Stickney Ave.	Poor		4.9	8	388	0.52	23.4	87.2	116.0	21.2	124.0	4.3
Ottawa River	US 24-A	Poor		1.6	6	616	—	—	—	—	—	—	—
Lake Erie Tributaries Subwatershed													
Cedar Creek	US 20	Good		20.8	34	90	—	—	—	—	—	—	—

Ohio EPA also analyzed sediment samples from the Maumee River, Swan Creek, and the Ottawa River for a variety of volatile organic compounds. The complete sampling records are presented in Appendix A. Table 14 gives the sediment organic compound data in summary form, listing only those samples where detectable amounts of the volatile organics were found. The complete Lower Maumee River Technical Support Document is presented in Appendix G.

Cd = Cadmium
Cr = Chromium
Cu = Copper
Pb = Lead
Ni = Nickel
Zn = Zinc
As = Arsenic

TABLE 14

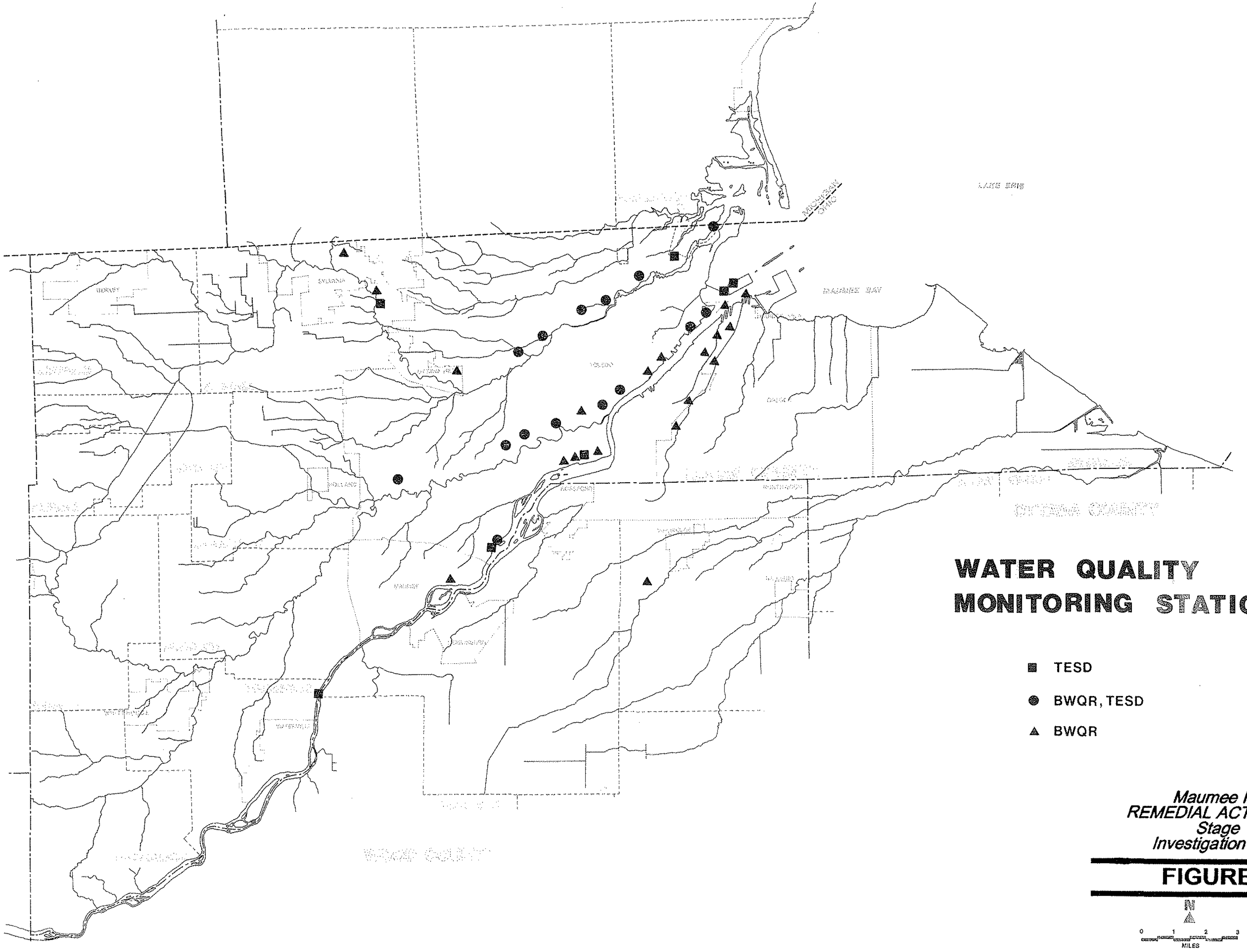
TSD SEDIMENTS: PRIORITY POLLUTANT DATA

	Stream ==========>	Maumee	Maumee	Maumee	Swan	Otter	Otter	Otter	Ottawa	Ottawa
	River Mile =======>	9.4	4.9	1	1.2	5.9	4	2.1	6.4	4.9
	Station =========>	Eagle Pt	Cherry St	WWTP	Collingwood	Oakdale	Wheeling	Millard	Lagrange	Stickney
CAS Number	Volatile Compound		Conc ug/kg	Conc ug/kg	Conc ug/kg	Conc ug/kg	Conc ug/kg	Conc ug/kg	Conc ug/kg	Conc ug/kg
67-64-1	Acetone		44		38	49				
108-05-4	Vinyl Acetate				39					
79-01-6	Trichloroethene				19					
108-88-3	Toluene	1300						320		
108-95-2	Phenol							890		
106-44-5	4-Methylphenol			1400				1700		
91-57-6	2-Methylnaphthalene		790							
83-32-9	Acenaphthene		1400		5300					
132-64-9	Dibenzofuran		1300		4900					
86-73-7	Fluorene		2500		7500					
85-01-8	Phenanthrene		11000	1000	29000	8700	2300		2800	4100
120-12-7	Anthracene					1900	830			
206-44-0	Fluoranthene		11000	2100	26000	12000	3500		6900	5400
129-00-0	Pyrene		7300	1900	22000	7500	3700	710		4900
85-68-7	Butylbenzylphthalate									4300
56-55-3	Benzo(a)anthracene		3900	1000	11000	5000	1800			3200
117-81-7	Bis(2-ethylhexyl) Phthalate (DEHP)	8600					650			
218-01-9	Chrysene		4000	1000	8800	3400	1700			2800
117-84-0	Di-n-octyl Phthalate			1200						3600
205-99-2	Benzo(b)Fluoranthene		1900	2000	6500	3900				
207-08-9	Benzo(k)Fluoranthene		2500	880	4400	2700				
50-32-8	Benzo(a)Pyrene		2300	990	4800	2900	1000			1800
193-39-5	Indeno(1,2,3-co)Pyrene		1500	910		2200	680			1700
53-70-3	Dibenz(a,h)Anthracene		970	890		1000				
191-24-2	Benzo(g,h,i)Perylene		1800	1100		2600	750			1800
53469-21-9	Aroctor 1242				1600					2500

Figure 15 shows the sampling sites for both TESD and Ohio EPA for the major waterways. The "square" indicates only TESD sites, the "circle" indicates both agencies, while the "triangle" indicates the sampling sites for the TSD investigative team.

U.S. Army Corps of Engineers 1983 Toledo Harbor Sediment Analyses

In 1983, Floyd Browne Associates and Aquatech, under contract from the U.S. Army Corps of Engineers (USCOE), collected and analyzed sediments from Toledo Harbor. These data collected under this project are presented in Table 15 (Floyd Brown & Associates, 1984). Included in this table are the severity ratings for various parameters when applying either the Ohio EPA guidelines or the U.S. EPA guidelines. Figure 4 has lake and river miles marked and can be referred to for Table 15 sediment sample collection locations.



WATER QUALITY MONITORING STATIONS

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 15

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

TABLE 15

U.S. ARMY CORPS OF ENGINEERS, 1983-88
TOLEDO HARBOR SEDIMENT DATA

PARAMETER	Abbrev.	L-16		L-15		L-14		L-13		L-12	
		1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
THERE ARE NO SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Tot Solids, %	TS		59.4		38.5		42.2		54.0		35.0
Phenols	Phenol		0.26		0.13		0.14		0.16		0.28
U.S. EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Vol. Solids, %	TVS		2.51		5.12		4.81		3.23		4.67
Severity			A		C		A		A		A
Mercury	Hg		0.3		0.7		0.5		0.3		0.4
Severity			A		A		A		A		A
Cyanide	CN		<.3		<.5		<.5		<.4		0.69
Severity											E
Nickel	Ni		30		49		39		32		42
Severity			C		C		C		C		C
Ammonia-N	NH3-N		21		50		42		37		93
Severity			A		A		A		A		C
Manganese	Mn		280		400		350		255		400
Severity			A		C		C		A		C
Total P	P		570		830		710		560		760
Severity			C		E		E		C		E
TKN	TKN		472		952		852		649		1,050
Severity			A		A		A		A		C
COD	COD		34,000		72,000		53,000		38,000		76,000
Severity			A		C		C		A		C
OHIO EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING METALS:											
Cadmium	Cd		2.0		3.0		3.0		2.0		3.0
Severity			E		E		E		E		E
Arsenic	As		9		16		13		9		19
Severity			A		B		B		A		C
Chromium	Cr		32		49		38		28		37
Severity			E		E		E		E		E
Lead	Pb		40		67		45		34		59
Severity			C		D		D		C		D
Copper	Cu		32		50		39		30		44
Severity			D		E		D		D		E
Zinc	Zn		130		200		160		110		160
Severity			C		D		D		C		D
Iron	Fe		12,600		17,700		14,700		11,300		22,300
Severity			A		A		A		A		A

Except where noted, units are mg/kg.

KEY TO SEVERITY RATINGS:

	Ohio EPA Guidelines	US EPA Guidelines
A	Non-Elevated concentration	Non-Polluted
B	Slightly Elevated concentration	
C	Elevated concentration	Moderately Polluted
D	Highly Elevated concentration	
E	Extreme Elevated concentration	Heavily Polluted

TABLE 15 (Continued)

U.S. ARMY CORPS OF ENGINEERS, 1983-88
TOLEDO HARBOR SEDIMENT DATA

PARAMETER	Abbrev.	L-11		L-10		L-9		L-8		L-7	
		1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
THERE ARE NO SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Tot Solids, %	TS		36.3		30.0		38.2		48.8	37.4	39.3
Phenols	Phenol		0.20		0.20		0.18		0.10	0.10	0.19
U.S. EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Vol. Solids, %	TVS		4.89		6.51		4.77		3.88	4.85	5.52
Severity			A		C		A		A	A	C
Mercury	Hg		0.3		0.3		0.3		0.2	0.3	0.1
Severity			A		A		A		A	A	A
Cyanide	CN		0.35		0.75		0.4		0.23	0.49	0.52
Severity			E		E		E		C	E	E
Nickel	Ni		38		39		28		25	38	29
Severity			C		C		C		C	C	C
Ammonia-N	NH3-N		110		170		81		59	116	120
Severity			C		C		C		A	C	C
Manganese	Mn		400		440		450		360	445	440
Severity			C		C		C		C	C	C
Total P	P		780		750		700		760	900	750
Severity			E		E		E		E	E	E
TKN	TKN		1,440		1,470		1,300		1,060	2,050	1,270
Severity			C		C		C		C	E	C
COD	COD		74,000		93,000		67,000		63,000	77,600	76,000
Severity			C		E		C		C	C	C
OHIO EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING METALS:											
Cadmium	Cd		2.0		2.0		2.0		2.0	1.2	0.9
Severity			E		E		E		E	D	C
Arsenic	As		18		21		17		14	11.8	16
Severity			B		C		B		B	A	B
Chromium	Cr		31		30		19		21	24	18
Severity			E		E		D		D	E	D
Lead	Pb		48		38		23		33	24	25
Severity			D		C		B		C	B	B
Copper	Cu		43		41		31		29	31	28
Severity			D		D		D		D	D	D
Zinc	Zn		160		150		100		100	112	100
Severity			D		C		B		B	C	B
Iron	Fe		17,600		23,300		15,300		18,000	22,900	20,300
Severity			A		A		A		A	A	A

Except where noted, units are mg/kg.

KEY TO SEVERITY RATINGS:

	Ohio EPA Guidelines	US EPA Guidelines
A	Non-Elevated concentration	Non-Polluted
B	Slightly Elevated concentration	
C	Elevated concentration	Moderately Polluted
D	Highly Elevated concentration	
E	Extreme Elevated concentration	Heavily Polluted

TABLE 15 (Continued)

U.S. ARMY CORPS OF ENGINEERS, 1983-88
TOLEDO HARBOR SEDIMENT DATA

PARAMETER	Abbrev.	L-6		L-5		L-4		L-3		L-2	
		1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
THERE ARE NO SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Tot Solids, %	TS	32.3	44.4	47.7	46.2	51.7	38.9	34.7	43.3	53.5	36.9
Phenols	Phenol	<0.1	0.23	<0.1	0.13	<0.1	0.20	1.4	<0.1	0.3	0.39
U.S. EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Vol. Solids, %	TVS	6.19	5.58	4.43	6.11	4.31	5.98	5.10	4.83	4.21	7.16
Severity		C	C	A	C	A	C	C	A	A	C
Mercury	Hg	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.1
Severity		A	A	A	A	A	A	A	A	A	A
Cyanide	CN	0.46	0.6	0.28	0.56	0.32	0.48	0.05	0.47	0.52	0.7
Severity		E	E	E	E	E	E	A	E	E	E
Nickel	Ni	49	25	42	23	41	27	50	24	38	30
Severity		C	C	C	C	C	C	C	C	C	C
Ammonia-N	NH3-N	205	160	192	140	146	110	169	160	133	200
Severity		E	C	C	C	C	C	C	C	C	C
Manganese	Mn	555	360	434	370	481	400	576	355	382	470
Severity		E	C	C	C	C	C	E	C	C	C
Total P	P	812	770	804	830	749	840	869	900	827	980
Severity		E	E	E	E	E	E	E	E	E	E
TKN	TKN	1,330	1,460	1,820	1,450	1,570	1,500	2,550	1,810	1,510	1,420
Severity		C	C	C	C	C	C	E	C	C	C
COD	COD	95,000	76,000	76,600	72,000	77,700	82,000	102,000	74,000	56,400	86,000
Severity		E	C	C	C	C	E	E	C	C	E
OHIO EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING METALS:											
Cadmium	Cd	1.6	1.0	1.2	1.0	1.0	1.0	1.4	1.0	1.2	2.0
Severity		D	C	D	C	C	C	D	C	D	E
Arsenic	As	13.4	16	10.5	15	11.6	20	13.8	18	10.3	20
Severity		B	B	A	B	A	C	B	B	A	C
Chromium	Cr	31	19	24	18	22	20	30	17	23	23
Severity		E	D	E	D	D	D	E	D	D	D
Lead	Pb	26	24	25	24	20	23	27	23	19	29
Severity		B	B	B	B	A	B	B	B	A	C
Copper	Cu	40	27	35	29	35	32	43	29	30	33
Severity		D	D	D	D	D	D	D	D	D	D
Zinc	Zn	142	95	120	100	106	110	142	98	106	120
Severity		C	B	C	B	B	C	C	B	B	C
Iron		30,400	18,900	25,300	14,400	24,500	23,100	30,500	16,000	23,000	22,900
Severity	Fe	B	A	A	A	A	A	B	A	A	A

Except where noted, units are mg/kg.

KEY TO SEVERITY RATINGS:

	Ohio EPA Guidelines	US EPA Guidelines
A	Non-Elevated concentration	Non-Polluted
B	Slightly Elevated concentration	
C	Elevated concentration	Moderately Polluted
D	Highly Elevated concentration	
E	Extreme Elevated concentration	Heavily Polluted

TABLE 15 (Continued)

U.S. ARMY CORPS OF ENGINEERS, 1983-88
TOLEDO HARBOR SEDIMENT DATA

PARAMETER	Abbrev.	L-1		R-0		R-1		R-2		R-3	
		1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
THERE ARE NO SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Tot Solids, %	TS	36.7	37.6	39.5	42.3	52.8	36.8	39.9	37.0	38.0	37.6
Phenols	Phenol	<0.1	0.23	0.2	0.21	0.30	0.69	1.3	0.29	<0.1	0.16
U.S. EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:											
Vol. Solids, %	TVS	6.69	7.58	5.48	6.63	5.80	8.84	6.99	7.45	6.55	7.29
Severity		C	C	C	C	C	E	C	C	C	C
Mercury	Hg	0.2	0.1	0.3	0.2	0.2	0.4	<0.1	0.2	0.2	0.1
Severity		A	A	A	A	A	A	A	A	A	A
Cyanide	CN	0.80	1.5	2.5	0.52	1.6	1.58	1.0	0.67	0.37	0.98
Severity		E	E	E	E	E	E	E	E	E	E
Nickel	Ni	53	32	59	33	59	46	61	33	54	31
Severity		E	C	E	C	E	C	E	C	E	C
Ammonia-N	NH3-N	236	180	260	270	716	870	275	210	170	150
Severity		E	C	E	E	E	E	E	E	C	C
Manganese	Mn	580	460	504	390	467	420	482	530	491	470
Severity		E	C	E	C	C	C	C	E	C	C
Total P	P	1,050	1,100	1,470	1,200	2,120	3,500	1,340	1,400	1,210	1,100
Severity		E	E	E	E	E	E	E	E	E	E
TKN	TKN	2,410	1,870	2,540	1,700	1,630	2,620	847	1,630	1,740	2,860
Severity		E	C	E	C	C	E	A	C	C	E
COD	COD	9,5600	9,7000	9,1900	8,3000	8,4700	120,000	82,700	84,000	60,900	87,000
Severity		E	E	E	E	E	E	E	E	C	E
OHIO EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING METALS:											
Cadmium	Cd	2.0	2.0	2.2	2.0	4.0	2.0	2.0	2.0	1.8	2.0
Severity		E	E	E	E	E	E	E	E	D	E
Arsenic	As	12.4	22	18.2	20	9.9	21	18.6	22	12.3	23
Severity		A	C	C	C	A	C	C	C	A	C
Chromium	Cr	34	24	50	31	71	57	43	39	34	24
Severity		E	E	E	E	E	E	E	E	E	E
Lead	Pb	29	26	36	34	135	52	42	29	40	32
Severity		C	B	C	C	E	D	C	C	C	C
Copper	Cu	43	37	52	38	76	52	51	39	46	36
Severity		D	D	E	D	E	E	E	D	E	D
Zinc	Zn	161	150	211	140	303	330	213	170	184	160
Severity		D	C	D	C	E	E	D	D	D	D
Iron	Fe	32,600	24,900	33,100	27,200	30,200	31,500	37,000	29,000	34,900	30,600
Severity		B	A	B	A	B	B	C	B	B	B

Except where noted, units are mg/kg.

KEY TO SEVERITY RATINGS:

	Ohio EPA Guidelines	US EPA Guidelines
A	Non-Elevated concentration	Non-Polluted
B	Slightly Elevated concentration	
C	Elevated concentration	Moderately Polluted
D	Highly Elevated concentration	
E	Extreme Elevated concentration	Heavily Polluted

TABLE 15 (Continued)

U.S. ARMY CORPS OF ENGINEERS, 1983-88
TOLEDO HARBOR SEDIMENT DATA

PARAMETER	Abbrev.	R-4		R-5		R-6		R-7	
		1983	1988	1983	1988	1983	1988	1983	1988
THERE ARE NO SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:									
Tot Solids, %	TS	47.4	54.7	53.5	41.5	43.1	46.6	44.7	47.6
Phenols	Phenol	0.1	0.13	0.3	0.17	<0.1	0.13	<0.1	0.12
U.S. EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING PARAMETERS:									
Vol. Solids, %	TVS	5.94	4.29	5.61	10.0	5.22	4.25	6.14	7.47
Severity		C	A	C	E	C	A	C	C
Mercury	Hg	<0.1	0.2	0.4	0.2	<0.1	0.1	0.2	0.2
Severity		A	A	A	A	A	A	A	A
Cyanide	CN	0.27	<0.3	2.1	0.5	0.92	<0.6	0.18	<0.3
Severity		E		E	E	E		E	
Nickel	Ni	57	19	47	27	51	23	48	23
Severity		E	C	C	C	E	C	E	C
Ammonia-N	NH3-N	150	88	132	150	139	91	191	89
Severity		C	C	C	C	C	C	C	C
Manganese	Mn	480	320	382	440	510	340	488	335
Severity		C	C	C	C	E	C	C	C
Total P	P	1,200	840	1,030	1,100	1,030	820	952	735
Severity		E	E	E	E	E	E	E	E
TKN	TKN	1,650	1,630	1,570	2,750	1,980	1,690	988	1,980
Severity		C	C	C	E	C	C	A	C
COD	COD	61,700	46,000	54,400	82,000	73,200	58,000	76,000	61,000
Severity		C	C	C	E	C	C	C	C
OHIO EPA HAS ESTABLISHED SEDIMENT GUIDELINES FOR THE FOLLOWING METALS:									
Cadmium	Cd	1.2	2.0	1.6	1.0	1.4	0.9	1.4	2.0
Severity		D	E	D	C	D	C	D	E
Arsenic	As	16.4	12	8.5	22	18	18	13.2	16
Severity		B	A	A	C	B	B	B	B
Chromium	Cr	29	14	26	20	26	16	28	13
Severity		E	C	E	D	E	C	E	C
Lead	Pb	37	23	55	41	28	19	22	16
Severity		C	B	D	C	B	A	B	A
Copper	Cu	53	27	46	40	39	26	38	23
Severity		E	C	E	D	D	C	D	C
Zinc	Zn	158	93	149	150	145	97	140	82
Severity		D	B	C	C	C	B	C	A
Iron	Fe	31,800	13,900	20,300	24,500	32,600	19,900	31,100	13,200
Severity		B	A	A	A	B	A	B	A

Except where noted, units are mg/kg.

KEY TO SEVERITY RATINGS:

	Ohio EPA Guidelines	US EPA Guidelines
A	Non-Elevated concentration	Non-Polluted
B	Slightly Elevated concentration	
C	Elevated concentration	Moderately Polluted
D	Highly Elevated concentration	
E	Extreme Elevated concentration	Heavily Polluted

Facilities Plans

Facilities Plans are the first step in an application for a Water Pollution Control Loan from Ohio EPA. The Water Pollution ControlLoan Fund Program used to be the Construction Grant Program. Most of the requirements are the same, such as requiring Facilities Plans. These plans include an assessment of the present situation in the study area, including water quality, and a forecast of future needs. Many Facilities Plans involved stream sampling to document water quality problems, especially septic tank discharges or other problems which new sewers or treatment plant improvements would alleviate.

Lucas County Facilities Plan

Finkbeiner, Pettis, and Strout (1983) performed water quality sampling on many streams in western Lucas County for the Lucas County Plan Update. On the smaller ditches, data collected for the Facilities Plan are still the only samples on record. The parameters tested, for the most part, were NH_3-N, BOD_5, DO, Fecal Coliform, and Fecal Strep. Data for each station include the ratio of coliform to strep which is used as a basis for determining whether bacterial contamination is due to animal wastes or human wastes. Many violations of water quality standards were noted, but will not be reiterated here. The data are available in Appendix G of the Facilities Plan. Since 1981, portions of the problem areas have been sewered, and it is probable that water quality violations in those areas have been eliminated.

Table 16 is an updated summary of this facilities plan data. The sampling points listed are:

a. Points at which water quality violations were found in 1981, and

b. Are still unsewered or are immediately downstream from unsewered areas, and

c. Indicated (in 1981) that contamination was due to human wastes.

TABLE 16

LUCAS COUNTY FACILITIES PLAN: WATER QUALITY MONITORING FOR 1983 UPDATE

SITE NO	STREAM	APPROXIMATE LOCATION	PARAMETER VIOLATED	NOTES
Ottawa River Subwatershed				
1	Tenmile Cr.	Sylvania & Mitchaw	NH_3, FC	
2	Tenmile Cr.	Sylvania & Silica	FC	
3 *	Ottawa River	Sylvania W of Corey	FC	Bentbrook to be sewered
5 *	Tenmile Cr.	Centennial & Silica	FC	
9 *	Smith Dt .	Central & King	FC	
11	Smith Dt.	Bancroft E of McCord	FC	Subdivision upstream sewered
12*	Vanderpool Ditch	Bancroft & King	FC	
13*	Heldman Dt	Dorr & King	FC	
16*	Heldman Dt	Nebraska & McCord	NH_3, FC	Immediate area sewered
17*	Heldman Dt	McCord SE of Nebraska	NH_3, FC	Immediate area sewered
20*	Haefner Dt	Dorr & McCord	FC	
Swan Creek Subwatershed				
24*	Butler Dt	Old St Line & Irwin	FC	
28*	Butler Dt	Airport E of Crissey	NH_3, FC	
29*	Kujowski Dt	Crissey S of Airport	FC	
30	Cunningham Dt	Crissey N of Garden	FC	
31	Zaleski Dt	Eber & Salisbury	FC	
32	Wolf Cr	Albon & Airport	FC	
33	Wolf Cr	Gunn & Airport	FC	
34	Wolf Cr	Off Airport W of Holloway		
38*	Good Dt	Angola @ I-475	NH_3, FC	
39*	Butler Dt	Old St Line W of Crissey	FC	
45*	Wiregrass Dt	Soul Rd E of Wilkins	FC	
46*	Wiregrass Dt	Wilkins @ 20A	FC	

NH_3 = Ammonia
FC = Fecal coliform
* = In designated area planned for sanitary sewer service in Areawide Water Quality Management Plan

Fish kills, cited by a 1979 ODNR report, are also mentioned in the Lucas County Facilities Plan Update. They occurred in 1976 on Wolf Creek, due to a chlorine solution, and in 1976 on Swan Creek due to a municipal sewage discharge.

Additional sampling was conducted in 1985 for a Facilities Plan update (Finkbeiner, Pettis, and Strout, 1985) which was written to apply for funding to construct sanitary sewers for the Dorcas Farms and South Hill Park subdivisions in Springfield Township, northeast of Holland. As yet, these sewers have not been built, so these data, which are summarized in Table 17, may still be considered current.

TABLE 17
LUCAS COUNTY FACILITIES PLAN:
1985 MONITORING FOR DORCAS FARMS & SOUTH HILL PARK

SITE NO	1983 SITE NO	STREAM	APPROXIMATE LOCATION	SAMPLE NO	BOD$_5$	DO	NH$_3$	FC
1	38	Good Dt	Angola W of I-475,	1	164.0	1.6*	26.3*	2,600,000*
			Below S Hill Park	2	46.0	2.9*	13.9*	550,000*
				3	24.0	1.8*	7.4*	1,600,000*
				AVG	78.0	2.1*	15.8*	1,583,333*
2	n/a	Good Dt	Above Wolf Creek	1	5.4	7.8	.4	380
				2	4.8	7.4	.0	120
				3	2.1	7.2	.4	320
				AVG	4.1	7.5	.3	273
3	n/a	Wolf Cr	Below Good Ditch	1	1.4	8.4	.0	1,200
				2	2.0	8.4	.0	630
				3	1.6	8.0	.1	630
				AVG	1.7	8.3	.1	820
4	n/a	Swan Cr	Below Wolf Creek	1	1.1	8.6	.0	680
				2	1.8	7.4	.0	560
				3	1.4	8.0	.1	460
				AVG	1.4	8.0	.0	567

* = A water quality violation based on 2000 fecal coliform/100 ml, 0.5 ppm NH_3, and 5.0 ppm DO. There is no water quality standard for BOD_5, but in clean water, it should be close to 0.

Good Ditch flows through the subdivisions, and sampling site #1 is immediately downstream. Houses in the development presently use septic systems, and failures of these systems are widespread and well-documented. The sampling data clearly show pollution from untreated sewage.

Toledo Facilities Plan

The Toledo Facilities Plan was written in a number of volumes. It included separate volumes for different phases of sewerage system improvements, and there was a Combined Sewer Overflow Study (CSO) written in 1978 (Jones & Henry Engineers, Ltd., 1978), and updated in 1987.

The 1978 study included the following water quality monitoring:

1. Rainfall quantity vs. overflow quantity from various combined sewage regulators.

2. Sediments were collected at five sites along Swan Creek from the mouth to Byrne Road; and at six sites on the Maumee ranging from river mile 0 to river mile 8. Samples were analyzed for BOD_5, COD_5, P, TKN, Organic Nitrogen, NH_3, NO_2, NO_3, Oil & Grease, Fe, and Zn.

The Tenmile Creek Facilities Plan (Jones & Henry Engineers, Ltd., 1976) included similar sediment sampling at four sites on Tenmile Creek, ranging from mile point 6.2 to mile point 15.0. Parameters tested were BOD_5, COD_5, P, TKN, Organic Nitrogen, NH_3, NO_2, NO_3, Oil & Grease, Fe, and Zn.

Oregon Facilities Plan

Seven ditches and creeks were sampled for the 1974 Oregon Facilities Plan, (Finkbeiner, Pettis & Strout, 1974). Drainage areas sampled were Amlosch/Driftmeyer Ditches, Heckman Ditch, Big Ditch, Tobias Ditch and Wolf Creek. Fifteen samples were taken between 12/3/73 and 6/26/74. Parameters recorded were Conductivity, DO, BOD_5, P, Total Coliform, Fecal Coliform, Fecal Strep., Turbidity, Cl, NH_3, NO_2, and NO_3.

Additional sampling was conducted for the Harbor View Area update of the Oregon Facilities Plan (Finkbeiner, Pettis & Strout, 1974). Samples were collected at five sites, catch basins or ditches, and analyzed for DO, BOD_5, SS, P, Fecal Coliform, and Fecal Strep. One site had a DO of 4.4 ppm, and another had 5.1 ppm; the other three were under 1.5 ppm. Fecal coliform counts ranged from 25,000 to 1.1 million. BOD_5 ranged from 1.0 ppm to 148 ppm. These parameters indicated the presence of sewage.

Following thunder storms, Ohio EPA collected grab samples from seven ditches or storm sewers in July, 1981. The only parameter analyzed was fecal coliform. Two sites had counts under 100, one was 360 bacteria/100 ml, and the other four ranged from 1000 to 360,000. These samples also indicate sewage.

Luckey Facilities Plan

One grab sample was taken at each of 27 sites in local streams and ditches. Parameters analyzed were BOD_5, Fecal Coliform and DO. These samples showed the presence of sewage in the streams. The Village of Luckey presently has a combined sewerage system. The system collects dry-weather sewage flows and treats the wastewater in a lagoon WWTP, which is operated by the Village. This system was placed in operation in late 1987.

Maumee Combined Sewer Overflow Study

Maumee's combined sewer overflows were studied in detail in this report. This study is discussed in more depth in the section under CSOs.

The TMACOG 208 Program

When the Clean Water Act (PL 92-500) was originally enacted in 1972, funding was included to perform intensive water quality assessment and planning. Water quality parameters analyzed included SS, C, N, P, CODs and BODs of various durations and Fecal Coliform. One site in the Maumee Basin was monitored in 1974, and eight sites in 1975-76.

Maumee Bay Environmental Quality Studies

In 1974 and again in 1977, detailed investigations of the environmental conditions of the Maumee Bay were conducted by a team of researchers directed by Dr. Peter Fraleigh of the University of Toledo. These studies represented an examination of Maumee Bay before and after the construction of the Confined Disposal Facility (Facility #3) in Maumee Bay at the mouth of the River. The studies examined water quality, water mixing patterns, sedimentation and erosion patterns, and the biological characteristics of the Bay. Major reports of the studies are:

The Maumee Bay Environmental Quality Study 1974-Final Report, Toledo Lucas Port Authority, September 1975.

The Maumee Bay Environmental Quality Study 1977-Final Report, Toledo Lucas County Port Authority, January 1979.

WATER QUALITY DATA ANALYSIS

BOD, bacteria counts, nitrogen compounds (NO_3, NO_2, NH_3, TKN), and phosphorus compounds are "conventional pollutants" and are commonly used to test for sewage. Nitrogen and phosphorus parameters also are commonly measured to determine the effects of agricultural runoff on a stream. Most of the water quality collected in the Maumee basin consists of tests for these "conventional" pollutants.

The USGS station at Waterville provides a long history of water quality data for the Maumee River as it comes into the Toledo area. TESD data provide a similar history for water quality in the Toledo area. The TSD monitoring covered many of the same parameters, but also took a detailed look at the stream's biology and sampled sediments.

TOLEDO ENVIRONMENTAL SERVICES DATA

Discussion of TESD Data

TESD sampling includes the "conventional" pollutants: solids, phosphorus, BOD_5, nitrogen compounds, bacteria counts, conductivity, chloride, and pH. The sampling program is geared toward detecting pollution from untreated sewage. The reason for this is to record the effects of CSOs which have long been known as a major source of pollution in Toledo streams.

Trends from TESD Data

Table 18 compares the year-to-year increases and decreases in the average BOD_5, DO, NH_3, P, and fecal coliform values at the upstream and downstream stations.

TABLE 18

TESD DATA: WATER QUALITY TRENDS

	1982	1983	1984	1985	1986
Maumee River Subwatershed					
Waterville BOD_5	+	-	+	-	-
TT Bridge BOD_5	+	-	-	-	+
Waterville DO	+	-	+	-	-
TT Bridge DO	-	-	-	-	+
Waterville NH_3	+	+	x	+	x
TT Bridge NH_3	-	+	-	-	-
Waterville P	x	+	x	+	x
TT Bridge P	-	-	x	x	+
Waterville Fecal coliform	+	-	-	+	-
TT Bridge Fecal coliform	-	-	-	-	+
Swan Creek Subwatershed					
Eastgate BOD_5	-	+	+	+	+
Hawley BOD_5	-	-	+	+	
Eastgate DO	-	-	-	-	+
Hawley DO	-	-	-	-	+
Eastgate NH_3	+	+	+	+	-
Hawley NH_3	-	x	+	-	-
Eastgate P	+	+	-	-	+
Hawley P	+	-	+	+	x
Eastgate Fecal coliform	+	-	-	-	+
Hawley Fecal coliform	+	-	-	+	-
Ottawa River Subwatershed					
Sylvania Ave BOD_5	-	+	-	-	+
Lagrange BOD_5	+	-	-	-	-
Sylvania Ave DO	-	+	-	-	+
Lagrange DO	-	-	-	+	-
Sylvania Ave NH_3	+	+	+	+	-
Lagrange NH_3	+	-	+	+	-
Sylvania Ave P	-	-	+	-	x
Lagrange P	+	-	x	-	x
Sylvania Ave Fecal coliform	+	+	-	+	+
Lagrange Fecal coliform	+	-	-	-	+

KEY:

+ = This parameter showed improvement from the previous year
− = This parameter showed lower water quality than the previous year
x = This parameter showed little or no change from the previous year
TT = Toledo Terminal rail bridge over the Maumee River

Maumee River Subwatershed (Figures 11 and 12 on page 52)

Note: Sampling at MP (milepoint) 1.2 (NE corner WWTP) was discontinued after 1983. No samples were taken at this site in July or August 1981-83.

Bacteria Counts

The Maumee River showed a sharp peak in average bacterial counts for years 1981-1986. The peak station was MP 1.7 with an annual average count of 320,000 total coliform, and 140,000 fecal coliform.

Pollution Counts

For 1981-1986 annual averages, BOD_5 and NH_3 both peaked at MP 1.7 (6.94 ppm and 2.3 ppm, respectively). At one upstream station (MP 1.7, Toledo Terminal bridge), both parameters were notably higher than further upstream. Below MP 1.2, both parameters dropped sharply.

DO reached its lowest level (6.6 ppm) at MP 1.2, and increased to 7.0 ppm at MP 1.7. Further downstream, average DO was over 7.0 ppm.

Year-to-Year Comparisons

Upstream at Waterville, BOD_5 appears to show a general increase without any big peaks. However, in 1986 levels were lower than 1985. Near the mouth (Toledo Terminal bridge), BOD_5 shows a declining trend instead, with an especially large drop in 1984. There was an increase in 1986. DO at Waterville appears to show a slight general increase, although with a peak average DO of 10 ppm in 1984. The trend appears reversed near the mouth, with drops in DO from 1982-1985 and improvement in 1986.

At Waterville, NH_3 was low in 1981-82 and showed a marked increase in 1983 which was maintained in 1984-86. Near the mouth, NH_3 showed a general decline with a big drop in 1982. Concentrations were lower than upstream.

At Waterville, P was steady throughout the period. At the mouth, P remained fairly steady through the period although with a peak in 1986.

Bacterial counts at Waterville showed large variations with no noticeable trend. Generally all three bacterial parameters (total coliform, fecal coliform, and fecal strep) follow the same pattern, with total coliform showing the highest numbers and greatest fluctuations. In 1986, however, total coliform and fecal strep decrease at Waterville, while fecal coliform showed a sharp increase. Near the mouth, there appears to be a very clear trend. Bacterial counts showed a sharp decrease in 1982, and continued dropping in 1983-5. In 1986 there was a slight increase again.

Swan Creek (Figures 7 and 8 on page 50)

Bacteria Counts

The average July bacteria counts were less than the year-round averages for Swan Creek. The creek reaches its worst around MP 2.6 (Hawley St). At this point, the annual average total coliform was over 1.3 million. Fecal coliform counts were also high (66,000 annual average). Bacteria counts decreased below MP 2.6.

Pollution Counts

Annual average DO ranged from 8.5 ppm at MP 10.6 (Eastgate Road) down to 6.7 ppm at MP 0.6 (St. Clair St). Annual average NH_3 showed a steady increase heading downstream from MP 10.6 to MP 0.6. Average phosphorus concentrations were in the range of 0.4 to 0.5 ppm, and did not vary much from station to station.

Year-to-Year Comparisons

Upstream at Eastgate Road, BOD_5 was nearly constant from 1981-84, and showed increases in 1985 and 1986. Downstream at Hawley St, it decreased in 1982 and 1983. At Eastgate, DO decreased each year from 1981-85, and showed a marked improvement in 1986, but at Hawley the pattern was the same.

At Eastgate, NH_3 showed a constant increase from 1981-85 and dropped in 1986. At Hawley, there were small increases in 1982 and 1983 and a large one in 1984. NH_3 decreased in 1985 and 1986 overall. Phosphorus was fairly constant at both stations.

Bacteria counts showed big peaks at Eastgate in 1982 and 1983 and a smaller peak in 1985. At Hawley, there was a large peak in 1985 but counts were relatively constant the other years.

Tenmile Creek/Ottawa River (Figures 9 and 10 on page 51)

Bacteria Counts

Bacteria counts peaked at MP 6.0 (Lagrange St) and MP 4.7 (Stickney Ave). Annual average peaked at MP 6.0 with a count of around 140,000/100 ml. Fecal coliform showed less of a sharp peak.

Pollution Counts

Annual average DO ranged from 8.8 ppm at MP 10.9 (UT Bridge) dropped to 7.2 at MP 6.0, and increased back to 9.2 at MP 1.6 (Summit St). The lowest DO readings were found at MP 6.0. Below MP 3.1 (Suder Ave), DO was over 9.0 ppm. BOD_5 averaged 4-5 ppm above MP 7 (Berdan Ave) where it increased sharply. All averages below MP 7 were over 6.0 ppm.

NH_3 ranged from 0.63 ppm at MP 14.1 (Sylvania Ave) to 2.1 ppm at MP 1.6. Phosphorus remained steady at 0.2 to 0.3 ppm at all stations.

Year-to-Year Comparisons

Upstream at Sylvania Ave, BOD_5 increased in 1982-83, dropped in 1984-85 and rose again in 1986. Downstream at Lagrange Street, there was a big peak in 1982 and steady decreases in 1983-86. At Sylvania, DO showed fluctuations from year to year, but appear to be slowly decreasing over the six-year period. Lagrange showed the same pattern in DO.

NH_3 showed a general increase at Sylvania with a slight decrease in 1986. This pattern was repeated at Lagrange. Phosphorus remained constant at both stations.

Bacteria counts showed increases in 1982 and 1983, improvement the next two years, and a big peak in 1986 at Sylvania. At Lagrange, there was a big peak in 1982, then some improvement, but still had a high count the next year; more decreases in 1984-85, and a peak back to 1983 levels in 1986.

Tributaries (Figures 13 and 14 on page 53)

Bacteria Counts

The annual average fecal coliform counts for all sampling stations exceeded 1000, the average standard for Warmwater Habitat primary contact streams. Otter Creek had an average fecal coliform count of 4000/100ml, Delaware Creek had 3700/100ml, Grassy Creek had 2000/100ml, Hill Ditch had 5010/100ml, Silver Creek had 6531/100ml, Shantee Creek had 4776/100ml, and Heilman Ditch had 26266/100ml.

Pollution Counts

Otter Creek and Grassy Creek both showed high BOD_5 levels and lower DO than the other creeks. Otter Creek had an average BOD_5 of 15.1 ppm and DO averaged about 6.7 ppm. Grassy Creek BOD_5 averaged 6.7 ppm. DO averaged 7.3 ppm. The other creeks had 5.0 to 6.0 ppm BOD_5.

NH_3 was in the 0.7 to 0.8 ppm range for all creeks except Otter Creek and Heilman Ditch which averaged close to 5.0 ppm. All creeks had P concentrations in the 0.2 to 0.3 ppm range except Otter Creek (0.6 ppm) and Heilman Creek (1.1 ppm).

DISCUSSION OF LOWER MAUMEE TSD DATA

Substantially, the Maumee Basin TSD gives the same picture of water quality in area streams as do the TESD data. In general, the three major streams (Maumee River, Ottawa River and Swan Creek) have their best water quality upstream of the RAP area, continually decline until just above the mouth of the stream, and then show some improvement. The point where each of these streams is most severely degraded, according to TSD data, corresponds closely to the "worst point" shown by TESD data. This is not absolutely true for every parameter sampled, but overall, the generalization holds. For additional detail, refer to Appendix G.

TSD Sediment Samples

There are no specific standards for pollutant concentrations in stream sediments. U.S. EPA, Ohio EPA and the Ontario Ministry of Environment (MOE) offer guidelines for metals, nutrients, and PCBs, but none for the volatile organics that were found in the TSD samples of November, 1986.

Table 19 displays the results of Ohio EPA's analyses of the 1986 sediment sampling at eleven locations for seven heavy metals, when applying the U.S. EPA Sediment Quality Guidelines. Only cadmium is classed as "non-polluted" at all locations. None of these metals are considered a pollution factor upstream at the Grand Rapids Dam. As shown, the other three locations on the Maumee River are classed "heavily polluted" for arsenic, with the Cherry Street Bridge location classed as "heavily polluted" for both lead and copper, with the Toledo WWTP location classed as "heavily polluted" for zinc. Chromium, copper, lead, nickel and zinc are classed as "moderately polluted" at the remainder locations.

For Swan Creek at the Collingwood Blvd. location, lead, zinc and arsenic are classed as "heavily polluted", chromium and nickel as "moderately polluted", and copper as "non-polluted".

For the Ottawa River, classified as "heavily polluted" are copper, lead, nickel and zinc for the Lagrange Street location, with the Stickney Avenue location similarly classed for copper and lead. Arsenic is classed as "non-polluted" at both locations with chromium being classed as "non-polluted" for the Stickney Avenue location. The remaining metals for these two locations on the Ottawa River are classed as "moderately polluted".

For Otter Creek, the Wheeling Street location is classed as "heavily polluted" for chromium, lead and arsenic, with the Oakdale Avenue location similarly classed for arsenic, and Millard Avenue for copper. Copper is classed as "non-polluted" for the Oakdale Avenue and Wheeling Street locations, and arsenic being similarily classed at Millard Avenue. The remaining metals for these three locations on Otter Creek are classed as "moderately polluted".

Duck Creek at York Street is classed as "heavily polluted" for arsenic; as "moderately polluted" for zinc, lead and nickel; and as "non-polluted" for the remaining three metals.

TABLE 19

RATING OF HEAVY METALS IN SEDIMENT BY STREAM LOCATION

STREAM	LOCATION	RM	Cd	Cr	Cu	Pb	Ni	Zn	As
(by U.S. EPA Classification)									
Maumee River Subwatershed									
Maumee	Grand Rapids Dam	32.6	NP	NP	NP	NP	NP	NP	--
Maumee	Eagle Point	9.4	NP	MP	MP	MP	MP	MP	HP
Maumee	Cherry Street	4.9	NP	MP	HP	HP	MP	MP	HP
Maumee	Toledo WWTP	1.0	NP	MP	MP	MP	MP	HP	HP
Otter Creek	Oakdale Avenue	5.9	NP	MP	NP	MP	MP	MP	HP
Otter Creek	Wheeling Street	4.0	NP	HP	MP	HP	MP	MP	HP
Otter Creek	Millard Avenue	2.1	NP	MP	HP	MP	MP	MP	MP
Duck Creek	York Street	2.1	NP	NP	NP	MP	NP	MP	HP
Swan Creek Subwatershed									
Swan Creek	Collingwood Blvd.	1.2	NP	MP	NP	HP	MP	HP	HP
Ottawa River Subwatershed									
Ottawa River	Lagrange Street	6.4	NP	MP	HP	HP	HP	HP	MP
Ottawa River	Stickney Avenue	4.9	NP	NP	HP	HP	MP	MP	MP

Key
HP = Heavily Polluted
MP = Moderately Polluted
NP = Non-polluted

Source: Table 6, Lower Maumee River TSD, Ohio EPA

TSD Fish Indices

As a part of the Technical Support Document conducted by Ohio EPA in the summer of 1986, fish species documented in the Maumee River study area reported in Trautman were compared with fish species from Ohio EPA electrofishing collections (Trautman, M.B., 1981). Trautman reported 87 different species in 1981, with Ohio EPA reporting 50, finding four new species, with 41 missing species. The four new species were: smallmouth buffalo, ghost shiner, mosquitofish, and white perch.

The Ohio EPA investigative team reported 39 species for Swan Creek compared to Trautman's 75, with three new species, totaling 36 missing species. For the Ottawa River, Trautman had reported 79 species in 1981, with the investigative team reporting 44 species, five new species, totaling 38 missing species. For Duck and Otter creeks, Trautman reported 62 species, with the investigative team reporting 25, one new species, totaling 38 missing species.

This investigative team reported the percentage of fish with external anomalies for Swan Creek. The investigation began at Eastgate Road (RM 10.2) where faunal conditions were the best, going downstream to St. Clair Street (RM 0.5). Eastgate Road is upstream from all listed permitted dischargers with results being 9.3% light blackspot, 0.6% light anchor worm, and 0.9% lesions. The Detroit Avenue station (RM 4.9), the point of the upstream lake effect on Swan Creek, results were: 3.1% light blackspot, 1.5% heavy blackspot, and 3.1% deformities. Above the Roller Dam (RM 4.4) results were: 7% light blackspot, 0.6% deformities, 1.4% eroded fins, and 0.8% lesions. At Champion Street (RM 3.9), where the combined sewers begin, results were: 0.7% light blackspot, 0.7% heavy blackspot, 1.7% light anchor worm, 0.7% deformities, 1.7% eroded fins, 2.9% lesions, and 0.7% other. At Hawley Street (RM 2.6), still in the combined sewer area, the results were: 1.5% light anchor worm, 1.5% eroded fins and 1.5% lesions. At Collingwood Blvd. (RM 1.2), the results were: 6.2% lesions and 1.8% external parasites. At St. Clair Street (RM 0.5), near the mouth where the Maumee River dilutes Swan Creek, the results were: 0.4% light anchor worm, 1.2% lesions, and 0.8% other. The investigative team reported that fish community conditions were poor in all of the areas of Swan Creek with RM 2.6 and 1.2 being very poor.

The mean fish community indices, based on electrofishing samples for both Duck Creek and Otter Creek as conducted by the investigative team, indicated Class V or very poor except for the near the mouth of Duck Creek which was poor, or Class IV.

The investigative team reported that the Maumee River upstream at RM 45.7 (downstream of Napoleon WWTP and Campbell Soup Co.) where fish community values were high (IWB=9.0, IWB2=8.7), the community composition and quality were not that exceptional. At RM 38.5 and RM 33.0 upstream of the Grand Rapids dam (RM 32.2), community values displayed a significant drop (IWB=6.9 and 6.7, IWB2=6.5 and 6.5 respectively).

The next four sites were located amongst the rapids, RMs 31.5, 26.7, 19.8 and 17.2; the community values were amongst the highest (IWB=9.2, 8.8, 9.0 and 8.6, IWB2=9.0, 8.6, 8.5 and 8.1 respectively). At RM 13.7 below the Perrysburg WWTP (RM 14.5) and at the point of the beginning of the lake effect, the community values dropped nearly a full point (IWB=7.5, IWB2=7.1). It is reported that the community values remained near this level at RMs 9.4, 7.4, 7.3 and 4.7. However, species composition did change at RM 4.7 downstream of Swan Creek. The IWB ranged from 7.8 to 7.1 while IWB2 ranged from 7.5 to 6.4.

The next five downstream stations (RMs 3.6, 3.3, 1.5 and 0.6), an area where strong seiche activities move pollution plumes both up and downstream, the IWB ranged from 7.2 and 6.4 and IWB2's ranged from 6.5 and 5.5, approximately a full point below those sites just upstream. The 1986 Ohio EPA report attributed these low community values to the upstream movement of the Toledo WWTP plume and the numerous combined sewer overflow discharges.

The report states that the Toledo WWTP also affects the Maumee Bay wherein the Maumee Bay area (0.1 Toledo Edison intake channel and 0.0 southeast of Grassy Island disposal area) displayed the lowest community values, while site 0.4 in the bay farthest from the WWTP, showed the best community values in the bay area.

Fish Tissue Sampling

Biological monitoring is a valuable tool for determining water quality because it provides a direct measure of the effects of pollutants on aquatic life. Fish tissue sampling answers the question of what pollutants, and how much, are being taken into the food chain. Fish which contain unacceptable levels of PCBs, heavy metals, or other toxics, cannot be used for human consumption. Even if people do not eat the contaminated fish, however, the toxics will stay in the food chain, and, ultimately, may find their way to the humans. Table 20 gives details of fish tissue sampling done in the Lower Maumee River from 1976 to date (Ohio EPA, 1989b).

TABLE 20

PCB CONTENT OF FISH TISSUE, LOWER MAUMEE RIVER

YEAR	SAMPLE NUMBER	SPECIES	SAMPLE TYPE	RIVER MILE	LOCATION	TOTAL PCBs (ppm)
Maumee River Subwatershed						
1985		Rock bass	W.B.C.	20.6	Waterville	0.5
1985		Carp	W.B.C.	20.6	Waterville	1.0
1985		Carp	W.B.C.	20.6	Waterville	0.2
1978		Carp	W.B.C.	20.6	Waterville	0.3
1986		Green sunfish	W.B.C.	4.6	Maumee	3.9
1986		Yellow perch	W.B.C.	0.7	Cullen Park	4.0
1986		Carp	W.B.C.	0.7	Cullen Park	6.8
1985		Carp	W.B.C.	0.7	Cullen Park	3.0
1985		Bluegill	W.B.C.	0.7	Cullen Park	1.0
1978		Carp	W.B.C.	0.7	Cullen Park	4.8
1986		White perch	W.B.C.	0.0	Maumee Mouth	7.0
1986		Channel catfish	F.	0.0	Maumee Mouth	3.8
1986		Carp	W.B.C.	0.0	Maumee Mouth	5.5
1982		Carp	W.B.C.	0.0	Maumee Mouth	11.5
1979(b)		Spottail shiner	W.B.C.	0.0	Maumee Mouth	3.3
1979(b)		Spottail shiner	W.B.C.	0.0	Maumee Mouth	2.9
1979(b)		Northern pike	W.B.	0.0	Maumee Mouth	4.9
1979(b)		Northern pike	W.B.	0.0	Maumee Mouth	4.9
1979		Carp	W.B.C.	0.0	Maumee Mouth	5.9
1979		Yellow perch	W.B.C.	0.0	Maumee Mouth	2.1
1976		Carp/Catfish	W.B.C.	0.0	Maumee Mouth	5.4
Swan Creek Subwatershed						
1986		Carp	W.B.C.	0.5	Swan Creek	5.9
Ottawa River Subwatershed						
1986		Largemouth Bass	W.B.C.	1.6	Ottawa River	12.0
1986		Carp	W.B.C.	1.6	Ottawa River	25.4
1986		Carp	W.B.C.	4.9	Stickney Ave	15.1
Tenmile Creek						
1986		Carp	W.B.C.	4.1	Tenmile Creek	6.8

a. Data rounded to the nearest tenth; W.B.C. = whole body composite sample; F = fillet sample.

b. Sample analyzed twice.

US ARMY CORPS OF ENGINEERS SEDIMENT DATA

U.S. EPA has established guidelines for sediment quality for COD, Volatile Solids, TKN, NH_3, Oil & Grease, Pb, Zn, P, Fe, As, Cd, Cr, Cu, CN, Ni, Mn, Ba, Hg, and PCBs in sediments. Ohio EPA has a set of guidelines for seven metals.

The U.S. EPA guidelines for sediment quality parameters (U.S. EPA, 1977) not covered by Ohio EPA guidelines are presented in Table 21.

TABLE 21

US EPA GUIDELINES FOR
SEDIMENT QUALITY FOR GREAT LAKES HARBORS

	US EPA CLASSIFICATION		
Pollutant	Non-Polluted	Moderately Polluted	Heavily Polluted
Volatile Solids (%)	< 5	5 - 8	> 8
COD	< 40,000	40,000 - 80,000	> 80,000
TKN	< 1000	1000 - 2000	> 2000
Oil & Grease (Hexane Solubles)	< 1000	1000 - 2000	> 2000
Pb	< 40	40 - 60	> 60
Zn	< 90	90 - 200	> 200
NH_3	< 75	75 - 200	> 200
CN	< 0.1	0.1 - 0.25	> 0.25
P	< 420	420 - 650	> 650
Fe	< 17,000	17,000 - 25,000	> 25,000
Ni	< 20	20 - 50	> 50
Mn	< 300	300 - 500	> 500
As	< 3	3 - 8	> 8
Cd	---------Lower limits not established----		
Cr	< 25	25 - 75	> 75
Ba	< 20	20 - 60	> 60
Cu	< 25	25 - 50	> 50
Hg	---	---	1
Total PCB	---	---	10

All units are mg/kg dry weight unless otherwise indicated.

US Army Corps of Engineers shipping channel sediment data collected in 1983 and 1988 (see Table 15) show a serious heavy metal contamination problem. The metals of particular concern are CN, Cd, Cr, Pb, Cu, Mn and Ni. In nearly all cases, the concentrations of these parameters are highest at and slightly above the mouth of the Maumee, between R-2 and L-1.

Table 22 displays the concentration levels of metals as found in the 1983 and 1988 shipping channel sediments when applying the Ohio EPA sediment guidelines and the concentration levels of the remainder parameters for these same sediments when applying the U.S. EPA sediment guidelines.

TABLE 22

CONCENTRATION LEVELS OF METALS AND CHEMICALS
IN 1983 SHIPPING CHANNEL SEDIMENTS

Metal or Chemical	Concentration Level
Arsenic (As)	Non-elevated to Elevated
Cadmium (Cd)	Elevated to Extreme Elevated
Chromium (Cr)	Highly to Extreme Elevated
Copper (Cu)	Highly to Extreme Elevated
Iron (Fe)	Non-elevated to Slightly Elevated
Lead (Pb)	Non-elevated to Elevated
Zinc (Zn)	Slightly Elevated to Highly Elevated
Cyanide (CN)	Heavily Polluted
Chemical Oxygen Demand (COD)	Moderately Polluted to Heavily Polluted
Mercury (Hg)	Non-Polluted
Manganese (Mn)	Non-Polluted to Heavily Polluted
Nickel (Ni)	Moderately Polluted to Heavily Polluted
Ammonia (NH_3)	Non-Polluted to Heavily Polluted
Phosphorus (P)	Heavily Polluted
Total Kjeldahl Nitrogen (TKN)	Non-Polluted to Heavily Polluted
Volatile Solids (VS)	Non-Polluted to Moderately Polluted

OVERVIEW OF TOXIC POLLUTANTS

This section is concerned with those chemicals which are known to biomagnify, bioaccumulate, or are suspected of causing cancer as well as those which are acutely toxic to aquatic organisms. Categories of toxic pollutants of concern, in the AOC, include polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), phthalates, and metals. Other categories of toxics which have not been studied in the Toledo area include the dioxins and furans. Studies of Toledo Harbor sediments to date have not shown sediment bound pesticides at levels high enough to arouse concern.

The Great Lakes International Surveillance Plan (GLISP), states that, "The chemical contaminants issue, especially persistent toxic substances, is the major focus of the 1978 Great Lakes Water Quality Agreement and the monitoring and surveillance plans. The effects of toxic substances on the health of the Great Lakes ecosystem, including man, are not well understood. However, some obvious problems including closed fisheries, fish morphological abnormalities, fish kills, and impairment of reproduction and deformities in aquatic birds have been well documented. Present levels of certain substances are adversely affecting growth and reproduction in some Great Lakes biota, and contaminant levels in many top predator fish still exceed the guidelines for human consumption set by public health agencies in Canada and the United States" (Lake Erie Task Force, 1986). To understand where and how these substances interact, both biotic and abiotic components of the system must be scrutinized. It is important to know the quantities and distribution of chemical contaminants and to identify the sources and fates of contaminants.

The GLISP goes on to say that "The Lake Erie Basin is the most seriously impacted of all the Great Lakes, having a total of eight Areas of Concern (including both Connecting Channels)." There is a lack of thorough quantitative pollution data bases for any of these areas (except Raisin River). "It has been documented that the most conspicuous problem found in the Areas of Concern centers around sediment contamination" (IJC, 1986b). The current knowledge and understanding of geochemical and biological processes, and their contaminated sediment problems, are limited.

Further, the 1986 Plan states that, "The Maumee River contributes over 50% of the total non-point tributary loading to Lake Erie (excluding the Detroit River). It is the most important source of agricultural nutrients and suspended sediment to the lake and particularly to the Western Basin. Records of metal and organic contaminants, as well as nutrients preserved in the sediments, measure the change in status of the lake since before the beginning of man's influence. However, due to the widespread occurrence and activity of benthic organisms in recent lake sediments and generally low sedimentation rates, annual contributions of material are mixed with older sediments so that on the average two decades of input are smeared together (Robbins, 1983). As a result of this mixing, changes in the state of the Great Lakes can be detected in the sedimentary records only on multi-decade time scales. However, in certain areas of Lake Erie sedimentation rates are so high that the time resolution may be as low as 3 to 5 years. This means that the changes in the status of Lake Erie may be more closely monitored using these areas having high sedimentation rates" (IJC, 1986b).

Nriagu and Simmons in their 1984 study found that the Total Suspended Matter (TSM) in Lake Erie (4-8 mg/l) is greater than any of the other Great Lakes. In the upper lakes 90% of the PAHs are in the dissolved phase, but in nearshore areas of Western Lake Erie a substantial fraction of the PAHs are associated with particles. Resuspension of sediments from the western basin of Lake Erie is extensive but release rates of sediment contaminants are unknown (Eadie, 1984).

Lake Erie inputs are less than the other Great Lakes except Ontario. The atmosphere is the largest source of PAH to the Great Lakes. Atmospheric inputs of benzo(a)pyrene (BaP) to Toledo area waters had been declining steadily until 1979, the last year for which there was available data (Lake Erie Task Force, 1986).

Table 23 displays Nriagu and Simmons' findings for 1982 PAH levels in Lake Erie.

TABLE 23

1982 PAH LEVELS IN LAKE ERIE

Polynuclear Aromatic Hydrocarbon	Sediment ng/g(ppb)	Atmospheric input (metric tons per year)
phenanthrene	345±92	1.5
anthracene	?	1.5
fluoranthene	569±442	?
pyrene	391±91	2.6
benzo(a)pyrene	255±52	2.5
Benzo(a)anthracene	?	1.5
Perylene	?	1.5

Source: Eadie, 1984, p 200-201

The Lake Erie Task Force (1986) found that in Lake Erie, the Western Basin sediments had the highest concentration of PCBs (660 ng/g [ppb]). This amount is twice the level of PCBs in sediments of the Central and Eastern basins of Lake Erie (Frank, et al, 1977). Nriagu and Simmons found that PCB concentrations are highest in areas of recent sedimentation and lowest in areas of scour where faster water currents prevent sediment accumulation. For Lake Erie waters, an average PCB concentration of 27 ng/l has been reported. From 1968 - 1976, the average PCB concentration in Lake Erie fish was 0.88 ug/g (ppm) with a range from 0.1 to 9.3 ug/g (Lake Erie Task Force (1986).

The 1986 Surveillance Plan states that, "Heavy metal contamination problems associated with Lake Erie have been recognized for many years. For example, mercury concentration of Lakes Erie and St. Clair from 1950 - 1970 led to a ban of commercial fishing in both systems during the early 1970's. The Lake Erie Task Force (1979), estimated loading of Cu, Pb and Zn into Lake Erie from various sources and found over 1 x 10^6 kg/yr of Cu and Pb and over 3 x 10^6 kg/yr of Zn to be retained in the lake annually. A significant portion of the load was attributed to sources originating from the Detroit River Connecting Channel System. In addition, metal contamination problems have been identified at numerous smaller tributaries entering Lake Erie's southern shore. Metal and organic contamination has led to the classification of six tributaries as Areas of Concern. As a result, the dispersion of metals into the open lake remains a concern and needs to be addressed" (IJC, 1986b).

Lead concentrations in Lake Erie sediments tend to be highest in depositional zones and least in shallow nearshore zones. One exception is the "plume" of high sediment lead concentration emanating from Toledo. Levels of lead in Lake Erie waters range from 0.46 to 3.5 ug/l. Concentrations in sediments average 154±43 mg/kg (Lake Erie Task Force, 1986).

Carbon uptake in plants is a measure of growth or photosynthesis. Munawar and Thomas (1986), found that standard elutriates of Toledo Harbor sediments caused significant inhibition of C^{14} uptake by ultraplankton (5-20 um) in algal fractionation bioassays (AFB). Such phytoplankton are abundant, have very short generation times, and are fragile and sensitive to environmental perturbations. They also are primary producers--the food source upon which the rest of the aquatic food web is ultimately dependent.

All Toledo standard elutriates caused significant inhibition of the ultra-plankton C^{14} uptake compared to the control (a reduction of 29% to 35% at a 20% elutriate concentration. (A standard elutriate was prepared by mixing one part sediment (v) with 4 parts (v) of filtered (0.45 um) lake water. This was then agitated 30 minutes by air, settled for one hour, and filtered (0.45 um). The liquid filtrate was then used in the AFB tests (Munawar and Thomas, 1986).

Mac and Willford (1986), found that Toledo Harbor sediments contained 0.210 ug/g (ppm) PCBs, most of which resembled Aroclor 1248. In a bioassay, there was no death of fathead minnows exposed to Toledo Harbor sediments and in a similar test of earthworms 36% died, although these were all in one tank in which an increase in temperature and a decrease in oxygen concentration occurred.

Preliminary review of PCBs in fathead minnows exposed to the Toledo Harbor sediments suggested a slight increase in residues during the exposure. However, the apparent increase was not statistically significant. Interpretation of the results was confounded by the finding of relatively high background levels of PCBs (pre-exposure = 4.46 ug/g) in the fathead minnows used for testing. The presence of elevated background concentrations of PCBs in the fish most likely interfered with accumulation of PCBs as compared to that noted in earthworms (Mac and Willford, 1986).

"Residues of mercury in fathead minnows showed no significant change after exposure to Toledo Harbor sediments. These results thus confirmed those results obtained with earthworms indicating no significant accumulation of mercury from Toledo Harbor sediments" (Mac and Willford, 1986).

"The bioaccumulation test is but one of several procedures available for evaluating sediments and, in dredging operations, for helping in evaluation of disposal options. The test appears to be most valuable in determining the bioavailability of contaminants present in sediments that are not considered highly contaminated or acutely toxic to aquatic organisms. When a particular sediment greatly exceeds bulk criteria for accumulable contaminants or is acutely toxic to organisms, there is little need or value in performing a bioaccumulation test" (Mac and Willford, 1986).

"Toledo Harbor sediments represent the type of materials for which bioaccumulation tests appear useful. Although the sediments contained relatively low levels of PCBs (0.21 ug/g), the earthworms accumulated 2.56 ug/g during a 10-day exposure. Even though we were unable to confirm significant accumulation of PCBs in the fathead minnows, we nevertheless believe that the test was successful in demonstrating the potential for bioaccumulation of PCBs by earthworms. The information thus should be helpful for use in selecting appropriate disposal options for dredged sediments that will protect against significant accumulation of contaminants in the tissues of organisms (Mac and Willford, 1986)."

McFarland and Peddicord (1986) studied the potential for bioaccumulation from Toledo Harbor sediments. The four organisms tested were fathead minnows, golden shiner, Japanese Medaka, and Asiatic clams. When challenged with Toledo Harbor sediments, no priority pollutants other than phthalates were detected in tissues of these organisms, and these may have been from laboratory contamination. Also, fewer than 6% mortalities occurred during bioassays on the four test species.

McFarland and Peddicord (1986) concluded that polynuclear aromatic hydrocarbons (PAH) were the compounds most likely to be bioaccumulated from Toledo Harbor sediments. Based on fluoranthene (a PAH) concentration in sediments (1.5 ppm) they calculated a thermodynamically-defined bioaccumulation potential for fluoranthene of 80.6 ppm in animal lipids. This translated to the following body burden for test animals:

Corbicula (2.4% lipid)	Medaka (9.8% lipid)	Fathead (.5% lipid)	Shiner (1.5% lipid)
1.94 ppm	7.90 ppm	4.03 ppm	1.21 ppm

No PAH were found in actual tissue. This can be explained by the fact that, unlike chlorinated hydrocarbons with similar octanol/water partition coefficients, PAHs are quickly broken down by the organisms mixed function oxidase system. Tissue residues of PAH are inversely correlated with the mixed function oxidase activity of an organism (McFarland and Peddicord, 1986)."

Chapman, et al, 1986, conducted bioassays with Toledo Harbor sediment on several organisms. "Prater-Anderson test series indicated little or no acute mortality of either Daphnia or Hexagenia exposed to the Toledo sediment system; although Hexagenia suffered 20% mortality in Toledo sediments, control mortality was 13% indicating a possible problem with organism vitality" (Chapman, et al, 1986).

In beaker tests, Daphnia mortality was 14 and 0% in freshly-prepared test systems with sediments from Toledo and Porter Lake control, respectively. However, after sitting for one week, the systems produced essentially no Daphnia mortality during the second bioassay. "One can speculate that aged samples and elutriates tend to be closer to equilibrium than unequilibrated unmixed sediment-water systems. This could be the common thread linking the results of these toxicity tests; equilibrated systems lacked the toxicity of newly-interfaced sediment and water. Would this phenomenon have occurred if we had used Toronto or Toledo Harbor water? Would these harbor waters have been toxic in their own chemistry" (Chapman, et al, 1986)? Table 24 displays the levels of organic priority pollutants found in the analyses of Toledo Harbor sediments by McFarland and Peddicord and Chapman, et al.

TABLE 24

ORGANIC PRIORITY POLLUTANTS IN TOLEDO HARBOR SEDIMENTS

	McFarland and Peddicord, 1986	Chapman, et al, 1986
	(in parts per million)	
Methylene chloride	0.036	
Dichlorobiphenyls (PCB)	0.120	
Trichlorobiphenyls (PCB)	0.220	
Tetrachlorobiphenyls (PCB)	0.680	
Pentachlorobiphenyls (PCB)	0.100	
Hexachlorobiphenyls (PCB)	0.180	
Total PCB	1.300	
BIS (2 ethylhexyl) phthalate	8.800	8.500-10.600
Acenaphthene (PAH)		0.100
Acenaphthylene (PAH)		0.062-0.065
Fluorene (PAH)		0.089.0.160
Naphthalene (PAH)		0.140-0.610
Anthracene (PAH)	0.98	0.077
Fluoranthene (PAH)	1.500	0.210-0.600
Phenanthrene (PAH)	0.980	0.480-0.610
Benzo(a)anthracene		0.670-0.730
Benzo(k)fluoranthene (PAH)		1.100-5.909
Chrysene (PAH)		1.000-5.909
Pyrene (PAH)	2.000	0.580-0.870
Benzo(ghi)perylene (PAH)		0.600
Benzo(a)pyrene (PAH)		0.600-0.770

To determine whether the concentration levels for PAHs in the Toledo Harbor sediments should be of concern, the 1983 Corps of Engineer's data results were sent to Dr. Paul Baumann, U.S. Fish & Wildlife Service. These data included the Corps station number by lake and river mile along with the concentrations for the following chemicals: Phenanthrene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(k)fluoranthene and Benzo(a)pyrene. Baumann stated in written communication that "PAH concentrations at these sites are at the lower end of the range of values for sites with cancer epizootics. However, I would consider these concentrations to pose a possible problem and to be of concern (Baumann, 1988).

Further, Baumann stated, "Since PAHs are not very soluble in water and stay in sediment close to the point source (concentrations after decline as a log function from the point source), and especially since RM 1 values are often higher than RM 2 or RM 3 values but lower than RM 4 values, it appears as if you have at least two separate point sources, one near RM 1 and one near RM 4. With additional sampling and some checking of what industries have outfalls in these areas (any coke plants associated with steel companies?), you should be able to track down the sources" (Baumann, 1988).

Table 25 lists only those chemicals that were detected in Toledo Harbor sediments by the Corps of Engineers. It also gives the river or lake monitoring station at which the chemical was detected and the concentration found.

TABLE 25

TOLEDO HARBOR CHEMICAL SEDIMENT ANALYSES
US ARMY CORPS OF ENGINEERS DATA
(mg/kg dry wt. basis)

	L-16		L-15		L-14		L-13		L-12	
Parameter	1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
Acenaphthene	--	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--	--
Benzo (a) Anthracene	--	--	--	--	--	--	--	--	--	--
Benzo(a) Pyrene	--	--	--	--	--	--	--	--	--	--
Bis(2-ethyhexyl) Phthalate	--	--	--	0.93	--	--	--	0.60	--	--
Chrysene	--	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	0.16	--	--	--	--
Pyrene	--	--	--	0.24	--	--	--	--	--	--
Di-n-octyl Phthalate	--	--	--	--	--	--	--	--	--	--

TABLE 25 (Continued)

TOLEDO HARBOR CHEMICAL SEDIMENT ANALYSES
US ARMY CORPS OF ENGINEERS DATA

Parameter	L-11		L-10		L-9		L-8		L-7	
	1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
Acenaphthene	--	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--	--
Benzo (a) Anthracene	--	--	--	--	--	--	--	--	--	--
Benzo(a) Pyrene	--	--	--	--	--	--	--	--	--	--
Bis(2-ethyhexyl) Phthalate	--	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	0.14	--	0.12	--	--	--	0.22	--	0.15
Pyrene	--	0.42	--	-.28	--	0.41	--	0.52	--	0.53
Di-n-octyl Phthalate	--	--	--	--	--	--	--	--	--	--

TABLE 25 (Continued)

TOLEDO HARBOR CHEMICAL SEDIMENT ANALYSES
US ARMY CORPS OF ENGINEERS DATA

	L-6		L-5		L-4		L-3		L-2	
Parameter	1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
Acenaphthene	--	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	--	--	--	--	--
Benzo (a) Anthracene	--	--	--	--	--	--	--	--	--	--
Benzo(a) Pyrene	--	--	--	--	--	--	--	--	--	--
Bis(2-ethyhexyl) Phthalate	--	1.09	--	1.20	--	0.78	0.24	2.09	0.23	--
Chrysene	--	--	--	--	--	--	--	0.38	--	--
Fluoranthene	--	--	--	--	--	--	--	0.40	00	0.46
Naphthalene	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	0.13	--	0.25	--	0.19	--	0.38	--	0.53
Pyrene	--	0.31	--	0.48	--	0.38	--	1.06	--	0.85
Di-n-octyl Phthalate	--	--	--	--	--	--	--	--	--	--

TABLE 25 (Continued)

TOLEDO HARBOR CHEMICAL SEDIMENT ANALYSES
US ARMY CORPS OF ENGINEERS DATA

	L-1		R-0		R-1		R-2		R-3	
Parameter	1983	1988	1983	1988	1983	1988	1983	1988	1983	1988
Acenaphthene	--	--	--	--	--	--	--	0.39	--	--
Anthracene	--	--	--	0.12	--	--	--	0.47	--	--
Benzo (a) Anthracene	--	--	--	--	--	--	--	1.21	--	--
Benzo(a) Pyrene	--	--	--	--	0.74	--	--	0.65	--	--
Bis(2-ethyhexyl) Phthalate	0.41	1.76	1.69	3.05	0.22	17.8	1.20	3.82	0.49	2.34
Chrysene	--	1.05	--	--	--	1.67	--	1.45	--	--
Fluoranthene	--	0.41	--	--	2.70	--	0.25	0.71	--	--
Naphthalene	--	--	--	0.65	--	0.57	--	0.61	--	--
Phenanthrene	--	0.67	--	0.77	0.15	1.57	0.17	2.99	0.10	0.81
Pyrene	--	0.98	--	1.20	1.24	2.44	--	2.24	--	1.50
Di-n-octyl Phthalate	--	--	--	--	--	1.79	--	--	--	--

TABLE 25 (Continued)

TOLEDO HARBOR CHEMICAL SEDIMENT ANALYSES
US ARMY CORPS OF ENGINEERS DATA

	R-4		R-5		R-6		R-7	
Parameter	1983	1988	1983	1988	1983	1988	1983	1988
Acenaphthene	--	--	--	--	--	--	--	--
Anthracene	0.10	--	--	--	--	--	--	--
Benzo (a) Anthracene	1.01	--	--	--	--	--	--	--
Benzo(a) Pyrene	0.62	--	--	--	--	--	--	--
Bis(2-ethyhexyl) Phthalate	1.50	--	0.94	1.88	0.48	--	--	0.83
Chrysene	1.43	--	--	1.27	--	--	--	--
Fluoranthene	3.03	--	0.79	1.96	0.26	0.75	--	0.33
Naphthalene	--	--	--	--	--	--	--	--
Phenanthrene	1.45	0.85	0.35	1.53	--	0.44	--	0.26
Pyrene	2.24	1.98	0.62	2.40	0.20	0.78	--	0.36
Di-n-octyl Phthalate	--	--	--	--	--	--	--	--

Table 26 displays a comparison of the analytic results of these four studies of the Toledo Harbor sediments with the Great Lakes International Surveillance Plan, 1986, analysis of heavy metals on Western Basin sediments. Cyanide and PCB levels, where available, are also included in the table.

TABLE 26

COMPARISON OF TOLEDO HARBOR AND WESTERN BASIN SEDIMENTS

	Western Basin Background Levels GLWQB Nriagu, et al, 1979	Toledo Harbor Munawar & Thomas 1986	Toledo Harbor Chapman, et al 1986	Toledo Harbor McFarland & Peddicord 1986	Toledo Harbor Mac & Willford 1986
			(In Parts Per Million)		
Hg	0.1	0.130-0.625	-	0.63	0.314
Pb	28.0	49.0-88.0	62.0	65.0	-
Zn	70.0	166.0-285.0	23.0	220.0	-
Cu	30.0	34.0-55.0	47.0	50.0	-
Cd	2.0	-	4.0	2.8	-
Mn	600.0	-	-	-	-
As	N/A	11.0-17.0	-	-	-
Cr	N/A	117.0-177.0	100.0	57.0	-
Ni	N/A	30.0-36.0	83.0	48.0	-
Cyanide	N/A	-	-	2.7	-
PCB	N/A	0.279-0.678	-	-	0.210

One of the problems with the existing sediment data in Toledo Harbor is that most of it comes from areas of the harbor that are periodically dredged by the Corps of Engineers. The need exists to sample the harbor and tributaries in a uniform manner covering areas previously unsampled for priority pollutants. Sampling should be thorough enough to allow plotting isopleths. Tributaries to Toledo Harbor which are likely sources of priority pollutants such as the Maumee River, Ottawa River, and Otter Creek should also be sampled.

Unfortunately, nationwide sediment quality criteria currently do not exist. It is our understanding that USEPA at the national level is developing national sediment quality criteria, but a final document is 1-3 years away. However, some preliminary attempts at criteria development have been completed. The EPA has developed guidelines for the pollution classification of Great Lakes harbor sediments for evaluation of dredged material disposal. As part of EPA's evaluation process for the development of sediment criteria, a paper entitled "A Discussion of PCB Target Levels in Aquatic Sediments" has been prepared by Mr. Jay Field of the Ocean Assessments Division, National Oceanic and Atmospheric Administration. The conclusion in this paper is that although toxic effects may occur at lower levels, a sediment concentration of 0.1 ppm PCBs appears to be a reasonable preliminary target level for use in assessing environmental hazards from PCB contamination and the need for remedial action. This compares to an average value of 0.21 to 1.3 ppm for the area of Maumee Bay dredged for navigation. Although national sediment quality criteria have not been completed, it appears that the sediments of the AOC are of concern and may be above future criteria levels.

Summary of Toxic Pollutants

1. Toxic substances have caused injuries to Lake Erie. There is at the present time a health advisory against eating carp or channel catfish from Lake Erie due to high PCB levels (over 2 ppm) in their flesh.

2. Sediment contamination is the most conspicuous problem in all the AOCs. There is a lack of thorough quantitative pollution data for the Toledo AOC.

3. A larger portion of Lake Erie PAHs are associated with particles than any of the other Great Lakes. Sediments in the Western Basin of Lake Erie have twice the PCB levels of the Central Basin and Eastern Basin. Contaminant release rates from resuspended sediments are unknown.

4. Some of Lake Erie's metal pollution originates on Lake Erie's southern shore. A "plume" of high sediment lead levels emanates from Toledo.

5. Chapman (1986) speculated that equilibrated sediment/water systems are less toxic than newly interfaced sediment and water. This has direct bearing on the effects of dredging and other disturbances of bottom sediments. Further study could be required.

6. Laboratory studies by Munawar and Thomas (1986) indicate that Toledo sediment elutriate caused up to 35% reduction in algae growth when diluted to 20% of its original strength.

7. Mac and Willford (1986) demonstrated that earthworms accumulated PCBs from Toledo Harbor sediments. The AOCs contribution to Lake Erie's PCB pollution problem requires further study and quantification.

8. Most of the data here reviewed comes from the navigation channel and may not adequately reflect pollutants in other parts of the AOC.

RAP AREA WATER QUALITY: OVERVIEW & CONCLUSIONS

The Lower Maumee River TSD (Ohio EPA, 1989b) provides a clear summary of how good or bad the water quality is at many points along each major stream. Each segment is rated for its water quality, and the sampling points range from "very poor" to "excellent."

The TSD gives a clear picture of water quality along Swan Creek, the Ottawa River and the Maumee River. In all three cases, water is cleanest far upstream. The Maumee River upstream water quality (the Napoleon area around river mile 50) was excellent, Tenmile Creek upstream water quality was fair to marginally good and Swan Creek was rated as fair. The streams get progressively worse as they approach and enter Toledo. All three show some recovery near their mouths, which may be due to the occasional inflow of relatively high quality water from Lake Erie.

The data provided by other sampling programs support the Technical Support Document's conclusions. The TESD data provide substantially the same picture of water quality, and the US Army Corps of Engineers' sediment data point to the same problem areas along the major streams.

One of the things the TSD data misses is the seasonally high concentration of NO_3 in the Maumee River which occurs in the spring and fall. However, the TSD was not designed to measure seasonality. NO_3 in the Maumee River at these times of year often makes the water unacceptable as a public water supply source.

The USGS/Heidelberg University data collected at the Waterville station on the Maumee River provide a record of water quality as it enters the RAP Area. They include a substantial body of information on water quality parameters associated with agricultural runoff which are not monitored anywhere else in the RAP Area.

The majority of other studies are focused on documenting specific known water quality problems. The Facilities Plans, for example, provide information on CSO problems, malfunctioning package plants, and failed septic systems. They are especially useful in determining severe effects of untreated sewage on small streams. In terms of the greater Lake Erie Basin, these problems are not significant but do pose a serious health threat, and are disastrous to the water quality of local streams.

In addition, the Invertebrate Community Indices, fish tissue data, and sediment analyses show violations of the "swimmable-fishable" goals of the Clean Water Act for the tributaries to the Maumee Bay. Further, due to toxic pollutants, there is the inability to meet the specific objectives of the Great Lakes Water Quality Agreement for these lower stream reaches.

Aquatic life use attainment for the Maumee River becomes non-attainment at RM 9.4 and persists all the way into Maumee Bay. The fish species investigation in 1986 for both the Maumee River and Swan Creek show a 50% decline since 1981. The fish community composite and quality values drop 2 points on the Maumee River from upstream at the Grand Rapids dam to the Swan Creek confluence. From there these values drop another point to the mouth.

PAHs and phthalates have been found at detectable levels in the Maumee River shipping channel sediments, wherein the PAH concentrations could pose a possible problem and must be of concern. Studies of the Toledo Harbor sediments have not shown sediment-bound pesticides at levels high enough to arouse concern. Dioxins and furans have not been studied.

Impacting water quality on the Ottawa River are the dumps which leak conventional and organic priority pollutants. The degradation of Otter Creek is directly related to arsenic leaking from settling ponds, with oil soaked banks, and nickel and cyanide being detected in its waters.

In terms of the greater Lake Erie Basin, phosphorus is considered the critical nutrient contributing to eutrophication. Ohio EPA's Phosphorus Reduction Strategy for the Lake Erie Basin states that a total loading reduction of 1,365 tons P/year needs to be achieved (Ohio EPA, 1985). The Maumee basin is one of the major sources of phosphorus loading in the Lake Erie Basin. Total phosphorus loadings to the Lake Erie Basin from various sources in the RAP Area are estimated and displayed in Table 27.

TABLE 27

TOTAL PHOSPHORUS LOADINGS FROM RAP AREA SOURCES

PHOSPHORUS SOURCE	ESTIMATED LOADING (Tons P/year)
Agricultural Runoff	1197
POTWs	189
Urban Runoff	21
Package Plants	9
CSOs	Insufficient data
Industrial Wastewater	Refer to Appendix I
Home Sewage Disposal	Insufficient data
Landfills & Dumpsites	Insufficient data
Atmospheric Deposition	Insufficient data
TOTAL:	1416

WATER POLLUTION SOURCES

INDUSTRIAL WASTEWATER DISCHARGES

Industrial wastewater dischargers cover a broad range of types of facilities. Examples include treated chemical discharges from plating operations, cooling water from power generating stations, quarry dewatering from crushed stone producers, lime sludge from municipal water treatment plants, and treated process wastes from diverse manufacturers, such as food processing, automotive, plastics, and glass. Some NPDES permits fall into more than one category. For example, a manufacturer may have process wastes, site runoff, and a package sewage treatment plant. An NPDES permit deals with this situation by issuing discharge standards for three different outfall points.

At present, there are 60 NPDES permits in the Maumee RAP Area which breakdown as follows:

0 = Agricultural
2 = Electric Utility
30 = Industrial and Miscellaneous
2 = Landfill
4 = Quarry & Crushed Stone Producer
18 = Municipal and other Sewage Treatment Plants
4 = Municipal Water Treatment Plants

Out of these 60 permits, the status is as follows:

24 (40%) = not current on January 1, 1988
42 (70%) = active
4 (6%) = being sewered
2 (1%) = revoked or inactive
12 (20%) = expired, but still active

An "Active" permit is presently in operation. "Being sewered" means that the permit is active, but a sewer line is being built which will eliminate the discharge. A permit that is "Revoked" has been revoked by Ohio EPA because the facility is no longer discharging. "Inactive" means the facility is not presently discharging. "Expired" means the facility is in operation and discharging, but the permit has not yet been renewed.

There are presently no Findings and Orders for industrial NPDES dischargers in the Maumee Basin RAP Area. A list of NPDES Permits in the RAP Area, with notes on their present status and compliance, is given in Table 28. The source of these notes is from discussion with personnel of Ohio EPA Northwest District Office and Toledo Environmental Services Division, and the files of those agencies.

A complete listing of NPDES permits is given in Appendix C.

Ohio EPA is considering issuing NPDES permits for stormwater runoff to other facilities that presently have no permits. One is the Evergreen Landfill, in Northwood, which is part of the Maumee basin. Others are the truck stops in the Interchange-Five area of Lake Township, in Wood County, Lake Erie Tributaries basin.

TABLE 28

NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
ASHLAND OIL COMPANY NPDES: 2IG00006*ED OLD NAME:	Maumee River	1.8	Permitted to treat ship ballast, but does not receive much, usually 2 to 4 times/year. Stormwater, 17,300 gpd, is treated separately.
BENTBROOK FARMS NPDES: 2PG00002 OLD NAME:	Ten Mile Creek	——	——
BOWLING GREEN WTP NPDES: 2IW00010 OLD NAME:	Maumee River	22.8	Presently backwash solids are being discharged to the Maumee River. Backwash lagoons are being designed, and in the future, backwash will be recycled. New permit is being processed.
CSX-CHESSIE-PRESQLE ISLE NPDES: 2IT00013 OLD NAME:	Maumee	0.1	Has had oil leak problems in the past. No information is available on the sewage treatment plant. A new permit is being processed, and the facility will be inspected before issuance.
CSX-CHESSIE-WALBRIDGE TERMINAL NPDES: 2IT00002*CD OLD NAME: C&S, Chessie	Cedar Creek	2.0	Site runoff is treated, which includes a lot of oil and grease. Effluent quality is good.
CENTENNIAL MANOR NPDES: 1PY00000*DO OLD NAME:	Ten Mile Creek	2.0	——
CHARTER HOUSE INN NPDES: R 725 *AD OLD NAME:	Crane Creek	——	——
CONRAIL NPDES: 2IT00015*AD OLD NAME: Penn Central	Unnamed Tributary	—	********** Problem Discharger ********** This facility has massive oil problems. Discharge goes to an unnamed tributary of the Maumee. The receiving stream is, in effect, being used to treat the runoff. There are baffles across the stream, which are used to trap the oil. They are located about 30 or 40 feet above a culvert the stream enters before flowing into the Maumee.
CONRAIL-STANLEY YARD NPDES: 2IT00007*CD OLD NAME:	Cedar Creek	——	********** Problem Discharger ********** There was a major oil spill from this facility in March '88, and oil in the effluent is a continuing problem. The treatment lagoons are old, and need improvements for better control.

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
DIVERSI TECH GENERAL NPDES: 21Q00012*BD OLD NAME:	Ottawa River	6.0	Has had oil problems in effluent in the past. New oil separator has been installed, with a Permit To Install being submitted after the fact. A white solid (resin) in the effluent has been an occasional problem (TESD notes: twice in the past ten years). Toxic organics (in low concentrations) have been found in the effluent. The present NPDES permit does not have limits for these chemicals. Ohio EPA expects to add them the next time the permit is renewed.
DOEHLER-JARVIS/FARLEY, PLANT 2 NPDES: 21C00021*FD OLD NAME:	Shantee Creek	---	********** Problem Discharger ********** Effluent includes a milky-white discharge (machine coolant). Both TESD and Ohio EPA have received complaints about this facility.
DUPONT DE NEMOURS, FORMALDEHYDE PLANT NPDES: 21F00017*CD OLD NAME:	Ottawa River	4.8	There was at one time a formaldehyde leak to the stormwater lagoon (the NPDES Permit for this facility is for non-contact cooling water). Since that time, the lagoon has been eliminated. Ohio EPA plans reinspection.
DUPONT DE NEMOURS, PAINT PLANT NPDES: 21F00016*DD OLD NAME:	Blodget Ditch	---	Effluent quality is good.
FONDESSY ENTERPRISES NPDES: 21N00013*CD OLD NAME: Envirosafe	Otter Creek	2.3	One outfall had a problem with NH3 violations several years ago, but is now meeting effluent limits. Runoff covered by this permit is from the truck area, not the landfill. Landfill runoff goes to Otter Creek. Runoff from the Land Farm collected and taken to a storage tank, sampled, and discharged to the Toledo sewer system. It is sampled and discharged to the Toledo sanitary sewer system and is subject to Toledo's pretreatment program. The land farm is located at Cedar Point & Wynn, and was used for disposal of oily wastes. This practice has been discontinued. Wastes are collected, trucked, and sampled by Millren.
FRANCE STONE CO., SILICA PLANT NPDES: 21J00039*FD OLD NAME:	Ten Mile Creek	2.0	This facility is in compliance with its NPDES permit.
FRANCE STONE CO., WATERVILLE NPDES: 21J00047 OLD NAME:	Maumee River	22.2	This facility is in compliance with its NPDES permit.

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
FULLER'S CREEKSIDE ESTATES NPDES: 2PH00000*BD OLD NAME:	Shantee Creek	---	---
GENERAL MILLS NPDES: 2IH00093*BD OLD NAME:	Jamieson Ditch	---	********** Problem Discharger ********** Effluent has shown violations of BOD, SS, and pH limits. BOD has shown some improvement. The problem comes from organic matter from the air pollution control equipment on the roof. This material is washed off the roof by rain, and results in a high-BOD wastewater.
HARBOR VIEW, VILLAGE OF NPDES: 2PA00012*CD OLD NAME:	Maumee Bay	---	This facility is not in compliance with its NPDES Permit. Findings and Orders have been issued. See discussion under POTWs for details.
HASKINS WWTP NPDES: 2PA00026*CD OLD NAME:	Liberty Hwy. Ditch	21.6	This facility is in compliance with its NPDES permit. Haskins WWTP is at RM 1.0 of Liberty High Rd Ditch. It empties into the Maumee at RM 21.6.
HYDRA-MATIC NPDES: 2IC00026*CD OLD NAME: GMC Chevrolet	Silver Creek	---	State of the art stormwater system. This facility is in compliance with its NPDES permit.
JEEP CORPORATION NPDES: 2IC00022 OLD NAME:	Ottawa River	7.6	New NPDES Permit is being drafted. Process waste goes to Toledo sanitary sewer. This permit is for site runoff. There are other outfalls (runoff) that are not covered by the permit. High water levels in the Ottawa River cause stream water to backflow into the treatment system. There is a lot of garbage (litter) in the stream at this site. It comes not from Jeep, but its employees.
KERN-LIEBERS USA NPDES: 2IC00056 OLD NAME:	Wolf Creek	4.1	This facility is in compliance with its NPDES permit. Ohio EPA is processing a draft permit for renewal.

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
KING ROAD SANITARY LANDFILL NPDES: 2IN00079*AD OLD NAME:	Ottawa River	4.5	********** Problem Discharger ********** Ohio EPA enforcement actions are pending on this facility. OEPA's Draft Plan of Study for the Maumee BWQR notes that NH3 discharged here is 'highly elevated.' Contamination of local groundwater has been documented. This facility is an old dump. When closed, the dump was covered with sand, which allows rain water to infiltrate. In places, the cover has worn away, leaving garbage exposed on the surface. Because of the lack of impermeable cover, there is no runoff from the site. Rain water soaks into the dump and enters the Ottawa River as leachate, which contains high concentrations of BOD and NH$_3$. * Hydrogeological study of the area * City water for residents * Clay cap on the old dump * Fence to prohibit new dumping
LIBBEY OWENS FORD - PLANTS #4 AND #8 NPDES: 2IN00020*DD OLD NAME:	Otter Creek	6.6	********** Problem Discharger ********** Even though this plant is no longer producing, it still has an active NPDES permit. There is leachate from the lagoon through weep-holes. The lagoon has been dewatering faster than expected, and flow from weep-holes has gradually decreased. Leachate running out of banks is collected and discharged to the Toledo sanitary sewer system. The problem is that Otter Creek runs through an old, leaky sewer under the lagoon. This facility formerly produced laminated car glass. Leachate contains phthalate esters, dienoctyl Phthalate, and 2-m-butyl Phthalate. Monitor for As also, but none has been found. LOF's plans call for 1] dewatering the lagoon at this site, 2] divert Otter Creek so that it will no longer flow under the lagoon.
LIBBEY OWENS FORD - FLOAT GLASS PLANT #6 NPDES: 2IN00030*ED OLD NAME:	Maumee River	6.9	********** Problem Discharger ********** An outfall from this facility discharging to the Maumee at the Rossford Marina was discovered in Fall, 1987. Samples from this effluent contained Arsenic in 1987, but as of 1990 they no longer use Arsenic. A system of perforated collection tiles was completed in September, 1988. The leachate is to be pumped to the Toledo sanitary sewer system.
LINCOLN GREEN SUBDIV. NPDES: H 704 *AD OLD NAME:	Potter Ditch	---	---

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
LIQUID CARBONIC CORP. NPDES: 2IN00069 OLD NAME:	Otter Creek	1.9	Discharge is from package sewage treatment plant, which is oversized for the number of employees. But the site is unsuited for a septic system.
MARATHON OIL COMPANY NPDES: 2IG00024*BD OLD NAME:	Driftmeyer Ditch	---	This facility is in compliance with its NPDES permit.
MAUMEE RIVER WWTP NPDES: 2PK00000*DD OLD NAME:	Maumee River	18.2	This facility is in compliance with its NPDES permit.
MEDUSA PORTLAND CEMENT COMPANY NPDES: 2IN00032 OLD NAME:	Tenmile Creek	5.3	Medusa Cement shut down in '82 or '83, but may have resumed operations. Hasn't reapplied for a discharge permit.
MIDLAND-ROSS SURFACE COMBUSTION DIV. NPDES: 2IN00072* OLD NAME:	Williams Ditch	---	This facility is in operation, but may have eliminated its discharge.
NORFOLK SOUTHERN RR NPDES: 2IT00005*BD OLD NAME: N&W RR	Duck Creek	---	This facility is in compliance with its NPDES permit. The wastewater from this facility is runoff containing oil. A treatment lagoon is used.
OAK OPENINGS - FALLEN TIMBERS PLAZA NPDES: 2PP00003*CD OLD NAME:	Murbach Ditch	---	---
OAK OPENINGS INDUSTRIAL PARK NPDES: 2PH00013*CD OLD NAME:	Kujawski Ditch	---	This facility is not in compliance with its NPDES permit. The permit has expired in September 1989. Findings and Orders have been issued.
OAK TERRACE NPDES: 2PH00014*CD OLD NAME:	Butler Ditch	---	This facility is not in compliance with its NPDES permit. The permit expired in June 1989. Findings and Orders have been issued.
OREGON SOUTH SHORE PARK WWTP NPDES: 2PB00007*CD OLD NAME:	Maumee Bay	---	This facility is not in compliance with its NPDES Permit. Findings and Orders have been issued.
OREGON WTP NPDES: 2IW00220*BD OLD NAME:	Berger Ditch	---	This facility is in compliance with its NPDES permit.

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
OREGON WWTP NPDES: 2PD00035*ED OLD NAME:	Maumee Bay	---	This facility is in compliance with its NPDES permit.
OWENS-ILLINOIS, PLANT 27 NPDES: N 275 *AD OLD NAME:	County Ditch #1139	---	Ohio EPA is processing a new permit for this facility. A reinspection is planned.
PERRYSBURG WWTP NPDES: 2PD00002 OLD NAME:	Maumee River	14.5	This facility is not in compliance with its NPDES Permit. Findings and Orders have been issued. See discussion under POTWs.
PETROLEUM FUEL & TERMINAL CO. NPDES: 2IG00013 OLD NAME: Shell, Apex	Maumee River	2.2	This facility is in compliance with its NPDES permit.
PLASKON ELECTRONIC MATERIALS NPDES: 2IF00000*CD OLD NAME: Allied Chem.	Delaware Creek	1.2	This facility is in compliance with its NPDES permit.
REICHERT STAMPING NPDES: 2IS00008*ED OLD NAME: Tol. Steel Tube	Ten Mile Creek	5.1	This facility is in compliance with its NPDES permit.
STANDARD OIL - HILL AVE TERMINAL NPDES: 2IB00010*CD OLD NAME:	Fleig Ditch	11.1	This facility has occasional effluent quality problems, but is generally in compliance with its NPDES Permit. The effluent has been sampled for organic chemicals. None were found.
STANDARD OIL - TOLEDO REFINERY NPDES: 2IG00007*DD OLD NAME:	Maumee Bay	0.4	This facility is in compliance with its NPDES permit. Package sewage treatment plant(s), tributary to the main treatment plant may be in use here.
STONECO - LIME CITY PL. NPDES: 2IJ00052*CD OLD NAME: Maumee Stone Co.	Dry Creek	---	This facility is in compliance with its NPDES permit. Sewage was once treated with a package plant here. It has been replaced by a Maumee Stone Co. septic system.
STONECO - MAUMEE PLANT NPDES: 2IJ00048*CD OLD NAME: Maumee Stone Co.	Graham Ditch	---	This facility is in compliance with its NPDES permit.

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
SUN PETROLEUM – MARINE TERMINAL NPDES: 2IG00009*CD OLD NAME:	Maumee River	6.5	This facility is in compliance with its NPDES permit.
SUN PETROLEUM – TOLEDO REFINERY NPDES: 2IG00003*FD OLD NAME:	Otter Creek	4.9	********** Problem Discharger ********** There have been overflow bypasses from this facility. Effluent sampling has found oil, phenol, Cr and Sulfide. A new Permit for this facility will be issued in 1989.
TELEDYNE INDUSTRIES NPDES: 2I000001*BD OLD NAME:	Silver Creek	---	This facility is in compliance with its NPDES permit.
TOLEDO BAY VIEW PARK WWTP NPDES: 2PF00000*GD OLD NAME:	Maumee River	1.4	This facility is in compliance with its NPDES permit. See discussions under POTWs and CSOs for detailed information.
TOLEDO COKE NPDES: 2ID00011 OLD NAME: Koppers	Maumee River	1.7	This facility is in compliance with its NPDES permit.
TOLEDO COLLINS PARK WTP NPDES: 2IE00260*BD OLD NAME:	Duck Creek	3.4	This facility is in compliance with its NPDES permit. There was a major spill of backwash (lime) sludge in the past, which is in the process of being excavated from Duck Creek: 6000-8000 cy in '87, and 9000 cy planned for '88. The backwash lagoons are nearly full of sludge, and will be excavated: 20-30 kcy '88, 70 kcy in '89, and 90 kcy for each of the next three years.
TOLEDO EDISON – ACME STATION NPDES: 2IB00001*CD OLD NAME:	Maumee River	4.0	This facility is in compliance with its NPDES permit.
TOLEDO EDISON BAYSHORE PLANT NPDES: 2IB00000*ID OLD NAME:	Driftmeyer Ditch	---	This facility is in compliance with its NPDES permit. Besides cooling water and sewage, the Bayshore plant also has ash ponds, which are rarely used. They exist, and Toledo Edison has them on the discharge permit only in case of emergency. Exception: the bottom ash pond is in constant use.
UNION 76 TRUCK STOP AND RESTAURANT NPDES: R 724 *AD OLD NAME:	Crane Creek	---	---

TABLE 28
(continued)
NOTES ON NPDES DISCHARGERS

NPDES DISCHARGER	STREAM	RIVER MILE	NOTES
WATERVILLE WWTP NPDES: 2IV00080*BD OLD NAME:	Maumee River	21.1	This facility is in compliance with its NPDES permit.
WHITEHOUSE WWTP NPDES: 2PB00062*CD OLD NAME:	Discher Ditch	---	Inactive facility. Tied into Lucas County sewer system.
WOODSIDE TERRACE TRAILER PARK NPDES: S702*BD OLD NAME:	Wolf Creek	---	---

MUNICIPAL WASTEWATER DISCHARGES

There are twelve municipal sewage treatment plants, or "Publicly-Operated Treatment Works" (POTWS) in the RAP Area. These include city, county, and village sewage treatment plants, plus package plants that serve suburban or rural developments. The RAP Area POTWs are given in Table 29, with 1986 effluent data. This table includes information on what treatment plant served each area in 1986, and what treatment plant is planned to serve the area in 2005. Table 29 also includes present and projected populations, flow rates, and BOD_5, SS, and P discharges in tons per year (tpy). Projected discharges for BOD_5, SS, and P assume that the plants will produce the same quality effluent in 2005 as they did in 1986.

Phosphorus Loadings

As noted in Table 27, the total phosphorus discharge from RAP Area POTWs in 1986 was 189 tons. Smaller plants are not required to monitor phosphorus, so using an estimated effluent phosphorus concentration of 2 ppm for extended aeration plants with filters, and 4 ppm without filters, the actual total phosphorus discharge would be higher than 189 tons per year. It has been calculated that the smaller plants contribute at least 9.4 tons per year (see section on Package Sewage Treatment Plants).

TABLE 29

MAUMEE BASIN RAP AREA POTWs
CURRENT AND PROJECTED
POPULATIONS AND DISCHARGE LOADINGS

SANITARY SEWER SERVICE AREA	1980 & 2005 POP.	DSGN, 1986, & 2005 FLOWS	1986 & 2005 BOD LOADS	1986 & 2005 TSS LOADS	1986 & 2005 P LOADS
LUCAS COUNTY					
Lucas County	1980 POP: 33,397	CAPACITY: 15.00 mgd			
1986: Maumee River WWTP	2005 POP: 40,257	1986: 9.01 mgd	1986: 127.2 tpy BOD	1986: 209.1 tpy TSS	1986: 11.5 tpy P
2005: Maumee River	1986 Flow: 163 gpcd	2005: 12.42 mgd	2005: 155.4 tpy BOD	2005: 255.4 tpy TSS	2005: 14.0 tpy P
Oak Openings	1980 POP: 0	CAPACITY: 0.18 mgd			
1986: Oak Openings Industrial Park	2005 POP: 0	1986: 0.11 mgd	1986: 3.8 tpy BOD	1986: 4.7 tpy TSS	1986: 0.0 tpy P
2005: Maumee River	1986 Flow: 67 gpcd	2005: 0.00 mgd	2005: 4.7 tpy BOD	2005: 5.8 tpy TSS	2005: 0.0 tpy P
Oak Terrace	1980 POP: 0	CAPACITY: 0.00 mgd			
1986: Oak Terrace WWTP	2005 POP: 0	1986: 0.10 mgd	1986: 0.7 tpy BOD	1986: 1.2 tpy TSS	1986: 0.0 tpy P
2005: Maumee River	1986 Flow: 70 gpcd	2005: 0.00 mgd	2005: 0.7 tpy BOD	2005: 1.1 tpy TSS	2005: 0.0 tpy P
Oregon **	1980 POP: 31,763	CAPACITY: 8.00 MGD			
1986: Oregon WWTP	2005 POP: 38,365	1986: 4.31 mgd	1986: 40.9 typ BOD	1986: 79.0 tpy TSS	1986: 6.2 tpy P
2005: Oregon DuPont	1986 Flow: 114 gpcd	2005: 5.41 mgd	2005: 49.4 tpy BOD	2005: 95.8 tpy TSS	2005: 7.4 tpy P
Oregon South Shore	1980 POP: 1,400	CAPACITY: 0.23 mgd			
1986: Oregon South Shore WWTP	2005 POP: 1,670	1986: 0.49 mgd	1986: 27.0 tpy BOD	1986: 22.1 tpy TSS	1986: 1.4 tpy P
2005: Oregon DuPont	1986 Flow: 350 gpcd	2005: 0.00 mgd	2005: 32.3 tpy BOD	2005: 26.4 tpy TSS	2005: 1.8 tpy P
Toledo **	1980 POP: 388,194	CAPACITY: 102.00 mgd			
1986: Toledo Bay View WWTP	2005 POP: 388,851	1986: 91.15 mgd	1986: 2,737.3 tpy BOD	1986: 6,123.6 tpy TSS	1986: 157.6 tpy P
2005: Toledo	1986 Flow: 234 gpcd	2005: 91.48 mgd	2005: 2,741.9 tpy BOD	2005: 6,133.8 tpy TSS	2005: 157.9 tpy P
Whitehouse	1980 POP: 2,819	CAPACITY: 0.29 mgd			
1986: Whitehouse WWTP	2005 POP: 3,915	1986: 0.32 mgd	1986: 8.0 tpy BOD	1986: 10.9 tpy TSS	1986: 3.1 tpy P
2005: Maumee River	1986 Flow: 113 gpcd	2005: 0.00 mgd	2005: 11.1 tpy BOD	2005: 15.3 tpy TSS	2005: 4.3 tpy P

TABLE 29 (continued)

SANITARY SEWER SERVICE AREA	1980 & 2005 POP.	DSGN, 1986, & 2005 FLOWS	1986 & 2005 BOD LOADS	1986 & 2005 TSS LOADS	
WOOD COUNTY					
Haskins	1980 POP: 568	CAPACITY: 0.10 mgd			
1986: Haskins WWTP	2005 POP: 723	1986: 0.06 mgd	1986: 0.7 tpy BOD	1986: 0.5 tpy TSS	1986: 0.0 tpy P
2005: Haskins	1986 Flow: 105 gpcd	2005: 0.08 mgd	2005: 0.9 tpy BOD	2005: 0.7 tpy TSS	2005: 0.0 tpy P
Perrysburg *	1980 POP: 17,612	CAPACITY: 2.75 mgd			
1986: Perrysburg WWTP	2005 POP: 26,010	1986: 3.00 mgd	1986: 119.2 tpy BOD	1986: 241.8 tpy TSS	1986: 8.7 tpy P
2005: Perrysburg	1986 Flow: 160 gpcd	2005: 4.48 mgd	2005: 177.8 tpy BOD	2005: 360.6 tpy TSS	2005: 13.1 tpy P
TOTAL PHOSPHORUS LOADING, 1986					188.5 tpy P

* = The Perrysburg plant is being expanded to 5.4 mgd

** = Toledo and Oregon each own and operate one package plant not listed here, because these plants do not have NPDES permits. The Oregon plant is a 5000 gpd unit that serves the City Municipal Building on Seaman Road. The Toledo plant is a 40,000 gpd package plant that serves the House of Correction in Waterville Township.

*** = This plant is soon to be replaced with a tap to the Lucas County sanitary sewer system. All three facilities listed are presently in the design or bid phase.

NOTES: 1.) Zero population denotes no information available. Zero flow for 2005 means this plant is expected to be abandoned by then.
2.) Further details on these facilities are given in Appendix E.

Findings and Orders

Ohio EPA has current Findings and Orders issued for a number of POTWs. Holders of NPDES permits are required under the Clean Water Act to be in compliance with their permits by July 1, 1988. That is the deadline for all Findings and Orders. Current Findings and Orders are detailed in Table 30.

TABLE 30

POTW FINDINGS AND ORDERS

SERVICE AREA/ FACILITY	OWNER/ OPERATOR	NPDES NO.	ORDERS TO:	DATE
Harbor View	Oregon	2PA000012* CD	Sewer surrounding area & tap into Oregon system	Pending
Interchange-Five Area	Wood Co S.D. #120	None	---	1986, To be sewered
Maumee	Maumee	None	CSOs	1985, 4-Phase CSO project
Oregon S. Shore Park	Oregon	2PB00007*CD	Effluent Limits	1986
Perrysburg	Perrysburg	2PD00002*DD	Effluent Limits	1985,

Status Of Facilities With Findings And Orders

Maumee Basin

City of Maumee

The City of Maumee is separating its combined sewers in four-phases, spaced at three-year intervals. The first phase has been completed. The separation program is scheduled for completion in 1996. This construction program will result in the elimination of 90% of the combined sewage bypasses. User fees, direct assessments and City funds will be used to finance the estimated $4 million cost of these improvements.

The existing combined sewer will serve as a sanitary sewer, and will be smoke tested to remove as many "clean water connections" (downspouts) as possible. The regulators will remain in place with slide gates controlling overflow to the river. It is estimated that a 10% inflow component from foundation drains will remain in the system. The construction schedule by district is as follows:

White Street District	1987
Sackett Street District	1990
Allen Street District	1993
Duane Street District	1996

Village of Harbor View

Harbor View has sanitary sewers, but cannot use them. The City of Oregon received a grant for a Facilities Plan for Harbor View and the surrounding portions of Oregon. The Facilities Plan (Finkbeiner, Pettis and Strout, 1981) recommended construction of an interceptor sewer to serve the area. HUD awarded a grant to the Village of Harbor View for construction of local sanitary sewers, among other improvements, but EPA did not award a grant for construction of the interceptor.

South Shore Park Subdivision of City of Oregon

The subdivision of South Shore Park in Oregon is served by sanitary sewers and its own treatment plant. The system, however, has a severe inflow problem, and the plant is overloaded by excess flow. The City of Oregon currently plans to construct an interceptor along Bayshore Road to connect South Shore Park to the main wastewater treatment plant on Dupont Road. When the Bayshore interceptor is built, the South Shore Park treatment plant will be abandoned. Construction of this interceptor will also be necessary to extend service to the Harbor View area and to Maumee Bay State Park.

Perrysburg

Perrysburg is expanding its treatment plant from 2.75 mgd to 5.4 mgd. The expansion of the primary treatment facilities has been completed; expansion of the second treatment facilities is in progress. Vacuum-assisted drying beds have also been added to the plant to improve sludge-handling capabilities. The plant upgrade is scheduled for completion in 1991.

Swan Creek Basin

Village of Whitehouse

The Whitehouse Facilities Plan (Finkbeiner, Pettis and Strout, 1978) calls for the Village of Whitehouse to abandon its existing sewage treatment plant, and tie into the Lucas County system. The Village of Whitehouse has submitted plans to Ohio EPA for construction of an interceptor to tie into the County system. Construction was completed in 1989.

Lake Erie Tributaries Basin

Interchange-Five Area

Sanitary sewers to serve the Interchange Five area have been installed. These sewers connected into the existing Wood County sanitary sewer system. Wastewater receives treatment at the Toledo Bay View WWTP.

Village of Luckey

The Village of Luckey has constructed interceptor sewers and a sewage treatment lagoon system. They went into operation in late 1987.

PACKAGE SEWAGE TREATMENT PLANTS

Package treatment plants frequently cause water quality problems. These are privately and publicly-owned treatment plants that serve mobile home parks, marinas, or restaurants in an unsewered area that produce too much wastewater for a septic tank. There are quite a few package plants in the Swan Creek watershed, especially around Toledo Express Airport, and on the fringes of the Toledo and Lucas County sewer systems.

Package plants are not a large source of pollution, in terms of the overall Great Lakes Basin. They are estimated to contribute roughly 1% of the phosphorus which reaches Lake Erie (TMACOG, 1985). However, an improperly operated package plant can have a severe effect on its receiving stream, resulting in a local health problem.

TMACOG staff has worked with OEPA and County Health Departments in the past on constructing inventories of package plants, and working with the owners and operators of the facilities to improve performance.

Most package plants use the "extended aeration" process, which is similar to the "conventional activated sludge" process commonly used by municipal sewage treatment plants. Package plants cause problems for a number of reasons, which are discussed below. The discussion below should be taken as a broad generalization.

Lack of Training and Improper Operation

The extended aeration treatment process is complicated, and unless the plant operator has received formal training, he/she probably will not understand it. Operating a package plant usually falls to a janitor, the manager, or the owner, depending on the particular situation. In most cases, the person operating the package plant has not had any training at all.

For municipal sewage treatment plants and other treatment facilities which have NPDES permits, the Operator is required to have a License; obtaining that License includes taking courses and passing tests. Most package plants are not required by law to have NPDES permits. Ohio EPA does issue NPDES permits for package plants under five conditions, however:

1. If the plant is operated by the County, or a municipality,
2. If the facility requires an NPDES permit for another wastewater discharge,
3. If the package plant is a known and continuing problem,
4. If the facility is under Public Utilities Commission of Ohio (PUCO) regulation.
5. If it is a State operated facility.

Lack of Maintenance

The maintenance problem is closely-related to the operation problem. Failure of the plant operator to understand proper operation directly results in many maintenance problems. Also, maintenance is viewed as an unpleasant job, and only conducted when required.

Lack of Enforcement

Ohio EPA has responsibility for enforcement for package plants. The main problem is that there are a lot of package plants around. Just keeping track of them has been a problem. Lack of staff to do field inspections and write letters has also been a problem.

Under a law passed in 1985, the County Health Department may contract with Ohio EPA to perform inspections and charge license fees for package plants under 25,000 gpd. Wood County has signed such a contract, but Lucas and Ottawa Counties have not. Lucas County, however, uses nuisance abatement and health statutes to conduct inspections, and attempts to visit plants monthly. They do not inspect plants which have NPDES permits. Enforcement actions remain the responsibility of Ohio EPA.

Phosphorus

In most cases, there are no data on what a given package is discharging, in terms of quantity of flow or nutrients. However, work has been done on what the effluent quality of an extended aeration package plant "typically" is. The Water Pollution Control Federation (1977) and U.S. EPA (1980) suggest figures of 2 ppm phosphorus for package plants with filters and 4 ppm without. However, these values were obtained using trained plant operators. For purposes of estimating phosphorus loadings from package plants in the RAP Area, a figure of 4 ppm P was used.

Using an estimated total package plant effluent volume of 2.09 mgd (see Appendix D), the total phosphorus contribution to receiving waters would be 12.7 tons/year. Deducting package plants listed in Appendix D which are also POTWs (Oak Terrace, Oak Openings Industrial Park, Bentbrook, Fuller's Creekside Estates, and Lincoln Green: see Appendix B) leaves a contribution of 9.4 tons P/year for the remaining plants. This number is an approximation, intended to put the phosphorus loading from this source in perspective with the other sources.

AGRICULTURAL RUNOFF WATER POLLUTION

The croplands of the Maumee River Basin are major sources of sediment, phosphorus, nitrate and pesticide loadings to the Maumee River System. These pollutants originate primarily upstream of the AOC and are transported to the lower Maumee River and Lake Erie where they negatively affect water quality.

We are fortunate to have an extensive record of sediment and nutrient loads for the Maumee River. The U.S. Geological Survey water quality monitoring site at Waterville Ohio has been in existence since 1950. The drainage area above the gauge is 6,330 square miles (USGS, 1983).

Sediment and nutrient loads for the Maumee River have been reported by the Water Quality Laboratory of Heidelberg College for U.S. EPA and are shown in Table 31.

TABLE 31

HISTORICAL SEDIMENT & NUTRIENTS FOR THE MAUMEE AT WATERVILLE

WATER YEAR	SUSPENDED SOLIDS	TOTAL PHOSPHORUS	SOLUBLE REACTIVE PHOSPHORUS	$NO_2 + NO_3$ NITROGEN
		(in metric tons)		
1982	1,280,000	2,820	576	28,400
1983	947,000	2,080	286	26,200
1984	1,080,000	2,660	389	35,450
1985	897,000	1,900	128	24,100
1986	1,221,000	2,434		30,800

Source: U.S. EPA, 1988

The extent to which these loads are attributable to nonpoint pollution sources and particularly agriculture has been the topic of several significant studies and reports. Studies performed by TMACOG, the U.S. Army Corps of Engineers Lake Erie Wastewater Management Study, Pollution from Land Use Activities Reference Group (PLUARG) of the International Joint Commission, Great Lakes National Program Office, and Water Quality Laboratory of Heidelberg College have documented the magnitude and nature of the problems affecting the Maumee River. In addition, the Ohio EPA has prepared the State of Ohio Phosphorus Reduction Strategy for Lake Erie which in turn is included in the United States Task Force Plan for Phosphorus Load Reductions from NonPoint and Point Sources on Lake Erie, Lake Ontario, and Saginaw Bay.

The conclusions of these numerous studies provide the basis for our knowledge of the fact that agriculture is a major source of pollutants (sediment, phosphorus, nitrogen, pesticides) to the Maumee River. Phosphorus and sediment have received the majority of the attention because sediment has been identified as the vehicle for transporting phosphorus. Both nitrogen and pesticides have received greater attention in recent years as public health issues.

Each of the pollutants originating from agricultural sources in the Maumee River and their impacts are discussed in the following sections.

Sediment

Sediment is considered to be the most prevalent nonpoint source pollutant by volume. By Ohio law (Agricultural Pollution Abatement and Urban Sediment Pollution Abatement Law), sediment is defined as "solid material", both mineral and organic, in suspension and being transported, or moved from its site of origin by air, water, gravity, or ice that has come to rest on earth's surface either above or below sea level." Therefore, soil particles are not considered sediment until they are detached and are being transported or have come to rest on the earth's surface.

Soil erosion is the removal and loss of soil from the land by rainfall, flowing water or wind action. Sedimentation is the resulting build-up of this soil in the downstream areas and Lake Erie.

Soil erosion rates (per acre) in the Maumee River Basin are generally low, but because of the amount of land in agriculture, erosion from cropland poses a major pollution problem. The sediment load in the Maumee River at high flow has been measured to exceed 150 thousand tons per day. The average annual sediment load from the Maumee River is 1.2 million tons per year, but it can accumulate to nearly 2 million tons per year.

There are numerous problems created by suspended and deposited sediment. Suspended sediment problems include:

1. Increased treatment costs of water supplies due to increased levels of suspended sediment. The taste and odor of the treated water can also be affected by these increased levels;

2. The reduced aesthetic quality of water for recreation purposes;

3. Reduced light penetration caused by turbidity which reduces photosynthesis thereby preventing aquatic plant growth, disrupting the food chain and impairing biological systems;

4. Decreased visibility in the water which affects the ability of fish to feed as well as creating a safety hazard for boaters, swimmers, and water skiers;

5. Provides a vehicle for the transport of phosphorus and other pollutants; and

6. Causes species extirpations and impacts on biological communities.

Deposited sediment problems include:

1. Navigation problems in Toledo Harbor and the necessity to provide annual maintenance dredging of 1 million cubic yards per year.

2. Impaired biological systems due to covering of the bottom spawning and feeding areas of fish. In addition, deposited sediment reduces the productivity of many species of aquatic organisms which are food for fish.

3. Filled drainage ditches which require expensive ditch maintenance and environmentally destructive channelization and modification to restore usage.

The Lake Erie Wastewater Management Study (LEWMS) was conducted by the U.S. Army Corps of Engineers pursuant to Section 108 of the Clean Water Act of 1972. The LEWMS used the Land Resources Information System to calculate existing Potential Gross Erosion for the Lake Erie Basin. The Maumee River Basin in its entirety was identified as having 2,596,736 acres of cropland which contributed 9,092,447 tons of potential gross erosion, or an average of 3.5 tons of soil loss to the acre under 1978 conditions (Urban, et al, 1978).

The State of Ohio Phosphorus Reduction Strategy for Lake Erie (1985) divided the Lake Erie drainage area (Ohio portion only) into 34 hydrologic groups. Table 32 identifies 14 of these hydrologic groups that make up the Maumee River Basin in Ohio (Ohio EPA, 1985). Table 32 shows that there was 3,322,095 total acres in the Ohio portion of the Maumee River Basin and the Lower Maumee River Area of Concern in 1980. These were estimated to yield 6,384,071 tons of sediment at the edge of the field or 1.9 tons/acre/year.

This difference between the Ohio Strategy and the LEWMS is likely the result of higher levels of erosion in the Indiana and Michigan portions of the basin and a difference in methodology. In either instance, both studies support the concept that there are many acres with low levels of erosion which add up to a substantial contribution of sediment to the streams and rivers of the Maumee River Basin.

These calculations of Potential Gross Erosion by the LEWMS and for the Ohio Phosphorus Strategy have been designed to develop a relationship between soil erosion on the croplands and the sediment that is actually transported to Lake Erie and its tributaries. The calculation of Potential Gross Erosion reflects the soil loss from the field. The transport of the soil particles may or may not continue for some distance until it actually arrives downstream. The sediment delivery ratio reflects the percentage of material that actually is transported to an area of deposition. The LEWMS calculated the sediment delivery ratio for the Maumee as 9.2% (USCOE, 1982). The Ohio Phosphorus Strategy calculated a delivery ratio of 13.7% for the Maumee (Ohio EPA, 1985).

Phosphorus

The phosphorus associated with sediment, as well as the phosphorus from other sources such as urban runoff, combined sewer overflows and industrial and municipal discharges, has been identified as the principle limiting nutrient in the cultural eutrophication of Lake Erie. It is also responsible for eutrophic conditions in the Lower Maumee River, Maumee Bay and the tributaries of both.

Eutrophication is a natural aging process generally describing the fertility (mainly aquatic plant productivity) of lakes. Over time, a lake will become filled with sediment and organically derived material from streams draining its watershed and from atmospheric deposition. These processes occur naturally and will fill in a lake on a geologic time scale. However, man's activities within a drainage basin can alter the natural processes in a watershed and accelerate this (extinction) process. This latter situation is referred to as cultural eutrophication to distinguish it from the natural process of aging of a lake.

Cultural eutrophication is caused by the excessive loads of aquatic plant nutrients (usually phosphorus) to natural waters. These nutrients, in turn, can produce nuisance growths of algae and higher aquatic plants which interfere with man's use of the water. While some lakes are naturally eutrophic, in that they receive a sufficient supply of phosphorus and nutrients from other sources to produce nuisance growths, an increased nutrient load to a water body has most often been associated with an intensification of human activity in the drainage area surrounding the water body.

TABLE 32

SEDIMENT AND PHOSPHORUS AFFECTING THE LOWER MAUMEE RIVER AREA OF CONCERN

BASIN NAME (Ohio Basins Only)	TOTAL AREA (ACRES)	1980 GROSS EROSION (TONS/YR)	1980 PHOS YIELD (MT/YR)
Maumee River Subwatershed			
Maumee River Mainstem (section)	181,444	235,881	185
Maumee River Mainstem (section)	203,296	327,952	182
Maumee River Mainstem (section)	308,683	461,697	290
Maumee River Mainstem (section)	129,748	357,212	140
St. Mary's River	289,600	642,317	312
St. Joseph River	151,347	216,764	106
Tiffin River	357,200	626,537	337
Ottawa River	233,700	515,773	256
Auglaize River Mainstem	251,952	636,346	236
Little Auglaize River	261,142	680,900	316
Auglaize River Headwaters	249,105	571,666	275
Blanchard River	490,220	788,072	364
Ottawa River Subwatershed			
Ten Mile Creek	107,134	140,722	118
Lake Erie Tributaries Subwatershed			
Lake Erie Direct (partial)*	107,517	182,232	111
TOTAL	3,322,095	6,384,071	3,234

* = Includes 46% of Group 14 watersheds from the Ohio Phosphorus Strategy. This includes all of the drainage between Crane Creek and the Maumee River.

Source: State of Ohio Phosphorus reduction Strategy for Lake Erie, Ohio EPA, (1985).

A major focus of the Lake Erie Wastewater Management Study was to assess the relative importance of point source and nonpoint source contributions of phosphorus and other pollutants. Their conclusion was that even after the major wastewater treatment plants had achieved the 1.0 mg/l standard for phosphorus, there would still be a need to reduce phosphorus contributions to Lake Erie from nonpoint sources by 47% in order to upgrade the Western and Central Basins of Lake Erie to a stable trophic condition. Such improvement would generally be associated with improved water quality in that the fertility levels would be moderated and nuisance growths would be eliminated.

The Water Quality Agreement of 1983 between the United States and Canada includes Annex III which establishes a phosphorus loading target for Lake Erie of 11,000 metric tons per year. It also called upon the United States and Canada to prepare strategies to achieve this load reduction. The United States Task Force Plans for Phosphorus Load Reductions to Lake Erie, Lake Ontario, and Saginaw Bay establishes a total Lake Erie reduction of 1,700 metric tons of which Ohio is responsible for 1,390 metric tons.

Ohio has prepared the Phosphorus Reduction Strategy for Lake Erie which presents Ohio's plan to reduce 1,390 metric tons of phosphorus. Agricultural sources are considered to contribute about 64% of the total phosphorus load to the Lake. Therefore, they have been assigned 64% of the reduction, or 890 metric tons/year of phosphorus. The strategy identifies 112 watersheds in the Lake Erie Basin that are to receive priority treatment with conservation tillage. To meet the required reductions, conservation tillage practices are to be adopted on 50% of these acres.

The Maumee River Basin contains 57 of these watersheds which are divided into watershed groups according to the Planning and Engineering Data Management System for Ohio (PEMSO) developed by Ohio EPA (Table 33). These watersheds contain 1,095,979 acres of cropland which contribute 1,197 metric tons of phosphorus annually. The strategy proposed that this contribution would be reduced by 447 metric tons. This is about half of the required Ohio phosphorus reduction from agriculture.

Achieving this reduction will improve water quality in the lower Maumee River and Maumee Bay as well as Lake Erie. However, most of this problem originates upstream from the AOC and will have to be addressed in upstream areas.

TABLE 33

PROPOSED PHOSPHORUS REDUCTIONS
FOR PRIORITY WATERSHEDS BY PEMSO WATERSHED GROUP
AFFECTING THE MAUMEE AREA OF CONCERN

PEMSO WATERSHED (Group #	CROPLAND (Acres)	AGRICULTURAL PHOSPHORUS (M. Tons)	PHOSPHORUS REDUCTION (M. Tons)
Ottawa River Subwatershed			
1. Ten Mile Creek	51,364	74	26
Maumee River Subwatershed			
2. Maumee River Mainstem	90,468	116	41
4. Maumee River Mainstem	56,005	41	20
5. Tiffin River	159,418	132	63
6. Auglaize River Mainstem	78,059	73	28
7. Little Auglaize River	143,374	146	54
8. Auglaize River Headwaters	140,398	139	55
10. Blanchard River	74,189	161	42
11. Maumee River Mainstem	46,549	55	21
12. St. Mary's River	192,277	181	69
Lake Erie Tributaries Subwatershed			
14. Lake Erie Direct (Partial)	63,878	78	28
TOTAL	1,095,979	1,197	447

Source: State of Ohio Phosphorus Reduction Strategy for Lake Erie, Ohio EPA, (1985)

Nitrogen

Nitrogen is an essential plant nutrient and is applied to cropland as a fertilizer. Nitrogen is also a nutrient for aquatic plants although it is less of a limiting factor than phosphorus, and therefore, has not received the same level of attention in water quality control strategies. The concentrations of nitrate nitrogen increase during runoff events. However, nitrates are soluble and are carried to the waterway with the runoff rather than adsorbed to sediment as is phosphorus. Tile effluent often carries nitrates to the waterways.

Dr. David Baker of Heidelberg College reports that the nitrogen export rate for the Maumee River Basin is 19 kg/hectare/year (17.1 lb./acre/year) and that this is much higher than national averages. This represents an amount equal to about 50% of the amount of fertilizers applied by farmers in the basin each year and represents a significant loss to these farmers.

Table 31 shows that the annual load of nitrate/nitrite nitrogen in recent years has ranged from 24,100 metric tons to 35,450 metric tons. The 1982 water year which has been selected as a typical or average year for the Great Lakes had an annual load 28,400 metric tons of nitrate/nitrite nitrogen.

Nitrate nitrogen levels in the Great Lakes have been increasing. Lake Erie has experienced an increase of 7.95 ppb/year over the period of 1970 to 1986. The International Joint Commission has expressed concern about this increase and has recommended that research be performed to identify the effects of these increases.

Nitrate concentrations have exceeded the 10 mg/l standard on the Maumee River. This usually occurs during the spring when fertilzer application and runoff events are likely. The standard has been exceeded up to 92% of the time during May, June or July. Peak concentration for the period of time ranged from 10.3 to 12.3 mg/l. Public health concerns about nitrate nitrogen have constituted the major effect of these events. The solubility of nitrate nitrogen adds to the public health concerns about nitrates because they are difficult to remove through the standard drinking water treatment process. As a result, drinking water alerts have been issued for communities that utilize the Maumee River for their drinking supply.

Pesticides

A recent report by the Water Quality Laboratory of Heidelberg College entitled Lake Erie Agro-Ecosystem Program: Sediment, Nutrient, and Pesticide Export Studies (Heidelberg College, 1987b) is the most thorough review of pesticide loads in the Maumee River. A summary of the situation as reported in this document follows.

During spring and early summer, the concentrations of many currently used pesticides increase in Lake Erie Tributaries. In general, the concentrations of herbicides are much higher than the concentration of insecticides, and concentrations of both are generally proportional to their usage. The herbicide concentrations in these rivers appear to be higher than in many other rivers draining cropland. The effects of these herbicides on ambient water quality remain uncertain. Because of the low acute toxicity, the relatively low persistence and the insignificant bioaccumulation of most herbicides, direct toxic effects on animal life in streams and rivers appear unlikely. However, the concentrations of herbicides observed in these streams are within the range where effects on both algal and higher aquatic plant communities could be expected. Such effects may already be manifest in the existing algal and rooted aquatic plant communities in this region's streams and rivers, and within their associated wetlands and bays. Changes in these plant communities could affect the fish and invertebrate communities in streams and rivers. Also the herbicide concentrations could possibly induce behavioral responses in animals that could be detrimental to these communities.

Most of the pesticides present in streams occur primarily in the dissolved state rather than attached to the sediments. Consequently, the removal of sediments at drinking water treatment plants does not remove most pesticides. Since other aspects of conventional water treatment, such as chlorination, do not remove or alter these compounds, finished tap water has very similar concentrations of these pesticides to those found in the raw water. The U.S. Environmental Protection Agency has established health standard advisory levels in drinking water for many of the herbicides monitored in these studies. The chronic levels set in 1989 include 4ppb for Simazine, 3ppb for Atrazine, 200ppb for Metribuzin, 2ppb for Alachlor, 100 ppb for Metolachlor, and 10ppb for Cyanazine.

The concentrations of herbicides in Lake Erie tributaries do exceed some of these guidelines, for relatively short periods of maximum concentration. Activated carbon can be used to remove these compounds at water treatment plants and research is underway to evaluate other possible treatment techniques.

Table 34 contains information about the concentrations of pesticides in the Maumee River at Waterville (at the upstream end of the Area of Concern) and their extrapolated loads to the lower Maumee River. The accuracy of the load estimates is dependent on the frequency and representiveness of the pesticide samples and the flow data. Infrequent pesticide samples are more often the limiting factor of load estimates than are inadequate flow data.

TABLE 34

PESTICIDE CONCENTRATIONS AND EXTRAPOLATED LOADS

		----1983----		----1984----		----1985----	
PESTICIDE	TRADE NAME	Conc. ppb	Load kg	Conc. ppb	Load kg	Conc. ppb	Load kg
Simazine	Princep	0	0	0.185	290.95	0.165	67.33
Carbofuran	Furadan	0.175	245.95	0.188	509.38	0.046	27.41
Atrazine	Aatrex	1.751	2476.11	2.975	4807.74	1.902	727.89
Terbufos	Counter	0.001	2.35	0	0.53	0.001	0.34
Fonofos	Dyfonate	0	0	0.002	6.45	0	0.53
Metribuzin	Sencor, Lexone	0.443	700.06	0.448	1816.42	0.254	125.68
Alachlor	Lasso	1.046	2053.38	1.756	5251.98	0.472	264.131
Linuron	--	0.036	46.86	0.040	54.96	0.013	19.81
Metolachlor	Dual	1.308	1763.06	1.574	3056.82	1.316	618.73
Cyanazine	Bladex	0.662	1160.87	1.146	2888.98	0.322	137.28
Penoxalin	--	---	59.91	---	118.51	---	0

NOTE: Concentration is the "Time Weighted Mean Concentration" and is calculated for the time period of April 15 to August 15.

Source: Lake Erie Agro-Ecosystem Program: Sediment, Nutrient, and Pesticide Export Studies (Heidelberg College, 1987b)

OPEN WATER DISPOSAL OF DREDGED MATERIAL

The Corps of Engineers (COE) annually conducts maintenance dredging of the Toledo Harbor in order to maintain the depth of the shipping channel. This dredging produces between 800,000 to 1,000,000 cubic yards of dredged material annually. In recent years (since 1970s), about 90 to 95% of the material was placed in one of the confined disposal facilities (CDF) at the mouth of Maumee Bay. In September 1984, the COE proposed to change operations to open lake dispose of about 60% of the dredged material from the Maumee Bay portion of the channel (and upper 2 miles of river channel) due to cleaner sampling. The remainder of the more polluted material was to be placed in the CDF.

U.S. EPA found that portions of the material were suitable for open lake disposal with the following stipulation:

> "Potentially adverse impacts of open-water disposal should be minimized by locating the open-water disposal sites in areas where the sediment will remain in-place and where biological productivity is relatively low (U.S. EPA, 1984).

Ohio EPA has provided annual Section 401 Water Quality Certifications (required for dumping operations) with special stipulations. In 1985 and 1986 the COE was required by Ohio EPA to conduct monitoring operations and the Toledo-Lucas County Port Authority and the City of Toledo were to explore alternatives for the reuse and or disposal of the material other than open lake disposal. In 1987, the annual 401 certification also included the following stipulations:

The Ohio EPA intends to impose the following conditions on any future 401 Certifications to dredge the federal navigation channel at Toledo harbor from lake mile 2 outward over the next four years. These conditions will be imposed provided the lake channel sediments remain classified by USEPA as suitable for open lake disposal.

1988 - The Corps shall open lake dispose an amount not to exceed 90% of the material dredged from the lake channel. The Toledo-Lucas County Port Authority and the City of Toledo are responsible for identifying reuse alternatives for at least 10% of the dredged material. This volume shall either be placed in a confined disposal facility, with the commitment that an equal amount be removed from a confined disposal facility prior to 1989 lake channel dredging, or used in a (direct) reuse project.

1989 - Same as 1988 except that the open lake disposal is restricted to 70% of the material and 30% is to be subjected to reuse alternatives.

1990 - Same as 1988 except that open lake disposal is restricted to 50% of the material and 50% is to be reused.

No open lake disposal of dredged material will take place after 1991. The Toledo-Lucas County Port Authority and the City of Toledo are responsible for identifying reuse alternatives for 100% of the dredged material. This volume shall either be placed in a confined disposal facility, with the commitment that an equal amount be removed from a confined disposal facility prior to the following year's lake channel dredging, or used in a direct reuse project (Tyler, 1987).

Differences of Opinion

There are several effects of open water disposal that have or may have negative impacts on the Area of Concern. These effects have been described and documented by various sources, however, there are still considerable differences in opinion over the extent of the impacts. Therefore, COE comments on the problems summarized below have been included.

OPEN LAKE DISPOSAL

COE Comment: Open lake disposal is considered to be environmentally suitable for disposal at the present disposal site by USEPA. Furthermore, the most recent and most specific studies and testing indicates that overall there may be no measurable negative impacts due to lake disposal. It even seems likely that lake disposal could have beneficial effects related to covering polluted bottom areas and in providing better contoured underwater habitat for fish.

Local Comment: The material does not stay at the disposal site but is dispersed by the currents and wave action. The current open lake dump site was previously used as a part of a 155 acre site where material was dumped. The COE reports that 3,840,000 cubic yards were dumped on the site from 1965 to 1975. When the site was put back into use in 1985, water depths ranged from 20 --24 feet which were very similar to the area surrounding the dump site. Had the 3,840,000 cubic yards that were placed on the site remained, then it would have formed a column rising 15.5 feet off the bottom and would result in water depths that averaged about 7 feet. Since this is not the case, and the material is gone, it is evident that it erodes away over a relatively short period of time (TMACOG, 1986).

COE Comment: Soundings clearly indicate that material dumped from 1965 - 1975 is basically still there. The dump site depths are not similar to the surrounding bottom. Calculations of depths are in error due to an error in area (640 acres vs. 155 acres). Several years of capacity remain at the present site.

Local Comment: Material from the Lake portion of the shipping channel is not similar in physical composition to the lake bottom surrounding the dump site: more silt (46% in dredged material compared to 27% in lake sediments near the disposal site); more clay (29% to 13% in lake sediments); and much less sand (25% in dredged material and 69% in lake bottom sediment). The dredged material is also higher in phosphorus (Fraleigh, Peter, 1987a). Therefore, the erosion and resuspension of the dredged materials results in the bottom sediments of the surrounding areas to be covered with lower quality dredged material.

COE Comment: The physical characteristics of dredge material varies somewhat from area to area and depending on how deep the dredge is dredging. The bottom of the Bay is certainly similar in some aspects to the dredge material because most, if not all, of the material in the Bay originally came from the same upland sources of the Maumee River. Both dredge and bottom material have also been subject to much of the same pollutant sources. Thus it seems more correct to say that both are similar than not similar overall.

SUSPENDED PARTICULATES / TURBIDITY

Local Comment: During the dumping operations, a turbidity plume is created that is persistent for the duration of dumping operations and extends well beyond the one square mile of the dump site. This turbidity plume has been observed by numerous individuals and has been extensively photographed. This corresponds with the fact that dissolved solids violated water quality standards during dumping operations (Tyler, 1986).

COE Comment: Turbidity plumes need further study as to how much material is transported or suspended. Even a trace of material may be visible and the Corps position is that practically all the material goes immediately to the bottom. Remaining quantities at the disposal site support this.

Local Comment: Laboratory tests have shown that 24% of the material remains in suspension after 24 hours (DePinto, 1986). A 1972 study has shown that the current moving across the Western Basin of Lake Erie will move 0.3 feet/second (Kovack, 1972). Therefore, the material could move 25,920 feet or 4.9 miles in 24 hours. Herdendorf has shown the average velocity of Detroit River water flow in western Lake Erie is approximately 0.5 feet/second (Herdendorf, 1969). This also demonstrates that the material can be spread around the Western Basin.

COE Comment: Hopper dredge disposal as done in the Bay with a split-hull dredge does not leave the amounts suspended as with an agitated laboratory sample. The dredge load "slides" to the bottom essentially in bulk. Most, if not essentially all, of the material is still in place after 20 years in site #2 so actual resuspension after 24 hours appears to be drastically lower than the 24% from lab testing. The remaining material in site #2 also undermines the conjecture that substantial amounts of resuspended material are transported for miles around the Bay. Survey lines one-quarter mile from site #2 also showed no change from 1985 to 1987 thus indicating no detectable movement of material.

WATER QUALITY

Local Comment: Pursuant to the provisions of the Section 401 Water Quality Certification issued by Ohio EPA, the COE conducted monitoring of water quality conditions on the dump site and in surrounding water in both 1985 and in 1986. A change in pH that violated Lake Erie Water Quality Standards was reported for 1985 (Fraleigh, 1986). The 1986 monitoring program detected several violations of Lake Erie Water Quality Standards both on and off the dump site, including copper, cadmium, iron, mercury, and dissolved solids (Tyler, 1986). This was acknowledged by COE (Clark, Col. Daniel, 1986). The 1986 monitoring program has also shown several impacts on water quality conditions around and off the dump site (Fraleigh, 1987; Stevenson, 1987).

COE Comment: The Corps interpretation of the monitoring of 1985 and 1986 was that there were no violations that could be attributed to the disposal operations. One violation noted above was from sampling done before disposal started. Other apparent violations were not true violations because simultaneous remote reference results indicated that conditions were no worse at the disposal site than at the remote reference sites. A Corps' bioassay report on the Bay is to be complete in April 1988. This hopefully should clarify some environmental misunderstandings.

Local Comment: The effect of the open water disposal on phosphorus loads has also been a topic of study. Bioavailable phosphorus concentrations in the Lake portion of the shipping channel are higher than those of the surrounding Lake according to work performed by DePinto (1986). Annual loading of bioavailable phosphorus is 101 metric tons/year or 28% of the average annual Maumee River load (Fraleigh, Peter, 1987a).

COE Comment: Annual loadings of bioavailable phosphorous is 0.4 to 0.6% not 28% as reported above.

EFFECT ON MUNICIPAL WATER SUPPLIES

Local Comment: City of Toledo has repeatedly stated that the current dump site is within an area where current will carry the material to the water intake and requested that the dump site be moved further to the East and North. Stevenson has stated that water from the dump site does arrive at the water intake (Stevenson, 1987). This conforms to the prediction of movement of the material over a 24 hour period that was described above. Movement of the material may carry toxics or other organic chemicals whose limits are below the level of sensitivity of testing performed by the COE (TMACOG, 1986).

COE Comment: As stated previously this is largely conjecture, and data needs to be developed on resuspension and its effect on phosphorous levels.

Confined Disposal Facility (CDF) Alternatives

An economically feasible and environmentally acceptable site or method for future disposal of dredged materials that are unacceptable for open-lake disposal will be required within two to five years. Within this time period, the existing active 242-acre CDF will be filled to capacity.

Disposal alternatives that have been mentioned for consideration include: upland use of the dredged material at Maumee Bay State Park, Buckeye Basin Greenbelt Parkway, and various old landfill sites; construction of a CDF along the east side of Woodtick Peninsula to prevent the continued erosion of the peninsula and provide some protection to the marshes, marinas, and other lands west of the peninsula; increasing the height of the dike around the active 242-acre CDF or around the old Island 18 (Grassy Island) CDF to increase disposal capacity; or constructing a new CDF at one of the four potential alternative locations adjacent to the navigation channel.

The preferred action identified by the COE in the Draft Environmental Impact Statement involves the construction of a new lake shore CDF (Alternative 1C) bounded on the northeast and southeast sides by the existing 242-acre CDF, on the south side by the Port Authority CDF, and on the west and northwest sides by a 4,265 foot long dike to be built to a top elevation of 23.5 feet above the LWD elevation of 568.6 feet. The new CDF would occupy about 176 acres of Maumee Bay and would provide about 162 acres of disposal area.

As long as the water quality of the lower Maumee River is significantly degraded, rapid mixing of river and bay waters appears to be important in minimizing the zone of influence of the river water in Maumee Bay. It is expected that water quality in the lower Maumee River will continue to improve, but the process will be a very gradual one. A new CDF at three of the sites considered, or even an expansion of Grassy Island to the northwest would result in reduced mixing in the "shadow zone" of the CDF. Even the construction of a CDF at the preferred site near the existing active CDF will have some impact on mixing by eliminating the 176-acre embayment area as a mixing zone and shifting the mixing zone to the north of the site.

The impacts of this construction on mixing might be greater if it were not for two ameliorating factors. First, much of the river flow does not pass by the preferred site due to an average withdrawal rate of about 1,149 cfs by the Toledo Edison Bayshore Power Plant, the mouth of whose intake canal is located at the southwest corner of the proposed CDF site. Comparing this average withdrawal rate to the discharge frequency data for the Maumee River at Waterville indicates that for the period of June through August, the river flow exceeds the power plant withdrawal rate less than 50 percent of the time. Thus, for perhaps half of the time during the summer months, water may be moving from the bay across the face of the site to the power plant intake, rather than from the river into the bay area. The second ameliorating influence is the additional water mass mixing produced by winds and seiches. The resulting movement of water masses can cause bay water to move several miles into the lower Maumee River. Thus, even when river flow rates substantially exceed the withdrawal rate of the power plant, the site will often be under the influence of bay water due to a wind or seiche induced movement of bay water up into the Maumee River estuary area.

The preferred site was selected primarily due to the fact that the amount of diking required, and thus the cost of construction, would be much lower than at any other location in Maumee Bay. Even the most efficient of designs for a 176-acre CDF at another location, such as an extended semi-circular CDF expansion of the northwest side of Grassy Island, would require a dike approximately 60 percent longer than the one proposed. Only the most serious of water quality impacts or the elimination of the most unique of fish and wild-life habitats might have precluded the selection of this site for construction of a new CDF. The water quality impacts of this alternative should be relatively minor, and the fish and wildlife resources of the site are significant but not unique.

Environmental Conditions

In 1986, the Ohio EPA conducted an extensive biological and water quality survey of the lower Maumee River, with some additional fisheries surveys in Maumee Bay. A preliminary data set of surface and bottom DO readings was taken on 8 to 10 dates between July 14 and October 8, 1986. The combined mean for River Mile 1.0 is about 5.1 ppm (range 3.3 to 6.3 ppm), for River Mile 0.5 about 5.4 ppm (range 3.6 to 7.3 ppm), and for the mouth near Presque Isle about 5.5 ppm (range 3.1 to 7.5 ppm). These values are somewhat higher than values from earlier studies indicating that some improvement in water quality has occurred between the early 1970's and the mid-1980's.

While Maumee Bay has historically been influenced by the degraded water quality of the lower river, and this influence has been increased by the construction of the 242-acre CDF, the aquatic community of the CDF site and of the rest of Maumee Bay is not a poor assemblage. The application of the pollution classification of Wright (Wright, 1955) to benthic invertebrate data indicates that the area southeast of the navigation channel is lightly polluted, the navigation channel and the area northwest of the channel is moderately polluted, and the area near the Toledo Sewage Treatment Plant discharge is heavily polluted (see Figure 6 on page 44).

Just as the water quality in the bay has apparently improved and will continue to improve, the sediment quality also appears to have improved significantly. A prime example would be that the dredged sediments from Lake Mile 2 to Lake Mile 8 are now considered suitable for open-lake disposal. Another indication of this change is the change in the benthic community of the bay. In 1930, 1961, and 1982, a series of stations throughout the western end of the western basin of Lake Erie were sampled for benthic macrofauna. From 1930 to 1961, the stations in and near Maumee Bay either remained at high level of pollution or became much more polluted, as evidenced by the number of oligochaetes per square mile and by loss of pollution intolerant organisms such as *Hexagenia* mayfly nymphs.

By 1982, the trend had dramatically reversed itself, at least concerning the numbers of oligochaetes. The 1930 survey results are presented in Wright (1955) and the 1961 survey results in Carr and Hiltunen (1965). The 1982 data of Manny, Hiltunen and Judd (1987) are preliminary, have not yet been statistically analyzed, and are subject to some modification. Note that while the density of oligochaetes has decreased at stations in and near Maumee Bay, the densities at most stations further offshore have remained relatively the same or increased.

CDF Impact on Fish Habitat

In spite of obvious water quality problems in the lower Maumee River and in Maumee Bay, these areas serve as valuable nursery habitat and perhaps spawning habitat for white bass and other sport and commercial species such as walleye, yellow perch, freshwater drum, and channel catfish. Mizera (1981) found the average density of larval white bass in Maumee Bay was more than five times greater than the average density east of the bay and more than seven times greater than the average density north of the bay. A similar pattern was found for freshwater drum. For larval walleye, the density found in Maumee Bay was slightly greater than that north of the bay but considerably less than that east of the bay. The density of yellow perch larvae in the bay was high but was slightly below that of the other two areas. Heniken (1977) also found somewhat similar patterns of larval distributions in his summarization of data from 1975 and 1976 for the Ohio portion of the western basin.

Based on the larval surveys of 1975 and 1976, Heniken (1977) indicates that gizzard shad production in the Ohio portion of the western basin appears to be centered mainly in Maumee Bay and that concentrations often exceeded 1,000 per 100 square miles. Gizzard shad are the most important forage species for walleye in the western basin of Lake Erie.

The data show that the preferred CDF site presently consists of a diversity of valuable aquatic habitats and that without the implementation of the proposed project, the value of these habitats would continue to increase with the improvement of water quality in the lower Maumee River. The value of these resources is sufficient to qualify their loss as significant, and that loss should be appropriately mitigated.

The proposed CDF will neither take on the appearance of an island nor add diversity to the area. It will reduce the diversity that presently exists in the CDF peninsula by reducing the shoreline length of the peninsula and eliminating the varied aquatic habitats in the existing 176-acre embayment. It is unlikely that the short-term increased utilization of the CDF area by water birds during the filling phase will outweigh the long-term loss of use of the existing 176 acres of Maumee Bay by herons, egrets, and particularly by diving ducks.

The proposed CDF is but one in a series of CDFs that have been constructed in Maumee Bay and the lower Maumee River. With the construction of the proposed CDF, almost 5 percent of the surface area of Maumee Bay will be occupied by CDFs. The cumulative impacts to fisheries have been significant and there has been no mitigation of fish habitat losses resulting from the construction of any of these existing CDFs. If a CDF is constructed at the preferred site, a combination of in-kind and out-of-kind mitigation could partially offset fish habitat losses and such mitigation should be made a part of the project.

URBAN RUNOFF

Urban runoff encompasses combined sewer overflows, as well as a significant nonpoint source of pollution. Any type of street debris that is small and light enough to be washed away by a heavy rain will end up in Lake Erie in some form, sooner or later. Contaminants in urban runoff cover a broad range, but typically include pollutants washed out of the air by rainfall, animal droppings, construction sediment, leaves, litter, salt, and oil. Some of these occur naturally; the pollution problem results from the high rate of runoff from urban areas.

A number of studies on the problems and possible solutions to urban runoff pollution have been conducted. Subjects investigated include urban soil sediment and street cleaning. Urban runoff is higher in suspended solids than sanitary sewage; the BOD is lower than in sewage, but not low enough for runoff to be considered clean water.

In developed urban areas, rainwater runs off of roof tops, sidewalks, and streets, and becomes polluted as it dissolves or washes away debris. Any debris on the street or sidewalk sooner or later ends up in a nearby stream. There are two ways to reduce urban runoff pollution from developed areas; either collect the water and treat it, or reduce the sources of pollutants by keeping debris from being washed into storm sewers to start with. This is a matter of urban housekeeping.

In newly developing areas, there are special problems related to sediment and debris from construction sites. While of limited duration, the impact of large quantities of sediment can be substantial.

Urban runoff is a significant source of nutrients: it is estimated (USCOE, 1979) to contribute 0.8 lb of available phosphorus per urbanized acre per year. This estimate was based on runoff samples taken from urban areas in the Great Lakes region. On the basis of this loading, it was estimated that for the Swan Creek watershed (TMACOG, 1985) phosphorus loadings from urban areas total roughly 13% of agricultural runoff. This would make urban runoff the second largest source of phosphorus in the sub-basin. Applying the 0.8 pound of available phosphorus per urbanized acre per year, a total of 21 tons, is the estimated phosphorus loadings per year for the RAP area. These calculated loadings are displayed in Table 35 by municipality and by TMACOG watershed.

Apart from the estimate that urban runoff yields 0.8 pound of phosphorus per acre per year to Lake Erie, no other monitoring or sampling data, specifically aimed at urban runoff, are known in the Maumee RAP area.

Salt for deicing streets is a potential source of water pollution from urban runoff. If present in high enough concentrations, salt can be toxic to aquatic life. No data are available to indicate whether deicing salt causes problems in the Toledo area.

Present Urban Runoff Control Practices

Typically, there are no urban runoff control practices in use in the older, developed urban areas. However, the City of Toledo and Lucas County enforce site drainage design regulations for new development. These regulations limit the allowable discharge rate of stormwater to a storm sewer. Any flow above the rate at which runoff occurred from a 25-year storm before development must be retained.

TABLE 35

ESTIMATED URBAN RUNOFF PHOSPHORUS LOADINGS

MUNICIPALITY	TOTAL HECTARES	TOTAL ACRES	URBAN HECTARES	URBAN ACRES	LB. PHOSPHORUS	TMACOG WATERSHED(S)
LUCAS COUNTY						
Berkey	1,052	2,599	52	128	103	1
Harbor View	4	10	4	10	8	28
Holland	112	277	84	208	166	9
Maumee	2,536	6,266	1,236	3,054	2,443	10,41,47,79
Oregon	7,432	18,364	1,776	4,388	3,511	28, 29
Ottawa Hills	448	1,107	308	761	609	6
Sylvania	1,464	3,618	808	1,997	1,597	3
Toledo	21,704	53,631	14,840	36,670	29,336	2, 6, 10,13, 14,15,22,23, 25,26,30
Waterville	568	1,404	232	573	459	41, 43, 44
Whitehouse	792	1,957	200	494	395	39, 40
TOTAL	36,112	89,233	19,540	48,283	38,627	
WOOD COUNTY						
Haskins	408	1,008	64	158	127	122
Luckey	160	395	80	198	158	83
Millbury	248	613	72	178	142	115
Northwood	2,052	5,070	496	1,226	980	43
Perrysburg	1,076	2,659	676	1,670	1,336	121, 122
Rossford	728	1,799	432	1,067	854	115
Walbridge	264	652	164	405	324	28, 29, 32
TOTAL	4,936	12,197	1,984	4,902	3,922	
TOTAL FOR AREA	41,048 Hectares	101,430 Acres	21,524 Hectares	53,186 Acres	42,549 lb P/Yr (21.3 Tons P/Yr)	

Retention/detention basins, and rooftop and parking lot stormwater storage are frequently used, as are swales and oversized ditches with restricted outlets. Design standards call for the use of passive stormwater control facilities that will work without having to be operated; e.g., the outlet from a retention basin is controlled by a small outlet to restrict flow, rather than a valve. Also, a valve can be easily removed by the owner, defeating the purpose of the basin.

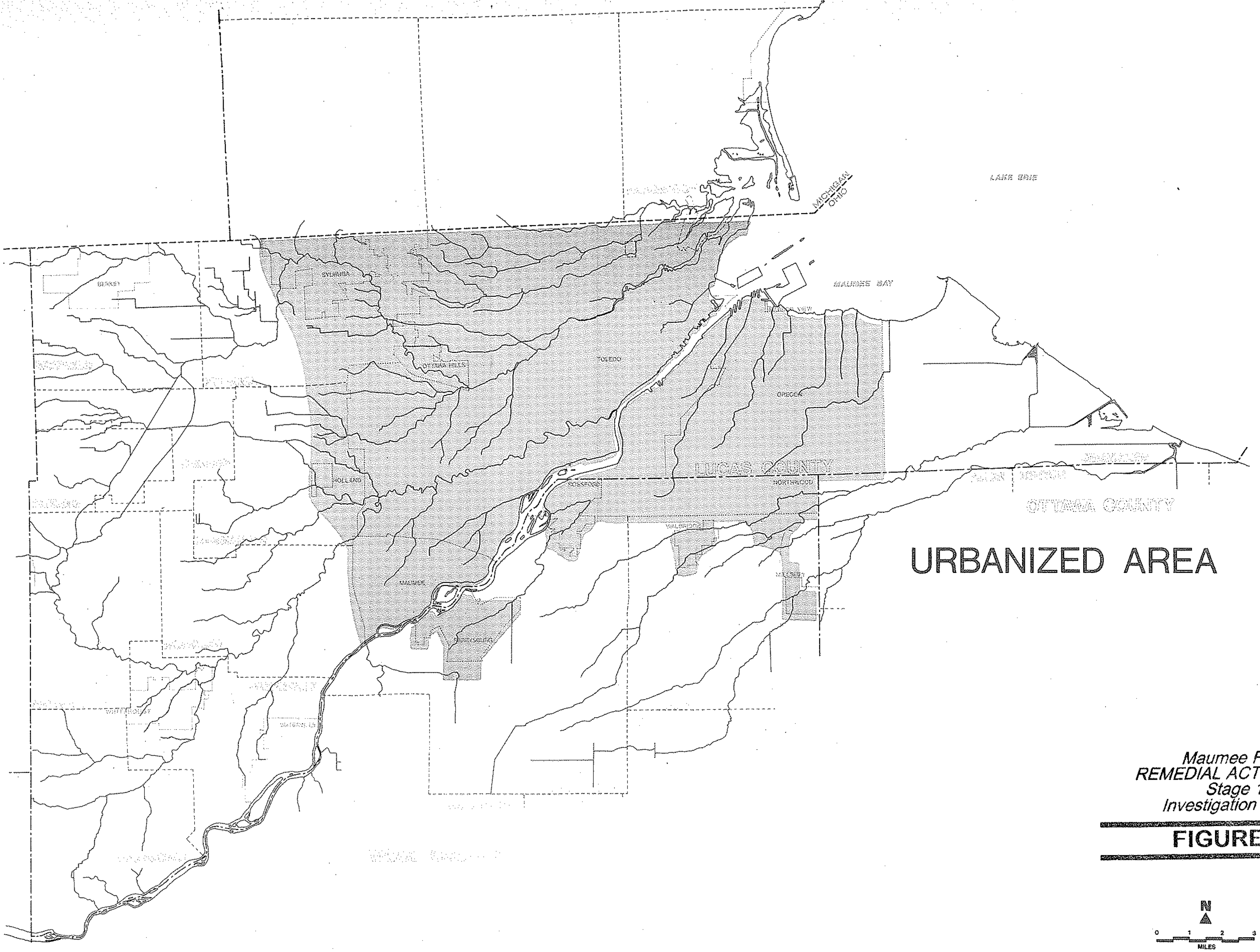
Identified urban runoff control concerns include:

- Some problems and shortcomings with the present regulations. They are not stringently enforced. Regulation may be no more than paying a fee for a permit.
- Training of inspection personnel is a problem. Better awareness of the purpose of these stormwater facilities, especially relating to water pollution control, would be beneficial.
- No enforcement for proper maintenance of stormwater control facilities.

Proposed NPDES Permit Requirements for Storm Sewers

U.S. EPA (Federal Register) has been developing NPDES requirements for separate storm sewer outfalls over the past several years. The regulations developed required communities to classify storm sewers as "Group I" or "Group II," depending on the type of area drained by the sewer, and the likelihood of contaminated runoff. The filing deadline for permit applications was set at December 31, 1987. The area affected by the regulation was defined as "the most current criteria established by the Bureau of Census." A map showing the areas classified as "urbanized" by the 1980 Census is included as Figure 16. However, a lawsuit was filed, and in December, 1987, a Court of Appeals threw out the regulation (CFR 2/12/88) (Federal Register). The issue of how to regulate stormwater discharges has been remanded to U.S. EPA for further rule-making.

EPA intends to issue new regulations codifying storm water provisions found in sections 401, 405, and 503 of the Clean Water Act of 1987 in the near future. Details and proposed rules will be published for public comment in the Federal Register.



URBANIZED AREA

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 16

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

tmacog

Combined Sewer Overflows

Storm runoff causes a serious pollution problem resulting from combined sewer overflows, or "CSOs." Almost every town has areas where sewage and runoff use the same, or "combined" sewers. During a storm, runoff overloads these sewers, and causes a mixture of rainwater and raw sewage to overflow into the nearest creek.

This is a serious problem, not only because of the pollution it causes, but also because it's difficult and expensive to correct. During a heavy rain, the amount of storm water flowing through the sewers is likely to be much greater than the amount of sewage.

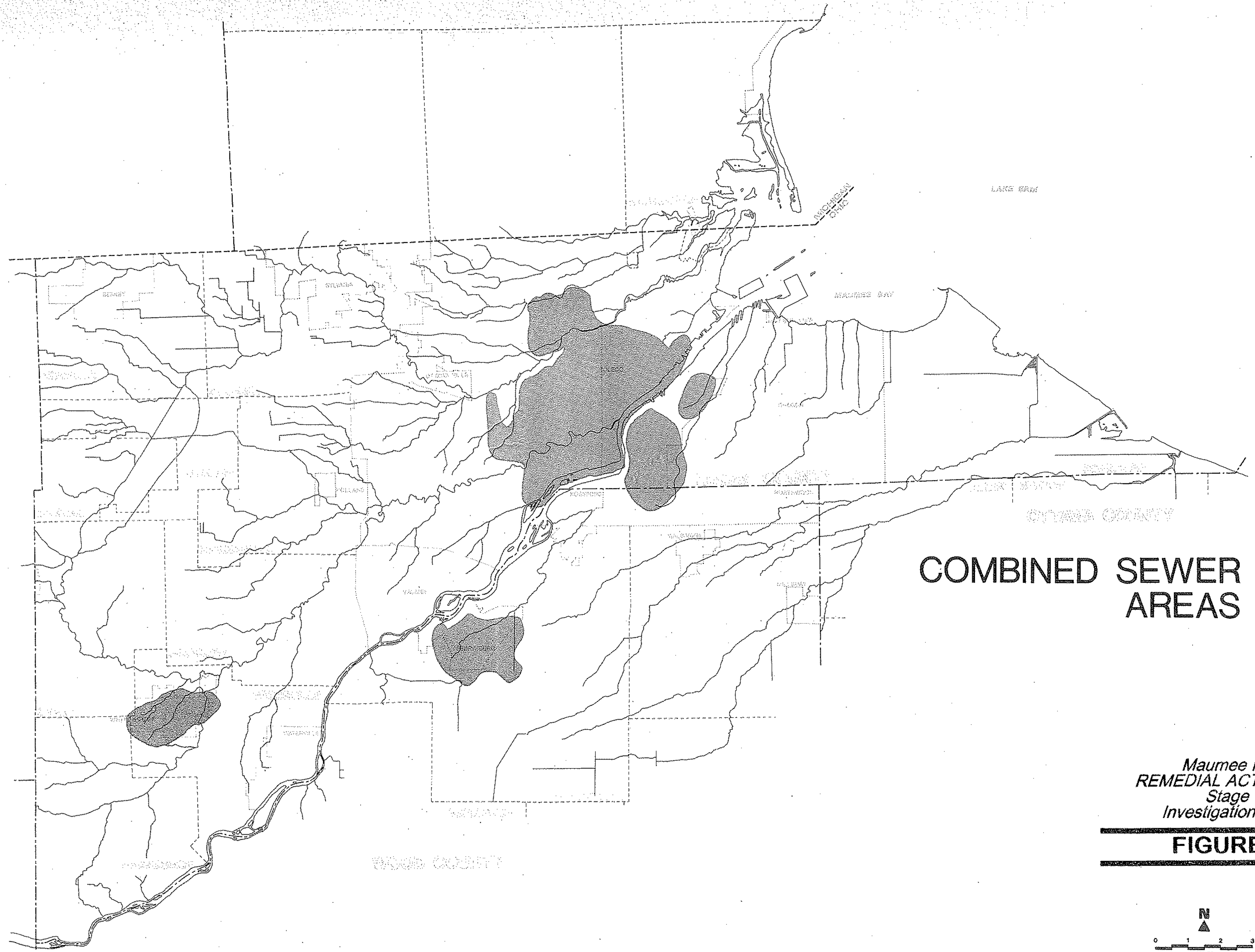
Designing a sewage treatment plant for this peak flow rate would be expensive, and would be significantly oversized for normal flow rates. But if this peak flow surge is allowed to go through the treatment plant, it can upset the treatment processes and keep the plant from doing a good job of treating sewage for days or weeks afterward.

The best way to eliminate pollution from CSOs, from a purely environmental standpoint, is to build a separate system of storm sewers. It is standard practice to do so in new developments, and has been for many years, but in the older parts of every town, combined sewers are the rule. Separating the sewers for even a small town could cost in the millions of dollars and would require digging up the streets. These are two big reasons why separate sewer systems are rarely added to existing neighborhoods.

U.S. EPA does not award construction grants for CSO abatement projects, but allows individual states the alternative of setting aside up to 20% of total grant money statewide for otherwise nonfundable projects. In Ohio, 5% is earmarked for CSOs. The City of Toledo has been a major benefactor of this program, receiving a grant of $6.3 million for Phases I and II for its CSO abatement project.

The municipalities in the Maumee Basin Area of Concern which have CSOs are Toledo, Maumee, Northwood, Perrysburg, and Whitehouse. Areas served by combined sewer systems are shown in Figure 17. Listings of these overflow points are given in Tables 36 through 40. In Toledo, 8,902 acres are tributary to the CSO regulators (Jones & Henry, Ltd., 1978; Jones & Henry Ltd., 1978; Earthview, Inc., 1973); in Maumee, 456 acres (Finkbeiner, Pettis, Strout, 1982); and in Perrysburg, 882 acres (Finkbeiner, Pettis, Strout, 1980).

Most of Northwood is served by separate sanitary sewers. The western portion of the city is served by combined sewers. The Northwood Facilities Plan (Finkbeiner, Pettis, Strout, 1979) notes: "Wet weather from the combined sewer, which bypasses the existing intercepting manhole at Andrus Road and Sheffield Place, discharges into the Maumee River through a storm sewer of the City of Toledo. The two discharge points (overflow from Regulator No. 9 and the storm sewer) are located approximately 300 feet apart."



COMBINED SEWER OVERFLOW AREAS

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 17

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

Toledo Combined Sewer Overflows

Toledo's combined sewer system presently has 34 overflow points to the Maumee River, the Ottawa River, and Swan Creek. The problems associated with these overflows are well-known, and have been documented in past studies (Earthview, Inc., 1973) and (Jones & Henry Engineers, Ltd., 1987). They severely degrade water quality and are aesthetically offensive.

Combined sewer overflows are controlled by float-operated gates called regulators. They are designed to direct all sewage flow to the treatment plant during normal conditions. They should bypass only when the sewer system is overloaded with stormwater. However, regulators can experience problems which cause them to bypass during dry weather.

Toledo has experienced problems with river water entering the sanitary sewer system through the regulators. This phenomenon occurred when northeast winds caused the river levels to rise. In 1987, Toledo began installing tide gates on the regulators. Most are now in place. It is too early to tell whether the new tide gates will show a significant improvement in water quality.

Toledo's regulators experience other problems as well (Jones & Henry Engineers, Ltd., 1987). One is that most of them are below Lake Erie's mean annual flood elevation. Another is debris, which causes the regulator gate to stick in the open position, and continue bypassing when it shouldn't. The regulators can experience problems from collapse of pipelines and other mechanical failures. The regulators are inspected an average of about 12-15 times per year. Also, telemetering equipment records the status of each regulator, and how many hours each day the discharge gate is open.

Toledo plans a 9-phase CSO abatement program for these areas, to be completed between 1990 and 1996. Phases 1 and 2 will be a downtown combined sewage tunnel for storing surge storm flows. The downtown tunnel will catch a 0.24 inch first flush, which is estimated to contain 85% of the pollution. Similar smaller tunnels will be built along Swan Creek as phases 3 and 4, will be designed to catch a first flush of 0.55 inches.

Other rehabilitative work is included in the CSO abatement program. The tide gates are now in place on nearly all of the regulators. Repairs and/or improvements will be made to a number of the regulators. Some sewer separation will also be done. Once the present 9-phase program is complete, Toledo plans to reevaluate the situation to determine whether improvements are needed for the remaining CSO areas along the Maumee.

A listing of Toledo's CSO points is given in Table 36, and a summary of regulator bypasses for October 1986-February 1987 (Jones & Henry Engineers, Ltd., 1987) is presented in Table 37.

TABLE 36
CITY OF TOLEDO COMBINED SEWAGE REGULATORS

Regulator No.	Name	Stream	RIVER MILE	SIZE (inches)	DRAINAGE AREA SANITARY ----(Acres)---	STORM	LOCATION
4	Paine	Maumee (E)	3.2	84	380.2	296.0	2201 Front @ Paine
5	Dearborn	Maumee (E)	4.1	90	523.7	352.0	1547 Front @ Dearborn
6	Main	Maumee (E)	4.82	60,54	207.8	174.7	Main @ Sports Arena
7	Nevada	Maumee (E)	5.8	60	581.6	608.0	609 Nevada @ Miami
8	Fassett	Maumee (E)	6.5	48	116.9	104.6	1152 Miami @ Fassett
9	Oakdale	Maumee (E)	6.85	93	638.2	467.1	1435 Miami @ Oakdale
22	New York	Maumee (W)	2.37	60	116.8	44.9	212 New York @ Summit
23	Columbus	Maumee (W)	2.85	48,102	675.9	204.9	214 Columbus @ Summit
24	Galena	Maumee (W)	3.25	30	27.6	27.5	216 Galena @ Summit
25	Ash	Maumee (W)	3.6	48	75.7	101.9	200 Ash @ Summit/I-280
26	Magnolia	Maumee (W)	4.2	48	143.3	121.2	210 Magnolia @ Summit
27	Locust	Maumee (W)	4.66	75,60	141.2	111.5	215 Locust between Water and Summit
28	Jackson	Maumee (W)	4.9	72	630.2	630.2	216 Jackson between Water and Summit
29*	Adams	Maumee (W)	4.98	24	---	---	215 Adams @ Portside
30	Jefferson	Maumee (W)	5.2	60	435.9	440.3	215 Jefferson between Water and Summit
31	Bostwick	Maumee (W)	0.07	36	---	---	315 Monroe @ Summit
32	Williams	Maumee (W)	---	---	70.3	59.9	
33	Maumee	Maumee (W)	7.5	60	345.5	343.6	502 Maumee @ Orchard
41	Knapp	Swan Creek	0.8	48	77.3	57.8	328 St. Clair @ Williams
42	Erie	Swan Creek	0.93	24	40.2	37.5	42 Erie St @ Hamilton
43	Hamilton	Swan Creek	1.1	60	292.7	349.8	Hamilton & Ant. Wayne Tr.
44	City Park	Swan Creek	1.58	30	37.9	22.2	City Pk, S. of bridge
45	Ewing	Swan Creek	1.9	48	261.9	220.2	Ewing & Hamilton
46	Hawley	Swan Creek	2.65	60	508.3	470.9	Hawley, S. of bridge
47	Junction	Swan Creek	3.15	96	867.4	841.3	Pere West, E. of Gibbons St.
48	Hillside	Swan Creek	3.45	24	190.5	49.3	Hillside & Chester St
49	Woodsdale	Swan Creek	4.3	---	547.3	17.9	Woodsdale & South St.
50	Highland	Swan Creek	4.22	---	230.6	209.3	Fearing St. in Highland Park
61	Lagrange	Ottawa River	6.45	60	555.2	167.1	3503 LaGrange @ Manhattan Blvd
62	Windermere	Ottawa River	6.7	---	958.3	865.6	202 Manhattan @ Windermere
63	DeVilbiss	Ottawa River	6.8	72	933.7	921.4	3646 Detroit @ Phillips
64	Lockwood	Ottawa River	7.75	114	---	---	3627 Lockwood @ I-475
65	Ayres	Ottawa River	8.65	54	283.5	213.4	2584 Ayres @ S. Cove
66	Monroe	Ottawa River	9.2	36	3763.0	0	3708 Monroe @ S. Cove W. of bridge

* Data refer to old regulator, which was replaced by a new unit at the end of Adams Street.

TABLE 37

TOLEDO REGULATOR BYPASSES, 10/86-2/87

Receiving Stream	No. of Regulators	October 1986	November 1986	December 1986	January 1987	February 1987
Maumee East	6	1400	1255	2376	2081	626
Maumee West	11	2089	3156	2668	2769	2871
Swan Creek	9	2404	2019	2627	2463	2028
Tenmile Creek	6	96	44	50	0	0

Maumee Combined Sewer Overflows

The City of Maumee published its CSO study in 1982 (Finkbeiner, Pettis, and Strout, 1982). It included detailed analysis of the overflow with regard to correlation between rainfall quantity, intensity, combined sewage bypasses, and their effect on the water quality of the Maumee River. While the primary focus of this study was the City of Maumee, it also included sampling on the Perrysburg side of the river. Samples were collected at two outfalls in Perrysburg, and three in Maumee. Rainfall data were collected in Maumee at four locations to correlate the response of the combined sewer system in terms of measured overflow. Sampling included primary sites (quality and quantity discharged), and secondary sites (quality only). Results of this sampling indicated high levels of BOD_5 and nutrients, and high bacteria counts.

The Maumee CSO Study concluded that rainfalls as low as 0.05 inch resulted in bypasses. These bypasses resulted in violations of the fecal coliform standards for the Maumee River, but did not have a serious impact on dissolved oxygen. The study recommended the City of Maumee proceed with a sewer separation program. A list of Maumee combined sewage regulators is given in Table 38.

TABLE 38

CITY OF MAUMEE COMBINED SEWAGE REGULATORS

(Finkbeiner, Pettis & Strout, 1982)

Regulator No. Name	Stream	Size, Inches	Drainage Area Sanitary Storm (acres)	Location
1	Maumee	12		Broadway & Ford
2	Maumee	18	38	Wayne & Kingsbury
3	Maumee	20	136	Broadway & Conant
4 *	Maumee	15	39	Broadway & Elizabeth
5	Maumee	12		Front & Ford
6 *	Maumee	24		Front & Kingsbury
7 *	Maumee	20		Front & Conant
8 *	Maumee	15		Front & Gibbs
9	Maumee	12		Key & River Road
10*	Maumee	36	113	Waite & Sackett

* = The City of Maumee's combined sewer system includes 10 regulators. Combined sanitary and storm water overflows to the Maumee at six locations: these are 33", 60", 20", 18", 15", and 60" inches in diameter, starting at the one furthest upstream. Those regulators marked with an asterisk (*) are directly above outfalls.

Perrysburg Combined Sewer Overflows

The City of Perrysburg's CSO study was prepared in 1980 (Finkbeiner, Pettis and Strout, 1980). River sampling data showed significant CSO-related increases in fecal coliform bacteria concentrations, but no serious impacts on dissolved oxygen and other water quality parameters. The study included the development of combined sewer network and receiving water quality models to evaluate various CSO control alternatives.

The Perrysburg CSO Study concluded that rainfall as low as 0.05 inch resulted in bypasses. The study recommended the capture and conveyance of CSOs to a swirl concentrator with chlorination facilities. The treated CSO would then be discharged to the Maumee River. Considering problems experienced with swirl concentrators during the years since the preparation of the CSO study, the City currently favors a combined sewer system separation project. Such a separation project would reduce the average annual CSO volume to the Maumee River by 90%. The first two phases of the sewer separation program will be constructed in 1990. The City is investing about $500,000 per year in sewer separation. Completion of the program is expected to take twenty years.

The City of Perrysburg's discharge permit (Finkbeiner, Pettis and Strout, 1980; Ohio EPA, 1982) lists overflows and bypasses as shown in Table 39.

TABLE 39

CITY OF PERRYSBURG, OHIO
BYPASS AND OVERFLOW POINTS

Ohio EPA Station No.	Description	Receiving Stream
D702002	Louisiana Ave - Water St.	Maumee River
D702003	Elm St. north of Front St.	Maumee River
D702004	Cherry St. - Water St.	Maumee River
D702005	Gorman View Subdivision	Grassy Creek
D702006	Hickory St. along Grassy Creek	Grassy Creek
D702007	Louisiana Ave. along Grassy Creek	Grassy Creek
D702008	Elm St. along Grassy Creek	Grassy Creek
D702009	West Boundary at Second	Blocked. No discharge.

Whitehouse Overflow Points

Like Perrysburg, the Village of Whitehouse's treatment plant did not have adequate capacity to treat combined sewage. Average 1986 flow was 0.32 mgd, not including bypassed sewage, to the 0.29 mgd WWTP. Whitehouse's sewer system suffered from a severe inflow/infiltration (I/I) problem.

The storm sewers were connected indirectly to the sanitary sewer system. Within the system were 8 overflow points where storm flow may be diverted to the sanitary line. Seven overflow locations discharge storm water to Disher Ditch; one overflow discharged to Lone Oak Ditch.

The Village of Whitehouse has constructed an interceptor sewer to tie into the Lucas County sanitary sewer system. Whitehouse is served by the Lucas County WWTP and has abandoned its existing WWTP. The Village of Whitehouse has mostly eliminated its CSOs. The connections between the sanitary and storm sewers have been sealed off. Dye testing is being conducted to check for any additional storm sewer connections. During heavy rains, one pump station becomes overloaded due to an inflow problem, and it is necessary to bypass to Disher Ditch. The Village of Whitehouse's old CSO points are listed in Table 40.

TABLE 40

VILLAGE OF WHITEHOUSE CSO POINTS

Regulator No. Name	Stream	Size	Location
Texas St.	Disher Ditch	8"	Texas St. S. of Waterville St.
Field Ave.	Disher Ditch	18"	Weckerly, East, Field Streets
Gilead St.	Disher Ditch	15"	South, Toledo, Maumee, Providence, Gilead Streets
Heller Rd.	Disher Ditch	12"	Heller S. of Waterville St.
Texas St.	Lone Oak Dt.	8"	Texas N. of Shepler
Gilead St.	Disher Ditch	15"	Waterville St & Alley NE of Providence St.
Providence St	Disher Ditch	10"	Providence St. S. of Otsego St.
Otsego St.	Disher Ditch	10"	Providence St. south of Otsego St.

HOME SEWAGE DISPOSAL

As reported in the Groundwater Quality Baseline Report (TMACOG, 1982), individual home sewage disposal systems affect ground water quality. The Lucas County Health Department reported leachate problems in the following areas within the county: (TMACOG, 1983a). See Figure 18.

Sylvania Township:

> Area bounded by Michigan line, Whiteford Road, Alexis Road and Sylvania corporation limits.
>
> Area bounded by King Road on west, Gower Road on east, Brint Road on south, Sylvania corporation limits on north.
>
> Winterhaven Road and area near the intersection of Centennial and Sylvania-Metamora Roads.
>
> Villa Farms Subdivision bounded by Central Avenue on the north, Centennial Road on east.

Monclova Township

> Coder Road Area, Village of Monclova

Springfield Township

> South Hill Park, Dorcas Farms, Layer Road, Village of Holland, Culley Road, Haven Park and Fairhaven Subdivisions, Devonshire Lane Subdivision.

Spencer Township

> Most of township

Jerusalem Township

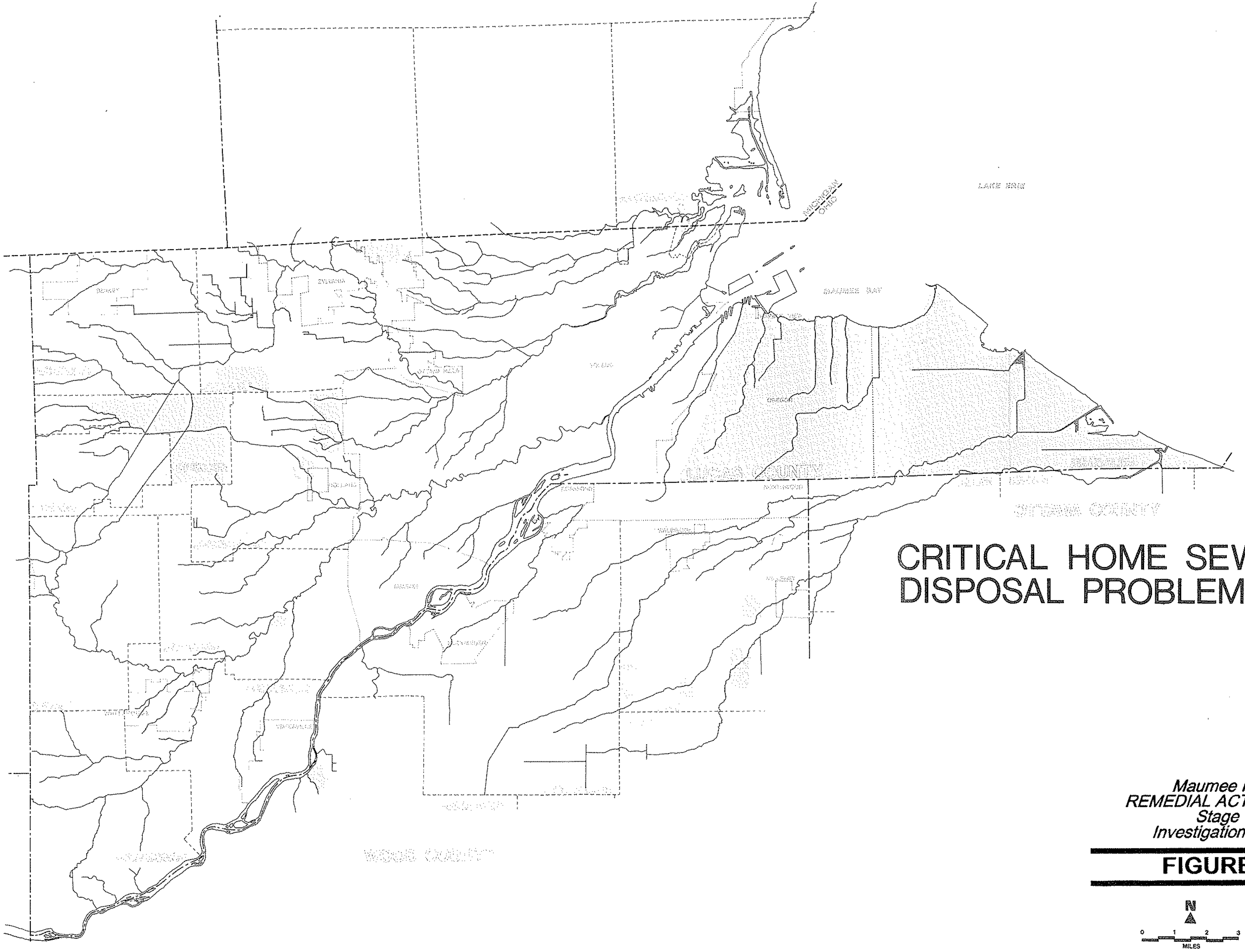
> All areas subject to flooding.

City of Oregon

> Entire area from Lallendorf Road east to City limits.

Three of the above identified problem areas, Sylvania and Springfield Townships and the City of Oregon, are of significant concern due to projected population increases. While public sewers have been targeted for these areas, facility planning must be stepped up. With implementation of the Western Lucas County Facility Plan and related segmented plans, many troublesome areas can be eliminated with tie-ins to public water and sewers.

These improvements will eliminate some package treatment plants and improve water quality in minor receiving streams. Because of the costs and cutbacks in federal funding, delays in bringing these areas on-line will continue to thwart the effect of public health improvements. Conditions will continue to worsen in areas where densities are high and existing on-site systems are failing. The soil and ground water conditions are such that at best, with a



CRITICAL HOME SEWAGE DISPOSAL PROBLEM AREAS

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 18

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

strong operation and maintenance program, the situation could be stabilized, but not significantly improved. It is imperative that those areas targeted for facility treatment system be given highest priority to reduce the health risks associated with contaminated surface and ground water conditions.

A second area of concern is in areas which are not targeted for correction in the near future. These are areas in eastern Lucas County and extreme western Lucas County outside of sewered areas, and are not near any sewer system. These on-site systems will continue to be a problem and like the on-site systems in the targeted areas of high density and priority, a sound operation and maintenance program would help, but often will not overcome the soil conditions, densities, lot size and high water table problems which are part of the landscape. Development bans are difficult to enforce and at times met with strong opposition.

The third area of concern is development in areas where soil and conditions warrant development bans or areas where systems are failing because of poor site selection in the past. These situations have resulted largely from inappropriate planning decisions and often left the health department in a reactive position rather than in a guidance and advisory role for the development.

Table 41 displays the number of septic systems and privies by minor civil division within Lucas County, including 1980 population with forecasted 1990 population and the percent change between these two decades, along with the status of active 201 facility projects as of June 1983. These statistics were taken from Table 3 and Table 8 of the TMACOG publication Home Sewage Disposal Priorities, December 1983 (TMACOG, 1983a).

Wood County and Ottawa County

The Wood County Health Department experienced a 6% decline of on-site systems from 1970 to 1980. This has resulted from many unsewered communities being sewered and much of the new development being confined to sewered areas. Although bans in some areas have been enforced, problems areas still exist and have increased. The area of major concern within Wood County is largely confined to the urbanizing areas of Lake Township which are outside of sewer districts and in sewered areas where final tie-ins have not been enforced. These areas are specifically include: Tracy Road, Millbury, areas along I-280 and Stony Ridge within the RAP study area (See Figure 18).

Health departments for both Wood and Ottawa Counties have reported problems for individual home sewage disposal systems in areas of shallow rock (less than 4 feet to bedrock) throughout their counties. Improper water well construction and abandoned water wells also cause localized problems affecting ground water.

Table 42 displays the number of septic systems and privies by those minor civil divisions within the AOC for Wood and Ottawa Counties, including 1980 population with forecasted 1990 population and the percent change between these two decades, along with the status of active 201 facility projects as of June 1983. These statistics were taken from Table 6 and Table 11 for Wood County from Table 4 and Table 9 for Ottawa County of the TMACOG publication Home Sewage Disposal Priorities, December 1983 (TMACOG, 1983a).

TABLE 41

LUCAS COUNTY STATISTICS BY MINOR CIVIL DIVISION AND POTENTIAL CONCENTRATIONS OF ON-SITE SYSTEMS

	Septic	Other	1980	1990a	% Chg.	To be Sewered[b]	Sewered
(by Year-Round Housing Units)							
Harbor View Village	52	7	164	154	-6.1	Step 1*	+
Harding Township	188	7	631	639	1.3	Step 1(pt.)*	
Jerusalem Township	1,101	26	3,327	3,376	1.5		
Maumee City	69	5	15,747	16,072	2.1	Step 1*	x
Monclova Township	903	25	4,285	4,467	4.2	Step 1*	
Oregon City	1,396	45	18,675	20,111	7.7	Step 1*	x(pt.)
Ottawa Hills Village	40	7	4,065	4,126	1.5	Step 2*	x
Providence Township	828	20	2,702	2,917	8.0	Step 1 (pt.)*	
Richfield Township							
Berkey Village	96		306	319	4.2		
Twp. balance	347	1	1,095	1,044	-4.5	Step 1 (pt.)*	
Spencer Township	446	36	1,744	1,758	0.8	Step 1 (pt.)*	
Springfield Township							
Holland Village	292	2	1,048	1,139	8.7	Step 1*	
Twp. balance	2,311	37	15,043	17,440	15.9	Steps 1 & 2*	
Swanton Township	975	43	3,379	3,453	2.2	Step 1 (pt.)*	
Sylvania Township							
Sylvania City	191	12	15,527	18,226	17.4		x
Twp. balance	3,844	46	17,534	18,698	6.6	Steps 1,2&3*	x(pt.)
Toledo City	750	426	354,635	336,565	-5.1	Steps 1&2*	x
Washington Township	167	4	4,000	4,159	4.0	Step 3*	x(pt.)
Waterville Township							
Waterville Village	18	—	3,884	4,537	16.8	Step 1*	x
Whitehouse Village	100	1	2,137	2,640	23.5	Step 1*	x
Twp. balance	494	8	1,813	2,030	12.0	Step 1 (pt.)*	

+ = Sewers constructed, but not connected to treatment facility.
a = TMACOG Draft Population Forecast for Lucas County 1985 through 2010.
b = TMACOG Status of Active 201 Facility Projects June 1983.
* = Out of Funding Range to receive USEPA grants in the next five years according to the Northwest District Office Ohio EPA.

1980 Census, STF 3A Table 108 (1980 Census)
(Excerpts from Table 3 and Table 8 - Home Sewage Disposal Priorities, December 1983, TMACOG)

TABLE 42

SEGMENTS OF WOOD AND OTTAWA COUNTIES WITHIN AOC DEALING WITH STATISTICS BY MINOR CIVIL DIVISION AND POTENTIAL CONCENTRATIONS OF ON-SITE SYSTEMS

	Septic	Other	1980	1990a	% Chg.	To be Sewered[b]	Sewered
			(by Year-Round Housing Units)				
WOOD COUNTY:							
Lake Township							
Millbury Village	15	—	955	1,452	52		
Walbridge Village	44	—	2,900	2,941	1.4	under construction	
Twp. balance	1,099	23	7,044	8,306	17.9	Step 3 (pt.)*	x(pt.)
Middleton Township							
Haskins Village	22	—	568	655	15.3		x
Twp. Balance	594	30	1,880	2,409	28.1		
Northwood City	150	37	5,495	6,730	22.5		x
Perrysburg City	60	—	10,215	11,559	13.2	Steps 1&2*0	x
Perrysburg Township	1,325	77	10,651	14,235	33.6	Step 1 (pt.)*	x
Rossford City	8	—	5,978	6,235	4.3	Step 1*	x
Troy Township							
Luckey Village	263	8	895	932	4.1	Step 1*0	
Twp. Balance	861	33	2,663	3,088	16.0	Step 1 (pt.)*	
OTTAWA COUNTY:							
Allen Township							
Clay Center Village	91	6	327	336	2.8	Plan of Study*	
Twp. Balance	878	23	2,995	3,319	10.8	Plan of Study*	
Benton Township							
Rocky Ridge Village	130	3	457	472	3.3		
Twp. balance	667	28	1,989	2,050	3.1		

a = TMACOG Draft Population Forecast for Wood & Ottawa Counties 1985 through 2010, December 1983
b = TMACOG Status of Active 201 Facility Projects June 1983.
* = Out of Funding Range to receive USEPA grants in the next five years according to the Northwest District Office Ohio EPA.
0 = Proceeding without Federal Funds.

1980 Census, STF 3A Table 108 (1980 Census)
(Excerpts from Tables 4, 6, 9 and 11 - Home Sewage Disposal Priorities, December 1983, TMACOG)

ACTIVE AND CLOSED LANDFILLS/DUMPSITES

As reported in the Ground Water Quality Baseline Report (TMACOG, 1982), active and closed landfills and/or dumpsites affect ground water quality. In past years, many dumpsites were created by private companies and local governments. Every political subdivision has had its dumpsite, usually in a low area along a stream just at the edge of its most populated area. These dumps were not designed to prevent leaching of chemicals and liquidized substances into surface waters or ground waters. These dumps are often sources of ground water contamination and are not monitored for their impact. The location of some dumpsites are not even known today and periodically one is found because the buried material has moved upward to the surface, or someone begins to dig a garden, or children find a leachate seep or spring to play in.

Within the past twenty years, the practice has been to site "sanitary" landfills with dependence upon clay soils to prevent leachate problems. They were still sited along a stream applying the trench and fill method, with no consideration that seasonal high water table could be within one to five feet of the surface. Underdraining with leachate collection systems were not required. In many instances during excavation, ground water had to be pumped with collapsible hoses in order to place the solid wastes in a dry trench. Leachate is generated by the infiltration of precipitation and surface runoff.

Past operational permits generally concentrated upon daily cover of the trench. Therefore, information on old sites is at best sketchy due to the fact that monitoring wells were not required. Today, however, monitoring wells and methane venting is required for new sites, or when a new cell is being established at a currently operating landfill.

Only two industrial landfills were identified in the 1981 Ohio EPA Open Dump Inventory. Both are located in the Maumee River Basin. The National Castings Midland Ross Corporation contains a 1 acre onsite landfill that contains only foundry sand. The landfill is 2,500 feet from the Maumee River.

The second site is the Rossford Landfill, a 26 acre parcel located 25 feet from Grassy Creek within the City of Rossford. The city employs the trench method using 10 acres overall. Its use is restricted to Rossford residents and businesses. There is an indication that contaminants are leaching into surface water and the Ohio EPA Northwest District Office believes that the site warrants further investigation. It has no leachate collection system, ground water monitoring plan or methane gas detection system. Depth to seasonal high water table is 1 foot. The Rossford Landfill is under orders to close by January 1991. Ground water monitoring, methane monitoring, etc., will be required as part of these orders.

Although excluded from the Ohio EPA list, there are abandoned ponds on Libbey-Owens-Ford Company property from which leachate is infiltrating Otter Creek via deteriorated sewer lines which run underneath the abandoned site. These grinding sand settling ponds, or lagoons, covered 50 acres and were used to settle fine particles of silica and felt waste products from the polishing and grinding of glass. They were abandoned prior to December 1971 and were covered with a layer of clay and are most likely unlined. It is important to note that no monitoring information from these sites is available for analysis. However, the Ohio EPA Northwest District Office reports that the leachate discharging from the Libbey-Owens-Ford waste glass settling ponds in Rossford contains arsenic.

Licensed Solid Waste Landfills

There are currently seven landfill sites in the AOC which are licensed by its respective local health department to operate. Two of these, the National Castings Landfill and the Rossford Landfill, are discussed above. The other five are described briefly following the table which displays them. These are all listed in Table 43 and displayed in Figure 19.

The Swan Creek and Lake Erie Tributaries basins did not contain any licensed solid waste landfills.

TABLE 43

LIST OF LICENSED SOLID WASTE LANDFILLS

License #	Health Department	Watershed	Landfill	Map #	Status
Maumee River Subwatershed					
48-00-01	Lucas County	Maumee	Fondessy Enterprises* Landfill #1 York St & Otter Creek Rd Oregon, Ohio	A	Closed
48-00-05	Lucas County	Maumee	Westover Landfill 820-920 Otter Creek Rd Oregon, Ohio	B	Closed
48-00-09	Lucas County	Maumee	Toledo Edison Co. Bay Shore Ash Landfill Oregon, Ohio	C	Active
48-01-06	Toledo	Maumee	National Casting Landfill Midland Ross Corp. 1414 East Broadway Toledo, Ohio	E	Active
87-00-01	Wood County	Maumee	Evergreen Landfill Waste Management 2625 E. Broadway Northwood, Ohio	F	Active
87-00-02	Wood County	Maumee	Rossford Landfill 8250 Wales Road Rossford, Ohio	G	Active
Ottawa River Subwatershed					
48-00-06	Toledo	Ottawa	Hoffman Road Landfill 4545 Hoffman Road Toledo, Ohio	D	Active

* = Envirosafe Services of Ohio

Maumee River Subwatershed

Fondessy Landfill

A 135 acre parcel located in the Otter Creek watershed in Oregon is operated as a hazardous waste site by Envirosafe Services of Ohio, Inc. It was first operated as a landfill for solid wastes for municipal and industrial disposal in the 1960's. Since the early 1980's the site has accepted only hazardous waste for disposal. These earlier solid waste cells known as landfill areas 1 and 2 and the Millard Avenue Landfill have no leachate collection system or synthetic liners. Cell F, designed for hazardous wastes, has no synthetic liner but does have a leachate collection system. However, newer cells have both. In November 1981 the Ohio Hazardous Waste Facility Board granted permission to dispose of certain types of hazardous wastes at the site under a Part A Interim Status provision under RCRA.

Two raw water supply lines owned and maintained by the City of Toledo traverse the site. The first of these water lines was installed in 1940, before the facility existed. This line is made of 78-inch coated steel pipe, lying between 11 and 21 feet below the ground surface. The second water line was installed in 1964, using 60-inch precast, prestressed concrete pipe. Together the lines deliver an average of 73 million gallons of water per day to the Collins Park Water Treatment Plant serving over one-half million people in the Toledo metropolitan area. The company maintains monitoring trenches along the water lines.

In 1983, Conversion Systems, Inc., a subsidiary of the IU International Company, acquired the Fondessy facility. The parent company later reorganized to place Fondessy under the management of Envirosafe Services, Inc., which continues to operate the site as a hazardous waste disposal facility. In the spring of 1988, NEOAX, a Hartford, Connecticut firm, acquired more than 90% of the IU International stock.

Westover Landfill

A small parcel permitted to establish operations in the floodplain of Otter Creek, it is now closed. It received municipal wastes from the residents of the City of Oregon and also industrial sludges, solvents, and paint wastes from the Dana Corporation, Johns-Manville, and two refineries, Sun and Standard. A severe leachate problem developed, with a leachate collection system being recently installed. Therefore, seepage only occurs when erosion problems opens an access for it. But erosion control systems are being installed.

Bay Shore Ash Pit

The Toledo Edison Company operates a monofill for its flyash at its location on Bay Shore Road adjacent to Maumee Bay.

Evergreen Landfill

A 265 acre parcel located in the Otter Creek watershed in Northwood, Ohio, was established in the mid-1950's as the Benton Landfill. The site was purchased by Ohio Waste Systems a subsidiary of Waste management in the mid-1970's. In December 1981 the Ohio Hazardous Waste Facility Approval Board granted permission to dispose of certain types of hazardous wastes at the site under a Part A Interim Status provision under RCRA. In November 1985, the company withdrew its application for Part B status, and now only again functions as a solid waste disposal facility. None of the cells at the site have synthetic liners and only recently has a leachate collection system been installed. It has an active methane gas monitoring system, and is working to upgrade its ground water monitoring system. It is Ohio EPA's opinion that no ground water contamination has occurred at this site (Ohio EPA, 1990d).

The Ohio EPA Northwest District Office reports that there is a staff gauge at the Evergreen Landfill. There are unusual water level fluctuations going on in the bedrock wells following storm events. The purpose of the gauge is to record water level rises in the bedrock immediately following the occurrence of rain. This monitor or staff gauge was installed by the United States Geological Survey, Columbus District Office, in connection with the Northwood Investigation of this site. Waste Management is currently conducting an additional investigation of the site. The Evergreen Landfill was granted a new solid waste Permit to Install (PTI) in April 1990 for a new area south of the present areas.

Ottawa River Subwatershed

Hoffman Road Landfill

A 262 acre parcel located south of the Ottawa River within the City of Toledo, with permit approval granted for Phase I in 1974. A second permit was approved in 1983 for above-grade filling to 30 feet, which relates to Area D. Generally, there are four "areas" of construction, with areas "A" and "C" considered above grade fill only, with area "B" consisting of above and below grade fill yet to be constructed. An increase in elevation was submitted in the form of a Permit-to-Install in December of 1986. An Ohio EPA Memo dated April 3, 1987 discusses the hydrogeologic and surface drainage of the site. Briefly, the Memo indicated a problem with high water table showing a mounding effect from filled cells and a discharge effect from excavated cells, and concerns with the relatively higher permeability soils in the upper 20 to 25 feet which indicate the potential for leachate migration. As a consequence of these findings, area "B" will be required to have a leachate collection system, if leachate is detected on the site, or is draining from the site. In addition, a ground water monitoring plan, a methane gas monitoring plan and synthetic liners are required. To date, no ground water contamination has been detected at this site.

Closed Dumpsites

With the assistance of the Northwest District Ohio EPA, the local health departments, the Toledo Environmental Services Division, and TMACOG files, a list of the known landfills and dumps are presented in Table 44 by watershed.

It is as complete a list as possible. Included with the listing is the current known status of each of the sites. Many of the sites need further investigation and remedial action plans to correct problems.

There are 56 known closed dumpsites within the AOC. Each received during its active life different types of wastes, much of it hazardous, and each has different types of problems. Many were located in low areas or floodplains along the Maumee River, the Ottawa River, Swan Creek, Otter Creek, etc. These closed sites are located in Figure 19.

TABLE 44

LIST OF CLOSED DUMPSITES BY WATERSHED

MAP #	WATERSHED	SITE NAME	CURRENT KNOWN STATUS
1	Maumee	Manhattan Dump now known as Miracle Park 2020 Manhattan Blvd. 21-34 acres, closed 1976 Deeded to Toledo in 1976 Site 1 and 2 are now contiguous.	Demolition Dump had underground fires from alumina oxide powder, but no fire hazard today; past leachate migration, none at present; has vegetative cover, but closure status is uncertain.
2	Maumee	Treasure Island Landfill Manhattan, New York & Counter Streets 150 acres, closed 1965	Industrial & Municipal Wastes Had chemical & underground fires; but no fire hazard today; Magnesium was the cause of the fires; has a 6" to 12" clay caps. Planned to become a park.
3	Maumee	South Avenue Dump at the Maumee River 50 acres in low area. Operated 1950 to 1957 - constructed over the fill are the Anderson & Cargill Grain Elevators, Ohio Bell & Kuhlman Concrete	Mixed municipal and industrial wastes with heavy metals and organics. Cargill installed sumps 20 to 30 feet deep in 1983, was discharging to Maumee River, but, holding tanks are being installed in order to treat the discharge. Prior to its use as a dump, these were settling ponds used by Libbey-Owens-Ford. Leachate from these are high in Arsenic.
4	Maumee	NL Industries aka Bunting Brass & Bronze, 715 Spencer 10 acres, 1916 to 1980 currently Eagle-Picher Bearing Co.	Presumed storage of drosses which would contain heavy metals
5	Maumee	Gulf Oil Refinery 2935 Front Street 2.75 acres sediments & sludges, 1953 to 1981 4 acre landfarm 4 separator ponds	Hazardous Wastes - Principal concerns are the landfarm with leaded sludge, followed by weathering area, the landfill and sludge pit areas
6	Maumee	Owens-Illinois, Inc. Libbey Plant 27 940 Ash Street 1883 to present	In 1800s some 10,000 Cu. feet of old furnaces and other waste materials are buried at the site containing arsenic & chromium

(continued)

TABLE 44
(continued)

LIST OF CLOSED DUMPSITES BY WATERSHED

MAP #	WATERSHED	SITE NAME	CURRENT KNOWN STATUS
7	Maumee	Florence Street	Was an open dump
8	Maumee	St. Mary's Street	Was an open dump
9	Maumee	Columbus Street	Was an open dump
10	Maumee	Buckeye Street	Was an open dump
11	Maumee	Mulberry Street	Was an open dump
12	Maumee	Buckeye Basin	Was an open dump
13	Swan	Western Avenue	
14	Swan	Angola Road Mobile Home Park constructed over site	Leachate contains iron
15	Swan	Arlington Avenue	
16	Swan	Swan Creek Landfill Glendale at Swan Creek	Could not be located in the field; may have apartment complex constructed on top
17	Swan	Scott Park	
18	Swan	Holland Village	
19	Swan	Springfield-Monclova Twps.	
20	Swan	Swanton Township	
21	Swan	Providence Township	
22	Swan	Spencer Township	
23	Otter (Maumee)	Sun Oil of Pennsylvania 1819 Woodville Road 1940-1950 tank bottoms contaminated with lead disposed in 37 pits within the dikes of the tank farm.	Contents of 37 pits later excavated and disposed of in onsite landfill adjacent to tank farm; monitoring wells are in place.

(continued)

TABLE 44
(continued)
LIST OF CLOSED DUMPSITES BY WATERSHED

MAP #	WATERSHED	SITE NAME	CURRENT KNOWN STATUS
24	Otter	Union Oil Co. of CA (UNOCAL) 1840 Otter Creek Road Operated as refinery until 1967 when sold to SOHIO, but still operated a petroleum products storage terminal	Concern for tank diked area to retention pond which is for oil and water separation, an NPDES permit is in preparation.
25	Otter (Driftmeyer Ditch)	Heist Corporation 3816 Cedar Point Road In 1981, old oil sludge pit in depressed area filled in.	Problems surfaced again in 1983 with black oily sludge breaking through earth cover; problem corrected but began oozing again in 1985 - no known offsite discharge currently
26	Otter (Maumee)	British Petroleum (BP) 4100 Cedar Point Road 1970s start of 5 acre landfarm for sludges, emulsions; leaded tank bottoms buried in small pits within tank farm.	Monitoring operation in place; all stormwater is collected and treated.
27	Otter	Westover 820 Otter Creek Road Municipal wastes, industrial	Leachate collection system recently installed and erosion control system being developed sludges, solvents & paint wastes
27A	Otter	Gradel Landfill (Old Westover Landfill) 1150 Otter Creek Rd. municipal, industrial, commercial wastes accepted from 1969-1975. After closure, site purchased by Commercial Oil Services, Inc.	A pond way excavated atop the landfill, which induces leachate production; analytical results on leachate samples show elevated aluminum, ammonia-nitrogen and traces of organic pesticides.
28	Otter (Maumee)	Fondessy Landfill #1 site west of Otter Creek Rd. demolition wastes	Monitoring operation to be expanded
29	Ten Mile	King Road Landfill 3535 King Road, 44 acres Operated by Lucas County from 1954 to 1976	Potential ground water contamination from leachate migration containing metals--chromium, lead, enforcement action pending

continued

TABLE 44
(continued)
LIST OF CLOSED DUMPSITES BY WATERSHED

MAP #	WATERSHED	SITE NAME	CURRENT KNOWN STATUS
30	Ottawa	Owens-Illinois, Inc. Technical Center 1700 North Westwood On-site Landfill	Chromium and lead sludges; test borings performed show no contamination discovery.
31	Ottawa	Owens-Illinois, Inc. Hilfinger Site 1800 North Westwood Hilfinger landfilled on-site electroplating & metal finishing wastes Closed in late 1970s.	Soil had been contaminated by heavy metals-chromium, arsenic, cadmium, nickel, zinc. Clean up completed with polyethylene liner and monitoring wells. Currently a parking lot.
32	Ottawa	South Cove Blvd.	
33	Ottawa	Willys Park	Part of North Cove Blvd. AMC investigation
34	Ottawa	Joe E. Brown Park Manhattan Blvd.	Presently a ball field
35	Ottawa	North Cove Landfill North Cove & Drexel Dr. Operated by AMC as landfill from 1941 to 1970. Industrial residues i.e. solvents & sludges, now owned by the Chrysler Corp.	During installation of a sanitary sewer west of site in 1979, hydrocarbon fumes were encountered. Ground water sampling performed indicating presence of hydrocarbons and low boiling solvents. Chrysler, ODOT, and Toledo are planning to conduct a remedial investigation/ feasibility study.
36	Ottawa	Sheller-Globe Corp., Armored Plastics, Lint & Dura Avenues Approx. 100 drums of Paint Residues disposed	Solvent portion believed to have evaporated leaving only residue.
37	Ottawa	Tyler Street Dump Operated by City of Toledo, located end of Tyler St. north of Ottawa River Municipal & industrial wastes	Leachates to Ottawa River

(continued)

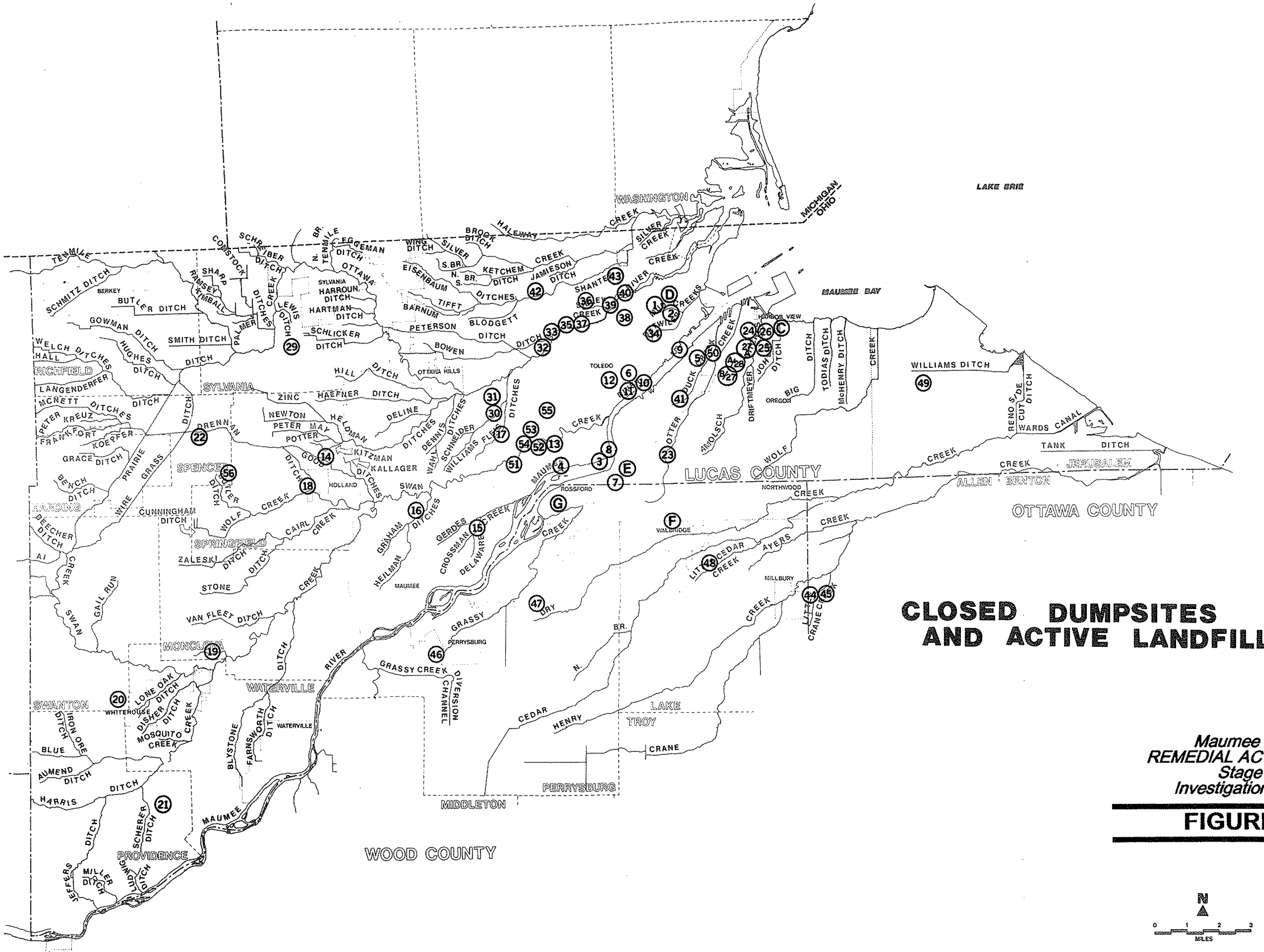
TABLE 44
(continued)
LIST OF CLOSED DUMPSITES BY WATERSHED

MAP #	WATERSHED	SITE NAME	CURRENT KNOWN STATUS
38	Ottawa	Stickney Avenue Landfill Owned by American Motors Corp. located southeast of Ottawa River Industrial wastes i.e. solvents & sludges	Leachates to Ottawa River composed of low conventional pollutants and organics
39	Ottawa	Dura Dump, 70 acres Operated by City of Toledo Located northwest of river Municipal, Industrial and Demolition Wastes - Opened 1952, closed 1980.	Leachates to Ottawa River containing PCBs, organics. Under investigation with a remedial action plan being developed. Enforcement is pending.
40	Ottawa	DuPont Waste Lagoon Matzinger Road 2% formaldehyde solution	Lagoon filled in. Site drainage patterns unknown, but no discharge to river.
41	Duck Creek (Maumee)	Consul Street Dump Operated by City of Toledo from 1948-1966, now site of Parkway Mobile Home Park solvents & paint sludges	Leachate collection system to sanitary sewer; water table within 6 feet of surface Methane Gas Venting; ongoing Ohio Dept of Health Study
42	Silver/ Shantee (Maumee Bay)	Jackman Road	Was an open dump
43	Silver/ Shantee (Maumee Bay)	NL Industries/Doehler-Jarvis/Farley Metals Inc. Toledo, Ohio	Past on-site storage for Plating Sludges 5400 N. Detroit Avenue
44	Crane (Lake Erie Tributary)	Millbury Village	Leachate problem; solid wastes Site 44 & 45 may be the same site.
45	Crane (Lake Erie Tributary)	Asman Dump St. Rt. 795 & Fostoria Rd.	Leachate problem; solid and hazardous waste
46	Grassy (Maumee)	Perrysburg Township	
47	Grassy (Maumee)	Perrysburg City St. Rt. 795 & Glenwood Rd.	

(continued)

TABLE 44
(continued)
LIST OF CLOSED DUMPSITES BY WATERSHED

MAP #	WATERSHED	SITE NAME	CURRENT KNOWN STATUS
48	Cedar (Lake Erie Tributary)	Walbridge-Lake Township	
49	Wolfe (Maumee Bay)	Jerusalem Township	
50	Duck	Oregon, Millard Ave. Overpass route, west of Duck Creek	PAHs from coal tars found in soil 6 to 15 feet deep. May be from waste material dumped from Coal Gas Reservoir once located at York and Front Streets.
51	Swan	Swan Creek near South Ave. at Woodsdale Bethel Lutheran Church	Old dump of household wastes and demolition debris. Church built on top of the dumpsite in 1953.
52	Swan	1401 to 1463 Western Ave Swan Creek	Household and Commercial wastes; closed in 1930
53	Swan	Chester Street to Swan Creek	Household and Commercial wastes; operated from 1948 to 1955
54	Swan	Louie Street to Swan Creek	Household and Commercial wastes; operated from 1920 to 1955
55	Swan	Swan Creek, south bank and west of Champion Street to the creek	Household and Commercial wastes; about 10 acres; operated from 1945 to 1950
56	Swan (Drennan or Butler Dt)	Irwin Road (west side) north of Angola Road)	Household and Commercial wastes; five acre site; 1948-1952 or longer
57	Little Cedar Creek	Wood County WWTP, 5555 Woodville Road at Walbridge/Matthews Rds.	Three transformers containing PCBs buried at site of former sewage treatment plant.
58	Maumee	Old Peanut Hill Dump: Oak St near Akron, Oaklawn & Richford streets, East Toledo	Low area filled in ca. 1920-40 Houses built on-site in 1950s. Materials dumped are unknown.



CLOSED DUMPSITES AND ACTIVE LANDFILLS

Maumee River
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FIGURE 19

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

Pits, Ponds and Lagoons

The Ohio EPA conducted a statewide assessment and inventory of surface impoundments during 1978 and 1979. The purpose was to determine their polluting effect upon underground drinking water sources. This project was referred to as the Surface Impoundment Assessment (SIA). By definition, surface impoundments include any earthen pond, pit or lagoon used for the storage, treatment or disposal of wastewaters and other fluids related to industrial, municipal, agricultural, mining, and oil and gas related activities.

With the assistance of the Northwest District Ohio EPA, TMACOG examined the SIA file for the Counties of Lucas, Wood and Ottawa. A list of the known pits, ponds and lagoons as listed in this SIA file are presented in this section by watershed in Table 45. Included with the listing is the Map #, watershed name, Facility Identification No., the number of impoundments at the site, the purpose of the impoundment, the age of the facility at the time of the survey, the size of impoundments, the recorded gallons per day if known, and the scored ground water contamination potential rating (GWCPR). The highest ground water contamination potential rating a site could receive is "29" while the lowest is "1". The NPDES number is also included if such number had been assigned.

There are 36 sites which include some 68 impoundments within the AOC. None of the impoundments as shown in the SIA file were lined by today's standards, nor were monitoring wells in place for water quality sampling purposes. Generally, this ten year old SIA file indicated that it was "unknown" whether the impoundment had an adverse affect by seepage to water quality of drinking water wells in the area. The SIA was based on a file review by Ohio EPA. The ground water contamination potential ratings were not based on field observations. A map (Figure 20) displaying these impoundment sites follows the table.

TABLE 45

LIST OF IMPOUNDMENTS BY WATERSHED

MAP #	WATERSHED	FACILITY IDENT. #	SIA FILE STATUS	GWCPR
1	Maumee	09581858MUN00236 NPDES OH003719 Waterville Water Treatment 16 North Second Street Waterville, OH 43566	(SIC 4941) 1 impoundment; waste storage sludge; 4 years; 0.03 acres	13
2	Maumee	09581858IND00274(SIC 3222) NPDES OH0002631 Johns-Manville Products Corp. 6055 River Road Waterville, OH 43566	(SIC) 3 impoundments; wastewater stabilization; 13 years; 0.12 acres, total - 0.35 acres; 120,000 gallons/day	17
3	Maumee	09581858IND00275 NPDES OH0054011 Johns-Manville Products Corp. U.S. 24 & Dutch Road Waterville, OH 43566	(SIC 3222) 3 impoundments; wastewater stabilization; 13 years; 0.15 acres, total - 0.5 acres; 36,000 gallons/day	6
4	Maumee	09577000IND00866 Consolidated Dock, Inc. Western Division 636 Paine Avenue Toledo, OH 43605	(SIC) 1 impoundment; wastewater retention; 3 years; 0.06 acres Note from SIA file: stormwater runoff = salt piles, coal, slag, etc.	19
5	Maumee	09577000IND00207 NPDES OH0002810 Gulf Oil Co. U.S. Div. Gulf Oil Corp. 2935 Front Street Toledo, OH 43697 (Ceased operation)	(SIC 2911) 4 impoundments; waste treatment settling; 15 years; 0.5 acres, total - 1.0 acres; 864,000 gallons/day	16
6	Maumee Bay	09558730IND00239 NPDES OH0002925 Toledo Edison Co. 4701 Bay Shore Road Oregon, OH 43616	(SIC 491) 3 impoundments; wastewater settling; 4 years; 31 acres, total - 50 acres; 3,100,000 gallons/day	17

(continued)

TABLE 45
(continued)
LIST OF IMPOUNDMENTS BY WATERSHED

MAP #	WATERSHED	FACILITY IDENT. #	SIA FILE STATUS	GWCPR
7	Maumee Bay	09558730MUN00244 NPDES OH0041815 Oregon Water Supply 935 North Curtice Road Oregon, OH 43616	(SIC 4941) 1 impoundment; waste storage of sludge; 18 years; 1.5 acres	18
8	Swan	09584770IND00863 American Can Co. 10444 Waterville-Swanton Rd. Whitehouse, OH 43571	(SIC 3411) 1 impoundment; wastewater retention; 4 years; 0.5 acres; 30,000 gallons/day	17
9	Otter	17341328IND00225 NPDES OH0002453 Libbey-Owens-Ford Co. 811 Madison Avenue Toledo, Ohio 43624 1701 East Broadway Toledo, OH 43605	(SIC 3211) 4 impoundments; waste treatment settling; 30 years; 21 acres, total - 67 acres LAST YEAR OF OPERATION 1966 Note from SIA file- Abandoned & capped(with clay) "sand ponds" with leachate problems, LOF pond "J".	16
10	Otter	09577000IND00226 NPDES OH0002453 Libbey-Owens-Ford Co. 1701 East Broadway Toledo, OH 43605 (Ceased operation)	(SIC 3211) 2 impoundments; waste treatment settling; 6 years; 7.5 acres, total - 19.5 acres	14
11	Otter	09577000IND00206 NPDES OH0002763 Sun Oil Co. of Penn. Toledo Refinery P.O. Box 920 Toledo, OH 43693	(SIC 2911) 3 impoundments; waste treatment equalization; 29 years; 7.5 acres, total - 8.5 acres; 3,600,000 gallons/day	16
12	Otter	09577000IND00894 NPDES OH0058581 Phillips Petroleum Co. 275 Millard Avenue Toledo, OH 43605	(SIC 3624) 4 impoundments; wastewater settling; 10 yrs; 0.26 acres, total - 1.04 acres	13

(continued)

TABLE 45
(continued)
LIST OF IMPOUNDMENTS BY WATERSHED

MAP #	WATERSHED	FACILITY IDENT. #	SIA FILE STATUS	GWCPR
13	Otter	0957700IND00892 C.H. Heist Corp. 3805 Cedar Point Road Toledo, OH 43694	(SIC 299) 3 impoundments; waste storage; 7 years; 0.03 acres, total - 0.09 acres	14
14	Otter	09558730IND00223 NPDES OH0058629 Commercial Oil Services, Inc. 3600 Cedar Point Road Oregon, OH 43616 (Ceased operation)	(SIC 2999) 3 impoundments; waste disposal; 13 years; 0.18 acres, total - 1.43 acres	18
15	Otter	09558730IND00865 Bills' Road Oil Services 3500 York Street Oregon, OH 43616	(SIC 2899) 2 impoundments; waste disposal; 9 years; 0.12 acres, total - 0.25 acres	17
16	Otter	09558730IND00249 NPDES OH0053864 Fondessy Enterprises, Inc. 876 Otter Creek Road Oregon, OH 43616	(SIC 2999) 1 impoundment; waste disposal; 11 years; 1.2 acres	17
17	Otter	09577000IND000208 NPDES OH0002461 Standard Oil of Ohio Toledo Refinery P.O. Box 696 Toledo, OH 43694	(SIC 2911) 2 impoundments; waste storage oil sludge; 33 years; 2 acres, total - 10 acres	16
18	Ten Mile	09576022IND00278 NPDES OH0058521 Northern Ohio Asphalt Paving 7920 Sylvania Avenue Sylvania, OH 43460	(SIC 2952) 1 impoundment; wastewater settling; 2 years; 0.25 acres; 144,000 gallons/day	17
19	Ten Mile	09572452IND00276 NPDES OH0033715 Medusa Cement Co. P.O. Box 310 Silica Plant Sylvania, OH 44350	(SIC 3241) 1 impoundment; wastewater settling; 6 years; 0.25 acres; 500,000 gallons/day	15

(continued)

TABLE 45
(continued)
LIST OF IMPOUNDMENTS BY WATERSHED

MAP #	WATERSHED	FACILITY IDENT. #	SIA FILE STATUS	GWCPR
20	Ottawa	09577000IND00233 Cleveland Metal Abrasive Co. 2351 Hill Avenue Toledo, OH 43607	(SIC 3291) 1 impoundment; waste treatment settling; 6 years; 0.03 acres; 460,800 gallons/day. Note from SIA file - 2 cell settling - av. flow value is design flow.	16
21	Ottawa	09577000IND00864 Incorporated Crafts, Inc. 3905 Stickney Avenue Toledo, OH 43608	(SIC 2899) 2 impoundments; waste disposal; 14 years; 1.5 acres, total - 3 acres	17
22	Ottawa	09577000IND00891 Royster Co., Inc. Creekside Avenue P.O. Box 6986 Toledo, OH 43612	(SIC 2875) 1 impoundment; waste water retention; 28 years; 2 acres. Note - surface runoff pond was developed to collect discharge.	15
23	Duck	09577000MUN00249 NPDES OH0030759 Toledo Water Treatment Plant 600 Collins Park Avenue Toledo, OH 43605	(SIC 4941) 2 impoundments; waste storage sludge; 26 years; 16 acres, total - 48 acres	16
24	Duck	09537478IND00277 NPDES OH0003000 Norfolk & Western Railway Ironville Yard 2750 Front Street Toledo, OH 43605	(SIC 4011) 1 impoundment; wastewater retention; 8 years; 0.5 acres	18
25	Duck	09577000IND00895 Westway Trading Corp. Ind Molasses Division Box 186, Station A 431 John Q. Carey Drive Toledo, OH 43605	(SIC 2875) 2 impoundments	

(continued)

TABLE 45
(continued)
LIST OF IMPOUNDMENTS BY WATERSHED

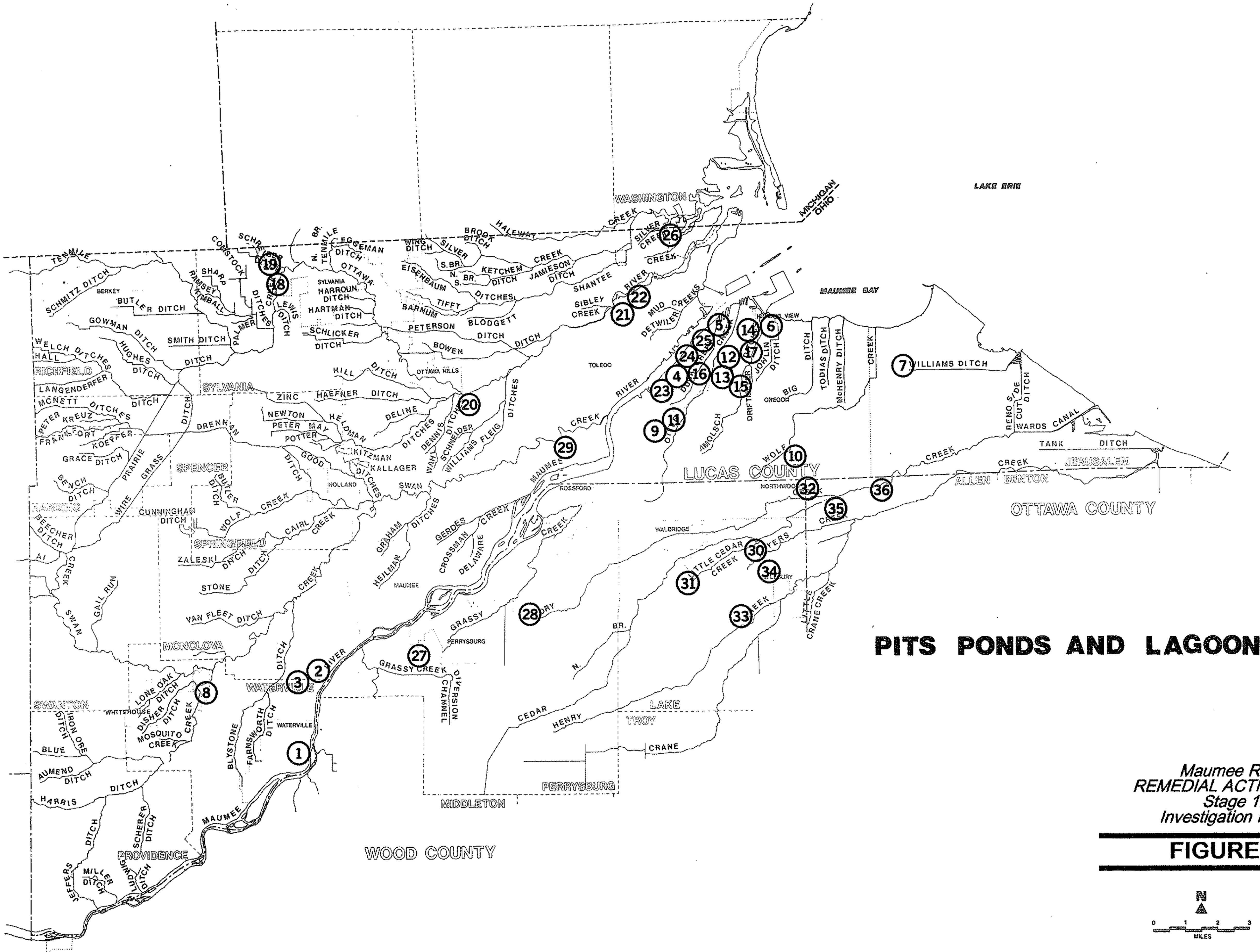
MAP #	WATERSHED	FACILITY IDENT. #	SIA FILE STATUS	GWCPR
26	Silver/ Shantee	09577000IND00234 NPDES OH0002640 General Motors Corp. 1455 West Alexis Road Toledo, OH 43612	(SIC 3714) 1 impoundment; waste treatment retention; 20 years; 0.75 acres; 100,000 gallons/day	18
27	Grassy	17362148IND00217 NPDES OH0003107 Owens-Illinois, Inc. P.O. Box 1035 Toledo, OH 43601 25875 U.S. Route 25 Perrysburg, OH 43551	(SIC 2893) 1 impoundment; waste treatment polishing; 12 years; 7 acres; 20,000 gallons/day. <u>Note from SIA file</u> - old DOT borrow pit - age uncertain.	14
28	Cedar/ Crane	17343610IND00876 NPDES OH0003573 Maumee Stone Co. Perrysburg Plan 8812 Fremont Pike Perrysburg, OH 43551	(SIC 1422) 4 impoundments; wastewater settling; 14 years; 0.5 acres; 138,000 gallons/day	23
29	Maumee	17351114IND00228 NPDES OH0057835 Penn Central Transportation 6 Penn Center Philadelphia, PA 19103 Stanley Diesel Shop 435 Emerald Avenue Toledo, OH 43602	(SIC) 1 impoundment; wastewater retention; 25 years; 7 acres; 5,000 gallons/day. <u>Note from SIA file</u>- old borrow pit, age unknown.	18
30	Cedar/ Crane	17380486IND00227 NPDES OH0002488 Chesapeake & Ohio Railway Co. P.O. Box 1800 Huntington, WV 25718 Walbridge, OH 43465	(SIC) 1 impoundment; wastewater retention; 9 years; 0.12 acres; clay liner	15
31	Cedar/ Crane	17341328IND00910 NPDES OH0003212 Burndy Corporation Richards Avenue Norwalk, OH 06856 Toledo Facility P.O. Box 817 Toledo, OH 43601	(SIC 3471) 1 impoundment; waste treatment retention; 11 years; 0.25 acres; 65,000 gallons/day. Ceased operation in 1976	17

(continued)

TABLE 45
(continued)
LIST OF IMPOUNDMENTS BY WATERSHED

MAP #	WATERSHED	FACILITY IDENT. #	SIA FILE STATUS	GWCPR
32	Cedar/ Crane	17357190IND00880 Hirzel Canning Co. 411 Lemoyne Road Toledo, OH 43616	(SIC 2033) 3 impoundments; wastewater aerated; 11 years; 1.25 acres, total - 3.75 acres; 30,000 gallons/day	16
33	Cedar/ Crane	1735020IND00908 Standard Oil Co. of Ohio 1800 L. Midland Bldg. Cleveland, OH 44115 I-280 & S.R. 795 Millbury, OH 43447	(SIC 299) 1 impoundment; waste treatment retention; 3 years; 0.02 acres; bentonite modified liner	15
34	Cedar/ Crane	17350260IND00229 NPDES OH0003221 Molnar Packing Co. Pemberville Road Millbury, OH 43447	(SIC 2011) 1 impoundment; wastewater aerated; 7 years; 1.2 acres; 7,050 gallons/day. Note from SIA file - two celled lagoon.	13
35	Cedar/ Crane	12301322IND00231 NPDES OH0003425 Permaglass Div. Guardian Industries Routes 51 & 795 Millbury, OH 43447	(SIC 0321) 1 impoundment; waste treatment biologic; 9 years; 2.3 acres; 30,000 gallons/day	13
36	Cedar/ Crane	12319736IND00210 NPDES OH0002755 Stokely-Van Camp, Inc. 941 N. Meridan Street Indianapolis, IN 46206 at Curtice, OH 43412 (Ceased operation)	(SIC 2033) 2 impoundments; waste treatment aerated; 26 years; 2.5 acres, total - 4.4 acres; range 150,000 to 269,000 gallons/day. CEASED OPERATION IN 1979 Note in SIA file - 2 lagoons inventoried, but 2nd lagoon partitioned to form 2 for a total of 3 lagoons.	17

PITS PONDS AND LAGOONS



Maumee River
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FIGURE 20

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

Water Quality Impacts

The Subcommittee's greatest concern deals with the Dura Dump, the LOF Grinding Sand Settling Ponds, and the King Road Landfill. Of obvious concern, too, are the wall-to-wall dumps once sited in the floodplains of the Ottawa River. The various closed sites have degrading impacts on water quality as shown when analyzing the Ohio EPA Water Quality Data Summary conducted during the summer of 1986.

The headwaters of the Ottawa River start in Michigan and flow through western Lucas County where it is known as the Ten Mile Creek. Upstream of the King Road Landfill at River Miles 5.2 and 5.1 (Centennial Road) the water quality is considered good, the primary influence being agriculture. The Dissolved Oxygen is 5.2 to 9.7 mg/l. Metals are near or below the detection limit, as are phenolic samples.

The King Road Landfill is located below River Miles 4.1 where water quality is considered fair to marginally good. This site was closed in 1976, with leachate problems developing in 1972. Heavy metals flowing from the site caused Lucas County to provide a municipal water line to those homes whose water wells were contaminated. Midwest Environmental Consultants has prepared an environmental assessment for the site, and has made recommendations for further investigations. Existing conditions at the site include loose garbage on the surface, insufficient grade, ponding of water, and serious erosion in many areas.

The North Cove Landfill site along the banks of the Ottawa River at River Mile 8.7, was formerly owned by American Motors. It operated from 1941 until 1970 where industrial residues were disposed of. During the installation of a sanitary sewer west of the site in 1979, hydrocarbon fumes were encountered. Ground water sampling was performed and indicated the presence of hydrocarbons and low boiling solvents. A site assessment was done for the landfill and a remedial investigation/feasibility study is to be conducted by AMC.

Lake Erie dilutes the polluted Ottawa River up to 4.9 miles from the mouth. The Dura, Stickney and Tyler dumps all owned by the City of Toledo, are located along the Ottawa River wherein a lake estuary effect takes place. Also in the vicinity are three Combined Sewer Overflows, and discharges from DuPont and AMC. Leachate samples from the Stickney Avenue site contain low to moderate levels of conventional pollutants and very low levels of organic priority pollutants.

At the Dura Dump the leachate contains high BOD, COD and organics. Among these organic chemicals are PCBs. The range of concentration of PCBs in the Ottawa River Sediment from sampling taken October 1986 is 0.86 to 9.7 parts per million. One sample taken from the river bank was as high as 135 parts per million. The six leachate seeps to the Ottawa River have been modeled to be 54,700 gallons per day. The City of Toledo has initiated a Remedial Investigation/Feasibility Study being conducted by URS Corp. Actions have been implemented to control leaching and runoff at the site. Clean up costs have been estimated to be $40 million.

The degradation of Otter Creek is directly related to the LOF site. At River Mile 5.9 (Oakdale Street) downstream of the LOF site, the Dissolved Oxygen is 1 mg/l, pH ranges from 8.6 to 10.2; Arsenic is 350 ug/l; Copper ranges from 17 to 30 ug/l. The water quality is considered to be very poor. Only upstream at River Mile 7.2, where Otter Creek is a small ditch-like stream, is the water quality considered to be fair.

At River Mile 5.7 (Pickle Road) there are noxious smelling chemicals, a reddish brown flocculent, hydrogen sulfide, etc., with the stream and banks at River Mile 4.0 (Wheeling Street) being oil soaked, with nickel and cyanide also being detected. The Sun Oil Refinery discharge is upstream at this point. At River Mile 2.1 (Millard Avenue), while the water quality is still degraded, it is slightly improved due to the Lake effect on Otter Creek. It is important to remember that Evergreen, Fondessy, and Westover sites each have leachate collection systems in place.

The ten dumpsites on Swan Creek do not appear to have severe water quality impact but this may be due to lack of thorough investigation of sediments and fish sampling.

For the Maumee River, the Ohio EPA Northwest District Office reports that Jennison-Wright (J-W) has entered into a consent decree with OEPA on February 4, 1987. Pursuant to the terms of this agreement J-W has prepared a Remedial Investigation Work Plan (utilizing Woodward Clyde Consultants). This work plan was approved, with conditions by OEPA on January 27, 1988. The RI is designed to provide a data-base for determining the best remediation alternative and extent of contamination.

Storm, sanitary, and treated process waters flow from the 26 acre site, located at 2332 Broadway, into the municipal sewer system. A 12" overflow from the city sewer flows through the J-W property into the Maumee River. The office parking lot, at 3463 Broadway, borders the Maumee's west bank. Contamination and remediation alternatives will be addressed by the RI/FS for this also.

RCRA Facilities

Hazardous waste regulations are implemented by Ohio EPA's Division of Solid and Hazardous Waste Management, and cover generation, storage, transportation, and treatment or disposal of hazardous wastes as defined in RCRA and the 1984 Hazardous and Solid Waste Amendments. Ohio's hazardous waste regulations were passed in 1980. Permits to operate hazardous waste facilities are issued by the Ohio Hazardous Waste Facility Board with monitoring and enforcement of the regulations being carried out by Ohio EPA.

Within the area of concern there are 13 different RCRA facilities licensed to operate as shown in Table 46. However, the Evergreen Landfill, operated by Ohio Waste Systems, a subsidiary of Waste Management, did operate as a hazardous waste facility until November 1985. The Fondessy Landfarm (Fondessy Enterprises Site #2) has not received refinery sludges for well over one year, with Ohio EPA recommending that the site be closed due to seasonal high water table and other problems.

TABLE 46

LIST OF RCRA FACILITIES

OHD #	Name	Address	
OHD045245271	Cast America Products	4243 South Ave.	43615
OHD005041843	E.I. DuPont deNemours	1930 Tremainsville	43613
OHD045243706	Fondessy*	876 Otter Creek Rd.	43616
OHD000721415	Fondessy* Landfarm Site #2	Cedar Point & Wynn	43616
OHD980279376	Texileather	3729 Twining St.	43608
OHD005562020	Owens-Illinois Tech. Center	1700 N. Westwood	43607
OHD980586804	XXKem	3903 Stickney Ave.	43608
OHD018354894	Sheller-Globe Corp.	Lint & Dura Aves.	43612
OHD063717565	Sheller-Globe Corp.	4444 N. Detroit Ave.	43612
OHD005057542	British Petroleum (BP)	Cedar Point Road	43614
OHD043642958	Luckey Beryllium	212 Luckey Road	43443

* = Now Envirosafe

Status of Superfund Sites

There are no designated Superfund sites in the AOC at this time (i.e., no sites have been included in the National Priority List under Superfund/CERCLA). All the preliminary assessments have been conducted for the sites listed in the following table. This is the first step in potential Superfund listing. Those sites listed in the Table 47 have the possibility of being named hazardous waste sites. All the sites listed are considered unregulated sites and each has been ranked high (H), medium (M), Low (L), or no priority (0).

The Ohio EPA Northwest District Office reports that Allied Automotive Toledo Stamping, Owens-Illinois (Hilfinger), Phillips Petroleum, and Webstrand sites have undertaken clean-up efforts. In cases where responsible companies can be identified, the EPA will try to get funding for cleanup from the businesses involved. The list of possible hazardous waste sites was compiled because of the federal Superfund Law, which required each company to report its hazardous waste activities of the past. The list not only includes these sites, but also sites reported by residents and anonymous tips.

Table 47 includes the U.S. EPA assigned number, the site name and address where known, the U.S. EPA Federal Investigation Team (FIT) ranking, and the Ohio EPA priority ranking. The actual list of potential problem sites is known as CERCLIS.

TABLE 47

POSSIBLE HAZARDOUS WASTE SITES

OHD #	Name and Address	FIT	Ohio EPA
OHD980678379 348-0024	Allen Charles Waste Removal Address Unreported (Transporter) Toledo 99999	L	L
Not Assigned 348-1027 Not on CERCLIS	Allied Automotive Toledo Stamping Fearing Blvd. Toledo 99999	--	--
OHD980823801 348-0045	Anderson's 439 Illinois Avenue Maumee 43537	M	L
Not Assigned 348-1029 Not on CERCLIS	Champion Spark Plug 900 Upton Avenue 43607 Toledo	--	--
OHD980611636 348-0175	City Owned Dump (AMC, North Cove) Foot of Drexel Dr. I-75 & Cove Toledo 43610	--	H
OHD000816843 348-0197	Commercial Oil Service, Inc. 3600 Cedar Point Road Oregon 43616	--	--
OHD980826119 348-0200	Consul Street Landfill 2510 Consul Street Toledo 43624	O	L
OHD043636463 348-0207	Coulton Chemical 6600 Sylvania Road Sylvania 43560	--	--
OHD020260188 348-0208	Coulton Chemical Corp. 1400 Otter Cheek Road Oregon 43616	L	L
OHD068081595 348-0211	Cousins Waste Management 2611 W. Center Toledo 43609	L	L

(continued)

TABLE 47
(continued)
POSSIBLE HAZARDOUS WASTE SUPERFUND SITES

OHD #	Name and Address	FIT	Ohio EPA
OHD986967800 348-1158	Dial Corporation 6120 N. Detroit Ave. Toledo 43612	--	--
OHD990777930 348-0248	DuPont E.I. deNemours & Co., Inc. Matzinger Rd., P.O. Box 6568 Toledo 43612	L	M
Not Assigned 348-1031 Not on CERCLIS	Erie Coatings 600 S. Hawley Toledo 99999	--	--
OHD980613640 348-0286	Essex Group, Inc. 5101 Telegraph Road Toledo 43612	O	O
OHD045243706 348-0303	Fondessy 876 Otter Creek Road Oregon 43616	L	H
Not Assigned 348-1148 Not on CERCLIS	Front St--Millard Ave. Millard Avenue Toledo/Oregon 99999	--	--
Not Assigned 348-1034 Not on CERCLIS	Greise Brothers 600-1 Bassett Street Toledo 99999	--	--
OHD005052410 348-0365	Gulf Oil Co., Toledo Refinery 2935 Front Street Toledo 43697	M	M
OHD000608695 348-0367	Gulf Oil Toledo Terminal 2774 Front Street Toledo 43605	--	--
Not Assigned 348-1032 Not on CERCLIS	Harrison Junkyard 10259 Dorr St. Spencer Twp. 99999	--	--
OHD981097157 348-0385	Heist Cleaning Service 3804 Cedar Point Road Oregon 43616	L	M

(continued)

TABLE 47
(continued)
POSSIBLE HAZARDOUS WASTE SUPERFUND SITES

OHD #	Name and Address	FIT	Ohio EPA
OHD000605295 348-0441	King Road Lucas County San. 3535 King Road Toledo 43617	M	M
OHD000817114 348-1166	Koppers 2563 Front Street Toledo 43605	--	--
OHD005050349 348-0463	Libbey-Owens-Ford Co., Plants 4 & 8 1769 E. Broadway Toledo 43605	--	--
OHD981529092 348-0482	Manhattan Dump 2020 Manhattan Blvd. Toledo 43612	L	L
OHD980615801 348-0502	Maston Septic Service 7202 Providence Whitehouse 43571	O	L
OHD980704381 348-0503	Matlack Trucking Co. 1728 Drouillard Road Toledo 44309	L	L
OHD005045992 348-0568	NL Industries 5400 N. Detroit Avenue Toledo 43612	L	L
OHD005051180 348-0569	NL Industries, Inc. Bearings Div. 715 Spencer Street Toledo 43609	L	L
OHD000720268 348-0576	North American Car Corp. 4545 Hoffman Road Toledo 43611	O	L
OHD980679427 348-0588	Oberly Ray DSPL 3812 Twining Street Toledo 43608	O	L
OHD9806159344 348-0589	Oberly Robert Waste Removal 3903 Stickney Toledo 43608	L	L

(continued)

TABLE 47
(continued)

POSSIBLE HAZARDOUS WASTE SUPERFUND SITES

OHD #	Name and Address	FIT	Ohio EPA
OHD980991798 348-0616	Owens Illinois Hilfinger 1800 N. Westwood Avenue Toledo 43606	M	M
OHD005034459 348-0621	Owens-Illinois Libbey Plant 27 940 Ash Street Toledo 43611	L	L
OHD005562020 348-0622	Owens-Illinois Tech. Center 1700 N. Westwood Avenue Toledo 43607	L	L
OHD980901276 348-0633	Phillips Petroleum Property Front St. & Millard Ave. Toledo 43605	L	L
OHD018354894 348-0730	Sheller-Globe Corp. Cy Auto Stamping Div. Lint & Dura Avenue Toledo 43612	L	M
OHD005057542 348-0767	Standard Oil Co. (Ohio) Lallendorf & Cedar Point Road Oregon 43616	0	L
OHD005046511 348-0781	Sun Oil Co. Of Pennsylvania 1819 Woodville Road Oregon 43616	L	L
OHD980679419 348-0787	Swan Creek Landfill Glendale Avenue Toledo 43614	L	L
OHD000605956 348-0812	Toledo City of Stickney Ave. Dspl. Site 3900 Stickney Avenue Toledo 43612	M	H
OHD980611685 348-0813	Toledo Edison Co. Coke Oven Gas Line Front & Cherry Streets Toledo 43652	L	L
OHD980509905 348-0814	Toledo Ldfl. City of Aka Dura San Ldfl Dura Ave. Toledo 43612	L	M

(continued)

TABLE 47
(continued)
POSSIBLE HAZARDOUS WASTE SUPERFUND SITES

OHD #	Name and Address		FIT	Ohio EPA
OHD980611677 348-0815	Toledo Powdered Metal Cross Street Toledo	43623	L	L
OHD980510499 348-0816	Toledo Sewage Disposal Plant Bay View Park Toledo	43611	L	L
OHD980611305 348-0818	Treasure Island Landfill Counter & Kalamazoo & York Sts. Toledo	43611	M	M
OHD980510523 348-0829	Tyler Street Dump Tyler St. Toledo	43612	Y	M
OHD005055777 348-0839	Union Oil Co., Toledo Refinery 1840 Otter Creek Road Oregon	43616	L	L
OHD980510580 348-0918	W/S Ave. Toledo Mun San Landfill South Ave & Maumee River Toledo	43615	L	M
OHD981525710 348-0895	Webstrand Corp. 525 Hamilton Street Toledo	43602	L	L
OHD000606368 348-0901	Westover Corp. San Landfill 820-920 Otter Creek Road Oregon	43616	M	M

(continued)

TABLE 47
(continued)
POSSIBLE HAZARDOUS WASTE SUPERFUND SITES

OHD #	Name and Address		FIT	Ohio EPA
OHD005044128 387-0033	American Cyanamid Co. 12600 Eckel Road Perrysburg	43551	O	O
OHD980610935 387-0071	Asman's Landfill Rt. 795 & Fostoria Road Millbury	43447	M	M
OHD041350323 387-0167	Chrysler Corp. Toledo Machining Plant 8000 Chrysler Drive Perrysburg	43551	L	L
OHD087050019 387-0190	Coastal Tank Lines 6622 SR-795 Walbridge	43465	L	L
OHD068111327 387-0294	Evergreen Landfill 6525 Wales Road Northwood	43619	L	M
OHD981529084 387-0454	Lake Township Dump Hanley Road & Cummings Road Walbridge	43465	L	L
OHD005050406 387-0462	Libbey-Owens-Ford Co. Plant 6 140 Dixie Hwy. Rossford	43460	L	L

Some of the sites on Table 47 are also on Tables 44 and 45. All of the sites are not separate and may have different names due to "aliases."

Underground Storage Tanks

The federal definition of an Underground Storage Tank (U.S.T.) is any tank including underground piping connected to the tank that has at least 10 percent of its volume underground. Not included in this definition are the tens of thousands of unregulated domestic heating oil tanks or other private fuel tanks. Several types of underground tanks are currently exempt from federal regulation:

> farm and residential tanks holding less than 1,100 gallons of motor fuel used for non-commercial purposes;
>
> tanks storing heating oil burned on the premises where it is stored;
>
> tanks on or above the floor of underground areas, such as basements or tunnels;
>
> septic tanks and systems for collecting storm water and waste water;
>
> and flow-through process tanks.

Hazardous waste tanks are regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA). Waste oil tanks may eventually also be regulated under Subtitle C. The great majority of U.S.T.s nationwide (more than 96 percent) contain petroleum fuels; the remainder store raw chemicals. U.S.T.s are found virtually everywhere in the industrialized world. U.S. EPA estimates that approximately one quarter of the U.S.T.'s leak (OEC, 1988).

In Ohio more that 70,000 commercial U.S.T.s currently in use are registered with the State Fire Marshal. Because the registry is still being developed, the Fire Marshal's Bureau of Underground Storage Tank Regulation estimates that there are actually close to 100,000 U.S.T.s in Ohio subject to regulation. As of May 1988, the registry was still incomplete. There are 2,834 U.S.T.s for Lucas County, 879 for Wood County, and 284 for Ottawa County. Because U.S.T.s are associated with business and industry, it appears that they are found in higher concentrations in areas of greater population (OEC, 1988).

Statewide, there have been more than 1,800 leaks from U.S.T.s reported to Ohio EPA since 1978. Ohio EPA's Office of Emergency Response reports that during this period there have been 50 reported leaks for Lucas County, 22 for Wood County, and 12 for Ottawa County. The majority (65 to 75 percent) of U.S.T. leaks came from tanks at gas stations.

Leaks in USTs typically are very small compared to tank size, and traditional inventory control measures such as the graduated dipstick pole and tallying volumes of liquid withdrawn are not accurate enough to detect most leaks. U.S.T.s have contaminated ground water and surface water, saturated soil with gasoline or other flammable or toxic substances, and created fire and explosion hazards when vapors enter buildings through foundation cracks or sump pumps. Gasoline from U.S.T.s in developed areas frequently is first discovered in utility company manholes, where it can destroy wiring and cause an explosion due to the concentration of gasoline vapors and a health hazard for workers due to the concentration of residual benzene in a confined space (OEC, 1988).

ATMOSPHERIC DEPOSITION

According to the 1987 Report on Great Lakes Water Quality (IJC, 1987), atmospheric transport and deposition into the Great Lakes basin, either directly onto the water surface or indirectly into the drainage basin with subsequent transport, has been clearly demonstrated. This summary report states that even though the magnitude of the input (relative to other sources and pathways) has not been fully defined, the available evidence indicates that atmospheric deposition is a major pathway for contamination of the Great Lakes ecosystem.

Releases of lead to the atmosphere, primarily from automotive exhausts, have decreased as the use of leaded gasoline in the United States and Canada has decreased, and that atmospheric transport and deposition of certain pesticides (e.g. DDT) into the Great Lakes continues today, even though their use has been banned or severely restricted in both the United States and Canada. These chemicals are still manufactured and used in great quantities in other locations in the world. Short of a worldwide ban on the manufacture, transport and use of these contaminants, appreciable contamination of the Great Lakes ecosystem may continue indefinitely.

The authority to regulate emissions into the atmosphere are based on clean air requirements, but legislative provision to control emissions of persistent toxic substances into the atmosphere need to be incorporated. The Ohio Alliance for the Environment in its March 1987 Newsletter reports that since 1987 improvements have been made in reducing the amount of discharge from direct sources of toxic contaminants, but much more research and action is still needed to restore the lakes to a healthy level; and that little is known about the specific effects and possible controls for toxic chemicals into the air.

The Ohio Alliance for the Environment's report goes on to say, that seven million chemical compounds now exist, 30,000 of which are in substantial commercial use; that approximately 1,000 new chemicals are developed each year; that over 1,000 chemicals are suspected carcinogens. It is important to note that some of these chemicals occur naturally, which means that manufactured chemicals are not the only source of toxic substances.

Air emissions of such substances are a concern because the atmosphere serves as a pathway into the environment as a whole. Large lakes such as the Great Lakes, tend to act as a "sink" for pollution from all sources. It has been shown that with the upper Great Lakes, the input of toxic chemicals such as PCBs and lead comes from atmospheric deposition.

The current USEPA and Ohio EPA ambient air quality standards are displayed in Table 48 on the following page. The Toledo Environmental Services Division functions as the air pollution enforcement arm of the Ohio EPA in the Toledo area. This Division was interviewed in order to secure information regarding attainment/non-attainment status regarding the pollutants listed in this table, with such status reported as on Table 48.

TABLE 48

US EPA & OHIO EPA AMBIENT AIR QUALITY STANDARDS*

			MAXIMUM ALLOWABLE CONCENTRATION**	
POLLUTANT	DURATION	RESTRICTION	PRIMARY	SECONDARY
Particulate Matter - PM10	Annual geometric mean	Not to be exceeded	50 mg/m^3	50 mg/m^3
	24 - hour concentration	Not to be exceeded more than once per year	150 mg/m^3	150 mg/m^3
Sulfur Dioxide	Annual arithmetic mean	Not to be exceeded	80 um/m^3 (0.03 ppm)	——
	24-hour arithmetic mean concentration	Not to be exceeded more than once per year	365 um/m^3 (0.14 ppm)	——
	3-hour arithmetic mean concentration	Not to be exceeded more than once per year	——	1300 um/m^3 (0.5 ppm)
Carbon Monoxide	8-hour arithmetic mean concentration	Not to be exceeded more than once per year	10 mg/m^3 (9.0 ppm)	——
	1-hour mean concentration	Not to be exceeded more than once per year	40 mg/m^3 (35.0 ppm)	——
Ozone	1-hour mean concentration	Not to be exceeded on more than one day per year, average over three years	0.12 ppm (244 um/m^3	——
Nitrogen Dioxide	Annual arithmetic mean	Not to be exceeded	0.53 ppm (100 um/m^3	——
Lead	3-month arithmetic mean concentration	Not to be exceeded	1.5 m/m^3	——

NOTES:

Primary standards are established for the protection of public health
Second standards are established for the protection of public welfare

um/m^3 = micrograms per cubic meter
ppm = parts per million
mg/m^3 = milligrams per cubic meter

* = U.S. EPA & Ohio EPA Air Quality Standards are Identical
** = 40CFR 50.4 - 50.12

LEAD: Attainment

Lead is a toxic metal released into the atmosphere primarily through the exhaust of automobiles using leaded fuels. Lead accumulates in the human body and can interfere with the blood-forming process, and the normal nervous and renal system functions. Young children are most susceptible to the ill effects of lead. The level of this pollutant has dropped substantially since the early 1970s. Because of enforcement activities related to fuel switching and the further reduction of lead levels in leaded gasoline, the data from recent years shows that the air quality in the area of concern related to lead is approximately 10 times cleaner than the national standard.

NITROGEN DIOXIDE: Attainment

Nitrogen dioxide is a brown gas, formed during high temperature combustion, which reacts with hydrocarbons in the presence of sunlight to produce photo-chemical oxidants or smog. It is also a pollutant in its own right, and can affect lung tissue, reduce resistance to disease, contribute to bronchitis and pneumonia, and aggravate chronic lung disorders. It is also a contributor to acid rain. The level of this pollutant has dropped with no violation ever having been recorded in the area of concern. In fact, routine monitoring of this pollutant was ended in July 1981, but reestablished in 1984 through a scaled-down sampling system in order to keep abreast of any new trend.

OZONE: Non-attainment

Ozone is a colorless, pungent, toxic gas, formed by a series of chemical reactions where hydrocarbons, nitrogen oxides from automobiles and other sources, are exposed to sunlight. Ozone is the principal constituent of smog, and is a severe irritant, impairing lung function and aggravating existing respiratory disorders. The level of this pollutant has dropped with only one violation of the standard in 1983, and no violations for succeeding years. Significant reduction in hydrocarbon emissions have taken place in recent years with redesignation expected by U.S. EPA to attainment status.

CARBON MONOXIDE: Attainment

Carbon monoxide is a colorless, odorless, tasteless, toxic gas produced by incomplete combustion of fossil fuels. The automobile engine is the main source of this pollutant. It is quickly absorbed by the blood, and reduces the oxygen available to the tissues, impairing visual perception and alertness. Continued exposure to elevated carbon monoxide levels can threaten life. Persons with cardiovascular diseases are especially vulnerable to this type of pollution. The level of this pollutant dropped measurable in 1976 and 1983. Two violations were measured in 1984, but none in the intervening years.

SULFUR DIOXIDE: Non-attainment for area east of Route 23 and west of eastern boundary for City of Oregon attainment for remainder area.

Sulfur dioxide is a heavy, pungent, colorless gas formed primarily by the combustion of sulfur-bearing fuels such as coal. It reacts readily with other atmospheric compounds and pollutants to form sulfates, a group of compounds that aggravate respiratory ailments such as bronchitis, emphysema, asthma and heart disease. Sulfates, combined with moisture in the atmosphere, produce acid rain. The area of concern is classified as non-attainment for sulfur dioxide, but there have been no violations, either primary or secondary, of the U.S. EPA Standards since 1979.

PARTICULATE MATTER: Attainment for primary sources, but non-attainment secondary sources for areas of East Toledo and Oregon, with attainment for secondary sources in the remainder area.

Particulate matter relates to particles in the air (such as soot, ash, etc.), including non-toxic materials (dust and dirt), as well as toxic substances (lead, asbestos and sulfates). Natural and man-made sources can contribute to adversely affect human respiratory systems to various degrees, depending on particle size and composition. Data show no violation of either primary or secondary standards for 1983, 1984 or 1985 with the Toledo Environmental Service Division petitioning for redesignation to total primary and secondary attainment for the entire area. However, there is a small area, mainly in East Toledo, where the monitoring station is located, that indicated a secondary violation for 1986.

Acid Rain

The Great Lakes National Program Office, U.S. EPA, has operated the Great Lakes Atmospheric Deposition (GLAD) network since early 1981. A precipitation sampling station as a part of GLAD had been located by Toledo Environmental Services Division in Oregon, Ohio at Bay Shore and Stadium Roads, from 1981 through 1985. Due to budget constraints this local sampling station was thereafter eliminated, with the nearest stations being Put-in-Bay, Ohio on South Bass Island, and Mount Clemons, Michigan.

During the period when local precipitation sampling station was in operation, the process consisted of collecting weekly samples and checking for pH and conductivity before sending the sample to the GLAD laboratory for further analysis. The pH of unpolluted rain is about 5.6. Because the pH scale is logarithmic, rain with a pH of 4.6 is ten times as acidic as "normal" rain, while rain with a pH of 3.6 would be 100 times as acidic. Figure 21 graphically displays the quarterly pH averages for the period covering 1981 through 1985 (Environmental Service Agency, 1985). The quarterly averages indicate that rainfall in the Toledo area is often 50 to 100 times more acidic than normal rainfall. The GLAD laboratory analysis for chemical pollutants was available for only one year, therefore, weighted calculations were not conducted.

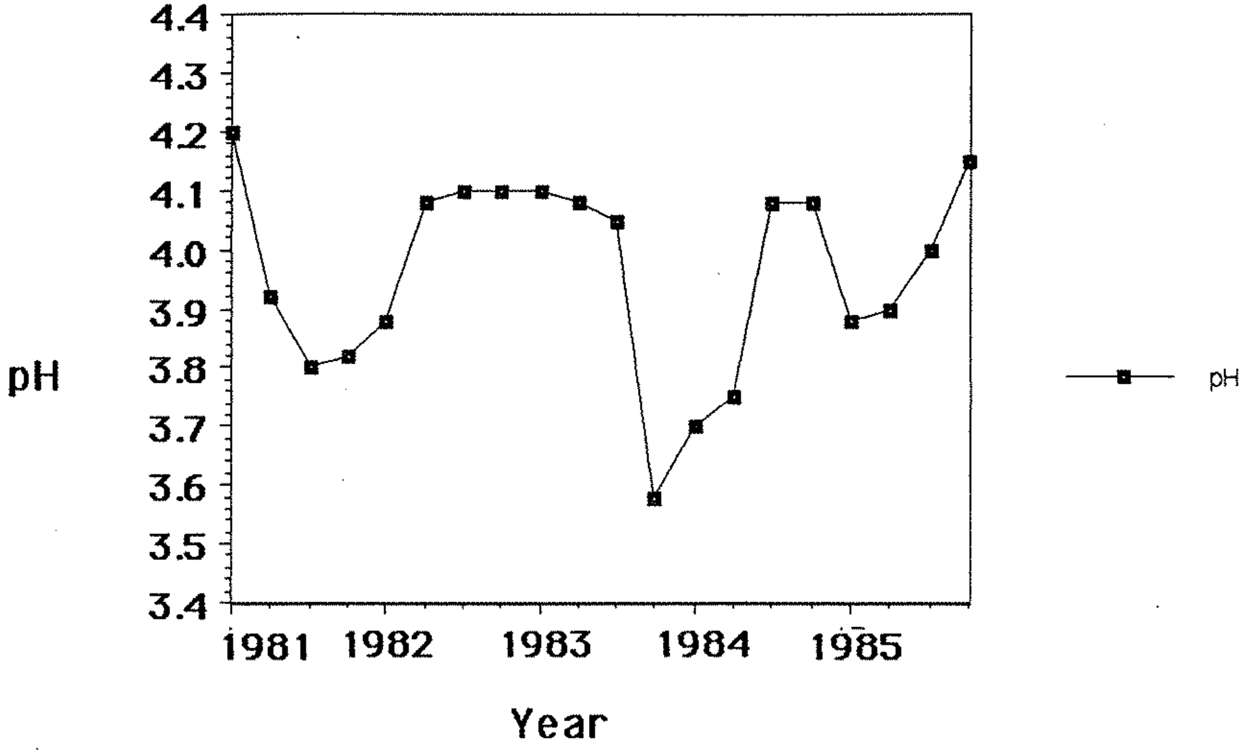
The area of concern is most fortunate in that the acidic rainfall seems to be buffered by our natural occurring limestone bedrock and local soils which mitigate the ecological effects of acid rain. However, even though most of the ecological effects to the local area are mitigated, there is substantial damage being caused locally by acid rain. Buildings and statues are being corroded, cars rust more quickly and their paints are damaged, and synthetic materials ranging from clothes and nylons to windshield wipers become more rapidly unusable. In addition, heavy metals are leached more readily from structures and soils, so the acid rain may be contributing to the presence of toxic substances in the water. Reduced productivity of farm crops, particularly soybeans, and forest resources has also been linked to acid rain. The buildings, statues, cars, trees and agricultural products all are impacted by the precipitation before it can be neutralized by the soil and bedrock of the area.

Wildlife resources locally may also be experiencing degradation due to the acidity. Many animal resources rely in early spring on temporary ponds and marshes for their breeding areas and important food resources. Most affected are the amphibians and waterfowl that move into these ponds and wetlands even before the snow has melted. Since the ground is still frozen, its ability to neutralize the acidity may be greatly limited. The most acidic precipitation of the year often occurs as snow in fall and winter. The spring snow melt may be sending a rush of still acidic water to the ponds and marshes at a critical time. For instance, most salamander species move into the breeding ponds for a brief period, beginning before the ice melts off of the pond. Salamander mortality has been directly linked to the acidity of their breeding ponds.

The decline of black duck populations is also now believed to be linked at least in part to the acidity of their feeding ponds when they arrive in early spring. Other migratory waterfowl are also finding reduced abundance of aquatic insects because the spring flush of acidic waters reduces insect populations at a time when food needs are high in order to fuel migration and prepare for the breeding season.

Despite the acidity of rain water in the RAP Area, water in streams is generally alkaline, as shown by Table 49. The pH averages 7.7 to 7.8 for all streams, with the exception of Otter Creek, which is notably more alkaline than any other stream in the area.

Figure 21
PRECIPITATION pH vs. TIME



Source: Environmental Services Agency, 1985.

TABLE 49

pH VALUES IN RAP AREA STREAMS
TESD DATA, 1981-1986

Stream Sampled	pH <6.0	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	>10.0	Avg	# Samples
All streams	1	79	809	486	28	1	7.8	1404
Maumee River Subwatershed								
Maumee River	0	23	196	165	3	0	7.8	387
Delaware Cr.	1	5	33	16	0	0	7.6	55
Grassy Cr.	0	6	30	20	0	0	7.7	56
Otter Cr.	0	0	7	28	21	0	8.7	56
Shantee Cr.	0	2	33	19	0	0	7.8	54
Silver Cr.	0	3	32	19	0	0	7.7	54
Ottawa River Subwatershed								
Ottawa River	0	27	255	134	4	1	7.7	421
Hill Dt.	0	3	36	16	0	0	7.7	55
Swan Creek Subwatershed								
Swan Creek	0	9	153	54	0	0	7.7	216
Heilman Dt.	0	1	34	15	0	0	7.7	50

TESD Air Sampling

TESD has eleven air sampling network sites. These are described in Table 50 by station number, location, and type of testing performed. The table also includes map numbers which correlate with Figure 22, a map that displays the location of air sampling sites.

TABLE 50

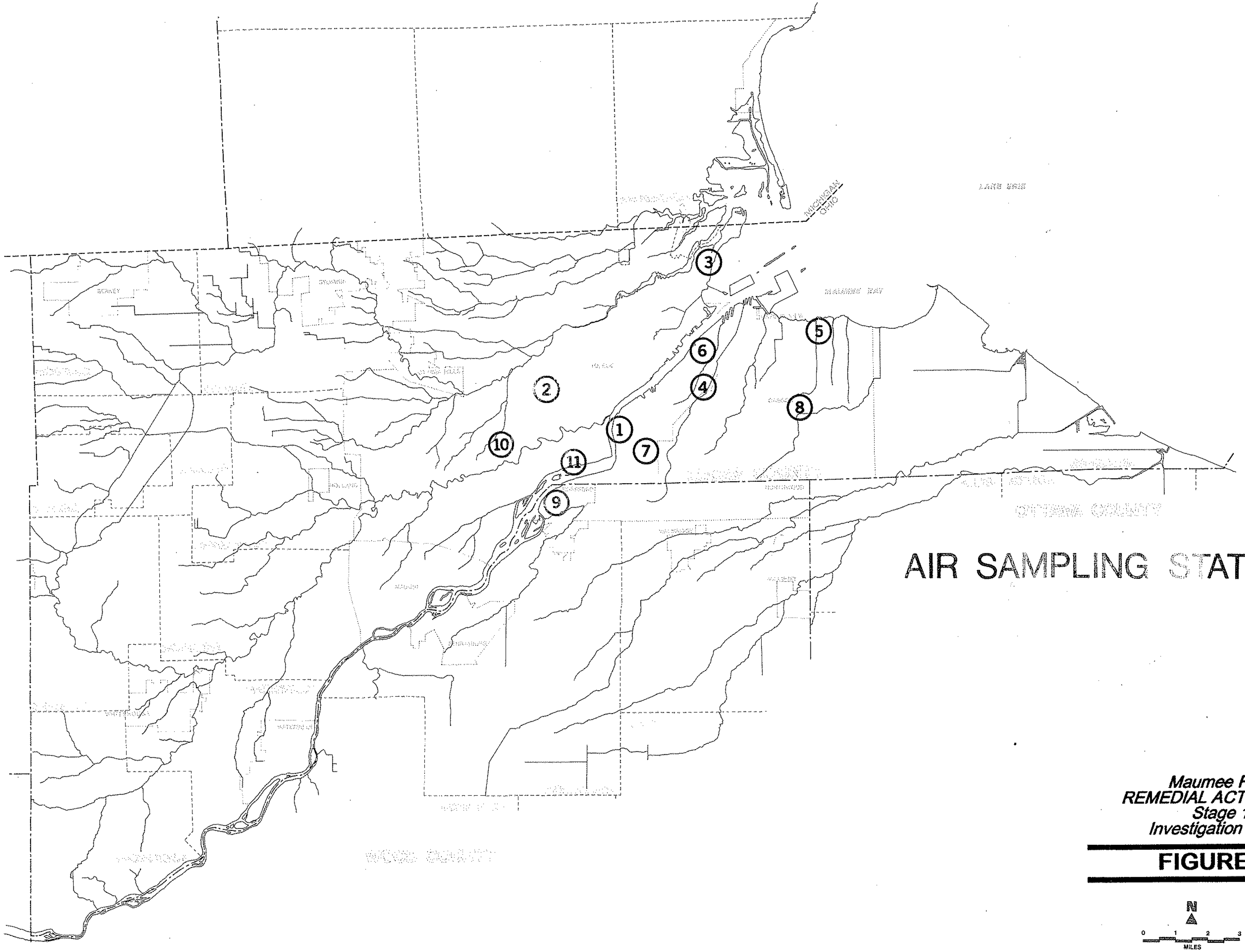
TESD AIR SAMPLING NETWORK SITES

Map #	TESD STATION	LOCATION	TESTS PERFORMED
6	1	East Side Sewage Pumping Station Lee and Front St.	T.S.P.
7	2	East Side Central School 825 Navarre Ave. at Berry St.	T.S.P
8	3	Oregon Municipal Building 5330 Seaman	T.S.P.
9	4	Rossford Municipal Building 133 Osborn Street	T.S.P.
10	5	60 N. Westwood at Hill (soon moving to U.T. Comm. Tech. and converted to P.M. 10)	T.S.P
11	6	1503 Broadway at South	T.S.P.
2	7	2927 Monroe (at Bancroft & Detroit) (heavy traffic intersection)	CO
3	8	2930 - 131st. Street	O_3
4	9	Water Filtration Plant 600 Collins Park	SO_2
5	10	Acid Rain Monitoring Site	Acid Rain
1	11	Toledo Environmental Services Bldg.	T.S.P., SO_2

T.S.P. = Total Suspended Particulates
CO = Carbon Monoxide
SO_2 = Sulfur Dioxide
O_3 = Ozone
NO_2 = Nitrogen Dioxide

Acid Rain
PM-10 Particulate Matter - 10 microns (a more refined T.S.P. Test; other T.S.P Sites may be converted at a later date)

Source: Rick Uscilowski - Chief Chemist, Toledo Environmental Services Div. (TESD)



AIR SAMPLING STATIONS

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 22

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

tmacog

WATER QUALITY IMPACTS

The previous sections of this report focused on the identification and discussion of the water quality problems present in the Lower Maumee River Area of Concern. These data were used to classify each of the subwatersheds in the AOC as to severity of the water quality problem caused by each of the identified water quality sources. In order to accomplish this, a rating system ranging from high impact to suspected low impact and the criteria to assign the ratings was developed by the Remedial Action Plan Advisory Committee and associated subcommittees. The subcommittees applied the rating system to each subwatershed for each of the identified water quality problems in order to assess the geographical extent of the water quality problems. The results of this analysis, a series of plots with graduated shading to indicate the degree of impact, are presented in Figures 23 through 35. The individual subwatershed analyses are presented in Appendix J. The criteria used to evaluate the severity of the water quality impacts due to each of the sources of pollution follow.

Rating System

The rating system used classifies the effects of each of the identified water quality problems as:

H	High impact
M	Medium impact
L	Low impact
N	Not applicable to this watershed/None
U	Unknown
US	Unknown, but suspected problem
S	Suspected problem, but no data
HS	Suspected high impact
MS	Suspected medium impact
LS	Suspected low impact

POTWs (See Figure 23)

The severity ratings which were assigned take into account the quality of the plant effluent and the quantity of effluent relative to the size of the receiving stream. The Whitehouse POTW is not included because it has been abandoned in favor of connecting to the Lucas County system.

The rationale used in assigning these impact ratings is as follows:

In most watersheds, there are no POTW discharges, so the rating is "N".

- The Toledo Bay View plant is a large facility with a significant number of NPDES discharge permit violations. Its impact is rated "H".

- The Oregon South Shore Park and DuPont Road treatment plants discharge to the lake. The DuPont Road plant is under capacity, and has a relatively small number of permit violations; its rating is "M". The South Shore Park plant, however, has severe problems from extraneous water entering the sewers. This plant has many permit violations and its rating is "H". Together their impact is rated "H".

- The Maumee River WWTP has few permit violations and discharges to a sizable stream (the river). Its impact rating is "L".

- The Perrysburg plant is not a large facility, but it has serious problems and more permit violations than any other POTW. Its impact is rated "H".

- The Haskins plant has a small number of permit violations but it discharges to a roadside ditch. However, its effect on the Maumee River itself is low. For this reason, its impact is rate "L".

Package Plants (See Figure 24)

In most cases, the only information regarding package plants is their location and size. A listing of NPDES Permit Violations (Appendix I), however, indicates that even package plants run by trained operators do not discharge very high quality effluent. Furthermore, even well-run package plants are vulnerable to upsets and can turn septic in a matter of hours. For this reason, package plants' impacts are rated either "N" for None, or "H" for High.

Industrial (See Figure 25)

The listing of NPDES Permit Violations in many cases agrees with the list of "Problem Dischargers". The classification of what is industrial and non-industrial is based on Ohio EPA's system. If the NPDES Permit number starts with "I", it is industrial. If it starts with "2P", it is not. By this classification, 186 of the 627 NPDES violations, or 30%, were from industrial dischargers.

Of the 186 industrial permit violations listed, 76 of them are from three "Problem" dischargers (Sun Oil 2IG00003, General Mills 2IH00093, and King Road Landfill 2IN00079), for an average of 25 violations. The other five "Problem" dischargers do not show any permit violations at all (Conrail 2IT00015, Conrail 2IT00007, Doehler-Jarvis 2IC00021, LOF 2IN00030, and LOF 2IN00020).

Fourteen non-problem dischargers account for the remaining 110 violations for an average of 8 apiece. Of these, the Toledo Edison ACME plant (2IB000001) shows 26 violations (mostly suspended solids); DuPont Paint (2IF00016) had 9 (all temperature); Diversitech (2IQ00012) had 9 (mostly oil & grease); Chessie system (CSX Presque Isle, 2IT00013) had 10 (oil & grease, pH, SS); and the Bowling Green water plant (2IW00010) had 19 (all SS). Based on this information, Diversitech was added to the list of "Problem" dischargers.

The following criteria were used for defining L/M/H impact for Industrial Dischargers:

- Watersheds which have no industrial dischargers are rated "N".

- Watersheds that have one or more "Problem" industrial dischargers are rate "H".

- A discharger that has more than 8 violations (the average number for "Non-Problem" dischargers) is rated "M".

- A discharger with 8 or fewer violations is rated "L".

- Where a watershed has more than one industrial discharger, the most severe impact rating applies.All other industrial NPDES dischargers reported no permit violations in this period and are rated as having a low (L) impact on their watersheds.

It may be noted that five of the "Problem" dischargers reported no permit violations. The Public and Industrial Wastewater Subcommittee offers the following notes to account for this:

Conrail, Emerald Avenue (2IT00015)

No explanation for why this discharger does not show violations in its Monthly Operating Reports (MORs). The receiving stream is severely impacted by oil discharge from this facility.

Conrail, Stanley Yard (2IT00007)

The problem at this site is more old spills than present discharges. A spill would not necessarily show up on the MORs, which is why this discharger does not show any violations.

Doehler-Jarvis (2IC00021

The suspected problem from this discharger is a periodic spill of soluble oils. Being intermittent, it would not necessarily show up on the MORs submitted to Ohio EPA. Periodic discharges to the stream have been documented, and while Doehler-Jarvis is the suspected source, the discharge has been traced back to this facility on only one occasion.

Libbey-Owens-Ford, Plants #4 & 8, East Broadway (2IN00020)

Otter Creek used to flow under the landfill at this site, and leaching into the creek was a problem. Otter Creek has now been diverted to flow around the landfill instead. At present, there is still some discharge. The leachate will be collected and pumped to the City of Toledo's sanitary sewer system.

LOF, Plant #6, Rossford (2IN00030)

The main pollutant cited from this discharger was arsenic. No violations were reported, however, because arsenic was not included in the permit (2IN00030*ED).

LOF has installed a leachate collection system here and eliminated the arsenic discharge. The leachate now goes to a treatment lagoon.

LOF has made substantial progress toward cleaning up both its facilities in Rossford/East Toledo. It is anticipated that the improvements made will solve the problem and remove LOF from the "Problem" discharger list. At present, however, new data are not yet available to document this.

CSOs (See Figure 26)

Watersheds which receive no discharges from CSOs are all rated "N". TESD data for 1981-1986 indicate the following tallies of fecal coliform counts in excess of 2000/100ml:

Stream	Fecal Coliform Counts over 2000	Total Number of Samples	Percent Over 2000/100ml.
Maumee River	79	399	20%
Ottawa River	162	436	37%
Swan Creek	102	224	46%

These numbers show a more severe effect on Swan Creek and the Ottawa River than on the Maumee River. There are no POTWs discharging to the Ottawa River, and there are few package plants and septic systems in the reach of stream monitored. The most severe bacterial counts were found between mile points 3.1 (Suder Ave.) and 8.9 (Monroe St.) which is in the CSO area.

On Swan Creek, conditions are similar. There are many package plants discharging to Swan Creek, but mostly upstream of the TESD sampling sites. The Whitehouse WWTP also was discharging to a tributary of Swan Creek during this period, but again, far upstream of the TESD sites. The severe bacterial counts were found between mile points 0.6 (St. Clair) and 5 (Detroit Ave.) which is the CSO area.

The Maumee River watershed with CSOs show fecal coliform violations, but at a lower frequency. Also, the Maumee River CSO area receives effluent from the Toledo and Perrysburg WWTPs, both of which had fecal coliform effluent violations. In addition, water from Swan Creek joins the Maumee in this reach. The POTWs and the two tributaries are sources of fecal coliform besides the local CSOs.

Swan Creek and Ottawa River watersheds with CSOs are both rated "H". The effect of CSOs on Swan Creek due to the Whitehouse bypasses is rated "H". Two segments of Swan Creek are rated "M". Watershed 041 receives the impact of the Whitehouse CSOs at its upstream end, but the rest of the watershed has none. In 010 in Toledo, the upper end of the watershed is above the CSOs, but the lower end has several. Maumee River CSO watersheds are rated "M", not because CSOs are not a problem, but because their effect is less severe due to dilution.

Urban Runoff (See Figure 27)

No water quality monitoring has ever been performed to document the effects of urban runoff in the RAP area. Not having any better information, it is assumed that the water quality effects of urban runoff depend only on the degree of urbanization of the watershed.

The LRIS land use database was used to determine the percentage of urban land uses and the impact ranking for each subwatershed.

Since the land use data were collected in 1975, there have been some significant land use changes since then. The major growth areas have been in the following areas:

003	Sylvania & Sylvania Twp.
009	Springfield Twp.
041	Maumee & Monclova Twp.
042	Springfield & Swanton Twps.
046	Perrysburg & Perrysburg Twp.
079	Perrysburg & Perrysburg Twp.

These watersheds are rated "MS" for suspected medium impact from urban runoff. Exception: watershed 079 is rated "M" based on 1975 land use.

Agricultural Runoff (See Figure 28)

Determination of the level of agricultural runoff impacts was based on watershed rankings in the State of Ohio Phosphorus Reduction Strategy for Lake Erie and the the Ohio EPA's Ohio Nonpoint Source Assessment. Watersheds with a Priority 1 ranking in the Reduction Strategy or a nonpoint source impaired Assessment ranking were rated "H". Watersheds ranked nonpoint source impacted in the Assessment were rated "M". In those cases where watersheds were ranked differently in the two reports, the higher impact rating was used. The remaining watersheds were rated "L".

Dumps, Landfills, and Pits, Ponds and Lagoons (See Figure 29)

Watersheds which have no identified landfills, dumps, pits, ponds or lagoons are rated "N" (None).

Watersheds which have an identified landfill, dump, pit, pond or lagoon, but have no known discharge, are rated "M" (Medium).

Watersheds which have an identified landfill, dump, pit, pond or lagoon, and have a known discharge, are rated "H" (High).

Leaking Underground Storage Tanks (LUST) (See Figure 30)

The best data available for underground tanks at this time indicate the number known to exist in each county. There does not yet exist an inventory that gives their locations, ages and materials, nor whether the tanks are leaking. What the data *do* indicate is that there tend to be higher concentrations of underground tanks in urban areas than in rural areas. For this reason, the impact of underground tanks was rated using the same degree of urbanization criteria applied to urban runoff. Watersheds are rated "HS" for highly urbanized watersheds (over 50%), "MS" for moderately-urbanized watersheds (31%-50%), and otherwise "LS".

Dredge Disposal (See Figure 31)

The major effects of open lake disposal of dredged materials in the Area of Concern are limited to the Lake Erie and Maumee Bay since the current and proposed open lake disposal sites are located there. Therefore, Lake Erie and Maumee Bay were rated "H". Those segments of the Maumee River that make up the shipping channel were rated "M". All remaining watersheds were rated "N".

Home Sewage Disposal (See Figure 32)

Watersheds which are in urbanized areas with available sanitary sewers are rated "N" (None). The Home Sewage Disposal Subcommittee recognizes that some isolated home sewage systems do exist in sewered areas. These, however, are few enough not to have a significant impact on water quality on the watershed level.

Watersheds which have identified on-site systems but are not identified as problem areas by the county health departments are rated "M" (Medium).

Watersheds which have identified on-site systems and are identified as problem areas by the county health departments are rated "H" (High).

Atmospheric Deposition (See Figure 33)

While no specific information exists for the effects of atmospheric deposition of pollutants in the RAP area, there is documentation of this source causing water quality problems in Michigan and other parts of Ohio. Acid rain does not show any harmful effects to streams of the RAP area because of the buffering capacity of the native limestone. In fact, most streams tend to be alkaline (pH around 7.7). Air quality data give reason to suspect potential problems from deposition. All watersheds are rated "US" for Unknown but suspected problem".

WWTP Sludge (See Figure 34)

Water Treatment Plant sludge deposits are a problem in only a few specific watersheds, and these cases are well-documented. For all other watersheds, the rating is "L".

Contaminated Sediments (See Figure 35)

There are no specific standards for pollutant concentration in stream sediments. However, sediment guidelines have been established by Ohio EPA for the following metals: cadmium, arsenic, chromium, lead, copper, zinc and iron. U.S. EPA has established guidelines for the following parameters: Volatile Solids, Mercury, Cyanide, Nickel, Ammonia-N, Manganese, Total P, TKN and COD. Other toxic pollutants of concern include PAHs, PCBs and phthalates as these have been found above the detection limits.

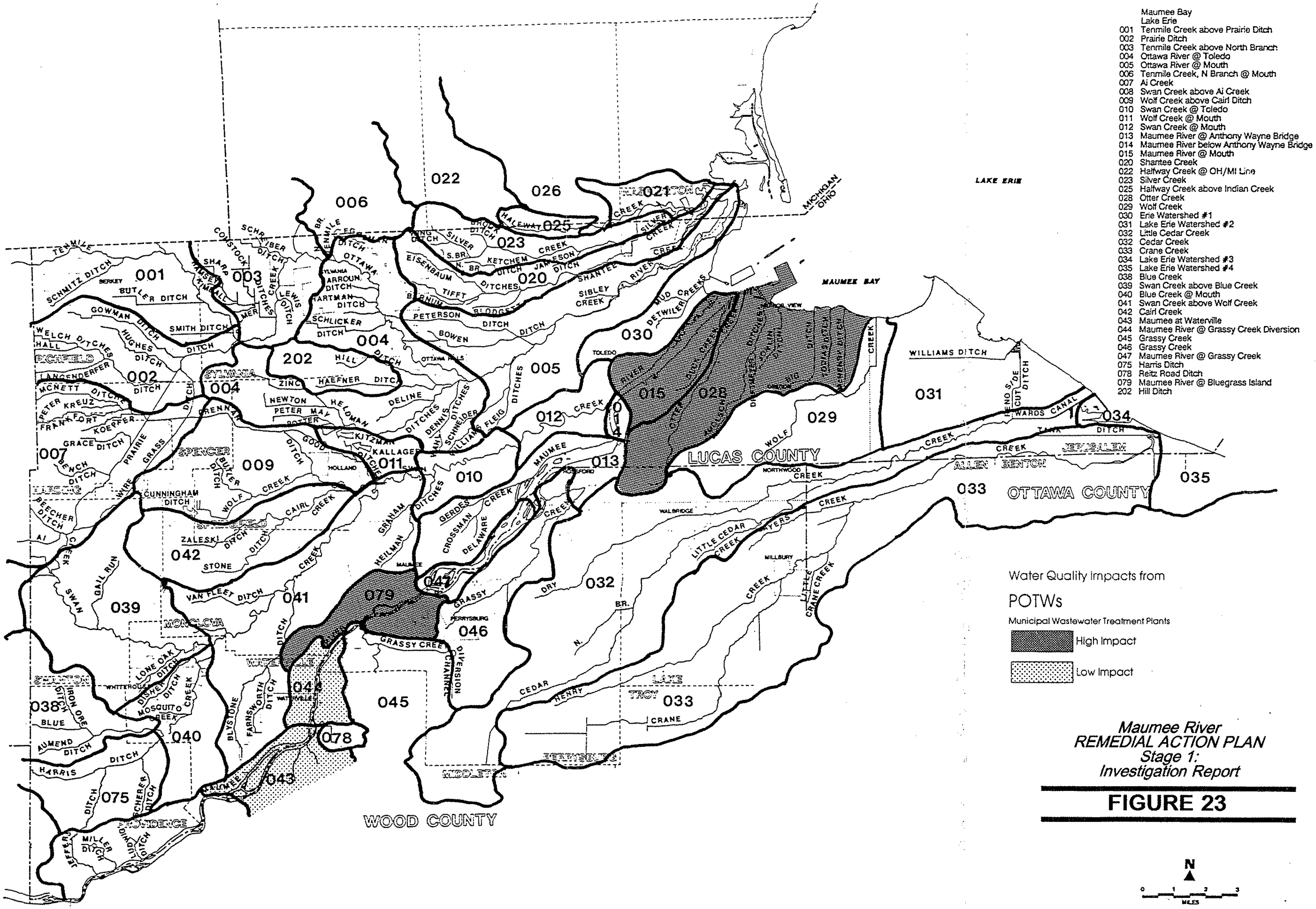
Low (L) is applied wherein the Ohio EPA Guidelines Severity Ratings indicate Non-elevated Concentrations and U.S. EPA Guidelines Severity Ratings indicate Non-polluted.

Medium (M) is applied wherein the Ohio EPA Guidelines Severity Ratings indicate either Slightly Elevated or Elevated Concentration and the U.S. EPA Guidelines Severity Ratings indicate Moderately Polluted.

High (H) is applied wherein the Ohio EPA Guidelines Severity Ratings indicated either Highly Elevated Concentration or Extreme Elevated Concentration and U.S. EPA Guidelines Severity Ratings indicated Heavily Polluted.

Further, the U.S. EPA Guidelines Severity Ratings indicate Total PCBs of $\geq$ 10 mg/kg is heavily polluted. Criteria to be applied is High (H) to conform with this Guideline.

Dr. Paul Baumann, U.S. Fish & Wildlife, indicated that the concentrations for PAHs and phthalates were "...the lower end of the range of values for sites with cancer epizootics. However, I would consider these concentrations to pose a possible problem and to be of concern". Criteria to be applied could be High (H) for any concentration above the detection limit, but because there is no data supporting that it is in the Suspected classification.



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
010	Swan Creek @ Toledo
011	Wolf Creek @ Mouth
012	Swan Creek @ Mouth
013	Maumee River @ Anthony Wayne Bridge
014	Maumee River below Anthony Wayne Bridge
015	Maumee River @ Mouth
020	Shantee Creek
022	Halfway Creek @ OH/MI Line
023	Silver Creek
025	Halfway Creek above Indian Creek
028	Otter Creek
029	Wolf Creek
030	Erie Watershed #1
031	Lake Erie Watershed #2
032	Little Cedar Creek
032	Cedar Creek
033	Crane Creek
034	Lake Erie Watershed #3
035	Lake Erie Watershed #4
038	Blue Creek
039	Swan Creek above Blue Creek
040	Blue Creek @ Mouth
041	Swan Creek above Wolf Creek
042	Cairl Creek
043	Maumee at Waterville
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

POTWs

Municipal Wastewater Treatment Plants

▩ High Impact

░ Low Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 23

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
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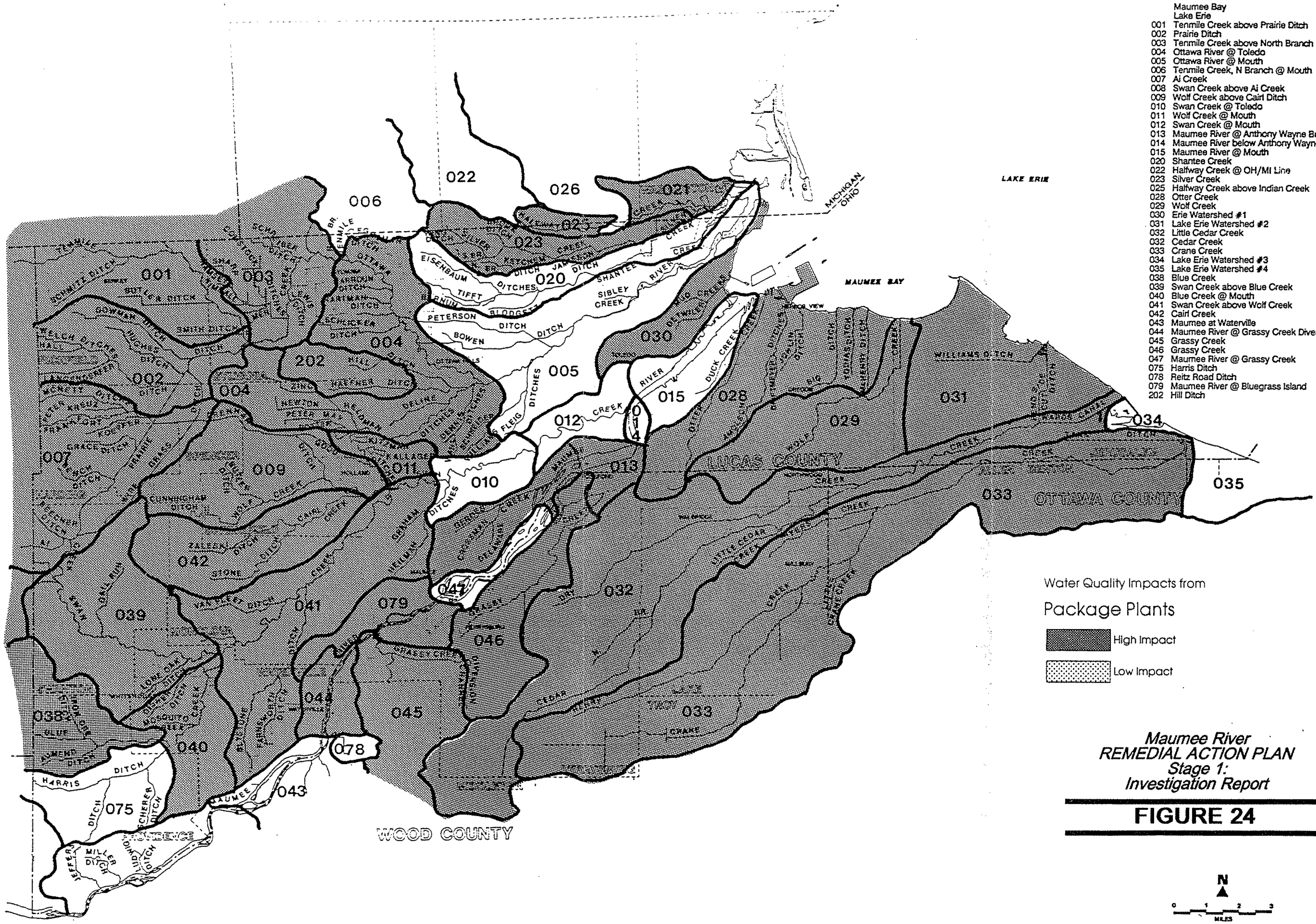
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch



Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 24

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
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011	Wolf Creek @ Mouth
012	Swan Creek @ Mouth
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014	Maumee River below Anthony Wayne Bridge
015	Maumee River @ Mouth
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032	Cedar Creek
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034	Lake Erie Watershed #3
035	Lake Erie Watershed #4
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039	Swan Creek above Blue Creek
040	Blue Creek @ Mouth
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042	Cairl Creek
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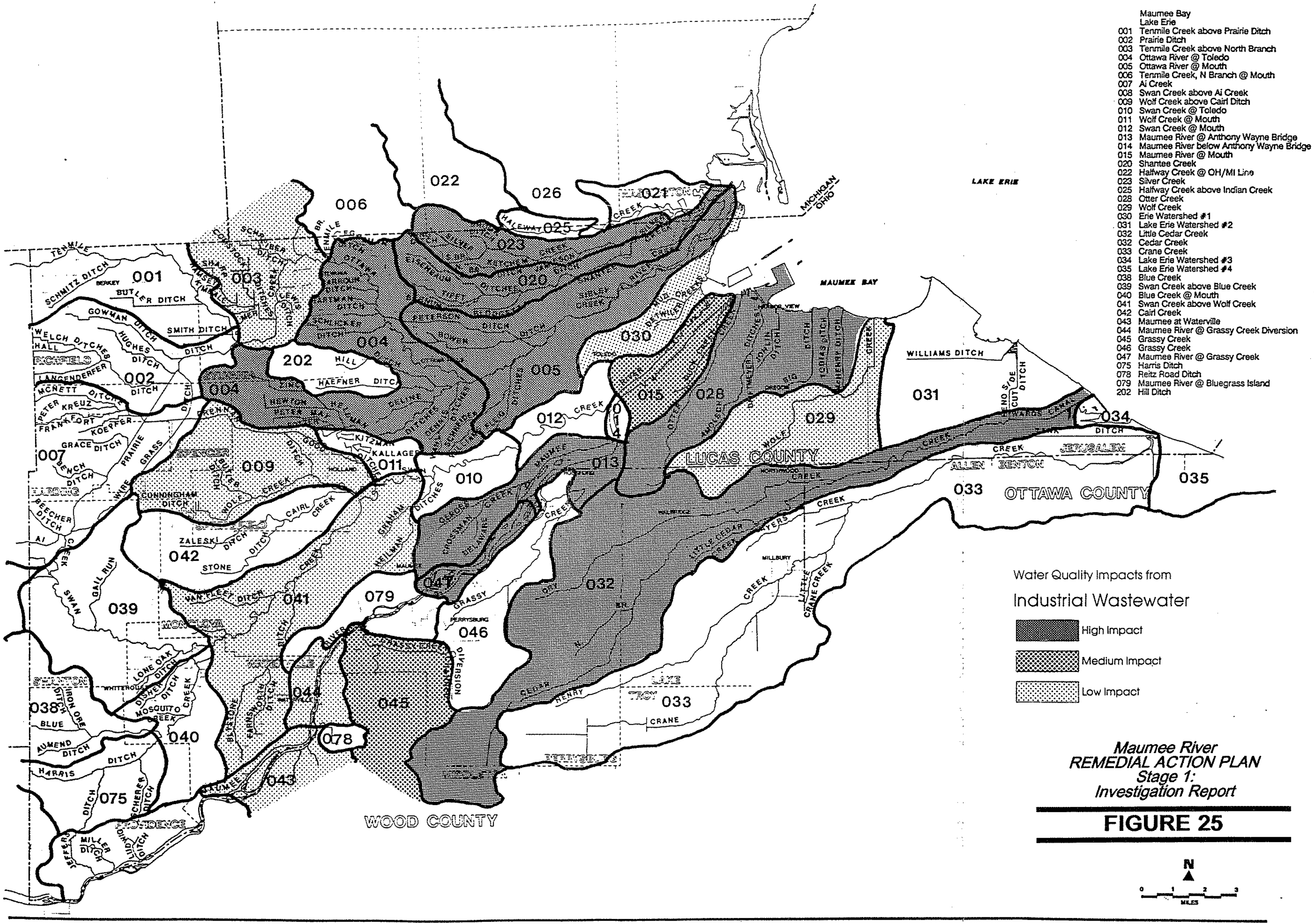
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch



Water Quality Impacts from

Industrial Wastewater

▩	High Impact
▦	Medium Impact
░	Low Impact

N

0 1 2 3

MILES

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 25

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

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WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
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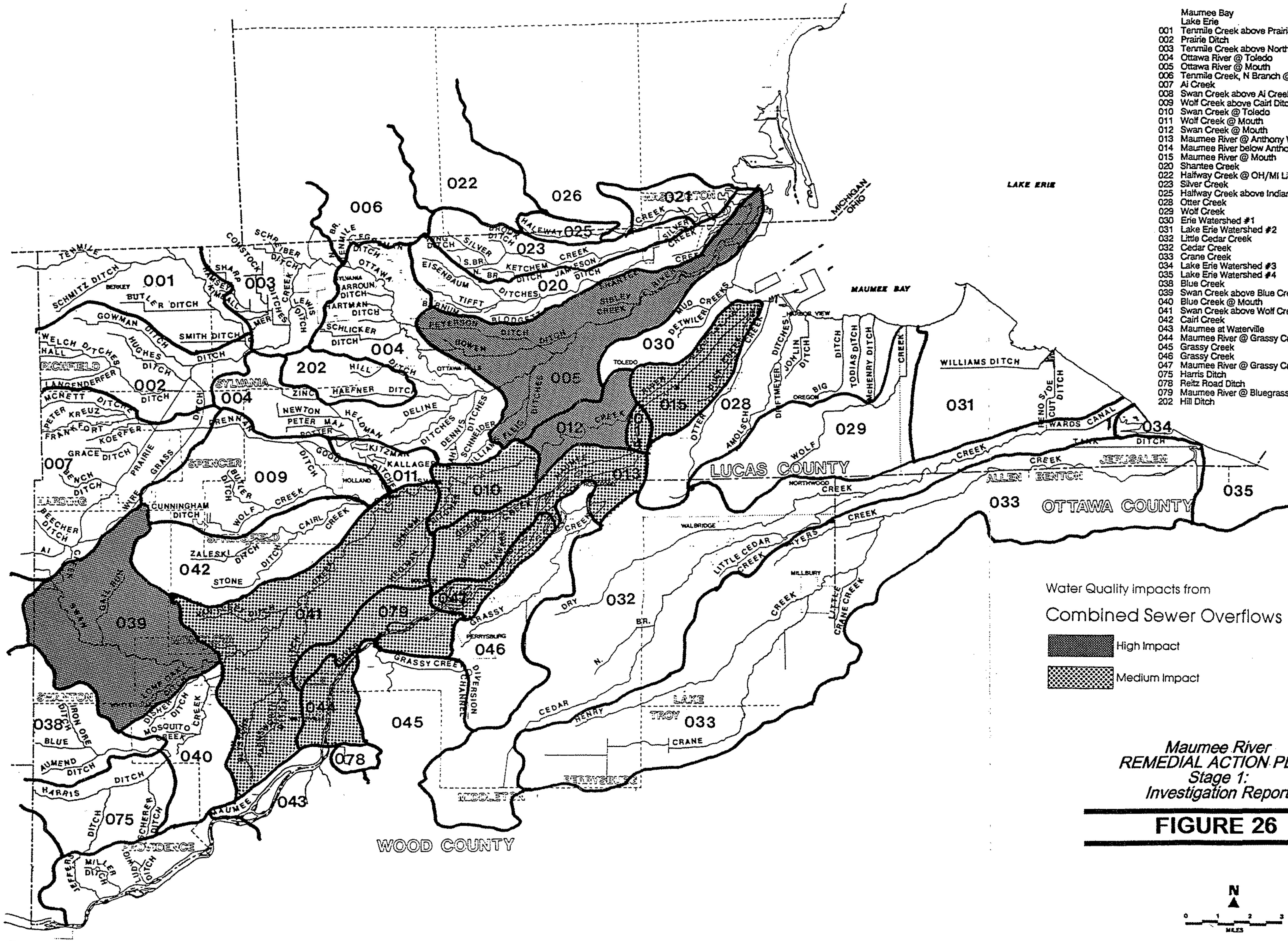
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch



Water Quality impacts from

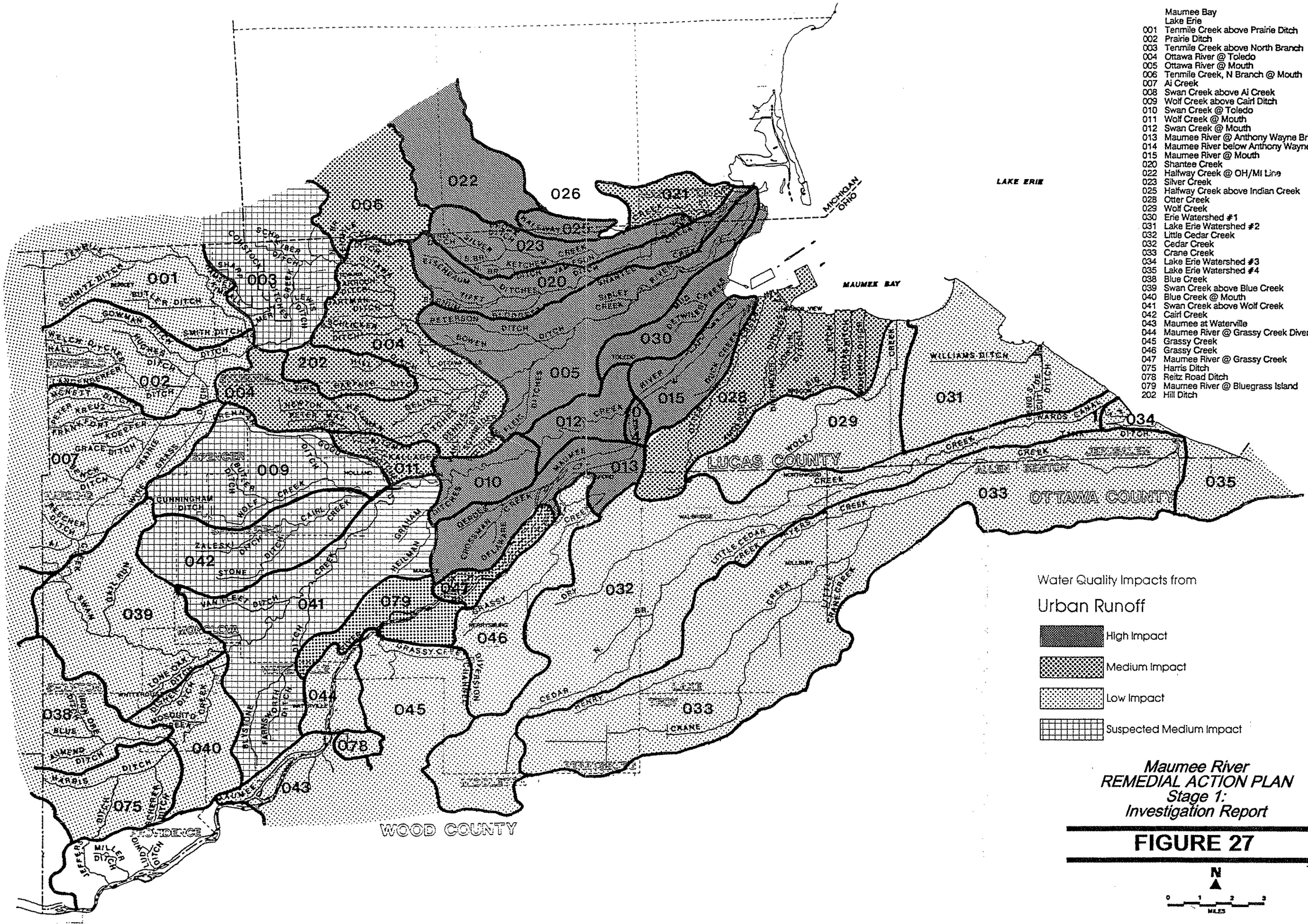
Combined Sewer Overflows

▩	High Impact
▨	Medium Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 26

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
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045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

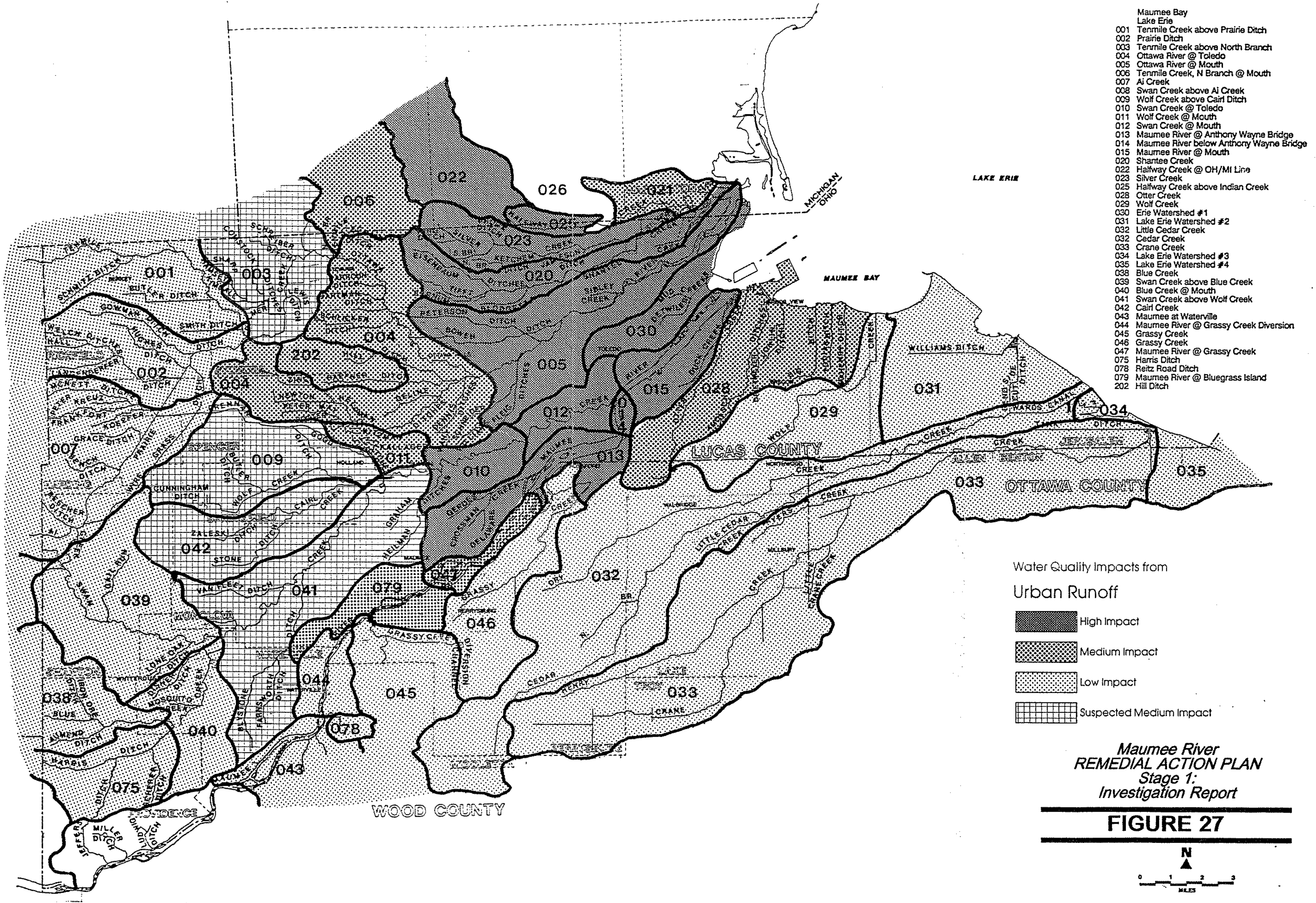
Urban Runoff

- ▓ High Impact
- ▒ Medium Impact
- ░ Low Impact
- ▦ Suspected Medium Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 27

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
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011	Wolf Creek @ Mouth
012	Swan Creek @ Mouth
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023	Silver Creek
025	Halfway Creek above Indian Creek
028	Otter Creek
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032	Cedar Creek
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035	Lake Erie Watershed #4
038	Blue Creek
039	Swan Creek above Blue Creek
040	Blue Creek @ Mouth
041	Swan Creek above Wolf Creek
042	Cairl Creek
043	Maumee at Waterville
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

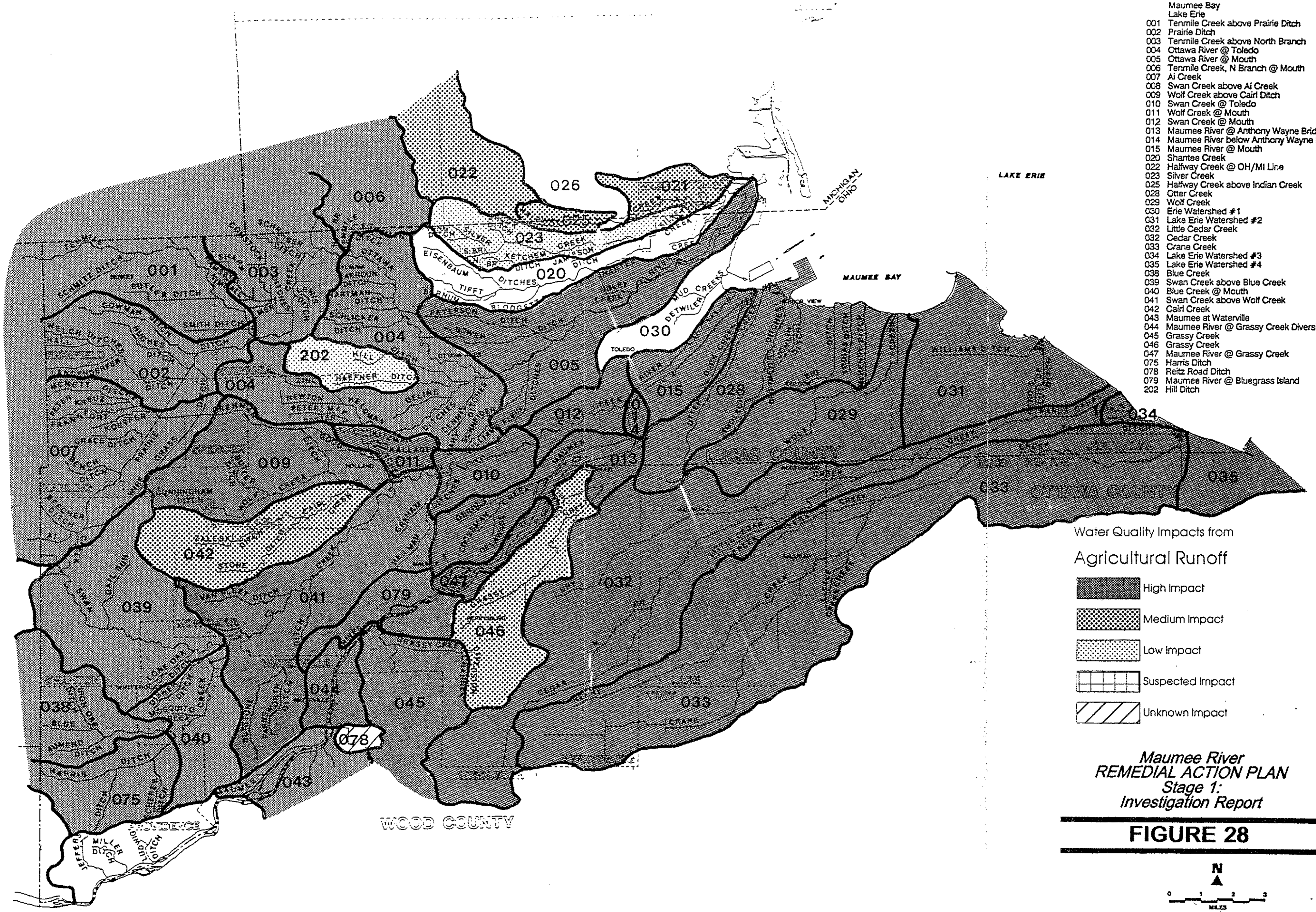
Urban Runoff

- ▓ High Impact
- ▒ Medium Impact
- ░ Low Impact
- ▦ Suspected Medium Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 27

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
010	Swan Creek @ Toledo
011	Wolf Creek @ Mouth
012	Swan Creek @ Mouth
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023	Silver Creek
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032	Cedar Creek
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038	Blue Creek
039	Swan Creek above Blue Creek
040	Blue Creek @ Mouth
041	Swan Creek above Wolf Creek
042	Cairl Creek
043	Maumee at Waterville
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

Agricultural Runoff

▩	High Impact
▦	Medium Impact
░	Low Impact
⊞	Suspected Impact
▨	Unknown Impact

Maumee River
REMEDIAL ACTION PLAN
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FIGURE 28

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
010	Swan Creek @ Toledo
011	Wolf Creek @ Mouth
012	Swan Creek @ Mouth
013	Maumee River @ Anthony Wayne Bridge
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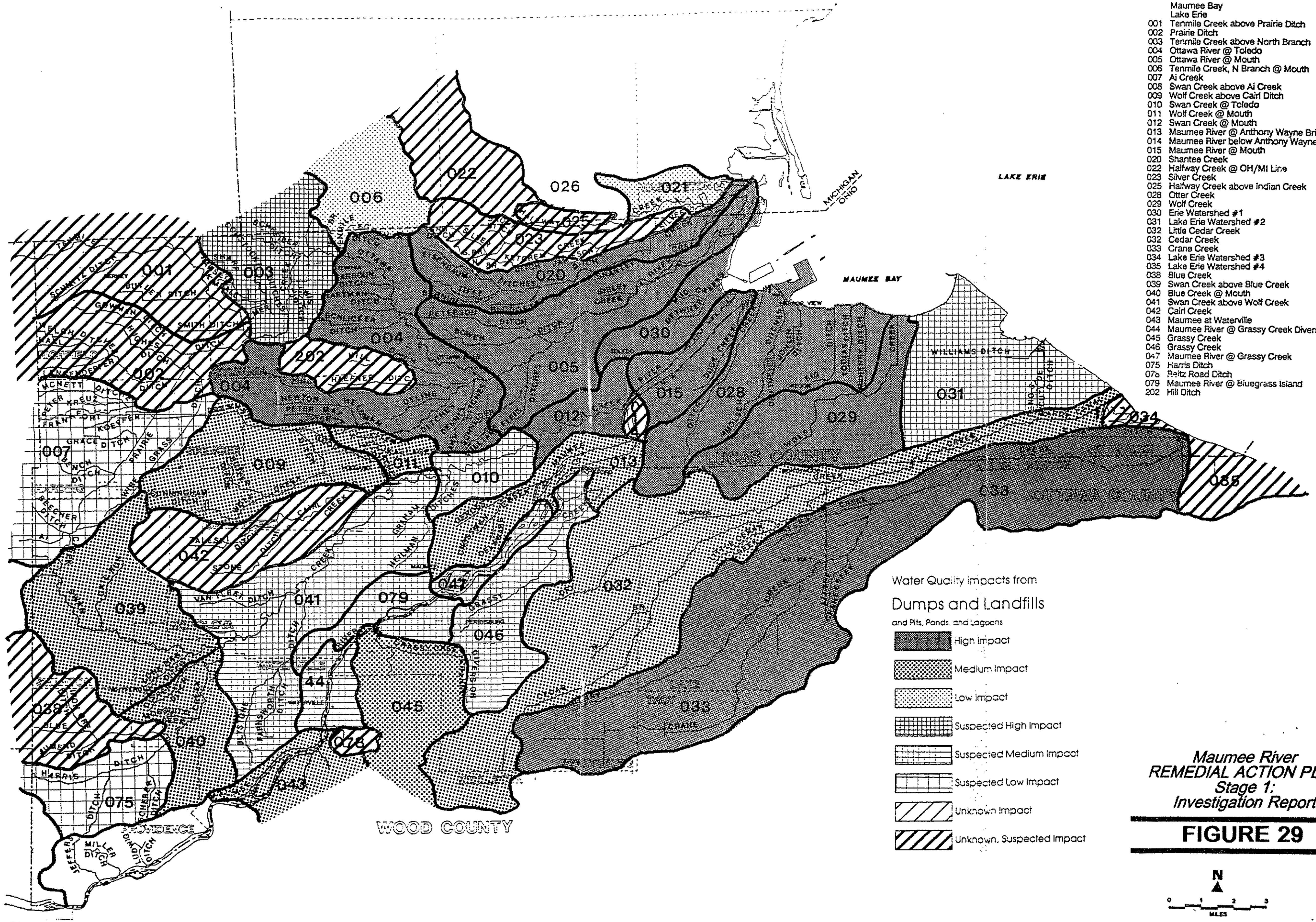
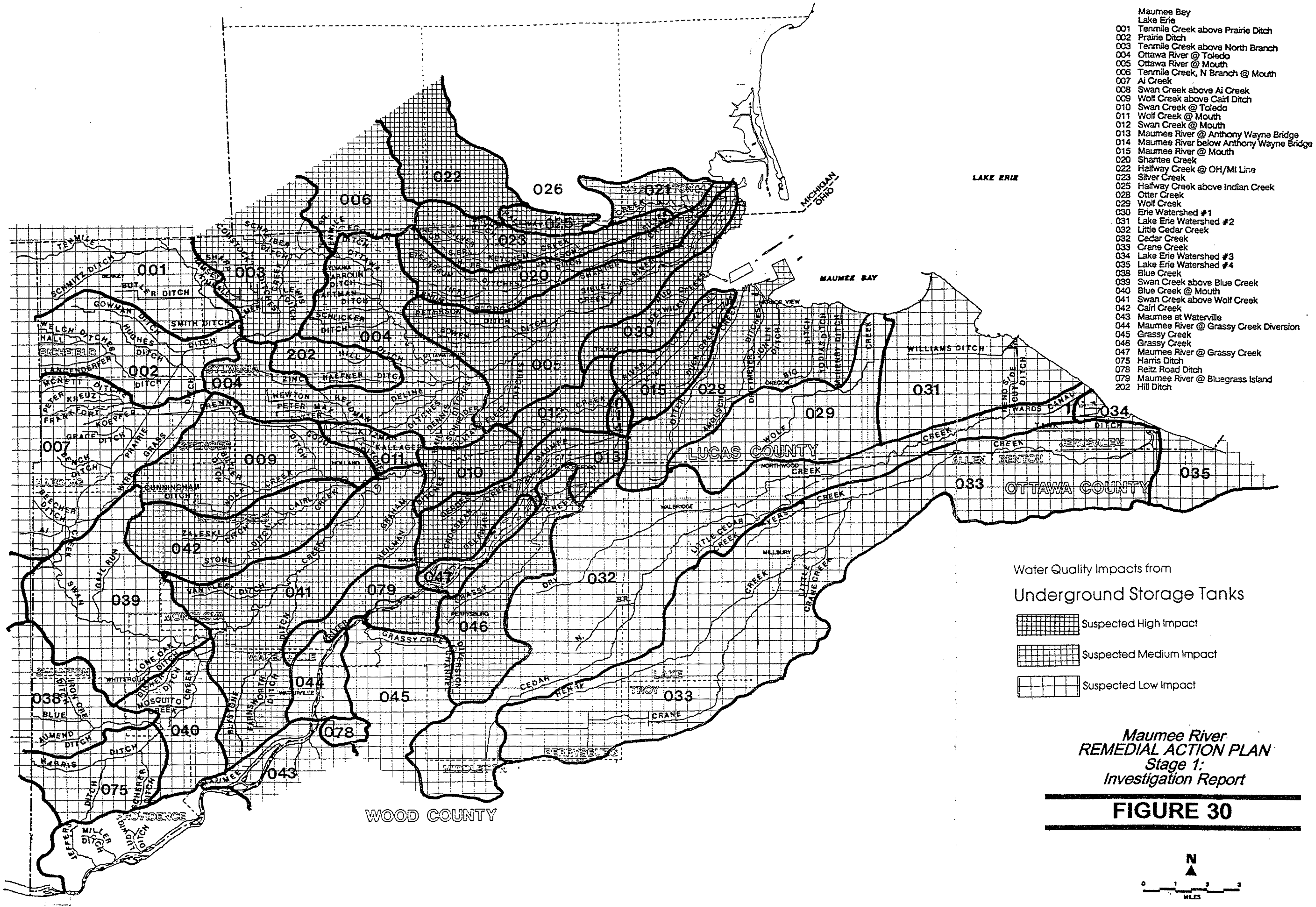
032	Cedar Creek
033	Crane Creek
034	Lake Erie Watershed #3
035	Lake Erie Watershed #4
038	Blue Creek
039	Swan Creek above Blue Creek
040	Blue Creek @ Mouth
041	Swan Creek above Wolf Creek
042	Cairl Creek
043	Maumee at Waterville
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
076	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch



Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 29

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
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007	Ai Creek
008	Swan Creek above Ai Creek
009	Wolf Creek above Cairl Ditch
010	Swan Creek @ Toledo
011	Wolf Creek @ Mouth
012	Swan Creek @ Mouth
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014	Maumee River below Anthony Wayne Bridge
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045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

Underground Storage Tanks

▦	Suspected High Impact
▦	Suspected Medium Impact
▦	Suspected Low Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
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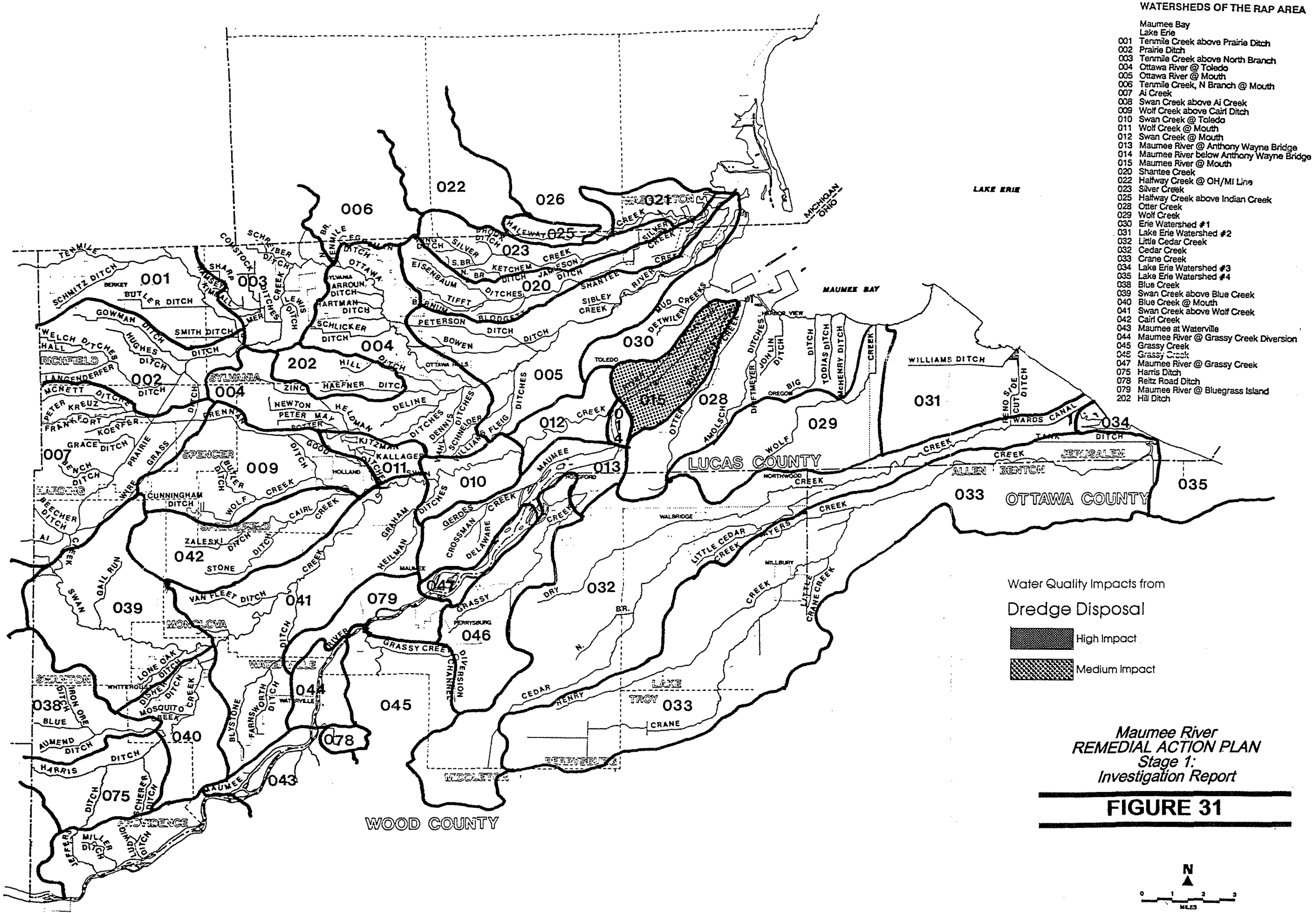
FIGURE 30

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



Maumee River
REMEDIAL ACTION PLAN
Stage 1:
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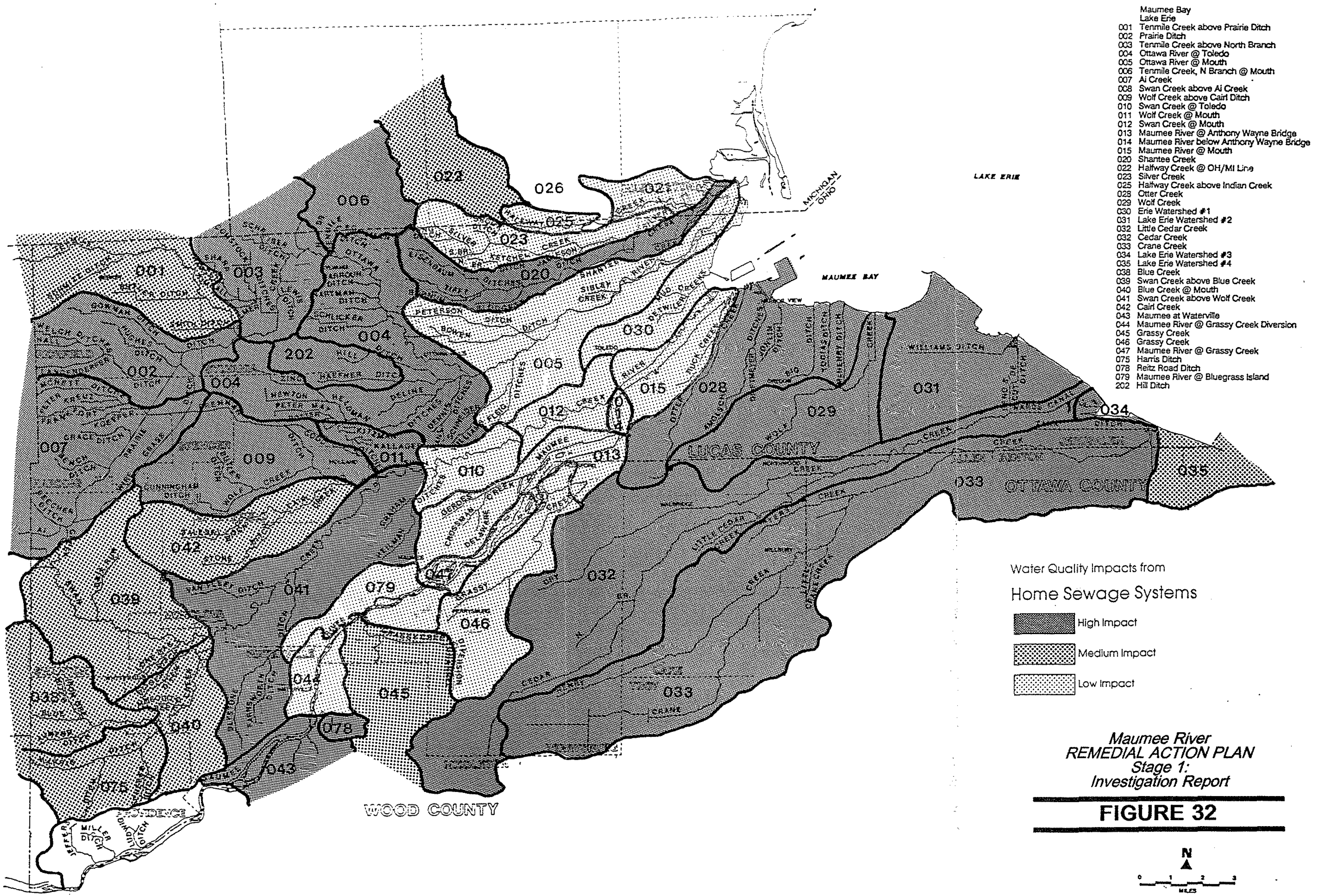
FIGURE 31

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
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045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

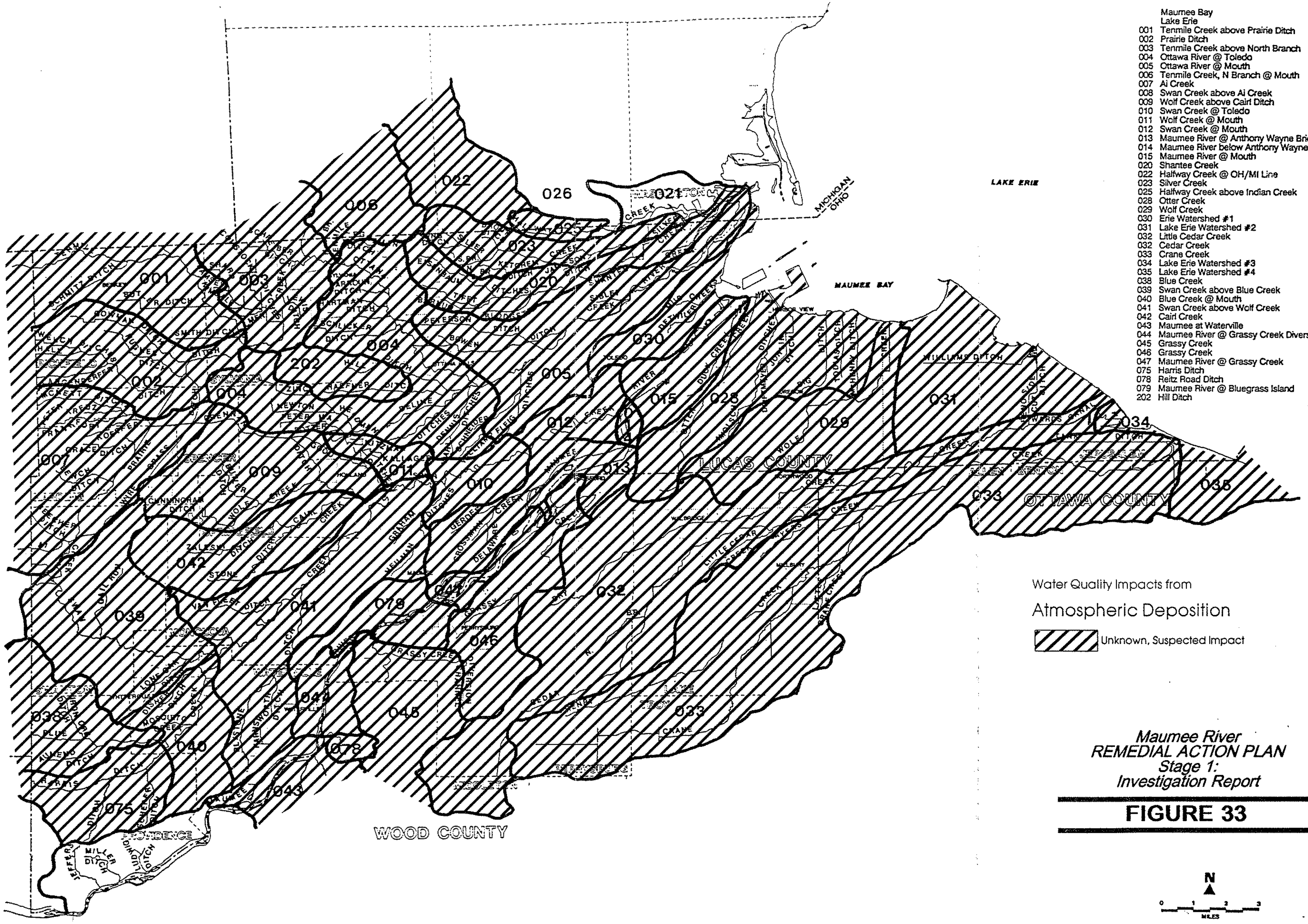
Home Sewage Systems

- ▩ High Impact
- ▨ Medium Impact
- ░ Low Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 32

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
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043	Maumee at Waterville
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

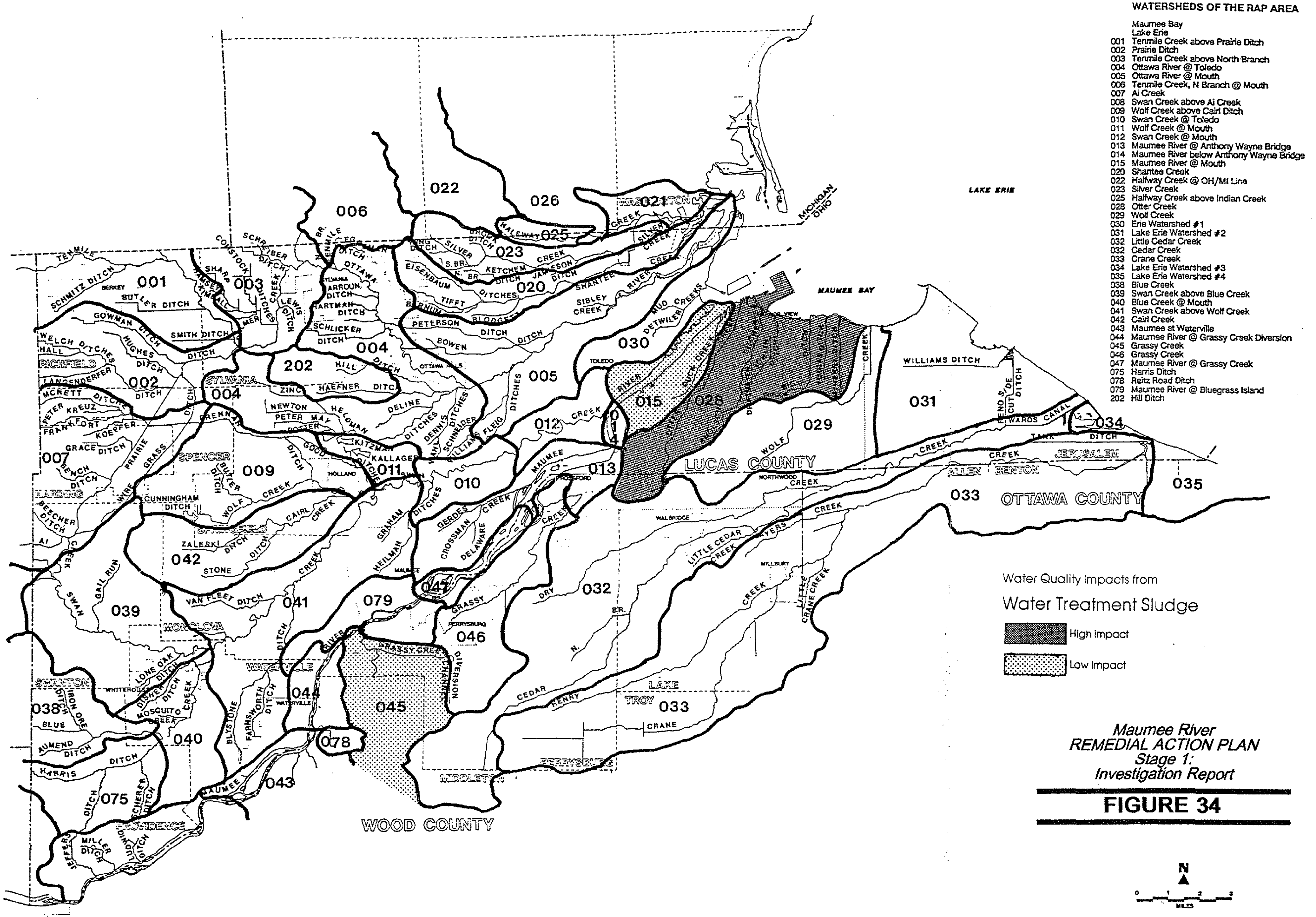
Atmospheric Deposition

▨ Unknown, Suspected Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 33

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN



WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
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005	Ottawa River @ Mouth
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025	Halfway Creek above Indian Creek
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044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch

Water Quality Impacts from

Water Treatment Sludge

▩	High Impact
░	Low Impact

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 34

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

WATERSHEDS OF THE RAP AREA

	Maumee Bay
	Lake Erie
001	Tenmile Creek above Prairie Ditch
002	Prairie Ditch
003	Tenmile Creek above North Branch
004	Ottawa River @ Toledo
005	Ottawa River @ Mouth
006	Tenmile Creek, N Branch @ Mouth
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008	Swan Creek above Ai Creek
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011	Wolf Creek @ Mouth
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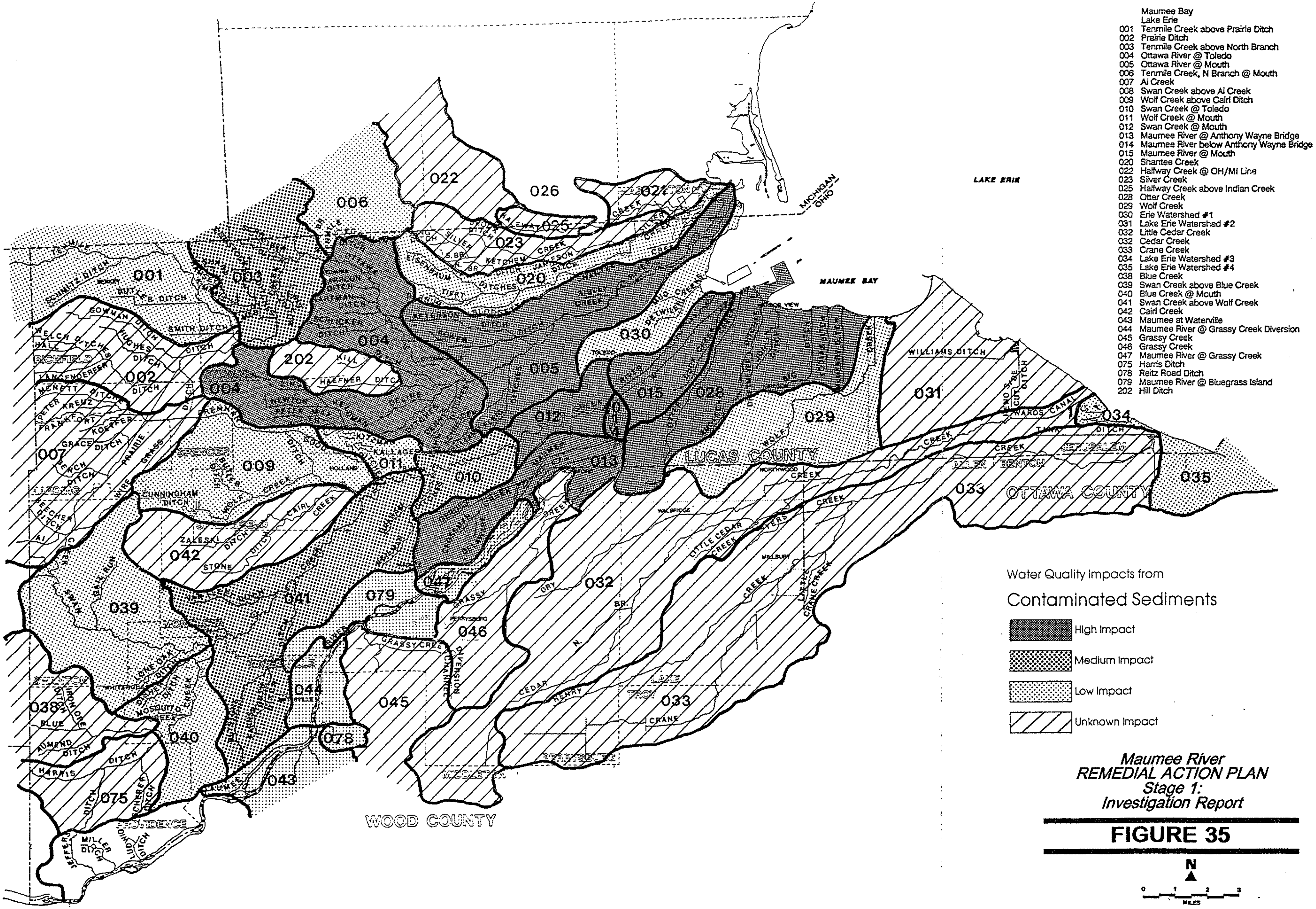
015	Maumee River @ Mouth
020	Shantee Creek
022	Halfway Creek @ OH/MI Line
023	Silver Creek
025	Halfway Creek above Indian Creek
028	Otter Creek
029	Wolf Creek
030	Erie Watershed #1
031	Lake Erie Watershed #2
032	Little Cedar Creek
032	Cedar Creek
033	Crane Creek
034	Lake Erie Watershed #3
035	Lake Erie Watershed #4
038	Blue Creek
039	Swan Creek above Blue Creek
040	Blue Creek @ Mouth
041	Swan Creek above Wolf Creek
042	Cairl Creek
043	Maumee at Waterville
044	Maumee River @ Grassy Creek Diversion
045	Grassy Creek
046	Grassy Creek
047	Maumee River @ Grassy Creek
075	Harris Ditch
078	Reitz Road Ditch
079	Maumee River @ Bluegrass Island
202	Hill Ditch



Water Quality Impacts from

Contaminated Sediments

- ▩ High Impact
- ▦ Medium Impact
- ░ Low Impact
- ▨ Unknown Impact

N

0 1 2 3 MILES

Maumee River
REMEDIAL ACTION PLAN
Stage 1:
Investigation Report

FIGURE 35

LOWER MAUMEE RIVER REMEDIAL ACTION PLAN - AREA OF CONCERN

GLOSSARY

305(b)	A biennial report from the state to U.S. EPA which describes the quality of the water of the state. Specifically, whether it meets the "fishable and swimmable" criteria mandated by the Clean Water Act. The term "305b" refers to the section of the Act requiring this report.
ug/l	Micrograms/liter (parts per billion)
Ag	Silver
As	Arsenic
BOD, BOD$_5$	Biochemical Oxygen Demand. This is a water quality parameter which serves as an indirect measure of the amount of organic matter (food) available for bacteria in a water sample. It measures the amount of oxygen, in pounds, needed to support the growth of bacteria in a water sample over a specified period of time; usually 5 days.
Ba	Barium, a "heavy metal".
Be	Beryllium, a "heavy metal".
BWQR	Biological Water Quality Report: a detailed water quality survey of a stream reach conducted by OEPA. BWQRs were formerly known as CWQRs (Comprehensive WQR).
Bypass	A point in a sanitary sewer system where untreated sewage can overflow directly to a stream instead of continuing to the treatment plant.
C	Carbon
CDF	Confined Disposal Facility. Diked areas in Maumee Bay which are used to hold and dewater sediments dredged off the bottom of the shipping channel.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, more commonly known as "Superfund," which provides authority for Federal cleanup of abandoned toxic waste sides and response to releases of hazardous substances into the environment.
CLEAR	Center for Lake Erie Area Research, a Lake Erie water quality monitoring program, sponsored by Ohio State University.
CN	Cyanide
COD	Chemical Oxygen Demand. An indirect measurement of the amount of carbon (food) in a water sample. This test is somewhat similar to the BOD test, in that it measures the pounds of oxygen needed to use up (oxidize) the carbon in a water sample. The COD uses chemicals to determine the amount of oxygen needed, while the BOD test is a biological test.
CSO	Combined sewer overflow.
$CaCO_3$	Calcium carbonate: "scale." Used as a standard in measuring water hardness.
Cd	Cadmium, a "heavy metal".
Cl,Cl^-	Chlorine, chloride. Chlorine is a poisonous gas commonly used to kill germs in treated sewage or drinking water. Chloride is an electrolyte, a "salt" (sodium chloride), and is not a disinfectant.
COE	US Army Corps of Engineers.
Combined sewage	Sanitary sewage and stormwater combined. Ideally, sanitary sewage and stormwater are carried in separate pipelines. In many inner-city areas, however, there is only one sewer system, and it carries combined sewage.

GLOSSARY
(continued)

Cond.	Conductivity: a specific laboratory test for determining the conductivity of a water sample. It indicates the quantity of dissolved electrolytes in a sample.
Cr	Chromium, a "heavy metal".
Cu	Copper
DO	Dissolved oxygen. Amount of oxygen dissolved in a water sample (in mg/l or ppm). DO is necessary for the survival of fish and other aquatic life.
EPA	Environmental Protection Agency. U.S. EPA is the Federal agency, and Ohio EPA is Ohio's statewide equivalent.
Eutrophication	A natural aging process generally describing the fertility (mainly aquatic plant productivity) of lakes. This process is speeded up if a lake receives an excess amount of nutrient pollutants, especially phosphorus.
F	Fluoride
Fe	Iron
Fecal Coliform	Bacteria which when found in large numbers in a water sample, indicate the presence of untreated sewage.
HUD	Housing and Urban Development. A Federal Agency which provides funding to assist cities and villages with housing and infrastructure problems.
GLISP	Great Lakes International Surveillance Plan.
Hg	Mercury, a "heavy metal"
I/I	Infiltration and Inflow: excess storm and/or ground water entering a sanitary sewer system.
ICI	Invertebrate Community Index: a numerical measure of water quality as reflected by a stream's ability to support aquatic life.
IJC	International Joint Commission
K	Potassium
kg	Kilogram(s): 1000 grams. A kilogram is slightly more than two pounds.
LEWMS	Lake Erie Wastewater Management Study.
LM	Lake mile. How many miles downstream (and out into Lake Erie) a given point is from the mouth of the Maumee.
Leachate	Liquid that leaks out of a landfill or dump; usually ground or surface water highly contaminated with wastes from the dump or landfill.
LWD	Low Water Datum.
MBAS	Methylene Blue Active Substance: a measure for the presence of surfactants in water or wastewater. Surfactants ("surface-active agents") are large organic molecules that cause water to foam or produce suds when agitated.
MG	Million gallons
mg	Milligram(s): a thousandth of a gram. There are 454 grams to a pound.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter (= ppm).
mgd	Million gallons per day
ml	Milliliter(s): a thousandth of a liter. A liter is slightly less than a quart.

MOE	(Ontario) Ministry of the Environment. Equivalent of EPA.
MP	Mile point. How many miles upstream (above) the mouth of a stream a given point is. See RM.
Methane	Natural gas. Formed by the decomposition of organic matter in the absence of oxygen.
Mn	Manganese
N	Nitrogen: one of the chemical elements which in certain forms is a nutrient necessary for life.
NH_3	Ammonia: a form of nitrogen, which is a pollutant.
NO_2	Nitrite(s): a form of nitrogen, which is a pollutant.
NO_3	Nitrate(s): a form of nitrogen, which is a pollutant.
ng/g	Nanograms/gram. "Nano" is a prefix which means "one billionth", or 10^{-9}. ng/g=ppb.
NPDES	National Pollutant Discharge Elimination System. Refers to a permit which is required in order to discharge wastewater to a stream. This permit dictates how clean the water must be before it can be discharged.
Na	Sodium
Ni	Nickel, a "heavy metal".
O/G	Oil and grease. In water quality monitoring, refers to a specific chemical test for amount of oils in a sample.
ODNR	Ohio Department of Natural Resources.
OEPA	Ohio Environmental Protection Agency.
P	Phosphorus. Considered the critical nutrient in the pollution of the Great Lakes. By limiting amount of phosphorus discharged to Lake Erie, the lake's eutrophication can be controlled.
PAH	Polynuclear Aromatic Hydrocarbons.
Pb	Lead, a "heavy metal".
PCB	Polychlorinated Biphenyls. Organic chemicals which, during the 50 years they were manufactured and used, an estimated 400 million pounds entered the environment, according to U.S. EPA Hazardous Waste laboratory. Their use ranged from dielectric oils to carbonless paper production. A colorless liquid, it was used as an insulating fluid in electrical equipment: e.g., transformers, capacitors, because of its stability and heat resistance. PCBs are a suspect carcinogen. A significant health impact has been linked to incomplete combustion of PCBs. The oxidation of PCBs form dioxins and furans, the most toxic of all man-made substances. They have been found in measurable concentrations in waterways and sediments throughout the world, and are widely-spread contaminants of fish and wildlife resources. PCB contamination began in an era when industrial wastes were disposed of by flushing them directly into waterways, local sewage treatment plants, or landfills.
PEMSO	Planning and Engineering Data Management System for Ohio (PEMSO) system, which Ohio EPA uses for classifying stream segments, modeling pollution sources, and their effects on water quality. Related watershed classification systems: TMACOG uses smaller watersheds, which are generally a subset of the PEMSO watersheds. The third system is Land Resources Information System (LRIS), developed for the 208 program, and further defined for the Lake Erie Wastewater Management Study (LEWMS). LRIS watersheds are usually, but not always, the same as TMACOG's.

GLOSSARY
(continued)

pH	A measure of acidity or alkalinity, on a scale of 1 to 14. Neutral is 7.0; lower values are acidic, and higher values are alkaline (basic).
POTW	Publicly-Operated Treatment Works. A wastewater treatment facility operated by a city, village, or county that treats primary domestic sewage. Usually refers to a municipal sewage treatment plant.
ppb	Parts per billion (= ug/l).
ppm	Parts per million (= mg/l).
RCRA	Resource Conservation and Recovery Act of 1976.. Deals with the transport, storage, treatment, or disposal of hazardous wastes and their associated facilities.
RM	River mile: how many miles upstream (above) the mouth of a stream.
Regulator	A device used to control the bypass of untreated combined sewage to a stream. The purpose of the regulator is to allow the system to bypass combined sewage when the system is overloaded from stormwater; but to prevent bypasses during dry weather.
S.D.	Sewer District.
SO_4	Sulfate(s)
SS	Suspended solids: in water quality sampling, the weight of solids (in mg) suspended in a milliliter (ml) of water.
Se	Selenium
Superfund	See CERCLA
TDS	Total dissolved solids.
TESD	Toledo Environmental Services Division: a division of the City of Toledo which is responsible for performing air and water quality monitoring in Toledo. Formerly TESA (Agency).
TKN	Total Kjeldahl Nitrogen: a specific chemical test used to determine how much of certain forms of nitrogen are in a water sample. It includes organic and ammonia nitrogen, but excludes nitrites and nitrates.
TMACOG	Toledo Metropolitan Area Council of Governments: regional planning agency for Lucas, Wood, Ottawa, Sandusky and Erie Counties in Northwest Ohio, and Erie, Bedford, and Whiteford Townships in Monroe County, Michigan.
tpy	Tons per year.
Turb.	Turbidity: a measure of whether or not water is clear. When used in terms of water quality monitoring, it refers to a specific test used to quantity how turbid a water sample is.
USGS	United States Geological Survey. Federal agency involved in detailed mapping of the U.S., and surface and ground water monitoring.
WQ	Water quality.
WTP	Water Treatment Plant. Usually refers to a municipal plant for producing city drinking water.
WWH	Warmwater Habitat: a stream classification used by Ohio EPA to set the water quality standards for a stream. Warmwater standards are not as stringent as Coldwater.
WWTP	Wastewater Treatment Plant. Usually refers to a municipal treatment facility, and often used interchangeably with "Sewage Treatment Plant".
Zn	Zinc, a "heavy metal".

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[redacted]

Ohio EPA Ohio Environmental Protection Agency

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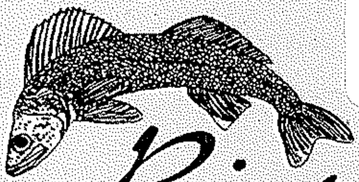

Maumee River REMEDIAL ACTION PLAN

Stage I Investigation Report

Appendices

October 1990

Maumee River Remedial Action Plan Advisory Committee

APPENDIX A

Ohio EPA *Biological Water Quality Report*
Sediment Data: Priority Pollutants

APPENDIX A
SEDIMENT DATA: VOLATILE ORGANICS

MAUMEE RIVER RA 1.0
DOWNSTREAM OF TOLEDO NWTP

: SAMPLE NUMBER :
:   :
: V162924 R :

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: TMA/ERG
LAB SAMPLE ID NO: V162926R
SAMPLE MATRIX: SOIL
DATA RELEASE AUTHORIZED BY: Josepha. Hnatow
CASE NO: AS035
QC REPORT NO:
CONTRACT NO: _
DATE SAMPLE RECEIVED: 11/16/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 12/02/86
DATE ANALYZED: 12/02/86
DIL FACTOR: 9.434 PH 7.38
PERCENT MOISTURE: (NOT DECANTED) 61.0

CAS NUMBER		UG/KG		CAS NUMBER		UG/KG	
74-87-3	CHLOROMETHANE	240.	U	78-87-5	1,2-DICHLOROPROPANE . . .	120.	U
74-83-9	BROMOMETHANE	240.	U	10061-02-6	TRANS-1,3-DICHLOROPROENE .	120.	U
75-01-4	VINYL CHLORIDE	240.	U	79-01-6	TRICHLOROETHENE	120.	U
75-00-3	CHLOROETHANE	240.	U	124-48-1	DIBROMOCHLOROMETHANE . . .	120.	U
75-09-2	METHYLENE CHLORIDE	270.	B	79-00-5	1,1,2-TRICHLOROETHANE . .	120.	U
67-64-1	ACETONE	180.	BJ	71-43-2	BENZENE	120.	U
75-15-0	CARBON DISULFIDE	120.	U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	120.	U
75-35-4	1,1-DICHLOROETHENE	120.	U	110-75-8	2-CHLOROETHYLVINYLETHER .	240.	U
75-35-3	1,1-DICHLOROETHANE	120.	U	75-25-2	BROMOFORM	120.	U
156-60-5	TRANS-1,2-DICHLOROETHENE .	120.	U	108-10-1	4-METHYL-2-PENTANONE . . .	240.	U
67-66-3	CHLOROFORM	120.	U	591-78-6	2-HEXANONE	240.	U
107-06-2	1,2-DICHLOROETHANE	120.	U	127-18-4	TETRACHLOROETHENE	120.	U
78-93-3	2-BUTANONE	240.	U	79-34-5	1,1,2,2-TETRACHLOROETHANE	240.	U
71-55-6	1,1,1-TRICHLOROETHANE . . .	120.	U	108-88-3	TOLUENE	1300.	
56-23-5	CARBON TETRACHLORIDE . . .	120.	U	108-90-7	CHLOROBENZENE	120.	U
108-05-4	VINYL ACETATE	240.	U	100-41-4	ETHYLBENZENE	120.	U
75-27-4	BROMODICHLOROMETHANE . . .	120.	U	100-42-5	STYRENE	120.	U
					TOTAL XYLENES	120.	U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
J - REPORTED VALUE IS LESS THAN THE DETECTION LIMIT.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

FORM I

LABORATORY NAME: TMA/ERG
CASE NO: OHIOEPAS035

: SAMPLE NUMBER :
: 162926 :
:   :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 01/27/87
CONC/DIL FACTOR: 1.
PERCENT MOISTURE: (DECANTED) 61.0

GPC CLEANUP X YES NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG		CAS NUMBER		UG/KG	
108-95-2	PHENOL	850.	U	83-32-9	ACENAPHTHENE	850.	U
111-44-4	BIS(2-CHLOROETHYL)ETHER .	850.	U	51-28-5	2,4-DINITROPHENOL	4100.	U
95-57-8	2-CHLOROPHENOL	850.	U	100-02-7	4-NITROPHENOL	4100.	U
541-73-1	1,3-DICHLOROBENZENE . . .	850.	U	132-64-9	DIBENZOFURAN	850.	U
106-46-7	1,4-DICHLOROBENZENE . . .	850.	U	121-14-2	2,4-DINITROTOLUENE	850.	U
100-51-6	BENZYL ALCOHOL	850.	U	606-20-2	2,6-DINITROTOLUENE	850.	U
95-50-1	1,2-DICHLOROBENZENE . . .	850.	U	84-66-2	DIETHYLPHTHALATE	850.	BU
95-48-7	2-METHYLPHENOL	850.	U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	850.	U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	850.	U	86-73-7	FLUORENE	250.	J
106-44-5	4-METHYLPHENOL	1400.		100-01-6	4-NITROANILINE	4100.	U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	850.	U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	4100.	U
67-72-1	HEXACHLOROETHANE	850.	U	86-30-6	N-NITROSODIPHENYLAMINE (1)	850.	U
98-95-3	NITROBENZENE	850.	U	101-55-3	4-BROMOPHENYL-PHENYLETHER	850.	U
78-59-1	ISOPHORONE	850.	U	118-74-1	HEXACHLOROBENZENE	850.	U
88-75-5	2-NITROPHENOL	850.	U	87-86-5	PENTACHLOROPHENOL	4100.	U
105-67-9	2,4-DIMETHYLPHENOL	850.	U	85-01-8	PHENANTHRENE	1000.	
65-85-0	BENZOIC ACID	4100.	U	120-12-7	ANTHRACENE	490.	BJ
111-91-1	BIS(2-CHLOROETHOXY)METHANE	850.	U	84-74-2	DI-N-BUTYLPHTHALATE . . .	850.	BU
120-83-2	2,4-DICHLOROPHENOL	850.	U	206-44-0	FLUORANTHENE	2100.	
120-82-1	1,2,4-TRICHLOROBENZENE . .	850.	U	129-00-0	PYRENE	1900.	
91-20-3	NAPHTHALENE	380.	BJ	85-68-7	BUTYLBENZYLPHTHALATE . . .	850.	U
106-47-8	4-CHLOROANILINE	850.	U	91-94-1	3,3'-DICHLOROBENZIDINE . .	1700.	U
87-68-3	HEXACHLOROBUTADIENE . . .	850.	U	56-55-3	BENZO(A)ANTHRACENE	1000.	
59-50-7	4-CHLORO-3-METHYLPHENOL .	850.	U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	8600.	B
91-57-6	2-METHYLNAPHTHALENE . . .	850.	U	218-01-9	CHRYSENE	1200.	
77-47-6	HEXACHLOROCYCLOPENTADIENE	850.	U	117-84-0	DI-N-OCTYL PHTHALATE . . .	2000.	
88-06-2	2,4,6-TRICHLOROPHENOL . .	850.	U	205-99-2	BENZO(B)FLUORANTHENE . . .	880.	
95-95-4	2,4,5-TRICHLOROPHENOL . .	4100.	U	207-08-9	BENZO(K)FLUORANTHENE . . .	990.	
91-58-7	2-CHLORONAPHTHALENE . . .	850.	U	50-32-8	BENZO(A)PYRENE	910.	
88-74-4	2-NITROANILINE	4100.	U	193-39-5	INDENO(1,2,3-CD)PYRENE . .	890.	
131-11-3	DIMETHYL PHTHALATE	850.	U	53-70-3	DIBENZ(A,H)ANTHRACENE . .	820.	J
208-96-8	ACENAPHTHYLENE	850.	U	191-24-2	BENZO(G,H,I)PERYLENE . . .	1100.	
99-09-2	3-NITROANILINE	4100.	U				

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name. TMA/ERG, Inc.
Case No OEPA AS035

Sample Number
162924

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-21-86
Date Analyzed: 2-24-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 61

GPC Cleanup ☑Yes ☐No
Separatory Funnel Extraction ☐Yes
Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	21	U
319-85-7	Beta-BHC	21	U
319-86-8	Delta-BHC	21	U
58-89-9	Gamma-BHC (Lindane)	21	U
76-44-8	Heptachlor	21	U
309-00-2	Aldrin	21	U
1024-57-3	Heptachlor Epoxide	21	U
959-98-8	Endosulfan I	21	U
60-57-1	Dieldrin	42	U
72-55-9	4, 4'-DDE	42	U
72-20-8	Endrin	42	U
33213-65-9	Endosulfan II	42	U
72-54-8	4, 4'-DDD	42	U
1031-07-8	Endosulfan Sulfate	42	U
50-29-3	4, 4'-DDT	42	U
72-43-5	Methoxychlor	210	U
53494-70-5	Endrin Ketone	42	U
57-74-9	Chlordane	210	U
8001-35-2	Toxaphene	420	U
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	210	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	210	U
12672-29-6	Aroclor-1248	210	U
11097-69-1	Aroclor-1254	420	U
11096-82-5	Aroclor-1260	420	U
	Mirex	41	u

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s ——— or W_s 12g DRY WT. V_t 1000 ul V_i 3.0 ul

MAUMEE RIVER RM 4.9
AT CHERRY ST. BRIDGE

SAMPLE NUMBER
V162923R3

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: TMA/ERG
LAB SAMPLE ID NO: V162923R3
SAMPLE MATRIX: SOIL
DATA RELEASE AUTHORIZED BY: Joseph C.

CASE NO: AS035
QC REPORT NO:
CONTRACT NO:
DATE SAMPLE RECEIVED: 11/14/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 11/21/86
CONC/DIL FACTOR: 1. PH 7.53
PERCENT MOISTURE: (NOT DECANTED) 55.0

CAS NUMBER		UG/KG		CAS NUMBER		UG/KG	
74-87-3	CHLOROMETHANE	22.	U	78-87-5	1,2-DICHLOROPROPANE . . .	11.	U
74-83-9	BROMOMETHANE	22.	U	10061-02-6	TRANS-1,3-DICHLOROPROENE .	11.	U
75-01-4	VINYL CHLORIDE	22.	U	79-01-6	TRICHLOROETHENE	11.	U
75-00-3	CHLOROETHANE	22.	U	124-48-1	DIBROMOCHLOROMETHANE . . .	11.	U
75-09-2	METHYLENE CHLORIDE	51.	B	79-00-5	1,1,2-TRICHLOROETHANE . .	11.	U
67-64-1	ACETONE	44.		71-43-2	BENZENE	11.	U
75-15-0	CARBON DISULFIDE	11.	U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	11.	U
75-35-4	1,1-DICHLOROETHENE	11.	U	110-75-8	2-CHLOROETHYLVINYLETHER .	22.	U
75-35-3	1,1-DICHLOROETHANE	11.	U	75-25-2	BROMOFORM	11.	U
156-60-5	TRANS-1,2-DICHLOROETHENE .	11.	U	108-10-1	4-METHYL-2-PENTANONE . . .	22.	U
67-66-3	CHLOROFORM	11.	U	591-78-6	2-HEXANONE	22.	U
107-06-2	1,2-DICHLOROETHANE	11.	U	127-18-4	TETRACHLOROETHENE	11.	U
78-93-3	2-BUTANONE	22.	U	79-34-5	1,1,2,2-TETRACHLOROETHANE	22.	U
71-55-6	1,1,1-TRICHLOROETHANE . .	11.	U	108-88-3	TOLUENE	11.	U
56-23-5	CARBON TETRACHLORIDE . . .	11.	U	108-90-7	CHLOROBENZENE	11.	U
108-05-4	VINYL ACETATE	22.	U	100-41-4	ETHYLBENZENE	11.	U
75-27-4	BROMODICHLOROMETHANE . . .	11.	U	100-42-5	STYRENE	11.	U
					TOTAL XYLENES	11.	U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

FORM I

LABORATORY NAME: THA/ERG
CASE NO: OHIOEPA5035

: SAMPLE NUMBER :
: 162923 :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 01/27/87
CONC/DIL FACTOR: 1.
PERCENT MOISTURE: (DECANTED) 55.0

GPC CLEANUP X YES NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG		CAS NUMBER		UG/KG	
108-95-2	PHENOL	730.	U	83-32-9	ACENAPHTHENE	1400.	
111-44-4	BIS(2-CHLOROETHYL)ETHER	730.	U	51-28-5	2,4-DINITROPHENOL	3600.	U
95-57-8	2-CHLOROPHENOL	730.	U	100-02-7	4-NITROPHENOL	3600.	U
541-73-1	1,3-DICHLOROBENZENE	730.	U	132-64-9	DIBENZOFURAN	1300.	
106-46-7	1,4-DICHLOROBENZENE	730.	U	121-14-2	2,4-DINITROTOLUENE	730.	U
100-51-6	BENZYL ALCOHOL	730.	U	606-20-2	2,6-DINITROTOLUENE	730.	U
95-50-1	1,2-DICHLOROBENZENE	730.	U	84-66-2	DIETHYLPHTHALATE	730.	BU
95-48-7	2-METHYLPHENOL	730.	U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	730.	U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	730.	U	86-73-7	FLUORENE	2500.	
106-44-5	4-METHYLPHENOL	730.	U	100-10-6	4-NITROANILINE	3600.	U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	730.	U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	3600.	U
67-72-1	HEXACHLOROETHANE	730.	U	86-30-6	N-NITROSODIPHENYLAMINE (1)	730.	U
98-95-3	NITROBENZENE	730.	U	101-55-3	4-BROMOPHENYL-PHENYLETHER	730.	U
78-59-1	ISOPHORONE	730.	U	118-74-1	HEXACHLOROBENZENE	730.	U
88-75-5	2-NITROPHENOL	730.	U	87-86-5	PENTACHLOROPHENOL	3600.	U
105-67-9	2,4-DIMETHYLPHENOL	730.	U	85-01-8	PHENANTHRENE	11000.	
65-85-0	BENZOIC ACID	3600.	U	120-12-7	ANTHRACENE	6400.	B
111-91-1	BIS(2-CHLOROETHOXY)METHANE	730.	U	84-74-2	DI-N-BUTYLPHTHALATE	960.	B
120-83-2	2,4-DICHLOROPHENOL	730.	U	206-44-0	FLUORANTHENE	11000.	
120-82-1	1,2,4-TRICHLOROBENZENE	730.	U	129-00-0	PYRENE	7300.	
91-20-3	NAPHTHALENE	770.	B	85-68-7	BUTYLBENZYLPHTHALATE	730.	U
106-47-8	4-CHLOROANILINE	730.	U	91-94-1	3,3'-DICHLOROBENZIDINE	1500.	U
87-68-3	HEXACHLOROBUTADIENE	730.	U	56-55-3	BENZO(A)ANTHRACENE	3900.	
59-50-7	4-CHLORO-3-METHYLPHENOL	730.	U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1100.	B
91-57-6	2-METHYLNAPHTHALENE	790.		218-01-9	CHRYSENE	4000.	
77-47-4	HEXACHLOROCYCLOPENTADIENE	730.	U	117-84-0	DI-N-OCTYL PHTHALATE	730.	U
88-06-2	2,4,6-TRICHLOROPHENOL	730.	U	205-99-2	BENZO(B)FLUORANTHENE	1900.	
95-95-4	2,4,5-TRICHLOROPHENOL	3600.	U	207-08-9	BENZO(K)FLUORANTHENE	2500.	
91-58-7	2-CHLORONAPHTHALENE	730.	U	50-32-8	BENZO(A)PYRENE	2300.	
88-74-4	2-NITROANILINE	3600.	U	193-39-5	INDENO(1,2,3-CD)PYRENE	1500.	
131-11-3	DIMETHYL PHTHALATE	730.	U	53-70-3	DIBENZ(A,H)ANTHRACENE	970.	
208-96-8	ACENAPHTHYLENE	730.	U	191-24-2	BENZO(G,H,I)PERYLENE	1800.	
99-09-2	3-NITROANILINE	3600.	U				

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name THA/E.R.G., Inc.
Case No OEPA A5035

Sample Number
162923

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-21-86
Date Analyzed: 2-24-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 55

GPC Cleanup ☑ Yes ☐ No
Separatory Funnel Extraction ☐ Yes
Continuous Liquid - Liquid Extraction ☐ Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	18	U
319-85-7	Beta-BHC	18	U
319-86-8	Delta-BHC	18	U
58-89-9	Gamma-BHC (Lindane)	18	U
76-44-8	Heptachlor	18	U
309-00-2	Aldrin	18	U
1024-57-3	Heptachlor Epoxide	18	U
959-98-8	Endosulfan I	18	U
60-57-1	Dieldrin	36	U
72-55-9	4, 4'-DDE	36	U
72-20-8	Endrin	36	U
33213-65-9	Endosulfan II	36	U
72-54-8	4, 4'-DDD	36	U
1031-07-8	Endosulfan Sulfate	36	U
50-29-3	4, 4'-DDT	36	U
72-43-5	Methoxychlor	180	U
53494-70-5	Endrin Ketone	36	U
57-74-9	Chlordane	180	U
8001-35-2	Toxaphene	360	U
12674-11-2	Aroclor-1016	180	U
11104-28-2	Aroclor-1221	180	U
11141-16-5	Aroclor-1232	180	U
53469-21-9	Aroclor-1242	180	U
12672-29-6	Aroclor-1248	180	U
11097-69-1	Aroclor-1254	360	U
11096-82-5	Aroclor-1260	360	U
	Mirex	36	U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s ______ or W_s 14g DRY WT. V_t 1000 ul V_i 3.0 ul

MAUMEE RIVER RM 9.4

: SAMPLE NUMBER :
: :
:V162922R :

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: THA/ERG
CASE NO: AS035
LAB SAMPLE ID NO: V162922R
QC REPORT NO:
SAMPLE MATRIX: SOIL
CONTRACT NO:
DATA RELEASE AUTHORIZED BY: Joseph A. Hostoul
DATE SAMPLE RECEIVED: 11/14/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/19/86
DATE ANALYZED: 11/19/86
CONC FACTOR: 1.041666 PH 7.50
PERCENT MOISTURE: (NOT DECANTED) 56.0

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
74-87-3	CHLOROMETHANE	22. U	78-87-5	1,2-DICHLOROPROPANE . . .	11. U
74-83-9	BROMOMETHANE	22. U	10061-02-6	TRANS-1,3-DICHLOROPROPENE .	11. U
75-01-4	VINYL CHLORIDE	22. U	79-01-6	TRICHLOROETHENE	6. BJ
75-00-3	CHLOROETHANE	22. U	124-48-1	DIBROMOCHLOROMETHANE . . .	11. U
75-09-2	METHYLENE CHLORIDE	15. B	79-00-5	1,1,2-TRICHLOROETHANE . .	11. U
67-64-1	ACETONE	8. BJ	71-43-2	BENZENE	11. U
75-15-0	CARBON DISULFIDE	11. U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	11. U
75-35-4	1,1-DICHLOROETHENE	11. U	110-75-8	2-CHLOROETHYLVINYLETHER .	22. U
75-33-3	1,1-DICHLOROETHANE	11. U	75-25-2	BROMOFORM	11. U
156-60-5	TRANS-1,2-DICHLOROETHENE .	11. U	108-10-1	4-METHYL-2-PENTANONE . . .	22. U
67-66-3	CHLOROFORM	11. U	591-78-6	2-HEXANONE	22. U
107-06-2	1,2-DICHLOROETHANE	11. U	127-18-4	TETRACHLOROETHENE	11. U
78-93-3	2-BUTANONE	22. U	79-34-5	1,1,2,2-TETRACHLOROETHANE	22. U
71-55-6	1,1,1-TRICHLOROETHANE . .	11. U	108-88-3	TOLUENE	11. U
56-23-5	CARBON TETRACHLORIDE . . .	11. U	108-90-7	CHLOROBENZENE	11. U
108-05-4	VINYL ACETATE	22. U	100-41-4	ETHYLBENZENE	11. U
75-27-4	BROMODICHLOROMETHANE . . .	11. U	100-42-5	STYRENE	11. U
				TOTAL XYLENES	11. U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
J - REPORTED VALUE IS LESS THAN THE DETECTION LIMIT.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

LABORATORY NAME: THA/ERG
CASE NO: OEPAS035

: SAMPLE NUMBER :
: 162922 :
: :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 01/28/87
CONC/DIL FACTOR: 1.
PERCENT MOISTURE: (DECANTED) 56.0

GPC CLEANUP X YES NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
108-95-2	PHENOL	750. U	83-32-9	ACENAPHTHENE	750. U
111-44-4	BIS(2-CHLOROETHYL)ETHER .	750. U	51-28-5	2,4-DINITROPHENOL	3600. U
95-57-8	2-CHLOROPHENOL	750. U	100-02-7	4-NITROPHENOL	3600. U
541-73-1	1,3-DICHLOROBENZENE . . .	750. U	132-64-9	DIBENZOFURAN	750. U
106-46-7	1,4-DICHLOROBENZENE . . .	750. U	121-14-2	2,4-DINITROTOLUENE	750. U
100-51-6	BENZYL ALCOHOL	750. U	606-20-2	2,6-DINITROTOLUENE	750. U
95-50-1	1,2-DICHLOROBENZENE . . .	750. U	84-66-2	DIETHYLPHTHALATE	750. BU
95-48-7	2-METHYLPHENOL	750. U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	750. U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	750. U	86-73-7	FLUORENE	750. U
106-44-5	4-METHYLPHENOL	750. U	100-01-6	4-NITROANILINE	3600. U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	750. U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	3600. U
67-72-1	HEXACHLOROETHANE	750. U	86-30-6	N-NITROSODIPHENYLAMINE (1)	750. U
98-95-3	NITROBENZENE	750. U	101-55-3	4-BROMOPHENYL-PHENYLETHER	750. U
78-59-1	ISOPHORONE	750. U	118-74-1	HEXACHLOROBENZENE	750. U
88-75-5	2-NITROPHENOL	750. U	87-86-5	PENTACHLOROPHENOL	3600. U
105-67-9	2,4-DIMETHYLPHENOL	750. U	85-01-8	PHENANTHRENE	750. U
65-85-0	BENZOIC ACID	3600. U	120-12-7	ANTHRACENE	750. BU
111-91-1	BIS(2-CHLOROETHOXY)METHANE	750. U	84-74-2	DI-N-BUTYLPHTHALATE . . .	750. BU
120-83-2	2,4-DICHLOROPHENOL	750. U	206-44-0	FLUORANTHENE	190. J
120-82-1	1,2,4-TRICHLOROBENZENE . .	750. U	129-00-0	PYRENE	750. U
91-20-3	NAPHTHALENE	750. BU	85-68-7	BUTYLBENZYLPHTHALATE . . .	750. U
106-47-8	4-CHLOROANILINE	750. U	91-94-1	3,3'-DICHLOROBENZIDINE . .	1500. U
87-68-3	HEXACHLOROBUTADIENE . . .	750. U	56-55-3	BENZO(A)ANTHRACENE	750. U
59-50-7	4-CHLORO-3-METHYLPHENOL .	750. U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	350. BJ
91-57-6	2-METHYLNAPHTHALENE . . .	750. U	218-01-9	CHRYSENE	750. U
77-47-4	HEXACHLOROCYCLOPENTADIENE	750. U	117-84-0	DI-N-OCTYL PHTHALATE . . .	750. U
88-06-2	2,4,6-TRICHLOROPHENOL . .	750. U	205-99-2	BENZO(B)FLUORANTHENE . . .	750. U
95-95-4	2,4,5-TRICHLOROPHENOL . .	3600. U	207-08-9	BENZO(K)FLUORANTHENE . . .	750. U
91-58-7	2-CHLORONAPHTHALENE . . .	750. U	50-32-8	BENZO(A)PYRENE	750. U
88-74-4	2-NITROANILINE	3600. U	193-39-5	INDENO(1,2,3-CD)PYRENE . .	750. U
131-11-3	DIMETHYL PHTHALATE	750. U	53-70-3	DIBENZ(A,H)ANTHRACENE . .	750. U
208-96-8	ACENAPHTHYLENE	750. U	191-24-2	BENZO(G,H,I)PERYLENE . . .	750. U
99-09-2	3-NITROANILINE	3600. U			

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

Laboratory Name TMA/ERG, Inc.
Case No. OEPA A5035

Sample Number
162922

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration. [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-21-86
Date Analyzed: 2-24-87
Conc/Dil Factor:
Percent Moisture (decanted) 56

GPC Cleanup ☑ Yes ☐ No
Separatory Funnel Extraction ☐ Yes
Continuous Liquid - Liquid Extraction ☐ Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	18	U
319-85-7	Beta-BHC	18	U
319-86-8	Delta-BHC	18	U
58-89-9	Gamma-BHC (Lindane)	18	U
76-44-8	Heptachlor	18	U
309-00-2	Aldrin	18	U
1024-57-3	Heptachlor Epoxide	18	U
959-98-8	Endosulfan I	18	U
60-57-1	Dieldrin	36	U
72-55-9	4, 4'-DDE	36	U
72-20-8	Endrin	36	U
33213-65-9	Endosulfan II	36	U
72-54-8	4, 4'-DDD	36	U
1031-07-8	Endosulfan Sulfate	36	U
50-29-3	4, 4'-DDT	36	U
72-43-5	Methoxychlor	180	U
53494-70-5	Endrin Ketone	36	U
57-74-9	Chlordane	180	U
8001-35-2	Toxaphene	360	U
12674-11-2	Aroclor-1016	180	U
11104-28-2	Aroclor-1221	180	U
11141-16-5	Aroclor-1232	180	U
53469-21-9	Aroclor-1242	180	U
12672-29-6	Aroclor-1248	180	U
11097-69-1	Aroclor-1254	360	U
11096-82-5	Aroclor-1260	360	U
	Mirex	36	U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s ______ or W_s 13g DRY WT. V_t 1000 ul V_i 3.0 ul

OTTAWA RIVER RM 4.9
AT STICKNEY AVE.

SAMPLE NUMBER
V162930R

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: TMA/ERG
LAB SAMPLE ID NO: V162930R
SAMPLE MATRIX: SOIL
DATA RELEASE AUTHORIZED BY: Joseph A. H

CASE NO: A5035
QC REPORT NO:
CONTRACT NO:
DATE SAMPLE RECEIVED: 11/14/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/19/86
DATE ANALYZED: 11/19/86
CONC FACTOR: 1.023541 PH 7.76
PERCENT MOISTURE: (NOT DECANTED) 34.0

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
74-87-3	CHLOROMETHANE	15. U	78-87-5	1,2-DICHLOROPROPANE . . .	7.4U
74-83-9	BROMOMETHANE	15. U	10061-02-6	TRANS-1,3-DICHLOROPROENE .	7.4U
75-01-4	VINYL CHLORIDE	15. U	79-01-6	TRICHLOROETHENE	7.4U
75-00-3	CHLOROETHANE	15. U	124-48-1	DIBROMOCHLOROMETHANE . . .	7.4U
75-09-2	METHYLENE CHLORIDE	16. B	79-00-5	1,1,2-TRICHLOROETHANE . .	7.4U
67-64-1	ACETONE	15. U	71-43-2	BENZENE	7.4U
75-15-0	CARBON DISULFIDE	7.4U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	7.4U
75-35-4	1,1-DICHLOROETHENE	7.4U	110-75-8	2-CHLOROETHYLVINYLETHER .	15. U
75-34-3	1,1-DICHLOROETHANE	7.4U	75-25-2	BROMOFORM	7.4U
156-60-5	TRANS-1,2-DICHLOROETHENE .	7.4U	108-10-1	4-METHYL-2-PENTANONE . . .	15. U
67-66-3	CHLOROFORM	7.4U	591-78-6	2-HEXANONE	15. U
107-06-2	1,2-DICHLOROETHANE	7.4U	127-18-4	TETRACHLOROETHENE	7.4U
78-93-3	2-BUTANONE	15. U	79-34-5	1,1,2,2-TETRACHLOROETHANE	15. U
71-55-6	1,1,1-TRICHLOROETHANE . .	7.4U	108-88-3	TOLUENE	7.4U
56-23-5	CARBON TETRACHLORIDE . . .	7.4U	108-90-7	CHLOROBENZENE	7.4U
108-05-4	VINYL ACETATE	15. U	100-41-4	ETHYLBENZENE	7.4U
75-27-4	BROMODICHLOROMETHANE . . .	7.4U	100-42-5	STYRENE	7.4U
				TOTAL XYLENES	7.4U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

FORM I

LABORATORY NAME: THA/ERG
CASE NO: OHIOEPAS035

: SAMPLE NUMBER :
: 162930 :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 02/03/87
DIL FACTOR: 2.000
PERCENT MOISTURE: (DECANTED) 34.0

GPC CLEANUP X YES NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG		CAS NUMBER		UG/KG	
108-95-2	PHENOL	1000.	U	83-32-9	ACENAPHTHENE	330.	J
111-44-4	BIS(2-CHLOROETHYL)ETHER .	1000.	U	51-28-5	2,4-DINITROPHENOL	4800.	U
95-57-8	2-CHLOROPHENOL	1000.	U	100-02-7	4-NITROPHENOL	4800.	U
541-73-1	1,3-DICHLOROBENZENE . . .	1000.	U	132-64-9	DIBENZOFURAN	260.	J
106-46-7	1,4-DICHLOROBENZENE . . .	1000.	U	121-14-2	2,4-DINITROTOLUENE	1000.	U
100-51-6	BENZYL ALCOHOL	1000.	U	606-20-2	2,6-DINITROTOLUENE	1000.	U
95-50-1	1,2-DICHLOROBENZENE . . .	1000.	U	84-66-2	DIETHYLPHTHALATE	1000.	BU
95-48-7	2-METHYLPHENOL	1000.	U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	1000.	U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	1000.	U	86-73-7	FLUORENE	670.	J
106-44-5	4-METHYLPHENOL	1000.	U	100-01-6	4-NITROANILINE	4800.	U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	1000.	U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	4800.	U
67-72-1	HEXACHLOROETHANE	1000.	U	86-30-6	N-NITROSODIPHENYLAMINE (1)	1000.	U
98-95-3	NITROBENZENE	1000.	U	101-55-3	4-BROMOPHENYL-PHENYLETHER	1000.	U
78-59-1	ISOPHORONE	1000.	U	118-74-1	HEXACHLOROBENZENE	1000.	U
88-75-5	2-NITROPHENOL	1000.	U	87-86-5	PENTACHLOROPHENOL	4800.	U
105-67-9	2,4-DIMETHYLPHENOL	1000.	U	85-01-8	PHENANTHRENE	4100.	
65-85-0	BENZOIC ACID	4800.	U	120-12-7	ANTHRACENE	870.	BJ
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1000.	U	84-74-2	DI-N-BUTYLPHTHALATE . . .	1000.	BU
120-83-2	2,4-DICHLOROPHENOL	1000.	U	206-44-0	FLUORANTHENE	5800.	
120-82-1	1,2,4-TRICHLOROBENZENE . .	1000.	U	129-00-0	PYRENE	4900.	
91-20-3	NAPHTHALENE	230.	BJ	85-68-7	BUTYLBENZYLPHTHALATE . . .	4300.	
106-47-8	4-CHLOROANILINE	1000.	U	91-94-1	3,3'-DICHLOROBENZIDINE . .	2000.	U
87-68-3	HEXACHLOROBUTADIENE . . .	1000.	U	56-55-3	BENZO(A)ANTHRACENE	3200.	
59-50-7	4-CHLORO-3-METHYLPHENOL .	1000.	U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	14000.	B
91-57-6	2-METHYLNAPHTHALENE . . .	1000.	U	218-01-9	CHRYSENE	2800.	
77-47-4	HEXACHLOROCYCLOPENTADIENE	1000.	U	117-84-0	DI-N-OCTYL PHTHALATE . . .	3600.	
88-06-2	2,4,6-TRICHLOROPHENOL . .	1000.	U	205-99-2	BENZO(B)FLUORANTHENE . . .	1000.	U
95-95-4	2,4,5-TRICHLOROPHENOL . .	4800.	U	207-08-9	BENZO(K)FLUORANTHENE . . .	1000.	U
91-58-7	2-CHLORONAPHTHALENE . . .	1000.	U	50-32-8	BENZO(A)PYRENE	1000.	
88-74-4	2-NITROANILINE	4800.	U	193-39-5	INDENO(1,2,3-CD)PYRENE . .	1700.	
131-11-3	DIMETHYL PHTHALATE	1000.	U	53-70-3	DIBENZ(A,H)ANTHRACENE . .	930.	J
208-96-8	ACENAPHTHYLENE	100.	J	191-24-2	BENZO(G,H,I)PERYLENE . . .	1800.	
99-09-2	3-NITROANILINE	4800.	U				

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name: TMA/E.R.G. Inc.
Case No OEPA AS035

Sample Numbe
162930

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-21-86
Date Analyzed: 2-24-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 34

GPC Cleanup ☑Yes ☐No
Separatory Funnel Extraction ☐Yes
Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	12	U
319-85-7	Beta-BHC	12	U
319-86-8	Delta-BHC	12	U
58-89-9	Gamma-BHC (Lindane)	12	U
76-44-8	Heptachlor	12	U
309-00-2	Aldrin	12	U
1024-57-3	Heptachlor Epoxide	12	U
959-98-8	Endosulfan I	12	U
60-57-1	Dieldrin	24	U
72-55-9	4, 4'-DDE	24	U
72-20-8	Endrin	24	U
33213-65-9	Endosulfan II	24	U
72-54-8	4, 4'-DDD	24	U
1031-07-8	Endosulfan Sulfate	24	U
50-29-3	4 4'-DDT	24	U
72-43-5	Methoxychlor	120	U
53494-70-5	Endrin Ketone	24	U
57-74-9	Chlordane	120	U
8001-35-2	Toxaphene	240	U
12674-11-2	Aroclor-1016	120	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	120	U
53469-21-9	Aroclor-1242	2500	
12672-29-6	Aroclor-1248	120	U
11097-69-1	Aroclor-1254	240	U
11096-82-5	Aroclor-1260	240	U
	Mirex	24	U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s ——— or W_s 20g DRY WT. V_t 1000 ul V_i 3.0 ul

OTTAWA RIVER RM 6.4
AT LAGRANGE ST.

! SAMPLE NUMBER !
! !
!V162929 R2 !

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: THA/ERG
CASE NO: A5035
LAB SAMPLE ID NO: V162929R2
QC REPORT NO:
SAMPLE MATRIX: SOIL
CONTRACT NO:
DATA RELEASE AUTHORIZED BY Joseph A. Hnatko
DATE SAMPLE RECEIVED: 11/14/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/19/86
DATE ANALYZED: 11/19/86
CONC FACTOR: 1.034126 PH 7.55
PERCENT MOISTURE: (NOT DECANTED) 35.0

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
74-87-3	CHLOROMETHANE	15. U	78-87-5	1,2-DICHLOROPROPANE . . .	7.4U
74-83-9	BROMOMETHANE	15. U	10061-02-6	TRANS-1,3-DICHLOROPROPENE .	7.4U
75-01-4	VINYL CHLORIDE	15. U	79-01-6	TRICHLOROETHENE	6.8J
75-00-3	CHLOROETHANE	15. U	124-48-1	DIBROMOCHLOROMETHANE . . .	7.4U
75-09-2	METHYLENE CHLORIDE	14. B	79-00-5	1,1,2-TRICHLOROETHANE . .	7.4U
67-64-1	ACETONE	5.3J	71-43-2	BENZENE	7.4U
75-15-0	CARBON DISULFIDE	7.4U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	7.4U
75-35-4	1,1-DICHLOROETHENE	7.4U	110-75-8	2-CHLOROETHYLVINYLETHER .	15. U
75-35-3	1,1-DICHLOROETHANE	7.4U	75-25-2	BROMOFORM	7.4U
156-60-5	TRANS-1,2-DICHLOROETHENE .	7.4U	108-10-1	4-METHYL-2-PENTANONE . . .	15. U
67-66-3	CHLOROFORM	7.4U	591-78-6	2-HEXANONE	15. U
107-06-2	1,2-DICHLOROETHANE	7.4U	127-18-4	TETRACHLOROETHENE	7.4U
78-93-3	2-BUTANONE	15. U	79-34-5	1,1,2,2-TETRACHLOROETHANE	15. U
71-55-6	1,1,1-TRICHLOROETHANE . .	7.4U	108-88-3	TOLUENE	7.4U
56-23-5	CARBON TETRACHLORIDE . . .	7.4U	108-90-7	CHLOROBENZENE	7.4U
108-05-4	VINYL ACETATE	15. U	100-41-4	ETHYLBENZENE	7.4U
75-27-4	BROMODICHLOROMETHANE . . .	7.4U	100-42-5	STYRENE	7.4U
				TOTAL XYLENES	7.4U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
J - REPORTED VALUE IS LESS THAN THE DETECTION LIMIT.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

FORM I

LABORATORY NAME: THA/ERG
CASE NO: 5035

! SAMPLE NUMBER !
! 162929 !
! !

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 01/23/87
CONC/DIL FACTOR: 1.
PERCENT MOISTURE: (DECANTED) 35.0

GPC CLEANUP X YES NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
108-95-2	PHENOL	510. U	83-32-9	ACENAPHTHENE	510. U
111-44-4	BIS(2-CHLOROETHYL)ETHER .	510. U	51-28-5	2,4-DINITROPHENOL	2500. U
95-57-8	2-CHLOROPHENOL	510. U	100-02-7	4-NITROPHENOL	2500. U
541-73-1	1,3-DICHLOROBENZENE . . .	510. U	132-64-9	DIBENZOFURAN	510. U
106-46-7	1,4-DICHLOROBENZENE . . .	510. U	121-14-2	2,4-DINITROTOLUENE	510. U
100-51-6	BENZYL ALCOHOL	510. U	606-20-2	2,6-DINITROTOLUENE	510. U
95-50-1	1,2-DICHLOROBENZENE . . .	510. U	84-66-2	DIETHYLPHTHALATE	510. BU
95-48-7	2-METHYLPHENOL	510. U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	510. U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	510. U	86-73-7	FLUORENE	510. U
106-44-5	4-METHYLPHENOL	510. U	100-01-6	4-NITROANILINE	2500. U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	510. U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	2500. U
67-72-1	HEXACHLOROETHANE	510. U	86-30-6	N-NITROSODIPHENYLAMINE (1)	510. U
98-95-3	NITROBENZENE	510. U	101-55-3	4-BROMOPHENYL-PHENYLETHER	510. U
78-59-1	ISOPHORONE	510. U	118-74-1	HEXACHLOROBENZENE	510. U
88-75-5	2-NITROPHENOL	510. U	87-86-5	PENTACHLOROPHENOL	2500. U
105-67-9	2,4-DIMETHYLPHENOL	510. U	85-01-8	PHENANTHRENE	2900.
65-85-0	BENZOIC ACID	2500. U	120-12-7	ANTHRACENE	510. BU
111-91-1	BIS(2-CHLOROETHOXY)METHANE	510. U	84-74-2	DI-N-BUTYLPHTHALATE . . .	510. BU
120-83-2	2,4-DICHLOROPHENOL	510. U	206-44-0	FLUORANTHENE	6900.
120-82-1	1,2,4-TRICHLOROBENZENE . .	510. U	129-00-0	PYRENE	510. U
91-20-3	NAPHTHALENE	510. BU	85-68-7	BUTYLBENZYLPHTHALATE . . .	510. U
106-47-8	4-CHLOROANILINE	510. U	91-94-1	3,3'-DICHLOROBENZIDINE . .	1000. U
87-68-3	HEXACHLOROBUTADIENE . . .	510. U	56-55-3	BENZO(A)ANTHRACENE	510. U
59-50-7	4-CHLORO-3-METHYLPHENOL .	510. U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	510. BU
91-57-6	2-METHYLNAPHTHALENE . . .	510. U	218-01-9	CHRYSENE	510. U
77-47-4	HEXACHLOROCYCLOPENTADIENE	510. U	117-84-0	DI-N-OCTYL PHTHALATE . . .	510. U
88-06-2	2,4,6-TRICHLOROPHENOL . .	510. U	205-99-2	BENZO(B)FLUORANTHENE . . .	510. U
95-95-4	2,4,5-TRICHLOROPHENOL . .	2500. U	207-08-9	BENZO(K)FLUORANTHENE . . .	510. U
91-58-7	2-CHLORONAPHTHALENE . . .	510. U	50-32-8	BENZO(A)PYRENE	510. U
88-74-4	2-NITROANILINE	2500. U	193-39-5	INDENO(1,2,3-CD)PYRENE . .	510. U
131-11-3	DIMETHYL PHTHALATE	510. U	53-70-3	DIBENZ(A,H)ANTHRACENE . .	510. U
208-96-8	ACENAPHTHYLENE	140. J	191-24-2	BENZO(G,H,I)PERYLENE . . .	510. U
99-09-2	3-NITROANILINE	2500. U			

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name: TMA/E.R.G. Inc.
Case No. OEPA AS035

Sample Number
162929

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-21-86
Date Analyzed: 2-25-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 35

GPC Cleanup ☑ Yes ☐ No
Separatory Funnel Extraction ☐ Yes
Continuous Liquid - Liquid Extraction ☐ Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	12	U
319-85-7	Beta-BHC	12	U
319-86-8	Delta-BHC	12	U
58-89-9	Gamma-BHC (Lindane)	12	U
76-44-8	Heptachlor	12	U
309-00-2	Aldrin	12	U
1024-57-3	Heptachlor Epoxide	12	U
959-98-8	Endosulfan I	12	U
60-57-1	Dieldrin	24	U
72-55-9	4, 4'-DDE	24	U
72-20-8	Endrin	24	U
33213-65-9	Endosulfan II	24	U
72-54-8	4, 4'-DDD	24	U
1031-07-8	Endosulfan Sulfate	24	U
50-29-3	4, 4'-DDT	24	U
72-43-5	Methoxychlor	120	U
53494-70-5	Endrin Ketone	24	U
57-74-9	Chlordane	120	U
8001-35-2	Toxaphene	240	U
12674-11-2	Aroclor-1016	120	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	120	U
53469-21-9	Aroclor-1242	860	
12672-29-6	Aroclor-1248	120	U
11097-69-1	Aroclor-1254	710	
11096-82-5	Aroclor-1260	240	U
	Mirex	24	U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s ______ or W_s 20g DRY WT. V_t 1000 ul V_i 3.0 ul

TENMILE CREEK RM4.1 SYLVANIA AVE.

Sample Number
162273

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: E.R.G., Inc.
Lab Sample ID No: 162273
Sample Matrix: soil/sed.
Data Release Authorized By:

Case No: OEPA A4989
QC Report No:
Contract No: 360336 - G1
Date Sample Received: 11/5/86

Volatile Compounds

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11/7/86
Date Analyzed: 11/7/86
Conc/Dil Factor: 1 pH 6.7
Percent Moisture: (Not Decanted) 22

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	16	B
67-64-1	Acetone	13	U
75-15-0	Carbon Disulfide	6	U
75-35-4	1, 1-Dichloroethene	6	U
75-34-3	1, 1-Dichloroethane	6	U
156-60-5	Trans-1, 2-Dichloroethene	6	U
67-66-3	Chloroform	6	U
107-06-2	1, 2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1, 1, 1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U

CAS Number		ug/l or ug/ (Circle On
78-87-5	1, 2-Dichloropropane	6
10061-02-6	Trans-1, 3-Dichloropropene	6
79-01-6	Trichloroethene	6
124-48-1	Dibromochloromethane	6
79-00-5	1, 1, 2-Trichloroethane	6
71-43-2	Benzene	6
10061-01-5	cis-1, 3-Dichloropropene	6
110-75-8	2-Chloroethylvinylether	13
75-25-2	Bromoform	6
108-10-1	4-Methyl-2-Pentanone	13
591-78-6	2-Hexanone	13
127-18-4	Tetrachloroethene	6
79-34-5	1, 1, 2, 2-Tetrachloroethane	6
108-88-3	Toluene	6
108-90-7	Chlorobenzene	6
100-41-4	Ethylbenzene	6
100-42-5	Styrene	6
	Total Xylenes	6

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g., 10U) based on necessary concentration/dilution action. (This is not necessarily the instrument detection limit.) The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g., 10J). If limit of detection is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J
C	This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/ul in the final extract should be confirmed by GC/MS
B	This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action
NR	No value required.

LABORATORY NAME: TMA/ERG
CASE NO: A4989

SAMPLE NUMBER
162273

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/07/86
DATE ANALYZED: 12/24/86
CONC FACTOR: 1.016240
PERCENT MOISTURE: (DECANTED) 22

GPC CLEANUP YES X NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
108-95-2	PHENOL	420. U	83-32-9	ACENAPHTHENE	420. U
111-44-4	BIS(2-CHLOROETHYL)ETHER .	420. U	51-28-5	2,4-DINITROPHENOL	2000. U
95-57-8	2-CHLOROPHENOL	420. U	100-02-7	4-NITROPHENOL	2000. U
541-73-1	1,3-DICHLOROBENZENE . . .	420. U	132-64-9	DIBENZOFURAN	420. U
106-46-7	1,4-DICHLOROBENZENE . . .	420. U	121-14-2	2,4-DINITROTOLUENE	420. U
100-51-6	BENZYL ALCOHOL	420. U	606-20-2	2,6-DINITROTOLUENE	420. U
95-50-1	1,2-DICHLOROBENZENE . . .	420. U	84-66-2	DIETHYLPHTHALATE	420. U
95-48-7	2-METHYLPHENOL	420. U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	420. U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	420. U	86-73-7	FLUORENE	420. U
106-44-5	4-METHYLPHENOL	420. U	100-01-6	4-NITROANILINE	2000. U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	420. U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	2000. U
67-72-1	HEXACHLOROETHANE	420. U	86-30-6	N-NITROSODIPHENYLAMINE (1)	420. U
98-95-3	NITROBENZENE	420. U	101-55-3	4-BROMOPHENYL-PHENYLETHER	420. U
78-59-1	ISOPHORONE	420. U	118-74-1	HEXACHLOROBENZENE	420. U
88-75-5	2-NITROPHENOL	420. U	87-86-5	PENTACHLOROPHENOL	2000. U
105-67-9	2,4-DIMETHYLPHENOL	420. U	85-01-8	PHENANTHRENE	420. U
65-85-0	BENZOIC ACID	2000. U	120-12-7	ANTHRACENE	420. U
111-91-1	BIS(2-CHLOROETHOXY)METHANE	420. U	84-74-2	DI-N-BUTYLPHTHALATE	420. U
120-83-2	2,4-DICHLOROPHENOL	420. U	206-44-0	FLUORANTHENE	170. J
120-82-1	1,2,4-TRICHLOROBENZENE . .	420. U	129-00-0	PYRENE	110. J
91-20-3	NAPHTHALENE	420. U	85-68-7	BUTYLBENZYLPHTHALATE . . .	420. U
106-47-8	4-CHLOROANILINE	420. U	91-94-1	3,3'-DICHLOROBENZIDINE . .	830. U
87-68-3	HEXACHLOROBUTADIENE . . .	420. U	56-55-3	BENZO(A)ANTHRACENE	420. U
59-50-7	4-CHLORO-3-METHYLPHENOL .	420. U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	420. U
91-57-6	2-METHYLNAPHTHALENE . . .	420. U	218-01-9	CHRYSENE	420. U
77-47-4	HEXACHLOROCYCLOPENTADIENE	420. U	117-84-0	DI-N-OCTYL PHTHALATE . . .	420. U
88-06-2	2,4,6-TRICHLOROPHENOL . .	420. U	205-99-2	BENZO(B)FLUORANTHENE . . .	420. U
95-95-4	2,4,5-TRICHLOROPHENOL . .	2000. U	207-08-9	BENZO(K)FLUORANTHENE . . .	420. U
91-58-7	2-CHLORONAPHTHALENE . . .	420. U	50-32-8	BENZO(A)PYRENE	420. U
88-74-4	2-NITROANILINE	2000. U	193-39-5	INDENO(1,2,3-CD)PYRENE . .	420. U
131-11-3	DIMETHYL PHTHALATE	420. U	53-70-3	DIBENZ(A,H)ANTHRACENE . .	420. U
208-96-8	ACENAPHTHYLENE	420. U	191-24-2	BENZO(G,H,I)PERYLENE . . .	420. U
99-09-2	3-NITROANILINE	2000. U			

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name TM/E.R.G. Inc.
Case No OEPA A4979

Sample Num
162273

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-7-86
Date Analyzed: 2-3-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 22

GPC Cleanup ☐Yes ☒No
Separatory Funnel Extraction ☐Yes
Continuous Liquid - Liquid Extraction ☐Ye

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
319-84-6	Alpha-BHC	10 U
319-85-7	Beta-BHC	10 U
319-86-8	Delta-BHC	10 U
58-89-9	Gamma-BHC (Lindane)	10 U
76-44-8	Heptachlor	10 U
309-00-2	Aldrin	10 U
1024-57-3	Heptachlor Epoxide	10 U
959-98-8	Endosulfan I	10 U
60-57-1	Dieldrin	20 U
72-55-9	4, 4'-DDE	20 U
72-20-8	Endrin	20 U
33213-65-9	Endosulfan II	20 U
72-54-8	4, 4'-DDD	20 U
1031-07-8	Endosulfan Sulfate	20 U
50-29-3	4, 4'-DDT	20 U
72-43-5	Methoxychlor	100 U
53494-70-5	Endrin Ketone	20 U
57-74-9	Chlordane	100 U
8001-35-2	Toxaphene	200 U
12674-11-2	Aroclor-1016	100 U
11104-28-2	Aroclor-1221	100 U
11141-16-5	Aroclor-1232	100 U
53469-21-9	Aroclor-1242	100 U
12672-29-6	Aroclor-1248	100 U
11097-69-1	Aroclor-1254	200 U
11096-82-5	Aroclor-1260	200 U
	MIREX	20 U

V = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s —— or W_s 23 g DRY WT. V_t 1000 ul V_i 3.0 ul

SWAN CREEK AT COLLINGWOOD BLVD. RM 1.2

! SAMPLE NUMBER !
! !
! V162928 !

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: TMA/ERG
LAB SAMPLE ID NO: V162928
SAMPLE MATRIX: SOIL
DATA RELEASE AUTHORIZED BY: Joseph A. Hnatow

CASE NO: AS035
QC REPORT NO:
CONTRACT NO:
DATE SAMPLE RECEIVED: 11/14/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/19/86
DATE ANALYZED: 11/19/86
CONC/DIL FACTOR: 1. PH 7.40
PERCENT MOISTURE: (NOT DECANTED) 54.0

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
74-87-3	CHLOROMETHANE	22. U	78-87-5	1,2-DICHLOROPROPANE . . .	11. U
74-83-9	BROMOMETHANE	22. U	10061-02-6	TRANS-1,3-DICHLOROPROENE .	11. U
75-01-4	VINYL CHLORIDE	22. U	79-01-6	TRICHLOROETHENE	19.
75-00-3	CHLOROETHANE	22. U	124-48-1	DIBROMOCHLOROMETHANE . . .	11. U
75-09-2	METHYLENE CHLORIDE	13. B	79-00-5	1,1,2-TRICHLOROETHANE . .	11. U
67-64-1	ACETONE	22. U	71-43-2	BENZENE	11. U
75-15-0	CARBON DISULFIDE	11. U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	11. U
75-35-4	1,1-DICHLOROETHENE	11. U	110-75-8	2-CHLOROETHYLVINYLETHER .	22. U
75-35-3	1,1-DICHLOROETHANE	11. U	75-25-2	BROMOFORM	11. U
156-60-5	TRANS-1,2-DICHLOROETHENE .	11. U	108-10-1	4-METHYL-2-PENTANONE . . .	22. U
67-66-3	CHLOROFORM	11. U	591-78-6	2-HEXANONE	22. U
107-06-2	1,2-DICHLOROETHANE	11. U	127-18-4	TETRACHLOROETHENE	11. U
78-93-3	2-BUTANONE	22. U	79-34-5	1,1,2,2-TETRACHLOROETHANE	22. U
71-55-6	1,1,1-TRICHLOROETHANE . .	11. U	108-88-3	TOLUENE	11. U
56-23-5	CARBON TETRACHLORIDE . . .	11. U	108-90-7	CHLOROBENZENE	11. U
108-05-4	VINYL ACETATE	22. U	100-41-4	ETHYLBENZENE	11. U
75-27-4	BROMODICHLOROMETHANE . . .	11. U	100-42-5	STYRENE	11. U
				TOTAL XYLENES	11. U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

SWAN CREEK AT COLLINGWOOD BLVD. RM 1.2

! SAMPLE NUMBER !
! !
! V162929R !

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

LABORATORY NAME: TMA/ERG
LAB SAMPLE ID NO: V162928R
SAMPLE MATRIX: SOIL
DATA RELEASE AUTHORIZED BY: Joseph A. Hnatow

CASE NO: AS035
QC REPORT NO:
CONTRACT NO:
DATE SAMPLE RECEIVED: 11/14/86

VOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/20/86
DATE ANALYZED: 11/20/86
CONC/DIL FACTOR: 1. PH 7.60
PERCENT MOISTURE: (NOT DECANTED) 54.0

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
74-87-3	CHLOROMETHANE	22. U	78-87-5	1,2-DICHLOROPROPANE . . .	11. U
74-83-9	BROMOMETHANE	22. U	10061-02-6	TRANS-1,3-DICHLOROPROENE .	11. U
75-01-4	VINYL CHLORIDE	22. U	79-01-6	TRICHLOROETHENE	6.2J
75-00-3	CHLOROETHANE	22. U	124-48-1	DIBROMOCHLOROMETHANE . . .	11. U
75-09-2	METHYLENE CHLORIDE	56. B	79-00-5	1,1,2-TRICHLOROETHANE . .	11. U
67-64-1	ACETONE	38.	71-43-2	BENZENE	11. U
75-15-0	CARBON DISULFIDE	11. U	10061-01-5	CIS-1,3-DICHLOROPROPENE .	11. U
75-35-4	1,1-DICHLOROETHENE	11. U	110-75-8	2-CHLOROETHYLVINYLETHER .	22. U
75-35-3	1,1-DICHLOROETHANE	11. U	75-25-2	BROMOFORM	11. U
156-60-5	TRANS-1,2-DICHLOROETHENE .	11. U	108-10-1	4-METHYL-2-PENTANONE . . .	22. U
67-66-3	CHLOROFORM	11. U	591-78-6	2-HEXANONE	22. U
107-06-2	1,2-DICHLOROETHANE	11. U	127-18-4	TETRACHLOROETHENE	11. U
78-93-3	2-BUTANONE	22. U	79-34-5	1,1,2,2-TETRACHLOROETHANE	22. U
71-55-6	1,1,1-TRICHLOROETHANE . .	11. U	108-88-3	TOLUENE	11. U
56-23-5	CARBON TETRACHLORIDE . . .	11. U	108-90-7	CHLOROBENZENE	11. U
108-05-4	VINYL ACETATE	39. J	100-41-4	ETHYLBENZENE	11. U
75-27-4	BROMODICHLOROMETHANE . . .	11. U	100-42-5	STYRENE	11. U
				TOTAL XYLENES	11. U

B - COMPOUND WAS DETECTED IN THE QC BLANK.
J - REPORTED VALUE IS LESS THAN THE DETECTION LIMIT.
U - COMPOUND ANALYZED FOR BUT NOT DETECTED. THE REPORTED VALUE IS THE MINIMUM ATTAINABLE DETECTION LIMIT FOR THE SAMPLE.

SEE PAGE 1A FOR COMPLETE DEFINITIONS OF THE DATA REPORTING QUALIFIERS.

LABORATORY NAME: TMA/ERG
CASE NO: OHIOEPAS035

: SAMPLE NUMBER :
: 162928 :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/21/86
DATE ANALYZED: 02/03/87
DIL FACTOR: 4.000
PERCENT MOISTURE: (DECANTED) 54.0

GPC CLEANUP X YES NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
108-95-2	PHENOL	2900. U	83-32-9	ACENAPHTHENE	5300.
111-44-4	BIS(2-CHLOROETHYL)ETHER	2900. U	51-28-5	2,4-DINITROPHENOL	14000. U
95-57-8	2-CHLOROPHENOL	2900. U	100-02-7	4-NITROPHENOL	14000. U
541-73-1	1,3-DICHLOROBENZENE	2900. U	132-64-9	DIBENZOFURAN	4900.
106-46-7	1,4-DICHLOROBENZENE	2900. U	121-14-2	2,4-DINITROTOLUENE	2900. U
100-51-6	BENZYL ALCOHOL	2900. U	606-20-2	2,6-DINITROTOLUENE	2900. U
95-50-1	1,2-DICHLOROBENZENE	2900. U	84-66-2	DIETHYLPHTHALATE	2900. BU
95-48-7	2-METHYLPHENOL	2900. U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	2900. U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	2900. U	86-73-7	FLUORENE	7500.
106-44-5	4-METHYLPHENOL	2900. U	100-01-6	4-NITROANILINE	14000. U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	2900. U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	14000. U
67-72-1	HEXACHLOROETHANE	2900. U	86-30-6	N-NITROSODIPHENYLAMINE (1)	2900. U
98-95-3	NITROBENZENE	2900. U	101-55-3	4-BROMOPHENYL-PHENYLETHER	2900. U
78-59-1	ISOPHORONE	2900. U	118-74-1	HEXACHLOROBENZENE	2900. U
88-75-5	2-NITROPHENOL	2900. U	87-86-5	PENTACHLOROPHENOL	14000. U
105-67-9	2,4-DIMETHYLPHENOL	2900. U	85-01-8	PHENANTHRENE	29000.
65-85-0	BENZOIC ACID	14000. U	120-12-7	ANTHRACENE	12000. B
111-91-1	BIS(2-CHLOROETHOXY)METHANE	2900. U	84-74-2	DI-N-BUTYLPHTHALATE	610. BJ
120-83-2	2,4-DICHLOROPHENOL	2900. U	206-44-0	FLUORANTHENE	26000.
120-82-1	1,2,4-TRICHLOROBENZENE	2900. U	129-00-0	PYRENE	22000.
91-20-3	NAPHTHALENE	2700. BJ	85-68-7	BUTYLBENZYLPHTHALATE	2900. U
106-47-8	4-CHLOROANILINE	2900. U	91-94-1	3,3'-DICHLOROBENZIDINE	5700. U
87-68-3	HEXACHLOROBUTADIENE	2900. U	56-55-3	BENZO(A)ANTHRACENE	11000.
59-50-7	4-CHLORO-3-METHYLPHENOL	2900. U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	6300. B
91-57-6	2-METHYLNAPHTHALENE	2000. J	218-01-9	CHRYSENE	8800.
77-47-4	HEXACHLOROCYCLOPENTADIENE	2900. U	117-84-0	DI-N-OCTYL PHTHALATE	590. J
88-06-2	2,4,6-TRICHLOROPHENOL	2900. U	205-99-2	BENZO(B)FLUORANTHENE	6500.
95-95-4	2,4,5-TRICHLOROPHENOL	14000. U	207-08-9	BENZO(K)FLUORANTHENE	4600.
91-58-7	2-CHLORONAPHTHALENE	2900. U	50-32-8	BENZO(A)PYRENE	4800.
88-74-4	2-NITROANILINE	14000. U	193-39-5	INDENO(1,2,3-CD)PYRENE	2600. J
131-11-3	DIMETHYL PHTHALATE	2900. U	53-70-3	DIBENZ(A,H)ANTHRACENE	1200. J
208-96-8	ACENAPHTHYLENE	2900. U	191-24-2	BENZO(G,H,I)PERYLENE	2300. J
99-09-2	3-NITROANILINE	14000. U			

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name. TMA/E.R.G. inc.
Case No. OEPA AS035

Sample Numb
162928

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-21-86
Date Analyzed: 2-25-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 54

GPC Cleanup ☑ Yes ☐ No
Separatory Funnel Extraction ☐ Yes
Continuous Liquid - Liquid Extraction ☐ Ye

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
319-84-6	Alpha-BHC	17 U
319-85-7	Beta-BHC	17 U
319-86-8	Delta-BHC	17 U
58-89-9	Gamma-BHC (Lindane)	17 U
76-44-8	Heptachlor	17 U
309-00-2	Aldrin	17 U
1024-57-3	Heptachlor Epoxide	17 U
959-98-8	Endosulfan I	17 U
60-57-1	Dieldrin	34 U
72-55-9	4,4'-DDE	34 U
72-20-8	Endrin	34 U
33213-65-9	Endosulfan II	34 U
72-54-8	4,4'-DDD	34 U
1031-07-8	Endosulfan Sulfate	34 U
50-29-3	4,4'-DDT	34 U
72-43-5	Methoxychlor	170 U
53494-70-5	Endrin Ketone	34 U
57-74-9	Chlordane	170 U
8001-35-2	Toxaphene	340 U
12674-11-2	Aroclor-1016	170 U
11104-28-2	Aroclor-1221	170 U
11141-16-5	Aroclor-1232	170 U
53469-21-9	Aroclor-1242	1600
12672-29-6	Aroclor-1248	170 U
11097-69-1	Aroclor-1254	340 U
11096-82-5	Aroclor-1260	340 U
	Mirex	34 U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V. ________ or W. 14 g V, 1000 ml V 3.0 ml

OTTER CREEK RM2.1 MILLARD AVE.

Sample Number
162270

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: E.R.G., Inc.
Case No: OEPA A4989
Lab Sample ID No: 162270
QC Report No:
Sample Matrix: SOIL/SED
Contract No: 360336 - GS
Data Release Authorized By:
Date Sample Received: 11/5/86

Volatile Compounds

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 12/2/86
Date Analyzed: 12/2/86
Conc/Dil Factor: 1 pH 6.58
Percent Moisture: (Not Decanted) 53

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
74-87-3	Chloromethane	21	U
74-83-9	Bromomethane	21	U
75-01-4	Vinyl Chloride	21	U
75-00-3	Chloroethane	21	U
75-09-2	Methylene Chloride	21	B
67-64-1	Acetone	21	B
75-15-0	Carbon Disulfide	11	U
75-35-4	1, 1-Dichloroethene	11	U
75-34-3	1, 1-Dichloroethane	11	U
156-60-5	Trans-1, 2-Dichloroethene	11	U
67-66-3	Chloroform	11	U
107-06-2	1, 2-Dichloroethane	11	U
78-93-3	2-Butanone	21	U
71-55-6	1, 1, 1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
108-05-4	Vinyl Acetate	21	U
75-27-4	Bromodichloromethane	11	U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
78-87-5	1, 2-Dichloropropane	11	U
10061-02-6	Trans-1, 3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1, 1, 2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-01-5	cis-1, 3-Dichloropropene	11	U
110-75-8	2-Chloroethylvinylether	21	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	21	U
591-78-6	2-Hexanone	21	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1, 1, 2, 2-Tetrachloroethane	11	U
108-88-3	Toluene	320	
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
	Total Xylenes	11	U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g., 10U) based on necessary concentration/dilution action. (This is not necessarily the instrument detection limit.) The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g., 10J). If limit of detection is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J.
C	This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/ul in the final extract should be confirmed by GC/MS.
B	This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
NR	No value required.

LABORATORY NAME: TMA/ERG
CASE NO: A4989

: SAMPLE NUMBER :
: 162270 :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/07/86
DATE ANALYZED: 01/14/87
CONC FACTOR: 1.007049
PERCENT MOISTURE: (DECANTED) 53

GPC CLEANUP YES X NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG	
108-95-2	PHENOL	890.	
111-44-4	BIS(2-CHLOROETHYL)ETHER	700.	U
95-57-8	2-CHLOROPHENOL	700.	U
541-73-1	1,3-DICHLOROBENZENE	700.	U
106-46-7	1,4-DICHLOROBENZENE	700.	U
100-51-6	BENZYL ALCOHOL	700.	U
95-50-1	1,2-DICHLOROBENZENE	700.	U
95-48-7	2-METHYLPHENOL	700.	U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	700.	U
106-44-5	4-METHYLPHENOL	1700.	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	700.	U
67-72-1	HEXACHLOROETHANE	700.	U
98-95-3	NITROBENZENE	700.	U
78-59-1	ISOPHORONE	700.	U
88-75-5	2-NITROPHENOL	700.	U
105-67-9	2,4-DIMETHYLPHENOL	700.	U
65-85-0	BENZOIC ACID	3400.	U
111-91-1	BIS(2-CHLOROETHOXY)METHANE	700.	U
120-83-2	2,4-DICHLOROPHENOL	700.	U
120-82-1	1,2,4-TRICHLOROBENZENE	700.	U
91-20-3	NAPHTHALENE	700.	U
106-47-8	4-CHLOROANILINE	700.	U
87-68-3	HEXACHLOROBUTADIENE	700.	U
59-50-7	4-CHLORO-3-METHYLPHENOL	700.	U
91-57-6	2-METHYLNAPHTHALENE	700.	U
77-47-4	HEXACHLOROCYCLOPENTADIENE	700.	U
88-06-2	2,4,6-TRICHLOROPHENOL	700.	U
95-95-4	2,4,5-TRICHLOROPHENOL	3400.	U
91-58-7	2-CHLORONAPHTHALENE	700.	U
88-74-4	2-NITROANILINE	3400.	U
131-11-3	DIMETHYL PHTHALATE	700.	U
208-96-8	ACENAPHTHYLENE	700.	U
99-09-2	3-NITROANILINE	3400.	U

CAS NUMBER		UG/KG	
83-32-9	ACENAPHTHENE	700.	U
51-28-5	2,4-DINITROPHENOL	3400.	U
100-02-7	4-NITROPHENOL	3400.	U
132-64-9	DIBENZOFURAN	700.	U
121-14-2	2,4-DINITROTOLUENE	700.	U
606-20-2	2,6-DINITROTOLUENE	700.	U
84-66-2	DIETHYLPHTHALATE	700.	U
7005-72-3	4-CHLOROPHENYL-PHENYLETHER	700.	U
86-73-7	FLUORENE	700.	U
100-10-6	4-NITROANILINE	3400.	U
534-52-1	4,6-DINITRO-2-METHYLPHENOL	3400.	U
86-30-6	N-NITROSODIPHENYLAMINE (1)	700.	U
101-55-3	4-BROMOPHENYL-PHENYLETHER	700.	U
118-74-1	HEXACHLOROBENZENE	700.	U
87-86-5	PENTACHLOROPHENOL	3400.	U
85-01-8	PHENANTHRENE	700.	U
120-12-7	ANTHRACENE	700.	U
84-74-2	DI-N-BUTYLPHTHALATE	700.	U
206-44-0	FLUORANTHENE	540.	J
129-00-0	PYRENE	710.	
85-68-7	BUTYLBENZYLPHTHALATE	700.	U
91-94-1	3,3'-DICHLOROBENZIDINE	1400.	U
56-55-3	BENZO(A)ANTHRACENE	700.	U
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	610.	J
218-01-9	CHRYSENE	420.	J
117-84-0	DI-N-OCTYL PHTHALATE	700.	U
205-99-2	BENZO(B)FLUORANTHENE	700.	U
207-08-9	BENZO(K)FLUORANTHENE	700.	U
50-32-8	BENZO(A)PYRENE	260.	J
193-39-5	INDENO(1,2,3-CD)PYRENE	700.	U
53-70-3	DIBENZ(A,H)ANTHRACENE	700.	U
191-24-2	BENZO(G,H,I)PERYLENE	290.	J

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

Laboratory Name: TM/E.R.G. inc

Case No. OEPA A4989

Sample Number
162270

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)

Date Extracted/Prepared: 11-7-86

Date Analyzed: 2-3-87

Conc/Dil Factor: 1

Percent Moisture (decanted) 53

GPC Cleanup ☐Yes ☑No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	17	U
319-85-7	Beta-BHC	17	U
319-86-8	Delta-BHC	17	U
58-89-9	Gamma-BHC (Lindane)	17	U
76-44-8	Heptachlor	17	U
309-00-2	Aldrin	17	U
1024-57-3	Heptachlor Epoxide	17	U
959-98-8	Endosulfan I	17	U
60-57-1	Dieldrin	34	U
72-55-9	4, 4'-DDE	34	U
72-20-8	Endrin	34	U
33213-65-9	Endosulfan II	34	U
72-54-8	4, 4'-DDD	34	U
1031-07-8	Endosulfan Sulfate	34	U
50-29-3	4, 4'-DDT	34	U
72-43-5	Methoxychlor	170	U
53494-70-5	Endrin Ketone	34	U
57-74-9	Chlordane	170	U
8001-35-2	Toxaphene	340	U
12674-11-2	Aroclor-1016	170	U
11104-28-2	Aroclor-1221	170	U
11141-16-5	Aroclor-1232	170	U
53469-21-9	Aroclor-1242	170	U
12672-29-6	Aroclor-1248	170	U
11097-69-1	Aroclor-1254	340	U
11096-82-5	Aroclor-1260	340	U
	MIREX	34	U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s —— or W_s 14g DRY WT. V_t 1000 ml V_i 3.0 ml

OTTER CREEK RM 4.0
WHEELING ST.

Sample Number
162271

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: E.R.G., Inc.

Lab Sample ID No: 162271

Sample Matrix: SOIL/SED.

Data Release Authorized By:

Case No: OEPA A4989

QC Report No:

Contract No: 360336 - G1

Date Sample Received: 11/5/86

Volatile Compounds

Concentration: [✓ Low] Medium (Circle One)

Date Extracted/Prepared: 11/8/86

Date Analyzed: 11/8/86

Conc/Dil Factor: 1 pH 6.5

Percent Moisture: (Not Decanted) 31

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	12	JB
67-64-1	Acetone	8	J
75-15-0	Carbon Disulfide	6	U
75-35-4	1, 1-Dichloroethene	6	U
75-34-3	1, 1-Dichloroethane	6	U
156-60-5	Trans-1, 2-Dichloroethene	6	U
67-66-3	Chloroform	6	U
107-06-2	1, 2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1, 1, 1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
78-87-5	1, 2-Dichloropropane	6	U
10061-02-6	Trans-1, 3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1, 1, 2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-01-5	cis-1, 3-Dichloropropene	6	U
110-75-8	2-Chloroethylvinylether	13	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1, 1, 2, 2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	Total Xylenes	6	U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

Value	If the result is a value greater than or equal to the detection limit report the value	C	This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/ul in the final extract should be confirmed by GC/MS.
U	Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution action. (This is not necessarily the instrument detection limit.) The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.	B	This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g., 10J). If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J	NR	No value required.

LABORATORY NAME: TMA/ERG
CASE NO: A4989

: SAMPLE NUMBER :
: 142271 :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/07/86
DATE ANALYZED: 01/16/87
CONC FACTOR: 1.019368
PERCENT MOISTURE: (DECANTED) 31

GPC CLEANUP YES X NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG	CAS NUMBER		UG/KG
108-95-2	PHENOL	480. U	83-32-9	ACENAPHTHENE	480. U
111-44-4	BIS(2-CHLOROETHYL)ETHER	480. U	51-28-5	2,4-DINITROPHENOL	2300. U
95-57-8	2-CHLOROPHENOL	480. U	100-02-7	4-NITROPHENOL	2300. U
541-73-1	1,3-DICHLOROBENZENE	480. U	132-64-9	DIBENZOFURAN	150. J
106-46-7	1,4-DICHLOROBENZENE	480. U	121-14-2	2,4-DINITROTOLUENE	480. U
100-51-6	BENZYL ALCOHOL	480. U	606-20-2	2,6-DINITROTOLUENE	480. U
95-50-1	1,2-DICHLOROBENZENE	480. U	84-66-2	DIETHYLPHTHALATE	480. U
95-48-7	2-METHYLPHENOL	480. U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	480. U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	480. U	86-73-7	FLUORENE	290. J
106-44-5	4-METHYLPHENOL	480. U	100-01-6	4-NITROANILINE	2300. U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	480. U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	2300. U
67-72-1	HEXACHLOROETHANE	480. U	86-30-6	N-NITROSODIPHENYLAMINE (1)	480. U
98-95-3	NITROBENZENE	480. U	101-55-3	4-BROMOPHENYL-PHENYLETHER	480. U
78-59-1	ISOPHORONE	480. U	118-74-1	HEXACHLOROBENZENE	480. U
88-75-5	2-NITROPHENOL	480. U	87-86-5	PENTACHLOROPHENOL	2300. U
105-67-9	2,4-DIMETHYLPHENOL	480. U	85-01-8	PHENANTHRENE	2300. -
65-85-0	BENZOIC ACID	2300. U	120-12-7	ANTHRACENE	830.
111-91-1	BIS(2-CHLOROETHOXY)METHANE	480. U	84-74-2	DI-N-BUTYLPHTHALATE	480. U
120-83-2	2,4-DICHLOROPHENOL	480. U	206-44-0	FLUORANTHENE	3500.
120-82-1	1,2,4-TRICHLOROBENZENE	480. U	129-00-0	PYRENE	3700.
91-20-3	NAPHTHALENE	480. U	85-68-7	BUTYLBENZYLPHTHALATE	480. U
106-47-8	4-CHLOROANILINE	480. U	91-94-1	3,3'-DICHLOROBENZIDINE	970. U
87-68-3	HEXACHLOROBUTADIENE	480. U	56-55-3	BENZO(A)ANTHRACENE	1800.
59-50-7	4-CHLORO-3-METHYLPHENOL	480. U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	650.-
91-57-6	2-METHYLNAPHTHALENE	480. U	218-01-9	CHRYSENE	1700.-
77-47-4	HEXACHLOROCYCLOPENTADIENE	480. U	117-84-0	DI-N-OCTYL PHTHALATE	480. U
88-06-2	2,4,6-TRICHLOROPHENOL	480. U	205-99-2	BENZO(B)FLUORANTHENE	480. U
95-95-4	2,4,5-TRICHLOROPHENOL	2300. U	207-08-9	BENZO(K)FLUORANTHENE	480. U
91-58-7	2-CHLORONAPHTHALENE	480. U	50-32-8	BENZO(A)PYRENE	1000.
88-74-4	2-NITROANILINE	2300. U	193-39-5	INDENO(1,2,3-CD)PYRENE	600.
131-11-3	DIMETHYL PHTHALATE	480. U	53-70-3	DIBENZ(A,H)ANTHRACENE	240. J
208-96-8	ACENAPHTHYLENE	480. U	191-24-2	BENZO(G,H,I)PERYLENE	750.
99-09-2	3-NITROANILINE	2300. U			

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name: TMA/E.R.G. inc.
Case No. OE9A A4989

Sample Number
162271

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration. [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-7-86
Date Analyzed: 2-3-87
Conc/Dil Factor: 1
Percent Moisture (decanted) 31

GPC Cleanup ☐Yes ☑No
Separatory Funnel Extraction ☐Yes
Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	12	U
319-85-7	Beta-BHC	12	U
319-86-8	Delta-BHC	12	U
58-89-9	Gamma-BHC (Lindane)	12	U
76-44-8	Heptachlor	12	U
309-00-2	Aldrin	12	U
1024-57-3	Heptachlor Epoxide	12	U
959-98-8	Endosulfan I	12	U
60-57-1	Dieldrin	24	U
72-55-9	4, 4'-DDE	24	U
72-20-8	Endrin	24	U
33213-65-9	Endosulfan II	24	U
72-54-8	4, 4'-DDD	24	U
1031-07-8	Endosulfan Sulfate	24	U
50-29-3	4, 4'-DDT	24	U
72-43-5	Methoxychlor	120	U
53494-70-5	Endrin Ketone	24	U
57-74-9	Chlordane	120	U
8001-35-2	Toxaphene	240	U
12674-11-2	Aroclor-1016	120	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	120	U
53469-21-9	Aroclor-1242	120	U
12672-29-6	Aroclor-1248	120	U
11097-69-1	Aroclor-1254	240	U
11096-82-5	Aroclor-1260	240	U
	MiRex	24	U

V_i = Volume of extract injected (ul)
V_s = Volume of water extracted (ml)
W_s = Weight of sample extracted (g)
V_t = Volume of total extract (ul)

V_s — or W_s 21 g DRY WT. V_t 1000 ul V_i 3.0 ul

OTTER CREEK RM 5.9
OAKDALE AVE.

Sample Number
162272

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: E.R.G., Inc.
Case No: OEPA A4989
Lab Sample ID No: 162272 R
QC Report No:
Sample Matrix: SOIL/SED.
Contract No: 360336 - 45
Data Release Authorized By:
Date Sample Received: 11/5/86

Volatile Compounds

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 12/2/86
Date Analyzed: 12/2/86
Conc/Dil Factor: 1 pH 7.69
Percent Moisture: (Not Decanted) 67

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
74-87-3	Chloromethane	30	U
74-83-9	Bromomethane	30	U
75-01-4	Vinyl Chloride	30	U
75-00-3	Chloroethane	30	U
75-09-2	Methylene Chloride	37	B
67-64-1	Acetone	47	
75-15-0	Carbon Disulfide	15	U
75-35-4	1, 1-Dichloroethene	15	U
75-34-3	1, 1-Dichloroethane	15	U
156-60-5	Trans-1, 2-Dichloroethene	15	U
67-66-3	Chloroform	15	U
107-06-2	1, 2-Dichloroethane	15	U
78-93-3	2-Butanone	30	U
71-55-6	1, 1, 1-Trichloroethane	15	U
56-23-5	Carbon Tetrachloride	15	U
108-05-4	Vinyl Acetate	30	U
75-27-4	Bromodichloromethane	15	U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
78-87-5	1, 2-Dichloropropane	15	U
10061-02-6	Trans-1, 3-Dichloropropene	15	U
79-01-6	Trichloroethene	15	U
124-48-1	Dibromochloromethane	15	U
79-00-5	1, 1, 2-Trichloroethane	15	U
71-43-2	Benzene	15	U
10061-01-5	cis-1, 3-Dichloropropene	15	U
110-75-8	2-Chloroethylvinylether	30	U
75-25-2	Bromoform	15	U
108-10-1	4-Methyl-2-Pentanone	30	U
591-78-6	2-Hexanone	30	U
127-18-4	Tetrachloroethene	15	U
79-34-5	1, 1, 2, 2-Tetrachloroethane	15	U
108-88-3	Toluene	15	U
108-90-7	Chlorobenzene	15	U
100-41-4	Ethylbenzene	15	U
100-42-5	Styrene	15	U
	Total Xylenes	15	U

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action. (This is not necessarily the instrument detection limit.) The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J — Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g., 10J). If limit of detection is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J.

C — This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/ul in the final extract should be confirmed by GC/MS.

B — This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

NR No value required.

LABORATORY NAME: THA/ERG
CASE NO: A4989

: SAMPLE NUMBER :
: 162272 :

ORGANICS ANALYSIS DATA SHEET
(PAGE 2)

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW
DATE EXTRACTED/PREPARED: 11/07/86
DATE ANALYZED: 12/24/86
CONC FACTOR: 1.007049
PERCENT MOISTURE: (DECANTED) 67

GPC CLEANUP YES X NO
SEPARATORY FUNNEL EXTRACTION YES
CONTINUOUS LIQUID-LIQUID EXTRACTION YES

CAS NUMBER		UG/KG		CAS NUMBER		UG/KG	
108-95-2	PHENOL	960.	U	83-32-9	ACENAPHTHENE	630.	J
111-44-4	BIS(2-CHLOROETHYL)ETHER .	960.	U	51-28-5	2,4-DINITROPHENOL	4700.	U
95-57-8	2-CHLOROPHENOL	960.	U	100-02-7	4-NITROPHENOL	4700.	U
541-73-1	1,3-DICHLOROBENZENE . . .	960.	U	132-64-9	DIBENZOFURAN	390.	J
106-46-7	1,4-DICHLOROBENZENE . . .	960.	U	121-14-2	2,4-DINITROTOLUENE	960.	U
100-51-6	BENZYL ALCOHOL	960.	U	606-20-2	2,6-DINITROTOLUENE	960.	U
95-50-1	1,2-DICHLOROBENZENE . . .	960.	U	84-66-2	DIETHYLPHTHALATE	960.	U
95-48-7	2-METHYLPHENOL	960.	U	7005-72-3	4-CHLOROPHENYL-PHENYLETHER	960.	U
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	960.	U	86-73-7	FLUORENE	830.	J
106-44-5	4-METHYLPHENOL	960.	U	100-01-6	4-NITROANILINE	4700.	U
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	960.	U	534-52-1	4,6-DINITRO-2-METHYLPHENOL	4700.	U
67-72-1	HEXACHLOROETHANE	960.	U	86-30-6	N-NITROSODIPHENYLAMINE (1)	960.	U
98-95-3	NITROBENZENE	960.	U	101-55-3	4-BROMOPHENYL-PHENYLETHER	960.	U
78-59-1	ISOPHORONE	960.	U	118-74-1	HEXACHLOROBENZENE	960.	U
88-75-5	2-NITROPHENOL	960.	U	87-86-5	PENTACHLOROPHENOL	4700.	U
105-67-9	2,4-DIMETHYLPHENOL	960.	U	85-01-8	PHENANTHRENE	8700.	
65-85-0	BENZOIC ACID	4700.	U	120-12-7	ANTHRACENE	1900.	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	960.	U	84-74-2	DI-N-BUTYLPHTHALATE . . .	960.	U
120-83-2	2,4-DICHLOROPHENOL	960.	U	206-44-0	FLUORANTHENE	12000.	
120-82-1	1,2,4-TRICHLOROBENZENE . .	960.	U	129-00-0	PYRENE	7500.	
91-20-3	NAPHTHALENE	960.	U	85-68-7	BUTYLBENZYLPHTHALATE . . .	960.	U
106-47-8	4-CHLOROANILINE	960.	U	91-94-1	3,3'-DICHLOROBENZIDINE . .	1900.	U
87-68-3	HEXACHLOROBUTADIENE . . .	960.	U	56-55-3	BENZO(A)ANTHRACENE	5000.	
59-50-7	4-CHLORO-3-METHYLPHENOL .	960.	U	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	550.	J
91-57-6	2-METHYLNAPHTHALENE . . .	960.	U	218-01-9	CHRYSENE	3400.	
77-47-4	HEXACHLOROCYCLOPENTADIENE	960.	U	117-84-0	DI-N-OCTYL PHTHALATE . . .	960.	U
88-06-2	2,4,6-TRICHLOROPHENOL . .	960.	U	205-99-2	BENZO(B)FLUORANTHENE . . .	3900.	
95-95-4	2,4,5-TRICHLOROPHENOL . .	4700.	U	207-08-9	BENZO(K)FLUORANTHENE . . .	2700.	
91-58-7	2-CHLORONAPHTHALENE . . .	960.	U	50-32-8	BENZO(A)PYRENE	2900.	
88-74-4	2-NITROANILINE	4700.	U	193-39-5	INDENO(1,2,3-CD)PYRENE . .	2200.	
131-11-3	DIMETHYL PHTHALATE	960.	U	53-70-3	DIBENZ(A,H)ANTHRACENE . .	1000.	
208-96-8	ACENAPHTHYLENE	960.	U	191-24-2	BENZO(G,H,I)PERYLENE . . .	2400.	
99-09-2	3-NITROANILINE	4700.	U				

(1) - CANNOT BE SEPARATED FROM DIPHENYLAMINE

FORM I

Laboratory Name TMA/E.R.G. inc.
Case No. OEPA A4989

Sample Number
162272

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 11-7-96
Date Analyzed: 2-3-97
Conc/Dil Factor: 1
Percent Moisture (decanted) 67

GPC Cleanup ☐Yes ☑No
Separatory Funnel Extraction ☐Yes
Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or [✓ ug/Kg] (Circle One)	
319-84-6	Alpha-BHC	24	U
319-85-7	Beta-BHC	24	U
319-86-8	Delta-BHC	24	U
58-89-9	Gamma-BHC (Lindane)	24	U
76-44-8	Heptachlor	24	U
309-00-2	Aldrin	24	U
1024-57-3	Heptachlor Epoxide	24	U
959-98-8	Endosulfan I	24	U
60-57-1	Dieldrin	48	U
72-55-9	4, 4'-DDE	48	U
72-20-8	Endrin	48	U
33213-65-9	Endosulfan II	48	U
72-54-8	4, 4'-DDD	48	U
1031-07-8	Endosulfan Sulfate	48	U
50-29-3	4, 4'-DDT	48	U
72-43-5	Methoxychlor	240	U
53494-70-5	Endrin Ketone	48	U
57-74-9	Chlordane	240	U
8001-35-2	Toxaphene	480	U
12674-11-2	Aroclor-1016	240	U
11104-28-2	Aroclor-1221	240	U
11141-16-5	Aroclor-1232	240	U
53469-21-9	Aroclor-1242	240	U
12672-29-6	Aroclor-1248	240	U
11097-69-1	Aroclor-1254	480	U
11096-82-5	Aroclor-1260	480	U
	MIREX	48	U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s ——— or W_s 9.9 g DRY WT. V_t 1000 ul V_i 3.0 ul

APPENDIX B

Package Sewage Treatment Plant Data

APPENDIX B

PACKAGE SEWAGE TREATMENT PLANT EFFLUENT DATA

NOTE: There are many package plants in the RAP Area, and most of them do not have NPDES Discharge Permits; and consequently, there are no data available on what they are discharging. The data in this table covers package plants in Lucas County, most of which are or were operated by the Lucas County Sanitary Engineer, and in all likelihood, are better operated and maintained than the "typical" package plant. Two of these plants (Corey Meadows and Lincoln Green) are no longer in use. Data for these plants is included here as examples of package plant discharge.

SOURCE: Lucas County Facilities Plan[5]

PACKAGE PLANT DATA

Maumee Basin Plants with NPDES Permits

	FLOW RATE	TOTAL FLOW, MG				Avg BOD	TOTAL BOD, POUNDS				Avg SS	TOTAL SS, POUNDS				Avg P	TOTAL P (est), POUNDS				FILTERS?
	Avg, gpd	1979	1980	1981	1982		1979	1980	1981	1982		1979	1980	1981	1982		1979	1980	1981	1982	
Bentbrook	88,200	29.0	30.2	33.8	35.8	934	4,938	6,057	11,892	8,834	902	5,193	6,484	11,010	7,579	940	848	883	985	1,046	N
Corey Meadows	62,100	21.1	22.0	23.3	24.4	136	814	948	1,011	1,449	227	1,458	2,446	1,359	2,193	662	615	642	680	711	N
Lincoln Green	117,800	38.6	42.7	48.7	42.1	1,162	6,099	10,533	13,088	10,235	1,463	11,962	13,544	10,929	11,600	1,256	1,127	1,245	1,422	1,230	N
Oak Openings Ind	48,100	12.6	11.3	19.1	27.2	88	483	339	714	1,594	176	1,109	987	1,349	2,578	293	210	189	318	454	Y
Oak Terrace	61,200	18.8	15.2	33.2	22.2	291	820	526	5,195	4,535	358	1,226	823	7,097	4,226	373	314	254	553	371	Y

EXTENDED AERATION PACKAGE PLANT EFFLUENT DATA

Source: Lucas County Facilities Plan, Appendix F

PACKAGE PLANT NAME:	BENTBROOK FARMS
PACKAGE PLANT NUMBER:	L-68
NPDES PERMIT NUMBER:	G 702 *AD

MONTH/YEAR	FLOW	pH	CL2	BOD	SS	DO	Coliform
January 1979	.079	6.7	.6	23.4	29.3	3.0	71.0
February	.080	6.7	.6	14.3	15.0	3.5	23.0
March	.089	6.7	.6	27.3	31.2	3.5	19.0
April	.101	6.9	.6	18.3	25.8	3.5	31.0
May	.113	6.9	.6	14.0	13.8	3.3	21.0
June	.057	6.9	.6	22.7	17.7	3.2	32.0
July	.066	7.1	.6	10.6	6.8	3.3	11.0
August	.083	6.7	.6	23.3	34.5	3.7	180.0
September	.063	6.7	.6	10.2	7.9	2.8	6.0
October	.058	6.7	.6	11.0	13.7	2.9	9.0
November	.069	6.8	.6	11.5	15.9	3.3	31.0
December	.096	7.0	.6	58.1	45.7	3.6	1,198.0
AVERAGES	79,500	6.8	.6	20.4	21.4	3.3	136.0
TOTALS	348		5.2	175.8	184.8	28.4	
January 1980	.080	7.0	.6	65.2	41.5	3.4	1,319.0
February	.070	6.9	.6	25.0	21.6	3.4	96.0
March	.091	6.9	.6	8.5	13.0	3.3	12.0
April							
May	.114	6.9	.6	6.2	8.2	3.3	3.0
June	.108	6.9	.6	54.7	54.3	2.7	337.0
July	.080	7.1	.6	6.3	7.4	3.2	3.0
August	.116	6.9	.6	7.1	13.3	2.1	6.0
September	.080	7.0	.6	AH	AH	3.6	AH
October	.058	6.9	.6	12.7	26.0	1.6	36.0
November	.062	7.0	.4	42.5	56.7	3.3	1,240.0
December	.052	6.7	.5	11.9	15.0	3.0	302.0
AVERAGES	82,818	6.9	.6	24.0	25.7	3.0	335.4
TOTALS	333		4.7	182.4	195.3	24.8	
January 1981	.075	6.7	AH	107.9	71.6	3.0	AH
February	.132	6.9	AH	84.0	92.0	3.8	AH
March	.076	6.7	AH	47.4	38.3	3.0	AH
April	.072	6.9	AH	43.1	40.2	2.4	AH
May	.090	7.0	.6	32.7	32.9	1.8	54.0
June	.098	6.9	.6	33.3	23.9	2.2	61.0
July	.099	6.8	.6	23.7	24.7	2.2	25.0
August	.079	6.9	.6	12.6	8.5	2.2	15.0
September	.118	6.8	.6	42.3	40.6	2.0	280.0
October	.097	6.8	.6	35.6	35.6	3.1	460.0
November	.088	6.8	.5	30.8	48.2	3.7	1,100.0
December	.085	6.9	AH	13.5	12.8	2.6	AH
AVERAGES	92,417	6.8	.6	42.2	39.1	2.7	285.0
TOTALS	405		3.6	423.3	391.9	26.7	
January 1982	.105	6.8	AH	23.6	18.2	3.0	AH
February	.081	7.0	AH	51.7	49.0	4.0	AH
March	.143	7.0	AH	58.9	50.6	3.1	AH
April	.102	7.0	AH	38.0	26.0	3.4	AH
May	.123	6.9	AH	43.8	43.5	3.3	AH
June	.178	6.8	.5	34.3	39.6	2.3	265.0
July	.118	6.7	.6	7.7	10.5	2.5	56.0
August	.061	6.9	.4	23.0	13.5	2.6	109.0
September	.069	6.8	.5	8.7	7.0	3.0	15.0
October	.055	6.9	.4	22.9	12.4	3.2	100.0
November	.062	6.9	AH	16.9	14.5	3.4	AH
December	.080	7.0	AH	25.3	19.6	3.3	AH
AVERAGES	98,083	6.9	.5	29.6	25.4	3.1	109.0
TOTALS	430		2.4	314.4	269.8	32.9	

PACKAGE PLANT NAME: COREY MEADOWS
PACKAGE PLANT NUMBER: L-75
NPDES PERMIT NUMBER: G 701 *AD

MONTH/YEAR	FLOW	pH	CL2	BOD	SS	DO	Coliform
January 1979	.059	6.7	.6	9.6	20.2	2.7	10.0
February	.047	6.7	.6	2.7	9.9	3.5	2.0
March	.045	6.7	.6	1.8	7.4	3.4	2.0
April	.072	6.8	.6	7.0	7.7	3.6	2.0
May	.068	7.0	.6	1.5	4.0	3.1	1.0
June	.059	6.8	.6	2.0	9.9	3.1	14.0
July	.075	7.0	.6	6.1	5.5	2.8	2.0
August	.051	6.7	.6	3.2	1.3	2.9	3.0
September	.040	6.8	.6	3.8	3.6	1.9	3.0
October	.043	6.7	.6	11.9	15.5	2.5	7.0
November	.051	6.9	.6	1.6	6.0	2.9	1.0
December	.082	7.2	.6	4.4	8.6	3.7	2.0
AVERAGES	57,667	6.8	.6	4.6	8.3	3.0	4.1
TOTALS	253		3.7	29.0	51.9	18.8	
January 1980	.071	6.9	.5	17.4	23.3	3.5	18.0
February	.044	6.9	.6	7.6	12.9	3.2	3.0
March	.070	6.8	.6	2.8	7.8	3.3	2.0
April							
May	.076	6.9	.6	1.0	1.8	3.2	1.0
June	.071	6.8	.6	.6	1.6	2.5	1.0
July	.056	6.7	.6	9.1	53.0	1.6	11.0
August	.082	6.8	.6	6.0	8.4	3.2	5.0
September	.058	6.8	.6	AH	AH	2.8	AH
October	.045	6.7	.6	2.5	8.8	3.3	2.0
November	.043	6.8	.5	1.9	4.9	3.2	156.0
December	.046	6.7	.4	2.8	10.9	2.8	1.0
AVERAGES	60,182	6.8	.6	5.2	13.3	3.0	20.0
TOTALS	242		3.4	28.5	73.7	17.8	
January 1981	.043	7.0	AH	2.9	3.4	3.2	AH
February	.058	6.7	AH	12.5	16.9	3.7	AH
March	.061	6.7	AH	3.6	3.1	2.2	AH
April	.055	6.5	AH	2.2	3.2	2.2	AH
May	.062	6.8	.6	1.0	2.0	2.1	1.0
June	.065	6.8	.6	1.0	1.9	1.9	1.0
July	.064	6.7	.6	1.7	3.3	2.1	1.0
August	.047	6.7	.6	1.9	3.1	2.2	3.0
September	.101	6.7	.6	8.4	9.5	1.7	9.0
October	.068	6.9	.5	10.7	17.7	2.5	13.0
November	.080	6.8	.6	9.8	9.8	3.2	2.0
December	.061	6.8	AH	6.8	10.1	2.6	AH
AVERAGES	63,750	6.8	.6	5.2	7.0	2.5	4.3
TOTALS	279		2.5	36.0	48.4	17.0	
January 1982	.075	6.8	AH	10.1	13.2	3.1	AH
February	.063	6.8	AH	6.3	12.2	3.4	AH
March	.108	7.0	AH	12.6	23.8	2.5	AH
April	.091	6.7	AH	3.7	4.5	3.2	AH
May	.061	6.8	AH	4.6	10.5	3.3	AH
June	.067	6.7	.5	3.4	3.5	2.3	5.0
July	.050	6.7	.5	3.5	3.0	2.2	5.0
August	.047	6.7	.4	2.4	4.6	2.0	11.0
September	.062	6.9	.4	3.1	4.4	2.8	10.0
October	.048	6.9	.4	1.9	1.7	3.0	7.0
November	.055	7.0	AH	32.2	44.6	3.5	AH
December	.073	7.1	AH	1.8	3.6	3.2	AH
AVERAGES	66,667	6.8	.4	7.1	10.8	2.9	7.6
TOTALS	292		1.5	51.6	78.1	20.8	

PACKAGE PLANT LINCOLN GREEN
PACKAGE PLANT L-49
NPDES PERMIT H 704 *AD

MONTH/YEAR	FLOW	pH	CL2	BOD	SS	DO	Coliform
January 1979	.109	6.7	.6	13.5	9.7	3.1	22.0
February	.075	6.8	.6	38.2	44.8	3.4	225.0
March	.105	6.7	.6	7.5	9.3	3.5	14.0
April	.142	6.8	.6	6.4	4.3	3.3	4.0
May	.141	7.0	.6	5.1	8.3	3.2	6.0
June	.094	6.9	.6	3.7	8.6	3.1	8.0
July	.091	6.9	.6	2.9	2.7	3.1	3.0
August	.127	6.8	.6	3.6	5.0	3.5	2.0
September	.092	6.7	.6	3.4	2.9	2.8	3.0
October	.078	6.7	.6	16.5	193.2	2.6	33.0
November	.093	6.8	.6	93.4	128.8	3.5	4,021.0
December	.122	7.0	.6	33.0	28.0	3.7	303.0
AVERAGES	105,750	6.8	.6	18.9	37.1	3.2	387.0
TOTALS	464		6.9	217.1	425.7	37.1	
January 1980	.119	7.1	.5	64.1	72.6	3.5	103.0
February	.102	6.9	.6	29.4	18.0	3.4	124.0
March	.161	6.9	.6	42.3	51.2	3.5	135.0
April							
May	.143	7.1	.6	6.0	7.5	3.1	6.0
June	.134	6.9	.6	10.4	13.2	3.1	8.0
July	.094	6.8	.6	5.7	4.8	3.2	4.0
August	.106	6.9	.6	20.0	18.3	2.5	40.0
September	.102	7.2	.7	AH	AH	2.4	AH
October	.091	6.9	.6	7.7	9.2	2.1	11.0
November	.093	7.0	.6	89.2	165.5	2.9	779.0
December	.140	6.8	.6	21.2	20.3	2.5	42.0
AVERAGES	116,818	7.0	.6	29.6	38.1	2.9	125.2
TOTALS	469		7.0	317.2	407.9	34.2	
January 1981	.149	7.0	.6	126.7	117.6	3.3	299.0
February	.144	7.0	.5	106.5	71.5	3.9	533.0
March	.128	7.0	.6	35.7	22.0	3.0	58.0
April	.123	6.7	.6	20.7	13.2	3.1	46.0
May	.131	6.7	.6	24.4	28.9	2.8	56.0
June	.184	6.8	.6	15.8	10.7	2.2	15.0
July	.101	6.6	.6	22.8	24.0	2.8	47.0
August	.101	6.8	.6	6.8	8.6	2.4	4.0
September	.170	6.6	.6	14.7	16.2	2.3	10.0
October	.122	6.9	.5	4.1	5.1	3.3	12.0
November	.118	6.9	.6	3.5	2.4	2.5	2.0
December	.129	6.8	AH	5.0	2.7	2.8	AH
AVERAGES	133,333	6.8	.6	32.2	26.9	2.9	98.4
TOTALS	584		7.8	465.8	389.0	41.4	
January 1982	.098	6.9	AH	17.4	10.3	3.2	AH
February	.122	6.8	AH	15.7	19.2	2.6	AH
March	.161	6.8	AH	15.8	11.6	2.5	AH
April	.158	6.9	AH	47.2	65.7	3.6	AH
May	.109	6.8	AH	35.4	23.8	3.1	AH
June	.107	6.8	.5	46.8	46.4	2.9	199.0
July	.103	6.8	.5	10.6	6.1	2.4	29.0
August	.095	6.7	.4	5.0	5.8	1.9	16.0
September	.102	6.9	.5	10.5	9.6	3.0	55.0
October	.099	6.8	.4	22.4	30.5	3.8	166.0
November	.107	6.9	AH	21.8	31.2	3.4	AH
December	.123	7.0	AH	101.0	136.0	3.4	AH
AVERAGES	115,333	6.8	.5	29.1	33.0	3.0	93.0
TOTALS	506		2.7	364.3	412.9	37.3	

PACKAGE PLANT NAME: OAK OPENINGS INDUSTRIAL PARK
PACKAGE PLANT NUMBER: L-52
NPDES PERMIT NUMBER: 2PH00013*CD

MONTH/YEAR	FLOW	pH	CL2	BOD	SS	DO	Coliform
January 1979							
February	.013	6.8	.6	1.5	6.5	3.7	3.0
March	.032	6.8	.6	3.7	11.5	3.5	7.0
April	.037	6.9	.6	3.8	12.1	3.7	5.0
May	.030	7.0	.6	5.2	15.2	3.4	13.0
June	.024	6.8	.6	3.9	13.6	3.3	21.0
July	.027	6.9	.6	5.0	6.4	3.8	7.0
August	.034	6.8	.6	1.6	8.0	3.7	3.0
September	.038	6.8	.6	4.4	2.5	2.7	2.0
October	.034	6.8	.6	2.2	7.4	3.5	1.0
November	.065	6.7	.6	2.8	11.4	4.7	6.0
December	.046	7.2	.6	16.4	21.3	4.5	17.0
AVERAGES	34,545	6.9	.6	4.6	10.5	3.7	7.7
TOTALS	**139**		**2.1**	**15.9**	**36.4**	**12.7**	
January 1980	.052	7.0	.5	4.7	13.0	4.6	7.0
February	.029	6.9	.6	3.6	8.6	4.2	1.0
March	.029	6.9	.6	4.0	12.0	4.1	3.0
April							
May	.025	6.9	.6	3.0	11.1	4.1	2.0
June	.023	6.8	.5	3.1	5.9	4.5	2.0
July	.020	6.7	.6	2.1	5.4	4.0	1.0
August	.021	6.6	.6	2.0	4.9	3.4	3.0
September	.021	6.9	.6	AH	AH	2.4	AH
October	.042	6.8	.6	AH	AH	1.8	2.0
November	.038	7.0	.5	7.0	22.9	2.3	290.0
December	.041	6.7	.4	2.8	10.3	2.9	1.0
AVERAGES	31,000	6.8	.6	3.6	10.5	3.5	31.2
TOTALS	**125**		**1.7**	**9.3**	**27.0**	**10.8**	
January 1981	.037	6.7	AH	3.3	3.8	3.2	AH
February	.046	6.8	AH	6.5	13.4	3.8	AH
March	.051	6.5	AH	5.1	10.8	2.5	AH
April	.044	6.7	AH	4.2	5.3	4.1	AH
May	.052	6.7	.6	2.7	8.6	4.6	5.0
June	.060	6.7	.6	2.6	5.5	4.2	2.0
July	.063	6.7	.6	3.3	6.6	4.0	5.0
August	.048	6.8	.6	3.1	6.0	3.4	4.0
September	.051	6.8	.6	2.7	5.2	4.4	3.0
October	.056	6.8	.6	7.6	11.0	3.1	11.0
November	.062	6.8	.6	7.8	14.5	4.1	15.0
December	.056	6.9	AH	5.0	11.2	3.6	AH
AVERAGES	52,167	6.7	.6	4.5	8.5	3.8	6.4
TOTALS	**229**		**2.1**	**25.4**	**48.0**	**21.2**	
January 1982	.063	6.8	AH	15.3	21.3	3.9	AH
February	.067	7.0	AH	11.1	17.3	3.7	AH
March	.101	6.9	AH	8.3	12.3	4.1	AH
April	.104	6.9	AH	4.5	7.1	3.9	AH
May	.067	6.9	AH	5.6	8.9	3.7	AH
June	.078	6.9	.5	4.1	6.5	3.6	24.0
July	.064	6.8	.6	12.0	12.2	3.2	62.0
August	.063	6.7	.4	2.9	3.7	2.4	13.0
September	.082	6.8	.5	2.8	2.2	3.1	5.0
October	.062	6.8	.4	4.5	7.1	3.5	21.0
November	.075	6.9	AH	9.9	29.5	3.9	AH
December	.068	7.0	AH	3.3	8.2	3.5	AH
AVERAGES	74,500	6.9	.5	7.0	11.4	3.5	25.0
TOTALS	**327**		**1.8**	**56.7**	**91.7**	**28.6**	

PACKAGE PLANT NAME: OAK TERRACE SUBDIVISION
PACKAGE PLANT BER: L-37
NPDES PERMIT NUMBER: 2PH00014*CD

MONTH/YEAR	FLOW	pH	CL2	BOD	SS	DO	Coliform
January 1979							
February							
March							
April							
May							
June				1.3	4.3	6.3	3.0
July	.047	6.8	.6	2.2	1.3	3.5	1.0
August	.037	6.8	.6	2.1	5.1	3.6	3.0
September	.054	6.8	.6	22.1	24.5	2.7	27.0
October	.062	6.8	.6	2.7	8.3	4.0	1.0
November	.045	6.7	.6	2.4	5.2	4.4	3.0
December	.064	7.0	.6	3.8	6.0	4.7	3.0
AVERAGES	51,500	6.8	.6	5.2	7.8	4.2	5.9
TOTALS	**113**		**1.8**	**18.0**	**26.9**	**14.3**	
January 1980	.046	7.0	.5	2.0	4.5	4.5	1.0
February	.042	6.9	.6	3.9	6.4	4.2	2.0
March	.031	6.9	.6	2.6	4.6	4.2	1.0
April							
May	.045	6.8	.6	4.3	8.8	4.1	4.0
June	.050	7.0	.6	19.9	17.9	4.0	20.0
July	.040	6.6	.6	2.0	6.0	3.8	2.0
August	.046	6.6	.6	1.5	.7	3.1	1.0
September	.043	6.6	.6	AH	AH	2.2	AH
October	.033	6.8	.6	1.8	4.6	2.1	2.0
November	.033	6.9	.5	1.7	6.1	2.6	1.0
December	.049	6.7	.5	1.8	5.3	3.1	2.0
AVERAGES	41,636	6.8	.6	4.2	6.5	3.4	3.6
TOTALS	**167**		**2.4**	**15.9**	**24.8**	**14.4**	
January 1981	.059	6.7	.6	2.9	4.1	3.1	2.0
February	.089	6.8	.5	4.6	4.0	3.7	2.0
March	.201	6.7	.5	5.0	7.3	2.7	6.0
April	.156	6.6	.6	4.3	3.4	3.2	6.0
May	.159	6.6	.6	4.2	5.3	2.4	4.0
June	.106	6.6	.6	3.5	6.7	2.7	5.0
July	.067	6.7	.6	4.5	7.4	2.9	5.0
August	.051	6.9	.6	2.5	2.3	2.9	2.0
September	.042	6.7	.6	11.7	13.3	2.1	47.0
October	.051	6.9	.6	45.1	63.0	4.1	110.0
November	.054	6.7	.6	53.0	44.0	3.8	280.0
December	.055	6.8	AH	84.0	147.0	4.1	AH
AVERAGES	90,833	6.7	.6	18.8	25.7	3.1	42.6
TOTALS	**398**		**5.3**	**184.9**	**252.6**	**30.9**	
January 1982	.052	6.8	AH	76.0	49.0	4.2	AH
February	.058	7.0	AH	73.0	69.0	3.4	AH
March	.050	6.8	AH	23.7	18.6	2.9	AH
April	.056	6.8	AH	26.0	22.6	3.8	AH
May	.078	6.8	AH	4.4	6.1	3.4	AH
June	.077	6.8	.5	4.9	4.2	3.3	26.0
July	.059	6.7	.6	4.7	4.4	3.1	24.0
August	.066	6.7	.4	18.4	9.9	2.2	27.0
September	.070	6.8	.4	3.9	3.0	3.1	13.0
October	.049	6.8	.4	30.9	37.2	3.5	111.0
November	.054	6.8	AH	6.6	14.6	4.3	AH
December	.062	6.8	AH	20.8	34.7	4.7	AH
AVERAGES	60,917	6.8	.5	24.4	22.8	3.5	40.2
TOTALS	**267**		**1.4**	**161.4**	**150.4**	**23.1**	

APPENDIX C

NPDES Permits in the RAP Area

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

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  NPDES & PACKAGE PLANT NO.       FACILITY NAME AND ADDRESS                  RECEIVING STREAM(S)                  RIVER   CAPACITY FLOW NOW    ANNUAL FLOW
     AND PERMIT STATUS            LOCATION, COUNTY, AND CITY          SUB-BASIN, WATERSHED #, & RAP STATUS         MILE       mgd      mgd        MG/Year
***************************** ************************************ ********************************************* ********** ******** ********  ***********

** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                Ashland Oil Company                  WTRSHED NO: 015                               R.M.:         0.018    0.018          0.549
2IG00006*ED                   3147 Jessie St                       SUB-BASIN: Maumee River  *RAP? Yes *PRE? No   1.8
OUTFALL:                      Toledo Terminal                      STREAM: Maumee River
EXPIR. DATE: 10/24/88         Lucas County, Toledo                 VERIFIED? Yes
STATUS: Expired               OLD NAME(S):                         WASTE: Runoff, ship ballast
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                Bowling Green WTP                    WTRSHED NO: 045                               R.M.:         8.000    5.550        168.928
2IW00010*AD                   304 N. Church St                     SUB-BASIN:               *RAP? Yes *PRE? No   22.8
OUTFALL: 001                  17549 W. River Rd @ Hull-Prairie Rd  STREAM: Hull-Prarie Road Ditch
EXPIR. DATE: 12/01/79         Wood County, Plain Twp.              VERIFIED? Yes
STATUS: Expired               OLD NAME(S):                         WASTE: WTP backwash
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: L-20               CSX - Chessie - Presque Isle         WTRSHED NO: 028                               R.M.:         0.003    0.003          0.076
2IT00013*BD                   P.O. Box 45052                       SUB-BASIN: Maumee River  *RAP? Yes *PRE? No   0.1
OUTFALL:                      Presque Isle, Otter Cr & Bayshore    STREAM: Maumee River
EXPIR. DATE: 01/07/87         Lucas County, Oregon                 VERIFIED? Yes
STATUS: Expired               OLD NAME(S): C&O, Chessie            WASTE: Runoff, sewage
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                Conrail                              WTRSHED NO: 013                               R.M.:         0.000    0.000          0.000
2IT00015*AD                   415 Emerald Ave.                     SUB-BASIN: Maumee River  *RAP? Yes *PRE? No   0.0
OUTFALL: 001                  415 Emerald Ave.                     STREAM: Maumee River via unnamed trib.
EXPIR. DATE: 04/13/90         Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                OLD NAME(S): Penn Central            WASTE: Runoff
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                Doehler-Jarvis/Farley, Plant 2       WTRSHED NO: 020                               R.M.:         0.000    0.000          0.000
2IC00021*FD                   1945 Smead Ave., POB 902             SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL:                      5400 N. Detroit Ave.                 STREAM: Shantee Creek
EXPIR. DATE: 03/20/92         Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                OLD NAME(S):                         WASTE: Cooling water
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                DuPont De Nemours, Paint Plant       WTRSHED NO: 020                               R.M.:         0.490    0.490         14.914
2IF00016*DD                   PO Box 953                           SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL: 001                  1930 Tremainsville Rd., 43613        STREAM: Blodgett Ditch via storm sewers
EXPIR. DATE: 12/13/92         Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                OLD NAME(S):                         WASTE: Non-contact cooling water
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                DuPont De Nemours, Paint Plant       WTRSHED NO: 020                               R.M.:         0.000    0.000          0.000
2IF00016*DD                                                        SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL: 002                                                       STREAM: Blodgett Ditch via storm sewers
EXPIR. DATE: 12/13/82          County,                             VERIFIED? Yes
STATUS: Active                OLD NAME(S):                         WASTE:
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                                                                     WASTEWATER DISCHARGE NPDES PERMITS
                                                                           In the Maumee RAP Area

  NPDES & PACKAGE PLANT NO.       FACILITY NAME AND ADDRESS                   RECEIVING STREAM(S)                  RIVER    CAPACITY FLOW NOW      ANNUAL FLOW
      AND PERMIT STATUS           LOCATION, COUNTY, AND CITY          SUB-BASIN, WATERSHED #, & RAP STATUS          MILE          mgd      mgd          MG/Year
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** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                 Fondessy / Envirosafe Services of Oh WTRSHED NO: 028                                R.M.:          0.050    0.050          1.522
2IN00013*CD                    876 Otter Creek Rd.                  SUB-BASIN:                *RAP? Yes *PRE? No   2.3
OUTFALL: 001                   876 Otter Creek Rd.                  STREAM: Otter Creek
EXPIR. DATE: 01/01/93          Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S): Fondessey               WASTE: Runoff, sewage
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 France Stone Co., Waterville         WTRSHED NO: 044                                R.M.:          0.300    0.300          9.131
2IJ00047*BD                    8130 Brint Road, PO Box 278          SUB-BASIN: Maumee River   *RAP? Yes *PRE? No   22.2
OUTFALL: 001                   700 S.River Rd                       STREAM: Maumee River
EXPIR. DATE: 03/31/87          Lucas County, Waterville Twp.        VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                         WASTE: Dewatering quarry
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: L-96                Fuller's Creekside Estates           WTRSHED NO: 021                                R.M.:          0.100    0.270          8.218
2PH00000*BD                    1 Government Center Suite 800        SUB-BASIN: Portage        *RAP? Yes *PRE? No   0.0
OUTFALL:                       6064 Villamar                        STREAM: Shantee Creek
EXPIR. DATE: 04/23/93          Lucas County, Washington Twp.        VERIFIED? Yes
STATUS: To be sewered 7/1/88   OLD NAME(S):                         WASTE: Sewage
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 General Mills                        WTRSHED NO: 023                                R.M.:          0.000    0.000          0.000
2IH00093*BD                    PO Box 923                           SUB-BASIN: Silver Creek   *RAP? Yes *PRE? Yes  0.0
OUTFALL: 001                   1250 Laskey Rd.                      STREAM: Jamieson Ditch
EXPIR. DATE: 08/31/92          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Runoff, high BOD
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 Haskins WWTP                         WTRSHED NO: 043                                R.M.:          0.100    0.060          1.826
2PA00026*CD                    Village Hall, Church St.             SUB-BASIN:                *RAP? Yes *PRE? No   21.6
OUTFALL:                       S.R. 64 and King Rd.                 STREAM: Liberty High Rd Ditch
EXPIR. DATE: 09/23/88          Wood County, Middleton Twp.          VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Municipal Wastewater
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 Hydra-Matic                          WTRSHED NO: 023                                R.M.:          0.000    0.100          3.044
2IC00026*CD                    3044 W. Grant Blvd.                  SUB-BASIN:                *RAP? Yes *PRE? No   0.0
OUTFALL:                       1455 West Alexis Rd                  STREAM: Silver Creek
EXPIR. DATE: 08/01/82          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Expired                OLD NAME(S): GMC Chevrolet           WASTE: Runoff
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 Libbey Owens Ford - Plants #4 and #8 WTRSHED NO: 028                                R.M.:          0.100    0.100          3.044
2IN00020*DD                    811 Madison                          SUB-BASIN:                *RAP? Yes *PRE? No   6.6
OUTFALL:                       1701 E Broadway                      STREAM: Otter Creek
EXPIR. DATE: 09/27/90          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Glass mfg process waste
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

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 NPDES & PACKAGE PLANT NO.      FACILITY NAME AND ADDRESS                RECEIVING STREAM(S)                  RIVER   CAPACITY FLOW NOW    ANNUAL FLOW
    AND PERMIT STATUS           LOCATION, COUNTY, AND CITY       SUB-BASIN, WATERSHED #, & RAP STATUS          MILE      mgd       mgd        MG/Year
****************************** ************************************ ********************************************* ********** ******** ********  ***********

** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                 Libbey Owens Ford Float Glass Plant  WTRSHED NO: 047                               R.M.:         6.500    6.500        197.844
2IN00030*ED                    811 Madison                          SUB-BASIN: Maumee River  *RAP? Yes *PRE? No   6.9
OUTFALL:                       140 Dixie Hwy                        STREAM: Maumee River
EXPIR. DATE: 06/30/82          Wood County, Rossford                VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                         WASTE: Runoff,Cooling, Lagoon effluent
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: L-25                Liquid Carbonic Corp.                WTRSHED NO: 028                               R.M.:         0.002    0.002          0.054
2IN00069*ED                    135 S. LaSalle St                    SUB-BASIN:               *RAP? Yes *PRE? No   1.9
OUTFALL: 001                   3742 Cedar Point Rd., 43616          STREAM: Otter Creek
EXPIR. DATE: 08/11/93          Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Sewage
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 Marathon Oil Company                 WTRSHED NO: 028                               R.M.:         0.085    0.085          2.587
2IG00024*BD                    4131 Seaman Road                     SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL: 001                   3855 York                            STREAM: Driftmeyer Ditch
EXPIR. DATE: 10/10/92          Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Runoff water
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 Maumee Combined Sewer Overflows      WTRSHED NO: 044, 078                          R.M.:         0.000    0.000          0.000
2PD00015*AD                    214 Illinois Ave                     SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL:                       214 Illinois Ave                     STREAM: Maumee
EXPIR. DATE: 06/30/77          Lucas County, Maumee                 VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                         WASTE: Sewage, storm runoff
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 Maumee River WWTP                    WTRSHED NO: 044                               R.M.:        15.000    9.010        274.242
2PK00000*DD                    1111 S McCord Rd                     SUB-BASIN: Maumee River  *RAP? Yes *PRE? No   18.2
OUTFALL:                       5858 North River Road, Waterville    STREAM: Maumee River
EXPIR. DATE: 09/15/90          Lucas County, Monclova Twp.          VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Municipal Wastewater
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 Norfolk Southern RR                  WTRSHED NO: 015                               R.M.:         0.242    0.242          7.366
2IT00005*BD                    8 N. Jefferson St                    SUB-BASIN: Maumee River  *RAP? Yes *PRE? No   0.0
OUTFALL: 001                   2750 Front St                        STREAM: Duck Creek
EXPIR. DATE: 10/25/88          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Expired                OLD NAME(S): N&W RR                  WASTE: Runoff
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 Oregon South Shore Park WWTP         WTRSHED NO: 028                               R.M.:         0.225    0.490         14.914
2PB00007*CD                    5350 Seaman Road, POB 7541           SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL:                       5760 Bayshore Rd.                    STREAM: Lake Erie
EXPIR. DATE: 06/08/89          Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Municipal Wastewater
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: MAUMEE RIVER/BAY

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IW00220*BD OUTFALL: EXPIR. DATE: 04/23/93 STATUS: Active ; draft permit	Oregon WTP 5350 Seaman Rd 5350 Seaman Rd Lucas County, Oregon OLD NAME(S):	WTRSHED NO: 029 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Berger Ditch VERIFIED? Yes WASTE: WTP backwash water	R.M.: 0.0	0.320	0.320	9.740
PKG PLANT: n/a 2PD00035*ED OUTFALL: EXPIR. DATE: 09/15/90 STATUS: Active	Oregon WWTP 5330 Seaman Rd Dupont Rd, N of Cedar Point Rd Lucas County, Oregon OLD NAME(S):	WTRSHED NO: 028 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Maumee Bay VERIFIED? Yes WASTE: Municipal Wastewater	R.M.: 0.0	8.000	4.310	131.186
PKG PLANT: n/a 2IN00075*BD OUTFALL: 001 EXPIR. DATE: 05/26/80 STATUS: Expired	Owens-Illinois, Libbey Plant 27 PO Box 919 940 Ash St Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 030 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River via Co. Dt. No.1139 VERIFIED? Yes WASTE: Cooling water,non-contact	R.M.: 0.0	0.000	0.150	4.566
PKG PLANT: n/a 2PD00002*CD OUTFALL: EXPIR. DATE: 06/28/87 STATUS: Expired	Perrysburg WWTP 201 W Indiana 1 West Boundary St Wood County, Perrysburg OLD NAME(S):	WTRSHED NO: 079 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Municipal wastewater	R.M.: 14.5	2.750	3.000	91.313
PKG PLANT: n/a 2IG00013*CD OUTFALL: EXPIR. DATE: 05/10/92 STATUS: Active	Petroleum Fuel & Terminal Co. 2844 Summit Ave. 2844 Summit Ave. Lucas County, Toledo OLD NAME(S): Shell, Apex	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Runoff	R.M.: 2.2	0.000	0.000	0.000
PKG PLANT: n/a 2IF00000*CD OUTFALL: EXPIR. DATE: 03/26/90 STATUS: Active	Plaskon Electronic Materials 2829 Glendale Ave 2829 Glendale Ave Lucas County, Toledo OLD NAME(S): Allied Chemical	WTRSHED NO: 013 SUB-BASIN: Maumee River *RAP? Yes *PRE? Yes STREAM: Delaware Creek VERIFIED? Yes WASTE: Cooling water,non-contact	R.M.: 1.2	0.071	0.071	2.161
PKG PLANT: n/a 2IG00007*DD OUTFALL: EXPIR. DATE: 09/02/90 STATUS: Active	Standard Oil - Toledo Refinery PO Box 696 SE cor. Cedar Point Rd @ Bay Shore Lucas County, Oregon OLD NAME(S):	WTRSHED NO: 028 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Maumee Bay VERIFIED? Yes WASTE: Refinery & sewage	R.M.: 0.4	25.000	25.000	760.938

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: MAUMEE RIVER/BAY

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IG00009*CD OUTFALL: EXPIR. DATE: 07/05/92 STATUS: Active (draft)	Sun Petroleum - Marine Terminal PO Box 920 1900-2100 Front Street, Toledo Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Runoff	R.M.: 6.5	0.001	0.001	0.015
PKG PLANT: n/a 2IG00003*FD OUTFALL: EXPIR. DATE: 09/24/89 STATUS: Active	Sun Petroleum - Toledo Refinery PO Box 920 1819 Woodville Rd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 028 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: Refinery, runoff, non-contact cooling	R.M.: 4.9	3.000	3.000	91.313
PKG PLANT: n/a 2IO00001*BD OUTFALL: 001 EXPIR. DATE: 09/20/92 STATUS: Active	Teledyne Industries 1330 Laskey Road 1330 Laskey Road Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 023 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Silver Creek VERIFIED? Yes WASTE: Runoff, non-contact cooling	R.M.: 0.0	0.069	0.069	2.100
PKG PLANT: n/a 2PF00000*GD OUTFALL: EXPIR. DATE: 12/27/90 STATUS: Active	Toledo Bay View Park WWTP 1 Govt Center, Ste 1500 3900 N Summit, 43611 Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Municipal Wastewater	R.M.: 1.4	102.000	91.150	2774.378
PKG PLANT: n/a 2ID00011*CD OUTFALL: 001 EXPIR. DATE: 01/01/93 STATUS: Active	Toledo Coke 436 7th Ave. 2563 Front Street, Toledo Lucas County, Toledo OLD NAME(S): Koppers	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Runoff, Non-contact cooling water	R.M.: 1.7	3.730	3.730	113.532
PKG PLANT: n/a 2IW00260*BD OUTFALL: 008 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 009 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: MAUMEE RIVER/BAY

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IW00260*BD OUTFALL: 005 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Duck Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 006 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 004 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 003 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Duck Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 002 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*CB OUTFALL: 001 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: Backwash supernatant	R.M.: 3.4	10.500	10.500	319.594
PKG PLANT: n/a 2IW00260*BD OUTFALL: 007 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

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 NPDES & PACKAGE PLANT NO.      FACILITY NAME AND ADDRESS            RECEIVING STREAM(S)                       RIVER    CAPACITY FLOW NOW    ANNUAL FLOW
    AND PERMIT STATUS           LOCATION, COUNTY, AND CITY      SUB-BASIN, WATERSHED #, & RAP STATUS            MILE        mgd      mgd       MG/Year
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** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                 Toledo Edison                   WTRSHED NO: 015                               R.M.:         0.000    0.000          0.000
2IB00002*CD                    300 Madison Ave                 SUB-BASIN: Maumee River   *RAP? Yes *PRE? No  4.0
OUTFALL:                       300 Madison Ave                 STREAM: Maumee River
EXPIR. DATE: 01/09/92          Lucas County, Toledo            VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                    WASTE:
------------------------------ -------------------------------- -------------------------------------------- ----------
PKG PLANT: n/a                 Toledo Edison - ACME Station    WTRSHED NO: 015                               R.M.:       406.000  406.000      12357.625
2IB00001*CD                    300 Madison Ave                 SUB-BASIN: Maumee River   *RAP? Yes *PRE? No  4.0
OUTFALL:                       1401 Front St                   STREAM: Maumee River
EXPIR. DATE: 08/09/87          Lucas County, Toledo            VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                    WASTE: Cooling wtr, Ash ponds
------------------------------ -------------------------------- -------------------------------------------- ----------
PKG PLANT: L-100               Toledo Edison Bayshore Plant    WTRSHED NO: 028                               R.M.:         0.015    0.015          0.457
2IB00000*JD                    300 Madison Ave.                SUB-BASIN:                *RAP? Yes *PRE? No  0.0
OUTFALL: 604                   4701 Bayshore Road              STREAM: Driftmeyer Ditch
EXPIR. DATE: 09/15/90          Lucas County, Oregon Twp.       VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                    WASTE: Sewage & cooling water
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PKG PLANT: n/a                 Waterville WTP                  WTRSHED NO: 043                               R.M.:         0.026    0.026          0.791
2IV00080*BD                    16 N 2nd St                     SUB-BASIN: Maumee River   *RAP? Yes *PRE? No  21.1
OUTFALL:                       Waterworks Dr.                  STREAM: Maumee River
EXPIR. DATE: 01/22/89          Lucas County, Waterville        VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                    WASTE: WTP Backwash Water
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** SUBTOTAL **                                                                                                           592.696  570.611      17367.965
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
** BASIN: SWAN CREEK						
PKG PLANT: n/a 2IC00060*AD OUTFALL: 001 EXPIR. DATE: 07/19/93 STATUS: Active	Feinblanking, Ltd. 1510 Albon Rd 1510 Albon Rd Lucas County, Holland OLD NAME(S): Kern-L same addr	WTRSHED NO: 009 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Wolf Creek VERIFIED? Yes WASTE: Machining, stamping wastes	R.M.: 0.0	0.009	0.009	0.274
PKG PLANT: n/a 2IC00056*BD OUTFALL: 001 EXPIR. DATE: 01/01/93 STATUS: Active	Kern-Liebers USA 1510 Albon Rd 1510 Albon Rd Lucas County, Springfield Twp. OLD NAME(S): Feinblank same addr	WTRSHED NO: 009 SUB-BASIN: Wolf Creek *RAP? Yes *PRE? No STREAM: Wolf Creek VERIFIED? Yes WASTE: Well water	R.M.: 4.1	0.000	0.032	0.974
PKG PLANT: L-62 2PP00003*CD OUTFALL: EXPIR. DATE: 06/17/89 STATUS: Active	Oak Openings - Fallen Timbers Plaza 682 Prospect Turnpike near Shaffer Road Lucas County, Swanton Twp. OLD NAME(S):	WTRSHED NO: 007 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Murbach Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.150	0.110	3.348
PKG PLANT: L-53 2PH00013*CD OUTFALL: EXPIR. DATE: 06/17/89 STATUS: Active ; draft permit	Oak Openings Industrial Park 1 Government Center Suite 800 1771 S. Eber Road @ Geiser Road Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 009 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Kujowski Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.180	0.110	3.348
PKG PLANT: L-37 2PH00014*CD OUTFALL: EXPIR. DATE: 09/03/89 STATUS: Active	Oak Terrace 1111 S. McCord Rd. 329 Oak Terrace Blvd. Lucas County, Spencer Twp. OLD NAME(S):	WTRSHED NO: 009 SUB-BASIN: Swan/Wolf Cr *RAP? Yes *PRE? No STREAM: Butler Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.100	0.100	3.044
PKG PLANT: L-102 2IO00003*AD OUTFALL: 001 EXPIR. DATE: 07/01/84 STATUS: Expired	Ohio National Guard Toledo Express Airport Toledo Express Airport Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 042 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Zaleski Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.029	0.029	0.867
PKG PLANT: n/a 2IJ00048*CD OUTFALL: 001 EXPIR. DATE: 03/20/93 STATUS: Active	Stoneco - Maumee Plant PO Box 29A, 221 Allen St. 3845 Ford St Lucas County, Monclova Twp. OLD NAME(S): Maumee Stone Co.	WTRSHED NO: 041 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Graham Ditch VERIFIED? Yes WASTE: Dewatering quarry	R.M.: 0.0	0.435	0.435	13.240

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
** BASIN: SWAN CREEK						
PKG PLANT: L-98 2PB00066*AD OUTFALL: EXPIR. DATE: 07/13/93 STATUS: Active	Toledo House of Correction 1 Government Center, Ste. 1710 7846 Schadel Road, 43571 Lucas County, Waterville Twp. OLD NAME(S):	WTRSHED NO: 040 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Blue Creek VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.040	0.040	1.218
PKG PLANT: L-60 2PS00002*BD OUTFALL: 001 EXPIR. DATE: 05/12/85 STATUS: Expired	Woodside Terrace Trailer Park 5025 Brinthaven 7717 Angola Rd Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 009 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Wolf Creek VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.080	0.080	2.435
** SUBTOTAL **				1.023	0.945	28.749

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: OTTAWA RIVER

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: L-68 2PG00002*BD OUTFALL: 001 EXPIR. DATE: 09/13/92 STATUS: To be sewered 1988	Bentbrook Farms 1 Government Center Suite 800 5447 Sturbridge Road Lucas County, Sylvania OLD NAME(S):	WTRSHED NO: 004 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.060	0.120	3.653
PKG PLANT: L-71 2PY00000*DD OUTFALL: 001 EXPIR. DATE: 03/18/93 STATUS: Active	Centennial Manor 3230 Centennial Road 3230 Centennial Road Lucas County, Sylvania Twp. OLD NAME(S):	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek VERIFIED? Yes WASTE: Sewage	R.M.: 2.0	0.030	0.015	0.457
PKG PLANT: L-71 2PY00000*DD OUTFALL: 581 EXPIR. DATE: 03/18/93 STATUS: Active	Centennial Manor Lucas County, Sylvania Twp. OLD NAME(S):	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek VERIFIED? Yes WASTE:	R.M.: 2.0	0.000	0.000	0.000
PKG PLANT: n/a 2IQ00012*BD OUTFALL: EXPIR. DATE: 02/24/92 STATUS: Active	Diversi Tech General PO Box 875 3729 Twinning St. Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ottawa River VERIFIED? Yes WASTE: Runoff	R.M.: 6.0	0.100	0.100	3.044
PKG PLANT: n/a 2IF00017*CD OUTFALL: EXPIR. DATE: 04/16/90 STATUS: Active	DuPont De Nemours, Formaldehyde Plan PO Box 6568, W. Toledo Stn 700 Matzinger Road Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ottawa River VERIFIED? Yes WASTE: Non-contact cooling water	R.M.: 4.8	1.700	1.700	51.744
PKG PLANT: n/a 2IJ00039*FD OUTFALL: 001 EXPIR. DATE: 03/28/93 STATUS: Active	France Stone Co., Silica Plant PO Box 278, 8130 Brint Rd Centennial Road, Sylvania Lucas County, Sylvania OLD NAME(S):	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek via Schreiber Ditch VERIFIED? Yes WASTE: Dewatering quarry	R.M.: 2.0	0.800	2.000	60.875
PKG PLANT: n/a 2IJ00039*FD OUTFALL: 002 EXPIR. DATE: 03/28/93 STATUS: Active	France Stone Co., Silica Plant County, OLD NAME(S):	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek via Schreiber Ditch VERIFIED? Yes WASTE: Dewatering quarry	R.M.: 2.0	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: OTTAWA RIVER

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IC00022*CD OUTFALL: 003 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IC00022*CD OUTFALL: 001 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IC00022*CD OUTFALL: 002 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IC00022*CD OUTFALL: 004 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IN00079*AD OUTFALL: 001 EXPIR. DATE: 05/19/78 STATUS: Expired	King Road Sanitary Landfill 111 S. McCord Rd 3535 King Rd. Lucas County, Sylvania Twp. OLD NAME(S):	WTRSHED NO: 004 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ottawa River VERIFIED? Yes WASTE: Leachate	R.M.: 4.5	0.000	0.310	9.436
PKG PLANT: L-49 2PH00004*BD OUTFALL: 001 EXPIR. DATE: 09/13/92 STATUS: To be sewered 1988	Lincoln Green Subdivision 1 Government Center Suite 800 6520 Burnham Green Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 004 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Potter Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.168	0.160	4.870
PKG PLANT: n/a 2IN00032 OUTFALL: EXPIR. DATE: 11/30/79 STATUS: Revoked	Medusa Portland Cement Company 2301 Front St., Toledo Sylvania, OH Lucas County, Sylvania OLD NAME(S):	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek VERIFIED? No WASTE:	R.M.: 5.3	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

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 NPDES & PACKAGE PLANT NO.      FACILITY NAME AND ADDRESS            RECEIVING STREAM(S)                        RIVER    CAPACITY FLOW NOW    ANNUAL FLOW
   AND PERMIT STATUS            LOCATION, COUNTY, AND CITY          SUB-BASIN, WATERSHED #, & RAP STATUS         MILE       mgd      mgd         MG/Year
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** BASIN: OTTAWA RIVER
PKG PLANT: n/a                 Midland-Ross Surface Combustion Div. WTRSHED NO: 005                                R.M.:        0.000    0.002          0.061
2IN00072*                      2375 Dorr St                         SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No    0.0
OUTFALL:                       2375 Dorr St                         STREAM: Williams Ditch
EXPIR. DATE: 04/13/83          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Expired, NPR?          OLD NAME(S):                         WASTE:
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PKG PLANT: L-86                Reichert Stamping                    WTRSHED NO: 003                                R.M.:        0.008    0.008          0.244
2IS00008*ED                    8200 W. Central Ave.                 SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No    5.1
OUTFALL: 002                   8200 W. Central Ave.                 STREAM: Ten Mile Creek via storm sewer
EXPIR. DATE: 06/15/91          Lucas County, Syvlania Twp.          VERIFIED? Yes
STATUS: Active                 OLD NAME(S): Toledo Steel Tube       WASTE: Sewage
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PKG PLANT: n/a                 Standard Oil - Hill Ave Terminal     WTRSHED NO: 004                                R.M.:        0.003    0.003          0.091
2IG00010*DD                    4850 E 49th St.                      SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No    11.1
OUTFALL: 001                   2450 Hill Ave., 43607                STREAM: Fleig Ditch
EXPIR. DATE: 07/13/93          Lucas County, Toledo                 VERIFIED? No
STATUS: Active                 OLD NAME(S):                         WASTE: Runoff
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** SUBTOTAL **                                                                                                              2.989    4.538        138.125
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
** BASIN: LAKE ERIE						
PKG PLANT: n/a 2IT00002*CD OUTFALL: EXPIR. DATE: 02/17/92 STATUS: Active	CSX - Chessie - Walbridge Terminal PO Box 45052 Union Street, Walbridge Wood County, Walbridge OLD NAME(S): C&O, Chessie	WTRSHED NO: 032 SUB-BASIN: Cedar *RAP? Yes *PRE? No STREAM: Cedar Creek VERIFIED? Yes WASTE: Runoff	R.M.: 0.0	0.000	0.000	0.000
PKG PLANT: W-19 R 725 *AD OUTFALL: EXPIR. DATE: 06/30/77 STATUS: To be sewered in '88	Charter House Inn I-280 @ Hanley Rd. I-280 @ Hanley Rd. Wood County, Lake Twp. OLD NAME(S):	WTRSHED NO: 033 SUB-BASIN: Crane *RAP? Yes *PRE? No STREAM: Crane Creek VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.030	0.030	0.913
PKG PLANT: n/a 2IT00007*CD OUTFALL: EXPIR. DATE: 06/23/91 STATUS: Active	Conrail - Stanley Yard 435 Emerald Ave Stanley Yard, 29460 E Broadway, Moli Wood County, Lake Twp. OLD NAME(S):	WTRSHED NO: 032 SUB-BASIN: Cedar *RAP? Yes *PRE? No STREAM: Cedar Creek VERIFIED? No WASTE:	R.M.: 0.0	0.000	0.000	0.000
PKG PLANT: n/a 2PA00012*CD OUTFALL: EXPIR. DATE: / / STATUS: Proposed Facility	Harbor View, Village of 127 Lakeview Dr 127 Lakeview Dr Lucas County, Harbor View OLD NAME(S):	WTRSHED NO: SUB-BASIN: *RAP? Yes *PRE? No STREAM: Lake Erie VERIFIED? Yes WASTE: Untreated sewage, septic tank effluent	R.M.: 0.0	0.000	0.000	0.000
PKG PLANT: n/a 2IJ00052*CD OUTFALL: 001 EXPIR. DATE: 06/02/92 STATUS: Active	Stoneco - Lime City Plant PO Box 29A, 221 Allen St. US 20, 8812 Fremont Pike Wood County, Perrysburg OLD NAME(S): Maumee Stone Co.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek *RAP? Yes *PRE? No STREAM: Dry Creek via ditch VERIFIED? Yes WASTE: Quarry runoff	R.M.: 0.0	0.216	0.216	6.575
PKG PLANT: W-39 R 724 *AD OUTFALL: EXPIR. DATE: / / STATUS: To be sewered	Union 76 Truck Stop and Restaurant 16000 9-Mi. Rd I-280 & Tpk. (@ Libbey Rd) Wood County, Lake Twp. OLD NAME(S):	WTRSHED NO: 033 SUB-BASIN: Crane *RAP? Yes *PRE? No STREAM: Crane Creek VERIFIED? Yes WASTE:	R.M.: 0.0	0.030	0.030	0.913
** SUBTOTAL **				0.276	0.276	8.401
*** Total ***				596.983	576.369	17543.240

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04/19/90
                                                                    WASTEWATER DISCHARGE NPDES PERMITS
                                                                          In the Maumee RAP Area

  NPDES & PACKAGE PLANT NO.         FACILITY NAME AND ADDRESS                RECEIVING STREAM(S)                 RIVER    CAPACITY FLOW NOW      ANNUAL FLOW
      AND PERMIT STATUS             LOCATION, COUNTY, AND CITY            SUB-BASIN, WATERSHED #, & RAP STATUS     MILE         mgd      mgd         MG/Year
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** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                 Ashland Oil Company                  WTRSHED NO: 015                              R.M.:         0.018    0.018           0.548
2IG00006*ED                    3147 Jessie St                       SUB-BASIN: Maumee River  *RAP? Yes *PRE? No  1.8
OUTFALL:                       Toledo Terminal                      STREAM: Maumee River
EXPIR. DATE: 10/24/88          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                         WASTE: Runoff, ship ballast
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 Bowling Green WTP                    WTRSHED NO: 045                              R.M.:         8.000    5.550         168.928
2IW00010*AD                    304 N. Church St                     SUB-BASIN:               *RAP? Yes *PRE? No  22.8
OUTFALL: 001                   17549 W. River Rd @ Hull-Prairie Rd  STREAM: Hull-Prarie Road Ditch
EXPIR. DATE: 12/01/79          Wood County, Plain Twp.              VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                         WASTE: WTP backwash
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: L-20                CSX - Chessie - Presque Isle         WTRSHED NO: 028                              R.M.:         0.003    0.003           0.076
2IT00013*BD                    P.O. Box 45052                       SUB-BASIN: Maumee River  *RAP? Yes *PRE? No  0.1
OUTFALL:                       Presque Isle, Otter Cr & Bayshore    STREAM: Maumee River
EXPIR. DATE: 01/07/87          Lucas County, Oregon                 VERIFIED? Yes
STATUS: Expired                OLD NAME(S): C&O, Chessie            WASTE: Runoff, sewage
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 Conrail                              WTRSHED NO: 013                              R.M.:         0.000    0.000           0.000
2IT00015*AD                    415 Emerald Ave.                     SUB-BASIN: Maumee River  *RAP? Yes *PRE? No  0.0
OUTFALL: 001                   415 Emerald Ave.                     STREAM: Maumee River via unnamed trib.
EXPIR. DATE: 04/13/90          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S): Penn Central            WASTE: Runoff
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 Doehler-Jarvis/Farley, Plant 2       WTRSHED NO: 020                              R.M.:         0.000    0.000           0.000
2IC00021*FD                    1945 Smead Ave., POB 902             SUB-BASIN:               *RAP? Yes *PRE? No  0.0
OUTFALL:                       5400 N. Detroit Ave.                 STREAM: Shantee Creek
EXPIR. DATE: 03/20/92          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Cooling water
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 DuPont De Nemours, Paint Plant       WTRSHED NO: 020                              R.M.:         0.490    0.490          14.914
2IF00016*DD                    PO Box 953                           SUB-BASIN:               *RAP? Yes *PRE? No  0.0
OUTFALL: 001                   1930 Tremainsville Rd., 43613        STREAM: Blodgett Ditch via storm sewers
EXPIR. DATE: 12/13/92          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Non-contact cooling water
------------------------------ ------------------------------------- --------------------------------------------- ----------
PKG PLANT: n/a                 DuPont De Nemours, Paint Plant       WTRSHED NO: 020                              R.M.:         0.000    0.000           0.000
2IF00016*DD                                                         SUB-BASIN:               *RAP? Yes *PRE? No  0.0
OUTFALL: 002                                                        STREAM: Blodgett Ditch via storm sewers
EXPIR. DATE: 12/13/82           County,                             VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE:
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

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 NPDES & PACKAGE PLANT NO.     FACILITY NAME AND ADDRESS              RECEIVING STREAM(S)                   RIVER    CAPACITY FLOW NOW    ANNUAL FLOW
   AND PERMIT STATUS           LOCATION, COUNTY, AND CITY      SUB-BASIN, WATERSHED #, & RAP STATUS       MILE       mgd      mgd         MG/Year
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** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                Fondessy / Envirosafe Services of Oh WTRSHED NO: 028                          R.M.:        0.050    0.050        1.522
2IN00013*CD                   876 Otter Creek Rd.              SUB-BASIN:                *RAP? Yes *PRE? No 2.3
OUTFALL: 001                  876 Otter Creek Rd.              STREAM: Otter Creek
EXPIR. DATE: 01/01/93         Lucas County, Oregon             VERIFIED? Yes
STATUS: Active                OLD NAME(S): Fondessey           WASTE: Runoff, sewage
------------------------------ -------------------------------- -------------------------------------------- ---------
PKG PLANT: n/a                France Stone Co., Waterville     WTRSHED NO: 044                              R.M.:        0.300    0.300        9.131
2IJ00047*BD                   8130 Brint Road, PO Box 278      SUB-BASIN: Maumee River   *RAP? Yes *PRE? No 22.2
OUTFALL: 001                  700 S.River Rd                   STREAM: Maumee River
EXPIR. DATE: 03/31/87         Lucas County, Waterville Twp.    VERIFIED? Yes
STATUS: Expired               OLD NAME(S):                     WASTE: Dewatering quarry
------------------------------ -------------------------------- -------------------------------------------- ---------
PKG PLANT: L-96               Fuller's Creekside Estates       WTRSHED NO: 021                              R.M.:        0.100    0.270        8.218
2PH00000*BD                   1 Government Center Suite 800    SUB-BASIN: Portage        *RAP? Yes *PRE? No 0.0
OUTFALL:                      6064 Villamar                    STREAM: Shantee Creek
EXPIR. DATE: 04/23/93         Lucas County, Washington Twp.    VERIFIED? Yes
STATUS: To be sewered 7/1/88  OLD NAME(S):                     WASTE: Sewage
------------------------------ -------------------------------- -------------------------------------------- ---------
PKG PLANT: n/a                General Mills                    WTRSHED NO: 023                              R.M.:        0.000    0.000        0.000
2IH00093*BD                   PO Box 923                       SUB-BASIN: Silver Creek   *RAP? Yes *PRE? Yes 0.0
OUTFALL: 001                  1250 Laskey Rd.                  STREAM: Jamieson Ditch
EXPIR. DATE: 08/31/92         Lucas County, Toledo             VERIFIED? Yes
STATUS: Active                OLD NAME(S):                     WASTE: Runoff, high BOD
------------------------------ -------------------------------- -------------------------------------------- ---------
PKG PLANT: n/a                Haskins WWTP                     WTRSHED NO: 043                              R.M.:        0.100    0.060        1.826
2PA00026*CD                   Village Hall, Church St.         SUB-BASIN:                *RAP? Yes *PRE? No 21.6
OUTFALL:                      S.R. 64 and King Rd.             STREAM: Liberty High Rd Ditch
EXPIR. DATE: 09/23/88         Wood County, Middleton Twp.      VERIFIED? Yes
STATUS: Active                OLD NAME(S):                     WASTE: Municipal Wastewater
------------------------------ -------------------------------- -------------------------------------------- ---------
PKG PLANT: n/a                Hydra-Matic                      WTRSHED NO: 023                              R.M.:        0.000    0.100        3.044
2IC00026*CD                   3044 W. Grant Blvd.              SUB-BASIN:                *RAP? Yes *PRE? No 0.0
OUTFALL:                      1455 West Alexis Rd              STREAM: Silver Creek
EXPIR. DATE: 08/01/82         Lucas County, Toledo             VERIFIED? Yes
STATUS: Expired               OLD NAME(S): GMC Chevrolet       WASTE: Runoff
------------------------------ -------------------------------- -------------------------------------------- ---------
PKG PLANT: n/a                Libbey Owens Ford - Plants #4 and #8 WTRSHED NO: 028                          R.M.:        0.100    0.100        3.044
2IN00020*DD                   811 Madison                      SUB-BASIN:                *RAP? Yes *PRE? No 6.6
OUTFALL:                      1701 E Broadway                  STREAM: Otter Creek
EXPIR. DATE: 09/27/90         Lucas County, Toledo             VERIFIED? Yes
STATUS: Active                OLD NAME(S):                     WASTE: Glass mfg process waste
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                                                  WASTEWATER DISCHARGE NPDES PERMITS
                                                      In the Maumee RAP Area

 NPDES & PACKAGE PLANT NO.   FACILITY NAME AND ADDRESS          RECEIVING STREAM(S)                        RIVER    CAPACITY FLOW NOW   ANNUAL FLOW
   AND PERMIT STATUS         LOCATION, COUNTY, AND CITY      SUB-BASIN, WATERSHED #, & RAP STATUS          MILE        mgd      mgd       MG/Year
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** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a               Libbey Owens Ford Float Glass Plant  WTRSHED NO: 047                            R.M.:        6.500    6.500     197.844
2IN00030*ED                  811 Madison                          SUB-BASIN: Maumee River  *RAP? Yes *PRE? No 6.9
OUTFALL:                     140 Dixie Hwy                        STREAM: Maumee River
EXPIR. DATE: 06/30/82        Wood County, Rossford                VERIFIED? Yes
STATUS: Expired              OLD NAME(S):                         WASTE: Runoff,Cooling, Lagoon effluent
---------------------------- ---------------------------------- ------------------------------------------ ----------
PKG PLANT: L-25              Liquid Carbonic Corp.                WTRSHED NO: 028                            R.M.:        0.002    0.002       0.054
2IN00069*ED                  135 S. LaSalle St                    SUB-BASIN:               *RAP? Yes *PRE? No 1.9
OUTFALL: 001                 3742 Cedar Point Rd., 43616          STREAM: Otter Creek
EXPIR. DATE: 08/11/93        Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active               OLD NAME(S):                         WASTE: Sewage
---------------------------- ---------------------------------- ------------------------------------------ ----------
PKG PLANT: n/a               Marathon Oil Company                 WTRSHED NO: 028                            R.M.:        0.085    0.085       2.587
2IG00024*BD                  4131 Seaman Road                     SUB-BASIN:               *RAP? Yes *PRE? No 0.0
OUTFALL: 001                 3855 York                            STREAM: Driftmeyer Ditch
EXPIR. DATE: 10/10/92        Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active               OLD NAME(S):                         WASTE: Runoff water
---------------------------- ---------------------------------- ------------------------------------------ ----------
PKG PLANT: n/a               Maumee Combined Sewer Overflows      WTRSHED NO: 044, 078                       R.M.:        0.000    0.000       0.000
2PD00015*AD                  214 Illinois Ave                     SUB-BASIN:               *RAP? Yes *PRE? No 0.0
OUTFALL:                     214 Illinois Ave                     STREAM: Maumee
EXPIR. DATE: 06/30/77        Lucas County, Maumee                 VERIFIED? Yes
STATUS: Expired              OLD NAME(S):                         WASTE: Sewage, storm runoff
---------------------------- ---------------------------------- ------------------------------------------ ----------
PKG PLANT: n/a               Maumee River WWTP                    WTRSHED NO: 044                            R.M.:       15.000    9.010     274.242
2PK00000*DD                  1111 S McCord Rd                     SUB-BASIN: Maumee River  *RAP? Yes *PRE? No 18.2
OUTFALL:                     5858 North River Road, Waterville    STREAM: Maumee River
EXPIR. DATE: 09/15/90        Lucas County, Monclova Twp.          VERIFIED? Yes
STATUS: Active               OLD NAME(S):                         WASTE: Municipal Wastewater
---------------------------- ---------------------------------- ------------------------------------------ ----------
PKG PLANT: n/a               Norfolk Southern RR                  WTRSHED NO: 015                            R.M.:        0.242    0.242       7.366
2IT00005*BD                  8 N. Jefferson St                    SUB-BASIN: Maumee River  *RAP? Yes *PRE? No 0.0
OUTFALL: 001                 2750 Front St                        STREAM: Duck Creek
EXPIR. DATE: 10/25/88        Lucas County, Toledo                 VERIFIED? Yes
STATUS: Expired              OLD NAME(S): N&W RR                  WASTE: Runoff
---------------------------- ---------------------------------- ------------------------------------------ ----------
PKG PLANT: n/a               Oregon South Shore Park WWTP         WTRSHED NO: 028                            R.M.:        0.225    0.490      14.914
2PB00007*CD                  5350 Seaman Road, POB 7541           SUB-BASIN:               *RAP? Yes *PRE? No 0.0
OUTFALL:                     5760 Bayshore Rd.                    STREAM: Lake Erie
EXPIR. DATE: 06/08/89        Lucas County, Oregon                 VERIFIED? Yes
STATUS: Active               OLD NAME(S):                         WASTE: Municipal Wastewater
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: MAUMEE RIVER/BAY

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IW00220*BD OUTFALL: EXPIR. DATE: 04/23/93 STATUS: Active ¦ draft permit	Oregon WTP 5350 Seaman Rd 5350 Seaman Rd Lucas County, Oregon OLD NAME(S):	WTRSHED NO: 029 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Berger Ditch VERIFIED? Yes WASTE: WTP backwash water	R.M.: 0.0	0.320	0.320	9.740
PKG PLANT: n/a 2PD00035*ED OUTFALL: EXPIR. DATE: 09/15/90 STATUS: Active	Oregon WWTP 5330 Seaman Rd Dupont Rd, N of Cedar Point Rd Lucas County, Oregon OLD NAME(S):	WTRSHED NO: 028 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Maumee Bay VERIFIED? Yes WASTE: Municipal Wastewater	R.M.: 0.0	8.000	4.310	131.186
PKG PLANT: n/a 2IN00075*BD OUTFALL: 001 EXPIR. DATE: 05/26/80 STATUS: Expired	Owens-Illinois, Libbey Plant 27 PO Box 919 940 Ash St Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 030 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River via Co. Dt. No.1139 VERIFIED? Yes WASTE: Cooling water,non-contact	R.M.: 0.0	0.000	0.150	4.566
PKG PLANT: n/a 2PD00002*CD OUTFALL: EXPIR. DATE: 06/28/87 STATUS: Expired	Perrysburg WWTP 201 W Indiana 1 West Boundary St Wood County, Perrysburg OLD NAME(S):	WTRSHED NO: 079 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Municipal wastewater	R.M.: 14.5	2.750	3.000	91.313
PKG PLANT: n/a 2IG00013*CD OUTFALL: EXPIR. DATE: 05/10/92 STATUS: Active	Petroleum Fuel & Terminal Co. 2844 Summit Ave. 2844 Summit Ave. Lucas County, Toledo OLD NAME(S): Shell, Apex	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Runoff	R.M.: 2.2	0.000	0.000	0.000
PKG PLANT: n/a 2IF00000*CD OUTFALL: EXPIR. DATE: 03/26/90 STATUS: Active	Plaskon Electronic Materials 2829 Glendale Ave 2829 Glendale Ave Lucas County, Toledo OLD NAME(S): Allied Chemical	WTRSHED NO: 013 SUB-BASIN: Maumee River *RAP? Yes *PRE? Yes STREAM: Delaware Creek VERIFIED? Yes WASTE: Cooling water,non-contact	R.M.: 1.2	0.071	0.071	2.161
PKG PLANT: n/a 2IG00007*DD OUTFALL: EXPIR. DATE: 09/02/90 STATUS: Active	Standard Oil - Toledo Refinery PO Box 696 SE cor. Cedar Point Rd @ Bay Shore Lucas County, Oregon OLD NAME(S):	WTRSHED NO: 028 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Maumee Bay VERIFIED? Yes WASTE: Refinery & sewage	R.M.: 0.4	25.000	25.000	760.938

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: MAUMEE RIVER/BAY

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IG00009*CD OUTFALL: EXPIR. DATE: 07/05/92 STATUS: Active (draft)	Sun Petroleum - Marine Terminal PO Box 920 1900-2100 Front Street, Toledo Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Runoff	R.M.: 6.5	0.001	0.001	0.015
PKG PLANT: n/a 2IG00003*FD OUTFALL: EXPIR. DATE: 09/24/89 STATUS: Active	Sun Petroleum - Toledo Refinery PO Box 920 1819 Woodville Rd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 028 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: Refinery, runoff, non-contact cooling	R.M.: 4.9	3.000	3.000	91.313
PKG PLANT: n/a 2IO00001*BD OUTFALL: 001 EXPIR. DATE: 09/20/92 STATUS: Active	Teledyne Industries 1330 Laskey Road 1330 Laskey Road Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 023 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Silver Creek VERIFIED? Yes WASTE: Runoff, non-contact cooling	R.M.: 0.0	0.069	0.069	2.100
PKG PLANT: n/a 2PF00000*GD OUTFALL: EXPIR. DATE: 12/27/90 STATUS: Active	Toledo Bay View Park WWTP 1 Govt Center, Ste 1500 3900 N Summit, 43611 Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Municipal Wastewater	R.M.: 1.4	102.000	91.150	2774.378
PKG PLANT: n/a 2ID00011*CD OUTFALL: 001 EXPIR. DATE: 01/01/93 STATUS: Active	Toledo Coke 436 7th Ave. 2563 Front Street, Toledo Lucas County, Toledo OLD NAME(S): Koppers	WTRSHED NO: 015 SUB-BASIN: Maumee River *RAP? Yes *PRE? No STREAM: Maumee River VERIFIED? Yes WASTE: Runoff, Non-contact cooling water	R.M.: 1.7	3.730	3.730	113.532
PKG PLANT: n/a 2IW00260*BD OUTFALL: 008 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 009 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: MAUMEE RIVER/BAY

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IW00260*BD OUTFALL: 005 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Duck Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 006 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 004 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 003 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 015 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Duck Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*BD OUTFALL: 002 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000
PKG PLANT: n/a 2IW00260*CB OUTFALL: 001 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: Backwash supernatant	R.M.: 3.4	10.500	10.500	319.594
PKG PLANT: n/a 2IW00260*BD OUTFALL: 007 EXPIR. DATE: 10/23/92 STATUS: Active	Toledo Collins Park WTP PO Box 786 York St @ Collins Park Ave Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 014 SUB-BASIN: Maumee Bay *RAP? Yes *PRE? No STREAM: Otter Creek VERIFIED? Yes WASTE: WTP Backwash	R.M.: 3.4	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

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 NPDES & PACKAGE PLANT NO.       FACILITY NAME AND ADDRESS              RECEIVING STREAM(S)                   RIVER   CAPACITY FLOW NOW    ANNUAL FLOW
   AND PERMIT STATUS             LOCATION, COUNTY, AND CITY     SUB-BASIN, WATERSHED #, & RAP STATUS          MILE       mgd      mgd        MG/Year
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** BASIN: MAUMEE RIVER/BAY
PKG PLANT: n/a                 Toledo Edison                      WTRSHED NO: 015                              R.M.:        0.000    0.000        0.000
2IB00002*CD                    300 Madison Ave                    SUB-BASIN: Maumee River   *RAP? Yes *PRE? No 4.0
OUTFALL:                       300 Madison Ave                    STREAM: Maumee River
EXPIR. DATE: 01/09/92          Lucas County, Toledo               VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                       WASTE:
------------------------------ ---------------------------------- -------------------------------------------- ----------
PKG PLANT: n/a                 Toledo Edison - ACME Station       WTRSHED NO: 015                              R.M.:      406.000  406.000    12357.625
2IB00001*CD                    300 Madison Ave                    SUB-BASIN: Maumee River   *RAP? Yes *PRE? No 4.0
OUTFALL:                       1401 Front St                      STREAM: Maumee River
EXPIR. DATE: 08/09/87          Lucas County, Toledo               VERIFIED? Yes
STATUS: Expired                OLD NAME(S):                       WASTE: Cooling wtr, Ash ponds
------------------------------ ---------------------------------- -------------------------------------------- ----------
PKG PLANT: L-100               Toledo Edison Bayshore Plant       WTRSHED NO: 028                              R.M.:        0.015    0.015        0.457
2IB00000*JD                    300 Madison Ave.                   SUB-BASIN:                *RAP? Yes *PRE? No 0.0
OUTFALL: 604                   4701 Bayshore Road                 STREAM: Driftmeyer Ditch
EXPIR. DATE: 09/15/90          Lucas County, Oregon Twp.          VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                       WASTE: Sewage & cooling water
------------------------------ ---------------------------------- -------------------------------------------- ----------
PKG PLANT: n/a                 Waterville WTP                     WTRSHED NO: 043                              R.M.:        0.026    0.026        0.791
2IV00080*BD                    16 N 2nd St                        SUB-BASIN: Maumee River   *RAP? Yes *PRE? No 21.1
OUTFALL:                       Waterworks Dr.                     STREAM: Maumee River
EXPIR. DATE: 01/22/89          Lucas County, Waterville           VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                       WASTE: WTP Backwash Water
------------------------------ ---------------------------------- -------------------------------------------- ----------
** SUBTOTAL **                                                                                                            592.696  570.611    17367.965
```

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
** BASIN: SWAN CREEK						
PKG PLANT: n/a 2IC00060*AD OUTFALL: 001 EXPIR. DATE: 07/19/93 STATUS: Active	Feinblanking, Ltd. 1510 Albon Rd 1510 Albon Rd Lucas County, Holland OLD NAME(S): Kern-L same addr	WTRSHED NO: 009 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Wolf Creek VERIFIED? Yes WASTE: Machining, stamping wastes	R.M.: 0.0	0.009	0.009	0.274
PKG PLANT: n/a 2IC00056*BD OUTFALL: 001 EXPIR. DATE: 01/01/93 STATUS: Active	Kern-Liebers USA 1510 Albon Rd 1510 Albon Rd Lucas County, Springfield Twp. OLD NAME(S): Feinblank same addr	WTRSHED NO: 009 SUB-BASIN: Wolf Creek *RAP? Yes *PRE? No STREAM: Wolf Creek VERIFIED? Yes WASTE: Well water	R.M.: 4.1	0.000	0.032	0.974
PKG PLANT: L-62 2PP00003*CD OUTFALL: EXPIR. DATE: 06/17/89 STATUS: Active	Oak Openings - Fallen Timbers Plaza 682 Prospect Turnpike near Shaffer Road Lucas County, Swanton Twp. OLD NAME(S):	WTRSHED NO: 007 SUB-BASIN: *RAP? Yes *PRE? No STREAM: Murbach Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.150	0.110	3.348
PKG PLANT: L-53 2PH00013*CD OUTFALL: EXPIR. DATE: 06/17/89 STATUS: Active ; draft permit	Oak Openings Industrial Park 1 Government Center Suite 800 1771 S. Eber Road @ Geiser Road Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 009 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Kujowski Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.180	0.110	3.348
PKG PLANT: L-37 2PH00014*CD OUTFALL: EXPIR. DATE: 09/03/89 STATUS: Active	Oak Terrace 1111 S. McCord Rd. 329 Oak Terrace Blvd. Lucas County, Spencer Twp. OLD NAME(S):	WTRSHED NO: 009 SUB-BASIN: Swan/Wolf Cr *RAP? Yes *PRE? No STREAM: Butler Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.100	0.100	3.044
PKG PLANT: L-102 2IO00003*AD OUTFALL: 001 EXPIR. DATE: 07/01/84 STATUS: Expired	Ohio National Guard Toledo Express Airport Toledo Express Airport Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 042 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Zaleski Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.029	0.029	0.867
PKG PLANT: n/a 2IJ00048*CD OUTFALL: 001 EXPIR. DATE: 03/20/93 STATUS: Active	Stoneco - Maumee Plant PO Box 29A, 221 Allen St. 3845 Ford St Lucas County, Monclova Twp. OLD NAME(S): Maumee Stone Co.	WTRSHED NO: 041 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Graham Ditch VERIFIED? Yes WASTE: Dewatering quarry	R.M.: 0.0	0.435	0.435	13.240

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
** BASIN: SWAN CREEK						
PKG PLANT: L-98 2PB00066*AD OUTFALL: EXPIR. DATE: 07/13/93 STATUS: Active	Toledo House of Correction 1 Government Center, Ste. 1710 7846 Schadel Road, 43571 Lucas County, Waterville Twp. OLD NAME(S):	WTRSHED NO: 040 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Blue Creek VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.040	0.040	1.218
PKG PLANT: L-60 2PS00002*BD OUTFALL: 001 EXPIR. DATE: 05/12/85 STATUS: Expired	Woodside Terrace Trailer Park 5025 Brinthaven 7717 Angola Rd Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 009 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Wolf Creek VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.080	0.080	2.435
** SUBTOTAL **				1.023	0.945	28.748

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                                                                    WASTEWATER DISCHARGE NPDES PERMITS
                                                                          In the Maumee RAP Area

  NPDES & PACKAGE PLANT NO.         FACILITY NAME AND ADDRESS               RECEIVING STREAM(S)                  RIVER    CAPACITY FLOW NOW     ANNUAL FLOW
      AND PERMIT STATUS             LOCATION, COUNTY, AND CITY       SUB-BASIN, WATERSHED #, & RAP STATUS         MILE         mgd      mgd        MG/Year
============================== ==================================== ============================================= ========== ======== ========   ===========

** BASIN: OTTAWA RIVER
PKG PLANT: L-68                Bentbrook Farms                      WTRSHED NO: 004                               R.M.:        0.060    0.120           3.653
2PG00002*BD                    1 Government Center Suite 800        SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   0.0
OUTFALL: 001                   5447 Sturbridge Road                 STREAM: Ten Mile Creek
EXPIR. DATE: 09/13/92          Lucas County, Sylvania               VERIFIED? Yes
STATUS: To be sewered 1988     OLD NAME(S):                         WASTE: Sewage
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: L-71                Centennial Manor                     WTRSHED NO: 003                               R.M.:        0.030    0.015           0.457
2PY00000*DD                    3230 Centennial Road                 SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   2.0
OUTFALL: 001                   3230 Centennial Road                 STREAM: Ten Mile Creek
EXPIR. DATE: 03/18/93          Lucas County, Sylvania Twp.          VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Sewage
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: L-71                Centennial Manor                     WTRSHED NO: 003                               R.M.:        0.000    0.000           0.000
2PY00000*DD                                                         SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   2.0
OUTFALL: 581                                                        STREAM: Ten Mile Creek
EXPIR. DATE: 03/18/93          Lucas County, Sylvania Twp.          VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE:
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 Diversi Tech General                 WTRSHED NO: 005                               R.M.:        0.100    0.100           3.044
2IQ00012*BD                    PO Box 875                           SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   6.0
OUTFALL:                       3729 Twinning St.                    STREAM: Ottawa River
EXPIR. DATE: 02/24/92          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Runoff
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 DuPont De Nemours, Formaldehyde Plan WTRSHED NO: 005                               R.M.:        1.700    1.700          51.744
2IF00017*CD                    PO Box 6568, W. Toledo Stn           SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   4.8
OUTFALL:                       700 Matzinger Road                   STREAM: Ottawa River
EXPIR. DATE: 04/16/90          Lucas County, Toledo                 VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Non-contact cooling water
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 France Stone Co., Silica Plant       WTRSHED NO: 003                               R.M.:        0.800    2.000          60.875
2IJ00039*FD                    PO Box 278, 8130 Brint Rd            SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   2.0
OUTFALL: 001                   Centennial Road, Sylvania            STREAM: Ten Mile Creek via Schreiber Ditch
EXPIR. DATE: 03/28/93          Lucas County, Sylvania               VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Dewatering quarry
------------------------------ ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                 France Stone Co., Silica Plant       WTRSHED NO: 003                               R.M.:        0.000    0.000           0.000
2IJ00039*FD                                                         SUB-BASIN: Ottawa River  *RAP? Yes *PRE? No   2.0
OUTFALL: 002                                                        STREAM: Ten Mile Creek via Schreiber Ditch
EXPIR. DATE: 03/28/93           County,                             VERIFIED? Yes
STATUS: Active                 OLD NAME(S):                         WASTE: Dewatering quarry
------------------------------ ------------------------------------ --------------------------------------------- ----------
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WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

** BASIN: OTTAWA RIVER

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
PKG PLANT: n/a 2IC00022*CD OUTFALL: 003 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IC00022*CD OUTFALL: 001 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IC00022*CD OUTFALL: 002 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IC00022*CD OUTFALL: 004 EXPIR. DATE: 01/01/93 STATUS: Active	Jeep 1000 Jeep Pkwy. 940 North Cove Blvd Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? Yes STREAM: Ottawa River VERIFIED? Yes WASTE: Site runoff	R.M.: 7.6	0.030	0.030	0.913
PKG PLANT: n/a 2IN00079*AD OUTFALL: 001 EXPIR. DATE: 05/19/78 STATUS: Expired	King Road Sanitary Landfill 111 S. McCord Rd 3535 King Rd. Lucas County, Sylvania Twp. OLD NAME(S):	WTRSHED NO: 004 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ottawa River VERIFIED? Yes WASTE: Leachate	R.M.: 4.5	0.000	0.310	9.436
PKG PLANT: L-49 2PH00004*BD OUTFALL: 001 EXPIR. DATE: 09/13/92 STATUS: To be sewered 1988	Lincoln Green Subdivision 1 Government Center Suite 800 6520 Burnham Green Lucas County, Springfield Twp. OLD NAME(S):	WTRSHED NO: 004 SUB-BASIN: Swan Creek *RAP? Yes *PRE? No STREAM: Potter Ditch VERIFIED? Yes WASTE: Sewage	R.M.: 0.0	0.168	0.160	4.870
PKG PLANT: n/a 2IN00032 OUTFALL: EXPIR. DATE: 11/30/79 STATUS: Revoked	Medusa Portland Cement Company 2301 Front St., Toledo Sylvania, OH Lucas County, Sylvania OLD NAME(S):	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek VERIFIED? No WASTE:	R.M.: 5.3	0.000	0.000	0.000

WASTEWATER DISCHARGE NPDES PERMITS
In the Maumee RAP Area

NPDES & PACKAGE PLANT NO. AND PERMIT STATUS	FACILITY NAME AND ADDRESS LOCATION, COUNTY, AND CITY	RECEIVING STREAM(S) SUB-BASIN, WATERSHED #, & RAP STATUS	RIVER MILE	CAPACITY mgd	FLOW NOW mgd	ANNUAL FLOW MG/Year
** BASIN: OTTAWA RIVER						
PKG PLANT: n/a 2IN00072* OUTFALL: EXPIR. DATE: 04/13/83 STATUS: Expired, NPR?	Midland-Ross Surface Combustion Div. 2375 Dorr St 2375 Dorr St Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 005 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Williams Ditch VERIFIED? Yes WASTE:	R.M.: 0.0	0.000	0.002	0.061
PKG PLANT: L-86 2IS00008*ED OUTFALL: 002 EXPIR. DATE: 06/15/91 STATUS: Active	Reichert Stamping 8200 W. Central Ave. 8200 W. Central Ave. Lucas County, Syvlania Twp. OLD NAME(S): Toledo Steel Tube	WTRSHED NO: 003 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Ten Mile Creek via storm sewer VERIFIED? Yes WASTE: Sewage	R.M.: 5.1	0.008	0.008	0.244
PKG PLANT: n/a 2IG00010*DD OUTFALL: 001 EXPIR. DATE: 07/13/93 STATUS: Active	Standard Oil - Hill Ave Terminal 4850 E 49th St. 2450 Hill Ave., 43607 Lucas County, Toledo OLD NAME(S):	WTRSHED NO: 004 SUB-BASIN: Ottawa River *RAP? Yes *PRE? No STREAM: Fleig Ditch VERIFIED? No WASTE: Runoff	R.M.: 11.1	0.003	0.003	0.091
** SUBTOTAL **				2.989	4.538	138.125

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                                                    WASTEWATER DISCHARGE NPDES PERMITS
                                                          In the Maumee RAP Area

  NPDES & PACKAGE PLANT NO.        FACILITY NAME AND ADDRESS                RECEIVING STREAM(S)                     RIVER   CAPACITY FLOW NOW   ANNUAL FLOW
     AND PERMIT STATUS             LOCATION, COUNTY, AND CITY         SUB-BASIN, WATERSHED #, & RAP STATUS          MILE        mgd      mgd        MG/Year
============================= ==================================== ============================================= ========== ======== ========  ===========

** BASIN: LAKE ERIE
PKG PLANT: n/a                CSX - Chessie - Walbridge Terminal   WTRSHED NO: 032                               R.M.:         0.000    0.000        0.000
2IT00002*CD                   PO Box 45052                         SUB-BASIN: Cedar         *RAP? Yes *PRE? No   0.0
OUTFALL:                      Union Street, Walbridge              STREAM: Cedar Creek
EXPIR. DATE: 02/17/92         Wood County, Walbridge               VERIFIED? Yes
STATUS: Active                OLD NAME(S): C&O, Chessie            WASTE: Runoff
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: W-19               Charter House Inn                    WTRSHED NO: 033                               R.M.:         0.030    0.030        0.913
R 725 *AD                     I-280 @ Hanley Rd.                   SUB-BASIN: Crane         *RAP? Yes *PRE? No   0.0
OUTFALL:                      I-280 @ Hanley Rd.                   STREAM: Crane Creek
EXPIR. DATE: 06/30/77         Wood County, Lake Twp.               VERIFIED? Yes
STATUS: To be sewered in '88  OLD NAME(S):                         WASTE: Sewage
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                Conrail - Stanley Yard               WTRSHED NO: 032                               R.M.:         0.000    0.000        0.000
2IT00007*CD                   435 Emerald Ave                      SUB-BASIN: Cedar         *RAP? Yes *PRE? No   0.0
OUTFALL:                      Stanley Yard, 29460 E Broadway, Moli STREAM: Cedar Creek
EXPIR. DATE: 06/23/91         Wood County, Lake Twp.               VERIFIED? No
STATUS: Active                OLD NAME(S):                         WASTE:
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                Harbor View, Village of              WTRSHED NO:                                   R.M.:         0.000    0.000        0.000
2PA00012*CD                   127 Lakeview Dr                      SUB-BASIN:               *RAP? Yes *PRE? No   0.0
OUTFALL:                      127 Lakeview Dr                      STREAM: Lake Erie
EXPIR. DATE:   /  /           Lucas County, Harbor View            VERIFIED? Yes
STATUS: Proposed Facility     OLD NAME(S):                         WASTE: Untreated sewage, septic tank effluent
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: n/a                Stoneco - Lime City Plant            WTRSHED NO: 032                               R.M.:         0.216    0.216        6.575
2IJ00052*CD                   PO Box 29A, 221 Allen St.            SUB-BASIN: Cedar Creek   *RAP? Yes *PRE? No   0.0
OUTFALL: 001                  US 20, 8812 Fremont Pike             STREAM: Dry Creek via ditch
EXPIR. DATE: 06/02/92         Wood County, Perrysburg              VERIFIED? Yes
STATUS: Active                OLD NAME(S): Maumee Stone Co.        WASTE: Quarry runoff
----------------------------- ------------------------------------ --------------------------------------------- ----------
PKG PLANT: W-39               Union 76 Truck Stop and Restaurant   WTRSHED NO: 033                               R.M.:         0.030    0.030        0.913
R 724 *AD                     16000  9-Mi.  Rd                     SUB-BASIN: Crane         *RAP? Yes *PRE? No   0.0
OUTFALL:                      I-280 & Tpk. (@ Libbey Rd)           STREAM: Crane Creek
EXPIR. DATE:   /  /           Wood County, Lake Twp.               VERIFIED? Yes
STATUS: To be sewered         OLD NAME(S):                         WASTE:
----------------------------- ------------------------------------ --------------------------------------------- ----------
** SUBTOTAL **                                                                                                                 0.276    0.276        8.401

*** Total ***                                                                                                                596.983  576.369    17543.240
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APPENDIX D

Package Sewage Treatment Plants in the RAP Area

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for MAUMEE RIVER/BAY

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-5 BUILT: 1961	Eisenhower Jr. High School 331 N. Curtice Lucas County, Jerusalem Twp.	WTRSHED NO: 029 SUB-BASIN: Wolf Creek STREAM: Wolf Creek	20000	20000	7.3
PLANT: L-113 BUILT: 1988	Bay Village Condominiums N side Bayshore Rd 1000' W of Stadium Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	200000	200000	73.1
PLANT: L-19 BUILT: 1962	Buckeye Pipeline 3211 York Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	1500	1500	0.5
PLANT: L-20 T213*BD BUILT: 1957	Chessie System Presque Isle Dock, near Otter Creek & Bayshore Rds Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Maumee Bay	2500	2500	0.9
PLANT: L-99 BUILT:	Clay School Complex 5633 Seaman Rd., @ NW cor. of Seaman & Stadium Rd Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	30000	30000	11.0
PLANT: L-21 BUILT: 1973	G.A.F. Society Banquet Hall 3624 Seaman Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Amlosch Ditch	3000	3000	1.1
PLANT: L-22 BUILT:	Globe Industries, Inc. 645 N. Lallendorf St. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	6000	6000	2.2
PLANT: L-23 BUILT: 1964	Lakefront Dock & Terminal Co. Otter Creek & Bayshore Rds Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	3000	3000	1.1
PLANT: L-24 BUILT:	Lakeside Trailer Park 5404 Bayshore Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7
PLANT: L-25 2IN00069 BUILT: 1966	Liquid Carbonic Corp. 3742 Cedar Point Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	1500	1500	0.5
PLANT: L-26 BUILT: 1981	Lucas County Residential Center 133/157 Wynn Rd. (NW cor. Wynn & Seaman) Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for MAUMEE RIVER/BAY

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-27 BUILT: 1973	National Wire of Ohio, Inc. 832 N. Lallendorf Rd. at York St. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Amlosch Ditch	3500	3500	1.3
PLANT: L-28 BUILT:	Oregon Municipal Building 5330 Seaman Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	5000	5000	1.8
PLANT: L-29 MI 49267 BUILT:	Shuer, Jay J., School 4955 Seaman Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Johlin Ditch -> tile field	3000	3000	1.1
PLANT: L-30 BUILT: 1958, 1974	Standard Oil Asphalt Plant Cedar Point Rd. at Otter Creek Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	21500	21500	7.9
PLANT: L-100 2IB00000*ID BUILT:	Toledo Edison Bayshore Plant 4701 Bayshore Road (E. of Channel St.) Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Driftmeyer Ditch	15000	15000	5.5
PLANT: L-31 BUILT:	Vargo Carry Out 5781 Corduroy Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2500	2500	0.9
PLANT: L-101 BUILT:	Wynn Elementary School 5633 Bay Shore Rd Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	0	0	0.0
PLANT: L-109 BUILT: 1982	McDonald's SW cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	7000	7000	2.6
PLANT: L-107 BUILT: 1980	Pee-Wee Inn Hagman 0.25 mi N of Alexis Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	6000	0	0.0
PLANT: L-108 BUILT: 1981	Speedway Truck Stop NE cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	1500	1500	0.5
PLANT: L-106 BUILT: 1975	Standard Oil NW cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	1500	1500	0.5

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for MAUMEE RIVER/BAY					
PLANT: L-105 BUILT: 1969	State Line Builders Supply NW cor State Line & Ann Arbor RR Lucas County	WTRSHED NO: 025 SUB-BASIN: STREAM: Halfway Creek	2500	2500	0.9
PLANT: L-96 2PH00000*BD BUILT: 1972 or earlier	Fuller's Creekside Estates 6064 Villamar Lucas County, Washington Twp.	WTRSHED NO: 021 SUB-BASIN: Portage STREAM: Halfway Creek	100000	270000	98.6
PLANT: W-47 BUILT:	Southview Estates Mobile Home Park 12865 Five Point Road Wood County, Middleton Twp.	WTRSHED NO: 045 SUB-BASIN: Maumee River STREAM: Maumee River	40000	40000	14.6
PLANT: W-98 BUILT: 1957	East Lane Mobile Manor SE cor Florence & Shomberg Sts. Wood County	WTRSHED NO: 013 SUB-BASIN: Maumee River STREAM: Maumee River	10000	10000	3.7
PLANT: W-100 BUILT:	Abbey Aetna 11140 Avenue Rd Wood County, Perrysburg Twp.	WTRSHED NO: 046 SUB-BASIN: Maumee River STREAM: Grassy Creek?	3000	3000	1.1
PLANT: W-55-W BUILT:	Divine Word Prepatory Seminary 26581 West River Road Wood County, Perrysburg Twp.	WTRSHED NO: 044 SUB-BASIN: Maumee River STREAM: Maumee River	10000	10000	3.7
PLANT: W-55-E BUILT:	Divine Word Prepatory Seminary 26581 West River Road Wood County, Perrysburg Twp.	WTRSHED NO: 044 SUB-BASIN: Maumee River STREAM: Maumee River	5000	5000	1.8
PLANT: W-57 BUILT: 1974	Fort Meigs State Memorial Park Off SR 65 bet. Fort & parking lot Wood County, Perrysburg Twp.	WTRSHED NO: 079 SUB-BASIN: Maumee River STREAM: Maumee River	5000	5000	1.8
PLANT: W-58 H 202 *AD BUILT: 1975	Henry Packing Company 9244 Fremont Pike (US 20) Wood County, Perrysburg Twp.	WTRSHED NO: 046 SUB-BASIN: Cedar Creek STREAM: Dry Creek via unnamed tributary	4000	4000	1.5
** Subtotal **			517500	681500	248.9

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for SWAN CREEK

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-14 BUILT: 1967	Chateau Estates 10430 Airport Hwy Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	36000	36000	13.1
PLANT: L-15 BUILT: 1961	Highway Patrol Post 10391 Airport Hwy., E of Turnpike Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Swan Creek	1500	1500	0.5
PLANT: L-16 BUILT: 1973	Monclova School (New) Monclova Road & Waterville-Monclova Rd Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Swan Creek	5000	5000	1.8
PLANT: L-17 BUILT: 1966	Monclova School (Old) 4526 Lose Rd. Lucas County, Monclova Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Swan Creek	8500	8500	3.1
PLANT: L-33 BUILT: 1970	Peaceful Acres Trailer Park 13555 Waterville-Neapolis Rd. Lucas County, Providence Twp.	WTRSHED NO: 038 SUB-BASIN: Swan Creek STREAM: Blue Creek	12500	12500	4.6
PLANT: L-37 2PH00014*CD BUILT: 1970	Oak Terrace 329 Oak Terrace Blvd. (off Angola at Irwin) Lucas County, Spencer Twp.	WTRSHED NO: 009 SUB-BASIN: Swan/Wolf Cr STREAM: Butler Ditch->Drennan Dt, Wolf Cr.	100000	100000	36.5
PLANT: L-40 BUILT: 1969	Burroughs Corporation 7300 Airport Highway (W. of Holloway Rd) Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	4000	4000	1.5
PLANT: L-43 BUILT: 1988	Elizabeth Scott Nursing Home 2720 Albon Rd. Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan/Wolf Cr STREAM: Stone Ditch	15500	11000	4.0
PLANT: L-45 BUILT: 1984, 1958	Glengary Country Club SE cor Hill & Crissey Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Dt. (effl sprayed->golf)	9000	9000	3.3
PLANT: L-47 BUILT: 1968	Holland Amoco (Station #00648) Airport Highway (SR 2) at I-475, SW corner Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	2000	2000	0.7
PLANT: L-48 BUILT: 1962	Holland Shopping Center 6835 Angola Rd. @ SW cor. Clarion & Angola. Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Ditch	5000	5000	1.8

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for SWAN CREEK					
PLANT: L-50 BUILT: 1972	Monclova Care Center 9831 Garden Road, 2000 ft E. of Eber Rd. Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Cunningham Ditch	8000	8000	2.9
PLANT: L-51 BUILT: 1969	Neville Funeral Home 7438 Airport Highway Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	8000	8000	2.9
PLANT: L-53 2PH00013*CD BUILT: 1970	Oak Openings Industrial Park 1771 S. Eber Road @ Geiser Road Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Kujowski Ditch	180000	110000	40.2
PLANT: L-102 2I000003*AD BUILT: 1957	Ohio National Guard Toledo Express Airport Lucas County, Springfield Twp.	WTRSHED NO: 042 SUB-BASIN: Swan Creek STREAM: Zaleski Ditch	28500	28500	10.4
PLANT: L-56 BUILT:	Springfield Saloon 904 Clark St. at Angola Road Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Ditch	6000	6000	2.2
PLANT: L-58 BUILT: 1971	Stairs Apts. 750 S. McCord Road (1000 ft N. of Angola Rd) Lucas County, Springfield Twp.	WTRSHED NO: 011 SUB-BASIN: Swan Creek STREAM: Good Ditch	18000	18000	6.6
PLANT: L-57 BUILT: 1968	Sun Oil Company 6405 Airport Highway (at I-475) Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	1500	1500	0.5
PLANT: L-59 BUILT: 1972	Villa West 10005 Garden Road Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Cunningham Ditch	15000	15000	5.5
PLANT: L-60 S702*BD BUILT: 1969	Woodside Terrace Trailer Park 7717 Angola Rd Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek via tributary from north	80000	80000	29.2
PLANT: L-61 BUILT: 1979	Arrowhead Trailer Park 5402 Jerome Road, W. side SR 295, S. of Turnpike Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Wiregrass Ditch	35500	35500	13.0
PLANT: L-62 2PP00003*CD BUILT: 1961 or earlier	Oak Openings - Fallen Timbers Service Plaza Turnpike near Shaffer Road Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan/Wolf Cr STREAM: Murback Ditch->Prairie Ditch->AI Cr	150000	110000	40.2

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for SWAN CREEK					
PLANT: L-63 BUILT:	Ohio Gas Co. Airport Highway Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Ai Creek	2000	2000	0.7
PLANT: L-64 BUILT: 1951	Swanton School Airport Highway E. of US 20A (Maumee-Western Road) Lucas County, Swanton Twp.	WTRSHED NO: 039 SUB-BASIN: Swan Creek STREAM: Gale Run	6000	6000	1.6
PLANT: L-65 BUILT: 1963	Valleywood Golf Club 13501 Airport Hwy. @ NW cor Scott & SR 2 Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Ai Creek	12500	12500	4.6
PLANT: L-97 BUILT: 1975 (additions)	Sisters of Notre Dame (AKA Lial Convent) 5900 Davis Road, bet. Obee & Weckerly Rds. Lucas County, Waterville Twp.	WTRSHED NO: 039 SUB-BASIN: Swan Creek STREAM: Swan Creek via Lake Lial	17500	17500	6.4
PLANT: L-98 2PB00066*AD BUILT: 1988	Toledo House of Correction 7846 Schadel Road, 43571 Lucas County, Waterville Twp.	WTRSHED NO: 040 SUB-BASIN: Swan Creek STREAM: Blue Creek	40000	40000	14.6
** Subtotal **			807500	693000	252.6

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-35 BUILT:	Corbett Gentry (Private Residence) 3917 Richfield Center Rd. Lucas County, Richfield Twp.	WTRSHED NO: 001 SUB-BASIN: STREAM:	1500	1500	0.5
PLANT: L-36 BUILT:	Richfield Center Market 3902 Washburn Lucas County, Richfield Twp.	WTRSHED NO: 001 SUB-BASIN: STREAM:	1000	1000	0.4
PLANT: L-38 BUILT: 1963	Spencer-Sharples School Unknown Lucas County, Spencer Twp.	WTRSHED NO: 001 SUB-BASIN: Swan/Wolf Cr STREAM: Butler Ditch->Drennan Dt->Wolf Cr.	15000	0	0.0
PLANT: L-39 BUILT: 1960, 1974	Bancroft Trailer Park 6951 Bancroft, Toledo OH 43615 (bet. McCord & King Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Haefner Ditch	6000	6000	2.2
PLANT: L-41 BUILT: 1967	Crissey Elementary School #1 Geiser Road (NW corner Crissey & Geiser Roads) Lucas County, Springfield Twp.	WTRSHED NO: 001 SUB-BASIN: Swan Creek STREAM: Butler Ditch->Drennan Dt->Wolf Cr.	6000	6000	1.6
PLANT: L-42 BUILT: 1974	Dorr St. Elementary School Dorr and King Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	13000	13000	4.7
PLANT: L-46 BUILT: 1966, 1975	Hidden Lake 7777 W. Bancroft Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	7200	7200	2.6
PLANT: L-49 H 704 *AD BUILT: 1971 or before	Lincoln Green Subdivision 6520 Burnham Green Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Potter Ditch -> Zink/Heldman Ditch	168000	160000	58.4
PLANT: L-52 BUILT: 1970	Oak Grove Mobile Court 1839 McCord Rd, N. of NW cor. of intersection w/ D Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Haeffner Ditch	8500	8500	3.1
PLANT: L-54 BUILT: 1970	Royal Vilage Mobile Home Park 7519 Dorr St. (betw. Dorr & Nebraska) Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Heldman/Zink Ditch	40000	40000	14.6
PLANT: L-44 BUILT: 1971	Twin Hills Apts. (form. 4S+2) 6653 Dorcas @ SW cor. of Dorcas & Hill Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Potter Ditch -> Zink Ditch	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-67 BUILT: 1969	Arbor Hills Jr. High (Sylvania Middle School) 5334 Whiteford Rd @ SE cor. Whiteford & McGregor Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via tributary	18000	18000	6.6
PLANT: L-69 BUILT: 1971, 1974	Briarfield Rest Home 5757 Whiteford Road (N of Alexis) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	15000	15000	5.5
PLANT: L-71 Y700*CD BUILT: 1980 (expansion)	Centennial Manor 3230 Centennial Road Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	30000	30000	11.0
PLANT: L-72 BUILT: 1959	Central Avenue Elementary School 7460 W. Central Ave. at NE cor. Centennial Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	12500	12500	4.6
PLANT: L-73 BUILT: 1963	Central Mobile Village Trailer Park 7924 W Central Ave. (E. of Centennial Rd) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	12500	12500	4.6
PLANT: L-76 BUILT: 1974	Courts of Sylvania Centennial Rd. at Little Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek -> tile field	2000	2000	0.7
PLANT: L-77 BUILT:	Design for Living 7640 W. Bancroft St. Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	1000	1000	0.4
PLANT: L-78 BUILT: 1971	Franklin Park Cinemas 5235 Monroe St., 0.5 mi. W of Talmadge Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Tifft Ditch via storm sewer	12000	12000	4.4
PLANT: L-79 BUILT: 1971	Garden Court South Apartments 5522 Alexis Rd @ SW cor. of Alexis & Rudyard Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	3000	3000	1.1
PLANT: L-80 BUILT: 1969	General Telephone 3126 McCord Road at Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 202 SUB-BASIN: Swan Creek STREAM: Hill Ditch	1500	1500	0.5
PLANT: L-81 BUILT: 1973	Golden Garden Tavern & Restaurant 8256 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8000	8000	2.9

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for MAUMEE RIVER/BAY					
PLANT: L-5 BUILT: 1961	Eisenhower Jr. High School 331 N. Curtice Lucas County, Jerusalem Twp.	WTRSHED NO: 029 SUB-BASIN: Wolf Creek STREAM: Wolf Creek	20000	20000	7.3
PLANT: L-113 BUILT: 1988	Bay Village Condominiums N side Bayshore Rd 1000' W of Stadium Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	200000	200000	73.1
PLANT: L-19 BUILT: 1962	Buckeye Pipeline 3211 York Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	1500	1500	0.5
PLANT: L-20 T213*BD BUILT: 1957	Chessie System Presque Isle Dock, near Otter Creek & Bayshore Rds Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Maumee Bay	2500	2500	0.9
PLANT: L-99 BUILT:	Clay School Complex 5633 Seaman Rd., @ NW cor. of Seaman & Stadium Rd Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	30000	30000	11.0
PLANT: L-21 BUILT: 1973	G.A.F. Society Banquet Hall 3624 Seaman Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Amlosch Ditch	3000	3000	1.1
PLANT: L-22 BUILT:	Globe Industries, Inc. 645 N. Lallendorf St. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	6000	6000	2.2
PLANT: L-23 BUILT: 1964	Lakefront Dock & Terminal Co. Otter Creek & Bayshore Rds Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	3000	3000	1.1
PLANT: L-24 BUILT:	Lakeside Trailer Park 5404 Bayshore Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7
PLANT: L-25 2IN00069 BUILT: 1966	Liquid Carbonic Corp. 3742 Cedar Point Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	1500	1500	0.5
PLANT: L-26 BUILT: 1981	Lucas County Residential Center 133/157 Wynn Rd. (NW cor. Wynn & Seaman) Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for MAUMEE RIVER/BAY					
PLANT: L-27 BUILT: 1973	National Wire of Ohio, Inc. 832 N. Lallendorf Rd. at York St. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Amlosch Ditch	3500	3500	1.3
PLANT: L-28 BUILT:	Oregon Municipal Building 5330 Seaman Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	5000	5000	1.8
PLANT: L-29 MI 49267 BUILT:	Shuer, Jay J., School 4955 Seaman Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Johlin Ditch -> tile field	3000	3000	1.1
PLANT: L-30 BUILT: 1958, 1974	Standard Oil Asphalt Plant Cedar Point Rd. at Otter Creek Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	21500	21500	7.9
PLANT: L-100 2IB00000*ID BUILT:	Toledo Edison Bayshore Plant 4701 Bayshore Road (E. of Channel St.) Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Driftmeyer Ditch	15000	15000	5.5
PLANT: L-31 BUILT:	Vargo Carry Out 5781 Corduroy Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2500	2500	0.9
PLANT: L-101 BUILT:	Wynn Elementary School 5633 Bay Shore Rd Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	0	0	0.0
PLANT: L-109 BUILT: 1982	McDonald's SW cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	7000	7000	2.6
PLANT: L-107 BUILT: 1980	Pee-Wee Inn Hagman 0.25 mi N of Alexis Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	6000	0	0.0
PLANT: L-108 BUILT: 1981	Speedway Truck Stop NE cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	1500	1500	0.5
PLANT: L-106 BUILT: 1975	Standard Oil NW cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	1500	1500	0.5

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for MAUMEE RIVER/BAY					
PLANT: L-105 BUILT: 1969	State Line Builders Supply NW cor State Line & Ann Arbor RR Lucas County	WTRSHED NO: 025 SUB-BASIN: STREAM: Halfway Creek	2500	2500	0.9
PLANT: L-96 2PH00000*BD BUILT: 1972 or earlier	Fuller's Creekside Estates 6064 Villamar Lucas County, Washington Twp.	WTRSHED NO: 021 SUB-BASIN: Portage STREAM: Halfway Creek	100000	270000	98.6
PLANT: W-47 BUILT:	Southview Estates Mobile Home Park 12865 Five Point Road Wood County, Middleton Twp.	WTRSHED NO: 045 SUB-BASIN: Maumee River STREAM: Maumee River	40000	40000	14.6
PLANT: W-98 BUILT: 1957	East Lane Mobile Manor SE cor Florence & Shomberg Sts. Wood County	WTRSHED NO: 013 SUB-BASIN: Maumee River STREAM: Maumee River	10000	10000	3.7
PLANT: W-100 BUILT:	Abbey Aetna 11140 Avenue Rd Wood County, Perrysburg Twp.	WTRSHED NO: 046 SUB-BASIN: Maumee River STREAM: Grassy Creek?	3000	3000	1.1
PLANT: W-55-W BUILT:	Divine Word Prepatory Seminary 26581 West River Road Wood County, Perrysburg Twp.	WTRSHED NO: 044 SUB-BASIN: Maumee River STREAM: Maumee River	10000	10000	3.7
PLANT: W-55-E BUILT:	Divine Word Prepatory Seminary 26581 West River Road Wood County, Perrysburg Twp.	WTRSHED NO: 044 SUB-BASIN: Maumee River STREAM: Maumee River	5000	5000	1.8
PLANT: W-57 BUILT: 1974	Fort Meigs State Memorial Park Off SR 65 bet. Fort & parking lot Wood County, Perrysburg Twp.	WTRSHED NO: 079 SUB-BASIN: Maumee River STREAM: Maumee River	5000	5000	1.8
PLANT: W-58 H 202 *AD BUILT: 1975	Henry Packing Company 9244 Fremont Pike (US 20) Wood County, Perrysburg Twp.	WTRSHED NO: 046 SUB-BASIN: Cedar Creek STREAM: Dry Creek via unnamed tributary	4000	4000	1.5
** Subtotal **			517500	681500	248.9

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for SWAN CREEK

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-14 BUILT: 1967	Chateau Estates 10430 Airport Hwy Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	36000	36000	13.1
PLANT: L-15 BUILT: 1961	Highway Patrol Post 10391 Airport Hwy., E of Turnpike Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Swan Creek	1500	1500	0.5
PLANT: L-16 BUILT: 1973	Monclova School (New) Monclova Road & Waterville-Monclova Rd Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Swan Creek	5000	5000	1.8
PLANT: L-17 BUILT: 1966	Monclova School (Old) 4526 Lose Rd. Lucas County, Monclova Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Swan Creek	8500	8500	3.1
PLANT: L-33 BUILT: 1970	Peaceful Acres Trailer Park 13555 Waterville-Neapolis Rd. Lucas County, Providence Twp.	WTRSHED NO: 038 SUB-BASIN: Swan Creek STREAM: Blue Creek	12500	12500	4.6
PLANT: L-37 2PH00014*CD BUILT: 1970	Oak Terrace 329 Oak Terrace Blvd. (off Angola at Irwin) Lucas County, Spencer Twp.	WTRSHED NO: 009 SUB-BASIN: Swan/Wolf Cr STREAM: Butler Ditch->Drennan Dt, Wolf Cr.	100000	100000	36.5
PLANT: L-40 BUILT: 1969	Burroughs Corporation 7300 Airport Highway (W. of Holloway Rd) Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	4000	4000	1.5
PLANT: L-43 BUILT: 1988	Elizabeth Scott Nursing Home 2720 Albon Rd. Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan/Wolf Cr STREAM: Stone Ditch	15500	11000	4.0
PLANT: L-45 BUILT: 1984, 1958	Glengary Country Club SE cor Hill & Crissey Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Dt. (effl sprayed->golf)	9000	9000	3.3
PLANT: L-47 BUILT: 1968	Holland Amoco (Station #00648) Airport Highway (SR 2) at I-475, SW corner Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	2000	2000	0.7
PLANT: L-48 BUILT: 1962	Holland Shopping Center 6835 Angola Rd. @ SW cor. Clarion & Angola. Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Ditch	5000	5000	1.8

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for SWAN CREEK

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-50 BUILT: 1972	Monclova Care Center 9831 Garden Road, 2000 ft E. of Eber Rd. Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Cunningham Ditch	8000	8000	2.9
PLANT: L-51 BUILT: 1969	Neville Funeral Home 7438 Airport Highway Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	8000	8000	2.9
PLANT: L-53 2PH00013*CD BUILT: 1970	Oak Openings Industrial Park 1771 S. Eber Road @ Geiser Road Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Kujowski Ditch	180000	110000	40.2
PLANT: L-102 2I000003*AD BUILT: 1957	Ohio National Guard Toledo Express Airport Lucas County, Springfield Twp.	WTRSHED NO: 042 SUB-BASIN: Swan Creek STREAM: Zaleski Ditch	28500	28500	10.4
PLANT: L-56 BUILT:	Springfield Saloon 904 Clark St. at Angola Road Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Ditch	6000	6000	2.2
PLANT: L-58 BUILT: 1971	Stairs Apts. 750 S. McCord Road (1000 ft N. of Angola Rd) Lucas County, Springfield Twp.	WTRSHED NO: 011 SUB-BASIN: Swan Creek STREAM: Good Ditch	18000	18000	6.6
PLANT: L-57 BUILT: 1968	Sun Oil Company 6405 Airport Highway (at I-475) Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	1500	1500	0.5
PLANT: L-59 BUILT: 1972	Villa West 10005 Garden Road Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Cunningham Ditch	15000	15000	5.5
PLANT: L-60 S702*BD BUILT: 1969	Woodside Terrace Trailer Park 7717 Angola Rd Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek via tributary from north	80000	80000	29.2
PLANT: L-61 BUILT: 1979	Arrowhead Trailer Park 5402 Jerome Road, W. side SR 295, S. of Turnpike Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Wiregrass Ditch	35500	35500	13.0
PLANT: L-62 2PP00003*CD BUILT: 1961 or earlier	Oak Openings - Fallen Timbers Service Plaza Turnpike near Shaffer Road Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan/Wolf Cr STREAM: Murback Ditch->Prairie Ditch->AI Cr	150000	110000	40.2

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for SWAN CREEK					
PLANT: L-63 BUILT:	Ohio Gas Co. Airport Highway Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Ai Creek	2000	2000	0.7
PLANT: L-64 BUILT: 1951	Swanton School Airport Highway E. of US 20A (Maumee-Western Road) Lucas County, Swanton Twp.	WTRSHED NO: 039 SUB-BASIN: Swan Creek STREAM: Gale Run	6000	6000	1.6
PLANT: L-65 BUILT: 1963	Valleywood Golf Club 13501 Airport Hwy. @ NW cor Scott & SR 2 Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Ai Creek	12500	12500	4.6
PLANT: L-97 BUILT: 1975 (additions)	Sisters of Notre Dame (AKA Lial Convent) 5900 Davis Road, bet. Obee & Weckerly Rds. Lucas County, Waterville Twp.	WTRSHED NO: 039 SUB-BASIN: Swan Creek STREAM: Swan Creek via Lake Lial	17500	17500	6.4
PLANT: L-98 2PB00066*AD BUILT: 1988	Toledo House of Correction 7846 Schadel Road, 43571 Lucas County, Waterville Twp.	WTRSHED NO: 040 SUB-BASIN: Swan Creek STREAM: Blue Creek	40000	40000	14.6
** Subtotal **			807500	693000	252.6

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-35 BUILT:	Corbett Gentry (Private Residence) 3917 Richfield Center Rd. Lucas County, Richfield Twp.	WTRSHED NO: 001 SUB-BASIN: STREAM:	1500	1500	0.5
PLANT: L-36 BUILT:	Richfield Center Market 3902 Washburn Lucas County, Richfield Twp.	WTRSHED NO: 001 SUB-BASIN: STREAM:	1000	1000	0.4
PLANT: L-38 BUILT: 1963	Spencer-Sharples School Unknown Lucas County, Spencer Twp.	WTRSHED NO: 001 SUB-BASIN: Swan/Wolf Cr STREAM: Butler Ditch->Drennan Dt->Wolf Cr.	15000	0	0.0
PLANT: L-39 BUILT: 1960, 1974	Bancroft Trailer Park 6951 Bancroft, Toledo OH 43615 (bet. McCord & King Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Haefner Ditch	6000	6000	2.2
PLANT: L-41 BUILT: 1967	Crissey Elementary School #1 Geiser Road (NW corner Crissey & Geiser Roads) Lucas County, Springfield Twp.	WTRSHED NO: 001 SUB-BASIN: Swan Creek STREAM: Butler Ditch->Drennan Dt->Wolf Cr.	6000	6000	1.6
PLANT: L-42 BUILT: 1974	Dorr St. Elementary School Dorr and King Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	13000	13000	4.7
PLANT: L-46 BUILT: 1966, 1975	Hidden Lake 7777 W. Bancroft Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	7200	7200	2.6
PLANT: L-49 H 704 *AD BUILT: 1971 or before	Lincoln Green Subdivision 6520 Burnham Green Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Potter Ditch -> Zink/Heldman Ditch	168000	160000	58.4
PLANT: L-52 BUILT: 1970	Oak Grove Mobile Court 1839 McCord Rd, N. of NW cor. of intersection w/ D Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Haeffner Ditch	8500	8500	3.1
PLANT: L-54 BUILT: 1970	Royal Vilage Mobile Home Park 7519 Dorr St. (betw. Dorr & Nebraska) Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Heldman/Zink Ditch	40000	40000	14.6
PLANT: L-44 BUILT: 1971	Twin Hills Apts. (form. 4S+2) 6653 Dorcas @ SW cor. of Dorcas & Hill Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Potter Ditch -> Zink Ditch	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for OTTAWA RIVER					
PLANT: L-67 BUILT: 1969	Arbor Hills Jr. High (Sylvania Middle School) 5334 Whiteford Rd @ SE cor. Whiteford & McGregor Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via tributary	18000	18000	6.6
PLANT: L-69 BUILT: 1971, 1974	Briarfield Rest Home 5757 Whiteford Road (N of Alexis) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	15000	15000	5.5
PLANT: L-71 Y700*CD BUILT: 1980 (expansion)	Centennial Manor 3230 Centennial Road Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	30000	30000	11.0
PLANT: L-72 BUILT: 1959	Central Avenue Elementary School 7460 W. Central Ave. at NE cor. Centennial Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	12500	12500	4.6
PLANT: L-73 BUILT: 1963	Central Mobile Village Trailer Park 7924 W Central Ave. (E. of Centennial Rd) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	12500	12500	4.6
PLANT: L-76 BUILT: 1974	Courts of Sylvania Centennial Rd. at Little Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek -> tile field	2000	2000	0.7
PLANT: L-77 BUILT:	Design for Living 7640 W. Bancroft St. Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	1000	1000	0.4
PLANT: L-78 BUILT: 1971	Franklin Park Cinemas 5235 Monroe St., 0.5 mi. W of Talmadge Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Tifft Ditch via storm sewer	12000	12000	4.4
PLANT: L-79 BUILT: 1971	Garden Court South Apartments 5522 Alexis Rd @ SW cor. of Alexis & Rudyard Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	3000	3000	1.1
PLANT: L-80 BUILT: 1969	General Telephone 3126 McCord Road at Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 202 SUB-BASIN: Swan Creek STREAM: Hill Ditch	1500	1500	0.5
PLANT: L-81 BUILT: 1973	Golden Garden Tavern & Restaurant 8256 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8000	8000	2.9

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-83 BUILT: 1967	Home Cafe 5102 W. Alexis Rd (at Whiteford Rd.) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	3500	3500	1.3
PLANT: L-85 BUILT: 1970	Oak Tree (Shopping Center) 4024 N. Holland-Sylvania Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8500	8500	3.1
PLANT: L-86 2IS00008*ED BUILT: 1964	Reichert Stamping 8200 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8000	8000	2.9
PLANT: L-87 2IQ00002 BUILT: 1970	Robintech 3610 Centennial Road Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	1500	1500	0.5
PLANT: L-88 BUILT: 1973	Second Honeymoon (Motel) 8613 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	7000	7000	2.6
PLANT: L-82 BUILT: 1966	Shed, The 5365 Monroe St (at Sadalia Road) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via Monroe St. storm	2500	2500	0.9
PLANT: L-90-B BUILT: 1969 (Phase I)	Swiss Aire Chalet Condominiums, Middle plant 4555 to 4615 Holland-Sylvania Rd., Toledo Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	6000	6000	2.2
PLANT: L-90-A BUILT: 1968 (Phase III)	Swiss Aire Chalet Condominiums, North Plant 4555 to 4615 Holland-Sylvania Rd., Toledo Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	12000	12000	4.4
PLANT: L-90-C BUILT: 1967 (Phase II)	Swiss Aire Chalet Condominiums, South Plant 4555 to 4615 Holland-Sylvania Rd., Toledo Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	6000	6000	2.2
PLANT: L-92 BUILT: 1977 (filters)	Toledo Concrete Pipe Company 3756 Centennial Road, (S. of Sylvania Ave.) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	1500	1500	0.5
PLANT: L-70 BUILT: 1973, 1981	Ventura's Restaurant 7742 W. Bancroft, (west of Hesyler) Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: STREAM: Haeffer Ditch via	7000	7000	2.6

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for OTTAWA RIVER					
PLANT: L-94 BUILT:	Wayside General Store 7702 W. Bancroft Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	1000	1000	0.4
PLANT: L-95 BUILT: 1966	Whiteford Elementary School 4708 Whiteford Rd Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	10000	10000	3.7
PLANT: L-104 BUILT: 1960	Mill Mfg. Co. 4511 South St. Lucas County	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Ottawa River via storm sewer	1500	1500	0.5
PLANT: L-112 BUILT: 1970	Netterfield's Fish & Chips N side Monroe just E of Laskey Lucas County	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Tifft Ditch?	6000	0	0.0
** Subtotal **			465700	436700	159.0

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for LAKE ERIE

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-1 BUILT: 1964	Anchor Point Marina (Condo Marine Properties) off Corduroy Rd. Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie, via boat lagoon	10000	10000	3.7
PLANT: L-2 BUILT:	Butch and Denny's Bait and Sporting Goods Corduroy Rd. Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	1500	1500	0.5
PLANT: L-3 BUILT: 1969	Cooley Canal Yacht Club Bono Rd. - South Side, North of SR 2 Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	4000	4000	1.5
PLANT: L-4 BUILT: 1974	Country Inn 10711 Jerusalem Road Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7
PLANT: L-6 BUILT:	Flying Bridge Restaurant Anchor Point, N. side Corduroy Rd., E. of Teachout Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	6000	6000	2.2
PLANT: L-7 BUILT:	Gulish Villa 7802 Jerusalem Road Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie via Anderson Ditch via SR	7000	7000	2.6
PLANT: L-8 BUILT: 1967	Jack's Cardinal Supermarket SE Cor. Howard Rd. & Rachel Rd. Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	1000	1000	0.4
PLANT: L-9 BUILT: 1962	Lakemont Landing N. end Coolie Rd., Reno Plat 4, lot 1581 Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	6000	6000	1.1
PLANT: L-10 BUILT: 1967 (expansion)	Our Lady of Mt. Carmel E. Side of Elliston Rd., N. of Veler Rd. Lucas County, Jerusalem Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar STREAM: Cedar Creek	4000	4000	1.5
PLANT: L-11 BUILT:	Professional Mechanical Service 406 N. Howard Rd. Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	1500	1500	0.5
PLANT: L-12 BUILT: 1965	Wolf Creek Sportsman's Association 349 Teachout Rd. Lucas County, Jerusalem Twp.	WTRSHED NO: 031 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for LAKE ERIE					
PLANT: O-2 BUILT: 1958	Allen Park Mobile Court Reservation Line Road Ottawa County, Allen Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Cedar Creek	5000	11700	4.3
PLANT: O-5 OH 0003425 BUILT: 1967	Guardian Industries NW cor Martin-Moline Rd. at SR 51 Ottawa County, Allen Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Little Crane Creek	2000	2750	1.0
PLANT: O-4 BUILT: 1972, 1983	Luther Home of Mercy Corner of Williston and Main St. Ottawa County, Allen Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Crane Creek	32500	32500	11.9
PLANT: O-7 BUILT: 1975	Wayside Inn NE cor SR 579 at SR 2 (& Graytown Rd) Ottawa County, Benton Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Crane Creek via tributary	3500	3500	1.3
PLANT: W-94 BUILT: 1986	795 Fuel Stop (Total Oil & Arxon Motel) I-280 @ SR 795 3510 Moline-Martin Rd Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	12000	12000	4.4
PLANT: W-17 BUILT:	Berman's Supper Club/Christmas Shop 5104 Walbridge Rd. Wood County, Lake Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar STREAM: Cedar Creek	12000	12000	4.4
PLANT: W-27 BUILT:	Lusher Trailer Court E. Broadway @ Walbridge Rd. Wood County, Lake Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek	2000	2000	0.7
PLANT: W-28 BUILT: 1967	Metcalf Airport Airport Rd (N of NW cor. SR 795 & I-280) Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Ayres Creek	1500	1500	0.5
PLANT: W-33 BUILT: 1982	Rudolph/Libbe Inc. 6494 Latcha Road Wood County, Lake Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar STREAM: Cedar Creek	1500	1500	0.5
PLANT: W-91 BUILT: 1960	Sohio I-280 @ SR 795 Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	1500	0	0.0
PLANT: W-36 BUILT: 1966	Total Oil Station SR 795 @ I-280, 3510 Martin-Moline Rd Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Ayres Creek	1500	1500	0.5

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for LAKE ERIE					
PLANT: W-40 BUILT: 1974	Wagoner Apartments 6817 Fremont Pike: US 20, SE of Tracy Rd Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek via storm sewer	5000	5000	1.8
PLANT: W-87-N BUILT: 1958	Wood-Lake Trailer Park NE cor. of Cummings Road crossing under Tpk Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	15000	15000	5.5
PLANT: W-87-S BUILT: 1965	Wood-Lake Trailer Park NE cor. of Cummings Rd crossing under Tpk Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	9000	9000	3.3
PLANT: W-54 BUILT:	Bayer Trailer Park US 20, E. of Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek or Grassy Creek	12500	12500	4.6
PLANT: W-56 BUILT:	Five Points Trailer Park 24370 Route 199 @ SE cor int Five Pts/Dunbrdg Rd Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: STREAM:	7000	7000	2.6
PLANT: W-59 BUILT: 1948	Lime City School US 20 & Lime City Road Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek via ditch	1840	0	0.0
PLANT: W-61 BUILT:	Perrysburg Estates MHP, SS #5 Lime City Rd, N of Reitz Rd. - 23720 Lime City Rd Wood County, Perrysburg Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Ditch	25000	25000	9.1
PLANT: W-60 BUILT:	Perrysburg Township Police & Ambulance Building 26609 Lime City Road, N. of US 20 Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek via ditch	1500	1500	0.5
PLANT: W-97 BUILT: 1966	Leisure Village Mobile Home Park N side Fremont Pike (US 20) @ Lemoyne Rd Wood County, Troy Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Crane Creek	4000	4000	1.5
** Subtotal **			200840	204950	73.8
*** Total ***			1991540	2016150	734.2

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for MAUMEE RIVER/BAY

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-5 BUILT: 1961	Eisenhower Jr. High School 331 N. Curtice Lucas County, Jerusalem Twp.	WTRSHED NO: 029 SUB-BASIN: Wolf Creek STREAM: Wolf Creek	20000	20000	7.3
PLANT: L-113 BUILT: 1988	Bay Village Condominiums N side Bayshore Rd 1000′ W of Stadium Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	200000	200000	73.1
PLANT: L-19 BUILT: 1962	Buckeye Pipeline 3211 York Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	1500	1500	0.5
PLANT: L-20 T213*BD BUILT: 1957	Chessie System Presque Isle Dock, near Otter Creek & Bayshore Rds Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Maumee Bay	2500	2500	0.9
PLANT: L-99 BUILT:	Clay School Complex 5633 Seaman Rd., @ NW cor. of Seaman & Stadium Rd Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	30000	30000	11.0
PLANT: L-21 BUILT: 1973	G.A.F. Society Banquet Hall 3624 Seaman Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Amlosch Ditch	3000	3000	1.1
PLANT: L-22 BUILT:	Globe Industries, Inc. 645 N. Lallendorf St. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	6000	6000	2.2
PLANT: L-23 BUILT: 1964	Lakefront Dock & Terminal Co. Otter Creek & Bayshore Rds Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	3000	3000	1.1
PLANT: L-24 BUILT:	Lakeside Trailer Park 5404 Bayshore Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7
PLANT: L-25 2IN00069 BUILT: 1966	Liquid Carbonic Corp. 3742 Cedar Point Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	1500	1500	0.5
PLANT: L-26 BUILT: 1981	Lucas County Residential Center 133/157 Wynn Rd. (NW cor. Wynn & Seaman) Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for MAUMEE RIVER/BAY

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-27 BUILT: 1973	National Wire of Ohio, Inc. 832 N. Lallendorf Rd. at York St. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Amlosch Ditch	3500	3500	1.3
PLANT: L-28 BUILT:	Oregon Municipal Building 5330 Seaman Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	5000	5000	1.8
PLANT: L-29 MI 49267 BUILT:	Shuer, Jay J., School 4955 Seaman Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Johlin Ditch -> tile field	3000	3000	1.1
PLANT: L-30 BUILT: 1958, 1974	Standard Oil Asphalt Plant Cedar Point Rd. at Otter Creek Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Otter Creek	21500	21500	7.9
PLANT: L-100 2IB00000*ID BUILT:	Toledo Edison Bayshore Plant 4701 Bayshore Road (E. of Channel St.) Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Driftmeyer Ditch	15000	15000	5.5
PLANT: L-31 BUILT:	Vargo Carry Out 5781 Corduroy Rd. Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	2500	2500	0.9
PLANT: L-101 BUILT:	Wynn Elementary School 5633 Bay Shore Rd Lucas County	WTRSHED NO: 028 SUB-BASIN: STREAM: Lake Erie	0	0	0.0
PLANT: L-109 BUILT: 1982	McDonald's SW cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	7000	7000	2.6
PLANT: L-107 BUILT: 1980	Pee-Wee Inn Hagman 0.25 mi N of Alexis Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	6000	0	0.0
PLANT: L-108 BUILT: 1981	Speedway Truck Stop NE cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	1500	1500	0.5
PLANT: L-106 BUILT: 1975	Standard Oil NW cor Alexis & Hagman Lucas County	WTRSHED NO: 023 SUB-BASIN: STREAM: Silver Creek	1500	1500	0.5

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for MAUMEE RIVER/BAY					
PLANT: L-105 BUILT: 1969	State Line Builders Supply NW cor State Line & Ann Arbor RR Lucas County	WTRSHED NO: 025 SUB-BASIN: STREAM: Halfway Creek	2500	2500	0.9
PLANT: L-96 2PH00000*BD BUILT: 1972 or earlier	Fuller's Creekside Estates 6064 Villamar Lucas County, Washington Twp.	WTRSHED NO: 021 SUB-BASIN: Portage STREAM: Halfway Creek	100000	270000	98.6
PLANT: W-47 BUILT:	Southview Estates Mobile Home Park 12865 Five Point Road Wood County, Middleton Twp.	WTRSHED NO: 045 SUB-BASIN: Maumee River STREAM: Maumee River	40000	40000	14.6
PLANT: W-98 BUILT: 1957	East Lane Mobile Manor SE cor Florence & Shomberg Sts. Wood County	WTRSHED NO: 013 SUB-BASIN: Maumee River STREAM: Maumee River	10000	10000	3.7
PLANT: W-100 BUILT:	Abbey Aetna 11140 Avenue Rd Wood County, Perrysburg Twp.	WTRSHED NO: 046 SUB-BASIN: Maumee River STREAM: Grassy Creek?	3000	3000	1.1
PLANT: W-55-W BUILT:	Divine Word Prepatory Seminary 26581 West River Road Wood County, Perrysburg Twp.	WTRSHED NO: 044 SUB-BASIN: Maumee River STREAM: Maumee River	10000	10000	3.7
PLANT: W-55-E BUILT:	Divine Word Prepatory Seminary 26581 West River Road Wood County, Perrysburg Twp.	WTRSHED NO: 044 SUB-BASIN: Maumee River STREAM: Maumee River	5000	5000	1.8
PLANT: W-57 BUILT: 1974	Fort Meigs State Memorial Park Off SR 65 bet. Fort & parking lot Wood County, Perrysburg Twp.	WTRSHED NO: 079 SUB-BASIN: Maumee River STREAM: Maumee River	5000	5000	1.8
PLANT: W-58 H 202 *AD BUILT: 1975	Henry Packing Company 9244 Fremont Pike (US 20) Wood County, Perrysburg Twp.	WTRSHED NO: 046 SUB-BASIN: Cedar Creek STREAM: Dry Creek via unnamed tributary	4000	4000	1.5
** Subtotal **			517500	681500	248.9

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for SWAN CREEK					
PLANT: L-14 BUILT: 1967	Chateau Estates 10430 Airport Hwy Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	36000	36000	13.1
PLANT: L-15 BUILT: 1961	Highway Patrol Post 10391 Airport Hwy., E of Turnpike Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Swan Creek	1500	1500	0.5
PLANT: L-16 BUILT: 1973	Monclova School (New) Monclova Road & Waterville-Monclova Rd Lucas County, Monclova Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Swan Creek	5000	5000	1.8
PLANT: L-17 BUILT: 1966	Monclova School (Old) 4526 Lose Rd. Lucas County, Monclova Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Swan Creek	8500	8500	3.1
PLANT: L-33 BUILT: 1970	Peaceful Acres Trailer Park 13555 Waterville-Neapolis Rd. Lucas County, Providence Twp.	WTRSHED NO: 038 SUB-BASIN: Swan Creek STREAM: Blue Creek	12500	12500	4.6
PLANT: L-37 2PH00014*CD BUILT: 1970	Oak Terrace 329 Oak Terrace Blvd. (off Angola at Irwin) Lucas County, Spencer Twp.	WTRSHED NO: 009 SUB-BASIN: Swan/Wolf Cr STREAM: Butler Ditch->Drennan Dt, Wolf Cr.	100000	100000	36.5
PLANT: L-40 BUILT: 1969	Burroughs Corporation 7300 Airport Highway (W. of Holloway Rd) Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	4000	4000	1.5
PLANT: L-43 BUILT: 1988	Elizabeth Scott Nursing Home 2720 Albon Rd. Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan/Wolf Cr STREAM: Stone Ditch	15500	11000	4.0
PLANT: L-45 BUILT: 1984, 1958	Glengary Country Club SE cor Hill & Crissey Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Dt. (effl sprayed->golf)	9000	9000	3.3
PLANT: L-47 BUILT: 1968	Holland Amoco (Station #00648) Airport Highway (SR 2) at I-475, SW corner Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	2000	2000	0.7
PLANT: L-48 BUILT: 1962	Holland Shopping Center 6835 Angola Rd. @ SW cor. Clarion & Angola. Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Ditch	5000	5000	1.8

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for SWAN CREEK

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-50 BUILT: 1972	Monclova Care Center 9831 Garden Road, 2000 ft E. of Eber Rd. Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Cunningham Ditch	8000	8000	2.9
PLANT: L-51 BUILT: 1969	Neville Funeral Home 7438 Airport Highway Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	8000	8000	2.9
PLANT: L-53 2PH00013*CD BUILT: 1970	Oak Openings Industrial Park 1771 S. Eber Road @ Geiser Road Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Kujowski Ditch	180000	110000	40.2
PLANT: L-102 2I000003*AD BUILT: 1957	Ohio National Guard Toledo Express Airport Lucas County, Springfield Twp.	WTRSHED NO: 042 SUB-BASIN: Swan Creek STREAM: Zaleski Ditch	28500	28500	10.4
PLANT: L-56 BUILT:	Springfield Saloon 904 Clark St. at Angola Road Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Drennan Ditch	6000	6000	2.2
PLANT: L-58 BUILT: 1971	Stairs Apts. 750 S. McCord Road (1000 ft N. of Angola Rd) Lucas County, Springfield Twp.	WTRSHED NO: 011 SUB-BASIN: Swan Creek STREAM: Good Ditch	18000	18000	6.6
PLANT: L-57 BUILT: 1968	Sun Oil Company 6405 Airport Highway (at I-475) Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek	1500	1500	0.5
PLANT: L-59 BUILT: 1972	Villa West 10005 Garden Road Lucas County, Springfield Twp.	WTRSHED NO: 041 SUB-BASIN: Swan Creek STREAM: Cunningham Ditch	15000	15000	5.5
PLANT: L-60 S702*BD BUILT: 1969	Woodside Terrace Trailer Park 7717 Angola Rd Lucas County, Springfield Twp.	WTRSHED NO: 009 SUB-BASIN: Swan Creek STREAM: Wolf Creek via tributary from north	80000	80000	29.2
PLANT: L-61 BUILT: 1979	Arrowhead Trailer Park 5402 Jerome Road, W. side SR 295, S. of Turnpike Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Wiregrass Ditch	35500	35500	13.0
PLANT: L-62 2PP00003*CD BUILT: 1961 or earlier	Oak Openings - Fallen Timbers Service Plaza Turnpike near Shaffer Road Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan/Wolf Cr STREAM: Murback Ditch->Prairie Ditch->AI Cr	150000	110000	40.2

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for SWAN CREEK					
PLANT: L-63 BUILT:	Ohio Gas Co. Airport Highway Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Ai Creek	2000	2000	0.7
PLANT: L-64 BUILT: 1951	Swanton School Airport Highway E. of US 20A (Maumee-Western Road) Lucas County, Swanton Twp.	WTRSHED NO: 039 SUB-BASIN: Swan Creek STREAM: Cale Run	6000	6000	1.6
PLANT: L-65 BUILT: 1963	Valleywood Golf Club 13501 Airport Hwy. @ NW cor Scott & SR 2 Lucas County, Swanton Twp.	WTRSHED NO: 007 SUB-BASIN: Swan Creek STREAM: Ai Creek	12500	12500	4.6
PLANT: L-97 BUILT: 1975 (additions)	Sisters of Notre Dame (AKA Lial Convent) 5900 Davis Road, bet. Obee & Weckerly Rds. Lucas County, Waterville Twp.	WTRSHED NO: 039 SUB-BASIN: Swan Creek STREAM: Swan Creek via Lake Lial	17500	17500	6.4
PLANT: L-98 2PB00066*AD BUILT: 1988	Toledo House of Correction 7846 Schadel Road, 43571 Lucas County, Waterville Twp.	WTRSHED NO: 040 SUB-BASIN: Swan Creek STREAM: Blue Creek	40000	40000	14.6
** Subtotal **			807500	693000	252.6

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-35 BUILT:	Corbett Gentry (Private Residence) 3917 Richfield Center Rd. Lucas County, Richfield Twp.	WTRSHED NO: 001 SUB-BASIN: STREAM:	1500	1500	0.5
PLANT: L-36 BUILT:	Richfield Center Market 3902 Washburn Lucas County, Richfield Twp.	WTRSHED NO: 001 SUB-BASIN: STREAM:	1000	1000	0.4
PLANT: L-38 BUILT: 1963	Spencer-Sharples School Unknown Lucas County, Spencer Twp.	WTRSHED NO: 001 SUB-BASIN: Swan/Wolf Cr STREAM: Butler Ditch->Drennan Dt->Wolf Cr.	15000	0	0.0
PLANT: L-39 BUILT: 1960, 1974	Bancroft Trailer Park 6951 Bancroft, Toledo OH 43615 (bet. McCord & King Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Haefner Ditch	6000	6000	2.2
PLANT: L-41 BUILT: 1967	Crissey Elementary School #1 Geiser Road (NW corner Crissey & Geiser Roads) Lucas County, Springfield Twp.	WTRSHED NO: 001 SUB-BASIN: Swan Creek STREAM: Butler Ditch->Drennan Dt->Wolf Cr.	6000	6000	1.6
PLANT: L-42 BUILT: 1974	Dorr St. Elementary School Dorr and King Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	13000	13000	4.7
PLANT: L-46 BUILT: 1966, 1975	Hidden Lake 7777 W. Bancroft Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	7200	7200	2.6
PLANT: L-49 H 704 *AD BUILT: 1971 or before	Lincoln Green Subdivision 6520 Burnham Green Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Potter Ditch -> Zink/Heldman Ditch	168000	160000	58.4
PLANT: L-52 BUILT: 1970	Oak Grove Mobile Court 1839 McCord Rd, N. of NW cor. of intersection w/ D Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Haeffner Ditch	8500	8500	3.1
PLANT: L-54 BUILT: 1970	Royal Vilage Mobile Home Park 7519 Dorr St. (betw. Dorr & Nebraska) Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Heldman/Zink Ditch	40000	40000	14.6
PLANT: L-44 BUILT: 1971	Twin Hills Apts. (form. 4S+2) 6653 Dorcas @ SW cor. of Dorcas & Hill Lucas County, Springfield Twp.	WTRSHED NO: 004 SUB-BASIN: Swan Creek STREAM: Potter Ditch -> Zink Ditch	2000	2000	0.7

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-67 BUILT: 1969	Arbor Hills Jr. High (Sylvania Middle School) 5334 Whiteford Rd @ SE cor. Whiteford & McGregor Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via tributary	18000	18000	6.6
PLANT: L-69 BUILT: 1971, 1974	Briarfield Rest Home 5757 Whiteford Road (N of Alexis) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	15000	15000	5.5
PLANT: L-71 Y700*CD BUILT: 1980 (expansion)	Centennial Manor 3230 Centennial Road Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	30000	30000	11.0
PLANT: L-72 BUILT: 1959	Central Avenue Elementary School 7460 W. Central Ave. at NE cor. Centennial Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	12500	12500	4.6
PLANT: L-73 BUILT: 1963	Central Mobile Village Trailer Park 7924 W Central Ave. (E. of Centennial Rd) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	12500	12500	4.6
PLANT: L-76 BUILT: 1974	Courts of Sylvania Centennial Rd. at Little Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek -> tile field	2000	2000	0.7
PLANT: L-77 BUILT:	Design for Living 7640 W. Bancroft St. Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	1000	1000	0.4
PLANT: L-78 BUILT: 1971	Franklin Park Cinemas 5235 Monroe St., 0.5 mi. W of Talmadge Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Tifft Ditch via storm sewer	12000	12000	4.4
PLANT: L-79 BUILT: 1971	Garden Court South Apartments 5522 Alexis Rd @ SW cor. of Alexis & Rudyard Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	3000	3000	1.1
PLANT: L-80 BUILT: 1969	General Telephone 3126 McCord Road at Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 202 SUB-BASIN: Swan Creek STREAM: Hill Ditch	1500	1500	0.5
PLANT: L-81 BUILT: 1973	Golden Garden Tavern & Restaurant 8256 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8000	8000	2.9

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for OTTAWA RIVER

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: L-83 BUILT: 1967	Home Cafe 5102 W. Alexis Rd (at Whiteford Rd.) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	3500	3500	1.3
PLANT: L-85 BUILT: 1970	Oak Tree (Shopping Center) 4024 N. Holland-Sylvania Rd. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8500	8500	3.1
PLANT: L-86 2IS00008*ED BUILT: 1964	Reichert Stamping 8200 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	8000	8000	2.9
PLANT: L-87 2IQ00002 BUILT: 1970	Robintech 3610 Centennial Road Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	1500	1500	0.5
PLANT: L-88 BUILT: 1973	Second Honeymoon (Motel) 8613 W. Central Ave. Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek	7000	7000	2.6
PLANT: L-82 BUILT: 1966	Shed, The 5365 Monroe St (at Sadalia Road) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via Monroe St. storm	2500	2500	0.9
PLANT: L-90-B BUILT: 1969 (Phase I)	Swiss Aire Chalet Condominiums, Middle plant 4555 to 4615 Holland-Sylvania Rd., Toledo Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	6000	6000	2.2
PLANT: L-90-A BUILT: 1968 (Phase III)	Swiss Aire Chalet Condominiums, North Plant 4555 to 4615 Holland-Sylvania Rd., Toledo Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	12000	12000	4.4
PLANT: L-90-C BUILT: 1967 (Phase II)	Swiss Aire Chalet Condominiums, South Plant 4555 to 4615 Holland-Sylvania Rd., Toledo Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	6000	6000	2.2
PLANT: L-92 BUILT: 1977 (filters)	Toledo Concrete Pipe Company 3756 Centennial Road, (S. of Sylvania Ave.) Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	1500	1500	0.5
PLANT: L-70 BUILT: 1973, 1981	Ventura's Restaurant 7742 W. Bancroft, (west of Hesyler) Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: STREAM: Haeffer Ditch via	7000	7000	2.6

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for OTTAWA RIVER					
PLANT: L-94 BUILT:	Wayside General Store 7702 W. Bancroft Lucas County, Sylvania Twp.	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Zink Ditch	1000	1000	0.4
PLANT: L-95 BUILT: 1966	Whiteford Elementary School 4708 Whiteford Rd Lucas County, Sylvania Twp.	WTRSHED NO: 003 SUB-BASIN: Ottawa River STREAM: Tenmile Creek via storm sewer	10000	10000	3.7
PLANT: L-104 BUILT: 1960	Mill Mfg. Co. 4511 South St. Lucas County	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Ottawa River via storm sewer	1500	1500	0.5
PLANT: L-112 BUILT: 1970	Netterfield's Fish & Chips N side Monroe just E of Laskey Lucas County	WTRSHED NO: 004 SUB-BASIN: Ottawa River STREAM: Tifft Ditch?	6000	0	0.0
** Subtotal **			465700	436700	159.0

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for LAKE ERIE					
PLANT: L-1	Anchor Point Marina (Condo Marine Properties)	WTRSHED NO: 031	10000	10000	3.7
	off Corduroy Rd.	SUB-BASIN:			
BUILT: 1964	Lucas County, Jerusalem Twp.	STREAM: Lake Erie, via boat lagoon			
PLANT: L-2	Butch and Denny's Bait and Sporting Goods	WTRSHED NO: 031	1500	1500	0.5
	Corduroy Rd.	SUB-BASIN:			
BUILT:	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-3	Cooley Canal Yacht Club	WTRSHED NO: 031	4000	4000	1.5
	Bono Rd. - South Side, North of SR 2	SUB-BASIN:			
BUILT: 1969	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-4	Country Inn	WTRSHED NO: 031	2000	2000	0.7
	10711 Jerusalem Road	SUB-BASIN:			
BUILT: 1974	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-6	Flying Bridge Restaurant	WTRSHED NO: 031	6000	6000	2.2
	Anchor Point, N. side Corduroy Rd., E. of Teachout	SUB-BASIN:			
BUILT:	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-7	Gulish Villa	WTRSHED NO: 031	7000	7000	2.6
	7802 Jerusalem Road	SUB-BASIN:			
BUILT:	Lucas County, Jerusalem Twp.	STREAM: Lake Erie via Anderson Ditch via SR			
PLANT: L-8	Jack's Cardinal Supermarket	WTRSHED NO: 031	1000	1000	0.4
	SE Cor. Howard Rd. & Rachel Rd.	SUB-BASIN:			
BUILT: 1967	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-9	Lakemont Landing	WTRSHED NO: 031	6000	6000	1.1
	N. end Coolie Rd., Reno Plat 4, lot 1581	SUB-BASIN:			
BUILT: 1962	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-10	Our Lady of Mt. Carmel	WTRSHED NO: 032	4000	4000	1.5
	E. Side of Elliston Rd., N. of Veler Rd.	SUB-BASIN: Cedar			
BUILT: 1967 (expansion)	Lucas County, Jerusalem Twp.	STREAM: Cedar Creek			
PLANT: L-11	Professional Mechanical Service	WTRSHED NO: 031	1500	1500	0.5
	406 N. Howard Rd.	SUB-BASIN:			
BUILT:	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			
PLANT: L-12	Wolf Creek Sportsman's Association	WTRSHED NO: 031	2000	2000	0.7
	349 Teachout Rd.	SUB-BASIN:			
BUILT: 1965	Lucas County, Jerusalem Twp.	STREAM: Lake Erie			

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

** Basin Totals for LAKE ERIE

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
PLANT: O-2 BUILT: 1958	Allen Park Mobile Court Reservation Line Road Ottawa County, Allen Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Cedar Creek	5000	11700	4.3
PLANT: O-5 OH 0003425 BUILT: 1967	Guardian Industries NW cor Martin-Moline Rd. at SR 51 Ottawa County, Allen Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Little Crane Creek	2000	2750	1.0
PLANT: O-4 BUILT: 1972, 1983	Luther Home of Mercy Corner of Williston and Main St. Ottawa County, Allen Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Crane Creek	32500	32500	11.9
PLANT: O-7 BUILT: 1975	Wayside Inn NE cor SR 579 at SR 2 (& Graytown Rd) Ottawa County, Benton Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Crane Creek via tributary	3500	3500	1.3
PLANT: W-94 BUILT: 1986	795 Fuel Stop (Total Oil & Arxon Motel) I-280 @ SR 795 3510 Moline-Martin Rd Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	12000	12000	4.4
PLANT: W-17 BUILT:	Berman's Supper Club/Christmas Shop 5104 Walbridge Rd. Wood County, Lake Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar STREAM: Cedar Creek	12000	12000	4.4
PLANT: W-27 BUILT:	Lusher Trailer Court E. Broadway @ Walbridge Rd. Wood County, Lake Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek	2000	2000	0.7
PLANT: W-28 BUILT: 1967	Metcalf Airport Airport Rd (N of NW cor. SR 795 & I-280) Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Ayres Creek	1500	1500	0.5
PLANT: W-33 BUILT: 1982	Rudolph/Libbe Inc. 6494 Latcha Road Wood County, Lake Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar STREAM: Cedar Creek	1500	1500	0.5
PLANT: W-91 BUILT: 1960	Sohio I-280 @ SR 795 Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	1500	0	0.0
PLANT: W-36 BUILT: 1966	Total Oil Station SR 795 @ I-280, 3510 Martin-Moline Rd Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Ayres Creek	1500	1500	0.5

PACKAGE SEWAGE TREATMENT PLANTS
In the Maumee RAP Area

PACKAGE PLANT & NPDES NO. AND YEAR INSTALLED	PACKAGE PLANT NAME AND LOCATION	RECEIVING STREAM(S) AND WATERSHED BASIN	CAPACITY gpd	FLOW NOW gpd	ANNUAL FLOW MG/Year
** Basin Totals for LAKE ERIE					
PLANT: W-40 BUILT: 1974	Wagoner Apartments 6817 Fremont Pike: US 20, SE of Tracy Rd Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek via storm sewer	5000	5000	1.8
PLANT: W-87-N BUILT: 1958	Wood-Lake Trailer Park NE cor. of Cummings Road crossing under Tpk Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	15000	15000	5.5
PLANT: W-87-S BUILT: 1965	Wood-Lake Trailer Park NE cor. of Cummings Rd crossing under Tpk Wood County, Lake Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Creek	9000	9000	3.3
PLANT: W-54 BUILT:	Bayer Trailer Park US 20, E. of Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek or Grassy Creek	12500	12500	4.6
PLANT: W-56 BUILT:	Five Points Trailer Park 24370 Route 199 @ SE cor int Five Pts/Dunbrdg Rd Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: STREAM:	7000	7000	2.6
PLANT: W-59 BUILT: 1948	Lime City School US 20 & Lime City Road Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek via ditch	1840	0	0.0
PLANT: W-61 BUILT:	Perrysburg Estates MHP, SS #5 Lime City Rd, N of Reitz Rd. > 23720 Lime City Rd Wood County, Perrysburg Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Henry Ditch	25000	25000	9.1
PLANT: W-60 BUILT:	Perrysburg Township Police & Ambulance Building 26609 Lime City Road, N. of US 20 Wood County, Perrysburg Twp.	WTRSHED NO: 032 SUB-BASIN: Cedar Creek STREAM: Dry Creek via ditch	1500	1500	0.5
PLANT: W-97 BUILT: 1966	Leisure Village Mobile Home Park N side Fremont Pike (US 20) @ Lemoyne Rd Wood County, Troy Twp.	WTRSHED NO: 033 SUB-BASIN: Crane Creek STREAM: Crane Creek	4000	4000	1.5
** Subtotal **			200840	204950	73.8
*** Total ***			1991540	2016150	734.2

APPENDIX E

Publicly-Owned Treatment Works in the RAP Area

APPENDIX E

PUBLICLY-OPERATED TREATMENT WORKS IN THE RAP AREA

SOURCE: TMACOG Arewide Water Quality Management Plan[21]

POTW NAME	COUNTY	OPERATED BY	CAPACITY, MGD	PRESENT TREATMENT FACILITIES
** TOTAL FOR COUNTY Lucas				
Bentbrook Farms Subdiv.	Lucas	Lucas County	0.1	0.1 Extended aeration
Fuller's Creek Subdiv.	Lucas	Lucas County	0.1	0.3 Extended aeration
Lincoln Green Subdiv.	Lucas	Lucas County	0.2	0.2 Extended aeration
Maumee River WWTP	Lucas	Lucas County	15.0	9.0 Contact Stab/step feed,aer dig., belt filt
Oak Openings Ind Park	Lucas	Lucas County	0.2	0.0 Extended aeration
Oak Terrace	Lucas	Lucas County	0.1	0.1 Extended aeration, filt, CL2
Oregon South Shore Park	Lucas	Oregon	0.2	0.5 Contact Stabilization
Oregon WWTP	Lucas	Oregon	8.0	4.3 Activated Sludge, phos.
Toledo Bay View WWTP	Lucas	Toledo	102.0	91.2 Act Sludge, anaer dig., phos., belt filt press
Whitehouse WWTP	Lucas	Whitehouse	0.3	0.3 Extended aeration
** Subtotal **				
			126.1	105.9
** TOTAL FOR COUNTY Wood				
Haskins WWTP	Wood		0.1	0.1 Extended aeration, filters, drying beds
Perrysburg WWTP	Wood		2.8	3.0 Act Sldg, pre-aer, phos, anaer digest, vac dry beds
** Subtotal **				
			2.9	3.1
*** Total ***				
			129.0	109.0

APPENDIX F

Publicly-Owned Treatment Works Effluent Data

APPENDIX F

POTW 1986 EFFLUENT DATA

SOURCE: Ohio EPA NPDES effluent data

LUCAS COUNTY

POTW NAME	OEPA PERMIT NO	NPDES PERMIT NO	AVG FLOW MGD	EFFLUENT BOD mg/l	EFFLUENT TSS mg/l	EFFLUENT NH3 mg/l	EFFLUENT NO2 mg/l	EFFLUENT NO3 mg/l	EFFLUENT TOTAL P mg/l	EFFLUENT CBOD mg/l	SLUDGE DRY TONS	SLUDGE VOLUME GALLONS	SLUDGE % TOTAL SOLIDS
FULLER'S CREEKSIDE ESTATES	2PW00000*AD	OH0053732											
January, 1986			.279	10.0	12.5								
February			.463	13.0	12.3								
March			.454	13.3	10.7								
April			.300	12.8	15.2								
May			.299	9.5	14.5								
June			.268	5.7	7.0								
July			.116	7.0	9.5								
August			.095	9.5	11.0								
September			.135	8.8	16.5								
October			.216	37.4	34.0								
November			.201	22.7	17.3								
December			.371	21.3	11.7								
Annual Average			.266	14.2	14.3								
Effluent Limits, 30-day Average				30.0	30.0								
MAUMEE RIVER WWTP	2PK00000*DD	OH0034223											
January, 1986			7.653	8.3	15.4	.6	.1	13.0	.9	6.1	115.2		15.6
February			12.264	9.7	19.6	.6	.1	10.5	.8	7.8	81.6		14.8
March			13.749	16.3	25.1	2.5	.3	9.8	.9	8.4	121.5		16.9
April			9.853	15.1	22.0	1.9	.5	9.0	.9	10.0	94.9		17.6
May			7.178	12.2	11.6	.6	.1	11.2	.8	5.5	91.4		17.8
June			9.450	6.1	12.5	.5	.0	9.3	.8	4.5	128.1		20.5
July			6.893	5.6	12.9	.2	.0	12.5	.9	3.6	264.5		20.3
August			6.657	5.5	8.4	.6	.1	13.1	.7	3.8	98.8		18.4
September			7.152	7.5	11.7	.9	.1	9.5	.8	4.0	90.1		29.3
October			10.268	6.5	14.9	.3	.0	9.6	.8	4.5	80.9		17.6
November			7.478	7.8	13.8	.8	.0	11.7	.8	5.4	112.6		19.7
December			9.557	10.5	14.7	2.6	.1	7.4	.9	6.2	94.1		15.5
Annual Average			9.013	9.3	15.2	1.0	.1	10.6	.8	5.8	114.5		18.7
Effluent Limits, 30-day Average				30.0	30.0				1.0				
OREGON DUPONT RD WWTP	2PD00035*ED	OH0052914											
January, 1986			3.533	6.5	12.4	.4	.0	9.4	1.0	2.4	143.4		2.8
February			5.710	8.0	17.8	.2	.0	7.6	1.0	2.8	43.6		3.0
March			5.949	8.8	15.5	.2	.0	7.4	.9	3.4	3.1		1.9
April			3.922	6.4	10.8	.3	.0	9.5	1.0	2.0	14.6		.5
May			3.913	7.2	15.9	.2	.0	10.5	.9	2.1	34.3		3.3
June													
July			3.448	4.4	5.4	.3	.0	11.0	.9	1.9	98.4		3.3
August			3.104	3.9	7.9	.5	.1	6.7	1.0	1.4			
September			3.347	5.1	8.1	.3	.0	8.8	1.0	1.3	8.5		4.3
October			5.219	5.8	10.2	.2	.0	9.3	1.0	1.7	16.6		4.8
November			3.821	3.9	11.1	.2	.0	12.8	.9	1.7	57.1		3.8
December			5.423	8.6	17.6	.2	.0	8.3	1.0	3.6	50.3		3.8
Annual Average			4.308	6.2	12.1	.3	.0	9.2	.9	2.2	47.0		3.1
Effluent Limits, 30-day Average				20.0	20.0				1.0				

POTW NAME	OEPA PERMIT NO	NPDES PERMIT NO	AVG FLOW MGD	EFFLUENT BOD mg/l	EFFLUENT TSS mg/l	EFFLUENT NH3 mg/l	EFFLUENT NO2 mg/l	EFFLUENT NO3 mg/l	EFFLUENT TOTAL P mg/l	EFFLUENT CBOD mg/l	SLUDGE DRY TONS	SLUDGE VOLUME GALLONS	SLUDGE % TOTAL SOLIDS
OREGON SOUTHSHORE	2PB00007*CD	OH0052591											
January, 1986			.343	12.8	24.2	10.2	.3	.8	1.8				
February			.655	23.8	22.3	1.2	3.3	2.2	.1				
March			.705	30.9	32.1	2.5	.0	2.0	1.1				
April			.560	45.9	29.8	3.9	.1	1.8	1.6				
May			.525	39.5	48.5	4.0	.0	.9	.9				
June													
July			.382	41.1	27.9	5.1	.1	.6	1.3	23.6			
August			.296	13.1	11.1	6.2	.2	.5	1.6	8.8			
September			.306	47.8	22.3	1.2	.1	.8	8.8	7.3			
October			.585	43.1	26.8	4.9	.0	.4	.8	30.0			
November			.391	66.9	43.4	10.8	.0	.2	2.7	46.4			
December			.664	32.0	37.1	1.2	.0	2.5	1.9	24.4			
Annual Average			.492	36.1	29.6	4.7	.4	1.2	2.0	23.4			
Effluent Limits, 30-day Average				20.0	25.0								
TOLEDO BAY VIEW WWTP	2PF00000*GD	OH0027740											
January, 1986			67.744	36.4	35.5	19.5	.3	1.9	1.4	18.2	1891.1		6.8
February			114.861	18.8	37.6	9.3	.5	1.3	1.0	13.9	1217.8		6.4
March			126.458	17.7	25.2	7.7	.5	1.5	.8	14.8	1117.3		29.9
April			85.022	17.8	24.9	10.5	.3	1.9	.7	13.6	734.3		29.8
May			87.999	19.9	34.8	11.5	.2	2.5	1.0	13.9	517.3		29.4
June			110.340	9.5	39.3	7.9	.3	1.4	1.0	5.8	598.5		30.4
July			81.420	28.0	50.8	9.7	.2	1.5	1.7	8.6	554.8		31.0
August			73.554	16.6	35.9	11.0	.2	2.3	1.0	6.0	895.2		26.0
September			76.705	24.9	75.8	11.7	.1	1.4	1.4	10.4	439.1		27.0
October			102.152	12.1	54.7	9.4	.2	2.2	.8	5.3	521.9		31.1
November			74.819	15.3	53.8	17.5	.2	2.2	1.3	8.8	539.3		26.0
December			92.774	19.6	61.0	10.1	.3	2.2	1.5	11.9	553.5		24.8
Annual Average			91.154	19.7	44.1	11.3	.3	1.9	1.1	10.9	798.3		24.9
Effluent Limits, 30-day Average				40.0	60.0				1.0				
WHITEHOUSE *	2PB00062*CD	OH0053350											
January, 1986			.285	31.4	33.8								
February			.365	14.3	16.3								
March													
April													
May			.289	20.0	19.1	10.0	.0	.1	36.0	21.5			
June			.345	9.8	15.8	18.0	3.7	.5	1.6	17.3	.1		.7
July			.310	7.2	19.4	5.0	1.1	4.1	3.9	9.3	.1		.4
August			.300	9.5	13.3	*4*	*4*	*4*	*4*	20.8	.0		
September			.297	18.6	22.6	6.5	.9	.3	1.0	16.7	.0		.1
October			.377	18.3	33.3	.4	54.0	4.0	1.0	19.7	.0		.7
November			.303	21.0	33.3	.0	.1	6.9	.8	20.1	.1		.4
December			.365	13.0	17.3	1.5	.5	16.0	.6	15.1	.0		.6
Annual Average			.324	16.3	22.4	5.9	8.6	4.6	6.4	17.6	.0		.5
Effluent Limits, 30-day Average (Interim)				30.0	30.0								

POTW NAME	OEPA PERMIT NO	NPDES PERMIT NO	AVG FLOW MGD	EFFLUENT BOD mg/l	EFFLUENT TSS mg/l	EFFLUENT NH3 mg/l	EFFLUENT NO2 mg/l	EFFLUENT NO3 mg/l	EFFLUENT TOTAL P mg/l	EFFLUENT CBOD mg/l	SLUDGE DRY TONS	SLUDGE VOLUME GALLONS	SLUDGE % TOTAL SOLIDS
LINCOLN GREEN	2PH00004*AD	OH0053520											
January, 1986			.106	3.3	5.5								
February			.176	16.3	29.5								
March			.262	13.0	5.7								
April			.148	4.6	5.8								
May			.159	9.5	4.5								
June			.172	15.0	13.3								
July			.107	5.3	4.0								
August			.133	4.3	3.0								
September			.161	7.8	16.0								
October			.284	20.0	13.4								
November			.108	64.7	83.0								
December			.160	83.7	60.7								
Annual Average			.165	20.6	20.4								
Effluent Limits, 30-day Average													
OAK OPENINGS	2PH00013*AD	OH0058483											
January, 1986													
February													
March													
April													
May			.078	21.0	14.5	8.4				20.2			
June			.141	10.3	13.7	.1				7.3			
July			.088	41.3	50.0	14.2				38.4			
August			.108	20.8	33.5	7.8				12.0			
September			.081	34.8	43.0	5.3				31.9			
October			.131	6.8	13.4	.4				5.9			
November			.150	14.0	20.7	11.6				11.4			
December			.133	30.7	31.0	28.1				22.1			
Annual Average			.114	22.4	27.5	9.5				18.7			
Effluent Limits, 30-day Average													
OAK TERRACE	2PH00014*AD	OH0058912											
January, 1986			.059	4.3	4.0	.1				3.3			
February			.069	5.5	6.8	.1				4.2			
March			.080	2.0	1.7	.2				1.4			
April			.084	3.6	5.0	.2				3.3			
May			.050	3.5	3.5	.1				3.2			
June			.097	2.0	2.7	.1				1.5			
July			.134	2.8	3.3	.2				2.4			
August			.139	2.3	1.5	.1				2.2			
September			.133	5.3	8.5	.3				4.6			
October			.158	3.0	1.6	.3				2.2			
November			.107	22.7	39.3	5.8				17.9			
December			.110	6.7	18.7	.4				6.2			
Annual Average			.102	5.3	8.0	.6				4.4			
Effluent Limits, 30-day Average													

POTW NAME	OEPA PERMIT NO	NPDES PERMIT NO	AVG FLOW MGD	EFFLUENT BOD mg/l	EFFLUENT TSS mg/l	EFFLUENT NH3 mg/l	EFFLUENT NO2 mg/l	EFFLUENT NO3 mg/l	EFFLUENT TOTAL P mg/l	EFFLUENT CBOD mg/l	SLUDGE DRY TONS	SLUDGE VOLUME GALLONS	SLUDGE % TOTAL SOLIDS
SYLVAN ** WOODS	2PG00000*BD	OH0054089											
January, 1986			.189	46.0	33.0								
February			.164	6.5	764.0								
March			.154	28.7	18.3								
April			.096	67.0	66.0								
May													
June													
July													
August													
September													
October													
November													
December													
Annual Average			.151	37.0	220.3								
Effluent Limits, 30-day Average													
COREY ** MEADOWS	2PG00001*BD	OH0053741											
January, 1986			.041	8.5	8.8								
February			.061	3.0	1.5								
March			.076	2.0	3.7								
April			.078	10.8	13.4								
May			.053	8.0	11.0								
June			.096	1.7	4.7								
July			.078	12.5	15.8								
August			.080	6.9	62.6								
September													
October													
November													
December													
Annual Average			.070	6.7	15.2								
Effluent Limits, 30-day Average													
BENTBROOK FARMS	2PG00002*AD	OH0053759											
January, 1986			.080	41.5	32.5								
February			.100	12.8	13.3								
March			.134	16.3	9.7								
April			.157	42.6	52.6								
May			.108	69.0	78.0								
June			.125	143.3	158.7								
July			.087	78.8	129.3								
August			.075	372.5	337.5								
September			.100	110.3	79.8								
October			.136	76.4	41.8								
November			.143	54.3	20.7								
December			.144	92.7	169.3								
Annual Average			.116	92.5	93.6								
Effluent Limits, 30-day Average													

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*
** Plant is scheduled to be abandoned in 1988.
Plant now out of service; this area has been tapped into the Lucas County sanitary sewer.

WOOD COUNTY

POTW NAME	OEPA PERMIT NO	NPDES PERMIT NO	AVG FLOW MGD	EFFLUENT BOD mg/l	EFFLUENT TSS mg/l	EFFLUENT NH3 mg/l	EFFLUENT NO2 mg/l	EFFLUENT NO3 mg/l	EFFLUENT TOTAL P mg/l	EFFLUENT CBOD mg/l	SLUDGE DRY TONS	SLUDGE VOLUME GALLONS	SLUDGE % TOTAL SOLIDS
HASKINS	2PA00026*CD	OH0021873											
January, 1986			.061	5.5	6.3	.4				4.0		.0	.7
February			.073	6.5	6.5	.1				4.0		.0	.1
March			.062	6.3	8.0	.6				6.5		2200.0	.8
April			.067	9.8	2.5	1.2				7.5		.0	.8
May			.052	8.4	5.8	1.0				3.4		7000.0	.9
June			.058	6.5	6.5	1.5				4.5		5000.0	.9
July			.056	7.7	7.0	.7				4.7		12500.0	.8
August			.054	7.3	4.0	.6				1.5		5000.0	.9
September			.061	8.0	2.5	2.4				3.5		3000.0	.8
October			.065	8.8	6.8	1.2				5.6		1500.0	.1
November			.056	10.3	4.8	1.3				8.5		2000.0	.8
December			.064	8.3	7.3	1.0				7.0		2000.0	.1
Annual Average			.061	7.8	5.7	1.0				5.1		3350.0	.6
Effluent Limits, 30-day Average				10.0	12.0								
LUCKEY ***	2PA00080*BD												
Effluent Limits, 30-day Average					65.0					25.0			
PERRYSBURG	2PD00002*CD	OH0021008											
January, 1986			2.423	9.5	43.5	11.8		*4*	.5		11.7		4.5
February			3.190	38.3	80.3	5.8		1.9	1.3		2.8		5.5
March			3.556	15.4	26.6	7.4		1.6	.6		10.5		5.5
April			3.186	17.0	45.0	8.7		.3	.9		13.7		2.9
May			2.598	35.0	64.1	12.2		.4	2.1		12.1		3.9
June			3.351	6.9	17.7	8.8		.4	1.4		18.4		4.0
July			2.856	23.7	46.4	13.2		.4	3.5		6.8		5.5
August			2.467	28.8	71.3	14.6		.4	3.4		7.8		4.2
September			2.484	28.3	49.7	15.0		.4	3.2		4.0		4.2
October			3.273	31.8	38.2	10.9		.4	1.0		16.8		3.3
November			2.896	36.8	65.3	15.5		.7	2.4		12.7		4.8
December			3.752	41.6	86.6	8.0		1.3	2.8		10.1		5.3
Annual Average			3.003	26.1	52.9	11.0		.8	1.9		10.6		4.5
Effluent Limits, 30-day Average				50.0	50.0				1.0				

*** Treatment plant completed and went into use in late 1987.

APPENDIX G

Ohio EPA *Biological Water Quality Study*
of the Lower Maumee River Mainstem
Technical Support Document (TSD)

Biological and Water Quality Study of the Lower Maumee River Mainstem and Major Tributaries

- Wood and Lucas Counties, Ohio.

July 15, 1989

prepared by

Ohio Environmental Protection Agency
Division of Water Quality Monitoring and Assessment
Surface Water Section
1030 King Ave.
Columbus, Ohio 43212

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Biological Assessment:

Macroinvertebrates - Chuck McKnight and Jeff DeShon
Fish - Marc Smith and Roger Thoma

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Reviewers - Dave Altfater, Jeff DeShon, Julie Letterhos, Marc Smith, Roger Thoma

Typing - Carole Thall and Pam Jaques

This evaluation and report would not have been possible without the assistance of numerous full and part time staff in the field and the chemistry analyses provided by the Ohio EPA Water Quality Laboratory.

METHODS AND MATERIALS

All chemical, physical, and biological field, laboratory, data processing, and data analysis methods and procedures adhere to those specified in the Ohio EPA Manual of Surveillance Methods and Quality Assurance Practices (fifth update; Ohio EPA 1987a) and Biological Criteria for the Protection of Aquatic Life, vols. I-III (Ohio EPA 1987b, 1987c, 1988).

Attainment/non-attainment of aquatic life uses is determined by using the recently developed biological criteria (Ohio EPA 1987b, 1987c, 1988). The biological community performance measures that are used include the Index of Biotic Integrity (IBI) and the Modified Index of Well-Being (I_{wb}), both of which are based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics. Performance expectations for the basic aquatic life uses (Warmwater Habitat, Exceptional Warmwater Habitat) and a proposed Modified Warmwater Habitat use were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1988). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981).

An aquatic life use is fully attained if all three indices (or those available) meet the applicable criteria. Partial attainment is reached if one or more indices attain and at least one does not attain. A site is considered to be in non-attainment if all three indices (or those available) fail to meet the applicable criteria. This also applies if one of the two organism groups indicate poor or very poor performance, even if the other group is attaining the applicable criteria.

Doc. 2126e/0049e Lower Maumee River TSD (1986) July 15, 1989

Biological and Water Quality Survey of the Lower Maumee River Mainstem and Major Tributaries (Wood and Lucas Counties, Ohio).

Ohio EPA, Division of Water Quality Monitoring & Assessment
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INTRODUCTION

The Lower Maumee River mainstem study area extended from upstream of Grand Rapids (RM 54.9) downstream to Maumee Bay (RM 0.0). Also included were the lower sections of Swan Creek (RM 10.2 - 0.5), Ottawa River (RM 18.5 - 1.6), Tenmile Creek (RM 5.1 - 1.0), Otter Creek (RM 7.2 - 0.3), and Duck Creek (RM 3.0 - 0.4). One site was located on Cedar Creek (RM 20.8) which is a direct Lake Erie tributary east of the study area.

Specific objectives of this evaluation were to:

1) characterize and quantify aquatic life use impairment and identify causes and sources whenever possible;

2) determine if existing aquatic life uses are appropriate; and,

3) discover and document previously unknown or under-rated problems.

It was not an objective of this effort to determine the rate or quantity of export of loadings of nutrients or toxic substances to Lake Erie. However, a knowledge of any localized impairments in the lower mainstem river and tributaries can provide insights on how these substances might be managed and controlled.

This survey represents the first effort by Ohio EPA to comprehensively document and quantify degradation in the lower Maumee River mainstem and major tributaries using the resident aquatic biota as a direct measure of aquatic life use attainment or non-attainment. The findings of this evaluation may factor into regulatory actions taken by Ohio EPA (e.g. NPDES permits) and may eventually be incorporated into the Ohio Water Quality Standards (WQS) regulations (OAC 3745-1), State water quality management plans and the next biennial 305(b) report.

CONCLUSIONS AND RECOMMENDATIONS

General

- Of the 57 sampling locations evaluated in the lower Maumee River study area 37 did not attain the Warmwater Habitat (WWH) use designation, 11 partially attained, and 9 fully attained. Of the 20 sampling locations that either partially or fully attained the WWH use, 16 were located on the Maumee River mainstem. WWH use attainment was the most consistent in the Maumee River mainstem between RM 13.6 (downstream from Perrysburg) and 54.9 (near Napoleon).

- Major causes and sources of WWH use non-attainment included: low dissolved oxygen (D.O.) and elevated ammonia-nitrogen (NH_3-N) from combined sewer overflow (CSO) and wastewater treatment plant (WWTP) discharges (Maumee R., Swan Creek, Ottawa R., Tenmile Creek); intermittent releases of toxic substances from industrial sources via CSOs (Swan Creek, Ottawa R.); heavy metals, low D.O. and elevated NH_3-N from landfill leachate and industrial sources (Otter Creek, Duck Creek, Ottawa R., Tenmile Creek). Habitat modification is a factor in eventual use attainment in Otter Creek and Duck Creek, but it was not a major factor in the observed impairment.

- Seiche effects were observed to influence biological and chemical degradation in the Lake Erie influenced sections of the Maumee River mainstem and lower tributaries. Biological effects occurred both upstream and downstream from major sources such as the Toledo WWTP. In the tributaries seiches acted to concentrate pollutants at the upstream limits of the estuary effect, but also diluted poorer quality tributary water at the mouth of each. This latter phenomenon also occurred at the Maumee River mainstem/Maumee Bay interface where relatively cleaner Lake Erie water tended to mix with and dilute poorer quality Maumee River water.

- Arsenic was detected in concentrations above background levels at several locations in the mainstem and at very high levels in Otter Creek and Duck Creek This appears to indicate widespread contamination along the south shore of the mainstem and the general area behind it from Rossford to Oregon. The principal source is landfill leachate associated with glass making operations.

- Fish tissue results indicate elevated concentrations of total PCB (compared to upstream levels) in the lower 5 miles of the Maumee River mainstem, lower Swan Creek, Tenmile Creek (RM 4.1), and the lower 4 miles of the Ottawa River. Concentrations in whole body composite samples upstream from the general Toledo metropolitan area were less than 1.0 ppm. The highest concentrations of total PCB (12-25.4 ppm) were found in fish from the Ottawa River.

<u>Maumee River</u>

- The WWH use was either fully or partially attained between RM 54.9 to RM 13.6, with the exception of one location in the Grand Rapids dam pool. Thirteen (13) of the 16 locations downstream from RM 9.4 did not attain the interim Lake Erie river mouth criteria; the remaining 3 sites partially or fully attained these criteria. The severity of the non-attainment increased downstream from the Swan Creek confluence (RM 5.2) and was worse along the north shore. This shore is impacted by Swan Creek (CSO, industrial releases), CSOs, and the Toledo WWTP. The results of this survey indicate that the existing WWH use is appropriate.

- Biological degradation as measured by the Index of Biotic Integrity (IBI) and the modified Index of Well-Being (I_{wb}) was typical of a response to the discharge of oxygen demanding wastes when the results were plotted in terms of linear distance from the Toledo WWTP outfall. D.O. and NH_3-N results indicated this same phenomenon, but to a lesser degree than the biological results.

- Concentrations of heavy metals in the sediments and total PCB in fish tissue reached their highest levels in the lower 5-6 miles of the mainstem reflecting inputs from a variety of urban, industrial, and municipal sources, as well as the concentrating effect of seiches.

Swan Creek

- The existing WWH use was impaired upstream from the general area impacted by CSO discharges. The overall biological performance was fair and typified impacts associated with siltation and nutrient enrichment associated with agricultural nonpoint sources.

- Use impairment increased in severity downstream into the area impacted by CSOs. Chemical water quality, bottom sediment, and biological community results all reflected a complex impact caused by oxygen demanding wastes from CSOs and toxic substances (i.e. creosote) from intermittent industrial releases via a CSO. The discharge of creosote may pose an additional threat to non-aquatic life uses due to the presence of numerous polynuclear aromatic hydrocarbon (PAH) derivitives. This contamination extends into the Maumee River mainstem.

Ottawa River/Tenmile Creek

- The existing WWH use was impaired at 2 of the 3 Tenmile Creek sampling locations (RM 5.1 - 1.0) with the downstream site achieving partial attainment. Overall biological performance was fair. Localized areas of macrohabitat modification were noted, but this alone does not preclude eventual attainment of the WWH use.

- Evidence of conventional organic enrichment in Tenmile Creek suggests inputs from sources upstream from RM 5.1. A discharge of "septic" wastewater was also noted at the RM 5.1 sampling location. Other sources of impact on Tenmile Creek include Reichart Stamping and the Kings Rd. landfill.

- The existing WWH use was impaired at all of the Ottawa River sampling locations (RM 17.8 - 1.6) with the severity increasing downstream from RM 11.0. Overall biological performance was poor or very poor in the lower sections with indications of a toxic impact in combination with very low D.O. levels. Several sources contribute to this degradation and include CSOs, runoff and spills from AMC Jeep, and leachate from the Stickney Ave. and Dura landfills. The possibility of previously unknown sources exists in the upper sections as evidenced by the presence of raw sewage. The degradation in the Ottawa River was pronounced in every media that was tested. This includes sediment contamination which consisted of elevated heavy metals and detectable concentrations of organics (mainly PAH compounds) and PCBs.

- The effects of previous habitat modifications and general urban encroachment was evident in the Ottawa River downstream from RM 9.8. Although QHEI scores were marginal ($\bar{X} = 53$), instream cover and overall pool quality was good, thus the existing WWH use should be maintained.

Otter Creek/Duck Creek

- The existing WWH use was impaired at 2 of the 3 Duck Creek locations (RM 3.0 - 0.5) with one site (RM 0.5) achieving partial attainment. Overall performance was poor and was attributed to accumulated water treatment plant sludge that is contaminated with heavy metals, abandoned landfill leachate, and possibly the Toledo Edison - Acme EGS ash pond discharge. Some recovery was observed at the mouth and was attributed to dilution by relatively better quality Maumee River water.

- Otter Creek showed use impairment at all 5 sampling locations (RM 7.2 - 0.5). The overall biological performance was very poor at all sites and indicated acutely toxic conditions. Sources of the severe impairment include the abandoned LOF landfill, Sun Oil refinery, and the BP America refinery (the thermal discharge was diverted to Maumee Bay in 1987). The sediments were contaminated with heavy metals, a few organic chemical compounds, and oil. Water samples revealed a wide array of contamination with acutely toxic levels of arsenic and ammonia-N observed at the site immediately downstream from the LOF landfill. D.O. was near zero at several locations.

- Although no formal records of previous channel modifications could be obtained from local, county, or federal agencies, the existence of such was very obvious in the field. The effects of past channel modification are still prevalent in both Otter Creek and Duck Creek which results in poor or very poor habitat quality. The extent of the modifications is reflected in the mean QHEI scores for each creek (41 in Otter Cr.; 40 in Duck Cr.) which satisfies a key criteria for the eventual consideration of the proposed Modified Warmwater Habitat (MWH) or Limited Resource Waters (LRW) use designations. It is recommended that Otter Creek be redesignated LRW upstream from the LOF landfill and MWH between the landfill and the mouth. Duck Creek should be redesignated MWH from its headwaters to RM 0.5. The MWH designations are contingent upon the eventual adoption of the MWH use in the Ohio WQS.

STUDY AREA DESCRIPTION

Potential sources of impact to surface waters in the study area are numerous and include point source discharges of industrial and municipal wastewater, combined sewer overflows (CSO), landfill leachate, accidental spills and intermittent releases, and general encroachment on the riparian zone by various anthropogenic activities. The principal point source discharges to the lower Maumee River mainstem include the Toledo WWTP (RM 1.4), Libby-Owens-Ford (LOF Rossford, RM 6.9-8.3), Perrysburg WWTP (RM 14.5), Lucas Co.-Maumee WWTP (RM 18.2), Campbell Soup (RM 43.5-45.8), and the Napoleon WWTP (RM 45.9). Other discharges to major tributaries that were evaluated include Jennison-Wright (Swan Creek, RM 2.6), Reichart Stamping (Tenmile Creek, RM 5.1), Sun Oil (Otter Creek, RM 4.9-5.2), BP America (Otter Creek, RM 0.4), AMC Jeep (Ottawa R., RM 7.6-8.0), and Diversitech General (Ottawa R., RM 6.0). Several landfills that were evaluated include the LOF facility on Otter Creek (RM 6.4-6.6), Kings Rd. landfill (Tenmile Creek, RM 4.5), Stickney Ave. landfill (Ottawa R., RM 5.5-5.7), and the Dura landfill (Ottawa R., RM 5.1).

Several smaller landfills occur throughout the study area particularly along the Ottawa River and Duck Creek. More than 40 CSO discharge locations are listed for the study area and include approximately 25 for the lower Maumee River mainstem (RM 15.5-3.2), 11 on Swan Creek (RM 4.2-0.1), and 7 to the Ottawa River (RM 9.2-6.5). A more detailed description of the study area can be found elsewhere (Toledo Metropolitan Area Council of Governments 1988).

The lower sections of the Maumee River mainstem and tributaries are influenced by the level of Lake Erie and as such experience seiche activity and have base gradients. Such areas are commonly referred to as estuaries. The lower 7.2 miles of the mainstem is used extensively for commercial navigation and the center of the river is periodically dredged and maintained for that purpose by the U.S. Army Corps of Engineers. Dredged material has been disposed of both in a confined disposal area at the mouth of the mainstem and at an off-shore location in the open lake.

RESULTS AND DISCUSSION

The results, discussion, and attainment status summary is organized by principal stream or river as follows: lower Maumee River mainstem, Swan Creek, Ottawa River/Tenmile Creek, and Otter Creek/Duck Creek. Within each the physical habitat, chemical/physical water quality, bottom sediment chemistry, macroinvertebrate community, fish community, fish tissue, and overall aquatic life use attainment status are described.

LOWER MAUMEE RIVER MAINSTEM

The 1986 sampling effort included 14 chemical/physical water quality, 4 bottom sediment, 18 macroinvertebrate, 27 fish, and 4 fish tissue sites between Napoleon and Maumee Bay (RM 54.9-0.0).

Physical Habitat for Aquatic Life

- Between RM 54.9 and approximately RM 18 the Maumee River mainstem offers typical large river habitat. A dam at Grand Rapids results in a 7-8 mile long impoundment - the remaining distance is free flowing. Qualitative Habitat Evaluation Index (QHEI) scores ranged from 56 to 58 ($\bar{X}$ QHEI = 56.7) within the impoundment and 70-82 ($\bar{X}$ QHEI = 77.0) in the free-flowing sections. The latter scores indicate very good to exceptional habitat.

- In the vicinity of RM 16-17 the level of Lake Erie and attendant seiche activity begins to influence the riverine habitat resulting in a transition to estuary habitat. This type of habitat is characterized by slack flow, flow reversals, base gradients, a total pool morphology, and depths of 1-3 meters. Downstream from RM 7.2 and well into Maummee Bay a 8.5 m deep navigation channel is maintained in the center of the mainstem. However, this activity itself leaves the shoreline relatively undisturbed. Shoreline disturbances include sheet piling and rock rip-rap, but this is not continuous. QHEI scores ranged from 61 to 71 ($\bar{X}$ QHEI = 64.3) between RM 18 and 7.2 and 46 to 67 ($\bar{X}$ QHEI = 59) downstream in the navigation channel area. Compared to some other Lake Erie river mouth areas subject to navigation channel maintenance activities (e.g. Cuyahoga River) the lower Maumee River mainstem offers relatively good habitat.

- River flow measured at the USGS continuous flow gage at Waterville (RM 20.7) was higher than a range of critical low flows, but was below the historical average being less than 1000 cfs through most of the summer months (Fig. 2).

Chemical/Physical Water Quality (Tables 2-4; Figures 3-4)

- Water quality was relatively good upstream from RM 9.4. Downstream from the Swan Creek confluence (RM 5.2) levels of NH_3-N increased, D.O. generally declined, and exceedences of the water quality standard (WQS) for zinc were detected.

- Although WQS violations of the copper criteria were frequent between RM 32.6 and the mouth (RM 0.0), most were in the 15-30 ug/l range which does not constitute a serious threat to aquatic life use attainment. These levels probable represent background concentrations for the lower mainstem. The statewide copper criterion is currently under review by Ohio EPA.

- Surface and bottom samples were collected at each location downstream from RM 9.4. Surface NH_3-N concentrations were generally higher than bottom samples, but the differences were generally small (0.1-0.3 mg/l). Ammonia-N concentrations peaked immediately upstream and downstream from the Toledo WWTP (RM 1.4), and declined with distance away (both upstream and downstream) from this source. Concentrations downstream from the WWTP to the mouth remained elevated compared to samples from farther upstream, however.

- Surface and bottom D.O. concentrations also exhibited minimal differences with bottom D.O. usually higher. Violations of the 4 mg/l WQS were measured downstream from RM 4.9. Longitudinally, D.O. concentrations followed a general pattern similar to the "sag" typically observed in free-flowing rivers when the results were plotted against linear distance from the Toledo WWTP. Overall, D.O. declined to the lowest point upstream from the Toledo WWTP (RM 1.4) and downstream from Swan Creek (RM 5.2).

- Zinc concentrations exceeded the WWH WQS downstream from the Toledo WWTP (RM 1.4) reaching a maximum concentration of 170 ug/l on three occasions at RM 1.0 and 0.2.

- Arsenic was detected in measurable quantities between RM 20.7 and the mouth (RM 0.0). Concentrations were highest at RM 6.5 (23 ug/l), 4.9 (34 ug/l), and 3.3 (40 ug/l) downstream from a previously unknown discharge (maximum conc. = 38,500 ug/l) at Rossford. None of the instream values are WQS violations, but are much higher than background levels.

Bottom Sediment Chemistry (Tables 6 and 6a)

- Sediment concentrations of several heavy metals (chromium, lead, zinc) were classified as highly to extremely elevated (Kelly and Hite 1984) and moderately to heavily polluted (U.S. EPA great lakes harbors criteria) downstream from RM 9.4. In contrast concentrations in the Grand Rapids dam pool (RM 32.6) were non-elevated and non-polluted, respectively.

- Concentrations for each of the seven heavy metal parameters analyzed were highest at either RM 4.9 or 1.0 with the exception of arsenic which was highest at RM 9.4. With the exception of copper sediment concentrations for the remaining parameters were in the elevated to extremely elevated range and the moderately to heavily polluted ranges at these two locations.
- Analysis for organic chemical compounds revealed none above detection at RM 9.4, but several compounds were detected at RM 4.9. PAHs were the most frequently detected with phenanthrene and fluoranthene at 11.0 ppm. Concentrations of these and other compounds were reduced at RM 1.0.

Macroinvertebrates (Table 7; Figures 7-8)

- Water quality conditions as reflected by the macroinvertebrate community ranged from exceptional to fair in the mainstem upstream from the estuary section (RM 54.9-20.9). Invertebrate Community Index (ICI) values ranged from 26-54 and diverse assemblages of mayflies and caddisflies were present. Departures from the WWH ICI criteria in the Grand Rapids dam pool (RM 44.2 and 34.8) were attributed to a lack of consistent current due to the impoundment type habitat. ICI values of 26 and 28 probably represent the level of performance that can be expected in such habitats. No significant impairments due to water quality were noted in this segment. The slack water inhabiting caddisfly Cyrnellus fraternus was collected in relatively high numbers.
- Downstream from RM 15.0 the macroinvertbrate community changed in response to the influence of estuary type habitat. No formal or interim ICI criteria have been developed for these areas, therefore community performance was interpreted in narrative terms on a best professional judgement basis. ICI scores were useful, however, on a site comparison basis.
- Narrative evaluations were fair to marginally good downstream to RM 8.8 (ICI range = 14-24). Downstream from RM 7.3 the results were judged to represent marginally fair water quality, recovering slightly to fair at RM 0.7. ICI values ranged from 6-16 in this section.
- A comparison of samples collected from the north (river left looking downstream) and south shoreline of the river downstream from RM 15.0 revealed somewhat higher ICI scores from the south (right) shore. Mayflies and caddisflies were generally absent from the north shore locations. Conversely, mayflies and slack water inhabiting caddisflies were present at the south shore locations. Most of the CSOs, Swan Creek, and the Toledo WWTP discharge to and impact the north shoreline.

Fish Community (Tables 9-10; Figure 11)

- Electrofishing collections in the free-flowing sections of the mainstem generally resulted in Index of Biotic Integrity (IBI) and modified Index of Well-Being (I_{wb}) scores that marginally attained the WWH criteria. An exception was the two sites (RM 33.0 and 38.5) in the Grand Rapids dam pool where the impoundment type habitat was a factor and precluded full WWH attainment.

- Downstream from RM 13.7 the fish community reflected fair to poor condition with the poor ratings being most frequent downstream from RM 1.5. Modified I_{wb} values ranged from 6.3-7.1 between RM 3.3 and 13.7 and 4.4-6.7 downstream from RM 1.5. All modified I_{wb} and IBI values (except IBI = 29 at RM 0.4) downstream from RM 13.6 failed to attain the interim criteria for Lake Erie river mouth and harbor areas.

- IBI and modified I_{wb} results were plotted against linear distance away from the Toledo WWTP dishcarge (Fig. 10). The resultant longitudinal profile resembles that commonly observed in free-flowing rivers where the index pattern closely follows the classic D.O. "sag" curve.

- The frequency of external anomalies (deformities, eroded fins, lesions, tumors) was elevated downstream from RM 9.4. Two of the highest rates occurred downstream from Swan Creek (2.7%) and in the Toledo Edison - Bayshore EGS thermal mixing zone (4.7%). Frequencies above 1% were not uncommon elsewhere in this section. These results are typical for areas impacted by CSOs and WWTP discharges. A unique aspect of the Toledo Edison - Bayshore EGS mixing zone location is that the discharge contains Toledo WWTP effluent and chlorine (used as a biocide) is added to the effluent.

<u>Fish Tissue Results</u> (Table 11)

- Total PCB data from 21 fish tissue samples collected from the lower Maumee River mainstem between RM 20.6 to the mouth (RM 0.0) were reviewed. All except one channel catfish sample from RM 0.0 were analyzed as whole body composites. Nine different species comprised these samples with carp being the most frequently tested species.

- All samples analyzed at RM 20.6 had less than 1.0 ppm total PCB (range = 0.2-1.0).

- Total PCB concentrations ranged from 2.1 ppm (1979 yellow perch, RM 0.0) to 11.5 ppm (1982 carp, RM 0.0). Most values were in the 3-6 ppm range.

<u>Aquatic Life Use Attainment Summary</u> (Table 12)

- General attainment of the WWH use designation in the free-flowing section of the lower Maumee River mainstem (RM 54.9-17.2) was full (5 of 9 locations) or partial (3 of 9 locations), with only one site (RM 33.0/34.8) not attaining. This site was located at the downstream end of the Grand Rapids dam pool and habitat alone was the precluding factor. Two of the partial attainment locations were due to IBI scores that fell just outside of the non-significant departure range. The remaining partial attainment site was the upstream most Grand Rapids dam pool site (RM 38.5) where impoundment type habitat was the principal factor. The number of IBI and modified I_{wb} scores that fell into the non-significant departure range may be indicative of more subtle impacts from general nonpoint sources which predominate in the Maumee River watershed. Given the good to excellent habitat quality the general performance of the fish community should have been better. The macroinvertebrate community was generally reflective of very good water quality which may further support the notion of a silt/sediment type of impact on the fish community.

- General attainment of the interim Lake Erie river mouth criteria was either full or partial between RM 15.0 and RM 13.6. Downstream from RM 9.4 thirteen (13) of 17 sites were <u>not</u> attaining these criteria. The relative magnitude of the non-attainment increased downstream from RM 4.7.

- The major sources responsible for the impairment of aquatic life uses in the lower mainstem Maumee River were the Toledo WWTP, CSO discharges to the mainstem and via Swan Creek, and possibly the LOF-Rossford landfill discharge. The biological impairment observed was generally correlated with elevated concentrations of NH_3-N, zinc, and low D.O. Some correlation with the extent and severity of bottom sediment contamination was also noted.

SWAN CREEK

Swan Creek was sampled between RM 10.2 and 0.5 for chemical/physical water quality (6 locations), bottom sediment chemistry (1 location), macroinvertebrates (6 locations), and fish (8 locations) during 1986. In addition the results of fish sampling at RM 21.2 in 1984 was also considered.

<u>Physical Habitat for Aquatic Life</u>

- The lower 3 miles of Swan Creek are influenced by the level of Lake Erie and the RM 4.4 location is impounded by a small roller dam. The RM 10.2 location was free-flowing and had good pool-run-riffle habitat.

- QHEI values ranged from 55-62 ($\bar{X}$ QHEI = 57.8) at RM 0.5-4.4 reflecting the impoundment type and estuary habitat characteristics. A QHEI of 70 at RM 10.2 reflected very good stream habitat.

<u>Chemical/Physical Water Quality</u> (Tables 2-4; Figure 5)

- Chemical water quality was generally good at RM 10.2 and 4.9 with only minor WQS violations for copper and phenolics which occurred following rainfall events. Some nutrient enrichment was evident at both sites with elevated nitrate-N (NO_3-N) at RM 10.2 and elevated NH_3-N at RM 4.9. The influence of general urban runoff was evident in detectable concentrations of lead, zinc, and oil and grease at RM 4.9.

- Degradation of chemical water quality becomes more evident at RM 3.9 within the general area affected by CSO discharges (RM 4.2-0.1). Ammonia-N reached its highest concentration at RM 3.9 and D.O. values were lowest at RM 2.6, 1.2, and 0.5. The NH_3-N values were highest (max.= 2.35 mg/l) following rainfall events and were at or below detection (0.05 mg/l) during dry weather. D.O. was highly variable with daily maximum values of 8.0-9.5 mg/l and minimum values of 0.2-0.4 mg/l at the three downstream locations.

- Phenolics were elevated (max.= 34 ug/l) in the lower 2.6 miles and reflected spills or releases of creosote into the sewer system and the stream via a CSO located at RM 2.6.

- Highly elevated fecal coliform counts (290,000-1,800,000/100 ml) indicate the discharge of raw sewage via CSOs into the lower 2.6 miles of Swan Creek.

Bottom Sediment Chemistry (Tables 6 and 6a)

- Elevated to extremely elevated concentrations of chromium, lead, zinc, and arsenic were measured in a sediment sample collected at RM 1.2. These parameters along with nickel were also considered moderately to heavily polluted.

- Eleven (11) different PAH derivitives were detected at RM 1.2 and included three compounds in excess of 20 ppm, the highest in the study area. Total PCB was also detected at 1.6 ppm.

Macroinvertebrates (Table 7; Figure 9)

- A fairly diverse community assemblage was found at RM 10.2 upstream from the urban and CSO impacts. The pollution intermediate mayfly Stenacron predominated. An ICI value of 24 reflected only fair water quality.

- Declining water quality was evident at RM 4.9. The mayfly genus Stenacron continued to predominate, but a reduced population of other mayflies and the absence of caddisflies resulted in an ICI of 16 which is at the extreme low end of the fair range.

- Poor water quality conditions were indicated by the macroinvertebrate community at RM 3.9, 2.6, and 1.2, all of which are impacted by CSO discharges. The substrate was covered by a layer of sewage sludge and oil was noted on the surface. Pollution tolerant organisms (oligochaetes, pulmonate snails) predominated and mayfly and caddisfly taxa were nearly absent. ICI values ranged from 6-8 which indicated poor water quality.

- A detectable increase in the number of taxa was noted at RM 0.6, but overall water quality remained poor (ICI = 12). Much of this increase was due to the addition of pollution tolerant midge taxa.

Fish Community (Tables 9-10; Figure 12)

- The fish community at RM 10.2 reflected a moderate degree of degradation presumably due to land use practices in the upper watershed. An IBI of 25 and a modified I_{wb} of 5.6 indicate the impairment, particularly in view of the very good habitat (QHEI = 70). Historical data (1984) from RM 21.6 (IBI = 30) indicated marginal attainment of the WWH use (HELP ecoregion criteria = 32).

- A similarly degraded fish community was observed at RM 4.4. This site is impounded and the IBI (24) and modified I_{wb} (5.9) barely miss the HELP criteria for the proposed Modified Warmwater Habitat (MWH) use for impounded sites. Several pipes (presumably storm sewers) were observed and one appeared to be discharging raw sewage.

- A severely degraded fish community was noted downstream from RM 3.9 within the area impacted by CSOs. The impairment was the most severe at RM 2.6 and 1.2 with IBI and modified I_{wb} values indicating a toxic response. During the second sampling run no fish were collected and several dead fish and dead rodents were observed. Significant quantities of creosote was apparent in the sediments and as an oily film on the surface at these two sites. A CSO outfall at RM 2.6 was identified as

  the source of this problem. Some recovery from these conditions occurred at RM 0.5. The influx of relatively less polluted Maumee River water and the proximity to the mainstem fish community were factors in this improvement. Overall community condition remained poor, however.

<u>Fish Tissue Results</u> (Table 11)

- One sample (carp, whole body) collected at RM 0.5 in 1986 had a total PCB concentration of 5.9 ppm.

<u>Aquatic Life Use Attainment Summary</u> (Table 12)

- Swan Creek failed to fully attain the WWH use in the lower 10.2 miles. The impairment was most severe at RM 3.9, 2.6, and 1.2, all of which are impacted by CSO discharges. Biological performance at these locations was poor or very poor. The non-attainment at RM 10.9 seemed related to nonpoint source impacts and at RM 4.4 to impoundment and possibly general urban/CSO impacts.

- In addition to sewage from CSO discharges, creosote was discharged in significant amounts from a CSO at RM 2.6. This resulted in acutely toxic conditions that resulted in a fish kill and longer term impairments as evidenced by the biological community results.

OTTAWA RIVER/TENMILE CREEK

Tenmile Creek was sampled at three locations (RM 5.1, 4.1, 1.0) upstream from its confluence with the Ottawa River for chemical/physical water quality, macroinvertebrates, and fish. The Ottawa River was sampled for chemical/physical water quality (6 locations), bottom sediment (2), macroinvertebrates (7), and fish (8) between RM 18.5 and 1.6.

<u>Physical Habitat for Aquatic Life</u>

- Tenmile Creek has been previously modified as evidenced by a straightened, rip-rap lined channel at RM 5.1. QHEI values of 58 at RM 5.1 and 4.1 reflected these past modifications. The substrate at RM 4.1 was largely composed of sand and was the likely result of sand and gravel discharges. Habitat was much improved at RM 1.0 (QHEI = 74).

- The upstream site on the Ottawa River (RM 17.8) had very good habitat (QHEI = 73) with no evidence of recent modifications.

- Evidence of past stream channel modification existed from RM 12.2 to 1.6 (X QHEI = 53). Encroachment of general urban activity on the riparian buffer zone increased as the Ottawa River entered the Toledo urban area. Bank stabilization (rip-rap), diking, bridge construction, and channel maintenance were the principal modifications. Despite these activities instream cover and pool quality were good.

- The level of Lake Erie and attendant seiches affects the Ottawa River from 7-8 miles upstream. This results in a 100 percent pool and backwater habitat with flow reversals in the lower section.

<u>Chemical/Physical Water Quality</u> (Tables 2-4; Figure 6)

- Chemical water quality in Tenmile Creek was generally good with the following exceptions: one cyanide sample was well above detection (160 ug/l) and NH_3-N was elevated at RM 5.1. Fecal coliform bacteria counts (6100-7400/100 ml) were also elevated throughout this area. The longitudinal D.O. pattern reflected an increase from RM 5.1 to 1.1 suggesting recovery from lower levels upstream. This along with the elevated NH_3-N and fecal coliforms suggests mild sewage enrichment at and downstream from RM 5.1.

- Detectable quantities of cadmium were noted at RM 4.1 in Tenmile Creek which is downstream from the Kings Rd. landfill (RM 4.5).

- Good chemical water quality was observed in the Ottawa River at RM 17.9. Two detections (but not WQS violations) of cadmium were noted, however.

- Water quality remained good at RM 12.2, but the longitudinal pattern indicates the beginning of a decline in D.O. and increases in NH_3-N. Fecal coliform counts were elevated (4600/100 ml).

- WQS violations for D.O. began at RM 8.9 and increased in severity downstream to RM 6.4. Considerable varability between samples both on a diurnal and temporal basis were noted. D.O. measurements taken near the bottom were much lower than near the surface indicating the significant effect of organic sludge. This area is impacted by CSO discharges, several point sources, and two major landfills. Some slight improvements were noted at RM 4.9, but WQS violations remained.

- Ammonia-N concentrations generally increased at each station downstream with the highest maximum values recorded at RM 6.4 and 4.9. None of these were WQS violations, however. A great deal of variability was noted for NH_3-N with several individual samples less than detection (0.05 mg/l). The maximum values were recorded following rainfall events and are presumably related to CSO discharges.

- The amount of floating trash, debris, and other flotsam increased in the lower 6-8 miles of the Ottawa River. The appearance of oil and surface films was likewise more prevalent in this section.

Bottom Sediment Chemistry (Tables 6 and 6a)

- Heavy metal concentrations were extremely elevated for chromium, lead, and zinc at RM 6.4 and 4.9 in the Ottawa River. These concentrations also were in the moderately to heavily polluted categories for Great Lakes harbor areas. Nickel concentrations were in the heavily polluted range at RM 6.4. With the exception of copper, metals concentrations were higher at RM 6.4.

- Analysis for organic chemical compounds revealed two PAH derivitives and total PCB (1.6 ppm) at RM 6.4. This increased to 11 compounds (mostly PAHs) including total PCB (2.5 ppm) at RM 4.9.

- Total PCB concentrations in sediment collected in October 1986 (need reference) at RM 6.4 and 4.9 were 1.6 ppm and 2.1 ppm, respectively. Water column concentrations were at or slightly above detection. Bottom sediment samples from the Ottawa River immediately adjacent to the Dura Landfill (RM 5.1) ranged from 2.1-17 ppm. Samples collected from the stream bank soils had concentrations of 2-193 ppm.

Macroinvertebrates (Table 8; Figure 10)

- Qualitative sampling in Tenmile Creek revealed fair to marginally good water quality. Isopods predominated at RM 5.1 and 4.1 with midges and mayflies common. A slight improvement was noted at RM 1.0 with water pennies, heptagnid mayflies, and hydropsychid caddisflies predominating.

- Only fair water quality was indicated in the Ottawa River at RM 18.5 (ICI = 24). Although taxa richness was relatively good the community was predominated by pollution intermediate and tolerant organisms.

- The macroinvertebrate community declined at RM 11.0 with an ICI of 14 indicating marginally fair water quality. Black flies and pollution intermediate caddisflies (genus Cheumatopysche) predominated.

- Degradation worsened to the poor range at RM 9.0 (ICI = 10) and reflected the impact of CSO discharges even though estuary conditions prevailed.

- Poor water quality was further reflected by the results at RM 7.4 and downstream to RM 4.9. The community was composed almost entirely of tolerant organisms. ICI values ranged from 6-10.

- A slight improvement was noted at RM 1.6 although the evaluation was poor (ICI = 6). The collection of a mayfly (Caenis) and caddisfly (Cyrnellus fraternus) indicated the slight improvement which was apparently due to dilution of degraded Ottawa Riber water with Maumee Bay water.

Fish Community (Tables 9-10; Figure 13)

- Modified habitat at RM 5.1 and 4.1 in Tenmile Creek may have influenced the results. Both the IBI and modified I_{wb} results attain the proposed Modified Warmwater Habitat (MWH) criteria for HELP ecoregion wading site type. However, QHEI scores of 58 indicate that sufficient habitat should have been available to attain the HELP WWH criteria.

- The fish community failed to fully attain the IBI and modified I_{wb} WWH criteria for the HELP ecoregion at RM 1.0 despite a much improved macrohabitat (QHEI = 74).

- The Ottawa River fish community at RM 17.8 was similar in performance to Tenmile Creek. Macrohabitat was very good (QHEI = 73) at this site, also.

- Fish community condition declined at RM 9.8 with the modified I_{wb} indicating very poor performance. An odor of raw sewage was prevalent at this site.

- Degradation worsened further at RM 8.7 with both indices reflecting poor and very poor community performance. CSO impacts were evident as were spills of oils and thinned paints (discharged via a CSO by AMC Jeep).

- The severe level of degradation persisted between RM 8.7 and 4.7 with poor to very poor community performance. Previous stream bank erosion exposed trash and debris from the many small landfills that are located along the Ottawa River (Toledo Metropolitan Area Council of Governments 1988).

- Some improvement was noted at RM 1.8 even though overall community performance was fair. This was likely the result of dilution by less polluted Maumee Bay water and the proximity to Maumee Bay itself.

<u>Fish Tissue Results</u> (Table 11)

- Fish tissue samples were collected at RM 1.6 and 4.9 in the Ottawa River and at RM 4.1 in Tenmile Creek. All except the RM 1.6 sample (largemouth bass) were carp whole body composites. Total PCB content was 12 ppm (largemouth bass) and 25.4 ppm (carp) in the Ottawa River at RM 1.6 and 15.1 ppm at RM 4.9. The sample from RM 4.1 in Tenmile Creek contained 6.8 ppm total PCB.

<u>Aquatic Life Use Attainment Summary</u> (Table 12)

- The existing WWH use was not fully attained at any of the 3 Tenmile Creek or 8 Ottawa River sampling locations. Partial attainment was observed at RM 1.0/1.1 in Tenmile Creek. The relative magnitude of the WWH non-attainment was the greatest in the Ottawa River between RM 9.0 and 4.7.

- Although macrohabitat conditions in Tenmile Creek were locally marginal, this alone does not explain the serious non-attainment of the WWH use. Unexplained sources of organic enrichment and possibly episodic releases from industrial sources and landfill leachate were possible causes of the observed use impairment.

- Use impairment in the free-flowing section of the Ottawa River were linked to organic enrichment from unknown sources. A sanitary sewer line parallels the Ottawa River in the vicinity of RM 9.8-11.0 upstream from any known CSO discharges. The odor of raw sewage was noted in this area on each sampling run and this combined with the use impairment indicate that sewage (probably untreated) is entering the Ottawa River.

DUCK CREEK/OTTER CREEK

Samples were collected at 4 locations in Duck Creek for chemical/physical water quality, 1 location for bottom sediment, and 3 locations each for macroinvertebrates and fish (Table 1). Otter Creek was sampled for chemical/physical water quality (4 locations), bottom sediment (3), macroinvertebrates (4), and fish (5). One chemical/physical water quality and one macroinvertebrate site were sampled in Cedar Creek which is adjacent and to the east of Otter Creek.

Physical Habitat for Aquatic Life

- Overall macrohabitat was poor in both streams. QHEI values ranged from 35-47 ($\bar{X}$ QHEI = 41) in Otter Creek and 34-44 ($\bar{X}$ QHEI = 40) in Duck Creek. Both streams contained visual evidences of past channel modification and very little if any recovery has occurred.

Chemical/Physical Water Quality (Tables 2-5)

- Some of the most significant water quality problems in the study area were encountered in Otter Creek and Duck Creek. Minimum D.O. values in both streams was less than 1 mg/l on several occasions.

- Otter Creek had significantly elevated concentrations of arsenic at RM 5.9 just downstream from the abandoned LOF landfill which physically covers a section of Otter Creek. Violations of the WQS for the prevention of acute toxicity were recorded twice. Concentrations declined abruptly at RM 4.0, but remained above detection limits downstream to RM 0.5.

- Arsenic concentrations were elevated to a much lesser degree in Duck Creek at RM 3.0, and these likewise declined in a downstream direction to RM 0.4.

- Ammonia-N levels were elevated in Otter Creek and in combination with high pH readings resulted in WQS violations for the prevention of acute toxicity and the chronic WWH criterion. Elevated readings persisted to RM 0.5 and WQS violations were recorded downstream to RM 2.1. High NH_3-N levels were also recorded at RM 3.0 and 2.1 in Duck Creek which likewise resulted in WQS violations.

- Phenolics concentrations exceeded the WQS for fish flesh tainting (10 ug/l) at 3 locations in Otter Creek and one location in Duck Creek. None of the concentrations were high enough to cause any toxicity problems for aquatic life, however. Concentrations in Otter Creek were highest at RM 5.9 and declined to less than detection at RM 0.5.

- Several violations of the WWH WQS for copper were observed, but only one at RM 0.5 in Otter Creek was considered significant.

- Several organic chemical compounds were detected in water column samples upstream and downstream from the Evergreen landfill, in a small ditch adjacent to Fondessey Enterprises, and in a tributary to Driftmeyer Ditch following a spill from Commercial Oil. None were at particularly high concentrations, but their detection in the water column is noteworthy.

<u>Bottom Sediment Chemistry</u> (Tables 6 and 6a)

- Concentrations of chromium, lead, zinc, and arsenic were highly to extremely elevated and moderately to heavily polluted in Otter Creek. Nickel was in the moderately polluted range and copper was elevated and heavily polluted at RM 2.1. Zinc and arsenic declined with distance downstream and chromium, lead, and nickel were highest at RM 4.0.
- In Duck Creek lead, zinc, and arsenic were elevated to highly elevated and moderately or heavily polluted.
- Four organic chemical compounds were detected at low levels and included toluene, pyrene, and two phenol derivitives.

<u>Macroinvertebrates</u> (Table 8)

- Upstream from the LOF landfill in Otter Creek the macroinvertebrate community was predominated by pollution tolerant taxa. Water quality was considered fair.
- Downstream from the LOF landfill (RM 6.0) and at all sites downstream to RM 2.0 water quality was very poor (ICI = 0). No organisms were collected from the artificial substrate samplers at RM 6.0 and only 2 taxa were found on the natural substrates. Conditions were considered to be acutely toxic. The severe toxicity indicated between RM 6.0 and 2.0 was only slightly diminished at RM 0.3 (ICI = 2).
- Sampling in Cedar Creek, a similarly sized stream in an adjacent subbasin, produced a macroinvertebrate community predominated by Heptagniid and Ephemeriid mayflies. An ICI score of 34 met the HELP ecoregion WWH criteria.
- The Duck Creek macroinvertebrate community reflected poor water quality at RM 3.0 (ICI = 4). Some slight improvement was noted at RM 2.1 and 0.4 (ICI = 10 at both sites), but pollution tolerant taxa still predominated. Water treatment plant lime sludge blanketed the substrates in Duck Creek.

<u>Fish Community</u> (Tables 9-10)

- Macrohabitat (both small stream size and channel modification) was a principal limiting factor at Otter Creek RM 7.2. Potential sources of water quality degradation were also located upstream. Only two fish species were found at RM 7.2.

- Severe degradation was observed in the remainder of the Otter Creek mainstem between RM 5.7 and 0.5. One or two species each were collected at RM 5.7, 2.1, and 0.5. No fish were found at RM 4.0. IBI values were 12 at all of these sites with the exception of IBI = 13 at RM 0.5.

  Modified I_{wb} values were less than 1.0 at each site. These results reflect severe degradation of an acutely toxic character. Macrohabitat, although quite marginal in Otter Creek, was not the principal limiting factor in these results. Various colors of precipitates and noxious chemical odors were noted at the sampling site (RM 5.7) downstream from the LOF landfill. The stream banks and substrates at RM 4.0 downstream from the Sun Oil Co. refinery were oil soaked. Heated effluent (T[°C] of 38 were measured) impacted the RM 0.5 location.

- The Duck Creek fish community was affected by the relatively poor macrohabitat and chemical water quality. The RM 3.0 location minimally attained the proposed HELP ecoregion MWH criteria for the IBI (22). Results at RM 2.1 reflected further degradation (IBI = 15). The fish community improved substantially at RM 0.5 (IBI = 34) and partially attained the interim criteria for Lake Erie river mouth areas. The dilution provided by less polluted Maumee Bay water and the presence of fish species associated with such larger water bodies likely aided the community performance at this location.

<u>Aquatic Life Use Attainment</u> (Table 12)

- The existing WWH habitat use was not attained at any of the 5 Otter Creek locations or the 3 Duck Creek locations. One location in Duck Creek partially attained the interim criteria for Lake Erie river mouth areas. Overall conditions were rated as poor or very poor in both streams. In contrast Cedar Creek fully attained the HELP ecoregion WWH criteria for the ICI.

- Given the extensive macrohabitat modifications and apparent lack of physical recovery it is doubtful that the WWH use can realistically be attained in either creek. However, biological improvements should be expected with improved chemical water quality. The proposed MWH criteria were not attained at any of the Otter Creek locations and at only one location in Duck Creek. The MWH biocriteria are the minimum levels of biological community performance that a habitat modified stream should be able to support.

- The severe non-attainment in Otter Creek was due to a complex combination of impacts including landfill leachate (LOF landfill) and major point sources of wastewater (Sun Oil, BP America refineries).

- Non-attainment in Duck Creek was somewhat less severe, but still substantial. This was attributed to a combination of factors that include water treatment plant sludge, landfill leachate (abandoned), and possibly the Toledo Edison-Acme EGS ash pond discharge. It is also possible that unknown sources of contamination are also impacting Duck Creek.

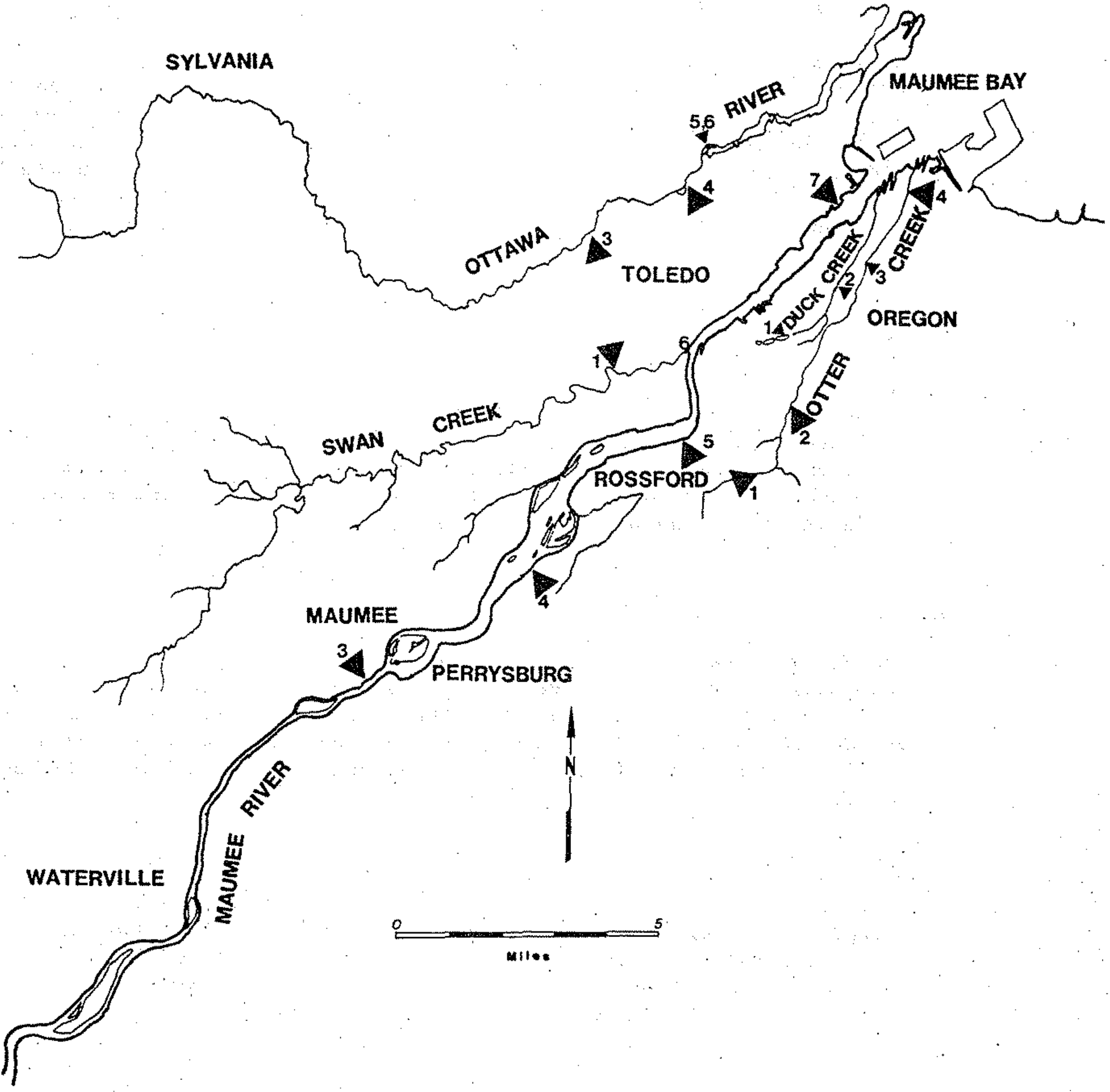
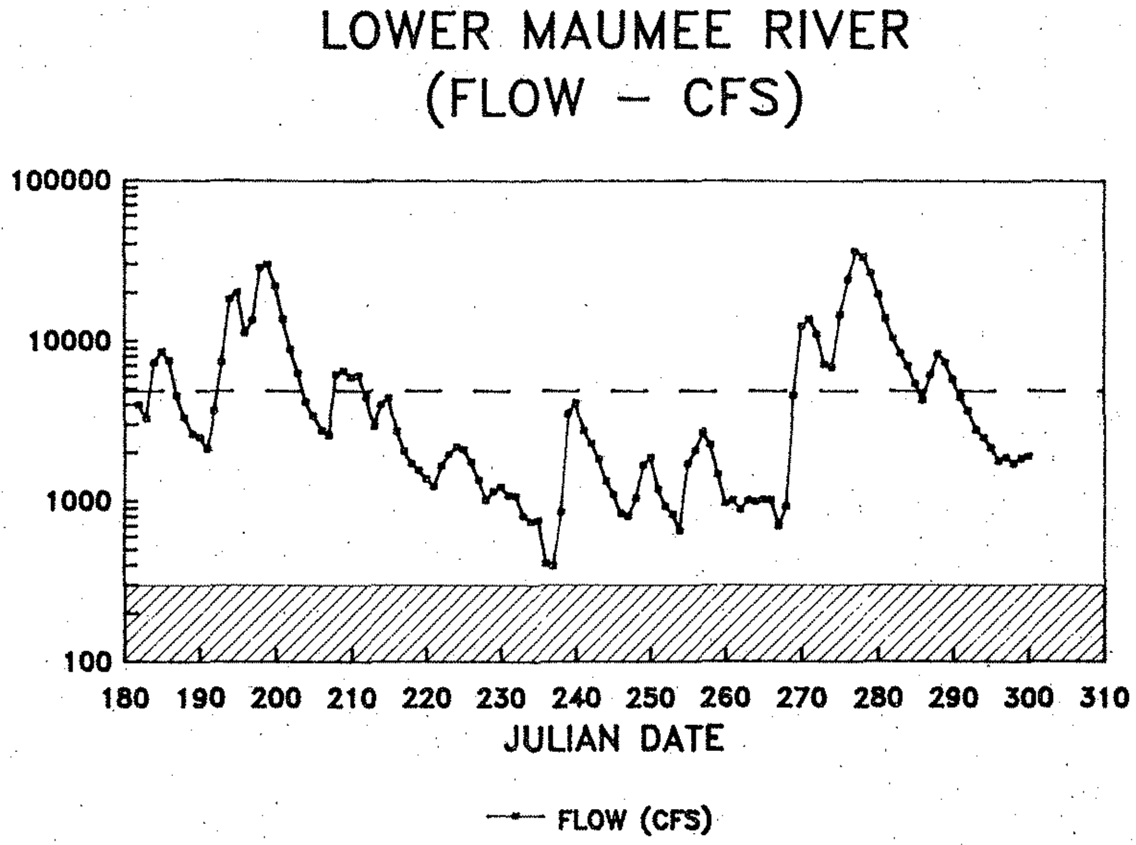


Figure 1. The Lower Maumee River study area showing principal streams and tributaries, population centers, and pollution sources (see Table 4 for discharger legend).

Table 1. Summary of sampling conducted in the lower Maumee River study area, June-October, 1986. Number of locations is given by sampling type.

Segment	Chemical/ Physical	Sediment	Fish	Macro-invertebrates
Maumee R. & Bay (RM 54.9-0.0)	14*	4	27	18
Swan Creek (RM 10.2-0.5)	6	1	8	6
Ottawa River (RM 18.5-1.6)	6	2	8	7
Tenmile Creek (RM 5.1-1.0)	3	-	3	3
Otter Creek (RM 7.2-0.3)	4	3	5	4
Duck Creek (RM 3.0-0.4)	3	1	3	3
Cedar Creek (RM 20.8)	1	-	-	1
Total Sites	37	11	54	39

* water column parameters are listed in Table 2.



WATERVILLE USGS GAGE

Figure 2. Flow hydrograph for the Maumee River near Waterville, Ohio (RM 20.7); May 1 through October 31, 1986. Critical low flows ($Q_{7,10}$ [94 cfs] to 80% duration flow [300 cfs, May through November for the period of record 1939 to 1978]) are represented by the shaded area; dashed line represents period of record average flow.

Table 2. Chemical/physical parameters measured in the water column in the Lower Maumee River study area, 1986[a].

Temperature
Dissolved Oxygen (D.O.)
pH
Conductivity
Flow
Ammonia-Nitrogen (NH_3-N)
Nitrate-Nitrogen (NO_3-N)
Nitrite-Nitrogen (NO_2-N)
Total Kjeldahl Nitrogen (TKN)
Phosphorus, Total (P-T)
Hardness, Total ($CaCO_3$)
Residue, Total Nonfilterable (TSS)
Oil and Grease (O&G)
Chemical Oxygen Demand (COD)
Cadmium, Total Recoverable (Cd-TR)
Calcium, Total Recoverable (Ca-TR)
Chromium, Total Recoverable (Cr-TR)
Copper, Total Recoverable (Cu-TR)
Iron, Total Recoverable (Fe-TR)
Lead, Total Recoverable (Pb-TR)
Magnesium, Total Recoverable (Mg-TR)
Nickel, Total Recoverable (Ni-TR)
Zinc, Total Recoverable (Nn-TR)
Phenolic Compounds (Phenol)
Cyanide, Total (CN-T)
Arsenic, Total Recoverable (AS-TR)
Selenium, Total Recoverable (Se-TR)

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[a] Sample collection, preservation, and analytical methods are specified in Ohio EPA (1987a).

Table 3. Violations of Ohio EPA Warmwater Habitat water quality standards (OAC 3745-1) for chemical/physical parameters measured in the Lower Maumee River study area, 1986. Violations of criteria for the prevention of acute toxicity or the prevention of nuisance conditions are denoted with a double asterisk (**).

Stream Name Location	River Mile	Violation: Parameter(value)
Maumee River		
Grand Rapids Dam pool	32.6	Cu (15, 20, 35)
Waterville St. Rt. 64	20.7	Cu (15)
Ust. I-475	17.2	Cu (15, 15, 20)
Ewing Island	13.6	Cu (18, 30)
Eagle Pt.	9.4	Cu (14, 18, 30, 35)
Dst. I-75	6.5	Cu (15, 20, 15, 17)
Cherry St.	4.9	Cu (20, 12, 18, 17); Pb (70); D.O. (3.0)
U.S. Rt. 120	3.3	Cu (25, 17, 18, 11, 10); D.O. (2.6, 3.0, 3.6)
Ust. Toledo WWTP	1.5	Cu (12, 14, 10); D.O. (3.2, 3,2, 3.5, 3.5); Cu (10, 10)
Dst. Toledo WWTP	1.0	Zn (170, 170); D.O. (3.8, 3.7, 3.9, 3.3)
Near Mouth	0.5	Cu (30, 10, 12, 15, 15); D.O. (3.6)
Grassy Island/ Cullen Park	0.2	Cu (20, 20); Zn (140, 170)
Bayshore Intake	0.1	Cu (20, 20, 10); D.O. (3.1, 2.1)
Presque Isle	0.0	Cu (20, 20, 11, 15); Zn (140); D.O. (3.1)

Table 3. continued.

Stream Name Location	River Mile	Violation: Parameter(value)
Tenmile Creek		
Centennial Rd.	5.1	Cu (9.6); Fe (1280, 3420, 1180)
Sylvania Rd.	4.1	Fe (1240, 3480, 1180)
Old Post Rd.	1.0	Fe (1420, 1120)
Ottawa River		
Sturbridge Rd.	17.9	Fe (1350, 4700)
Bancroft St.	12.2	Fe (2170, 1160, 4180, 2110)
Auburn Ave.	8.9	D.O. (4.2); Cu (7.6); Fe (1890, 2230, 3170, 2120, 3500)
Berdan Ave.	7.4	D.O. (2.3, 3.9); Fe (2330, 1730, 2280, 3150, 2290, 3720)
Lagrange St.	6.4	D.O. (1.7**, 2.8); Cu (9.5); Fe (2700, 1380, 3910, 4310, 2230, 3850)
Stickney Ave.	4.9	D.O. (3.0, 3.9); Cu (13.3, 39.6); Fe (3940, 2900, 2930, 4150)
Swan Creek		
Eastgate Rd.	10.2	Cu (13.0); Fe (3950, 10200); phenolics (23)
Detroit Ave.	4.9	Cu (20.3); Fe (3700, 1040, 18400, 4720)
Champion St.	3.9	D.O. (2.7); Cu (17.7, 9.0); Fe (4450, 1050, 17800, 1290, 4910, 4850)

Table 3. continued.

Stream Name Location	River Mile	Violation: Parameter(value)
Swan Creek (continued)		
Hawley St.	2.6	D.O. (2.3, 0.4**); phenolics (41); Cu (19.1); Fe (19700, 1970, 4650, 2200)
Collingwood Blvd	1.2	D.O. (0.4**, 2.7); phenolics (34); Cu (11.8, 18.8); Fe (1230, 17500, 1330, 3670, 10400)
St. Clair St.	0.5	D.O. (2.6, 0.2**), Cu (10, 12.9); Fe (1510, 9620, 1260, 2780, 1660)
Otter Creek		
Oakdale St.	5.9	D.O. (0.2**, 0.2**, 0.5**); pH (10.0, 10.1, 10.2); NH_3-N (0.4, 2.0, 2.2, 2.5); phenolics (100, 113); As (362**, 388**), Cd (1.0), Cu (30, 21.6, 16.5); Fe (1350, 2140, 2940, 3410)
Wheeling St. (& Starr Ave.)	4.0	D.O. (2.4, 3.5, 3.8); NH_3-N (0.7, 1.4, 1.7); phenolics (25, 27, 34, 48); Cu (9.3)
Millard Ave.	2.1	D.O. (0.1**, 2.7, 3.8); NH_3-N (1.3); phenolics (20, 27, 34); Cu (15); Fe (1210, 1760)
Unnamed Port Rd.	0.5	Cu (15, 17, 25, 53**); Fe (2050, 2250, 3210, 5530)
Duck Creek		
Wheeling St.	3.0	D.O. (0.2**, 0.3**, 0.5**); NH_3-N (5.7, 6.5) Fe (1900, 2320, 2750)
York St.	2.1	pH (9.6), NH_3-N (0.5); Fe (1140, 1400, 1680, 3950); D.O. (2.4)
Oberlin Dr.	0.4	D.O. (1.9**, 3.1); Cu (10.3); Fe (2050, 2140, 2160, 3600)

Table 4. Location of significant point sources of surface water impacts in the Lower Maumee River study area. The number corresponds to that used in the study area map (Figure 1) and longitudinal graphs of the chemical water quality and biological index results (Figs. 3 through 14).

River/Stream River Mile	Number	Description
Maumee River mainstem		
45.9	1	Napoleon WWTP (2PD00000) - 4 CSO, 1 Bypass
43.5 - 45.8	2	Campbell Soup (2IH00021) - mult. outfalls
18.2	3	Lucas Co.- Maumee WWTP (2PK00000)
14.5	4	Perrysburg WWTP (2PD00002) - 7 CSO, 2 Byp.
6.9 - 8.3	5	LOF Rossford (2IN00030) - 9 outfalls
5.2	6	Swan Creek - CSO discharges
1.4	7	Toledo WWTP (2PF00000) - 34 CSO, 1 Bypass
Swan Creek		
2.6	1	Jennison-Wright (no permit) - via CSO
Tenmile Creek/Ottawa River		
5.1 (Tenmile)	1	Reichart Stamping (2IS00008)
4.5 (Tenmile)	2	Kings Rd. landfill (2IN00079)
7.6 - 8.0 (Ottawa)	3	AMC Jeep (2IC00022) - 4 outfalls
6.0 (Ottawa)	4	Diversitech General (2IQ00012)
5.5 - 5.7 (Ottawa)	5	Stickney Ave. landfill - 50 A (closed)
5.1 (Ottawa)	6	Dura landfill - 55 A

Table 4. (continued)

River/Stream River Mile	Number	Description
Otter Creek		
6.4 - 6.6	1	Libbey-Owens-Ford (2IN00020)
4.9 - 5.2	2	Sun Oil (2IG00003)
2.3	3	Fondessey Landfill (2IN00013)
0.4	4	BP America Refinery (2IG00007)
Duck Creek		
4.0 - 4.2	1	Toledo Edison - Acme EGS (2IB00001)
2.6	2	Toledo WTP (2IW00260)

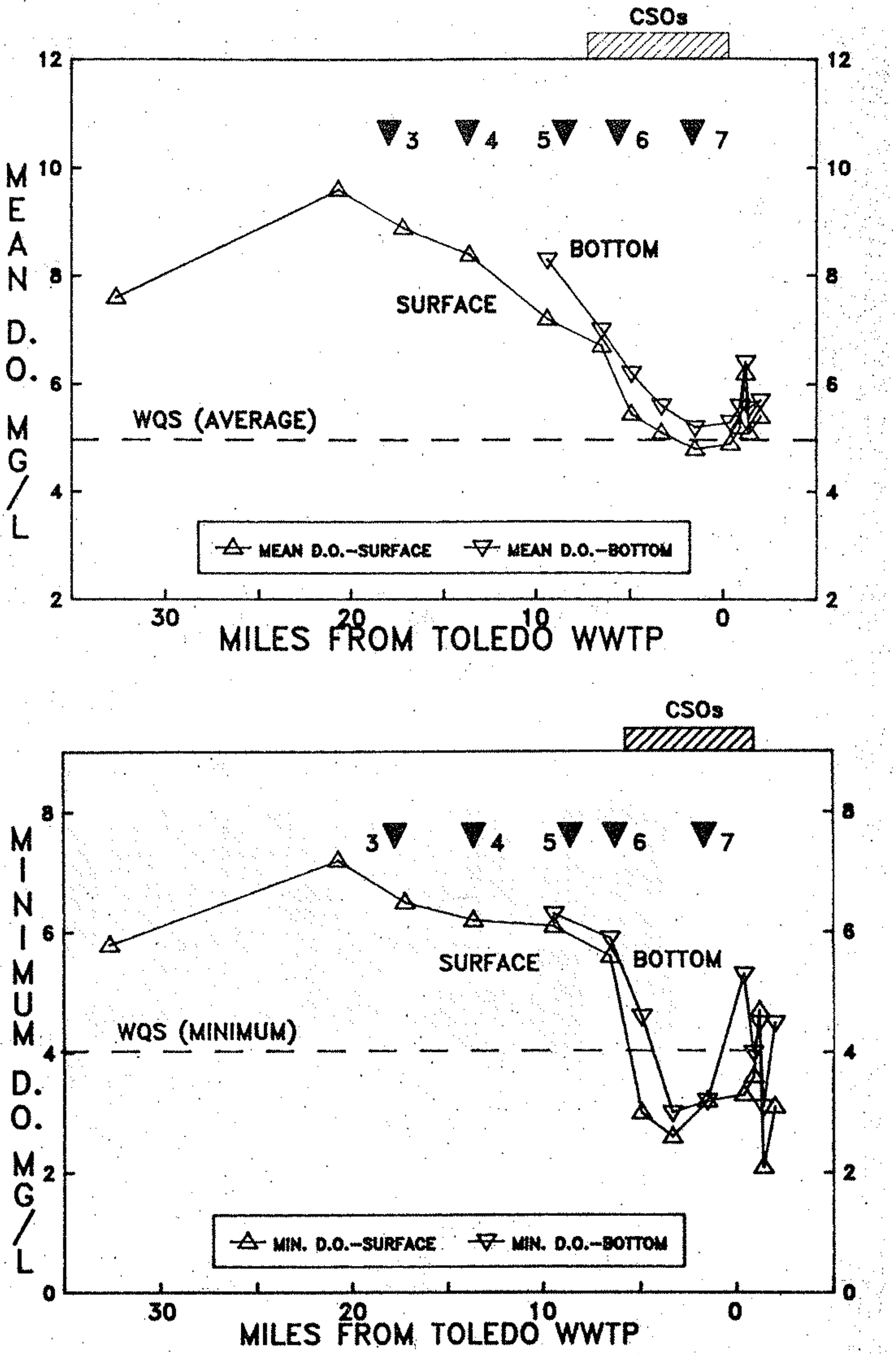

Figure 3. Longitudinal profile of mean (top tier) and minimum (lower tier) dissolved oxygen (D.O.) in the Maumee River mainstem during June - October, 1986.

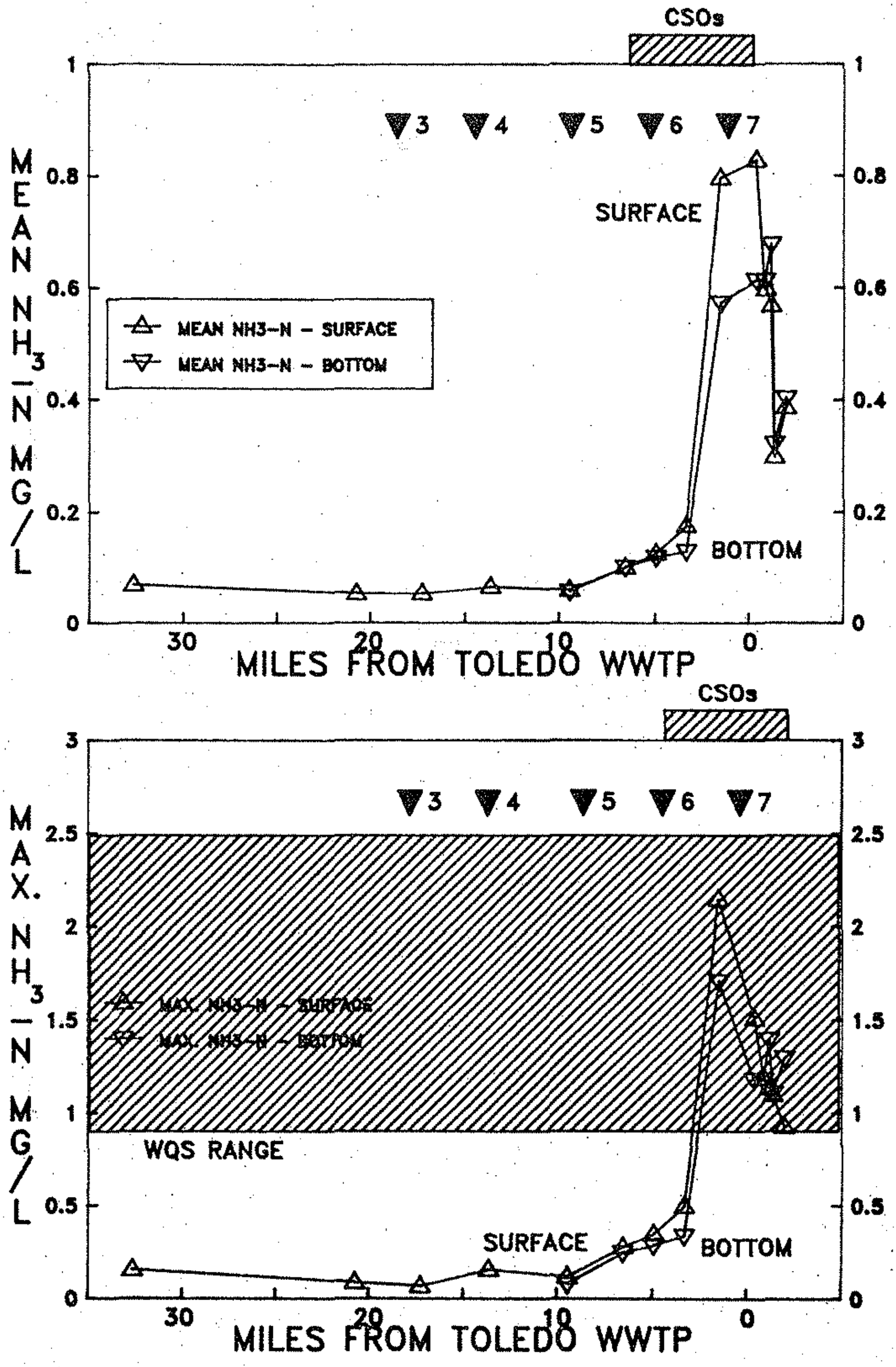

Figure 4. Longitudinal profile of mean (top tier) and maximum (lower tier) ammonia-nitrogen (NH_3-N) in the Maumee River mainstem during June - October, 1986. Shaded area in the top tier is the WQS range between the 90th percentile and 25th percentile pH and temperatures recorded during sample collection.

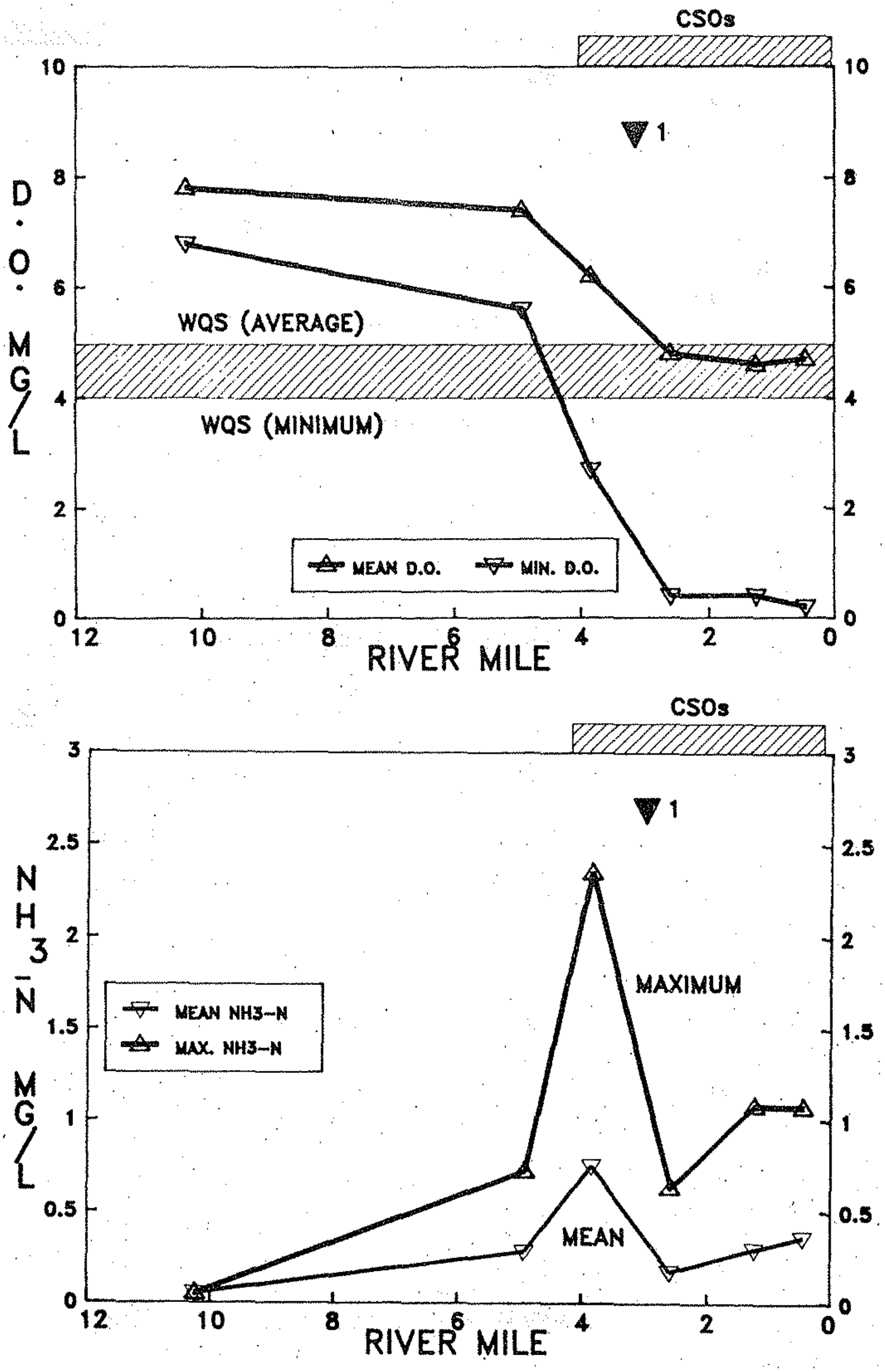

Figure 5. Longitudinal profile of mean and minimum dissolved oxygen (D.O.; top tier) and mean and maximum ammonia-nitrogen (NH_3-N; lower tier) in Swan Creek during June - October, 1986.

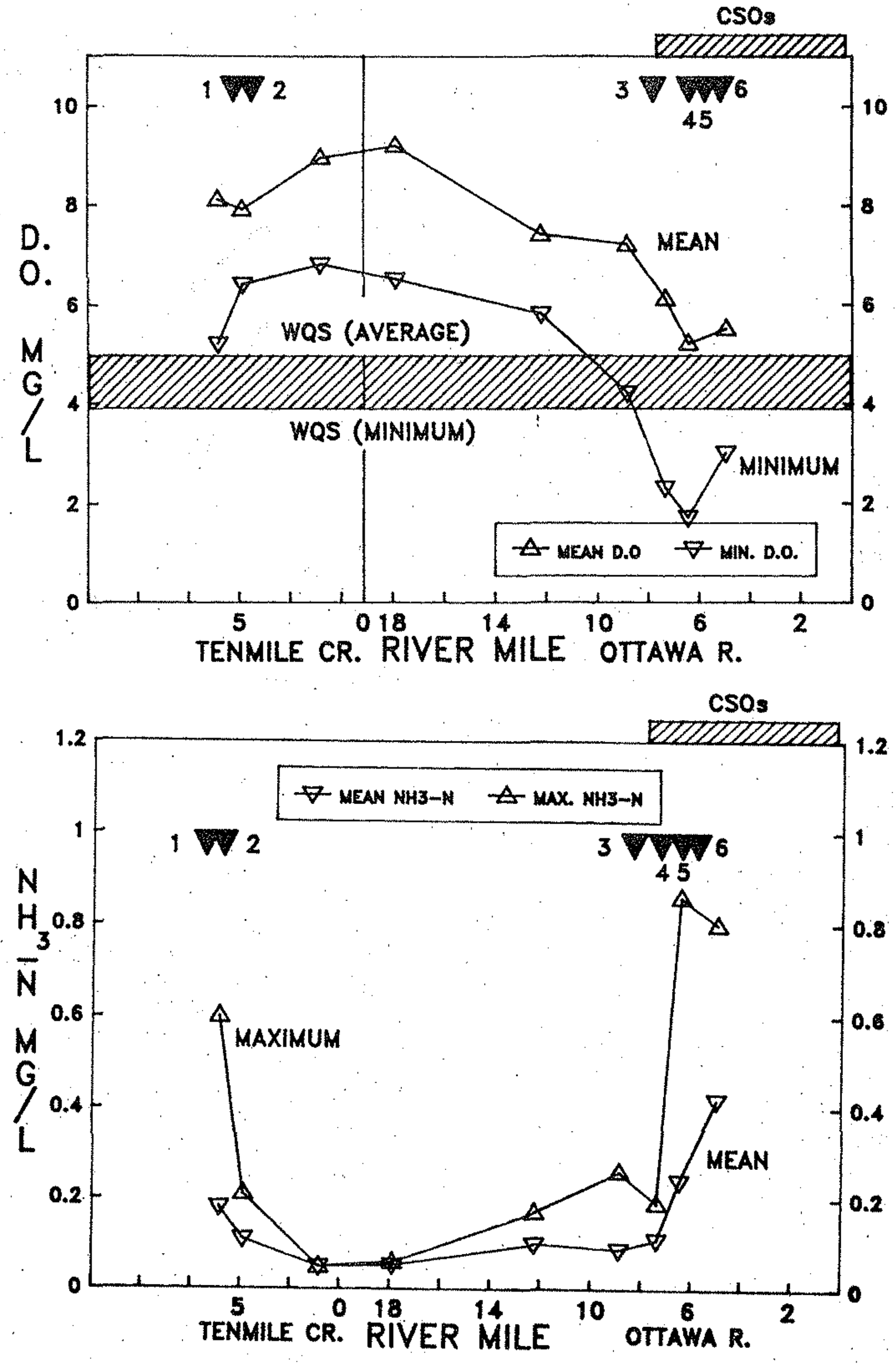

Figure 6. Longitudinal profile of mean and minimum dissolved oxygen (D.O.; top tier) and mean and maximum ammonia-nitrogen (NH_3-N; lower tier) in Tenmile Creek and the Ottawa River during June - October, 1986.

Table 5. Mean and minimum D.O. and mean and maximum NH_3-N, total recoverable arsenic, and phenolics at sampling locations in Otter Creek and Duck Creek during June - October, 1986. Violations of chronic (WWH) criteria are denoted with an asterisk (*) and exceedences of criteria for the prevention of acute toxicity are denoted with a double asterisk (**).

Stream Location	River Mile	D.O. (mg/l) Mean	Min.	NH_3-N (mg/l) Mean	Max.	Arsenic (ug/l) Mean	Max.	Phenolics Mean	Max.
Otter Creek									
Oakdale St.	5.9	1.3**	0.2**	1.76**	2.45**	287*	388**	78*	113*
Wheeling St. (& Starr Ave.)	4.0	3.2*	2.4*	2.02*	2.97*	19	22	29*	34*
Millard Ave.	2.1	3.1*	0.1**	1.38	2.37*	16	20	25*	34*
Unnamed Port Rd.	0.5	4.7*	4.2	0.24	0.42	5	7	20K	20K
Duck Creek									
Wheeling St.	3.0	1.8**	0.2**	3.30*	6.45**	50	89	20K	20K
York St.	2.1	5.2	2.4*	0.74*	1.20**	12	18	47*	102*
Oberlin Dr.	0.4	3.8*	1.9**	0.31	0.36	7	10	20K	20K

Table 6. Concentrations of heavy metals in sediments of the Lower Maumee River study area, 1986. All parameter concentrations, excluding nickel, were ranked based on a stream sediment classificatio system described by Kelly and Hite (1984) and U.S. EPA criteria for great lakes harbor areas. Highly and extremely elevated results are underlined.

Stream Name	River	Sediment Concentration (mg/kg dry weight)						
Location	Mile	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Arsenic
Maumee River								
Grand Rapids Dam pool	32.6	$0.24^{a,N}$	$5.9^{a,N}$	$5.3^{a,N}$	$15.3^{a,N}$	4.8^{N}	$24.5^{a,N}$	
Eagle Point	9.4	$0.95^{b,N}$	$43.2^{d,M}$	$36.3^{a,M}$	$52.3^{c,M}$	44.8^{M}	$178^{d,M}$	$21.5^{d,H}$
Cherry St.	4.9	$1.52^{c,N}$	$33.4^{c,M}$	$65.3^{c,H}$	$108^{e,H}$	34.4^{M}	$190^{d,M}$	$10.1^{b,H}$
Dst. Toledo WWTP	1.0	$1.46^{c,N}$	$57.2^{d,M}$	$45.5^{b,M}$	$52.5^{c,M}$	46.2^{M}	$384^{e,H}$	$12.9^{c,H}$
Swan Creek								
Collingwood Blvd.	1.2	$1.39^{c,N}$	$27.2^{c,M}$	$18.6^{a,N}$	$165^{e,H}$	29.8^{M}	$285^{d,H}$	$13.5^{c,H}$
Ottawa River								
Lagrange St.	6.4	$1.77^{c,N}$	$72.2^{e,M}$	$71.4^{c,H}$	$195^{e,H}$	53.4^{H}	$333^{e,H}$	$6.2^{a,N}$
Stickney Ave.	4.9	$0.52^{b,N}$	$23.4^{c,N}$	$87.2^{c,H}$	$116^{e,H}$	21.2^{M}	$124^{c,M}$	$4.3^{a,N}$
Otter Creek								
Oakdale Ave.	5.9	$0.52^{b,N}$	$32^{c,M}$	$30^{a,N}$	$49^{c,M}$	22^{M}	$170^{d,M}$	$26.1^{d,H}$
Wheeling St.	4.0	$0.66^{b,N}$	$149^{e,H}$	$46^{b,N}$	$142^{e,H}$	26^{M}	$163^{c,M}$	$14.4^{c,H}$
Millard Ave.	2.1	$0.53^{b,N}$	$54^{d,M}$	$71^{c,H}$	$68^{d,M}$	19^{M}	$129^{c,M}$	$7.7^{a,N}$
Duck Creek								
York St.	2.1	$0.60^{b,N}$	$14^{a,N}$	$21.2^{a,N}$	$72.8^{d,M}$	14^{M}	$115^{c,M}$	$13.9^{c,H}$

(Illinois criteria)

^{a} Non-elevated
^{b} Slightly elevated
^{c} Elevated
^{d} Highly elevated
^{e} Extremely elevated

(U.S. EPA Harbor guidelines)

^{N} – non-polluted
^{M} – moderately polluted
^{H} – heavily polluted

Table 6a. Concentrations of organic chemical compounds that were detected in GC/MS analysis of bottom sediment samples from seven locations in the lower Maumee River study area, 1986. All values are in mg/kg (ppm).

	Sampling Location (RM)						
	Maumee R.			Swan Cr.	Ottawa R.		Otter Cr.
Compound	9.4	4.9	1.0	1.2	6.4	4.9	2.1
Acetone	*	0.04		0.04			
Toluene		1.30					0.32
2-methylnaphthalene		0.79					
Acenaphthene		1.40		5.30			
Dibenzofuran		1.30		4.90			
Fluorene		2.50		7.50			
Phenanthrene		11.00	1.00	29.00	2.80	4.10	
Fluoranthene		11.00	2.10	26.00	6.90	5.40	
Pyrene		7.30	1.90	22.00		4.90	0.17
Benzo(a)anthracene		3.90	1.00	11.00		3.20	
Chrysene		4.00	1.20	8.80		2.80	
Benzo(b)fluoranthene		1.90	0.88	6.50			
Benzo(k)fluoranthene		2.50	0.99	4.40			
Benzo(a)pyrene		2.30	0.91	4.80		1.80	
Indeno(1,2,3-cd)pyrene		1.50	0.89			1.70	
Dibenz(a,h)anthracene		0.97					
Benzo(g,h,i)perlyne		1.80	1.10			1.80	
4-methylphenol		1.40					
Butyl benzylphthalate						4.30	
Di-N-octlyl phthalate			2.00			3.60	
Vinyl acetate				0.04			
Total PCB				1.60	1.57	2.50	
Phenol							0.89
4-methylphenol							1.70

* all values at RM 9.4 were below detection limits.

Table 7. Summary of benthic data collected from artificial substrate samplers and natural substrates in the lower Maumee River and Swan Creek, August 11 to September 24, 1986. N and S designations indicate north or south bank of the mainstem. Unless specified otherwise, ICI status is evaluated by comparison to ecoregional biocriteria for designated aquatic life uses.

Station River Mile	Narrative Evaluation	Invertebrate Community Index (ICI)	No. Quant. Taxa	No. Qual. Taxa	Density (/ft.^{2})
Maumee River					
54.9	Exceptional	52	27	30	873
52.3	Exceptional	48	42	31	400
44.2	Marginally Good[a]	26	27	26	823
34.8	Marginally Good[a]	28	31	27	488
32.1	Good	42	42	36	1697
25.1	Exceptional	52	54	37	1384
20.9	Exceptional	54	50	36	1627
15.0	Marginally Good[b]	24	22	15	544
13.6S	Marginally Good[b]	20	25	28	405
13.3N	Fair[b]	14	22	11	467
8.8N	Fair[b]	18	26	14	913
7.3S	Fair[b]	12	17	11	688
7.2N	Marginally Fair[b]	8	16	6	440
4.7N	Marginally Fair[b]	8	14	12	544
3.6S	Fair[b]	14	18	21	706
3.1N	Marginally Fair[b]	10	19	10	387
1.5N	Marginally Fair[b]	6	12	14	579
0.7N	Marginally Good[b]	16	29	19	1166
Swan Creek					
10.2	Fair	24*	33	31	369
4.9	Fair	16*	28	22	199
3.9	Poor[b]	8	20	8	602
2.6	Poor[b]	6	13	7	602
1.2	Poor[b]	8	13	13	489
0.6	Poor[b]	12	23	10	748

Huron/Erie Lake Plain ICI criteria: EWH = 48, WWH = 34

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* significant departure from ecoregion biocriteria (more than 4 ICI units); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 ICI units).

[a] no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

[b] no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

Table 7. (continued)

Station River Mile	Narrative Evaluation	No. Qual. Taxa	Relative Density	Predominant Organisms
Maumee River				
43.5	Good	25	Low	Midges and amphipods

* significant departure from ecoregion biocriteria (more than 4 ICI units); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 ICI units).

a no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

b no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

Table 8. Summary of benthic data collected from artificial substrate samplers and natural substrates in Duck Creek, Otter Creek, Cedar Creek, and the Ottawa River, August 11 to September 24, 1986.

Station River Mile	Narrative Evaluation	Invertebrate Community Index (ICI)	No. Quant. Taxa	No. Qual. Taxa	Density (/ft.^{2})
Duck Creek					
3.0	Very Poor[b]	4	6	10	145
2.1	Poor[b]	10	16	6	190
0.4	Poor[b]	10	19	14	43
Otter Creek					
6.0	Very Poor	0*	0	2	0
4.0	Very Poor	0*	2	2	166
2.0	Very Poor[b]	0	3	13	1623
0.3	Very Poor[b]	2	7	10	299
Ottawa River					
18.5	Fair	24*	40	42	382
11.0	Fair	14*	25	28	297
9.0	Poor[b]	10	23	19	272
7.4	Poor[b]	10	22	12	365
6.9	Poor[b]	10	21	16	551
4.9	Poor[b]	8	16	10	388
1.6	Poor[b]	6	14	18	616
Cedar Creek					
20.8	Good	34	34	43	90

Huron/Erie Lake Plain ICI criteria: EWH = 48, WWH = 34

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* significant departure from ecoregion biocriteria (more than 4 ICI units); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 ICI units).

[a] no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

[b] no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

Table 8. (continued)

Station River Mile	Narrative Evaluation	No. Qual. Taxa	Relative Density	Predominant Organisms
Tenmile Creek				
5.1	Fair/Marg. Good	28	Low	Isopods
4.1	Fair/Marg. Good	35	Low	Isopods
1.0	Marginally Good	36	Moderate	Water pennies, heptagnid mayflies, hydropsychid caddisflies
Otter Creek				
7.2	Fair	15	High	Isopods

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* significant departure from ecoregion biocriteria (more than 4 ICI units); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 ICI units).

a no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

b no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

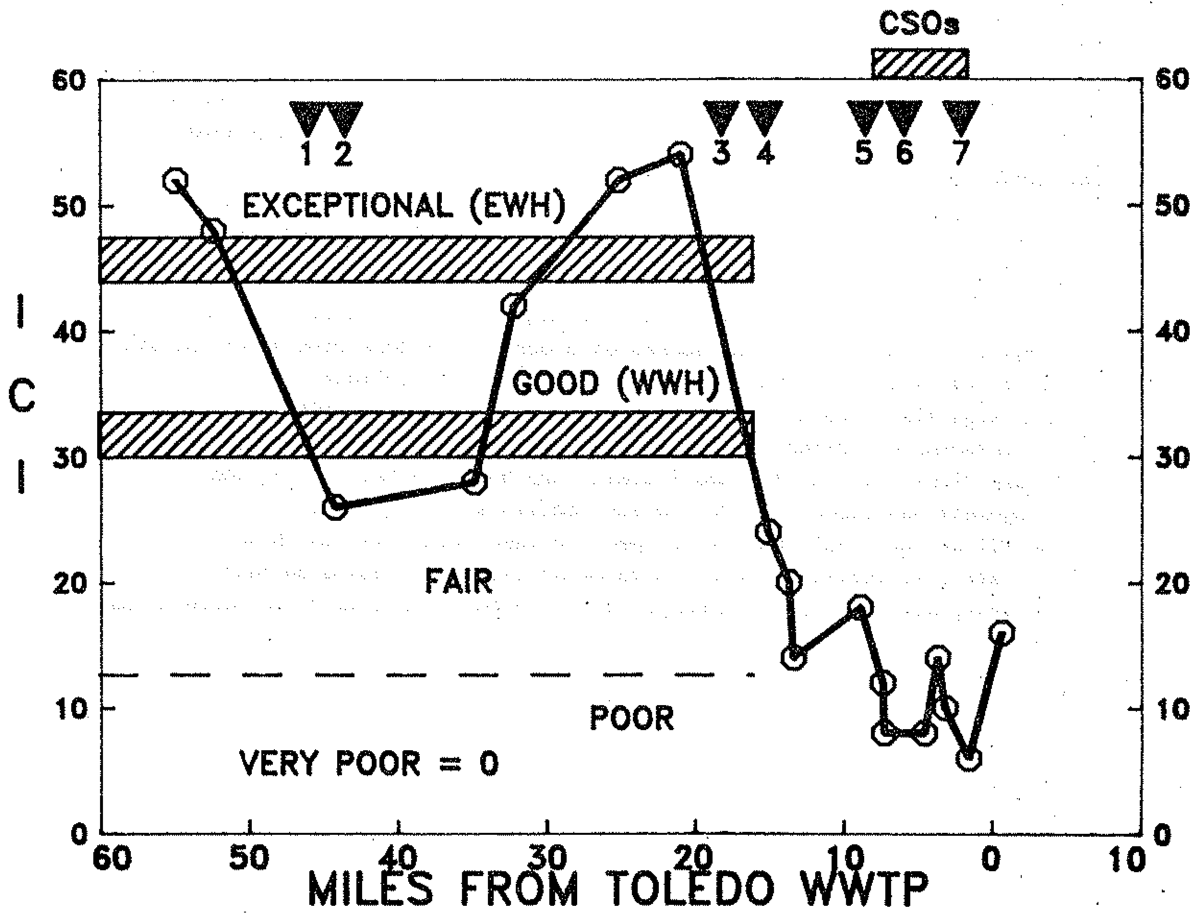

Figure 7. Longitudinal trend of the Invertebrate Community Index (ICI) in the Lower Maumee River mainstem, 1986. Shading indicates boundaries between narrative categories based on the insignificant departure range of the ICI (4 ICI units) values falling below the WWH (good) range do not attain the WWH aquatic life use designation.

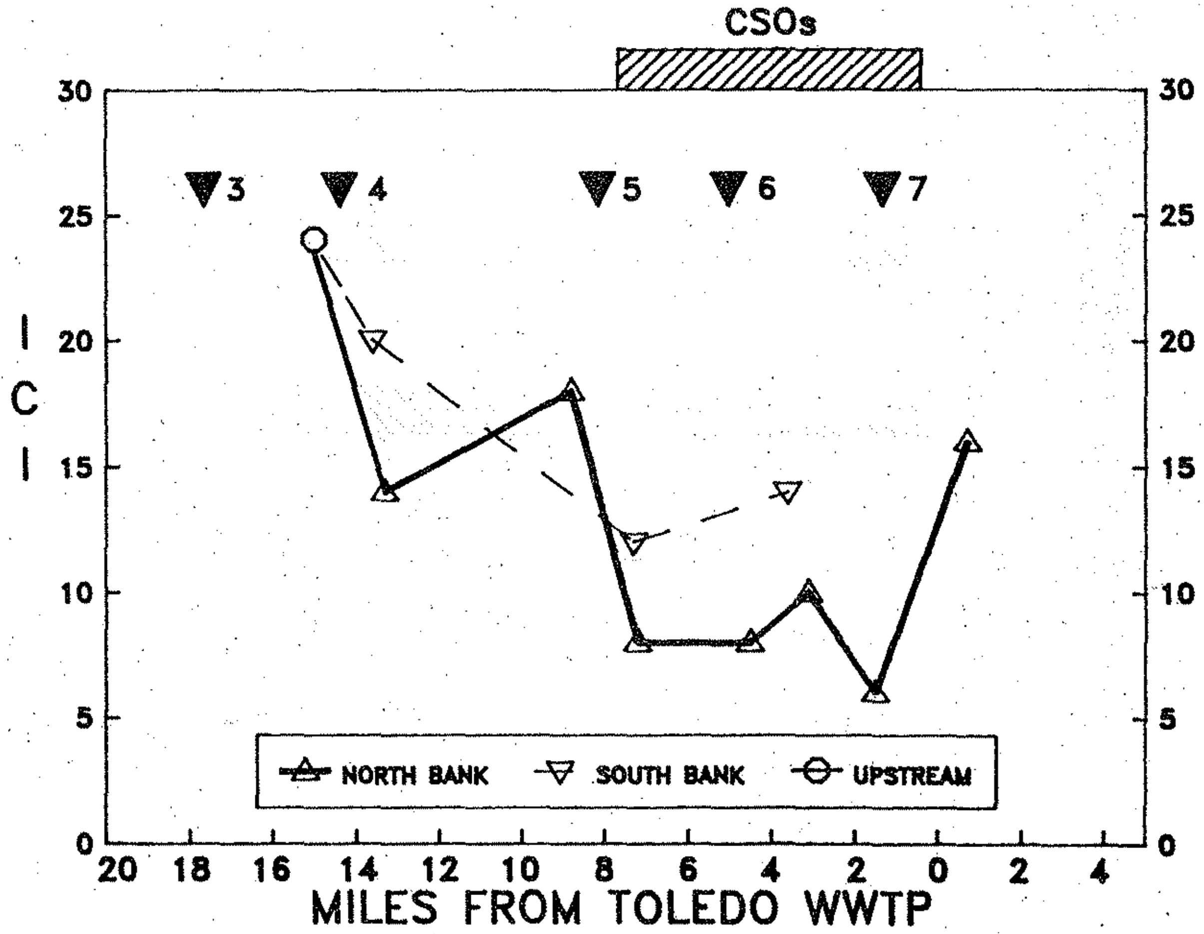

Figure 8. Longitudinal trend of the Invertebrate Community Index (ICI) in the Lower Maumee River mainstem river mouth area, 1986. Sites located along the north shoreline (NORTH) are compared to sites sampled along the south shoreline (SOUTH) in the area of the river affected by the level of Lake Erie.

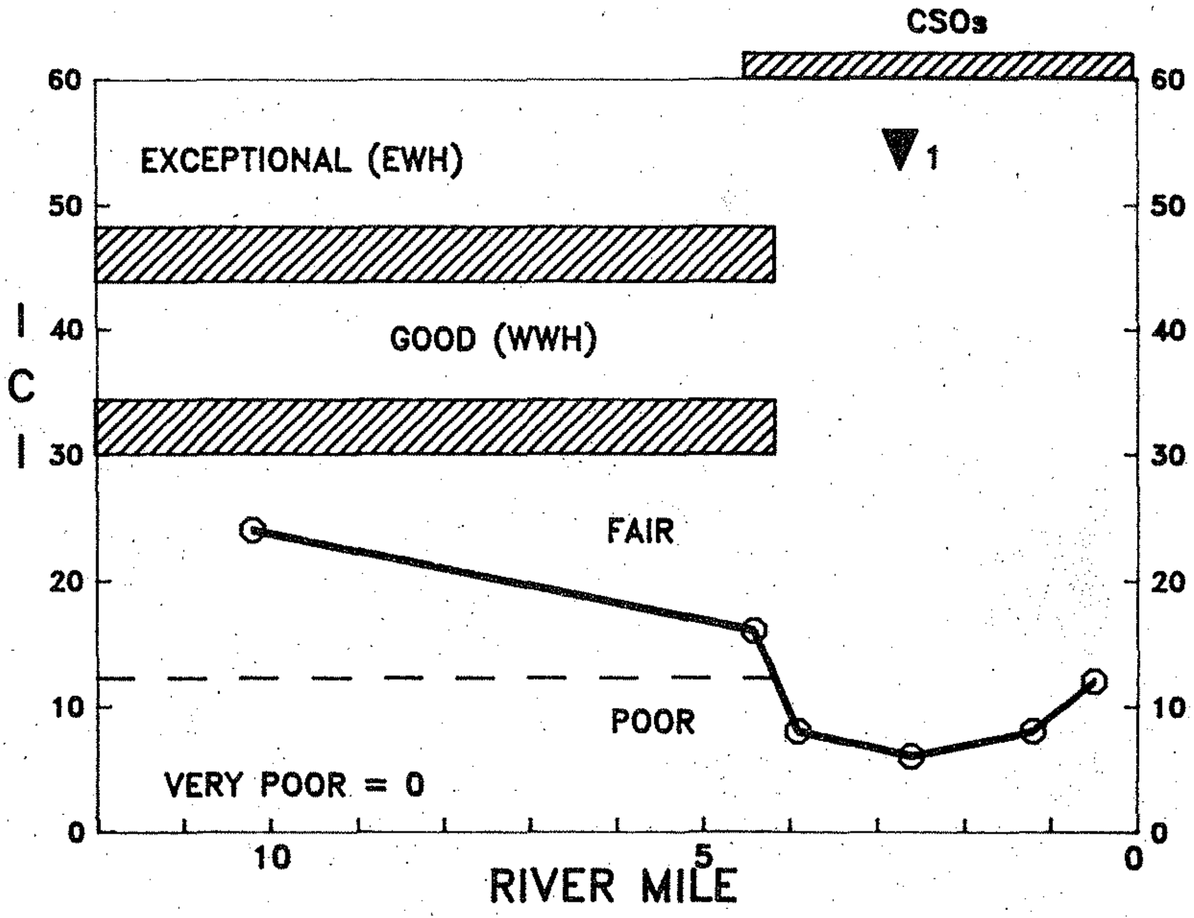

Figure 9. Longitudinal trend of the Invertebrate Community Index (ICI) in Swan Creek, 1986. Shading indicates boundaries between narrative categories based on the insignificant departure range of the ICI (4 ICI units) values falling below the WWH (good) range do not attain the WWH aquatic life use designation.

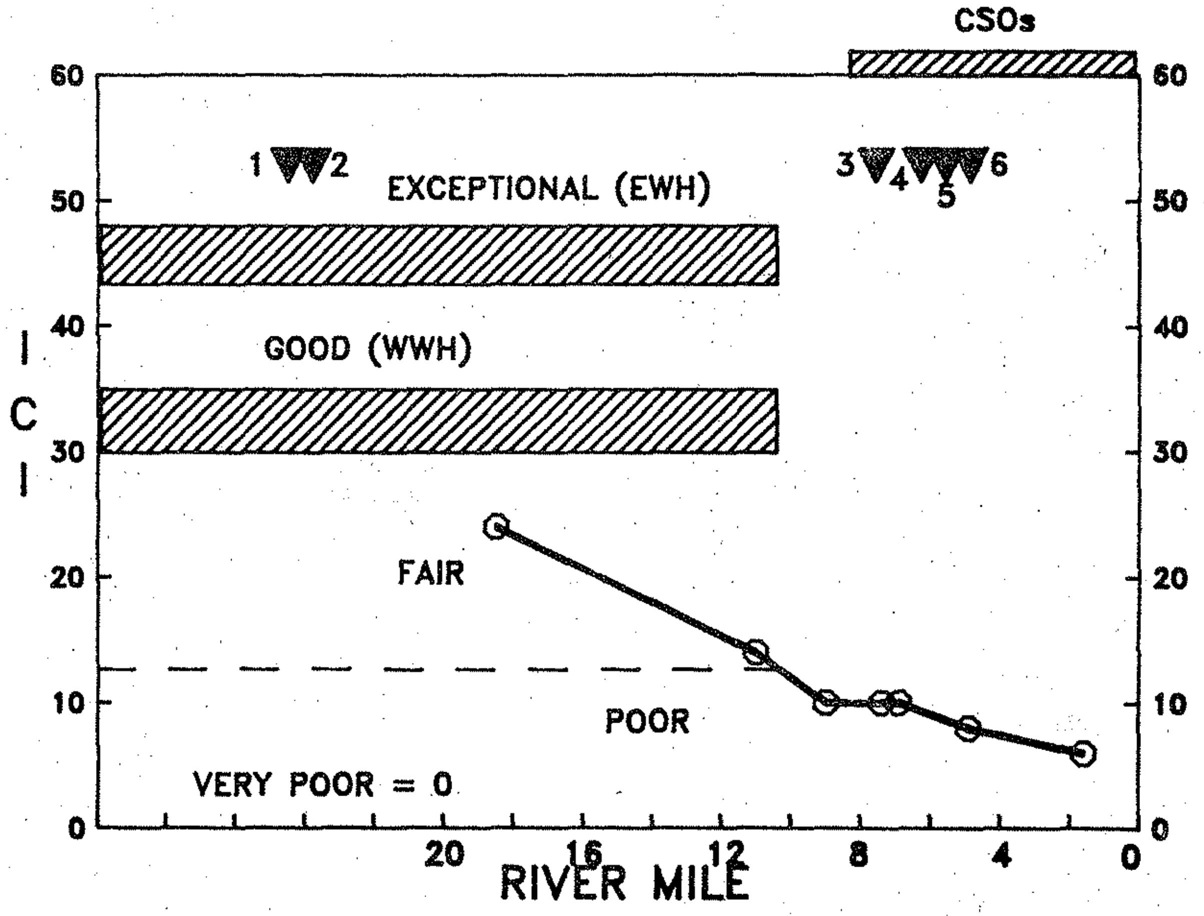

Figure 10. Longitudinal trend of the Invertebrate Community Index (ICI) in the Ottawa River, 1986. Shading indicates boundaries between narrative categories based on the insignificant departure range of the ICI (4 ICI units) values falling below the WWH (good) range do not attain the WWH aquatic life use designation.

Table 9. Summary of fish sampling methods (pulsed D.C. electrofishing) used in the Lower Maumee River study area by the Ohio EPA during June - October, 1986.

Stream Name	Inclusive River Miles	Site Type (Sampler Type)	Number of Sites	Distance Sampled (Km)
Maumee River				
	45.7-0.0	Boat (A,B)	27	40.25
Swan Creek				
	RM 10.2	Wading (D)	1	0.90
	4.4-0.5	Boat (A)	5	7.54
Tenmile Creek				
	5.1-1.0	Wading (D)	3	1.80
Ottawa River				
	17.8-12.2	Wading (D)	2	1.20
	8.9-1.6	Boat (A)	6	8.99
Otter Creek				
	7.2-4.0	Wading (D,E)	3	1.55
	2.0-0.5	Boat (A)	2	1.50
Duck Creek				
	3.0-2.1	Wading (D,E)	2	0.98
	RM 0.5	Boat (A)	1	1.50

Table 10. Mean fish community indices based on 52 electrofishing locations sampled by Ohio EPA in the Lower Maumee River study area during June - October, 1986.

Stream River Mile	Mean No. of Species	Cumulative Species	Mean Relative Number	Mean Relative Weight	Index of Well-Being (Iwb)	Modified Index of Well-Being	Index of Biotic Integrity	QHEI[a]	Narrative Evaluation
Maumee River Mainstem									
45.7	17.0	27	162	51.0	9.0	8.7	39	56	Good
38.5	11.3	18	78	18.0	6.9	6.5*	30[ns]	56	Fair-Good
33.0	11.7	20	107	13.9	6.7	6.5*	25*	58	Fair
31.5	15.0	20	265	82.5	9.2	9.0	33[ns]	70	Good
26.7	17.5	21	647	63.8	8.8	8.6[ns]	32[ns]	82	Good
19.8	17.0	23	616	129.1	9.0	8.5[ns]	27*	79	Good-Fair
17.2	17.0	25	3,163	79.4	8.6	8.1[ns]	28*	64	Good-Fair
14.8	18.0	27	457	87.0	8.2	7.9	30[ns]	71	Good
14.2[c]	7.0	7	68	80.3	7.3	7.1[ns]	26*		Good-Fair
14.1	20.0	33	222	29.4	8.4	8.0	32	61	Good
13.7	13.7	20	217	32.0	7.5	7.1[ns]	25*	62	Good-Fair
9.4	15.8	28	178	26.7	7.6	6.9*	20*	63	Fair-Poor
7.4	13.5	23	263	29.0	7.5	6.4*	23*	64	Fair
7.3	14.8	25	463	117.8	7.8	7.0[ns]	28[ns]	65	Good
4.7	12.7	87	472	23.0	7.8	7.2[ns]	32	46	Good
3.6	12.0	24	234	25.7	7.1	6.3*	23*	61	Fair
3.3	12.3	20	251	24.5	7.2	6.3*	23*	59	Fair
1.5[c]	14.0	17	257	34.4	6.7	5.6*	27*	67	Fair
1.4	10.0	15	181	12.6	6.4	6.1*	27*	67	Fair
0.7	11.0	15	90	20.9	6.8	5.9*	22*	58	Fair
0.6	10.0	14	414	20.0	6.4	5.5*	20*	60	Poor
0.5	11.5	15	253	39.7	6.9	5.9*	25*	64	Fair
0.4	16.7	23	292	51.5	7.7	6.7*	29[ns]	56	Fair-Good
0.3	11.7	18	309	162.6	7.8	6.2*	21*	59	Fair-Poor
0.2	14.3	24	146	39.2	7.2	5.8*	23*	58	Fair
0.1	7.7	15	132	2.1	4.9	4.4*	19*	49	Poor
0.0	6.0	10	504	7.4	5.9	5.4*	21*	63	Poor
Swan Creek									
10.2	13.0	19	127	110.0	6.8	5.6*	25*	70	Poor
4.4	11.7	20	143	511.0	7.2	5.3*	24*	58	Poor
3.9	9.3	15	94	8.1	5.9	4.6*	15*	57	Poor-V. Poor
2.6	5.3	11	45	16.8	4.1	2.9*	14*	62	Very Poor
1.2	3.3	7	43	16.1	3.4	2.5*	14*	57	Very Poor
0.5	10.3	17	169	24.0	6.3	5.7*	22*	55	Fair

[a] QHEI - Qualitative Habitat Evaluation Index.; [b] less than 0.1 kg.; [c] night electrofishing sample only.

* significant departure from ecoregion biocriteria (or interim L. Erie river mouth criteria); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 IBI and ICI units; 0.5 Iwb units).

Table 10. (continued).

Stream River Mile	Mean No. of Species	Cumulative Species	Mean Relative Number	Mean Relative Weight	Index of Well-Being (Iwb)	Modified Index of Well-Being	Index of Biotic Integrity	QHEI[a]	Narrative Evaluation
Tenmile Creek									
5.2	14.3	21	653	15.0	7.8	5.8*	26*	58	Poor
4.2	12.3	15	287	6.0	7.2	5.8*	25*	58	Poor
1.1	11.3	17	495	3.4	7.1	6.3*	29^{ns}	74	Fair-Good
Ottawa River									
17.8	12.7	17	943	17.3	7.5	6.1*	23*	73	Poor
9.8	7.3	12	180	3.6	5.3	3.0*	23*	61	V. Poor-Poor
8.7	12.0	17	295	39.0	6.9	4.8*	16*	44	Very Poor
7.4	10.3	18	257	40.9	6.6	5.1*	14*	50	Poor-V. Poor
6.4	8.7	17	198	20.8	5.9	4.0*	17*	57	Poor
5.4	6.0	10	190	9.6	5.2	3.7*	15*	47	Very Poor
4.7	9.7	17	370	62.7	6.6	3.8*	15*	57	Very Poor
1.8	19.0	24	650	81.0	8.2	6.8*	25*	53	Fair
Otter Creek									
7.2	0.7	2	2.5	b	0.4	N/A	12*	35	Very Poor
5.7	0.7	2	1.7	b	0.3	N/A	12*	46	Very Poor
4.0	0.0	0	0.0	0.0	0.0	N/A	12*	43	Very Poor
2.1	0.3	1	1.2	0.2	8.6	0.0*	12*	35	Very Poor
0.5	1.0	1	2.0	0.8	8.2	0.4*	13*	47	Very Poor
Duck Creek									
3.0	33(0.7)	7	255.7	0.5	3.6	N/A	22*	34	Very Poor
2.1	4.3	9	407.6	1.2	3.0	N/A	15*	41	Very Poor
0.4	12.3	20	160.0	18.8	6.9	5.9*	34^{ns}	44	Fair-Good

Huron Erie Lake Plain (HELP) - Biocriteria for Fish:

	IBI	Modified Iwb
Boat Sites	34	8.6
Wading Sites	32	7.5
Lake Erie Affected Sites	32	7.5

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[a] QHEI - Qualitative Habitat Evaluation Index.; [b] less than 0.1 kg.; [c] night electrofishing sample only.

* significant departure from ecoregion biocriteria (or interim L. Erie river mouth criteria); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 IBI and ICI units; 0.5 Iwb units).

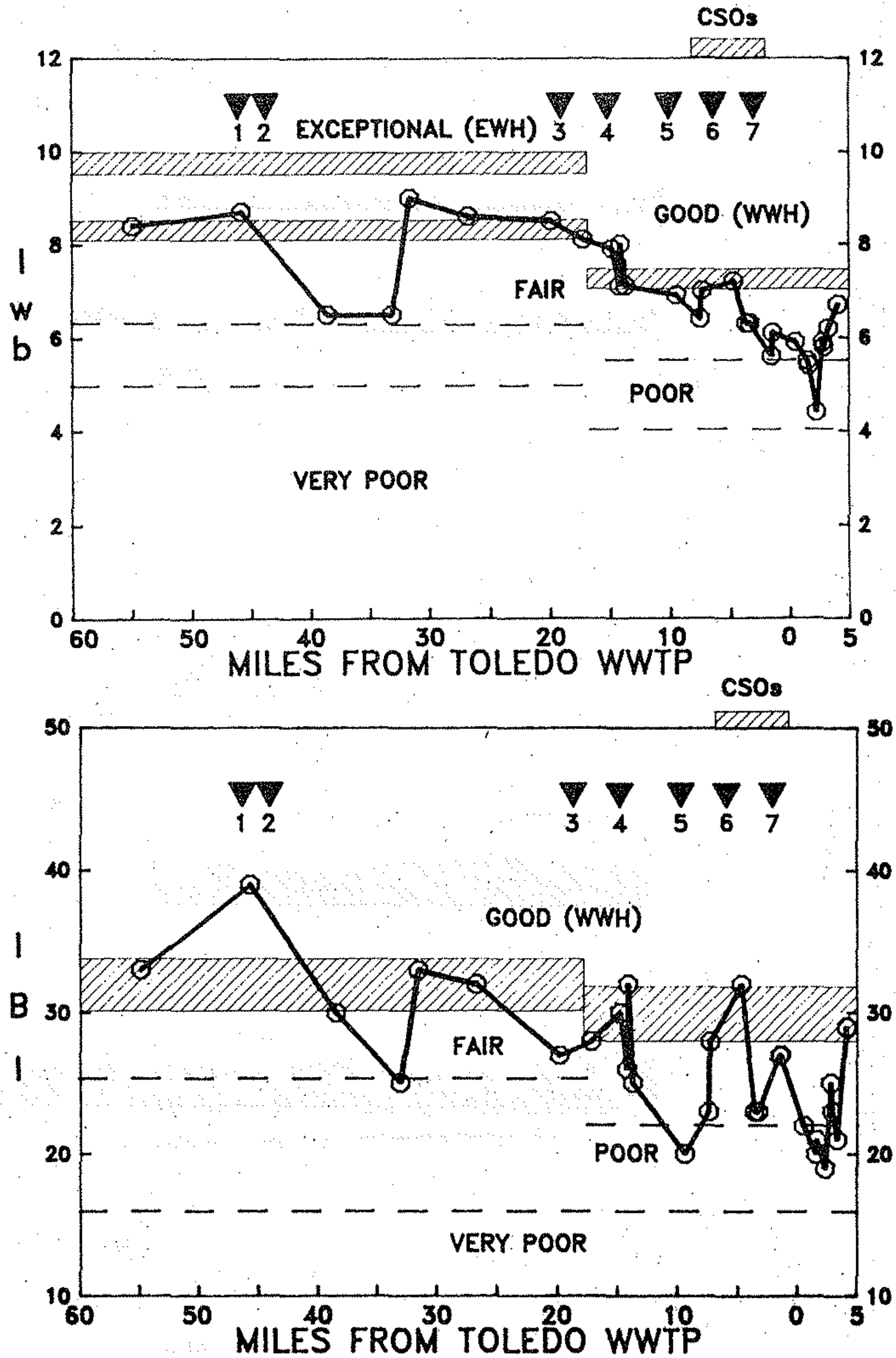

Figure 11. Longitudinal trend of the Modified Index of Well-Being (Iwb) and the Index of Biotic Integrity (IBI) at 27 sites in the lower Maumee River mainstem and Maumee Bay based on pulsed D.C. electrofishing collections during June-October, 1986. Shading indicates boundaries between these areas based on the insignificant departure range of each index (4 IBI units, 0.5 Iwb units). Values falling below the WWH (good) range do not attain the WWH aquatic life use designation.

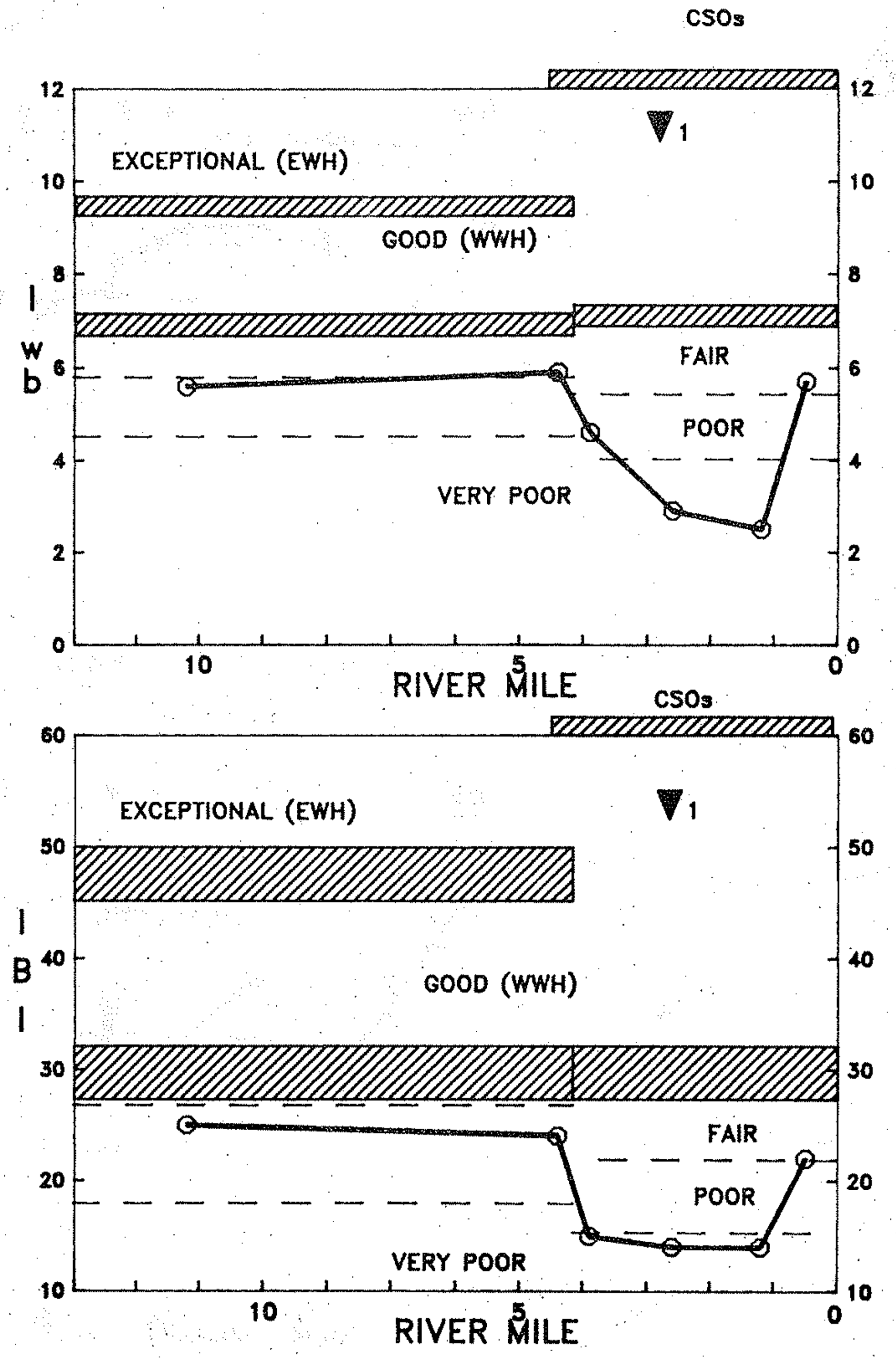

Figure 12. Longitudinal trend of the Modified Index of Well-Being (Iwb) and the Index of Biotic Integrity (IBI) in Swan Creek based on pulsed D.C. electrofishing collections during June-October, 1986. Shading indicates boundaries between these areas based on the insignificant departure range of each index (4 IBI units, 0.5 Iwb units). Values falling below the WWH (good) range do not attain the WWH aquatic life use designation.

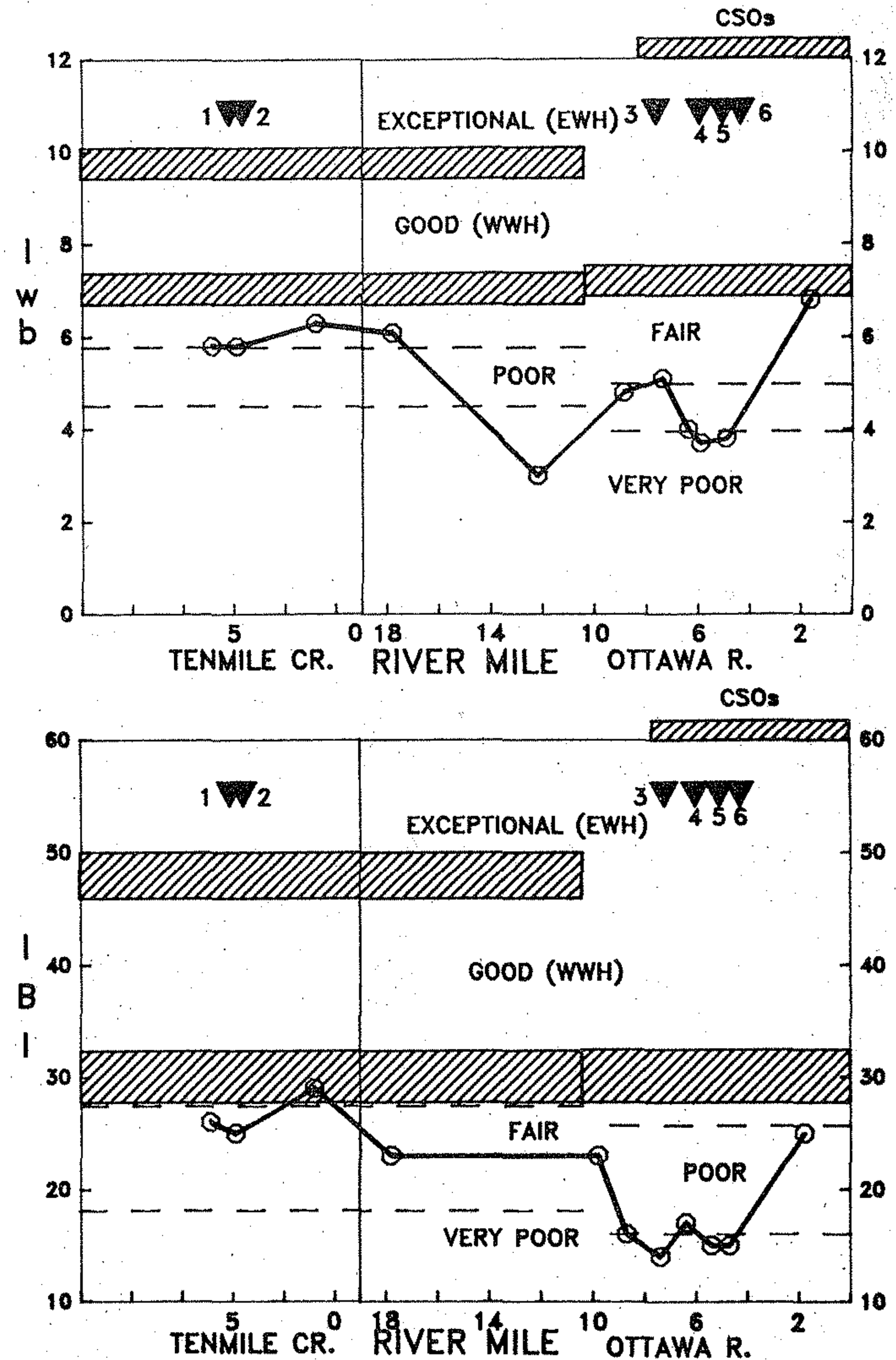

Figure 13. Longitudinal trend of the Modified Index of Well-Being (Iwb) and the Index of Biotic Integrity (IBI) in Tenmile Creek and the Ottawa River based on pulsed D.C. electrofishing collections during June-October, 1986. Shading indicates boundaries between these areas based on the insignificant departure range of each index (4 IBI units, 0.5 Iwb units). Values falling below the WWH (good) range do not attain the WWH aquatic life use designation.

Table 11. Results of analysis for total PCB (ppm) in fish collected from the lower Maumee River study area, 1977-1986.

Species	Year	River/Stream (RM)	Sample Type	Total PCB (ppm)'
Rock bass	1985	Maumee R. (20.6)	WBC	0.5
Carp	1985	Maumee R. (20.6)	WBC	1.0
Carp	1985	Maumee R. (20.6)	WBC	0.2
Carp	1978	Maumee R. (20.6)	WBC	0.3
Green Sunfish	1986	Maumee R. (4.6)	WBC	3.9
Yellow Perch	1986	Maumee R. (0.7)	WBC	4.0
Carp	1986	Maumee R. (0.7)	WBC	6.8
Carp	1985	Maumee R. (0.7)	WBC	3.0
Bluegill	1985	Maumee R. (0.7)	WBC	1.0
Carp	1978	Maumee R. (0.7)	WBC	4.8
White perch	1986	Maumee R. (0.0)	WBC	7.0
Channel catfish	1986	Maumee R. (0.0)	Fillet	3.8
Carp	1986	Maumee R. (0.0)	WBC	5.5
Carp	1982	Maumee R. (0.0)	WBC	11.5
Spottail shiner	1979*	Maumee R. (0.0)	WBC	3.3
Spottail shiner	1979*	Maumee R. (0.0)	WBC	2.9
Northern pike	1979*	Maumee R. (0.0)	WBC	4.9
Northern pike	1979*	Maumee R. (0.0)	WBC	4.9
Carp	1979	Maumee R. (0.0)	WBC	5.9
Yellow perch	1979	Maumee R. (0.0)	WBC	2.1
Carp/catfish	1976	Maumee R. (0.0)	WBC	5.4
Carp	1986	Swan Cr. (0.5)	WBC	5.9
Carp	1986	Tenmile Cr. (4.1)	WBC	6.8
Carp	1986	Ottawa R. (4.9)	WBC	15.1
Largemouth bass	1986	Ottawa R. (1.6)	WBC	12.0
Carp	1986	Ottawa R. (1.6)	WBC	25.4

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* duplicate sample analysis.
WBC whole body composite sample.

Table 12. Summary of biological use attainment status for all sampling locations in the Lower Maumee River study area, 1986 (fish results from RM 54.9 are from 1984). Attainment status follows guidance in Ohio EPA (1987c).

Stream River Mile Fish/Invert.	IBI	Mod. Iwb	ICI	QHEI	WWH Attainment Status	Comments
Maumee River Mainstem						
54.9/54.9	33[ns]	8.4[ns]	52		FULL	EWH for ICI
/52.3			48		FULL	EWH for ICI
45.7/44.2	39	8.7	26[a]	56	FULL	ICI in dam pool effect
38.5/	30[ns]	6.5*		56	PARTIAL	Grand Rapids dam pool
33.0/34.8	25*	6.5*	28[a]	58	NON	Grand Rapids dam pool
31.5/32.1	33[ns]	9.0	42	70	FULL	
26.7/25.1	32[ns]	8.6	52	82	FULL	
19.8/20.9	27*	8.5[ns]	54	79	PARTIAL	
17.2/	28[ns]	8.1		64	FULL	L. Erie influence begins
14.8/15.0	30[ns]	7.9	24[b]	71	FULL	Ust. Perrysburg
14.2/	26*	7.1[ns]			PARTIAL	Dst. Perrysburg
14.1/13.6S	32	8.0	20[b]	61	FULL	Dst. Perrysburg
13.7/13.3N	25*	7.1[ns]	14[b]	62	PARTIAL	
9.4/ 8.8N	20*	6.9*	18[b]	63	NON	
7.4/ 7.3S	23*	6.4*	12[b]	64	NON	Dst. LOF; elevated As
7.3/ 7.2N	28[ns]	7.0[ns]	8[b]	65	PARTIAL	N. Shore (rip-rap, sea wall)
4.7/ 4.7N	32	7.2[ns]	8[b]	46	FULL	Ship channel; CSOs enter
3.6/ 3.6S	23*	6.3*	10[b]	61	NON	
3.3/ 3.1N	23*	6.3*	10[b]	59	NON	Low D.O.
1.5/ 1.5N	27*	5.6*	6[b]	67	NON	Elevated NH_3-N
1.4/	27*	6.1*		67	NON	Dst. Toledo WWTP
0.7/ 0.7N	22*	5.9*	16[b]	58	NON	
0.6/	20*	5.5*		60	NON	
0.5/	25*	5.9*		64	NON	Elevated NH_3-N, Zn
0.4/	29[ns]	6.7*		56	PARTIAL	
0.3/	21*	6.2*		59	NON	
0.2/	23*	5.8*		58	NON	Elevated NH_3-N, Zn
0.1/	19*	4.4*		49	NON	Bayshore EGS intake channel
0.0/	21*	5.4*		63	NON	

* significant departure from ecoregion biocriteria (or interim L. Erie river mouth criteria); underlined values represent poor and very poor conditions.

[ns] non significant departure from ecoregion biocriteria (4 IBI and ICI units; 0.5 Iwb units).

[a] no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

[b] no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

Table 12. (continued).

Stream River Mile Fish/Invert.	IBI	Mod. Iwb	ICI	QHEI	WWH Attainment Status	Comments
Swan Creek						
21.6/	30[ns]				FULL	1984 sampling data.
10.2/10.2	25*	5.6*	24*	70	NON	Good habitat; NPS impacts
4.4/ 4.4	24*	5.9*	16*	58	NON	Impoundment habitat
3.9/ 3.9	15*	4.6*	8[b]	57	NON	L. Erie influence
2.6/ 2.6	14*	2.9*	6[b]	62	NON	Creosote discharge via CSO
1.2/ 1.2	14*	2.5*	8[b]	57	NON	Creosote/CSO impacts
0.5/ 0.6	22*	5.7*	12[b]	55	NON	Dilution by Maumee R.
Tenmile Creek						
5.1/ 5.1	26*	5.8*	F/MG	58	NON	Septic discharge noted
4.1/ 4.1	25*	5.8*	F/MG	58	NON	Dst. Kings Rd. landfill
1.0/ 1.0	29[ns]	6.3*	MG	74	PARTIAL	Good habitat
Ottawa River						
17.8/18.5	23*	6.1*	24*	73	NON	Good habitat; NPS impacts
9.8/11.0	23*	3.0*	14*	61	NON	Sewage odor evident
8.7/ 9.0	16*	4.8*	10[b]	44	NON	CSOs enter; paint spill
7.4/ 7.4	14*	5.1*	10[b]	50	NON	Dst. AMC Jeep via CSO
6.4/ 6.9	17*	4.0*	10[b]	57	NON	
5.4/ 5.9	15*	3.7*		47	NON	Dst. Diversitech General
4.7/ 4.9	15*	3.8*	8[b]	57	NON	Dst. landfills
1.8/ 1.6	25*	6.8*	6[b]	53	NON	Dilution from Maumee Bay
Duck Creek						
3.0/ 3.0	22*	N/A	4*	34	NON	Poor habitat
2.1/ 2.1	15*	N/A	10[b]	41	NON	Dst. Acme ash ponds
0.5/ 0.5	34	5.9*	10[b]	44	PARTIAL	Dilution from Maumee R.

* significant departure from ecoregion biocriteria (or interim L. Erie river mouth criteria); underlined values represent poor and very poor conditions.

[ns] non significant departure from ecoregion biocriteria (4 IBI and ICI units; 0.5 Iwb units).

[a] no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

[b] no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

Table 12. (continued).

Stream River Mile Fish/Invert.	IBI	Mod. Iwb	ICI	QHEI	WWH Attainment Status	Comments
Otter Creek						
7.2/	12*	N/A	F	35	NON	Poor habitat
5.8/ 6.0	12*	N/A	0*	46	NON	Dst. LOF; As very high
4.0/ 4.0	12*	N/A	0*	43	NON	Dst. Sun Oil
2.0/ 2.0	12*	0.0*	0[b]	35	NON	
0.5/ 0.5	13*	0.4*	2[b]	47	NON	BP America thermal impact
Cedar Creek						
/20.8		N/A	34		FULL	Similar size to Otter Cr.

ECOREGIONAL BIOCRITERIA

Macroinvertebrates:

Huron/Erie Lake Plain ICI criteria: EWH = 48, WWH = 34

Fish Community:

Huron Erie Lake Plain (HELP) - Biocriteria for Fish:

	IBI	Modified Iwb
Boat Sites	34	8.6
Wading Sites	32	7.5
L. Erie Affected Sites	32	7.5

---

* significant departure from ecoregion biocriteria (or interim L. Erie river mouth criteria); underlined values represent poor and very poor conditions.

ns non significant departure from ecoregion biocriteria (4 IBI and ICI units; 0.5 Iwb units).

[a] no interim ICI criteria have been developed for impoundments; narrative evaluations and use attainment status are based on best professional judgement and comparison to similar locations throughout Ohio.

[b] no ICI criteria have been developed for Lake Erie river mouth areas; narrative evaluations and use attainment status are based on best professional judgement and comparison to other Lake Erie river mouth areas.

RECOMMENDATIONS FOR FUTURE MONITORING

As a result of this survey the following recommendations are made for future water quality and biological monitoring in the Lower Maumee River study area.

1. The frequency of significant detections of arsenic in the lower Maumee River and two tributaries (Otter and Duck Creeks) raises some concern over the extent of the contamination in both surface and ground waters. This needs further investigation with emphasis on possible human health implications.

2. The number of detections of PAH derivitives in the sediments of Swan Creek and the lower portion of the Maumee River also raises concerns about further aquatic life impacts and non-aquatic life implications. The extent of the existing problem needs to be quantified and potential sources of the contamination identified and controlled.

3. A repeat of this or portions of this survey should be undertaken following upgrades to various wastewater treatment facilities and other sources of impairment (CSOs, landfills) providing that sufficient time for recovery is allowed prior to sampling.

4. Fish tissue sampling should be expanded to include edible portions of those species most likely to be consumed. This should provide a partial basis for any consumption advisories.

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APPENDIX H

Toxic Pollutant Listing
1987 Clean Water Act, §307

APPENDIX H

[Section 307(a)(1) of the Clean Water Act of 1987 refers to the list of toxic pollutants published in Table 1 of Committee Print Number 95-30 of the House Committee of Public Works and Transportation. Following is the text of Table 1:]

SECTION 307
TABLE 1: TOXIC POLLUTANTS

Acenaphthene
Acrolein
Acrylonitrile
Aldrin/Dieldrin
Antimony and compounds*
Arsenic and compounds
Asbestos
Benzene
Benzidine
Beryllium and compounds
Cadmium and compounds
Carbon tetrachloride
Chlordane (technical mixture & metabolites)
Chlorinated benzenes (other than dichlorobenzenes)
    Chlorinated ethanes (including 1,2 - dichloroethane, 1,1,1 - trichloroethane, and hexachloroethane)
Chloroalkyl ethers (chloromethyl, chloroethyl, and mixed ethers)
Chlorinated naphthalene
Chlorinated phenols (other than those listed elsewhere; includes trichlorophenois and chlorinated cresols)
Chloroform
2-chlorophenol
Chromium and compounds
Copper and compounds
Cyanides
DDT and metabolites
Dichlorobenzenes (u,2-, 1,3-, and 1,4-dichlorobenzenes)
Dichlorobenzidine
Dichloroethylenes (1,1- and 1,2-dichloroethylene)
2,4-dimethylphenol
Dinitrotoluene
Diphenylhydrazine
Endosulfan and metabolites
Endrin and metabolites
Ethylbenzene
Flouranthene
Haloethers (other than those listed elsewhere; includes chlorophenylphenyl ethers, bromophenylphenyl ether, bis(dischloroisopropyl) ether, bis-(chloroethoxy)methane and polychlorinated diphenyl ethers)
Halomethanes (other than those listed elsewhere; includes methylene chloride, methylchloride, methylbromide, bromide, bromoform, dichlorobromomethane, trichlorofluoromethane, dichlorodifluoromethane)

APPENDIX H continued

Heptachlor and metabolites
Hexachlorobutadiene
Hexachlorocyclohexane (all isomers)
Hexachlorocyclopentadiene
Isophorone
Lead and compounds
Mercury and compounds
Naphthalene
Nickel and compounds
Nitrobenzene
Nitrophenols (including 2,4-dinitrophenol) dinitrocresol)
Nitrosamines
Pentachlorophenol
Phenol
Phthalate esters
Polychlorinated biphenyls (PCSs)
Polynuclear aromatic hydrocarbons (including benzathracenes, benzopyrenes, benzofluoranthene, chrysenes, dibenzathracenes, and indenopyrenes)
Selenium and compounds
Silver and compounds
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
Tetrachloroethylene
Thallium and compounds
Toluene
Toxaphene
Trichloroethylene
Vinyl Chloride
Zinc and compounds

APPENDIX I

NPDES Permit Violations, 1987-1988

APPENDIX I
NPDES PERMIT VIOLATIONS
In the Lower Maumee RAP Area
1987 - 1988

The following Appendix lists violations of NPDES Permits in the RAP Area for 1987 and most of 1988. The listing is grouped by effluent parameter for each outfall of each NPDES Permit.

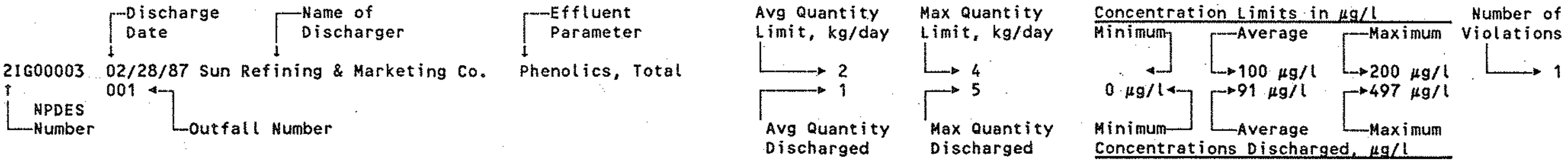
There are five columns of violations data: the Average Quantity, the Maximum Quantity, the Minimum Concentration, the Average Concentration, and the Maximum Concentration. Under each of these there may or may not be a limitation set in the NPDES permit, depending on the parameter. For example, for pH both maximum and minimum "concentration" limitations are normally set. There may not be a limit based on the average, and "quantity" is not applicable. For BOD_5, there are normally maximum concentration and quantity limits, while for Dissolved Oxygen, the limit is based on minimum concentration.

These data are included as violations because the limit was exceeded in <u>at least</u> one column, <u>but not necessarily in all five</u>. Where there are no applicable effluent limitations, the space is left blank. Where no data was reported, "0" is printed.

The units of the effluent data are shown. Total quantities are in kg/day, and most concentrations are in mg/l or µg/l. "SU" stands for "Standard Units." This abbreviation is used for pH (refers to the standard pH scale of 0 to 14), and for bacteria, which are measured in organisms per 100 ml of water. Very high bacterial counts are often reported as "TNTC," or "too numerous to count." Such cases are given here as 1,000,000. Water temperatures are given as ° Fahrenheit or ° Celsius.

As an example of how to read the table:

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY



In this example, violations have occurred in both the **maximum quantity** and the **maximum concentration.**

* Subsubtotal * = Number of violations of this specific effluent parameter at this outfall.
** Subtotal ** = Total number of violations of all parameters at all outfalls for this permit.
*** Total *** = Grand total of violations for all permits.

```
NPDES     DATE &    NAME OF FACILITY/OWNER          NAME OF PARAMETER VIOLATED      AVG QUANTITY MAX QUANTITY MIN CONC     AVG CONC     MAX CONC      TALLY
PERMIT    OUTFALL                                                                   in kg/day    in kg/day
NUMBER    NUMBER                                                                    Lim/Measured Lim/Measured Lim/Measured Lim/Measured Lim/Measured


** VIOLATIONS FOR NPDES: 2IB00000

* VIOLATIONS FOR PARAMETER: FECAL COLIFORM
2IB00000  05/31/87 Toledo Edison, Bayshore Plant  Fecal Coliform                                                          1000 SU      2000 SU          1
          604                                                                       0            0            0 SU         5000 SU      5000 SU
* Subsubtotal *
                                                                                                                                                      1
* VIOLATIONS FOR PARAMETER: PH
2IB00000  04/30/87 Toledo Edison, Bayshore Plant  pH                                                           6 SU                      9 SU             1
          003                                                                       0            0            6 SU         0 SU         10 SU
2IB00000  05/31/88 Toledo Edison, Bayshore Plant  pH                                                           6 SU                      9 SU             1
          003                                                                       0            0            6 SU         0 SU         9 SU
2IB00000  06/30/88 Toledo Edison, Bayshore Plant  pH                                                           6 SU                      9 SU             1
          003                                                                       0            0            6 SU         0 SU         10 SU
* Subsubtotal *
                                                                                                                                                      3
** Subtotal **
                                                                                                                                                      4

** VIOLATIONS FOR NPDES: 2IB00001

* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL
2IB00001  10/31/87 Toledo Edison, ACME Plant      Chlorine, Total Residual          8            23                                                   1
          001                                                                       5            45           0 mg/l       0 mg/l       0 mg/l
2IB00001  12/31/87 Toledo Edison, ACME Plant      Chlorine, Total Residual          8            23                                                   1
          001                                                                       10           58           0 mg/l       0            0 mg/l
2IB00001  02/29/88 Toledo Edison, ACME Plant      Chlorine, Total Residual          8            23                                                   1
          001                                                                       20           91           0 mg/l       0 mg/l       0 mg/l
2IB00001  05/31/88 Toledo Edison, ACME Plant      Chlorine, Total Residual          8            23                                                   1
          001                                                                       2            29           0 mg/l       0 mg/l       0 mg/l
2IB00001  06/30/88 Toledo Edison, ACME Plant      Chlorine, Total Residual          8            23                                                   1
          001                                                                       52           91           0 mg/l       0 mg/l       0 mg/l
* Subsubtotal *
                                                                                                                                                      5

* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED
2IB00001  06/30/87 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            466          0 mg/l       0 mg/l       0 mg/l
2IB00001  09/30/87 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            579          0 mg/l       0 mg/l       0 mg/l
2IB00001  11/30/87 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            1022         0 mg/l       0 mg/l       0 mg/l
2IB00001  12/31/87 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            534          0 mg/l       0 mg/l       0 mg/l
2IB00001  01/31/88 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            568          0 mg/l       0 mg/l       0 mg/l


2IB00001  02/29/88 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            806          0 mg/l       0 mg/l       0 mg/l
2IB00001  03/31/88 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            659          0 mg/l       0 mg/l       0 mg/l
2IB00001  04/30/88 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            806          0 mg/l       0 mg/l       0 mg/l
2IB00001  05/31/88 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
          010                                                                       0            500          0 mg/l       0 mg/l       0 mg/l
2IB00001  06/30/88 Toledo Edison, ACME Plant      Solids, Total Suspended                                                                             1
```

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	010			0	375	0 mg/l	0 mg/l	0 mg/l	
21B00001	07/31/88	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	010			0	318	0 mg/l	0 mg/l	0 mg/l	
21B00001	01/31/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	749	0 mg/l	0 mg/l	0 mg/l	
21B00001	02/28/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	511	0 mg/l	0 mg/l	0 mg/l	
21B00001	03/31/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	488	0 mg/l	0 mg/l	0 mg/l	
21B00001	04/30/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	397	0 mg/l	0 mg/l	0 mg/l	
21B00001	05/31/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	261	0 mg/l	0 mg/l	0 mg/l	
21B00001	06/30/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	534	0 mg/l	0 mg/l	0 mg/l	
21B00001	07/31/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	522	0 mg/l	0 mg/l	0 mg/l	
21B00001	08/31/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	318	0 mg/l	0 mg/l	0 mg/l	
21B00001	09/30/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	954	0 mg/l	0 mg/l	0 mg/l	
21B00001	10/31/87	Toledo Edison, ACME Plant	Solids, Total Suspended						1
	011			0	693	0 mg/l	0 mg/l	0 mg/l	
* Subsubtotal *									21
** Subtotal **									26
** VIOLATIONS FOR NPDES: 2ID00011									
* VIOLATIONS FOR PARAMETER: PH									
2ID00011	05/31/87	Koppers Company, Inc.	pH				7 SU	9 SU	1
	001			0	0	0 SU	6 SU	7 SU	
2ID00011	06/30/87	Koppers Company, Inc.	pH				7 SU	9 SU	1
	001			0	0	0 SU	6 SU	7 SU	
* Subsubtotal *									2
* VIOLATIONS FOR PARAMETER: TEMPERATURE, FAHRENHEIT									
2ID00011	04/30/87	Koppers Company, Inc.	Temperature, Fahrenheit					15 °F	1
	001			0	0	0 °F	0 °F	16 °F	
* Subsubtotal *									1
** Subtotal **									3
** VIOLATIONS FOR NPDES: 2IF00016									
* VIOLATIONS FOR PARAMETER: TEMPERATURE, CELSIUS									
2IF00016	01/31/88	E. I. DuPont Denemours & Co.	Temperature, Celsius					20 °C	1
	001			0	0	0 °C	0 °C	55 °C	
2IF00016	02/29/88	E. I. DuPont Denemours & Co.	Temperature, Celsius					20 °C	1
	001			0	0	0 °C	0 °C	56 °C	
2IF00016	03/31/88	E. I. DuPont Denemours & Co.	Temperature, Celsius					20 °C	1
	001			0	0	0 °C	0 °C	49 °C	
2IF00016	04/30/88	E. I. DuPont Denemours & Co.	Temperature, Celsius					20 °C	1
	001			0	0	0 °C	0 °C	21 °C	
2IF00016	06/30/88	E. I. DuPont Denemours & Co.	Temperature, Celsius					20 °C	1
	001			0	0	0 °C	0 °C	23 °C	

```
NPDES     DATE &   NAME OF FACILITY/OWNER         NAME OF PARAMETER VIOLATED     AVG QUANTITY MAX QUANTITY MIN CONC     AVG CONC     MAX CONC      TALLY
PERMIT    OUTFALL                                                                in kg/day    in kg/day
NUMBER    NUMBER                                                                 Lim/Measured Lim/Measured Lim/Measured Lim/Measured Lim/Measured


2IF00016  07/31/88 E. I. DuPont Denemours & Co.   Temperature, Celsius                                                               20 °C            1
          001                                                                    0            0            0 °C         0 °C         22 °C
2IF00016  01/31/88 E. I. DuPont Denemours & Co.   Temperature, Celsius                                                               20 °C            1
          002                                                                    0            0            0 °C         0 °C         56 °C
2IF00016  02/29/88 E. I. DuPont Denemours & Co.   Temperature, Celsius                                                               20 °C            1
          002                                                                    0            0            0 °C         0 °C         60 °C
2IF00016  07/31/88 E. I. DuPont Denemours & Co.   Temperature, Celsius                                                               20 °C            1
          002                                                                    0            0            0 °C         0 °C         25 °C
* Subsubtotal *
                                                                                                                                                      9
** Subtotal **
                                                                                                                                                      9

** VIOLATIONS FOR NPDES: 2IF00017

* VIOLATIONS FOR PARAMETER: TEMPERATURE, CELSIUS
2IF00017  08/31/88 E. I. DuPont Denemours & Co.   Temperature, Celsius                                                  15 °C        20 °C            1
          001                                                                    0            0            0 °C         13 °C        22 °C
* Subsubtotal *
                                                                                                                                                      1
** Subtotal **
                                                                                                                                                      1
** VIOLATIONS FOR NPDES: 2IG00003

* VIOLATIONS FOR PARAMETER: BOD 5
2IG00003  05/31/87 Sun Refining & Marketing Co.   BOD 5                          305          568                                                     1
          001                                                                    291          730          0 mg/l       0 mg/l       0 mg/l
2IG00003  06/30/87 Sun Refining & Marketing Co.   BOD 5                          305          568                                                     1
          001                                                                    357          1172         0 mg/l       0 mg/l       0 mg/l
2IG00003  03/31/88 Sun Refining & Marketing Co.   BOD 5                          305          568                                                     1
          001                                                                    564          945          0 mg/l       0 mg/l       0 mg/l
* Subsubtotal *
                                                                                                                                                      3

* VIOLATIONS FOR PARAMETER: COD
2IG00003  06/30/87 Sun Refining & Marketing Co.   COD                            1820         3410                                                    1
          001                                                                    1940         7336         0 mg/l       0 mg/l       0 mg/l
2IG00003  03/31/88 Sun Refining & Marketing Co.   COD                            1820         3410                                                    1
          001                                                                    2280         6225         0 mg/l       0 mg/l       0 mg/l
* Subsubtotal *
                                                                                                                                                      2

* VIOLATIONS FOR PARAMETER: OIL AND GREASE
2IG00003  02/29/88 Sun Refining & Marketing Co.   Oil and Grease                 146          273                       10 mg/l      20 mg/l          1
          001                                                                    62           189          0 mg/l       7 mg/l       22 mg/l
* Subsubtotal *
                                                                                                                                                      1

* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED
2IG00003  04/30/87 Sun Refining & Marketing Co.   Oxygen, Dissolved                                        4 mg/l       5 mg/l                        1
          001                                                                    0            0            4 mg/l       7 mg/l       0 mg/l
2IG00003  05/31/87 Sun Refining & Marketing Co.   Oxygen, Dissolved                                        4 mg/l       5 mg/l                        1
          001                                                                    0            0            4 mg/l       6 mg/l       0 mg/l
2IG00003  06/30/87 Sun Refining & Marketing Co.   Oxygen, Dissolved                                        4 mg/l       5 mg/l                        1
          001                                                                    0            0            4 mg/l       6 mg/l       0 mg/l
2IG00003  07/31/87 Sun Refining & Marketing Co.   Oxygen, Dissolved                                        4 mg/l       5 mg/l                        1
          001                                                                    0            0            4 mg/l       6 mg/l       0 mg/l
2IG00003  08/31/87 Sun Refining & Marketing Co.   Oxygen, Dissolved                                        4 mg/l       5 mg/l                        1
```

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	4 mg/l	6 mg/l	0 mg/l	
21G00003	09/30/87	Sun Refining & Marketing Co.	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	001			0	0	4 mg/l	7 mg/l	0 mg/l	
21G00003	03/31/88	Sun Refining & Marketing Co.	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
* Subsubtotal *									
									7
* VIOLATIONS FOR PARAMETER: PH									
21G00003	03/31/88	Sun Refining & Marketing Co.	pH			6 SU		9 SU	1
	001			0	0	7 SU	0 SU	10 SU	
* Subsubtotal *									
									1
* VIOLATIONS FOR PARAMETER: PHENOLICS, TOTAL									
21G00003	02/28/87	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			1	5	0 µg/l	91 µg/l	497 µg/l	
21G00003	06/30/87	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			2	13	0 µg/l	226 µg/l	1320 µg/l	
21G00003	10/31/87	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			1	3	0 µg/l	82 µg/l	330 µg/l	
21G00003	12/31/87	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			1	4	0 µg/l	82 µg/l	378 µg/l	
21G00003	01/31/88	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			1	3	0 µg/l	95 µg/l	262 µg/l	
21G00003	02/28/88	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			1	4	0 µg/l	127 µg/l	476 µg/l	
21G00003	03/31/88	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			9	41	0 µg/l	877 µg/l	4495 µg/l	
21G00003	05/31/88	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			0	2	0 µg/l	90 µg/l	401 µg/l	
21G00003	06/30/88	Sun Refining & Marketing Co.	Phenolics, Total	2	4		100 µg/l	200 µg/l	1
	001			0	3	0 µg/l	117 µg/l	821 µg/l	
* Subsubtotal *									
									9
* VIOLATIONS FOR PARAMETER: SULFIDE, TOTAL									
21G00003	03/31/88	Sun Refining & Marketing Co.	Sulfide, Total	3	6				1
	001			3	8	0 mg/l	0 mg/l	0 mg/l	
* Subsubtotal *									
									1
** Subtotal **									
									24
** VIOLATIONS FOR NPDES: 21G00007									
* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED									
21G00007	04/30/87	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	002			0	0	6 mg/l	7 mg/l	0 mg/l	
21G00007	05/31/87	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	002			0	0	6 mg/l	7 mg/l	0 mg/l	
21G00007	06/30/87	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	002			0	0	6 mg/l	7 mg/l	0 mg/l	
21G00007	07/31/87	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	002			0	0	6 mg/l	6 mg/l	0 mg/l	
21G00007	08/31/87	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	002			0	0	6 mg/l	6 mg/l	0 mg/l	
21G00007	09/30/87	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	002			0	0	6 mg/l	6 mg/l	0 mg/l	
2IG00007	07/31/88	Standard Oil Co., Ohio	Oxygen, Dissolved			4 mg/l	5 mg/l		1
	002			0	0	4 mg/l	0 mg/l	0 mg/l	
* Subsubtotal *									7
** Subtotal **									7
** VIOLATIONS FOR NPDES: 2IH00093									
* VIOLATIONS FOR PARAMETER: BOD 5									
2IH00093	09/30/87	General Mills, Inc.	BOD 5					45 mg/l	1
	001			0	0	0 mg/l	56 mg/l	56 mg/l	
2IH00093	04/30/88	General Mills, Inc.	BOD 5					45 mg/l	1
	001			0	0	0 mg/l	25 mg/l	48 mg/l	
2IH00093	05/31/88	General Mills, Inc.	BOD 5					45 mg/l	1
	001			0	0	0 mg/l	70 mg/l	110 mg/l	
* Subsubtotal *									3
* VIOLATIONS FOR PARAMETER: PH									
2IH00093	05/31/87	General Mills, Inc.	pH			6 SU		9 SU	1
	001			0	0	6 SU	0 SU	6 SU	
2IH00093	09/30/87	General Mills, Inc.	pH			6 SU		9 SU	1
	001			0	0	5 SU	0 SU	5 SU	
2IH00093	10/31/87	General Mills, Inc.	pH			6 SU		9 SU	1
	001			0	0	6 SU	0 SU	6 SU	
2IH00093	05/31/88	General Mills, Inc.	pH			6 SU		9 SU	1
	001			0	0	6 SU	0 SU	7 SU	
* Subsubtotal *									4
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2IH00093	05/31/87	General Mills, Inc.	Solids, Total Suspended					45 mg/l	1
	001			0	0	0 mg/l	0 mg/l	56 mg/l	
2IH00093	02/29/88	General Mills, Inc.	Solids, Total Suspended					45 mg/l	1
	001			0	0	0 mg/l	35 mg/l	67 mg/l	
2IH00093	04/30/88	General Mills, Inc.	Solids, Total Suspended					45 mg/l	1
	001			0	0	0 mg/l	33 mg/l	49 mg/l	
* Subsubtotal *									3
** Subtotal **									10
** VIOLATIONS FOR NPDES: 2IJ00039									
* VIOLATIONS FOR PARAMETER: PH									
2IJ00039	06/30/88	The France Stone Company	pH			7 SU		9 SU	1
	001			0	0	6 SU	0 SU	6 SU	
* Subsubtotal *									1
** Subtotal **									1

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NPDES     DATE &   NAME OF FACILITY/OWNER         NAME OF PARAMETER VIOLATED    AVG QUANTITY MAX QUANTITY MIN CONC     AVG CONC     MAX CONC     TALLY
PERMIT    OUTFALL                                                               in kg/day    in kg/day
NUMBER    NUMBER                                                                Lim/Measured Lim/Measured Lim/Measured Lim/Measured Lim/Measured


** VIOLATIONS FOR NPDES: 21J00052
* VIOLATIONS FOR PARAMETER: PH

21J00052  03/00/00 Stoneco                        pH                                                                                                  1
          001                                                                   0            0            0 SU         0 SU         0 SU
* Subsubtotal *
                                                                                                                                                     1
** Subtotal **
                                                                                                                                                     1
** VIOLATIONS FOR NPDES: 21N00013

* VIOLATIONS FOR PARAMETER: AMMONIA NITROGEN
21N00013  01/31/87 Fondessy Enterprises Inc.      Ammonia Nitrogen              0            1                         3 mg/l       5 mg/l           1
          001                                                                   0            0            0 mg/l       6 mg/l       6 mg/l
21N00013  06/30/88 Fondessy Enterprises Inc.      Ammonia Nitrogen              0            1                         3 mg/l       5 mg/l           1
          001                                                                   0            0            0 mg/l       15 mg/l      15 mg/l
21N00013  07/31/88 Fondessy Enterprises Inc.      Ammonia Nitrogen              0            1                         3 mg/l       5 mg/l           1
          001                                                                   0            0            0 mg/l       13 mg/l      15 mg/l
* Subsubtotal *
                                                                                                                                                     3

* VIOLATIONS FOR PARAMETER: PH
21N00013  03/31/88 Fondessy Enterprises Inc.      pH                                                      7 SU                      9 SU             1
          001                                                                   0            0            9 SU         0 SU         9 SU
21N00013  03/31/88 Fondessy Enterprises Inc.      pH                                                      7 SU                      9 SU             1
          001                                                                   0            0            9 SU         0 SU         9 SU
* Subsubtotal *
                                                                                                                                                     2
** Subtotal **
                                                                                                                                                     5

** VIOLATIONS FOR NPDES: 21N00069

* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL
21N00069  06/30/87 Liquid Carbonic Corp.          Chlorine, Total Residual                                             0 mg/l       1 mg/l           1
          601                                                                   0            0            5 mg/l       0 mg/l       5 mg/l
21N00069  06/30/88 Liquid Carbonic Corp.          Chlorine, Total Residual                                             0 mg/l       1 mg/l           1
          601                                                                   0            0            0 mg/l       4 mg/l       4 mg/l
* Subsubtotal *
                                                                                                                                                     2

* VIOLATIONS FOR PARAMETER: PH
21N00069  06/30/87 Liquid Carbonic Corp.          pH                                                      7 SU                      9 SU             1
          001                                                                   0            0            6 SU         0 SU         6 SU
* Subsubtotal *
                                                                                                                                                     1

* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED
21N00069  03/31/88 Liquid Carbonic Corp.          Solids, Total Suspended                                                           15 mg/l          1
          001                                                                   0            0            0 mg/l       0 mg/l       16 mg/l
21N00069  06/30/88 Liquid Carbonic Corp.          Solids, Total Suspended                                                           15 mg/l          1
          001                                                                   0            0            0 mg/l       0 mg/l       41 mg/l
* Subsubtotal *
                                                                                                                                                     2
** Subtotal **
                                                                                                                                                     5
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NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
** VIOLATIONS FOR NPDES: 2IN00079									
* VIOLATIONS FOR PARAMETER: AMMONIA NITROGEN									
2IN00079	01/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 107 mg/l	5 mg/l 138 mg/l	1
2IN00079	02/28/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 81 mg/l	5 mg/l 120 mg/l	1
2IN00079	03/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 120 mg/l	5 mg/l 155 mg/l	1
2IN00079	04/30/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 151 mg/l	5 mg/l 158 mg/l	1
2IN00079	05/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 111 mg/l	5 mg/l 137 mg/l	1
2IN00079	06/30/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 103 mg/l	5 mg/l 113 mg/l	1
2IN00079	07/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 73 mg/l	5 mg/l 87 mg/l	1
2IN00079	08/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 86 mg/l	5 mg/l 102 mg/l	1
2IN00079	09/30/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 107 mg/l	5 mg/l 115 mg/l	1
2IN00079	10/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 125 mg/l	5 mg/l 163 mg/l	1
2IN00079	11/30/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 115 mg/l	5 mg/l 162 mg/l	1
2IN00079	12/31/87 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 61 mg/l	5 mg/l 80 mg/l	1
2IN00079	01/31/88 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 128 mg/l	5 mg/l 128 mg/l	1
2IN00079	03/31/88 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 63 mg/l	5 mg/l 83 mg/l	1
2IN00079	04/30/88 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 67 mg/l	5 mg/l 86 mg/l	1
2IN00079	05/18/88 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 62 mg/l	5 mg/l 71 mg/l	1
2IN00079	06/30/88 001	King Road Sanitary & Landfill	Ammonia Nitrogen	 0	 0	 0 mg/l	3 mg/l 78 mg/l	5 mg/l 123 mg/l	1
* Subsubtotal *									17
* VIOLATIONS FOR PARAMETER: BOD 5									
2IN00079	01/31/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 73 mg/l	20 mg/l 80 mg/l	1
2IN00079	02/28/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 14 mg/l	20 mg/l 22 mg/l	1
2IN00079	03/31/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 34 mg/l	20 mg/l 40 mg/l	1
2IN00079	04/30/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 60 mg/l	20 mg/l 83 mg/l	1
2IN00079	05/31/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 63 mg/l	20 mg/l 79 mg/l	1
2IN00079	06/30/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 71 mg/l	20 mg/l 84 mg/l	1
2IN00079	07/31/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 62 mg/l	20 mg/l 66 mg/l	1
2IN00079	08/31/87 001	King Road Sanitary & Landfill	BOD 5	 0	 0	 0 mg/l	10 mg/l 58 mg/l	20 mg/l 68 mg/l	1
2IN00079	09/30/87	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	0 mg/l	67 mg/l	85 mg/l	
21N00079	10/31/87	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	64 mg/l	68 mg/l	
21N00079	11/30/87	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	44 mg/l	52 mg/l	
21N00079	12/31/87	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	60 mg/l	73 mg/l	
21N00079	01/31/88	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	51 mg/l	51 mg/l	
21N00079	03/31/88	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	56 mg/l	73 mg/l	
21N00079	04/30/88	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	25 mg/l	38 mg/l	
21N00079	05/31/88	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	20 mg/l	29 mg/l	
21N00079	06/30/88	King Road Sanitary & Landfill	BOD 5				10 mg/l	20 mg/l	1
	001			0	0	0 mg/l	33 mg/l	47 mg/l	
* Subsubtotal *									
									17
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
21N00079	02/28/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	20 mg/l	66 mg/l	
21N00079	04/30/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	30 mg/l	78 mg/l	
21N00079	05/31/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	25 mg/l	57 mg/l	
21N00079	07/31/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	77 mg/l	106 mg/l	
21N00079	08/31/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	56 mg/l	97 mg/l	
21N00079	09/30/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	17 mg/l	46 mg/l	
21N00079	11/30/87	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	68 mg/l	188 mg/l	
21N00079	03/31/88	King Road Sanitary & Landfill	Solids, Total Suspended				30 mg/l	45 mg/l	1
	001			0	0	0 mg/l	20 mg/l	70 mg/l	
* Subsubtotal *									
									8
** Subtotal **									
									42
** VIOLATIONS FOR NPDES: 2I000001									
* VIOLATIONS FOR PARAMETER: COD									
2I000001	01/31/87	Teledyne Industries	COD	14	26		30 mg/l	100 mg/l	1
	001			9	16	0 mg/l	51 mg/l	105 mg/l	
2I000001	07/31/87	Teledyne Industries	COD	14	26		30 mg/l	100 mg/l	1
	001			11	24	0 mg/l	43 mg/l	76 mg/l	
* Subsubtotal *									
									2
* VIOLATIONS FOR PARAMETER: OIL AND GREASE, TOTAL									
2I000001	06/30/88	Teledyne Industries	Oil and Grease, Total				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	18 mg/l	45 mg/l	
* Subsubtotal *									
									1
** Subtotal **									

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
									3
** VIOLATIONS FOR NPDES: 21Q00012									
* VIOLATIONS FOR PARAMETER: OIL AND GREASE, TOTAL									
21Q00012	03/31/87 001	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 18 mg/l	1
21Q00012	04/30/87 001	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 59 mg/l	1
21Q00012	05/31/87 001	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 20 mg/l	1
21Q00012	02/29/88 001	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 11 mg/l	1
21Q00012	04/30/87 002	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 14 mg/l	1
21Q00012	08/31/87 002	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 12 mg/l	1
21Q00012	10/31/87 002	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 16 mg/l	1
21Q00012	01/31/88 002	Diversitech General Inc.	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 17 mg/l	1
* Subsubtotal *									8
* VIOLATIONS FOR PARAMETER: PH									
21Q00012	02/28/87 001	Diversitech General Inc.	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
* Subsubtotal *									1
** Subtotal **									9
** VIOLATIONS FOR NPDES: 21S00008									
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
21S00008	06/30/87 002	Reichert Stamping Company	Chlorine, Total Residual	 0	 0	 10 mg/l	2 mg/l 0 mg/l	3 mg/l 10 mg/l	1
21S00008	07/31/87 002	Reichert Stamping Company	Chlorine, Total Residual	 0	 0	 3 mg/l	2 mg/l 0 mg/l	3 mg/l 3 mg/l	1
* Subsubtotal *									2
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
21S00008	02/29/88 002	Reichert Stamping Company	Solids, Total Suspended	 0	 0	 0 mg/l	30 mg/l 35 mg/l	45 mg/l 35 mg/l	1
* Subsubtotal *									1
** Subtotal **									3
** VIOLATIONS FOR NPDES: 21T00002									
* VIOLATIONS FOR PARAMETER: OIL AND GREASE									
21T00002	06/30/88 002	The Chessie System	Oil and Grease	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 15 mg/l	1
21T00002	06/30/88 004	The Chessie System	Oil and Grease	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 14 mg/l	1
* Subsubtotal *									2

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
* VIOLATIONS FOR PARAMETER: PH									
21T00002	12/31/87 002	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 7 SU	1
21T00002	12/31/87 004	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 7 SU	1
* Subsubtotal *									2
** Subtotal **									4
** VIOLATIONS FOR NPDES: 21T00013									
* VIOLATIONS FOR PARAMETER: OIL AND GREASE, TOTAL									
21T00013	05/31/88 003	The Chessie System	Oil and Grease, Total	 0	 0	 0 mg/l	 0 mg/l	10 mg/l 12 mg/l	1
* Subsubtotal *									1
* VIOLATIONS FOR PARAMETER: PH									
21T00013	12/31/87 003	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
21T00013	12/31/87 004	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
21T00013	05/31/88 004	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
21T00013	06/30/88 004	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
21T00013	12/31/87 005	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
21T00013	06/30/88 005	The Chessie System	pH	 0	 0	7 SU 6 SU	 0 SU	9 SU 6 SU	1
* Subsubtotal *									6
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
21T00013	04/30/88 004	The Chessie System	Solids, Total Suspended	 0	0 1	 0 mg/l	 0 mg/l	 0 mg/l	1
21T00013	07/31/88 004	The Chessie System	Solids, Total Suspended	 0	0 0	 0 mg/l	 0 mg/l	 0 mg/l	1
21T00013	06/30/88 005	The Chessie System	Solids, Total Suspended	 0	 0	 0 mg/l	 0 mg/l	45 mg/l 2440 mg/l	1
* Subsubtotal *									3
** Subtotal **									10
** VIOLATIONS FOR NPDES: 21W00010									
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
21W00010	01/31/87 001	Bowling Green Water Plant	Solids, Total Suspended	 0	 0	 0 mg/l	15 mg/l 13593 mg/l	20 mg/l 14230 mg/l	1
21W00010	02/28/87 001	Bowling Green Water Plant	Solids, Total Suspended	 0	 0	 0 mg/l	15 mg/l 13760 mg/l	20 mg/l 14100 mg/l	1
21W00010	03/31/87 001	Bowling Green Water Plant	Solids, Total Suspended	 0	 0	 0 mg/l	15 mg/l 13415 mg/l	20 mg/l 14100 mg/l	1
21W00010	04/30/87 001	Bowling Green Water Plant	Solids, Total Suspended	 0	 0	 0 mg/l	15 mg/l 13216 mg/l	20 mg/l 13570 mg/l	1
21W00010	05/31/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	0 mg/l	13213 mg/l	13670 mg/l	
2IW00010	06/30/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13395 mg/l	13700 mg/l	
2IW00010	07/31/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13243 mg/l	13870 mg/l	
2IW00010	08/31/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13228 mg/l	13560 mg/l	
2IW00010	09/30/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13078 mg/l	13650 mg/l	
2IW00010	10/31/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	42965 mg/l	13245 mg/l	
2IW00010	11/30/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13158 mg/l	13590 mg/l	
2IW00010	12/31/87	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13082 mg/l	13750 mg/l	
2IW00010	01/31/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13125 mg/l	13680 mg/l	
2IW00010	02/29/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13235 mg/l	13690 mg/l	
2IW00010	03/31/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	12992 mg/l	13790 mg/l	
2IW00010	04/30/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13035 mg/l	13300 mg/l	
2IW00010	05/31/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13270 mg/l	13890 mg/l	
2IW00010	06/30/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13295 mg/l	13590 mg/l	
2IW00010	07/31/88	Bowling Green Water Plant	Solids, Total Suspended				15 mg/l	20 mg/l	1
	001			0	0	0 mg/l	13355 mg/l	13970 mg/l	
* Subsubtotal *									19
** Subtotal **									19

** VIOLATIONS FOR NPDES: 2PA00026

* VIOLATIONS FOR PARAMETER: BOD 5

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PA00026	03/31/87	Village of Haskins	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			3	4	0 mg/l	11 mg/l	18 mg/l	
2PA00026	07/31/87	Village of Haskins	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			3	10	0 mg/l	4 mg/l	7 mg/l	
* Subsubtotal *									2

* VIOLATIONS FOR PARAMETER: FECAL COLIFORM

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PA00026	05/31/88	Village of Haskins	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	1000000 SU	
* Subsubtotal *									1

* VIOLATIONS FOR PARAMETER: PH

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PA00026	05/31/87	Village of Haskins	pH			7 SU		9 SU	1
	001			0	0	6 SU	0 SU	7 SU	
* Subsubtotal *									1

* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PA00026	07/31/87	Village of Haskins	Solids, Total Suspended	5	7		12 mg/l	18 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			3	10	0 mg/l	4 mg/l	7 mg/l	
* Subsubtotal *									1
** Subtotal **									5
** VIOLATIONS FOR NPDES: 2PB00007									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PB00007	01/31/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			56	75	0 mg/l	36 mg/l	45 mg/l	
2PB00007	02/28/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			60	69	0 mg/l	46 mg/l	60 mg/l	
2PB00007	03/31/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			67	80	0 mg/l	42 mg/l	52 mg/l	
2PB00007	04/30/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			62	84	0 mg/l	27 mg/l	33 mg/l	
2PB00007	05/31/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			49	58	0 mg/l	39 mg/l	42 mg/l	
2PB00007	06/30/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			28	51	0 mg/l	18 mg/l	26 mg/l	
2PB00007	07/31/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			14	51	0 mg/l	10 mg/l	24 mg/l	
2PB00007	08/31/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			14	72	0 mg/l	8 mg/l	20 mg/l	
2PB00007	09/30/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			54	81	0 mg/l	47 mg/l	70 mg/l	
2PB00007	11/30/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			69	436	0 mg/l	61 mg/l	367 mg/l	
2PB00007	12/31/87	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			60	67	0 mg/l	25 mg/l	28 mg/l	
2PB00007	01/31/88	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			44	64	0 mg/l	32 mg/l	45 mg/l	
2PB00007	02/29/88	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			46	63	0 mg/l	29 mg/l	38 mg/l	
2PB00007	03/31/88	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			61	176	0 mg/l	32 mg/l	67 mg/l	
2PB00007	04/30/88	South Shore Park WWTP	BOD 5	18	26		20 mg/l	30 mg/l	1
	001			45	70	0 mg/l	29 mg/l	37 mg/l	
* Subsubtotal *									15
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PB00007	05/31/87	South Shore Park WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	1 mg/l	
2PB00007	06/30/87	South Shore Park WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	1 mg/l	
2PB00007	07/31/87	South Shore Park WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	1 mg/l	
2PB00007	08/31/87	South Shore Park WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	440 mg/l	
2PB00007	06/30/88	South Shore Park WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	1 mg/l	
* Subsubtotal *									5
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PB00007	05/31/87	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	0 SU	588695 SU	349428 SU	
2PB00007	06/30/87	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	1000000 SU	
2PB00007	07/31/87	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	2365 SU	189736 SU	
2PB00007	08/31/87	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	3961 SU	69282 SU	
2PB00007	09/30/87	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	439364 SU	4300002 SU	
2PB00007	10/31/87	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	180 SU	7007 SU	
2PB00007	05/31/88	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	4255 SU	36660 SU	
2PB00007	06/30/88	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	706 SU	3072 SU	
2PB00007	07/31/88	South Shore Park WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	340 SU	2549 SU	
* Subsubtotal *									9
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PB00007	01/31/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			45	106	0 mg/l	29 mg/l	38 mg/l	
2PB00007	02/28/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			40	47	0 mg/l	28 mg/l	39 mg/l	
2PB00007	03/31/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			82	107	0 mg/l	42 mg/l	53 mg/l	
2PB00007	04/30/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			68	136	0 mg/l	26 mg/l	38 mg/l	
2PB00007	05/31/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			44	61	0 mg/l	30 mg/l	36 mg/l	
2PB00007	06/30/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			59	166	0 mg/l	30 mg/l	57 mg/l	
2PB00007	07/31/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			10	30	0 mg/l	7 mg/l	15 mg/l	
2PB00007	09/30/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			28	37	0 mg/l	24 mg/l	29 mg/l	
2PB00007	10/31/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			17	43	0 mg/l	16 mg/l	27 mg/l	
2PB00007	11/30/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			98	391	0 mg/l	82 mg/l	331 mg/l	
2PB00007	12/31/87	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			72	189	0 mg/l	22 mg/l	37 mg/l	
2PB00007	01/31/88	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			54	119	0 mg/l	33 mg/l	52 mg/l	
2PB00007	02/29/88	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			58	112	0 mg/l	32 mg/l	64 mg/l	
2PB00007	03/31/88	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			26	47	0 mg/l	15 mg/l	17 mg/l	
2PB00007	04/30/88	South Shore Park WWTP	Solids, Total Suspended	22	30		25 mg/l	35 mg/l	1
	001			33	52	0 mg/l	23 mg/l	26 mg/l	
* Subsubtotal *									15
** Subtotal **									44

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
** VIOLATIONS FOR NPDES: 2PB00062									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PB00062	05/31/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			41	47	0 mg/l	41 mg/l	48 mg/l	
2PB00062	06/30/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			42	61	0 mg/l	36 mg/l	42 mg/l	
2PB00062	08/31/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			40	53	0 mg/l	34 mg/l	37 mg/l	
2PB00062	09/30/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			34	38	0 mg/l	36 mg/l	38 mg/l	
2PB00062	10/31/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			30	42	0 mg/l	37 mg/l	44 mg/l	
2PB00062	11/30/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			22	24	0 mg/l	36 mg/l	36 mg/l	
2PB00062	12/31/87	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			44	60	0 mg/l	33 mg/l	39 mg/l	
2PB00062	01/31/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			30	33	0 mg/l	33 mg/l	35 mg/l	
2PB00062	02/29/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			43	56	0 mg/l	31 mg/l	34 mg/l	
2PB00062	03/31/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			49	56	0 mg/l	38 mg/l	42 mg/l	
2PB00062	04/30/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			434	54	0 mg/l	35 mg/l	39 mg/l	
2PB00062	05/31/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			44	54	0 mg/l	35 mg/l	39 mg/l	
2PB00062	05/31/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			49	50	0 mg/l	43 mg/l	44 mg/l	
2PB00062	06/30/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			28	33	0 mg/l	45 mg/l	48 mg/l	
2PB00062	07/31/88	Village of Whitehouse	BOD 5	40	60		30 mg/l	45 mg/l	1
	001			42	45	0 mg/l	42 mg/l	46 mg/l	
* Subsubtotal *									15
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PB00062	05/31/87	Village of Whitehouse	Chlorine, Total Residual					1 mg/l	1
	001			0	0	1 mg/l	0 mg/l	1 mg/l	
* Subsubtotal *									1
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PB00062	05/31/87	Village of Whitehouse	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PB00062	06/30/87	Village of Whitehouse	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PB00062	07/31/87	Village of Whitehouse	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PB00062	09/30/87	Village of Whitehouse	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PB00062	10/31/87	Village of Whitehouse	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
* Subsubtotal *									5
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PB00062	05/31/87	Village of Whitehouse	Solids, Total Suspended	40	60		30 mg/l	45 mg/l	1
	001			39	45	0 mg/l	39 mg/l	42 mg/l	

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PB00062	06/30/87 001	Village of Whitehouse	Solids, Total Suspended	40 43	60 67	 0 mg/l	30 mg/l 37 mg/l	45 mg/l 45 mg/l	1
2PB00062	07/31/87 001	Village of Whitehouse	Solids, Total Suspended	40 33	60 51	 0 mg/l	30 mg/l 32 mg/l	45 mg/l 34 mg/l	1
2PB00062	08/31/87 001	Village of Whitehouse	Solids, Total Suspended	40 41	60 52	 0 mg/l	30 mg/l 34 mg/l	45 mg/l 37 mg/l	1
2PB00062	09/30/87 001	Village of Whitehouse	Solids, Total Suspended	40 36	60 41	 0 mg/l	30 mg/l 39 mg/l	45 mg/l 41 mg/l	1
2PB00062	10/31/87 001	Village of Whitehouse	Solids, Total Suspended	40 26	60 33	 0 mg/l	30 mg/l 33 mg/l	45 mg/l 43 mg/l	1
2PB00062	11/30/87 001	Village of Whitehouse	Solids, Total Suspended	40 23	60 24	 0 mg/l	30 mg/l 37 mg/l	45 mg/l 40 mg/l	1
2PB00062	12/31/87 001	Village of Whitehouse	Solids, Total Suspended	40 40	60 46	 0 mg/l	30 mg/l 31 mg/l	45 mg/l 39 mg/l	1
2PB00062	01/31/88 001	Village of Whitehouse	Solids, Total Suspended	40 30	60 38	 0 mg/l	30 mg/l 32 mg/l	45 mg/l 37 mg/l	1
2PB00062	02/29/88 001	Village of Whitehouse	Solids, Total Suspended	40 43	60 58	 0 mg/l	30 mg/l 31 mg/l	45 mg/l 32 mg/l	1
2PB00062	03/31/88 001	Village of Whitehouse	Solids, Total Suspended	40 49	60 68	 0 mg/l	30 mg/l 37 mg/l	45 mg/l 42 mg/l	1
2PB00062	04/30/88 001	Village of Whitehouse	Solids, Total Suspended	40 43	60 55	 0 mg/l	30 mg/l 35 mg/l	45 mg/l 41 mg/l	1
2PB00062	05/31/88 001	Village of Whitehouse	Solids, Total Suspended	40 48	60 49	 0 mg/l	30 mg/l 42 mg/l	45 mg/l 45 mg/l	1
2PB00062	06/30/88 001	Village of Whitehouse	Solids, Total Suspended	40 29	60 34	 0 mg/l	30 mg/l 46 mg/l	45 mg/l 48 mg/l	1
2PB00062	07/31/88 001	Village of Whitehouse	Solids, Total Suspended	40 39	60 48	 0 mg/l	30 mg/l 38 mg/l	45 mg/l 44 mg/l	1
* Subsubtotal *									15
** Subtotal **									36
** VIOLATIONS FOR NPDES: 2PD00002									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PD00002	04/30/87 001	Perrysburg, City of	BOD 5	522 565	678 687	 1 mg/l	50 mg/l 44 mg/l	65 mg/l 60 mg/l	1
2PD00002	05/31/87 001	Perrysburg, City of	BOD 5	522 570	678 633	 1 mg/l	50 mg/l 53 mg/l	65 mg/l 72 mg/l	1
2PD00002	08/31/87 001	Perrysburg, City of	BOD 5	522 585	678 1256	 1 mg/l	50 mg/l 56 mg/l	65 mg/l 94 mg/l	1
2PD00002	09/30/87 001	Perrysburg, City of	BOD 5	522 504	678 640	 0 mg/l	50 mg/l 56 mg/l	65 mg/l 77 mg/l	1
2PD00002	10/31/87 001	Perrysburg, City of	BOD 5	522 478	678 543	 0 mg/l	50 mg/l 56 mg/l	65 mg/l 63 mg/l	1
2PD00002	11/30/87 001	Perrysburg, City of	BOD 5	522 437	678 893	 0 mg/l	50 mg/l 43 mg/l	65 mg/l 86 mg/l	1
* Subsubtotal *									6
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PD00002	01/31/87 001	Perrysburg, City of	Chlorine, Total Residual	 0	 0	 0 mg/l	 0 mg/l	1 mg/l 1 mg/l	1
2PD00002	05/31/87 001	Perrysburg, City of	Chlorine, Total Residual	 0	 0	 0 mg/l	 0 mg/l	1 mg/l 1 mg/l	1
2PD00002	06/30/87 001	Perrysburg, City of	Chlorine, Total Residual	 0	 0	 0 mg/l	 0 mg/l	1 mg/l 1 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PD00002	01/31/88 001	Perrysburg, City of	Chlorine, Total Residual	 0	 0	 0 mg/l	 0 mg/l	1 mg/l 1 mg/l	1
* Subsubtotal *									4
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PD00002	02/28/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 3156 SU	2000 SU 9794 SU	1
2PD00002	03/31/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 1000000 SU	2000 SU 100000000 SU	1
2PD00002	04/30/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 1000000 SU	2000 SU 100000000 SU	1
2PD00002	05/31/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 1287 SU	2000 SU 1978 SU	1
2PD00002	06/30/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 523 SU	2000 SU 5023 SU	1
2PD00002	10/31/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 82 SU	2000 SU 4071 SU	1
2PD00002	12/31/87 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 2522 SU	2000 SU 21037 SU	1
2PD00002	02/29/88 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 2670 SU	2000 SU 11505 SU	1
2PD00002	03/31/88 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 2301 SU	2000 SU 2672 SU	1
2PD00002	04/30/88 001	Perrysburg, City of	Fecal Coliform	 0	 0	 0 SU	1000 SU 1686 SU	2000 SU 10993 SU	1
* Subsubtotal *									10
* VIOLATIONS FOR PARAMETER: OIL AND GREASE									
2PD00002	02/28/87 001	Perrysburg, City of	Oil and Grease	 0	 0	 0 mg/l	 0 mg/l	5 mg/l 6 mg/l	1
* Subsubtotal *									1
* VIOLATIONS FOR PARAMETER: PHOSPHORUS, TOTAL									
2PD00002	07/31/88 001	Perrysburg, City of	Phosphorus, Total	10 8	16 13	 0 mg/l	1 mg/l 1 mg/l	2 mg/l 2 mg/l	1
2PD00002	01/31/87 001	Perrysburg, City of	Phosphorus, Total	10 26	16 35	 0 mg/l	1 mg/l 2 mg/l	2 mg/l 3 mg/l	1
2PD00002	02/28/87 001	Perrysburg, City of	Phosphorus, Total	10 24	16 39	 0 mg/l	1 mg/l 2 mg/l	2 mg/l 3 mg/l	1
2PD00002	03/31/87 001	Perrysburg, City of	Phosphorus, Total	10 31	16 34	 0 mg/l	1 mg/l 2 mg/l	2 mg/l 3 mg/l	1
2PD00002	04/30/87 001	Perrysburg, City of	Phosphorus, Total	10 24	16 33	 0 mg/l	1 mg/l 2 mg/l	2 mg/l 3 mg/l	1
2PD00002	05/31/87 001	Perrysburg, City of	Phosphorus, Total	10 36	16 48	 0 mg/l	1 mg/l 3 mg/l	2 mg/l 4 mg/l	1
2PD00002	06/30/87 001	Perrysburg, City of	Phosphorus, Total	10 11	16 16	 0 mg/l	1 mg/l 1 mg/l	2 mg/l 1 mg/l	1
2PD00002	07/31/87 001	Perrysburg, City of	Phosphorus, Total	10 18	16 36	 0 mg/l	1 mg/l 2 mg/l	2 mg/l 2 mg/l	1
2PD00002	08/31/87 001	Perrysburg, City of	Phosphorus, Total	10 32	16 95	 0 mg/l	1 mg/l 3 mg/l	2 mg/l 6 mg/l	1
2PD00002	09/30/87 001	Perrysburg, City of	Phosphorus, Total	10 30	16 58	 0 mg/l	1 mg/l 3 mg/l	2 mg/l 5 mg/l	1
2PD00002	10/31/87 001	Perrysburg, City of	Phosphorus, Total	10 17	16 37	 0 mg/l	1 mg/l 2 mg/l	2 mg/l 3 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PD00002	11/30/87	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			32	61	0 mg/l	3 mg/l	6 mg/l	
2PD00002	12/31/87	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			26	41	0 mg/l	1 mg/l	2 mg/l	
2PD00002	01/31/88	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			28	42	0 mg/l	2 mg/l	3 mg/l	
2PD00002	02/29/88	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			26	36	0 mg/l	2 mg/l	2 mg/l	
2PD00002	03/31/88	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			18	21	0 mg/l	1 mg/l	2 mg/l	
2PD00002	04/30/88	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			23	38	0 mg/l	2 mg/l	2 mg/l	
2PD00002	05/31/88	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			35	48	0 mg/l	4 mg/l	6 mg/l	
2PD00002	06/30/88	Perrysburg, City of	Phosphorus, Total	10	16		1 mg/l	2 mg/l	1
	001			20	26	0 mg/l	3 mg/l	3 mg/l	
* Subsubtotal *									
									19
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PD00002	01/31/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			491	927	0 mg/l	43 mg/l	58 mg/l	
2PD00002	02/28/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			440	1051	0 mg/l	33 mg/l	74 mg/l	
2PD00002	03/31/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			772	1161	0 mg/l	56 mg/l	80 mg/l	
2PD00002	04/30/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			413	826	0 mg/l	28 mg/l	42 mg/l	
2PD00002	05/31/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			700	1091	0 mg/l	59 mg/l	76 mg/l	
2PD00002	06/30/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			459	779	0 mg/l	38 mg/l	65 mg/l	
2PD00002	08/31/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			721	2270	0 mg/l	57 mg/l	146 mg/l	
2PD00002	09/30/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			737	1236	0 mg/l	80 mg/l	99 mg/l	
2PD00002	11/30/87	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			467	1548	0 mg/l	42 mg/l	141 mg/l	
2PD00002	01/31/88	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			437	1106	0 mg/l	28 mg/l	65 mg/l	
2PD00002	02/29/88	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			427	850	0 mg/l	25 mg/l	47 mg/l	
2PD00002	04/30/88	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			267	735	0 mg/l	18 mg/l	44 mg/l	
2PD00002	05/31/88	Perrysburg, City of	Solids, Total Suspended	522	678		50 mg/l	65 mg/l	1
	001			538	830	0 mg/l	63 mg/l	97 mg/l	
* Subsubtotal *									
									13
** Subtotal **									
									53
** VIOLATIONS FOR NPDES: 2PD00035									
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PD00035	05/31/87	DuPont Road WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	1 mg/l	
* Subsubtotal *									
									1

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* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PD00035	07/31/87	DuPont Road WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PD00035	08/31/87	DuPont Road WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
* Subsubtotal *									2
* VIOLATIONS FOR PARAMETER: PHENOLICS, TOTAL									
2PD00035	04/30/87	DuPont Road WWTP	Phenolics, Total					27 µg/l	1
	001			0	0	0 µg/l	0 µg/l	60 µg/l	
2PD00035	06/30/88	DuPont Road WWTP	Phenolics, Total					27 µg/l	1
	001			0	0	0 µg/l	0 µg/l	110 µg/l	
* Subsubtotal *									2
* VIOLATIONS FOR PARAMETER: PHOSPHORUS, TOTAL									
2PD00035	07/31/87	DuPont Road WWTP	Phosphorus, Total	31	46		1 mg/l	2 mg/l	1
	001			15	26	0 mg/l	1 mg/l	1 mg/l	
* Subsubtotal *									1
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PD00035	06/30/87	DuPont Road WWTP	Solids, Total Suspended	607	910		20 mg/l	30 mg/l	1
	001			254	381	0 mg/l	15 mg/l	33 mg/l	
* Subsubtotal *									1
** Subtotal **									7
** VIOLATIONS FOR NPDES: 2PF00000									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PF00000	01/31/88	Toledo, City of	BOD 5	19713	29569		40 mg/l	60 mg/l	1
	001			13201	13446	0 mg/l	49 mg/l	55 mg/l	
2PF00000	02/29/88	Toledo, City of	BOD 5	19713	29569		40 mg/l	60 mg/l	1
	001			19232	27425	0 mg/l	53 mg/l	66 mg/l	
2PF00000	03/31/88	Toledo, City of	BOD 5	19713	29569		40 mg/l	60 mg/l	1
	001			15442	23800	0 mg/l	40 mg/l	63 mg/l	
* Subsubtotal *									3
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PF00000	04/30/87	Toledo, City of	Chlorine, Total Residual					1 mg/l	1
	001			0	0	21 mg/l	0 mg/l	149 mg/l	
* Subsubtotal *									1
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PF00000	04/30/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	05/31/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	06/30/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	07/31/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	08/31/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1

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	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	09/30/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	10/31/87	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	04/30/88	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	05/31/88	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
2PF00000	07/31/88	Toledo, City of	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1000000 SU	100000000 SU	
* Subsubtotal *									
									10
* VIOLATIONS FOR PARAMETER: MERCURY, AS HG									
2PF00000	07/31/88	Toledo, City of	Mercury, as Hg					0 µg/l	1
	001			0	0	0 µg/l	0 µg/l	1 µg/l	
* Subsubtotal *									
									1
* VIOLATIONS FOR PARAMETER: PH									
2PF00000	02/29/88	Toledo, City of	pH			7 SU		9 SU	1
	001			0	0	6 SU	0 SU	8 SU	
* Subsubtotal *									
									1
* VIOLATIONS FOR PARAMETER: PHENOLICS, TOTAL									
2PF00000	07/31/88	Toledo, City of	Phenolics, Total					16 µg/l	1
	001			0	0	0 µg/l	0 µg/l	41 µg/l	
* Subsubtotal *									
									1
* VIOLATIONS FOR PARAMETER: PHOSPHORUS, TOTAL									
2PF00000	01/31/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			252	523	0 mg/l	1 mg/l	2 mg/l	
2PF00000	02/28/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			314	451	0 mg/l	1 mg/l	2 mg/l	
2PF00000	03/31/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			540	803	0 mg/l	2 mg/l	2 mg/l	
2PF00000	04/30/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			267	785	0 mg/l	1 mg/l	2 mg/l	
2PF00000	06/30/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			423	659	0 mg/l	1 mg/l	3 mg/l	
2PF00000	07/31/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			399	613	0 mg/l	2 mg/l	3 mg/l	
2PF00000	08/31/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			502	665	0 mg/l	2 mg/l	3 mg/l	
2PF00000	09/30/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			424	649	0 mg/l	2 mg/l	3 mg/l	
2PF00000	10/31/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			228	393	0 mg/l	1 mg/l	1 mg/l	
2PF00000	12/31/87	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			512	933	0 mg/l	1 mg/l	2 mg/l	
2PF00000	01/31/88	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			440	484	0 mg/l	2 mg/l	2 mg/l	
2PF00000	02/29/88	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			529	849	0 mg/l	1 mg/l	2 mg/l	
2PF00000	03/31/88	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1

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	001			492	798	0 mg/l	1 mg/l	2 mg/l	
2PF00000	05/31/88	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			218	413	0 mg/l	1 mg/l	2 mg/l	
2PF00000	06/30/88	Toledo, City of	Phosphorus, Total	493	740		1 mg/l	2 mg/l	1
	001			281	396	0 mg/l	1 mg/l	2 mg/l	
* Subsubtotal *									
									15
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PF00000	03/31/87	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			34359	43934	0 mg/l	110 mg/l	124 mg/l	
2PF00000	04/30/87	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			20316	57101	0 mg/l	50 mg/l	137 mg/l	
2PF00000	06/30/87	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			20351	33570	0 mg/l	65 mg/l	134 mg/l	
2PF00000	07/31/87	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			19112	28208	0 mg/l	77 mg/l	119 mg/l	
2PF00000	08/31/87	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			18842	22947	0 mg/l	79 mg/l	99 mg/l	
2PF00000	12/31/87	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			23438	43898	0 mg/l	62 mg/l	97 mg/l	
2PF00000	01/31/88	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			21743	22426	0 mg/l	80 mg/l	81 mg/l	
2PF00000	02/29/88	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			30351	57789	0 mg/l	78 mg/l	117 mg/l	
2PF00000	03/31/88	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			34598	42243	0 mg/l	94 mg/l	111 mg/l	
2PF00000	04/30/88	Toledo, City of	Solids, Total Suspended	29569	44354		60 mg/l	90 mg/l	1
	001			20653	28330	0 mg/l	62 mg/l	101 mg/l	
* Subsubtotal *									
									10
** Subtotal **									
									42
** VIOLATIONS FOR NPDES: 2PG00002									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PG00002	01/31/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			63	83	0 mg/l	215 mg/l	300 mg/l	
2PG00002	02/28/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			20	28	0 mg/l	63 mg/l	96 mg/l	
2PG00002	03/31/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			9	12	0 mg/l	27 mg/l	44 mg/l	
2PG00002	04/30/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			73	134	0 mg/l	146 mg/l	300 mg/l	
2PG00002	06/30/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			4	6	0 mg/l	11 mg/l	17 mg/l	
2PG00002	07/31/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			5	10	0 mg/l	11 mg/l	16 mg/l	
2PG00002	10/31/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			7	10	0 mg/l	26 mg/l	34 mg/l	
2PG00002	11/30/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			7	9	0 mg/l	25 mg/l	30 mg/l	
2PG00002	12/31/87	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			5	6	0 mg/l	13 mg/l	13 mg/l	
2PG00002	01/31/88	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			7	12	0 mg/l	19 mg/l	26 mg/l	
2PG00002	02/29/88	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1

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	001			12	24	0 mg/l	32 mg/l	77 mg/l	
2PG00002	03/31/88	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			5	5	0 mg/l	13 mg/l	16 mg/l	
2PG00002	04/30/88	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			4	6	0 mg/l	12 mg/l	19 mg/l	
2PG00002	05/31/88	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			11	18	0 mg/l	44 mg/l	70 mg/l	
2PG00002	06/30/88	Lucas County Bentbrook Farms	BOD 5	4	6		18 mg/l	25 mg/l	1
	001			4	3	0 mg/l	24 mg/l	12 mg/l	
* Subsubtotal *									
									15
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PG00002	05/31/87	Lucas County Bentbrook Farms	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PG00002	06/30/87	Lucas County Bentbrook Farms	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PG00002	07/31/87	Lucas County Bentbrook Farms	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PG00002	08/31/87	Lucas County Bentbrook Farms	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PG00002	09/30/87	Lucas County Bentbrook Farms	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PG00002	10/31/87	Lucas County Bentbrook Farms	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
* Subsubtotal *									
									6
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PG00002	05/31/87	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	1261 SU	5300 SU	
2PG00002	06/30/87	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	11994 SU	25800 SU	
2PG00002	07/31/87	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	1058 SU	370 SU	
2PG00002	08/31/87	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	993 SU	1600 SU	
2PG00002	09/30/87	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	1522 SU	13500 SU	
2PG00002	10/31/87	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	146325 SU	292000 SU	
2PG00002	05/31/88	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	10000 SU	10000 SU	
2PG00002	06/30/88	Lucas County Bentbrook Farms	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	10275 SU	34000 SU	
* Subsubtotal *									
									8
* VIOLATIONS FOR PARAMETER: FLOW, TOTAL									
2PG00002	10/31/87	Lucas County Bentbrook Farms	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PG00002	01/31/88	Lucas County Bentbrook Farms	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PG00002	02/29/88	Lucas County Bentbrook Farms	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PG00002	03/31/88	Lucas County Bentbrook Farms	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PG00002	04/30/88	Lucas County Bentbrook Farms	Flow, Total		0				1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	0 mgd	0 mgd	0 mgd	
2PG00002	05/31/88	Lucas County Bentbrook Farms	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PG00002	06/30/88	Lucas County Bentbrook Farms	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
* Subsubtotal *									
									7
* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED									
2PG00002	10/31/87	Lucas County Bentbrook Farms	Oxygen, Dissolved			5 mg/l			1
	001			0	0	2 mg/l	0 mg/l	0 mg/l	
2PG00002	11/30/87	Lucas County Bentbrook Farms	Oxygen, Dissolved			5 mg/l			1
	001			0	0	2 mg/l	0 mg/l	0 mg/l	
2PG00002	01/31/88	Lucas County Bentbrook Farms	Oxygen, Dissolved			5 mg/l			1
	001			0	0	5 mg/l	0 mg/l	0 mg/l	
2PG00002	04/30/88	Lucas County Bentbrook Farms	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PG00002	05/31/88	Lucas County Bentbrook Farms	Oxygen, Dissolved			5 mg/l			1
	001			0	0	4 mg/l	0 mg/l	0 mg/l	
2PG00002	06/30/88	Lucas County Bentbrook Farms	Oxygen, Dissolved			5 mg/l			1
	001			0	0	4 mg/l	0 mg/l	0 mg/l	
* Subsubtotal *									
									6
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PG00002	01/31/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			67	84	0 mg/l	218 mg/l	252 mg/l	
2PG00002	02/28/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			27	40	0 mg/l	86 mg/l	120 mg/l	
2PG00002	03/31/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			10	17	0 mg/l	32 mg/l	62 mg/l	
2PG00002	04/30/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			127	239	0 mg/l	254 mg/l	536 mg/l	
2PG00002	06/30/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			4	8	0 mg/l	12 mg/l	20 mg/l	
2PG00002	07/31/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			8	16	0 mg/l	17 mg/l	26 mg/l	
2PG00002	10/31/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			10	13	0 mg/l	33 mg/l	40 mg/l	
2PG00002	11/30/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			9	17	0 mg/l	29 mg/l	40 mg/l	
2PG00002	12/31/87	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			6	11	0 mg/l	15 mg/l	19 mg/l	
2PG00002	01/31/88	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			9	19	0 mg/l	22 mg/l	43 mg/l	
2PG00002	02/29/88	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			23	46	0 mg/l	61 mg/l	148 mg/l	
2PG00002	03/31/88	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			9	8	0 mg/l	24 mg/l	25 mg/l	
2PG00002	04/30/88	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			7	10	0 mg/l	20 mg/l	32 mg/l	
2PG00002	05/31/88	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			15	26	0 mg/l	60 mg/l	102 mg/l	
2PG00002	06/30/88	Lucas County Bentbrook Farms	Solids, Total Suspended	5	8		20 mg/l	35 mg/l	1
	001			16	2	0 mg/l	92 mg/l	9 mg/l	
* Subsubtotal *									
									15
** Subtotal **									

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NPDES     DATE &   NAME OF FACILITY/OWNER         NAME OF PARAMETER VIOLATED     AVG QUANTITY MAX QUANTITY MIN CONC     AVG CONC     MAX CONC      TALLY
PERMIT    OUTFALL                                                                in kg/day    in kg/day
NUMBER    NUMBER                                                                 Lim/Measured Lim/Measured Lim/Measured Lim/Measured Lim/Measured


                                                                                                                                                      57
** VIOLATIONS FOR NPDES: 2PH00000

* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL
2PH00000  06/30/88 Fuller's Creekside Estates     Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       1 mg/l
* Subsubtotal *
                                                                                                                                                       1

* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED
2PH00000  05/31/88 Fuller's Creekside Estates     Oxygen, Dissolved                                        5 mg/l                                      1
          001                                                                    0            0            1 mg/l       0 mg/l       0 mg/l
2PH00000  06/30/88 Fuller's Creekside Estates     Oxygen, Dissolved                                        5 mg/l                                      1
          001                                                                    0            0            2 mg/l       0 mg/l       0 mg/l
* Subsubtotal *
                                                                                                                                                       2

* VIOLATIONS FOR PARAMETER: PH
2PH00000  06/30/88 Fuller's Creekside Estates     pH                                                       7 SU                      9 SU              1
          001                                                                    0            0            6 SU         0 SU         7 SU
* Subsubtotal *
                                                                                                                                                       1
** Subtotal **
                                                                                                                                                       4

** VIOLATIONS FOR NPDES: 2PH00004

* VIOLATIONS FOR PARAMETER: BOD 5
2PH00004  01/31/87 Lincoln Green                  BOD 5                          13           23                        20 mg/l      35 mg/l           1
          001                                                                    29           43           0 mg/l       45 mg/l      108 mg/l
2PH00004  02/28/87 Lincoln Green                  BOD 5                          13           23                        20 mg/l      35 mg/l           1
          001                                                                    70           268          0 mg/l       154 mg/l     594 mg/l
2PH00004  04/30/87 Lincoln Green                  BOD 5                          13           23                        20 mg/l      35 mg/l           1
          001                                                                    13           55           0 mg/l       27 mg/l      114 mg/l
* Subsubtotal *
                                                                                                                                                       3

* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL
2PH00004  05/31/87 Lincoln Green                  Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       4 mg/l
2PH00004  06/30/87 Lincoln Green                  Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       4 mg/l
2PH00004  07/31/87 Lincoln Green                  Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       4 mg/l
2PH00004  08/31/87 Lincoln Green                  Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       4 mg/l
2PH00004  09/30/87 Lincoln Green                  Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       3 mg/l
2PH00004  10/31/87 Lincoln Green                  Chlorine, Total Residual                                                           1 mg/l            1
          001                                                                    0            0            0 mg/l       0 mg/l       4 mg/l
* Subsubtotal *
                                                                                                                                                       6

* VIOLATIONS FOR PARAMETER: FECAL COLIFORM
2PH00004  05/31/87 Lincoln Green                  Fecal Coliform                                                        200 SU       400 SU            1
          001                                                                    0            0            0 SU         458 SU       10500 SU
2PH00004  06/30/87 Lincoln Green                  Fecal Coliform                                                        200 SU       400 SU            1
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NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	0 SU	8272 SU	25700 SU	
2PH00004	07/31/87	Lincoln Green	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	909 SU	6800 SU	
2PH00004	08/31/87	Lincoln Green	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	6095 SU	16100 SU	
2PH00004	09/30/87	Lincoln Green	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	24016 SU	46000 SU	
2PH00004	05/31/88	Lincoln Green	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	6000 SU	6000 SU	
2PH00004	06/30/88	Lincoln Green	Fecal Coliform				200 SU	400 SU	1
	001			0	0	0 SU	24150 SU	90000 SU	
* Subsubtotal *									
									7
* VIOLATIONS FOR PARAMETER: FLOW, TOTAL									
2PH00004	11/30/87	Lincoln Green	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PH00004	12/31/87	Lincoln Green	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PH00004	01/31/88	Lincoln Green	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PH00004	02/29/88	Lincoln Green	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PH00004	03/31/88	Lincoln Green	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
2PH00004	04/30/88	Lincoln Green	Flow, Total		0				1
	001			0	0	0 mgd	0 mgd	0 mgd	
* Subsubtotal *									
									6
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PH00004	01/31/87	Lincoln Green	Solids, Total Suspended	21	33		32 mg/l	52 mg/l	1
	001			23	55	0 mg/l	44 mg/l	140 mg/l	
2PH00004	02/28/87	Lincoln Green	Solids, Total Suspended	21	33		32 mg/l	52 mg/l	1
	001			29	108	0 mg/l	64 mg/l	240 mg/l	
2PH00004	04/30/87	Lincoln Green	Solids, Total Suspended	21	33		32 mg/l	52 mg/l	1
	001			22	96	0 mg/l	44 mg/l	200 mg/l	
* Subsubtotal *									
									3
** Subtotal **									
									25
** VIOLATIONS FOR NPDES: 2PH00013									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PH00013	01/31/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			12	21	0 mg/l	35 mg/l	54 mg/l	
2PH00013	02/28/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			12	37	0 mg/l	43 mg/l	126 mg/l	
2PH00013	03/31/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			7	16	0 mg/l	20 mg/l	41 mg/l	
2PH00013	04/30/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			5	17	0 mg/l	20 mg/l	50 mg/l	
2PH00013	05/31/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			5	13	0 mg/l	26 mg/l	68 mg/l	
2PH00013	06/30/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			2	4	0 mg/l	12 mg/l	20 mg/l	
2PH00013	08/31/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			2	7	0 mg/l	12 mg/l	31 mg/l	
2PH00013	10/31/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			3	4	0 mg/l	16 mg/l	24 mg/l	
2PH00013	11/30/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			2	5	0 mg/l	13 mg/l	30 mg/l	
2PH00013	12/31/87	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			6	7	0 mg/l	31 mg/l	45 mg/l	
2PH00013	02/29/88	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			2	2	0 mg/l	11 mg/l	14 mg/l	
2PH00013	05/31/88	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			6	12	0 mg/l	34 mg/l	57 mg/l	
2PH00013	06/30/88	Oak Openings Industrial Park	BOD 5	7	10		10 mg/l	15 mg/l	1
	001			6	7	0 mg/l	32 mg/l	23 mg/l	
* Subsubtotal *									
									13
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PH00013	05/31/87	Oak Openings Industrial Park	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00013	06/30/87	Oak Openings Industrial Park	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00013	07/31/87	Oak Openings Industrial Park	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00013	08/31/87	Oak Openings Industrial Park	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00013	09/30/87	Oak Openings Industrial Park	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00013	10/31/87	Oak Openings Industrial Park	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
* Subsubtotal *									
									6
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PH00013	05/31/87	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	9402 SU	17000 SU	
2PH00013	06/30/87	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	23263 SU	97000 SU	
2PH00013	07/31/87	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	3946 SU	4500 SU	
2PH00013	08/31/87	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	8878 SU	43200 SU	
2PH00013	09/30/87	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	7807 SU	24000 SU	
2PH00013	10/31/87	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	54034 SU	167000 SU	
2PH00013	05/31/88	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	130000 SU	130000 SU	
2PH00013	06/30/88	Oak Openings Industrial Park	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	20325 SU	42500 SU	
* Subsubtotal *									
									8
* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED									
2PH00013	01/31/87	Oak Openings Industrial Park	Oxygen, Dissolved			5 mg/l			1
	001			0	0	4 mg/l	0 mg/l	0 mg/l	
2PH00013	02/28/87	Oak Openings Industrial Park	Oxygen, Dissolved			5 mg/l			1
	001			0	0	2 mg/l	0 mg/l	0 mg/l	
2PH00013	03/31/87	Oak Openings Industrial Park	Oxygen, Dissolved			5 mg/l			1

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NPDES      DATE &   NAME OF FACILITY/OWNER         NAME OF PARAMETER VIOLATED AVG QUANTITY MAX QUANTITY MIN CONC     AVG CONC     MAX CONC     TALLY
PERMIT     OUTFALL                                                            in kg/day    in kg/day
NUMBER     NUMBER                                                             Lim/Measured Lim/Measured Lim/Measured Lim/Measured Lim/Measured


           001                                                                0            0            1 mg/l       0 mg/l       0 mg/l
2PH00013   04/30/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            3 mg/l       0 mg/l       0 mg/l
2PH00013   05/31/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            3 mg/l       0 mg/l       0 mg/l
2PH00013   06/30/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            2 mg/l       0 mg/l       0 mg/l
2PH00013   07/31/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            2 mg/l       0 mg/l       0 mg/l
2PH00013   08/31/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            2 mg/l       0 mg/l       0 mg/l
2PH00013   09/30/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            1 mg/l       0 mg/l       0 mg/l
2PH00013   10/31/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            2 mg/l       0 mg/l       0 mg/l
2PH00013   11/30/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            1 mg/l       0 mg/l       0 mg/l
2PH00013   12/31/87 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            1 mg/l       0 mg/l       0 mg/l
2PH00013   01/31/88 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            5 mg/l       0 mg/l       0 mg/l
2PH00013   02/29/88 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            4 mg/l       0 mg/l       0 mg/l
2PH00013   03/31/88 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            4 mg/l       0 mg/l       0 mg/l
2PH00013   05/31/88 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            4 mg/l       0 mg/l       0 mg/l
2PH00013   06/30/88 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            4 mg/l       0 mg/l       0 mg/l
2PH00013   07/31/88 Oak Openings Industrial Park   Oxygen, Dissolved                                    5 mg/l                                 1
           001                                                                0            0            3 mg/l       0 mg/l       0 mg/l
* Subsubtotal *
                                                                                                                                             18

* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED
2PH00013   01/31/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                12           18           0 mg/l       37 mg/l      60 mg/l
2PH00013   02/28/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                34           118          0 mg/l       117 mg/l     404 mg/l
2PH00013   03/31/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                11           23           0 mg/l       34 mg/l      70 mg/l
2PH00013   04/30/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                8            20           0 mg/l       30 mg/l      60 mg/l
2PH00013   05/31/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                11           39           0 mg/l       63 mg/l      210 mg/l
2PH00013   06/30/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                2            4            0 mg/l       13 mg/l      21 mg/l
2PH00013   08/31/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                6            16           0 mg/l       30 mg/l      77 mg/l
2PH00013   09/30/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                2            2            0 mg/l       12 mg/l      19 mg/l
2PH00013   10/31/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                9            20           0 mg/l       56 mg/l      132 mg/l
2PH00013   11/30/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                2            5            0 mg/l       15 mg/l      29 mg/l
2PH00013   12/31/87 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
           001                                                                16           37           0 mg/l       79 mg/l      168 mg/l
2PH00013   01/31/88 Oak Openings Industrial Park   Solids, Total Suspended    818          12                        12 mg/l      18 mg/l      1
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NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			3	4	0 mg/l	14 mg/l	19 mg/l	
2PH00013	02/29/88	Oak Openings Industrial Park	Solids, Total Suspended	818	12		12 mg/l	18 mg/l	1
	001			3	6	0 mg/l	17 mg/l	36 mg/l	
2PH00013	03/31/88	Oak Openings Industrial Park	Solids, Total Suspended	818	12		12 mg/l	18 mg/l	1
	001			3	5	0 mg/l	15 mg/l	28 mg/l	
2PH00013	04/30/88	Oak Openings Industrial Park	Solids, Total Suspended	818	12		12 mg/l	18 mg/l	1
	001			3	3	0 mg/l	13 mg/l	15 mg/l	
2PH00013	05/31/88	Oak Openings Industrial Park	Solids, Total Suspended	818	12		12 mg/l	18 mg/l	1
	001			26	64	0 mg/l	134 mg/l	308 mg/l	
2PH00013	06/30/88	Oak Openings Industrial Park	Solids, Total Suspended	818	12		12 mg/l	18 mg/l	1
	001			35	45	0 mg/l	174 mg/l	152 mg/l	
* Subsubtotal *									
									17
** Subtotal **									
									62

** VIOLATIONS FOR NPDES: 2PH00014

* VIOLATIONS FOR PARAMETER: BOD 5

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PH00014	03/31/87	Oak Terrace	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			13	51	0 mg/l	47 mg/l	180 mg/l	
2PH00014	06/30/87	Oak Terrace	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			3	7	0 mg/l	8 mg/l	17 mg/l	
2PH00014	08/31/87	Oak Terrace	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			14	47	0 mg/l	38 mg/l	128 mg/l	
2PH00014	12/31/87	Oak Terrace	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			39	154	0 mg/l	99 mg/l	384 mg/l	
2PH00014	06/30/88	Oak Terrace	BOD 5	4	6		10 mg/l	15 mg/l	1
	001			9	0	0 mg/l	24 mg/l	1 mg/l	
* Subsubtotal *									
									5

* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PH00014	05/31/87	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	06/30/87	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	07/31/87	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	08/31/87	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	09/30/87	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	10/31/87	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	05/31/88	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	06/30/88	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	4 mg/l	
2PH00014	07/31/88	Oak Terrace	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	2 mg/l	
* Subsubtotal *									
									9

* VIOLATIONS FOR PARAMETER: FECAL COLIFORM

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
2PH00014	05/31/87	Oak Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	1020 SU	2000 SU	
2PH00014	06/30/87	Oak Terrace	Fecal Coliform				1000 SU	2000 SU	1

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NPDES     DATE &   NAME OF FACILITY/OWNER          NAME OF PARAMETER VIOLATED     AVG QUANTITY MAX QUANTITY MIN CONC     AVG CONC     MAX CONC     TALLY
PERMIT    OUTFALL                                                                 in kg/day    in kg/day
NUMBER    NUMBER                                                                  Lim/Measured Lim/Measured Lim/Measured Lim/Measured Lim/Measured


          001                                                                     0            0            0 SU         7829 SU      20600 SU
2PH00014  07/31/87 Oak Terrace                     Fecal Coliform                                                        1000 SU      2000 SU         1
          001                                                                     0            0            0 SU         1166 SU      800 SU
2PH00014  08/31/87 Oak Terrace                     Fecal Coliform                                                        1000 SU      2000 SU         1
          001                                                                     0            0            0 SU         1786 SU      106000 SU
2PH00014  09/30/87 Oak Terrace                     Fecal Coliform                                                        1000 SU      2000 SU         1
          001                                                                     0            0            0 SU         1261 SU      5900 SU
2PH00014  10/31/87 Oak Terrace                     Fecal Coliform                                                        1000 SU      2000 SU         1
          001                                                                     0            0            0 SU         1784 SU      12000 SU
* Subsubtotal *
                                                                                                                                                      6

* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED
2PH00014  01/31/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            3 mg/l       0 mg/l       0 mg/l
2PH00014  02/28/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            3 mg/l       0 mg/l       0 mg/l
2PH00014  03/31/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            2 mg/l       0 mg/l       0 mg/l
2PH00014  04/30/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            3 mg/l       0 mg/l       0 mg/l
2PH00014  05/31/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            2 mg/l       0 mg/l       0 mg/l
2PH00014  06/30/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            2 mg/l       0 mg/l       0 mg/l
2PH00014  07/31/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            4 mg/l       0 mg/l       0 mg/l
2PH00014  08/31/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            4 mg/l       0 mg/l       0 mg/l
2PH00014  09/30/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            4 mg/l       0 mg/l       0 mg/l
2PH00014  12/31/87 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            2 mg/l       0 mg/l       0 mg/l
2PH00014  02/29/88 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            4 mg/l       0 mg/l       0 mg/l
2PH00014  07/31/88 Oak Terrace                     Oxygen, Dissolved                                        5 mg/l                                    1
          001                                                                     0            0            3 mg/l       0 mg/l       0 mg/l
* Subsubtotal *
                                                                                                                                                     12

* VIOLATIONS FOR PARAMETER: PH
2PH00014  02/28/87 Oak Terrace                     pH                                                       7 SU                      9 SU            1
          001                                                                     0            0            6 SU         0 SU         7 SU
2PH00014  09/30/87 Oak Terrace                     pH                                                       7 SU                      9 SU            1
          001                                                                     0            0            6 SU         0 SU         8 SU
2PH00014  10/31/87 Oak Terrace                     pH                                                       7 SU                      9 SU            1
          001                                                                     0            0            6 SU         0 SU         7 SU
* Subsubtotal *
                                                                                                                                                      3

* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED
2PH00014  03/31/87 Oak Terrace                     Solids, Total Suspended        5            7                         12 mg/l      18 mg/l         1
          001                                                                     37           145          0 mg/l       132 mg/l     510 mg/l
2PH00014  06/30/87 Oak Terrace                     Solids, Total Suspended        5            7                         12 mg/l      18 mg/l         1
          001                                                                     3            7            0 mg/l       8 mg/l       18 mg/l
2PH00014  08/31/87 Oak Terrace                     Solids, Total Suspended        5            7                         12 mg/l      18 mg/l         1
          001                                                                     133          507          0 mg/l       359 mg/l     1368 mg/l
2PH00014  12/31/87 Oak Terrace                     Solids, Total Suspended        5            7                         12 mg/l      18 mg/l         1
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NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			256	1019	0 mg/l	640 mg/l	2540 mg/l	
2PH00014	02/29/88	Oak Terrace	Solids, Total Suspended	5	7		12 mg/l	18 mg/l	1
	001			4	13	0 mg/l	13 mg/l	43 mg/l	
2PH00014	04/30/88	Oak Terrace	Solids, Total Suspended	5	7		12 mg/l	18 mg/l	1
	001			4	8	0 mg/l	6 mg/l	10 mg/l	
2PH00014	06/30/88	Oak Terrace	Solids, Total Suspended	5	7		12 mg/l	18 mg/l	1
	001			47	2	0 mg/l	120 mg/l	7 mg/l	
* Subsubtotal *									
									7
** Subtotal **									
									42
** VIOLATIONS FOR NPDES: 2PK00000									
* VIOLATIONS FOR PARAMETER: CHLORINE, TOTAL RESIDUAL									
2PK00000	05/31/87	Maumee River WWTP	Chlorine, Total Residual					1 mg/l	1
	001			0	0	0 mg/l	0 mg/l	5 mg/l	
* Subsubtotal *									
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									1
2PK00000	05/31/88	Maumee River WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	253 SU	54327 SU	
2PK00000	06/30/88	Maumee River WWTP	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	267 SU	61111 SU	
* Subsubtotal *									
									2
** Subtotal **									
									3
** VIOLATIONS FOR NPDES: 2PS00002									
* VIOLATIONS FOR PARAMETER: BOD 5									
2PS00002	01/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			6	7	0 mg/l	18 mg/l	20 mg/l	
2PS00002	02/28/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			7	11	0 mg/l	18 mg/l	29 mg/l	
2PS00002	03/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			12	15	0 mg/l	32 mg/l	41 mg/l	
2PS00002	04/30/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			10	13	0 mg/l	27 mg/l	36 mg/l	
2PS00002	05/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			7	12	0 mg/l	20 mg/l	33 mg/l	
2PS00002	06/30/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			13	23	0 mg/l	36 mg/l	67 mg/l	
2PS00002	07/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			10	13	0 mg/l	26 mg/l	34 mg/l	
2PS00002	08/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			6	7	0 mg/l	16 mg/l	19 mg/l	
2PS00002	09/30/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			6	14	0 mg/l	17 mg/l	37 mg/l	
2PS00002	10/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			3	6	0 mg/l	9 mg/l	16 mg/l	
2PS00002	11/30/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			3	5	0 mg/l	9 mg/l	14 mg/l	
2PS00002	12/31/87	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			9	12	0 mg/l	26 mg/l	32 mg/l	
2PS00002	01/31/88	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			8	10	0 mg/l	21 mg/l	28 mg/l	
2PS00002	02/29/88	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			8	12	0 mg/l	23 mg/l	32 mg/l	
2PS00002	03/31/88	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			9	13	0 mg/l	25 mg/l	35 mg/l	
2PS00002	04/30/88	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			9	26	0 mg/l	24 mg/l	70 mg/l	
2PS00002	05/31/88	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			5	7	0 mg/l	14 mg/l	20 mg/l	
2PS00002	07/31/88	Woodside Terrace	BOD 5	3	5		10 mg/l	15 mg/l	1
	001			3	5	0 mg/l	8 mg/l	14 mg/l	
* Subsubtotal *									
									18
* VIOLATIONS FOR PARAMETER: FECAL COLIFORM									
2PS00002	05/31/87	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	2907 SU	6000 SU	
2PS00002	06/30/87	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	14091 SU	50000 SU	
2PS00002	07/31/87	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	20596 SU	25600 SU	
2PS00002	08/31/87	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	18886 SU	20175 SU	
2PS00002	09/30/87	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	13500 SU	17600 SU	
2PS00002	10/31/87	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	3613 SU	12400 SU	
2PS00002	05/31/88	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	17110 SU	23200 SU	
2PS00002	07/31/88	Woodside Terrace	Fecal Coliform				1000 SU	2000 SU	1
	001			0	0	0 SU	15111 SU	19000 SU	
* Subsubtotal *									
									8
* VIOLATIONS FOR PARAMETER: OXYGEN, DISSOLVED									
2PS00002	01/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	02/28/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	03/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	04/30/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	05/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	06/30/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	07/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	08/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	09/30/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	10/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	11/30/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	12/31/87	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	01/31/88	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	02/29/88	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	1 mg/l	0 mg/l	0 mg/l	
2PS00002	03/31/88	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1

NPDES PERMIT NUMBER	DATE & OUTFALL NUMBER	NAME OF FACILITY/OWNER	NAME OF PARAMETER VIOLATED	AVG QUANTITY in kg/day Lim/Measured	MAX QUANTITY in kg/day Lim/Measured	MIN CONC Lim/Measured	AVG CONC Lim/Measured	MAX CONC Lim/Measured	TALLY
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	04/30/88	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	05/31/88	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
2PS00002	07/31/88	Woodside Terrace	Oxygen, Dissolved			5 mg/l			1
	001			0	0	0 mg/l	0 mg/l	0 mg/l	
* Subsubtotal *									
									18
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PS00002	01/31/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			12	17	0 mg/l	35 mg/l	48 mg/l	
2PS00002	02/28/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			10	15	0 mg/l	27 mg/l	42 mg/l	
2PS00002	03/30/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			10	15	0 mg/l	28 mg/l	40 mg/l	
2PS00002	04/30/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			7	14	0 mg/l	19 mg/l	38 mg/l	
2PS00002	05/31/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			8	15	0 mg/l	21 mg/l	41 mg/l	
2PS00002	06/30/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			7	9	0 mg/l	20 mg/l	25 mg/l	
2PS00002	08/31/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			7	8	0 mg/l	17 mg/l	21 mg/l	
2PS00002	09/30/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			6	11	0 mg/l	16 mg/l	29 mg/l	
2PS00002	10/31/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			5	9	0 mg/l	14 mg/l	25 mg/l	
2PS00002	11/30/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			5	6	0 mg/l	15 mg/l	17 mg/l	
2PS00002	12/31/87	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			6	9	0 mg/l	16 mg/l	24 mg/l	
2PS00002	01/31/88	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			8	12	0 mg/l	22 mg/l	33 mg/l	
2PS00002	02/29/88	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			7	14	0 mg/l	19 mg/l	39 mg/l	
2PS00002	03/31/88	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			8	13	0 mg/l	22 mg/l	36 mg/l	
2PS00002	04/30/88	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			13	16	0 mg/l	35 mg/l	43 mg/l	
2PS00002	05/31/88	Woodside Terrace	Solids, Total Suspended	4	6		12 mg/l	18 mg/l	1
	001			10	18	0 mg/l	27 mg/l	48 mg/l	
* Subsubtotal *									
									16
** Subtotal **									
									60
** VIOLATIONS FOR NPDES: 2PY00000									
* VIOLATIONS FOR PARAMETER: SOLIDS, TOTAL SUSPENDED									
2PY00000	03/31/88	Centennial Manor	Solids, Total Suspended	1			18 mg/l		1
	001			2	0	0 mg/l	37 mg/l	0 mg/l	
* Subsubtotal *									
									1
** Subtotal **									
									1
*** Total ***									
									627

APPENDIX J

Lower Maumee Remedial Action Plan Water Quality Problem Matrix

LOWER MAUMEE BASIN
REMEDIAL ACTION PLAN

WATER QUALITY PROBLEM MATRIX

The Remedial Action Plan Advisory Committee (RAPAC) and its subcommittees have identified twelve water quality problem areas that affect the streams of the Lower Maumee Basin. These water quality problems are:

POTW	Publicly-Operated Treatment Works (sewage treatment plants)
IND	Industrial waste effluent discharges
URBAN	Runoff from urban areas
CSOs	Combined sewer overflows
HOME	Private sewage systems (septic systems, privies, etc.)
PKG	Package sewage treatment plants
SEDIMENTS	Contaminated stream sediments
ATMOS	Deposition of air-borne pollutants
WTP SLUDGE	Accumulation of Water Treatment Plant (lime) sludge in a stream
AG	Runoff from agricultural land
DUMPS	Dumps; landfills; and pits, ponds, and lagoons.
LUST	Leaking Underground Storage Tanks (e.g., gasoline)
DREDGE	Disposal of material dredged from Toledo Harbor

Each of these water quality problems is being addressed by one of the RAPAC subcommittees; the problem ratings are grouped by subcommittee below. The Agricultural Runoff, Dumps/Landfills, and Dredge Disposal subcommittees are listed under 'other' because each has a single water quality issue to deal with.

Classification of Watersheds are based on the impact of each identified water quality problem. The abbreviations are as follows:

H = High Impact
M = Medium Impact
L = Low Impact
N = No Impact
U = Unknown
S = Suspected, but no data.
HS= Suspected High
MS= Suspected Medium
LS= Suspected Low
US= Unknown, but suspected problem

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Page #1                        WATER QUALITY PROBLEM MATRIX
04/10/90                       ============================
                                     Lower Maumee Basin
                                    Remedial Action Plan

==================================================================================
Watershed Numbers       PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                        Public/Industrial Home Sewage  Wtr Qual/Uses   Others
==================================================================================

** BASIN  MAUMEE RIVER/BAY
Watershed Name:         DELAWARE CREEK
                       ¦                 ¦             ¦              ¦
TMACOG 013             ¦ POTW N  URBAN H ¦ HOME L      ¦ SEDIMENTS  U ¦ AG      N
LRIS   013             ¦ IND  N  CSOs  N ¦ PKG  N      ¦ ATMOS     US ¦ DUMPS   HS
PEMSO  410133          ¦                 ¦             ¦ WTP SLUDGE N ¦ DREDGE  N
                       ¦                 ¦             ¦              ¦ LUST    HS
NOTES
     ----------------------------------------------------------------------------
Watershed Name:         MAUMEE RIVER @ ANTHONY WAYNE BR
                       ¦                 ¦             ¦              ¦
TMACOG 013             ¦ POTW N  URBAN H ¦ HOME L      ¦ SEDIMENTS  H ¦ AG      H
LRIS   013             ¦ IND  H  CSOs  M ¦ PKG  H      ¦ ATMOS     US ¦ DUMPS   M
PEMSO  410133          ¦                 ¦             ¦ WTP SLUDGE N ¦ DREDGE  N
                       ¦                 ¦             ¦              ¦ LUST    HS
NOTES IND: Conrail 2IT00015

     ----------------------------------------------------------------------------
Watershed Name:         MAUMEE RIVER BELOW ANTHONY WAYNE BR
                       ¦                 ¦             ¦              ¦
TMACOG 014             ¦ POTW N  URBAN H ¦ HOME L      ¦ SEDIMENTS  H ¦ AG      H
LRIS   014             ¦ IND  N  CSOs  M ¦ PKG  N      ¦ ATMOS     US ¦ DUMPS   US
PEMSO  410133          ¦                 ¦             ¦ WTP SLUDGE N ¦ DREDGE  N
                       ¦                 ¦             ¦              ¦ LUST    HS
NOTES
     ----------------------------------------------------------------------------
Watershed Name:         DUCK CREEK
                       ¦                 ¦             ¦              ¦
TMACOG 015             ¦ POTW N  URBAN H ¦ HOME L      ¦ SEDIMENTS  H ¦ AG      N
LRIS   015             ¦ IND  L  CSOs  N ¦ PKG  N      ¦ ATMOS     US ¦ DUMPS   H
PEMSO  410133          ¦                 ¦             ¦ WTP SLUDGE L ¦ DREDGE  N
                       ¦                 ¦             ¦              ¦ LUST    HS
NOTES urbanized

     ----------------------------------------------------------------------------
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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

Watershed Numbers	PROBLEM AREAS BY COMMITTEE ASSIGNMENT Public/Industrial		Home Sewage	Wtr Qual/Uses	Others

** BASIN MAUMEE RIVER/BAY

Watershed Name: **MAUMEE RIVER @ MOUTH**

TMACOG 015	POTW H	URBAN H	HOME L	SEDIMENTS H	AG H
LRIS 015	IND M	CSOs M	PKG N	ATMOS US	DUMPS H
PEMSO 410133				WTP SLUDGE N	DREDGE M
					LUST HS

NOTES SEDIMENTS: PAHs.
Consaul St. Dump
POTW: Toledo Bay View WWTP = H
IND: Toledo Edison Acme (2IB00001) M, Toledo Coke (2ID00011) L

Watershed Name: **SHANTEE CREEK**

TMACOG 020	POTW N	URBAN H	HOME H	SEDIMENTS L	AG N
LRIS 020	IND H	CSOs N	PKG N	ATMOS US	DUMPS H
PEMSO 410302				WTP SLUDGE N	DREDGE N
					LUST HS

NOTES Partly on septic systems; mostly sewered.
IND: Doehler-Jarvis (2IC00021) H, DuPont Paint (2IF00016) M

Watershed Name: **HALFWAY CR. ABOVE SHANTEE CR**

TMACOG 021	POTW N	URBAN M	HOME L	SEDIMENTS U	AG M
LRIS 021	IND N	CSOs N	PKG H	ATMOS US	DUMPS L
PEMSO 410302				WTP SLUDGE N	DREDGE N
					LUST MS

NOTES

Watershed Name: **HALFWAY CR. @ OH/MI LINE**

TMACOG 022	POTW N	URBAN H	HOME M	SEDIMENTS U	AG M
LRIS 022	IND N	CSOs N	PKG N	ATMOS US	DUMPS US
PEMSO 410302				WTP SLUDGE N	DREDGE N
					LUST HS

NOTES

WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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=============================================================================
Watershed Numbers     PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                      Public/Industrial Home Sewage  Wtr Qual/Uses   Others
=============================================================================

** BASIN  MAUMEE RIVER/BAY
Watershed Name:       SILVER CREEK
                     |                 |          |                |
TMACOG 023           | POTW N  URBAN H | HOME L   | SEDIMENTS  U   | AG     L
LRIS   023           | IND  H  CSOs  N | PKG  H   | ATMOS      US  | DUMPS  US
PEMSO  410302        |                 |          | WTP SLUDGE N   | DREDGE N
                     |                 |          |                | LUST   HS
NOTES IND: General Mills (2IH00093) H, Teledyne
      (2I000001) L

          -------------------------------------------------------------------
Watershed Name:       HALFWAY CR. ABOVE INDIAN CR
                     |                 |          |                |
TMACOG 025           | POTW N  URBAN H | HOME L   | SEDIMENTS  U   | AG     M
LRIS   025           | IND  N  CSOs  N | PKG  H   | ATMOS      US  | DUMPS  US
PEMSO  410302        |                 |          | WTP SLUDGE N   | DREDGE N
                     |                 |          |                | LUST   HS
NOTES
          -------------------------------------------------------------------
Watershed Name:       OTTER CREEK
                     |                 |          |                |
TMACOG 028           | POTW H  URBAN M | HOME H   | SEDIMENTS  H   | AG     H
LRIS   028           | IND  H  CSOs  N | PKG  H   | ATMOS      US  | DUMPS  H
PEMSO  1610364       |                 |          | WTP SLUDGE H   | DREDGE N
                     |                 |          |                | LUST   MS
NOTES Evergreen Landfill
      IND: LOF #4 & #8 (2IN00020) H, Sun Oil (2IG00003)
      H, CSX Presque Isle (2IT00013) M, Fondessey
      (2IN00013) L, Liquid Carbonic (2IN00069) L, Toledo
      Edison Bayshore (2IB00000) L, Standard Oil
      (2IG00007) L
      WTP SLUDGE: Toledo WTP
      POTW: Oregon DuPont Road (=M) and South Shore Park
      WWTPs (=H)

          -------------------------------------------------------------------
Watershed Name:       WOLF CREEK
                     |                 |          |                |
TMACOG 029           | POTW N  URBAN L | HOME H   | SEDIMENTS  L   | AG     H
LRIS   029           | IND  L  CSOs  N | PKG  H   | ATMOS      US  | DUMPS  H
PEMSO  1610364       |                 |          | WTP SLUDGE N   | DREDGE N
                     |                 |          |                | LUST   LS
NOTES
          -------------------------------------------------------------------
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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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==========================================================================================
Watershed Numbers       PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                        Public/Industrial Home Sewage  Wtr Qual/Uses   Others
==========================================================================================

** BASIN  MAUMEE RIVER/BAY
Watershed Name:         LAKE ERIE WATERSHED #1
                       ¦                ¦          ¦             ¦
TMACOG 030             ¦ POTW N  URBAN H ¦ HOME L   ¦ SEDIMENTS  L ¦ AG     N
LRIS   030             ¦ IND  L  CSOs  N ¦ PKG  H   ¦ ATMOS     US ¦ DUMPS  H
PEMSO  411133          ¦                ¦          ¦ WTP SLUDGE N ¦ DREDGE N
                       ¦                ¦          ¦             ¦ LUST   HS
NOTES Dumps/Landfills: Treasure Island, Willys Park,
      Stickney Ave.

      ------------------------------------------------------------------------------------
Watershed Name:         MAUMEE AT WATERVILLE
                       ¦                ¦          ¦             ¦
TMACOG 043             ¦ POTW L  URBAN L ¦ HOME H   ¦ SEDIMENTS  L ¦ AG     H
LRIS   043             ¦ IND  L  CSOs  N ¦ PKG  N   ¦ ATMOS     US ¦ DUMPS  M
PEMSO  410235          ¦                ¦          ¦ WTP SLUDGE N ¦ DREDGE N
                       ¦                ¦          ¦             ¦ LUST   LS
NOTES POTW: Haskins WWTP (=L)

      ------------------------------------------------------------------------------------
Watershed Name:         MAUMEE RIVER @ GRASSY CR DIVERSION
                       ¦                ¦          ¦             ¦
TMACOG 044             ¦ POTW L  URBAN L ¦ HOME L   ¦ SEDIMENTS  L ¦ AG     H
LRIS   044             ¦ IND  L  CSOs  M ¦ PKG  H   ¦ ATMOS     US ¦ DUMPS  MS
PEMSO  410133          ¦                ¦          ¦ WTP SLUDGE N ¦ DREDGE N
                       ¦                ¦          ¦             ¦ LUST   LS
NOTES POTW: Maumee River WWTP (=L)

      ------------------------------------------------------------------------------------
Watershed Name:         GRASSY CREEK
                       ¦                ¦          ¦             ¦
TMACOG 045             ¦ POTW N  URBAN L ¦ HOME M   ¦ SEDIMENTS  U ¦ AG     H
LRIS   045             ¦ IND  M  CSOs  N ¦ PKG  H   ¦ ATMOS     US ¦ DUMPS  M
PEMSO  410133          ¦                ¦          ¦ WTP SLUDGE L ¦ DREDGE N
                       ¦                ¦          ¦             ¦ LUST   LS
NOTES WTP SLUDGE: Bowling Green WTP
      IND: BG WTP (2IW00010) M

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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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==========================================================================================
Watershed Numbers      PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                       Public/Industrial  Home Sewage  Wtr Qual/Uses   Others
==========================================================================================

** BASIN  MAUMEE RIVER/BAY
Watershed Name:        GRASSY CREEK
                       |                    |            |                  |
TMACOG 046             | POTW N  URBAN MS   | HOME L     | SEDIMENTS  U     | AG     M
LRIS   046             | IND  N  CSOs  N    | PKG  H     | ATMOS      US    | DUMPS  MS
PEMSO  410133          |                    |            | WTP SLUDGE N     | DREDGE N
                       |                    |            |                  | LUST   MS
NOTES Rossford Landfill
      ------------------------------------------------------------------------------------
Watershed Name:        MAUMEE RIVER @ GRASSY CR
                       |                    |            |                  |
TMACOG 047             | POTW N  URBAN M    | HOME L     | SEDIMENTS  L     | AG     H
LRIS   047             | IND  H  CSOs  M    | PKG  N     | ATMOS      US    | DUMPS  MS
PEMSO  410133          |                    |            | WTP SLUDGE N     | DREDGE N
                       |                    |            |                  | LUST   MS
NOTES IND: Libbey-Owens-Ford #6 (2IN00030) H

      ------------------------------------------------------------------------------------
Watershed Name:        REITZ ROAD DITCH
                       |                    |            |                  |
TMACOG 078             | POTW N  URBAN L    | HOME H     | SEDIMENTS  L     | AG     U
LRIS   078             | IND  N  CSOs  N    | PKG  N     | ATMOS      US    | DUMPS  US
PEMSO  411235          |                    |            | WTP SLUDGE N     | DREDGE N
                       |                    |            |                  | LUST   LS
NOTES
      ------------------------------------------------------------------------------------
Watershed Name:        MAUMEE RIVER @ BLUEGRASS IS
                       |                    |            |                  |
TMACOG 079             | POTW H  URBAN M    | HOME L     | SEDIMENTS  L     | AG     H
LRIS   079             | IND  N  CSOs  M    | PKG  H     | ATMOS      US    | DUMPS  MS
PEMSO  410133          |                    |            | WTP SLUDGE N     | DREDGE N
                       |                    |            |                  | LUST   MS
NOTES POTW: Perrysburg WWTP (=H)

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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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==============================================================================
Watershed Numbers     PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                      Public/Industrial Home Sewage  Wtr Qual/Uses   Others
==============================================================================

** BASIN  SWAN CREEK
Watershed Name:       AI CREEK
                     ¦                ¦          ¦                ¦
TMACOG 007           ¦ POTW N  URBAN L ¦ HOME H    ¦ SEDIMENTS  U   ¦ AG      H
LRIS   007           ¦ IND  N  CSOs  N ¦ PKG  H    ¦ ATMOS      US  ¦ DUMPS   LS
PEMSO  410102        ¦                ¦          ¦ WTP SLUDGE N   ¦ DREDGE  N
                     ¦                ¦          ¦                ¦ LUST    LS
NOTES Spencer Twp. Dump

      ________________________________________________________________________
Watershed Name:       SWAN CREEK ABOVE AI CREEK
                     ¦                ¦          ¦                ¦
TMACOG 008           ¦ POTW N  URBAN L ¦ HOME M    ¦ SEDIMENTS  L   ¦ AG      H
LRIS   008           ¦ IND  N  CSOs  N ¦ PKG  N    ¦ ATMOS      US  ¦ DUMPS   US
PEMSO  410101        ¦                ¦          ¦ WTP SLUDGE N   ¦ DREDGE  N
                     ¦                ¦          ¦                ¦ LUST    LS
NOTES
      ________________________________________________________________________
Watershed Name:       GAIL RUN
                     ¦                ¦          ¦                ¦
TMACOG 039           ¦ POTW N  URBAN L ¦ HOME M    ¦ SEDIMENTS  U   ¦ AG      S
LRIS   039           ¦ IND  N  CSOs  N ¦ PKG  H    ¦ ATMOS      US  ¦ DUMPS   M
PEMSO  410101        ¦                ¦          ¦ WTP SLUDGE N   ¦ DREDGE  N
                     ¦                ¦          ¦                ¦ LUST    LS
NOTES
      ________________________________________________________________________
Watershed Name:       SWAN CREEK @ TOLEDO
                     ¦                ¦          ¦                ¦
TMACOG 010           ¦ POTW N  URBAN H ¦ HOME L    ¦ SEDIMENTS  M   ¦ AG      H
LRIS   010           ¦ IND  N  CSOs  M ¦ PKG  N    ¦ ATMOS      US  ¦ DUMPS   MS
PEMSO  410132        ¦                ¦          ¦ WTP SLUDGE N   ¦ DREDGE  N
                     ¦                ¦          ¦                ¦ LUST    HS
NOTES CSO: Lower watershed has CSOs, but upper watershed
      has none.

      ________________________________________________________________________
Watershed Name:       WOLF CREEK @ MOUTH
                     ¦                ¦          ¦                ¦
TMACOG 011           ¦ POTW N  URBAN M ¦ HOME H    ¦ SEDIMENTS  L   ¦ AG      H
LRIS   011           ¦ IND  N  CSOs  N ¦ PKG  H    ¦ ATMOS      US  ¦ DUMPS   M
PEMSO  410132        ¦                ¦          ¦ WTP SLUDGE N   ¦ DREDGE  N
                     ¦                ¦          ¦                ¦ LUST    MS
NOTES Angola Rd. Dump
      ________________________________________________________________________
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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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==========================================================================================
Watershed Numbers      PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                       Public/Industrial Home Sewage  Wtr Qual/Uses   Others
==========================================================================================

** BASIN  SWAN CREEK
Watershed Name:        SWAN CREEK @ MOUTH
                      |                   |            |                |
TMACOG 012            | POTW N   URBAN H  | HOME L     | SEDIMENTS  H   | AG      H
LRIS   012            | IND  N   CSOs  H  | PKG  N     | ATMOS      US  | DUMPS   H
PEMSO  410132         |                   |            | WTP SLUDGE N   | DREDGE  N
                      |                   |            |                | LUST    HS
NOTES South Ave. Dump
          ________________________________________________________________________________
Watershed Name:        BLUE CREEK ABOVE HARRIS DITCH
                      |                   |            |                |
TMACOG 038            | POTW N   URBAN L  | HOME M     | SEDIMENTS  U   | AG      H
LRIS   038            | IND  N   CSOs  N  | PKG  H     | ATMOS      US  | DUMPS   US
PEMSO  410103         |                   |            | WTP SLUDGE N   | DREDGE  N
                      |                   |            |                | LUST    LS
NOTES
          ________________________________________________________________________________
Watershed Name:        SWAN CREEK ABOVE BLUE CREEK
                      |                   |            |                |
TMACOG 039            | POTW N   URBAN L  | HOME M     | SEDIMENTS  L   | AG      H
LRIS   039            | IND  N   CSOs  H  | PKG  H     | ATMOS      US  | DUMPS   LS
PEMSO  410131         |                   |            | WTP SLUDGE N   | DREDGE  N
                      |                   |            |                | LUST    LS
NOTES CSO: Whitehouse
          ________________________________________________________________________________
Watershed Name:        BLUE CREEK @ MOUTH
                      |                   |            |                |
TMACOG 040            | POTW N   URBAN L  | HOME M     | SEDIMENTS  U   | AG      H
LRIS   040            | IND  N   CSOs  N  | PKG  H     | ATMOS      US  | DUMPS   LS
PEMSO  410103         |                   |            | WTP SLUDGE N   | DREDGE  N
                      |                   |            |                | LUST    LS
NOTES American Can Impoundment
          ________________________________________________________________________________
Watershed Name:        MOSQUITO CREEK
                      |                   |            |                |
TMACOG 040            | POTW N   URBAN L  | HOME M     | SEDIMENTS  L   | AG      M
LRIS   040            | IND  N   CSOs  N  | PKG  N     | ATMOS      US  | DUMPS   M
PEMSO  410103         |                   |            | WTP SLUDGE N   | DREDGE  N
                      |                   |            |                | LUST    LS
NOTES
          ________________________________________________________________________________
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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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==========================================================================================
Watershed Numbers      PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                       Public/Industrial Home Sewage  Wtr Qual/Uses   Others
==========================================================================================

** BASIN  SWAN CREEK
Watershed Name:        SWAN CREEK ABOVE WOLF CR
                      |                 |            |                |
TMACOG 041            | POTW N   URBAN MS | HOME H     | SEDIMENTS   M  | AG      H
LRIS   041            | IND  L   CSOs  M  | PKG  H     | ATMOS       US | DUMPS   MS
PEMSO  410132         |                 |            | WTP SLUDGE N   | DREDGE N
                      |                 |            |                | LUST    MS
NOTES Partly on septic systems, partly sewered.
      CSO: Below Whitehouse. Most of watershed has none.
      ------------------------------------------------------------------------------------
Watershed Name:        CAIRL CREEK
                      |                 |            |                |
TMACOG 042            | POTW N   URBAN MS | HOME M     | SEDIMENTS   U  | AG      M
LRIS   042            | IND  N   CSOs  N  | PKG  H     | ATMOS       US | DUMPS   US
PEMSO  410132         |                 |            | WTP SLUDGE N   | DREDGE N
                      |                 |            |                | LUST    MS
NOTES
      ------------------------------------------------------------------------------------
Watershed Name:        HARRIS DITCH
                      |                 |            |                |
TMACOG 075            | POTW N   URBAN L  | HOME M     | SEDIMENTS   U  | AG      H
LRIS   075            | IND  N   CSOs  N  | PKG  N     | ATMOS       US | DUMPS   LS
PEMSO  410103         |                 |            | WTP SLUDGE N   | DREDGE N
                      |                 |            |                | LUST    LS
NOTES
      ------------------------------------------------------------------------------------
Watershed Name:        WOLF CREEK ABOVE CAIRL DITCH
                      |                 |            |                |
TMACOG 009            | POTW N   URBAN MS | HOME H     | SEDIMENTS   L  | AG      H
LRIS   009            | IND  L   CSOs  N  | PKG  H     | ATMOS       US | DUMPS   M
PEMSO  0410132        |                 |            | WTP SLUDGE N   | DREDGE N
                      |                 |            |                | LUST    MS
NOTES
      ------------------------------------------------------------------------------------
```

WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

Watershed Numbers	PROBLEM AREAS BY COMMITTEE ASSIGNMENT Public/Industrial		Home Sewage	Wtr Qual/Uses	Others

** BASIN OTTAWA RIVER

Watershed Name: **TENMILE CREEK ABOVE PRAIRIE DITCH**

TMACOG 001	POTW N	URBAN L	HOME M	SEDIMENTS L	AG H
LRIS 001	IND N	CSOs N	PKG H	ATMOS US	DUMPS US
PEMSO 410301				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES

Watershed Name: **PRAIRIE DITCH**

TMACOG 002	POTW N	URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 002	IND N	CSOs N	PKG N	ATMOS US	DUMPS US
PEMSO 410301				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES

Watershed Name: **TENMILE CREEK ABOVE NORTH BRANCH**

TMACOG 003	POTW N	URBAN MS	HOME H	SEDIMENTS M	AG H
LRIS 003	IND L	CSOs N	PKG H	ATMOS US	DUMPS HS
PEMSO 410301				WTP SLUDGE N	DREDGE N
					LUST MS

NOTES IND: Reichert Stamping (2IS00008) L, France Stone Silica (2IJ00039) L

Watershed Name: **OTTAWA RIVER @ TOLEDO**

TMACOG 004	POTW N	URBAN M	HOME H	SEDIMENTS H	AG H
LRIS 004	IND H	CSOs N	PKG H	ATMOS US	DUMPS H
PEMSO 411331				WTP SLUDGE N	DREDGE N
					LUST MS

NOTES IND: King Road Landfill (2IN0079)

Watershed Name: **OTTAWA RIVER @ MOUTH**

TMACOG 005	POTW N	URBAN H	HOME L	SEDIMENTS H	AG H
LRIS 005	IND H	CSOs H	PKG N	ATMOS US	DUMPS H
PEMSO 411331				WTP SLUDGE N	DREDGE N
					LUST HS

NOTES Dura dump, et al., and Helfinger Pond
IND: Diversitech (2IQ00012) H, DuPont (2IF00017) L

WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

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================================================================================
Watershed Numbers    PROBLEM AREAS BY COMMITTEE ASSIGNMENT
                     Public/Industrial Home Sewage  Wtr Qual/Uses   Others
================================================================================

** BASIN  OTTAWA RIVER

     ---------------------------------------------------------------------------
Watershed Name:      SIBLEY CREEK
                    |                 |           |               |
TMACOG 005          | POTW N  URBAN H | HOME L    | SEDIMENTS  U  | AG     H
LRIS   005          | IND  N  CSOs  N | PKG  N    | ATMOS      US | DUMPS  H
PEMSO  411331       |                 |           | WTP SLUDGE N  | DREDGE N
                    |                 |           |               | LUST   HS
NOTES
     ---------------------------------------------------------------------------
Watershed Name:      TENMILE CREEK, N BRANCH @ MOUTH
                    |                 |           |               |
TMACOG 006          | POTW N  URBAN M | HOME H    | SEDIMENTS  L  | AG     H
LRIS   006          | IND  N  CSOs  N | PKG  N    | ATMOS      US | DUMPS  L
PEMSO  410301       |                 |           | WTP SLUDGE N  | DREDGE N
                    |                 |           |               | LUST   MS
NOTES Partly on septic systems; mostly sewered.
     ---------------------------------------------------------------------------
Watershed Name:      SAXTON DRAIN
                    |                 |           |               |
TMACOG 006          | POTW L  URBAN M | HOME      | SEDIMENTS     | AG     H
LRIS   006          | IND     CSOs  L | PKG  L    | ATMOS      U  | DUMPS  US
PEMSO  410301       |                 |           | WTP SLUDGE N  | DREDGE
                    |                 |           |               | LUST   MS
NOTES
     ---------------------------------------------------------------------------
Watershed Name:      BISCHOFF DRAIN
                    |                 |           |               |
TMACOG 006          | POTW L  URBAN M | HOME      | SEDIMENTS     | AG     H
LRIS   006          | IND     CSOs  L | PKG  L    | ATMOS      U  | DUMPS
PEMSO  410301       |                 |           | WTP SLUDGE N  | DREDGE
                    |                 |           |               | LUST   MS
NOTES
     ---------------------------------------------------------------------------
Watershed Name:      HILL DITCH
                    |                 |           |               |
TMACOG 202          | POTW N  URBAN M | HOME H    | SEDIMENTS  U  | AG     L
LRIS   202          | IND  N  CSOs  N | PKG  H    | ATMOS      US | DUMPS  US
PEMSO  411331       |                 |           | WTP SLUDGE N  | DREDGE N
                    |                 |           |               | LUST   MS
NOTES
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WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

Watershed Numbers — **PROBLEM AREAS BY COMMITTEE ASSIGNMENT**

** BASIN LAKE ERIE

Watershed Name: **LAKE ERIE WATERSHED #2**

Watershed Numbers	Public/Industrial		Home Sewage	Wtr Qual/Uses	Others
TMACOG 031	POTW N	URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 031	IND N	CSOs N	PKG H	ATMOS US	DUMPS MS
PEMSO 411364				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES

Watershed Name: **LITTLE CEDAR CREEK**

Watershed Numbers	Public/Industrial		Home Sewage	Wtr Qual/Uses	Others
TMACOG 032	POTW N	URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 032	IND N	CSOs N	PKG N	ATMOS US	DUMPS HS
PEMSO 1610303				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES

Watershed Name: **CEDAR CREEK**

Watershed Numbers	Public/Industrial		Home Sewage	Wtr Qual/Uses	Others
TMACOG 032	POTW N	URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 032	IND H	CSOs N	PKG H	ATMOS US	DUMPS M
PEMSO 1610303				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES IND: Conrail/Stanley Yard (2IT00007) H, CSX Walbridge (2IT00002) L, Stoneco Lime City (2IJ00052) L

Watershed Name: **DRY CREEK**

Watershed Numbers	Public/Industrial		Home Sewage	Wtr Qual/Uses	Others
TMACOG 032	POTW N	URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 032	IND N	CSOs N	PKG H	ATMOS US	DUMPS M
PEMSO 1610303				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES

Watershed Name: **CRANE CREEK**

Watershed Numbers	Public/Industrial		Home Sewage	Wtr Qual/Uses	Others
TMACOG 033	POTW N	URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 033	IND N	CSOs N	PKG H	ATMOS US	DUMPS M
PEMSO 1610302				WTP SLUDGE N	DREDGE N
					LUST LS

NOTES

WATER QUALITY PROBLEM MATRIX

Lower Maumee Basin
Remedial Action Plan

Watershed Numbers	PROBLEM AREAS BY COMMITTEE ASSIGNMENT			
	Public/Industrial	Home Sewage	Wtr Qual/Uses	Others

** BASIN LAKE ERIE

Watershed Name: HENRY CREEK

TMACOG 033	POTW N URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 033	IND N CSOs N	PKG H	ATMOS US	DUMPS H
PEMSO 1610302			WTP SLUDGE N	DREDGE N
				LUST LS

NOTES

Watershed Name: AYRES CREEK

TMACOG 033	POTW N URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 033	IND N CSOs N	PKG H	ATMOS US	DUMPS H
PEMSO 1610302			WTP SLUDGE N	DREDGE N
				LUST LS

NOTES Asman Dump, Milbury Dump, Molner Packing Imp., Std. Oil Co. Imp.

Watershed Name: LITTLE CRANE CREEK

TMACOG 033	POTW N URBAN L	HOME H	SEDIMENTS U	AG H
LRIS 033	IND N CSOs N	PKG H	ATMOS US	DUMPS HS
PEMSO 1610302			WTP SLUDGE N	DREDGE N
				LUST LS

NOTES

Watershed Name: LAKE ERIE WATERSHED #3

TMACOG 034	POTW N URBAN L	HOME H	SEDIMENTS L	AG H
LRIS 034	IND N CSOs N	PKG N	ATMOS US	DUMPS US
PEMSO 411363			WTP SLUDGE N	DREDGE N
				LUST LS

NOTES

Watershed Name: LAKE ERIE WATERSHED #4

TMACOG 035	POTW N URBAN L	HOME M	SEDIMENTS L	AG H
LRIS 035	IND N CSOs N	PKG N	ATMOS US	DUMPS US
PEMSO 411362			WTP SLUDGE N	DREDGE N
				LUST LS

NOTES