Watershed Restoration Action Strategy for the Little Calumet-Galien Watershed

Prepared for

Indiana Department of Environmental Management
Office of Water Quality
Watershed Management Section

Prepared by

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FOREWORD

The Little Calumet-Galien Watershed Restoration Action Strategy (WRAS) is intended to be a living document designed to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

The first draft of the Little Calumet-Galien WRAS was released for public review during the spring of 2002. A 60-day public comment period followed the public meetings at which this WRAS document was introduced. This final version of the WRAS includes public comments received during the 60-day comment period. For comments to be included in the final version, they were required to be written and submitted to WHPA, Inc. (the firm contracted to produce this WRAS) during the comment period.

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EXECUTIVE SUMMARY

The overall goal and purpose of Part I of the Watershed Restoration Action Strategy (WRAS) is to provide a reference point and map to assist local citizens with improving water quality. The major water quality concerns and recommended management strategies will be addressed in Part II: Concerns and Recommendations of the WRAS.

This Strategy broadly covers the entire watershed; therefore, it is intended to be an overall strategy and does not dictate management and activities at the stream site or segment level. Water quality management decisions and activities for individual portions of the watershed are most effective and efficient when managed through sub-watershed plans. However, these sub-watershed plans must also consider the impact on the watershed as a whole.

This Strategy is intended to be a fluid document in order to respond to the changing and dynamic quality of our environment. Therefore, this Strategy will require revision when updated information becomes available. Additionally, the reader may notice that some of the information in this Strategy is provided in duplicate. This is a result of the interconnectedness of the issues discussed and an assumption made by the authors that many readers may only be interested in a few sections of this Strategy.

Overview of the Little Calumet-Galien Watershed

The Little Calumet River watershed discussed in this report is composed of portions of two larger watersheds that happen to lie within Indiana's borders. The Little Calumet River collects its waters from many small streams and drainage ditches in northwestern Indiana before emptying into Lake Michigan via Burns Ditch in Indiana and the Calumet Harbor in Illinois. An interesting feature of the Grand Calumet River is that its direction of flow is intimately tied with the water levels in Lake Michigan. The direction of flow can shift, depending on the lake levels and climate conditions (USGS 1994). Most of the Little Calumet-Galien watershed has been altered from its historic setting. Land use in this watershed is predominantly urban, suburban, and industrial. Some of the land is used for agriculture, while only a remnant of the historic wetlands remains (USEPA 2002a).

Current Status of Water Quality in the Little Calumet-Galien Watershed

Section 303(d) of the Clean Water Act requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. The Clean Water Act Section 303(d) list for Indiana provides a basis for understanding the current status of water quality in the Little Calumet-Galien Watershed. The waterbodies listed in Table 0-1 are on Indiana's 1998 Clean Water Act Section 303(d) list submitted to and approved by EPA (IDEM 1998). The 2002 draft 303(d) list has been completed and the final list will be released in October 2002. The draft 2002 list is not included in this document, but is available from IDEM's Office of Water Quality (http://www.state.in.us/idem/water/planbr/wqs/303d.html).

Water Quality Goal

The overall water quality goal for the Little Calumet-Galien Watershed is that all waterbodies meet the applicable water quality standards for their designated uses as determined by the State of Indiana, under the provisions of the Clean Water Act.

Part I, Chapter 1: Characterization and Responsibilities

1. Introduction

The Clean Water Action Plan was developed by federal agencies in 1998 to commemorate the 25th anniversary of the Clean Water Act and to "help revitalize the nation's commitment to our valuable water resources." The Plan proposed that "states and tribes should work with public agencies and private-sector organizations and citizens to develop, based on the initial schedule for the first two years, Watershed Restoration Action Strategies, for watersheds most in need of restoration" (USEPA 1998). A WRAS is essentially a large-scale coordination plan for an eight-digit hydrologic unit watershed. Each year, more assessments and data may become available. This will require amendments to the WRAS, which must be flexible and broad enough to accommodate change. The WRAS will also foster greater cooperation among State and Federal agencies, which should result in more effective use of personnel and resources.

The WRAS provides an opportunity to assemble, in one place, projects and monitoring that have been completed or are on-going within a watershed. It also allows agencies and stakeholders to compare watershed goals and provides a guide for future work within a watershed.

The WRAS for the Little Calumet-Galien watershed contains two parts. Part I provides a characterization of water quality in the watershed and agency responsibilities. Part II provides a discussion of resource concerns and recommended strategies.

1.1 Purpose of This Document

The overall goal and purpose of the Watershed Restoration Action Strategy Part I is to provide a reference point and roadmap to assist with improving water quality. Part I is a compilation of information, facts, and local concerns in this watershed. It will serve as a reference document for watershed groups and others involved in the assessment and planning of watershed restoration activities.

Part I of the Strategy is intended to be a fluid document in order to respond to the changing and dynamic quality of our environment. Therefore, it will require revision when updated information becomes available.

1.2 Guide to the Use of This Document

Chapter 1: Introduction - This Chapter provides a non-technical description of the purpose of Part 1 of the Strategy. This Chapter also provides an overview of stakeholder groups in the Little Calumet-Galien watershed.

Chapter 2: General Watershed Description - Some of the specific topics covered in this chapter include:

- An overview of the watershed
- Hydrology of the watershed
- A summary of land use within the watershed
- Natural resources in the watershed
- Population statistics

- Major water uses in the watershed
- Water quality classifications and standards

Chapter 3: Causes and Sources of Water Pollution - This Chapter describes a number of important causes of water quality impacts including biochemical oxygen demand (BOD), toxic substances, nutrients, *E. coli* bacteria and others. This Chapter also describes both point and nonpoint sources of pollution.

Chapter 4: Water Quality and Use Support Ratings - This Chapter describes the various types of water quality monitoring conducted by IDEM. It summarizes water quality in the watershed based on Office of Water Quality data, and presents a summary of use support ratings for those surface waters that have been monitored or evaluated.

Chapter 5: State and Federal Water Quality Programs - Chapter 5 summarizes the existing State and Federal point and nonpoint source pollution control programs available to address water quality problems. These programs are management tools available for addressing the priority water quality concerns and issues that are discussed in Part II of the Strategy. Chapter 5 also describes the concept of Total Maximum Daily Loads (TMDLs). TMDLs represent management strategies aimed at controlling point and nonpoint source pollutants. IDEM's TMDL Strategy will also be discussed.

1.3 Stakeholder Groups in the Watershed

The Little Calumet-Galien watershed contains several stakeholder groups that have different missions (Appendix C). Many of these groups have a long history of conservation work in the Little Calumet-Galien watershed. The following discussions briefly describe some of the watershed groups.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS), under the U.S. Department of Agriculture (USDA), provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. The NRCS offers landowners financial, technical, and educational assistance to implement conservation practices on privately owned land. Using this help, farmers, ranchers, and forest landowners apply practices that reduce soil erosion, improve water quality, and enhance crop land, forest land, wetlands, grazing lands, and wildlife habitat. Incentives offered by USDA promote sustainable agricultural and forestry practices, which protect and conserve valuable farm and forest land for future generations. USDA assistance also helps individuals and communities restore natural resources after floods, fires, or other natural disasters.

Soil and Water Conservation Districts

Local Soil and Water Conservation Districts (SWCD) assist land users and residents in the protection and improvement of the local environment. SWCDs can provide technical and financial assistance to local watershed conservation groups.

Grand Calumet Task Force

The Grand Calumet Task Force is a community environmental organization which works to improve the land, air and water quality of the Grand Calumet River and the urban ecosystem that surrounds it and to achieve environmental justice for the people of Northwest Indiana.

Goals:

To restore the Grand Calumet River Basin, including the adjacent wetlands and near shore Lake Michigan;

To alert the community about the impact of pollution on human health and the environment;

To promote public involvement and decision-making in all aspects of environmental protection and restoration;

To promote environmentally sound jobs and diverse economic development in sustainable communities;

To be a catalyst for the people, their organizations, businesses and governments to come together to eliminate the effects of over 100 years of industrial pollution;

To disclose and fight environmental discrimination actions and policies by industry or government that place unfair burdens on people of color and the poor;

To support and/or participate in regional development initiatives that preserve and enhance the ecosystem;

To be a resource for residents of at-risk communities who assert their environmental rights.

Hoosier River Watch

Hoosier Riverwatch is a state-sponsored water quality monitoring initiative. The program was started in 1994 to increase public awareness of water quality issues and concerns by training volunteers to monitor stream water quality. Hoosier Riverwatch collaborates with agencies and volunteers to:

- Increase public involvement in water quality issues through hands-on training of volunteers in stream monitoring and cleanup activities.
- Educate local communities about the relationship between land use and water quality.
- Provide water quality information to citizens and governmental agencies working to protect Indiana's rivers and streams.

Lake Michigan Coastal Program

Indiana is developing the Lake Michigan Coastal Program (LMCP) to participate in a national initiative, Coastal Zone Management Program, with 33 other coastal states to protect, restore, and responsibly develop Indiana's coastal area. The purpose of the LMCP is to support coordination and partnerships among local, state, and federal agencies and local organizations for the protection and sustainable use of natural and cultural resources in the Lake Michigan region. The LMCP is based on Indiana's existing laws. It does not create any new laws. Development of the LMCP will make more than $900,000 (based on the proposed 2001 Congressional budget) available annually to implement the LMCP and for grants to communities in northwest Indiana. Examples of how these funds might be used include:

Protection and restoration of significant natural and cultural resources.

Programs to prevent the loss of life and property in coastal hazard areas.

Improved public access for recreational purposes.

Revitalized urban waterfronts and ports.

Improved coordination among government agencies in policy and decision-making processes.

Pollution prevention initiatives, including non-point source pollution into coastal waters.

Little Calumet River Project

The Little Calumet River Watershed is an area draining into Lake Michigan from Will and Cook Counties in Illinois; Lake, Porter and LaPorte Counties Indiana; and Berrien County in Michigan. The watershed project area includes land in the Hydrologic Units 712003 and 04040001 as determined by the U.S. Geological Survey, Department of Interior. The Porter and Lake Soil and Water Conservation Districts in Indiana and the Will-South Cook County Soil and Water Conservation District in

Illinois have signed a mutual agreement to proceed with the development of the Little Calumet River Project.

The Little Calumet River Planning initiative resulted from the concerns of local landowners/occupiers living in the area. Watershed planning is recognized as one method to give local stakeholders the opportunity to identify their desired future conditions while enlisting the assistance and support of agencies and organizations involved in administering technical or financial support to natural resources issues.

The Illinois Little Calumet Watershed Plan, dated November 1978, identified several issues, however, the upper area involving Lake County, Indiana was not included. The importance of an updated comprehensive watershed plan involving both Illinois and Indiana is recognized as a valuable document that will reflect the goals of the stakeholders in the Little Calumet Watershed. The Porter and Lake Soil and Water Conservation Districts of Indiana and the Will-South Cook County Soil and Water Conservation District of Illinois are taking the lead to assist in this effort.

The watershed plan will identify the needs, while the agencies and organizations involved in the watershed activities will be asked for their support for solutions to the needs that the area faces. This will enable the local citizens to reside in this geographical area and enjoy the quality of life they have come to expect.

NIRPC

The Northwestern Indiana Regional Planning Commission (NIRPC) is developing a watershed management plan for the Little-Calumet-Galien and Kankakee basins that are located in Lake, Porter and LaPorte Counties. A Watershed Management Advisory Group has been formed with stakeholders from the three counties. The plan will be completed by the summer of 2005 addressing issues such as water quality enhancement, restoration and protection, land use planning, farm preservation, government regulation, coordination and enhancement, wetland preservation, and public education.

Northwest Territory RC&D

The Northwest Territory Resource Conservation and Development program helps people protect and develop their economic, natural and social resources in ways that improve their area's economy, environment, and quality of life. The NWT RC&D Council provides a way for people to plan and implement projects in Lake, Porter, and St. Joseph counties that will make our communities a better place to live.

Save the Dunes

The Save the Dunes Council of northwest Indiana was founded in 1952, one of the oldest grassroots conservation organizations in the country. Its objectives are to maintain and restore the integrity and quality of the natural environment of the Indiana Dunes region. The hard work of Save the Dunes Council members led to the establishment of the Indiana Dunes National Lakeshore in 1966; the group continues to work on a wide variety of issues concerning the Dunes and the environmental quality of the area. The efforts of the Save the Dunes Council are supported entirely by membership dues, donations and volunteer time.

The Save the Dunes Conservation Fund was established in 1994 to restore and protect the environment of the Indiana Dunes. Among its activities the Conservation Fund has restored a foredune on Gary's Lake Michigan shoreline, has assisted the Minority Health Coalition of LaPorte County on projects in the area of a Superfund site, and has worked with teachers, individuals, and agencies to monitor the health of local streams and waterways.

Shirley Heinze Environmental Fund

The Shirley Heinze Environmental Fund, a non-profit organization, was endowed in 1981 as a charitable trust to preserve and protect the unique ecosytems of the Indiana Dunes region. The Heinze Fund's goals are threefold: (1) to protect endangered habitats through the acquisition and restoration of environmentally significant properties; (2) to promote environmental awareness through community outreach programs and publications; and (3) to advance the goals of clean air and water for Northwest Indiana.

LaPorte County Parks & Rec

The LaPorte County Parks Department manages several parks in the county that include a variety of ecosystems: upland forest, wetland, prairie, and stocked ponds. The Red Mill Property includes a 100-acre nature preserve and the headwaters to the Little Calumet River. The dam, circa 1830, was originally built to support a grist sawmill, but now provides open water and wetland habitat for a variety of wildlife. The Parks Department is currently applying for a grant from the Indiana DNR Division of Water-Lake Michigan Coastal Program for maintenance and dredging work upstream of the dam. This will promote both recreational activities and wetland preservation in the Little Calumet Headwaters State Dedicated Nature Preserve associated with the park.

Laporte County Conservation Trust Inc.

The LaPorte County Conservation Trust is an all volunteer, non-profit 501 (c) (3) organization committed to maintaining and improving water quality in LaPorte County. As a land trust, they are dedicated to protecting natural lands by purchasing and accepting donations of land or conservation easements. They currently own a 23 acre state nature preserve known as Wintergreen Woods, a wet woodland that contains a drainage into the Trail Creek Watershed. They also perform educational functions concerning land conservation and bio-diversity.

Part I, Chapter 2: General Watershed Description

This Chapter provides a general description of the Little Calumet-Galien Watershed and includes the following:

Section 2.1 Little Calumet-Galien Watershed Overview

Section 2.2 Land Cover, Population, and Growth Trends

Section 2.3 Agricultural Activities in the Little Calumet-Galien Watershed

Section 2.4 Significant Natural Areas in the Little Calumet-Galien Watershed

Section 2.5 Surface Water Use Designations and Classifications

Section 2.6 US Geological Survey Water Use Information for the Little Calumet-Galien Watershed

Section 2.7 Superfund Sites in the Little Calumet-Galien Watershed

2.1 Little Calumet-Galien Watershed Overview

The Little Calumet-Galien watershed consists of portions of two 8 digit (04040001 and 07120003) hydrologic unit code (HUC) watersheds located in northwestern Indiana (Figure 2-1). The Indiana portions of these watersheds encompass approximately 1000 square miles in four different counties and approximately 500 miles of perennial streams (USEPA 2002a). It is subdivided into 44 subbasins represented on the map by 14 digit HUCs (Figure 2-2). Nearly one-quarter of the watershed is classified as urban, one-quarter is forested and two-fifths is agricultural. The majority of the soils in the watershed have low to medium erosion potential (Figure 2-3).

The Little Calumet River watershed discussed in this report is composed of portions of two larger watersheds that happen to lie within Indiana's borders. The Little Calumet River collects its waters from many small streams and drainage ditches in northwestern Indiana before emptying into Lake Michigan via Burns Ditch in Indiana and the Calumet Harbor in Illinois. An interesting feature of the Grand Calumet River is that its direction of flow is intimately tied with the water levels in Lake Michigan. The direction of flow can shift, depending on the lake levels and climate conditions (USGS 1994). Most of the Little Calumet-Galien watershed has been altered from its historic setting. Land use in this watershed is predominantly urban, suburban, and industrial. Some of the land is used for agriculture, while only a remnant of the historic wetlands remains (USEPA 2002a).

The eastern portion of the Little Calumet-Galien watershed is located in the Southern Michigan/Northern Indiana Drift Plains ecoregion, which is characterized by many lakes and marshes, as well as an assortment of landforms, soil types and textures, and land uses. The drift plains ecoregion is less agricultural than the Corn Belt plains to the south and west. The western portion of the Little Calumet-Galien watershed is located in the Central Corn Belt plains ecoregion, which is characterized by smooth plains that once supported extensive prairie communities intermixed with oak-hickory forests. The dark, fertile soil is well-suited for agriculture and much of the natural vegetation has been replaced by corn and soybeans (US EPA 1999).

2.2 Land Cover, Population, and Growth Trends

2.2.1 General Land Cover

Native vegetation in the Little Calumet-Galien watershed is a mixture of prairie and oak-hickory forest in varied stages of succession. The U.S. Geological Survey - Biological Resources Division and the U.S. Fish and Wildlife Service are overseeing

the National Gap Analysis Program (GAP). In Indiana, Indiana State University and Indiana University are carrying out the Indiana GAP Project which involves an analysis of current vegetative land cover through remote sensing (ISU 2001). This analysis provides vegetative land cover data in 30 by 30-meter grids (Figure 2-4). The following is a summary of vegetative cover in the watershed determined from the GAP image:

22.3% Urban (impervious, low and high density)
40.4% Agricultural vegetation (row crop and pasture)
25.3% Forest vegetation (shrubland, woodland, forest)
10.1% Wetland vegetation (Palustrine: forest, shrubland, herbaceous)
1.9% Open Water

2.2.2 Population

The 2000 total population in the four counties that have land portions in the watershed was 1,007,027 (Census 2001). Table 2-1 shows a break down of population by county and estimated population projections. It should be noted that these numbers do not reflect the actual population living in the Little Calumet-Galien watershed. For example, only a small portion of St. Joseph County lies within the land area of the Little Calumet-Galien watershed (Figure 2-1). A better estimate of the population within the Little Calumet-Galien watershed may be the 1995 U.S. Geological Survey Water Use Reports, which show a total population in the watershed of 614,670 in 1995 (Table 2-7).

The U.S. Census and the Indiana Business Research Center also provide information about the population in cities and towns (IBRC 1997). Table 2-2 contains population estimates for various cities and towns located within the watershed.

2.3 Agricultural Activities in the Little Calumet-Galien Watershed

Agriculture is an important land use in the Little Calumet-Galien Watershed. Section 2.2.1 shows that 40.4 percent of land cover in the watershed is agricultural vegetation. This section provides an overview of the agricultural activities in the watershed.

2.3.1 Livestock Operations

Livestock production within the watershed encompasses several species and the overall composition changes from county to county. Hogs and cattle are produced in all four counties, significant numbers of layers are produced in three of the four counties, and a significant number of sheep are produced in Porter and La Porte counties. See Table 2-3 for livestock inventory numbers. Some animals are raised in open lots or pastures and some are raised in confined feeding lots or buildings.

Confined feeding is the raising of animals for food, fur or recreation in lots, pens, ponds, sheds or buildings, where they are confined, fed and maintained for at least 45 days during any year, and where there is no ground cover or vegetation present over at least half of the animals' confinement area. Livestock markets and sale barns are generally excluded (IDEM 1999a).

Indiana law defines a confined feeding operation as any livestock operation engaged in the confined feeding of at least 300 cattle, or 600 swine or sheep, or 30,000 fowl, such as chickens, ducks and other poultry. The IDEM regulates these confined feeding operations, as well as smaller livestock operations which have violated water pollution rules or laws, under IC 13-18-10.

As of October 1999, there were 47 livestock producers operating under the Confined Feeding Rules in the four counties of the watershed (IDEM 1999). Table 2-3 shows livestock numbers from the USDA Agricultural Census "inventory" animals in each county (USDA 1997).

2.3.2 Crop Production

The soils of the Little Calumet-Galien watershed are good for crop production. Table 2-4 lists the 1997 acres of the major crops

produced in 1997 throughout the four counties in the watershed. For 1997, total acres of corn for grain edged out total acres of soybeans for beans as the number one crop produced in the four counties. Corn and soybeans are clearly the primary crops produced in the watershed on the basis of total acres.

2.4 Significant Natural Areas in the Little Calumet-Galien Watershed

In 1993, the Indiana Natural Resources Commission (NRC) adopted its "Outstanding Rivers" List for Indiana. This listing is referenced in the standards for utility line crossings within floodways, formerly governed by IC 14-28-2 and now controlled by 310 IAC 6-1-16 through 310 IAC 6-1-18. Except where incorporated into a statute or rule, the "Outstanding Rivers List" is intended to provide guidance rather than to have regulatory application (NRC 1997). To help identify the rivers and streams which have particular environmental or aesthetic interest, a special listing has been prepared by IDNR's Division of Outdoor Recreation. This listing is a corrected and condensed version of a list compiled by American Rivers and dated October 1990. The NRC has adopted the IDNR listing as an official recognition of the resource values of these waters. A river included in the "Outstanding Rivers List" qualifies under one or more of 22 categories. Table 2-5 presents the rivers in the Little Calumet-Galien watershed which are on the "Outstanding Rivers List" and their significance.

State Parks, Forests, Nature Preserves, and Recreation Areas

Table 2-6 lists a number of parks, forests, nature preserves and other recreational areas within the counties included in the Little Calumet-Galien Watershed. Since all the special areas in these counties are listed, some of the areas may be located outside of the Little Calumet-Galien Watershed.

2.5 Surface Water Use Designations and Classifications

The following uses are designated by the Indiana Water Pollution Control Board (327 IAC 2-1-3 [327 IAC 2-1.5-5 for the Great Lakes system]):

- Surface waters of the state are designated for full-body contact recreation.
- All waters, except limited use waters, will be capable of supporting a well-balanced, warm water aquatic community and, where natural temperatures will permit, will be capable of supporting put-and-take trout fishing. All waters capable of supporting the natural reproduction of trout as of February 17, 1977, shall be so maintained.
- All waters, which are used for public or industrial water supply, must meet the standards for those uses at the point where water is withdrawn.
- All waters, which are used for agricultural purposes, must meet minimum surface water quality standards.
- All waters in which naturally poor physical characteristics (including lack of sufficient flow), naturally poor or reversible man-induced conditions, which came into existence prior to January 1, 1983, and having been established by use attainability analysis, public comment period, and hearing may qualify to be classified for limited use and must be evaluated for restoration and upgrading at each triennial review of this rule.
- All waters, which provide unusual aquatic habitat, which are an integral feature of an area of exceptional natural beauty or character, or which support unique assemblages of aquatic organisms may be classified for exceptional use (or designated as outstanding state resource waters in the Great Lakes system).

All waters of the state, at all times and at all places, including the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil, or scum attributable to municipal, industrial, agricultural, and other land use practices, or other discharges (327 IAC 2-1-6 [327 IAC 2-1.5-8 for the Great Lakes system]):

- that will settle to form putrescent or otherwise objectionable deposits,
- that are in amounts sufficient to be unsightly or deleterious,
- that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance,
- which are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans, or
- which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such degree as to create a nuisance, be unsightly, or otherwise impair designated uses.

2.5.1 Surface Water Classifications in the Little Calumet-Galien Watershed

The classification of waterbodies within the Great Lakes System discussed in Section 2.5 applies to all stream segments in the Little Calumet-Galien Watershed with the exception of the following:

Designated as salmonid waters and shall be capable of supporting a salmonid fishery (327 IAC 2-1.5-5; 1997):

* Trail Creek and its tributaries downstream to Lake Michigan,

* East Branch of the Little Calumet River and its tributaries downstream to Lake Michigan via Burns Ditch,

* Salt Creek above its confluence with the Little Calumet River,

* Kintzele Ditch (Black Ditch) from Beverly Drive downstream to Lake Michigan,

* The Galena River and its tributaries in LaPorte County,

* The Indiana portion of the open waters of Lake Michigan,

* Those waters designated by the Indiana department of natural resources for put-and-take trout fishing.

Designated as an outstanding state resource water (327 IAC 2-1.5-19; 1997):

* The Indiana portion of the open waters of Lake Michigan,

* All waters incorporated in the Indiana Dunes National Lakeshore.

There are no waterbodies in the Little Calumet-Galien Watershed designated for limited use by the Indiana Water Pollution Control Board in 327 IAC 2-1.5-19 (1997).

2.6 US Geological Survey Water Use Information for the Little Calumet-Galien Watershed

The U.S. Geological Survey's (USGS) National Water-Use Information Program is responsible for compiling and disseminating the nation's water-use data. The USGS works in cooperation with local, State, and Federal environmental agencies to collect water-use information at a site-specific level. USGS also compiles the data from hundreds of thousands of sites to produce water-use information aggregated up to the county, state, and national levels. Every five years, data at the state and hydrologic region level are compiled into a national water-use data system. Table 2-7 shows the USGS Water-Use information for the Little

Calumet-Galien Watershed for 1995 (USGS 2001).

2.7 Superfund Sites in the Little Calumet-Galien Watershed

Superfund is a program administered by the EPA to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. Before the Superfund Program was established in 1980, hazardous wastes were often left in the open, where they seeped into the ground, flowed into rivers and lakes, and contaminated soil and groundwater. Consequently, where these practices were intensive or continuous, there were uncontrolled or abandoned hazardous waste sites. These sites include abandoned warehouses, manufacturing facilities, processing plants, and landfills (USEPA 2002b).

There are six Superfund (CERCLA) sites listed in the Little Calumet-Galien Watershed:

- American Chemical Service, Inc. - Griffith, IN
- Lake Sandy Jo (M&M Landfill) - Gary, IN
- MIDCO I - Gary, IN
- MIDCO II - Gary, IN
- Ninth Avenue Dump - Gary, IN
- Waste, Inc., Landfill - Michigan City, IN

The Record of Decision (ROD) gives a detailed description of each site, including the media and contaminants involved. These are included in Appendix E. A seventh site, U.S. Smelter & Lead Refinery Inc. (East Chicago, IN), is a RCRA closure but has not been added to the National Priority List and no ROD is available.

Part I, Chapter 3: Causes and Sources of Water Pollution

A number of substances including nutrients, bacteria, oxygen-demanding wastes, metals, and toxic substances, cause water pollution. Sources of these pollution-causing substances are divided into two broad categories: point sources and nonpoint sources. Point sources are typically piped discharges from wastewater treatment plants, large urban and industrial stormwater systems, and other facilities. Nonpoint sources can include atmospheric deposition, groundwater inputs, and runoff from urban areas, agricultural lands and others. Chapter 3 includes the following:

3.1 Causes of Pollution

'Causes of pollution' refers to the substances which enter surface waters from point and nonpoint sources and result in water quality degradation and impairment. Major causes of water quality impairment include biochemical oxygen demand (BOD), nutrients, pesticides, toxicants (such as heavy metals, polychlorinated biphenyls [PCBs], chlorine, pH, ammonia, and cyanide), and *E. coli* bacteria. Table 3-1 provides a general overview of causes of impairment and the activities that may lead to their introduction into surface waters. Each of these causes is discussed in the following sections.

3.1.1 *E. coli* Bacteria

E. coli bacteria are associated with the intestinal tract of warm-blooded animals. They are widely used as an indicator of the potential presence of waterborne disease-causing (pathogenic) bacteria, protozoa, and viruses because they are easier and less costly to detect than the actual pathogenic organisms. The presence of waterborne disease-causing organisms can lead to outbreaks of such diseases as typhoid fever, dysentery, cholera, and cryptosporidiosis. The detection and identification of specific bacteria, viruses, and protozoa (such as *Giardia*, *Cryptosporidium*, and *Shigella*), require special sampling protocols and very sophisticated laboratory techniques which are not commonly available.

E. coli water quality standards have been established in order to ensure safe use of waters for water supplies and recreation. 327 IAC 2-1-6 Section 6(d) (327 IAC 2-1.5-8(e)(2) for Great Lakes system) states that *E. coli* bacteria, using membrane filter count (MF), shall not exceed 125 per 100 milliliters as a geometric mean based on not less than five samples equally spaced over a 30 day period nor exceed 235 per 100 milliliters in any one sample in a 30 day period.

E. coli bacteria may enter surface waters from nonpoint source runoff, but they also come from improperly treated discharges of domestic wastewater. Common potential sources of *E. coli* bacteria include leaking or failing septic systems, direct septic discharge, leaking sewer lines or pump station overflows, runoff from livestock operations, urban stormwater and wildlife. *E. coli* bacteria in treatment plant effluent are controlled through disinfection methods including chlorination (often followed by dechlorination), ozonation or ultraviolet light radiation.

E. coli is a significant source of pollution in the Little Calumet-Galien watershed. Five waterbodies are listed as impaired by *E. coli* contamination on the Indiana 303(d) list. These five waterbodies are scheduled for TMDL development from 2000-2004.

3.1.2 Toxic Substances

327 IAC 2-1-9(45) (327 IAC 2-1.5-2(84) for Great Lakes system) defines toxic substances as substances which are or may become harmful to plant or animal life or to food chains when present in sufficient concentrations or combinations. Toxic

substances include, but are not limited to, those pollutants identified as toxic under Section 307 (a)(1) of the Clean Water Act. Standards for individual toxic substances are listed in 327 IAC 2-1-6 (327 IAC 2-1.5-8 for Great Lakes system). Toxic substances frequently encountered include chlorine, ammonia, organics (hydrocarbons and pesticides), heavy metals and pH. These materials are toxic to different organisms in varying amounts, and the effects may be evident immediately or may only be manifested after long-term exposure or accumulation in living tissue.

Whole effluent toxicity testing is required for major NPDES dischargers (discharge over 1 million gallons per day or population greater than 10,000). This test shows whether the effluent from a treatment plant is toxic, but it does not identify the specific cause of toxicity. If the effluent is found to be toxic, further testing is done to determine the specific cause. This follow-up testing is called a toxicity reduction evaluation. Other testing, or monitoring, done to detect aquatic toxicity problems include fish tissue analyses, chemical water quality sampling and assessment of fish community and bottom-dwelling organisms such as aquatic insect larvae. These monitoring programs are discussed in Chapter 4.

Each of the substances below can be toxic in sufficient quantity or concentration.

Metals

Municipal and industrial dischargers and urban runoff are the main sources of metal contamination in surface water. Indiana has stream standards for many heavy metals, but the most common ones in municipal permits are cadmium, chromium, copper, nickel, lead, mercury, and zinc. These standards are listed in 327 IAC 2-1-6 (327 IAC 2-1.5-8 for Great Lakes system). Point source discharges of metals are controlled through the National Pollution Discharge Elimination System (NPDES) permit process. Mass balance models are employed to determine allowable concentrations for a permit limit. Municipalities with significant industrial users discharging wastes to their treatment facilities limit the heavy metals from these industries through a pretreatment program. Source reduction and wastewater recycling at waste water treatment plants (WWTP) also reduces the amount of metals being discharged to a stream. Nonpoint sources of metal pollution are controlled through best management practices.

In Indiana, as well as many other areas of the country, mercury contamination in fish has caused the need to post widespread fish consumption advisories. The source of the mercury is unclear; however, atmospheric sources are suspected and are currently being studied.

Metals are a significant source of pollution in the Little Calumet-Galien watershed. There are fifteen waterbodies on Indiana's 303(d) list with impairments due to contamination of metals including mercury, lead, and copper. These fifteen waterbodies are scheduled for TMDL development from 1998-2012.

Polychlorinated biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) were first created in 1881 and began to be commercially manufactured around 1929. Because of their fire-resistant and insulating properties, PCBs were widely used in transformers, capacitors, and in hydraulic and heat transfer systems. In addition, PCBs were used in products such as plasticizers, rubber, ink, and wax. In 1966, PCBs were first detected in wildlife, and were soon found to be ubiquitous in the environment (Bunce 1994). PCBs entered the environment through unregulated disposal of products such as waste oils, transformers, capacitors, sealants, paints, and carbonless copy paper. In 1977, production of PCBs in North America was halted. The PCB contamination present in our surface waters and environment today is the result of historical waste disposal practices.

There are thirteen waterbodies in the Little Calumet-Galien watershed on Indiana's 1998 Section 303(d) list due to impairment by PCBs. These segments are currently scheduled for TMDL development from 1998-2012.

Ammonia (NH_3)

Point source dischargers are one of the major sources of ammonia. In addition, discharge of untreated septic effluent, decaying organisms which may come from nonpoint source runoff and bacterial decomposition of animal waste also contribute to the level of ammonia in a waterbody. Standards for ammonia are listed in 327 IAC 2-1-6 (327 IAC 2-1.5-8 for Great Lakes system).

Ammonia is not a significant source of pollution in the Little Calumet-Galien watershed. There is only one waterbody in this

watershed listed on Indiana's 303(d) list due to impairment by ammonia. This segment is currently undergoing TMDL development.

Pesticides

Pesticides include a broad array of chemicals used to control plant growth (herbicides), insects (insecticides), fungi (fungicides), and other organisms. Pesticides enter surface waters primarily through nonpoint source runoff from agricultural lands and urban areas. While some pesticides undergo biological degradation by soil and water bacteria, others are very resistant to degradation. Such nonbiodegradable compounds may become "fixed" or bound to clay particles and organic matter in the soil, making them less available. However, many pesticides are not permanently fixed by the soil. Instead they collect on plant surfaces and enter the food chain, eventually accumulating in wildlife such as fish and birds. Many pesticides have been found to negatively affect both humans and wildlife by damaging the nervous, endocrine, and reproductive systems or causing cancer (Kormondy 1996).

Pesticide contamination is due not only to current nonpoint sources of pesticides, but also to legacy pesticides, or those pesticides that are no longer being used but are still persistent in the environment. Thus, measurements of pesticide pollution may not be accurate estimates of the amount of pesticides currently being discharged into surface waters, but rather reflections of both past and present pesticide use.

Pesticides are a significant source of pollution in the Little Calumet-Galien watershed. There are seven waterbodies listed as impaired by pesticides on Indiana's 303(d) list. These seven waterbodies are scheduled for TMDL development from 1998-2004.

Cyanide

Cyanide is used in several manufacturing processes, including metal finishing and glass manufacturing, and consequently it may enter surface waters through industrial runoff. Cyanide ties up the hemoglobin sites that bind oxygen to red blood cells, resulting in oxygen deprivation. This condition is known as cyanosis and is characterized by a blue skin color. Cyanide also causes chronic effects on the thyroid and central nervous system (Davis & Cornwell 1998). Most water quality monitoring programs measure total cyanide. This may overestimate the threat posed by cyanide contamination however, as total cyanide is a waste product of wastewater treatment plants. The parameter of concern to human health is free cyanide, which is included in measurements of total cyanide but different methods must be used to measure it separately.

Cyanide is a significant source of pollution in the Little Calumet-Galien watershed. There are five waterbodies listed as impaired by cyanide pollution on the Indiana 303(d) list. These five segments are scheduled for TMDL development from 1998-2004.

3.1.3 Oxygen-Consuming Wastes

Oxygen-consuming wastes include decomposing organic matter or chemicals, which reduce dissolved oxygen in water through chemical reactions, creating what is known as biochemical oxygen demand (BOD). Raw domestic wastewater contains high concentrations of oxygen-consuming wastes that need to be removed from the wastewater before it can be discharged into a waterway. Maintaining a sufficient level of dissolved oxygen in the water is critical to most forms of aquatic life.

The concentration of dissolved oxygen in a water body is one indicator of the general health of an aquatic ecosystem. 327 IAC 2-1 Section 6(b)(3) states that concentrations of dissolved oxygen shall average at least five milligrams per liter per calendar day and shall not be less than four milligrams per liter at any time. Salmonid waters which support cold water fish have a higher dissolved oxygen requirement. In these waters, dissolved oxygen concentrations shall not be less than six milligrams per liter at any time and shall not be less than seven milligrams per liter in areas where spawning and imprinting occur during the season in which they occur. Dissolved oxygen concentrations in the open waters of Lake Michigan shall not be less than seven milligrams per liter at any time (327 IAC 2-1.5-8(d)(1)).

Dissolved oxygen concentrations are affected by a number of factors. Higher dissolved oxygen is produced by turbulent actions, such as waves, which mix air and water. Lower water temperature also generally allows for retention of higher dissolved oxygen concentrations. Low dissolved oxygen levels tend to occur more often in warmer, slow-moving waters. In general, the lowest dissolved oxygen concentrations occur during the warmest summer months and particularly during low flow periods.

Sources of dissolved oxygen depletion include wastewater treatment plant effluent, the decomposition of organic matter (such as

leaves, dead plants and animals) and organic waste matter that is washed or discharged into the water. Sewage from human and household wastes is high in organic waste matter. Bacterial decomposition can rapidly deplete dissolved oxygen levels unless these wastes are adequately treated at a wastewater treatment plant. In addition, excess nutrients in a water body may lead to an over-abundance of algae and reduce dissolved oxygen in the water through algal respiration and decomposition of dead algae. Also, some chemicals may react with and bind up dissolved oxygen. Industrial discharges with oxygen-consuming wasteflow may be resilient instream and continue to use oxygen for a long distance downstream.

Three waterbodies in the Little Calumet-Galien watershed are on Indiana's 303(d) list for impairment due to oxygen-consuming wastes. These three segments are presently undergoing TMDL development.

3.1.4 Nutrients

The term "nutrients" in this Strategy refers to two major plant nutrients: phosphorus and nitrogen. These are common components of fertilizers, animal and human wastes, vegetation, and some industrial processes. Nutrients in surface waters come from both point and nonpoint sources. Nutrients are beneficial to aquatic life in small amounts. However, in over-abundance and under favorable conditions, they can stimulate algal blooms and excessive plant growth in quiet waters or low flow conditions. The algal blooms and excessive plant growth often reduce the dissolved oxygen content of surface waters through plant respiration and decomposition of dead algae and other plants. This is accentuated in hot weather and low flow conditions because of the reduced capacity of the water to retain dissolved oxygen.

There are no waterbodies in the Little Calumet-Galien watershed on Indiana's 303(d) list because of impairment due to nutrient pollution.

3.2 Point Sources of Pollution

As discussed previously, sources of water pollution are divided into two broad categories: point sources and nonpoint sources. This section focuses on point sources. Section 3.2.1 defines point sources and Section 3.2.2 discusses point sources in the Little Calumet-Galien Watershed.

3.2.1 Defining Point Sources

Point sources refer to discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge. The term applies to wastewater and stormwater discharges from a variety of sources. Wastewater point source discharges include municipal (city and county) and industrial wastewater treatment plants and small domestic wastewater treatment systems that may serve schools, commercial offices, residential subdivisions and individual homes. Stormwater point source discharges include stormwater collection systems for medium and large municipalities which serve populations greater than 100,000 and stormwater discharges associated with industrial activity as defined in the Code of Federal Regulations (40 CFR 122.26(a)(14)). The primary pollutants associated with point source discharges are oxygen-demanding wastes, nutrients, sediment, color and toxic substances including chlorine, ammonia and metals.

Point source dischargers in Indiana must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit from the state. Discharge permits are issued under the NPDES program, which is delegated to Indiana by the US Environmental Protection Agency (EPA). See Chapter 5 for a description of the NPDES program and permitting strategies.

3.2.2 Point Source Discharges in the Little Calumet-Galien Watershed

As of June 1999, there were 337 active NPDES permits within the Little Calumet-Galien watershed (Table 3-3, Figure 3-1). Of the 337 active NPDES permits, 31 are for major discharges (see Table 5-1 for a definition of a major discharge).

Another point source covered by NPDES permits is combined sewer overflows (CSO). A combined sewer system is a wastewater collection system that conveys sanitary wastewater (domestic, commercial and industrial wastewater) and stormwater through a single pipe system to a Publicly Owned Treatment Works. A CSO is the discharge from a combined sewer system at a point prior to the Publicly Owned Treatment Works. CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the Clean Water Act. Table 3-2 shows the CSOs in the Little Calumet-

Galien watershed.

In addition to the NPDES permitted dischargers in the watershed, there may be many unpermitted, illegal discharges to the Little Calumet-Galien watershed system. Illegal discharges of residential wastewater (septic tank effluent) to streams and ditches from straight pipe discharges and old inadequate systems are a problem within the watershed.

3.3 Nonpoint Sources of Pollution

Nonpoint source pollution refers to runoff that enters surface waters through stormwater runoff, contaminated ground water, snowmelt or atmospheric deposition. There are many types of land use activities that can serve as sources of nonpoint source pollution including land development, construction, mining operations, crop production, animal feeding lots, timber harvesting, failing septic systems, landfills, roads and paved areas. Stormwater from large urban areas (greater than 100,000 people) and from certain industrial and construction sites is technically considered a point source since NPDES permits are required for discharges of stormwater from these areas.

Sediment and nutrients are major pollution-causing substances associated with nonpoint source pollution. Others include *E. coli* bacteria, heavy metals, pesticides, oil and grease, and any other substance that may be washed off the ground or removed from the atmosphere and carried into surface waters. Unlike point source pollution, nonpoint pollution sources are diffuse in nature and occur at random time intervals depending on rainfall events. Below is a brief description of major areas of nonpoint sources of pollution in the Little Calumet-Galien watershed.

3.3.1 Agriculture

There are a number of activities associated with agriculture that can serve as potential sources of water pollution. Land clearing and tilling make soils susceptible to erosion, which can then cause stream sedimentation. Pesticides and fertilizers (including synthetic fertilizers and animal wastes) can be washed from fields or improperly designed storage or disposal sites. Construction of drainage ditches on poorly drained soils enhances the movement of oxygen-consuming wastes, sediment and soluble nutrients into groundwater and surface waters.

Concentrated animal operations can be a significant source of nutrients, biochemical oxygen demand and *E. coli* bacteria if wastes are not properly managed. Impacts can result from over-application of wastes to fields, from leaking lagoons and from flows of lagoon liquids to surface waters due to improper waste lagoon management. Also there are potential concerns associated with nitrate nitrogen movement through the soil from poorly constructed lagoons and from wastes applied to the soil surface.

Grassed waterways, conservation tillage, and no-till practices are several common practices used by many farmers to minimize soil loss. Maintaining a vegetated buffer between fields and streams is another excellent way to minimize sediment and nutrient loads to streams.

3.3.2 Urban/Residential

Runoff from urbanized areas, as a rule, is more localized and can often be more severe in magnitude than agricultural runoff. Any type of land-disturbing activity such as land clearing or excavation can result in soil loss and sedimentation. The rate and volume of runoff in urban areas is much greater due both to the high concentration of impervious surface areas and to storm drainage systems that rapidly transport stormwater to nearby surface waters. This increase in volume and rate of runoff can result in streambank erosion and sedimentation in surface waters.

Urban drainage systems, including curb and guttered roadways, also allow urban pollutants to reach surface waters quickly and with little or no filtering. Pollutants include lawn care pesticides and fertilizers, automobile fluids, lawn and household wastes, road salts, and *E. coli* bacteria (from animals and failing septic systems). Household hazardous wastes have the potential to severely contaminate the water if disposed of improperly by pouring down the drain or on the ground. The diversity of these pollutants makes it very challenging to attribute water quality degradation to any one pollutant.

Replacement of natural vegetation with pavement and removal of buffers reduces the ability of the watershed to filter pollutants before they enter surface waters. The chronic introduction of these pollutants and increased flow and velocity into streams results

in degraded waters. Many waters adjacent to urban areas are rated as biologically poor. This degradation also exists in lakes, which have been heavily influenced by adjacent urban development.

The population figures discussed in Section 2.3.2 are good indicators of where urban development and potential urban water quality impacts are likely to occur. Concentrated areas where urban development is high may lead to further water quality problems associated with the addition of impervious surfaces next to surface waters.

3.3.3 Onsite Wastewater Disposal

Septic systems contain all of the wastewater from a household or business. A complete septic system consists of a septic tank and an absorption field to receive effluent from the septic tank. The septic tank removes some wastes, but the soil absorption field provides further absorption and treatment. Septic systems can be a safe and effective method for treating wastewater if they are sized, sited, and maintained properly. However, if the tank or absorption field malfunction or are improperly placed, constructed or maintained, nearby wells and surface waters may become contaminated.

Some of the potential problems from malfunctioning septic systems include:

- Polluted groundwater: Pollutants in septic effluent include bacteria, nutrients, toxic substances, and oxygen-consuming wastes. Nearby wells can become contaminated by failing septic systems.

- Polluted surface water: Groundwater often carries the pollutants mentioned above into surface waters, where they can cause serious harm to aquatic ecosystems. Leaking septic tanks can also leak into surface waters through or over the soil. In addition, some septic tanks may directly discharge to surface waters.

- Risks to human health: Septic system malfunctions can endanger human health when they contaminate nearby wells, drinking water supplies, and fishing and swimming areas.

Pollutants associated with onsite wastewater disposal may also be discharged directly to surface waters through direct pipe connections between the septic system and surface waters (straight pipe discharge). However, 327 IAC 5-1-1.5 specifically states that "point source discharge of sewage treated or untreated, from a dwelling or its associated residential sewage disposal system, to the waters of the state is prohibited".

3.3.4 Construction

Construction activities that involve excavation, grading or filling can result in significant erosion and, consequently, sedimentation in streams, if not properly controlled. Sedimentation from developing urban areas can be a major source of pollution due to the cumulative number of acres disturbed in a watershed. Construction of single family homes in rural areas can also be a source of sedimentation when homes are placed in or near stream corridors.

As a pollution source, construction activities are typically temporary, but the impacts on water quality can be severe and long-lasting. Construction activities tend to be concentrated in the more rapidly developing areas of the watershed.

3.3.5 Degraded Wetlands

Healthy wetlands and riparian areas perform valuable water quality-related functions by filtering water and trapping sediments and pollutants. The ability of wetland and riparian areas to remove NPS pollutants from surface water runoff is determined by plant species composition, geochemistry and hydrogeomorphic characteristics. Any changes to these characteristics can affect the filtering capacities of these areas. Activities such as channelization, which modify the hydrology of floodplain wetlands, can alter the ability of these areas to retain sediment when they are flooded and result in erosion and a net export of sediment from the wetland (Reinelt and Horner 1990).

Management measures have been developed for the control of NPS pollution through the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems. Information on degraded wetlands as potential contributors to nonpoint source pollution and the management measures for NPS pollution abatement is available in the USEPA Draft Guidance

entitled "National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution" (USEPA 2001).

Part I, Chapter 4: Water Quality and Use Support Ratings in the Little Calumet-Galien Watershed

This section provides a detailed overview of water quality monitoring, water quality, and use support ratings in the Little Calumet-Galien watershed and includes the following:

Section 4.1 Water Quality Monitoring Programs

Section 4.2 Summary of Ambient Monitoring Data for the Little Calumet-Galien Watershed

Section 4.3 Fish Consumption Advisories

Section 4.4 Clean Water Act Section 305(b) Report

Section 4.5 Clean Water Act Section 305(b) Assessment and Use-Support: Methodology

4.1 Water Quality Monitoring Programs

This section discusses water quality monitoring programs. Specifically, Section 4.1.1 describes IDEM's Office of Water Quality monitoring programs and Section 4.1.2 discusses other monitoring efforts in the watershed.

4.1.1 Office of Water Quality Programs

The Water Quality Assessment Branch of the Office of Water Quality is responsible for assessing the quality of water in Indiana's lakes, rivers and streams. This assessment is performed by field staff from the Survey Section and the Biological Studies Section. Virtually every element of IDEM's surface water quality management program of IDEM is directly or indirectly related to activities currently carried out by this Branch. The biological and surface water monitoring activities identify stream reaches, watersheds or segments where physical, chemical and/or biological quality has been or would be impaired by either point or nonpoint sources. This information is used to help allocate waste loads equitably among various sources in a way that would ensure that water quality standards are met along stream reaches in each of the nearly 100 stream segments in Indiana.

The purpose of the Surveys Section is to provide the water quality and hydrological data required for the assessment of Indiana's waters by conducting Watershed/Basin Surveys and Stream Reach Surveys. In 1996, the Section began a five-year comprehensive study (Basin Monitoring Strategy) of the State's ten major watersheds. Information from these studies is being integrated with data from biological and nonpoint source studies as well as the Fixed Station Monitoring Program to make a major assessment of the State's waters. Such surveys determine the extent to which water quality standards are being met and whether the fishable, swimmable and water supply uses are being maintained.

Information derived from this strategy will contribute significantly to improved planning processes throughout the Office of Water Quality. This plan should initiate the development of interrelated action plans, which encompass the wide range of responsibilities, such as rule-making, permitting, compliance, nonpoint source issues, and wastewater treatment facility oversight.

The Biological Studies Section conducts studies of fish and macroinvertebrate communities as well as stream habitats to establish biological conditions to which other streams may be compared in order to identify impaired streams or watersheds. The Biological Studies Section also conducts fish tissue and sediment sampling to pinpoint sources of toxic and bioconcentrating substances. Fish tissue data serve as the basis for fish consumption advisories, which are issued, through the Indiana State Department of Health, to protect the health of Indiana citizens. This Section also participates in the development of site-specific water quality standards.

The Biological Studies Section relies on the Volunteer Water Quality Monitoring Programs to provide additional data on lakes and wetlands that may not be sampling sites in the Monitoring Strategy. Volunteer-collected data provides IDEM scientists with an overall view of water quality trends and early warning of problems that may be occurring in a lake or wetland. If volunteers detect that a lake or wetland is severely degraded, professional IDEM scientists will conduct follow-up investigation.

4.1.2 Local Volunteer Monitoring Programs

There are numerous local volunteer monitoring programs actively working throughout the Little Calumet-Galien watershed. Almost all of these volunteer monitoring programs are conducted through schools and county Soil and Water Conservation Districts. The individual volunteer monitoring programs in the watershed receive support and guidance from Indiana WaterWatchers, IDNR's Hoosier Riverwatch, and various other groups. The main focus of the various watershed volunteer monitoring programs is education.

The following four volunteer monitoring programs are involved in conservation and/or education activities in the Little Calumet-Galien watershed:

Group Name: Beverly Shores Lakefront Modern Beach Ridge
Contact: Edwin Hartke
Contact Address: 611 N Walnut Grv
Bloomington, INDIANA 47405-2208
Contact Phone: 812-855-1353
Contact Email: ehartke@Indiana.edu
URL: http://www.indiana.eud/~igs
Activity: Watershed Alliance/Council

Group Name: Friends of McCoy's Creek
Contact: Scott King David Young
Contact Address: 306 Liberty
Buchanan, Michigan 49107
Contact Phone: 616 695-4413
Activity: Volunteer Monitoring
Description: Friends of McCoy's Creek cleans and monitors McCoy's Creek, one of southwestern Michigan's finest trout/salmon streams.

Group Name: Grand Calumet Task Force
Contact: Bowden Quinn
Contact Address: 2400 New York Ave.
Whiting, INDIANA 46394
Contact Phone: 219-473-4246
Contact Email: gctf@igc.org
URL: http://www.grandcal.org
Activity: Watershed Alliance/Council
Description: A not-for-profit community environmental organization working cooperatively to protect the Grand Calumet River and its surrounding urban ecosystem in Northwest Indiana.

Group Name: Save the Dunes Conservation Fund
Contact: Sandy Wilmore
Contact Address: 444 Barker Rd.
Michigan City, INDIANA 46360
Contact Phone: 219-879-3564
Contact Email: std@adsnet.com
URL: http://www.savedunes.org
Activity: Watershed Alliance/Council
Description: The Save the Dunes Conservation Fund was established in 1994 to restore and protect the environment of the Indiana Dunes. Among its activities the Conservation Fund has restored a foredune on Gary's Lake Michigan shoreline, has

assisted the Minority Health Coalition of LaPorte County on projects in the area of a Superfund site, and has worked with teachers, individuals, and agencies to monitor the health of local streams and waterways.

Group Name: Wetlands Conservation Association
Contact: Allan Puplis
Contact Address: P.O. Box 133
Stevensville, MICHIGAN 49127-0133
Contact Phone: 616-429-1862
Activity: Other
Description: Educate the public to be able to protect and conserve area wetlands, streams and biodiversity. We monitor MDEQ wetland permit applications for public comment. We speak to kids in schools, we do road, beach, and stream cleanups. Our greatest accomplishment is working with USP& W to protect endangered species.

4.2 Summary of Ambient Monitoring Data for the Little Calumet-Galien Watershed

The fixed station-monitoring program managed by IDEM's Office of Water Quality has been monitoring surface water chemistry throughout the state since 1957. The data set from 1986 to 1995 was analyzed using the Seasonal Kendall test. This test deduces if a statistical change in the surface water chemistry occurred over a certain time period. The results of the Seasonal Kendall analysis for stations located in the Little Calumet-Galien watershed are provided in Table 4-1. The data collected from 1991 to 1997 from this monitoring program were also analyzed to determine benchmark characteristics. The results of the benchmark characteristic analysis for stations located in the Little Calumet-Galien watershed are provided in Appendix A. For a more in-depth discussion of this analysis, please refer to the 1997 Indiana Fixed Station Statistical Analysis (IDEM 1998b).

4.3 Fish Consumption Advisories

Since 1972, the Indiana Department of Natural Resources, the IDEM, and the Indiana State Department of Health (ISDH) have worked together to create the Indiana Fish Consumption Advisory (ISDH, IDNR, and IDEM 2001). Each year members from these three agencies meet to discuss the findings of recent fish monitoring data and to develop the new statewide fish consumption advisory.

The 2001 advisory is based on levels of PCBs and mercury found in fish tissue. Fish are tested regularly only in areas where there is suspected contamination. In each area, samples were taken of bottom-feeding fish, top-feeding fish, and fish feeding in between. Over 1,600 fish tissue samples collected throughout the state were analyzed for PCBs, pesticides, and heavy metals. Of those samples, the majority contained at least some mercury. However, not all fish tissue samples had mercury at levels considered harmful to human health. If they did, they are listed in Table 4-3. Because of past, widespread agricultural and industrial use of these materials, their great stability and persistence in the environment, and the potential for bioaccumulation, it is not surprising that concentrations exceeding safe levels have been found in some species. Criteria for placing fish on the Indiana Fish Consumption Advisory are developed from the Great Lakes Task Force risk-based approach.

Table 4-2 shows the ISDH definitions for each Advisory Group.

Table 4-3 shows the waterbodies in the Little Calumet-Galien Watershed that are under the 2001 fish consumption advisory.

4.4 Clean Water Act Section 305(b) Report

Section 305(b) of the Clean Water Act requires states to prepare and submit to the EPA a water quality assessment report of state water resources. A new surface water monitoring strategy for the Office of Water Quality was implemented in 1996 with the goal of monitoring all waters of the state by 2001 and reporting the assessments by 2003. Each year approximately 20 percent of the waterbodies in the state will be assessed and reported the following year. To date, one five-year monitoring cycle to survey the surface water quality of the State has been completed. The second survey cycle was begun in 2001. Appendix B contains the listing of the Little Calumet-Galien watershed waterbodies assessed, status of designated use support, probable causes of

impairment, and stream miles affected (IDEM 1998a). The methodologies of the Clean Water Act Section 305(b) assessment and use support ratings are discussed in Section 4.5.

4.5 Clean Water Act Section 305(b) Assessment and Use-Support: Methodology

The Office of Water Quality determines use support status for each stream and waterbody in accordance with the assessment guidelines provided by EPA (USEPA 1997). Results from four monitoring programs are integrated to provide an assessment for each stream and waterbody:

- Physical/chemical water column results,

- Benthic aquatic macroinvertebrate community assessments,

- Fish tissue and surficial aquatic sediment contaminant results, and

- *E. coli* monitoring results.

The assessment process was applied to each data sampling program. The individual assessments were integrated into an overall assessment for each waterbody by use designation: aquatic life support, fish consumption, and recreational use. River miles in a watershed appear as one waterbody while each lake in a watershed is reported as a separate waterbody.

Physical/chemical data for toxicants (total recoverable metals), conventional water chemistry parameters (dissolved oxygen, pH, and temperature), and bacteria (*E. coli*) were evaluated for exceedance of the Indiana Water Quality Standards (327 IAC 2-1-6). U.S. EPA 305(b) Guidelines were applied to sample results as indicated in Table 4-4 (U.S. EPA 1997).

Part I, Chapter 5: State and Federal Water Programs

This Chapter summarizes the existing point and nonpoint source pollution control programs available for addressing water quality problems in the Little Calumet-Galien watershed. Chapter 5 includes:

Section 5.1 Indiana Department of Environmental Management Water Quality Programs

Section 5.2 Indiana Department of Natural Resources Water Programs

Section 5.3 USDA/Natural Resources Conservation Service Water Programs

5.1 Indiana Department of Environmental Management Water Quality Programs

This Section describes the water quality programs managed by the Office of Water Quality within IDEM and includes:

Section 5.1.1 State and Federal Legislative Authorities for Indiana's Water Quality Program

Section 5.1.2 Indiana's Point Source Control Program

Section 5.1.3 Indiana's Nonpoint Source Control Programs

Section 5.1.4 Integrating Point and Nonpoint Source Pollution Control Strategies

Section 5.1.5 Potential Sources of Funding for Water Quality Projects

5.1.1 State and Federal Legislative Authorities for Indiana's Water Quality Program

Authorities for some of the programs and responsibilities carried out by the Office of Water Quality are derived from a number of federal and state legislative mandates outlined below. The major federal authorities for the state's water quality program are found in sections of the Clean Water Act. State authorities are from state statutes.

Federal Authorities for Indiana's Water Quality Program:

- The Clean Water Act Section 301 - Prohibits the discharge of pollutants into surface waters unless permitted by EPA.
- The Clean Water Act Section 303(c) - States are responsible for reviewing, establishing and revising water quality standards for all surface waters.
- The Clean Water Act Section 303(d) - Each state shall identify waters within its boundaries for which the effluent limits required by 301(b)(1)(A) and (B) are not stringent enough to protect any water quality standards applicable to such waters. Requires states to develop Total Maximum Daily Loads that set the maximum amount of pollution that a water body can receive without violating water quality standards.
- The Clean Water Act Section 305(b) - Each state is required to submit a biennial report to the EPA describing the status of surface waters in that state.

- The Clean Water Act Section 319 - Each state is required to develop and implement a nonpoint source pollution management program.
- The Clean Water Act Section 402 - Establishes the National Pollutant Discharge Elimination System (NPDES) permitting program. Allows for delegation of permitting authority to qualifying states (which Indiana has received).
- The Clean Water Act Section 404/401 - Section 404 regulates the discharge of dredge and fill materials into navigable waters and adjoining wetlands. Section 401 requires the U.S. Army Corps of Engineers to receive a state Water Quality Certification prior to issuance a 404 permit.

State Authority for Indiana's Water Quality Program:

IC 13-13-5 Designation of Department for Purposes of Federal Law: Designates the Indiana Department of Environmental Management as the water pollution agency for Indiana for all purposes of the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) effective January 1, 1988, and the federal Safe Drinking Water Act (42 U.S.C. 300f through 300j) effective January 1, 1988. The state rulemaking authority for water is the Water Pollution Control Board. The board holds monthly meetings that are open to the public. Information on agendas, draft rules, and meeting notices can be obtained by contacting IDEM (see Appendix C).

5.1.2 Indiana's Point Source Control Program

The State of Indiana's efforts to control the direct discharge of pollutants to waters of the State were inaugurated by the passage of the Stream Pollution Control Law of 1943. The vehicle currently used to control direct discharges to waters of the State is the National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the Federal Water Pollution Control Act Amendments of 1972 (also referred to as the Clean Water Act). The State of Indiana was granted primacy from U.S. EPA to issue NPDES permits on January 1, 1975 through a Memorandum of Agreement. These permits place limits on the amount of pollutants that may be discharged to waters of the State by each discharger. Limits are set at levels protective of both the aquatic life in the waters which receive the discharge and human health.

U.S. EPA, Region V, has oversight authority for Indiana's NPDES permits program. Under terms of the Memorandum of Agreement, Region V has the right to comment on all draft Major discharger permits. In addition to NPDES, the Office of Water Quality Permits Section has a pretreatment group which regulates municipalities in their development of municipal pretreatment programs and indirect discharges, or those discharges of process wastewater to municipal sewage treatment plants through Industrial Waste Pretreatment permits, and regulates Stormwater, Combined Sewer Overflow (CSO), and variance requests through a special projects group currently known as the Urban Wet Weather Group. Land Application of waste treatment plant sludge is no longer a part of the Office of Water Quality but is now a part of the Office of Land Quality (formerly Office of Solid and Hazardous Waste).

The purpose of the NPDES permit is to control the point source discharge of pollutants into the waters of the State such that the quality of the water of the State is maintained in accordance with the standards contained in 327 IAC 2. The NPDES permit requirements must ensure that the minimum amount of control is imposed upon any new or existing point source through the application of technology-based treatment requirements contained in 327 IAC 5-5-2. According to 327 IAC 5-2-2, "any discharge of pollutants into waters of the State as a point source discharge, except for exclusions made in 327 IAC 5-2-4, is prohibited unless in conformity with a valid NPDES permit obtained prior to discharge." This is the most basic principal of the NPDES permit program.

There are several different types of permits that are issued in the NPDES permitting program. Table 5-1 lists and describes the various permits. The majority of NPDES permits have existed since 1974. This means that most of the permit writing is for permit renewals. Approximately 10 percent of each year's workload is attributed to new permits, modifications and requests for estimated limits. NPDES permits are designed to be re-issued every five years but are administratively extended in full force and effect indefinitely if the permittee applies for a renewal before the current permit expires.

The federal Clean Water Act Section 104(b)(3) is the authority for NPDES-related State Program Grants. The Section 104(b)(3) program provides for developing, implementing and demonstrating new concepts or requirements that will improve the

effectiveness of the NPDES permit program. A project proposed for assistance by this program should deal predominantly with water pollution sources and activities regulated by the NPDES program and produce a strong, beneficial value for the statewide NPDES permit program. Organizations eligible for Section 104(b)(3) funding include State water pollution control agencies, interstate agencies, Tribes, colleges and universities, and other public or nonprofit organizations. For-profit entities, private associations and individuals are not eligible to receive this assistance. The Section 104(b)(3) grant program is administered by the Watershed Management Section within the Planning Branch of the IDEM Office of Water Quality.

5.1.3 Nonpoint Source Control Programs

Nonpoint source (NPS) pollution is so named because the pollutants do not originate at single point sources, such as industrial and municipal waste discharge pipes. Instead, NPS pollutants are carried over fields, lawns, and streets by rainwater, wind, or snowmelt. This runoff may carry with it such things as fertilizer, road salt, sediment, motor oil, or pesticides. These pollutants either enter lakes and streams or seep into groundwater. While some NPS pollution is naturally occurring, most of it is a result of human activities.

Reducing NPS pollution requires careful attention to land use management and local geographic and economic conditions. The state's NPS Program, administered by the IDEM Office of Water Quality's Watershed Management Section, focuses on the assessment and prevention of NPS water pollution. The program also provides for education and outreach in order to improve the way land is managed. Through the use of federal funding for the installation of best management practices (BMPs), the development of watershed management plans, and the implementation of watershed restoration pollution prevention activities, the NPS Program reaches out to citizens so that land is managed in such a way that less pollution is generated.

While a number of agencies and organizations currently have their own programs for addressing specific NPS issues, overall NPS coordination is being aided through the consolidated NPS Management Plan that was developed in the early stages of the Program's formation. The NPS Management Plan was prepared in 1989, partially based on findings from the NPS Assessment Report, which was also completed that year. The NPS Management Plan was updated and received EPA approval in 1999. Some of the objectives of the Management Plan include the education of land users and the reduction and remediation of NPS pollution caused by erosion and sedimentation of forested and agricultural lands and urban runoff. Other objectives address pesticide and fertilizer use, land application of sludge, animal waste practices, past and present mining practices, on-site sewage disposal, and atmospheric deposition.

The many nonpoint source projects funded through the Office of Water Quality are a combination of local, regional, and statewide efforts sponsored by various public and not-for-profit organizations. The emphasis of these projects has been on the local, voluntary implementation of NPS water pollution controls. Since the inception of the program in the late 1980s, it has utilized approximately $23 million of federal funds for the development of over 299 projects.

The federal Clean Water Act contains nonpoint source provisions in several sections of the Act including the Section 319 Nonpoint Source Program, the Section 314 Clean Lakes Program (no longer funded), and the Section 205(j) Water Quality Planning Program. The Section 319 program provides for various voluntary projects throughout the state to prevent water pollution and also provides for assessment and management plans related to water bodies in Indiana impacted by NPS pollution. Section 314 has assessment provisions that assist in determining the nonpoint and point source water quality impacts on lakes and provides recommendations for improvements, but it is currently not funded by Congress. Section 205(j) provides for planning activities relating to the improvement of water quality from nonpoint and point sources by making funding available to municipal and county governments, regional planning commissions, and other public organizations. For-profit entities, non-profit organizations, private associations, and individuals are not eligible for funding through Section 205(j).

The Watershed Management Section within the Planning Branch of the Office of Water Quality provides for the administration of the Section 319 funding source for the NPS-related projects, as well as Section 205(j) grants. Clean Water Act Section 319(h) grant monies are made available to the states on an annual basis by EPA. Agencies and organizations in the state that deal with NPS problems submit proposals to the Office of Water Quality each year for use of these funds in various projects.

One of the most important aspects of all NPS pollution prevention programs is the emphasis on the watershed approach to these programs. This calls for users in the watershed to become involved in the planning and implementation of practices which are designed to prevent pollution. By looking at the watershed as a whole, all situations causing the degradation of water quality will be addressed, not just a few. Appendix C lists the conservation partners and local stakeholders located in the Little Calumet-Galien watershed.

5.1.4 Integrating Point and Nonpoint Source Pollution Control Strategies

Two key long-term objectives of watershed management are integrating point and nonpoint source pollution controls and determining the amount and location of the remaining assimilative capacity in a watershed. The information is used for a number of purposes, including: determining if and where new or expanded municipal or industrial wastewater treatment facilities can be allowed; setting the recommended treatment level at these facilities; and identifying where point and nonpoint source pollution controls must be implemented to restore capacity and maintain water quality standards.

Total Maximum Daily Loads

The Clean Water Act mandates an integrated point and nonpoint source pollution control approach. This approach, called a total maximum daily load (TMDL), uses the concept of determining the total pollutant loading from point and nonpoint sources that a waterbody can assimilate while still maintaining its designated use (maintaining water quality standards). The U.S. EPA is responsible for ensuring that TMDLs are completed by States and for approving the completed TMDLs.

Under the TMDL approach, waterbodies that do not meet water quality standards are identified. States establish priorities for action, and then determine reductions in pollutant loads or other actions needed to meet water quality goals. The approach is flexible and promotes a watershed approach driven by local needs and directed by the State's list of priority waterbodies. The overall goal in developing the TMDL is to establish the management actions on point and nonpoint sources of pollution necessary for a waterbody to meet water quality standards.

The IDEM Office of Water Quality has reorganized its work activities around a five-year rotating basin schedule. The waters of the state have been grouped geographically into major river basins, and water quality data and other information will be collected and analyzed from each basin, or group of basins, once every five years. The schedule for implementing the TMDL Strategy is proposed to follow this rotating basin plan to the extent possible. Supplemental data collection (i.e. collection during a year other than the one prescribed in the Surface Water Quality Monitoring Strategy) may also be required to complete the TMDL process. The TMDL Strategy discusses activities to be accomplished in three phases. Phase One involves planning, sampling and data collection and will take place the first year. Phase Two involves TMDL development and will occur in the second year, and Phase Three is the TMDL implementation and will occur the third year. It is expected that some phases, especially implementation of TMDLs (Phase Three) in the basin(s), may take more than one year to fully accomplish.

In Phase Three, the TMDL scenario chosen in conjunction with watershed stakeholders during Phase Two will be used to develop a plan to implement the TMDL. During this process, stakeholder participation will be essential. The Basin Coordinator, in conjunction with the stakeholder groups, will develop a plan to implement the TMDL. Once the draft plan has been finalized through comments from stakeholder groups and IDEM, the plan becomes 'draft-final' and open to public review. Public meetings will be held in affected areas to solicit comments.

5.1.5 Potential Sources of Funding for Water Quality Projects

There are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofits, and private funding. Funds may be loans, cost share projects, or grants. Section 319(h) grants and other funding sources are discussed below.

If a local government, environmental group, university researcher, or other individual or agency wants to find funding to address a local water quality problem, it is well worth the time to prepare a thorough but concise proposal and submit it to applicable funding agencies. Even if a project is not funded, follow-up should be done to determine what changes may be needed in order to make the application more competitive.

Section 319(h) Grants

EPA offers Clean Water Act Section 319(h) grant moneys to the state on an annual basis. These grants must be used to fund projects that address nonpoint source pollution issues. Some projects which the Office of Water Quality has funded with this money in the past include best management practice (BMP) demonstrations, watershed water quality improvements, data management, educational programs, modeling, stream restoration, and riparian buffer establishment. Projects are usually two to

three years in length. Section 319(h) grants are intended to be used for project start-up, not as a continuous funding source. Units of government, nonprofit groups, and universities in the state that have expertise in nonpoint source pollution problems are invited to submit Section 319(h) proposals to the Office of Water Quality

Office of Water Quality staff review proposals for minimum 319(h) eligibility criteria such as:

- Does it support the state NPS Management Program objectives?
- Does the project address targeted, high priority watersheds?
- Are there sufficient non-federal cost-share matching funds available (25% of project costs, either cash or in-kind services)?
- Are measurable outputs identified?
- Is monitoring required? Is there a Quality Assurance/Quality Control plan for monitoring?
- If a Geographical Information System/Global Positioning System is used, is it compatible with that of the state?
- Is there a commitment for educational activities and a final report?
- Are upstream sources of NPS pollution addressed?
- Are local stakeholders involved in the project?

Office of Water Quality staff separately review and rank each proposal which meets the minimum 319(h) eligibility criteria. In their review, members consider such factors as: technical soundness; likelihood of achieving water quality results; degree of balance lent to the statewide NPS Program in terms of project type; and competence/reliability of contracting agency. They then convene to discuss individual project merits, to pool all rankings and to arrive at final rankings for the projects. Comments are also sought from outside experts in other governmental agencies, nonprofit groups, and universities. The Office of Water Quality seeks a balance between geographic regions of the state and types of projects. All proposals that rank above the funding target are included in the annual grant application to EPA, with EPA reserving the right to make final changes to the list. Actual funding depends on approval from EPA and yearly congressional appropriations.

To obtain more information about applying for a Section 319(h) grant, contact:

IDEM Office of Water Quality
Watershed Management Section
100 N. Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 233-8803

Other Sources of Funding

Besides Section 319(h) funding, there are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofit, and private funding. Funds may be loans, cost shares, or grants. Appendix D provides a summary list of agencies and funding opportunities.

5.2 Indiana Department of Natural Resources Water Programs

5.2.1 Division of Soil Conservation

The Division of Soil Conservation's mission is to ensure the protection, wise use, and enhancement of Indiana's soil and water resources. The Division's employees are part of Indiana's Conservation Partnership, which includes the 92 soil and water conservation districts (SWCDs), the USDA Natural Resources Conservation Service, and the Purdue University Cooperative Extension Service. Working together, the partnership provides technical, educational, and financial assistance to citizens to solve erosion and sediment-related problems occurring on the land or impacting public waters.

The Division administers the Clean Water Indiana soil conservation and water quality protection program under guidelines established by the State Soil Conservation Board, primarily through the local SWCDs in direct service to landusers. The Division staff includes field-based resource specialists who work closely with landusers, assisting in the selection, design, and installation of practices to reduce soil erosion on agricultural land. The Stormwater and Sediment Control Program works primarily with developers, contractors, realtors, property holders and others to address erosion and sediment concerns on non-agricultural lands, especially those undergoing development.

The Lake and River Enhancement (LARE) program utilizes a watershed approach to reduce non-point source sediment and nutrient pollution of Indiana's and adjacent states' surface waters to a level that meets or surpasses state water quality standards. To accomplish this goal, LARE provides technical and financial assistance to local entities for qualifying projects that improve and maintain water quality in public access lakes, rivers, and streams.

Hoosier Riverwatch is a water quality monitoring initiative which aims to increase public awareness of water quality issues and concerns through hands-on training of volunteers in stream monitoring and cleanup activities. Hoosier Riverwatch collaborates with agencies and volunteers to educate local communities about the relationship between land use and water quality and to provide water quality information to citizens and governmental agencies working to protect Indiana's rivers and streams.

5.2.2 Division of Water

The IDNR Division of Water (DOW) is charged by the State of Indiana to maintain, regulate, collect data on, and evaluate Indiana's surface and ground water resources.

The Engineering Branch of the DOW includes Dam and Levee Safety, Project Development, Surveying, Drafting, and Computer Services. The Dam and Levee Safety Section performs geotechnical and hydraulic evaluation on existing and proposed dams and levees throughout the State. The Project Development Section provides technical support to locally funded water resource projects along with engineering leadership and construction management to State-funded water resource projects. The remaining sections provide support services to all Sections within the DOW such as reservoir depth mapping, topographic mapping, highwater marks, design of publications and brochures, and computer procurement and maintenance.

The Planning Branch of the DOW consists of Basin Studies, Coastal Coordination, Floodplain Management, Ground Water, Hydrology and Hydraulics, and Water Rights. Basin Studies are comprehensive reports on surface- and ground-water availability and use. Coastal Coordination is a communication vehicle to address Lake Michigan's diverse shoreline issues. Floodplain Management involves various floodplain management aspects including coordination with the National Flood Insurance Program and with State and Federal Emergency Management agencies during major flooding events. The Ground Water Section maintains the water-well record computer database and publishes reports and maps on the groundwater resource for the State. The Hydrology and Hydraulics Section develops and reviews floodplain mapping and performs hydrologic studies and modeling. The Water Rights Section investigates and mediates groundwater/surface water rights issues, licenses water-well drillers, and develops well construction and abandonment procedures.

The Regulations Branch of DOW is made up of Stream Permits, Lake Permits, Permit Administration, Public Assistance, and Legal Counsel. The Stream Permits Section is responsible for reviewing permit applications for construction activity in the 100 year regulatory floodway along Indiana's waterways. The Lake Permits Section reviews construction projects at or below the

legal lake level for all of Indiana's public freshwater lakes. Permit Administration Section provides administrative support to Branch staff, maintains the application database, and coordinates the application review process with other Divisions. The Public Assistance Section provides technical assistance on possible permit applications on proposed construction projects, investigates and mediates unpermitted construction activities and in some cases, with the support of Legal Counsel, pursues legal action for violation of State laws.

5.3 USDA/Natural Resources Conservation Service Water Quality Programs

While there are a variety of USDA programs available to assist people with their conservation needs, the following assistance programs are the principal programs available.

Conservation of Private Grazing Land Initiative (CPGL)

The Conservation of Private Grazing Land initiative will ensure that technical, educational, and related assistance is provided to those who own private grazing lands. It is not a cost-share program. This technical assistance will offer opportunities for: better grazing land management; protecting soil from erosive wind and water; using more energy efficient ways to produce food and fiber; conserving water; providing habitat for wildlife; sustaining forage and grazing plants; using plants to sequester greenhouse gases and increase soil organic matter; and using grazing lands as a source of biomass energy and raw materials for industrial products.

Conservation Reserve Program (CRP)

NRCS provides technical assistance to landowners interested in participating in the Conservation Reserve Program administered by the USDA Farm Service Agency. The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost-share funding is provided to establish the vegetative cover practices.

Conservation Technical Assistance (CTA)

The purpose of the CTA program is to assist landusers, communities, units of state and local government, and other Federal agencies in planning and implementing conservation systems. The purpose of the conservation systems is to reduce erosion, improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitat, improve air quality, improve pasture and range condition, reduce upstream flooding, and improve woodlands.

One objective of the program is to assist individual landusers, communities, conservation districts, and other units of State and local government and Federal agencies to meet their goals for resource stewardship and assist individuals in complying with State and local requirements. NRCS assistance to individuals is provided through conservation districts in accordance with the Memorandum of Understanding signed by the Secretary of Agriculture, the Governor of the State, and the conservation district. Assistance is provided to landusers voluntarily applying conservation practices and to those who must comply with local or State laws and regulations.

Another objective is to provide assistance to agricultural producers to comply with the highly erodible land (HEL) and wetland (Swampbuster) provisions of the 1985 Food Security Act as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (16 U.S.C. 3801 et. seq.), the Federal Agriculture Improvement and Reform Act of 1996, and wetlands requirements of Section 404 of the Clean Water Act. NRCS makes HEL and wetland determinations and helps landusers develop and implement conservation plans to comply with the law. The program also provides technical assistance to participants in USDA cost-share and conservation incentive programs.

NRCS collects, analyzes, interprets, displays, and disseminates information about the condition and trends of the Nation's soil

and other natural resources so that people can make good decisions about resource use and about public policies for resource conservation. They also develop effective science-based technologies for natural resource assessment, management, and conservation.

Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program provides technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation. The purposes of the program are achieved through the implementation of a conservation plan, which includes structural, vegetative, and land management practices on eligible land. Five to ten year contracts are made with eligible producers. Cost-share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, and grazing land management.

Fifty percent of the funding available for the program is targeted at natural resource concerns relating to livestock production. The program is carried out primarily in priority areas that may be watersheds, regions, or multi-state areas, and for significant statewide natural resource concerns that are outside of geographic priority areas.

Small Watershed Program and Flood Prevention Program (WF 08 or FP 03)

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Watershed Surveys and Planning

The Watershed and Flood Prevention Act, P.L. 83-566, August 4, 1954, (16 U.S.C. 1001-1008) authorized this program. Prior to fiscal year 1996, small watershed planning activities and the cooperative river basin surveys and investigations authorized by Section 6 of the Act were operated as separate programs. The 1996 appropriations act combined the activities into a single program entitled the Watershed Surveys and Planning program. Activities under both programs are continuing under this authority.

The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries.

Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and floodplain management assistance. The focus of these plans is to identify solutions that use land treatment and non-structural measures to solve resource problems.

Wetlands Reserve Program (WRP)

The Wetlands Reserve Program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30 year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetlands. The 30 year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The voluntary agreements are for a minimum 10 year duration and provide for 75 percent of the cost of restoring the involved wetlands. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the

easement or agreement. In all instances, landowners continue to control access to their land.

Wildlife Habitat Incentives Program (WHIP)

The Wildlife Habitat Incentives Program provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices. USDA and program participants enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts a minimum of 10 years from the date that the contract is signed.

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Part I Tables

TABLE 0-1: WATERS OF THE LITTLE CALUMET-GALIEN ON INDIANA'S 1998 303(D) LIST

ID	Waterbody	Parameter of Concern	Priority for TMDL development
ILHAA01_HAA01-1998	CALUMET R	AMMONIA METALS NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	34
ILHAA01_HAA02-1998	CALUMET R	AMMONIA METALS NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	34
ILRHA-1998	WOLF	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	34
IN-0001BIOTA-1998	BEAVER DAM DITCH	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0002BIOTA-1998	BURNS DITCH	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0002ECOLI-1998	BURNS DITCH	E. COLI	2000-2004
IN-0002FCMRC-1998	BURNS DITCH	FCA - MERCURY	2010-2012
IN-0002FCPCB-1998	BURNS DITCH	FCA - PCBS	2010-2012
IN-0002LEAD-1998	BURNS DITCH	LEAD	2000-2004

ID	Waterbody	Parameter of Concern	Priority for TMDL development
1998			
IN-0002PESTI-1998	BURNS DITCH	PESTICIDES	2000-2004
IN-0005BIOTA-1998	DEEP RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0006BIOTA-1998	DUNES CREEK	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0008BIOTA-1998	GRAND CALUMET RIVER (EAST BRANCH)	IMPAIRED BIOTIC COMMUNITIES	1998-2000
IN-0008COPPR-1998	GRAND CALUMET RIVER (EAST BRANCH)	COPPER	1998-2000
IN-0008CYAND-1998	GRAND CALUMET RIVER (EAST BRANCH)	CYANIDE	1998-2000
IN-0008FCMRC-1998	GRAND CALUMET RIVER (EAST BRANCH)	FCA - MERCURY	1998-2000
IN-0008FCPCB-1998	GRAND CALUMET RIVER (EAST BRANCH)	FCA - PCBS	1998-2000
IN-0008LEAD-1998	GRAND CALUMET RIVER (EAST BRANCH)	LEAD	1998-2000
IN-0008OILGR-1998	GRAND CALUMET RIVER (EAST BRANCH)	OIL AND GREASE	1998-2000
IN-0008PESTI-1998	GRAND CALUMET RIVER (EAST BRANCH)	PESTICIDES	1998-2000
IN-0009AMMON-1998	GRAND CALUMET RIVER (WEST BRANCH)	AMMONIA	1998-2000
IN-0009BIOTA-1998	GRAND CALUMET RIVER (WEST BRANCH)	IMPAIRED BIOTIC COMMUNITIES	1998-2000
IN-0009CHLRD-1998	GRAND CALUMET RIVER (WEST BRANCH)	CHLORIDES	1998-2000

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0009CYAND-1998	GRAND CALUMET RIVER (WEST BRANCH)	CYANIDE	1998-2000
IN-0009DISOX-1998	GRAND CALUMET RIVER (WEST BRANCH)	DISSOLVED OXYGEN	1998-2000
IN-0009FCMRC-1998	GRAND CALUMET RIVER (WEST BRANCH)	FCA - MERCURY	1998-2000
IN-0009FCPCB-1998	GRAND CALUMET RIVER (WEST BRANCH)	FCA - PCBS	1998-2000
IN-0009LEAD-1998	GRAND CALUMET RIVER (WEST BRANCH)	LEAD	1998-2000
IN-0009PESTI-1998	GRAND CALUMET RIVER (WEST BRANCH)	PESTICIDES	1998-2000
IN-0010FCPCB-1998	GRAND CALUMET RIVER LAGOONS / MARQUETTE PARK LAGOON	FCA - PCBS	1998-2000
IN-0011DISOX-1998	INDIANA HARBOR CANAL (IHC)	DISSOLVED OXYGEN	1998-2000
IN-0011FCMRC-1998	INDIANA HARBOR CANAL (IHC)	FCA - MERCURY	1998-2000
IN-0011FCPCB-1998	INDIANA HARBOR CANAL (IHC)	FCA - PCBS	1998-2000
IN-0011LEAD-1998	INDIANA HARBOR CANAL (IHC)	LEAD	1998-2000
IN-0011PESTI-1998	INDIANA HARBOR CANAL (IHC)	PESTICIDES	1998-2000
IN-0012BIOTA-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	IMPAIRED BIOTIC COMMUNITIES	1998-2000
IN-0012DISOX-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	DISSOLVED OXYGEN	1998-2000
IN-0012FCMRC-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	FCA - MERCURY	1998-2000
IN-0012FCPCB-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	FCA - PCBS	1998-2000

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0012OILGR-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	OIL AND GREASE	1998-2000
IN-0012PESTI-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	PESTICIDES	1998-2000
IN-0015FCPCB-1998	LAKE GEORGE	FCA - PCBS	2010-2012
IN-0017ECOLI-1998	LAKE MICHIGAN	E. COLI	2000-2004
IN-0017FCMRC-1998	LAKE MICHIGAN	FCA - MERCURY	2010-2012
IN-0017FCPCB-1998	LAKE MICHIGAN	FCA - PCBS	2010-2012
IN-0021CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0021ECOLI-1998	LITTLE CALUMET RIVER	E. COLI	2000-2004
IN-0021FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0021FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0021PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0022FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0022FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0024BIOTA-1998	LITTLE CALUMET RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0024CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0024FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0024FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0024PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0029BIOTA-1998	NILES DITCH	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0034ECOLI-1998	SALT CREEK	E. COLI	2000-2004
IN-0037CYAND-1998	TRAIL CREEK	CYANIDE	2000-2004
IN-0037ECOLI-1998	TRAIL CREEK	E. COLI	2000-2004
IN-0037FCMRC-1998	TRAIL CREEK	FCA - MERCURY	2010-2012
IN-0037FCPCB-1998	TRAIL CREEK	FCA - PCBS	2010-2012
IN-0038BIOTA-1998	TURKEY CREEK	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0039FCPCB-1998	WOLF LAKE	FCA - PCBS	2010-2012
MI083301A-1998	GALIEN RIVER	E. COLI PATHOGENS	
MI083301D-1998	DEER CREEK	ALGAE BACTERIAL SLIMES MACROINVERTEBRATE COMMUNITY RATED POOR PATHOGENS	
MI083301E-1998	SAWYER CREEK	MACROINVERTEBRATE COMMUNITY RATED POOR	
MI083301F-1998	GALIEN RIVER, E. BR.	ALGAE NUTRIENTS	

ID	Waterbody	Parameter of Concern	Priority for TMDL development
MI083301G-1998	GALIEN RIVER	CHLORDANE FCA (PCBS)	
MI083301J-1998	BLOOD RUN	DEGRADED HABITAT SEDIMENTATION	
ILGI02_GI 04-1998	CHIC SAN & SHIP CANAL	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	6
ILGI02_GI 05-1998	CHIC SAN & SHIP CANAL	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	6
ILGI03_GI 03-1998	CHIC SAN & SHIP CANAL	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	18
ILH01_H 01-1998	CALUMET-SAG CHANNEL	AMMONIA NUTRIENTS PRIORITY ORGANICS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	92

ID	Waterbody	Parameter of Concern	Priority for TMDL development
ILH02_H 02-1998	CALUMET-SAG CHANNEL	AMMONIA NUTRIENTS PRIORITY ORGANICS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	114
ILHA04_HA 04-1998	LITTLE CALUMET R N	AMMONIA NUTRIENTS PRIORITY ORGANICS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	138
ILHA04_HA 06-1998	LITTLE CALUMET R N	AMMONIA NUTRIENTS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	138
ILHAA01_HAA 01-1998	CALUMET R	AMMONIA METALS NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	34
ILHAA01_HAA 40-1998	CALUMET R	AMMONIA NUTRIENTS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN	34
ILHAB01_HAB 41-1998	GRAND CALUMET R	AMMONIA PRIORITY ORGANICS METALS NUTRIENTS	305

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	
ILHB42_HB 01-1998	LITTLE CALUMET R S	NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS PATHOGENS	27
ILHB42_HB 42-1998	LITTLE CALUMET R S	AMMONIA NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SALINITY/TDS/CHLORIDES PATHOGENS	27
ILHBD04_HBD 04-1998	THORN CR	NUTRIENTS METALS PH SALINITY/TDS/CHLORIDES OTHER HABITAT ALTERATIONS PATHOGENS	52
ILHC01_HC 01-1998	S BR CHICAGO R	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	14
ILHC01_HC-1998	S BR CHICAGO R	METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN	14

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	
ILHC01_HCA 01-1998	S FK S BR CHICAGO R	AMMONIA METALS FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	14
ILHC01_HCB 01-1998	CHICAGO R	METALS NUTRIENTS OTHER HABITAT ALTERATIONS	14
ILHCC07_HCC 07-1998	N BR CHICAGO R	PRIORITY ORGANICS NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SALINITY/TDS/CHLORIDES PATHOGENS	39
ILHCC08_HCC 02-1998	N BR CHICAGO R	NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	45
ILHCC08_HCC 08-1998	N BR CHICAGO R	NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	45
ILHCCA01_HCC A01-1998	N SHORE CHANNEL	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT	42

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		ALTERATIONS	
ILHCCA01_HCCA03-1998	N SHORE CHANNEL	AMMONIA METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS PATHOGENS	42
ILHCCA01_HCCA04-1998	N SHORE CHANNEL	AMMONIA METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS PATHOGENS	42
ILHCCA01_HCCA05-1998	N SHORE CHANNEL	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	42
ILHCCC04_HCCC02-1998	MID FK N BR CHIC R	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SALINITY/TDS/CHLORIDES NOXIOUS AQUATIC PLANTS	96
ILQZF-1998	WASHINGTON PARK LGN	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS	18

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		NOXIOUS AQUATIC PLANTS	
ILRHJ-1998	SKOKIE LAGOONS	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	322
ILRHR-1998	GEORGE	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	236
ILRHS-1998	TURTLEHEAD	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	243
ILRHU-1998	SHERMAN PARK LAGOONS	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	18
ILRHW-1998	GARFIELD PK LAGOON	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	18
ILRHX-1998	DOUGLAS PARK LAGOON	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW	18

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	
ILRHZA-1998	GOMPERS PARK LAGOON	NUTRIENTS SILTATION SUSPENDED SOLIDS	39
ILRHZE-1998	ARROWHEAD	NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	114
IN-0023BIOTA-1998	LITTLE CALUMET RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0023CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0023DISOX-1998	LITTLE CALUMET RIVER	DISSOLVED OXYGEN	2000-2004
IN-0023FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0023FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0023PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0024BIOTA-1998	LITTLE CALUMET RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0024CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0024FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0024FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0024PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0055BIOTA-1998	DYER DITCH	IMPAIRED BIOTIC COMMUNITIES	2004-2006

FCA - Fish Consumption Advisory
PCB - Polychlorinated Biphenyls
Hg - Mercury

***Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above. The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.

TABLE 2-1: LITTLE CALUMET-GALIEN COUNTY POPULATION PROJECTIONS 1990-2020

County	1990	2000	2010	2020	Percent Change (1990 to 2020)
La Porte	107066	110106	112124	113217	5
Lake	475594	484564	496886	503185	5
Porter	128932	146798	162781	169493	31
St. Joseph	247052	265559	272800	278093	12

(from IBRC 1999)

TABLE 2-2: LITTLE CALUMET-GALIEN CITY AND TOWN POPULATION ESTIMATES

City/Town	Census 1990	Estimate 1996	Percent Change (1990 to 1996)
Beverly Shores	620	634	2
Burns Harbor	825	894	8
Chesterton	9188	10313	12
Crown Point	18204	20104	10
Dune Acres	271	254	-6
Dyer	10823	13687	26
East Chicago	33860	30457	-10
Gary	116587	110271	-5
Griffith	16941	16812	0
Hammond	84248	77363	-8
Highland	23724	24073	1
Hobart	24659	25108	1
Lake Station	13881	13841	0
Long Beach	1923	1757	-8
Merrillville	27987	31290	11
Michiana Shores	384	420	9
Michigan City	33989	32752	-3
Munster	19934	20440	2
New Chicago	2037	1989	-2
Ogden Dunes	1490	1381	-7
Portage	29256	33477	14
Porter	3242	4744	46
Schererville	19098	23236	21

City/Town	Census 1990	Estimate 1996	Percent Change (1990 to 1996)
Town of Pines	797	771	-3
Trail Creek	2456	2384	-2
Valparaiso	24564	27048	10
Whiting	5163	4568	-11
Winfield	635	796	25

(from IBRC 1997)

TABLE 2-3: LIVESTOCK IN THE LITTLE CALUMET-GALIEN WATERSHED

	1997 Livestock Inventory							
	Hogs and pigs		**Cattle and calves**		**Sheep and lamb**		**Layers 20 weeks and older**	
County	**Number**	**State Rank***	**Number**	**State Rank***	**Number**	**State Rank***	**Number**	**State Rank***
La Porte	27110	47	24980	7	780	29	782	42
Lake	9435	74	3204	84	@	@	999	37
Porter	14134	66	4416	74	558	43	@	@
St. Joseph	27430	46	6440	61	@	@	(D)	13

* State Rank is out of a total of 92 counties in Indiana
@ - indicates species is not in the top 4 for this county
D - Numbers not disclosed by USDA-NASS
(from USDA 1997)

TABLE 2-4: CROPS PRODUCED IN THE LITTLE CALUMET-GALIEN WATERSHED

	1997 Crops							
	Corn for grain		**Soybeans for beans**		**Wheat**		**Hay crops**	
County	**Acres**	**State Rank***	**Acres**	**State Rank***	**Acres**	**State Rank***	**Acres**	**State Rank***
La Porte	113242	5	76809	22	4186	49	10490	23
Lake	68344	38	55698	45	3101	68	3754	68
Porter	60976	49	47866	54	3964	56	3381	74
St. Joseph	69251	36	45696	56	4073	53	5832	44

* State Rank is out of a total of 92 counties in Indiana
@ - indicates species is not in the top 4 for this county
D - Numbers not disclosed by USDA-NASS
(from USDA 1997)

TABLE 2-5: OUTSTANDING RIVERS LIST FOR INDIANA

In 1993, the Natural Resources Commission adopted its "Outstanding Rivers List for Indiana." The listing was published in the Indiana Register on March 1 of that year as Information Bulletin #4 in Volume 16, Number 6, page 1677 through 1680 (sometimes cited as 16 IR 1677). The listing has also been specifically incorporated by reference into statutes and rules. Notably, the listing is referenced in the standards for utility line crossings within floodways, formerly governed by IC 14-28-2 and now controlled by 310 IAC 6-1-16 through 310 IAC 6-1-18. See, also, the general permit for logjam removals, implemented as an emergency rule and pending for adoption as a permanent rule at 310 IAC 6-1-20. Except where incorporated into a statute or rule, the listing is intended to provide guidance rather than to have regulatory application.

I. INTRODUCTION

To help identify the rivers and streams which have particular environmental or aesthetic interest, a special listing has been prepared by the division of outdoor recreation of the department of natural resources. The listing is a corrected and condensed version of a listing complied by American Rivers and dated October 1990. There are about 2,000 river miles included on the listing, a figure which represents less than 9% of the estimated 24,000 total river miles in Indiana. The natural resources commission has adopted the listing as an official recognition of the resource values of these waters.

A river included in the listing qualifies under one or more of the following 22 categories. An asterisk indicates that all or part of the river segment was also included in the "Roster of Indiana Waterways Declared Navigable," 15 IR 2385 (July 1992). [Note: this listing is now included in the 1997 "Roster of Indiana Waterways Declared Navigable or Nonnavigable."] A river designated "EUW" is an exceptional use water. A river designated "HQW" is a high quality water, and a river designated "SS" is a salmonoid stream.

1. Designated National Wild and Scenic Rivers. Rivers that Congress has included in the National Wild and Scenic System pursuant to the National Wild and Scenic River Act, Public Law 90-452.

2. National Wild and Scenic Study Rivers. Rivers that Congress has determined should be studied for possible inclusion in the National Wild and Scenic Rivers System.

3. Federally Protected Rivers other than Wild and Scenic. Rivers subject to federal legal protection other than pursuant to the National Wild and Scenic Rivers Act, such as National Rivers and Waterways and National Recreation Areas.

4. State designated Scenic Rivers. Rivers included in state river conservation systems or otherwise protected pursuant to an act of the state legislature.

5. Nationwide Rivers Inventory Rivers. The 1,524 river segments identified by the National Park Service in its 1982 "Nationwide Rivers Inventory" as qualified for consideration for inclusion in the National Wild and Scenic Rivers System.

6. Hydro Ban Rivers. Rivers on which Congress has prohibited future hydropower development.

7. Rivers Identified in State Inventories or Assessments. Outstanding rivers from state inventories or assessments, i.e., rivers identified as having statewide or greater significance.

8. Atlantic Salmon Restoration Rivers. Rivers undergoing active Atlantic salmon restoration efforts and identified by the U.S. Fish and Wildlife Service for planned restoration.

9. Federal Public Lands Rivers. Rivers identified in U.S. Forest Service and Bureau of Land Management resource planning as potential additions to the National Wild and Scenic Rivers System.

10. State Fishing Rivers. Rivers identified by states as having outstanding fishing values, such as Blue Ribbon Trout Streams.

11. State Heritage Program Sites. Rivers identified by state natural heritage programs or similar state programs as having outstanding ecological importance.

12. Priority Aquatic Sites. Rivers identified in "Priority Aquatic Sites for Biological Diversity Conservation," published by the Nature Conservancy in 1985.

13. Canoe Trails. State-designated canoe/boating routes.

14. Outstanding Whitewater Streams. Rivers listed in the American Whitewater Affiliation's 1990 Inventory of American Whitewater.

15. Locally Protected Rivers. Rivers protected through local and private protection strategies.

16. State Park Rivers. Rivers protected by inclusion in a state park or state preserve.

17. Other Rivers. Miscellaneous rivers identified as having outstanding ecological, recreational, or scenic importance.

18. High Water Quality Rivers. "Outstanding Resources Waters" designated by states and other rivers identified by states as having outstanding water quality.

19. National Natural Landmark Rivers. Rivers designated as, or included within, National Natural Landmarks.

20. State Study Rivers. Rivers that have been formally proposed for state protection or designation.

21. BOR Western Rivers. Rivers listed in the Bureau of Outdoor Recreation's 1982 "Western U.S. Water Plan" proposal as exhibiting identified free-flowing values.

22. State legislated Wabash River Heritage Corridor.

II. LISTING OF OUTSTANDING RIVERS AND STREAMS IN THE LITTLE CALUMET-GALIEN WATERSHED

River	Significance	County	Segment
Deep River	13, 17	Lake, Porter	1 mile south of U.S. 30 to Little Calumet River
Little Calumet East Fork	10, 13, SS	Porter	C.R. 600E to S.R. 249

TABLE 2-6: SPECIAL AREAS IN THE LITTLE CALUMET-GALIEN WATERSHED

County	Special Area	Manager	Access
LA PORTE	BARKER WOODS NATURE PRESERVE	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LA PORTE	FISH CREEK FEN NATURE PRESERVE	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LA PORTE	FOX MEMORIAL PARK	LOCAL- LAPORTE CO. PARKS & RECREATION	OPEN-
LA PORTE	GALENA (SPRINGFIELD FEN) WETLAND CONSERVATION AREA	DNR FISH & WILDLIFE	OPEN-
LA PORTE	HILDEBRANDT LAKE	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LA PORTE	HOG LAKE PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
LA PORTE	IDNL - PINHOOK BOG UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
LA PORTE	IZAAK WALTON LEAGUE PROPERTY	PRIV- IZAAK WALTON LEAGUE	RESTRICTED-
LA PORTE	KANKAKEE FISH AND WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
LA PORTE	KANKAKEE RIVER SWAMPLAND	DNR FISH & WILDLIFE	OPEN-
LA PORTE	KESLING OUTDOOR REC. CENTER	LOCAL- LAPORTE CO. PARKS & RECREATION	OPEN-
LA PORTE	KINGSBURY FISH AND WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
LA PORTE	LUHR PARK	LOCAL- LAPORTE CO. PARKS & RECREATION	OPEN-
LA PORTE	MICHIGAN CITY FISH & WILDLIFE HEADQUARTERS	DNR FISH & WILDLIFE	OPEN-
LA PORTE	MILL CREEK FEN NATURE PRESERVE	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LA PORTE	PRAIRIE MEADOW PARK	LOCAL- WESTVILLE PARK BOARD	OPEN-

County	Special Area	Manager	Access
LA PORTE	RUMELY PARK	LOCAL- LAPORTE CO. PARKS & RECREATION	OPEN-
LA PORTE	SPRINGFIELD FEN NATURE PRESERVE	DNR NATURE PRESERVES	OPEN-
LA PORTE	STOCKWELL WOODS	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LA PORTE	TRAIL CREEK - NIPSCO	DNR FISH & WILDLIFE	RESTRICTED-
LA PORTE	TRAIL CREEK FEN	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LA PORTE	TRAIL CREEK P.F.A.	DNR FISH & WILDLIFE	OPEN-
LA PORTE	WASHINGTON PARK	LOCAL- MICHIGAN CITY PARK BOARD	OPEN-
LA PORTE	YELLOW BIRCH WETLAND	PRIV- THE NATURE CONSERVANCY	RESTRICTED-
LAKE	25TH AVENUE PARK	LOCAL- GARY PARK BOARD	OPEN-
LAKE	BADAL WILDLIFE HABITAT TRUST AREA	DNR FISH & WILDLIFE	OPEN-
LAKE	BEAVER DAM WETLAND CONSERVATION AREA	DNR FISH & WILDLIFE	OPEN-
LAKE	BIESECKER (COOK) PRAIRIE NATURE PRESERVE	DNR NATURE PRESERVES	RESTRICTED-
LAKE	BLUEBIRD PARK	LOCAL- MUNSTER PARK BOARD	OPEN-
LAKE	CALUMET PRAIRIE NATURE PRESERVE	DNR NATURE PRESERVES	RESTRICTED-
LAKE	CEDAR LAKE PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
LAKE	CENTENNIAL PLAZA AND TRAIL	LOCAL- HAMMOND PARK BOARD	OPEN-
LAKE	CLARK AND PINE EAST	DNR NATURE PRESERVES	RESTRICTED-
LAKE	CLARK AND PINE NATURE PRESERVE	DNR NATURE PRESERVES	RESTRICTED- BY PERMISSION ONLY
LAKE	DEEP RIVER COUNTY PARK	LOCAL- LAKE CO. PARKS &	OPEN-

County	Special Area	Manager	Access
		RECREATION	
LAKE	DEEP RIVER PRESERVE	PRIV- THE NATURE CONSERVANCY	RESTRICTED-
LAKE	EDWARD C. DOWLING PARK	LOCAL- HAMMOND PARK BOARD	OPEN-
LAKE	ELLENDALE PARK	LOCAL- HIGHLAND PARK BOARD	OPEN-
LAKE	GAYLORD BUTTERFLY AREA	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LAKE	GERMAN METHODIST CEMETERY PRAIRIE	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LAKE	GIBSON WOODS NATURE PRESERVE	LOCAL- LAKE CO. PARKS & RECREATION	OPEN- 9 TO 5 DAILY
LAKE	GRAND KANKAKEE MARSH	LOCAL- LAKE CO. PARKS & RECREATION	OPEN-
LAKE	GRAND LAKE RECREATION AREA	LOCAL- EAST GARY PARK BOARD	OPEN-
LAKE	HARRISON PARK	LOCAL- HAMMOND PARK BOARD	OPEN-
LAKE	HATCHER PARK	LOCAL- GARY PARK BOARD	OPEN-
LAKE	HOBART LAKEFRONT PARK	LOCAL- HOBART PARK BOARD	OPEN-
LAKE	HOMESTEAD PARK	LOCAL- HIGHLAND PARK BOARD	OPEN-
LAKE	HOOSIER PRAIRIE NATURE PRESERVE	DNR NATURE PRESERVES	OPEN-
LAKE	HOOSIER PRAIRIE-GAYLORD	DNR NATURE PRESERVES	RESTRICTED- BY PERMISSION ONLY
LAKE	HOWE PARK	LOCAL- GARY PARK BOARD	OPEN-
LAKE	IDNL - MILLER UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
LAKE	IDNL - TOLLESTON UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
LAKE	IVANHOE NATURAL AREA	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
LAKE	JACKSON PARK	LOCAL- GARY PARK BOARD	OPEN-
LAKE	JEORSE PARK	LOCAL-	OPEN-

County	Special Area	Manager	Access
LAKE	LAKE ETTA PARK	LOCAL- LAKE CO. PARKS & RECREATION	OPEN-
LAKE	LASALLE FISH AND WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
LAKE	LEMON LAKE COUNTY PARK	LOCAL- LAKE CO. PARKS & RECREATION	OPEN-
LAKE	LEROY SITE	LOCAL- LAKE CO. PARKS & RECREATION	OPEN-
LAKE	LIBERTY PARK	LOCAL- LOWELL PARK BOARD	OPEN-
LAKE	LIVERPOOL NATURE PRESERVE	DNR NATURE PRESERVES	OPEN-
LAKE	MAC JAY LAKE	PRIV- IZAAK WALTON LEAGUE	RESTRICTED-
LAKE	MAIN SQUARE PARK	LOCAL- HIGHLAND PARK BOARD	OPEN-
LAKE	MARQUETTE PARK BEACH	LOCAL- GARY PARK BOARD	OPEN-
LAKE	MAYWOOD PARK	LOCAL- HAMMOND PARK BOARD	OPEN-
LAKE	MC CLOSKEY SAVANNA(MCCLOSKEY'S WOODS)	DNR NATURE PRESERVES	RESTRICTED-
LAKE	MEADOWS PARK	LOCAL- HIGHLAND PARK BOARD	OPEN-
LAKE	MUNSTER COMMUNITY PARK	LOCAL- MUNSTER PARK BOARD	OPEN-
LAKE	NEW CHICAGO CENTENNIAL PARK	LOCAL- NEW CHICAGO PARK BOARD	OPEN-
LAKE	NORTHGATE PARK	LOCAL- DYER PARK BOARD	OPEN-
LAKE	OAK RIDGE PRAIRIE COUNTY PARK	LOCAL- LAKE CO. PARKS & RECREATION	OPEN-
LAKE	PHEASANT HILLS PARK	LOCAL- DYER PARK BOARD	OPEN-
LAKE	RIDGEWAY PARK	LOCAL- MUNSTER PARK BOARD	OPEN-
LAKE	RIVERVIEW COMMUNITY PARK	LOCAL- EAST GARY PARK BOARD	OPEN-
LAKE	SHIRLEY HEINZE F. HOBART TRACT	PRIV- SHIRLEY HEINZE FOUNDATION	RESTRICTED-
LAKE	SOUTHRIDGE PARK (SHEPPARD PARK)	LOCAL- HIGHLAND PARK BOARD	OPEN-

County	Special Area	Manager	Access
LAKE	ST. JOHN PRAIRIE	DNR NATURE PRESERVES	RESTRICTED-
LAKE	SUNNYSIDE PARK	LOCAL- EAST CHICAGO PARK BOARD	OPEN-
LAKE	TOLLESTON PARK	LOCAL- GARY PARK BOARD	OPEN-
LAKE	TOLLESTON RIDGES NATURE PRESERVE	LOCAL- LAKE CO. PARKS & RECREATION	CLOSED-
LAKE	WADSWORTH PARK	LOCAL- GRIFFITH PARK BOARD	OPEN-
LAKE	WASHINGTON PARK	LOCAL- GARY PARK BOARD	OPEN-
LAKE	WHIHALA BEACH COUNTY PARK	LOCAL- LAKE CO. PARKS & RECREATION	OPEN-
LAKE	WOLF LAKE	LOCAL- HAMMOND PARK BOARD	OPEN-
PORTER	COFFEE CREEK (MORAINE) MANAGED AREA	PRIV- THE NATURE CONSERVANCY	RESTRICTED-
PORTER	DOGWOOD PARK	LOCAL- CHESTERTON PARK BOARD	OPEN-
PORTER	DRAZER PARK	LOCAL- KOUTS PARK BOARD	OPEN-
PORTER	DUNES NATURE PRESERVE	DNR STATE PARKS	OPEN-
PORTER	FOREST PARK GOLF COURSE	LOCAL- HIGHLAND PARK BOARD	OPEN-
PORTER	HAVEN HOLLOW PARK	LOCAL- PORTAGE PARK BOARD	OPEN-
PORTER	IDNL - BAILLY UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - COWLES BOG	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - DUNE ACRES UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - HERON ROOKERY UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - KEISER UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - TAMARACK UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - VISITOR CENTER UNIT	U.S. NATIONAL PARK SERVICE	OPEN-
PORTER	IDNL - WEST BEACH UNIT	U.S. NATIONAL PARK SERVICE	OPEN-

County	Special Area	Manager	Access
PORTER	INDIANA DUNES STATE PARK	DNR STATE PARKS	OPEN-
PORTER	IZAAK WALTON LEAGUE PROPERTY	PRIV- IZAAK WALTON LEAGUE	RESTRICTED-
PORTER	LAKEWOOD (ROGERS) PARK	LOCAL- VALPARAISO PARK BOARD	OPEN-
PORTER	LAKEWOOD DUNE FOREST	PRIV- THE NATURE CONSERVANCY	RESTRICTED- BY PERMISSION ONLY
PORTER	LANGELUTTIG MARSH WETLAND CONSERVATION AREA	DNR FISH & WILDLIFE	OPEN-
PORTER	MORAINE NATURAL AREA (WOMER TRACT 3)	DNR NATURE PRESERVES	RESTRICTED- BY PERMISSION ONLY
PORTER	MORAINE NATURE PRESERVE	DNR NATURE PRESERVES	RESTRICTED- BY PERMISSION ONLY
PORTER	NELSON PARK	LOCAL- TRAIL CREEK PARK BOARD	OPEN-
PORTER	NORTHSIDE PARK	LOCAL- VALPARAISO PARK BOARD	OPEN-
PORTER	PORTAGE (WOODLAND) PARK	LOCAL- PORTAGE PARK BOARD	OPEN-
PORTER	PORTAGE BICENTENNIAL PARK	LOCAL- PORTAGE PARK BOARD	OPEN-
PORTER	PRAIRIE-DUNELAND TRAIL CO. PARK	LOCAL- PORTAGE PARK BOARD	OPEN-
PORTER	SUMAN FEN	DNR NATURE PRESERVES	RESTRICTED- BY PERMISSION ONLY
PORTER	SUNSET HILL FARM PARK	LOCAL- PORTER CO. PARKS & RECREATION DEPT.	OPEN-
PORTER	UNIVERSITY OF CHICAGO WOODS	UNIV- UNIVERSITY OF CHICAGO	RESTRICTED-
ST. JOSEPH	(YE OLDE) EAST RACEWAY PARK	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	ABANDONED RAILROAD ACQ.	LOCAL- ROSELAND PARK BOARD	OPEN-
ST. JOSEPH	BAUGO CREEK PARK - PHASE I	LOCAL- ST. JOSEPH CO. PARKS & RECREATION	OPEN-
ST.	BELLVILLE GARDENS	LOCAL- SOUTH BEND PARKS AND	OPEN-

County	Special Area	Manager	Access
JOSEPH		RECREATION	
ST. JOSEPH	BENDIX WOODS NATURE PRESERVE	LOCAL- ST. JOSEPH CO. PARKS & RECREATION	OPEN-
ST. JOSEPH	BLUE HERON (LILLOVITCH) ROOKERY NONGAME AREA	DNR FISH & WILDLIFE	RESTRICTED- BY PERMISSION ONLY
ST. JOSEPH	BOOTH TARKINGTON PARK (PAUL BOEHM PARK)	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	CENTRAL PARK	LOCAL- MISHAWAKA PARK BOARD	OPEN-
ST. JOSEPH	EAST BANK PARK	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	KANKAKEE FEN NATURE PRESERVE	PRIV- THE NATURE CONSERVANCY	CLOSED-
ST. JOSEPH	LEEPER PARK	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	MARTIN LUTHER KING PARK	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	MARY GIBBARD PARK	LOCAL- MISHAWAKA PARK BOARD	OPEN-
ST. JOSEPH	MISHAWAKA FISH LADDER	DNR FISH & WILDLIFE	OPEN-
ST. JOSEPH	NORTHSIDE PARK	LOCAL- MISHAWAKA PARK BOARD	OPEN-
ST. JOSEPH	OLD RAILROAD BIKE TRAIL	LOCAL-	OPEN-
ST. JOSEPH	PIER PARK	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	PLEASANT LAKE PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
ST. JOSEPH	POTATO CREEK STATE PARK	DNR STATE PARKS	OPEN-
ST. JOSEPH	SOUTH BEND (ST. JOSEPH R.) PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-

County	Special Area	Manager	Access
ST. JOSEPH	SPICER LAKE NATURE PRESERVE	LOCAL- ST. JOSEPH CO. PARKS & RECREATION	OPEN-
ST. JOSEPH	SPICER LAKE, EBERSOLE II ADDITION	PRIV- THE NATURE CONSERVANCY	OPEN-
ST. JOSEPH	ST. JOSEPH RIVER (HOWARD) PARK	LOCAL- SOUTH BEND PARKS AND RECREATION	OPEN-
ST. JOSEPH	ST. PATRICKS PARK	LOCAL- ST. JOSEPH CO. PARKS & RECREATION	OPEN-
ST. JOSEPH	SWAMP ROSE NATURE PRESERVE	DNR STATE PARKS	OPEN-
ST. JOSEPH	TOLL ROAD FIELD	LOCAL- ROSELAND PARK BOARD	OPEN-
ST. JOSEPH	TRAIL CREEK P.F.A.	DNR FISH & WILDLIFE	OPEN-
ST. JOSEPH	TWIN BRANCH FISH HATCHERY	DNR FISH & WILDLIFE	RESTRICTED- BY PERMISSION ONLY
ST. JOSEPH	ZAPPIA (TWIN BRANCH) PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-

TABLE 2-7: 1995 WATER USE INFORMATION FOR THE LITTLE CALUMET-GALIEN WATERSHED

Population and Water Use totals	**1995**
Total population in the watershed (thousands)	614.67
Public Water Supply	**1995**
Population served by public groundwater supply (thousands)	61.68
Population served by surface water supply (thousands)	456.68
Total population served by public water supply (thousands)	518.36
Total groundwater withdrawals (mgd)	4.97
Total surface water withdrawals (mgd)	0.0
Total water withdrawals (mgd)	4.97
Total per capita withdrawal (gal/day)	13.95
Population self-supplied with water (thousands)	96.31
Commercial Water Use	**1995**
Groundwater withdrawal for commercial use (mgd)	1.24
Surface water withdrawal for commercial use (mgd)	0.94
Deliveries from public water supplies for commercial use (mgd)	25.99
Total commercial water use (mgd)	4.21
Industrial Water Use	**1995**
Groundwater withdrawal for industrial use (mgd)	8.08
Surface water withdrawals for industrial use (mgd)	250.02
Deliveries from public water suppliers for industrial use (mgd)	15.74

Total industrial water use (mgd)	101.69
Agricultural Water Use	**1995**
Groundwater withdrawals for livestock use (mgd)	0.1
Surface water withdrawals for livestock use (mgd)	0.15
Total livestock water use (mgd)	0.19
Groundwater withdrawals for irrigation (mgd)	0.03
Surface water withdrawals for irrigation (mgd)	0.07
Total irrigation water use (mgd)	0.1

Notes:
mgd: million gallons per day
gal/day: gallons per day
(from USGS 2001)

- The water-use information presented in this table was compiled from information provided in the U.S. Geological Survey's National Water-Use Information Program data system for 1990 and 1995. The National Water-Use Information Program is responsible for compiling and disseminating the nation's water-use data. The U.S. Geological Survey works in cooperation with local, State, and Federal environmental agencies to collect water-use information at a site-specific level. Every five years, the U.S. Geological Survey compiles data at the state and hydrologic region level into a national water-use data system and publishes a national circular.

TABLE 3-1: CAUSES OF WATER POLLUTION AND CONTRIBUTING ACTIVITIES

Cause	Activity associated with cause
E. coli	Failing septic systems, direct septic discharge, animal waste (including runoff from livestock operations and impacts from wildlife), improperly disinfected wastewater treatment plant effluent
Toxic Chemicals	Pesticide/herbicide applications, household hazardous waste, disinfectants, automobile fluids, accidental spills, illegal dumping, urban stormwater runoff, direct septic discharge, industrial effluent
Oxygen-Consuming Substances	Wastewater effluent, leaking sewers and septic tanks, direct septic discharge, animal waste
Nutrients	Fertilizer on agricultural crops and residential/commercial lawns, animal wastes, leaky sewers and septic tanks, direct septic discharge, atmospheric deposition, wastewater treatment plants

TABLE 3-2: COMBINED SEWER OVERFLOWS IN THE LITTLE CALUMET-GALIEN WATERSHED

Community	CSO Outfalls
Chesterton	1
Crown Point	5
East Chicago	3
Gary	12
Hammond	20
Michigan City	2

(from ICAA 2000)

TABLE 3-3: NPDES PERMITTED FACILITIES IN THE LITTLE CALUMET-GALIEN WATERSHED

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0000027	CERESTAR USA, INC.	MAJOR	HAMMOND	LAKE	ACTIVE
IN0000035	PRAXAIR, INC., LAKESIDE PLANT	MAJOR	GARY,	LAKE	ACTIVE
IN0000043	PRAXAIR, INC. LINDE DIVISION	MINOR	EAST CHICAGO	LAKE	INACTIVE
IN0000051	ENERGY COOPERATIVE	MINOR	EAST CHICAGO	LAKE	INACTIVE
IN0000086	MOBIL OIL CORPORATION	MAJOR		LAKE	INACTIVE
IN0000094	ISPAT INLAND, INC.	MAJOR	EAST CHICAGO,	LAKE	ACTIVE
IN0000108	BP PRODUCTS NORTH AMERICA INC.	MAJOR	WHITING	LAKE	ACTIVE
IN0000116	NIPSCO, MICHIGAN CITY GEN. STA	MAJOR	MICHIGAN CITY	LA PORTE	ACTIVE
IN0000124	NIPSCO, DEAN H. MITCHELL STA	MAJOR	GARY	LAKE	ACTIVE
IN0000132	NIPSCO, BAILEY GENERATING STA	MAJOR	CHESTERTON	PORTER	ACTIVE
IN0000141	KAISER ALUM & CHEM-GARY COKE	MINOR		LAKE	INACTIVE
IN0000159	CITGO PETROLEUM CORP.	MINOR	EAST CHICAGO	LAKE	INACTIVE
IN0000167	AMERICAN STEEL FOUNDRIES	MINOR	EAST CHICAGO	LAKE	ACTIVE
IN0000175	BETHLEHEM STEEL CORPORATION	MAJOR	CHESTERTON	PORTER	ACTIVE
IN0000183	JOY MANUFACTURING COMPANY	MINOR	MICHIGAN CITY,	LA PORTE	INACTIVE
IN0000191	VULCAN MATERIALS CO-METALLICS	MAJOR	GARY	LAKE	INACTIVE
IN0000205	LTV STEEL COMPANY	MAJOR	EAST CHICAGO,	LAKE	ACTIVE
IN0000221	STATE LINE ENERGY, LLC	MAJOR	HAMMOND	LAKE	ACTIVE
IN0000248	HARBISON-WALKER REFRACTORIES	MINOR	HAMMOND	LAKE	ACTIVE
IN0000264	UNILEVER HPC USA	MINOR	HAMMOND,	LAKE	ACTIVE
IN0000272	MYSTIK CORPORATION	MINOR		LA PORTE	INACTIVE
IN0000281	U.S. STEEL LLC - GARY WORKS	MAJOR	GARY,	LAKE	ACTIVE
IN0000299	ITT PHILLIPS DRILL DIVISION	MAJOR		LA PORTE	INACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0000302	CCA OF INDIANA, INC.	MINOR	VALPARAISO	PORTER	INACTIVE
IN0000329	W.R. GRACE & CO. -CONN.	MINOR	EAST CHICAGO	LAKE	ACTIVE
IN0000337	NATIONAL STEEL, MIDWEST DIV.	MAJOR	PORTAGE	PORTER	ACTIVE
IN0004553	SANDBORN WATER DEPARTMENT	MINOR		KNOX	INACTIVE
IN0020931	ROLLING PRAIRIE SERVICE AREA	MINOR	ROLLING PRAIRIE	LA PORTE	ACTIVE
IN0021521	US COAST GUARD-INDIANA HARBOR	MINOR		LAKE	INACTIVE
IN0021725	MIDWEST STEEL DIVISION NAT. ST	MINOR		PORTER	INACTIVE
IN0021784	AMERICAN CYANAMID CO	MINOR		LA PORTE	INACTIVE
IN0021946	TEXACO BULK PLT	MINOR		LAKE	INACTIVE
IN0022055	CHESTERTON TOWN OF	MINOR		PORTER	INACTIVE
IN0022578	CHESTERTON MUNICIPAL STP	MAJOR	PORTER	PORTER	ACTIVE
IN0022829	EAST CHICAGO_MUNICIPAL STP	MAJOR	EAST CHICAGO	LAKE	ACTIVE
IN0022977	GARY WASTEWATER TREATMENT PLT	MAJOR	GARY	LAKE	ACTIVE
IN0023060	HAMMOND MUNICIPAL STP	MAJOR	HAMMOND	LAKE	ACTIVE
IN0023086	HOBART MUNICIPAL STP	MINOR		LAKE	INACTIVE
IN0023752	MICHIGAN CITY SANITARY DIST.	MAJOR	MICHIGAN CITY	LA PORTE	ACTIVE
IN0024368	PORTAGE MUNICIPAL STP	MAJOR	PORTAGE	PORTER	ACTIVE
IN0024457	SCHERERVILLE MUNICIPAL STP	MAJOR	SCHERERVILLE	LAKE	ACTIVE
IN0024660	VALPARAISO MUNICIPAL STP	MAJOR	VALPARAISO	PORTER	ACTIVE
IN0025178	US AIR FORCE 1ST MISSLE NPR	MINOR		PORTER	INACTIVE
IN0025283	SOUTH COUNTY UTILITIES	MINOR	CROWN POINT	LAKE	ACTIVE
IN0025551	NORTHERN INDIANA PUBLIC SERVIC	MINOR		LA PORTE	INACTIVE
IN0025763	CROWN POINT MUNICIPAL STP	MAJOR	CROWN POINT	LAKE	ACTIVE
IN0025887	VALPARAISO DEPT WTR WKS-AIRPOR	MINOR	VALPARAISO	PORTER	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0025925	CHRIS CRAFT PRIUSTRIES	MINOR		PORTER	INACTIVE
IN0025941	CITIES SERVICES OIL CO	MINOR		LAKE	INACTIVE
IN0029793	LEHIGH PORTLAND CEMENT/GARY	MINOR	GARY	LAKE	INACTIVE
IN0029866	WILLIAMSBURG MANOR M.H.P.	MINOR		PORTER	INACTIVE
IN0029891	PURDUE UNIV.-N. CENTRAL CAMPUS	MINOR	WESTVILLE	LA PORTE	ACTIVE
IN0029971	LINCOLN UTILITIES INC.	MINOR		LAKE	INACTIVE
IN0029980	OAK TREE MOBILE HOME PARK	MINOR	PORTAGE	PORTER	INACTIVE
IN0029998	NEIGHBORHOOD UTILITIES	MINOR		PORTER	INACTIVE
IN0030252	IDNR INDIANA DUNES STATE PARK	MINOR		PORTER	INACTIVE
IN0030554	RIVER FOREST HIGH SCHOOL	MINOR	HOBART	LAKE	INACTIVE
IN0030651	SOUTH HAVEN SEWER WORKS, INC.	MAJOR	VALPARAISO	PORTER	ACTIVE
IN0030767	LIBERTY ELEM & MIDDLE SCHOOL	MINOR	CHESTERTON	PORTER	ACTIVE
IN0030821	HYLES-ANDERSON COLLEGE	MINOR		LAKE	INACTIVE
IN0030937	BRUMMIT ELEM. SCHOOL	MINOR	CHESTERTON	PORTER	INACTIVE
IN0031089	LINCOLN GARDEN SUBD.	MINOR	MERRILLVILLE	LAKE	INACTIVE
IN0031119	SHOREWOOD FOREST UTILITIES	MINOR	VALPARAISO	PORTER	ACTIVE
IN0031771	JOHN WOOD ELEMENTARY SCHOOL	MINOR	MERRILLVILLE	LAKE	ACTIVE
IN0031852	WILLIAMSBURG MANNOR MOBILE HOM	MINOR		PORTER	INACTIVE
IN0032069	AMERICAN TRAILER COURT	MINOR		PORTER	INACTIVE
IN0032221	BURNS HARBOR ESTATES	MINOR		PORTER	INACTIVE
IN0032239	SCHERERVILLE HGHTS UTL INC	MINOR		LAKE	INACTIVE
IN0032417	EAST GARY CITY OF	MINOR		LAKE	INACTIVE
IN0032425	U.S.S. LEAD REFINERY, INC.	MINOR	EAST CHICAGO	LAKE	INACTIVE
IN0032450	MICHIGAN CITY FILTRATION PLANT	MINOR	MICHIGAN CITY	LA PORTE	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0032549	BLAW-KNOX FOUNDRY & MILL	MINOR		LAKE	INACTIVE
IN0032557	CROWN POINT WTR TRMT PLT	MINOR	CROWN POINT	LAKE	INACTIVE
IN0032565	ANDERSON COMPANY, THE	MAJOR	MICHIGAN CITY	LA PORTE	INACTIVE
IN0032689	BERKO ELECTRIC MFG CORP-DIV OF	MINOR		LA PORTE	INACTIVE
IN0032701	CULLIGAN SOFT WATER SERVICE	MINOR		LAKE	INACTIVE
IN0032883	PLEASANT VALLEY MOBILE HOME PK	MINOR		PORTER	INACTIVE
IN0032999	PHILLIPS PIPE LINE COMPANY	MINOR	EAST CHICAGO	LAKE	INACTIVE
IN0035483	K A STEEL CHEMICALS INC-GARY P	MAJOR		LAKE	INACTIVE
IN0035491	MUNSTER TOWN OF	MINOR		LAKE	INACTIVE
IN0035548	MERRILLVILLE CONSERVANCY DIST.	MINOR	MERRILLVILLE	LAKE	INACTIVE
IN0035581	SANDS MOBILE HOME PARK	MINOR	VALPARAISO	PORTER	ACTIVE
IN0035661	UNION CARBIDE CORP-LINDE DIV-B	MINOR		PORTER	INACTIVE
IN0035793	SHADY OAKS MOBILE HOME PARK	MINOR	MICHIGAN CITY	LA PORTE	ACTIVE
IN0035939	ELMWOOD MOBILE HOME PARK - AME	MINOR		PORTER	INACTIVE
IN0036323	CAMELOT MOBILE HOME PARK INC	MINOR		PORTER	INACTIVE
IN0036510	WHITTINGTON UTILITIES INC	MINOR		LAKE	INACTIVE
IN0036765	NORTHWEST IND. WATER CORP:	MINOR	PORTER	PORTER	INACTIVE
IN0036803	LALUMIERE SCHOOL	MINOR	LAPORTE	LA PORTE	ACTIVE
IN0037010	BURNS HARBOR TOWN OF	MINOR		PORTER	INACTIVE
IN0037591	HIGHLAND SANITARY DIST	MINOR		LAKE	INACTIVE
IN0037630	CHESTERTON TOWN OF	MINOR		PORTER	INACTIVE
IN0037800	UNION CARBIDE CORP LINDE DIV	MINOR		LAKE	INACTIVE
IN0038687	MELODY LANE M.H.P.	MINOR	GARY	LAKE	INACTIVE
IN0038709	LIBERTY FARM MOBILE HOME PARK	MINOR	VALPARAISO	PORTER	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0039331	DYER MUNICIPAL STP	MAJOR	DYER	LAKE	ACTIVE
IN0039373	GRIFFITH MUNICIPAL STP	MINOR		LAKE	INACTIVE
IN0039535	PIONEER VILLAGE MHP	MINOR	LAPORTE	LA PORTE	ACTIVE
IN0039659	BURNS HARBOR ESTATES	MINOR	CHESTERTON	PORTER	ACTIVE
IN0039683	CHRISTIAN ASSEMBLY CHURCH	MINOR	HOBART	LAKE	INACTIVE
IN0040975	INDIAN SPRINGS SUBDIVISION	MINOR	LAPORTE	LA PORTE	ACTIVE
IN0041581	GREEN ACRES MOBILE HOME PARK	MINOR		LA PORTE	INACTIVE
IN0041891	NOB HILL SUBDIVISION	MINOR	HOBART	LAKE	ACTIVE
IN0042021	ELMWOOD MOBILE HOME PARK	MINOR	VALPARAISO	PORTER	ACTIVE
IN0042498	VALPARAISO WTR WRKS-FLINT LAKE	MINOR	VALPARAISO	PORTER	ACTIVE
IN0042943	LAKE REGION CHRISTIAN ASSEMBLY	MINOR	CROWN POINT	LAKE	ACTIVE
IN0043435	PRAXAIR, BURNS HARBOR FACILITY	MINOR	BURNS HARBOR,	PORTER	ACTIVE
IN0043613	CHRIS CRAFT INDUSTRIAL PRODUCT	MINOR	PORTAGE	PORTER	INACTIVE
IN0043907	COMMUNITY UTILITIES OF GARY	MINOR	MERRILLVILLE	LAKE	ACTIVE
IN0044148	LAKE GEORGE PLATEAU SUBD.	MINOR		LAKE	INACTIVE
IN0044580	BROOKVIEW TERRACE SUBDIVISION	MINOR	HOBART	LAKE	INACTIVE
IN0045136	HEINOLD OIL CO-SERVICE STATION	MINOR		PORTER	INACTIVE
IN0045560	CONTINENTAL CAN CO PLT.17	MAJOR		PORTER	INACTIVE
IN0045705	JOSAM MANUFACTURING	MINOR		LA PORTE	INACTIVE
IN0045985	AVERY DENNISON INTERNATIONAL	MINOR	SCHERERVILLE	LAKE	ACTIVE
IN0046736	MARATHON PIPE LINE, GRIFFITH	MINOR	GRIFFITH	LAKE	INACTIVE
IN0046949	PORTER POTW	MINOR	PORTER	PORTER	INACTIVE
IN0047333	BURNS INTERNATIONAL HARBOR	MINOR		PORTER	INACTIVE
IN0048062	DOME PIPELINE CORP. (GRIFFITH)	MINOR	GRIFFITH	LAKE	INACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0048402	WHEELER SANITARY LANDFILL	MINOR	WHEELER,	PORTER	INACTIVE
IN0048810	MARATHON OIL, HAMMOND TERMINAL	MINOR	HAMMOND,	LAKE	INACTIVE
IN0050041	DAPHNE PARK MOBILE HOME COURT	MINOR	MICHIGAN CITY	LA PORTE	ACTIVE
IN0050202	EXPLORER PIPELINE CO	MINOR		LAKE	INACTIVE
IN0050504	CHEM-METALS INC.	MINOR		PORTER	INACTIVE
IN0050563	AMG RESOURCES CORPORATION	MINOR	GARY	LAKE	ACTIVE
IN0050911	INDUSTRIAL DISPOSAL CORP.	MINOR		LAKE	INACTIVE
IN0052094	U.S. STEEL CORP.	MINOR		LAKE	INACTIVE
IN0052345	CONTINENTAL CAN CO	MINOR		PORTER	INACTIVE
IN0052639	SOUTH HAVEN WATER WORK INC	MINOR	VALPARAISO	PORTER	INACTIVE
IN0052825	CALUMET FLEXICORE CORPORATION	MINOR	HAMMOND	LAKE	ACTIVE
IN0053481	BURNS HARBOR MUNICIPAL STP	MINOR	BURNS HARBOR	PORTER	INACTIVE
IN0053589	TALL TIMBER SUBD.	MINOR		LA PORTE	INACTIVE
IN0053694	PRAXAIR, INC. WHITING	MINOR	WHITING	LAKE	INACTIVE
IN0054062	LODGING INNS OF AMERICA	MINOR	CROWN POINT	LAKE	INACTIVE
IN0054178	AGA GAS INC.	MINOR	HAMMOND	LAKE	ACTIVE
IN0054470	CHICAGOLAND CHRISTIAN VILLAGE	MINOR	CROWN POINT	LAKE	ACTIVE
IN0054712	NORCO PIPELINE, INC. HARTSDALE	MINOR	SCHERERVILLE	LAKE	INACTIVE
IN0054798	H-V ROLL CENTER, INC.	MINOR	GARY,	LAKE	ACTIVE
IN0054941	DYER CREAMERY CORPORATION	MINOR	DYER	LAKE	INACTIVE
IN0055611	MOBIL SERVICE STATION	MINOR	DYER	LAKE	INACTIVE
IN0056014	CLARK OIL & REFINING, HAMMOND	MINOR	HAMMOND	LAKE	INACTIVE
IN0056031	BUCKEYE PIPE LINE COMPANY LP	MINOR	EAST CHICAGO	LAKE	ACTIVE
IN0056341	MIDWEST PIPE COATINGS, INC.	MINOR	SCHERERVILLE,	LAKE	INACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0056367	NINTH AVENUE DUMP SUPERFUND SI	MINOR	GARY	LAKE	INACTIVE
IN0056481	MOBIL SERVICE STATION #05-HCC	MINOR	HAMMOND	LAKE	INACTIVE
IN0056715	MCGILL MANUFACTURING WAREHOUSE	MINOR	MALDEN	PORTER	INACTIVE
IN0056766	MARATHON SERVICE STATION #2318	MINOR	SCHERERVILLE	LAKE	INACTIVE
IN0056910	EXXONMOBIL OIL CORP, E CHICAGO	MINOR	EAST CHICAGO	LAKE	ACTIVE
IN0056944	MOBIL SERVICE STATION #99-571	MINOR	MICHIGAN CITY,	LA PORTE	INACTIVE
IN0056952	SPEEDWAY STORE #6090	MINOR	MICHIGAN CITY	LA PORTE	INACTIVE
IN0057380	UNITED GAS STATION #6089	MINOR	MERRILLVILLE	LAKE	INACTIVE
IN0057835	WEIL-MCLAIN	MINOR	MICHIGAN CITY	LA PORTE	INACTIVE
IN0058343	WINFIELD UTILITIES, INC.	MINOR	WINFIELD,	LAKE	ACTIVE
IN0058378	DEEP RIVER WATER PARK WWTP	MINOR	CROWN POINT	LAKE	ACTIVE
IN0058467	UNION TANK CAR COMPANY	MINOR	EAST CHICAGO,	LAKE	ACTIVE
IN0058475	NATURE WORKS CONSERVANCY DIST.	MINOR	VALPARAISO	PORTER	ACTIVE
IN0058785	U.S. GYPSUM CO., E. CHICAGO	MINOR	EAST CHICAGO,	LAKE	INACTIVE
IN0058921	HOWELL TRACTOR & EQUIPMENT CO.	MINOR	GARY	LAKE	ACTIVE
IN0059064	MALLARDS POINTE CONDOMINIUM	MINOR	VALPARAISO	PORTER	ACTIVE
IN0059226	FEDERAL-MOGUL CORPORATION	MINOR	MICHIGAN CITY	LA PORTE	ACTIVE
IN0059714	BETA STEEL CORP.	MINOR	PORTAGE	PORTER	ACTIVE
IN0060330	LAKE GEORGE CONTAINMENT SITE	MINOR	HOBART	LAKE	INACTIVE
IN0060771	WILLIAMS EXPRESS TRAVEL CENTER	MINOR	BURNS HARBOR	PORTER	ACTIVE
IN0060879	BRUMMITT ACRES ELEM. SCHOOL	MINOR	CHESTERTON	PORTER	INACTIVE
IN0109738	WHITE GARY SALES & SERVICE INC	MINOR		LAKE	INACTIVE
ING080022	TRISTATE COACH LINES, INC.	MINOR	GARY	LAKE	INACTIVE
ING080026	PAULSON OIL COMPANY	MINOR	MERRILLVILLE,	LAKE	INACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
ING080041	MARATHON ASHLAND UNIT #3183	MINOR	PORTAGE	PORTER	ACTIVE
ING080050	BUCKEYE PIPE LINE - GRIFFITH	MINOR	GRIFFITH	LAKE	ACTIVE
ING080051	SPEEDWAY STATION #6089	MINOR	MERRILLVILLE,	LAKE	ACTIVE
ING080058	IDOT TOLL ROAD AREA 1 SOUTH	MINOR	PORTAGE	PORTER	ACTIVE
ING080071	MARATHON SERVICE STATION #2318	MINOR	SCHERERVILLE,	LAKE	INACTIVE
ING080072	BLUE CHIP CASINO, INC.	MINOR	MICHIGAN CITY	LA PORTE	INACTIVE
ING080076	MARATHON PIPE LINE, GRIFFITH T	MINOR	GRIFFITH	LAKE	INACTIVE
ING080081	SPEEDWAY STATION #7553	MINOR	MERRILLVILLE	LAKE	ACTIVE
ING080089	MARATHON ASHLAND, GRIFFITH TER	MINOR	GRIFFITH	LAKE	ACTIVE
ING080115	SPEEDWAY STATION #7680	MINOR	MUNSTER	LAKE	INACTIVE
ING080131	TRANMONTAIGNE PIPELINE, DYER	MINOR	DYER	LAKE	ACTIVE
ING250008	CHRIS CRAFT INDUSTRIAL PRODUCT	MINOR	PORTAGE	PORTER	INACTIVE
ING250069	MONOSOL, LLC	MINOR	PORTAGE	PORTER	ACTIVE
ING340003	PHILLIPS PIPE LINE, E CHICAGO	MINOR	EAST CHICAGO	LAKE	ACTIVE
ING340006	SHELL OIL, EAST CHICAGO PLANT	MINOR	HAMMOND	LAKE	INACTIVE
ING340009	CITGO PETROLEUM CORP-E CHICAGO	MINOR	EAST CHICAGO,	LAKE	ACTIVE
ING340011	EQUILION ENTERPRISES, HAMMOND	MINOR	HAMMOND	LAKE	INACTIVE
ING340012	EXPLORER PIPELINE COMPANY	MINOR	HAMMOND	LAKE	ACTIVE
ING340014	TRANSMONTAIGNE, HARTSDALE STAT	MINOR	SCHERERVILLE,	LAKE	INACTIVE
ING340015	LAKETON REFINING, HARTSDALE TE	MINOR	SCHERERVILLE	LAKE	INACTIVE
ING340020	MARATHON OIL, HAMMOND TERM.	MINOR	HAMMOND,	LAKE	INACTIVE
ING340026	TEPPCO - GRIFFITH TERMINAL	MINOR	GRIFFITH	LAKE	ACTIVE
ING340032	EXXONMOBIL OIL CORP, HAMMOND	MINOR	HAMMOND	LAKE	ACTIVE
ING340034	LAKEHEAD PIPE LINE, HARTSDALE	MINOR	SCHERERVILLE	LAKE	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
ING340036	MARATHON ASHLAND, HAMMOND TERM	MINOR	HAMMOND	LAKE	ACTIVE
ING340038	LAKEHEAD PIPE LINE, GRIFFITH T	MINOR	GRIFFITH	LAKE	ACTIVE
ING340041	TRANSMONTAIGNE, EAST CHICAGO T	MINOR	EAST CHICAGO	LAKE	INACTIVE
ING340042	EQUILON ENTERPRISES, E. CHICAG	MINOR	HAMMOND	LAKE	ACTIVE
ING340043	GAS CITY, LTD.	MINOR	LOWELL	LAKE	ACTIVE
ING340044	EQUILON ENTERPRISES, HAMMOND T	MINOR	HAMMOND	LAKE	ACTIVE
ING340052	BUCKEYE TERMINALS, HARTSDALE S	MINOR	SCHERERVILLE	LAKE	ACTIVE
ING340053	BUCKEYE TERMINALS, E. CHICAGO	MINOR	EAST CHICAGO	LAKE	ACTIVE
ING670008	TRANSMONTAIGNE, HARTSDALE STA.	MINOR	SCHERERVILLE,	LAKE	INACTIVE
ING670013	ANR PIPELINE, MICHIGAN CITY	MINOR	MICHIGAN CITY	LA PORTE	INACTIVE
ING670017	VECTOR PIPELINE, L.P.	MINOR	LAKE COUNTY	LAKE	ACTIVE
ING670018	VECTOR PIPELINE, L.P.	MINOR	LAKE COUNTY	LAKE	ACTIVE
ING670021	VECTOR PIPELINE, L.P.	MINOR	LAKE COUNTY	LAKE	ACTIVE
ING670023	TRANSMONTAIGNE, HARTSDALE STAT	MINOR	SCHERERVILLE	LAKE	INACTIVE
ING670028	CUSHING-CHICAGO PIPELINE SYS.	MINOR	ST. JOHN	LAKE	ACTIVE
ING670030	BUCKEYE TERMINALS, HARTSDALE S	MINOR	SCHERERVILLE	LAKE	ACTIVE
INL022578	CHESTERTON MUNICIPAL STP	MINOR		PORTER	ACTIVE
INL022829	EAST CHICAGO_MUNICIPAL STP	MINOR		LAKE	ACTIVE
INL022977	GARY WASTEWATER TREATMENT PLT	MINOR		LAKE	ACTIVE
INL023060	HAMMOND MUNICIPAL STP	MINOR		LAKE	ACTIVE
INL023752	MICHIGAN CITY SANITARY DIST.	MINOR		LA PORTE	ACTIVE
INL024368	PORTAGE MUNICIPAL STP	MINOR		PORTER	ACTIVE
INL024457	SCHERERVILLE MUNICIPAL STP	MINOR		LAKE	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
INL024660	VALPARAISO MUNICIPAL STP	MINOR		PORTER	ACTIVE
INL025763	CROWN POINT MUNICIPAL STP	MINOR		LAKE	ACTIVE
INL030651	SOUTH HAVEN WATER WORKS, INC.	MINOR		PORTER	ACTIVE
INL030767	LIBERTY ELEM & MIDDLE SCHOOL	MINOR		PORTER	ACTIVE
INL030937	BRUMMIT ELEM. SCHOOL	MINOR		PORTER	ACTIVE
INL031178	GALENA ELEM&FLOYD CENTRAL HS.	MINOR		LA PORTE	ACTIVE
INL031771	JOHN WOOD ELEMENTARY SCHOOL	MINOR		LAKE	ACTIVE
INL035548	MERRILLVILLE CONSERVANCY DIST.	MINOR		LAKE	ACTIVE
INL039331	DYER MUNICIPAL STP	MINOR		LAKE	ACTIVE
INL046949	PORTER POTW	MINOR		PORTER	ACTIVE
INL052248	MORGAN TOWNSHIP SCHOOLS	MINOR		PORTER	ACTIVE
INL053481	BURNS HARBOR MUNICIPAL STP	MINOR		PORTER	ACTIVE
INL057703	WASHINGTON TOWNSHIP SCHOOL	MINOR		PORTER	ACTIVE
INM022578	CHESTERTON COMBINED SEWER SYST	MINOR	CHESTERTON	PORTER	ACTIVE
INP000027	INDIANA PICKLING & PROCESSING	MINOR	PORTAGE	PORTER	ACTIVE
INP000034	ELECTRO SEAL CORPORATION	MINOR	CHESTERTON	PORTER	INACTIVE
INP000059	CHROME DEPOSIT CORPORATION	MINOR	PORTAGE	PORTER	INACTIVE
INP000148	DIETRICH INDUSTRIES, WORTHINGT	MINOR	PORTER	PORTER	ACTIVE
INP000199	MIDWEST PIPE COATING, INC.	MINOR	SCHERERVILLE	LAKE	ACTIVE
INP000203	DEARCRAFT RECYCLING & DISPOSAL	MINOR	MICHIGAN CITY	LA PORTE	ACTIVE
INP000224	NEO INDUSTRIES, INC.	MINOR	PORTAGE	PORTER	ACTIVE
INS100006	LEHIGH PORTLAND DEMOLITION	MINOR	GARY	LAKE	ACTIVE
INS200001	INDIANA PICKLING & PROCESSING	MINOR	PORTAGE,	PORTER	ACTIVE
INS210001	MARBLEHEAD LIME CO, BUFFINGTON	MINOR	GARY	LAKE	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
INS230001	PRAXAIR, INC.	MINOR	WHITING	LAKE	ACTIVE
INU000083	ICF KAISER ENG, PCI SYSTEMS CO	MINOR	GARY	LAKE	INACTIVE
INU000156	AMOCO OIL CO. CALUMET AVE FAC	MINOR		LAKE	ACTIVE
INU000209	BI-COUNTY DEVEL., PARKWOOD EST	MINOR		PORTER	ACTIVE
INU000225	STA DECANTING & ENVIRONMENTAL	MINOR		LAKE	ACTIVE
INU000279	MUNSTER, TOWN OF/OAKWOOD AVE S	MINOR		LAKE	ACTIVE
INU000327	VIR-MA INDUSTRIES	MINOR		LAKE	ACTIVE
INU000357	LIVERPOOL SEPTIC & SEWER	MINOR		PORTER	ACTIVE
INU031089	INDEPENDENCE HILL C.D.	MINOR	MERRILLVILLE	LAKE	ACTIVE
INU035548	MERRILLVILLE C.D. WWTP	MINOR	MERRILLVILLE	LAKE	ACTIVE
INU046949	PORTER WWTP, TOWN OF	MINOR	PORTER	PORTER	ACTIVE
INU058998	TOLL ROAD PLAZA 1 NORTH	MINOR	P0RTAGE,	PORTER	ACTIVE
INU059978	SPEEDWAY STATION #7524	MINOR	VALPARAISO	PORTER	ACTIVE
INU060801	BURNS HARBOR & BETHLEHEM STEEL	MINOR	BURNS HARBOR	PORTER	ACTIVE
INW000221	COMMONWEALTH EDISON-EDI TEST	MINOR		LAKE	ACTIVE

(from IDEM 2001)

TABLE 4.1: RESULTS OF SEASONAL KENDALL ANALYSIS FOR STATIONS LOCATED IN THE LITTLE CALUMET-GALIEN WATERSHED 1986 TO 1995

Parameter	BOD	COD	D.O.	E. coli	Ammonia	Nitrate + Nitrite	Total Phosphorus	Total Residue	Total Residue, Filterable	Total Residue, Nonfilterable
BD-1	↓	↘	↑	↔	↓	↔	↘	↔	↔	↔
BD-2E	↓	↘	↑	↔	↔	↔	↘	↔	↔	?
BD-3W	↔	↓	↑	↘	↓	↔	↓	↔	?	↔
GCR-34	↓	↓	↑	↘	↓	↑	↓	↑	?	↔
GCR-37	↓	↓	↑	↓	↓	↔	↓	↔	↔	↔
GCR-42	↘	↓	↖	↓	↓	↔	↓	↘	?	↘
IHC-0	↔	↔	↑	↔	↔	↑	↔	↑	↑	↔
IHC-2	↔	↔	↑	↘	↓	↑	↔	↑	↑	↔
IHC-3S	↓	↓	↑	↓	↓	↔	↓	↖	?	↔
IHC-3W	↓	↓	↑	↓	↓	↑	↔	↑	?	↔
LCR-13	↓	↓	↑	↓	↓	↖	↘	↔	?	↔
LCR-39	↓	?	↑	↔	↔	↑	↓	↔	?	↘
LM-EC	↔	↓	?	↔	↔	↔	↔	↔	↔	↔
LM-G	↔	↘	?	↔	↔	↔	↔	↔	↔	↔
LM-H	↓	↓	↑	↓	↔	↔	↔	↘	↖	↔
LM-M	↔	↘	?	↔	↔	↔	↔	↔	↔	↔
LM-W	↔	↓	?	↔	↔	↔	↔	↔	↔	↔
SLC-1	↓	↘	↑	↔	↔	↔	↓	↘	↔	↘

Parameter	BOD	COD	D.O.	E. coli	Ammonia	Nitrate + Nitrite	Total Phosphorus	Total Residue	Total Residue, Filterable	Total Residue, Nonfilterable
SLC-17	↔	↔	↑	↔	↔	↔	↔	↔	?	↔
TC-0.5	?	↔	↑	?	↓	↑	↓	↑	?	↔
TC-1	↓	↔	↑	↘	↓	↑	↓	↔	?	↘
TC-2	↔	↔	↖	↔	↔	↔	↓	↘	?	↔
WL-SL	↘	↔	↖	↔	↔	↔	↔	↔	?	↓

Notes

BOD = Biological Oxygen Demand
COD = Chemical Oxygen Demand
D.O. = Dissolved Oxygen

↔ = No Statistical Change; significance < 80% or reported slope = 0.00000

↓ = Statistically Decreasing; significance >95% with a negative slope

↘ = Potentially Decreasing; significance >80% with a negative slope

↖ = Potentially Increasing; significance >80% with a positive slope

↑ = Statistically Increasing; significance >95 % with a positive slope

? = Insufficient Data for analysis

The fixed station monitoring site codes used above refer to the following locations:

BD-1 = Burns Ditch, U.S. Hwy 12 Bridge, Portage
BD-2E = Burns Ditch, State Hwy 249 Bridge, Portage
BD-3W = Burns Ditch, Portage Boat Yard Dock, Portage
GCR-34 = Grand Calumet River, Hohman Avenue Bridge, Hammond
GCR-37 = Grand Calumet River, Bridge on Kennedy Avenue, East Chicago
GCR-42 = Grand Calumet River, Bridge Street Bridge, Gary
IHC-0 = Indiana Harbor Canal, At Mouth at LTV Steel, East Chicago
IHC-2 = Indiana Harbor Canal, Bridge on Dickey Road, East Chicago
IHC-3S = Indiana Harbor Canal, Bridge on Columbus Drive, East Chicago
IHC-3W = Indiana Harbor Canal, Bridge on Indianapolis Blvd, East Chicago
LCR-13 = Little Calumet River, Hohman Avenue Bridge, Hammond
LCR-39 = Little Calumet River, S.R. 149, Porter
LM-EC = Lake Michigan, Raw Water of the East Chicago Waterworks, East Chicago
LM-G = Lake Michigan, Raw Water of the Gary Waterworks, Gary
LM-H = Lake Michigan, Raw Water of the Hammond Waterworks, Hammond
LM-M = Lake Michigan, Raw Water of the Michigan City Waterworks, Michigan City
LM-W = Lake Michigan, Raw Water of the Whiting Waterworks, Whiting
SLC-1 = Salt Creek, U.S. 20 Bridge, Portage
SLC-17 = Salt Creek, S.R. 130 Bridge, Valparaiso
TC-0.5 = Trail Creek, Franklin Street Bridge, Michigan City
TC-1 = Trail Creek, U.S. Hwy 12 Bridge, Michigan City
TC-2 = Trail Creek, Krueger Park Bridge, Michigan City
WL-SL = Wolf Lake, Culvert at Stateline at End of 129th St, Hammond

TABLE 4-2: ISDH DEFINITIONS FOR FISH CONSUMPTION ADVISORY GROUPS

Group 1	Unrestricted consumption
Group 2	One meal per week (52 meals per year) for adult males and females. One meal per month for women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15.
Group 3	One meal per month (12 meals per year) for adult males and females. Women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15 do not eat.
Group 4	One meal every two months (six meals per year) for adult males and females. Women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15 do not eat.
Group 5	No consumption (DO NOT EAT)

Carp generally are contaminated with both PCBs and mercury. Except as otherwise noted, carp in all Indiana rivers and streams fall under the following risk groups:

Carp, 15-20 inches - Group 3

Carp, 20-25 inches - Group 4

Carp over 25 inches - Group 5

(from ISDH, IDNR, and IDEM 2001)

TABLE 4-3: 2001 INDIANA FISH CONSUMPTION ADVISORY

Location	Species	Fish Size (inches)	Contaminant	Group
Grand Calumet River/Indiana Harbor Canal				
Lake County	**ALL**	**ALL**	■❍	**5**
Trail Creek				
LaPorte County	**Carp**	**23-25**	■	**5**
Lake George				
Lake County	Northern Pike	18+	■	2
Marquette Park Lagoon				
Lake County	Bluegill	4-7 7+	■ ■	3 4
	Largemouth Bass	12+	■	3
Wolf Lake				
Lake County	Largemouth Bass	13-17 17+	■ ■	3 4
	White Bass	13-15 15+	■ ■	3 4
ALL Other Tributaries to Lake Michigan				
Lake County, LaPorte County, & Porter County	Black Crappie	7-8 8+	■ ■	3 4
	Bloater	10+	■	3
	Bluegill	7-8 8+	❍ ❍	2 3
	Brook Trout	ALL	■	3

	Brown Trout	Up to 18 18-27 **27+**	■ ■ ■	3 4 **5**
	Carp	**ALL**	■❍	**5**
	Channel Catfish	**ALL**	■	**5**
	Chinook Salmon	Up to 26 26-30 **30+**	■ ■ ■	3 4 **5**
	Coho Salmon	17-28 28+	■ ■	3 4
	Freshwater Drum	14-17 17-20 **20+**	■ ■ ■	3 4 **5**
	Lake Trout	Up to 21 21-26 **26+**	■ ■ ■	3 4 **5**
	Lake Whitefish	9-12 12-20 20-24 **24+**	■❍ ■❍ ■❍ ■❍	2 3 4 **5**
	Largemouth Bass	4-7 7+	■ ■	3 4
	Longnose Sucker	14-23 **23+**	■❍ ■	4 **5**
	Northern Pike	10-14 14+	■ ■	3 4
	Pink Salmon	ALL	■	3
	Quillback	20+	■	3
	Rainbow Trout	Up to 22 22-32 **32+**	■ ■ ■	3 4 **5**
	Rock Bass	8-9	■❍	2

	Round Goby	3-4 4+	■❍ ■❍	2 3
	Silver Redhorse	**25+**	■	**5**
	Smallmouth Bass	11-12 **12+**	■ ■	3 **5**
	Walleye	17-26 26+	■ ■	3 4
	White Sucker	15-23 23+	■❍ ■	3 4
	Yellow Perch	7-10	■	2

*❍ = Mercury, ■ = PCBs
(from ISDH, IDNR, and IDEM 2001)

TABLE 4-4: CRITERIA FOR USE SUPPORT ASSESSMENT (U.S. EPA 305(B) GUIDELINES)

Parameter	Fully Supporting	Partially Supporting	Not Supporting
Aquatic Life Use Support			
Toxicants	Metals were evaluated on a site by site basis and judged according to magnitude of exceedance and the number of times exceedances occurred.		
Conventional inorganics	There were very few water quality violations, almost all of which were due to natural conditions.		
Benthic aquatic macroinvertebrate Index of Biotic Integrity (mIBI)	mIBI $\geq$ 4.	mIBI < 4 and $\geq$ 2.	mIBI < 2.
Qualitative habitat use evaluation (QHEI)	QHEI $\geq$ 64.	QHEI < 64 and $\geq$ 51.	QHEI < 51.
Fish community (fIBI) **(Lower White River only)**	IBI $\geq$ 44.	IBI < 44 and $\geq$ 22	IBI < 22.
Sediment **(PAHs = polynuclear aromatic hydrocarbons. AVS/SEM = acid volatile sulfide/ simultaneously extracted metals.)**	All PAHs $\leq$ 75th percentile. All AVS/SEMs $\leq$ 75th percentile. All other parameters $\leq$ 95th percentile.	PAHs or AVS/SEMs > 75th percentile. (Includes Grand Calumet River and Indiana Harbor Canal sediment results, and so is a conservative number.)	Parameters > 95thpercentile as derived from IDEM Sediment Contaminants Database.
Indiana Trophic State Index (lakes only)	Nutrients, dissolved oxygen, turbidity, algal growth, and sometimes pH were evaluated on a lake-by-lake basis. Each parameter judged according to magnitude.		
Fish Consumption			
Fish tissue	No specific Advisory*	Limited Group 2 - 4 Advisory*	Group 5 Advisory*
* Indiana Fish Consumption Advisory, 1997, includes a statewide advisory for carp consumption. This was not included in individual waterbody reports because it obscures the magnitude of impairment caused by other parameters.			
Recreational Use Support (Swimmable)			
Bacteria (cfu = colony forming units.)	No more than one grab sample slightly > 235 cfu/100ml, and geometric mean not exceeded.	No samples in this classification.	One or more grab sample exceeded 235 cfu/100ml, and geometric mean exceeded.

(from Indiana Water Quality Report for 1998 (IDEM 1998))

TABLE 5-1: TYPES OF PERMITS ISSUED UNDER THE NPDES PROGRAM

Type of Permit	Subtype	Comment
Municipal, Semi-Public or State (sanitary discharger)	Major	A facility owned by a municipality with a design flow Municipal of 1 MGD or greater (Cities, Towns, Regional Sewer Districts)
	Minor	Any municipally owned facility with a design flow of less than 1 MGD (Cities, Towns, Regional Sewer Districts)
	Semi-public	Any facility not municipally, State or Federally owned (i.e. mobile home parks, schools, restaurants, etc.)
	State Owned	A facility owned or managed by a State agency (State parks, prisons, etc.)
	Federally Owned	A facility owned by a federal agency (military owned installation, national park, federal penitentiary, etc.)
Industrial (Wastewater generated in the process of producing a product)	Major	Any point source discharger designated annually by agreement between the commissioner and EPA. Classification of discharger as major involves consideration of factors relating to significance of impact on the environment, such as: nature and quantity of pollutants discharged; character and assimilative capacity of receiving waters; presence of toxic pollutants in discharge; compliance history of discharger.
	Minor	All dischargers which are not designated as major dischargers.
	General	General permit rule provides streamlined NPDES permitting process for certain categories of industrial point source discharges under requirements of the applicable general permit rule, rather than requirements of an individual permit specific to a single discharge. General permit rules: 327 IAC 15-7 Coal mining, coal processing, and reclamation activities; 327 IAC 15-8 Non-contact cooling water; 327 IAC 15-9 Petroleum product terminals; 327 IAC 15-10 Groundwater petroleum remediation systems; 327 IAC 15-11 Hydrostatic testing of commercial pipelines; 327 IAC 15-12 Sand, gravel, dimension stone or crushed stone operations.
	Cooling Water	Water which is used to remove heat from a product or process; the water may or may not come in contact with the product.
	Public Water Supply	Wastewater generated from the process of removing pollutants from ground or surface water for the purpose of producing drinking water.
Pretreatment Urban Wet Weather Group (Associated with NPDES but do not fall under same rule.)	Stormwater-related	Wastewater resulting from precipitation coming in contact with a substance which is dissolved or suspended in the water.
	Industrial Wastewater Pre-treatment	Processed wastewater generated by industries that contribute to the overall wastewater received by the wastewater treatment plant.
	Combined Sewer Overflow (CSO)	Wastewater discharged from combined storm and sanitary sewers due to precipitation events. Municipal and Industrial Urban Wet Weather Programs

Part II, FOREWORD

The Little Calumet-Galien Watershed Restoration Action Strategy (WRAS) is intended to be a living document designed to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

The first draft of the Little Calumet-Galien WRAS was released for public review during the spring of 2002. A 60-day public comment period followed the public meetings at which this WRAS document was introduced. This final version of the WRAS includes public comments received during the 60-day comment period. For comments to be included in the final version, they were required to be written and submitted to WHPA, Inc. (the firm contracted to produce this WRAS) during the comment period.

Wittman Hydro Planning Associates, Inc.
320 West Eighth Street
Showers Plaza, Suite 201
Bloomington, IN 47404

(812) 333-9399

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Part II, Chapter 1: Concerns and Recommendations

Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Little Calumet-Galien Watershed and lists recommended management strategies to address these concerns.

Part II includes:

Section 1 - Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

Section 2 - Water Quality Concerns and Priority Issues Identified by State and Federal Agencies

Section 3 - Identification of Impaired Waters

Section 4 - Priority Issues and Recommended Management Strategies

Section 5 - Future Actions and Expectations

1. Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

The Little Calumet-Galien watershed contains potential stakeholder groups that have different missions (contact information is included in Appendix C). Many of these groups have a long history of working in the Little Calumet-Galien watershed. The following discussion briefly describes some of the watershed groups.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS), under the U.S. Department of Agriculture (USDA), provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. The NRCS offers landowners financial, technical, and educational assistance to implement conservation practices on privately owned land. Using this help, farmers, ranchers, and forest landowners apply practices that reduce soil erosion, improve water quality, and enhance crop land, forest land, wetlands, grazing lands, and wildlife habitat. Incentives offered by USDA promote sustainable agricultural and forestry practices, which protect and conserve valuable farm and forest land for future generations. USDA assistance also helps individuals and communities restore natural resources after floods, fires, or other natural disasters.

Soil and Water Conservation Districts

Local Soil and Water Conservation Districts (SWCD) assist land users and residents in the protection and improvement of the local environment. SWCDs can provide technical and financial assistance to local watershed conservation groups.

Grand Calumet Task Force

The Grand Calumet Task Force is a community environmental organization which works to improve the land, air and water quality of the Grand Calumet River and the urban ecosystem that surrounds it and to achieve environmental justice for the people of Northwest Indiana.

Goals:

To restore the Grand Calumet River Basin, including the adjacent wetlands and near shore Lake Michigan;

To alert the community about the impact of pollution on human health and the environment;

To promote public involvement and decision-making in all aspects of environmental protection and restoration;

To promote environmentally sound jobs and diverse economic development in sustainable communities;

To be a catalyst for the people, their organizations, businesses and governments to come together to eliminate the effects of over 100 years of industrial pollution;

To disclose and fight environmental discrimination actions and policies by industry or government that place unfair burdens on people of color and the poor;

To support and/or participate in regional development initiatives that preserve and enhance the ecosystem;

To be a resource for residents of at-risk communities who assert their environmental rights.

Hoosier River Watch

Hoosier Riverwatch is a state-sponsored water quality monitoring initiative. The program was started in 1994 to increase public awareness of water quality issues and concerns by training volunteers to monitor stream water quality. Hoosier Riverwatch collaborates with agencies and volunteers to:

- Increase public involvement in water quality issues through hands-on training of volunteers in stream monitoring and cleanup activities.
- Educate local communities about the relationship between land use and water quality.
- Provide water quality information to citizens and governmental agencies working to protect Indiana's rivers and streams.

Lake Michigan Coastal Program

Indiana is developing the Lake Michigan Coastal Program (LMCP) to participate in a national initiative, Coastal Zone Management Program, with 33 other coastal states to protect, restore, and responsibly develop Indiana's coastal area. The purpose of the LMCP is to support coordination and partnerships among local, state, and federal agencies and local organizations for the protection and sustainable use of natural and cultural resources in the Lake Michigan region. The LMCP is based on Indiana's existing laws. It does not create any new laws. Development of the LMCP will make more than $900,000 (based on the proposed 2001 Congressional budget) available annually to implement the LMCP and for grants to communities in northwest Indiana. Examples of how these funds might be used include:

Protection and restoration of significant natural and cultural resources.

Programs to prevent the loss of life and property in coastal hazard areas.

Improved public access for recreational purposes.

Revitalized urban waterfronts and ports.

Improved coordination among government agencies in policy and decision-making processes.

Pollution prevention initiatives, including non-point source pollution into coastal waters.

Little Calumet River Project

The Little Calumet River Watershed is an area draining into Lake Michigan from Will and Cook Counties in Illinois; Lake, Porter and LaPorte Counties Indiana; and Berrien County in Michigan. The watershed project area includes land in the Hydrologic Units 712003 and 04040001 as determined by the U.S. Geological Survey, Department of Interior. The Porter and Lake Soil and Water Conservation Districts in Indiana and the Will-South Cook County Soil and Water Conservation District in Illinois have signed a mutual agreement to proceed with the development of the Little Calumet River Project.

The Little Calumet River Planning initiative resulted from the concerns of local landowners/occupiers living in the area. Watershed planning is recognized as one method to give local stakeholders the opportunity to identify their desired future conditions while enlisting the assistance and support of agencies and organizations involved in administering technical or financial support to natural resources issues.

The Illinois Little Calumet Watershed Plan, dated November 1978, identified several issues, however, the upper area involving Lake County, Indiana was not included. The importance of an updated comprehensive watershed plan involving both Illinois and Indiana is recognized as a valuable document that will reflect the goals of the stakeholders in the Little Calumet Watershed. The Porter and Lake Soil and Water Conservation Districts of Indiana and the Will-South Cook County Soil and Water Conservation District of Illinois are taking the lead to assist in this effort.

The watershed plan will identify the needs, while the agencies and organizations involved in the watershed activities will be asked for their support for solutions to the needs that the area faces. This will enable the local citizens to reside in this geographical area and enjoy the quality of life they have come to expect.

NIRPC

The Northwestern Indiana Regional Planning Commission (NIRPC) is developing a watershed management plan for the Little-Calumet-Galien and Kankakee basins that are located in Lake, Porter and LaPorte Counties. A Watershed Management Advisory Group has been formed with stakeholders from the three counties. The plan will be completed by the summer of 2005 addressing issues such as water quality enhancement, restoration and protection, land use planning, farm preservation, government regulation, coordination and enhancement, wetland preservation, and public education.

Northwest Territory RC&D

The Northwest Territory Resource Conservation and Development program helps people protect and develop their economic, natural and social resources in ways that improve their area's economy, environment, and quality of life. The NWT RC&D Council provides a way for people to plan and implement projects in Lake, Porter, and St. Joseph counties that will make our communities a better place to live.

Save the Dunes

The Save the Dunes Council of northwest Indiana was founded in 1952, one of the oldest grassroots conservation organizations in the country. Its objectives are to maintain and restore the integrity and quality of the natural environment of the Indiana Dunes region. The hard work of Save the Dunes Council members led to the establishment of the Indiana Dunes National Lakeshore in 1966; the group continues to work on a wide variety of issues concerning the Dunes and the environmental quality of the area. The efforts of the Save the Dunes Council are supported entirely by membership dues, donations and volunteer time.

The Save the Dunes Conservation Fund was established in 1994 to restore and protect the environment of the Indiana Dunes. Among its activities the Conservation Fund has restored a foredune on Gary's Lake Michigan shoreline, has assisted the Minority Health Coalition of LaPorte County on projects in the area of a Superfund site, and has worked with teachers, individuals, and agencies to monitor the health of local streams and waterways.

Shirley Heinze Environmental Fund

The Shirley Heinze Environmental Fund, a non-profit organization, was endowed in 1981 as a charitable trust to preserve and

protect the unique ecosytems of the Indiana Dunes region. The Heinze Fund's goals are threefold: (1) to protect endangered habitats through the acquisition and restoration of environmentally significant properties; (2) to promote environmental awareness through community outreach programs and publications; and (3) to advance the goals of clean air and water for Northwest Indiana.

LaPorte County Parks & Rec

The LaPorte County Parks Department manages several parks in the county that include a variety of ecosystems: upland forest, wetland, prairie, and stocked ponds. The Red Mill Property includes a 100-acre nature preserve and the headwaters to the Little Calumet River. The dam, circa 1830, was originally built to support a grist sawmill, but now provides open water and wetland habitat for a variety of wildlife. The Parks Department is currently applying for a grant from the Indiana DNR Division of Water-Lake Michigan Coastal Program for maintenance and dredging work upstream of the dam. This will promote both recreational activities and wetland preservation in the Little Calumet Headwaters State Dedicated Nature Preserve associated with the park.

Laporte County Conservation Trust Inc.

The LaPorte County Conservation Trust is an all volunteer, non-profit 501 (c) (3) organization committed to maintaining and improving water quality in LaPorte County. As a land trust, they are dedicated to protecting natural lands by purchasing and accepting donations of land or conservation easements. They currently own a 23 acre state nature preserve known as Wintergreen Woods, a wet woodland that contains a drainage into the Trail Creek Watershed. They also perform educational functions concerning land conservation and bio-diversity.

Part II, Chapter 2: Water Quality Concerns and Priority Issues Identified by State and Federal Agencies

This section presents the combined efforts of state and federal agencies, and universities (such as IDEM, IDNR, USDA-Natural Resources Conservation Service, Ohio River Valley Water Sanitation Commission, Purdue University, Indiana University, Indiana Geologic Survey, and US Geological Survey) to assess water quality concerns and priority issues in the Little Calumet-Galien Watershed. This multi-organization effort formed the basis of the Unified Watershed Assessment for Indiana. At this time, the Unified Watershed Assessment has been completed for 1998 and updated for 2000-2001.

Indiana's Unified Watershed Assessment (UWA)

The UWA workgroup gathered a wide range of water quality data that could be used to characterize Indiana's water resources. These data were used in 'layers' in order to sort the 8-digit HUC watersheds according to the present condition of the water in lakes, rivers, and streams. The workgroup used only those data which concerned the water column, organisms living in the water, or the suitability of the water for supporting aquatic ecosystems. Each 'layer' of information/data was partitioned by percentiles into scores. The scores ranged between one and five, with a score of one indicative of good water quality or minimum impairment, and a score of five indicating heavily impacted or degraded water quality.

The data layers used in the 1998 and the 2000-2001 update include:

- Lake Fishery: Large-mouth bass community information for lakes
- Stream Fishery: Small-mouth bass community information for streams
- Aquatic Life Use Support: The "livability" of the water column for aquatic life, determined from evaluation of chemical and physical water data, and assessment of aquatic life
- Fish Consumption Advisories: Site specific advisories based on current data
- Fish Index of Biotic Integrity: Based on fish community diversity and fish health
- Qualitative Habitat Evaluation Index: Measure of whether the aquatic habitat is suitable for diverse communities, based on visual observations
- Lake Trophic Scores: Indicator for the rate at which a lake is 'aging' due to inputs of nutrients and other factors
- Sediment Potential: Indicator of potential sediment input to waterbodies in the watershed

The sources and additional information for these data layers include:

- Lake Fishery: From IDNR fisheries surveys of lakes and reservoirs from 1972 to 1994. Raw scores were averaged for all lakes in the watershed
- Stream Fishery: From IDNR fisheries surveys of streams from 1970 to 1994. Raw scores were averaged for all streams in the watershed

- Aquatic Life Use Support: IDEM, Office of Water Quality, Assessment Branch
- Fish Consumption Advisories: ISDH and IDEM, Office of Water Quality, Assessment Branch
- Fish Index of Biotic Integrity: IDEM, Office of Water Quality, Assessment Branch
- Qualitative Habitat Evaluation Index: IDEM, Office of Water Quality, Assessment Branch
- Lake Trophic Scores: Indiana Clean Lakes Program through IDEM, Office of Water Quality, Assessment Branch. This score was based on information gathered from sampling conducted in the 1970's and 1980's

During summer 1999 the UWA workgroup used additional layers of information to identify the resource concerns and stressors for each of the 361 11-digit watersheds in Indiana. Examination of the human activities that have the potential to impact the ecosystem will help planners to focus on those areas where restoration may be most critical. Organizations can identify opportunities to use their programs and resources to address those areas.

This focusing process will illuminate areas where the interests of two or more partner agencies may converge. It is intended that this will lead to more effective allocation of resources for restoration and protection activities. At the local level, this information can assist groups to prioritize watershed activities and provide some discussion points for planning.

This amended assessment has the following benefits:

- Provides a logical process for targeting funds, which may be expanded or updated without changing the basic framework.
- Provides information at a finer resolution (11-digit hydrologic units) to agencies and local groups interested in watershed assessment.
- Identifies data gaps.
- Can be used as a compliment to other assessments, such as the 305(b) Report and 303(d) List.

Table 2-1 and Figure 2-1 show the results of the 2000-2001 UWA for the Little Calumet-Galien watershed (NRCS & IDEM 2000).

Part II, Chapter 3: Identification of Impaired Waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology-based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Indiana's 303(d) list was approved by EPA on February 16, 1999.

Once the Section 303(d) list and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. The TMDL is an allocation that determines the point and nonpoint source (plus margin of safety) load reductions required in order for the waterbody to meet water quality standards. IDEM's Office of Water Quality has and continues to perform point source waste load allocations for receiving waters. Part I of the WRAS briefly outlines IDEM's strategy for developing TMDLs.

Table 0-1 shows the Little Calumet-Galien Watershed waterbodies that are on Indiana's 1998 Clean Water Act Section 303(d) list submitted and approved by EPA (IDEM 1998, Figure 3-1). The 2002 draft 303(d) list has been completed and the final list will be released in October 2002. The draft 2002 list is not included in this document, but is available from IDEM's Office of Water Quality (http://www.state.in.us/idem/water/planbr/wqs/303d.html)

Part II, Chapter 4: Priority Issues and Recommended Management Strategies

Part I provided the existing water quality information for the Little Calumet-Galien Watershed and Part II lists priority issues and concerns from local, state, and federal stakeholders in the watershed. This section pulls together the priority issues and concerns held by all stakeholders and recommends management strategies. Underlying all discussions of priority issues and concerns is the fact that improving water quality in the Little Calumet-Galien Watershed will also enhance the natural and recreational values of the Little Calumet River . Each subsection below focuses on a single priority issue.

4.1 Data/Information and Targeting

The success in restoring water quality in the Little Calumet-Galien Watershed is fundamentally based on identifying the specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source.

Recommended Management Strategy 1: Numerous data collection efforts are ongoing in the Little Calumet-Galien Watershed. This information should be used in prioritizing and targeting specific problems and geographic areas in the watershed. The scale at which targeting and prioritization should occur is the 14-digit HUC watershed area (Figure 2-2 of Part I). Targeting and prioritization will require input from stakeholders living in those geographic areas. The purpose of prioritization and targeting is to enhance allocation of resources in the effort of improving water quality.

Recommended Management Strategy 2: Through the development of Total Maximum Daily Loads (TMDLs) for impaired waterbodies in the Little Calumet-Galien Watershed, all sources contributing to the impairment of a waterbody will be identified and quantified in terms of their contribution to the waterbody. This includes gathering more data and information on nonpoint sources of water pollution. Throughout the TMDL process, information and feedback from watershed stakeholders will be required in order to generate appropriate allocation scenarios. The result of developing TMDLs will be an understanding of the impact of nonpoint sources on water quality in the watershed.

4.2 Streambank Erosion and Stabilization

The cutting and erosion of streambanks within the Little Calumet-Galien Watershed is a major concern. This cutting and erosion increases the sediment load in waterbodies and directly impacts the scenic and recreational values of waterbodies in the Little Calumet-Galien Watershed. Streambank cutting and erosion is often a function of many factors that include stream energy and velocity, flooding, and land management. Increased drainage in headwater streams and ditches increases stream energy during rainfall events and often leads to increased streambank cutting and erosion downstream. Land clearing and urban development also impact volume and velocity of runoff. Hence, this problem is not easily solved.

Recommended Management Strategy 1: Structural stabilization of specific streambank areas in the Little Calumet-Galien watershed may solve problems on a temporary basis. However, a comprehensive understanding of drainage, stream flows and energies, and land management practices is required to adequately approach this problem. Conservation partners (local, state, and federal) are actively working within their specific geographic areas (typically at the county level); however, this may not facilitate solving the streambank cutting and erosion problems because efforts may not be coordinated between headwater and downstream areas. For example, drainage should take into account the work and efforts of downstream partners to reduce flooding and streambank cutting. Conservation efforts should be in the context of watersheds and span county boundaries in order to account for downstream impacts. Local Drainage Boards, Planning and Zoning Boards, and County Commissioners could effectively address this issue by involving local stakeholders in the decision making process and approaching the issue on a watershed basis.

4.3 Failing Septic Systems and Straight Pipe Discharges

Local county health departments and other stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as significant sources of water pollution in the Little Calumet-Galien watershed. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (327 IAC 5-1-1.5); however, these practices still exist in the Little Calumet-Galien watershed.

Recommended Management Strategy 1: The direct impact of communities discharging their septic tank effluent to waterbodies needs to be adequately characterized. This will involve coordination between the Office of Water Quality, local health departments, Indiana State Department of Health, and other stakeholders. The choice to eliminate the illegal discharges will be a cooperative effort between homeowners and local, state, and federal stakeholders.

Recommended Management Strategy 2: Local planning, zoning, and health ordinances could be adopted or strengthened to address this problem during new development. Existing local ordinances could be enforced more vigorously to correct problems with existing systems. Both of these strategies will require input from local stakeholders.

Recommended Management Strategy 3: An education/outreach program on the health and environmental risks of septic system discharges, system maintenance, and system function would provide homeowners and others with basic information to better understand the impacts of inadequate systems. This kind of education effort would involve local health departments, Indiana State Department of Health, IDEM, and other stakeholders. For example, the Arrowhead Country RC&D in northwest Indiana is working on a project to demonstrate proper septic system installation.

4.4 Water Quality - General

The Clean Water Act Section 303(d) list presented in Chapter 3 lists impaired waterbodies for the Little Calumet-Galien watershed.

Recommended Management Strategy: The Clean Water Act requires states to complete TMDLs for waterbodies listed on the Section 303(d) list. The Office of Water Quality is currently evaluating and exploring the modeling process and data needs required to complete TMDLs for the Section 303(d) listed waterbodies. Completion of a TMDL will involve loading allocations of a pollutant to both point and nonpoint sources. The development of TMDLs will involve meetings with stakeholder groups linked to the Section 303(d) waterbodies. As TMDLs are developed, this Watershed Restoration Action Strategy will be amended to incorporate the final TMDLs.

4.5 Fish Consumption Advisories

As noted in Part I and Part II, fish consumption advisories are concerns within the Little Calumet-Galien watershed.

Recommended Management Strategy 1: In many cases, the source of the contamination is unknown and may be from atmospheric deposition or some unknown discharge. To address this concern, the cause or source must be identified. Until that is accomplished, the fish consumption advisories should be followed.

4.6 Nonpoint Source Pollution - General

Nonpoint source pollution contributions are often difficult to assess or quantify. They can include sediment deposition from soil erosion, nutrient runoff from animal wastes and commercial fertilizer, herbicide and insecticide runoff, and oil or fuel waste runoff. Degraded wetlands may also contribute to nonpoint source pollution, as their capacity for abatement of runoff and the associated pollutants is diminished or lost. Nonpoint pollution can emanate from agricultural as well as urban lands. Currently, loadings of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the Little Calumet-Galien watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution.

Recommended Management Strategy 1: Through the TMDL development process, the Office of Water Quality will identify, assess, and quantify nonpoint source pollutant loadings to impaired waterbodies. In order to accomplish this task, the Office of Water Quality will work closely with local, state, and federal stakeholders at the watershed and subwatershed level. Loading scenarios for nonpoint source pollutants will be developed by the Office of Water Quality and reviewed by local, state, and federal stakeholders. Implementation of nonpoint source controls will involve a blend of funding assistance and regulatory action, where applicable.

Recommended Management Strategy 2: Numerous funding mechanisms, such as Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement program, and 319(h) grants, exist to promote practices to reduce nonpoint source pollution in the watershed. To more efficiently and effectively address nonpoint source pollution in the watershed, the prioritization and targeting discussed previously in Part II should be used to allocate further application of resources.

Recommended Management Strategy 3: The management of urban nonpoint sources can be addressed through effective land use planning and site design. Designs that incorporate less impervious area and more natural infiltration areas have proven effective in reducing urban nonpoint pollution. Local stakeholders working with local planning and zoning authorities, and developers, should implement more stringent site design requirements to reduce nonpoint source contaminants. This effort would be supported by the state and federal stakeholders.

Recommended Management Strategy 4: Practicing the following management measures for NPS pollution abatement may significantly reduce the sediment, nutrient, pesticide and other pollutant contributions to surface waters:
1) Protection of Wetlands and Riparian Areas of those serving a significant NPS pollution abatement function
2) Restoration of Wetlands and Riparian Areas of preexisting functions in damaged and destroyed areas, esp. where the systems will serve significant NPS pollution abatement function
3) Vegetated Treatment Systems (VTS) to promote use of constructed wetlands and vegetated filter strips where these systems will serve significant NPS pollution abatement function
*The information on degraded wetlands as potential contributors to nonpoint source pollution and the management measures for NPS pollution abatement is compiled from the USEPA Draft Guidance entitled "National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution" (EPA 841-B-01-001 June 2001).

4.6.1 Nonpoint Source Pollution- Education and Outreach

This Watershed Restoration Action Strategy is a beginning point for education and outreach efforts. It compiles existing knowledge about the water resources in this watershed and presents it to the stakeholders who live in the Little Calumet-Galien watershed. It brings to a public forum the available information and local concerns. However, the education process does not stop with the publication of this document.

Recommended Management Strategy: Local stakeholders, in cooperation with state and federal agencies, need to seek additional information on water quality concerns and issues addressed in this document and make that information available to the public. Additionally, the problems associated with septic failures, soil erosion, land use issues, and riparian zones can be emphasized through meetings, training sessions, and stakeholder group discussions. Field days are excellent ways to present information and encourage discussion. Use of experts with strong background knowledge coupled with local sponsors is an effective method to convey solutions to these problems.

4.7 Point Sources - General

There are 337 active NPDES permitted dischargers, and 43 CSO discharge points in the Little Calumet-Galien watershed. Additionally there are illegal point source discharges, such as tiles discharging septic tank effluent that exist in the watershed.

Recommended Management Strategy: The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illegal point sources and noncomplying point sources. Improving compliance of NPDES dischargers and identifying illegal dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illegal discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution.

Part II, Chapter 5: Future Expectations and Actions

As discussed in Part I, this Watershed Restoration Action Strategy is intended to be a fluid document that will be revised or amended as new information becomes available. Section 5.1 discusses expectations derived from the Strategy and how progress will be measured. Specific revisions and amendments to the Watershed Restoration Action Strategy are discussed in Section 5.2. Finally, the Watershed Restoration Action Strategy will be reviewed by all stakeholders before it becomes final, as described in Section 5.3.

5.1 Expectations and Measuring Progress

The Little Calumet-Galien Strategy provides a starting point to address water quality concerns held by local, state, and federal stakeholders. Part II provides recommended management strategies to address these concerns. Through cooperative efforts with stakeholders, all of the recommended management strategies listed will begin implementation by the summer of 2003.

Measurement of progress is critical to the success of any plan. Water quality improvements will not take place overnight. Measuring of progress in terms of water quality will be provided through the Office of Water Quality Assessment Branch's rotating basin monitoring strategy.

5.2 Expected Revisions and Amendments

This Watershed Restoration Action Strategy is intended to provide a starting point to improve water quality and measure the improvement. Hence, this document will require revisions and amendments as new information becomes available. The future revisions and amendments have been divided into those that are expected within the next year (Section 5.2.1) and those that will occur over a long-term basis (Section 5.2.2).

5.2.1 Short Term Revisions and Amendments

The most significant revisions and amendments will likely occur during 2002 and after, as a result of stakeholder review.

5.2.2 Long Term Revisions and Amendments

The Office of Water Quality is moving toward adopting a watershed management approach to solve water quality problems. Part of the watershed approach is the use of a rotating basin management cycle. The Assessment Branch of the Office of Water Quality has already adopted this rotating basin cycle in its intensive monitoring and assessment of Indiana waterbodies (this is in addition to the already established fixed station monitoring which occurs on a monthly basis). The Watershed Restoration Action Strategy may be revised or amended when sufficient information becomes available.

5.3 Review of the Watershed Restoration Action Strategy

Before this Watershed Restoration Action Strategy becomes final, it will undergo rigorous review. The first stage of review will be performed internally by the Office of Water Quality. Once the Watershed Restoration Action Strategy has been revised to address internal Office of Water Quality comments, it will be circulated to local, state, and federal stakeholders in the watershed. Written comments from local, state, and federal stakeholders will be addressed and the Watershed Restoration Action Strategy will again be revised to incorporate applicable comments. Once internal and external comments have been addressed, the final version of the Watershed Restoration Action Strategy will be released.

Part II Tables

TABLE 2-1: UNIFIED WATERSHED ASSESSMENT FOR THE LITTLE CALUMET-GALIEN WATERSHED, 2000-2001

Hydrologic Unit Scores for Each Parameter Used in the Unified Watershed Assessment [2000-2001]															
	Measured Parameters														
11 Digit Hydrologic Unit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
04040001010	nd	nd	nd	nd	nd	nd	nd	1	nd	1	nd	1	1	1	1
04040001020	nd	nd	nd	nd	nd	nd	3	5	2	1	4	4	1	2	1
04040001030	nd	nd	nd	nd	nd	nd	3	4	3	1	5	3	1	2	1
04040001040	nd	nd	nd	nd	nd	nd	nd	5	2	1	5	3	2	2	1
04040001050	nd	nd	nd	nd	nd	nd	3	3	2	1	5	3	2	2	1
04040001060	nd	nd	nd	nd	nd	nd	nd	5	3	1	5	2	2	2	1
04040001070	nd	nd	nd	nd	nd	nd	nd	5	2	1	5	2	3	3	1
04040001080	nd	nd	nd	nd	nd	nd	nd	5	2	1	5	3	2	2	1
04040001090	nd	nd	nd	nd	nd	nd	nd	5	3	1	5	2	3	3	1
04040001100	nd	nd	nd	nd	nd	nd	nd	4	3	1	4	2	3	3	1
07120003030	nd	nd	nd	nd	nd	nd	nd	5	3	1	5	4	1	2	1
07120003040	nd	nd	nd	nd	nd	nd	nd	1	4	1	1	3	1	2	1
07120003050	nd	nd	nd	nd	nd	nd	nd	2	2	1	1	5	1	2	1

KEY
Parameters:

1 - Mussel Diversity and Occurrence
2 - Aquatic Life Use Support
3 - Recreational Use Attainment
4 - Stream Fishery
5 - Lake Fishery
6 - Eurasian Milfoil Infestation Status
7 - Lake Trophic Status
8 - Critical Biodiversity Resource
9 - Aquifer Vulnerability
10 - Population Using Surface Water for Drinking Water
11 - Residential Septic System Density
12 - Degree of Urbanization
13 - Density of Livestock
14 - % Cropland
15 - Mineral Extraction Activities

Score range:
1 = good water quality (minimum impairment)
5 = heavily impacted or degraded water quality
nd = no data

(from NRCS & IDEM 2000)

TABLE 0-1: WATERS OF THE LITTLE CALUMET-GALIEN ON INDIANA'S 1998 303(D) LIST

ID	Waterbody	Parameter of Concern	Priority for TMDL development
ILHAA01_HAA 01-1998	CALUMET R	AMMONIA METALS NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	34
ILHAA01_HAA 02-1998	CALUMET R	AMMONIA METALS NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	34
ILRHA-1998	WOLF	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	34
IN-0001BIOTA-1998	BEAVER DAM DITCH	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0002BIOTA-1998	BURNS DITCH	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0002ECOLI-1998	BURNS DITCH	E. COLI	2000-2004
IN-0002FCMRC-1998	BURNS DITCH	FCA - MERCURY	2010-2012
IN-0002FCPCB-1998	BURNS DITCH	FCA - PCBS	2010-2012
IN-0002LEAD-1998	BURNS DITCH	LEAD	2000-2004
IN-0002PESTI-1998	BURNS DITCH	PESTICIDES	2000-2004
IN-0005BIOTA-1998	DEEP RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0006BIOTA-1998	DUNES CREEK	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0008BIOTA-1998	GRAND CALUMET RIVER (EAST BRANCH)	IMPAIRED BIOTIC COMMUNITIES	1998-2000

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0008COPPR-1998	GRAND CALUMET RIVER (EAST BRANCH)	COPPER	1998-2000
IN-0008CYAND-1998	GRAND CALUMET RIVER (EAST BRANCH)	CYANIDE	1998-2000
IN-0008FCMRC-1998	GRAND CALUMET RIVER (EAST BRANCH)	FCA - MERCURY	1998-2000
IN-0008FCPCB-1998	GRAND CALUMET RIVER (EAST BRANCH)	FCA - PCBS	1998-2000
IN-0008LEAD-1998	GRAND CALUMET RIVER (EAST BRANCH)	LEAD	1998-2000
IN-0008OILGR-1998	GRAND CALUMET RIVER (EAST BRANCH)	OIL AND GREASE	1998-2000
IN-0008PESTI-1998	GRAND CALUMET RIVER (EAST BRANCH)	PESTICIDES	1998-2000
IN-0009AMMON-1998	GRAND CALUMET RIVER (WEST BRANCH)	AMMONIA	1998-2000
IN-0009BIOTA-1998	GRAND CALUMET RIVER (WEST BRANCH)	IMPAIRED BIOTIC COMMUNITIES	1998-2000
IN-0009CHLRD-1998	GRAND CALUMET RIVER (WEST BRANCH)	CHLORIDES	1998-2000
IN-0009CYAND-1998	GRAND CALUMET RIVER (WEST BRANCH)	CYANIDE	1998-2000
IN-0009DISOX-1998	GRAND CALUMET RIVER (WEST BRANCH)	DISSOLVED OXYGEN	1998-2000
IN-0009FCMRC-1998	GRAND CALUMET RIVER (WEST BRANCH)	FCA - MERCURY	1998-2000
IN-0009FCPCB-1998	GRAND CALUMET RIVER (WEST BRANCH)	FCA - PCBS	1998-2000
IN-0009LEAD-1998	GRAND CALUMET RIVER (WEST BRANCH)	LEAD	1998-2000
IN-0009PESTI-1998	GRAND CALUMET RIVER (WEST BRANCH)	PESTICIDES	1998-2000
IN-0010FCPCB-1998	GRAND CALUMET RIVER LAGOONS / MARQUETTE PARK LAGOON	FCA - PCBS	1998-2000
IN-0011DISOX-1998	INDIANA HARBOR CANAL (IHC)	DISSOLVED OXYGEN	1998-2000
IN-0011FCMRC-1998	INDIANA HARBOR CANAL (IHC)	FCA - MERCURY	1998-2000
IN-0011FCPCB-1998	INDIANA HARBOR CANAL (IHC)	FCA - PCBS	1998-2000
IN-0011LEAD-1998	INDIANA HARBOR CANAL (IHC)	LEAD	1998-2000
IN-0011PESTI-1998	INDIANA HARBOR CANAL (IHC)	PESTICIDES	1998-2000
IN-0012BIOTA-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	IMPAIRED BIOTIC COMMUNITIES	1998-2000

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0012DISOX-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	DISSOLVED OXYGEN	1998-2000
IN-0012FCMRC-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	FCA - MERCURY	1998-2000
IN-0012FCPCB-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	FCA - PCBS	1998-2000
IN-0012OILGR-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	OIL AND GREASE	1998-2000
IN-0012PESTI-1998	INDIANA HARBOR CANAL (LAKE GEORGE BRANCH OF)	PESTICIDES	1998-2000
IN-0015FCPCB-1998	LAKE GEORGE	FCA - PCBS	2010-2012
IN-0017ECOLI-1998	LAKE MICHIGAN	E. COLI	2000-2004
IN-0017FCMRC-1998	LAKE MICHIGAN	FCA - MERCURY	2010-2012
IN-0017FCPCB-1998	LAKE MICHIGAN	FCA - PCBS	2010-2012
IN-0021CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0021ECOLI-1998	LITTLE CALUMET RIVER	E. COLI	2000-2004
IN-0021FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0021FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0021PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0022FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0022FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0024BIOTA-1998	LITTLE CALUMET RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0024CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0024FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0024FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0024PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0029BIOTA-1998	NILES DITCH	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0034ECOLI-	SALT CREEK	E. COLI	2000-2004

ID	Waterbody	Parameter of Concern	Priority for TMDL development
1998			
IN-0037CYAND-1998	TRAIL CREEK	CYANIDE	2000-2004
IN-0037ECOLI-1998	TRAIL CREEK	E. COLI	2000-2004
IN-0037FCMRC-1998	TRAIL CREEK	FCA - MERCURY	2010-2012
IN-0037FCPCB-1998	TRAIL CREEK	FCA - PCBS	2010-2012
IN-0038BIOTA-1998	TURKEY CREEK	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0039FCPCB-1998	WOLF LAKE	FCA - PCBS	2010-2012
MI083301A-1998	GALIEN RIVER	E. COLI PATHOGENS	
MI083301D-1998	DEER CREEK	ALGAE BACTERIAL SLIMES MACROINVERTEBRATE COMMUNITY RATED POOR PATHOGENS	
MI083301E-1998	SAWYER CREEK	MACROINVERTEBRATE COMMUNITY RATED POOR	
MI083301F-1998	GALIEN RIVER, E. BR.	ALGAE NUTRIENTS	
MI083301G-1998	GALIEN RIVER	CHLORDANE FCA (PCBS)	
MI083301J-1998	BLOOD RUN	DEGRADED HABITAT SEDIMENTATION	
ILGI02_GI 04-1998	CHIC SAN & SHIP CANAL	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	6
ILGI02_GI 05-1998	CHIC SAN & SHIP CANAL	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW	6

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	
ILGI03_GI 03-1998	CHIC SAN & SHIP CANAL	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	18
ILH01_H 01-1998	CALUMET-SAG CHANNEL	AMMONIA NUTRIENTS PRIORITY ORGANICS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	92
ILH02_H 02-1998	CALUMET-SAG CHANNEL	AMMONIA NUTRIENTS PRIORITY ORGANICS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	114
ILHA04_HA 04-1998	LITTLE CALUMET R N	AMMONIA NUTRIENTS PRIORITY ORGANICS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	138
ILHA04_HA 06-1998	LITTLE CALUMET R N	AMMONIA NUTRIENTS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	138
ILHAA01_HAA 01-1998	CALUMET R	AMMONIA METALS	34

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	
ILHAA01_HAA 40-1998	CALUMET R	AMMONIA NUTRIENTS METALS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN	34
ILHAB01_HAB 41-1998	GRAND CALUMET R	AMMONIA PRIORITY ORGANICS METALS NUTRIENTS ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS	305
ILHB42_HB 01-1998	LITTLE CALUMET R S	NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN OTHER HABITAT ALTERATIONS PATHOGENS	27
ILHB42_HB 42-1998	LITTLE CALUMET R S	AMMONIA NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SALINITY/TDS/CHLORIDES PATHOGENS	27
ILHBD04_HBD 04-1998	THORN CR	NUTRIENTS METALS PH SALINITY/TDS/CHLORIDES OTHER HABITAT ALTERATIONS PATHOGENS	52
ILHC01_HC 01-1998	S BR CHICAGO R	AMMONIA METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW	14

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	
ILHC01_HC-1998	S BR CHICAGO R	METALS NUTRIENTS PH ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	14
ILHC01_HCA01-1998	S FK S BR CHICAGO R	AMMONIA METALS FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	14
ILHC01_HCB01-1998	CHICAGO R	METALS NUTRIENTS OTHER HABITAT ALTERATIONS	14
ILHCC07_HCC07-1998	N BR CHICAGO R	PRIORITY ORGANICS NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SALINITY/TDS/CHLORIDES PATHOGENS	39
ILHCC08_HCC02-1998	N BR CHICAGO R	NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	45
ILHCC08_HCC08-1998	N BR CHICAGO R	NUTRIENTS METALS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS	45
ILHCCA01_HCCA01-1998	N SHORE CHANNEL	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW	42

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	
ILHCCA01_HCCA03-1998	N SHORE CHANNEL	AMMONIA METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS PATHOGENS	42
ILHCCA01_HCCA04-1998	N SHORE CHANNEL	AMMONIA METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS PATHOGENS	42
ILHCCA01_HCCA05-1998	N SHORE CHANNEL	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN FLOW ALTERATIONS OTHER HABITAT ALTERATIONS	42
ILHCCC04_HCCC02-1998	MID FK N BR CHIC R	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SALINITY/TDS/CHLORIDES NOXIOUS AQUATIC PLANTS	96
ILQZF-1998	WASHINGTON PARK LGN	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	18
ILRHJ-1998	SKOKIE LAGOONS	NUTRIENTS	322

ID	Waterbody	Parameter of Concern	Priority for TMDL development
		SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	
ILRHR-1998	GEORGE	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN PATHOGENS SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	236
ILRHS-1998	TURTLEHEAD	NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	243
ILRHU-1998	SHERMAN PARK LAGOONS	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	18
ILRHW-1998	GARFIELD PK LAGOON	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	18
ILRHX-1998	DOUGLAS PARK LAGOON	METALS NUTRIENTS SILTATION ORGANIC ENRICHMENT/LOW DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	18
ILRHZA-1998	GOMPERS PARK LAGOON	NUTRIENTS SILTATION SUSPENDED SOLIDS	39
ILRHZE-1998	ARROWHEAD	NUTRIENTS ORGANIC ENRICHMENT/LOW	114

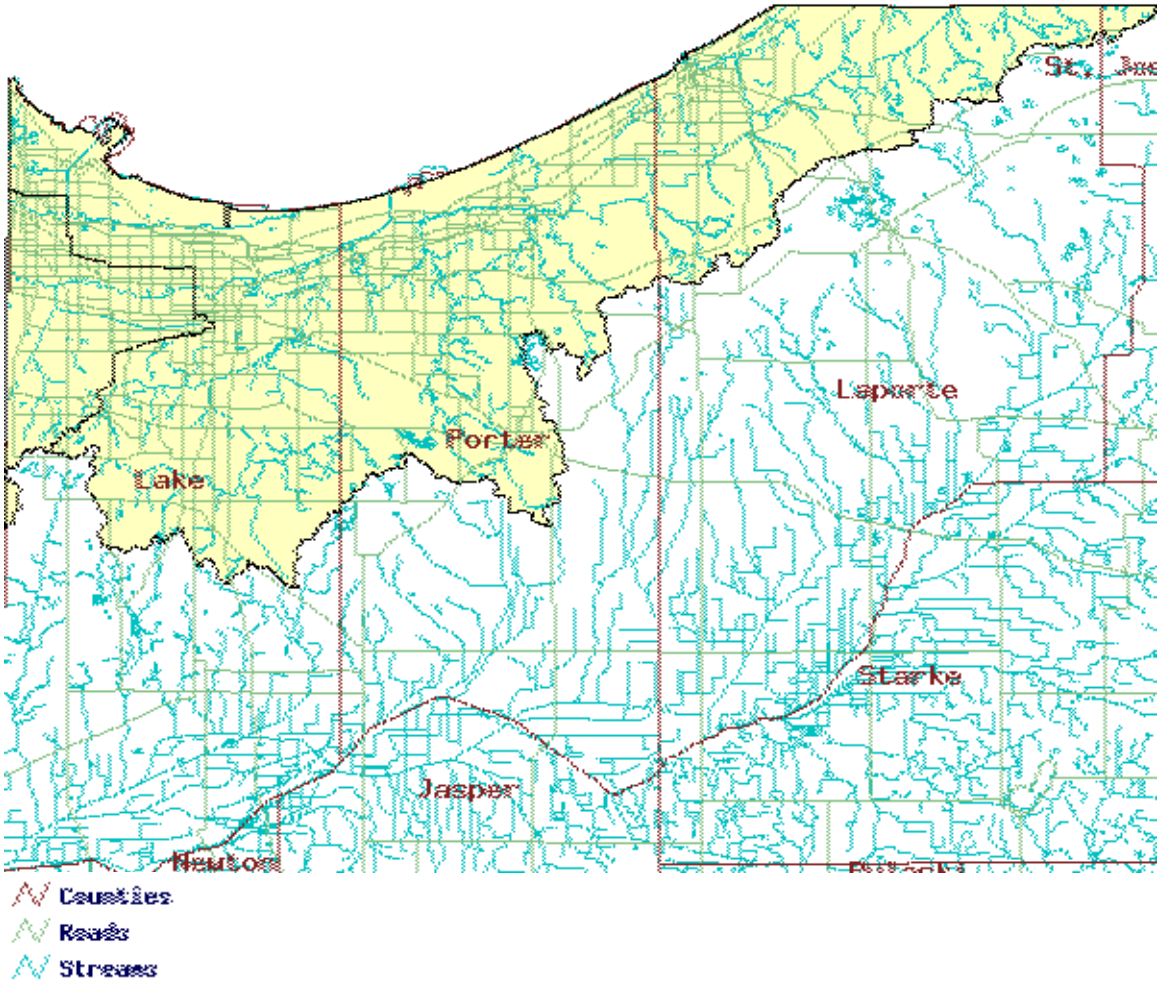
ID	Waterbody	Parameter of Concern	Priority for TMDL development
		DISSOLVED OXYGEN SUSPENDED SOLIDS NOXIOUS AQUATIC PLANTS	
IN-0023BIOTA-1998	LITTLE CALUMET RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0023CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0023DISOX-1998	LITTLE CALUMET RIVER	DISSOLVED OXYGEN	2000-2004
IN-0023FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0023FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0023PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0024BIOTA-1998	LITTLE CALUMET RIVER	IMPAIRED BIOTIC COMMUNITIES	2005-2007
IN-0024CYAND-1998	LITTLE CALUMET RIVER	CYANIDE	2000-2004
IN-0024FCMRC-1998	LITTLE CALUMET RIVER	FCA - MERCURY	2010-2012
IN-0024FCPCB-1998	LITTLE CALUMET RIVER	FCA - PCBS	2010-2012
IN-0024PESTI-1998	LITTLE CALUMET RIVER	PESTICIDES	2000-2004
IN-0055BIOTA-1998	DYER DITCH	IMPAIRED BIOTIC COMMUNITIES	2004-2006

FCA - Fish Consumption Advisory
PCB - Polychlorinated Biphenyls
Hg - Mercury

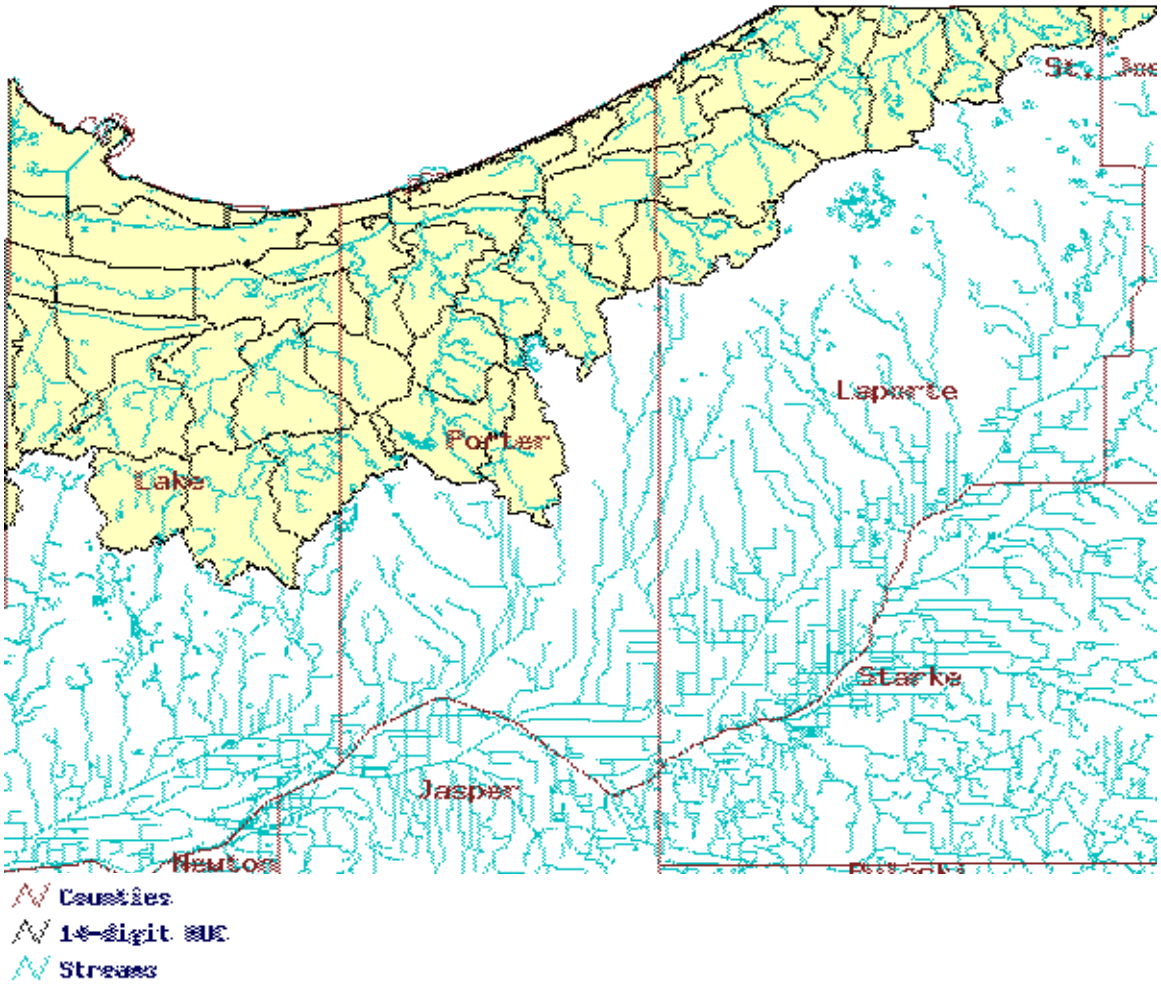
***Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above. The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.

Figures

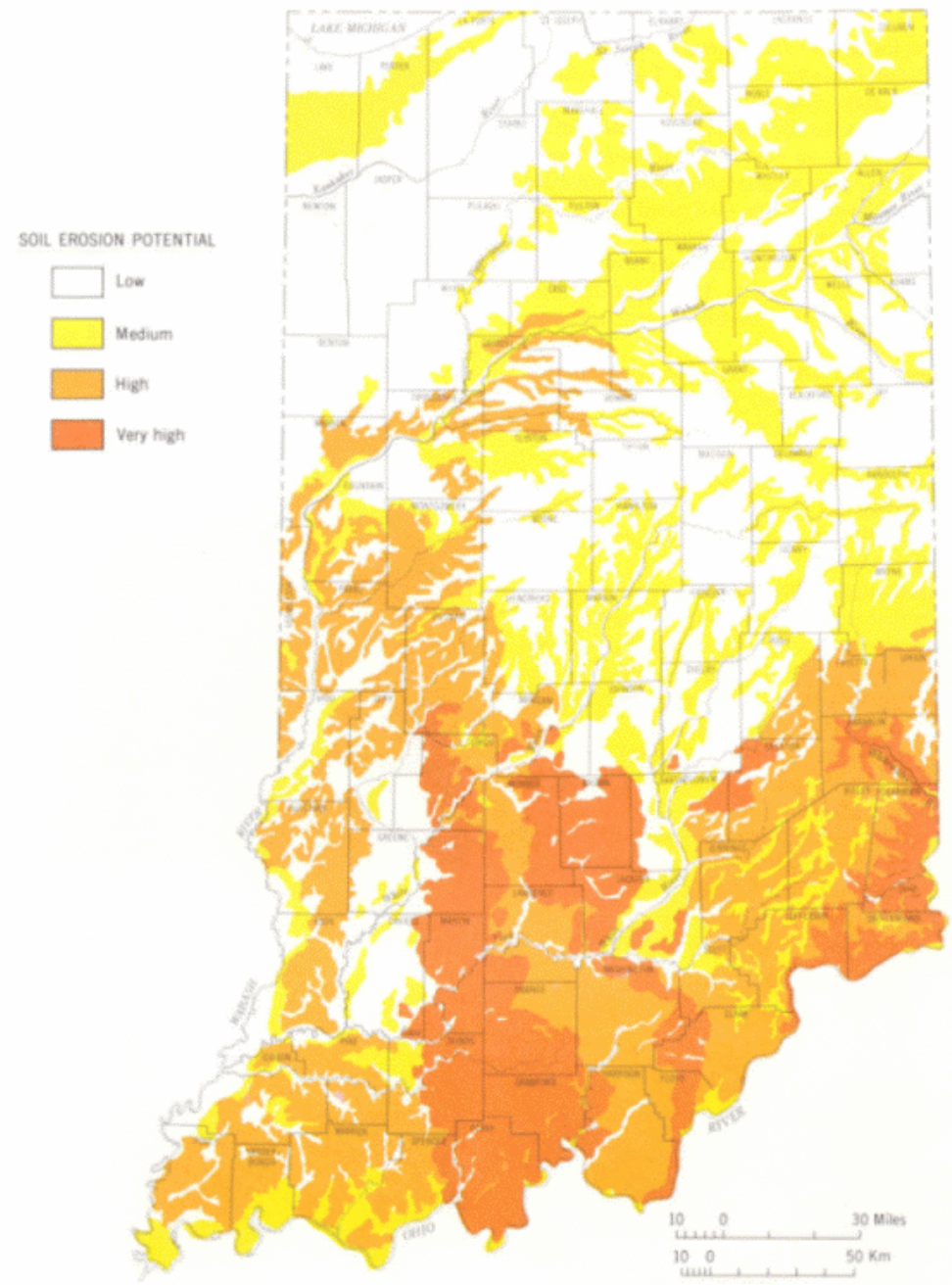
Part One, Figure 2-1: Watershed Area



Part One, Figure 2-2: 14 Digit HUCs



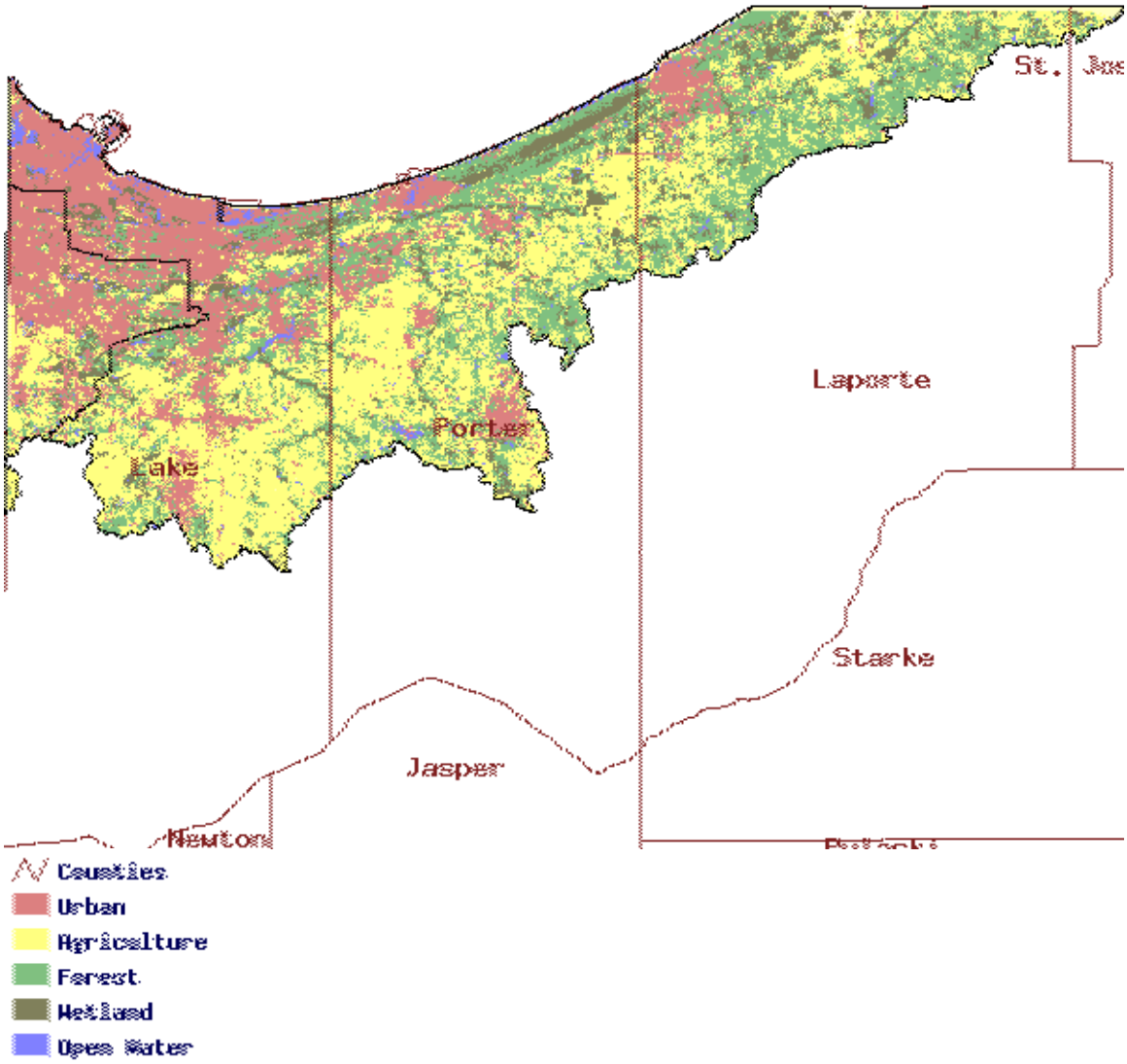
Part One, Figure 2-3 Erosion Potential



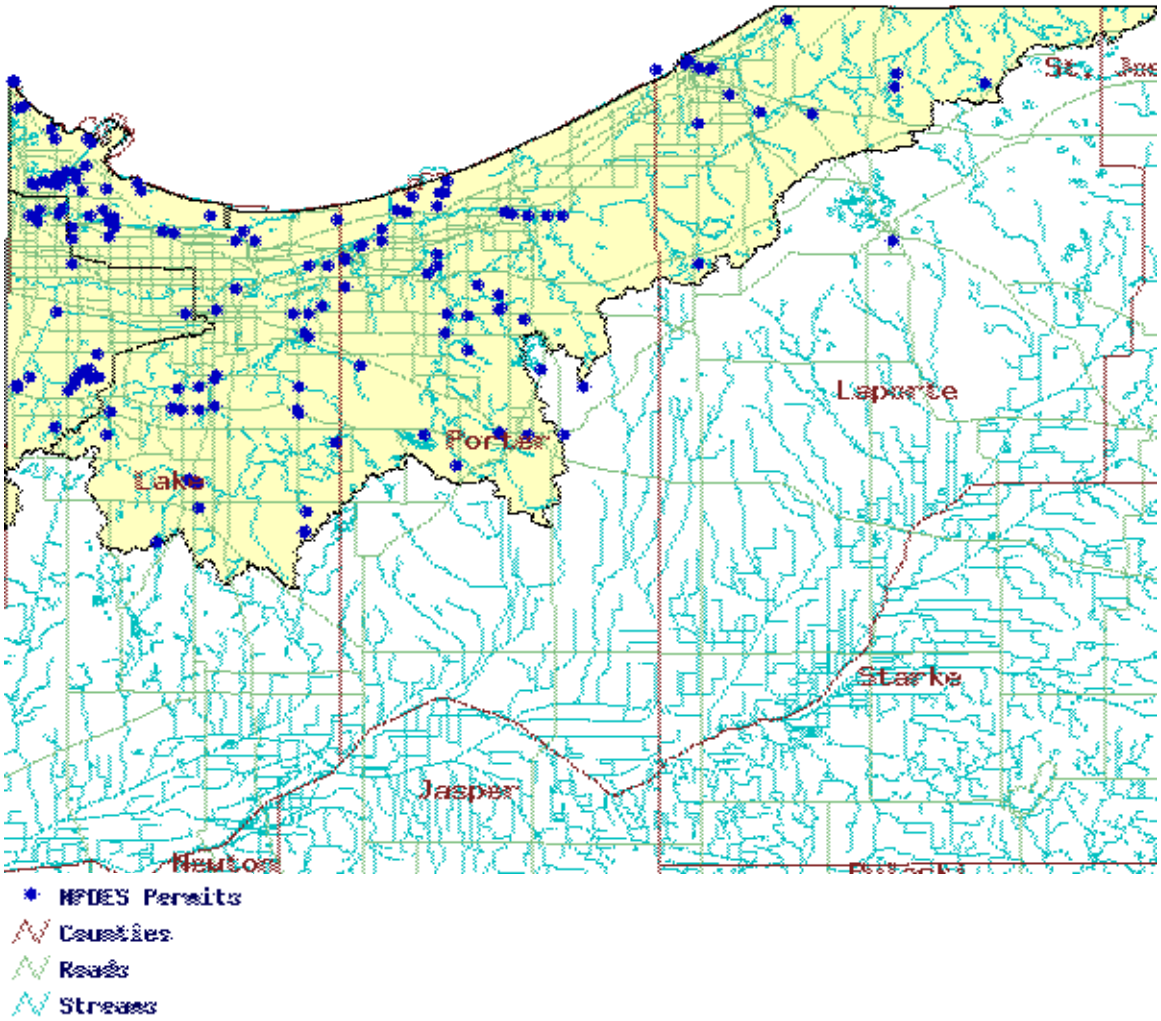
Map showing soil erosion potential of Indiana soil associations.

(from The Indiana Water Resource, IDNR 1980)

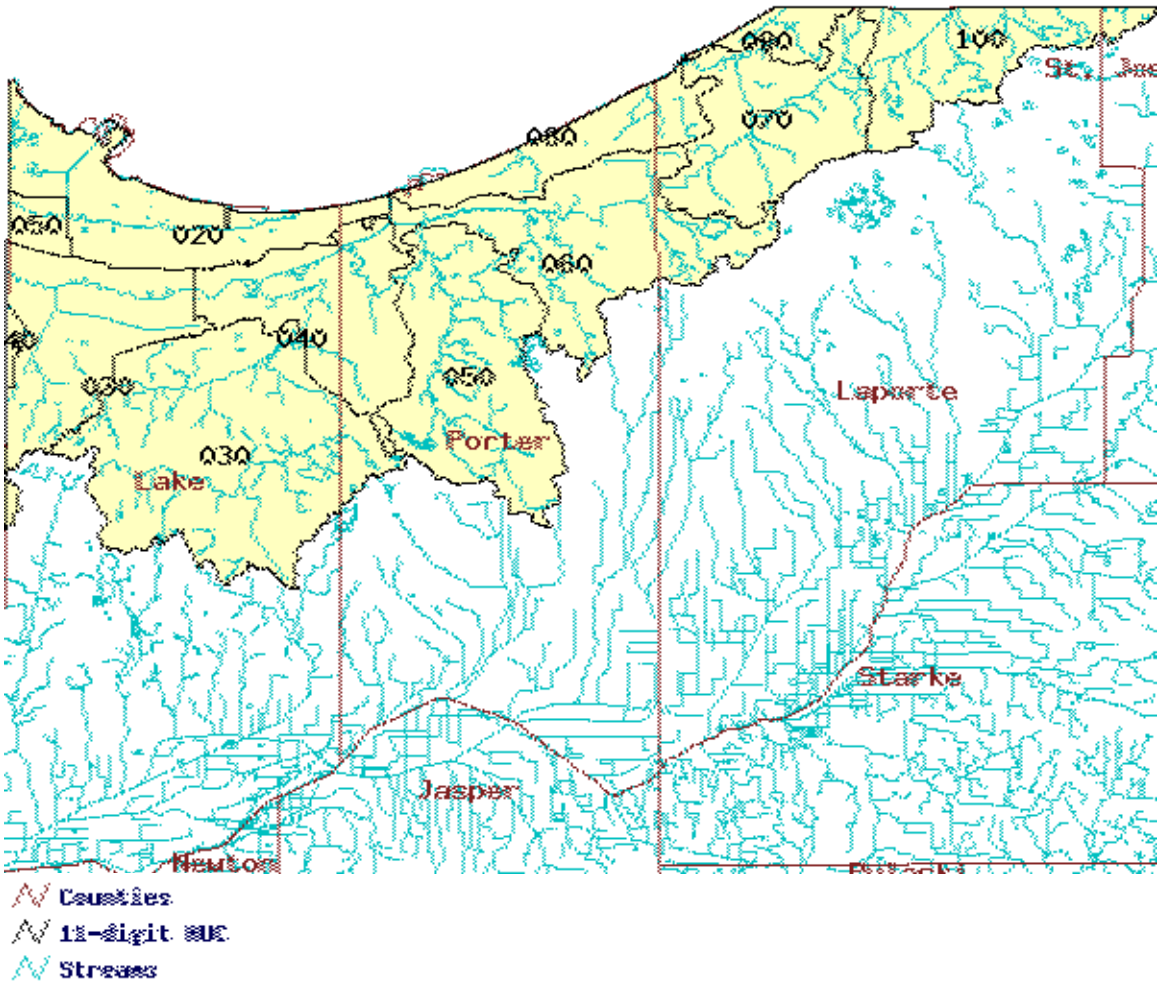
Part One, Figure 2-4: Land Cover



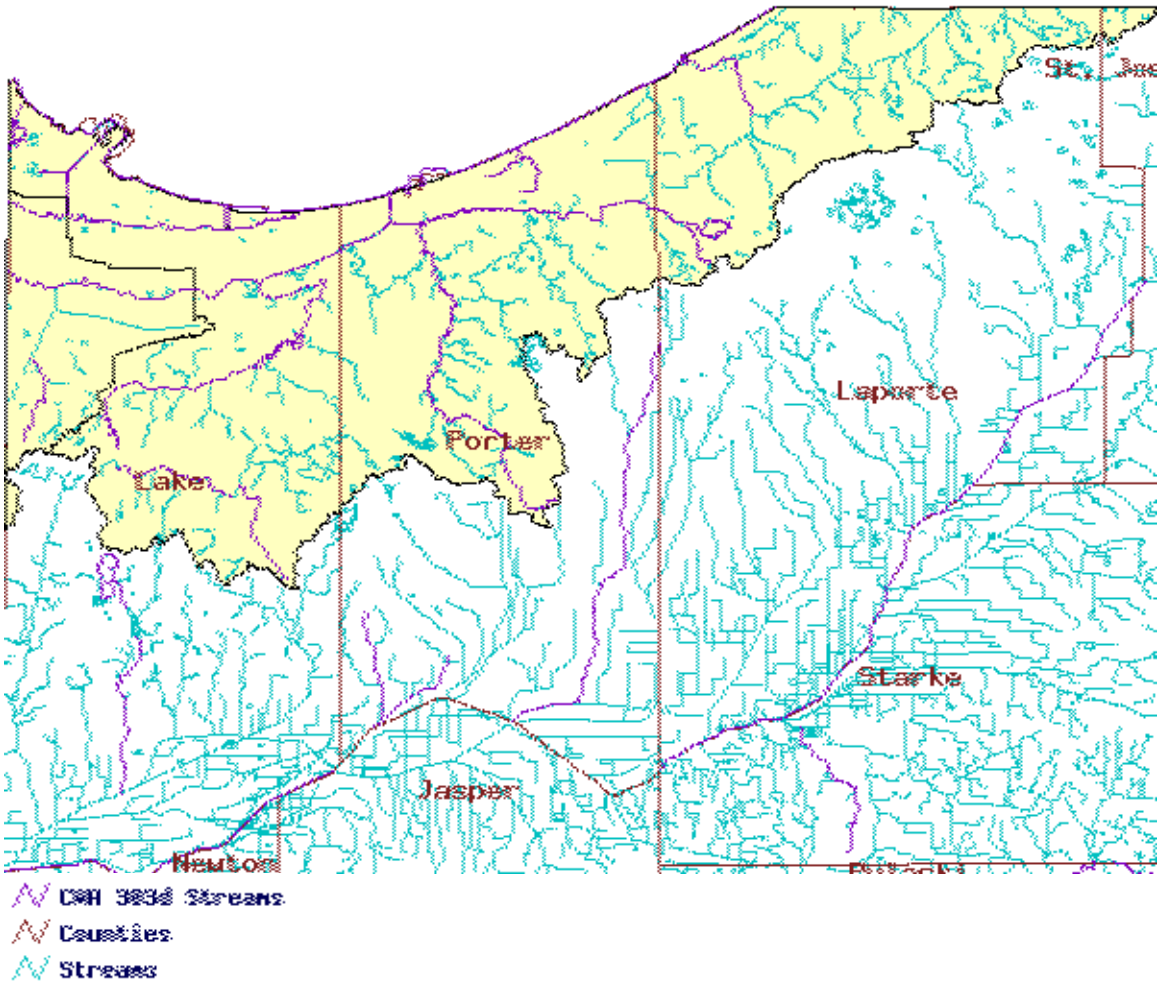
Part One, Figure 3-1: NPDES Facility Locations



Part Two, Figure 2-1: Unified Watershed Assesment



Part Two, Figure 3-1: 303d Streams



APPENDIX A

BENCHMARK CHARACTERISTIC ANALYSIS OF DATA FROM FIXED STATIONS IN THE LITTLE CALUMET-GALIEN WATERSHED

Station BD-2E

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std Dev.	Standard Error	Skewness	Std Err. Skewness	Kurtosis	Std Err. Kurtosis
Alkalinity (mg/l)	74	169.1892	162.0645	176.3139	165	12520	98	259	152	179	161	27	945.6897	30.75207	3.574855	1.171291	0.279197	2.122241	0.551684
Ammonia (mg/l as N)	76	0.223684	0.20057	0.246798	0.2	17	0.05	0.6	0.2	0.3	0.55	0.1	0.010232	0.101151	0.011603	0.753751	0.275637	1.515119	0.544804
BOD (mg/l)	35	1.742857	1.380821	2.104893	1.6	61	0.5	6	1.3	2.1	5.5	0.8	1.110756	1.053924	0.178146	1.996554	0.397694	7.091295	0.777794
COD (mg/l)	76	16.28158	14.75172	17.81144	14	1237.4	7	38.8	12	19	31.8	7	44.82232	6.694948	0.767963	1.502833	0.275637	2.116308	0.544804
Cyanide (mg/l)	75	0.005387	0.005166	0.005607	0.005	0.404	0.005	0.009	0.005	0.005	0.004	0	9.2E-07	0.000957	0.000111	2.470874	0.2774	4.893992	0.548211
Nitrate (mg/l as N)	76	1.834211	-0.05718	3.725596	0.8	139.4	0.6	7.3	0.7	1	72.4	0.3	68.50948	8.277045	0.949442	8.70192	0.275637	75.81188	0.544804
Total Phosphorus (mg/l as P)	76	0.063618	0.05464	0.072597	0.05	4.835	0.015	0.2	0.04	0.07	0.185	0.03	0.001544	0.03929	0.004507	1.843894	0.275637	3.306984	0.544804
Total Solids (mg/l)	73	373.3699	361.6871	385.0526	367	27256	269	596	344	388	327	44	2507.236	50.07231	5.860521	1.753368	0.281029	5.851723	0.555223
Suspended Solids (mg/l)	74	21.28378	15.31507	27.2525	13	1575	2	150	8	22	148	14	663.7129	25.76263	2.994844	3.011537	0.279197	10.27275	0.551684
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	76	0.794211	0.732561	0.85586	0.7	60.35	0.5	1.8	0.6	0.9	1.3	0.3	0.072787	0.269791	0.030947	1.686871	0.275637	3.009757	0.544804
E. coli (CFU/100ml)	74	387.3919	205.4219	569.3619	130	28667	0.5	5500	40	350	5499.5	340	616904.3	785.4326	91.30468	4.762854	0.279197	26.9793	0.551684
TOC (mg/l)	0																		
Hardness (mg/l)	74	235.8649	227.8674	243.8623	234.5	17454	150	342	220	254	192	34	1191.571	34.51913	4.012768	0.310514	0.279197	1.296327	0.551684
Chloride (mg/l)	74	44.09459	40.60783	47.58136	43	3263	19	110	34	47	91	13	226.4978	15.04984	1.749509	2.20419	0.279197	7.112024	0.551684
Dissolved Oxygen (mg/l)	57	9.105965	8.668045	9.543885	8.9	519.04	6.2	13.6	7.86	10.31	7.4	2.45	2.723939	1.650436	0.218606	0.495366	0.316327	-0.21439	0.623134
pH	56	7.87125	7.79716	7.944784	7.9	440.79	7.19	8.48	7.705	8.04	1.29	0.335	0.075397	0.274584	0.036693	-0.37194	0.319	-0.03963	0.628256
Copper (ug/l)	1	2				2	2	2											
Iron (ug/l)	76	1090.395	891.4785	1289.311	785	82870	260	4700	565	1200	4440	635	757758.5	870.4933	99.85242	2.126033	0.275637	4.639745	0.544804
Zinc (ug/l)	1	31				31	31	31											

Station BD-1

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std Dev.	Standard Error	Skewness	Std Err. Skewness	Kurtosis	Std Err. Kurtosis
Alkalinity (mg/l)	76	172.75	166.6054	178.8946	173	13129	116	259	154.5	187.5	143	33	723.07	26.88968	3.08449	0.423725	0.275637	0.687227	0.544804
Ammonia (mg/l as N)	77	0.199351	0.178564	0.220138	0.2	15.35	0.05	0.4	0.1	0.2	0.35	0.1	0.008388	0.091585	0.010437	0.309797	0.273908	-0.21019	0.54146
BOD (mg/l)	36	2.008333	1.609187	2.407479	1.65	72.3	0.5	5.5	1.25	2.6	5	1.35	1.391643	1.179679	0.196613	1.210111	0.392544	1.474581	0.766076
COD (mg/l)	77	19.39351	17.74693	21.04008	18	1493.3	9.8	48.1	14	23.2	38.3	9.2	52.62798	7.254515	0.826729	1.384871	0.273908	2.900463	0.54146
Cyanide (mg/l)	74	0.005284	0.005011	0.005556	0.005	0.391	0.005	0.013	0.005	0.005	0.008	0	1.4E-06	0.001176	0.000137	5.025837	0.279197	27.7841	0.551684
Nitrate (mg/l as N)	77	1.82987	0.871976	2.787764	1.1	140.9	0.7	38	0.9	1.8	37.3	0.9	17.81107	4.220316	0.48095	8.499342	0.273908	73.70427	0.54146
Total Phosphorus (mg/l as P)	77	0.096818	0.083763	0.109874	0.08	7.455	0.015	0.36	0.06	0.12	0.345	0.06	0.003308	0.057519	0.006555	2.107601	0.273908	6.428374	0.54146
Total Solids (mg/l)	75	418.6	403.5986	433.6014	419	31395	198	616	382	446	418	64	4251.162	65.20094	7.528756	0.162275	0.2774	1.743323	0.548211
Suspended Solids (mg/l)	76	26.57895	19.39891	33.75898	16.5	2020	2	176	10	28.5	174	18.5	987.287	31.42112	3.605893	3.085893	0.275637	10.47941	0.544804
Dissolved Solids (mg/l)	74	374.2297	358.7437	389.7158	365.5	27693	254	602	326	405	348	79	4467.851	66.84198	7.770223	0.849728	0.279197	1.140485	0.551684
Sulfate (mg/l)	0																		
TKN (mg/l as N)	77	0.951169	0.879991	1.022346	0.9	73.24	0.4	1.9	0.7	1.1	1.5	0.4	0.098342	0.313595	0.035738	0.831072	0.273908	0.396208	0.54146
E. coli (CFU/100ml)	73	620.8288	411.7426	829.9149	200	45320.5	0.5	4000	100	670	3999.5	570	803076.1	896.1451	104.8859	2.097399	0.281029	4.099467	0.555223
TOC (mg/l)	1	8.1				8.1	8.1	8.1											
Hardness (mg/l)	76	251.7895	243.6039	259.975	253	19136	162	360	226.5	276.5	198	50	1283.182	35.82153	4.109011	0.151191	0.275637	0.408434	0.544804
Chloride (mg/l)	76	54.05263	49.46724	58.63802	51.5	4108	22	125	40.5	60	103	19.5	402.6639	20.06649	2.301784	1.642094	0.275637	3.590404	0.544804
Dissolved Oxygen (mg/l)	58	9.113276	8.695816	9.530736	8.8	528.57	6.29	12.2	7.66	10.32	5.91	2.46	2.520738	1.587683	0.208473	0.135051	0.31372	-1.03932	0.618136
pH	57	7.878596	7.807831	7.949362	7.86	449.08	7.2	8.4	7.72	8.05	1.2	0.33	0.07113	0.266702	0.035326	-0.20475	0.316327	-0.15567	0.623134
Copper (ug/l)	76	4.247368	3.740987	4.753739	4	322.8	2	10	2	5.8	8	3.8	4.910526	2.215971	0.254189	0.778607	0.275637	0.109443	0.544804
Iron (ug/l)	76	1294.605	987.0531	1602.157	900	98390	10	8000	575	1350	7990	775	1811457	1345.904	154.3858	3.279637	0.275637	12.20556	0.544804
Zinc (ug/l)	76	21.36316	14.55278	28.17354	13.5	1623.6	4.5	240	10	20	235.5	10	888.2456	29.80345	3.41869	5.774296	0.275637	39.65075	0.544804

Station: GCR-34

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	74	178.9865	167.0954	190.8776	182	13245	65	318	135	214	253	79	2634.287	51.32531	5.966446	0.139302	0.279197	0.005837	0.551684
Ammonia (mg/l as N)	75	2.820667	1.806074	3.835259	0.6	211.55	0.05	25	0.3	4.2	24.95	3.9	19.44595	4.409756	0.509195	2.552844	0.2774	8.273289	0.548211
BOD (mg/l)	35	6.477143	3.794266	9.16002	2.6	226.7	0.5	32	1.5	8	31.5	6.5	60.99829	7.81014	1.320155	1.769499	0.397694	2.537541	0.777794
COD (mg/l)	75	47.31867	35.78202	58.85531	35.3	3548.9	12	390	26.3	52.4	378	26.1	2514.23	50.14209	5.78991	5.189685	0.2774	31.82434	0.548211
Cyanide (mg/l)	74	0.015081	0.010168	0.019995	0.009	1.116	0.005	0.17	0.005	0.016	0.165	0.011	0.00045	0.021208	0.002465	5.646766	0.279197	39.52355	0.551684
Nitrate (mg/l as N)	75	6.422	5.031539	7.812461	4.1	481.65	0.05	24	1.5	10	23.95	8.5	36.52272	6.043403	0.697832	1.053413	0.2774	0.20516	0.548211
Total Phosphorus (mg/l as P)	75	0.5416	0.43386	0.64934	0.43	40.62	0.04	2.2	0.22	0.7	2.16	0.48	0.219278	0.468272	0.054071	1.96604	0.2774	4.392499	0.548211
Total Solids (mg/l)	73	925.2877	863.1064	987.469	934	67546	327	1538	786	1080	1211	294	71027.37	266.5096	31.19259	-0.16579	0.281029	0.394336	0.555223
Suspended Solids (mg/l)	74	25.94595	17.296	34.59589	16.5	1920	2	223	7	28	221	21	1393.942	37.33554	4.340168	3.829034	0.279197	16.29892	0.551684
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	1	56				56	56	56											
TKN (mg/l as N)	75	5.04	3.72478	6.35522	2.1	378	0.6	28	1.4	6.8	27.4	5.4	32.67703	5.716382	0.660071	2.068008	0.2774	4.880657	0.548211
E. coli (CFU/100ml)	70	74944.73	17828.69	132060.8	1450	5246131	5	1204000	280	11000	1203995	10720	5.7E+10	239538.9	28630.38	3.968398	0.28675	15.33332	0.566265
TOC (mg/l)	0																		
Hardness (mg/l)	74	392.9595	363.2863	422.6326	397	29079	128	728	286	464	600	178	16403.88	128.0776	14.88872	0.38889	0.279197	0.321483	0.551684
Chloride (mg/l)	74	195.2297	178.2194	212.2401	212.5	14447	34	415	150	235	381	85	5390.7	73.42139	8.535063	-0.24597	0.279197	0.540921	0.551684
Dissolved Oxygen (mg/l)	58	7.074138	6.555759	7.592516	7.28	410.3	1.4	11.61	5.63	8.38	10.21	2.75	3.886797	1.971496	0.25887	-0.21584	0.31372	0.366081	0.618136
pH	58	7.566552	7.443822	7.689281	7.495	438.86	6.55	8.47	7.19	7.88	1.92	0.69	0.217869	0.466764	0.061289	0.342476	0.31372	-0.62794	0.618136
Copper (ug/l)	16	19.5625	13.25168	25.87332	18.5	313	5	42	8	27	37	19	140.2625	11.84325	2.960812	0.635229	0.564308	-0.65737	1.090774
Iron (ug/l)	79	990	792.3472	1187.653	730	78210	200	6800	480	1200	6600	720	778676.9	882.4267	99.28076	3.97906	0.270545	23.55514	0.534952
Zinc (ug/l)	16	85.6875	64.36793	107.0071	83.5	1371	40	170	50	110	130	60	1600.763	40.00953	10.00238	0.723569	0.564308	-0.47575	1.090774

Station: BD-3W

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	74	190.3514	182.2628	198.4399	190	14086	109	274	170	214	165	44	1218.889	34.91258	4.058506	-0.12313	0.279197	-0.01073	0.551684
Ammonia (mg/l as N)	75	0.184667	0.15759	0.211743	0.2	13.85	0.05	0.6	0.1	0.3	0.55	0.2	0.01385	0.117684	0.013589	0.852165	0.2774	0.778073	0.548211
BOD (mg/l)	35	2.854286	2.293332	3.415239	2.2	99.9	0.5	7	1.8	3.8	6.5	2	2.666672	1.632995	0.276027	0.934968	0.397694	0.398849	0.777794
COD (mg/l)	75	26.58667	24.97931	28.19402	26.7	1994	6.8	45	23	30	38.2	7	48.8055	6.986093	0.806685	0.046516	0.2774	1.355076	0.548211
Cyanide (mg/l)	74	0.005568	0.005184	0.005951	0.005	0.412	0.005	0.014	0.005	0.005	0.009	0	2.7E-06	0.001656	0.000192	3.496741	0.279197	12.69271	0.551684
Nitrate (mg/l as N)	75	2.069333	1.864346	2.27432	2.1	155.2	0.3	5.1	1.4	2.7	4.8	1.3	0.793777	0.890941	0.102877	0.653054	0.2774	0.751332	0.548211
Total Phosphorus (mg/l as P)	75	0.1696	0.154393	0.184807	0.16	12.72	0.05	0.35	0.12	0.21	0.3	0.09	0.004369	0.066097	0.007632	0.499988	0.2774	0.275217	0.548211
Total Solids (mg/l)	73	523.6712	504.0724	543.2701	518	38228	317	739	480	576	422	96	7056.14	84.00084	9.831554	0.126943	0.281029	0.264254	0.555223
Suspended Solids (mg/l)	74	35.01351	26.92446	43.10256	25.5	2591	4	198	19	40	194	21	1219.027	34.91457	4.058736	3.182035	0.279197	11.44198	0.551684
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	75	1.293467	1.219254	1.367679	1.3	97.01	0.7	2.2	1	1.5	1.5	0.5	0.104039	0.322551	0.037245	0.536435	0.2774	0.091008	0.548211
E. coli (CFU/100ml)	71	857.3521	464.5464	1250.158	340	60872	0.5	11000	90	750	10999.5	660	2754059	1659.536	196.9507	4.17899	0.284805	21.24364	0.562511
TOC (mg/l)	0																		
Hardness (mg/l)	74	289.6892	277.7995	301.5788	298	21437	153	432	260	330	279	70	2633.642	51.31902	5.965715	-0.2992	0.279197	0.380003	0.551684
Chloride (mg/l)	74	74.25676	67.73125	80.78226	72	5495	21	180	60	88	159	28	793.3167	28.16588	3.274217	0.939493	0.279197	2.345436	0.551684
Dissolved Oxygen (mg/l)	56	9.235357	8.652404	9.818311	9.385	517.18	5.27	13.61	7.44	10.92	8.34	3.48	4.738502	2.17681	0.290888	0.032093	0.319	-0.81675	0.628256
pH	55	7.78	7.680273	7.879727	7.76	427.9	6.75	8.85	7.59	7.98	2.1	0.39	0.136085	0.368897	0.049742	0.159273	0.321742	1.323478	0.633507
Copper (ug/l)	1	2				2	2	2											
Iron (ug/l)	1	1600				1600	1600	1600											
Zinc (ug/l)	1	21				21	21	21											

Station: GCR-42

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	77	117.4286	113.7404	121.1167	115	9042	82	198	110	119	116	9	264.0376	16.24923	1.851772	2.700863	0.273908	10.42054	0.54146
Ammonia (mg/l as N)	79	0.650633	0.59215	0.709116	0.6	51.4	0.2	1.4	0.4	0.8	1.2	0.4	0.068173	0.261099	0.029376	0.941468	0.270545	0.636197	0.534952
BOD (mg/l)	36	4.741667	-1.95397	11.4373	1.25	170.7	0.5	120	0.5	2.05	119.5	1.55	391.6048	19.78901	3.298168	5.971065	0.392544	35.75938	0.768076
COD (mg/l)	78	11.26154	9.654895	12.86818	9	878.4	2.5	42	7.3	12	39.5	4.7	50.7785	7.125904	0.80685	2.547382	0.272211	7.854506	0.538176
Cyanide (mg/l)	77	0.006883	0.00578	0.007986	0.005	0.53	0.005	0.039	0.005	0.007	0.034	0.002	2.4E-05	0.004858	0.000554	4.826021	0.273908	27.6901	0.54146
Nitrate (mg/l as N)	78	0.532051	0.419319	0.644783	0.4	41.5	0.3	4.5	0.4	0.5	4.2	0.1	0.249998	0.499998	0.056614	6.973844	0.272211	53.4368	0.538176
Total Phosphorus (mg/l as P)	79	0.065063	-0.00847	0.138592	0.015	5.14	0.015	2.92	0.015	0.03	2.905	0.015	0.107762	0.328271	0.036933	8.661219	0.270545	76.10214	0.534952
Total Solids (mg/l)	77	228.6753	214.9619	242.3888	214	17608	194	653	205	227	459	22	3650.459	60.41903	6.885387	5.275462	0.273908	33.42306	0.54146
Suspended Solids (mg/l)	78	8.628205	6.738643	10.51777	6	673	2	50	2	11	48	9	70.2366	8.380728	0.948931	2.449067	0.272211	7.923839	0.538176
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	1	19				19	19	19											
TKN (mg/l as N)	1	1.5				1.5	1.5	1.5											
E. coli (CFU/100ml)	74	925.1351	226.9079	1623.362	45	68460	5	19000	10	270	18995	260	9082638	3013.741	350.3403	4.71505	0.279197	23.76633	0.551684
TOC (mg/l)	1	8.1				8.1	8.1	8.1											
Hardness (mg/l)	77	152.4286	146.625	158.2321	150	11737	108	294	142	158	186	16	653.8008	25.56953	2.913918	3.55551	0.273908	17.98974	0.54146
Chloride (mg/l)	3	27.33333	-1.67192	56.33859	25	82	17	40			23		136.3333	11.67619	6.741249	0.863354	1.224745		
Dissolved Oxygen (mg/l)	59	8.580508	8.245883	8.915134	8.6	506.25	4.1	11.26	7.73	9.4	7.16	1.67	1.648788	1.284051	0.167169	-0.54946	0.311176	1.569402	0.613257
pH	58	8.026724	7.931469	8.12198	8.125	465.55	6.85	8.74	7.88	8.27	1.89	0.39	0.131243	0.362275	0.047569	-1.24583	0.31372	2.014342	0.618136
Copper (ug/l)	17	5.829412	5.080405	6.578419	6	99.1	2	8	5	7	6	2	2.122206	1.456779	0.353321	-1.13874	0.549747	1.723816	1.063198
Iron (ug/l)	77	572.0779	503.8358	640.3201	540	44050	120	1600	360	710	1480	350	90398.26	300.663	34.26373	1.063726	0.273908	1.168806	0.54146
Zinc (ug/l)	16	30.8125	20.90409	40.72091	30	493	10	90	20	40	80	20	345.7625	18.59469	4.648673	2.242058	0.564308	6.844408	1.090774

Station: GCR-37

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	73	119.6712	116.2707	123.0717	118	8736	91	207	112	123	116	11	212.4182	14.57457	1.705825	3.249148	0.281029	17.65097	0.555223
Ammonia (mg/l as N)	75	0.546	0.493631	0.598369	0.5	40.95	0.05	1.1	0.4	0.7	1.05	0.3	0.051808	0.227614	0.026283	0.303183	0.2774	-0.22678	0.548211
BOD (mg/l)	34	2.15	1.73776	2.56224	1.9	73.1	0.5	7	1.4	2.6	6.5	1.2	1.395909	1.181486	0.202623	2.165854	0.403053	7.746119	0.787898
COD (mg/l)	75	13.852	12.54099	15.16301	12.7	1038.9	7	46	10.8	15	39	4.2	32.46821	5.698088	0.657959	2.976985	0.2774	13.45605	0.548211
Cyanide (mg/l)	74	0.007216	0.005715	0.008717	0.006	0.534	0.005	0.059	0.005	0.007	0.054	0.002	4.2E-05	0.006479	0.000753	7.214688	0.279197	57.60834	0.551684
Nitrate (mg/l as N)	75	1.185333	1.112116	1.258551	1.2	88.9	0.4	2.1	1	1.3	1.7	0.3	0.101268	0.318227	0.036746	0.52257	0.2774	1.042869	0.548211
Total Phosphorus (mg/l as P)	75	0.058067	0.047639	0.068494	0.05	4.355	0.015	0.38	0.04	0.06	0.365	0.02	0.002054	0.045321	0.005233	5.050269	0.2774	34.57151	0.548211
Total Solids (mg/l)	73	297.6712	287.7518	307.5907	294	21730	209	453	269	315	244	46	1807.502	42.51472	4.975972	1.070912	0.281029	2.341047	0.555223
Suspended Solids (mg/l)	73	9.917808	7.204188	12.63143	7	724	2	87	5	11	85	6	135.2709	11.6306	1.361259	4.558033	0.281029	27.14198	0.555223
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	1	36				36	36	36											
TKN (mg/l as N)	75	1.041333	0.965392	1.117275	1	78.1	0.5	2.2	0.8	1.2	1.7	0.4	0.108944	0.330067	0.038113	0.87955	0.2774	1.140755	0.548211
E. coli (CFU/100ml)	70	2043.786	530.8033	3556.768	150	143065	5	45000	40	570	44995	530	4E+07	6345.296	758.4079	5.132765	0.28675	31.21821	0.566265
TOC (mg/l)	0																		
Hardness (mg/l)	73	171.3014	167.0877	175.515	170	12505	128	216	158	185	88	27	326.1579	18.05984	2.113745	0.113018	0.281029	-0.09364	0.555223
Chloride (mg/l)	73	43.34247	40.51894	46.166	42	3164	18	96	37	47	78	10	146.4505	12.10167	1.416394	1.598516	0.281029	4.977291	0.555223
Dissolved Oxygen (mg/l)	60	7.835167	7.414002	8.256331	8.05	470.11	4.7	11.34	6.65	9.13	6.64	2.48	2.658046	1.630351	0.210477	-0.03555	0.308694	-0.84169	0.608492
pH	59	7.785932	7.704797	7.867067	7.83	459.37	6.94	8.29	7.66	8	1.35	0.34	0.096931	0.311338	0.040533	-0.83822	0.311176	0.845139	0.613257
Copper (ug/l)	15	5.32	4.031733	6.608267	5	79.8	2	12	4	6	10	2	5.411714	2.326309	0.60065	1.480055	0.580119	4.670966	1.120897
Iron (ug/l)	74	887.5676	714.7055	1060.43	675	65680	170	5400	470	1000	5230	530	556695.4	746.1202	86.73471	3.54805	0.279197	18.11557	0.551684
Zinc (ug/l)	74	35.63514	31.39934	39.87093	30	2637	10	120	20	42	110	22	334.2623	18.28284	2.125337	1.831518	0.279197	5.465822	0.551684

Station: IHC-2

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	51	126.098	121.5877	130.6084	125	6431	98	180	114	133	82	19	257.1702	16.03653	2.245563	1.194447	0.333464	2.123706	0.65592
Ammonia (mg/l as N)	52	0.533654	0.44768	0.619628	0.5	27.75	0.05	1.5	0.3	0.7	1.45	0.4	0.095365	0.308812	0.042825	0.819747	0.330414	0.692012	0.650093
BOD (mg/l)	24	1.920833	1.448486	2.393181	1.45	46.1	0.5	4.8	1.2	2.55	4.3	1.35	1.251286	1.118609	0.228335	0.99545	0.472261	0.571208	0.917777
COD (mg/l)	52	13.45769	12.12761	14.78778	13.55	699.8	5	33	10.45	15.65	28	5.2	22.82523	4.777576	0.662531	1.551827	0.330414	4.788675	0.650093
Cyanide (mg/l)	51	0.006098	0.005613	0.006583	0.005	0.311	0.005	0.013	0.005	0.007	0.008	0.002	3E-06	0.001723	0.000241	2.038451	0.333464	4.520369	0.65592
Nitrate (mg/l as N)	52	1.380769	1.250883	1.510656	1.35	71.8	0.3	2.8	1.1	1.6	2.5	0.5	0.217662	0.466543	0.064698	0.589342	0.330414	1.50364	0.650093
Total Phosphorus (mg/l as P)	52	0.067981	0.058156	0.077805	0.06	3.535	0.015	0.23	0.05	0.07	0.215	0.02	0.001245	0.03529	0.004894	2.577001	0.330414	9.133045	0.650093
Total Solids (mg/l)	51	320.451	306.6559	334.246	321	16343	165	420	289	354	255	65	2405.733	49.04827	6.868131	-0.39496	0.333464	0.890596	0.65592
Suspended Solids (mg/l)	51	7.803922	5.432681	10.17516	6	398	2	56	4	9	54	5	71.08078	8.430942	1.180568	4.073626	0.333464	21.45721	0.65592
Dissolved Solids (mg/l)	51	299.6471	287.7803	311.5138	305	15282	170	386	274	319	216	45	1780.193	42.19233	5.908108	-0.35912	0.333464	0.664698	0.65592
Sulfate (mg/l)	0																		
TKN (mg/l as N)	52	1.045192	0.939386	1.150999	1	54.35	0.05	2.2	0.8	1.3	2.15	0.5	0.144437	0.380049	0.052703	0.43543	0.330414	1.003823	0.650093
E. coli (CFU/100ml)	48	357.5	174.4284	540.5716	75	17160	5	3400	20	450	3395	430	397502.1	630.4777	91.00162	3.157087	0.343149	12.00714	0.674397
TOC (mg/l)	0																		
Hardness (mg/l)	51	182.7843	175.074	190.4947	182	9322	112	240	168	201	128	33	751.5325	27.41409	3.838741	-0.3436	0.333464	0.092907	0.65592
Chloride (mg/l)	51	50.13725	46.56542	53.70909	51	2557	12	83	42	59	71	17	161.2808	12.69964	1.778305	-0.18033	0.333464	0.904538	0.65592
Dissolved Oxygen (mg/l)	48	7.695208	7.179104	8.211313	7.64	369.37	4.8	12.39	6.3	8.92	7.59	2.62	3.15917	1.777405	0.256546	0.404015	0.343149	-0.39379	0.674397
pH	46	7.79087	7.708769	7.872971	7.78	358.38	6.99	8.36	7.57	7.95	1.37	0.38	0.076435	0.276468	0.040763	-0.02053	0.350096	0.435181	0.687628
Copper (ug/l)	52	4.403846	3.858544	4.949148	4.65	229	2	12	2	5.2	10	3.2	3.836456	1.958687	0.271621	1.078256	0.330414	3.333563	0.650093
Iron (ug/l)	52	674.4038	552.1216	796.6861	545	35069	89	2600	420	850	2511	430	192922.6	439.2296	60.91018	2.108245	0.330414	6.442835	0.650093
Zinc (ug/l)	52	35	25.45456	44.54544	30	1820	5	260	20	40	255	20	1175.569	34.28657	4.754691	5.744457	0.330414	37.77755	0.650093

Station: IHC-0

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	68	116.1618	113.0156	119.3079	113	7899	82	165	108	124	83	16	168.9436	12.99783	1.576218	0.942839	0.290765	2.366094	0.574005
Ammonia (mg/l as N)	69	0.346377	0.288029	0.404725	0.3	23.9	0.05	1.2	0.2	0.5	1.15	0.3	0.058994	0.242887	0.02924	0.942778	0.288737	0.907342	0.570095
BOD (mg/l)	32	1.31875	0.905289	1.732211	1.1	42.2	0.5	5.5	0.5	1.55	5	1.05	1.315121	1.146787	0.202725	2.304636	0.414457	5.955717	0.809371
COD (mg/l)	69	10.7	9.726513	11.67349	9.9	738.3	2.5	23	8	12	20.5	4	16.42176	4.052378	0.487849	1.235713	0.288737	1.719152	0.570095
Cyanide (mg/l)	68	0.006147	0.005373	0.006921	0.005	0.418	0.005	0.029	0.005	0.006	0.024	0.001	1E-05	0.003196	0.000388	5.795543	0.290765	39.8584	0.574005
Nitrate (mg/l as N)	69	1.007246	0.921784	1.092709	0.9	69.5	0.3	2.2	0.8	1.2	1.9	0.4	0.126564	0.355759	0.042828	0.756086	0.288737	0.978514	0.570095
Total Phosphorus (mg/l as P)	69	0.047464	0.041481	0.053447	0.04	3.275	0.015	0.14	0.03	0.06	0.125	0.03	0.00062	0.024906	0.002998	1.209858	0.288737	2.080849	0.570095
Total Solids (mg/l)	68	291.1324	278.2796	303.9852	281	19797	182	429	254.5	324.5	247	70	2819.549	53.09943	6.439252	0.520774	0.290765	0.081106	0.574005
Suspended Solids (mg/l)	68	7.602941	5.841951	9.363932	6	517	2	41	2	9	39	7	52.92954	7.275269	0.882256	2.927782	0.290765	10.97626	0.574005
Dissolved Solids (mg/l)	68	271.5147	259.3714	283.658	261	18463	176	403	238	304	227	66	2516.851	50.16822	6.083791	0.659023	0.290765	0.233465	0.574005
Sulfate (mg/l)	3	46.66667	38.68128	54.65205	48	140	43	49			6		10.33333	3.21455	1.855921	-1.54539	1.224745		
TKN (mg/l as N)	69	0.782464	0.697357	0.867571	0.8	53.99	0.3	1.9	0.5	1	1.6	0.5	0.125513	0.354278	0.04265	0.896516	0.288737	0.82706	0.570095
E. coli (CFU/100ml)	65	168.2308	90.645	245.8165	60	10935	5	1900	20	160	1895	140	98040.18	313.1137	38.83697	3.677958	0.297116	15.74475	0.586236
TOC (mg/l)	0																		
Hardness (mg/l)	68	171	165.0991	176.9009	168	11628	116	232	156	186.5	116	30.5	594.3284	24.37885	2.95637	0.157168	0.290765	0.238658	0.574005
Chloride (mg/l)	68	43.98529	39.97961	47.99098	40.5	2991	14	92	32	52.5	78	20.5	273.8655	16.54888	2.006847	0.929563	0.290765	0.534818	0.574005
Dissolved Oxygen (mg/l)	54	8.397407	8.022213	8.772602	8.3	453.46	5.4	12.65	7.64	8.9	7.25	1.26	1.889537	1.374604	0.18706	0.721775	0.324556	1.958578	0.638893
pH	53	7.946038	7.863696	8.02838	7.98	421.14	7.02	8.48	7.81	8.14	1.46	0.33	0.089244	0.298737	0.041035	-1.06772	0.327446	1.644963	0.64442
Copper (ug/l)	69	4.055072	3.576167	4.533977	4	279.8	2	10	2	5	8	3	3.974275	1.993558	0.239996	0.74175	0.288737	0.068168	0.570095
Iron (ug/l)	69	506.7536	388.1432	625.364	370	34966	56	3300	240	600	3244	360	243783.7	493.7445	59.43986	3.637605	0.288737	17.05719	0.570095
Zinc (ug/l)	69	36.88406	31.30649	42.46163	30	2545	10	170	20	41	160	21	539.0746	23.21798	2.795116	3.330516	0.288737	15.97474	0.570095

Station: IHC-3W

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	78	129.1538	125.0859	133.2218	127	10074	104	228	117	136	124	19	325.5345	18.04257	2.042919	2.407191	0.272211	10.7782	0.538176
Ammonia (mg/l as N)	79	0.596835	0.521722	0.671949	0.6	47.15	0.05	1.7	0.3	0.8	1.65	0.5	0.112458	0.335347	0.03773	0.804961	0.270545	0.463388	0.534952
BOD (mg/l)	37	2.078378	1.710936	2.445821	1.7	76.9	0.5	5.7	1.3	2.6	5.2	1.3	1.21452	1.102052	0.181176	1.306412	0.387589	2.049851	0.758719
COD (mg/l)	79	14.48608	13.42961	15.54254	14	1144.4	7.3	32	11	17	24.7	6	22.24634	4.716603	0.530659	1.085465	0.270545	1.887441	0.534952
Cyanide (mg/l)	78	0.006603	0.00603	0.007175	0.006	0.515	0.005	0.019	0.005	0.008	0.014	0.003	6.5E-06	0.00254	0.000288	2.925787	0.272211	10.36497	0.538176
Nitrate (mg/l as N)	79	1.501266	1.426503	1.576028	1.5	118.6	0.6	2.2	1.3	1.7	1.6	0.4	0.111409	0.333779	0.037553	-0.03891	0.270545	-0.24916	0.534952
Total Phosphorus (mg/l as P)	79	0.06	0.054256	0.065744	0.06	4.74	0.015	0.14	0.04	0.07	0.125	0.03	0.000658	0.025646	0.002885	0.979094	0.270545	1.381617	0.534952
Total Solids (mg/l)	78	338.1795	326.8807	349.4783	337.5	26378	210	434	296	375	224	79	2511.344	50.11331	5.674215	0.035263	0.272211	-0.66166	0.538176
Suspended Solids (mg/l)	78	6.089744	5.124118	7.055369	5.5	475	2	21	2	8	19	6	18.34249	4.282813	0.484933	1.298764	0.272211	1.862472	0.538176
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	1	57				57	57	57											
TKN (mg/l as N)	79	1.261646	1.156498	1.366793	1.2	99.67	0.6	2.8	0.9	1.5	2.2	0.6	0.220368	0.469433	0.052815	1.121311	0.270545	1.568051	0.534952
E. coli (CFU/100ml)	74	215.473	131.9688	298.9771	50	15945	5	1700	10	210	1695	200	129907.6	360.427	41.89879	2.294019	0.279197	4.830042	0.551684
TOC (mg/l)	0																		
Hardness (mg/l)	78	189.0128	182.6981	195.3276	186.5	14743	128	292	173	205	164	32	784.4284	28.00765	3.171242	0.501236	0.272211	1.437064	0.538176
Chloride (mg/l)	78	53.19231	49.85147	56.53315	51.5	4149	24	110	42	64	86	22	219.5599	14.81756	1.677758	0.771099	0.272211	1.591089	0.538176
Dissolved Oxygen (mg/l)	59	7.66678	7.260884	8.072675	7.71	452.34	4.5	12.41	6.6	8.8	7.91	2.2	2.425912	1.557534	0.202774	0.225504	0.311176	0.319298	0.613257
pH	58	7.742586	7.655257	7.829915	7.785	449.07	6.97	8.46	7.55	7.93	1.49	0.38	0.110311	0.332131	0.043611	-0.28603	0.31372	-0.09724	0.618136
Copper (ug/l)	3	4.466667	-1.74533	10.67867	4.4	13.4	2	7			5		6.253333	2.500667	1.443761	0.119883	1.224745		
Iron (ug/l)	78	562.0513	500.3315	623.7711	495	43840	180	1500	350	710	1320	360	74936	273.7444	30.99545	1.153941	0.272211	1.706369	0.538176
Zinc (ug/l)	3	26	17.39469	34.60531	24	78	24	30			6		12	3.464102	2	1.732051	1.224745		

Station: IHC-3S

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	75	127.08	122.0211	132.1389	122	9531	102	266	117	133	164	16	483.453	21.98756	2.538905	3.877297	0.2774	21.47602	0.548211
Ammonia (mg/l as N)	77	0.630519	0.545352	0.715687	0.6	48.55	0.05	2.2	0.4	0.8	2.15	0.4	0.1408	0.375233	0.042762	1.386014	0.273908	2.954362	0.54146
BOD (mg/l)	36	2.302778	1.875674	2.729881	2.05	82.9	0.5	6.6	1.45	2.8	6.1	1.35	1.593421	1.262308	0.210385	1.444124	0.392544	2.927543	0.768076
COD (mg/l)	77	15.55195	14.1424	16.96149	14.9	1197.5	8.2	40	11.6	17.5	31.8	5.9	38.56674	6.210213	0.707719	1.808545	0.273908	4.157487	0.54146
Cyanide (mg/l)	76	0.006908	0.006338	0.007478	0.006	0.525	0.005	0.014	0.005	0.008	0.009	0.003	6.2E-06	0.002494	0.000286	1.405914	0.275637	0.977166	0.544804
Nitrate (mg/l as N)	77	1.475325	1.382312	1.568338	1.5	113.6	0.4	2.4	1.2	1.7	2	0.5	0.167936	0.4098	0.046701	-0.05948	0.273908	-0.04926	0.54146
Total Phosphorus (mg/l as P)	77	0.066429	0.058629	0.074228	0.06	5.115	0.015	0.18	0.05	0.08	0.165	0.03	0.001181	0.034363	0.003916	1.045082	0.273908	1.203163	0.54146
Total Solids (mg/l)	75	328.64	316.1474	341.1326	319	24648	207	447	291	365	240	74	2948.179	54.29714	6.269694	0.163886	0.2774	-0.5556	0.548211
Suspended Solids (mg/l)	75	9.226667	7.472163	10.98117	8	692	2	44	4	12	42	8	58.15063	7.625656	0.880535	1.944127	0.2774	5.67007	0.548211
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	1	50				50	50	50											
TKN (mg/l as N)	77	1.258442	1.140082	1.376801	1.2	96.9	0.6	3.2	0.8	1.6	2.6	0.8	0.271934	0.521473	0.059427	1.083719	0.273908	1.406593	0.54146
E. coli (CFU/100ml)	71	2890.423	375.7298	5405.115	210	205220	5	84000	40	1700	83995	1660	1.1E+08	10624.14	1260.853	6.773621	0.284805	50.33825	0.562511
TOC (mg/l)	0																		
Hardness (mg/l)	75	184.96	178.2611	191.6589	180	13872	120	304	166	202	184	36	847.7146	29.11554	3.361973	0.862727	0.2774	2.683621	0.548211
Chloride (mg/l)	74	50.36486	46.70617	54.02356	48	3727	17	97	40	59	80	19	249.3856	15.79195	1.835777	0.654208	0.279197	0.323957	0.551684
Dissolved Oxygen (mg/l)	58	7.537414	7.071731	8.003097	7.65	437.17	4.4	12.01	6.08	8.9	7.61	2.82	3.136742	1.771085	0.232555	0.10418	0.31372	-0.732	0.618136
pH	57	7.724912	7.643548	7.806277	7.7	440.32	7.1	8.38	7.55	7.87	1.28	0.32	0.094033	0.306647	0.040616	0.260025	0.316327	-0.19142	0.623134
Copper (ug/l)	1	5				5	5	5											
Iron (ug/l)	76	818.0263	713.0556	922.997	740	62170	220	2400	490	975	2180	485	211021.4	459.3706	52.69343	1.387213	0.275637	2.095469	0.544804
Zinc (ug/l)	2	18019	-210451	246489.3	18019	36038	38	36000			35962		6.5E+08	25428.97	17981				

Station: LCR-13

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	101	214.9802	204.4577	225.5027	224	21713	78	322	180	262	244	82	2841.12	53.30215	5.303763	-0.24399	0.240216	-0.38113	0.476065
Ammonia (mg/l as N)	103	0.32767	0.287502	0.367838	0.3	33.75	0.05	1.1	0.2	0.4	1.05	0.2	0.042242	0.205528	0.020251	1.29013	0.237938	2.844961	0.471627
BOD (mg/l)	50	2.476	2.091072	2.860928	2.3	123.8	0.5	5.6	1.6	3.7	5.1	2.1	1.834514	1.354442	0.191547	0.264359	0.336601	-0.78652	0.661908
COD (mg/l)	103	31.49806	29.28832	33.7078	30	3244.3	10	100	26	35	90	9	127.8374	11.30652	1.114065	2.706635	0.237938	13.41784	0.471627
Cyanide (mg/l)	101	0.012891	0.010301	0.015481	0.008	1.302	0.005	0.08	0.005	0.014	0.075	0.009	0.000172	0.013121	0.001306	2.749657	0.240216	8.892913	0.476065
Nitrate (mg/l as N)	103	3.131068	2.790266	3.47187	2.9	322.5	0.05	9.2	1.9	4	9.15	2.1	3.040741	1.743772	0.171819	1.38021	0.237938	2.377602	0.471627
Total Phosphorus (mg/l as P)	103	0.467573	0.399552	0.535594	0.36	48.16	0.04	1.85	0.24	0.6	1.81	0.36	0.121132	0.348041	0.034293	1.570354	0.237938	3.202925	0.471627
Total Solids (mg/l)	99	794.6465	739.4535	849.8394	720	78670	302	1707	611	1010	1405	399	76579.82	276.7306	27.81247	0.998613	0.242561	1.192427	0.48063
Suspended Solids (mg/l)	101	55.66337	43.03469	68.29204	36	5622	7	468	18	63	461	45	4092.286	63.97097	6.36535	3.458033	0.240216	17.15935	0.476065
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	99	2794.949	1936.187	3653.712	1200	276700	5	25000	440	3500	24995	3060	1.9E+07	4305.727	432.7418	3.133057	0.242561	10.92653	0.48063
TOC (mg/l)	0																		
Hardness (mg/l)	101	356.6832	336.8879	376.4785	359	36025	86	600	300	424	514	124	10054.84	100.2738	9.977618	-0.00377	0.240216	0.365795	0.476065
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	58	8.220172	7.610201	8.830143	8.41	476.77	2.42	12.23	6.65	10.11	9.81	3.46	5.381661	2.319841	0.30461	-0.63267	0.31372	-0.07252	0.618136
pH	57	7.761053	7.666437	7.855669	7.76	442.38	6.8	8.45	7.52	7.98	1.65	0.46	0.127156	0.356589	0.047231	-0.1155	0.316327	-0.21456	0.623134
Copper (ug/l)	1	2				2	2	2											
Iron (ug/l)	1	820				820	820	820											
Zinc (ug/l)	1	32				32	32	32											

Station: LM-EC

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	71	113.169	110.5863	115.7517	112	8035	73	150	108	115	77	7	119.0567	10.91131	1.294935	0.858225	0.284805	5.481511	0.562511
Ammonia (mg/l as N)	72	0.059722	0.044366	0.075078	0.05	4.3	0.05	0.6	0.05	0.05	0.55	0	0.00427	0.065348	0.007701	8.194089	0.282898	68.4892	0.558831
BOD (mg/l)	35	0.591429	0.510066	0.672792	0.5	20.7	0.5	1.4	0.5	0.5	0.9	0	0.056101	0.236856	0.040036	2.502689	0.397694	5.248277	0.777794
COD (mg/l)	72	7.623611	6.175289	9.071933	6	548.9	2.5	46	3.75	9	43.5	5.25	37.98718	6.163374	0.726361	3.718759	0.282898	20.71789	0.558831
Cyanide (mg/l)	71	0.005155	0.005007	0.005303	0.005	0.366	0.005	0.009	0.005	0.005	0.004	0	3.9E-07	0.000624	7.4E-05	4.591026	0.284805	22.85668	0.562511
Nitrate (mg/l as N)	72	0.338889	0.304835	0.372943	0.3	24.4	0.2	1.4	0.3	0.4	1.2	0.1	0.021002	0.144919	0.017079	5.596712	0.282898	41.09103	0.558831
Total Phosphorus (mg/l as P)	72	0.021528	0.01768	0.025375	0.015	1.55	0.015	0.09	0.015	0.015	0.075	0	0.000268	0.016372	0.00193	2.654008	0.282898	6.567298	0.558831
Total Solids (mg/l)	71	195	186.9281	203.0719	188	13845	165	346	176	196	181	20	1162.971	34.10237	4.047206	2.953807	0.284805	10.06592	0.562511
Suspended Solids (mg/l)	15	31.06667	6.937449	55.19588	12	466	2	166	6	43	164	37	1898.495	43.57173	11.25017	2.492055	0.580119	6.714734	1.120897
Dissolved Solids (mg/l)	70	174.9286	167.7081	182.149	170	12245	144	343	164	176	199	12	916.9948	30.28192	3.619382	4.71038	0.28675	24.28818	0.566265
Sulfate (mg/l)	71	25.70423	24.51172	26.89673	25	1825	21	64	24	26	43	2	25.3827	5.038124	0.597915	6.451093	0.284805	48.935	0.562511
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	69	11.66667	3.767012	19.56632	5	805	5	240	5	5	235	0	1081.373	32.88423	3.958796	5.90392	0.288737	37.19506	0.570095
TOC (mg/l)	0																		
Hardness (mg/l)	71	143.7606	140.4205	147.1006	143	10207	106	194	136	150	88	14	199.1276	14.11126	1.674698	0.818354	0.284805	2.876462	0.562511
Chloride (mg/l)	71	12.64789	11.39343	13.90234	12	898	9	55	11	13	46	2	28.08853	5.299861	0.628978	7.502795	0.284805	60.38367	0.562511
Dissolved Oxygen (mg/l)	0																		
pH	0																		
Copper (ug/l)	72	13.29861	9.812315	16.78491	11	957.5	2	120	8	13	118	5	220.1077	14.83603	1.748443	6.038305	0.282898	40.36213	0.558831
Iron (ug/l)	5	268.2	56.76609	479.6339	340	1341	21	460	180	340	439	160	28996.2	170.2827	76.15274	-0.67475	0.912871	-0.26739	2
Zinc (ug/l)	72	7.944444	5.916135	9.972754	5	572	2.25	70	5	10	67.75	5	74.50328	8.631528	1.017235	5.52345	0.282898	38.14558	0.558831

Station: LCR-39

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	73	222.1507	212.417	231.8844	230	16217	92	328	198	251	236	53	1740.463	41.71886	4.882823	-0.62896	0.281029	0.68194	0.555223
Ammonia (mg/l as N)	74	0.098649	0.07891	0.118387	0.05	7.3	0.05	0.4	0.05	0.1	0.35	0.05	0.007258	0.085196	0.009904	1.938603	0.279197	3.324226	0.551684
BOD (mg/l)	34	1.438235	1.057466	1.819005	1.2	48.9	0.5	4.2	0.5	2	3.7	1.5	1.190918	1.091292	0.187155	1.001186	0.403053	0.041254	0.787898
COD (mg/l)	1	10				10	10	10											
Cyanide (mg/l)	2	0.007	-0.01841	0.032412	0.007	0.014	0.005	0.009			0.004		8E-06	0.002828	0.002				
Nitrate (mg/l as N)	74	17.62973	-14.651	49.91051	1.3	1304.6	0.4	1200	1	1.8	1199.6	0.8	19413.61	139.3327	16.1971	8.601919	0.279197	73.99528	0.551684
Total Phosphorus (mg/l as P)	74	0.098311	0.083121	0.113501	0.08	7.275	0.015	0.38	0.05	0.13	0.365	0.08	0.004299	0.065565	0.007622	2.015587	0.279197	5.373217	0.551684
Total Solids (mg/l)	72	453.4028	436.1009	470.7047	455	32645	266	702	422.5	476	436	53.5	5421.174	73.62862	8.677216	0.517488	0.282898	2.732139	0.558831
Suspended Solids (mg/l)	73	24.38356	19.55969	29.20743	18	1780	2	84	8	29	82	21	427.4619	20.67515	2.419844	1.358212	0.281029	1.289107	0.555223
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	71	871.9437	502.5607	1241.327	300	61908	5	9700	120	780	9695	660	2435406	1560.579	185.2066	3.501163	0.284805	15.1063	0.562511
TOC (mg/l)	0																		
Hardness (mg/l)	73	295.6301	282.9662	308.2941	307	21581	122	410	259	332	288	73	2946.07	54.27771	6.352725	-0.9019	0.281029	1.375694	0.555223
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	56	9.303929	8.831267	9.77659	9.085	521.02	6	13.44	7.83	10.465	7.44	2.635	3.115112	1.764968	0.235854	0.358321	0.319	-0.54378	0.628256
pH	55	7.884	7.808828	7.959172	7.94	433.62	7.01	8.38	7.69	8.07	1.37	0.38	0.077321	0.278066	0.037494	-0.79807	0.321742	0.790541	0.633507
Copper (ug/l)	1	2				2	2	2											
Iron (ug/l)	0																		
Zinc (ug/l)	1	10				10	10	10											

Station: LM-H

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	77	111.5844	109.0865	114.0823	110	8592	65	158	107	115	93	8	121.1145	11.0052	1.254159	0.255051	0.273908	8.51709	0.54146
Ammonia (mg/l as N)	79	0.051266	0.049495	0.053036	0.05	4.05	0.05	0.1	0.05	0.05	0.05	0	6.2E-05	0.007904	0.000889	6.161281	0.270545	36.89509	0.534952
BOD (mg/l)	36	0.555556	0.46716	0.643951	0.5	20	0.5	2	0.5	0.5	1.5	0	0.068254	0.261255	0.043542	5.251938	0.392544	28.70606	0.768076
COD (mg/l)	79	7.187342	6.240939	8.133744	6.9	567.8	2.5	25	5	8.8	22.5	3.8	17.85266	4.225241	0.475377	1.58143	0.270545	4.147776	0.534952
Cyanide (mg/l)	78	0.005103	0.004922	0.005283	0.005	0.398	0.005	0.012	0.005	0.005	0.007	0	6.4E-07	0.000799	9E-05	8.585402	0.272211	74.799	0.538176
Nitrate (mg/l as N)	79	0.291772	0.272505	0.31104	0.3	23.05	0.05	0.6	0.2	0.3	0.55	0.1	0.007399	0.08602	0.009678	0.509721	0.270545	1.454084	0.534952
Total Phosphorus (mg/l as P)	79	0.021203	0.016765	0.02564	0.015	1.675	0.015	0.14	0.015	0.015	0.125	0	0.000392	0.01981	0.002229	4.00438	0.270545	18.31075	0.534952
Total Solids (mg/l)	77	186.4416	182.4219	190.4612	185	14356	143	284	176	194	141	18	313.6446	17.71001	2.018243	2.148254	0.273908	11.58028	0.54146
Suspended Solids (mg/l)	9	9	4.19967	13.80033	9	81	2	21	4	11	19	7	39	6.244998	2.081666	0.748291	0.717137	0.270076	1.399708
Dissolved Solids (mg/l)	77	167.6688	162.8215	172.5162	171	12910.5	57	204	165	178	147	13	456.1027	21.35656	2.433806	-3.21444	0.273908	13.32206	0.54146
Sulfate (mg/l)	77	25.28571	24.87429	25.69714	25	1947	21	33	24	26	12	2	3.285714	1.812654	0.206571	0.676278	0.273908	3.662927	0.54146
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	74	20.67568	-5.45059	46.80194	5	1530	5	960	5	5	955	0	12716.66	112.7682	13.10903	8.181987	0.279197	68.54574	0.551684
TOC (mg/l)	0																		
Hardness (mg/l)	77	141.4416	138.529	144.3542	141	10891	112	176	136	148	64	12	164.6709	12.83242	1.462389	0.187623	0.273908	0.881284	0.54146
Chloride (mg/l)	77	12.61039	12.16222	13.05856	12	971	10	21	11	13	11	2	3.898838	1.974548	0.225021	1.584342	0.273908	4.086302	0.54146
Dissolved Oxygen (mg/l)	1	7.2				7.2	7.2	7.2											
pH	1	8.26				8.26	8.26	8.26											
Copper (ug/l)	79	28.16456	24.70357	31.62555	27	2225	2	77	15	38	75	23	238.7546	15.45169	1.738451	0.640836	0.270545	0.646313	0.534952
Iron (ug/l)	10	112.5	40.3334	184.6666	81.5	1125	10	350	40	150	340	110	10177.17	100.8819	31.90167	1.62526	0.687043	2.874872	1.334249
Zinc (ug/l)	79	14.44177	7.896297	20.98725	5.3	1140.9	2.25	180	5	10	177.75	5	853.9525	29.22247	3.287784	4.41516	0.270545	20.67199	0.534952

Station: LM-G

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	75	112.7867	109.6718	115.9015	110	8459	75	196	108	117	121	9	183.2782	13.53803	1.563237	3.020041	0.2774	20.1904	0.548211
Ammonia (mg/l as N)	76	0.051974	0.048042	0.055905	0.05	3.95	0.05	0.2	0.05	0.05	0.15	0	0.000296	0.017206	0.001974	8.717798	0.275637	76	0.544804
BOD (mg/l)	35	0.5			0.5	17.5	0.5	0.5	0.5	0.5	0	0	0	0	0				
COD (mg/l)	76	6.430263	5.80354	7.056986	6	488.7	2.5	13	5	8	10.5	3	7.522139	2.742652	0.314604	0.238565	0.275637	-0.3548	0.544804
Cyanide (mg/l)	76	0.005013	0.004987	0.005039	0.005	0.381	0.005	0.006	0.005	0.005	0.001	0	1.3E-08	0.000115	1.3E-05	8.717798	0.275637	76	0.544804
Nitrate (mg/l as N)	76	0.307895	0.284964	0.330826	0.3	23.4	0.2	0.8	0.25	0.3	0.6	0.05	0.01007	0.10035	0.011511	2.277549	0.275637	9.126875	0.544804
Total Phosphorus (mg/l as P)	76	0.016974	0.014361	0.019586	0.015	1.29	0.015	0.11	0.015	0.015	0.095	0	0.000131	0.011433	0.001311	7.523424	0.275637	60.46756	0.544804
Total Solids (mg/l)	75	187.0133	182.5119	191.5147	182	14026	145	292	174	195	147	21	382.7701	19.56451	2.259115	2.39143	0.2774	10.63887	0.548211
Suspended Solids (mg/l)	75	9.16	6.511175	11.80883	4	687	2	58	2	13	56	11	132.5416	11.51267	1.329369	2.514309	0.2774	7.338384	0.548211
Dissolved Solids (mg/l)	75	169.2133	166.0604	172.3663	170	12691	110	230	164	176	120	12	187.7917	13.70371	1.582368	0.071772	0.2774	8.994033	0.548211
Sulfate (mg/l)	75	24.45333	23.88812	25.01855	24	1834	21	38	23	26	17	3	6.034955	2.456615	0.283665	2.445746	0.2774	11.3491	0.548211
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	72	28.75694	0.009852	57.50404	5	2070.5	0.5	750	5	5	749.5	0	14965.62	122.334	14.41721	5.452624	0.282898	29.47627	0.558831
TOC (mg/l)	0																		
Hardness (mg/l)	75	143.0933	140.1698	146.0169	142	10732	112	202	136	150	90	14	161.4641	12.70685	1.467261	0.99858	0.2774	5.391699	0.548211
Chloride (mg/l)	75	12.10667	11.62886	12.58448	12	908	9	25	11	13	16	2	4.312793	2.076726	0.2398	3.351048	0.2774	19.20652	0.548211
Dissolved Oxygen (mg/l)	0																		
pH	0																		
Copper (ug/l)	75	48.69333	33.31111	64.07556	38	3652	2	580	24	57	578	33	4469.756	66.85623	7.719893	6.955402	0.2774	55.37784	0.548211
Iron (ug/l)	8	264.625	-10.7798	540.0298	153	2117	10	970	45.5	370	960	324.5	108519.7	329.4233	116.4687	1.726936	0.752101	2.718622	1.48088
Zinc (ug/l)	75	6.582667	5.736984	7.42835	5	493.7	2.25	20	5	10	17.75	5	13.51017	3.675618	0.424424	1.287075	0.2774	2.804601	0.548211

Station: LM-W

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	75	112.04	109.6862	114.3938	112	8403	69	148	108	116	79	8	104.6605	10.23037	1.181302	-0.26899	0.2774	6.011415	0.548211
Ammonia (mg/l as N)	75	0.052	0.049731	0.054269	0.05	3.9	0.05	0.1	0.05	0.05	0.05	0	9.7E-05	0.009864	0.001139	4.791217	0.2774	21.52936	0.548211
BOD (mg/l)	36	0.588889	0.487616	0.690161	0.5	21.2	0.5	1.6	0.5	0.5	1.1	0	0.089587	0.299311	0.049885	3.159599	0.392544	8.479981	0.768076
COD (mg/l)	75	6.681333	5.865478	7.497189	6	501.1	2.5	19.2	5	8	16.7	3	12.57397	3.54598	0.409454	1.68185	0.2774	3.976735	0.548211
Cyanide (mg/l)	74	0.005081	0.004968	0.005195	0.005	0.376	0.005	0.009	0.005	0.005	0.004	0	2.4E-07	0.00049	5.7E-05	7.392469	0.279197	58.1877	0.551684
Nitrate (mg/l as N)	75	0.313333	0.291825	0.334841	0.3	23.5	0.2	0.6	0.2	0.4	0.4	0.2	0.008739	0.093481	0.010794	0.849019	0.2774	0.951211	0.548211
Total Phosphorus (mg/l as P)	75	0.0172	0.0151	0.0193	0.015	1.29	0.015	0.07	0.015	0.015	0.055	0	8.3E-05	0.009125	0.001054	4.579857	0.2774	21.5956	0.548211
Total Solids (mg/l)	75	190.8533	184.7192	196.9874	186	14314	118	324	178	198	206	20	710.8025	26.66088	3.078533	2.361416	0.2774	10.01896	0.548211
Suspended Solids (mg/l)	11	22	-12.4829	56.48286	7	242	2	176	2	12	174	10	2634.6	51.32835	15.47608	3.25829	0.660687	10.71215	1.279416
Dissolved Solids (mg/l)	74	173.1486	168.3821	177.9152	173.5	12813	82	284	166	181	202	15	423.279	20.57374	2.391649	0.798351	0.279197	15.67614	0.551684
Sulfate (mg/l)	74	25.87838	25.39642	26.36033	26	1915	22	31	24	27	9	3	4.327471	2.080258	0.241825	0.128864	0.279197	-0.19765	0.551684
TKN (mg/l as N)	75	0.237467	0.214618	0.260316	0.2	17.81	0.05	0.8	0.2	0.3	0.75	0.1	0.009862	0.09931	0.011467	2.612148	0.2774	13.17689	0.548211
E. coli (CFU/100ml)	72	10.625	2.226271	19.02373	5	765	5	300	5	5	295	0	1277.421	35.74102	4.21212	7.791329	0.282898	62.94784	0.558831
TOC (mg/l)	2	8.25	7.61469	8.88531	8.25	16.5	8.2	8.3			0.1		0.005	0.070711	0.05				
Hardness (mg/l)	75	143.08	140.2777	145.8823	142	10731	110	192	136	150	82	14	148.3449	12.17969	1.40639	0.686593	0.2774	3.142828	0.548211
Chloride (mg/l)	75	12.89333	12.4354	13.35127	12	967	10	20	12	14	10	2	3.961441	1.990337	0.229824	1.39795	0.2774	2.063611	0.548211
Dissolved Oxygen (mg/l)	0																		
pH	0																		
Copper (ug/l)	74	26.37027	22.62349	30.11705	23	1951.4	4	100	14	34	96	20	261.538	16.17214	1.879973	1.62402	0.279197	5.035456	0.551684
Iron (ug/l)	73	220.0137	143.4218	296.6056	110	16061	10	1900	49	240	1890	191	107763.6	328.2737	38.42153	3.342933	0.281029	12.75608	0.555223
Zinc (ug/l)	73	6.056849	5.134221	6.979478	5	442.15	2.25	20	5	5.3	17.75	0.3	15.63724	3.954396	0.462827	2.054202	0.281029	4.747651	0.555223

Station: LM-M

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	67	114.1194	110.1465	118.0923	110	7646	79	207	107	116	128	9	265.2886	16.28768	1.989857	3.536799	0.292836	17.68499	0.577996
Ammonia (mg/l as N)	69	0.056522	0.049119	0.063924	0.05	3.9	0.05	0.2	0.05	0.05	0.15	0	0.000949	0.030814	0.00371	4.577329	0.288737	19.51704	0.570095
BOD (mg/l)	31	0.593548	0.454055	0.733041	0.5	18.4	0.5	2.4	0.5	0.5	1.9	0	0.144624	0.380294	0.068303	4.286253	0.420536	18.72657	0.820803
COD (mg/l)	69	7.113043	6.412525	7.813562	6.5	490.8	2.5	20	5.6	8	17.5	2.4	8.503504	2.916077	0.351054	1.416457	0.288737	4.990832	0.570095
Cyanide (mg/l)	68	0.005147	0.004978	0.005316	0.005	0.35	0.005	0.009	0.005	0.005	0.004	0	4.9E-07	0.000697	8.4E-05	4.701595	0.290765	21.29967	0.574005
Nitrate (mg/l as N)	69	0.342754	0.270707	0.4148	0.3	23.65	0.05	2.7	0.3	0.4	2.65	0.1	0.089947	0.299911	0.036105	7.316693	0.288737	58.19377	0.570095
Total Phosphorus (mg/l as P)	68	0.017353	0.01456	0.020146	0.015	1.18	0.015	0.1	0.015	0.015	0.085	0	0.000133	0.011541	0.0014	6.124028	0.290765	41.10869	0.574005
Total Solids (mg/l)	67	199.7761	185.1059	214.4463	187	13385	162	514	180	194	352	14	3617.267	60.14372	7.347725	4.308282	0.292836	18.43632	0.577996
Suspended Solids (mg/l)	67	7.597015	5.771662	9.422368	5	509	2	43	2	11	41	9	56.00181	7.483436	0.914247	2.271961	0.292836	7.290759	0.577996
Dissolved Solids (mg/l)	64	176.5938	167.804	185.3835	172	11302	131	442	166.5	179	311	12.5	1238.213	35.18826	4.398532	6.981295	0.299327	53.41901	0.590491
Sulfate (mg/l)	67	25.13433	23.42063	26.84803	25	1684	21	80	23	25	59	2	49.36047	7.025701	0.858326	7.42039	0.292836	58.59177	0.577996
TKN (mg/l as N)	69	0.247826	0.213024	0.282628	0.2	17.1	0.05	0.8	0.2	0.3	0.75	0.1	0.020988	0.144872	0.017441	1.777872	0.288737	3.695959	0.570095
E. coli (CFU/100ml)	68	69.07353	-4.46954	142.6166	5	4697	0.5	2000	5	5	1999.5	0	92314.02	303.8322	36.84507	5.275555	0.290765	28.80247	0.574005
TOC (mg/l)	0																		
Hardness (mg/l)	67	144.9104	138.4957	151.3252	142	9709	106	303	136	147	197	11	691.6282	26.29883	3.212913	4.212855	0.292836	22.3919	0.577996
Chloride (mg/l)	67	13.38806	12.3815	14.39462	13	897	9	44	12	14	35	2	17.02895	4.126614	0.504146	6.333517	0.292836	47.18482	0.577996
Dissolved Oxygen (mg/l)	0																		
pH	0																		
Copper (ug/l)	69	2.813043	2.002052	3.624035	2	194.1	2	29	2	2	27	0	11.39703	3.375949	0.406417	7.110118	0.288737	55.0679	0.570095
Iron (ug/l)	69	187.2464	136.3953	238.0974	110	12920	10	1000	50	230	990	180	44808.34	211.6798	25.48325	1.901727	0.288737	3.454645	0.570095
Zinc (ug/l)	69	7.081884	5.945464	8.218304	5	488.65	2.25	30	4.6	10	27.75	5.4	22.37882	4.730626	0.5695	2.008862	0.288737	7.430495	0.570095

Station: SLC-17

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	74	229.4865	218.9336	240.0394	242.5	16982	96	328	199	263	232	64	2074.746	45.54938	5.295008	-0.71586	0.279197	0.10421	0.551684
Ammonia (mg/l as N)	74	0.103514	0.085636	0.121391	0.05	7.66	0.01	0.3	0.05	0.1	0.29	0.05	0.005955	0.077166	0.00897	1.311751	0.279197	0.637355	0.551684
BOD (mg/l)	33	1.336364	0.969491	1.703236	1	44.1	0.5	4	0.5	1.7	3.5	1.2	1.070511	1.034655	0.18011	1.234024	0.408635	0.509689	0.798414
COD (mg/l)	73	19.9726	18.42981	21.51539	19.2	1458	9	41.2	14.7	24	32.2	9.3	43.72396	6.61241	0.773924	0.69327	0.281029	0.351398	0.555223
Cyanide (mg/l)	7	0.005			0.005	0.035	0.005	0.005	0.005	0.005	0	0	0	0	0				
Nitrate (mg/l as N)	74	2.564865	2.320234	2.809496	2.5	189.8	0.4	5.4	1.8	3.4	5	1.6	1.114913	1.055894	0.122745	0.264928	0.279197	-0.42227	0.551684
Total Phosphorus (mg/l as P)	74	0.643108	-0.38779	1.674006	0.115	47.59	0.04	38.4	0.08	0.16	38.36	0.08	19.79929	4.449639	0.51726	8.600158	0.279197	73.97477	0.551684
Total Solids (mg/l)	73	516.6301	492.68	540.5802	548	37714	10	649	466	585	639	119	10537.1	102.6504	12.01432	-2.10059	0.281029	7.269429	0.555223
Suspended Solids (mg/l)	74	27.58108	21.68107	33.48109	20.5	2041	2	144	11	35	142	24	648.5207	25.46607	2.960371	2.208412	0.279197	6.375373	0.551684
Dissolved Solids (mg/l)	1	510				510	510	510											
Sulfate (mg/l)	0																		
TKN (mg/l as N)	1	1				1	1	1											
E. coli (CFU/100ml)	73	1118.521	728.5566	1508.485	500	81652	5	8800	220	990	8795	770	2793542	1671.389	195.6213	2.688737	0.281029	7.769889	0.555223
TOC (mg/l)	1	7.9				7.9	7.9	7.9											
Hardness (mg/l)	74	325.6216	310.3487	340.8945	346	24096	128	408	275	380	280	105	4345.718	65.92206	7.663284	-0.81435	0.279197	-0.11441	0.551684
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	57	9.730175	9.248204	10.21215	9.29	554.62	6.14	15.35	8.31	11.1	9.21	2.79	3.299523	1.816459	0.240596	0.591787	0.316327	0.300511	0.623134
pH	56	7.848929	7.761585	7.936272	7.855	439.54	6.86	8.66	7.715	8.005	1.8	0.29	0.106373	0.326149	0.043584	-0.2788	0.319	1.179154	0.628256
Copper (ug/l)	6	4.333333	2.899531	5.767135	4.5	26	2	6	4	5	4	1	1.866667	1.36626	0.557773	-0.88877	0.845154	1.339286	1.740777
Iron (ug/l)	0																		
Zinc (ug/l)	6	15	9.252004	20.748	15	90	10	20	10	20	10	10	30	5.477226	2.236068	2.6E-17	0.845154	-3.33333	1.740777

Station: SLC-1

	Valid N	Mean	Confid -95.000%	Confid +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	72	227.4306	216.0772	238.7839	236.5	16375	84	346	201	264.5	262	63.5	2334.277	48.31435	5.693901	-0.66702	0.282898	0.539278	0.558831
Ammonia (mg/l as N)	73	0.139041	0.10986	0.168222	0.1	10.15	0.05	0.6	0.05	0.2	0.55	0.15	0.015642	0.125068	0.014638	1.79473	0.281029	2.949844	0.555223
BOD (mg/l)	32	1.509375	1.135436	1.883314	1.4	48.3	0.5	5	0.5	1.8	4.5	1.3	1.075716	1.037167	0.183347	1.504431	0.414457	3.044021	0.809371
COD (mg/l)	73	19.63425	17.91515	21.35334	17.8	1433.3	9	38	13.5	24	29	10.5	54.28839	7.368066	0.862367	0.638411	0.281029	-0.45652	0.555223
Cyanide (mg/l)	70	0.005129	0.004952	0.005305	0.005	0.359	0.005	0.011	0.005	0.005	0.006	0	5.5E-07	0.000741	8.9E-05	7.502566	0.28675	59.42078	0.566265
Nitrate (mg/l as N)	73	1.99589	1.724147	2.267633	1.7	145.7	0.4	9.2	1.4	2.3	8.8	0.9	1.356511	1.164693	0.136317	3.470204	0.281029	19.61531	0.555223
Total Phosphorus (mg/l as P)	73	0.123288	0.109486	0.13709	0.12	9	0.015	0.29	0.08	0.16	0.275	0.08	0.003499	0.059156	0.006924	0.686643	0.281029	0.195468	0.555223
Total Solids (mg/l)	71	516.4225	495.6004	537.2447	536	36666	266	660	451	589	394	138	7738.733	87.97007	10.44013	-0.63337	0.284805	-0.15744	0.562511
Suspended Solids (mg/l)	72	34.02778	26.37894	41.67662	25	2450	2	174	11.5	44	172	32.5	1059.492	32.54984	3.836036	2.062796	0.282898	5.29845	0.558831
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	71	875.6408	584.2167	1167.065	470	62170.5	0.5	7100	180	1100	7099.5	920	1515893	1231.216	146.1185	3.053405	0.284805	11.04126	0.562511
TOC (mg/l)	0																		
Hardness (mg/l)	72	318.8056	303.4189	334.1922	336	22954	118	404	274	377	286	103	4287.398	65.47823	7.716683	-0.8116	0.282898	0.183022	0.558831
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	56	9.580893	9.087921	10.07386	9.575	536.53	5.72	14.58	8.3	10.565	8.86	2.265	3.388579	1.840809	0.245989	0.435582	0.319	0.140209	0.628256
pH	55	7.893818	7.803175	7.984462	7.95	434.16	6.79	8.49	7.69	8.13	1.7	0.44	0.112424	0.335297	0.045211	-0.80052	0.321742	0.971377	0.633507
Copper (ug/l)	1	2				2	2	2											
Iron (ug/l)	0																		
Zinc (ug/l)	1	14				14	14	14											

Station: TC-2

	Valid N	Mean	Confid. -95.000%	Confid +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	71	201.3944	194.945	207.8437	208	14299	112	270	183	219	158	36	742.4137	27.24727	3.233656	-0.83794	0.284805	1.418768	0.562511
Ammonia (mg/l as N)	73	0.09863	0.055461	0.1418	0.05	7.2	0.05	1.6	0.05	0.1	1.55	0.05	0.034234	0.185025	0.021656	7.637823	0.281029	62.33459	0.555223
BOD (mg/l)	33	1.163636	0.845272	1.482	1	38.4	0.5	4.5	0.5	1.4	4	0.9	0.806136	0.897851	0.156296	1.908932	0.408635	4.740634	0.798414
COD (mg/l)	73	16.62329	14.81888	18.4277	15.9	1213.5	7	45.3	11	20	38.3	9	59.81042	7.73372	0.905163	1.409811	0.281029	2.483999	0.555223
Cyanide (mg/l)	73	0.00511	0.004961	0.005258	0.005	0.373	0.005	0.01	0.005	0.005	0.005	0	4E-07	0.000636	7.4E-05	6.901494	0.281029	50.88348	0.555223
Nitrate (mg/l as N)	73	0.610274	0.480122	0.740426	0.4	44.55	0.05	3.3	0.4	0.6	3.25	0.2	0.311178	0.557833	0.065289	3.245056	0.281029	11.96954	0.555223
Total Phosphorus (mg/l as P)	72	0.053056	0.044275	0.061836	0.04	3.82	0.015	0.19	0.03	0.07	0.175	0.04	0.001396	0.037365	0.004404	1.361067	0.282898	1.929475	0.558831
Total Solids (mg/l)	71	405.1549	396.1765	414.1333	399	28766	342	632	385	422	290	37	1438.847	37.93214	4.501717	3.071091	0.284805	17.46129	0.562511
Suspended Solids (mg/l)	71	16.07042	12.13827	20.00258	10	1141	2	71	6	18	69	12	275.9807	16.61267	1.971561	1.96189	0.284805	3.427668	0.562511
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	1	0.5				0.5	0.5	0.5											
E. coli (CFU/100ml)	70	1094.729	317.6507	1871.806	355	76631	5	26100	150	650	26095	500	1.1E+07	3258.986	389.5234	6.840411	0.28675	51.82373	0.566265
TOC (mg/l)	0																		
Hardness (mg/l)	71	268.5634	261.1661	275.9607	276	19068	181	318	257	290	137	33	976.7066	31.25231	3.708966	-1.1074	0.284805	0.805458	0.562511
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	56	9.690536	9.287814	10.09326	9.735	542.67	6.7	13.64	8.41	10.775	6.94	2.365	2.261427	1.503804	0.200954	0.351543	0.319	0.070889	0.628256
pH	55	7.841455	7.763166	7.919743	7.88	431.28	7.01	8.46	7.76	8	1.45	0.24	0.083865	0.289594	0.039049	-0.85376	0.321742	1.38987	0.633507
Copper (ug/l)	2	2			2	4	2	2			0		0	0	0				
Iron (ug/l)	2	625	-455.027	1705.027	625	1250	540	710			170		14450	120.2082	85				
Zinc (ug/l)	2	7.5	-24.2655	39.26551	7.5	15	5	10			5		12.5	3.535534	2.5				

Station: TC-1

	Valid N	Mean	Confid. -95.000%	Confid +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	70	179.5	172.8551	186.1449	187	12565	82	226	166	200	144	34	776.6304	27.86809	3.330874	-1.28848	0.28675	1.745666	0.566265
Ammonia (mg/l as N)	72	0.179167	0.123819	0.234514	0.1	12.9	0.05	1.9	0.1	0.2	1.85	0.1	0.055475	0.235532	0.027758	5.89825	0.282898	41.3367	0.558831
BOD (mg/l)	33	1.2	0.948645	1.451355	1.1	39.6	0.5	3	0.5	1.8	2.5	1.3	0.5025	0.708872	0.123399	0.800722	0.408635	-0.20732	0.798414
COD (mg/l)	72	18.02778	16.13639	19.91916	16.5	1298	2.5	45	12.75	20.8	42.5	8.05	64.78372	8.048834	0.948564	1.080842	0.282898	1.351255	0.558831
Cyanide (mg/l)	70	0.005071	0.004997	0.005145	0.005	0.355	0.005	0.007	0.005	0.005	0.002	0	9.6E-08	0.00031	3.7E-05	4.770139	0.28675	24.26931	0.566265
Nitrate (mg/l as N)	72	2.094444	1.899911	2.288978	2.1	150.8	0.2	4.4	1.6	2.55	4.2	0.95	0.685321	0.827841	0.097562	0.310939	0.282898	0.121362	0.558831
Total Phosphorus (mg/l as P)	72	0.092778	0.079895	0.105661	0.08	6.68	0.015	0.35	0.07	0.11	0.335	0.04	0.003006	0.054823	0.006461	2.736028	0.282898	10.63619	0.558831
Total Solids (mg/l)	70	405.7857	392.1025	419.4689	424.5	28405	203	500	396	434	297	38	3293.156	57.38603	6.858942	-1.8963	0.28675	4.205683	0.566265
Suspended Solids (mg/l)	70	17.15714	13.72101	20.59327	13	1201	2	68	6	25	66	19	207.6706	14.41078	1.722418	1.457314	0.28675	1.792354	0.566265
Dissolved Solids (mg/l)	69	370.1783	353.1584	387.1982	388	25542.3	4.3	484	357	408	479.7	51	5019.651	70.8495	8.529277	-2.71127	0.288737	10.54784	0.570095
Sulfate (mg/l)	0																		
TKN (mg/l as N)	2	0.8	-1.74124	3.341241	0.8	1.6	0.6	1			0.4		0.08	0.282843	0.2				
E. coli (CFU/100ml)	70	1356.557	744.8703	1968.244	355	94959	5	13000	140	960	12995	820	6581037	2565.353	306.6183	2.979547	0.28675	9.273143	0.566265
TOC (mg/l)	0																		
Hardness (mg/l)	70	249.1571	239.043	259.2713	265	17441	90	306	229	278	216	49	1799.265	42.41774	5.06989	-1.48876	0.28675	2.111641	0.566265
Chloride (mg/l)	1	14				14	14	14											
Dissolved Oxygen (mg/l)	56	9.5975	9.16663	10.02837	9.535	537.46	6.46	13.22	8.275	10.865	6.76	2.59	2.588601	1.608913	0.215	0.059221	0.319	-0.53642	0.628256
pH	54	7.849815	7.77507	7.92456	7.85	423.89	7.03	8.36	7.7	8.03	1.33	0.33	0.074991	0.273844	0.037265	-0.72705	0.324556	1.105426	0.638893
Copper (ug/l)	12	3.916667	2.604486	5.228848	4	47	2	8	2	5	6	3	4.265152	2.065224	0.596179	0.80174	0.637302	-0.23396	1.232246
Iron (ug/l)	0																		
Zinc (ug/l)	12	17.16667	12.84179	21.49154	20	206	5	30	10.5	20	25	9.5	46.33333	6.806859	1.964971	-0.17256	0.637302	0.092514	1.232246

Station: WL-SL

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	65	107.8154	102.7998	112.831	112	7008	65	159	96	119	94	23	409.7154	20.24143	2.51064	-0.14825	0.297116	0.160216	0.586236
Ammonia (mg/l as N)	66	0.107727	0.078975	0.136479	0.05	7.11	0.01	0.6	0.05	0.2	0.59	0.15	0.013679	0.116959	0.014397	2.636539	0.294953	8.065753	0.582072
BOD (mg/l)	30	1.583333	1.206711	1.959955	1.55	47.5	0.5	4.6	0.5	2	4.1	1.5	1.017299	1.008612	0.184147	1.054306	0.426892	1.422226	0.832746
COD (mg/l)	66	18.63182	16.79664	20.46699	17	1229.7	4	39	13	24	35	11	55.72928	7.465205	0.918903	0.687011	0.294953	-0.13838	0.582072
Cyanide (mg/l)	63	0.005587	0.005016	0.006159	0.005	0.352	0.005	0.018	0.005	0.005	0.013	0	5.1E-06	0.002269	0.000286	4.518454	0.301589	21.00524	0.594841
Nitrate (mg/l as N)	66	0.176667	0.125757	0.227576	0.1	11.66	0.01	1.3	0.05	0.3	1.29	0.25	0.042887	0.207092	0.025491	3.178741	0.294953	13.69193	0.582072
Total Phosphorus (mg/l as P)	66	0.029848	0.025174	0.034523	0.03	1.97	0.015	0.12	0.015	0.04	0.105	0.025	0.000362	0.019014	0.00234	1.961178	0.294953	6.451457	0.582072
Total Solids (mg/l)	65	220.2462	213.1689	227.3234	215	14316	147	332	201	235	185	34	815.7822	28.5619	3.542668	1.016317	0.297116	2.956557	0.586236
Suspended Solids (mg/l)	65	9.338462	7.550416	11.12651	8	607	2	36	4	13	34	9	52.07115	7.216034	0.895039	1.34099	0.297116	2.122097	0.586236
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	61	46.88525	9.000618	84.76987	5	2860	5	900	5	10	895	5	21880.97	147.9222	18.93949	4.489816	0.30627	21.52057	0.603837
TOC (mg/l)	0																		
Hardness (mg/l)	65	137.2	131.1458	143.2542	140	8918	90	186	120	154	96	34	596.975	24.43307	3.03055	-0.09991	0.297116	-0.69111	0.586236
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	52	10.55019	10.1443	10.95609	10.425	548.61	7.5	13.52	9.475	11.48	6.02	2.005	2.125618	1.45795	0.202181	0.294751	0.330414	-0.64521	0.650093
pH	50	8.1586	8.034132	8.283068	8.185	407.93	7.17	8.95	7.87	8.49	1.78	0.62	0.191812	0.437964	0.061937	-0.19599	0.336601	-0.34018	0.661908
Copper (ug/l)	3	5	-7.90796	17.90796	2	15	2	11			9		27	5.196152	3	1.732051	1.224745		
Iron (ug/l)	0																		
Zinc (ug/l)	3	16.66667	-12.0177	45.35102	10	50	10	30			20		133.3333	11.54701	6.666667	1.732051	1.224745		

Station: TC- 5

	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quartile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err. Skewness	Kurtosis	Std.Err. Kurtosis
Alkalinity (mg/l)	72	173.625	166.6225	180.6275	174	12501	112	259	153.5	194.5	147	41	888.0123	29.79954	3.511909	0.054743	0.282898	-0.21429	0.558831
Ammonia (mg/l as N)	73	0.156986	0.100277	0.213696	0.1	11.46	0.01	2.1	0.05	0.2	2.09	0.15	0.059077	0.243057	0.028448	7.28468	0.281029	58.55488	0.555223
BOD (mg/l)	34	1.217647	0.858778	1.576516	0.75	41.4	0.5	4.6	0.5	1.5	4.1	1	1.057861	1.028524	0.17639	1.761652	0.403053	2.849242	0.787898
COD (mg/l)	73	16.23699	14.60885	17.86512	14	1185.3	2.5	35.9	12	19	33.4	7	48.69514	6.97819	0.816735	0.869804	0.281029	0.564676	0.555223
Cyanide (mg/l)	72	0.005278	0.004938	0.005618	0.005	0.38	0.005	0.015	0.005	0.005	0.01	0	2.1E-06	0.001446	0.00017	5.878613	0.282898	35.38749	0.558831
Nitrate (mg/l as N)	73	1.716438	1.56065	1.872227	1.7	125.3	0.6	4.2	1.2	2.1	3.6	0.9	0.445837	0.66771	0.07815	0.776278	0.281029	1.473475	0.555223
Total Phosphorus (mg/l as P)	73	0.073082	0.064775	0.08139	0.07	5.335	0.015	0.25	0.05	0.09	0.235	0.04	0.001268	0.035606	0.004167	1.64235	0.281029	7.079766	0.555223
Total Solids (mg/l)	72	368.1389	353.3701	382.9076	374.5	26506	209	487	334	418	278	84	3949.98	62.84887	7.40681	-0.69973	0.282898	0.087558	0.558831
Suspended Solids (mg/l)	72	14.125	11.17837	17.07163	10.5	1017	2	64	5	16.5	62	11.5	157.2377	12.53944	1.477788	1.86047	0.282898	3.807269	0.558831
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	72	0.7375	0.659669	0.815331	0.7	53.1	0.2	2.6	0.5	0.9	2.4	0.4	0.109701	0.331211	0.039034	2.513882	0.282898	13.02894	0.558831
E. coli (CFU/100ml)	71	1102	514.7352	1689.265	380	78242	5	18000	150	810	17995	660	6155815	2481.092	294.4514	5.123816	0.284805	31.60926	0.562511
TOC (mg/l)	0																		
Hardness (mg/l)	71	236.169	226.1119	246.2262	244	16768	155	336	202	270	181	68	1805.371	42.48966	5.042595	-0.20745	0.284805	-0.7595	0.562511
Chloride (mg/l)	71	39.19718	36.73229	41.66208	41	2783	16	61	31	46	45	15	108.4463	10.41375	1.235885	-0.16269	0.284805	-0.28208	0.562511
Dissolved Oxygen (mg/l)	57	9.409649	8.962789	9.856509	9.21	536.35	6.4	12.96	8.06	10.62	6.56	2.56	2.836296	1.684131	0.223069	0.341715	0.316327	-0.62895	0.623134
pH	55	7.857818	7.769338	7.946298	7.9	432.18	6.72	8.47	7.68	8.07	1.75	0.39	0.107121	0.327294	0.044132	-0.97736	0.321742	1.89526	0.633507
Copper (ug/l)	72	4.225	3.642685	4.807315	4	304.2	2	14	2	5.1	12	3.1	6.140775	2.478059	0.292042	1.6552	0.282898	4.01874	0.558831
Iron (ug/l)	72	836.9444	681.0011	992.8878	685	60260	90	3400	360	1150	3310	790	440393.3	663.6214	78.20853	1.652255	0.282898	3.422588	0.558831
Zinc (ug/l)	72	39.60139	0.777301	78.42548	16	2851.3	4.5	1400	10	20	1395.5	10	27296.65	165.217	19.47101	8.113567	0.282898	67.36236	0.558831

APPENDIX B

LITTLE CALUMET-GALIEN WATERS ASSESSED IN THE CLEAN WATER ACT SECTION 305(B) REPORT

Statewide data from the state's Clean Water Act Section 305(B) Report are available at the link below (IDEM's Office of Water Quality website) (http://www.state.in.us/idem/water/planbr/wqs/quality.html). Adobe Acrobat Reader(tm) is required to read these files.

- **Attachment A** - 1998 305 (B) Report (Upper White, Lower White, Patoka)
- **Attachment B** - 1999 & 2000 305 (B) Report (Eel-Wabash, Lower East Fork White, Middle Wabash-Deer, Muscatatuck, Salamonie, Upper East Fork White, Upper Wabash, Whitewater)
- **Attachment C** - 2001 305 (B) Report (Lower Wabash, Middle Wabash-Busseron, Middle Wabash-Little Vermilion, Sugar)
- **Attachment D** - 2002 305 (B) Report (Blue-Sinking, Little Calumet-Galien, Lower Ohio-Little Pigeon, Silver-Little Kentucky, St. Joseph-Maumee)

APPENDIX C

Potential Stakeholders

in the Little Calumet-Galien Watershed

Dunes Calumet Audubon Society
P.O. Box 1232
Crown Point, IN 46308-1232

Friends of Indiana Dunes
P.O. Box 166
Beverly Shores, IN 46301
219-926-7561

Grand Calumet Task Force
2400 New York Ave.
Whiting, Indiana 46394
219-473-4246

Hoosier Environmental Council
PO Box 1145
Indianapolis, IN 46206
317-685-8800

Hoosier River Watch
5785 Glenn Rd.
Indianapolis, Indiana 46216-1066
317-541-0617

Indiana Lakes Management Society
207 S. Wayne St., Suite B
Angola, IN 46703

Indiana Waterways Association
301 Fort Harrison Road
Terre Haute, IN 47804
812-460-1567

Izaak Walton League of America
Indiana Division President
2173 Pennsylvania Street
Portage, IN 46368-2448
219-762-4876

Kankakee Fish and Wildlife Area
4320 W. Toto Road
North Judson, IN 46366
219-896-3673

Know Your Watershed
Conservation Technology Information Ctr
1220 Potter Drive, Room 170
West Lafayette, IN 47906-1383
765-494-9555

Lake Michigan Coastal Program
IDNR
402 W. Washington St.
Indianapolis, Indiana 46204
317-232-4200

Little Calumet River Project
3001 Leonard Dr.
Suite 104
Valparaiso, Indiana 46383
219-462-7515

NIRPC
6100 Southport Rd.
Portage, Indiana 46368
219-763-6060

National Audubon Society
700 Broadway
New York, NY 10003
212-979-3000

Northwest Territory RC&D
3001 Leonard Drive
Valparaiso, IN 46383-4386
574-462-7515

Save the Dunes
444 Barker Rd.
Michigan City, IN 46360
219-879-3564

Shirley Heinze Environmental Fund
444 Barker Rd.
Michigan City, IN 46360-7426
219-879-4725

The Nature Conservancy
1505 N. Delaware St., Suite 200
Indianapolis, Indiana 46202
317-951-8818

Turkey Creek - Deep River Watershed Management Plan
414 Main St.
Hobart, Indiana 46542
317-254-8235

City of LaPorte Mayor (LaPorte County)
801 Michigan Ave.
LaPorte, IN 46350
219-362-3175

LaPorte County Commissioner (LaPorte County)
County Courthouse
813 Lincolnway, Suite 301
LaPorte, Indiana 46350
219-326-6808

LaPorte County Drainage Board (LaPorte County)
County Courthouse
813 Lincolnway, Suite101
LaPorte, Indiana 46350
219-326-6808

LaPorte County Farm Service Agency (LaPorte County)
100 Legacy Plaza W.
LaPorte, Indiana 46350
219-324-6303

LaPorte County Government Offices (LaPorte County)
County Courthouse
813 Lincolnway
LaPorte, IN 46350
219-326-6808

LaPorte County Parks & Rec (LaPorte County)
County Complex, 3rd Floor
809 State Street
LaPorte, IN 46350
219-326-6808

LaPorte County Purdue Univ. Co-op Extension Service (LaPorte County)
809 State St., Suite 502A
LaPorte, IN 46350
219-326-6808

LaPorte County SWCD (LaPorte County)
100 Legacy Plaza W.
LaPorte, IN 46350
219-324-6303

LaPorte County Surveyor (LaPorte County)
County Courthouse
813 Lincolnway, Suite 101
LaPorte, IN 46350
219-326-6808

LaPorte County USDA-NRCS (LaPorte County)
100 Legacy Plaza W.
LaPorte, IN 46350
219-324-6303

LaPorte Water Works (LaPorte County)
1119 Lake Street
LaPorte, IN 46350
219-362-9540

Laporte County Conservation Trust Inc. (LaPorte County)
405 Maple Ave.
La Porte, IN 46350-3609
219-778-2810

Laporte County Health Department (LaPorte County)
809 State St.
Laporte, IN 46350
219-326-6808

Michigan City Dept. of Water Works (LaPorte County)
111 Lake Shore Drive
Michigan City, IN 46360
219-872-4430

City of Crown Point Mayor (Lake County)
101 Northeast Street
Crown Point, IN 46307
219-662-3240

City of Hobart Mayor (Lake County)
414 Main Street
Hobart, IN 46342
219-942-6112

Crown Point Water Works (Lake County)
1313 E. North St.
Crown Point, IN 46307
219-662-3251

East Chicago Health Department (Lake County)
100 W. Chicago Ave.
East Chicago, IN 46312
219-391-8467

Gary City Health Department (Lake County)
1145 W. 5th Ave.
Gary, IN 46402
219-882-5565

Gary City Mayor (Lake County)
401 Broadway
Gary, Indiana 46402
219-881-1301

Hammond City Health Department (Lake County)
649 Conkey St.
Hammond, IN 46324
219-853-6358

Indiana-American Water Company-Northwest (Lake County)
650 Madison St.
Gary, IN 46401
219-880-2362

Lake County Commissioner (Lake County)
3rd Floor, Building A
2293 N. Main St.
Crown Point , IN 46307
219-755-3200

Lake County Drainage Board (Lake County)
County Government Center
2293 N. Main St.
Crown Point , IN 46307
219-755-3745

Lake County Farm Service Agency (Lake County)
928 S. Court St.
Crown Point, IN 46307
219-663-0588

Lake County Government Office (Lake County)
County Government Center
2293 N. Main St.
Crown Point , IN 46307
219-755-3100

Lake County Health Department (Lake County)
2293 N. Main St.
Crown Point, IN 46307
219-755-3655

Lake County Purdue Univ. Co-op Extension Service (Lake County)
2293 N. Main St.
Crown Point, IN 46307
219-755-3240

Lake County SWCD (Lake County)
928 S. Court St.
Suite C
Crown Point , IN 46307
219-663-0588

Lake County Surveyor (Lake County)
County Government Center
2293 N. Main St.
Crown Point , IN 46307
219-755-3745

Lake County USDA-NRCS (Lake County)
928 S. Court St.
Suite C
Crown Point, IN 46307
219-663-0588

Lincoln Utilities (Lake County)
5180 E 81st Ave.
Merrillville, IN 46410
219-942-2131

Chesterton Utilities (Porter County)
220 Broadway
Chesterton, IN 46304
219-926-1572

City of Valparaiso Mayors Office (Porter County)
166 Lincolnway
Valparaiso, IN 46383
219-462-1161

Lac Utilities (Porter County)
1805 Burlington Beach Rd.
Valparaiso, IN 46383
219-464-3770

Porter County Commissioner (Porter County)
155 Indiana
Valparaiso, IN 46383
219-465-3440

Porter County Drainage Board (Porter County)
155 Indiana
Suite 303
Valparaiso, IN 46383
219-465-3489

Porter County Farm Service Agency (Porter County)
3001 Leonard Dr.
Valparaiso, IN 46383-2733
219-462-7515

Porter County Government Offices (Porter County)
155 Indiana
Valparaiso, IN 46383
219-465-3460

Porter County Health Department (Porter County)
155 Indiana Ave. Rm 104
Valparaiso, IN 46383
219-465-3525

Porter County Purdue Univ. Co-op Extension Service (Porter County)
155 Indiana Ave., Suite 301
Valparaiso, IN 46383
219-465-3555

Porter County SWCD (Porter County)
3001 Leonard Dr.
Valparaiso, IN 46383
219-462-7515

Porter County Surveyor (Porter County)
155 Indiana
Valparaiso, IN 46383
219-465-3560

Porter County USDA-NRCS (Porter County)
3001 Leonard Dr.
Valparaiso, IN 46383
219-462-7515

Shorewood Forest Utilities (Porter County)
229 Shorewood Drive
Valparaiso, IN 46385
219-531-0706

Valparaiso Dept. of Water Works (Porter County)
205 Billings St.
Valparaiso, IN 46383
219-462-8412

Waste Managment of Northwest Indiana (Porter County)
1035 N. State Road 149
Valparaiso, IN 46383
219-763-2502

St. Joseph County Farm Service Agency (St. Joseph County)
St. Joseph Co. Farm Bureau
5605 US 31 S.
South Bend, IN 46614
219-291-7444

St. Joseph County Health Department (St. Joseph County)
227 W. Jefferson Blvd.
Rm 825
South Bend, IN 46601
219-235-9750

St. Joseph County Purdue Univ. Co-op Extension Service (St. Joseph County)
227 W. Jefferson Blvd.
South Bend, IN 46601
219-235-9604

St. Joseph USDA-NRCS (St. Joseph County)
St. Joseph Co. Farm Bureau
5605 US 31 S.
South Bend, IN 46614
219-291-7444

STATE STAKEHOLDERS

Indiana Farm Bureau Inc.
225 S East St
Indianapolis, IN 46202
(317) 692-7851

Indiana Department of Environmental Management
100 N. Senate Ave
P.O. Box 6015
Indianapolis, IN 46206-6015

IDEM Switchboard
(317) 232 8603 or (800) 451 6027

Agricultural Liaison
(317) 232 8587

Air Quality
(317) 233 0178

Community Relations
(317) 233 6648

Compliance and Technical Assistance
(317) 232 8172

Criminal Investigations
(317) 232 8128

Enforcement
(317) 233 5529

Environmental Response
(317) 308 3017

Legal Counsel
(317) 232 8493

Media and Communication Services
(317) 232 8560

Pollution Prevention and Technical Assistance
(317) 232 8172

Solid and Hazardous Waste Management
(317) 233 3656

Water Management
(317) 232 8670

Indiana Department of Natural Resources
402 West Washington Street
Indianapolis, IN 46204 2748

Division of Engineering
(317) 232 4150

Division of Entomology and Plant Pathology
(317) 232 4120

Division of Fish & Wildlife
(317) 232 4080

Division of Forestry
(317) 232 4105

Division of Historic Preservation & Archaeology
(317) 232 1646

Division of Law Enforcement
(317) 232 4010

Division of State Parks and Reservoirs
(317) 232 4124

Division of Water
(317) 232 4160

Division of Public Information and Education
(317) 232 4200

Division of Reclamation
(317) 232 1547

Division of Safety and Training
(317) 232 4145

Division of Soil Conservation
(317) 233 3870

Division of Oil and Gas
(317) 232 4055

Division of Outdoor Recreation
(317) 232 4070

Division of Nature Preserves
(317) 232 4052

Indiana State Department of Health
2 North Meridian St.
Indianapolis, IN 46204
(317) 233 1325

FEDERAL STAKEHOLDERS

Natural Resources Conservation Service
6013 Lakeside Blvd
Indianapolis, In 46278
(317) 290 3200
NRCS Field Representatives are generally located with the SWCD office in each county.

U.S. EPA Region 5
77 West Jackson Blvd
Chicago, IL 60604
(312) 353-2000
(800) 632-8431

U.S. Army Corps of Engineers

Chicago District
111 N. Canal
Chicago, IL 60606
(312) 353-6400

Detroit District
P.O. Box 1027
Detroit, MI 48231-1027
(888) 694-8313

Louisville District
600 Dr. Martin Luther King, Jr.
Louisville, KY 40202
(502) 315-6768

APPENDIX D

FUNDING SOURCES

This listing of funding sources was derived from the May 1999 *Watershed Action Guide for Indiana*, which is available from the Watershed Management Section of IDEM (IDEM 1999b).

FEDERAL CONSERVATION AND WATERSHED PROGRAMS

Environmental Protection Agency

Section 319, 205(j), and 104(b)(3) Grants

Grants for conservation practices, water body assessment, watershed planning, and watershed projects. Available to non-profit or governmental entities. These monies, enabled by the Clean Water Act, are funneled through the Indiana Department of Environmental Management. *For details see IDEM below.*

EPA Great Lakes Program

Numerous sources of funding are available for the area that drains into the Great Lakes. The complete grants guidance and application package for EPA Great Lakes grants is on the web, and additional funding sources are at the Great Lakes Information Network (http://www.great-lakes.net/). Grants are submitted in early spring for most of these sources.

U.S. Department of Agriculture/Natural Resources Conservation Service (NRCS) (See Appendix C for local federal agency contacts.)

CRP: Conservation Reserve Program.

Administered by the Farm Service Agency with technical assistance from NRCS. Conservation easements in certain critical areas on private property. CRP encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Easements are for 10 or 15 years, depending on vegetative cover, and compensation payments are made yearly to replace income lost through not farming the land. Cost share is available for planting vegetative cover on restored areas. http://www.fsa.usda.gov/dafp/cepd/crp.htm

EQIP: Environmental Quality Incentive Program.

Administered by the NRCS. Provides technical, financial, and educational assistance. Conservation cost-share program for implementing Best Management Practices, available to agricultural producers who agree to implement a whole-farm plan that addresses major resource concerns. Up to $50,000 over a 5- to 10- year period. Some parts of the state are designated Conservation Priority Areas and receive larger funding allotments. http://www.nhq.nrcs.usda.gov/PROGRAMS/COD/cit/eqipsmry.htm

FIP: Forestry Incentive Program.

Administered by the NRCS. Assists forest management on private lands of at least 10 acres and no more than 1,000 acres. Eligible practices are tree planting, timber stand improvement, site preparation for natural regeneration, and other related activities. Land must be suitable for conversion from nonforest to forest land, for reforestation, or for improved forest management and be capable of producing marketable timber crops. Cost share up to 65%, with a maximum of $10,000 per person per year. http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/FIPfact.html

Small Watershed Program.

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available. http://www.ftw.nrcs.usda.gov/pl566/pl566.html

WRP: Wetland Reserve Program.

Administered by the NRCS. Easement and restoration program to restore marginal agricultural land to wetland. Easements may be for 10 years, 30 years, or permanent. Longer easements are preferred. Partnerships with other acquisition programs are encouraged. Restoration and legal costs are paid by NRCS. Landowner retains ownership of the property and may use the land in ways that do not interfere with wetland function and habitat, such as hunting, recreational development, and timber harvesting. http://www.nhq.nrcs.usda.gov/PROGRAMS/wrp/

WHIP:Wildlife Habitat Incentive Program.

Administered by the NRCS. Cost share and technical assistance to develop and improve wildlife habitat on private land. Private landowners who are agricultural producers are eligible. A wildlife habitat plan is developed that describes landowner's goals for improving wildlife habitat, includes a list of practices and schedule for installing them, and details the steps necessary for maintenance. Cost share up to 75%, and contracts are for 10 years. http://www.nhq.nrcs.usda.gov/PROGRAMS/whip/

U.S. Fish & Wildlife Service

Partners for Wildlife Habitat Restoration Program

Provides technical and financial assistance to private landowners through voluntary cooperative agreements in order to restore formerly degraded wetlands, native grasslands, riparian areas, and other habitats to conditions as natural as feasible. Landowners agree to maintain restoration projects as specified in the agreement but otherwise retain full control of the land. Agreements are for fixed term of at least 10 years. No more than 60% of project cost is paid by Federal moneys (the program seeks remainder of cost share from landowners and nationally-based and local entities). http://www.fws.gov/

STATE CONSERVATION AND WATERSHED PROGRAMS

IDNR Division of Soil Conservation

LARE: Lake & River Enhancement Program

Funds diagnostic and feasibility studies in selected watersheds and cost-share programs through local Soil & Water Conservation Districts. Project oversight provided through county-based Resource Specialists and Lake & River Enhancement Watershed Coordinators. Funding requests for Watershed Land Treatment projects must come from Soil & Water Conservation Districts. If a proposed project area includes more than one district, the affected SWCDs should work together to develop an implementation plan. The SWCDs should then apply for the funding necessary to administer the watershed project. Before applying for funding, the SWCDs should contact the Lake & River Enhancement Coordinators to determine (1) the appropriate watershed to include in the project, (2) if the proposed project meets the eligibility criteria, and (3) if funding is available. http://www.in.gov/dnr/soilcons/lare.htm

IDNR Division of Fish & Wildlife

Classified Wildlife Habitat Program

Incentive program to foster private wildlife habitat management through tax reduction and technical assistance. Landowners need 15 or more acres of habitat to be eligible. IDNR provides management plans and assistance through District Wildlife Biologists (see county listings). http://www.ai.org/dnr/fishwild/about/habitat.htm

IDNR Division of Forestry

Classified Forest Program

Incentive program to foster private forest management through tax reduction and technical assistance. Landowners need 10 or more acres of woods to be eligible. IDNR provides management plans and assistance through District Foresters (see county listings). http://www.state.in.us/dnr/forestry/landassist/clasfor.htm

Classified Windbreak Act

Establishment of windbreaks at least 450 feet long adjacent to tillable land. Provides tax incentive, technical assistance through IDNR District Foresters.

Forest Stewardship Program & Stewardship Incentives Program

Cost share and technical assistance to encourage responsibly managed and productive private forests. http://www.state.in.us/dnr/forestry/htmldocs/grants.htm

IDNR Division of Reclamation

Appalachian Clean Streams Initiative

Funds for acid mine drainage abatement.

IDNR Division of Nature Preserves

State Nature Preserve Dedication

Acquisition and management of threatened habitat. http://www.in.gov/dnr/naturepr/

IDEM Office of Water Quality

State Revolving Fund

Available to municipalities and counties for a range of water quality infrastructure projects. Funds are available for a wide variety of projects including all types of nonpoint source management projects, as well as more traditional wastewater treatment projects. Funding is through very low-interest loans. http://www.in.gov/idem/water/fasb/srflp.html

Section 319 Grants - Nonpoint Source Program

Available to nonprofit groups, municipalities, counties, and universities for implementing water quality improvement projects that address nonpoint source pollution concerns. Twenty-five percent match is required, which may be cash or in-kind. Maximum grant amount for local watershed projects is $112,500, but statewide or larger scale projects may be funded up to $300,000. Projects are usually two to three years in length. Projects may be for land treatment through implementing Best Management Practices, for education, and for developing tools and applications for state-wide use. Proposals are due October 1, 2002 for FY2003 funds. See Section 5.1.5 for more details. http://www.in.gov/idem/water/planbr/wsm/index.html

Section 205(j) Grants - Water Quality Management Planning Program

Available to municipalities, counties, conservation districts, drainage districts, and other public organizations. For-profit entities, non-profit organizations, private associations, and individuals are not eligible for funding through Section 205(j). Grants are for water quality management projects such as studies of nonpoint pollution impacts, nonagricultural NPS mapping, and the development and implementation of watershed management projects. Funds can be requested for up to $100,000 and no match is required. http://www.in.gov/idem/water/planbr/wsm/index.html

Section 104(b)(3) Grants - NPDES Related State Grant Program

Provide for developing, implementing and demonstrating new concepts or requirements that will improve the effectiveness of the NPDES permit program. A project proposed for assistance by this program should deal predominantly with water pollution sources and activities regulated by the NPDES program. These may include innovative demonstration projects to promote statewide watershed approaches for permitted discharges, development of storm water management plans by small municipalities, projects involving a watershed approach to municipal separate sewer systems, and projects that directly promote community based environmental protection. Available to State water pollution control agencies, interstate agencies, Tribes, colleges and universities, and other public or nonprofit organizations. For-profit entities, private associations and individuals are not eligible to receive this assistance. Funds can be requested for up to $100,000. Five percent match is required, either cash or in-kind. http://www.in.gov/idem/water/planbr/wsm/index.html

NOTE: proposals are due to IDEM by January 31 annually for projects beginning the following December.

PRIVATE FUNDING SOURCES

National Fish and Wildlife Foundation

1120 Connecticut Avenue, NW Suite 900, Washington DC 20036. (http://www.nfwf.org/programs/grant_apply.htm)

Nonprofit, established by Congress 1984, awards challenge grants for natural resource conservation. Federally appropriated funds are used to match private sector funds. Six program areas include wetland conservation, conservation education, fisheries, migratory bird conservation, conservation policy, and wildlife habitat.

Individual Utilities

Check local utilities such as IPALCO, CINergy, REMC, NIPSCO. Many have grants for educational and environmental purposes (IPALCO Golden Eagle Program - http://www.ipalco.com/ABOUTIPALCO/Environment/Golden_Eagle/2001_Winners.html; CINergy - http://www.cinergy.com/Environment/default.asp).

Indiana Hardwood Lumbermen's Association

Indiana Tree Farm Program. http://www.ihla.org/leaders.htm

Conservation Technology Information Center (CTIC)

'Know Your Watershed' educational materials are available. http://www.ctic.purdue.edu/CTIC/CTIC.html

Ducks Unlimited

Land acquisition and habitat restoration assistance. http://www.ducks.org/

National Wild Turkey Federation

Funds for turkey and wildlife habitat improvement projects. http://www.nwtf.org/

Quail Unlimited

Funds for quail and wildlife habitat improvement projects. http://www.qu.org/

Pheasants Forever

Land acquisition and funds for local habitat improvement projects. http://www.pheasantsforever.org/

Indiana Heritage Trust

Land acquisition programs. http://www.state.in.us/dnr/heritage/

The Nature Conservancy

Land acquisition and restoration. http://nature.org/wherewework/northamerica/states/indiana/

Southern Lake Michigan Conservation Initiative

Blue River Focus Area

Kankakee Sands Focus Area

Upper St. Joseph River Focus Area

Tippecanoe River Focus Area

Natural Areas Registry

Hoosier Landscapes Capitol Campaign

Local/Regional Land Trusts

Land acquisition, conservation easements, and restoration

Acres Inc. (Fort Wayne, IN)

- http://www.acres-land-trust.org/

Buffalo Trace Land Trust, LLC (Mount Saint Francis, IN)

Central Indiana Land Trust, Inc. (Indianapolis, IN)

- http://www.cilti.org/

Clark's Valley Land Trust (Charlestown, IN)

- http://www.clarkswcd.org/LandTrust/LandTrusthome.htm

Indiana Karst Conservancy (Indianapolis, IN)

- http://www.caves.org/conservancy/ikc/

Laporte County Conservation Trust Inc. (La Porte, IN)

Little River Wetlands Project (Ft. Wayne, IN)

- http://www.lrwp.org/

Mud Creek Conservancy (Indianapolis, IN)

- http://www.mudcreekconservancy.org/

NICHES Land Trust (Lafayette, IN)

- http://dcwi.com/~niches/

Ohio River Conservancy (Bloomington, IN)

Oxbow, Inc. (Cincinnati, OH)

- http://math.uc.edu/~pelikan/OXBOW/wm.html

Red-tail Conservancy, Inc. (Muncie, IN)

- http://ourworld.cs.com/rtconserv1/id18.htm

River Fields, Inc. (Louisville, KY)

- http://www.riverfields.org/

Shirley Heinze Environmental Fund (Michigan City, IN)

- http://www.heinzefund.org/

Sycamore Land Trust (Bloomington, IN)

- http://www.sycamorelandtrust.org/

Wabash Heritage Land Trust (New Harmony, IN)

Wawasee Area Conservancy Foundation (Syracuse, IN)

- http://www.wacf.com/

Whitewater Valley Land Trust, Inc. (Centerville, IN)

Wood-Land-Lakes Resource Conservation & Development (Kendallville, IN)

- http://www.in.nrcs.usda.gov/conservation%20programs/rcd/woodland_lakes.htm

SOURCES OF ADDITIONAL FUNDING OPPORTUNITIES

Catalog of Federal Funding Sources for Watershed Protection

EPA Office of Water (EPA841-B-99-003) December 1999

Little Calumet-Galien Watershed Restoration Action Strategy

(http://www.epa.gov/owow/watershed/wacademy/fund.html)

GrantsWeb:

http://www.srainternational.org/cws/sra/resource.htm

APPENDIX E

Superfund (CERCLA) Site Fact Sheets

for sites listed within the Little Calumet-Galien watershed

AMERICAN CHEMICAL SERVICE, INC.

Site Information:

Site Name: AMERICAN CHEMICAL SERVICE, INC.

Address: 420 SOUTH COLFAX AVENUE
GRIFFITH, IN 46319

EPA ID: IND016360265

EPA Region: 05

County: 089 LAKE

Latitude: +41.514200

Longitude: -087.419100

NPL Status: Currently on the Final NPL

Non-NPL Status:

Federal Facility Flag: Not a Federal Facility

Incident Category: Chemical Plant

Record of Decision (ROD) List:

	ROD ID	ROD Date	OU
1	EPA/ROD/R05-92/217	09/30/1992	01
2	EPA/541/R-99/071	07/27/1999	01

1) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/ROD/R05-92/217

ROD Date: 09/30/1992

Media: Debris, Ground Water, Soil

Contaminant: VOCs, Other Organics, Metals

Abstract: SITE HISTORY/DESCRIPTION: The 36-acre American Chemical Services (ACS) site is a chemical manufacturing facility in Griffith, Indiana, which was formerly involved in solvent recovery. Land use in the area is predominantly residential and industrial with a wetlands area located north of the Chesapeake and Ohio railway on the west of the site. Nine upper aquifer wells and 16 lower aquifer wells are located within 1/2 mile of the site, with area residents using most of the lower aquifer wells for drinking water. From the late 1960's to early 1970's, ACS manufactured barium naphtherate, brominated vegetable oil, lacquers and paints, liquid soldering fluid, and polyethylene solutions in polybutene. Two onsite incinerators burned still bottoms, nonreclaimable materials generated from the site,and offsite wastes; however, in the 1970's, the incinerators were dismantled, the shells were cut up and scrapped, and the burners and blowers remain onsite. From 1970 to 1975, batch manufacturing expanded, and additives, lubricants, detergents, and soldering flux were manufactured. In 1980, a 31 - acre part of the property to the west of the offsite containment area was sold to the City of Griffith to expand the City's municipal landfill. Solvent recovery operations continued until 1990 when ACS lost interim status under RCRA regulations because of failure to obtain required insurance policies. Three identified disposal areas on the ACS property are the Onsite Containment Area, where approximately 400 drums containing sludge and semi-solids of unknown types were reportedly disposed of; the Still Bottoms, Treatment Lagoon #1, and adjacent areas, which received still bottoms from the solvent recovery process, including a pond and lagoon that were taken out of service in 1972, drained, and filled with

an estimated 3,200 drums containing sludge materials; and the Offsite Containment Area and Kapica/Pazmey property, which was used as a waste disposal area and received wastes that included onsite incinerator ash, general refuse, a tank truck containing solidified paint, and an estimated 20,000 to 30,000 drums that were reportedly punctured prior to disposal. Disposal practices in the Offsite Containment Area ceased in 1975. This ROD addresses a final remedy for the buried drums, as well as waste, contaminated soil, debris, and ground water. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PCBs, PAHs, and phenols; and metals, including arsenic, chromium, and lead. PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil clean-up goals are based on risk-based levels and include benzene 1.0 mg/kg; toluene 167-5,000 mg/kg;xylenes 867-26,000 mg/kg; PCBs 10 mg/kg (with 10-inch soil cover); chromium 47-1,400 mg/kg; and lead500 mg/kg. The lead clean-up level for soil is based on the Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites and the PCB clean-up level for soil is based on TSCA policy for unrestricted access. Chemical-specific ground water clean-up goals are based on riskbased levels, SDWA MCLs, and benzene 5 ug/l; PCE 5 ug/l; PCBs 0.06 ug/l; and arsenic 8.8 ug/l. INSTITUTIONAL CONTROLS: Institutional controls may be implemented in the form of deed restrictions, and site access restrictions such as fencing, to provide protection from contaminants until clean-up standards are met.

Remedy: SELECTED REMEDIAL ACTION: The selected remedial action for this site includes excavation and offsite incineration of approximately 400 intact buried drums, decontaminating and disposing of miscellaneous debris offsite;treating contaminated soil using in-situ vapor extraction; conducting an in-situ vapor extraction pilot study for Onsite Area buried waste; excavating and treating buried waste or PCB-contaminated soil onsite using low temperature thermal treatment, with vapor emission control during excavation, and possible immobilization of inorganics after treatment; depositing the treated residuals that meet healthbased levels onsite and covering the area with a soil cover; pumping and onsite treatment of contaminated ground water along with wash water from the decontamination processes and condensate from the soil treatment processes using a method to be determined during the RD phase, with onsite discharge of the treated water to surface water and wetlands; continuing to evaluate and monitor wetlands, with mitigation of affected wetlands if necessary; controlling and monitoring air emissions from excavation and treatment processes; conducting longterm ground water monitoring; and implementing, to the extent possible, institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action ranges from $37,800,000 to $46,800,000, which includes an annual O&M cost of$17,670,000 for 30 years.

2) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/541/R-99/071

ROD Date: 07/27/1999

Media: Groundwater, Sediment, Soil

Abstract: Please note that the text in this document summarizes the Record of Decision for the purposes of facilitating searching and retrieving key text on the ROD. It is not the officially approved abstract drafted by the EPA Regional offices. Once EPA Headquarters receives the official abstract, this text will be replaced.

The American Chemical Service (ACS) Site is located at 420 S. Colfax Ave., Griffith, Indiana. The site is 19 acres and consists of the "Offsite" and "Onsite" Containment Areas, the 2-acre "Kapica-Pazmey" property, and a 15-acre portion of the Griffith Municipal Landfill. Groundwater contaminant plumes emanate from the ACS site, and site wastes have impacted certain nearby wetland areas.

Since 1955, a solvent recovery business - American Chemical Service Corporation (ACSC) - has been located on this site. Past waste handling, storage and disposal practices led to contamination of the site. ACSC lost its interim (authorization to operate) status under Resource Conservation and Recovery Act (RCRA) in 1990, but it still maintains its specialty chemical manufacturing operations.

A Record of Decision (ROD) was completed in September 1992 that addressed the site.
A Record of Decision (ROD) Amendment was completed in July 1999.

Remedy: Soil contaminants will be contained on site by surrounding the site with a subsurface barrier wall, capping the site and withdrawing groundwater inside the barrier wall. Volatile organic compound-laden soil will be treated by a Soil Vapor Extraction system. Polychlorinated biphenyl (PCB)-laden sediments in site wetlands will be excavated to achieve cleanup level of 1mg/kg to depth. Excavated sediments containing less than 50 mg/kg PCBs will be disposed of offsite at a Toxic Substances Control Act compliant facility. The wetlands will be restored. A deed restriction will be maintained on the site. In addition, EPA will be gathering offsite groundwater data to determine whether contaminants may be addressed through monitored natural attentuation, and to determine whether enhanced bioremediation is appropriate in discreet areas. EPA may initiate a second Record of Decision amendment if necessary.

URL: http://www.epa.gov/superfund/sites/rodsites/0501376.htm
This page was last updated on: April 15, 2002
Site maintained by: Office of Emergency and Remedial Response
brown.margret@epa.gov

LAKE SANDY JO (M&M LANDFILL)

Site Information:

Site Name: LAKE SANDY JO (M&M LANDFILL)
Address: 3615 WEST 25TH AVENUE
GARY, IN 46404

EPA ID: IND980500524
EPA Region: 05
County: 089 LAKE

Latitude: +41.570839
Longitude: -087.382231

NPL Status: Currently on the Final NPL
Non-NPL Status:
Federal Facility Flag: Not a Federal Facility
Incident Category: Landfill

Record of Decision (ROD) List:

	ROD ID	ROD Date	OU
1	**EPA/ROD/R05-86/043**	09/26/1986	01

1) Record of Decision (ROD):

Operable Unit: 01
ROD ID: EPA/ROD/R05-86/043
ROD Date: 09/26/1986

Media: GROUNDWATER SEDIMENTS SOIL

Contaminant: HEAVY METALS, PAHS, PHTHALATES

Abstract: THE LAKE SANDY JO SITE IS LOCATED ON THE SOUTHEAST SIDE OF THE CITY OF GARY IN LAKE COUNTY, INDIANA. THE SITE WAS A FORMER 40-ACRE WATER-FILLED BORROW PIT THAT WAS USED AS A LANDFILL BETWEEN 1971 AND 1980. VARIOUS WASTES INCLUDING CONSTRUCTION AND DEMOLITION DEBRIS, GARAGE AND INDUSTRIAL WASTES, AND DRUMS ARE BELIEVED TO BE IN THE SITE. THE AREA SURROUNDING THE SITE IS PRIMARILY LOW DENSITY RESIDENTIAL PROPERTY. THE BORROW PIT ON THE SITE WAS ORIGINALLY DUG TO SUPPORT CONSTRUCTION OF I-90/84, WHICH IS ADJACENT TO THE SITE. IN 1971 THE PIT WAS FILLED WITH GROUND WATER AND WAS USED FOR A SHORT TIME AS A RECREATIONAL LAKE. BETWEEN 1971 AND 1975 THE PIT WAS FILLED WITH VARIOUS DEBRIS. COMPLAINTS WERE FILED BY LOCAL RESIDENTS ABOUT ODORS EMANATING FROM THE SITE, AND IN 1976 THE OWNERS WERE ORDERED TO DRAIN THE LAKE AND RESTRICT FILL TO DEMOLITION DEBRIS ONLY. LATER IN 1976 THE SITE WAS SOLD TO GLEN AND GORDON MARTIN, WHO CONTINUED FILLING OPERATIONS WITHOUT A PERMIT UNTIL THE SITE WAS CLOSED IN 1980. THE PRIMARY CONTAMINANTS OF CONCERN ARE PAHS, PHTHALATES AND HEAVY METALS, FOUND MAINLY IN SOILS.

THE SELECTED REMEDIAL ACTION FOR THIS SITE INCLUDES; INSTALLATION OF A SOIL COVER OVER THE LANDFILL WITH A DRAINAGE BLANKET TO CONTROL SURFACE SEEPS; EXTENSION OF WATER MAINS TO AFFECTED RESIDENTS IN GARY; ONSITE CONSOLIDATION OF CONTAMINATED SEDIMENTS; GROUND WATER AND SURFACE WATER/SEDIMENT MONITORING; AND DEED RESTRICTIONS ON LANDFILLED PROPERTY AND INSTITUTIONAL CONTROLS ON AQUIFER USE. THE ESTIMATED CAPITAL COST OF THE REMEDY IS $4,747,000 WITH ANNUAL O&M COSTS OF $63,000.

Remedy: - INSTALLATION OF A SOIL COVER OVER THE LANDFILL WITH A DRAINAGE BLANKET TO CONTROL SURFACE SEEPS.
- EXTENSION OF WATER MAINS FROM THE GARY-HOBART WATER DISTRIBUTION SYSTEM INTO THE COMMUNITY NORTH OF 29TH AVENUE, SOUTH OF 25TH AVENUE BETWEEN MORTON AND CHASE STREETS IN GARY.
- ONSITE CONSOLIDATION OF CONTAMINATED SEDIMENTS.
- GROUND WATER MONITORING ON A QUARTERLY BASIS AND SURFACE WATER/SEDIMENT AND SUPPLEMENTAL GROUND WATER MONITORING ON A SEMI-ANNUALLY BASIS.
- DEED RESTRICTIONS ON LANDFILL PROPERTY AND INSTITUTIONAL CONTROLS ON AQUIFER USE IN THE AFFECTED AREAS.

URL: http://www.epa.gov/superfund/sites/rodsites/0501630.htm
This page was last updated on: January 25, 2002
Site maintained by: Office of Emergency and Remedial Response
brown.margret@epa.gov

MIDCO I

Site Information:

Site Name: MIDCO I

Address: 7400 W 15TH AVE
GARY, IN 46401

EPA ID: IND980615421

EPA Region: 05

County: 089 LAKE

Latitude: +41.589500

Longitude: -087.428400

NPL Status: Currently on the Final NPL

Non-NPL Status:

Federal Facility Flag: Not a Federal Facility

Incident Category: Industrial Waste Treatment

Record of Decision (ROD) List:

	ROD ID	ROD Date	OU
1	EPA/ROD/R05-89/092	06/30/1989	01
2	EPA/AMD/R05-92/196	04/13/1992	01

1) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/ROD/R05-89/092

ROD Date: 06/30/1989

Media: SOIL SEDIMENT GROUNDWATER

Contaminant: VOCS, BENZENE, TOLUENE, TCE, PCBS, PAHS, PHENOLS, CHROMIUM, LEAD

Abstract: THE MIDCO I SITE IS A FOUR-ACRE, ABANDONED INDUSTRIAL WASTE RECYCLING, STORAGE, AND DISPOSAL FACILITY IN GARY, INDIANA. THE SURROUNDING AREA IS PARTIALLY RURAL, INCLUDING WETLANDS. RESIDENTIAL NEIGHBORHOODS LIE TO THE WEST, SOUTH, AND EAST, WITH SOME RESIDENTS LIVING AS CLOSE AS 900 FEET FROM THE SITE. TWELVE DRINKING WATER WELLS HAVE BEEN IDENTIFIED WITHIN APPROXIMATELY ONE MILE OF THE SITE. THE CALUMET AQUIFER, ONE OF THE TWO MAJOR AQUIFERS UNDERLYING THE SITE AND PROVIDING WATER TO THESE WELLS, IS HIGHLY SUSCEPTIBLE TO CONTAMINATION FROM SURFACE SOURCES. RECYCLING, STORING, AND DISPOSING OF INDUSTRIAL WASTES BEGAN AT THE SITE SOMETIME BEFORE JUNE 1973. WITHIN A THREE-YEAR PERIOD, THE SITE OWNERS ACCEPTED AND STOCKPILED APPROXIMATELY 6,000-7,000 55-GALLON DRUMS CONTAINING BULK LIQUID WASTE, AND 4 BULK TANKS, EACH 4,000-10,000 GALLONS. THE FACILITY CLOSED IN DECEMBER 1976 AFTER A FIRE BURNED APPROXIMATELY 14,000 DRUMS OF CHEMICAL WASTE. OPERATIONS RESUMED IN OCTOBER 1977 UNDER NEW OWNERSHIP. BY FEBRUARY 1979 THE NEW OWNERS ABANDONED THE FACILITY, LEAVING THOUSANDS OF DRUMS AND WASTE CHEMICALS UNATTENDED. BY JANUARY 1980 AN ESTIMATED 14,000 DRUMS WERE STILL STOCKPILED ONSITE. IN JUNE 1981 SEVERE FLOODING CAUSED WATER IN THE AREA TO DRAIN WEST INTO A NEIGHBORING CITY; CONTACT WITH THE FLOOD WATER REPORTEDLY RESULTED IN SKIN BURNS. IN 1982 EPA INITIATED A SURFACE REMOVAL ACTION WHICH INCLUDED REMOVING EXTENSIVE SURFACE WASTES, AN UNDERGROUND TANK, AND THE TOP ONE FOOT OF CONTAMINATED SOIL. BECAUSE THESE ACTIVITIES DID NOT ADDRESS THE CONTAMINATED SUBSURFACE SOIL, SEDIMENT, AND GROUND WATER, EPA HAS INITIATED THIS FIRST REMEDIAL ACTION TO ADDRESS THE ABOVE-REFERENCED CONTAMINATED MEDIA. THE PRIMARY CONTAMINANTS OF CONCERN AFFECTING THE SOIL, SEDIMENT, AND GROUND WATER ARE VOCS INCLUDING BENZENE, TOLUENE, AND TCE; OTHER ORGANICS INCLUDING PCBS, PHENOLS, AND PAHS; AND METALS INCLUDING CHROMIUM AND LEAD.

THE SELECTED REMEDIAL ACTION FOR THIS SITE INCLUDES EXCAVATION AND TREATMENT OF 12,400 YD3 OF CONTAMINATED SOIL AND SUBSURFACE MATERIALS USING A COMBINATION OF VAPOR EXTRACTION AND SOLIDIFICATION STABILIZATION, FOLLOWED BY ONSITE DISPOSAL; EXCAVATION AND ONSITE SOLIDIFICATION

STABILIZATION OF APPROXIMATELY 1,200 YD3 OF CONTAMINATED SEDIMENT IN SURROUNDING WETLANDS; COVERING THE SITE IN ACCORDANCE WITH RCRA LANDFILL CLOSURE REQUIREMENTS; GROUND WATER PUMPING AND DEEP WELL INJECTION IN A CLASS I WELL IF EPA GRANTS A PETITION TO ALLOW LAND DISPOSAL OF WASTE PROHIBITED UNDER RCRA; IF A PETITION IS NOT APPROVED, GROUND WATER WILL BE TREATED USING AIR STRIPPING AND A LIQUID-PHASE GRANULAR ACTIVATED CARBON POLISH SYSTEM TO MEET EPA REQUIREMENTS (LDR TREATMENT STANDARDS), FOLLOWED BY DEEP WELL INJECTION OR REINJECTION INTO THE AQUIFER; GROUND WATER MONITORING; AND IMPLEMENTATION OF DEED AND ACCESS RESTRICTIONS. THE ESTIMATED PRESENT WORTH COST FOR THIS REMEDIAL ACTION IS $13,989,000, WHICH INCLUDES ANNUAL O&M COSTS OF $525,000, IF GROUND WATER IS TREATED; OR $10,728,000, WHICH INCLUDES ANNUAL O&M COSTS OF $188,000, IF GROUND WATER IS NOT TREATED.

Remedy: THIS IS THE FINAL REMEDIAL ACTION FOR THE MIDCO I. A SURFACE REMOVAL ACTION INCLUDING REMOVAL AND OFF-SITE DISPOSAL OF WASTES IN DRUMS AND SUB-SURFACE TANKS AND THE TOP ONE FOOT OF CONTAMINATED SOIL WAS COMPLETED IN 1982. THE FINAL REMEDIAL ACTION WILL TREAT THE HIGHLY CONTAMINATED SUBSURFACE SOILS AND MATERIALS THAT REMAIN AT THE SITE AND THAT ARE CONTRIBUTING TO GROUND WATER AND SURFACE WATER CONTAMINATION NEAR THE SITE, AND WILL TREAT THE HIGHLY CONTAMINATED GROUND WATER NEAR THE SITE. THESE ACTIONS WILL ADDRESS THE PRINCIPAL THREATS POSED BY THE SITE WHICH INCLUDE PUBLIC HEALTH RISKS DUE TO FUTURE DEVELOPMENT OF THE SITE, PUBLIC HEALTH RISKS DUE TO OFF-SITE MIGRATION OF GROUND WATER AND, PUBLIC RISKS DUE TO AIR EMISSIONS, AND ENVIRONMENTAL IMPACTS ON SURROUNDING WETLANDS.

THE MAJOR COMPONENTS OF THE SELECTED REMEDIAL ACTIONS INCLUDE:

* ON-SITE TREATMENT OF AN ESTIMATED 12,400 CUBIC YARDS OF CONTAMINATED SOIL AND WASTE MATERIAL BY A COMBINATION OF VAPOR EXTRACTION AND SOLIDIFICATION/STABILIZATION FOLLOWED BY ON-SITE DEPOSITION OF THE SOLIDIFIED MATERIAL. THE SOIL VAPOR EXTRACTION SYSTEM WILL BE CONSIDERED SUCCESSFUL WHEN VOLATILE ORGANIC COMPOUNDS ARE REDUCED TO LEVELS THAT WILL POSE NO HEALTH THREAT AND ALLOW SOLIDIFICATION/STABILIZATION TO PROCEED SUCCESSFULLY. THE SOLIDIFICATION/STABILIZATION OPERATION WILL BE CONSIDERED SUCCESSFUL WHEN IT REDUCES THE MOBILITY OF CONTAMINANTS SO THAT LEACHATE FROM THE SOLID MASS WILL NOT CAUSE EXCEEDANCE OF HEALTH BASED LEVELS IN THE GROUND WATER.

* EXCAVATION AND ON-SITE SOLIDIFICATION/STABILIZATION OF APPROXIMATELY 1200 CUBIC YARDS OF CONTAMINATED SEDIMENTS IN SURROUNDING WETLANDS;

* INSTALLATION AND OPERATION OF A GROUND WATER PUMPING SYSTEM TO INTERCEPT CONTAMINATED GROUND WATER FROM THE SITE;

* INSTALLATION AND OPERATION OF A DEEP, CLASS I, UNDERGROUND INJECTION WELL FOR DISPOSAL OF THE CONTAMINATED GROUND WATER; OR IF A NO-MIGRATION PETITION IS DISAPPROVED BY US EPA, INSTALLATION AND OPERATION OF A TREATMENT SYSTEM FOR THE CONTAMINATED GROUND WATER TO REMOVE HAZARDOUS SUBSTANCES FOLLOWED BY DEEP WELL INJECTION OF THE SALT-CONTAMINATED WATER; OR INSTALLATION AND OPERATION OF A TREATMENT SYSTEM FOR THE CONTAMINATED GROUND WATER TO REMOVE HAZARDOUS SUBSTANCES FOLLOWED BY REINJECTION OF THE SALT-CONTAMINATED GROUND WATER INTO THE CALUMET AQUIFER IN A MANNER THAT WILL PREVENT SPREADING OF THE SALT PLUME;

* INSTALLATION OF A FINAL SITE COVER SATISFYING RCRA CLOSURE REQUIREMENTS, IF APPLICABLE OR IF CONSIDERED RELEVANT AND APPROPRIATE (THE QUALITY OF CAP REQUIRED WILL ALSO DEPEND ON THE RESULTS OF TESTS ON THE SOLIDIFIED MATERIAL);

* RESTRICTION OF SITE ACCESS AND IMPOSITION OF DEED RESTRICTIONS AS APPROPRIATE;

* RELATED TESTING AND LONG TERM MONITORING.

THE GROUNDWATER TREATMENT AND UNDERGROUND INJECTION PORTIONS OF THE REMEDIAL ACTION MAY BE COMBINED WITH THE REMEDIAL ACTION FOR MIDCO II. IN THIS CASE, THE COMBINED TREATMENT CONSTITUTES AN ON-SITE ACTION, FOR PURPOSES OF THE OFF-SITE POLICY.

2) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/AMD/R05-92/196

ROD Date: 04/13/1992

Media: Subsurface Soil, Sediment, Groundwater

Contaminant: VOCS, Metals, Inorganics

Abstract: SITE HISTORY/DESCRIPTION: The 4-acre MIDCO I site is an abandoned, industrial waste recycling, storage, and disposal facility in Gary, Indiana. The surrounding land use is mixed industrial, commercial, and residential. The nearest residential area is about 1/4-mile west of the site. The Calumet Aquifer underlies the site and provides drinking water to wells within 1 mile of the site. From 1973 to 1979, two different owners operated the facility and stockpiled thousands of drums of bulk liquid and chemical waste. In 1976, a fire at the site destroyed an estimated 14,000 waste drums. In 1981, EPA installed a fence around the site. In 1982, EPA removed all surface wastes, including thousands of drums and an underground storage tank; excavated and disposed of contaminated surface soil;and placed a clay cover over much of the site. This ROD amends a 1989 ROD that addressed the remaining contaminated soil and ground water by treatment of an estimated 12,400 cubic yards of soil using soil vapor extraction and

solidification/stabilization, followed by onsite disposal; excavation and solidification/stabilization of an estimated 1,200 cubic yards of contaminated sediments, followed by onsite disposal; and covering the site in accordance with RCRA landfill closure requirements; ground water pumping and injection into a shallow or deep aquifer. The amended remedy reduces the estimated amount of soil to be treated, as a result of new information on arsenic data and amended soil CALs; further defines the site cover requirements; and further defines the requirements of deep well injection of contaminated ground water. The primary contaminants of concern affecting the subsurface soil, sediment, and ground water are VOCs, including TCE, toluene, and xylenes; metals, including chromium and lead; and inorganics. PERFORMANCE STANDARDS OR GOALS: Ground water clean-up standards for the Calumet Aquifer are not changed from the 1989 ROD. Treatment requirements prior to DWI are further defined compared to the 1989 ROD and include, at a minimum, treatment to MACs, which are required for RCRA delisting. Specific MACs include methylene chloride 31.5 ug/l; trichloroethene 31.5 ug/l; toluene 6,300 ug/l; chromium 630 ug/l; nickel 630 ug/l; and lead 950 ug/l. Treatment below MACs will be required, if necessary, to protect underground sources of drinking water. Soil treatment action levels are increased from 1x10[-6] and HI = 1 in the 1989 ROD to 5x10[-4] and HI = 5 in this amendment INSTITUTIONAL CONTROLS: Institutional controls including access and deed restrictions will be implemented to protect the integrity of the site cover and operational aspects of the remedy.

Remedy: SELECTED REMEDIAL ACTION: The amended remedial action for this site includes reducing theamount of soil to be treated to a minimum of 5,200 cubic yards because of the amendment to soil CALs and the determination that arsenic may not be present above background levels at the site; treating thecontaminated soil onsite using with soil vapor extraction, followed by in- situ solidification/stabilization; excavating and treating an estimated 500 cubic yards of contaminated sediment from the surrounding wetlands onsite using solidification/stabilization; pumping and treatment of contaminated ground water using air stripping and carbon absorption, followed by onsite deep well injection; constructing a final RCRA cover over the entire site; implementing institutional controls including deed restrictions, and site access restrictions; conducting long-term monitoring and providing for a contingency remedy in the event that ground water clean-up action levels for the Calumet Aquifer are technically impracticable to attain, which includes low-level pumping to contain contaminated ground water and additional institutional controls. The ground water treatment or underground injection portions of this remedy may be combined with remedial actions for the nearby Midco II site. The estimated present worth cost for this amended remedial action is $10,000,000, which includes an annual O&M cost of $460,000.

URL: http://www.epa.gov/superfund/sites/rodsites/0501799.htm
This page was last updated on: April 15, 2002
Site maintained by: Office of Emergency and Remedial Response
brown.margret@epa.gov

MIDCO II

Site Information:

Site Name: MIDCO II

Address: 5900 INDUSTRIAL HIGHWAY
GARY, IN 46406

EPA ID: IND980679559

EPA Region: 05

County: 089 LAKE

Latitude: +41.622781

Longitude: -087.408611

NPL Status: Currently on the Final NPL

Non-NPL Status:

Federal Facility Flag: Not a Federal Facility

Incident Category: Industrial Waste Treatment

Record of Decision (ROD) List:

	ROD ID	ROD Date	OU
1	**EPA/ROD/R05-89/093**	06/30/1989	01
2	**EPA/AMD/R05-92/193**	04/13/1992	01

1) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/ROD/R05-89/093

ROD Date: 06/30/1989

Media: SOIL SEDIMENT GROUNDWATER

Contaminant: VOCS, BENZENE, TOLUENE, TCE, XYLENES, PCBS, ARSENIC, CHROMIUM, LEAD

Abstract: THE MIDCO II SITE IS A SEVEN-ACRE STORAGE AND DISPOSAL FACILITY IN GARY, INDIANA. THE SURROUNDING AREA IS PREDOMINANTLY USED FOR INDUSTRIAL PURPOSES, AND INCLUDES 34 OTHER POTENTIAL HAZARDOUS WASTE SITES. THE UNDERLYING AQUIFER IS HIGHLY SUSCEPTIBLE TO CONTAMINATION FROM SURFACE SOURCES BECAUSE OF THE HIGH WATER TABLE; HOWEVER, IN THE VICINITY OF THE SITE, THE AQUIFER IS USED PRIMARILY FOR NON-DRINKING WATER PURPOSES. THE SAME OPERATOR AS AT ANOTHER SUPERFUND SITE, MIDCO I, BEGAN WASTE OPERATIONS, INCLUDING DRUM STORAGE AT MIDCO II DURING THE SUMMER OF 1976. FOLLOWING A MAJOR FIRE AT THE MIDCO I SITE IN JANUARY 1977, MIDCO TRANSFERRED THE OPERATIONS FROM THE MIDCO I SITE TO THE MIDCO II SITE. OPERATIONS INCLUDED TEMPORARILY STORING BULK LIQUID AND DRUM WASTES; NEUTRALIZING ACIDS AND CAUSTICS; AND DISPOSING OF WASTES BY DUMPING WASTES INTO ONSITE PITS, WHICH ALLOWED WASTES TO PERCOLATE INTO THE GROUND WATER. ONE OF THESE PITS, THE FILTER PIT, HAD AN OVERFLOW PIPE LEADING INTO A DITCH, WHICH DRAINED INTO THE NEARBY GRAND CALUMENT RIVER. BY APRIL 1977 APPROXIMATELY 12,000 TO 15,000 55-GALLON DRUMS OF WASTE MATERIALS WERE STORED ONSITE. ADDITIONALLY, AN ESTIMATED TEN BADLY DETERIORATED AND LEAKING TANKS WERE HOLDING WASTES INCLUDING OILS, OIL SLUDGES, CHLORINATED SOLVENTS, PAINT SOLVENTS, PAINT SLUDGES, ACIDS, AND SPENT CYANIDES. IN AUGUST 1977 A FIRE AT THE SITE DESTROYED 50,000 TO 60,000 DRUMS. ALTHOUGH MOST DRUMS WERE BADLY DAMAGED A SUBSTANTIAL NUMBER OF DRUMS, INCLUDING 75 TO 100 DRUMS CONTAINING CYANIDE, SURVIVED THE FIRE. EPA CONDUCTED A PRELIMINARY INVESTIGATION RESULTING IN THE INSTALLATION OF A 10-FOOT HIGH FENCE AROUND THE SITE. IN 1984 AND 1985 EPA CONDUCTED EMERGENCY REMOVAL ACTIVITIES INCLUDING REPAIRING AND EXTENDING THE SITE FENCE; REMOVING MOST OF THE REMAINING DRUMS, TANKS, AND DEBRIS FROM THE SITE'S SURFACE; AND REMOVING THE SLUDGE PITS AND FILTER PIT CONTENTS. THE RESULTING PCB-CONTAMINATED SOIL PILE WAS REMOVED AND DISPOSED OF IN AN OFFSITE HAZARDOUS WASTE LANDFILL IN EARLY 1986, AND MOST OF THE CYANIDE-CONTAMINATED PILE WAS ALSO REMOVED. REMOVAL ACTIVITIES ENDED IN JANUARY 1986. THE PRIMARY CONTAMINANTS OF CONCERN CURRENTLY AFFECTING THE SOIL, SEDIMENT, AND GROUND WATER ARE VOCS INCLUDING BENZENE, TOLUENE, TCE, AND XYLENES; OTHER ORGANICS INCLUDING PCBS; AND METALS INCLUDING ARSENIC, CHROMIUM, AND LEAD.

THE SELECTED REMEDIAL ACTION FOR THIS SITE INCLUDES EXCAVATION AND TREATMENT OF 35,000 YD3 OF CONTAMINATED SOIL AND WASTE MATERIALS USING SOLIDIFICATION/STABILIZATION FOLLOWED BY ONSITE DISPOSAL; EXCAVATION AND

ONSITE SOLIDIFICATION/STABILIZATION OF 500 YD3 OF CONTAMINATED SEDIMENT; COVERING THE SITE IN ACCORDANCE WITH RCRA LANDFILL CLOSURE REQUIREMENTS; GROUND WATER PUMPING AND DEEP WELL INJECTION IN A CLASS I WELL IF EPA GRANTS A PETITION TO ALLOW LAND DISPOSAL OF WASTE PROHIBITED UNDER RCRA; IF A PETITION IS NOT APPROVED, GROUND WATER WILL BE TREATED USING AIR STRIPPING AND A LIQUID PHASE GRANULAR ACTIVATED CARBON POLISH SYSTEM TO MEET EPA REQUIREMENTS (LDR TREATMENT STANDARDS), FOLLOWED BY DEEP WELL INJECTION OR REINJECTION INTO THE AQUIFER; GROUND WATER MONITORING; AND IMPLEMENTING DEED AND ACCESS RESTRICTIONS. THE GROUND WATER TREATMENT AND UNDERGROUND INJECTION PORTIONS OF THE REMEDIAL ACTION MAY BE COMBINED WITH THE REMEDIAL ACTION FOR MIDCO I. THE ESTIMATED PRESENT WORTH COST FOR THE REMEDIAL ACTION IS $18,596,400, WHICH INCLUDES ANNUAL O&M COST OF $733,000, IF GROUND WATER IS TREATED; OR $14,419,000, WHICH INCLUDES ANNUAL O&M COSTS OF $301,000, IF GROUND WATER IS NOT TREATED.

Remedy: THIS IS THE FINAL REMEDIAL ACTION FOR THE MIDCO II. A SURFACE REMOVAL ACTION INCLUDING REMOVAL AND OFF-SITE DISPOSAL OF WASTES IN DRUMS AND SUB-SURFACE MATERIALS IN THE FORMER SLUDGE PIT AND FILTER BED HAS BEEN COMPLETED BY US EPA. THE FINAL REMEDIAL ACTION WILL TREAT THE HIGHLY CONTAMINATED SUBSURFACE SOILS AND MATERIALS THAT REMAIN AT THE SITE AND THAT ARE CONTRIBUTING TO GROUND WATER AND SURFACE WATER CONTAMINATION NEAR THE SITE, AND WILL TREAT THE HIGHLY CONTAMINATED GROUND WATER NEAR THE SITE. THESE ACTIONS WILL ADDRESS THE PRINCIPAL THREATS POSED BY THE SITE WHICH INCLUDE PUBLIC HEALTH RISKS DUE TO FUTURE DEVELOPMENT OF THE SITE, PUBLIC HEALTH RISKS DUE TO OFF-SITE MIGRATION OF GROUND WATER, ENVIRONMENTAL IMPACTS ON THE DITCH NORTHEAST OF THE SITE AND DOWN-STREAM WETLANDS.

THE MAJOR COMPONENTS OF THE SELECTED REMEDIAL ACTIONS INCLUDE:

* ON-SITE TREATMENT OF AN ESTIMATED 35,000 CUBIC YARDS OF CONTAMINATED SOIL AND WASTE MATERIAL BY SOLIDIFICATION STABILIZATION FOLLOWED BY ON-SITE DEPOSITION OF THE SOLIDIFIED MATERIAL. THE SOLIDIFICATION/STABILIZATION OPERATION WILL BE CONSIDERED SUCCESSFUL IF IT REDUCES THE MOBILITY OF CONTAMINANTS SO THAT LEACHATE FROM THE SOLID MASS WILL NOT CAUSE EXCEEDANCE OF HEALTH BASED LEVELS IN THE GROUND WATER.

* EXCAVATION AND ON-SITE SOLIDIFICATION STABILIZATION OF APPROXIMATELY 500 CUBIC YARDS OF CONTAMINATED SEDIMENTS IN THE DITCH ADJACENT TO THE NORTHEAST BOUNDARY OF THE SITE,

* INSTALLATION AND OPERATION OF A GROUND WATER PUMPING SYSTEM TO INTERCEPT CONTAMINATED GROUND WATER FROM THE SITE;

* INSTALLATION AND OPERATION OF A DEEP, CLASS I, UNDERGROUND INJECTION WELL FOR DISPOSAL OF THE CONTAMINATED GROUND WATER; OF IF A NO-MIGRATION DEMONSTRATION IS DISAPPROVED BY US EPA, INSTALLATION AND OPERATION OF A

TREATMENT SYSTEM FOR THE CONTAMINATED GROUND WATER TO REMOVE HAZARDOUS SUBSTANCES FOLLOWED BY DEEP WELL INJECTION OF THE SALT CONTAMINATED WATER; OR INSTALLATION AND OPERATION OF A TREATMENT SYSTEM FOR THE CONTAMINATED GROUND WATER TO REMOVE HAZARDOUS SUBSTANCES FOLLOWED BY REINJECTION OF THE SALT CONTAMINATED GROUND WATER INTO THE CALUMET AQUIFER IN A MANNER THAT WILL PREVENT SPREADING OF THE SALT PLUME.

* INSTALLATION OF A CONDUIT IN THE DITCH ALONG THE SITE AND A FINAL SITE COVER SATISFYING RCRA CLOSURE REQUIREMENTS, IF APPLICABLE OR IF CONSIDERED RELEVANT AND APPROPRIATE (THE QUALITY OF CAP REQUIRED WILL DEPEND ON THE RESULTS OF TESTS ON THE SOLIDIFED MATERIAL;

* RESTRICTION OF SITE ACCESS AND IMPOSITION OF DEED RESTRICTIONS AS APPROPRIATE;

* RELATED TESTING AND LONG TERM MONITORING.

THE GROUNDWATER TREATMENT AND UNDERGROUND INJECTION PORTIONS OF THE REMEDIAL ACTION MAY BE COMBINED WITH THE REMEDIAL ACTION FOR MIDCO I. IN THIS CASE, THE COMBINED TREATMENT CONSTITUTES AN ON-SITE ACTION, FOR PURPOSES OF THE OFF-SITE POLICY AND FOR COMPLIANCE WITH THE REQUIREMENTS OF THE RESOURCE CONSERVATION AND RECOVERY ACT.

2) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/AMD/R05-92/193

ROD Date: 04/13/1992

Media: Soil Sediments, Ground Water

Contaminant: VOCs Metals Inorganics

Abstract: SITE HISTORY/DESCRIPTION: The 7-acre MIDCO II site is an abandoned chemical waste storage and disposal facility in Gary, Indiana. Land use in the surrounding area is predominantly industrial. The underlying aquifer, which is used primarily for non-drinking purposes, is highly susceptible to contamination from surface sources. From 1976 to 1978, this site was used for treatment, storage, and disposal of chemical and bulk liquid wastes. Onsite pits were used for disposal, from which wastes percolated into and contaminated the ground water. An overflow pipe from a filter bed disposal pit discharged directly into a ditch draining directly into the nearby Grand Calumet River. Additionally, an estimated 10 waste storage tanks were deteriorated and leaking. In 1977, a fire at the site destroyed an estimated 50,000 to 60,000 waste drums. In 1981, EPAinstalled a fence around the site. From 1984 to 1989, EPA removed all surface wastes, including thousands of drums and numerous tanks of chemical waste; excavated and disposed offsite subsurface soils and wastes from the sludge pits and the filter bed; and extended the site fence. This ROD amends a 1989 ROD that addressed the

remaining contaminated soil, pit wastes, and ground water by treatment of an estimated 35,000 cubic yards of soil wastes using solidification/stabilization followed by onsite disposal; excavation and solidification/stabilization of 500 cubic yards of contaminated sediments followed by onsite disposal; covering the site in accordance with RCRA landfill closure requirements; ground water pumping and injection into a shallow or deep aquifer with or without treatment, depending on treatment studies; and implementing deed and access restrictions. The amended remedy reduces the estimated amount of soil to be treated, as a result of amended soil CALs and a determination that arsenic may not be present above background levels. The primary contaminants of concern affecting the subsurface soil, sediment, and ground water are VOCs, including toluene, TCE, and xylenes; metals, including chromium and lead; and inorganics. PERFORMANCE STANDARDS OR GOALS: Ground water clean-up standards are not changed from the 1989 ROD. Treatment required prior to OU1 are further defined compared to the 1989 ROD, and include at a minimum treatment to MACs, which are required for RCRA delisting. Specific MACs include methylene chloride 31.5 ug/l; trichloroethene 31.5 ug/l; toluene 6,300 ug/l; chromium 630 ug/l; nickel 630 ug/l; and lead 99.5 ug/l. Treatment below the MACs will be required if necessary to protect underground sources of drinking water. Soil treatment action levels are increased from 1x10[-6] and HI = 1 in the 1989 ROD to 5x10[-4] and HI = 5 in this ROD. INSTITUTIONAL CONTROLS: Institutional controls including deed and access restrictions will be implemented to protect the integrity of the site cover and operational aspects of the remedy.

Remedy: SELECTED REMEDIAL ACTION: The amended remedial action for this site includes reducing the amount of soil to be treated from an estimated 35,000 cubic yards to an estimated 12,200 cubic yards; excavating and treating the contaminated soil onsite using soil vapor extraction, followed by in-situ solidification/ stabilization; excavating an estimated 500 cubic yards of contaminated sediment from a ditch adjacent to the northeast boundary of the site, with onsite solidification/stabilization; pumping and onsite treatment of contaminated ground water using air stripping and carbon adsorption, or possibly precipitation, with deep well injection of the treated water; constructing a final vegetated RCRA cover over the entire site; implementing institutional controls including deed restrictions, and site access restrictions; conducting long-term monitoring and providing for a contingency remedy if clean-up action levels for the Calumet Aquifer are technically impracticable to attain which includes low-level pumping to contain contaminated ground water and additional institutional controls. The ground water treatment or underground injection portions of this remedy may be combined with remedial actions for the adjacent Midco I site. The estimated present worth cost for this amended remedial action is $13,000,000, which includes an annual O&M cost of $660,000.

URL: http://www.epa.gov/superfund/sites/rodsites/0501805.htm
This page was last updated on: April 15, 2002
Site maintained by: Office of Emergency and Remedial Response
brown.margret@epa.gov

NINTH AVENUE DUMP

Site Information:

Site Name: NINTH AVENUE DUMP

Address: 7357 W NINTH AVE
GARY, IN 46402

EPA ID: IND980794432

EPA Region: 05

County: 089 LAKE

Latitude: +41.593400

Longitude: -087.429000

NPL Status: Currently on the Final NPL

Non-NPL Status:

Federal Facility Flag: Not a Federal Facility

Incident Category: Industrial Waste Treatment

Record of Decision (ROD) List:

	ROD ID	ROD Date	OU
1	**EPA/ROD/R05-88/071**	09/20/1988	01
2	**EPA/ROD/R05-89/095**	06/30/1989	

02

3 **EPA/AMD/R05-94/260** 09/13/1994
02

1) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/ROD/R05-88/071

ROD Date: 09/20/1988

Media: GROUNDWATER

Contaminant: METALS, ORGANICS, PCBS, PAHS, VOCS, BENZENE, TOLUENE, XYLENES

Abstract: THE NINTH AVENUE DUMP (NAD) IS A 17-ACRE INACTIVE CHEMICAL AND INDUSTRIAL WASTE DISPOSAL SITE LOCATED IN GARY, INDIANA. NAD IS LOCATED IN A LOW-LYING AREA WITH POOR DRAINAGE. PRIOR TO FILLING, THE SITE CONSISTED OF PARALLEL RIDGES SEPARATED BY WETLANDS AREAS. HAZARDOUS WASTE DISPOSAL ACTIVITIES OCCURRED AT THE SITE FROM EARLY TO MID 1970S WITH SOME FILLING CONTINUING UNTIL 1980. THE SITE ACCEPTED DRY INDUSTRIAL, CONSTRUCTION AND DEMOLITION WASTE, OIL, SOLVENTS, PAINT SOLVENTS AND SLUDGES, RESINS, ACIDS, AND FLAMMABLE, CAUSTIC AND ARSENIC-CONTAMINATED MATERIALS. A SMALL-SCALE AUTO WRECKING OPERATION HAS REPORTEDLY BEEN OBSERVED AT THE PROPERTY IN 1975 BY THE INDIANA STATE BOARD OF HEALTH (ISBH) WHICH DOCUMENTED THE PRESENCE OF 10,000 55-GALLON DRUMS AT THE SITE, MANY OF WHICH WERE EMPTY. ADDITIONALLY, THE INSPECTION ESTIMATED APPROXIMATELY 500,000 GALLONS OF LIQUID INDUSTRIAL WASTE AND 1,000 BURIED DRUMS PRESENT AT THE SITE. SUBSEQUENT INSPECTION REVEALED PORTIONS OF DISCARDED AUTO BATTERIES, DRUMMED LIQUID WASTES, AND ABANDONED TANKER TRUCKS. IN 1975 AND 1980 EPA ORDERED THE SITE OPERATOR TO INITIATE SURFACE CLEANUPS. SUBSEQUENTLY, HE REMOVED SOME BARRELS, JUNK CARS, AND TRUCKS. THIS FIRST OPERABLE UNIT ADDRESSES REMEDIATION OF AN OIL LAYER FLOATING ON THE GROUND WATER SURFACE, THE PRINCIPAL ENVIRONMENTAL THREAT AT THE SITE. THE QUANTITY OF OIL UNDER THE SITE IS ESTIMATED AT 250,000 TO 700,000 GALLONS, OF WHICH 100,000 TO 500,000 GALLONS ARE ESTIMATED TO BE RECOVERABLE. SEVERAL ORGANIC AND INORGANIC CONTAMINANTS HAVE BEEN DETECTED IN THE OIL IN HIGHER CONCENTRATIONS THAN IN OTHER MEDIA. OIL SEEPS HAVE BEEN OBSERVED IN ONSITE

PONDS LEADING TO CONCERNS THAT THE OIL MAY BE AFFECTING AQUATIC LIFE, AND AN OIL SHEEN HAS BEEN SEEN ON SEVERAL SURFACE WATER BODIES. THE SECOND OPERABLE UNIT WILL ADDRESS BURIED WASTE, CONTAMINATED SOIL, AND CONTAMINATED GROUND WATER. THE PRIMARY CONTAMINANTS IN THE OIL LAYER INCLUDE: VOCS, BENZENE, TOLUENE, XYLENE, PAHS, ORGANICS, PCBS, METALS, AND CYANIDES.

THE SELECTED REMEDIAL ACTION FOR THIS SITE INCLUDES; CONSTRUCTION OF A SOIL-BENTONITE SLURRY WALL TO COMPLETELY SURROUND THE HYDROCARBON LAYER; SEPARATE EXTRACTION OF OIL AND GROUND WATER THROUGH A SERIES OF CENTRAL EXTRACTION WELLS, FOLLOWED BY STORAGE OF THE RECOVERED OIL IN AN ONSITE STORAGE TANK AND RECHARGE OF THE TREATED GROUND WATER THROUGH RECHARGE WELLS; AND GROUND WATER MONITORING. OIL TREATMENT WILL BE EVALUATED IN THE SECOND OPERABLE UNIT. THE ESTIMATED CAPITAL COST FOR THIS REMEDIAL ACTION IS $1,960,000 WITH ANNUAL O&M OF $190,000.

Remedy: THIS INTERIM REMEDIAL ACTION IS THE FIRST OF TWO OPERABLE UNITS FOR THE SITE. THIS OPERABLE UNIT ADDRESSES THE PRINCIPAL ENVIRONMENTAL THREAT AT THE SITE, AN OIL LAYER FLOATING ON THE GROUNDWATER AND SEEPING INTO WETLANDS AREAS. THE FUNCTION OF THIS OPERABLE UNIT IS TO EXTRACT AND STORE FREE-FLOWING OIL AND CONTAIN REMAINING OIL WITH A SLURRY WALL. THE SECOND OPERABLE UNIT WILL ADDRESS TREATMENT OF THE EXTRACTED OIL, AS WELL AS REMEDIATION OF WASTE, SOIL AND GROUNDWATER CONTAMINATION.
THE MAJOR COMPONENTS OF THE SELECTED REMEDY INCLUDE:
* CONSTRUCTING A SOIL - BENTONITE SLURRY WALL TO COMPLETELY SURROUND THE OIL LAYER;
* INSTALLING AN OIL/GROUNDWATER EXTRACTION AND GROUNDWATER RECHARGE SYSTEM;
* INSTALLING A SMALL SCALE ON-SITE GROUNDWATER TREATMENT SYSTEM TO ALLOW FOR DEWATERING OF THE SLURRY WALL;
* MONITORING GROUNDWATER INSIDE AND OUTSIDE THE SLURRY WALL TO ENSURE ITS EFFECTIVENESS; AND
* INSTALLING AN ON-SITE OIL STORAGE TANK.

2) Record of Decision (ROD):

Operable Unit: 02

ROD ID: EPA/ROD/R05-89/095

ROD Date: 06/30/1989

Media: SOIL SEDIMENT GROUNDWATER FILL MATERIAL

Contaminant: VOCS, BENZENE, TCE, TOULENE, PAHS, PCBS, LEAD

Abstract: THE NINTH AVENUE DUMP IS A 17-ACRE, INACTIVE CHEMICAL AND INDUSTRIAL WASTE DISPOSAL SITE IN GARY, INDIANA. THERE IS INDUSTRIAL, COMMERICAL, AND RESIDENTIAL DEVELOPMENT IN THE SURROUNDING AREA. THERE ARE APPROXIMATELY 60 INDUSTRIAL AND RESIDENTIAL WATER SUPPLY WELLS WITHIN 1 MILE OF THE SITE. INTERCONNECTING PONDS AND WETLANDS AREAS BORDER THE WASTE DISPOSAL AREAS INTO THE NORTH, WEST, AND SOUTH. THE WETLANDS AREAS TO THE EAST AND TO THE SOUTH OF THE SITE ARE RELATIVELY UNDISTURBED. HAZARDOUS WASTE DISPOSAL OCCURRED AT THE SITE FROM THE EARLY TO MID-1970S, WITH SOME FILLING ASSOCIATED WITH CLEANUP ACTIVITIES CONTINUING UNTIL 1980. INDUSTRIAL, CONSTRUCTION, DEMOLITION, AND CHEMICAL WASTES WERE ACCEPTED AT THE SITE. SPECIFIC INDUSTRIAL WASTES WHICH WERE ACCEPTED AT THE SITE INCLUDE OIL, PAINT, SOLVENTS AND SLUDGES, RESINS, AND FLAMMABLE, CAUSTIC, AND ARSENIC-CONTAMINATED MATERIALS. A STATE INSPECTION IN 1975 REVEALED THAT THERE WERE APPROXIMATELY 10,000 55-GALLON DRUMS AT THE SITE. ADDITIONALLY, THE STATE ESTIMATED THAT 500,000 GALLONS OF LIQUID INDUSTRIAL WASTE WERE DUMPED, AND 1,000 DRUMS WERE BURIED ONSITE AND IN CONTACT WITH GROUND WATER. AS A RESULT OF 1975 STATE ORDERS AND 1980 EPA ORDERS TO INITIATE SURFACE CLEANUP, THE SITE OPERATOR REMOVED DRUMS, TANK CARS, AND SOME CONTAMINATED SOIL FROM THE SITE'S SURFACE. THE FIRST RECORD OF DECISION (ROD), SIGNED IN SEPTEMBER 1988, ADDRESSED REMEDIATION OF AN OIL LAYER FLOATING ON THE GROUND WATER SURFACE AND WILL INCLUDE CONSTRUCTION OF A SLURRY WALL AROUND THE CONTAMINATED PORTION OF THE SITE AND EXCAVATION AND ONSITE STORAGE OF CONTAMINATED SOIL. THIS SECOND AND FINAL REMEDIAL ACTION ADDRESSES THE REMAINING THREATS TO THE SITE WHICH INCLUDE CONTAMINATED SOIL, SEDIMENT, FILL MATERIAL, GROUND WATER (GENERALLY ONSITE), AND OIL COLLECTED DURING THE FIRST OPERABLE UNIT. THE PRIMARY CONTAMINANTS OF CONCERN AFFECTING THE SOIL, SEDIMENT, FILL MATERIAL, AND GROUND WATER ARE VOCS INCLUDING BENZENE, TCE, AND TOLUENE; OTHER ORGANICS INCLUDING PAHS AND PCBS; AND METALS INCLUDING LEAD.

THE SELECTED REMEDIAL ACTION FOR THIS SITE INCLUDES EXCAVATING APPROXIMATELY 36,000 YD3 OF THE MOST SEVERELY OIL-CONTAMINATED WASTE AND FILL MATERIALS FROM THE AREA INSIDE THE SLURRY WALL, ONSITE THERMAL TREATMENT OF EXCAVATED WASTE, FILL, AND PREVIOUSLY EXTRACTED OIL, FOLLOWED BY FILLING THE EXCAVATED AREA WITH INCINERATOR AND GROUND WATER TREATMENT PROCESS RESIDUES, DISCARDED DRUMS, CONTAMINATED SEDIMENT REMOVED FROM ON- AND OFFSITE PONDS, AND TRENCH SPOILS; COVERING THE AREA CONTAINED BY THE SLURRY WELL

WITH A RCRA CAP; PUMPING AND TREATMENT OF GROUND WATER INSIDE THE SLURRY WALL WITH REINJECTION OF MOST OF THE GROUND WATER WITHIN THE SLURRY WALL TO PROMOTE SOIL FLUSHING; PUMPING AND TREATMENT OF CONTAMINATED GROUND WATER OUTSIDE THE SLURRY WALL WITH REINJECTION OR DISCHARGE TO SURFACE WATER; DISMANTLING, DECONTAMINATING, AND REMOVING THE OIL STORAGE UNIT CONSTRUCTED UNDER THE FIRST OPERABLE UNIT; CONTINUED LONG-TERM GROUND WATER MONITORING; AIR MONITORING DURING REMEDIAL ACTIVITIES; AND IMPLEMENTING INSTITUTIONAL CONTROLS TO PROTECT THE SITE AND RESTRICT GROUND WATER USE. THE ESTIMATED PRESENT WORTH COST FOR THIS REMEDIAL ACTION IS $22,209,000 WHICH INCLUDES AN ANNUAL O&M COST OF $489,000.

Remedy: THIS REMEDIAL ACTION IS THE SECOND AND FINAL OF TWO OPERABLE UNITS FOR THE SITE. THE FIRST OPERABLE UNIT ADDRESSED AN OIL LAYER FLOATING ON THE GROUNDWATER THROUGH OIL EXTRACTION, STORAGE, AND CONTAINMENT WITH A SOIL/BENTONITE SLURRY WALL. THE FINAL REMEDY ADDRESSES ALL REMAINING THREATS AT THE SITE, INCLUDING CONTAMINATED SOILS, FILL MATERIALS, STORED OIL, GROUNDWATER, SURFACE WATER AND SEDIMENT.

THE MAJOR COMPONENTS OF THE SELECTED REMEDY INCLUDE;

* EXCAVATION OF APPROXIMATELY 36,000 CUBIC YARDS OF OIL CONTAMINATED WASTE AND FILL DOWN TO THE NATIVE SAND,
* THERMAL TREATMENT OF EXCAVATED FILL AND EXTRACTED OIL, MOST LIKELY IN A MOBILE ON-SITE INCINERATOR,
* REMOVING DEBRIS AND CONTAMINATED SEDIMENTS FROM ON AND OFF-SITE SURFACE WATER BODIES,
* FILLING THE EXCAVATED AREA WITH TREATMENT PROCESS RESIDUALS, TRENCH SPOILS AND POND SEDIMENTS AND DEBRIS,
* COVERING THE AREA CONTAINED BY THE SLURRY WALL WITH A RCRA SUBTITLE C CAP,
* EXTRACTION, TREATMENT AND REINJECTION OF CONTAMINATED GROUNDWATER INSIDE THE SLURRY WALL TO PROMOTE SOIL FLUSHING,
* DISCHARGE OF A SMALL QUANTITY OF GROUNDWATER OUTSIDE THE SLURRY WALL TO COMPENSATE FOR INFILTRATION,
* DEED AND ACCESS RESTRICTIONS TO PROHIBIT USE OF GROUNDWATER UNDER THE SITE AND PROTECT THE CAP, AND
* LONG TERM GROUNDWATER MONITORING.

3) Record of Decision (ROD):

Operable Unit: 02

ROD ID: EPA/AMD/R05-94/260

ROD Date: 09/13/1994

Media: groundwater, sediments, soil

Contaminant: Ketones, chlorinated ethanes, BETX, PAHs, phenols, pesticides, PCBs, plasticizers, dioxins, furans, VOCs, pesticides, metals

Abstract: Please note that the text in this document summarizes the Record of Decision for the purposes of facilitating searching and retrieving key text on the ROD. It is not the officially approved abstract drafted by the EPA Regional offices. Once EPA Headquarters receives the official abstract, this text will be replaced.

The purpose of this Record of Decision Amendment is to present a change for the final site remedy for the Ninth Avenue Dump site.

The Ninth Avenue Dump site is an inactive chemical and industrial waste disposal site and is located in Gary, Indiana. It occupies approximately seventeen acres and is situated in an area of mixed industrial, commercial, and residential property use.

The site is located in a low-lying area with poor drainage. Prior to filling, the site consisted of parallel ridges separated by wetland areas. The site is relatively flat with small depressions and mounds remaining from waste disposal or cleanup activities. A slurry wall surrounds the area of the site that contained groundwater contamination which was known or suspected, at the time of the construction of the wall, to exceed acceptable concentrations. The wall is keyed about three feet into a clay formation that is approximately 30 feet below the ground surface. Situated within the slurry wall is a pond and wetland area. A fence had been installed around the site, which now includes portions of adjacent properties.

The site had been used for the disposal of hazardous wastes from the early to mid 1970s. Buried wastes at the site include foundry sand, wood, concrete, bricks, metals, slag, non-containerized liquids and sludges, and drummed liquid and solid materials. Depth of fill ranges from zero to ten feet. The water table is about three feet below the surface. Most of the filling appeared to have been in the central and southern portions of the site, with filling apparently having stopped at the ponded area in the southern portion. During the remedial investigation (RI), it was found that some of the soils were contaminated with a variety of ketones, chlorinated ethanes, BETX (benzene, ethylbenzene, toluene, and xylene), polycyclic aromatic hydrocarbons (PAHs), phenols, pesticides, polychlorinated biphenyls (PCBs), plasticizers, and dioxins and furans. On- and off-site surface water bodies and sediments contained only low levels of volatile organic compounds (VOCs), PAHs, pesticides, and metals at low frequencies of detection. An oil layer was found floating on the

groundwater in the central and south central portions of the site. The groundwater under the site was found to be contaminated with approximately 100 organic and inorganic substances, including many of the compounds found in the oil layer. However, groundwater contamination was found, for the most part, to have not migrated beyond the site boundaries, except on the eastern and northern sides of the site. The groundwater on the site is also contaminated by high concentrations of dissolved solids, including chlorides, that have migrated from an off-site source south of the site.

Remedy: The remedial action for the site consists of two operable units. The first operable unit addressed an oil layer floating on the groundwater by means of oil and groundwater extraction, oil storage, reintroduction of the groundwater, containment with a slurry wall, and management of excess surface water. The extracted groundwater was treated prior to reintroduction. The second operable unit, which is being amended by this decision document, addresses the remaining threats at the site.

The major components of the selected remedy for the second operable unit include: installation of an intermediate slurry wall that will separate the surface water area from the contaminated area (primary containment area); removal of debris and contaminated sediments from surface water bodies on the site that are to remain, and placement of this material under the cap; installation of a soil vapor extraction system covering the portions of the primary containment area known to be contaminated (after necessary dewatering) and subsequent operation of the system to provide a performance that is appropriate and acceptable while maintaining the water level about 10 feet below the present surface; disposal of the oil extracted during implementation of the first operable unit in a manner which is appropriate and acceptable, most likely in an off-site incinerator; installation of a cap over the primary containment area, landscaping of the site, and establishment of a storm water management system which includes discharge of excess water; containment or extraction and disposal of contaminated groundwater or sources of groundwater contamination found outside the primary containment area; removing or securing any equipment which was used during implementation of the first operable unit that will not be used as part of this remedy; maintenance of an acceptable water level within the primary containment area and disposal of the excess water; deed and access restrictions that prohibit use of groundwater at the site and protect the remedy; and operation and maintenance of the remedy, including the fence and slurry wall installed in the first operable unit, and monitoring of the site to ensure protectiveness.

URL: http://www.epa.gov/superfund/sites/rodsites/0501964.htm
This page was last updated on: April 15, 2002
Site maintained by: Office of Emergency and Remedial Response
brown.margret@epa.gov

WASTE, INC., LANDFILL

Site Information:

Site Name: WASTE, INC., LANDFILL

Address: 1701 EAST US 12
MICHIGAN CITY, IN 46360

EPA ID: IND980504005

EPA Region: 05

County: 091 LA PORTE

Latitude: +41.721669

Longitude: -086.880000

NPL Status: Currently on the Final NPL

Non-NPL Status:

Federal Facility Flag: Not a Federal Facility

Incident Category: Landfill

Record of Decision (ROD) List:

	ROD ID	ROD Date	OU
1	**EPA/ROD/R05-94/249**	08/18/1994	01

1) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/ROD/R05-94/249

ROD Date: 08/18/1994

Media: groundwater

Contaminant: Semi-volatile organics, polychlorinated biphenols (PCBs)

Abstract: Please note that the text in this document summarizes the Record of Decision for the purposes of facilitating searching and retrieving key text on the ROD. It is not the officially approved abstract drafted by the EPA Regional offices. Once EPA Headquarters receives the official abstract, this text will be replaced.

The site currently known as the Waste, Inc. Landfill site is located in LaPorte County, Indiana. The site is bound by U.S. Highway 12 to the northwest, Michiana Auto Builders to the north and Sullair Corporation to the east.
Prior to its development as a landfill, the property was used as farmland. Landfilling activities began as early as 1954, when several small disposal mounds were constructed in the northern portion of the site. The mounds consisted of a variety of different wastes including: debris, fill, and scrap metal. As time passed, these mounds greatly expanded. By 1965, the site had developed into a large unpermitted landfill and was operated by an unlicensed company called Dis-Pos-All Services.

In 1970, Dis-Pos-All Services submitted a proposal to the Indiana Stream Pollution Control Board for an operation permit. Under this
proposal, the landfill would only accept wood, paper, and cardboard wastes and would also begin the acceptance of foundry sand to be used as cover material. The Board issued a non-objection letter to this proposal in July, 1971. However, several subsequent inspections by the Indiana State Board of Health (ISBH) determined that in addition to accepting the permitted wastes, the site was also accepting unapproved materials.

In 1972, Dis-Pos-all sold its operation to Waste Inc. In 1975, Waste Inc. submitted an application to the ISBH for a construction and operation permit for the existing landfill. This application was denied. However, Waste Inc appealed the ISBH's refusal and because a hearing was never scheduled, the site continued to operate. In 1981, an Agreed Order was executed between Waste Inc. and the ISBH, which set conditions for the continued operation of the landfill. In August 1982, a Consent Order was signed and the site was closed with the exception of the continued acceptance of foundry sand for use as a landfill cover. In 1983, in response to the State of Indiana enforcement actions, a Court Order demanded proper closure of the site.

Remedy: The selected remedial action for this site is made up of several components. The first component is to install a Subtitle D cap. The second component is to collect contaminated leachate in a trench along the southern site boundary. The third component is to install and operate groundwater extraction wells on-si Sanitary District of Michigan City via direct discharge. The fifth component is to rerout or abandon the existing sewer line. The sixth component is to remove the on-site underground fuel storage tank. The seventh component is to post fish advisory signs along Trail Creek. The eighth and final component is to abandon the existing on site groundwater well.

URL: http://www.epa.gov/superfund/sites/rodsites/0501655.htm
This page was last updated on: January 25, 2002
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brown.margret@epa.gov

APPENDIX F

STAKEHOLDER COMMENTS

The following comments were received within the 60-day public comment period after the initial public meeting introducing the draft version of the Little Calumet-Galien WRAS. This meeting was held on April 4, 2002, in Portage, Indiana.

The Little Calumet-Galien WRAS has been revised to incorporate stakeholder comments, where appropriate. The following is a reproduction of the stakeholder comments:

General Comments

None

Specific Comments

Part I:

- Executive Summary, Overview of Little Calumet-Galien Watershed: The Calumet watershed hydrography is inaccurate. The western section of the Little Calumet should flow out the Cal-Sag Channel in Illinois into the Mississippi drainage basin. The same is normally true of the west branch of the Grand Calumet River, although sometimes these waters may flow into Lake Michigan through the O'Brien Lock and Dam on the Calumet River. The east branch of the Grand Calumet River usually flows into Lake Michigan through the Indiana Harbor and Ship Canal.

- Executive Summary, Water Quality Goal: The description is mealymouthed. These waters are designated for aquatic habitat and full-body contact recreational uses.

- Ch. 1, Introduction: Needs an explanation of what the "Clean Water Action Plan" is.

- 2.1 Watershed Overview: See comment about watershed above.

- 2.5 Surface Water Use Designations: These watersheds are in the Lake Michigan basin. Therefore, the applicable water use designation rule is 327 IAC 2-1.5-5.

- 2.5.1 Surface Water Classifications: While there are no exceptional use waters, the waters of the Indiana Dunes National Lakeshore, which includes part of the Little Calumet, are designated as Outstanding State Resource Waters. Designated salmonid waters should also be mentioned. The applicable rule sections are 2-1.5-5 and 2-1.5-19.

- 2.7 Superfund Sites: There are several more Superfund sites in the watershed: American Chemical Services, Griffith; Midco I and II, Gary; H&H Recycling, Gary; Ninth Avenue Dump, Gary; U.S.S. Lead, East Chicago (this was a RCRA closure, but is essentially the same as a Superfund cleanup and may have lately been added to the NPL). It is not clear what the relevance of this section is to a watershed restoration strategy. All of these sites, I believe, have been remediated to a greater or lesser degree. I believe all of them except H&H involve groundwater or surface water contamination. I think you either need to add more information to this section, explaining its significance to the WRAS, or delete it.

- 3.1.1 E. coli bacteria: The applicable rule subsection is 2-1.5-8(e)(2). Many IAC references in this chapter need to be changed to the corresponding subsections of 2-1.5-8.

- 3.1.3 Oxygen-Consuming Wastes: It would be helpful for non-experts like myself to explain the meaning and significance of BOD and CBOD, which are terms I frequently run across in technical writing on dissolved oxygen. There is a higher dissolved oxygen requirement for salmonid streams (cf. 2-1.5-8(d)(1).

- 4.1.1 Office of Water Quality Programs: second paragraph - "...the Section began a five-year synoptic study..." I suspect that few readers are going to know what "synoptic" means. Perhaps "comprehensive" would be better.

- 4.1.2 Local Volunteer Monitoring Programs: Save the Dunes Conservation Fund should be included. Contact Sandy Wilmore, 219/879-3564.

- 4.2 Summary of Ambient Monitoring Data: Results of the benchmark characteristic analysis are Appendix A in my copy, not B as stated in this paragraph. The data seems pretty worthless for the non-expert.

- 5.1.1 State Authority for Indiana's Water Quality Program: I would suggest adding a paragraph stating that the state rulemaking authority for water is the Water Pollution Control Board, which normally meets on the second Wednesday of the month in the Government Center South. Stress that these meetings are open to the public. Names and contact information of board members should be listed along with an IDEM contact for obtaining agendas, draft rules and rulemaking calendar, meeting notices, changes in board membership and other information. A brief explanation of the difference between rules and laws might also be helpful.

- 5.1.4 Total Maximum Daily Loads: It would be appropriate to indicate here the increase in impaired waterways between the 1998 303(d) list and the draft for 2002, to state how many individual TMDLs are envisioned by the 2002 list (assuming each impairment requires a separate TMDL), and the number of TMDLs completed and in development.

Part I, Tables:

- 303(d): The WRAS will be immediately out-of-date if they do not include the 2002 303(d) list.

- Population: Data seems unnecessarily old. Are the 2000 census numbers not available at this level of detail?

- Outstanding rivers: Information on Outstanding State Resource Waters and WPCB-designated salmonid streams should be included. In Table 2.5, the meaning of the numbers in the line below the river names is unclear.

- Water use: Table 2-7 is very useful. Is there no more recent data? A footnote should be added saying that most of the people in the watershed and many companies get their water from Lake Michigan. In fact, the Lake Michigan totals should be added if they are available. Otherwise the information here is potentially misleading.

- Table 3-2: The waterbodies to which the CSOs discharge should be noted. Gary and Hammond have CSO outfalls on both the Grand Calumet and Little Calumet rivers, and the number of each should be listed. East Chicago may have outfalls on both the Grand Cal and the Indiana Harbor Ship Canal. Gary has 13 CSO outfalls.

- 3-3, NPDES Permitted Facilities: Table should be dated, sourced and an explanation of active/inactive status given. The information appears fairly recent, since the Whiting refinery is listed as BP rather than Amoco. Still, there are some out-of-date entries: Nipsco has shut down its Dean Mitchell station and LTV Steel Co. was shut down and has been sold to International Steel Group, which plans to start some of it back up. Still, this could be a very useful list, especially if there is a reference somewhere about how people could use the NPDES permit numbers to obtain updated information on the web.

Part II:

- Chapter 1, Stakeholder Groups: Contact information for groups should be provided. This should probably be done in Part I. It is not clear why that information is repeated here. Are you planning at some point to add the groups' concerns

and priority issues to this section? Save the Dunes Conservation Fund should be included.

- Ch. 2, WQ Concerns Identified by State and Federal Agencies: This is very interesting information, which I was unaware of, but it is very poorly presented. The text, table and figure should be placed together. The numeric references from the figure to the table are unclear. The numeric range on the table (1=good, 5=poor) should be repeated below the table, and the meaning of nd (no data, I assume) should be included.

- Ch. 3, Impaired Waters: Should be updated to 2002 list. Locations of different segments of same body of water need to be identified. Mention should be made of limited number of TMDLs completed to date.

- Ch. 4, Recommended Management Strategies: Nowhere is the generic nature of the WRAS more evident than in this chapter. There is no mention of the biggest problem for the Grand Calumet and the western half of the Little Calumet, which is contaminated sediments. Streambank erosion and stabilization, on the other hand, is a relatively minor problem. CSOs are a much more acute problem than failing septic systems; they should be dealt with separately rather than lumped in with other point sources. As the culmination of the WRAS, this is a disappointment.

- Ch. 5, Future Expectations and Actions: This section is also a disappointment. Nothing indicates that anyone is taking ownership of the WRAS. In the executive summary, you state that the goal of the WRAS is to assist local citizens with improving water quality. The introduction to Part I, Chapter 1 also envisions a partnership in which states work with public agencies, private organizations and citizens. Yet this section does not indicate who has responsibility for the WRAS or gives any reliable indication that it won't become just another study collecting dust on a shelf: "The Watershed Restoration Action Strategy may be revised or amended when sufficient information becomes available (emphasis added)." This summary makes it appear that the WRAS is directed more toward the Office of Water Quality than to people living in the watershed. There is no suggestion here as to how citizens can get involved, let alone how they can make improvements to their watershed without having to rely on the state, a course of action that requires the patience of Job. You risk allowing all the useful information contained in previous chapters to go to waste if you don't provide a clear concluding message encouraging stakeholders to come together and reach consensus on how to improve their watersheds, and suggest a useful framework for doing so.