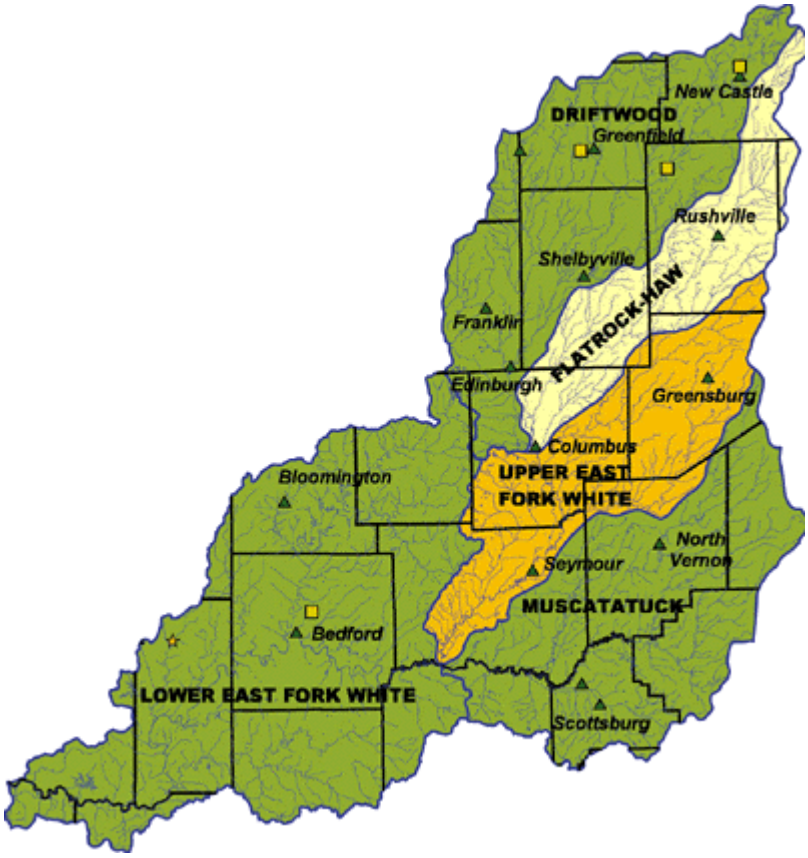
Watershed Restoration Action Strategy for the Upper East Fork White Watershed



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FOREWORD

The Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White Watershed

The Upper East Fork White River originates in southeastern Indiana and flows to the southwest for approximately 40 miles before joining the Muscatatuck River near Medora, Indiana. The Upper East Fork White River forms at the confluence of the Driftwood River and the Flatrock River near Columbus, Indiana. The East Fork often narrows as it fights its way south and west through unglaciated, rocky terrain. This is in marked contrast with the West Fork which flows through the glaciated section of Indiana accounting for a more broad and less rugged valley (IDNR 1999).

Current Status of Water Quality in the Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White watershed contains several stakeholder groups that have different missions (Appendix C). Many of these groups have a long history of conservation work in the Upper East Fork White 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.

Central Indiana Land Trust, Inc.

The Central Indiana Land Trust (CILTI) is a nonprofit 501(c)(3) corporation formed in 1990. CILTI maintains that development must be balanced with adequate greenspace. It operates in a regional capacity throughout central Indiana, and actively seeks to protect a broad array of natural areas from small urban greenspaces to pristine nature preserves of high biological integrity.

Historic Hoosier Hills RC & D, Inc.

The vision of Historic Hoosier Hills Resource Conservation and Development is to serve as a catalyst to motivate local people to solve overall economic and natural resources problems of the area, and to properly develop, utilize, and conserve our natural and human resources. Projects have included implementing an EQIP Grant to provide alternative livestock watering systems as a tool to promote Management Intensive Grazing in southeastern Indiana, and educational activities such as development of a short video which encourages proper harvesting techniques for Southern Indiana hardwoods.

Hoosier Heartland Resource Conservation and Development

The vision of the Hoosier Heartland Resource Conservation and Development is "to realize sustained economic and social prosperity while conserving our natural resources for future generations." Projects include the Backyard Tree Farm Program, Building with Nature, Urban Erosion Control seminars, Woodland Owners Clinics, and a Youth Farm Stand and outreach project.

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.

Indiana Karst Conservancy

The Indiana Karst Conservancy is a non-profit organization dedicated to the preservation and conservation of Indiana's unique karst features. The IKC was formed by concerned individuals when it was apparent that no similar group was actively protecting such features for their inherent geological, biological, and archaeological importance. The purposes of the IKC are the management, protection, and acquisition of the karst areas in Indiana. The IKC also supports research and promotes education related to karst and its appropriate use.

Sand Creek Watershed Project

The Sand Creek Watershed Project is a locally-led conservation effort supported by the Decatur County SWCD. The project is directed at enhancing water quality and other natural resources in the Sand Creek area of Decatur County. Their vision is "Clean Water, Full of Life, Safe and Scenic". They work toward this vision through community and classroom education, water monitoring and the planning and implementation of land conservation practices.

Tri-County Nutrient Management Committee

The Washington, Lawrence, and Orange County SWCD's organized to form the Tri-County Nutrient Management Committee (TCNMC) to apply for a 319 grant from IDEM to address nutrient management in the watersheds of the Blue River, Lost River, Muscatatuck River, and East Fork White River. The grant was received and allowed the committee to hire a nutrient management specialist to work with livestock producers, educating them on the need for proper management of animal waste. The TCNMC has completed two demonstration projects and will host several more in the summer of 2002. The committee is working to get a second grant to continue the work with the livestock producers.

White Creek Watershed Project

The Jackson, Jennings, and Ripley County SWCD's are working together in the White Creek Watershed. Donan Engineering Company is currently doing a diagnostic study on the watershed, which will be completed in December of 2002.

Part I, Chapter 2: General Watershed Description

This Chapter provides a general description of the Upper East Fork White Watershed and includes the following:

Section 2.1 Upper East Fork White Watershed Overview

Section 2.2 Land Cover, Population, and Growth Trends

Section 2.3 Agricultural Activities in the Upper East Fork White Watershed

Section 2.4 Significant Natural Areas in the Upper East Fork White Watershed

Section 2.5 Surface Water Use Designations and Classifications

Section 2.6 US Geological Survey Water Use Information for the Upper East Fork White Watershed

Section 2.7 Superfund Sites in the Upper East Fork White Watershed

2.1 Upper East Fork White Watershed Overview

The Upper East Fork White watershed is an 8 digit (05120206) hydrologic unit code (HUC) watershed located in southeastern Indiana (Figure 2-1). The watershed encompasses approximately 806 square miles in eight different counties and approximately 610 miles of perennial streams (USEPA 2002a). It is subdivided into 59 subbasins represented on the map by 14 digit HUCs (Figure 2-2). Nearly three-quarters of the watershed is classified as agricultural and one-fifth is forested. The majority of the soils in the watershed have medium to high erosion potential (Figure 2-3).

The Upper East Fork White River originates in southeastern Indiana and flows to the southwest for approximately 40 miles before joining the Muscatatuck River near Medora, Indiana. The Upper East Fork White River forms at the confluence of the Driftwood River and the Flatrock River near Columbus, Indiana. The East Fork often narrows as it fights its way south and west through unglaciated, rocky terrain. This is in marked contrast with the West Fork which flows through the glaciated section of Indiana accounting for a more broad and less rugged valley (IDNR 1999).

The entire Upper East Fork White watershed is located in the Eastern Corn Belt plains ecoregion, which is characterized by rolling plains, with beech/maple vegetation, and soils that are good for cropland (US EPA 1999).

2.2 Land Cover, Population, and Growth Trends

2.2.1 General Land Cover

Native vegetation in the Upper East Fork White watershed is an upland mixed hardwood 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:

3.4% Urban (impervious, low and high density)
73.2% Agricultural vegetation (row crop and pasture)

19.3% Forest vegetation (shrubland, woodland, forest)
3.7% Wetland vegetation (Palustrine: forest, shrubland, herbaceous)
0.5% Open Water

2.2.2 Population

The 2000 total population in the eight counties that have land portions in the watershed was 268,765 (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 Upper East Fork White watershed. For example, only a portion of Bartholomew and Shelby Counties are within the land area of the Upper East Fork White watershed (Figure 2-1). A better estimate of the population within the Upper East Fork White watershed may be the 1995 U.S. Geological Survey Water Use Reports, which show a total population in the watershed of 74,130 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 Upper East Fork White Watershed

Agriculture is the dominant land use in the Upper East Fork White Watershed. Section 2.2.1 shows that 73.2 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 almost every county, and Jackson and Jennings counties produce significant numbers of layers. 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 171 livestock producers operating under the Confined Feeding Rules in the eight 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 Upper East Fork White watershed are good for crop production. Table 2-4 lists the acres of the major crops produced in 1997 throughout the eight 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 eight 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White Watershed. Since all the special areas in these counties are listed, some of the areas may be located outside of the Upper East Fork White 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 Upper East Fork White Watershed

Currently, the statewide classifications discussed in Section 2.5 apply to all stream segments in the Upper East Fork White Watershed. There are no waters in the Upper East Fork White Watershed designated for limited or exceptional use by the Indiana Water Pollution Control Board in 327 IAC 2-1-11 (1997).

2.6 US Geological Survey Water Use Information for the Upper East Fork White 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 Upper East Fork White Watershed for 1995 (USGS 2001).

2.7 Superfund Sites in the Upper East Fork White 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 two Superfund (CERCLA) sites listed in the Upper East Fork White Watershed:

- Columbus Old Municipal Landfill #1 - Columbus, IN
- Seymour Recycling Corp. - Seymour, IN

The Record of Decision gives a detailed description of each site, including the media and contaminants involved. These are included in Appendix E.

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:

Section 3.1 Causes of Pollution

Section 3.2 Point Sources of Pollution

Section 3.3 Nonpoint Sources of Pollution

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 not a significant source of pollution in this watershed. There are no segments of the Upper East Fork White watershed currently appearing on Indiana's 303(d) list for impairment due to *E. coli* contamination.

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.

There are four segments of the Upper East Fork White watershed that appear on Indiana's 303(d) list for impairment due to mercury contamination. All four segments are currently scheduled for TMDL development from 2012-2014.

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 four segments of the Upper East Fork White watershed that appear on Indiana's 303(d) list for impairment due to PCB contamination. These four segments are currently scheduled for TMDL development from 2012-2014.

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 this watershed. There are no segments of the Upper East Fork White watershed currently appearing on Indiana's 303(d) list for impairment due to ammonia contamination.

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 not a significant source of pollution in this watershed. There are no segments of the Upper East Fork White watershed currently appearing on Indiana's 303(d) list for impairment due to pesticide contamination.

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 not a significant source of pollution in this watershed. There are no segments of the Upper East Fork White watershed currently appearing on Indiana's 303(d) list for impairment due to cyanide contamination.

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.

Oxygen-consuming wastes are not a significant source of pollution in this watershed. There are no segments of the Upper East Fork White watershed currently appearing on Indiana's 303(d) list for impairment due to oxygen-consuming wastes.

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.

Nutrients are not a significant source of pollution in this watershed. There are no segments of the Upper East Fork White watershed currently appearing on Indiana's 303(d) list for impairment due to nutrient contamination.

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 Upper East Fork White 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 Upper East Fork White Watershed

As of June 1999, there were 75 active NPDES permits within the Upper East Fork White watershed (Table 3-3, Figure 3-1). Of the 75 active NPDES permits, 3 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 Upper East Fork White watershed.

In addition to the NPDES permitted dischargers in the watershed, there may be many unpermitted, illegal discharges to the Upper

East Fork White 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 Upper East Fork White 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 Upper East Fork White Watershed

This section provides a detailed overview of water quality monitoring, water quality, and use support ratings in the Upper East Fork White watershed and includes the following:

Section 4.1 Water Quality Monitoring Programs

Section 4.2 Summary of Ambient Monitoring Data for the Upper East Fork White 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 Upper East Fork White 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 volunteer monitoring programs are involved in conservation and/or education activities in the Upper East Fork White watershed:

Group Name: Sand Creek Watershed Project
Contact: Andrea Bongen
Contact Address: c/o Decatur Co. SWCD
Greensburg, INDIANA 47240
Contact Email: andrea-bongen@iaswcd.org
Activity: Watershed Alliance/Council
Description: Our vision for the Sand Creek watershed is "Clean Water, Full of Life, Safe & Scenic." Directed by Steering Committee composed of local leaders, business people, farmers, media contacts and concerned citizens. Major funding from EPA 319 grant, also supported by many local businesses and organizations. Activities include community and classroom education of local water quality/watershed issues, Hoosier Riverwatch monitoring, watershed management planning, creek cleanups.

Group Name: Save The Valley, Inc.
Contact: Richard Hill
Contact Address: 3800 W H&H Rustic Lane
Madison, INDIANA 47250
Contact Phone: 812-273-6015
Contact Email: phill@venus.net
URL: http://www.oldmadison.com/stv/
Activity: Volunteer Monitoring
Description: Save the Valley is a non-profit volunteer organization incorprated in the Commonwealth of Kentucky and Licensed in the State of Indiana. Our purpose is to hold the line and prevent further pollution of our air, water, and land in the Valley of the Ohio River between Lawrenceburg, Indiana and Louisville, Kentucky. STV represents environmental and public interest before regulatory agencies and at all levels of the court system.

4.2 Summary of Ambient Monitoring Data for the Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 UPPER EAST FORK WHITE ON INDIANA'S 1998 303(D) LIST

ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0169FCMRC-1998	EAST FORK WHITE RIVER	FCA - MERCURY	2012-2014
IN-0169FCPCB-1998	EAST FORK WHITE RIVER	FCA - PCBS	2012-2014
IN-0170FCPCB-1998	EAST FORK WHITE RIVER	FCA - PCBS	2012-2014
IN-0177FCMRC-1998	MUDDY FORK OF SAND CREEK	FCA - MERCURY	2012-2014
IN-0177FCPCB-1998	MUDDY FORK OF SAND CREEK	FCA - PCBS	2012-2014
IN-0181FCMRC-1998	SAND CREEK	FCA - MERCURY	2012-2014
IN-0181FCPCB-1998	SAND CREEK	FCA - PCBS	2012-2014
IN-0182FCMRC-1998	SAND CREEK	FCA - MERCURY	2012-2014

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: UPPER EAST FORK WHITE COUNTY POPULATION PROJECTIONS 1990-2020

County	1990	2000	2010	2020	Percent Change (1990 to 2020)
Bartholomew	63657	71435	74132	76070	19
Brown	14080	14957	17825	18627	32
Decatur	23645	24555	28073	29047	22
Jackson	37730	41335	45256	46826	24
Jennings	23661	27554	31769	33404	41
Rush	18129	18261	19023	19306	6
Shelby	40307	43445	46986	48363	19
Washington	23717	27223	31490	33050	39

(from IBRC 1999)

TABLE 2-2: UPPER EAST FORK WHITE CITY AND TOWN POPULATION ESTIMATES

City/Town	Census 1990	Estimate 1996	Percent Change (1990 to 1996)
Brownstown	3018	3197	5
Elizabethtown	513	628	22
Greensburg	9497	10576	11
Hartsville	387	418	8
Jonesville	221	268	21
Medora	989	1035	4
Seymour	15770	18144	15
Westport	1478	1589	7
Milford (Decatur)	126	144	14

(from IBRC 1997)

TABLE 2-3: LIVESTOCK IN THE UPPER EAST FORK WHITE WATERSHED

	1997 Livestock Inventory							
	Hogs and pigs		**Cattle and calves**		**Horse and pony**		**Layers 20 weeks and older**	
County	**Number**	**State Rank***	**Number**	**State Rank***	**Number**	**State Rank***	**Number**	**State Rank***
Bartholomew	24052	56	6736	58	616	21	204	74
Brown	203	92	2087	87	285	66	234	70
Decatur	147844	4	16193	16	382	48	214	73
Jackson	34410	39	@	@	@	@	(D)	2
Jennings	11430	72	9529	38	@	@	(D)	6
Rush	109134	8	14194	22	535	34	@	@
Shelby	63453	23	6283	63	315	59	@	@
Washington	17299	62	30138	3	@	@	69439	24

* 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 UPPER EAST FORK WHITE 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***
Bartholomew	67794	39	58378	41	7670	19	5271	52
Brown	1840	91	1022	91	@	@	3221	78
Decatur	83777	22	62057	39	9023	13	5393	51
Jackson	59118	53	64134	38	7351	20	9121	29
Jennings	32757	71	38660	65	2222	76	6305	39
Rush	95585	14	88600	13	7884	17	6007	42
Shelby	92051	17	78870	20	6710	23	3784	67
Washington	34083	68	30036	69	4097	52	21895	5

* 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 UPPER EAST FORK WHITE WATERSHED

River	Significance	County	Segment
Sand Creek	17, 20	Bartholomew, Decatur, Jackson, Jennings	Confluence with Cobbs fork to confluence East Fork of White River
White, East Fork	5, 11, 13	Bartholomew, Daviess, Dubois, Jackskon, Lawrence, White, Martin, Pike	Columbus to confluence with West Fork

TABLE 2-6: SPECIAL AREAS IN THE UPPER EAST FORK WHITE WATERSHED

County	Special Area	Manager	Access
BARTHOLOMEW	ANDERSON FALLS NATURE PRESERVE	LOCAL- BARTHOLOMEW CO. PARKS AND RECREATION	OPEN-
BARTHOLOMEW	ATTERBURY FISH AND WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
BARTHOLOMEW	ATTERBURY RESERVE FORCES TRAINING AREA	U.S. DEPT. OF DEFENSE	CLOSED-
BARTHOLOMEW	AZALIA BRIDGE (FLATROCK R.) PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
BARTHOLOMEW	CLIFTY CREEK PARK	LOCAL- COLUMBUS PARK BOARD	OPEN-
BARTHOLOMEW	DRIFTWOOD P.F.A.	DNR FISH & WILDLIFE	OPEN-
BARTHOLOMEW	GROUSE RIDGE P.F.A.	DNR FISH & WILDLIFE	OPEN-
BARTHOLOMEW	HARRISON RIDGE PARK	LOCAL- COLUMBUS PARK BOARD	OPEN-
BARTHOLOMEW	LOWELL BRIDGE PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
BROWN	ATTERBURY RESERVE FORCES TRAINING AREA	U.S. DEPT. OF DEFENSE	CLOSED-
BROWN	BROWN COUNTY STATE PARK	DNR STATE PARKS	OPEN-
BROWN	CROOKED CREEK NATURE PRESERVE	DNR FORESTRY	CLOSED-
BROWN	HITZ - RHODEHAMEL WOODS	PRIV- THE NATURE CONSERVANCY	OPEN-
BROWN	HOOSIER N.F.-BROWNSTOWN R.D.-PLEASANT RUN P.U.	U.S. FOREST SERVICE	OPEN-
BROWN	HOOSIER N.F.-CHARLES DEAM WILDERNESS AREA NORTH	U.S. FOREST SERVICE	OPEN-
BROWN	MONROE RESERVOIR	COE, LEASED TO DNR RESERVOIRS	OPEN-
BROWN	NO NAME- PRIV OR LOCAL	PRIV- THE NATURE CONSERVANCY	RESTRICTED-

County	Special Area	Manager	Access
BROWN	OGLE HOLLOW NATURE PRESERVE	DNR STATE PARKS	OPEN-
BROWN	PRANGE (MIRIAM & HENRY) TRACT	DNR NATURE PRESERVES	RESTRICTED-
BROWN	STEELE (SELMA) NATURE PRESERVE	DNR STATE MUSEUM AND HISTORIC SITES	OPEN-
BROWN	T.C. STEELE STATE MEMORIAL	DNR STATE MUSEUM AND HISTORIC SITES	OPEN-
BROWN	VIETOR WOODS (WHIPPORWILL WOODS)	DNR NATURE PRESERVES & TNC	OPEN-
BROWN	YELLOWWOOD STATE FOREST	DNR FORESTRY	OPEN-
DECATUR	GREENSBURG CITY PARK	LOCAL- DECATUR COUNTY PARKS & RECREATION DEPT.	OPEN-
DECATUR	GREENSBURG RESERVOIR P.F.A.	DNR FISH & WILDLIFE	OPEN-
JACKSON	BELL FORD PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
JACKSON	BROWNSTOWN P.A.S./P.F.A.	DNR FISH & WILDLIFE	OPEN-
JACKSON	CYPRESS LAKE P.F.A.	DNR FISH & WILDLIFE	OPEN-
JACKSON	HEMLOCK BLUFF NATURE PRESERVE	DNR NATURE PRESERVES	OPEN-
JACKSON	HOOSIER N.F.-BROWNSTOWN R.D.-PLEASANT RUN P.U.	U.S. FOREST SERVICE	OPEN-
JACKSON	HOOSIER N.F.-CHARLES DEAM WILDERNESS AREA NORTH	U.S. FOREST SERVICE	OPEN-
JACKSON	JACKSON-WASHINGTON STATE FOREST	DNR FORESTRY	OPEN-
JACKSON	KNOBSTONE GLADES NATURE PRESERVE	DNR FORESTRY	OPEN-
JACKSON	MEDORA PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
JACKSON	MONROE RESERVOIR	COE, LEASED TO DNR RESERVOIRS	OPEN-
JACKSON	MUSCATATUCK ACID SEEP SPRING RNA	U.S. FISH & WILDLIFE SERVICE	OPEN-
JACKSON	MUSCATATUCK NATIONAL WILDLIFE REFUGE	U.S. FISH & WILDLIFE SERVICE	OPEN-
JACKSON	STARVE HOLLOW STATE RECREATION AREA	DNR FORESTRY	OPEN-

County	Special Area	Manager	Access
JACKSON	VALLONIA STATE NURSERY	DNR FORESTRY	RESTRICTED-
JENNINGS	BRUSH CREEK FISH & WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
JENNINGS	CROSLEY FISH AND WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
JENNINGS	GUTHRIE WOODS	PRIV- THE NATURE CONSERVANCY	OPEN-
JENNINGS	JEFFERSON PROVING GROUNDS	U.S. DEPT. OF DEFENSE	CLOSED-
JENNINGS	MUSCATATUCK NATIONAL WILDLIFE REFUGE	U.S. FISH & WILDLIFE SERVICE	OPEN-
JENNINGS	MUSCATATUCK RIVER BLUFFS	PRIV- THE NATURE CONSERVANCY	RESTRICTED-
JENNINGS	SELMIER STATE FOREST	DNR FORESTRY	OPEN-
JENNINGS	TRIBBETS FLATWOODS	PRIV- THE NATURE CONSERVANCY	OPEN-
JENNINGS	WELLS WOODS (COMMISKEY) NATURE PRESERVE	DNR NATURE PRESERVES	OPEN-
JENNINGS	WELLS WOODS (COMMISKEY) NATURE PRESERVE ADDITION	DNR NATURE PRESERVES	OPEN-
SHELBY	HAWK WOODS NATURE PRESERVE	PRIV- THE NATURE CONSERVANCY	RESTRICTED-
SHELBY	SHELBYVILLE (BIG BLUE R.) PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-
WASHINGTON	BIG SPRING NATURE PRESERVE	DNR NATURE PRESERVES	OPEN-
WASHINGTON	CHARLES SPRING MANAGED AREA	DNR NATURE PRESERVES	RESTRICTED-
WASHINGTON	CHRISTIAN CHURCH PLAYGROUND	LOCAL- SALEM PARK BOARD	OPEN-
WASHINGTON	CLARK STATE FOREST	DNR FORESTRY	OPEN-
WASHINGTON	ELK CREEK FISH AND WILDLIFE AREA	DNR FISH & WILDLIFE	OPEN-
WASHING	INDIAN-BITTER NATURE PRESERVE	DNR FORESTRY	OPEN-

County	Special Area	Manager	Access
TON			
WASHINGTON	JACKSON-WASHINGTON STATE FOREST	DNR FORESTRY	OPEN-
WASHINGTON	SALEM COMMUNITY PARK	LOCAL- SALEM PARK BOARD	OPEN-
WASHINGTON	WHITE/MUSCATATUCK RIVER PUBLIC ACCESS SITE	DNR FISH & WILDLIFE	OPEN-

TABLE 2-7: 1995 WATER USE INFORMATION FOR THE UPPER EAST FORK WHITE WATERSHED

Population and Water Use totals	**1995**
Total population in the watershed (thousands)	74.13
Public Water Supply	**1995**
Population served by public groundwater supply (thousands)	31.05
Population served by surface water supply (thousands)	17.62
Total population served by public water supply (thousands)	48.67
Total groundwater withdrawals (mgd)	13.37
Total surface water withdrawals (mgd)	3.7
Total water withdrawals (mgd)	17.07
Total per capita withdrawal (gal/day)	350.73
Population self-supplied with water (thousands)	25.46
Commercial Water Use	**1995**
Groundwater withdrawal for commercial use (mgd)	0.81
Surface water withdrawal for commercial use (mgd)	0.1
Deliveries from public water supplies for commercial use (mgd)	1.09
Total commercial water use (mgd)	0.3
Industrial Water Use	**1995**
Groundwater withdrawal for industrial use (mgd)	0.37
Surface water withdrawals for industrial use (mgd)	1.76
Deliveries from public water suppliers for industrial use (mgd)	3.26

Total industrial water use (mgd)	0.32
Agricultural Water Use	**1995**
Groundwater withdrawals for livestock use (mgd)	0.84
Surface water withdrawals for livestock use (mgd)	0.52
Total livestock water use (mgd)	1.09
Groundwater withdrawals for irrigation (mgd)	1.1
Surface water withdrawals for irrigation (mgd)	0.16
Total irrigation water use (mgd)	1.13

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 UPPER EAST FORK WHITE WATERSHED

Community	CSO Outfalls
Greensburg	3
Seymour	1

(from ICAA 2000)

TABLE 3-3: NPDES PERMITTED FACILITIES IN THE UPPER EAST FORK WHITE WATERSHED

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0001864	SILGAN P.E.T. CORP.	MINOR	SEYMOUR	JACKSON	ACTIVE
IN0002054	MESHBERGER STONE, COLUMBUS QUA	MINOR	COLUMBUS,	BARTHOLOMEW	INACTIVE
IN0002461	KIEFFER PAPER MILLS, INC.	MINOR	BROWNSTOWN	JACKSON	ACTIVE
IN0003077	NEW POINT STONE, HARRIS CITY Q	MINOR	GREENSBURG	DECATUR	INACTIVE
IN0003140	KS BEARINGS, INC.	MINOR	GREENSBURG	DECATUR	INACTIVE
IN0003719	SEYMOUR WATER TREATMENT PLANT	MINOR	SEYMOUR	JACKSON	ACTIVE
IN0004103	GREENSBURG CITY OF	MINOR		DECATUR	INACTIVE
IN0004499	GULF OIL CO-GULF PLASTICS	MINOR		DECATUR	INACTIVE
IN0020133	GREENSBURG MUNICIPAL STP	MAJOR	GREENSBURG	DECATUR	ACTIVE
IN0021075	HARTSVILLE MUNICIPAL STP	MINOR	HARTSVILLE	BARTHOLOMEW	ACTIVE
IN0021717	DELTA FAUCET CO OF INDIANA	MINOR		DECATUR	INACTIVE
IN0021989	TEXACO BULK PLT	MINOR		BARTHOLOMEW	INACTIVE
IN0022071	PHILLIPS PETROLEUM CO SERVICE	MINOR		BARTHOLOMEW	INACTIVE
IN0022454	BROWNSTOWN MUNICIPAL STP	MINOR	BROWNSTOWN	JACKSON	ACTIVE
IN0024473	SEYMOUR MUNICIPAL STP	MAJOR	SEYMOUR	JACKSON	ACTIVE
IN0024830	WESTPORT MUNICIPAL STP	MINOR	WESTPORT	DECATUR	ACTIVE
IN0030368	VALLONIA STATE NURSERY	MINOR		JACKSON	INACTIVE
IN0030741	SANDCREEK ELEM SCHOOL	MINOR		DECATUR	INACTIVE
IN0031607	NORTH DECATUR JR AND SR HS	MINOR		DECATUR	INACTIVE
IN0032140	ELKLAND HILLS ESTATES M.H.P.	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0032271	ROCKCREEK ELEM SCHOOL	MINOR		BARTHOLOME	INACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
				W	
IN0032280	MT HEALTHY ELEM SCHOOL	MINOR		BARTHOLOMEW	INACTIVE
IN0032352	DELTA FAUCET	MAJOR		DECATUR	INACTIVE
IN0032395	CANFIELD HO COMPANY INC	MINOR		JACKSON	INACTIVE
IN0032760	POWELL HILL HOG FARM	MINOR		JACKSON	INACTIVE
IN0035068	TANNEHILL PARK	MINOR		BARTHOLOMEW	INACTIVE
IN0035645	HERITAGE HEIGHTS ASSOCIATION	MINOR		BARTHOLOMEW	INACTIVE
IN0035831	UNION 76 TRUCK STOP-NOBBLE OIL	MINOR		DECATUR	INACTIVE
IN0037508	SCIPIO ELEMENTARY SCHOOL	MINOR	SCIPIO	JENNINGS	INACTIVE
IN0037559	ROCKCREEK ELEMENTARY SCHOOL	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0037567	MOUNT HEALTHY ELEM SCHOOL	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0037915	LA GLORIA OIL AND GAS CO.	MINOR	SEYMOUR	JACKSON	INACTIVE
IN0038644	WOODS-N-WATERS, INC.	MINOR	COLUMBUS	BARTHOLOMEW	INACTIVE
IN0038652	DOTYS MOBILE HOME PARK	MINOR		JENNINGS	INACTIVE
IN0038938	HILLVIEW ESTATES SUBDVSN UTIL.	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0039349	ELIZABETHTOWN MUNICIPAL STP	MINOR	ELIZABETHTOWN	BARTHOLOMEW	ACTIVE
IN0040843	ROYAL VIEW SUBDIVISION	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0041718	FREEMAN MUN AIRPORT WTR TRMT P	MINOR	SEYMOUR	JACKSON	INACTIVE
IN0043095	CRESWOOD MOBILE HOME PARK WWTP	MINOR	GREENSBURG	DECATUR	ACTIVE
IN0043176	ROSE ACRES FARM-LOOKACRES FACI	MINOR		JACKSON	INACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0043192	ROSE ACRES INC-PENTAGON 1	MINOR		JACKSON	INACTIVE
IN0043206	ROSE ACRES FARM INC-PENTAGON 2	MINOR		JACKSON	INACTIVE
IN0043681	SECOND TAMERIX LAKE ADDITION	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0044113	SEYMOUR RECYCLING, SEYMOUR	MINOR		JACKSON	INACTIVE
IN0044237	ESSEX CASTINGS	MINOR		BARTHOLOMEW	INACTIVE
IN0044431	LAKE & FOREST CLUB INC	MINOR		JACKSON	INACTIVE
IN0046086	HOOSIER LAKES CAMPGROUND	MINOR		JACKSON	INACTIVE
IN0048631	GREAT LAKES METALS GROUP	MINOR		JOHNSON	INACTIVE
IN0049018	BARTHOLOMEW COUNTY HOSPITAL	MINOR	COLUMBUS	BARTHOLOMEW	INACTIVE
IN0049620	BEECH ACRES MOBILE HOME PARK	MINOR		BARTHOLOMEW	INACTIVE
IN0049638	WOODLAWN MOTEL,INC	MINOR		BARTHOLOMEW	INACTIVE
IN0049654	GOLDI ANN MOBILE HOME PARK	MINOR		BARTHOLOMEW	INACTIVE
IN0049662	VESTS SPRING VALLEY MOBILE HM	MINOR		BARTHOLOMEW	INACTIVE
IN0049697	ANDERSON VILLAGE MHP	MINOR		BARTHOLOMEW	INACTIVE
IN0049701	OTTER CREEK GOLF COURSE	MINOR	COLUMBUS	BARTHOLOMEW	INACTIVE
IN0050709	CERALAND PARK	MINOR	COLUMBUS	BARTHOLOMEW	INACTIVE
IN0051683	HARRISON LAKE SUBDIVISION	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE
IN0053091	GRANDVIEW UTILITIES	MINOR	COLUMBUS	BARTHOLOMEW	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
IN0053210	NEW POINT STONE, NEW POINT QUA	MINOR	GREENSBURG	DECATUR	INACTIVE
IN0053619	HOLM INDUSTRIES, INC.	MINOR	SEYMOUR	JACKSON	INACTIVE
IN0053902	GENEVA TOWNSHIP RWD	MINOR	SCIPIO	JENNINGS	INACTIVE
IN0053937	TEPPCO - SEYMOUR TERMINAL	MINOR	SEYMOUR	JACKSON	ACTIVE
IN0055891	ROSE ACRE FARMS, SOY BEAN PROC	MINOR	SEYMOUR	JACKSON	ACTIVE
IN0056090	SHADY ACRES MHP	MINOR	NORTH VERNON	JENNINGS	INACTIVE
IN0056545	CHEVRON, FACILITY #49720	MINOR	COLUMBUS,	BARTHOLOME W	INACTIVE
IN0057321	SPEEDWAY STORE #5492	MINOR	BEDFORD	LAWRENCE	ACTIVE
IN0057363	LUTHERAN LAKE RESORT ASSOC.	MINOR	COLUMBUS	BARTHOLOME W	ACTIVE
IN0059625	ROCKCREEK M.H.P. WWTP	MINOR	COLUMBUS	JENNINGS	ACTIVE
IN0060674	LAKE AND FOREST CLUB	MINOR	BROWNSTOWN	JACKSON	ACTIVE
IN0060704	LAKE SANTEE REGIONAL WASTE	MINOR	GREENSBURG	DECATUR	ACTIVE
IN0060925	TRUE TEMPER HARDWARE CORP.	MINOR	NORTH VERNON	JENNINGS	ACTIVE
IN0061115	VALEO SYLVANIA	MINOR	SEYMOUR	JACKSON	ACTIVE
ING080020	TEPPCO SEYMOUR TERMINAL (002)	MINOR	SEYMOUR	JACKSON	INACTIVE
ING080042	SPEEDWAY STATION #1310	MINOR	GREENSBURG	DECATUR	INACTIVE
ING080097	CHEVRON FACILITY #49720	MINOR	OGILVILLE	BARTHOLOME W	INACTIVE
ING340007	TEPPCO SEYMOUR TERMINAL (003)	MINOR	SEYMOUR	JACKSON	INACTIVE
ING340019	LA GLORIA OIL & GAS, SEYMOUR	MINOR	SEYMOUR,	JACKSON	ACTIVE
ING490007	NEW POINT STONE, HARRIS CITY Q	MINOR	GREENSBURG	DECATUR	ACTIVE
ING490055	U.S. AGGREGATES, COLUMBUS PLT	MINOR	COLUMBUS	BARTHOLOME W	ACTIVE
INL020133	GREENSBURG MUNICIPAL STP	MINOR		DECATUR	ACTIVE

NPDES	Facility Name	Major/ Minor	City	County	Status
INL021075	HARTSVILLE MUNICIPAL STP	MINOR		BARTHOLOMEW	ACTIVE
INL021253	HOPE MUNICIPAL STP	MINOR		BARTHOLOMEW	ACTIVE
INL022454	BROWNSTOWN MUNICIPAL STP	MINOR		JACKSON	ACTIVE
INL023744	MEDORA MUNICIPAL STP	MINOR		JACKSON	ACTIVE
INL024473	SEYMOUR MUNICIPAL STP	MINOR		JACKSON	ACTIVE
INL031551	CROSS CLIFF ELEM. SCHOOL	MINOR		BARTHOLOMEW	ACTIVE
INL037559	ROCK CREEK ELEMENTARY SCHOOL	MINOR		BARTHOLOMEW	ACTIVE
INL037567	MT. HEALTHY ELEM. SCHOOL	MINOR		BARTHOLOMEW	ACTIVE
INL039349	ELIZABETHTOWN MUNICIPAL STP	MINOR		BARTHOLOMEW	ACTIVE
INU000167	SIMS HOG FARM	MINOR		BARTHOLOMEW	ACTIVE
INU000337	WITKEMPER FARM	MINOR		BARTHOLOMEW	ACTIVE
INU000367	FOGLE HOG FARM	MINOR		DECATUR	ACTIVE
INU060046	DAVE & SONS TRUCK WASH	MINOR	SEYMOUR	JACKSON	ACTIVE

(from IDEM 2001)

TABLE 4.1: RESULTS OF SEASONAL KENDALL ANALYSIS FOR STATIONS LOCATED IN THE UPPER EAST FORK WHITE WATERSHED 1986 TO 1995

Parameter	**EW-168** **East Fork White River** **C.R. 725 N. Bridge** **Seymour**	**EW-239** **East Fork White River** **S.R. 46 Bridge** **Columbus**
Biological Oxygen Demand	↓	↓
Chemical Oxygen Demand	↓	↘
Dissolved Oxygen	↔	↔
E. coli	↔	↔
Ammonia	↔	↔
Nitrite + Nitrate	↓	↓
Total phosphorus	↓	↑
Total Residue	↔	↔
Total Residue, Filterable	↔	?
Total Residue, Nonfilterable	↔	↔

Notes

↔ = 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

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
East Fork of the White River				
Bartholomew County	Golden Redhorse	8-13 13+	■ ■	2 3
	Silver Redhorse	16-18 18+	■ ■	3 4
Jackson County	Freshwater Drum	17-18 18+	❍ ❍	2 3
	Golden Redhorse	14-16 16+	■ ■	3 4
	Silver Redhorse	20-22 22+	■ ■	2 3
	Smallmouth Buffalo	19-26 26+	■ ■	3 4
	Bigmouth Buffalo	18+	■❍	3
Muddy Fork of Sand Creek				
Decatur County	Black Redhorse	12-15 15+	❍ ❍	2 3
	Largemouth Bass	6-11 11+	■ ■	3 4
	Northern Hogsucker	6-10 10+	■ ■	3 4
	White Sucker	10-13 13+	❍ ❍	2 3
Sand Creek				
Decatur County	Black Redhorse	14+	❍	2

	Northern Hogsucker	10-12 12+	■ ■	3 4
	Spotted Sucker	13-14 14+	❍ ❍	2 3
	White Sucker	8-11 11+	❍ ❍	2 3
	Yellow Bullhead	10-12 12+	■ ■	3 4
Jennings County	Rock Bass	6-9 9+	❍ ❍	2 3
	Spotted Bass	8-12 12+	❍ ❍	2 3
	Yellow Bullhead	8-11 11+	❍ ❍	2 3

*❍ = 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 Upper East Fork White 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 Upper East Fork White 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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Part II, Chapter 1: Concerns and Recommendations

Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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.

Central Indiana Land Trust, Inc.

The Central Indiana Land Trust (CILTI) is a nonprofit 501(c)(3) corporation formed in 1990. CILTI maintains that development must be balanced with adequate greenspace. It operates in a regional capacity throughout central Indiana, and actively seeks to protect a broad array of natural areas from small urban greenspaces to pristine nature preserves of high biological integrity.

Historic Hoosier Hills RC & D, Inc.

The vision of Historic Hoosier Hills Resource Conservation and Development is to serve as a catalyst to motivate local people to solve overall economic and natural resources problems of the area, and to properly develop, utilize, and conserve our natural and human resources. Projects have included implementing an EQIP Grant to provide alternative livestock watering systems as a tool to promote Management Intensive Grazing in southeastern Indiana, and educational activities such as development of a short video which encourages proper harvesting techniques for Southern Indiana hardwoods.

Hoosier Heartland Resource Conservation and Development

The vision of the Hoosier Heartland Resource Conservation and Development is "to realize sustained economic and social prosperity while conserving our natural resources for future generations." Projects include the Backyard Tree Farm Program, Building with Nature, Urban Erosion Control seminars, Woodland Owners Clinics, and a Youth Farm Stand and outreach project.

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.

Indiana Karst Conservancy

The Indiana Karst Conservancy is a non-profit organization dedicated to the preservation and conservation of Indiana's unique karst features. The IKC was formed by concerned individuals when it was apparent that no similar group was actively protecting such features for their inherent geological, biological, and archaeological importance. The purposes of the IKC are the management, protection, and acquisition of the karst areas in Indiana. The IKC also supports research and promotes education related to karst and its appropriate use.

Sand Creek Watershed Project

The Sand Creek Watershed Project is a locally-led conservation effort supported by the Decatur County SWCD. The project is directed at enhancing water quality and other natural resources in the Sand Creek area of Decatur County. Their vision is "Clean Water, Full of Life, Safe and Scenic". They work toward this vision through community and classroom education, water monitoring and the planning and implementation of land conservation practices.

Tri-County Nutrient Management Committee

The Washington, Lawrence, and Orange County SWCD's organized to form the Tri-County Nutrient Management Committee (TCNMC) to apply for a 319 grant from IDEM to address nutrient management in the watersheds of the Blue River, Lost River, Muscatatuck River, and East Fork White River. The grant was received and allowed the committee to hire a nutrient management specialist to work with livestock producers, educating them on the need for proper management of animal waste. The TCNMC has completed two demonstration projects and will host several more in the summer of 2002. The committee is working to get a second grant to continue the work with the livestock producers.

White Creek Watershed Project

The Jackson, Jennings, and Ripley County SWCD's are working together in the White Creek Watershed. Donan Engineering Company is currently doing a diagnostic study on the watershed, which will be completed in December of 2002.

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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White Watershed will also enhance the natural and recreational values of the Upper East Fork White River . Each subsection below focuses on a single priority issue.

4.1 Data/Information and Targeting

The success in restoring water quality in the Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 Upper East Fork White 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 75 active NPDES permitted dischargers, and 4 CSO discharge points in the Upper East Fork White 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 Upper East Fork White 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 UPPER EAST FORK WHITE 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**
05120206010	2	1	5	nd	nd	nd	nd	2	4	2	2	2	4	4	3
05120206020	nd	1	nd	3	nd	nd	4	2	3	1	4	2	2	3	1
05120206030	1	1	nd	2	nd	nd	nd	2	4	4	2	2	4	3	3
05120206040	1	1	nd	5	nd	nd	3	2	1	2	2	2	3	2	1
05120206050	nd	5	nd	nd	nd	nd	nd	2	4	1	3	2	3	3	1
05120206060	1	1	1	5	nd	nd	nd	2	2	1	1	2	3	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 UPPER EAST FORK WHITE ON INDIANA'S 1998 303(D) LIST

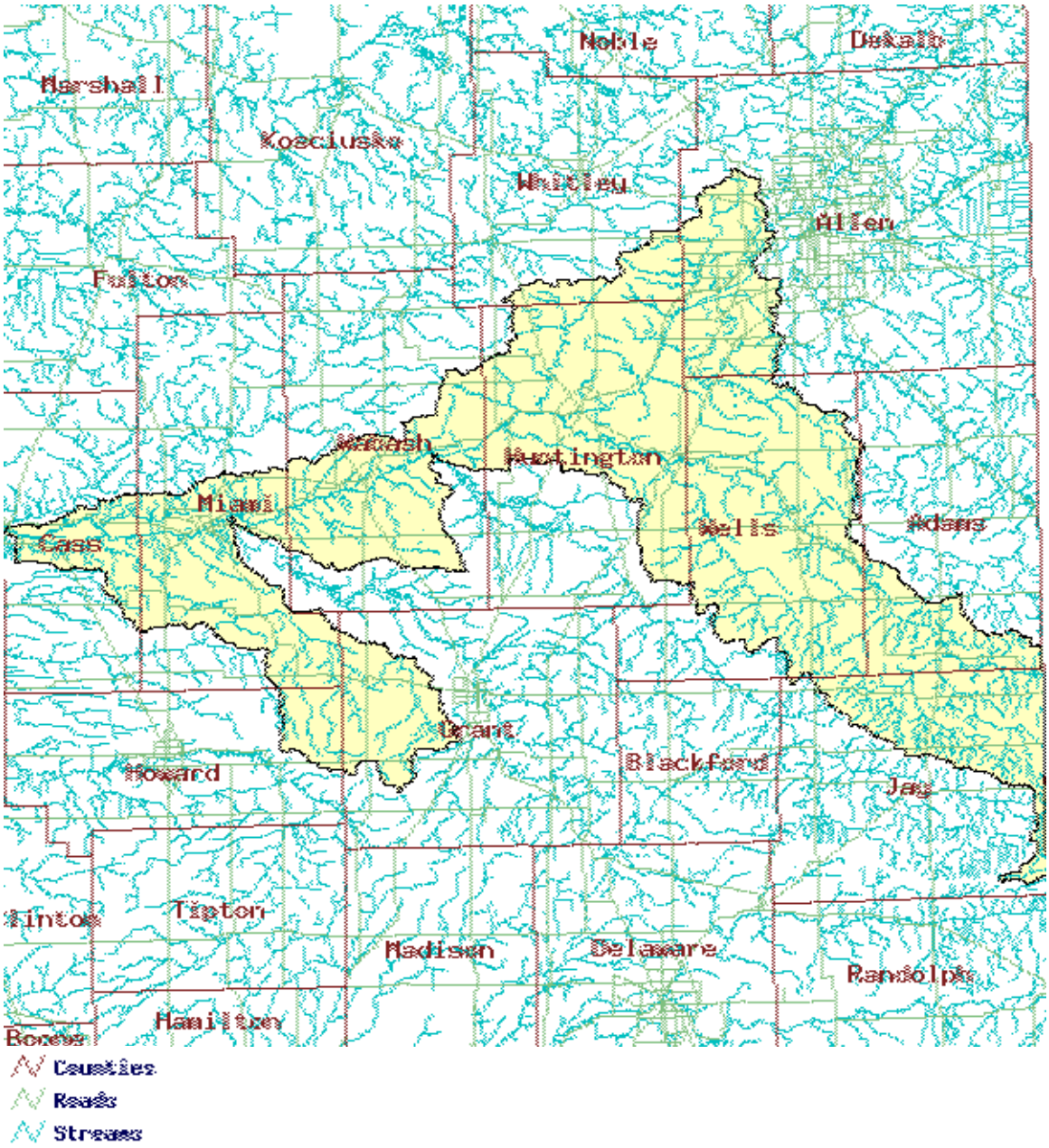
ID	Waterbody	Parameter of Concern	Priority for TMDL development
IN-0169FCMRC-1998	EAST FORK WHITE RIVER	FCA - MERCURY	2012-2014
IN-0169FCPCB-1998	EAST FORK WHITE RIVER	FCA - PCBS	2012-2014
IN-0170FCPCB-1998	EAST FORK WHITE RIVER	FCA - PCBS	2012-2014
IN-0177FCMRC-1998	MUDDY FORK OF SAND CREEK	FCA - MERCURY	2012-2014
IN-0177FCPCB-1998	MUDDY FORK OF SAND CREEK	FCA - PCBS	2012-2014
IN-0181FCMRC-1998	SAND CREEK	FCA - MERCURY	2012-2014
IN-0181FCPCB-1998	SAND CREEK	FCA - PCBS	2012-2014
IN-0182FCMRC-1998	SAND CREEK	FCA - MERCURY	2012-2014

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

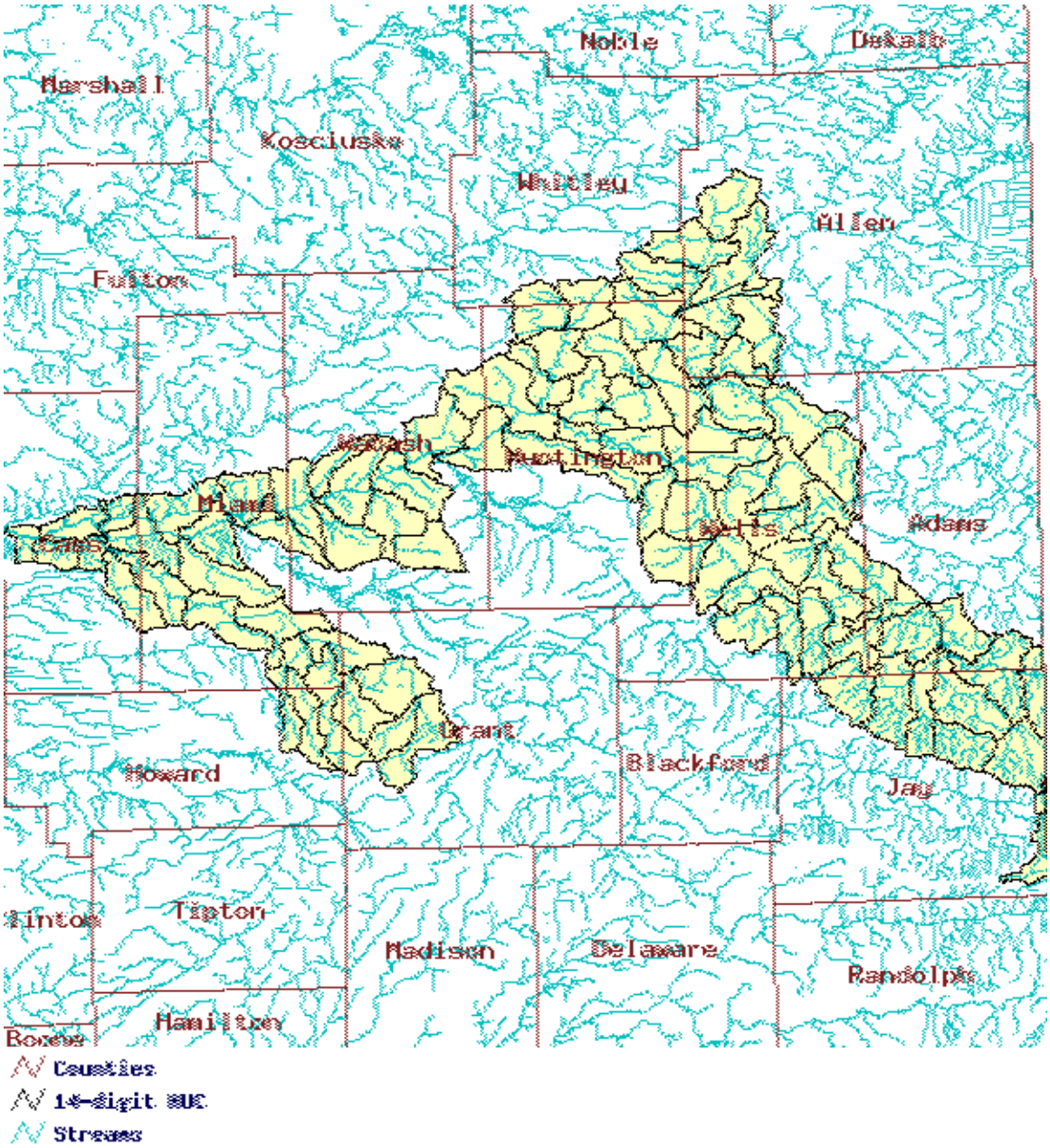
***Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above. The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that 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

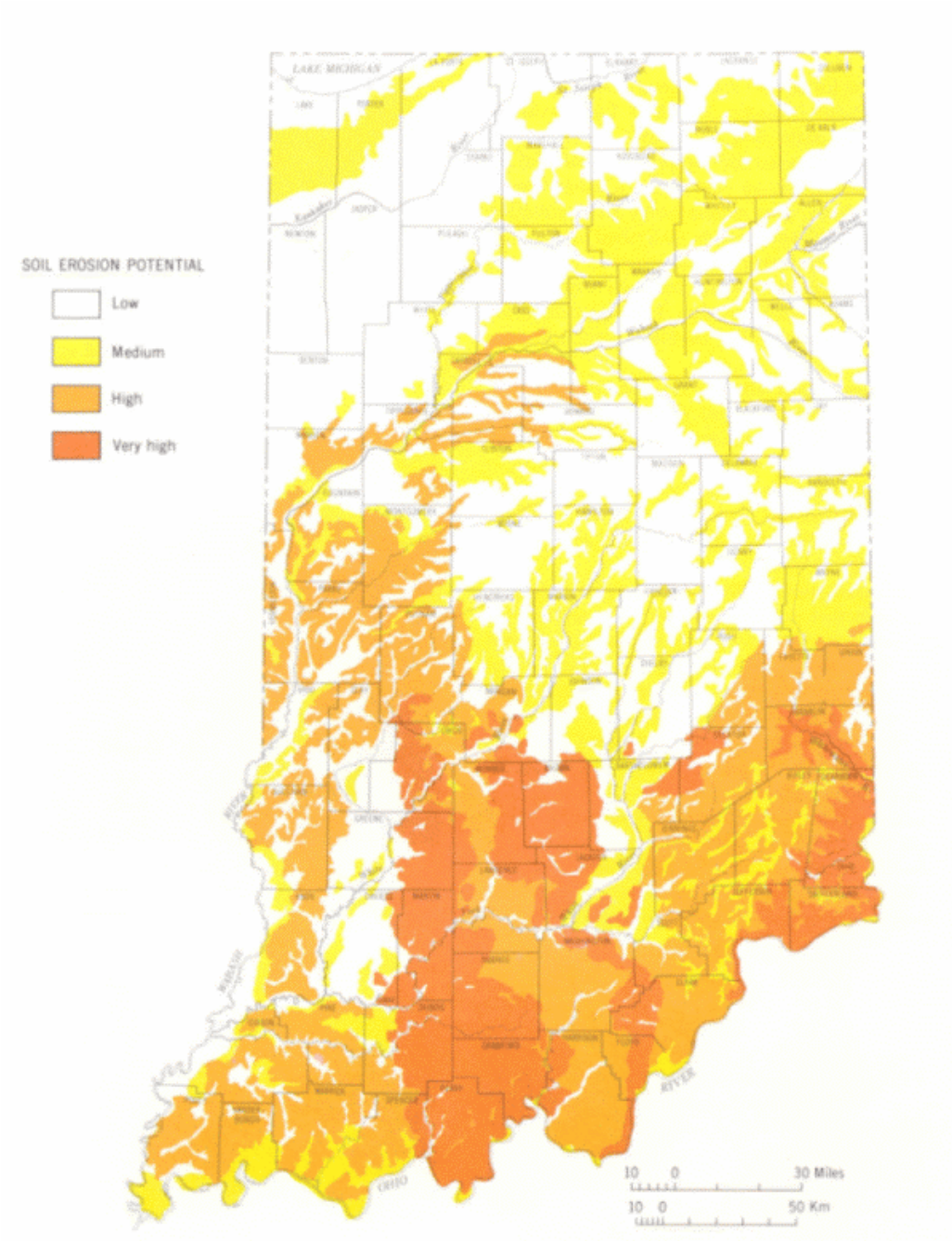
Part One, Figure 2-1: Watershed Area



Part One, Figure 2-2: 14 Digit HUCs



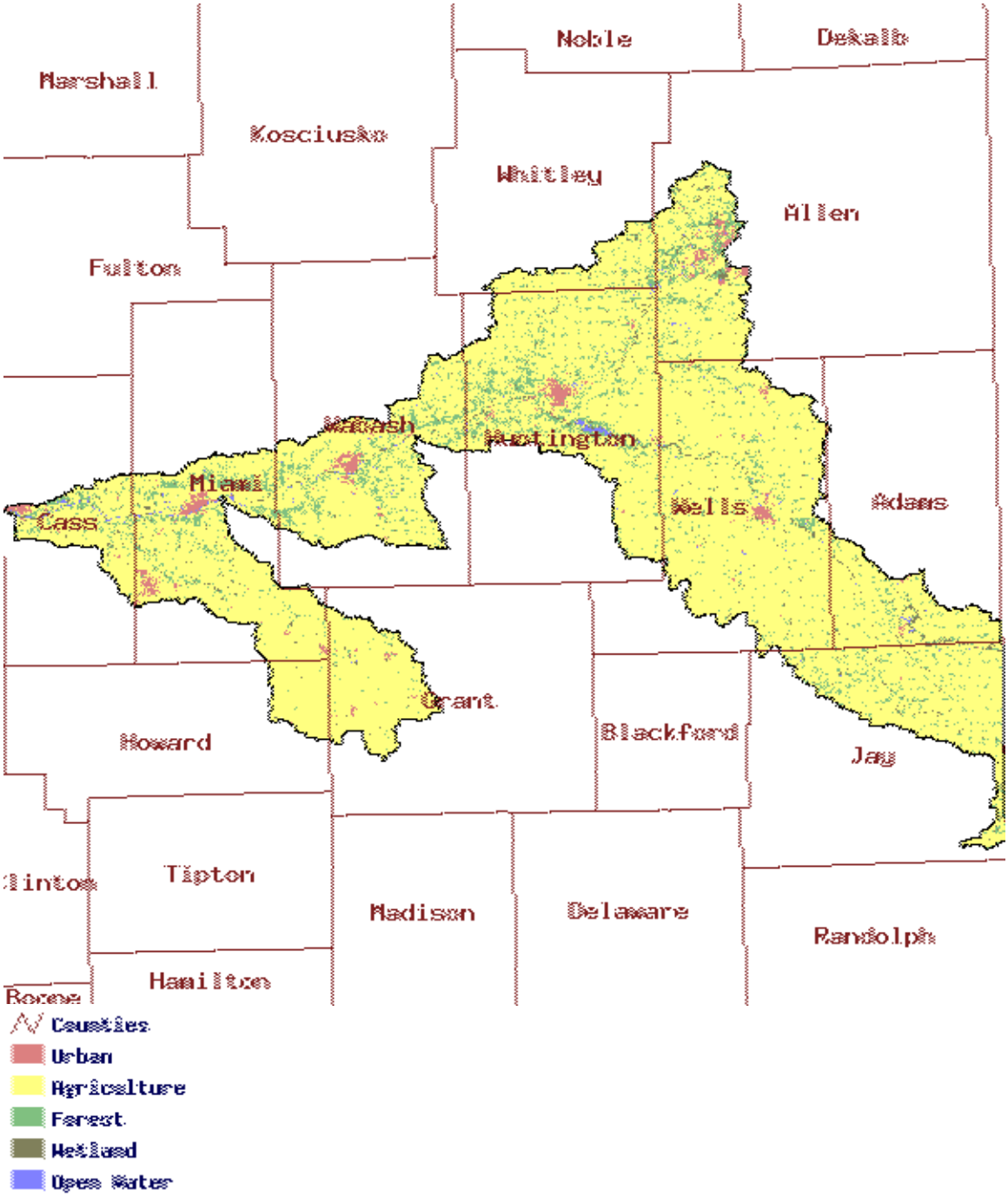
Part One, Figure 2-3 Erosion Potential



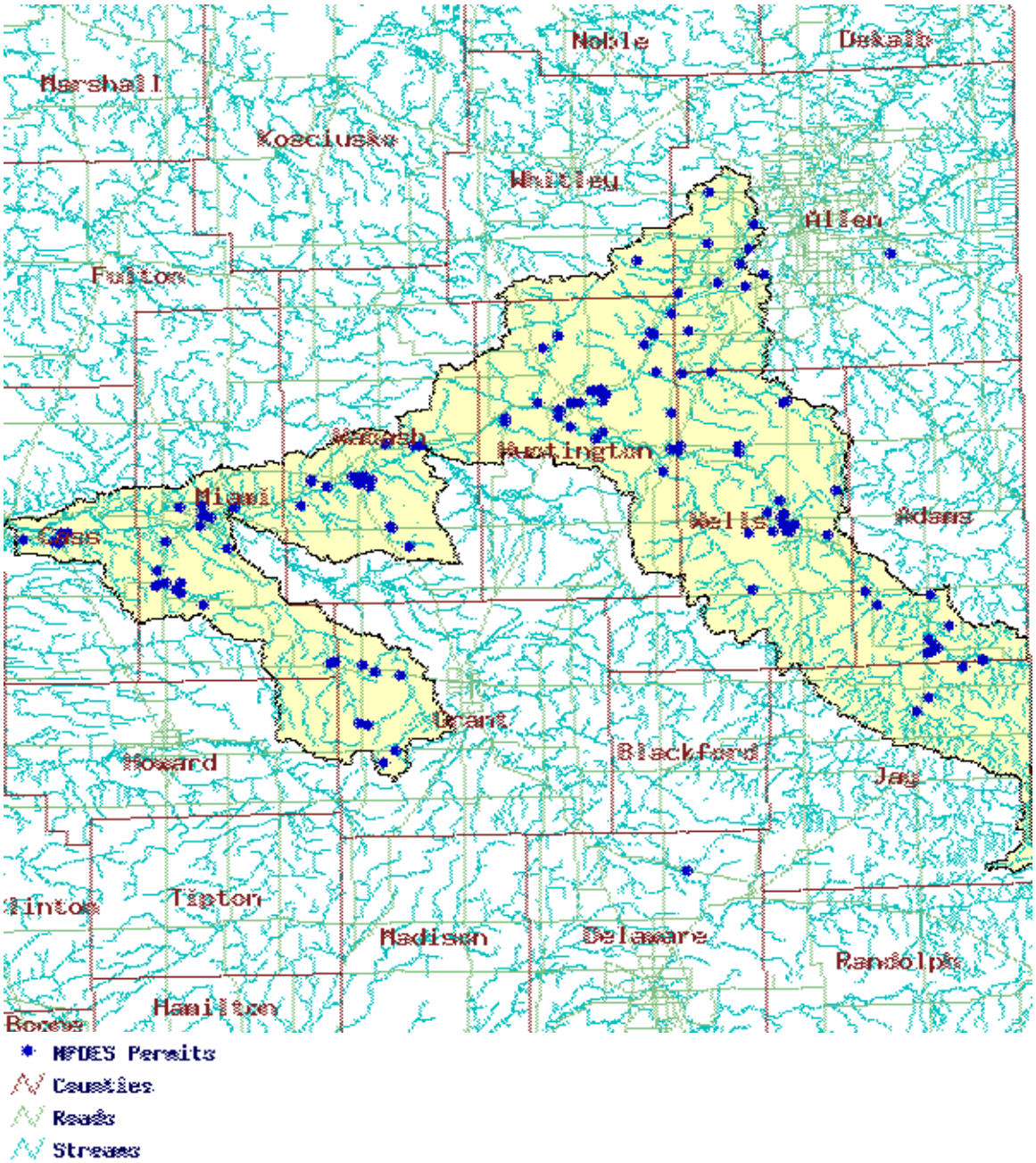
Map showing soil erosion potential of Indiana soil associations.

(from The Indiana Water Resource, IDNR 1980)

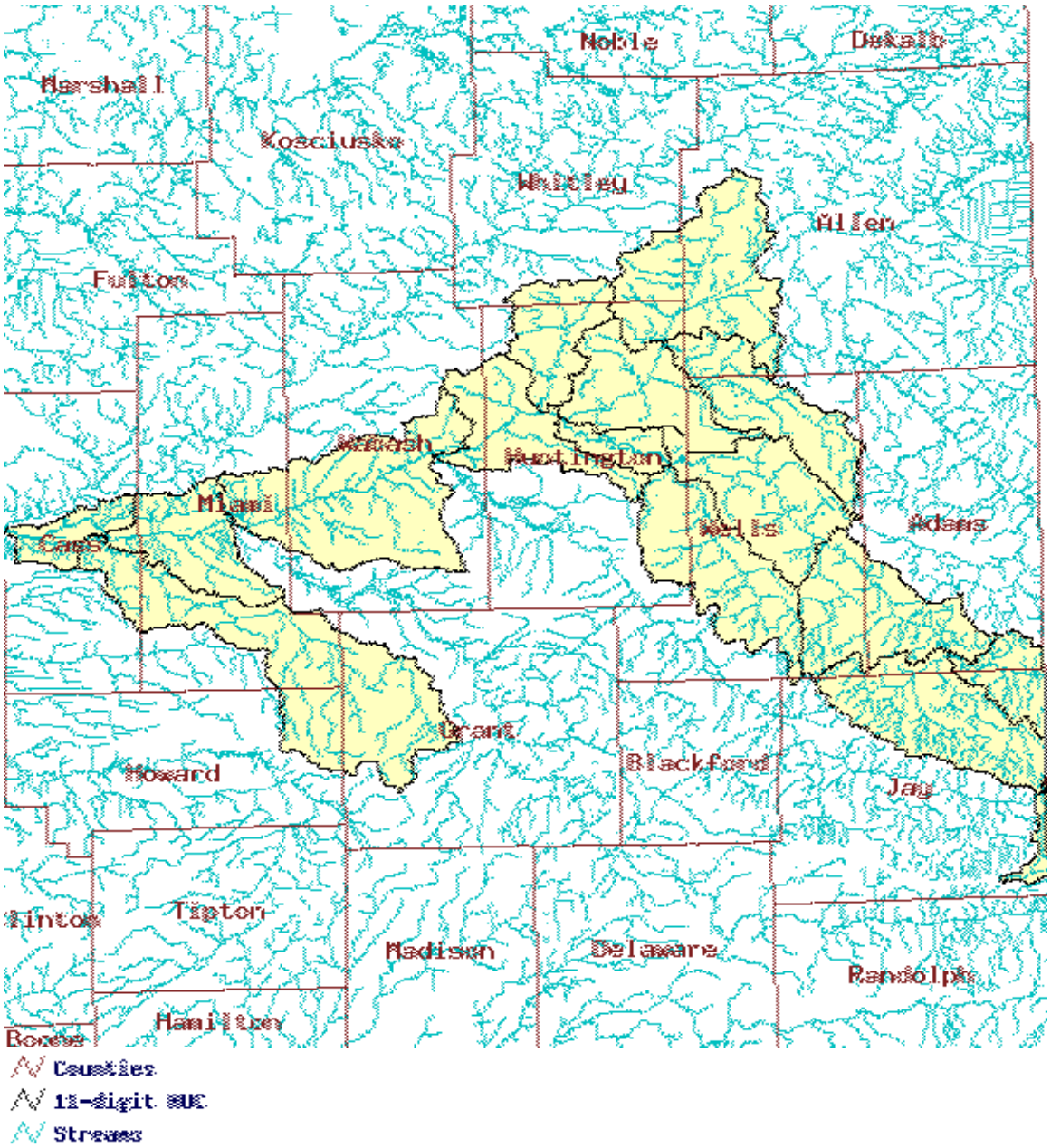
Part One, Figure 2-4: Land Cover



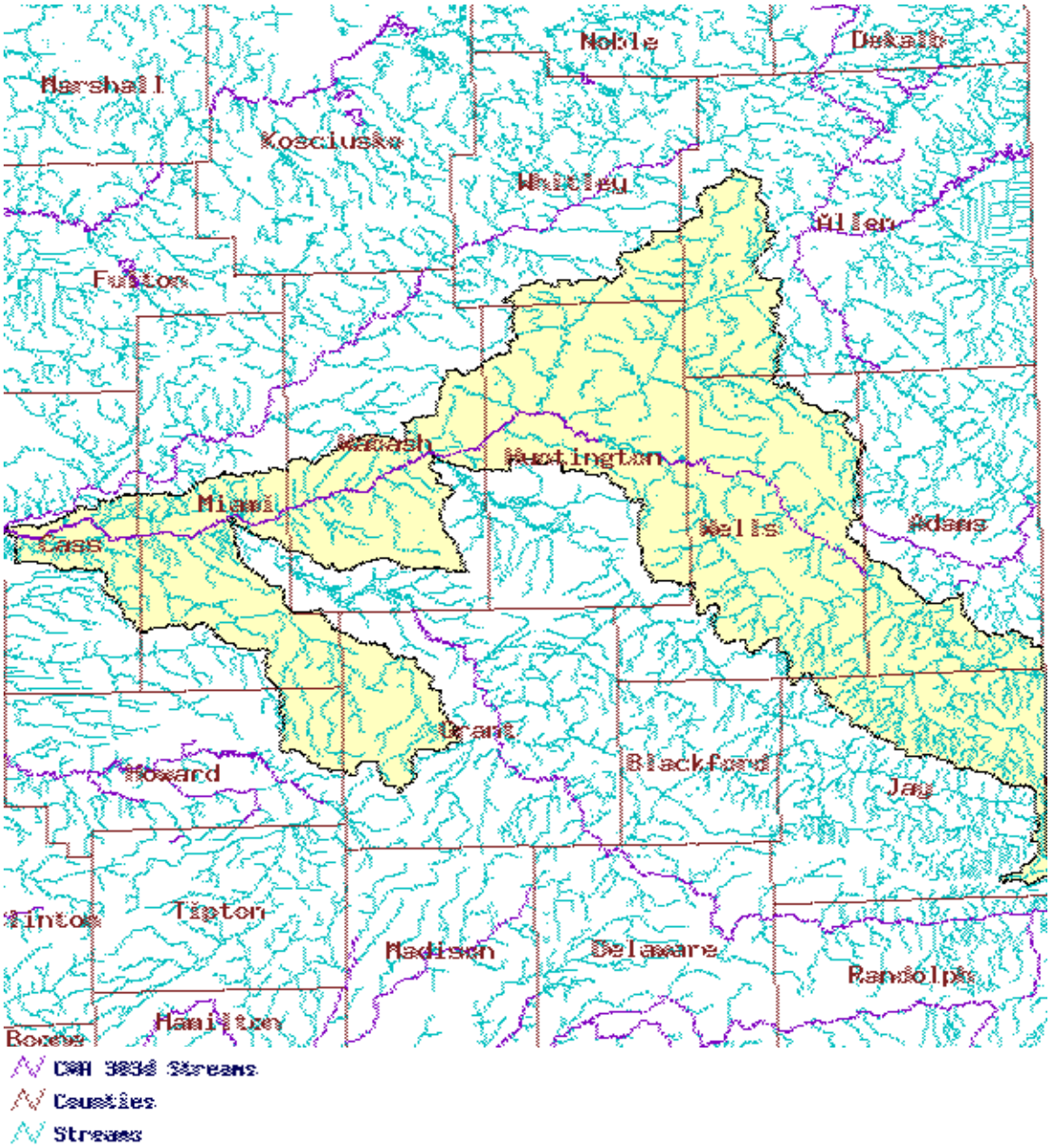
Part One, Figure 3-1: NPDES Facility Locations



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 UPPER EAST FORK WHITE WATERSHED

APPENDIX B

UPPER EAST FORK WHITE 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 Upper East Fork White Watershed

Central Indiana Land Trust, Inc.
324 West Morris St.
Indianapolis, IN 46225
317-631-5263

Cikana State Fish Hatchery
2650 State Road 44
Martinsville, IN 46151
765-342-5527

Driftwood State Fish Hatchery
4931 S. CR 250 W.
Vallonia , IN 47281
812-358-4110

Friends of the White River
P.O. Box 90171
Indianapolis, IN 46240
317-767-4140

Historic Hoosier Hills RC & D, Inc.
1981 S. Industrial Park Road
Suite 1
VersaiIIes, IN 47042-0407
812-689-6410x5

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

Hoosier Heartland Resource Conservation and Development
5995 Lakeside Blvd.
Indianapolis, IN 46278-1996
317-290-3250

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

Indiana Karst Conservancy
PO Box 2401
Indianapolis, IN 46206-2401
317-882-5420

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

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

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

Sand Creek Watershed Project
Decatur County SWCD
Greensburg, IN 47240
812-663-8685

Sycamore Land Trust
PO Box 7801
Bloomington, IN 47407-7801
812-336-5257

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

Tri-County Nutrient Management Committee
c/o Washington County USDA-NRCS
103 E. Westminster Center, Suite 115
Salem, IN 47167-9731
812-883-3704

White Creek Watershed Project
c/o Jackson County SWCD
102 E. Commerce Street
Brownstown, IN 47220-2004
812-358-2367

Bartholomew County Commissioner (Bartholomew County)
440 Third Street
Columbus, IN 47201
812-379-1515

Bartholomew County Cooperative Extension Office (Bartholomew County)
1971 State Street
Columbus , IN 47201-6965
812-379-1665

Bartholomew County Department of Health/Board of Health (Bartholomew County)
440 Third Street
Columbus, IN 47201
812-379-1550

Bartholomew County Drainage Board (Bartholomew County)
440 Third Street
Columbus , IN 47201
812-379-1525

Bartholomew County Farm Service Agency (Bartholomew County)
2314 State Street
Columbus, IN 47201-7346
812-378-1280

Bartholomew County Government Offices (Bartholomew County)
440 Third Street
Columbus, IN 47201

Bartholomew County Landfill (Bartholomew County)
811 East 550 South
Columbus, IN 47201
812-342-2756

Bartholomew County Purdue Univ. Co-op Extension Service (Bartholomew County)
1971 State St.
Columbus, IN 47201
812-379-1665

Bartholomew County SWCD (Bartholomew County)
2314 State Street
Columbus, IN 47201-7346
812-378-1280

Bartholomew County Surveyor (Bartholomew County)
440 Third Street
Room 400
Columbus, IN 47201
812-379-1525

Bartholomew County USDA-NRCS (Bartholomew County)
2314 State Street
Columbus , IN 47201-7346
812-378-1280

Columbus City Utilities (Bartholomew County)
PO Box 1987
Columbus, IN 47202-1987
812-372-8861

Brown County Chamber of Commerce (Brown County)
37 W. Main St.
Nashville, IN 47448
812-988-6647

Brown County Commissioners (Brown County)
P.O. Box 37
Nashville, IN 47448
812-988-5485

Brown County Farm Service Agency (Brown County)
1931 Liberty Dr.
Bloomington, IN 47403
812-334-2343

Brown County Health Department (Brown County)
County Office Building
Nashville, IN 47448
812-988-2255

Brown County Planning Commission (Brown County)
201 Locust Ln.
Nashville, IN 47448
812-988-5490

Brown County Purdue Univ. Co-op Extension Service (Brown County)
802 Memorial Dr.
Nashville, IN 47448
812-988-5495

Brown County SWCD (Brown County)
46 E. Gould
P.O. Box 308
Nashville, IN 47448
812-988-2211

Brown County Solid Waste (Brown County)
176 Old SR 46
Nashville, IN 47448
812-988-0140

Brown County Solid Waste Mngmnt Dist. (Brown County)
P.O. Box 1308
Nashville, IN 47448
812-988-0140

Brown County Surveyor (Brown County)
P.O. Box 37
Nashville, IN 47448
812-988-5500

Brown County USDA-NRCS (Brown County)
1931 Liberty Dr.
Bloomington , IN 47403
812-334-4323

Nashville Waste Water Treatment Plant (Brown County)
State Road 46 S.
Nashville , IN 47448
812-988-7315

Nashville Water Department (Brown County)
200 Commercial St.
Nashville, IN 47448
812-988-5524

City of Greensburg Water Plant (Decatur County)
1105 N. Ireland
Greensburg, IN 47240
812-663-2641

Decatur County Board of Commissioners (Decatur County)
150 Courthouse Square
Suite 109
Greensburg, IN 47240
812-663-2546

Decatur County Department of Health (Decatur County)
801 N. Lincoln Street
Greensburg, IN 47240
812-663-8301

Decatur County Drainage Board (Decatur County)
150 Courthouse Square
Suite 109
Greensburg, IN 47240
812-663-2546

Decatur County Farm Service Agency (Decatur County)
Greensburg Service Center
108 Smith Rd
Greensburg, IN 47240-8295
812-663-8676

Decatur County Government Offices (Decatur County)
314 N. Michigan
Greensburg, Indiana 47240
812-663-3344

Decatur County Purdue Univ. Co-op Extension Service (Decatur County)
545 S. 200 W.
Greensburg, IN 47240
812-663-8388

Decatur County SWCD (Decatur County)
108 Smith Rd
Greensburg, IN
812-663-8685

Decatur County Surveyor (Decatur County)
1672 N. County Rd. 80 NE
Greensburg, IN 47240
812-663-2615

Decatur County USDA-NRCS (Decatur County)
108 Smith Road
Greensburg, IN 47240-8217
812-663-8676

Decatur Hills Landfill (Decatur County)
2090 S. County Line Rd. 280 East
Greensburg, IN 47240
812-663-7054

Greensburg City Mayor (Decatur County)
314 N. Michigan
Greensburg, Indiana 47240
812-663-3344

Greensburg Sewage & Wastewater Treatment Plant (Decatur County)
950 S. Broadway
Greensburg, IN 47240
812-663-2138

Brownstown Wastewater Treatment Plant (Jackson County)
Brownstown, Indiana 47220
812-358-4274

City of Seymour Mayor (Jackson County)
301-309 N. Chestnut St.
Seymour, Indiana 47274
812-522-4020

Jackson County Commissioner (Jackson County)
111 S. Main St.
Courthouse
Brownstown, IN 47220
812-358-6122

Jackson County Department of Health (Jackson County)
207 N. Pine St.
Seymour, IN 47274-2143
812-522-6474

Jackson County Drainage Board (Jackson County)
111 S. Main St.
Courthouse
Brownstown, IN 47220
812-358-6107

Jackson County Farm Service Agency (Jackson County)
Brownstown Service Center
102 E. Commerce St.
Brownstown, IN 47220-2004
812-358-2367

Jackson County Government Office (Jackson County)
111 S. Main St.
Courthouse
Brownstown, IN 47220
812-358-6122

Jackson County Purdue Univ. Co-op Extension Service (Jackson County)
111 S. Main St.
Courthouse
Brownstown, IN 47220-2055
812-358-6101

Jackson County SWCD (Jackson County)
102 E. Commerce Street
Brownstown, IN 47220-2004
812-358-2367

Jackson County Surveyor (Jackson County)
111 S. Main St.
Courthouse
Brownstown, IN 47220
812-358-6106

Jackson County USDA-NRCS (Jackson County)
102 E. Commerce St.
Brownstown, IN 47220-2004
812-358-2367

Jackson County Water Utility (Jackson County)
1119 West Spring St.
Brownstown, IN 47220
812-358-3654

Rumpke of Indiana Landfill (Jackson County)
546 S. County Rd. 870 West
Medora, IN 47260
812-966-2935

City of North Vernon Utilities Water & Sewage Office (Jennings County)
275 Main St.
North Vernon, IN 47265
812-346-4691

Jennings County Commissioner (Jennings County)
3355 S. State Highway 7
North Vernon, IN 47265
812-346-4632

Jennings County Farm Service Agency (Jennings County)
North Vernon Service Center
2600 N. State Highway 7
North Vernon, IN 47265-7186
812-346-3411

Jennings County Government Office (Jennings County)
Jennings County Government Center
200 E. Brown St.
Vernon, IN 47282

Jennings County Health Dept (Jennings County)
Jennings County Government Center
200 E. Brown St.
Vernon, IN 47282-0323
812-352-3024

Jennings County SWCD (Jennings County)
2600 N. State Hwy 7
North Vernon, IN 47265
812-346-3411

Jennings County USDA-NRCS (Jennings County)
2600 N. State Highway 7
North Vernon, IN 47265-9109
812-346-3411

Jennings County-Purdue Univ. Co-Op Extension Office (Jennings County)
Jennings County Government Center
200 E. Brown St.
Vernon, IN 47282-0365
812-352-3033

Johnson County USDA-NRCS (Johnson County)
3059 N Morton St
Franklin, IN 46131
317-736-6822

Rush County Commissioner's Office (Rush County)
102 N. Main St.
Courthouse
Rushville, IN 46173
765-932-3791

Rush County Department of Health (Rush County)
Main Street
Courthouse, Room 5
Rushville, IN 46173-1854
765-932-3103

Rush County Purdue Univ. Co-op Extension Service (Rush County)
102 N. Main St.
Rushville, IN 46173
765-932-5974

Rush County SWCD (Rush County)
146 E. Highway 52
Rushville, IN
765-932-2813

Rush County Surveyor (Rush County)
102 N. Main St.
Rushville, IN 46173
765-932-3184

Rush County US Farm Service Agency (Rush County)
146 E. US Highway 52
Rushville, IN 46173-7911
765-932-2813

Rush County USDA-NRCS (Rush County)
146 E US Highway 52
Rushville, IN 46173-9801

Rushville City Mayor (Rush County)
133 West 1st Street
Rushville, Indiana 46173
765-932-3735

Shelby County Commissioner (Shelby County)
25 W. Polk St. #206
Shelbyville, IN 46176
317-392-6330

Shelby County Health Department (Shelby County)
1600 E. SR 44#b
Shelbyville, IN 46176
317-392-6470

Shelby County Purdue Co-Op Extension Office (Shelby County)
1110 Amos Rd. Suite D
Shelbyville, IN 46176-2806
317-392-6460

Shelby County SWCD (Shelby County)
1110 Amos Rd.
Shelbyville, IN 46176
317-392-1394

Shelby County Surveyor (Shelby County)
1600 E. State Rd. 44 #A
Shelbyville, IN 46176
317-3926481

Shelby County US Farm Service Agency (Shelby County)
1110 Amos Rd.
Shelbyville, IN 46175-2806
317-392-4149

Shelby County USDA-NRCS (Shelby County)
1110 Amos Rd., Suite C
Shelbyville, IN 47170-2017
317-392-4149

Shelbyville Mayor's Office (Shelby County)
44 W. Washington St.
Shelbyville, IN 46176
317-398-6624

Washington County Purdue Univ. Co-op Extension Service (Washington County)
806 Martinsburg Rd.
Suite 104
Salem, IN 47167
812-883-4601

Washington County SWCD (Washington County)
103 E. Westminster Center, Suite 115
Salem, IN 47167
812-883-3704

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

(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 Upper East Fork White watershed

COLUMBUS OLD MUNICIPAL LANDFILL #1

Site Information:

Site Name: COLUMBUS OLD MUNICIPAL LANDFILL #1

Address: 3RD ST BRIDGE AT WHITE RIVER
COLUMBUS, IN 47201

EPA ID: IND980607626

EPA Region: 05

County: 005 BARTHOLOMEW

Latitude: +39.197400

Longitude: -085.926000

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/R05-92/194	03/31/1992	01

1) Record of Decision (ROD):

Operable Unit: 01

ROD ID: EPA/ROD/R05-92/194

ROD Date: 03/31/1992

Media: Not Applicable

Contaminant: Not Applicable

Abstract: SITE HISTORY/DESCRIPTION: The 19-acre Old Municipal Landfill site is located near the City of Columbus in Bartholomew County, Indiana. The site, located in the 100-year floodplain of the East Fork of the White River, is bounded by farmland, state roads, and an inactive gravel quarry pond. Current land use in the vicinity of the site includes an abandoned shooting range, concrete mixing operation, and the City of Columbus POTW. From 1938 to the 1960's, the site was operated as a municipal landfill accumulating an estimated 500,000 cubic yards of fill material. After the landfill reached a maximum of 20 feet, operations ceased and the landfill was closed by placing two to three feet of dredged river sediments over the entire area. Deposited materials were mainly municipal and household wastes, although wastes from industrial sources were reportedly disposed of at the landfill. Limited dumping by unauthorized parties may also have occurred. No records of site operations were kept. The waste material was dumped directly on the ground surface and was exposed to the elements. Open burning of waste material occurred regularly. Annual spring flooding caused the waste material to become submerged periodically. Eventually, the landfill beganto function as a berm between the floodplain and the adjacent farmland. In 1981, Cummins Engine Company notified EPA of waste materials, including solvents, acids, lubricants, cutting fluids, and metals, that were generated and reportedly disposed of at the landfill. In 1990, the PRPs, under direct guidance of the state and EPA, conducted an investigation to assess the potential impacts of the waste material deposited in the landfill on soil, ground water, surface water, and river sediments in the vicinity of the site. Based upon findings of the remedial investigation and evaluation of current site risks, EPA concluded that the site currently poses no immediate or long-term risks to human health and the environment. This conclusion is based on current site conditions with the assumption that these conditions will not change. PERFORMANCE STANDARDS OR GOALS: Not applicable. INSTITUTIONAL CONTROLS: Institutional controls including deed restrictions will be implemented on land and ground water use.

Remedy: SELECTED REMEDIAL ACTION: The selected remedial action for this site is no further action, which includes ground water monitoring and a five-year review of site conditions to evaluate the protectiveness of the remedy. In the event that the Indiana Department of Transportation and the City of Columbus proceed with construction of the proposed roadway across the site, EPA will require the implementation of a contingency remedy, which includes implementing a landfill cover maintenance program; developing a ground water recovery system implementation plan; installing a minimum of two additional ground water monitoring wells; installing fencing with appropriate warning signs; implementing a ground water monitoring program; and implementing institutional controls, including deed restrictions on land and ground water use. There are no costs associated with this no action remedy.

URL: http://www.epa.gov/superfund/sites/rodsites/0501696.htm
This page was last updated on: January 25, 2002
Site maintained by: Office of Emergency and Remedial Response
brown.margret@epa.gov

SEYMOUR RECYCLING CORP.

Site Information:

Site Name: SEYMOUR RECYCLING CORP.

Address: G AVE WEST - FREEMAN MUNICIPAL AIRPORT

SEYMOUR, IN 47274

EPA ID: IND040313017

EPA Region: 05

County: 071 JACKSON

Latitude: +38.935200

Longitude: -085.921300

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/R05-86/046	09/30/1986	01
2	EPA/ROD/R05-87/050	09/30/1987	02

1) Record of Decision (ROD):

Operable Unit: 01
ROD ID: EPA/ROD/R05-86/046
ROD Date: 09/30/1986
Media: GROUNDWATER SOILS
Contaminant: BENZENE, DCE, HEAVY METALS, ORGANICS, TCE, TOLUENE, VOCS

Abstract: THE SEYMOUR RECYCLING CORPORATION (SRC) SITE, ENCOMPASSING A FOURTEEN-ACRE AREA, IS APPROXIMATELY TWO MILES SOUTHWEST OF SEYMOUR, IN. APPROXIMATELY ONE HUNDRED HOMES ARE LOCATED WITHIN A ONE-MILE RADIUS OF

THE SITE IN A PREDOMINATELY AGRICULTURAL AREA. FROM ABOUT 1970 UNTIL EARLY 1980 SRC OPERATED A PROCESSING CENTER FOR WASTE CHEMICALS. OVER THE YEARS TOXIC AND HAZARDOUS WASTES, INCLUDING SOLVENTS, METAL FINISHING WASTES AND OTHER MATERIALS, ACCUMULATED ON THE SITE IN 55-GALLON DRUMS, BULK TANKS AND OTHER CONTAINERS. WASTES LEAKED AND SPILLED FROM THE DRUMS CREATING FIRE AND ODOR PROBLEMS. A CONSENT DECREE, REACHED IN THE FALL OF 1982 AFTER A MAY 1980 SUIT FILED BY THE UNITED STATES AGAINST THE OWNERS AND SITE OPERATORS, RESULTED IN THE REMOVAL OF APPROXIMATELY THE UPPER ONE FOOT OF CONTAMINATED SOIL FROM ABOUT 75 PERCENT OF THE SITE'S SURFACE. CONTAMINATED SOIL REMAINS, HOWEVER, AND EXTENDS THROUGHOUT THE SHALLOW AND DEEP AQUIFER. THE SITE IS FENCED AND PARTIALLY COVERED WITH A TEMPORARY SOIL CAP. HOMES SURROUNDING THE SITE HAVE RECENTLY BEEN CONNECTED TO THE CITY WATER DISTRIBUTION SYSTEM DUE TO THE THREAT OF GROUND WATER CONTAMINATION. THE PRIMARY CONTAMINANTS OF CONCERN INCLUDE; VOCS, ORGANICS, TCE, DCE, BENZENE, TOLUENE, AND HEAVY METALS.

THE SELECTED REMEDIAL ALTERNATIVE FOR THE SITE IS THE IMPLEMENTATION OF A PLUME STABILIZATION SYSTEM WHICH WILL EXTRACT, TREAT, AND DISCHARGE APPROXIMATELY 101,690,000 GALLONS OF CONTAMINATED GROUND WATER TO THE SEYMOUR WASTEWATER TREATMENT PLANT. THE ESTIMATED CAPITAL COST FOR THIS REMEDY IS $300,000. O&M COSTS ARE ESTIMATED TO BE EITHER $100,000 PER YEAR OR $250,000 TOTAL COSTS FOR THE 2.5 YEAR PERIOD REQUIRED TO IMPLEMENT A FINAL REMEDIAL ACTION.

Remedy: - CONTAMINATED GROUNDWATER WILL BE EXTRACTED FROM THE SHALLOW AQUIFER NORTHWEST OF THE SITE.
- THE CONTAMINATED GROUNDWATER WILL BE TREATED TO THE EXTENT REQUIRED TO MEET THE PRETREATMENT REQUIREMENTS OF THE SEYMOUR WASTEWATER TREATMENT PLANT.
- THIS OPERABLE UNIT CAN BE INTEGRATED AS A PART OF THE FINAL REMEDIAL ACTION SELECTED FOR THE SITE.

2) Record of Decision (ROD):

Operable Unit: 02
ROD ID: EPA/ROD/R05-87/050
ROD Date: 09/30/1987
Media: GROUNDWATER SEDIMENTS SOIL
Contaminant: BENZENE, DCE, INORGANICS, ORGANICS, TCE, VOCS

Abstract: THE SEYMOUR RECYCLING CORPORATION (SRC) SITE, ENCOMPASSING A FOURTEEN-ACRE AREA, IS APPROXIMATELY TWO MILES SOUTHWEST OF SEYMOUR, INDIANA. SRC AND ITS CORPORATE PREDECESSOR, SEYMOUR MANUFACTURING COMPANY, PROCESSED, STORED AND INCINERATED CHEMICAL WASTES AT THE SITE FROM ABOUT 1970 TO EARLY 1980. THE FACILITY WAS CLOSED WHEN SRC FAILED TO COMPLY WITH A 1978 AGREEMENT WITH THE STATE OF INDIANA TO CEASE RECEIVING WASTES AND TO INSTITUTE BETTER WASTE MANAGEMENT PRACTICES. IN 1980, SEVERAL THOUSAND DRUMS WERE REMOVED FROM

THE SITE BY TWO POTENTIALLY RESPONSIBLE PARTIES (PRPS). IN 1981, THE U.S. EPA REMOVED CHEMICALS FROM TANKS AT THE SITE AND DISPOSED OF THOSE WASTES OFFSITE. A 1982 CONSENT DECREE WITH POTENTIAL PRPS RESULTED IN THE REMOVAL, BETWEEN DECEMBER 1982 AND JANUARY 1984, OF APPROXIMATELY 50,000 DRUMS, 100 STORAGE TANKS AND THE FIRST FOOT OF CONTAMINATED SOIL FROM ABOUT 75 PERCENT OF THE SITE'S SURFACE. A RECORD OF DECISION, SIGNED IN SEPTEMBER 1986, EVALUATED THE STABILIZATION OF THE GROUND WATER PLUME EMANATING FROM THE SITE AND SELECTED THE IMPLEMENTATION OF A PLUME STABILIZATION SYSTEM TO EXTRACT, TREAT AND DISCHARGE GROUND WATER TO A WASTE WATER TREATMENT PLANT. CURRENTLY, THE SHALLOW AQUIFER UNDER AND JUST BEYOND THE SITE BOUNDARIES, WHICH SERVES APPROXIMATELY 100 RESIDENCES AND BUSINESSES, IS HIGHLY CONTAMINATED WITH MORE THAN 35 DIFFERENT HAZARDOUS CHEMICALS, INCLUDING 1,2-DICHLOROETHANE, BENZENE, VINYL CHLORIDE AND 1,1,1-TRICHLOROETHANE.

THE SELECTED REMEDIAL ACTION FOR THIS SECOND OPERABLE UNIT INCLUDES; DEED AND ACCESS RESTRICTIONS AND OTHER INSTITUTIONAL CONTROLS; IMPLEMENTATION OF A FULL SCALE SOIL VAPOR EXTRACTION SYSTEM; GROUND WATER EXTRACTION AND TREATMENT BY AIR STRIPPING, MIXED-MEDIA CAP; AND EXCAVATION OF 800 CUBIC YARDS OF CONTAMINATED CREEK SEDIMENT AND CONSOLIDATION OF THE SEDIMENT BENEATH THE CAP. THE ESTIMATED CAPITAL COST FOR THIS REMEDY IS $10,536,000 WITH PRESENT WORTH O&M OF $7,200,000.

Remedy: THE SELECTED REMEDIAL ALTERNATIVE REPRESENTS THE FINAL REMEDY FOR THE SEYMOUR SITE. THE SELECTED REMEDIAL ALTERNATIVE INCLUDES THE FOLLOWING MAJOR COMPONENTS WHICH ARE DISCUSSED IN MORE DETAIL IN ATTACHMENT 1;

- DEED AND ACCESS RESTRICTIONS/OTHER INSTITUTIONAL CONTROLS TO PREVENT FUTURE DEVELOPMENT OF THE SITE AND ADJACENT PROPERTY AND TO ASSURE THE INTEGRITY OF THE REMEDIAL ACTION.
- IMPLEMENTATION OF A FULL SCALE SOIL VAPOR EXTRACTION SYSTEM.
- EXTRACTION AND TREATMENT OF CONTAMINATED GROUNDWATER AT AND BEYOND THE SITE BOUNDARIES. - INSTALLATION OF A MULTI-MEDIA CAP.
- EXCAVATION OF CONTAMINATED SEDIMENT AND CONSOLIDATION OF THE SEDIMENT BENEATH THE CAP.
- A REGULAR MONITORING PROGRAM TO DETERMINE THE EFFECTIVENESS OF THE PROPOSED REMEDIAL ACTION.

URL: http://www.epa.gov/superfund/sites/rodsites/0501439.htm
This page was last updated on: April 15, 2002
Site maintained by: Office of Emergency and Remedial Response
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 Upper East Fork White WRAS. This meeting was held on March 7, 2002, in Seymour, Indiana. The public comment period ended on May 7, 2002.

The Upper East Fork White 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:

- Section 2.1, Third paragraph: USEPA 1999 citation is not listed in references section.
- Section 3.3.5: Reinelt and Horner, 1990, and EPA 841-B-01-001 June 2001 citations are not listed in reference section.
- Section 4.4: Does Appendix B have the Upper East Fork White Watershed data?
- Table 0-1: No "s" on "PCB" in key, so no "s" needed in table [change "FCA-PCBS" in table to "FCA-PCB"].
- Table 2-2: Are there 2 Milfords in this watershed?
- Table 2-5, Introduction: Capitalize "division of outdoor recreation of the department of natural resources".
- Table 2-5, Listing of Outstanding Rivers and Streams: Sand Creek, 17 - Sand Creek does not go through any state parks.
- Table 2-6: At least 17 of these listings do not belong here, do they? (Brown County State Park, Monroe Reservoir (Brown and Jackson counties), Ogle Hollow Nature Preserve, Steele (Selma) Nature Preserve, T.C. Steele State Memorial, Yellowwood State Forest, Greensburg City Park, Starve Hollow State Recreation Area, Vallonia State Nursery, Brush Creek Fish & Wildlife Area, Crosley Fish and Wildlife Area, Jefferson Proving Grounds, Selmier State Forest, Christian Church Playground, Clark State Forest, Elk Creek Fish and Wildlife Area, and Salem Community Park.)
- Table 3-2: Is this the Milford in Decatur County?
- Table 3-3: Some listings seem to be outside watershed in question (Maple Leaf Farms, Inc., Vallonia State Nursery, Starve Hollow Beach, IDNR - Brownstown?, Shady Acres MHP?)
- Table 4-3: Check the Fish Size, Contaminant, and Group columns for typos.

Part II:

- Chapter 2, Last paragraph: Which Table 2-1 and Figure 2-1 is this referring to?
- Section 4.4: Where is Section 3?
- Section 4.7: The numbers of active NPDES permitted dischargers and CSO discharge points may need to be corrected.
- Table 2-1: What does "nd" mean? Change "20001" to "2001".

Appendices:

- Appendix B: Are the correct data listed here?
- Appendix C: Can these be listed alphabetically? Seems like it would be easier to use.
- Appendix C: There is no info for Washington Co. SWCD, Lawrence Co. SWCD, Orange Co. SWCD. There is a double entry for Bartholomew County Farm Service Agency.
- Appendix C, State Stakeholders: Indent under the IDEM entry the list of offices that follows. Indent under IDNR the Divisions that follow. The IDNR Division of Soil Conservation is listed twice.