VFC Index - Watershed (Plan)

Program:	Watershed
IDEM Document Type:	Plan
Document Date:	10/31/2008
Security Group:	Public
Project Name:	Upper Patoka River WMP
Plan Type:	Watershed Management Plan
HUC Code:	05120209 Patoka
Sponsor:	Dubois County SWCD
Contract #:	4-129
County:	Dubois
Cross Reference ID:	15954341
Comments:	Orange, Martin

Additional WMP Information

Checklist:	2003 Checklist
Grant type:	319
Fiscal Year:	2004
IDEM Approval Date:	10/31/2008
EPA Approval Date:	
Project Manager:	Alice Rubin

UPPER PATOKA RIVER WATERSHED

MANAGEMENT PLAN



Patoka River at Assessment Site #1

<u>Prepared for</u> Indiana Department of Environmental Management By Blair Borries Four River Resoure Conservation & Development Area, Inc.

Table of Contents

Chapter 1: Introducing the Project	5
1.1 Initiation	5
1.2: Funding	
1.3: Public Input and Initial Concerns	5
1.4: Steering Committee & Selection Method	6
1.5: Water Monitoring & Watershed Inventory	6
1.6: Vision Statement	7
Chapter 2: Describing the Watershed	8
2.1: Location of Watershed HUC unit 05120209020	8
2.2: Sub-watersheds	11
2.3: Geology	13
2.4: Soils	14
2.5: Climate	14
2.6: Natural History	15
2.7: Land Use	15
2.8: Reservoirs and Artificial Lakes	16
2.9: Public Land Ownership & Other Designations	17
2.9.1: Buffalo Flats Nature Preserve	
2.9.2: MS4 (Permitted Separated Municipal Sewers) Areas	17
2.9.3: The City of Jasper	17
Chapter 3: Benchmarks	19
3.1: Concerns from Previous Studies	
3.2: LARE Beaver Lake Study	19
3.3: Water Monitoring	22
3.5: Special Designations-Exceptional Use	25
3.6: Water Monitoring Conducted by Dubois County SWCD	25
3.7: Participation in NRCS Programs	
3.8: Use of Conservation Tillage	
3.9: Riparian Buffers	
3.10: Results from Windshield Inventory for Cattle Access to Streams	28
3.11: Atrazine Studies	-
Chapter 4: Problem Statements: Identification, Location, & Magnitude	
4.1: Nutrient & Sediment Concern	
4.1.1: Problem Statement for Nutrient Concerns	
4.1.2 Nutrient Problem Sources: Location & Magnitude	
4.2: Pathogen Concern	
4.2.1: Problem Statement for Pathogen Concerns	
4.2.2 Pathogen Problem Sources: Location & Relative Magnitude	
Chapter 5: Identifying Critical Areas	
5.1: Nutrient Concerns	
5.1.1: Pollutant loads	
5.2: Pathogen Concerns	
5.2.1: Pollutant Loads	
5.2.2: Critical Areas	
6.1: Nutrient Goals	45

6.1.1: Indicators	45
6.2: Pathogen Goals	46
6.2.1: Indicators	
Chapter 7: BMPs, Load Reduction, and Implementation	
7.1: Nutrient Goal	
7.1.1: Recommended BMPs and locations for water quality goals	
7.1.2: Recommendations for "other goals"	50
7.2: Pathogen Goals	
7.2.1: BMPs and Other Recommended Measures for Water Quality Goals	50
7.2.2: Recommended BMPs and locations for water quality goals	51
7.2.3: Recommendations for "other goals"	
7.3: Action Register	
7.3.1: Hiring a Watershed Coordinator/Technician	58
7.3.2: Develop Guidelines for a Cost-Share Program	58
7.3.3: Identify Possible Landowners for Demonstration Projects	58
7.3.4: Develop a Water Monitoring Program for Beaver Lake and Jasper Lake	58
7.3.5: Install Demonstration Projects	59
7.3.6: Complete Monitoring Program	59
7.3.7: Host Tour or Field Days and Follow-up with Attendees	59
7.3.8: Develop recommendations based on additional monitoring	59
7.3.9: Installation/Adoption of Recommended BMPs	59
7.3.10: Evaluate Plan and Make Additions or Corrections	60
Chapter 8: Monitor Effectiveness & Updating the Plan	60
8.1: Evaluating the Plan	61
8.2: Tracking Indicators	61
8.2.1: Water Quality monitoring	61
8.2.2: Milestones	61

List of Tables & Figures

Table 1.4-A: Steering Committee	6
Figure 2.1-A: Location of the Upper Patoka River Watershed in Indiana	8
Figure 2.1-B: Location of the Upper Patoka River Watershed in the Patoka River Basin 1	0
Table 2.2-A: Sub-watersheds & Sample Point Locations 1	1
Figure 2.2: Patoka River Sub-watersheds and Geography 1	2
Table 2.4-A: LS and K Factors 1	
Table 2.5-A: Monthly Precipitation (Inches) normals for Jasper IN 1971-2000 1	4
Table 2.5-B: Monthly Mean Temperature normals (Fahrenheit) for Dubois, IN 1971-2000 1	4
Table 2.6-A: Ecoregions in the Watershed 1	5
Table 2.7-A: Land-use By Sub-watershed (2005 Inventory) 1	6
Figure 2.8-B: City of Jasper Properties in the Upper Patoka River Watershed 1	8
Table 3.1-A: Concerns from Previous Studies 1	
Figure.3.2-A: Beaver Creek Reservoir: 1990 Sample Points & Study Areas	20
Table 3.2-A: Bacteria Testing on Beaver Creek Reservoir: 1990 2	21
Table 3.2-B: Nutrient Testing on Beaver Creek Reservoir: 1990 2	21
Table 3.3-A: Water Monitoring Sample Points & Sub-watersheds	23
Table 3.3-B: Water Monitoring Benchmark Analysis 2	24
Table 3.7-A: Amount of CRP & EQIP Contracts in the Watershed 2	
Table 3.8-A: Conservation Tillage Use in the Watershed	
Table 3.9-A: Riparian Buffer Inventory Survery	
Table 3.10-A: Results of Inventory for Livestock Access Events	
Table 4.1.2: Nutrient Problem Impairment Levels by Sub-watershed	51
Table 4.1.2: Nutrient Problem Sources: Relative Magnitude 3	
Table 4.2.2: Pathogen Problem Impairment Levels by Sub-watershed	4
Table 4.2.2: Pathogen Problem Sources: Relative Magnitude 3	5
Table 5.1.1: Sediment & Nutrient Loads 3	
Figure 5.1.2-A: Yearly Phosphorous Reductions Needed to Achieve Desired Levels	9
Figure 5.1.2-B: Yearly Nitrate Reductions Needed to Achieve Desired Levels 4	
Figure 5.1.2-C: Yearly Total Suspended Solids Reduction Needed to Achieve Desired Levels	
Figure 5.1.2-D: Priority Areas for Excessive Algae Growth Based on Ammonia Nitrogen and pH 4	
Table 5.2.1: E. Coli Loads	
Figure 5.2.2: Yearly E. coli Reductions Needed to Achieve Desired Levels 6: Goals & Indicators 4	4
* This measure also satisfies reductions needed for the pathogen problem	
Table 7.1.1: Recommended BMPs and locations 4	
Table 7.2.2: Recommended BMPs and Locations	51

Appendices

Appendix A: Raw Public Input Results Appendix B: Field Data Sheets Appendix C: Quality Assurance Project Plan Appendix D: Endangered & Threatened Species in Dubois County

1.1 Initiation

The project was first initiated through a partnership between the Dubois County Soil & Water Conservation District (SWCD) and the Four Rivers Resource Conservation & Development Area (RC&D). The area was chosen to evaluate the water quality that presently exists and to implement further improvements for the drinking water for Jasper and surrounding communities that is drawn from the Patoka River at the City of Jasper. Livestock operations in Dubois County, where the watershed is primarily located, had also been found to have soil test levels of phosphorous amounts exceeding what is required for crop production. The Patoka Lake Water District is expanding water service to the area which could encourage further rural residential development. In addition, the low permeability of the soils and steep slope causes the surface water runoff to have an increased chance for transportation of contaminates and impairments into the Patoka River.

1.2: Funding

The project was funded through the EPA 319 grant program. The Dubois County SWCD provided inkind services and matching funds as part of the agreement. The RC&D provided staffing and collected technical data and public input in developing the plan. IDEM provided consulting services in the preparation of the plan as did other agencies on a voluntary basis including the Indiana State Department of Agriculture (ISDA), the Purdue Cooperative Extensive Service, and the Natural Resource Conservation Services (NRCS).

1.3: Public Input and Initial Concerns

The project staff over the course of the grant period solicited input through 7 public meetings. These meetings were advertised through local SWCD mailings and in the local newspaper. Information on concerns was collected through focus group meetings and interviews with project participants within the impacted area. Other input was obtained through supervisor meetings and locally-led meetings arranged and/or facilitated by the Dubois County SWCD and associated staff. A steering committee was formed to be the ultimate decision makers in the plan-writing process.

To kick off the project, a list of initial concerns was gathered at public steering committee and stakeholder meetings, and through meetings with Dubois SWCD staff, NRCS staff & technical resources, Dubois County SWCD supervisors, and Dubois County Health Department staff. The following is a summarized list of the initial concerns:

- *E. coli* (and other associated pathogens)
- Jasper & Beaver Lakes
- Runoff contaminated by livestock
- Livestock in streams
- Septic systems
- Farming too close to the stream (no buffers)
- Nutrient management
- Soil erosion

1.4: Steering Committee & Selection Method

The nomination and acceptance process for the steering committee was created by the watershed coordinator and evaluated by the Dubois County SWCD executive director and Four Rivers RC&D coordinator. An announcement was made in the local newspaper that nominations were being accepted. Nomination forms were created and mailed to local individuals that had previously shown interest in the plan as well as made available at the Dubois County SWCD office. At a public meeting following the announcements and mailings held on March 16th, 2006, the nominations were presented to those in attendance and a unanimous vote was required to accept the nominees as steering committee members. Five members were selected at this time as well as one additional member selected at a public meeting held on April 25th, 2006. The nominees and their interests or reason for being involved in the planning process were listed on the nomination forms and listed in *Table 1.4-A: Steering* Committee.

Steering Committee Member	Professional Position or Reason to be Involved			
Jeanne Melchior	Educator at Vincennes			
	University-Jasper			
Jason Small	Dubois County SWCD			
	Supervisor, owner of Small and Small			
	Seeds			
Roger Seger	President of Wabash Valley			
	Foods, Owner of poultry in the			
	watershed			
Greg Seng	Farmer and landowner in the			
	watershed			
Ed Hollinden	Water Treatment			
	Superintendent, Jasper Municipal			
	Utilities			
Shawn Werner	Dubois County Health			
	Department Environmental Specialist			

Table 1.4-A: Steering Committee

1.5: Water Monitoring & Watershed Inventory

Water monitoring was conducted by the RC&D staff as part of the project to identify relationships between management practices and land use and its impacts on water quality. The monitoring also established baseline conditions that can be used to evaluate the progress of the plan.

The monitoring focused on nutrients (nitrogen and phosphorous), pathogens (*E. coli*), dissolved oxygen, water clarity (turbidity), and water conditions (temperature & pH). These parameters were chosen because they reflect land use conditions that were the focus of this study at its initiation. The monitoring was done according to a QAPP developed by RC&D and approved by IDEM prior to monitoring. The

QAPP is included in appendix C. A watershed inventory was conducted to verify concerns and identify possible sources affecting water quality. They also provide baseline conditions that can be used to evaluate the success of the plan through future monitoring.

1.6: Vision Statement

During a meeting held on November 27th, 2006 the stakeholder and steering committee group present developed a vision statement:

By 2020, the Upper Patoka River Watershed will be properly managed through the use of conservation practices such as forests and filter strips to protect this resource for the future. There will be a good balance between land use and environmental impact to keep the river free from pollutants harmful to fish, animals, or humans.





Figure 2.1-A: Location of the Upper Patoka River Watershed in Indiana

The watershed HUC unit 05120209020 drains the northeastern section of Dubois county as well as small parts of Orange and Martin counties. *Figure 2.1-A: Location of the Upper Patoka River Watershed in Indiana* shows the location of the study area. It is 71,311 acres. It makes up approximately 22% of Dubois County, 3% of Orange County, and 0.5% of Martin County. 87% of the drainage lies in Dubois County, 12% lies in Orange County, and 1% lies in Martin County. Its major drainage channel is a section of the Patoka River extending from Patoka Lake to the City of Jasper. The watershed is part of the larger Patoka River Watershed (HUC 05120209) which extends east of Patoka Lake and West-Southwest of Jasper until the River drains into the Wabash River near Mt. Carmel, IL. As the upper most watershed of the Patoka River it is commonly known as the Upper Patoka River Watershed. *Figure 2.1-B: Location of the Upper Patoka River Watershed in the Patoka River Basin* shows the Location of the study area within the larger 8-digit Patoka River Watershed.

A number of smaller streams carry water to the Patoka within the study area including Dillon Creek, Cane Creek, Davis Creek, Polson Creek, Bauer Creek, Bailey Creek, Sugar Creek, George Creek, Teder Creek, Beaver Creek, Long Ditch, Calumet stream, and Buffalo stream.



Figure 2.1-B: Location of the Upper Patoka River Watershed in the Patoka River Basin

The Upper Patoka River Watershed is subdivided into 8 - 14-digit HUC watersheds. Sample points were chosen to reflect water quality in each of the sub-watersheds. *Figure 2.2-A: Sub-watersheds & Sample Point Locations* shows the locations of sub-watershed and sample points on a road map of the project area. *Table 2.2-A: Sub-watershed & Sample Point Locations* list the 8 sub-watersheds, their HUC code, name, receiving water bodies and testing points contained in the areas.

HUC unit code	Name	Receiving waterbodies	Sample point #	% of Upper Patoka River Watershed
05120209020010	Patoka River – Lost Ridge	Patoka River	1	6.2%
		Dillon Creek	2	
05120209020020	Dillon-Cane Creek	Cane Creek	3	18.8%
		George Creek	None	
05120209020030	Davis Creek	Davis Creek	4	12.7%
03120209020030	Davis Cleek	Sugar Creek	6	12.770
	Detales Dissue	Patoka River	7	
05120209020040	Patoka River – Dubois	Unnamed Tributary	10	11.7%
		Leistner Creek	9	
		Polson Creek	8	
05120209020050	Polson-Bauer Creek	Bauer Creek 5 12.5		12.5%
		Bailey Creek	None	
05120200020000	Patoka River – Long	Detales Disser	13	12 10/
05120209020060	Ditch	Patoka River	14	12.1%
		Beaver Creek	None	
05120209020070	Beaver Creek	Beaver Lake	12 (outfall)	9.2%
		Teder Creek	11	
		Buffalo Stream	16	
05120209020080		Calumet Lake	None	
	D (1 D'	Jasper Brook	None	
	Patoka River-	Jasper (Idlewild)	15 (outfall)	16.6%
	Calumet Run	Lake	, <i>,</i>	
		Lottes Lake	None	
		Patoka River	None	

Table 2.2-A: Sub-watersheds & Sample Point Locations



Figure 2.2: Patoka River Sub-watersheds and Geography

Bedrock is found below the soil at varying depths. Its formation and components determine its characteristics. Bedrock generally blocks the downward passage of percolating groundwater and can affect the drainage and hydrology of its superseding land. The pH of surface water is affected when groundwater passing over the bedrock discharges to the surface. The bedrock of the Upper Patoka Watershed consists mostly of the Raccoon Creek group with small amounts of the Buffalo Wallow and Stephensport groups towards the northeast. Limestone aquifers that may cause natural increases in pH exist in the eastern section of the watershed in parts of the Polson-Bauer Creek, Davis Creek, Dillon-Cane Creek, and Patoka River-Lost Ridge Sub-watersheds.

Raccoon Creek

In the Raccoon Creek group shale and sandstone compose more than 95 percent, and clay, coal, and limestone make up nearly all the rest; small amounts of chert and sedimentary iron ore are in the lower part of the group. Shale is more common than sandstone, and most of it is light-gray to dark-gray shale and soft nonsilty shale to hard silty and sandy shale. A small amount of black fissile shale is also present. The sandstone is mostly fine grained; coarse-grained size is rare. Where the sandstone is present in the subsurface, massive crossbedded sandstone seems to be most common. The Raccoon Creek Group generally thickens toward the southeast but in some places has thickness variations of more than 300 feet (91 m) because of irregular unconformity on the surface of underlying rocks. It ranges in thickness from less than 100 feet (30 m) in some locations in Parke and Vermillion Counties to more than 1,000 feet (305 m) in Vanderburgh County. It crops out in southwestern Indiana along the easternmost margin of Pennsylvanian rocks.

Buffalo Wallow

The Buffalo Wallow Group is dominantly shale, mudstone, and siltstone, but it also contains prominent beds of sandstone and limestone, some of which are laterally extensive. The group exhibits its maximum surface thickness of about 270 feet (82 m) near Tobinsport on the Ohio River in the subsurface its maximum thickness is about 750 feet (200 m) in Posey County. It thins progressively and is truncated northward as a result of pre-Pennsylvanian erosion, so that in the subsurface its northern margin crosses southwestern Sullivan County, Daviess County, and northeastern Dubois County. Along the outcrop it reaches no farther north than southwestern Orange County.

Stephensport

The Stephensport Group consists of about equal parts of limestone, shale, and cliff-forming sandstone. The total thickness of the Stephensport Group is 130 to 230 feet (40 to 70 m).

STATSGO soils database defines soils in the watershed as belonging to Zanesville-Wellston-Gilpin, Dubois-Otwell-Peoga, Stendal-Bonnie-Birds, and Wellston-Berks-Gilpin soil groups. Wellston and Gilpin soils may have bedrock at up to 30 inches below the soil surface and steep slopes causing increased runoff. The slow permeability of lake bed soils such as Dubois and Peoga also contribute to high runoff. More detailed information about the soils and soil groups is available in the Dubois County Soil Survey. Through the soils data, factors have been established to estimate soil erosion from sheet and rill erosion. This is particularly important on crop fields because they experience this type of erosion on a significant level due to tillage and other traffic on the field. The K factor refers to the erodibility of the soil and the LS factor is a factor of slope and topography. Table 2.4-A: LS and K Factors shows minimum, maximum, and average K and LS factors for crop fields in the watershed.

LS and K Factors						
Minimum K 0.24						
Average K	0.351792					
Maximum K	0.55					
Minimum LS	0.053					
Average LS	1.411846					
Maximum LS	19.5					

Table 2.4-A: LS and K Factors

2.5: Climate

January	February	March	April	May	June	July	August	September	October	November	December	Annual
2.91	2.78	4.06	4.48	4.75	4.56	5.54	3.85	3.34	2.95	4.24	3.41	45.87
Table 25-4: Monthly Precipitation (Inches) normals for Jasper IN 1971-2000												

Table 2.5-A: Monthly Precipitation (Inches) normals for Jasper IN 1971-2000

January	February	March	April	May	June	July	August	September	October	November	December	Annual
28.9	33.4	43.4	53.8	53.2	71.8	75.8	74.2	67.4	55.8	44.9	33.9	53.9
Table 2.5 B: Monthly Magn Temporature normals (Eabranheit) for Dubois IN 1071 2000												

Table 2.5-B: Monthly Mean Temperature normals (Fahrenheit) for Dubois, IN 1971-2000

Table 2.5-A: Monthly Precipitation Normals for Jasper, IN 1971-2000 and *Table 2.5-B: Monthly Mean Temperature Normals* indicate the average (normal) precipitation, in inches and temperature, in Fahrenheit. As indicated in the tables, precipitation is at its highest in the months of July, June, May, and April. Temperature is at its highest in the months of July, August, June, and September.

2.6: Natural History

The Interior Plateau and Interior River Valleys and Hills level III ecoregions exist in the watershed with the Interior Plateau ecoregion dominating. Within the Interior Plateau, the flora and fauna communities in the watershed can be more narrowly defined as the Crawford Uplands Level IV ecoregion. The Interior River Valley and Hills ecoregion can be more narrowly defined in the watershed as the Southern Wabash Lowlands level IV ecoregion. *Table 2.6-A: Ecoregions in the Watershed* describes the ecoregions in details and shows the percent of the watershed made up by each ecoregion.

Ecoregion	Description	% Contribution to
		the Watershed
Crawford Uplands Level IV Ecoregion	The Crawford Uplands ecoregion is heavily dissected by medium to high gradient streams and is more rugged and wooded than Ecoregion 71b (Mitchell Plains). Oaks are found on well-drained upper slopes, mixed mesophytic forest occurs in coves as well as on north facing slopes, and specialized plant communities dominate the eastern sandstone-limestone cliffs. General farms occur especially in the west and in the wider valleys.	9
Southern Wabash Lowlands Level IV Ecoregion	The Southern Wabash Lowlands ecoregion is undulating to rolling and has many wide, shallow valleys. It lies to the south of Ecoregion 72b (Glaciated Wabash Lowlands) and its pre-Wisconsinan till plain; relict dunes and wind-blown silt deposits occur in the west, and shale and sandstone bedrock is exposed in the east. The Southern Wabash Lowlands is further characterized by its long growing season and neutral to acid soils. Originally, oak-hickory forests grew on the well drained upland soils while western mesophytic forests occurred on more poorly-drained soils; some southern plants reached their northern distributional limit in the Southern Wabash Lowlands.	81

Table 2.6-A: Ecoregions in the Watershed

2.7: Land Use

Dubois County was first settled in 1801 by Europeans. At this time, the watershed was almost entirely forested with a few hilltop barrens and a limited amount of wetland prairies in the lowlands. *Table 2.7-A: Land use by Sub-watershed (2005 inventory)* shows the current land-use statistics. Land designated as "other" includes roads, low-density residential areas, and agricultural facilities such as storage and feeding houses.

Sub-watershed	% Woods	% Cropland	% Grassland/Grazelands	% Urban	% Other
Lost Ridge	49.97	25.27	12.2	0	12.56
Dillon-Cane Creek	55.22	16.79	10.57	0.08	17.34
Davis Creek	66.17	12.43	8.68	0	12.72
Patoka River-Dubois	41.62	22.21	12.52	0.25	23.4
Polson-Bauer Creek	36.95	12.9	20.83	0.98	28.34
Long Ditch	37.72	33.57	12.51	0	16.2
Beaver Creek	50.5	23.4	11.77	0	14.32
Calumet Run	30.89	30.47	9.47	3.78	25.39
TOTAL	46.3	22.13	12.31	0.64	18.78

Table 2.7-A: Land-use By Sub-watershed (2005 Inventory)

The majority of the eastern section of the watershed is made up of steep, forested hills and pasture. Moving west, cropland increases, occurring mostly in the broad bottomlands along the major streams and on some relatively flat hilltops. The major crops are soybean and corn, as well as a small amount of winter wheat. Hay is often rotated to increase soil fertility. The majority of the urban and light residential areas occur in and surrounding the city of Jasper, in addition to small amounts in and around the towns of Dubois, Hillham, north of Celestine and Cuzco. Jasper, Dubois, and Celestine all use a municipal sewer system for wastewater treatment. The rest of the town and rural residents rely on onsite wastewater treatment systems.

There is also a high concentration of Animal Feeding Operations (AFOs), being mostly poultry houses and 2 swine operations. The animal waste may be spread on nearby adjacent land as fertilizer or transported off site to other crop or pasture land. Based on the IDEM Office of Land Quality Confined Feeding Operation database, there are 44 permitted AFOs in the Upper Patoka River Watershed. There is also one Confined Animal Feeding Operation (CFO) permitted by the USEPA. There are also several AFOs that have animal numbers below the level that IDEM or the EPA requires a permit.

2.8: Reservoirs and Artificial Lakes

The watershed contains a number of small ponds and lakes, mostly privately owned. The largest lakes are Idlewild (sometimes known as Jasper Lake), Beaver Creek Reservoir (also called Beaver Lake), Calumet Lake, and Lottes Lake. Beaver Lake is listed as a secondary water source for the city of Jasper though it has not served that purpose since the construction of Patoka Lake in the 70s. Before Patoka Lake was created, the area experienced much more frequent flooding and periods of low flow during the summer when it was difficult to support the population using the Patoka River alone. During these times, water was released from Beaver Dam to supplement the water supply. The City of Jasper Water Department is currently responsible for the maintenance of the dam. Beaver Lake is now used for recreational purposes and low-density residential.

Lots are available around Beaver Lake where renters may build "summer houses" that are used only seasonally. The Jasper Parks Department & Beckman Properties rent the lots. The remaining area surrounding the lake is owned privately and is used as a summer home, a year-round residence, farmed, or wooded. Idlewild Lake is totally privately owned by Idlewild Lake Inc., has a higher number of houses occupied year-round, and also a small amount of farmland surrounding the lake.

2.9: Public Land Ownership & Other Designations

2.9.1: Buffalo Flats Nature Preserve

The Nature Conservancy purchased a piece of bottomland swamp forest along Buffalo Stream in the Calumet Run sub-watershed near Jasper to protect the small population of Western Cottonmouth existing there. It was later dedicated a state nature preserve. It is the only known population of Western Cottonmouth in Indiana.

2.9.2: MS4 (Permitted Separated Municipal Sewers) Areas

The city of Jasper of Jasper has an MS4 permit from IDEM for its separated storm and sanitary sewer system. The specifics of the MS4 permit are detailed in their storm water management plan. It was created and is maintained by the City of Jasper Storm Water Board. The City has jurisdiction in reviewing erosion control at construction sites under the direction of the storm water coordinator. The boundaries of the MS4 area are the same as the boundaries for the city of Jasper.

2.9.3: The City of Jasper

The City of Jasper owns several properties in and surrounding the city of Jasper, including an area near Beaver Lake where the City Parks Department provides cabins for an annual rental fee. It also owns property near Idlewild Lake where they operate a youth camp. The property near Idlewild Lake includes no lakeshore land. The locations of the properties are shown in *figure 2.8-B: City of Jasper Properties in the Upper Patoka River Watershed*.



Figure 2.8-B: City of Jasper Properties in the Upper Patoka River Watershed

3.1: Concerns from Previous Studies

Previous studies have identified several concerns in the Upper Patoka River Watershed. The concerns are listed in *Table 3.1-A: Concerns from Previous Studies*

Concern	Location	Identified by (date)	Comments
Amount of manure produced by livestock	Patoka River watershed (Dubois County)	Pitstick (1999)	Patoka River Watershed Restoration Action Strategy, Final Draft 2000 – Fields must be aggressively managed because some fields are approaching phosphorous levels of 1000 ppm.
Storage of manure	Patoka River watershed (Dubois County)	Pitstick (1999)	Patoka River Watershed Restoration Action Strategy, Final Draft 2000 – Manure is stored on the top of a hill until a time to apply. Vegetative buffers may not exist to filter runoff before it enters a stream.
Septic system failure	Patoka River watershed (Dubois County)	Oeding (1999)	Patoka River Watershed Restoration Action Strategy, Final Draft 2000 – Many septic systems are not functioning properly due to high- water table, depth to rock or fragipan, and slopes of over 15%.
Septic System straight pipe discharges	Patoka River watershed (Dubois County)	Oeding (1999)	Patoka River Watershed Restoration Action Strategy, Final Draft 2000 – Older homes may be equipped with on-site wastewater disposal systems that are connected to drain tiles or other surface outlets.
Manure produced greater than assimilative capacity of farmland	Dubois County	USDA Economic Research Service (2001)	Confined Animal Production and Manure Nutrients – Dubois county livestock is found to produce 75% of the nitrogen needed for farm production and over 100% of the Phosphorous needed. Report states "the greater amount of excess nutrients in the area, the greater the risk of water quality impairment."

Table 3.1-A: Concerns from Previous Studies

Note: Patoka River Watershed Restoration Action Strategy, Final Draft was prepared by IDEM

3.2: LARE Beaver Lake Study

Although not initially the focus of study, the outlet of Beaver Creek Reservoir exhibited high ammonia nitrogen and low dissolved oxygen during the water monitoring rounds. It also became a frequent topic when citizens attending meetings were asked to list their concerns. Beaver Creek Reservoir was also the

topic of LARE funded study undertaken in 1990 due to concerns about algae and aquatic weeds that had been present since the 1950s. Extensive testing, modeling, and a watershed inventory were conducted through the study. *Figure 5.3-A: Beaver Creek Reservoir: 1990 Study Sample Points & Study Areas* indicates the locations of lakeside property owners, sample points from the 1990 study and the subwatersheds that the sample points reflect. The ownership is shown in different colored boxes; the sample points as squares, circles, etc.; and the sub-watershed areas as black.

The watersheds were numbered starting at the far left (west) and moving counter-clockwise around the lake.



Figure.3.2-A: Beaver Creek Reservoir: 1990 Sample Points & Study Areas

During the study, fecal coliform and nutrient contamination was found to be extensive throughout the lake. Results shown in *Table 3.2-A: Bacteria Testing on Beaver Creek Reservoir: 1990* indicates that 3 of the 7 sample points had high levels of disease causing bacteria at the time of the study. Bacteria found at sample points BC-5 and BC-1 was found to be from mostly or entirely human sources and bacteria found at sample point BC-4 was found to be from a mix of human and livestock sources by analyzing the ratio of fecal coliform to fecal strep.

••••••••••••••••••••••••••••••••••••••				
SAMPLE ID	DATE	FECAL COLIFORM <u>C/100 ml</u>	FECAL STREP <u>C/100 ml</u>	RATIO FC/FS
POOL (BC-6)	02 Oct 89	130	12	N/A
BC-1	02 Oct 89	1200	48	25
BC-2	02 Oct 89	62	20	N/A
BC-3	02 Oct 89	45	30	1.5
BC-4	02 Oct 89	246	132	1.9
BC-5	02 Oct 89	230	25	9.1
BC-7	02 Oct 89	84	8	N/A

Table 3.2-A: Bacteria Testing on Beaver Creek Reservoir: 1990

Sampling was also done to test for nutrient contamination. Results at sample point BC-3 were found to be high. These are shown in *Table 3.2-B: Nutrient Testing on Beaver Creek Reservoir: 1990.*

SAMPLE ID		DATE		NH3-N mg/Kg	NO ₃ -N mg/Kg	TKN mg/Kg	DP mg/Kg	TP mg/Kg	<u>15</u>
BC-1	09	Aug.	89	90.9	<0.05	1140	<0.05	284	67%
BC-2	09	Aug.	89	52.4	<0.05	1060	<0.05	351	68%
BC-3	09	Aug.	89 2	209.0	<0.05	2100	<0.05	466	56%
BC-4	09	Aug.	89	89.9	<0.05	1380	<0.05	320	64%

Table 3.2-B: Nutrient Testing on Beaver Creek Reservoir: 1990

Possible sources listed in the 1990 study include the prevalence of HEL soils in the lake's watershed (99% of farmed and grazed land), a turkey farm, hog farms, cropping land using conventional tillage, gullies forming in steep wooded areas, and onsite wastewater treatment systems. The onsite wastewater treatment systems used around the lake include septics, holding tanks, and outhouses. At the time the study was done very few users lived around the lake year-round. The lakeshore properties were said to be under the management of three owners: Beckman, Fritch, and the City of Jasper. The property owners rent lots to users who may develop them according to preference. In total 168 lots were rented between the three owners. A survey was conducted to learn about water use and waste disposal. 49% of lot renters only use lots during vacations and weekends. 68% carry in water and 27% have hook-ups to Dubois County water. 58% have an outhouse for waste disposal. 2% are year round residents. 20% have holding tanks for sewage disposal and 4% have septic tanks.

During the inventory conducted during the current project, the farmland was found to be following all conservation practices. No streams were without buffers. It suspected that one or more of the hog operations identified during the 1990 study are no longer in operation.

Conservation tillage has also increased. On the other hand, attendees at the meetings and representatives from the Dubois County Health Department note that it is likely that much more people are using municipal water hook-ups instead of carrying water in and more are living on the lake year round. Holding tanks and septic systems are a significant source of nutrient and *E. coli* pollution since as the health department reports, not all people have their tanks pumped indicating that there is an overflow pipe that empties into the lake. This is especially significant when the resident is served by a municipal water source. In general agricultural sources in the watershed seem to have decreased in impact while residential and recreational sources have increased.

Water monitoring as part of the Upper Patoka River Watershed study, described further in the next section, occurred only at the outlet of Beaver Creek Reservoir and not at any of the storm event, low flow, pool locations. The nearest to the Upper Patoka River Watershed study sample points is the lake pool sample 6. The lake pool sample did not show high fecal coliform levels when the low flow and storm event samples indicating that Upper Patoka River Watershed study sample point at the outlet may not be effective in verifying pathogen hotspots elsewhere in the lake. Nutrients were not tested at the lake pool sample point during the LARE study.

Since there has not been obvious evidence of improvements since the LARE study was completed, concerns about Beaver Lake voiced during public meetings are expected to be valid. *E. coli* concerns cannot be directly attributed to on-site waste water disposal systems through the Upper Patoka River Watershed study water monitoring, but a new concern arises over the ability of the testing conducted at the outlet to educate residents of the level of pathogens in the lake.

3.3: Water Monitoring

Water monitoring was conducted by the RC&D staff and IDEM's Office of Water Quality – Assessment Branch to identify relationships between land management practices and their impacts on water quality. The monitoring also established baseline conditions that can be used to evaluate the progress of the plan.

The monitoring evaluated the effect on water quality of contaminants related to nutrient loading (nitrate, orthophosphate), pathogen loading (*E. coli*), sediment loading (total suspended solids), water clarity (turbidity), and water conditions (dissolved oxygen, temperature, & pH). These are all common contaminants found in rural watersheds similar to the Upper Patoka River. The monitoring conducted by RC&D staff was done according to a QAPP developed by RC&D and approved by IDEM prior to monitoring. The QAPP is included in appendix C. In addition, during two sampling rounds, staff from the IDEM Office of Water Quality Assessment Branch were added to the monitoring team and tested for Chloride, Chemical Oxygen Demand, Coliforms, *E. coli*, Hardness, Nitrate+Nitrite, Ammonia nitrogen, Total Phosphorous, Sulfate, Total Dissolved Solids, Total Suspended Solids. The additional data allowed the data collected by the RC&D staff to be checked against the collection and analysis methods used by the state. In addition, the two rounds of evaluating for total suspended solids allowed for the analysis of sediment loading, a constituent less accurately represented by turbidity. A watershed inventory (detailed in later sections) was also conducted to verify concerns and identify possible sources affecting water quality. Together they also provide baseline conditions that can be used to evaluate the success of the plan through future monitoring.

The water quality monitoring program was conducted from April 11 2005-through May 2006, according to protocol established in the approved QAPP. Samples were collected at the 16 locations identified in the QAPP on 4-11-05, 6-14-05, 10-20-05, and 5-9-06. The locations of the sample points with respect to the 14 digit HUC sub-watersheds is shown in *Table 3.2-A: Water Monitoring Sample Points & Sub-watersheds*. Grouping sample points by sub-watershed is a convenient way to summarize the data and will continue to be used when evaluating throughout the plan.

HUC unit code	Name	Receiving waterbodies	Sample point #
05120209020010	Patoka River – Lost Ridge	Patoka River	1
		Dillon Creek	2
05120209020020	Dillon-Cane Creek	Cane Creek	3
		George Creek	None
05120209020030	Davis Creek	Davis Creek	4
03120209020030	Davis Cleek	Sugar Creek	6
	Patoka River –	Patoka River	7
05120209020040	Dubois	Unnamed Tributary	10
	Dubbis	Leistner Creek	9
		Polson Creek	8
05120209020050	Polson-Bauer Creek	Bauer Creek	5
		Bailey Creek	None
05120209020060	Patoka River – Long	Patoka River	13
03120209020000	Ditch	ratoka Nivel	14
		Beaver Creek	None
05120209020070	Beaver Creek	Beaver Lake	12 (outfall)
		Teder Creek	11
		Buffalo Stream	16
		Calumet Lake	None
	Patoka River-	Jasper Brook	None
05120209020080	Calumet Run	Jasper (Idlewild)	15 (outfall)
		Lake	
		Lottes Lake	None
		Patoka River	None

Table 3.3-A: Water Monitoring Sample Points & Sub-watersheds

To evaluate and summarize the data, it is compared against Indiana Water Quality Standards, where available, and benchmarks used in similar studies elsewhere. For *E. coli*, the grab sample standard of < 235 colonies/100 mL is used. For Nitrate, the state standard of < 10 mg/L is used. Orthophosphate was evaluated as part of the study using the Hach method, but when this test was compared against IDEM's testing of identical samples for total phosphorous in their lab most orthophosphate samples came out higher than the lab test for total phosphorous. It is not possible for orthophosphate levels to be significantly higher than total phosphorous since it is a component of total phosphorous. In fact when all the orthophosphate levels were compared to total phosphorous tested in a lab, there could be no correlation found among high or low samples. For this reason, the orthophosphate data will not be used and instead the total phosphorous lab test done on two of the sampling rounds will be used to evaluate the phosphorous component of the nutrient loading. The desired level for total phosphorous that will be used is 0.17 since this is the level used in the Wabash River TMDL. The standard for ammonia nitrogen

in Indiana varies based on temperature and pH. The detail of this standard can be found in Indiana administrative code. The standard for oxygen is > 5 mg/L and the standard for pH is between 6 and 9 (unitless). The desired level for Total Suspended Solids is set at 30 mg/L to match the Wabash River TMDL. An appropriate standard for turbidity could not be found, and many of the parameters tested by IDEM were not included because they did not have application to this study. Where parameters were tested by both IDEM and the RC&D staff, those tested by the RC&D staff were used in the analysis *Table 3.3-B: Benchmark Analysis of 2005-2006 Water Monitoring Data* shows the results of this analysis.

				Percent Exceeding Standard or Desired Level							
HUC	Name	Samples Taken	E. coli	DO	pН	Nitrate	Total Phosphoro us	Total Suspended Solids	Ammonia Nitrogen		
10	Patoka River - Lost Ridge	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
20	Dillon-Cane Creek	8	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%		
30	Davis Creek	8	25.0%	0.0%	25.0%	0.0%	0%	0.0%	0.0%		
40	Patoka River - Dubois	12	25.0%	0.0%	0.0%	8.3%	0%	0.0%	16.7%		
50	Polson - Bauer Creek	8	0.0%	12.5%	12.5%	0%	0%	0.0%	12.5%		
60	Patoka River - Long Ditch	8	0.0%	0.0%	0.0%	12.5%	0%	75.0%	12.5%		
70	Beaver Creek	11	9.1%	18.2%	9.1%	18.2%	25.0%	0.0%	18.2%		
80	Patoka River - Calumet Run	8	37.5%	12.5%	12.5%	0.0%	75.0%	75.0%	25.0%		

Table 3.3-B: Water Monitoring Benchmark Analysis

The analysis shows samples exceeding standards or other desired levels for *E. coli*, dissolved oxygen, pH, nitrate, total phosphorous, total suspended solids and ammonia nitrogen.

This analysis supports all initial concerns listed in section 1.3. *E. coli* levels were found unsafe for swimming in 4 of the 8 sub-watersheds. Samples exceeding ammonia nitrogen were found at the outlet of Beaver Lake, and samples were in excess of both the pH and ammonia nitrogen standard at the outlet of Jasper Lake making up 2 of the 5 sub-watersheds exceeding ammonia standards and 1 of the 4 sub-watersheds exceeding pH standards. Livestock areas are common in all sub-watersheds and runoff contaminated by livestock could cause any of the samples to fall outside the *E. coli* standard when any untreated manure is washed into streams. Samples could go beyond any of the remaining standards, which are all nutrient related, as a result of the nutrient excess produced by livestock in the watershed. Livestock in streams causes soil erosion and contamination with *E. coli*, and though the desirable level for total suspended solids was not surpassed during sampling, eroded soil often carries nutrients and access sites may have caused any of the two sub-watersheds impaired for *E. coli*. No direct evidence for contamination by septic systems was found in the same manner as the cattle access points described in the watershed inventory, but interviews and public input provided anecdotal support for the possibility of septic system failure as a source for nutrient or *E. coli* related impairments

discovered during sampling. Farming too close to the stream can be cited as a source for nutrient transport to the streams via erosion or transport of soluble nutrients such as nitrate, a cause of impairment in four sub-watersheds. In cases where manure is applied, the risk is increased for *E. coli* impairments. Nutrient management is more of a solution than a concern, and is listed to stress the importance of soil nutrient levels in creating nutrient related water quality issues when suspended sediment levels alone are not above those that are considered to impair aquatic life. Soil erosion allows for the transport of nutrients bound to soil and organic matter and compounds the oxygen demand of algae growth caused by high nutrient levels, evidence in the 4 sub-watersheds impaired for the dissolved oxygen standard.

3.4: Designated Uses for Waterways in Watershed

Statewide designated use classifications apply to all waterway segments in the watershed. These designated uses included:

• Surface waters of the state are designated for full-body recreation contact in the months of April-October

• All waters will be capable of supporting a well-balanced, warm water aquatic community

• All waters, which are used for public or industrial water supply, must meet the standards for those uses at the point the water is withdrawn.

• All waters, which are used for agricultural practices must meet the minimum surface water quality requirements.

• 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 classified for limited use and must be evaluated for restoration and upgrading at each triennial review of this rule.

• All waters, which provide unique 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.

3.5: Special Designations-Exceptional Use

The Patoka River from Patoka Reservoir to its confluence with the South Fork of the Patoka River is designated an outstanding river identified as having outstanding ecological, recreational, or scenic significance.

3.6: Water Monitoring Conducted by Dubois County SWCD

The Dubois County SWCD monitors the Patoka River quarterly near Jasper Lake. Dissolved oxygen, E. coli, pH, biochemical oxygen demand, water temperature, total phosphate, nitrate, and turbidity are tested. Indiana water quality standards were exceeded for total phosphate (< 0.3 mg/L) on 2/3 of the samples to date. No other parameters were exceeded. Current results may be found at the Hoosier Riverwatch website: www.hoosierriverwatch.com.

3.7: Participation in USDA farm bill Programs

CRP provides cost-share on the creation of grassed and tree-lined buffer strips next to streams and tree and grass plantings on highly erodible soils. It also pays landowners the soil rental rates for the areas where the practices are applied over a 10 year contract period. The map shows areas under contract in the year 2006. Some contracts expire in 2007. EQIP provides cost-share on a variety of conservation practices including, but not limited to, exclusion fencing for streams, WASCOB/dry dam systems, tree and grass plantings, manure stack buildings, improvements to grazing lands, and several other conservation practices designed by NRCS staff. Only cropland and grazing lands are eligible for EQIP and CRP programs. A summary of the participation in cost-share programs is shown in Table 3.7-A: Amount of CRP & EQIP contracts in the Watershed.

Upper Patoka Watershed	
total acres	80,000
acres of cropland + grassland	22810.93
Environmental Quality Incentives Program (EQIP)	
Total Acres in Contract	311
Percent of All Cropland + Grassland under EQIP contract	1.36%
Most Popular Resource Concern	Grazing Lands Health
Conservation Reserve Program (CRP)	
Total Acres	119.5

Percent of All Cropland + Grassland Under CRP contract

Most Popular Practice

CP21 - Filter Strip	

Table 3.7-A: Amount of CRP & EQIP Contracts in the Watershed

3.8: Use of Conservation Tillage

0.52%

Conservation tillage decreases soil loss by increasing the amount of cover during times when fields are normally bare (such as immediately after planting). Figure 3.8-A: Conservation Tillage in the Watershed shows the utilization of conservation tillage practices over the past 10 years based on yearly tillage inventories conducted by SWCD staff. Conservation tillage practices have increased by 15-20% since the study began 10 years ago thanks to education efforts and the increased availability of proper implements and seed strains.



Table 3.8-A: Conservation Tillage Use in the Watershed

On the other hand, no-till levels are only at about 32%, while the amount of highly erodible cropland in the watershed designated by the Farm Service Agency is about 57%. This means that 25% of the steepest, most erodible crop fields are not using no-till*. No-till farming has shown to reduce soil erosion by significant levels and the highly erodible fields are likely to contribute the most erosion. Soils eroding from these fields may also be carrying high amounts of nutrients to waterways resulting in some of the public concerns detailed in the study.

*Some no-till fields may have been in a double-cropped winter wheat/soybean rotation and would therefore have been recorded as n/a or unknown in the chart above.

3.9: Riparian Buffers

A Riparian buffer is most simply a strip of trees and other vegetation along streams and other water bodies. Riparian buffers filter sediment, nutrients, and other potentially harmful chemicals before they enter waterways. Riparian buffers also cool water and slow stream flows especially during flood conditions increasing the infiltration of rainfall to groundwater.

Using 2005 aerial photos and on-the-ground inventories, the locations of riparian buffers was determined. Overall for the 39.17 miles of the main channel of the Patoka River within the Upper Patoka River Watershed, 31 miles have effective riparian buffers for shading and cooling the water. Of the 52 miles of perennial streams that make up the major tributaries to the Patoka River, 27 miles contain effective riparian buffers for shading and cooling the water. Of all perennial streams (main stem

& tributaries), 39.9 miles of the 91.2 miles have a vegetative buffer less than 50 ft wide. In addition 28.2 miles of ephemeral streams and ditches were found to have vegetative buffers less than 50 ft. Using the inventory the amount of cropland and pasture next to an unbuffered waterway segment was determined. Approximately 44% of total crop land was next an unbuffered stream segment and 12% of total pasture was next to an unbuffered stream segment. Riparian buffers filter agricultural runoff including reducing nutrient and sediment delivery to stream by up to 75%. The findings support the concern that some are farming too close to the stream. The summary of the Riparian buffer inventory findings is shown below in *Table 3.9-A: Riparian Buffer Inventory Summary*.

Riparian Buffer Inventory Summary					
Miles of Perennial Streams without Buffers	48.07				
Miles of Ephemeral Streams and Ditch without Buffers	28.2				
Total Miles of Waterways without Buffers	76.27				
Acres of Crop fields without Buffers	7066				
Percent of Crop fields without Buffers	44%				
Acres of Pastures without Buffers	1026				
Percent of Pastures without Buffers	12%				

Table 3.9-A: Riparian Buffer Inventory Survery

3.10: Results from Windshield Inventory for Cattle Access to Streams

During the watershed inventory, an assessment was made of the amount of cattle directly accessing or coming near a stream. Instances where livestock were seen actually accessing the waterway or where certain evidence of stream bank erosion from cattle exist are indicated by livestock access events. Livestock that were seen near a waterway without a fence excluding them or where possible evidence such as trampled vegetation along the stream exists are considered possible access events. The results are shown in *table 3.9-A: Results of Inventory for Livestock Access Events*

	livestock access events	possible access events		
Total	22	12		

Table 3.10-A: Results of Inventory for Livestock Access Events

3.11: Atrazine Studies

An Atrazine monitoring program was conducted during 2004 and overseen by the City of Jasper. Atrazine is a herbicide used on 80% of corn fields across the state and may cause human health problems when found in drinking water at high levels. Water taken from the Patoka River at the point of the drinking water uptake and finished drinking water were both tested. The average level for pretreated water was 0.68 ppb (parts per billion) and the average for treated drinking water was 0.28 ppb. These scores are below the threshold of 3.0 ppb, the Atrazine maximum contamination level. Two pretreated water samples exceeded the threshold, but no treated water exceeded the maximum. Note: This study was conducted in cooperation of the City of Jasper and American Cyanamid Co. Inc and was not an identified item of concern in this study. The data is provided as further clarification of information that may be of public concern. The question of the results was asked by someone during a meeting of the watershed committee. All indicators were that no water was distributed to the public for consumption that even approached a threshold level. American Cyanamid is conducting a number of these types of monitoring programs across the United States. The reason they selected this watershed was because the city uses raw water from the stream as their public water supply. They have used those criteria nationally.

4.1: Nutrient & Sediment Concern

4.1.1: Problem Statement for Nutrient Concerns

Nutrient Related Concern	Validated				
Jasper & Beaver Lakes	Sections 3.3, Section 3.2				
Runoff Contaminated by Livestock	Sections 3.1, 3.3, 3.9, 3.10				
Livestock in streams	Sections 3.3, 3.10				
Septic systems	Section 3.2				
Farming too close to the stream	Sections 3.3, 3.9				
Nutrient Management	Section 3.1, 3.3				
Soil Erosion	Section 3.3, 3.8				

Problem Statement: Recent water testing shows water in the Upper Patoka River to be not supporting designated uses because of nutrient and sediment concerns. All but two of the eight sub-watersheds were found to be exceeding Indiana Water Quality Standards and other accepted threshold levels for one or more of Total Suspended Solids, pH, total phosphorous, nitrate, and ammonia nitrogen.

Stressors:

Steep slopes with high runoff High concentration of livestock including poultry and cattle Lack of information about the impact of nutrient sources

Sources:

High nutrient levels in soils from manure application Runoff of organic and synthetic fertilizer from cropfields un-filtered by vegetated riparian areas Soil loss from cropland Soil loss from pastures Livestock with access to waterways and ponds Failing septic systems or other wastewater collection systems

Other Concerns:

The source of high pH and ammonia nitrogen in Beaver Lake and Jasper Lake and the source of high ammonia nitrogen and pH in Polson Creek could not be accurately determined through the monitoring efforts of this project. Only Jasper Lake of the three waterbodies exceeded any standards or desired levels to protect aquatic life and drinking water quality for total phosphorous or nitrate, exceeding total phosphorous during 1 of the 2 sample events. As discussed above, high ammonia nitrogen and high pH are more commonly associated with algae blooms, which caused by high levels of phosphorous and

nitrate, limiting nutrient for plant growth. Direct sources of these water quality criteria may exist, or a more stringent standard may need to be set due to environmental variables that affect algae growth such as shade, temperature, or oxygen level.

To establish a magnitude for the overall level of nutrient problem, a ranking system was developed. Total phosphorous, pH, Nitrate, and Ammonia Nitrogen are four water quality constituents that can be used to establish the level of impairment or degradation, from nutrient related problems. Nitrate and total phosphorous are two nutrients that at high levels come directly from nutrient sources, from either commercial fertilizer or manure. Ammonia Nitrogen can originate from commercial fertilizer and manure as well, but is more often a product of the nitrogen cycle that occurs when oxygen levels are low and nitrogen converted by bacteria builds up as ammonia nitrogen rather than being converted to nitrate, a process that requires 3 parts oxygen for every part nitrogen. High pH is commonly associated with algae blooms, a byproduct of high nutrient levels in streams with no shade. Waterways showing impairments based on this ranking system are likely to not support some aquatic habitats. Algae blooms, a result of high levels of the nutrients of concern, cause periods of low dissolved oxygen that can make the water unsuitable for more sensitive aquatic species that need higher oxygen levels. In addition, high nitrate and phosphorous levels increase water treatment costs, of particular importance in the Upper Patoka River Watershed since a drinking water uptake is located at the outlet of the watershed.

Each sub-watershed was given a point for each of the four water quality constituents related to the nutrient problem (pH, ammonia nitrogen, total phosphorous, and nitrate) that exceeded desired levels in over 10% of the samples and half a point for each that exceeded on at least one sample, but less than 10% of the total samples. Sub-watersheds showing the greatest amount of impairments through this method are give a rank of (I), most impaired. The next most impaired are given a rank of (II) and the sub-watersheds with the least amount of impairment, but still having some constituents exceeding desired levels are given a rank of (III). The results are shown in *Table 4.1.2: Nutrient Problem Impairment Levels by Sub-watershed.* Two of the sub-watersheds, Patoka River-Calumet Run (I) and Beaver Creek (I) exceeded levels for 3 or more nutrient related water quality constituents. Three sub-watersheds, Patoka River-Dubois (II), Patoka River-Long Ditch (II), and Polson-Bauer Creek (II) exceeded the desired levels on 2 of the water quality constituents. Davis Creek (III) exceeded the desired levels for one of the constituents.

Sub-watershed	Rank
Patoka River - Lost Ridge (010)	No impairment
Dillon-Cane Creek (020)	No impairment
Davis Creek (030)	
Patoka River - Dubois (040)	II
Polson-Bauer Creek (050)	II
Patoka River - Long Ditch (060)	II
Beaver Creek (070)	
Patoka River - Calumet Run (080)	

Table 4.1.2: Nutrient Problem Impairment Levels by Sub-watershed

4.1.2 Nutrient Problem Sources: Location & Magnitude

The relative magnitude of each problem source is evaluated in *Table 4.1.2: Nutrient Problem Sources: Relative Magnitude* to determine what sources have the greatest potential for restoration. The sub-

watershed ranking established in section 4.1.1 is shown here on the chart as colors. Red columns are those sub-watersheds that were ranked (I) (greatest impairment). Yellow columns are sub-watersheds ranked (II) and the green column is the sub-watershed ranked (III) (least impaired). The relative magnitude for the "high nutrient levels in soils" source is determined by the percent of the subwatershed made up of land listed in a Confined Feeding Operation permit to fulfill the requirement for spreading acres. High phosphorous levels are especially likely in areas where poultry manure is applied to satisfy all or part of a crops nitrogen requirement, since poultry manure is very high in phosphorous. Soils high in nutrient cause an even greater nutrient problem when they erode into waterways than soils with a more average nutrient level. The relative magnitude of the source "runoff of organic & synthetic fertilizer" is evaluated by the percent of the sub-watershed with un-buffered cropland. Cropland adjacent to a stream or ditch without a vegetative buffer provides a direct conduit for high-nutrient fertilizer runoff to enter a stream. A buffer would partially filter this runoff and bring waterways to an acceptable nutrient level. The relative magnitude of the source "soil loss from crop land & pasture" is evaluated by the % of HEL fields. These fields are expected to experience the most erosion, loading soil with attached nutrients into streams. It's estimated that 25% of these fields in each sub-watershed are being tilled and experiencing significant erosion. Pastures on HEL ground may also be used to grow harvested forage crops that can experience significant erosion if they are being tilled. The relative magnitude of the source "soil loss from crop land & pasture" is also evaluated by the percent of the subwatershed made up of livestock areas with little or no vegetation. These areas may be near watering sources, in shade or other lounge areas, or around feeding areas. When there is inadequate vegetation on these areas, significant erosion can occur in the form of gullies and sheet/rill erosion. These areas are also likely to contain higher amount of manure and have more nutrients attached to the soil. The relative magnitude of the source "livestock with access to ponds and waterways" is evaluated by the percent of the watershed made up of stream side pastures with out fencing to exclude cattle from streams.

Sub-watershed	010	020	030	040	050	060	070	080
High Nutrient Levels								
in Soils: % CFO	18.43%	0.31%	6.45%	15.54%	20.48%	10.10%	22.66%	1.66%
Spreading Acres								
Runoff of Organic &								
Synthetic Fertilizer: %	14.05%	3.82%	4.36%	10.35%	13.61%	19.23%	8.18%	44.93%
Un-buffered Cropland								
Soil Loss from								
Cropland & Pasture:	18.30%	3.94%	6.31%	21.52%	18.28%	22.48%	23.79%	22.65%
% HEL fields								
Soil Loss from								
Cropland & Pasture:	0.04%	1.56%	0.14%	0.41%	0.72%	2.43%	0.24%	0.26%
% Livestock areas	0.04%	1.30%	0.14%	0.41%	0.72%	2.43%	0.24%	0.26%
without vegetation								
Livestock with access								
to ponds & waterways:								
% Stream side	0.28%	0.13%	0.09%	0.35%	1.96%	1.06%	0.70%	0.33%
pastures without								
fencing								

Table 4.1.2: Nutrient Problem Sources: Relative Magnitude

The sources with the greatest relative magnitude by area are "high nutrient levels in soils," "runoff of organic & synthetic fertilizer," and "soil loss cropland & pasture." These sources have the greatest impact and the greatest potential for restoration, but addressing livestock areas without vegetation and "livestock with access to ponds & waterways" still may result in significant progress towards water quality goals depending on the location and other factors not known at the time of this study.

4.2: Pathogen Concern

Pathogen Related Concern	Validated			
Jasper & Beaver Lakes	Beaver Lake Study			
Runoff Contaminated by Livestock	Sections 3.3, 3.9, 3.10			
Livestock in streams	Sections 3.3, 3.10			
Septic systems	Section 3.2			
E .coli	Section 3.3			

4.2.1: Problem Statement for Pathogen Concerns

Problem Statement: Recent water testing shows 3 of the 8 sub-watersheds in the Upper Patoka River to be not supporting and 1 of the 8 to be only partially supporting recreational use due to pathogens. This is due to elevated levels of *E. coli*, an indicator of the presence of pathogens and a microorganism found in the gut of all warm-blooded animals.

Stressors:

A lack of buffers near livestock areas and areas where organic fertilizer is used High concentration of livestock including poultry and cattle Lack of information about impacts of pathogen sources

Sources:

Runoff of organic fertilizer from crop fields un-filtered by vegetated riparian areas Livestock with access to waterways and ponds Inadequate vegetation on pastures, especially around water and other "lounging" areas Failing septic systems or other wastewater collection systems

Other Concerns:

The potential for septic system to cause *E. coli* standards to be exceeded, especially in Beaver and Jasper Lakes could not be confirmed or denied through the monitoring program. The Beaver Lake Study described in detail in *Section 3.2* showed that the "pool" sample, the sample nearest to the Upper Patoka River Watershed sampling point did not reflect high fecal coliform levels when they appeared nearer to the shoreline near homes and where tributaries entered the lake. Localized *E. coli* problems may exist that were not detected during the study Also, since both lakes are used for full-body contact recreation, a more thorough approach to monitoring and educating the public is desired.

To establish a magnitude for the overall level of pathogen problem, a ranking system was developed. Each sub-watershed was given a point if the state standard for *E. coli*, an indicator of pathogen contamination was exceeded on greater than 10% of the samples and half a point if it was exceeded on at least one sample, but less than 10% of the total samples. Sub-watersheds showing the greatest amount of impairments through this method are given a rank of (I), most impaired. The next most impaired are given a rank of (II), least impaired. The results are shown in *Table 4.2.2: Pathogen Problem Impairment Levels by Sub-watershed*. Three of the sub-watersheds, Davis Creek, Patoka River-Dubois, and Calumet Run exceeded levels for *E. coli* on more than 10% of samples. Beaver Creek sub-watershed exceeded the standard on at least one sample, but less than 10% of the total samples.

Sub-watershed	Rank		
Patoka River - Lost Ridge (010)	No impairment		
Dillon-Cane Creek (020)	No impairment		
Davis Creek (030)			
Patoka River - Dubois (040)			
Polson-Bauer Creek (050)	No impairment		
Patoka River - Long Ditch (060)	No impairment		
Beaver Creek (070)	II		
Patoka River - Calumet Run (080)	1		

Table 4.2.2: Pathogen Problem Impairment Levels by Sub-watershed

4.2.2 Pathogen Problem Sources: Location & Relative Magnitude

The relative magnitude of each problem source is evaluated in *Table 4.2.2: Pathogen Problem Sources:* Relative Magnitude to determine what sources have the greatest potential for restoration. The subwatershed ranking established in section 4.2.1 is shown here on the chart as colors. Red columns are those sub-watersheds that were ranked (I) (greatest impairment). Yellow columns are sub-watersheds ranked (II) (least impaired). The relative magnitude of the source "runoff of organic fertilizer" is evaluated by the percent of the sub-watershed in a CFO spreading area and with un-buffered cropland or pasture/forage crop. Cropland, pasture, or land used for growing forage crops where manure has been applied adjacent to a stream or ditch without a vegetative buffer provides a direct conduit for pathogen containing runoff to enter a stream. A buffer would partially filter this runoff and keep potential pathogens out of waterways. The relative magnitude of the source "Inadequate vegetation on pastures" is also evaluated by the percent of the sub-watershed made up of livestock areas with little or no vegetation. These areas may be near watering sources, in shade or other lounge areas, or around feeding areas. When there is inadequate vegetation on these areas, there is nothing to slow down or filter runoff containing manure. These areas are also likely to contain higher amount of manure and have more pathogens attached to the soil. The relative magnitude of the source "livestock with access to ponds and waterways" is evaluated by the percent of the watershed made up of stream-side pastures with out fencing to exclude cattle from streams.

Sub-watershed	010	020	030	040	050	060	070	080
Runoff of organic fertilizer: % Cropfields in CFO	0.27%	0.00%	0.00%	0.72%	0.09%	0.00%	0.23%	0.00%
spreading acres without vegetated riparian areas								
--	--------	-------	-------	-------	-------	-------	-------	-------
Runoff of organic fertilizer: % Pastures and forage crops in CFO spreading acres without vegetated riparian areas	10.47%	0.00%	1.09%	0.99%	1.45%	5.24%	6.83%	0.00%
Inadequate vegetation on pastures: % Livestock areas without vegetation	0.04%	1.56%	0.14%	0.41%	0.72%	2.43%	0.24%	0.26%
Livestock with access to ponds & waterways: % Pastures with Stream Access	0.28%	0.13%	0.09%	0.35%	1.96%	1.06%	0.70%	0.33%

Table 4.2.2: Pathogen Problem Sources: Relative Magnitude

The magnitude of the sources of the pathogen problem is evenly distributed across the sub-watersheds. No sources are dominant, and its likely than any of the sources provide a good potential for achieving water quality goals upon remediation. The most important will be those that are near a stream and near to the farthest downstream point in the area in need of reductions.

5.1: Nutrient Concerns

5.1.1: Pollutant loads

Using the water monitoring data and flow estimated from the Patoka River gage at Jasper, loading for total phosphorous, nitrate, and total suspended solids was established. Total phosphorous, total suspended solids and nitrate are the most important of the water quality constituents related to the water quality problem since they drive the algae blooms and low oxygen conditions that are also responsible for the high pH and ammonia nitrogen levels.

Total Phosphorous (Pound/Year)					
	Current Load	Target Load	Reduction Needed		
Patoka River - Lost Ridge (010)	127.8805128	127.8805128	0		
Dillon-Cane Creek (020)	752.2526774	752.2526774	0		
Davis Creek (030)	604.6191843	604.6191843	0		
Patoka River - Dubois (040)	568.7923396	568.7933561	36.5		
Polson-Bauer Creek (050)	494.0096032	494.0099386	0		
Patoka River - Long Ditch (060)	557.3152831	557.3154368	0		
Beaver Creek (070)	834.538945	796.3268307	38.2		
Patoka River - Calumet Run (080)	2459.387037	1806.968848	652.4		
Nitrate (F	Pounds/Year)				
Sub-watershed	Current Load	Target Load	Reduction Needed		
Patoka River - Lost Ridge (010)	11912	11912	0		
Dillon-Cane Creek (020)	21558	21558	0		
Davis Creek (030)	28304	28304	0		
Patoka River - Dubois (040)	42088	32403	9685		
Polson-Bauer Creek (050)	15063	15063	0		
Patoka River - Long Ditch (060)	36372	26605	9767		
Beaver Creek (070)	23448	19531	3917		
Patoka River - Calumet Run (080)	6820	6820	0		
Total Suspende	d Solids (Tons/Year)				
Sub-watershed	Current Load	Target Load	Reduction Needed		
Patoka River - Lost Ridge (010)	725	725	0		
Dillon-Cane Creek (020)	687	687	0		
Davis Creek (030)	310	236	74		
Patoka River - Dubois (040)	1240	867	374		
Polson-Bauer Creek (050)	292	192	100		
Patoka River - Long Ditch (060)	4014	3283	730		
Beaver Creek (070)	438	317	121		
Patoka River - Calumet Run (080)	231	127	103		

Table 5.1.1: Sediment & Nutrient Loads

To determine the load, the concentration of the constituents was multiplied by the flow to get a load in pounds per hour for each sample point location. This was then divided by the acres of the area draining to the sample point and an average yearly load per acre was established. GIS data was then used to establish an average load for each sub-watershed listed in *Table 5.1.1: Sediment & Nutrient Loads* as "Current Load." Sample points that exceeded state standards or desired levels were evaluated further to determine the reduction needed based on the amount that the concentration exceeded the state standard. The reduction for each event was then averaged for the year and the new target load for all the sample points was averaged to get "target load." The difference between the target load and the current load is the "reduction needed." Reduction is needed for total phosphorous in 3 of the 8 sub-watersheds. The area in need of reduction is discussed in the next section *critical areas*. Three of the eight sub-watersheds have areas that are in need of nitrate reduction.

5.1.2: Critical Areas

Figure 5.1.2-A: Yearly Phosphorous Reductions Needed to Achieve Desired Levels shows the location of the areas that must achieve reduction in order to attain water quality standards or desired levels. The method used to obtain these levels is discussed in section 5.1.1: Pollutant Loads. As discussed in Section 5.1.1, half of the sub-watersheds had areas that were in need of restoration, areas where a reduction needed to achieve the water quality standards or desired levels. The relative amount of reduction needed is displayed as either red for high (~ 600 pounds per year) or yellow for low (~ 40 pounds per year). Areas not in need of phosphorous reductions are shown as hollow or have no color.

From the figure it is obvious that the most reductions are needed in the Patoka River-Calumet Run subwatersheds. The areas within the Patoka River – Dubois and Beaver Creek Sub-watersheds need the least reductions, but still may be important in attaining desired levels of total phosphorous unless restoration attempts exceed needed reductions in other sub-watersheds (this may also be confirmed through *Table 5.1.1* which shows the total reduction needed of all the areas in need). Since there is no indication that one sub-watershed or another may have more willing landowners, all areas in need of reductions are considered critical areas and should be given equal priority until reductions are achieved. Once reductions are achieved priority should go towards other areas still in need of reductions.

Figure 5.1.2-B: Yearly Nitrate Reductions Needed to Achieve Desired Levels shows the location of the areas that must achieve reduction in order to attain water quality standards or desired levels. The method used to obtain these levels is discussed in section 5.1.1: Pollutant Loads. As discussed in Section 5.1.1, three sub-watersheds had areas that were in need of restoration, areas where a reduction was needed to achieve the water quality standards or desired levels. The relative amount of reduction needed is displayed as either red for high (~9000 pounds per year), orange for medium (~1000 pounds per year), or green for low (< 900 pounds per year). Areas not in need of nitrate reductions are shown as hollow or have no color.

From the figure it is obvious that the most reductions are needed in the Beaver Creek and Patoka River-Long Ditch sub-watersheds (this may also be confirmed through *Table 5.1.1* which shows the total reduction needed of all the areas in need). Some reduction is also need in the Patoka River-Dubois Subwatershed. All are important in attaining desired levels of nitrate, and only the orange area in Beaver Creek has a potential to impact any of the other areas needing reduction. Since there is no indication that one sub-watershed or another may have more willing landowners, all areas in need of reductions are considered critical areas and should be given equal priority until reductions are achieved. Once reductions are achieved priority should go towards other areas still in need of reductions.

Figure 5.1.2-C: Yearly Total Suspended Solids Reduction Needed to Achieve Desired Levels shows the location of the areas that must achieve reduction in order to attain desired levels. The relative amount of reduction is displayed as either red for high (126 - 600 tons per year), orange for medium (85 - 125 tons per year), or green for low (25 - 75 tons per year). Areas not in need of total suspended solids reductions are shown as hollow or have no color

From the figure it is clear that the most reductions are needed in the Patoka River – Long Ditch subwatersheds (this is also confirmed through *Table 5.1.1* which shows the total reduction needed of all areas in need). Areas in the Patoka River – Calumet Run, Beaver Creek, and Patoka River – Dubois subwatersheds all need considerable reductions. Only a small amount of reduction is needed in the Polson – Bauer Creek and Davis Creek Sub-watersheds.

In addition to the criteria above, ammonia nitrogen and pH were also used to evaluate priority areas. High levels of ammonia nitrogen and pH are most often associated with algae blooms and precede the eventual decomposition of the bloom that leads to low dissolved oxygen conditions unsuitable for fish life. Using the Indiana water quality standard for ammonia nitrogen (varies based on pH and temperature) and pH (must be > 6 and < 9), priority areas for excessive algae growth were established. By targeting sediment and nutrient loading and/or site specific practices such as establishing riparian buffers or eliminating stagnant water in these priority areas, water quality can be improved. The priority areas for excessive algae growth based on this criteria is shown in *Figure 5.1.2-D: Priority Areas for Excessive Algae Growth Based on Ammonia Nitrogen and pH*.



Figure 5.1.2-A: Yearly Phosphorous Reductions Needed to Achieve Desired Levels



Figure 5.1.2-B: Yearly Nitrate Reductions Needed to Achieve Desired Levels



Figure 5.1.2-C: Yearly Total Suspended Solids Reduction Needed to Achieve Desired Levels



Figure 5.1.2-D: Priority Areas for Excessive Algae Growth Based on Ammonia Nitrogen and pH

5.2: Pathogen Concerns 5.2.1: Pollutant Loads

<i>E. coli</i> (Thous			
HUC_14	Current Load	Target Load	Reduction Needed
Patoka River - Lost Ridge (010)	2014460.624	2014460.624	0
Dillon-Cane Creek (020)	7745516.715	7745516.715	0
Davis Creek (030)	10758863.92	9442817.922	1316046
Patoka River - Dubois (040)	8764509.279	7373192.982	1391316
Polson-Bauer Creek (050)	4026774.699	4026776.492	0
Patoka River - Long Ditch (060)	6232848.167	6232849.783	0
Beaver Creek (070)	5601790.03	5399477.248	202313
Patoka River - Calumet Run (080)	17829171.41	10026024.71	7803147

The same method described in *Section 5.1.1* is used to determine critical areas for *E. coli. Table 5.2.1: E. coli Loads* shows the results of this analysis. Reduction is needed for *E. coli* in 4 of the 8 subwatersheds. The area in need of reduction is discussed in the next section *critical areas*.

Table 5.2.1: E. Coli Loads

5.2.2: Critical Areas

Figure 5.2.2: Yearly E. coli Reductions Needed to Achieve Desired Levels shows the location of the areas that must achieve reduction in order to attain water quality standard. The method used to obtain these levels is discussed in section 5.1.1: Pollutant Loads. As discussed in Section 5.1.2, four sub-watersheds had areas that were in need of restoration, areas where a reduction was needed to achieve the water quality standards or desired levels. The relative amount of reduction needed is displayed as either red for high (1.2 - 1.4 billion colonies per year) or yellow for low (< 300 million colonies per year). Areas not in need of *E. coli* reductions are shown as hollow or have no color.

From the figure it is obvious that the most reductions are needed in the Patoka River – Calumet Run and Davis Creek sub-watersheds (this may also be confirmed through *Table 5.2.1* which shows the total reduction needed of all the areas in need). Significant reduction is also needed in the Patoka River-Dubois and Beaver Creek Sub-watersheds. All are important in attaining water quality standards for *E. coli*, none of the areas are upstream and thus do not have a potential to impact any of the other areas needing reduction. Since there is no indication that one sub-watershed or another may have more willing landowners, all areas in need of reductions are considered critical areas and should be given equal priority until reductions are achieved. Once reductions are achieved priority should go towards other areas still in need of reductions.



Figure 5.2.2: Yearly E. coli Reductions Needed to Achieve Desired Levels 6: Goals & Indicators

Water Quality Goals

The ten year goal for nutrients is that all the sub-watersheds be supporting of state aquatic life and drinking water quality standards, and other desired levels specified in the plan. This will be achieved primarily by the reduction of the two nutrient related water quality criteria most likely to cause nutrient related problems, nitrate and phosphorous. Phosphorous loads to waterways will be reduced from the current load of 3.2 tons per year to the target load of 2.9 tons per year, resulting in an overall reduction of about 0.3 tons per year. As a result of the reduction in nitrate and phosphorous, it is expected that standards for ammonia nitrogen, dissolved oxygen and pH within these areas will also be met.

Other Goals

In the areas where monitoring did not indicate a need to reduce nitrate or phosphorous yet standards for ammonia nitrogen and pH were exceeded, demonstration projects will be established to highlight practices that eliminate excessive algae growth with the end result of achieving ammonia nitrogen and pH standards through reducing algae in the critical areas.

A monitoring program will be established on Beaver and Jasper Lake in cooperation with landowners and the City of Jasper to identify the source of the impairments detected at the outlets, provide information to the community, and within five years a more specific plan to address the problem (if necessary) will be developed. Within 2 years, recommended BMPs or other measures will be determined in cooperation with landowners and community groups to address the impairment and within 10 years the standard for ammonia nitrogen and pH will be met on at least 10% of samples evenly spaced across one year.

6.1.1: Indicators

The indicators of the water quality goals for nutrient will obviously be the actual water quality constituents including most importantly total phosphorous and nitrate. In addition, pH, ammonia nitrogen, and dissolved oxygen levels should continue to be monitored to establish that the reductions, when accomplished, were sufficient to also protect waterways for being impaired due to these other criteria and that individual load reductions for other nutrient related criteria do not need to be established to protect aquatic life.

For the "other goals" involving demonstration projects to address excessive algae growth, interim measures will include tasks that are accomplished involving:

- Landowners/community groups identified and contacted within impacted area
- Identification of demonstration site
- Establishment of a demonstration project
- Field day or tour held with attendance from landowners within the critical areas
- Follow-up and technical assistance provided to attendees
- Adoption of recommended BMPs or other measures by other landowners in the priority areas
- Attainment of water quality standards for ammonia nitrogen and pH

For the "other goals" involving Beaver and Jasper Lake, interim measures will include tasks that are accomplished involving:

- Development of a monitoring program
- Implementation of the monitoring program
- Number of outreach events, mailing, newsletter/newspaper articles, or other media releases used to inform the public
- Increase in awareness as determined from interviews at events such as the SWCD annual meeting and SWCD monthly supervisors meeting.
- Amount of input provided by the community
- Development of a plan to address problems identified during the monitoring program
- Implementation of the plan (if needed)
- Attainment of ammonia nitrogen and pH standard

6.2: Pathogen Goals

Water Quality Goals

The five year goal for nutrients is that all the sub-watersheds exceeding standards for *E. coli* will meet the standard of 235 colonies/100 mL. Overall, a reduction of 10.7 billion colonies loaded to streams per year must be achieved to reduce the current load of 63.0 billion colonies to a target load of 52.3 billion colonies

The specific load reductions required to achieve this goal are described in section 5.2.1.

Other Goals

A monitoring program will also be established on Beaver and Jasper Lake in cooperation with landowners and the City of Jasper to identify whether or not *E. coli* levels are unsafe for swimming, to educate residents on the results and of the potential for contamination even if levels are not exceeded during the sample rounds, and if necessary to recommend BMPs or other measures to address any problems found. If problems are found recommendations should be made within two years.

6.2.1: Indicators

The indicator of the water quality goals for Pathogens will be the *E. coli* levels in streams and lakes.

For the "other goals" involving Beaver and Jasper Lake, interim measures will include tasks that are accomplished involving:

- Development of a monitoring program
- Implementation of the monitoring program
- Outreach events, mailing, newsletter/newspaper articles, or other media releases used to inform the public

- Increase in awareness as determined from personal interviews at events such as the SWCD annual meeting, SWCD monthly supervisors meeting, etc.
- Amount of input provided by the community
- Development of a plan to address problems identified during the monitoring program
- Implementation of plan

7.1: Nutrient Goal

7.1.1: Recommended BMPs and locations for water quality goals

Using the IDEM/EPA Region 5 Pollutant Load Reduction Model (http://it.tetratechffx.com/stepl/STEPLmain_files/Region%205%20manual05.pdf) for estimating pollutant load reduction and the relative magnitude of each source described in Chapter 5, the best BMPs to achieve the reductions needed in each sub-watershed was determined. The Region 5 Model was used because of its simplicity and the amount of data available. The relative magnitudes were used to ensure that that the recommended amount of BMPs to apply doesn't exceed the sources and to choose a BMP that will increase the chance for adoptions since adoption is unlikely to be 100%. The results are shown in *Table* 7.1.1: Recommended BMPs and locations. The table shows the recommended BMPs, but as land use changes and more data is available through one-on-one interviews, other BMPs may seem more applicable due to cost, landowner choice, or more efficient pollutant reductions. All recommended BMPs should be done in the critical areas for each sub-watershed

The BMPs chosen are also common BMPs that have had been successfully implemented in the watershed or near the watershed on other fields. These include no-till farming, nutrient management planning, filter strips, fencing, livestock watering systems, and livestock watering pads. The loading was evaluated using the Region 5 model. For fields changing to no-till it is assumed that the default C value for Dubois County in the model is the cover that is occurring prior to adoption of no-till. The default LS and K values were also used. This gives an average reduction that is good for estimating how much will be needed. Once landowners are identified, modeling should be done with more detailed information about the particular field and cropping history. The estimated reduction for nutrient management planning could not be established with the Region 5 model and without more information about the nutrient content of the soil and the types, timing, and amounts of nutrient application. For example, switching from ammonia nitrate liquid application to anhydrous ammonia or incorporating manure can have a drastic effect on the amount of nitrate that runs off into the stream. To estimate the reduction due to cattle exclusion it was assumed that the area near the stream access point has less than 40% cover since lounging is likely to occur near the stream and that after the practices are installed the affected area will have 90% or greater cover from the establishment of grasses or installation of watering pads that stabilize the soil.

Overall, to achieve the reductions needed to attain the goals, a total of 17 fields (332 acres) will need to switch to no-till farming practices, 14 fields (268 acres) should have nutrient management plan developed and followed, buffer strips should be established adjacent to the stream on 19 fields (15.6 acres of filter strips), and 3 pastures (10 acres) should have grazing plans developed, likely including some sort of cattle exclusion, alternative watering system, and/or watering pads.

D 1 D	Recommended BMPs	Amounts	Estimated load reductions
Patoka River –	Change to no-till farming on HEL	3 fields (60 acres)	1281 pounds/year N
Dubois	fields		
Duoois			639 pounds/year P
			744 tons/year sediment
-	Nutrient management planning on	10 fields (200 acres)	Variable N
	no-till fields	To fields (200 deles)	Variable P
-	Filter Strips on un-buffered fields	4 fields (7.9 acres of filter strips)	1528 pounds/year N
	Filter Strips on un-ouriered fields	4 heids (7.9 acres of finter surps)	
			820 pounds/year P
	Change to no-till farming on HEL	8 fields (160 acres)	1528 tons/year sediment 3416 pounds/year N
Patoka River – Long	fields	8 heids (160 acres)	1704 pounds/year P
Ditch	lields		1984 tons/year sediment
-	Filter Strips on un-buffered fields	7 fields (5.1 acres of filter strips)	6104 pounds/year N
	Filter Strips on un-bullered fields	7 heids (5.1 acres of hiter strips)	6104 pounds/year in
			3269 pounds/year P
			1704 tons/year sediment
Beaver Creek	Grazing plan, cattle exclusion, watering systems, & watering pad	3 pastures (10 acres affected)*	177 pounds/year N
			87 pounds/year P
			103 tons/year sediment
	Change to no-till farming on HEL fields	4 fields (68 acres)	1476 pounds/year N
			736 pounds/year P
			856 tons/year sediment
	Filter strips on un-buffered fields	4 fields (2.6 acres of filter strips)	1804 pounds/year N
			723 pounds/year P
			902 tons/year sediment
	Nutrient management planning on	4 fields (68 acres)	Variable
	no-till fields		Variable
Patoka River-	Filter strips on un-buffered fields	4 fields (100 acres)	1564 pounds/year N
Calumet Run			836 pounds/year P
			782 tons/year sediment
	Change to no-till farming on HEL	2 fields (34 acres)	144 pounds/year N
	fields		78 pounds/year P
			84 tons/year sediment
Polson-Bauer Creek	Filter Strips on un-buffered fields	1 field (1.1 acre of filter strip)	172 pounds/year N
			92 pounds/year P
			74 tons/year sediment
Davis Creek	Filter Strips on un-buffered fields	1 field (1.5 acre of filter strip)	237 pounds/year N
			127 pounds/year P
			103 tons/year sediment

* This measure also satisfies reductions needed for the pathogen problem

Table 7.1.1: Recommended BMPs and locations

This scenario represents the most basic approach to achieving the water quality goals. Additional practices may be necessary to accomplish the recommended BMPs or may enhance their benefit. A number of other BMPs exist that may be used in place of the recommended BMPs to accommodate a landowners existing conservation plan. These include but are not limited to:

- Increase in the amount of manure hauled outside of the watershed
- Grazing management plans
- stream crossings for livestock
- Installation of treatment systems for bare feeding or watering areas
- Installation of concrete pads or other corrective measures for bare feeding and watering areas
- Installation of erosion control structures including drop pipes, WaSCoBs, grassed waterways, etc.
- Stablilization of gullies
- Conversion of fields excessively high in phosphorous to permanent cover
- Creation or repair of ponds in livestock areas
- Extension of municipal sewer lines to include more areas or creation of smaller public treatment systems such as wetland systems
- Increase in the number of people upgrading or regularly servicing septic systems
- Creation of manure and animal storage and composting facilities

7.1.2: Recommendations for "other goals"

As described in Chapter 6, the "other goals" for the nutrient problem involve establishing a monitoring programs specific to Beaver Lake and Jasper Lake. This monitoring program should determine the source and impact of ammonia nitrogen and pH impairments as it relates to the public interest. Project leaders may look to members of the NRCS, SWCD, ISDA, DNR or other partner agencies for technical assistance to identify specific actions that have been proven to reduce algal growth or determine more stringent threshold levels for the loading of phosphorous and nitrogen.

In any of the areas defined as critical for excessive algae growth based on ammonia nitrogen and pH, demonstration projects should address sediment and nutrient loading or other factors that limit algae growth such as water stagnation or canopy cover. Sites should be chosen where excessive algae growth exists to demonstrate how different practices can keep nutrients out of streams and slow algae growth that hurts water quality. Any of the recommended or other BMPs listed above may be appropriate depending on the site chosen.

7.2: Pathogen Goals

7.2.1: BMPs and Other Recommended Measures for Water Quality Goals

To accomplish the water quality pathogen goals described in Chapter 6, a number of BMPs and measures are appropriate including but not limited to:

- riparian filter strips in areas where manure is applied
- Increase in the amount of manure hauled outside of the watershed

- Grazing management plans
- Fencing, watering systems, and stream crossings for livestock
- Installation of treatment systems for bare feeding or watering areas
- Installation of concrete pads, critical plantings, or other corrective measures for bare feeding and watering areas
- Maintenance or upgrading of lagoons or ponds in livestock areas that may be contributing pathogens
- Extension of municipal sewer lines to include more areas or creation of smaller public treatment systems such as wetland systems
- Increase in the number of people upgrading or regularly servicing septic systems

7.2.2: Recommended BMPs and locations for water quality goals

An appropriate method of modeling reduction in *E. coli* could not be found since the amount can be so variable. Runoff contaminated by manure can range from a low as 200 colonies per 100 mL to as high as 100,000 colonies per 100 mL depending on a wide variety of environmental variables and magnitudes. Instead, common sense will be used to estimate reductions. In most cases, the only observed source of *E. coli* was small and isolated. The most obvious source was identified as cattle with access to stream or pastures will large bare areas especially where feeding or watering occurs. The following BMPs are the recommended BMPs based on these assumptions and monitoring should continue to verify that the sources were correctly identified. Other ways of establishing the best locations within the critical areas for the BMPs include interviews with landowners or observing cattle to determine the amount of time spent and activities occurring while cattle are in streams or on bare areas of the pasture. The recommended BMPs and locations are described in *Table 7.2.2: Recommended BMPs and Locations*.

Sub-watershed	Recommended BMPs	Amount
Davis Creek	Grazing plan, cattle Exclusion, watering systems, & watering pad	2 pastures (7 acres affected)
Patoka River – Dubois	Grazing plan, cattle exclusion, watering systems, & watering pad	2 pastures (7 acres affected)
Beaver Creek	Grazing plan, cattle exclusion, watering systems, & watering pad	3 pastures (10 acres affected)
Patoka River – Calumet Run	Grazing plan, cattle exclusion, watering systems, & watering pad	3 pastures (10 acres affected)

Table 7.2.2: Recommended BMPs and Locations

Overall, 10 pastures (34 acres affected) should adopt grazing plans and install fencing, water systems, and/or water pads.

7.2.3: Recommendations for "other goals"

As described in Chapter 6, the other goals for the pathogen problem involve further monitoring of Jasper and Beaver Lake to establish with more certainty that *E. coli* is not exceeding the recreational standard while the lakes are being used for full contact recreation. Landowners, the city of Jasper, and the county health department should be central in developing a monitoring program that will ensure the safety of users of the lake by monitoring the levels of *E. coli*. If problems are found then the public should be notified through public meetings, the media, and mailings, paying particular attention to communicate the problem and the magnitude of the problem correctly and simply. The community should then be closely involved in developing a plan to remedy any problems that are found. Monitoring points should be chosen to reflect the areas most used for full body contact recreation.

						7.3: Action Register
Goal	Objective	Time of completion	Cost	Possible Funding Sources	Technical Assistance and input	Responsible parties
Sediment & Nutrient and Pathogen	Hire a watershed coordinator or technician	1 month	\$120,000- \$140,000 over 2 and a half years	Section 319 Grant, Dubois County, City of Jasper, ISDA Division of Soil Conservation Clean Water Indiana grant	IDEM Watershed Section, ISDA-DSC	Dubois County SWCD
Sediment & Nutrient and Pathogen	Develop guidelines for a cost-share plan to help landowners with costs of BMPs	3 months	Staff Included in coordinator cost and \$500 for advertising and holding meetings	Section 319 Grant, Dubois County, City of Jasper, ISDA Division of Soil Conservation Clean Water Indiana grant	NRCS, IDEM Watershed Section, ISDA-DSC, crop consultant, nutrient management planners, landowners	Watershed Coordinator, landowners, Dubois SWCD, IDEM Watershed Section
Sediment & Nutrient	Identify possible landowner(s) for demonstration projects	3 months	Staff Included in coordinator cost	Section 319 Grant, Dubois County, City of Jasper, ISDA Division of Soil Conservation Clean Water Indiana grant	NRCS, IDEM Watershed Section, ISDA-DSC, landowners	Watershed Coordinator, Dubois SWCD
Sediment & Nutrient and Pathogen	Develop a monitoring program for Beaver Lake and Jasper Lake, to study <i>E.</i> <i>coli</i> , ammonia nitrogen and pH	3 months	Staff Included in coordinator costs and \$500 for advertising and meetings	Section 319 Grant, Dubois County, City of Jasper, ISDA Division of Soil Conservation Clean Water Indiana grant	Watershed Coordinator, Dubois County SWCD, NRCS, IDEM, ISDA-DSC, landowners, water testing laboratory representative, EPA	City of Jasper, Dubois County Health Department, Lake associations

Sediment &	Install	12 months	Variable	Section 319 Grant,	NRCS, IDEM	Watershed
Nutrient	demonstration			Dubois County,	Watershed Section,	Coordinator,
	project(s)			ISDA-DSC Clean	ISDA-DSC, crop	Landowners, Dubois
				Water Indiana	consultants, nutrient	County SWCD
				grant	management planners,	
Sediment &	Complete	15 months	Staff	Section 319 Grant,	Watershed	City of Jasper,
Nutrient and	monitoring		included in	Dubois County,	Coordinator, Dubois	Dubois County
Pathogen	program		coordinator	City of Jasper,	County SWCD,	Health Department,
			costs	ISDA-DSC CWI	landowners, NRCS,	Lake associations
				grant	ISDA-DSC, IDEM,	
					EPA	
Sediment &	Host tour or field	20 months	Staff	Section 319 Grant,	landowners, NRCS,	Watershed
Nutrient	day to highlight		included in	Dubois County,	ISDA-DSC, IDEM,	Coordinator,
	demonstration		coordinator	ISDA-DSC CWI	Purdue Extension	Landowners, Dubois
	projects targeting		costs &	grant		County SWCD
	landowners in the		\$100-500 for			
	priority areas		mailings &			
			advertising			
Sediment &	Follow-up with	22 months	Staff	Section 319 Grant,	landowners, NRCS,	Watershed
Nutrient	field day or tour		included in	Dubois County,	ISDA-DSC, IDEM,	Coordinator,
	attendees to		coordinator	ISDA-DSC CWI	Purdue Extension	Landowners, Dubois
	determine interest		costs	grant		County SWCD
	in additional					
	practices					
Sediment &	Develop	24 months	Staff	Section 319 Grant,	Watershed	City of Jasper,
Nutrient and	recommendations		included in	Dubois County,	Coordinator, Dubois	Dubois County
Pathogen	based on additional		cost of	City of Jasper,	County SWCD,	Health Department
	monitoring		coordinator	ISDA-DSC CWI	landowners, NRCS,	
			and \$500 for	grant	ISDA-DSC, IDEM,	
			advertising		EPA	
			and holding			
			meetings			

Sediment &	Installation/adoptio	27 months	Base cost:	Section 319 Grant,	NRCS, IDEM	Watershed
Nutrient and	n of recommended		\$20,243 -	Dubois County,	Watershed Section,	Coordinator,
Pathogen	BMPs in Chapter 7		25,573	City of Jasper,	ISDA-DSC, crop	Landowners, Dubois
				ISDA-DSC CWI	consultants, nutrient	County SWCD
				grant, BMP	management planners,	
				challenge, DNR		
				LARE, NRCS		
Sediment &	Evaluate plan and	30 months	Staff	Section 319 Grant,	NRCS, IDEM	Watershed
Nutrient and	make additions or		included in	Dubois County,	Watershed Section,	Coordinator, Dubois
Pathogen	corrections		cost of	City of Jasper,	ISDA-DSC, City of	County SWCD
			coordinator	ISDA-DSC CWI	Jasper, Landowners,	
			and \$500 for	grant	Dubois County Health	
			advertising		Department	
			and holding a			
			meeting			

Interim milestones

- Funding secured
- Position advertised
- Interviews conducted
- Position filled

Cost estimate is based on previous watershed coordinator costs.

7.3.2: Develop Guidelines for a Cost-Share Program

Interim milestones

- Meeting with parties responsible and those providing technical assistance/input
- Public meeting for landowners to announce cost-share opportunity and gather input announced
- Public meeting held
- Personal interviews conducted with landowners in critical areas
- Guidelines for cost-share announced

Cost is based on the cost of postage, meeting space, newspaper ads and newsletter articles.

7.3.3: Identify Possible Landowners for Demonstration Projects

Interim milestones

- Sites identified with observed or expected excessive algae growth
- Personal interviews conducted with landowners
- Need for funding established based on possible projects
- Cost-share opportunities discussed with possible landowners

7.3.4: Develop a Water Monitoring Program for Beaver Lake and Jasper Lake

Interim milestones

- Meeting with parties responsible and those providing technical assistance/input
- Public meeting for landowners to discuss monitoring and gather input announced
- Public meeting held
- Number attending meeting
- Personal interviews conducted with landowners in areas of the water monitoring
- Willing landowners identified to assist in gathering data
- Sampling location and schedule identified
- Monitoring plan shared with technical partners for review

Cost is based on the cost of postage, meeting space, newspaper ads and newsletter articles.

7.3.5: Install Demonstration Projects

Interim milestones

- Project designed based on site needs
- Expected load reduction based on load reduction spreadsheet tool or other appropriate model
- Site documented before construction
- Projects installed

Cost varies based on practices to be installed

7.3.6: Complete Monitoring Program

- Reagents purchased and/or labs identified to run tests
- Samples collected according to schedule
- Results shared with public and technical partners

Cost based on the cost of reagents used in previous monitoring programs and the cost of labs for additional testing.

7.3.7: Host Tour or Field Days and Follow-up with Attendees

Interim milestones

- Event developed in cooperation with landowners
- Landowners in critical areas contacted about event
- Number attending
- Number considering implementing similar project

Cost is based on the cost of postage, meeting space, newspaper ads and newsletter articles

7.3.8: Develop recommendations based on additional monitoring

- Meeting with parties responsible and those providing technical assistance/input
- Analysis conducted to determine additional measures needed
- Public meeting for landowners to discuss results and gather input announced
- Public meeting held
- Number attending meeting
- Personal interviews conducted with landowners in areas of the water monitoring
- Recommendations shared with technical partners and public
- Recommendations added to the watershed management plan with a schedule of completion

7.3.9: Installation/Adoption of Recommended BMPs

- Landowners identified for BMPs
- Landowners contacted
- Number of landowners showing interest once cost-share is available
- Landowners provided technical assistant by technical partners/crop consultants in switching to no-till and/or adopting nutrient management planning
- Number of landowners signed up for BMP Challenge
- Number/acres of filter strip installed
- Acres of farmland switched to no-till
- Acres of farmland adopting nutrient management plans
- Number of pastures adopting grazing management plans
- Amount of fencing, alternative watering systems, or other corrective measures installed on pastures

Costs

Filter Strips: 150/acres * 18.2 acres = 2730 (more cost may be encountered if a forest buffer is used or if stabilization of gullies or streambank erosion is needed)

No-till: \$20/acres * 332 acres = \$6640 (additional cost is likely to be encountered for landowners requesting assistance from crop consultant or needing equipment modifications).

Nutrient Management Planning: 268 acres * \$20 = \$5360

Grazing plan: \$20/acre * 34 acres = \$680

Fencing: 10 pastures * 1944 feet per pasture * \$0.13 = \$2513.80

Alternative Watering Systems: 10 pastures * \$232-\$765/unit = \$2320 - \$7650

7.3.10: Evaluate Plan and Make Additions or Corrections

- Number of interim milestones completed or not completed summarized
- Public meeting advertised/announced
- Public meeting held to discuss accomplishment and results of 2 and a half years of implementation
- Number of people attending meeting
- Additions or corrections added to plan and plan made available to the community
- Number of places plan is available for review by the public
- Number of additional landowners interested in implementing more BMPs
- Need determined for additional funding

Cost is based on the cost of the meeting and advertisements for the meeting

Monitoring Effectiveness & Updating the Plan

Chapter 8:

8.1: Evaluating the Plan

The plan should be evaluated once a year to track progress and communicate the accomplishments to the public. The Dubois County SWCD and the watershed coordinator should get help from the original steering committee in evaluating the plan. A final evaluation of the first phase of the plan should be conducted after two and a half years to establish needed correction based on the additional montoring conducted on Beaver Lake, Jasper Lake, and Polson Creek and to establish additional funding that may be needed.

8.2: Tracking Indicators

8.2.1: Water Quality monitoring

Water quality monitoring at the sample points tested in the 2005-2006 monitoring should be tested again after 5 years of implementation to evaluate the effectiveness of the BMPs/measures installed or adopted. Total phosphorous, total nitrogen, nitrate, ammonia nitrogen, pH, dissolved oxygen, and *E. coli* should be tested. The HACH kit may be used for all but total phosphorous, total nitrogen, and *E. coli*. Total phosphorous and total nitrogen should be done by an outside lab, and *E. coli* should be tested using Easygel Coliscan plus. Monitoring should be conducted four times over a year by the Dubois County SWCD and results should be shared with the original steering committee and the public. If impairments are found, loading calculations should be redone and changes in the watershed should be determined to make corrections and additions to the watershed plan.

8.2.2: Milestones

BMPs and other practices adopted or implemented should be evaluated using the Region 5 pollutant load estimation tool and RUSLE2 (if necessary). Nutrient management planning should be evaluated based on the anticipated reduction in nutrients applied, especially nitrate, and possibly soil nutrient levels. Spot check should be conducted to identify landowners adopting BMPs without technical assistance if they are in the critical areas.

 Acknowledgements	

Several individuals & agencies were instrumental in the creation of this plan including:

Bart Pitstick, District Conservationist, NRCS Jim Peter, Extension Educator, Purdue Cooperative Extension Service Judi Brown, Executive Director, Dubois County SWCD Colt VanNatta, Livestock Specialist, Four Rivers RC&D Dave Elgin, Coordinator, Four Rivers RC&D Denise Tuggle, Program Assistant, Four Rivers RC&D Beverly Osgatharp, Clerical, Four Rivers RC&D Ken Eck, District Support Specialist, Indiana State Department of Agriculture Dubois County Farm Service Agency Staff Amanda Bough, Technician, Dubois County SWCD Wes Garris, Stormwater Coordinator, City of Jasper Adam Vaal, GIS Specialist, City of Jasper Dubois County Health Department Joe Craig, Practical Resource Consultants, Inc. Rick Obenshain, Four Rivers RC&D Joe Neukam, Four Rivers RC&D Levi Brown, Four Rivers RC&D Jack Welp, Dubois County SWCD Glenn Menke, Dubois County SWCD Alan Weyer, Dubois County SWCD Jason Small, Dubios County SWCD Sam Oxley, Dubois County SWCD Larry Vollmer, Dubois County Commissioners Jason Tower, Superintendent, SIPAC

References; IDEM's Patoka River Watershed Restoration Strategy, Final Draft 2000

UPPER PATOKA RIVER WATERSHED MANAGEMENT PLAN

APPENDICES



Patoka River at Assessment Site #1

<u>Prepared for</u> Indiana Department of Environmental Management By Blair Borries Four River Resoure Conservation & Development Area, Inc.

Appendix A Raw Public Input Results

(Sidadanasanas

operation would be

super-superson

Construction of the second sec

Stakeholders present at the 11/15/05 public meeting were given a survey with the following numbered questions. Their responses are shown in the bulleted section below each question.

11/15/05 Patoka Watershed Meeting Survey Results

- 1. Which critical areas do you think are causing the greatest damage?
 - The *E.coli* I believe would cause the most damage over time
 - Jasper Lake & Beaver Lake should be tested & results presented at the next meeting
 - Identify exposed problems & remedies then address with landowners only
 - Livestock contamination runoff
 - Cattle in stream
 - Septic systems
 - Farming too close to the streams
 - Animals having channel access
- 2. What do you think should be the goal of pollution reduction for this project?
 - Work on identifying sources & work on both management & education of setbacks.
 - Test water, identify problem areas, suggest possible solutions, communicate with landowners
 - Lagoons
 - Water supply assistance to farmers
 - Investigate the *E.coli*, check bmp's & get more of the farmers involved
- 3. Which measures/practices should be implemented with this project?
 - Setbacks for manure applications & fixing failing septics which both cause the elevated *E.coli*
 - To date two problem sources have been communicated: cattle in streams & a hog pit
 - Hog & turkey houses
 - Manure dry stacks
 - Assisting with developing CNMP
- 4. Other comments
 - Disclose practices that prevent cattle in streams and publicize those solutions

- If you are doing a watershed study, it is vital to also consider heavy metals such as mercury & lead and chemicals like PCB's etc. Since these have been identified in fish and in Patoka Lake upstream, it should be investigated. Industrial chemicals need to be identified as well. This may be expensive, but a water quality study would not be complete without this data as well.
- More involvement is needed. Should not reflect the ideas of the leaders in the group exclusively. One suggestion is to split people up into groups of 3 4 and have them brainstorm. Get those ideas out on the table.

Example Goals from 11/2/06 Dubois Co. SWCD Supervisors Meeting

Dubois County SWCD supervisors were asked to come up with potential goals for the livestock, soil erosion, and forestry problem areas for the Upper Patoka River Watershed based on their experience with the watershed study. The section of the meeting was facilitated by the watershed coordinator. The results are summarized below. They were not asked to rank in any way. This page was presented as a handout to steering committee members and stakeholders present at the 11/27/06 meeting when final goals were decided.

Action	Target	Votes	Amount
	_	Received	Recommended/Number
			Reached
Increase	Stream buffers	1	None provided
	Stream Crossings (for livestock)	1	None provided
	Watering Facilities	1	None provided
	Manure transported outside the watershed	1	25%
	Use of rotational grazing	2	10%, none provided
	Grazing plans completed by a specialist	1	None provided
	Specialist assisted manure management planning	1	10 farms
Decrease	Livestock access to waterways	3	100%, 90%, none provided
	<i>E. coli</i> concentrations in <i>E. coli</i>	1	50%
	Stockpiling manure outside	1	None provided
	Stocking rates in pastures	1	10%

Livestock Goals

Educate	Livestock owners about soil Phosphorous levels in the watershed	1	None provided
	Livestock owners about benefits of rotational grazing	1	All
	Livestock owners about benefits of cattle exclusion from streams	1	All
	Livestock owners about benefits of feedlot BMPs	1	All
	Livestock owners about E. Coli levels in waterways	1	None provided

Soil Erosion Goals

Construction of the second sec

Contraction (1997)

Photo Security in

(international and international and internation

STOWNSKI AND

401 A A 17 A A 44

ADD IN THE REAL PROPERTY INTERVENT IN THE REAL PROPERTY INTERVENTY I

0.0000000

A COMPANY

Action	Target	Votes Received	Amount Recommended/Number Reached
Increase	Cover Crops	3	50%, 20%
	Conservation Tillage	3	50%, 20%, none provided
	No-till on HEL land	1	Achieve 100%
	Marginal Cropland Converted to Forest or Pasture	3	25%, none provided, none provided
	Grassed Waterways	2	20%, none provided
	Diversion Structures/water and Sediment control Basin	2	20%, 25%
	Stream-side buffers	2	25%, None provided
Educate	Landowners on the benefits of buffering streams.	1	None provided

Everyone about the problem and related solutions	1	None provided	:
--	---	---------------	---

Forestry goals

Action	Target	Votes Received	Amount Recommended/Number Reached
Increase	Tree Planting Acreage	1	10%
	Use of good forestry best management practices	1	50%
	Incentives to reforest marginal cropland	1	None provided
Educate	Landowners about forestry management thorough field days	1	None provided

PATOKA RIVER WATERSHED Dubois County, Indiana HUC 05120209020

APPENDIX B

FIELD DATA SHEETS

Data from study by Four Rivers RC&D Completed by Practical Resource Management Joe Craig

- Stream analysis parameters
- Map of data locations
- Sampling points
- Sub-watershed maps
- Monitoring worksheet summary
- Chemical monitoring worksheets
- Water quality indexing worksheets
- CFS computations
STREAM ANALYSIS PARAMETERS

pН

pH is an indication of acidic or alkaline nature of the water. It is a mathematical relationship indicating the concentration of hydrogen ions in the water. It is measured with a pH meter after calibration to known standards. The scale ranges from 0 (acidic) to 14 (alkaline) with 7 being neutral. Aquatic organisms are sensitive to pH, especially during reproduction. A pH range of 6.5 to 8.2 is considered optimal. As an example, the pH of vinegar is about 3 and the pH of ammonia is about 11.

Things that can affect pH:

Run off from acidic or alkaline sources Run off after agricultural lime application Algae blooms raise pH

Dissolved Oxygen

Aquatic life requires oxygen. Dissolved oxygen is therefore an important indicator of stream health. Fish normally require a minimum DO level of 3 ppm. Typical normal range is 5 to 15 ppm. Since DO is affected by temperature, the most useful number is the % saturation. This tells us how much oxygen is in the water versus how much could be in the water at that given temperature.

Things that can affect DO concentrations are:

Temperature Turbulence Plant growth (photosynthesis) Decaying organic matter Ammonia

E. coli

E. coli is a bacterium found in the fecal matter from warm-blooded animals, including humans. The bacteria are naturally present in the digestive tract. However, the bacteria along with other pathogens can lead to serious illnesses if ingested or entered through a wound, eyes, etc. High levels are an indicator of the probability that someone could become ill.

Things that effect E. coli concentrations are:

Human waste from improperly functioning septic systems Pet wastes, wildlife and waterfowl wastes Livestock and manure runoff from fields or lagoons

Orthophosphate

Orthophosphate is one form of phosphate that is dissolved in the water and readily available for aquatic plant uptake. Thus it is an indicator for the potential of algae blooms, which ultimately leads to a serious reduction in dissolved oxygen. Total Phosphate levels are in the typical range of 0.01 to 0.17 ppm. The Indiana average is 0.09 ppm.

Things that can affect Phosphate levels are:

Manure sources Fertilization Septic tank effluent Soaps

Nitrate

Nitrogen occurs in the water as nitrate, nitrite, and ammonia. Nitrates are essential for plant growth and like phosphate, can lead to extraordinary algae blooms and aquatic plant growth, leading ultimately to a reduction in dissolved oxygen when the plants decay. Normal stream levels are below 4 ppm.

Things that can affect nitrate concentrations are: Manure sources Fertilization Sewage

Ammonia Nitrogen

Ammonia is a form of nitrogen that plants use for growth. However, at high concentrations, it is poisonous to animals and humans. It is a natural degradation product of manures and the decay of organisms.

Things than affect ammonia concentrations are: Fertilization Manure sources Dead animals and organisms

Turbidity / Transparency

water vertically and reducing the length of that column until an image is visible at the bottom. Turbidity should not be confused with color. Materials suspended in sunlight to aquatic plants, raise temperature, and thereby affect dissolved oxygen. Furbidity is the relative clarity of water and is measured by viewing a column of organic matter, and other suspended solids. Turbidity inhibits the penetration of the water absorb and scatter light. These materials may include algae, clay, silt,

Things that can affect turbidity are: Soil erosion Algae Organic matter



2
G
· _
0
<u> </u>
2 D D
Я
51
7
8
ିଲା
~~
V2

See Map 2 for sampling locations. Description of sampling points:

- 05120209020010- Patoka R.-Lost Ridge; S. Cuzco Rd. first sampling point downstream of Patoka Lake Reservoir ء إسسو
- 05120209020020- Dillon Cr.-Cane Cr; E. Cuzco Rd. southernmost tributary originating in Orange Co. N.
- 05120209020020- Dillon Cr.-Cane Cr; Cuzco-Norton Rd. northern tributary originating in Orange Co. က်
- 05120209020030- Davis Cr; W. Cuzco Rd. X SR 56 4.
- 05120209020050- Poison Cr.- Bauer Cr; Dubois-Patoka Lake Rd., eastern Polsous tributaries . س
 - 05120209020030- Davis Cr; SR 56, northern tributary ю. Ч.
 - 05120209020040- Patoka R.- Dubois; Dubois Rd.
- 05120209020050- Poison Cr.- Bauer Cr; N. Celestine Rd. western tributaries 8.
 - 05120209020040- Patoka R.-Dubois; SR 545, tributary north of town of Dubois о.
 - 16.05120209020080- Calumet Run; Jasper-Kellerville Rd., last tributary before 13.05120209020060- Patoka R.- Lono Ditch; CR 175 E, downstream of NPDES 14.05120209020060- Patoka R.- Lond Ditch; CR 300 N, main channel 15.05120209020080- Calumet Run; Jasper-Dubois Rd. south tributary 12.05120209020070- Beaver Cr.; Jasper-Dubois Rd. outfall from lake 11.05120209020070- Beaver Cr.; Jasper-Dubois Rd. east tributary 10. 05120209020040- Patoka R.-Dubois; SR 56, western tributary

Sample sites will be further described by latitude/longitude obtained from GPS or Internet website, i.e. www.topozone.crm water plant intake.

IDEM ARN A305-4-129	Physical Description	1st point below reservoir	S trib from Orange Co	N trib from Orange Co	W Cuzco x SR 56	E tribs of Poison/Bauer Cr.	N trib Davis Cr x SR 56	Patoka R x Dubois Rd	Poison/Bauer Cr x Jasper-Dubois Rd	Trib N of Dubois x SR 545	W trib x SR 56	E trib Beaver Cr x Jasper-Dubois Rd	Outfall from Beaver Lake x Jasper-Dubois Rd	Patoka R x CR 175 E downstream of 2 NPDES	Patoka R x CR 300 N	S trib Calumet Run x Jasper-Dubois Rd	Calumet Run x Jasper-Kellerville Rd
HUC = 05120209020	Latitude	86.7147	86.6970	86.7099	86.7564	86.7653	86.7670	86.7754	86.7922	86.8082	86.7974	86.8338	86.8443	86.8712	86.8714	86.8777	86.9181
HUC = 051	Longitude	38.4419	38.4731	38.4769	38.4879	38.4220	38.4858	38.4721	38.4276	38.4628	38.4856	38.4168	38.4049	38.4560	38.4230	38.4002	38.4046
	14 Dig HUC	010	020	020	030	050	030	040	050	040	040	070	070	090	090	080	080
<u>Monitoring Sites</u> Patoka River Watershed	Site Number	1	7	ß	4	ß	g	7	œ	σ	10	11	12	13	14	15	16





- **Possible Access Points**

- **Decent Buffer Points**
- **Confined Feeding Operations**
- - Interstate Highway
- United States Highway
- County Roads/Other

- Undefined Boundary



Legend

Sample Points

Possible Access Points
 No Buffer Points
 Good Buffer Points
 Decent Buffer Points
 Cow Access Points
 Confined Feeding Operations

Roads

 <all other values>

CFCC2

- Interstate Highway
- United States Highway

State Road

County Roads/Other

Waterways

--- <all other values>

- Unknown Waterway
- Streams or Rivers
- Undefined Boundary
- County Lines





- a second a second and and a
- a staget yet
- Contained Republic Contractor
 -) et sa
 - A SERVICE HELDON TO -----
 - 230 10
 - Number and hand
 - State Road
 - 519 (010 (11) COLOR)
 - Company with the hear
 - 73948
 - atter Parameter and

Legend

- Sample Points
- ? Possible Access Points
- X No Buffer Points
- \star Good Buffer Points
- Decent Buffer Points
- Cow Access Points
- Confined Feeding Operations

Roads

--- <all other values>

CFCC2

- Interstate Highway
- United States Highway
- State Road
- County Roads/Other

Waterways

--- <all other values>

- Unknown Waterway
- Streams or Rivers
- Undefined Boundary
 - County Lines



Legend

- Sample Points
- ? Possible Access Points
- X No Buffer Points
- ★ Good Buffer Points
- Decent Buffer Points
- Cow Access Points
- Confined Feeding Operations

Roads

— <all other values>

CFCC2

- Interstate Highway
- ---- United States Highway

State Road

County Roads/Other

Waterways

- <all other values>

- Unknown Waterway
- Streams or Rivers
- Undefined Boundary
- County Lines



Leg	end
•	Sample Points
?	Possible Access Points
X	No Buffer Points
*	Good Buffer Points
•	Decent Buffer Points
¥	Cow Access Points
•	Confined Feeding Operations
Ro	ads
	<all other="" values=""></all>
CF	CC2
_	Interstate Highway
-	United States Highway
-	State Road
-	County Roads/Other
Wa	terways
-	<all other="" values=""></all>
CF	CC2
-	Unknown Waterway
-	Streams or Rivers
-	Undefined Boundary
	County Lines



Legend

0	Sample Points						
?	Possible Access Points						
X	No Buffer Points						
*	Good Buffer Points						
0	Decent Buffer Points						
¥	Cow Access Points						
•	Confined Feeding Operations						
Ro	ads						
_	<all other="" values=""></all>						
CF	CFCC2						
_	Interstate Highway						
-	United States Highway						
-	State Road						
_	County Roads/Other						

Waterways

- <all other values>

- Unknown Waterway
- Streams or Rivers
- Undefined Boundary
- County Lines



Legend
 Sample Points Possible Access Points No Buffer Points Good Buffer Points Decent Buffer Points Cow Access Points
Confined Feeding Operations Roads
CFCC2 Interstate Highway United States Highway State Road County Roads/Other
Waterways
County Lines



Legend

- Sample Points
- Possible Access Points
- X No Buffer Points
- ★ Good Buffer Points
- Decent Buffer Points
- Cow Access Points
- Confined Feeding Operations

Roads

--- <all other values>

CFCC2

- --- Interstate Highway
- United States Highway

State Road

County Roads/Other

Waterways

--- <all other values>

- Unknown Waterway
- Streams or Rivers
- Undefined Boundary
- County Lines

Long Ditch

Total Woods	Total Croplands	Total Grassland	Total Urban	Other
2211.008445	1118.349417	539.802873	0	555.839265
Percentage:	Percentage:	Percentage:	Percentage:	Percentage:
49.97%	25.27%	12.20%	0.00%	12.56%
Dillon-Cane Cr				
Total Woods	Total Croplands	Total Grassland	Total Urban	Other
		1418.068075		
Percentage:	Percentage:	Percentage:	Percentage:	Percentage:
55.22%	16.79%	10.57%	0.08%	17.34%
Davis Creek				
Total Woods	Total Croplands	Total Grassland	Total Urban	Other
6003.054485	1127.324651	787.437078	0	1154.183786
Percentage:	Percentage:	Percentage:	Percentage:	Percentage:
66.17%	12.43%	8.68%	0.00%	12.72%
Crystal Bridge				
Total Woods	Total Croplands	Total Grassland	Total Urban	Other
3485.426638	1859.582015	1048.834977	20.749553	1959.406817
Percentage:	Percentage:	Percentage:	Percentage:	Percentage:
		-	0.25%	23.40%

T = 4 = 1 1 1 1 1 m = 1 m

Other

Polson-Bauer

Total Woods
3306.308102Total Croplands
1154.54234Total Grassland
1864.240766Total Urban
87.783692OtherPercentage:
36.95%Percentage:
12.90%Percentage:
20.83%Percentage:
0.98%Percentage:
28.34%

Long Ditch

Total Woods
3262.095592Total Croplands
2903.475784Total Grassland
1081.770903Total Urban
0OtherPercentage:
37.72%Percentage:
33.57%Percentage:
12.51%Percentage:
0.00%Percentage:
16.20%

Beaver Creek

Total Woods
3318.077148Total Croplands
1537.607318Total Grassland
773.456346Total Urban
0OtherPercentage:
50.50%Percentage:
23.40%Percentage:
11.77%Percentage:
0.00%Percentage:
14.32%

Calumet Run

Total WoodsTotal CroplandsTotal GrasslandTotal UrbanOther2585.8442832550.696398792.99114316.0221292125.44605Percentage:Percentage:Percentage:Percentage:Percentage:30.89%30.47%9.47%3.78%25.39%

ADVANCED CHEMICAL MONITORING DATA SHEE'	ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
---	----------	----------	------------	------	-------

0

Date <u>4 / 11 / 05</u> Begin Time MM DD YY End Time Certified Monitors' Names	(am/pm) # Students								
Organization Name									
	Watershed #								
Stream/River Name Patoka River (Please do not abbreviate.)	Site ID# / (Above ID numbers are required.)								
Current Weather Clear/Sunny Overcast	Showers 🛛 Rain (Steady) 🗍 Storm (Heavy)								
Weather in Past 48 hrs. I Clear/Sunny Overcast	Showers Rain (Steady) Storm (Heavy)								
WATER QUALITY INDEX (WQI) You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the <i>Calculation</i> column by the total of the <i>Weighting Factor</i> column to obtain the Water Quality Index rating.									
Test Results	Q-Value Weighting Calculation Factor								
Dissolved Oxygen% saturation	$\frac{90}{98} \times \frac{18}{17} = \frac{16.2}{16.7}$								
E. coli	<u>98</u> X .17 = <u>16.7</u>								
pH <u>7.94</u> units	<u>85</u> X .12 = <u>10.2</u>								
B.O.D. 5 mg/L	X .12 =								
H ₂ O Temp Change change in°C	X .11 =								
Total Phosphate mg/L	X .11 =								
Nitrate (NO ₃) $_{-}O9$ mg/L	$97 \times .10 = 9.7$								
Turbidity 15 NTU's	$70 \times .09 = 6.3$								
	TOTALS 0.66 59.1								
'Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% Very Bad 0 - 24%	INDEX RATING 89.5								
	Good								

Date <u>4/11/05</u> MM DD YY	-	ime:							
Certified Monitors' Nar	nes			Volunteer ID					
Organization Name									
Watershed Name Watershed #									
Stream/River Name	eek not abbreviate.)	Site ID $\#_{\mathcal{Z}}$ (Above ID numbers are required.							
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)				
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test 1	Results		Q-Value		Weighting		Calculation
	mg/L				Factor		
Dissolved Oxygen	135 % saturation		81.5	Х	.18	=	14.67
<i>E</i> . coli	colonies/100mL		43,4	х	.17	=	7.378
рН	7.63 units		90.6	х	.12	=	10.87
B.O.D. 5	mg/L			х	.12	=	
H ₂ O Temp Change	change in°C			х	.11	II	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	. 044 mg/L		97	х	.10	П	9.7
Turbidity	/SNTU's		70	х	.09	=	6.3
		_	TOTALS		. 66	_	48.9
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%				QUALITY ATING		74.12
							Good

0

Date <u>411105</u> Begin Time MM DD YY End Time Certified Monitors' Names	(am/pm) # Students									
Organization Name										
	Watershed #									
Stream/River Name Dillow Creek (Please do not abbreviate.)	Site ID $\frac{\# 3}{(\text{Above ID numbers are required.})}$									
Current Weather 🖸 Clear/Sunny 🗖 Overcast 🛛	Showers 🛛 Rain (Steady) 🗍 Storm (Heavy)									
Weather in Past 48 hrs. 🗹 Clear/Sunny 🗖 Overcast 🛛	Showers Rain (Steady) Storm (Heavy)									
You may perform as many of the following tests as you to obtain a Total Water Quality Index value. Divide the the Weighting Factor column to obtain the Water Quality Test Results	total of the Calculation column by the total ofy Index rating.Q-ValueWeightingCalculation									
mg/L Dissolved Oxygen/10_% saturation	Factor 95 X .18 = <u>17.1</u>									
<i>E</i> . coli <u>20</u> colonies/100mL	<u>63</u> X .17 = <u>10.71</u>									
pH7.87 units	$\frac{86}{12}$ X .12 = $\frac{10.32}{10.32}$									
B.O.D. 5 mg/L	X .12 =									
H ₂ O Temp Change change in°C	X .11 =									
Total Phosphatemg/L	X .11 =									
Nitrate (NO ₃) O mg/L	98 X .10 = 9.8									
TurbidityNTU's	$70 \times .09 = 6.3$									
19.57 199 199 199 199 199 199 199 199 199 19	TOTALS 54.23									
*Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 100% 100%	WATER QUALITY INDEX RATING 82.17 Good									

Date <u>4 111 105</u> MM DD YY		ime:	-	# Adults # Students				
Certified Monitors' Nar	nes			Volunteer ID				
Organization Name								
Watershed Name Watershed #								
Stream/River Name	Stream/River Name Ddvis Creek (Please do not abbreviate.)			Site ID # 4 (Above ID numbers are required				
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)			
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)			

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test	Results		Q-Value]	Weighting Factor		Calculation
	mg/L		85				15 3
Dissolved Oxygen	% saturation		03	Х	.18	=	15.3
<i>E</i> . coli	colonies/100mL		63	Х	.17	=	10.71
рН	<u>8.43</u> units		70	х	.12	=	8.4
B.O.D. 5	mg/L			х	.12	=	
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			Х	.11	=	
Nitrate (NO ₃)	mg/L		97	Х	.10	=	9.7
Turbidity	/ <u>S</u> NTU's		70	х	.09	=	6.3
			TOTALS	_	- 66		50.4
Good 70 - 89	te erie terj bud o bin						76.4
							Good

Date <u>4 20105</u> MM DD YY		ime: e:	-	# Adults # Students	NATES OF STREET
Certified Monitors' Na	mes			Volunteer ID	A DOLACK DYLCIS
Organization Name					, saski aorosinassi
Watershed Name	h ball mul	1	W	atershed #	and Name
Stream/River Name	Pinnick (Please do	Creek not abbreviate.)	<u>(2 8 65.</u>	and the second	# 5 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R	esults	_ mg/L		Q-Value]	Weighting Factor	12	Calculation
Dissolved Oxygen	147	_ mg/c _ % saturation	ų	50	х	.18		<u>9 9 9 9 0 0 0</u>
<i>E</i> . coli	0	_colonies/100mL	1	98	х	.17	=	16.7
рН	9.08	_ units		44.2	x	.12	=	5.3 10
B.O.D. 5	9. X	_ mg/L		2600	x	.12	=	3.0.D.5
H ₂ O Temp Change	in a	_ change in°C		egata to	х	.11	=	4 <u>0 Temp C</u> h
Total Phosphate	<u>n. x</u>	_ mg/L		_(pa	х	.11	=	igeoria laidi
Nitrate (NO3)	- 35	_ mg/L		96.5	x	.10	=	9.65
Turbidity	15	_NTU's		70	х	.09	=	6.3
	2	LATOY	-	TOTALS		. 66		46.9
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	0% Very I	25 - 49% 3ad 0 - 24%				QUALITY ATING	00	71.1
								Good

Date <u>4 / // / 05</u> MM DD YY	0	me:		# Adults # Students						
Certified Monitors' Nar	nes			Volunteer ID						
Organization Name										
Watershed Name			W	atershed #						
Stream/River Name	Sugar Ci (Please do	not abbreviate.)	Site ID <u>#6</u> (Above ID numbers are require							
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)					
Carrent Woather										

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test I	Results	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	mg/L % saturation	50	x	.18	=	9
<i>E</i> . coli	colonies/100mL	28.5	х	.17	=	4.85
рН	9.25 units	40	x	.12	=	4.8
B.O.D. 5	mg/L		х	.12	11	
H ₂ O Temp Change	change in°C		x	.11	Η	
Total Phosphate	mg/L		X	.11	=	
Nitrate (NO ₃)	<u>3.5</u> mg/L	77.5	x	.10	=	7.75
Turbidity	/ 5 NTU's	70	x	.09	=	6.3
		TOTALS	.	. 66	_	32.7
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%	WAIE		QUALITY ATING		49.5
						Bad

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
----------	----------	------------	------	-------

Date <u>4 / 11 / 05</u> MM DD YY Certified Monitors' Nar	End Time			# Adults # Students Volunteer ID_	Mail Martinel 20
Organization Name					anask ^a golietines
Watershed Name	aternised #	1	Wa	atershed #	Alershed Suma
Stream/River Name	Patoka Riv (Please do	ver @	Dubois Rd	Site ID (Above ID	# 7 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

U

Test R	esults	_ mg/L		Q-Value		Weighting Factor	10	Calculation
Dissolved Oxygen	120	_ % saturation	103	90	х	.18	I	16.2
<i>E</i> . coli	40	_colonies/100mL	00	56.5	х	.17	=	9.6
рН	7.71	_ units		90	x	.12	П	10.8
B.O.D. 5	SI. X	_ mg/L			х	.12	=	8,0,0,5
H ₂ O Temp Change	11.' X	_ change in°C		19205	x		1	MO grant, 0,1
Total Phosphate	re ist	_ mg/L			x	.11	-	deepit9 leto
Nitrate (NO3)	.176	_ mg/L		97	x	.10	=	9.7
Turbidity	00/50	_NTU's		70	x	.09	=	6.3
201.07		TOTALS		TOTALS		. 66		52.6
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	0% Very I	25 - 49% Bad 0 - 24%				QUALITY ATING		79.7
Weddani 50 - 0.								Good

Date <u>4,20,05</u> MM DD YY		ime:								
Certified Monitors' Nar	nes			Volunteer ID						
Organization Name										
Watershed Name			W	atershed #						
Stream/River Name		Creek not abbreviate.)	Site ID # 8 (Above ID numbers are require							
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)					
	Clear/Sunny	Overcast								

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

	Test R	Results	/1	Q-Value		Weighting Factor		Calculation
Dissol	ved Oxygen	mg/ /28_%s		86	х	.18	=	15.48
<i>E</i> . coli		20colo	nies/100mL	63	х	.17	=	10.71
рН		<i>8,35</i> unit	S	73	х	.12	=	8.76
B.O.D	. 5	mg/	L		х	.12	=	
H₂O Te	mp Change	chai	nge in°C		х	.11	=	
Total	Phosphate	mg/	L		х	.11	=	
Nitrate	e (NO ₃)	. 26 mg/	L	97	х	.10	=	9.7
Turbic	lity	15NTU	l's	70	х	.09	=	6.3
				TOTALS		.66		50.95
'Exceller Good Medium	70 - 89	% Very Bad	25 - 49% 0 - 24%			QUALITY ATING		77.19
								Good

Date <u>4 120105</u> MM DD YY Certified Monitors' Names_	End Time	ne:	(am/pm)	# :	Students _		an an matair Nam
Organization Name							<u>- 500.0% o</u>
Watershed Name	shed a	0					<u></u>
Stream/River Name	Please do n	Creek		- <u> </u>	_Site ID (Above I	# D nu	9 mbers are requi
Current Weather	/		□ Showers	D F	Rain (Steady		Storm (Hea
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	D F	Rain (Steady	1)	Storm (Hea
You may perform as man to obtain a Total Water Qu the Weighting Factor colu Test Re	uality Index v umn to obtain	value. Divide th	e total of the e ity Index ratir <i>Q-Value</i>	ng.	Veighting	umi	
to obtain a Total Water Que the <i>Weighting Factor</i> colu	uality Index v umn to obtain	value. Divide th	ity Index ratir	ng.		umi	
to obtain a Total Water Que the Weighting Factor columns	uality Index umn to obtain esults	value. Divide th 1 the Water Quali	ity Index ratir	ng.	Veighting	umi =	Calculation
to obtain a Total Water Que the Weighting Factor columns	uality Index umn to obtain esults	value. Divide th 1 the Water Quali _ mg/L	ity Index ratir	ng. V	Veighting Factor	umi	Calculation 17.82 9.57
to obtain a Total Water Qu the <i>Weighting Factor</i> colu <i>Test Re</i> Dissolved Oxygen	uality Index umn to obtain esults /00	value. Divide th h the Water Quali _ mg/L _ % saturation _ colonies/100mL	ity Index ratir	ng. V	Veighting Factor .18		Calculation 17.82 9.57
to obtain a Total Water Qu the Weighting Factor colu Test Re Dissolved Oxygen	uality Index v umn to obtain esults /00 40	value. Divide th the Water Quali _ mg/L _ % saturation _ colonies/100mL	ity Index ratir $ \begin{array}{r} \hline $	ng. V X X	Veighting Factor .18 .17	umi = =	Calculation 17.82 9.57
to obtain a Total Water Qu the Weighting Factor colu Test Re Dissolved Oxygen E. coli pH	uality Index v umn to obtain esults /00 40	value. Divide th the Water Quali _ mg/L _ % saturation _ colonies/100mL _ units	ity Index ratir $ \begin{array}{r} \hline $	ng. X X X	Weighting Factor .18 .17 .12	umi = =	Calculation 17.82 9.57
to obtain a Total Water Qu the Weighting Factor colu Test Re Dissolved Oxygen E. coli pH B.O.D. 5	uality Index v umn to obtain esults /00 40	value. Divide th h the Water Quali _ mg/L _ % saturation _ colonies/100mL _ units _ mg/L	ity Index ratir $ \begin{array}{r} \hline $	ng. X X X X	Weighting Factor .18 .17 .12 .12	umi = = =	Calculation 17.82 9.57
to obtain a Total Water Qu the <i>Weighting Factor</i> colu <i>Test Re</i> Dissolved Oxygen <i>E</i> . coli pH B.O.D. 5 H ₂ O Temp Change	uality Index v umn to obtain esults /00 40	value. Divide th h the Water Quali _ mg/L _ % saturation _ colonies/100mL _ units _ mg/L _ change in°C	ity Index ratir $ \begin{array}{r} \hline $	ng. X X X X X	Weighting Factor .18 .17 .12 .12 .12 .11		Calculation <u>17.82</u> <u>9.57</u> <u>11.09</u> <u>9.7</u>
to obtain a Total Water Qu the Weighting Factor colu Test Re Dissolved Oxygen E. coli pH B.O.D. 5 H ₂ O Temp Change Total Phosphate	uality Index umn to obtain esults /00 40 7.33	value. Divide th the Water Quali _ mg/L _ % saturation _ colonies/100mL _ units _ mg/L _ change in°C _ mg/L	ity Index ratir <i>Q-Value</i> <u>99</u> <u>56.3</u> <u>92.4</u>	ng. X X X X X X X	Weighting Factor .18 .17 .12 .12 .11 .11		Calculation 17.82 9.57 11.09

Date 4 1/2/05 MM DD YY		me:		# Adults # Students					
Certified Monitors' Names Volunteer ID									
Organization Name									
Watershed Name			W	atershed #					
Stream/River Name		tributary not abbreviate.)			4 10 numbers are required.)				
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)				
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results			2-Value		Weighting Factor		Calculation
Dissolved Oxygen	mg/L / 00% saturation	_	99	x	.18	=	17.8
<i>E</i> . coli	colonies/100mL	_	37	х	.17	=	6.29
рН	6-85 units	_	84.8	х	.12		10.2
B.O.D. 5	mg/L	-		х	.12	=	
H ₂ O Temp Change	change in°C	-		х	.11	=	
Total Phosphate	mg/L	-		х	.11	=	
Nitrate (NO ₃)	16.5 mg/L	_	41.2	х	.10	=	4.12
Turbidity	/NTU's	-	70	х	.09	=	6.3
		Т	OTALS	_	.66		44.7
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%				QUALITY ATING		67.7 Iedium

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
----------	----------	------------	------	-------

Date $\frac{4}{MM} \frac{2005}{DD}$ YY Certified Monitors' Nar	End Time	ne:	_ (am/pm)	# Adults # Students Volunteer ID
Organization Name				basi yan
Watershed Name	the second the first of	entill	W	atershed #
Stream/River Name	Teder Cre (Please don	e K ot abbreviate.)	a in Salitzain	Site ID # / / (Above ID numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady) Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady) Storm (Heavy)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Re	sults	and The	Q-Value		Weighting Factor		Calculation
– Dissolved Oxygen	120	_ mg/L _ % saturation	90	х	.18	II	16.2
<i>E</i> . coli _	80	_colonies/100mL	48.2	х	.17	=	8.2
рН _	7.78	_ units	87.87	х	.12	=	10.54
B.O.D. 5	<u>s</u> t.	_ mg/L		х	.12	11,	<u></u>
H ₂ O Temp Change _	11,	_ change in°C	0791009	х	.11	II	ama Chairte
Total Phosphate _	81. L	_ mg/L		х	.11	=	Martapars In
Nitrate (NO3)	1.05	_ mg/L	93.8	x	.10	I	9.38
Turbidity _	15	_NTU's	70	x	.09	=	6.3
		CTATES	TOTALS		.66	_	50.6
Excellent 90 - 1009 Good 70 - 899 Medium 50 - 699	6 Very I	25 - 49% Bad 0 - 24%	WAIE		QUALITY ATING	Γ	76.7
	U				ana ang kang panahanang system ang ang ang ang ang ang ang ang ang ang		Good

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
----------	----------	------------	------	-------

Date <u>4 1 201 05</u> MM DD YY	Begin Time: End Time:			
Certified Monitors' Nan	nes		Volunteer ID	
Organization Name				
Watershed Name		W	atershed #	
Stream/River Name	Beaver Creek (Please do not abbreviate.)		Site ID (Above ID r	$\frac{\#}{2}$ numbers are required.)
Current Weather	Clear/Sunny Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny Dovercast	Showers	Rain (Steady)	Storm (Heavy)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R	esults	mg/L	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	135	% saturation	81.5	х	.18	=	14.67
E. coli	0	colonies/100mL	98	х	.17	=	16.66
рН	8.63	units	61.8	x	.12	=	7.42
B.O.D. 5		mg/L		x	.12	=	
H ₂ O Temp Change		change in°C		х	.11	=	
Total Phosphate		mg/L		Х	.11	=	
Nitrate (NO ₃)	.92	mg/L	94.32	X	.10	=	9.43
Turbidity	15	NTU's	70	×	.09	=	6.3
			TOTALS	- -	. 66	_	54.48
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very B	25 - 49% ad 0 - 24%	WALL		QUALITY		82.6 Good

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
----------	----------	------------	------	-------

Date 4 1 201 05 MM DD YY	Begin Ti End Time	me: e:		# Adults # Students	30.05
Certified Monitors' Nam	nes		102-010	Volunteer ID	Charles Standards
Organization Name	7		Y		strinen "starte
Watershed Name	the the	Warris V		atershed #	
Stream/River Name	Datoka R (Please do	iver - Se not abbreviate.)	eitz Bri	dge Site ID	[≠] 13 umbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Res	ults	_ mg/L	Q-Value	en e	Weighting Factor		Calculation	
 Dissolved Oxygen	110	_ % saturation	95	x	.18	H	17.1	
<i>E</i> . coli	20	_colonies/100mL	63	х	.17	=	10.71	od.
рН	7.19	_ units	91.9	х	.12	H	11.028	
B.O.D. 5	12	_ mg/L		х	.12			:0
H ₂ O Temp Change	TŤ.	_ change in°C	- 27 Marga	х	.11	I	e <u>ortoni</u>) gané	0
Total Phosphate	1	_ mg/L		х	.11	11	elntigeonti	153
Nitrate (NO ₃)	.22	_ mg/L	97.12	x	.10	II	9.712	7.0
Turbidity	18.3	_NTU's	64	x	.09	=	5.76	an
		234761	TOTALS		. 66	-	55.5	
'Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Very I	25 - 49% Bad 0 - 24%	WALL		QUALITY		84.1	
							Good	

Date <u>4 / 20/ 05</u> MM DD YY	-	me:			
Certified Monitors' Nan	nes			Volunteer ID	
Organization Name					
Watershed Name			W	atershed #	
Stream/River Name		not abbreviate.)		Site ID (Above ID r	$\frac{\#}{4}$
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	-	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test K	Results	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	mg/L 97_% saturation	98.4	х	.18	11	17.7
E. coli	colonies/100mL	63	x	.17	II	10.71
рН	7.36 units	92.5	X	.12	=	11.1
B.O.D. 5	mg/L		x	.12	H	
H ₂ O Temp Change	change in°C		X	.11	=	
Total Phosphate	mg/L		X	.11	=	
Nitrate (NO ₃)	mg/L	98	X	.10	=	9.8
Turbidity	<u> 18.6</u> NTU's	63.7	×	.09	=	5.73
				.66	_	55.04
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%	WATE		QUALITY ATING		83.43
						Good

ADVA	NCED CHEMICAL	MONITORIN	G DATA SHE	ET
Date <u>4 / 20/ 05</u> MM DD YY Certified Monitors' Nar	Begin Time:_ End Time:_ nes_	and the second second	# Adults # Students Volunteer ID	1
Organization Name				and the late in the second
Watershed Name		W	atershed #	
Stream/River Name	Tasper Lake Ou (Please do not abbreviate	utflow	Site ID (Above ID n	umbers are required.)
Current Weather	Clear/Sunny Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny Overcast	Showers	Rain (Steady)	Storm (Heavy)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Re		Q-Value		Weighting Factor		Calculation	
_ Dissolved Oxygen _	116	_ mg/L _ % saturation	92	x	.18	-	16.56
E. coli _	0	_colonies/100mL	98	x	.17	=	16.66
pH _	9.70	_ units	27.4	x	.12	=	3.28
B.O.D. 5 _		_ mg/L	-	x	.12	=	-
H ₂ O Temp Change _		_ change`in°C		х	.11	=	A LONG TO THE REAL
Total Phosphate _		_ mg/L		х	.11	=	A TEN LT
Nitrate (NO ₃) _	. 35	_ mg/L	96.6	x	.10	=	9.66
Turbidity _	18	_NTU's	64.4	x	.09	=	5.796
1-manual and and a real of the second	DECOMP.	EXV	TOTALS		.66		51.96
Excellent 90 - 1009 Good 70 - 899 Medium 50 - 699	25 - 49% 3ad 0 - 24%			QUALITY RATING		78.73	

Date 4/20/05 MM DD YY	-	me:		# Adults # Students	
Certified Monitors' Nar	nes			Volunteer ID	-
Organization Name					
Watershed Name			W	atershed #	
Stream/River Name	Calumet (Please do	Run not abbreviate.)		Site ID (Above ID r	#16 numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test K	Results		Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	mg/L 90_% saturation		95	х	.18	=	17.1
<i>E</i> . coli	colonies/100mL		37	х	.17	=	6.29
рН	7.14 units		91.4	х	.12	=	10.97
B.O.D. 5	mg/L			х	.12	=	·
H ₂ O Temp Change	change in°C			Х	.11	=	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	- <u>88</u> mg/L		94.48	х	.10	=	9.4
Turbidity	<u>35</u> NTU's		_48	х	.09	=	4.32
			TOTALS		.66	_	48.13
"Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%	- I			QUALITY		72.9
	<i>)</i> 10				S.		6000

11

Lat 38° 26' 51.18" Long 86° 42' 88.1"

e 9:00 sm and Site I	<u>11 ±</u>				vva tel	Temp /8
Current Weather: 🗹 Clear eather in past 48 hrs: 🔀 Clear		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	and a second second second			120	Avg > 5 mg/L > 4 mg/L
	mg/L ·	11	12		11.5	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	_				none
<i>E</i> . Coli	colonies/ 100 mL	0		180	0	< 235 colonies/ 100 mL
рН	units	7.14 (out)	7.91	7.97	7.94	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C	_18				< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	,09			. 09	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60			>60	none
Orthophosphate	mg/Ĺ	0	Ö	an a sana ang ang ang ang ang ang ang ang ang	0	none
Ammonia Nitrogen	mg/L	0	0		0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other						

5.1

Date	4/11/05 Chen	nical M	onitori	ng Wor	rk Shee	2t Air Te	emp	°C
Time	11:30 am Stream Na and Site ID	Contro	Creek			Wate	r Temp /8	°C suspect
We	Current Weather: Clear/S ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation	135			135	Avg > 5 mg/L > 4 mg/L > 7 mg/L	
		mg/L	13			13	for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL	120			120	< 235 colonies/ 100 mL	
	рН	units	7.63			7.63	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L				2	< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	.044			.044	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			760	none	
	Orthophosphate	mg/L	0			0	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20=C)	
	Total Solids	mg/L						
	Other				l			
	Other							<u> </u>

51.

12:30 pm and Site ID	D als als de U	n Creek		(9812) 2 V	Water	Temp 2	0°C
Current Weather: Clear/S ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
98 1910 - 1910 - 1910	Units	Sample 1	Sample 2	Sam <mark>ple</mark> 3	Average	State Standard	
Dissolved Oxygen (DO)	% Saturation	110		E L Inst	110	Avg > 5 mg/L > 4 mg/L	an desire
n et "	mg/L	10	- Le		10	> 7 mg/L for trout	
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	_				none	6 99 A 6 50 A 9 6 6 A
<i>E</i> . Coli	colonies/ 100 mL	20			20	< 235 colonies/ 100 mL	1000
рН	units	7.87		0.8.	7.87	Avg 6-9	
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	Femi Lipch
Total Phosphate	mg/L			,	ným – L	< .04 mg/L (in Lake Michigan)	n'i ka
Nitrate (NO ₃)	mg/L	0		6.6	O D	< 44 mg/L	() 940
Transparency (Tube)	cm	>60			760	any your	aig an
Turbidity (from chart use in database entry)	NTU/JTU				UTEL M	none	dibici
Orthophosphate	ṁg/L	0			0	none	ticari
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	inom
Total Solids	mg/L		-		pm	de	773 IN
Other				1			- 10
Other							151

5.1. . .

Date	Christian Ma		onitori	ng Wo	rk She	et Air Te	
Time	2:00pm and Site II		Creek			Wate	rTemp 20 °C suspect
We	Current Weather: Clear/ ather in past 48 hrs: Clear/	· 🖵	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L	130			130	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
	<i>E</i> . Coli	colonies/ 100 mL	20			20	< 235 colonies/ 100 mL
	рН	units	8.54	8.31		8.43	Avg 6-9
	Temp at Your Site Upstream(1 mi)Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L			,		<.04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0.176			0.176	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60			>60	none
	Orthophosphate	mg/L	0.8			0.8	none
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20=C)
	Total Solids	mg/L					
	Other						
	Other						ex -
Lat 38° 25' 33.9" Long 86° 45' 92.4"

10:30am and Site I	me Pinnio D #5	ck Creek	. \	1	Wate	r Temp 22	°C Su
Current Weather: Clear/		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
elbik piet notes – nge	Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
Dissolved Oxygen (DO)	% Saturation			c.) rout	147	Avg > 5 mg/L > 4 mg/L	Dirack
e etter	mg/L	13	1.42	- 1	13	> 7 mg/L for trout	
Avg DO (original) DO after 5 days BOD 5-day (difference)	mg/L		_	_		none	Avg 00- 800 s
<i>E</i> . Coli	colonies/ 100 mL	0		12. 1861. Jm	0	< 235 colonies/ 100 mL	(lo0).3
pH	units	9.08	25	6 0	9.08	Avg 6-9	110
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C		_		- 0	< 5° F < 2° F in a trout stream	nis¥ , tertij sogmo*
Total Phosphate	mg/L			1	un (< .04 mg/L (in Lake Michigan)	t atai P
Nitrate (NO ₃)	mg/L	0.35		511	0.35	< 44 mg/L	alsoffi
Transparency (Tube)	cm			3 < 1	12	(i ²² 1) yona'i	Transor
Turbidity (from chart use in database entry)	NTU/JTU				1994 (1994) (1997)	none	Skidno T
Orthophosphate	mg/Ĺ	0	Ö	- 0 - A	0	none	lejxin0
Ammonia Nitrogen	mg/L	0	0	0	0	.076 mg/L (at pH 7, 20°C)	no mnA
Fotal Solids	mg/L			J	șin.	(chai)	ia tulot
Other							_ verii 0
Other							Other

H

H

31 3

5 **1** 1

Date	Stroom No		onitori	ng Wo	rk She			
Time	3:00 pm and Site II		of of contraction of the contrac			Wate	rTemp 20°	suspect
	Current Weather:		Overcast	Showers	Rain (St	eady)	Storm (Heavy)	
We	ather in past 48 hrs: Clear/S	Sunny	Overcast	Showers	Rain (St	eady)	Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation	150			150	Avg > 5 mg/L > 4 mg/L	
	20.2	mg/L ·	14			14	> 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL	500	400		450	< 235 colonies/ 100 mL	
	рН	units	9.25			9.25	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L			e.		< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	3.5			3.5	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			>60	none	
	Orthophosphate	mg/L	0.5	0.5		0.5	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							

IDEM# WPA020-0038

51 .

4:00 pm Stream Na and Site IE	1	a River			Water	Temp / (°C SL
Current Weather: Clear/ ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	กรานเรี 1 เป เปรล่า
State Standard	Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
Dissolved Oxygen (DO)	% Saturation	120		cod.	120	Avg > 5 mg/L > 4 mg/L	MazelO
tucal training the second	mg/L ·	12	1. 1. 1		121	> 7 mg/L for trout	
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	978 -00 5 008
<i>E</i> . Coli	colonies/ 100 mL	40		in la	40	< 235 colonies/ 100 mL	E Coll
рН	units	7.71	1.64	3 3	7.71	Avg 6-9	Re
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	nei Istu Setto
Total Phosphate	mg/L			, i		< .04 mg/L (in Lake Michigan)	n Istoï
Nitrate (NO ₃)	mg/L	0.176		A. 6	0.176	< 44 mg/L	bistill
Transparency (Tube)	cm	760			>60	(alion) yours	(ana)
Turbidity (from chart use in database entry)	NTU/JTU			Jun		none	Stad No 1
Orthophosphate	mg/L	0.2	1	0	0.2	none	oorino
Ammonia Nitrogen	mg/L	0	1	61-4	0	.076 mg/L (at pH 7, 20=C)	soramA
Total Solids	mg/L				170 -	ebii	S toto T
Other							Other
Other							other

Lat 38° 26' 11.5" Long 86° 48' 26.9"

1	Ctroom No.		onitori	ng Woi	rk She	et Air Te	emp °C
Time	11:30 Jm and Site ID	me Polson #8	n Creek			Wate	r Temp / 8 °C
We	Current Weather: Clear/ ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L	13	12.	12	/28	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		_			none
	<i>E</i> . Coli	colonies/ 100 mL	20			20	< 235 colonies/ 100 mL
	рН	units	8.35			8.35	Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0.26			0.26	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60			>60	none
	Orthophosphate	mg/L	0.3	а.		0.3	none
	Ammonia Nitrogen	mg/L	0.3			0.3	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
	Other					2	

5.1 .

Lat 38° 27' 78.8" Long 86° 48' 48.9"

e 9:15 am and Site II Current Weather: V Clear/ eather in past 48 hrs: V Clear/	And and the second second	Overcast	Showers Showers	Rain (Si	Chanter I I I I I I I I I I I I I I I I I I I	Storm (Heav Storm (Heav
	Units	Sample 1	Sample 2	Sample 3	Average	Stat Stand
Dissolved Oxygen (DO)	% Saturation				100	Avg > 5 i > 4 mg
A Real Days to a real of the	mg/L	10	0	J.pes	10	> 7 mg for tro
Avg DO (original) — <u>DO after 5 days</u> POD 5 day (difference)	mg/L					none
BOD 5-day (difference) <i>E</i> . Coli	colonies/ 100 mL	40	10.05	Vessional Vessional Vessional	40	< 23 coloni 100 n
рН	units	7.33		i aina	7.33	Avg 6
Temp at Your Site Upstream (1 mi) Temp	۰C	_ 16			_ /6	< 5° < 2° in a tro strea
Temperature Change Total Phosphate	mg/L			.Spo		<.04 m (in Lak Michiga
Nitrate (NO ₃)	mg/L	0.11	15.21	- Ligar	0.11	< 44 m
Transparency (Tube)	cm	>60	1	10	>60	Vortening
Turbidity (from chart use in database entry)	NTU/JTU					none
Orthophosphate	mg/L	0.2	0.2	rreș2.	0.2	none
Ammonia Nitrogen	mg/L	0	0	2000	0	.076 m (at pH 7, 2
Total Solids	mg/L			Libus		sbilds.
Other						

58.0

IDEM# WPA-0020-0041

5.3

Date	Stream Ma		onitori	-		or		
Time	7:30 and Site I	C KNARCHL				er Wate	rTemp 20°C	suspect
M			Overcast		Rain (St		Storm (Heavy)	
vve	eather in past 48 hrs: 🗹 Clear/	Sunny	Overcast	Showers	Rain (St	eady)	Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation				100	Avg > 5 mg/L > 4 mg/L > 7 mg/L	
		mg/L ·	9	9	9	9	for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL	200			200	< 235 colonies/ 100 mL	
	рН	units	6.84		6.86	6.85	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	15.4		17.6	16.5	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none	
	Orthophosphate	mg/L	0.14		0.2	0.17	none	
	Ammonia Nitrogen	mg/L	0		0	0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							R

Lat 38° 24' 97.0" Long 86° 50' 04.6"

4-20-05 Chen 12:30 pm Stream Na and Site II		Creek		al a	Water	Temp /
Current Weather: Clear/ eather in past 48 hrs: Clear/		Overcast] Showers] Showers	Rain (St	a la	Storm (Heavy) Storm (Heavy)
Angangal	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				120	Avg > 5 mg/L > 4 mg/L
$\phi \in \mathcal{C}^{(n), (n-1)}$	mg/L ·	11	12		11.5	> 7 mg/L for trout
Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L		_		(none
<i>E</i> . Coli	colonies/ 100 mL	80		10000 1001 -	80	< 235 colonies/ 100 mL
рН	units	7.78		2014	7.78	Avg 6-9
Temp at Your Site — Upstream (1 mi) Temp Temperature Change	°C		_		9 <u></u>	< 5° F < 2° F in a trout • stream
Total Phosphate	mg/L			4773 · ·	ni sutoj	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	1.05	. Q.	1000	1.05	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			>60	none
Orthophosphate	mg/L	0.4		(gm)	0.4	none
Ammonia Nitrogen	mg/L	0		ion	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			Nim	8	Total Scile
Other						Other
Other						Other

24 - "A.Gi P.L. 186 A.A. "A.Go DE "BB J.C.L

 $\left[\right]$

1

U

Lat 38° 24' 30.4" Long 86° 50' 65.1"

ي. در

Date	4-20-05 Chen	nical M	onitori	ng Wo	rk She	et Air Te	emp °C
Time	Stroom No.		er Creėk			Wate	r Temp 19°C
We	Current Weather: Clear/ ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L ·	/3	/3	12	135	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L					none
	<i>E</i> . Coli	colonies/ 100 mL	0			0	< 235 colonies/ 100 mL
	рН	units	8.63			8.63	Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L			r	т. н. Полого	< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0.88	0.96		0.92	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none
	Orthophosphate	mg/L	0	3		0	none
	Ammonia Nitrogen	mg/L	0.1			0.1	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
	Other						

5 t - 5

Lat 38° 27' 31.3" Long 86° 52' 23.5"

4:10 pm Stream Na and Site IE	me Patok	a River,		rk Shee		Temp /6
Current Weather: Clear/seather in past 48 hrs: Clear/seather in past 48 hrs:	Sunny	Overcast] Showers] Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L				110	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	//				none
<i>E</i> . Coli	colonies/ 100 mL	20		n 00†	20	< 235 colonies/ 100 mL
рН	units	7.16	7.21	(367a) 	7.19	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C			<u></u>	nin T(Ini 1)	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			olau) .	9997	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0.22	2	PD42	0.22	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	40	40		40	none
Orthophosphate	mg/L	0.34	3.6	2 gun	0.34	none
Ammonia Nitrogen	mg/L	0	S .]	Nora	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			rem		Total Sold
Other						Other
Other						Other

Ц

H

187 - 287 -

Lat 38° 25' 41.3" Long 86° 52' 27.9"

53

Date			onitori	ng Wo	rk She	et Air Te	emp °C
Time	3:20pm and Site I	me Patok) #14	a River			Wate	rTemp /6 °C
We	Current Weather: Clear/ ather in past 48 hrs: Clear/	· 🗆	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L ·	10	9	10	97 9.7	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-				none
	E. Coli	colonies/ 100 mL	20			20	< 235 colonies/ 100 mL
	рН	units	7.36				Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L			,		< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0	0	I		< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	40	38	38	38.6	none
	Orthophosphate	mg/L	0.4	2		0.4	none
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
	Other				<i>a</i>		

28.

Lat 38° 24' 02.2" Long 86° 52' 65.9"

2:30 pm and Site I	D #15		CALL DE MARKEN BA) which of	water	Temp 22
Current Weather: Clear ather in past 48 hrs: Clear		Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)
ultile (annova) e	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	Distances in allowing			116	Avg > 5 mg/l > 4 mg/L
	mg/L	11	10	10	10.31	> 7 mg/L for trout
Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	0		atco 201	0	< 235 colonies/ 100 mL
рН	units	9.72	9.69	30	9.70	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C				at You St <u>alterio</u> much chan	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L				oundoà	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0.35		an -	0.35	< 44 mg/L
Transparency (Tube)	cm	42		9	(08-17) ¥2/18	Transla
Turbidity (from chart use in database entry)	NTU/JTU		UTL		from cruo in prepare	none
Orthophosphate	mg/L	0.36		m	0.36	none
Ammonia Nitrogen	mg/L	0		- Ti	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L		43		zb	Total ac
Other						16rftD

11 1

ПО

Lat 38° 24' 27.9" Long 86° 55' 06.2"

Date			onitori	ng Woi	rk Shee	2t Air Te	emp	°C
Time	5:00pm. Stream Nam		net Run			Wate	r Temp 22	°C
We	Current Weather: Clear/S ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation 	8	8		90	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL	200			200	< 235 colonies/ 100 mL	
	рН	units	7.14			7.14	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L			a.		<.04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0.88			0.88	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	20	22	25.5	22.5	none	
	Orthophosphate	mg/L	0.8	70		0.8	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other		±					
	Other							

51 .

Lat 38° 24' 27.9" Long 86° 55' 06.2"

e 9:00 Jm Stream Na and Site IE		icaté Sam	pre/caru	met kun	Water	Temp
Current Weather: Clear/ eather in past 48 hrs: Clear/		Overcast] Showers] Showers	Rain (Si	the dise to an	Storm (Hea Storm (Hea
etek?	Units	Sample 1	Sample 2	Sample 3	Average	Sta Stand
Dissolved Oxygen (DO)	% Saturation		netter	100 100		Avg > 5 > 4 m
4 ¹¹⁴⁰ 10	mg/L →	1	1. 1.	11	NA	> 7 m for tr
Avg DO (original) — DO after 5 days				_	_	nor
BOD 5-day (difference)	mg/L				territer and	dea [
<i>E</i> . Coli	colonies/ 100 mL	260	lach Jú	iso DT	260	< 23 colon 100
рН	units	7.25	S.D. all	4	7.25	Avg
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C		-		f (en t) ritsel 	< 50 < 20 in a t strea
Total Phosphate	mg/L					<.04 (in L Michi
Nitrate (NO ₃)	mg/L	2.2			2.2	< 44 1
Transparency (Tube)	cm		unu	Tin Set	ty (more characterity)	street j
Turbidity (from chart use in database entry)	NTU/JTU				stariosor	nor
Orthophosphate	mg/L	0.84			0.84	nor
Ammonia Nitrogen	mg/L	0		n	0	.076 n (at pH 7,
Total Solids	mg/L					Other
Other						Dthor
Other	-		esta suara			-

 $\left[\right]$

	Stream Na		onitori	ng Woi	rk Shee			°C
Time	1:00pm and Site IE			ized Wate	er	Wate	r Temp	°C
We	Current Weather: Clear/ ather in past 48 hrs: Clear/		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation 	NA			NA	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL					< 235 colonies/ 100 mL	
	рН	units	NA			NA	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L				5	< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none	
	Orthophosphate	mg/L	0	1		0	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							

53 .

www.HoosierRiverwatch.com

1-

Date			and the second se	ng Wo	rk Shee	2t Air T	emp	°C
Time	10:30 and Site I			ized Wat	er	Wate	er Temp	°C
We	Current Weather: Clear/	· 🗆	Overcast	Showers Showers	Rain (Sto		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	NA				Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-				none	
	<i>E.</i> Coli	colonies/ 100 mL					< 235 colonies/ 100 mL	
	рН	units	NA				Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	٥C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L		т.		145 	< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none	
	Orthophosphate	mg/Ĺ	0			0	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
). X	Total Solids	mg/L						
	Other							
\ni	Other							

H

.

ADVANCED CH	IEMICAL	MONITORING	DATA	SHEET
-------------	---------	------------	------	-------

Date <u>6 / 14/ 05</u> MM DD YY	End Time:	(am/pm)	# Students	<u> </u>
Certified Monitors' Nar	nes		volunteer ID	Constant Marine Lang
Organization Name				Octamication Participation
Watershed Name	and the discontrained in the second second	W	atershed #	
	Patoka River		#	1
Stream/River Name	(Please do not abbreviate.)	and a first of the	Site ID (Above ID n	umbers are required.)
Stream/River Name		and a first of the	And and a second s	

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results mg/L	Q-Value		Weighting Factor	N.	Calculation
Dissolved Oxygen % saturation	88.8	х	.18	1	15.98
<i>E.</i> coli O colonies/100m	98	x	.17	=	16.66
pH 7.45 units	92.8	x	.12	=	11.14
B.O.D. 5 mg/L		x	.12	=	0.0.0
H ₂ O Temp Change change in°C	Ruba (maral)	x	.11	I	o nanst agu
Total Phosphate mg/L		x	.11	1	
Nitrate (NO ₃)	98	x	.10	=	9.8
Turbidity 16.38 NTU's	66.35	x	.09	=	5.97
ter et and the second secon	TOTALS		. 66	_	59.56
Excellent 90 - 100% Bad 25 - 49 Good 70 - 89% Very Bad 0 - 24 Medium 50 - 69% 100% 100%	WAIE		QUALITY RATING		90.24
				E	xcellent

Date <u>6 / 14 / 05</u> MM DD YY		ime:			
Certified Monitors' Names Volunteer ID					
Organization Name					
Watershed Name			W	atershed #	
Stream/River Name		ek not abbreviate.)		Site ID	4 2 numbers are required.)
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R	esults mg/L		Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	91_% saturation		95.5	х	.18	=	17.19
E. coli	80 colonies/100mL		48.2	x	.17	Π	8.194
рН	7.0 units		90	х	.12	=	10.8
B.O.D. 5	mg/L			х	.12	=	
H ₂ O Temp Change	change in°C			х	.11	=	-
Total Phosphate	mg/L			х	.11	=	1
Nitrate (NO ₃)	<u>4.4</u> mg/L		68	х	.10	=	6.8
Turbidity	15_NTU's		_70	х	.09	=	6.3
		-	TOTALS		- 66	-	49.28
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%				QUALITY ATING		74.67
Medium 50 - 69	%					L	GOOD

Date 6 114105	Begin Time	(constant)	(am/pm)				141.42 W
MM DD YY	End Time						and the second
Certified Monitors' Names_)	10-00 00 - 00 00-00-00-00-00-00-00-00-00-
Organization Name							S(3647)
Watershed Name	11 0						
Stream/River Name	(Please do not abb	hreviate)	(An and a second se	1	Site ID	# D m	3 umbers are rec
Current Weather	Clear/Sunny 0		Showers		Rain (Steady		Storm (H
Weather in Past 48 hrs.	Active Caller	and the second second	Showers		Rain (Steady	1)	Storm (H
You may perform as man to obtain a Total Water Q the <i>Weighting Factor</i> col <i>Test R</i>	uality Index value umn to obtain the V	g tests as you e. Divide the	total of the	Calc	culation col Weighting	um	n by the tot
to obtain a Total Water Q the <i>Weighting Factor</i> col	ny of the following quality Index value umn to obtain the V	g tests as you b. Divide the Water Quality	total of the y Index ratir	Calc	<i>culation</i> col	ust um	n by the tot
to obtain a Total Water Q the <i>Weighting Factor</i> col	by of the following quality Index value umn to obtain the value esults	g tests as you b. Divide the Water Quality	total of the y Index ratir <i>Q-Value</i>	Calc	culation col Weighting	ust um	n by the tot
to obtain a Total Water Q the <i>Weighting Factor</i> col	ny of the following puality Index value umn to obtain the v esults mg/l % sa	g tests as you b. Divide the Water Quality	total of the y Index ratir <i>Q-Value</i>	Calding.	culation col Weighting Factor	umi	n by the tot
to obtain a Total Water Q the <i>Weighting Factor</i> col <i>Test R</i> Dissolved Oxygen	ny of the following puality Index value umn to obtain the v esults mg/l % sa	g tests as you b. Divide the Water Quality 'L aturation nies/100mL	total of the y Index ratir <i>Q-Value</i> <u>96</u>	Cald ng. X	Weighting Factor .18	umi	n by the tot Calculati
to obtain a Total Water Q the <i>Weighting Factor</i> col <i>Test R</i> Dissolved Oxygen <i>E</i> . coli	ny of the following quality Index value umn to obtain the v esults 92 % sa 80 color	g tests as you b. Divide the Water Quality L aturation nies/100mL s	total of the y Index ratin Q-Value 96 48. 2	Calc ng. X X	weighting Factor .18 .17	umi	n by the tot Calculati
to obtain a Total Water Q the <i>Weighting Factor</i> col <i>Test R</i> Dissolved Oxygen <i>E</i> . coli pH	by of the following quality Index value umn to obtain the V esults 92 % sa $80 \mod$ $7.21 \qquad$ units mg/l	g tests as you b. Divide the Water Quality L aturation nies/100mL s	total of the y Index ratin Q-Value 96 48. 2	Calc ng. X X X	weighting Factor .18 .17 .12	= =	n by the tot Calculati 17.28 8.19
to obtain a Total Water Q the <i>Weighting Factor</i> col <i>Test R</i> Dissolved Oxygen <i>E</i> . coli pH B.O.D. 5	by of the following quality Index value umn to obtain the V esults 92 % sa $80 \mod$ $7.21 \qquad$ units mg/l	g tests as you b. Divide the Water Quality L aturation nies/100mL s L nge in°C	total of the y Index ratin Q-Value 96 48. 2	X X X X X	weighting Factor .18 .17 .12 .12	= = =	be complet n by the tot <i>Calculati</i> <u>17.28</u> <u>8.19</u> <u>11.04</u>
to obtain a Total Water Q the Weighting Factor col Test R Dissolved Oxygen E. coli pH B.O.D. 5 H_2O Temp Change	by of the following puality Index value umn to obtain the V esults 92 % so 80 color 7.21 units mg/l char	g tests as you b. Divide the Water Quality "L aturation nies/100mL s "L nge in°C "L	total of the y Index ratin Q-Value 96 48. 2	Cald ng. X X X X X X	weighting Factor .18 .17 .12 .12 .12 .11	= = =	n by the tot Calculati
to obtain a Total Water Q the Weighting Factor col Test R Dissolved Oxygen E. coli pH B.O.D. 5 H_2O Temp Change Total Phosphate	ny of the following puality Index value umn to obtain the V esults mg/l mg/l mg/l	g tests as you b. Divide the Water Quality L aturation nies/100mL s L nge in°C L L	total of the y Index ratir <i>Q-Value</i> <u>96</u> <u>48. 2</u> <u>92.03</u>	Cald ng. X X X X X X X	weighting Factor .18 .17 .12 .12 .12 .11 .11	= = =	n by the tot <i>Calculati</i> <u>17.28</u> <u>8.19</u> <u>11.04</u>

Date <u>6 / 14 / 05</u> MM DD YY		ne:		# Students		
Certified Monitors' Names Volunteer ID						
Organization Name						
Watershed Name			W	atershed #		
Stream/River Name	Davis Cree (Please do n	k tot abbreviate.)		Site ID (Above ID n	umbers are required.)	
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	
Current weather						

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R	esults	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	mg/L 90% saturation	95	x	.18	=	17.1
<i>E</i> . coli	colonies/100mL	43.4	x	.17	=	7.378
рН	7.23 units	92.1	х	.12	=	11.05
B.O.D. 5	mg/L		х	.12	=	
H ₂ O Temp Change	change in°C		x	.11	=	
Total Phosphate	mg/L		x	.11	=	
Nitrate (NO ₃)	7.92 mg/L	56.82	X	.10	=	5.682
Turbidity	/ <u>S</u> NTU's .	70	x	.09	=	6.3
		TOTALS		. 66	_	47.51
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	9% Very Bad 0 - 24%	WATE		QUALITY		71.99 Good

Date $\frac{6}{MM} \frac{14}{DD} \frac{05}{YY}$ Certified Monitors' Nam	Begin Time: End Time: nes	_ (am/pm) # Stud	ts ents eer ID
Organization Name	Marine Marine and A		emek adaaja
Watershed Name	* restarendf	Watershed #	<u> </u>
Stream/River Name	Pinnick Creek (Please do not abbreviate.)	Site	e ID <u>#5</u> bove ID numbers are required.)
Current Weather	Clear/Sunny Overcast	□ Showers □ Rain (Steady) Storm (Heavy) -
Weather in Past 48 hrs.	Clear/Sunny Overcast	Showers Rain (Steady) Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Re	sults	_mg/L	Q-Value		Weighting Factor		Calculation	
Dissolved Oxygen	96	_ mg/L _ % saturation	97.8	х	.18	=	17.6	ž,
<i>E</i> . coli _	140	_colonies/100mL	41.8	х	.17	=	7.106	1
рН _	7.69	_ units	90.15	x	.12	=	10.8	1z
B.O.D. 5 _	SI X	_ mg/L	<u></u>	х	.12	=	<u></u>	
H ₂ O Temp Change _	14. X	_ change in°C		х	.11	=	n <mark>larin Cita</mark> n	ł
Total Phosphate _	n. Is	_ mg/L	bah	х		=	r <u>edoebiti In</u> t	57
Nitrate (NO ₃) _	2.2	_ mg/L	89	х	.10	=	8-9	
Turbidity _	15.75	_NTU's	67.1	х	.09	=	6.039	1
		2.37/201	TOTALS		.66	-	50.47	
Excellent 90 - 1009 Good 70 - 899 Medium 50 - 699	6 Very I	25 - 49% 3ad 0 - 24%	WAIE		QUALITY RATING	ſ	76.47	
ivieululii 50 - 099	0						6000	1

Date <u>6 / 14 / 05</u> MM DD YY		ne:						
Certified Monitors' Names Volunteer ID								
Organization Name								
Watershed Name			W	atershed #				
Stream/River Name		k ot abbreviate.)		Site ID	umbers are required.)			
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)			
				Rain (Steady) Storm (Hea				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test K	Q-Value		Weighting Factor		Calculation	
Dissolved Oxygen	mg/L 93% saturation	96.5	х	.18	=	17.37
<i>E.</i> coli	colonies/100mL	37	х	.17	=	6.29
рН	7.21 units	92.03	х	.12	=	11.044
B.O.D. 5	mg/L		х	.12	=	
H ₂ O Temp Change	change in°C		х	.11	=	
Total Phosphate	mg/L		х	.11	=	
Nitrate (NO ₃)	<u> 4.4 </u> mg/L	68	х	.10	=	6.8
Turbidity	/5.33_NTU's	67.6	х	.09	=	6.084
	· · · · · · · · · · · · · · · · · · ·	TOTALS	-	.66	_	47.59
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	9% Very Bad 0 - 24%			QUALITY ATING		72.1 GOOD

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
A ALAN I A MAR I A MARTIN				the second se

Date <u>6 114 05</u> MM DD YY Certified Monitors' Nan	End Tim	ime: ne:	_ (am/pm)	#	# Adults # Students Volunteer ID		-77 00 1
Organization Name							ang Napita
Watershed Name	- to testers		W	ater	shed #		
Stream/River Name	Patoka.	River). Sugar)	Site ID	#	7
	(Please do	not abbreviate.)			(Above I	Dnu	umbers are requir
Current Weather	Clear/Sunny	Overcast	□ Showers	20	Rain (Steady	1)	Storm (Heav
Weather in Past 48 hrs.		Overcast	Showers		Rain (Steady	<i>'</i>)	LI Storm (Hea
Weather in Past 48 hrs. You may perform as to obtain a Total Wate the Weighting Factor	WAT many of the foll er Quality Index	TER QUALITY lowing tests as you could be a set of the s	INDEX (Wo ou wish; howe he total of the	QI) ever, Cald) at least 6 m	ust	be completed
You may perform as to obtain a Total Wate the <i>Weighting Factor</i>	WAT many of the foll er Quality Index	TER QUALITY lowing tests as yes value. Divide t in the Water Qua	INDEX (Wo ou wish; howe he total of the	QI) ever, Cald) at least 6 m	ust	Storm (Heaved be completed n by the total of <i>Calculation</i>
You may perform as to obtain a Total Wate the <i>Weighting Factor</i>	WAT many of the foll er Quality Index column to obta t Results	TER QUALITY lowing tests as you could be a set of the s	INDEX (Wo ou wish; howe he total of the lity Index ratio	QI) ever, Cald) at least 6 m culation col Weighting	ust	be completed n by the total o
You may perform as to obtain a Total Wate the Weighting Factor Test	WAT many of the foll er Quality Index column to obta t Results n63	ER QUALITY lowing tests as yo c value. Divide t in the Water Qua	INDEX (We ou wish; howe he total of the lity Index ration <i>Q-Value</i> <u>63.7</u>	QI) ever, Calong.) at least 6 m culation col Weighting Factor .18	ust um	be completed n by the total of <i>Calculation</i> <u>11.47</u>

Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	Wery Wery	25 - 49% Bad 0 - 24%	WAID	R C	.66 QUALITY ATING	Γ	37.32 56.54 Medium
Turbidity	39	_NTU's	45.6	x	.09	=	4.1
Nitrate (NO ₃)	7.92	_ mg/L	56.8	x	.10	=	5.68
Total Phosphate	Tr. IX	_ mg/L	100	х	.11	-	Total Phosphe
H ₂ O Temp Change	. H. X.	_ change in°C	a spints	х	.11	II	h <mark>o Temo Ch</mark> è
B.O.D. 5	81. X	_ mg/L	Post	х	.12	=	0.0.5
рН	6.81	_ units	83.35	х	.12	=	10.00
<i>E</i> . coli	240	_colonies/100mL	35.66	х	.17	=	6.06

Date <u>6 14 05</u> MM DD YY	Begin Time: End Time:	-	# Adults # Students				
Certified Monitors' Names Volunteer ID							
Organization Name							
Watershed Name		W	atershed #				
Stream/River Name	Polson Creek (Please do not abbreviate.)		Site ID # 8 (Above ID numbers are required.)				
Current Weather	Clear/Sunny Overcast	☐ Showers	Rain (Steady) Storm (Heavy)				
Weather in Past 48 hrs.	Clear/Sunny Overcast	□ Showers	Rain (Steady) Storm (Heavy)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test 1	Test Results				Weighting Factor		Calculation
Dissolved Oxygen	mg/L 88% saturation		93.8	х	.18	=	16.9
<i>E</i> . coli	colonies/100mL		36.33	х	.17	=	6.2
рН	<u>7.70</u> units		90	Х	.12	=	10.8
B.O.D. 5	mg/L	-		х	.12	=	
H ₂ O Temp Change	change in°C	-		х	.11	=	
Total Phosphate	mg/L	-		х	.11	=	· · · · · · · · · · · · · · · · · · ·
Nitrate (NO ₃)	mg/L	-	89.95	х	.10	П	8.995
Turbidity	<u>15</u> ntu's	-	70	х	.09	=	6.3
		_ T	TOTALS	_	.66	_	49.155
'Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%				QUALITY ATING		74.48
L							GOOD

Date $\frac{6}{MM}$ $\frac{14}{DD}$ $\frac{05}{YY}$ Certified Monitors' Nam	End Time	me:		# Adults # Students Volunteer ID_	Certified Mo
Organization Name	uri-tota V			atershed #	ocitasiango N baénara V
Watershed Name Stream/River Name	Leistner (Please do	Creek	ad to have	Site ID	
Current Weather Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	□ Rain (Steady) □ Rain (Steady)	☐ Storm (Heavy) ☐ Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R	<i>esults</i> mg/L	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	/01 % saturation	98.8	х	.18	=	17.78
<i>E.</i> coli	160_colonies/100mL	40.2	х	.17	=	6.83
pH	7.55 units	92.25	х	.12	=	11.07
B.O.D. 5	mg/L	л 	x	.12	- II.	0.0.8
H ₂ O Temp Change	change in°C		х	^{980,11}	EII -	аюж
Total Phosphate	mg/L	1	х	.11		leof
Nitrate (NO ₃)	1.32 mg/L	92.72	х	.10	-	9.27
Turbidity	15NTU's	_70	x	.09	I	6.3
	SJATOT	TOTALS		.66		51.26
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	9% Very Bad 0 - 24%			QUALITY ATING		77.67

Date <u>6 14105</u> MM DD YY	-	ime: e:		# Adults # Students					
Certified Monitors' Names Volunteer ID									
Organization Name									
Watershed Name			W	atershed #					
Stream/River Name <u>U</u>		not abbreviate.)	Patoka Ri		10 numbers are required.)				
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)				
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test I	Test Results				Weighting Factor		Calculation
Dissolved Oxygen	mg/L 88% saturation		93.8	х	.18	=	16.88
E. coli	colonies/100mL		38.6	х	.17	=	6.56
рН	7.30 units		92.33	х	.12	=	11.08
B.O.D. 5	mg/L			х	.12	I	
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	8_8 mg/L		54.36	х	.10	=	5.436
Turbidity	/NTU's		70	х	.09	Ш	6.3
		_	TOTALS	_	.66	_	46.26
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%					QUALITY ATING		70.09.
20 0.							Good

Date <u>6 14105</u> MM DD YY Certified Monitors' Nam	End Time	me: e:	(am/pm)	# Adults # Students Volunteer ID	7. 1994
Organization Name Watershed Name				atershed #	Constants N bertrateV/
Stream/River Name	Teder Cr		02/7 32	Construction of the local division of the lo	4// numbers are required.)
Current Weather Weather in Past 48 hrs.	Clear/Sunny	☐ Overcast ☐ Overcast	Showers	☐ Rain (Steady) ☐ Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Re	rsults mg/L	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	91 % saturation	95.5	x	.18	П	17.19
E. coli	60colonies/100mL	51.4	х	.17	II	8,74
рН _	7.39 units	92.63	х	.12	=	11.12
B.O.D. 5 _	mg/L		х	.12	II	0.0.8
H ₂ O Temp Change _	change in°C	dt	х	.11	I	ат ојн
Total Phosphate	mg/L		х	.11	11	n joto*
Nitrate (NO $_3$) _	<u>/3.2</u> mg/L	45.88	x	.10	I	4.59
Turbidity _	/ <u>5</u> NTU's	70	x	.09	-	6.3
and the second s	E.G.C.F. prophered and second	TOTALS		. 66	-	47.93
Excellent 90 - 1009 Good 70 - 899 Medium 50 - 699	% Very Bad 0 - 24%			QUALITY ATING		72.62 600D

Date 6 1 14 05 MM DD YY		ime:			
Certified Monitors' Nan	nes			Volunteer ID	
Organization Name					
Watershed Name		а. 	W	atershed #	
Stream/River Name		not abbreviate.)		Site ID (Above ID r	4/2 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test I	Results	Q-Value		Weighting		Calculation
	mg/L			Factor		
Dissolved Oxygen	82% saturation	89.6	Х	.18	=	16.13
<i>E</i> . coli	colonies/100mL	57.8	х	.17	=	10.71
рН	7.63 units	91.05	х	.12	=	10.93
B.O.D. 5	mg/L		х	.12	II.	
H ₂ O Temp Change	change in°C		х	.11	=	
Total Phosphate	mg/L		х	.11	=	
Nitrate (NO ₃)	<u>97</u> mg/L	94.12	х	.10	=	9.4
Turbidity	/_SNTU's	70	х	.09	=	6.3
		TOTALS		.66	-	53.48
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%			QUALITY ATING		81.02
		_				6000

Date 6 15 05 MM DD YY		me: e:		# Adults # Students	CC MM
Certified Monitors' Nar	nes			Volunteer ID	
Organization Name			an the Section of the section of	00	ale <u>Organitativa Nia</u>
Watershed Name		Δ.		atershed #	
Stream/River Name	Potoko 1 (Please do	RIVEV not abbreviate.)	<u>1911 - 1919 - 1919</u>	Site ID (Above ID 1	#13 numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
	XX7 ATT		INDEX (W	OD	

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Calculation Weighting Test Results Q-Value Factor mg/L 8.91 55 49.5 .18 Х % saturation **Dissolved Oxygen** 45 100 7.65 X .17 colonies/100mL E. coli 6.67_units 9.41 78.45 X .12 pH X .12 B.O.D. 5 mg/L Х .11 H₀ Temp Change ____ change in°C .11 X **Total Phosphate** mg/L = 4.84 mg/L 65.8 6.58 Х .10 Nitrate (NO_a) = 19.1 3.95 43.92 NTU's X .09 Turbidity = 36.51 .66 TOTALS 90 - 100% 25 - 49% Excellent Bad WATER QUALITY 55.31 Good 70 - 89% Very Bad 0 - 24% INDEX RATING Medium 50 - 69% Medium

Date <u>6 14105</u> MM DD YY	-	me:	-	# Adults # Students	
Certified Monitors' Nan	nes			Volunteer ID	
Organization Name					
Watershed Name			W	atershed #	
Stream/River Name Be		Outlet to 1 not abbreviate.)	Patoka Ri		# 14 umbers are required.)
Stream/River Name <u>Be</u> Current Weather		not abbreviate.)	Pstoks Ri		

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test 1	Results	Q-Value		Weighting Factor		Calculation
	mg/L			rucion		
Dissolved Oxygen	65 % saturation	71.5	Х	.18	=	12.87
E. coli	colonies/100mL	48.2	х	.17	=	8.19
рН	6.81 units	83.35	х	.12	=	10.00
B.O.D. 5	mg/L		х	.12	=	
H ₂ O Temp Change	change in°C		Х	.11	I	
Total Phosphate	mg/L		х	.11	I	
Nitrate (NO ₃)	10.56 mg/L	50.1	х	.10	I	5.01
Turbidity	<u>29.8</u> NTU's	53.16	х	.09	II	4.78
		 TOTALS	_	.66		40.86
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very Bad 0 - 24%			QUALITY ATING		61.91
					V	medium

Date $\frac{6}{MM}$ $\frac{14}{DD}$ $\frac{05}{YY}$ Certified Monitors' Nar	End Time	e:		# Adults # Students Volunteer ID	Due 6 / 5 Na Do Castifice Monus
Organization Name				State State	N reasonado
Watershed Name	Watershed *		Wat	ershed #	mphi bourner?
Stream/River Name	Jasper Lak (Please do not	<u>ke Outf</u> ot abbreviate.)	low	Site ID# (Above ID n	umbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Rest	<i>ults</i> mg/L	Q-Value	330	Weighting Factor		Calculation
Dissolved Oxygen	75 % saturation	82.5	x	.18	-	14.85
E. coli	80 colonies/100mL	48.2	х	.17	=	8.194
рН	7.48 units	92.93	x	.12	=	11.15
B.O.D. 5	mg/L	1 <u>1</u> 17	х	.12	1	8.0.0.8
H₂O Temp Change	change in°C	adu	х	.11	=	H O Temp
Total Phosphate	mg/L	<u>ep</u>	X	.11	1	Tatal Pho
Nitrate (NO ₃)	1.14 mg/L	93.44	x	.10	1	9.34
Turbidity	<u>43</u> NTU's	43.2	x	.09	=	3.89
	TOTALS	TOTALS		.66	_	47.43
Excellent90 - 100%Good70 - 89%Medium50 - 69%	Bad 25 - 49% Very Bad 0 - 24%	and and the second s		QUALITY ATING		71.86

Date 6 15 05 MM DD YY		ne::	-	# Adults # Students	
Certified Monitors' Nan	nes			Volunteer ID	
Organization Name					
Watarahad Nama					
Watershed Name			W	atershed #	
Stream/River Name		L Run tot abbreviate.)		Site ID#	
	(Please do n			Site ID#	16

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test	Results			Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	47	_ mg/L _ % saturation		39.1	х	.18	=	7.04
<i>E</i> . coli	160	_colonies/100mL		40.2	х	.17	H	6.83
рН	6.86	units		85.1	х	.12	=	10.21
B.O.D. 5	; ;	_mg/L			х	.12	=	
H ₂ O Temp Change	5	change in°C			х	.11	=	
Total Phosphate		_mg/L			х	.11	=	
Nitrate (NO ₃)	. 105	_mg/L		97.58	х	.10	=	9.76
Turbidity	19.5	NTU's		62.6	Х	.09	=	5.63
			_	TOTALS		.66		39.48
Excellent 90 - 10 Good 70 - 8 Medium 50 - 6	9% Very B	25 - 49% ad 0 - 24%				QUALITY ATING		59.81
							7	nedium

8:45 am and Site ID	#1	a River		soal) e	Water	
Current Weather: Clear/s ther in past 48 hrs: Clear/s	Telephone and the second se	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
areite eastevA	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation		a Merinang Tananka ang sang Ang sang sang sang sang sang sang sang sa		81	Avg > 5 mg/l > 4 mg/L
	mg/L	7.0	8.0	(inter	7.5	> 7 mg/L for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	0		Vasinovo	0	< 235 colonies/ 100 mL
рН	units	7.45			7.45	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C			-	- e1(2) - e1(2)	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Sec.	550P	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0		lines.	0	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	52.0	51.5		51.75	none
Orthophosphate	mg/L	0		Service of the servic	. 0	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L	· · · · · · · · · · · · · · · · · · ·				
Other						800000

H

0

Date	Stream Na	me ' Cane	onitorii _{Creek}	ng Wor	rk Shee				
	Time 9:30 m Gate offeet Water Temp 23 °C Current Weather: Clear/Sunny Overcast Showers Rain (Steady) Storm (Heavy) Weather in past 48 hrs: Clear/Sunny Overcast Showers Rain (Steady) Storm (Heavy)								
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard		
	Dissolved Oxygen (DO)	% Saturation mg/L	91 8.0			91 8.01	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout		
	Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		-			none		
	<i>E</i> . Coli	colonies/ 100 mL	80			80	< 235 colonies/ 100 mL		
	рН	units	7.0			7.0	Avg 6-9		
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C					< 5° F < 2° F in a trout stream		
;	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)		
	Nitrate (NO ₃)	mg/L	4.4		ોંલ	4.4	< 44 mg/L		
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			>60	none		
	Orthophosphate	mg/L	0			0	none		
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)		
	Total Solids	mg/L							
	Other								
(Other								

5 4 .

10:10 and Site ID	#3	the state of the s			Water	Temp 2
Current Weather: Clear/Stather in past 48 hrs: Clear/St	ALC: NOT THE REAL PROPERTY OF	Overcast] Showers] Showers	Rain (Si		Storm (Heavy) Storm (Heavy)
apareisi lagasea j	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation		ngk	() ()	92	Avg > 5 mg/ > 4 mg/L
	mg/L	8.5	8	ğn.	8.25	> 7 mg/L for trout
Avg DO (original) – DO after 5 days BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	80		okan DO :	80	< 235 colonies/ 100 mL
рН	units	7.21	1 B	ens.	7.21	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C	_			iks work to (<u>—foot) o</u> r opend 1 she	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L		3	an -	atkitigi	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	1.1	1 A	ien	1.10	< 44 mg/L
Transparency (Tube)	cm	57	59	2	58	Transpier
Turbidity (from chart use in database entry)	NTU/JTU		Lin	Unio (ven	from chort ordenativese	none
Orthophosphate	mg/L	0.2	3		0.2	none
Ammonia Nitrogen	mg/L	0	0 1	(T)	0	.076 mg/L (at pH 7, 20°C
Total Solids	mg/L		1	1	ab	Net isto?
Other						19rfiQ

 $[]\bigcirc$

St. 1

Stream Nat	me Davis	onitorii _{Creek}	ng Wor	rk Shee		emp °C rTemp کے °C	
me /0:551m and Site ID #4 Water Temp 22							
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
Dissolved Oxygen (DO)	% Saturation mg/L	90 8	8		90 8.0	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		1			none	
<i>E</i> . Coli	colonies/ 100 mL	120			120	< 235 colonies/ 100 mL	
рН	units	7.23			7.23	Avg 6-9	
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
Nitrate (NO ₃)	mg/L	7.92			7.92	< 44 mg/L	
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			>60	none	
Orthophosphate	mg/L	0.36	0		0.36	none	
Ammonia Nitrogen	mg/L	0.05			0.05	.076 mg/L (at pH 7, 20°C)	
Total Solids	mg/L	8					
Other							
Other							

5 t v
2:45 pm and Site ID	me Pinnic #5	k'Creek		i di el	Water	Temp 26
Current Weather: Clear/S ather in past 48 hrs: Clear/S	and the second second	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
Standard Standard	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	96	10		96	Avg > 5 mg/l > 4 mg/L
Cattle State	mg/L	8.0		pm and the second	8.0	> 7 mg/L for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	140	3 5 a 320 1	dokus Pod	140	< 235 colonies/ 100 mL
рН	units	7.69		00U .	7.69	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C	_		-		< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Qen .	sissiq	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	2.2	¥.	gra	2.2	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	55	56		55.5	none
Orthophosphate	mg/L	0.3			0.3	none
Ammonia Nitrogen	mg/L	0.1	.9	201	0.1	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			200		Total S III
Other						- indic
						sendin 1

H

Date Time	6-14-05 Chen 12:30pm Stream Nar and Site ID	me Sugar	onitori	ng Woi	rk Shee		r Temp 29°C
Wea	Current Weather: Clear/S		Overcast] Showers] Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L	8	7	7	93 7.33	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-	_			none
	<i>E</i> . Coli	colonies/ 100 mL	200			*200	< 235 colonies/ 100 mL
	рН	units	7.21			7.21	Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L					<.04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	4.4	ŧ		4.4	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	58	58		58	none
	Orthophosphate	mg/L	0.92	20	3	0.92	none
	Ammonia Nitrogen	mg/L	0.1			0.1	.076 mg/L (at pH 7, 20=С)
	Total Solids	mg/L		ь. 			
	Other						
	Other						

www.HoosierRiverwatch.com

* Total coliforms estimated @ 5,600 per 100 mL

e 12:00 pm and Site ID	me Patoka) #7	a River		(B) (D)	Water	Temp
Current Weather: Clear/Seather in past 48 hrs: Clear/S		Overcast] Showers] Showers	Rain (SI	March 1 march 1	Storm (Heav Storm (Heav
Sosports Against A	Units	Sample 1	Sample 2	Sample 3	Average	Stat Stand
Dissolved Oxygen (DO)	% Saturation			de tuto C	63	Avg > 5 > 4 m
Six 4. 101	mg/L ·	5.5	5.5	Jun .	5.5	> 7 m for tro
Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L					non
<i>E</i> . Coli	colonies/ 100 mL	240		ainpico (m:000 (*240	< 23 coloni 100 r
рН	units	6.81		etina	6.81	Avg 6
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C			_	0100000 	< 5° < 2° in a tr strea
Total Phosphate	mg/L			207	tata	< .04 n (in La Michig
Nitrate (NO ₃)	mg/L	7.92		nga	7.92	< 44 n
Transparency (Tube)	cm	20	21	053	20.5	ancequi
Turbidity (from chart use in database entry)	NTU/JTU					non
Orthophosphate	mg/L	0.5	5	Sigm -	0.5	non
Ammonia Nitrogen	mg/L	0.1		ham	0.1	.076 m (at pH 7, 3
Total Solids	mg/L			Agn		8. Pc8 In
Other						
Other						19

www.HoosierRiverwatch.com

* Total Coliforms Estimated @5,600 per looml

Date 6-14-05 Cher Time 2:15 pm Stream Na and Site II	me Polso	onitori	ng Woi	rk She		emp °C rTemp _2 ≲ °C
Current Weather: Clear, Clear, Weather in past 48 hrs: Clear/	· _	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	88 7.5			88	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	220			220	< 235 colonies/ 100 mL
рН	units	7.70			7.70	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			*		< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	2.01			2.01	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			760	none
Orthophosphate	mg/L	0.7	*		0.7	none
Ammonia Nitrogen	mg/L	0.1			0.1	.076 mg/L (at pH 7, 20°С)
Total Solids	mg/L					
Other			, l			
Other						

1:45pm and Site ID		ner Creek		011 91	Water	Temp 2
Current Weather: Clear/S ather in past 48 hrs: Clear/S	the standing of the standard	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
ingenerale Discontes	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	101		ortenota o	101	Avg > 5 mg. > 4 mg/L
	mg/L	8.5	7.0	Jam	8.5	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	160	5234	behrötike Sin 661	160	< 235 colonies/ 100 mL
рН	units	7.55	7.3	alino	7.55	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			April 1	othr	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	1.32	1-7.9.2	19 Bas	1.32	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760		(1) (1)	760	none
Orthophosphate	mg/L	0.4	0.0	Ng ti	0.4	none
Ammonia Nitrogen	mg/L	0	6.0	Sec.	0	.076 mg/L (at pH 7, 20°C
Total Solids	mg/L					ater Softan
Other						

www.HoosierRiverwatch.com

51 1

H

Time 1: 30 pm. Chem	me Unnam	onitorii	-		ar	r Temp 27 °C
Current Weather: Clear/S Weather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	7.0	7.5		88 7.25	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	180			*180	< 235 colonies/ 100 mL
рН	units	7.30			7.30	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	7.92	9.68		8.80	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760	760		760	none
Orthophosphate	mg/L	0.6			0.6	none
Ammonia Nitrogen	mg/L	0.2			0.2	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other						
Other						

www.HoosierRiverwatch.com

* Total Coliforms Estimated @5.600 per 100 ml

3:15pm Stream Na		er Creek	<u>8,1,8</u>	() uli	Water	Temp 2
Current Weather: Clear/ ather in past 48 hrs: Clear/		Overcast] Showers] Showers	Rain (St		Storm (Heavy) Storm (Heavy)
NANCE SPROVA	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	91 8.0		101 101 101 101	91 8.0 ₁	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	60	2891 2015 - 2013 2015 - 2013	607 607	60	< 235 colonies/ 100 mL
рН	units	7.39	5	(31.1	7.39	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			80°	60x10g	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	13.2		(st) 	13.2	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			760	none
Orthophosphate	mg/L	0.92	() - A	en	0.92	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L		A		28	Tetal Bor
Other						Other
Total Solids			A		1	280

Chroom No		onitori		rk Shee		
Time 3:45 pm Stream Va and Site ID Current Weather: Clear/) #12] Showers	Rain (St		r Temp 25 °C
Weather in past 48 hrs: Clear/S		Overcast	Showers	Rain (St		Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	82 7.0			82	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	20			20	< 235 colonies/ 100 mL
рН	units	7.63			7.63	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			,		< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0.97			0.97	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			760	none
Orthophosphate	mg/L	0.10			0.10	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20-C)
Total Solids	mg/L			А. 		
Other						
Other						

9:30 am and Site ID		toka Rive 3	A. 5	di ø	Water	Temp / C
Current Weather: Clear/S ather in past 48 hrs: Clear/S		Overcast] Showers] Showers	Rain (St		Storm (Heavy) Storm (Heavy)
jepologi (************************************	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	55	Avg > 5 mg/l > 4 mg/L > 7 mg/L
	mg/L	5.5	5.0		5.25	for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	_				none
<i>E</i> . Coli	colonies/ 100 mL	100	209 10	057 057	100	< 235 colonies/ 100 mL
рН	units	6.67		eu (6.67	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			977 ·	stado	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	4.84	CA 3	sn.	4.84	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	19.0	19.2		19.1	none
Orthophosphate	mg/Ĺ	0.64	5.1 1	m	0.64	none
Ammonia Nitrogen	mg/L	0.1		im 	0.1	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L		1	207	8	0 Distor
Other						Orinor .

1. 1

Stream Na		oka River		rk Shee		emp °C r Temp 2/°C
Current Weather: Clear/ Weather in past 48 hrs: Clear/	Sunny	Overcast] Showers] Showers	Rain (St	eady)	Storm (Heavy) Storm (Heavy)
- 12	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	65 6.0	6.0		65	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L	-				none
<i>E</i> . Coli	colonies/ 100 mL	120			120	< 235 colonies/ 100 mL
рН	units	6.71			6.71	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	17.6			17.6	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none
Orthophosphate	mg/L	0.64	2		0.64	none
Ammonia Nitrogen	mg/L	0.30			0.30	.076 mg/L (at pH 7, 20=C)
Total Solids	mg/L					
Other						
Other						

4:50 pm and Site I	me Bear D #142	A	Surfer a	C) a contraction of the contract	RiverWater	Temp 2
Current Weather: Clear/ eather in past 48 hrs: Clear/	and the second	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
Noreces Personal Planeta	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	65		anae (65	Avg > 5 mg/ > 4 mg/L
1. C ⁴ .)	mg/L	5.5			5.5	> 7 mg/L for trout
Avg DO (original) — DO after 5 days						none
BOD 5-day (difference)	mg/L colonies/ 100 mL	80	19 14		80	< 235 colonies/
рН	units	6.81		ting (6.81	100 mL Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				enie nuov Tenien dy documi o	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L				, etsric	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	10.56		CTT -	10.56	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	25	26		25.5	none
Orthophosphate	mg/L	0.34		0 ^e	0.34	none
Ammonia Nitrogen	mg/L	0		(C))	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			900		n as latar
Other	Ĺ					Other

80

5.1

Date Time	Stroom No.	me Jas	sper Lake		rk Shee	·]	emp °C rTemp <u>⊋4</u> °C
We	Current Weather: Clear/S	Sunny	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L ·	75 6.5	6.5		75	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		-			none
	<i>E</i> . Coli	colonies/ 100 mL	80			80	< 235 colonies/ 100 mL
	рН	units	7.48			7.48	Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L			,	c	< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	1.14			1.14	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	20	17		18.5	none
	Orthophosphate	mg/L	1.0			1.0	none
	Ammonia Nitrogen	mg/L	0.2			0.2	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
	Other						

31.

10:15 am Stream Na		lumet Run 6	golog in	and and	Water	Temp 20
Current Weather: Clear/ ather in past 48 hrs: Clear/	and the second second	Overcast	Showers Showers	Rain (Si	mail in the	Storm (Heavy) Storm (Heavy)
Sisis Sign	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				47	Avg > 5 mg/L > 4 mg/L
	mg/L	5	4	4	4.31	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E.</i> Coli	colonies/ 100 mL	160		latincies Jan QOI	160	< 235 colonies/ 100 mL
рН	units	6.86	0.5		6.86	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				otici suo	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0.1	0.11	lon-	0.105	< 44 mg/L
Transparency (Tube)	cm	34	32		33	า อาษยุสกรา
Turbidity (from chart use in database entry)	NTU/JTU			งกรุงการไ	e est charles S'an souches	none
Orthophosphate	mg/Ĺ	0.68	0.64	-Silem	0.66	none
Ammonia Nitrogen	mg/L	0.3	. 0.4	269	0.3	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			Apen		esilo8 tata
Other						10/130
Other						

> t

Date	6-15-05 Cher	nical M	onitori	ng Wor	rk Shee	2t Air T	°C °C
Time	1:00 pm and Site ID	K a	nk Deioni	zed Water	r	Wate	er Temp °C
We	Current Weather: Clear/S ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (Ste		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L ·	NA			NA	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L				-	none
	<i>E</i> . Coli	colonies/ 100 mL	0	,			< 235 colonies/ 100 mL
	рН	units	NA				Avg 6-9
_	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				_	< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0				< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none
	Orthophosphate	mg/Ĺ	0				none
	Ammonia Nitrogen	mg/L	0				.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
	Other						

5 1 1

E.

7:00 am and Site IE		r Creek		910	Water	Temp
Current Weather: Clear/		Overcast] Showers] Showers	Rain (St		Storm (Heavy) Storm (Heavy)
eta 12 eta 12 - Esperante (esperante) eta	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation			ause		Avg > 5 mg/l > 4 mg/L
	mg/L			19PM		> 7 mg/L for trout
Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	3500		nekas 160		< 235 colonies/ 100 mL
рН	units					Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C				2 <u>1</u> 3 2.407 	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			in the second	er, senadore Postere	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L			5 m		< 44 mg/L
Transparency (Tube)	cm					
Turbidity (from chart · use in database entry)	NTU/JTU					none
Orthophosphate	mg/Ĺ	entate é sodar	and and	inini a farana	ana	none
Ammonia Nitrogen	mg/L				•	.076 mg/L (at pH 7, 20=C)
Total Solids	mg/L					
Other				7		

3 1

www.HoosierRiverwatch.com

sampled by Elgin

Date 6-20-05 Cher Time 7:00 and Site I		onitorii ^{ka River}	ng Wor	rk Shee	2† Air Te Water	
	· 🗆	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L					Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	600				< 235 colonies/ 100 mL
рН	units					Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5∘ F < 2∘ F in a trout stream
Total Phosphate	mg/L			,		< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L					< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none
Orthophosphate	mg/Ĺ					none
Ammonia Nitrogen	mg/L					.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other						
Other						

. .

sampled by Elgin

Time	Stream Na	me Unname	onitori				
We	Current Weather: Clear/ eather in past 48 hrs: Clear/	Sunny	Overcast] Showers] Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	· · · · ·	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L					Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
	<i>E</i> . Coli	colonies/ 100 mL	1000				< 235 colonies/ 100 mL
	рН	units					Avg 6-9
	Temp at Your Site — Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L			,		< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L					< 44 mg/L
	Transparency (Tube)	cm					none
	Turbidity (from chart use in database entry)	NTU/JTU					
	Orthophosphate	mg/Ĺ					none
	Ammonia Nitrogen	mg/L					.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
\rightarrow	Other						

....

sampled by Elgin

•

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
----------	----------	------------	------	-------

Date <u>10 / 20 / 05</u> MM DD YY		ime: e:			00 MM	
Certified Monitors' Nan	nes			Volunteer ID	and hadronia	
Organization Name					16 antine ange	
Watershed Name	anna an tha an ta ta ta ta	Watershed #				
Stream/River Name		RIVCY not abbreviate.)	5		numbers are required.)	
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)	
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R		Q-Value	Test	Weighting Factor	-	Calculation
Dissolved Oxygen	8 mg/L % saturation	88	x	.18	=	15,84
<i>E</i> . coli	25colonies/100mL	49	х	.17	1	8.33
рН	6,91 units	86.5	x	.12	=	10.38
B.O.D. 5	mg/L		х	.12	=	
H ₂ O Temp Change	<u>16</u> change in°C		х	.11	=	
Total Phosphate	mg/L		х	.11	=	
Nitrate (NO ₃)	O mg/L	98	х	.10	=	9.80
Turbidity .	15_NTU's	68	x	.09	=	6.12
		TOTALS		,66		50.47
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%			QUALITY ATING		76.5%
		1		3394	G	ood

ADVANCED CH	EMICAL	MONI	TORING	DATA	SHEET
-------------	--------	------	--------	------	-------

Date <u>10/ 20/ 05</u> MM DD YY		ime: e:	-				
Certified Monitors' Nam	ies			Volunteer ID			
Organization Name							
Watershed Name			Watershed #				
Stream/River Name	not abbreviate.)		Site ID (Above ID r	# Z numbers are required.)			
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)		
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)		

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test I	Results 4.5 mg/L		Q-Value	1	Weighting Factor		Calculation
Dissolved Oxygen			36.5	х	.18	=	6.57
E. coli	colonies/100mL	о 10	98	х	.17	=	16.66
рН	6.83 units		83	х	.12	=	9.96
B.O.D. 5	mg/L			х	.12	Н.	
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	Total Phosphate mg/L			х	.11	=	
Nitrate (NO ₃)	Nitrate (NO ₃) O.18 mg/L			х	.10	=	9.10
Turbidity	/ 4 NTU's		74,4	х	.09	=	6.7
		,	TOTALS	_	.66		48,99
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATE: INDEX		UALITY		74.2%
		-				G	rood

Date <u>16/20/05</u> MM DD YY Certified Monitors' Nar	End Tim	ime: e:	(am/pm)	# Adults # Students Volunteer ID_	00 100	
Organization Name				90	ich noossineerO	
Watershed Name	en selo a construir construir a second	Watershed #				
Stream/River Name		Greek not abbreviate.)	A CARA	Site ID (Above ID	# 3 numbers are required.)	
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	

WATER QUALITY INDEX (WQI)

Test Res		Q-Value		Weighting Factor	1	Calculation
Dissolved Oxygen	8.0 mg/L 7.5 % saturation	82.5	x	.18	=	14.85
E. coli	50 colonies/100mL	53	х	.17	=	9.01
pH	7.5 units	93	х	.12	=	11.16
B.O.D. 5	mg/L	2.gm	х	.12		8.0.0.8
H ₂ O Temp Change	change in°C		х		I	dates o'h
Total Phosphate	mg/L		х	.11	1	Total Piros
Nitrate (NO ₃)	mg/L	98	х	.10	=	9.8
Turbidity	15_NTU's	68	х	.09	=	6.12
1	TOTALS	TOTALS	-	,66		50.94
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Bad 25 - 49% Very Bad 0 - 24%	and the second second second second		UALITY ATING		77.2.3
					G	ord

ADVANCED	CHEMICAL	MONITORING	DATA	SHEET
----------	----------	------------	------	-------

Date <u>10 / 20 / 0.5</u> MM DD YY	-	ime:: e::		# Adults # Students	
Certified Monitors' Nar	nes		······	Volunteer ID	
Organization Name		a			
Watershed Name	MANNERALAME		W	atershed #	1000.0000 Billion.com (according to according to accordin
Stream/River Name		Orcek not abbreviate.)	at were set as a set of the set o	Site ID (Above ID r	wimbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	☐ Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test I	Results]	Q-Value]	Weighting]	Calculation	
	8 <i>,0</i> mg/L				Factor			
Dissolved Oxygen	% saturation		82.5	Х	.18	=	14.85	
<i>E.</i> coli	colonies/100mL		<u> 98</u>	х	.17	=		
рН	7.4-2 units		92.8	х	.12	=	11.19	
B.O.D. 5	mg/L			x	.12	П.		
H ₂ O Temp Change	change in °C			х	.11	=		
Total Phosphate	mg/L			х	.11	=	·	
Nitrate (NO ₃)	<u> </u>		98	х	.10	=	9.8	
Turbidity	/ <i>5</i> NTU's		_68_	x	.09	=	9.8 6.28	
			TOTALS		.66		58.73	
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEI INDEX		UALITY		89%	
						6	rood	

Date <u>16 / 20 / 05</u> MM DD YY Certified Monitors' Nar	End Time	me:	_ (am/pm)	the state of the	en <u>bernek verien.</u> En <u>ber</u> ne
Organization Name					ANDEN ACTEMINATION
Watershed Name	a bedatere	R	Wa	tershed #	enter bodeson
Stream/River Name	Pinnick (Please do r	Creek	(# = - fa)		#5 numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Ro	esults	Q-Value		Weighting Factor	22	Calculation
	9.5 mg/L	14500				
Dissolved Oxygen	93 % saturation	96.16	X	.18	=	17.31
E. coli	Colonies/100mL	98	x	.17	II	16.66
pH _	7.87 units	84	х	.12	I	10.08
B.O.D. 5 _	mg/L	.Agen	х	.12	II.	5.0.3
H ₂ O Temp Change _	change in°C		х	.11	II	o Temp Chen
Total Phosphate	mg/L	Agra	х	.11	=	tel Phosphus
Nitrate (NO ₃) _	mg/L	98	х	.10	=	9.8
Turbidity _	15 NTU's	68	x	.09	=	6.28
. 23.5.5	TOTALS	TOTALS	_	.66		60.13
Excellent 90 - 1009 Good 70 - 899 Medium 50 - 699	6 Very Bad 0 - 24%			QUALITY ATING		91.1 %
				Exce	:1	leut

Date <u>10 / 20 / 05</u> MM DD YY			(am/pm) (am/pm)			
Certified Monitors' Nar	nes			Volunteer ID		
Organization Name						
Watershed Name			W	atershed #		
Stream/River Name	Stream/River Name <u>Sugar Creek</u> (Please do not abbreviate.) Site ID <u>*6</u> (Above ID numbers are					
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	

WATER QUALITY INDEX (WQI)

Test Results	Q-Value Weighting Calculation Factor
mg/L Dissolved Oxygen% saturation	<u>50</u> X .18 = <u>9.0</u>
E. coli colonies/100mL	<u>98</u> X .17 = <u>16.66</u>
pH <u>8.77</u> units	<u>57</u> X .12 = <u>6.24</u>
B.O.D. 5 mg/L	X .12 =
H ₂ O Temp Change change in°C	X .11 =
Total Phosphate mg/L	X .11 =
Nitrate (NO ₃) mg/L	98 X .10 = 9.8
Turbidity /S NTU's	<u>68</u> X .09 = <u>6,28</u>
	TOTALS .66 47.98
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% . .	

Date <u>10 / 20 / 0.5</u> MM DD YY Certified Monitors' Nar	End Tim	ime: e:	(am/pm)	# Adults # Students Volunteer ID	
Organization Name				97.39	Vi organization V
Watershed Name	Wassing		W	Vatershed #	
Stream/River Name	Patoka (Please do	River not abbreviate.)		Site ID (Above ID :	# 7 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Re	sults	Q-Value	10	Weighting		Calculation
22.3	7.0 mg/L	low to B		Factor	0	Dissolutio
Dissolved Oxygen _	70 % saturation	_77	x	.18	=	13.86
E. coli _	<u>50</u> colonies/100mL	53	х	.17	=	9.01
pH _	7.23 units	92	x	.12	=	11.04
B.O.D. 5	mg/L		х	.12	5	marioten
H ₂ O Temp Change _	change in°C	-	х	.11	-	and terest
Total Phosphate	mg/L		X	.11	=	A DECOMP
Nitrate (NO ₃)	0,18 mg/L	91	х	.10	=	9.1
Turbidity	NTU's	63	х	.09	Ξ	5.67
1939.14 1939.14	25 - 49% NATER OF	TOTALS		.66		48.68
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Very Bad 0 - 24%			QUALITY ATING	-	73.6%
	and the second	inf many or			G	rood

Date <u>10 / 20 / 05</u> MM DD YY	-	ime:		# Adults # Students	
Certified Monitors' Nar	1es			Volunteer ID	a da fa da
Organization Name					
Watershed Name		99948-20 <u></u>	W	atershed #	Michael Station Stationary administra American
Stream/River Name		Deck not abbreviate.)		Site ID (Above ID r	#8 numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	🛛 Rain (Steady)	☐ Storm (Hea∨y)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	🛛 Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test K	Test Results				Weighting Factor		Calculation
Dissolved Oxygen	3 , 0 mg/L 2 8 % saturation		18.6	х	.18	=	3.35
E. coli	colonies/100mL		45	x	.17	=	
рН	7.29 units		92	x	.12	=	11.04
B.O.D. 5	mg/L		40000-00-00-00-00-00-00-00-00-00-00-00-0	x	.12	-	
H ₂ O Temp Change	change in°C			х	.11	11	
Total Phosphate	mg/L			х	.11	1	
Nitrate (NO ₃)	mg/L		8	х	.10	=	9,8
Turbidity	NTU's		68	х	.09	=	6.28
L		ן 	TOTALS	. L	.66		38.12
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATE INDEX		UALITY ATING		57.8%
					Meg	li.	4 13-1

ADVANCED CHEMICAL MONITORIN	G DATA	SHEET
-----------------------------	--------	-------

	in Time:	-				<u>Data Kaka ata</u> Gali kwi jab	
Certified Monitors' Names						hadMibaltipeQ.	
Organization Name					10 Mar	A adamana	
Watershed Name Watershed #							
Stream/River Name <u>Acistner Creek</u> (Please do not abbreviate.) Site ID #9 (Above ID numbers are required.)							
Current Weather	unny Covercast	□ Showers		Rain (Stead	y)	Storm (Heavy)	
Weather in Past 48 hrs. Clear/St	unny Dovercast	□ Showers		Rain (Stead	y)	Storm (Heavy)	
to obtain a Total Water Quality I the Weighting Factor column to Test Results No Flow	obtain the Water Qual		ng.	Veighting Factor		Calculation	
"No Flow"	mg/L			Factor			
Dissolved Oxygen	% saturation	10 2 2	X	.18	=	the second for	
E. coli	colonies/100mL		Х	.17	=	100 11	
рН	units		х	.12	=		
B.O.D. 5	mg/L		х	.12	=		
H ₂ O Temp Change	change in°C		х	.11	=	DATE D.HT	
Total Phosphate	mg/L		х	.11	=	Tetra Phos	
Nitrate (NO ₃)	mg/L		х	.10	=		
Turbidity	NTU's		x	.09	=		

and the second	And the second second		1 La manager and	TOTALS	manager and we want
'Excellent Good Medium	90 - 100% 70 - 89% 50 - 69%	Bad Very Bad	25 - 49% 0 - 24%	WATER QUALITY INDEX RATING	

Date 10 / 20 / 0.5 Begin Time (am/pm) # Adults MM DD YY End Time (am/pm) # Students Certified Monitors' Names (am/pm) # Students Organization Name Volunteer ID Watershed Name Watershed # Strëam/River Name Un Name d Thibutary (Please do not abbreviate.) Site ID							
Current Weather Clear/Sunny Overcast	Showers Rain (Steady) Storm (Heavy)						
Weather in Past 48 hrs. If Clear/Sunny Dovercast	Showers Rain (Steady) Storm (Heavy)						
WATER QUALITY INDEX (WQI) You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the <i>Calculation</i> column by the total of the <i>Weighting Factor</i> column to obtain the Water Quality Index rating.							
Test Results	Q-Value Weighting Calculation						
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						
pH <u>7.18</u> units							
B.O.D. 5 mg/L	X .12 =						
H ₂ O Temp Change change inºC	X .11 =						
Total Phosphate mg/L	X .11 =						
Nitrate (NO ₃) <u>0.18</u> mg/L	$91 \times .10 = 9.1$						
Turbidity 15 NTU's	<u>68</u> X .09 = <u>6,28</u>						
	TOTALS , 66 41.81						
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% - -	INDEX RAIING 63,5%						
	Medium						

Date <u>10/20/05</u> Begin Time: MM DD YY End Time: Certified Monitors' Names	(am/pm)
Organization Name	Greation Nime
Watershed Name	Watershed #
Stream/River Name <u>Teder Creek</u> (Please do not abbreviate.)	Site ID # // (Above ID numbers are required.)
Current Weather Clear/Sunny Overcast	☐ Showers ☐ Rain (Steady) ☐ Storm (Heavy)
Weather in Past 48 hrs. I Clear/Sunny Overcast	Showers Rain (Steady) Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Results mg/L	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen% saturation	25	х	.18	=	4.5
<i>E. coli</i> <u>750</u> colonies/100mL	24,5	х	.17	=	4.17
pH <u>7.15</u> units	91.5	х	.12	=	10,98
B.O.D. 5 mg/L	6 <u>901</u>	х	.12	Н.	B.O.D. 5
H ₂ O Temp Change change in°C	(1010) <u>;</u>	х	.11	=	gmeT 0,H
Total Phosphate mg/L	hạn	х	.11	-	Total Phoe
Nitrate (NO ₃)	98	х	.10	-	9.8
Turbidity 25 NTU's	57	х	.09	=	5.13
14157. <u>182</u> 214107	TOTALS	_	.66		.34.58
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 50 50%			UALITY ATING	-	52,4%
· · · · · · · · · · · · · · · · · · ·			Me	d	ium

Date <u>10 / 20 / 0.5</u> MM DD YY		ne::		# Adults # Students		
Certified Monitors' Names						
Organization Name						
Watershed Name			Wa	atershed #		
Stream/River Name <u>Beaver Creek</u> (Please do not abbreviate.) Site ID <u>#12</u> (Above ID numbers are required.)						
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)	
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)	

WATER QUALITY INDEX (WQI)

Test F	Results		Q-Value]	Weighting Factor		Calculation
Dissolved Oxygen	Z.0 mg/L 19% saturation		12.5	х	.18	=	2.25
<i>E</i> . coli	colonies/100mL		49	х	.17	=	8.33
рН	7.07 units		90	х	.12	=	10.80
B.O.D. 5	mg/L			х	.12	1	
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	Ø mg/L		98	х	.10	=	9.8
Turbidity	/5 NTU's		68	х	.09	=	6.28
		_	TOTALS	_	,66	. '	37.46
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEJ INDEX		UALITY		56.8%
		1			Mea	11	um

ADVANCED CHEMI	CAL MONIT	ORING DAT	'A SHEET
----------------	-----------	-----------	----------

Date <u>10 21 0.5</u> MM DD YY	Begin Time: End Time:	(am/pm)	# Students	
Certified Monitors' Names_	<u> Andrewski se se se s</u> e se		_ Volunteer ID_	and and a line
Organization Name			1	id opposignation
Watershed Name	lennte#	Wat	ershed #	mald borkrowed
Stream/River Name Pa	Please do not abbreviate.)	Seitz Bri	Above D	numbers are required.)
Current Weather	Clear/Sunny Covercast	☐ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny Dovercast	Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results	Q-Value	air a	Weighting Factor		Calculation
7.0 mg/L	10m 9.3		racior		
Dissolved Oxygen66 % saturation	68.6	X	.18	(III)	12.35
E. coli 200 colonies/100mL	37	x	.17	=	6.29
pH <u>7. 23</u> units	92	х	.12	=	11.04
B.O.D. 5 mg/L	· · · · · · · · · · · · · · · · · · ·	х	.12	Π.	8.0.0.8
H ₂ O Temp Change change in°C	ento <u>inter</u>	x	.11	=	H ₂ O Terrys
Total Phosphate mg/L	pri	х	.11	4	Total Phys
Nitrate (NO ₃) 0.97 mg/L	94	х	.10	=	9.4
Turbidity <u>36</u> NTU's	47	x	.09	=	4.23
	TOTALS		.66		43.31
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 50 - 69% 50 - 69%	a second s		QUALITY ATING		65,6%
······································			Mo	·d.	ium

•

Date 10 / 20 / 0.5 Begin Time (am/pm) # Adults MM DD YY End Time (am/pm) # Students Certified Monitors' Names Volunteer ID Volunteer ID Organization Name Volunteer ID Volunteer ID							
Watershed Name Watershed #							
Strèam/River Name <u>Patoka</u> (Please do r	hot abbreviate.)			Site ID (Above]	ID n	umbers are required.)	
Current Weather Clear/Sunny		☐ Showers		Rain (Stead		Storm (Heavy)	
Weather in Past 48 hrs. 🛛 Clear/Sunny	Overcast [☐ Showers		Rain (Stead	y)	Storm (Heavy)	
WATE	ER QUALITY I	NDEX (W	QI))			
You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the <i>Calculation</i> column by the total of the <i>Weighting Factor</i> column to obtain the Water Quality Index rating.							
Test Results		Q-Value		Weighting		Calculation	
7.0	_mg/L			Factor			
Dissolved Oxygen <u>69</u>	% saturation	65.9	Х	.18	=	11.86	
E. coli <u>75</u>	colonies/100mL	49	х	.17	=	8,33	
рН 7.2	units	92	х	.12	=	11.04	
B.O.D. 5	. mg/L	Man Starballing, an Amerikaan dawi) aamaam	х	.12			
H ₂ O Temp Change	change in°C		х	.11	=		
Total Phosphate	mg/L		х	.11	=		
Nitrate (NO ₃) 1.54	mg/L	_92_	х	.10	=	9.2	
Turbidity <u>38</u>	NTU's	46	x	.09	=	4.14	
	to 2000 DOX 10 set West management	TOTALS		,66		44.57	
'Excellent 90 - 100% Bad Good 70 - 89% Very B Medium 50 - 69%	25 - 49% ad 0 - 24%	WATEI INDEX			L	67.5%	
				Medi	41		

Date <u>10/20/05</u> MM DD YY Certified Monitors' Names_	Begin Time: End Time:	(am/pm)	# Adults # Students _ Volunteer ID	QQ	
Organization Name			SITIS	Madarismogri) -	
Watershed Name	and W	Watershed #			
Stream/River Name	(Please do not abbreviate.)	al al az		14A numbers are required.)	
Current Weather	Clear/Sunny Dovercast	□ Showers	Rain (Steady)	Storm (Heavy)	
Weather in Past 48 hrs.	Clear/Sunny Dovercast	Showers	Rain (Steady)	Storm (Heavy)	

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Res	ults	Q-Value	1	Weighting Factor	1	Calculation
	10,5 mg/L	om - Mai	-	Pacion		
Dissolved Oxygen	10.3 % saturation	98.5	x	.18	-	17.73
E. coli	25 colonies/100mL	60.7	x	.17	=	10.32
pH	8.36 units	69	х	.12	=	8.28
B.O.D. 5	mg/L		х	.12	=	8,0,0,8
H ₂ O Temp Change	change in°C	10.05	х	.11	=	spinol 0,6
Total Phosphate	mg/L	1.000	х	.11	1	Potel Photo
Nitrate (NO ₃)	2.64 mg/L	87	х	.10	=	8.7
Turbidity	15 NTU's	68	x	.09	=	6.28
13.79.79 B.	TOTALS	TOTALS		.66	L	51.31
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Bad 25 - 49% Very Bad 0 - 24%	WATE INDEX		UALITY ATING		77.7%
	And the second s			Goo	d	

Date <u>/0 / 20/ 05</u> MM DD YY	-	ime:						
	End 11m	e:	(am/pm)	# Students				
Certified Monitors' Nar	nes			Volunteer ID				
Organization Name								
Watershed Name Watershed #								
Stream/River Name <u>Jasper Lake - Out Fell</u> Site ID <u>#15</u> (Please do not abbreviate.) (Above ID numbers are required.)								
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)			
Weather in Past 48 hrs.	Cloar/Suppy	Overcast	C Showers	Rain (Steady)	Storm (Heavy)			

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Γ	Test Results 7.0 mg/L			Q-Value	1	Weighting Factor		Calculation
	Dissolved Oxygen			79.2	х	.18	=	14.26
	E. coli	colonies/100mL		49	х	.17	=	8.33
	рН				х	.12	=	9.48
	B.O.D. 5	mg/L			х	.12	Π.	
1	H ₂ O Temp Change	change in°C			x	.11	=	
	Total Phosphate	mg/L			х	.11	=	
	Nitrate (NO ₃)	Ø mg/L		98	х	.10	=	9.8
	Furbidity	<u>4.5</u> NTU's		42	×	.09	=	_3.78_
_			_	TOTALS	_	.66	. '	45.65
G	Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEJ INDEX		UALITY		69,290
L					N	ledium	7	

Date <u>10 / 21 / 05</u> MM DD YY	End Tim	ime: e:	(am/pm)					
Certified Monitors' Names Volunteer ID								
Organization Name								
Watershed Name Watershed # Stream/River Name Calumet Run (Please do not abbreviate.) Site ID #16 (Above ID numbers are required.) (Above ID numbers are required.)								
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)			
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)			

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results			Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	3.0 mg/L 28% saturation		18.6	x	.18		3.35
E. coli			32,5	x	.17	=	5.53
рН	<u> </u>		87	x	.12	=	10,99
B.O.D. 5	mg/L			х	.12	П.	·
H ₂ O Temp Change	change in°C			x	.11	=	
Total Phosphate	mg/L			х	.11	=	<u></u>
Nitrate (NO ₃)	mg/L		95.5	x	.10	=	9.55
Turbidity	NTU's		_75_	x	.09	=	6.75
		-	TOTALS	-	.66		35.62
'Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 100% 100%			WATE		UALITY ATING	-	54,0%
······································					Mea	1:0	sm.

·
te 10/20/05	Chel Stream Na	A REAL PROPERTY OF THE PARTY OF			rk She		
Current Weathe	-/	/Sunny	Overcast	Showers Showers	Rain (Si	teady)	Storm (Heavy) Storm (Heavy)
		Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxyg	en (DO)	% Saturation mg/L	8	8		80	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (orig <u>DO after 5 da</u> BOD 5-day (diff	ays	mg/L					none
E. Coli	9	colonies/ 100 mL	\$	75	ation .	75	< 235 colonies/ 100 mL
рН		units	6.87	6.96	04	6.91	Avg 6-9
Temp at You — Upstream (1 mi Temperature Ch) Temp	°C			-	stanco	< 5° F < 2° F in a trout stream
Total Phosphate	6	mg/L		0.4	1 gn		< .04 mg/L (in Lake Michlgan)
Nitrate (NO ₃)		mg/L	0	0		0	< 44 mg/L
Transparency (T	ube)	cm	>60	>60	nounir	>60	n no yilbhir (u ro
Turbidity (from ch in datab	art use ase entry)	NTU/JTU		olaristica ak		2.15	none
Orthophosphate		mg/L	0.16	0.16	in and in the second	0.16	none
Ammonia Nitrog	en	mg/L	0.1	0.1		0.1	.076 mg/L (at pH 7, 20°C)
Total Solids		mg/L					
Other							19714
Other							

72

Quit et

	Stream Na	me CANE	onitori creex	ng Wor	rk Shee		emp 14.5 r Temp 15.4	°C °C
Time We	Current Weather: Clear/Stather in past 48 hrs: Clear/Stather	Sunny	Overcast] Showers] Showers	Rain (St	eady)	Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	4.5			45	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	E. Coli	colonies/ 100 mL	0			0	< 235 colonies/ 100 mL	
	рН	units	6.83		1	6.83	Avg 6-9	
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	∘C	_				< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L				6	< .04 mg/L (in Lake Michigan)	*
	Nitrate (NO ₃)	mg/L	0.18			0,18	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	/3	15		14 52	none	
	Orthophosphate	mg/L	0.2			0.2	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							2

www.HoosierRiverwatch.com

Its ation y/L g/L nies/ mL 5 its 7.3 c y/L	nple 1 0	Showers Sample 2	Rain (S Rain (S Sample 3		age	torm (Heavy) torm (Heavy) State Standard Avg > 5 mg > 4 mg/L > 7 mg/L for trout none < 235 colonies/ 100 mL Avg 6-9 < 5° F < 2° F in a trout stream < .04 mg/l
Its ation y/L g/L nies/ mL 5 its 7.3 c y/L	1 0 0	-	3	73 8:0 5	5	Standard Avg > 5 mg > 4 mg/L > 7 mg/L for trout none < 235 colonies/ 100 mL Avg 6-9 < 5° F < 2° F in a trout stream
ation /L 8, /L 5 its 7, 5 its 7, 5 p/L	0			- 	•	> 4 mg/L > 7 mg/L for trout none < 235 colonies/ 100 mL Avg 6-9 < 5° F < 2° F in a trout stream
nies/ mL 5 its 7.5						< 235 colonies/ 100 mL Avg 6-9 < 5° F < 2° F in a trout stream
its 7.5		2 49				colonies/ 100 mL Avg 6-9 < 5° F < 2° F in a trout stream
	50	242	2500	7,5	FD	< 5° F < 2° F in a trout stream
j/L				- 502 5 	a You S <u>an</u> AD sa	< 2° F in a trout stream
			Banka 1			< 04 mg/l
			1. K.		aisd	(in Lake Michigan)
	7	0	uligen -		10	< 44 mg/l
n >6	0			>6	0	none
UTU			CUIN 10	</td <td>5</td> <td></td>	5	
VL O	.2	5.0	1871	0.	2	none
VL C	2	0	Johns	0	,	.076 mg/l (at pH 7, 20°C
I/L			Digm			total Sold
					•	
		yl O			y/L 0.2 0. y/L 0 0	y/L 0.2 0.2 y/L 0 0

www.HoosierRiverwatch.com

$\frac{10/20/05}{\text{Me}}$ Chen Stream Na and Site ID	me DAV	onitori	ng Wor	rk Shee		° Temp روسین ۲emp /3.5°
Current Weather: Clear/S Neather in past 48 hrs: Clear/S		Overcast] Showers] Showers	Rain (St	,, <u> </u>	Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State <u>Standard</u>
Dissolved Oxygen (DO)	% Saturation mg/L	8.0			75 8.0	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	D			0	< 235 colonies/ 100 mL
рН	units	7,42			7.42	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C		,			< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L. (In Lake Michigan)
Nitrate (NO ₃)	mg/L	С			0	< 44 mg/L
Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	>60			>60 < 15	none
Orthophosphate	mg/L	0.2			0,2	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other						
Other			,	· · · · · · · · · · · · · · · · · · ·		

1:50 Pry Stream Name		IICK CK	EER	nan seneta 2.46 (31.5	Water	Temp /3
Current Weather: Clear/Seather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
Avenue SpinovA	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	9.5	2	anus Spin	93 9.5	Avg > 5 mg/ > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	D	N/4 1	ikrotoc m 601	0	< 235 colonies/ 100 mL
рН	units	7.87	17	ettru (7.87	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				Vour Bite TriefClant Sprinde	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			digin (6350	< .04 mg/L (In Lake Michigan)
Nitrate (NO ₃)	mg/L	0	0	Agen	0	< 44 mg/L
Transparency (Tube)	cm	>60	<u> </u>	650	>60.	none
Turbidity (from chart use in database entry)	NTU/JTU		1000		< 15	4 (10/04/457 6) 4
Orthophosphate	mg/L	0.2	0	nga	0.2	none
Ammonia Nitrogen	mg/L	0	0	Agm	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			_bem		otal Sol da
Other		1				veria.
Other						varies

72

Date	10/20/05 Cher				rk She	et Air T	emp °C
Time	Stream Na		(DUPLI	CATE SA	mplet	Wate	er Temp /5 °C
We	Current Weather: Clear eather in past 48 hrs: Clear/	/Sunny	Overcast	Showers Showers	Rain (S	teady)	Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L	NA			NA NA	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
	<i>E</i> . Coli	colonies/ 100 mL	NA			NA	< 235 colonies/ 100 mL
- 1	рН	units	7.79	-		7.79	Avg 6-9
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	۰C				_	< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L			8 		<.04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	NA NA			NA. NA	none
ſ	Orthophosphate	mg/L	0.1			0.1	none
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L			10		
	Other						
	Other						

12:00 Chen Chen Stream Na and Site ID		n creek			Water	Temp /(
Current Weather: Clear/Stather in past 48 hrs: Clear/Stather in past 48 hrs:		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	(HEAVY	ALGAE	G.ROWTH)	150	Avg > 5 mg/ > 4 mg/L > 7 mg/L
Dissolved oxygen (20)	mg/L	15	15	NON .	15	for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	0	0	0	0	< 235 colonies/ 100 mL
рН	units	8.77	24	04/10	8.77	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				ellê suor <u>Telêm B</u> r spansto e	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L				otado	< .04 mg/l (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0	1.0	ign	0	< 44 mg/L
Transparency (Tube)	cm	>60			>60	none
Turbidity (from chart use in database entry)	NTU/JTU				< 15	
Orthophosphate	mg/L	0	.0	NDA .	0	none
Ammonia Nitrogen	mg/L	0	0	Ngrin	0	.076 mg/L (at pH 7, 20°C
Total Solids	mg/L			1077		Total Solla
Other						Other
Other						Other .

www.HoosierRiverwatch.com

Date	Cherry Cherry	nical M	onitori	ng Wor	rk Shee	2t Air Te	emp	°C
Time	Stream Nat	me PArok	A RIVER	e			r Temp 16	°C
We	Current Weather: Clear/Seather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	7.0			70	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none < 235	
	E. Coli	colonies/ 100 mL	50			50	colonies/ 100 mL	
	рН	units	7.23			7.23	Avg 6-9	
	Temp at Your Site — Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0.18			0.18	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	40	38	38	38.7 19	none	
	Orthophosphate	mg/L	0,2			0.2	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other					e a		
	Other		×					

$\begin{array}{c} e \\ 10/20/05 \\ \hline \\ e \\ 2; 15 \\ Pm \\ \hline \\ and \\ Site \\ \hline \\ and \\ Site \\ \hline \\ \end{array}$	ante	ON CREE	t	Nr. Cie	Water	r Temp /
Current Weather: Clea		Overcast Overcast	Showers Showers	Rain (Si	Colored Colored	Storm (Heavy) Storm (Heavy)
and a second and a second as a second a	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	1 0	1	20 16-10107 	28	Avg > 5 mg/l > 4 mg/L
Dissolved Oxygen (De)	mg/L	3.0			3.0	> 7 mg/L for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	100		n 09:	100	< 235 colonies/ 100 mL
рН	units	7.29		(1973) 	7.29	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C			<u></u>		< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Jusm.	6761 ⁵	< .04 mg/L (In Lake Michlgan)
Nitrate (NO ₃)	mg/L	0		<u>Nons</u>	0	< 44 mg/L
Transparency (Tube)	cm	760			760.	none
Turbidity (from chart use in database entry)	NTU/JTU	u, i mu o tradi	en san inter		< 15	none
Orthophosphate	mg/L	0.2		Nom	0.2	none
Ammonia Nitrogen	mg/L	0		- Murc	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			Apri		t mai Solès
Other						Tractification of the second sec
Other						Land Longe

www.HoosierRiverwatch.com

72

Stroom N	ame KEIS	onitori		rk She		emp r Temp	°C
Time 2:45 Pm and Site I Current Weather: Clear Weather in past 48 hrs: Clear	/Sunny	Overcast	Showers Showers	Rain (St	eady)	Storm (Heavy) Storm (Heavy)	
	Units	Sample 1	Sample 2	Sample	Average	State <u>Standard</u>	
Dissolved Oxygen (DO)	% Saturation mg/L	No	FL	ow		Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
<i>E.</i> Coli	colonies/ 100 mL		•			< 235 colonies/ 100 mL	
рН	units					Avg 6-9	
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C	Seatores Marting and an and a seatore seatores	aanaanaa ayoo ahaa dahaanaa dahaanaa dahaa ahaa ahaa			< 5° F < 2° F in a trout stream	
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
Nitrate (NO ₃)	mg/L					< 44 mg/L	
Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU					none	
Orthophosphate	mg/L					none	
Ammonia Nitrogen	mg/L	~				,076 mg/L (al pH 7, 20∘C)	
Total Solids	mg/L	-					
Other							
Other							

.

;

and Site	ID #10			N/85 01 g	water	r Temp /3
Contraction of the second s	ear/Sunny	Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
ngeneral services	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation			a uto a	50	Avg > 5 mg/l > 4 mg/L
bissoired oxygen (bo)	mg/L	5		077	5	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	100	7.5	indice n (30)	100	< 235 colonies/ 100 mL
pH	units	7.18	. 2.1	Berg	7.18	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C		_		Your She <u>Your She</u> a Chadra	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			l'igen	media	<.04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0,18	0	Sigen	0.18	< 44 mg/L
Transparency (Tube)	cm	>60	5.	110	760.	stenatt
Turbidity (from chart use in database entry)	NTU/JTU		10	BLODA *	<15	none
Orthophosphate	mg/L	0.4	.0	Perm -	0.4	none
Ammonia Nitrogen	mg/L	0		Norr	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L	3		Ngar	b	Total Sol
Other						

Date 10/20/03	5- Chen	nical M	onitorii	ng Wor	rk Shee	2t Air Te	emp	°C
Time 3:00 Pl	Stream Na		R CREEH			Wate	r Temp 16	°C
Current V Weather in pa	Weather: Clear/S st 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State <u>Standard</u>	
Dissolved	d Oxygen (DO)	% Saturation mg/L	3.5			35 3.5	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
_ DO af	00 (original) <u>ter 5 days</u> ay (difference)	mg/L					none	
<i>E</i> . Coli		colonies/ 100 mL	750			750	< 235 colonies/ 100 mL	
рН		units	7.15			7.15	Avg 6-9	
- Upstre	at Your Site am(1 mi) Temp ture Change	۰C					< 5∘ F < 2∘ F in a trout stream	
Total Pho		mg/L					< .04 mg/L (in Lake Michigan)	
Nitrate (N	103)	mg/L	0			0	< 44 mg/L	
	ency (Tube) / (from chart use in database entry)	cm NTU/JTU	27	28		27.5 25	none	
Orthopho	osphate	mg/L	0.4			0.4	none	
Ammonia	a Nitrogen	mg/L	1.1			1.1	.076 mg/L (at pH 7, 20°C)	
Total Sol	ids	mg/L						
Other								
Other	· · · · · · · · · · · · · · · · · · ·							S.

e,

Stream Na and Site II			e 1 1	Cl	Water	Temp /
Current Weather: Clear/ ather in past 48 hrs: Clear/		Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
Izithers . Logenova .	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				19	Avg > 5 mg/ > 4 mg/L > 7 mg/L
	mg/L	2.0	27.6	- ⁵ 011	2.0	for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	75	200	erhaigo m 901	75	< 235 colonies/ 100 mL
pH	units	7.07	55	est a	7.07	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C	_			Your Silo	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Som La	tist	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0	9.0	hgen	0	< 44 mg/L
Transparency (Tube)	cm	>60	2.2	1002	760	n siganan T
Turbidity (from chart use in database entry)	NTU/JTU				760.	none
Orthophosphate	mg/L	0,24	5.0	Jen	0.24	none
Ammonia Nitrogen	mg/L	1.7	Q	lig n	1.7	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			Jam		Total Solid
Other						Other
Other						Defit()

72

Date	10/21/05 Chem Stream Nar	ical M	onitoria	ng Wor	k Shee		
Time	Stream Nar	ne 1970k 4	<u>/3</u>				10mp //
We	Current Weather: Clear/S ather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (Sti		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State <u>Standard</u>
	Dissolved Oxygen (DO)	% Saturation mg/L	7.0			66 7.0	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none < 235
	E. Coli	colonies/ 100 mL	200			200	colonies/ 100 mL
	рН	units	7.23			7.23	Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	0.97				< 44 mg/L
	Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	22	22		22 36	none
	Orthophosphate	mg/L	0.3			0.3	none
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20-C)
	Total Solids	mg/L					
	Other	i					
	Other						

Io/21/05 Che Stream N and Site	lame <i>PATC</i> ID #13	DUPLI	CATE (Z BRIDGE INDOORS)	Water	Temp NI
Current Weather:	r/Sunny	Overcast [Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
atal2 Atendo (Stendar	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				NA	Avg > 5 mg/ > 4 mg/L
the trat	mg/L	NA	5.	5131	MA	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	1	5			< 235 colonies/ 100 mL
pH	units	7.28		Rino -	7.28	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				ane woya	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			en l	eterfo	< .04 mg/L. (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0.88	in la	CA.	0.88	< 44 mg/L
Transparency (Tube)	cm	1.5	18	1110	NA	and the second
Turbidity (from chart use In database entry)	NTU/JTU		U	SURN PI	NA	none
Orthophosphate	mg/L	0.2	0	Fem .	0.2	none
Ammonia Nitrogen	mg/L	0	0	san (0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			Ngri	6	olal So
Other						Obser
Other		-				

Date 10/20/05 Chen	nical M	onitori	ng Woi	rk Shee	et Air	Temp	°C
Time 4:20 Stream Namand Site ID	me PATO	KA RIVE	n			ter Temp 15	°C
Current Weather: Clear/S Weather in past 48 hrs: Clear/S		Overcast _	Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
	Units	Sample 1	Sample 2	Sample 3	Average	e State Standard	
Dissolved Oxygen (DO)	% Saturation mg/L	7,0			69	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-				none	
E. Coli	colonies/ 100 mL	75			75	< 235 colonies/ 100 mL	
рН	units	7.2			7.2	A∨g 6-9	
Temp at Your Site Upstream (1 mi) Temp	۰C					< 5° F < 2° F in a trout stream	
Temperature Change Total Phosphate	mg/L					< .04 mg/L (In Lake Michigan)	
Nitrate (NO ₃)	mg/L	1.54			1.54	< 44 mg/L	
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	21	21	-	21 38	none	
Orthophosphate	mg/L	0.2			0.2	none	
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
Total Solids	mg/L						
Other							
Other							` <u>الار</u>

10/20/05	Stream Na and Site ID	me BEAVE	a creek		N. 014		Temp /3
Current Weath eather in past 48 I			Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
		Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)		% Saturation				103	Avg > 5 mg/ > 4 mg/L > 7 mg/L
		mg/L	10.5	1.5.1	Ngm	10.5	for trout
Avg DO (or <u>DO after 5</u> BOD 5-day (d	days	mg/L		- -			none
E. Coli		colonies/ 100 mL	25	S. 12	Paple0 n.001	25	< 235 colonies/ 100 mL
рН	11.8	units	8.36	1.8.	finu	8.36	Avg 6-9
Temp at Yo Upstream (1 Temperature (1)	mi) Temp	۰C			-	Your She	< 5° F < 2° F in a trout stream
Total Phospha		mg/L			2.Din	stade	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	0	mg/L	2.64	0		2.64	< 44 mg/L
Transparency	(Tube)	cm	760	5		760.	none
Turbidity (from in dat	chart use tabase entry)	NTU/JTU			ыли * М	< 15	none
Orthophospha	ate	mg/L	0,1	0	.Qm	0.1	none
Ammonia Nitr	ogen	mg/L	0	3	-um	0	.076 mg/L (at pH 7, 20°C)
Total Solids		mg/L			10m		Total Sold
Other							
					1.1	1	

Date	10/20/05 Chen	nical M	onitori R 1A4E	ng Woi	rk She		·
Time	4:00 Ph and Site ID			-	a de la companya de l	Wate	r Temp /7 °C
We	Current Weather: Clear/Seather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St	السبيب ا	Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State <u>Standard</u>
	Dissolved Oxygen (DO)	% Saturation mg/L	7.0	7,0		72 70	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
	E. Coli	colonies/ 100 mL	75		-	75	< 235 colonies/ 100 mL
	рН	units	8,11			8,11	Avg 6-9
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	٥C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michilgan)
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU		18		17.5 45	none
	Orthophosphate	mg/L	0.6			0.6	none
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other						
	Other						

^e 10/21/65 Cher ^{he} 12:00 Stream Na and Site II		IR 112ED W	ATER	10 GI 10	Water	Temp
		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)
Mineral Stradage	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				NA	Avg > 5 mg/L > 4 mg/L > 7 mg/L
	mg/L	NA			MA	for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	0	25	n 991	0	< 235 colonies/ 100 mL
рН	units	NA	4.5	201743	NA	Avg 6-9
Temp at Your Site — Upstream (1 mi) Temp Temperature Change	∘C			lo I	(<u>ro</u> ni) (m.1). To to to to	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L	alar in a state of the		."om	olari	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0	1.00	-NCM	0	< 44 mg/L
Transparency (Tube)	cm	NA			NA	a subjetty i
Turbidity (from chart use in database entry)	NTU/JTU				NA	none
Orthophosphate	mg/L	0	8.6	-Filler	0	none
Ammonia Nitrogen	mg/L	0	0	- JV203	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					0.631 25021
Other						Met U S

www.HoosierRiverwatch.com

72

H

Date	10/21/05 CHE	lame CAL	Nonitor		rk She		emp er Temp 14	°C °C
We		ar/Sunny 🛛	Overcast Overcast	Showers Showers	🗌 Rain (S 🗌 Rain (S		Storm (Heavy) Storm (Heavy)	
		Units	Sample	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	3.0			28	Avg > 5 mg/L > 4 mg/L > 7 mg/L	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					for trout	
	E. Coli	colonies/ 100 mL	750*			750*	< 235 colonies/ 100 mL	
	pH	units	6.90			6.90	Avg 6-9	
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	∘C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0.6			0.6	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	11	//		11 .	none	
	Orthophosphate	mg/L	0.4			0.4	none	
/	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
٦	Fotal Solids	mg/L						
C	Other							
c	Other							

Www.HoosierRiverwatch.com AUESTIONABLE RESULT. COLORATION OF BACTERIA NOT DISTINCTLY CLEAR.

Dat	Stream Na		onitori	ng Wo	rk She		emp r Temp	°C °C
U Tim	Current Weather: Clear Current and Site I Clear Clear	/Sunny	Overcast	Showers Showers	Rain (St	eady)	Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L					Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L			-		none	
	<i>E.</i> Coli	colonies/ 100 mL	400	300		350	< 235 colonies/ 100 mL	
	рН	units					Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L			х х 		< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L					< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU					none	
	Orthophosphate	mg/L					none	
	Ammonia Nitrogen	mg/L					.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							

72

.

Date <u>5 / 9 / 06</u> MM DD YY Certified Monitors' Nar	End Tim	ĩme: ne:	(am/pm)	# Adults # Students Volunteer ID	26 ////
Organization Name				2138	Organizzagy (
Watershed Name	Winenhed		Μ	Vatershed #	with the standing of the
Stream/River Name	Patoka (Please do	River not abbreviate.)	Creak.	Site ID (Above ID r	thumbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Re		Q-Value		Weighting Factor		Calculation
- Dissolved Oxygen	mg/L % saturation	95	x	.18	0	17,1
E. coli	Colonies/100mL	98	x	.17	=	16.7
pH _	7.77 units	86	х	.12	=	10.3
B.O.D. 5 _	mg/L	0/1	х	.12		8.0.0.8
H ₂ O Temp Change _	change in °C	(dat)	х	.11	_	HO Temp
Total Phosphate	mg/L	1999	х	.11	_	Total Pho
Nitrate (NO ₃)	0mg/L	98	х	.10	-	9.8
Turbidity _	15_NTU's	68	х	.09	=	6.1
Weine and Star	NOTATIS	TOTALS	_	.66		60,0
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Very Bad 0 - 24%			UALITY ATING		90.9
	· · · · · · · · · · · · · · · · · · ·			Exce.	110	eut.

Date <u>5 / 9 / 06</u> MM DD YY	-	ime:	(am/pm) (am/pm)		
Certified Monitors' Nan	nes			Volunteer ID	
Organization Name				····-	
Watershed Name	·····		W	atershed #	
Stream/River Name		not abbreviate.)	•	Site ID (Above ID r	Z numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	🛛 Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	🛛 Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test 1	Results]	Q-Value]	Weighting	1	Calculation
	<u>10,5</u> mg/L		173 may		Factor		
Dissolved Oxygen	/02 % saturation		98.5	Х	.18	=	17.7
<i>E</i> . coli	<u> </u>		_50_	Х	.17	=	8.5
рН	7.5 units		93	х	.12	=	
B.O.D. 5	mg/L			x	.12		
H ₂ O Temp Change	change in °C			х	.11	=	
Total Phosphate	mg/L			X	.11	=	
Nitrate (NO ₃)	mg/L		<u>98</u>	X	.10	=	9.8
Turbidity	/ 5 NTU's		68	Х	.09	=	6.1
			TOTALS	Der Level	,66	, ,	53.3
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEI INDEX	_	UALITY		80.8
		L			Ga	10	\$

ADVANCED CHEMICAL MO	ONITORING DATA SHEET
Date 5 9 06 Begin Time : MM DD YY End Time :	(am/pm) # Students
Certified Monitors' Names	
Organization Name	
Watershed Name	Watershed #
Stream/River Name <u>Dillon Creek</u> (Please do not abbreviate.)	Site ID 3 (Above ID numbers are required.)
Current Weather 🛛 Clear/Sunny 🗍 Overcast	Showers Rain (Steady) Storm (Heavy)
Weather in Past 48 hrs. 🖻 Clear/Sunny 🔲 Overcast	Showers Rain (Steady) Storm (Heavy)
WATER QUALITY	
You may perform as many of the following tests as you to obtain a Total Water Quality Index value. Divide the Weighting Factor column to obtain the Water Quality Test Results	ne total of the <i>Calculation</i> column by the total of lity Index rating.
Test Results	Q-Value Weighting Calculation Factor
mg/L Dissolved Oxygen % saturation	<u>_98</u> X .18 = <u>_17.6</u>
E. coli colonies/100mL	
pH <u>7.77</u> units	<u>86</u> X .12 = <u>10.3</u>
B.O.D. 5 mg/L	X .12 =
H ₂ O Temp Change change in °C	X .11 =
Total Phosphate mg/L	X .11 =
Nitrate (NO ₃) mg/L	<u>98</u> X .10 = <u>9,8</u>
Turbidity 15 NTU's	<u>68</u> × .09 = <u>6.1</u>
	TOTALS ,66 54.3
'Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%	WATER QUALITY

•••

www.HoosierRiverwatch.com

Date <u>5 / 9 / 06</u> MM DD YY		`ime:: ne::			· · · · · · · · · · · · · · · · · · ·
Certified Monitors' Nan	nes	· · · · · · · · · · · · · · · · · · ·		Volunteer ID	-
Organization Name	м 				
Watershed Name			W	atershed #	
Stream/River Name <u>Davis Creek</u> (Please do not abbreviate.) Site ID <u>#4</u> (Above ID numbers)					
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.		Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test 1	Results]	Q-Value]	Weighting		Calculation
	mg/L				Factor		
Dissolved Oxygen	107 % saturation		96.5	×	.18	=	17.4
E. coli	colonies/100mL		_98_	x	.17	=	16.7
рН	7.74 units		93	x	.12	=	11.2
B.O.D. 5	mg/L		······	x	.12	=	
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO₃)	mg/L		87.5	х	.10	=	8.8
Turbidity	/ 5 NTU's		68	х	.09	=	611
·		ـــــــــــــــــــــــــــــــــــــ	TOTALS	L.	.66	r	60.2
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	· · · · · · · · · · · · · · · · · · ·		WATEI INDEX	-	UALITY TING		91.2
L		1			Excel	le	at-

1. 18 1.

Date <u>6 / 1 / 06</u> MM DD YY	C.	ime: e:					
Certified Monitors' Nar	nes		•	Volunteer ID			
Organization Name					······································		
Watershed Name	****		Wa	tershed #			
Stream/River Name <u>Pinnick Creck</u> Site ID <u>#5</u> (Please do not abbreviate.) (Above ID numbers are required.)							
	(riease do	not abbreviate.)		(Above ID r	umbers are required.)		
Current Weather	Clear/Sunny		Showers	(Above ID r	Storm (Heavy)		

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test	Results]	Q-Value]	Weighting]	Calculation
	<u>13.0</u> mg/L				Factor		
Dissolved Oxygen	2 140 % saturation		50	×	.18	=	9,0
E. coli	200 colonies/100mL		37	х	.17	=	6.3
рН	8.69 units		63	x	.12	11	7.6
B.O.D. 5	mg/L			х	.12	,	
H ₂ O Temp Change	change In°C		,	х	.11	=	*******
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	<u>2.6</u> ₽ mg/L		88	х	.10	=	_8,8
Turbidity	/5 NTU's		68	x	.09	=	_6.1_
· ·		ــر بــــــــــــــــــــــــــــــــــ	FOTALS	L.	.66	L	37.8
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEI INDEX		UALITY TING		57.3
	· · · · · · · · · · · · · · · · · · ·		•		Med	lie	cm ····

www.HoosierRiverwatch.com

Date <u>5 / 9 / 0 6</u> MM DD YY Certified Monitors' Nam	End Tim		(am/pm)	# Adults # Students Volunteer ID	······································
Organization Name					
Watershed Name		NANGLU I INTERNET		atershed #	
Stream/River Name	Sugar (Please do	<u>Creek</u> not abbreviate.)			#6 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	🛛 Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test	Results /7.0 mg/L	Q-Value]	Weighting Factor		Calculation
Dissolved Oxygen	> 140 % saturation	50	х	.18	=	9.0
E. coli	/ 0 0 colonies/100mL	45	х	.17	=	7.7
рН	<u>9.87</u> units	25	х	.12	=	3.0
B.O.D. 5			х	.12	H.	
H ₂ O Temp Change	change In°C		х	.11	=	
Total Phosphate	mg/L		х	.11	=	
Nitrate (NO ₃)	mg/L	_93_	х	.10	=	9.3
Turbidity	<u>16</u> NTU's	67	Х	.09	=	6.0
- XXXX-10-10-0-0-10-0-0-0-0-0-0-0-0-0-0-0-		 FOTALS		,66		35.0
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%	WATEI INDEX		UALITY TING		53.0
	· · ·	· ·		Med	1:	· · · · · · · · · · · · · · · · · · ·

ADVANCEI) CHEMICAL	MONITORING	DATA	SHEET
----------	------------	------------	------	-------

Date <u>5 / 9 / 06</u> MM DD YY Certified Monitors' Names_	Canada and and and	e:	and The Instruction	# Adults # Students Volunteer ID_	The M Lorentee C 1
Organization Name				ershed #	Organization N
Watershed Name Stream/River Name				Site ID	
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	lear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Re	<i>sults</i>	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen _	110 % saturation	95	х	.18	_	17.1
<i>E</i> . coli _	33 colonies/100mL	52	x	.17	=	8.8
рН	7.87 units	84	х	.12	=	10.1
B.O.D. 5	mg/L	Q11	х	.12	=	8.0.0.8
H ₂ O Temp Change	change in°C	u arto	х	.11	=	H,O Temp
Total Phosphate	mg/L	(<u>ed</u>	х	.11	=	Total Phot
Nitrate (NO ₃)	0. 1 mg/L	98	x	.10	-	9.8
Turbidity	15 NTU's	68	x	.09	=	6.1
2,94, <u>)</u>	TOTALS	TOTALS	L	.66	L	51.9
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Very Bad 0 - 24%	WATEI INDEX		UALITY		78.6
	and the second			G	200	nd

Date <u>6 / / / 06</u> MM DD YY	End Tin	Yime ; ne ;	(am/pm)		
Certified Monitors' Names		· · · · · · · · · · · · · · · · · · ·	·	Volunteer ID	•
Organization Name	·				
Watershed Name			W	atershed #	
Strēam/River Name		not abbreviate.)		Site ID	the generation of the second s
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	C Overcast	□ Showers	🗌 Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Re			Q-Value		Weighting Factor		Calculation
Dissolved Oxygen	mg/L % saturation		92.5	x	.18	-	16.7
E. coli	225 colonies/100mL		36	х	.17	=	_6,1
pH _	7.5 units		93	х	.12	=	11.2
B.O.D. 5	mg/L			х	.12	Ξ.	
H ₂ O Temp Change	change in°C		·····	Х	.11	=	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	0.93 mg/L		_99_	х	.10	=	9.4
Turbidity	5 NTU's		68.	х	.09	=	_6.1_
		ے م	TOTALS	î	.66	L	49.5
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Bad 25 - 49% Very Bad 0 - 24%		WATEI INDEX	-	UALITY TING		75.0
			,		Go	<u> </u>	4

Date <u>5 / 9 / 06</u> MM DD YY Certified Monitors' Nam	End Time	me:	_ (am/pm)	# Adults # Students Volunteer ID	de MM
Organization Name				2.00	Organization N
Watershed Name	San Sungan William		W	atershed #	Witesbed Nu
Stream/River Name		not abbreviate.)	<u> </u>	Site ID (Above ID r	umbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test Results	Q-Value		Weighting Factor]	Calculation
Dissolved Oxygen /22 % saturation	89	x	.18	=	16.0
E. coli <u>133</u> colonies/100mL	42.5	х	.17	=	7.2
pH 7.86 units	84	х	.12	=	10,1
B.O.D. 5 mg/L	1000 consistentia	х	.12	=	8.0 0.5
H ₂ O Temp Change change in°C	40 (<u>211</u>)	х	.11	=	qmeT.Q.H
Total Phosphate mg/L	4	х	.11	=	Total Phon
Nitrate (NO ₃) <u>3.52</u> mg/L	78	x	.10	=	7.8
TurbidityNTU's	68	x	.09	=	6,1
TODUS AGA AGA	TOTALS	-	.66	L	47.2
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 100% 100%	WATEI INDEX		UALITY TING		71.5
	C. B. Links		G	00	4

Date <u>5/9/06</u>	Begin T	ime:	(am/pm)	# Adults			
MM DD YY	End Tim	e::	(am/pm)	# Students			
Certified Monitors' Nar	nes	· · · · ·		Volunteer ID	······································		
Organization Name							
Watershed Name		····		atershed #			
Strēam/River Name	(Please do	77-15-14-14 not abbreviate.)	y to Ratek	Above ID r	umbers are required.)		
Current Weather	Clear/Sunny	C Overcast	□ Showers	Bain (Steady)	Storm (Heavy)		
Weather in Past 48 hrs.	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)		

WATER QUALITY INDEX (WQI)

Test	Results		Q-Value		Weighting Factor		Calculation
	mg/L				racior		
Dissolved Oxygen	120 % saturation		90	Х	.18	=	16.2
E. coli	colonies/100mL		34	х	.17	=	5.8
рН	8,18 units		_77	х	.12	1	9.2
B.O.D. 5	mg/L			х	.12	Π.	
H ₂ O Temp Change	change in°C		<u> </u>	х	.11	Ξ	
Total Phosphate	mg/L		· · · · · · · · · · · · · · · · · · ·	х	.11	=	
Nitrate (NO ₃)	4.4 mg/L		68	x	.10	=	6.8
Turbidity	NTU's		68	x	.09	1	6.1
		, ,	TOTALS	L	,66	L	44,1
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEI INDEX		UALITY		66.8
		1		/	Mediu	191	

Date <u>6 / 1 / 06</u> MM DD YY	Begin Time _ End Time _		Sector Los	# Adults # Students	Date <u>6 / / /</u>
Certified Monitors' Names_	1.			_ Volunteer ID	Corthesi Mon
Organization Name				1013	i organizzelon i
Watershed Name			Wat	ershed #	
			and the second second second second		
Stream/River Name 7e	(Please do not abl		<u></u>	Site ID (Above ID n	
anter a sungdiven (1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	(Please do not abl	previate.)	☐ Showers		11

WATER QUALITY INDEX (WQI)

Test Results	Q-Value		Weighting Factor		Calculation
Dissolved Oxygen% saturation	92	x	.18	=	16.6
<i>E.</i> coli <u>150</u> colonies/100mL	41	x	.17	=	7.0
pH 7.57 units	92	x	.12	=	11.0
B.O.D. 5 mg/L		Х	.12	=	a.c.o.s
H ₂ O Temp Change change in°C	<u></u> -	х	.11	=	the Tamp
Total Phosphate mg/L	Ngen _{serve}	х	.11	=	Total Pitol
Nitrate (NO ₃) ///4 mg/L	93	х	.10	=	9.3
Turbidity 15 NTU's	68	х	.09	=	6.1
1. TO ALSO	TOTALS	-	,66	L.	50.0
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 100% 100%			UALITY ATING Good		75.8

Date <u>6 / / / 06</u> MM DD YY			(am/pm) (am/pm)	# Adults # Students	
Certified Monitors' Nam	les	·		Volunteer ID	
Organization Name			a	19-19-19-19-19-19-19-19-19-19-19-19-19-1	
Watershed Name			W	atershed #	
Stream/River Name		Creck not abbreviate.)		Site ID (Above ID r	tumbers are required.)
Current Weather	Clear/Sunny	Povercast	□ Showers	🛛 Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	C Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

Test I	Test Results			<u>ן</u>	Weighting	1	Calculation
	7mg/L				Factor		
Dissolved Oxygen	87% saturation		94	Х	.18	=	16.9
E. coli	colonies/100mL		_51	х	.17	I	8.7
рН	<u>9.6</u> units		30	х	.12	=	3.6
B.O.D. 5	mg/L		<u></u>	х	.12	=	
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			X	.11	=	
Nitrate (NO ₃)	mg/L		_978_	х	.10	=	9.8
Turbidity	<u>/5</u> NTU's		68	x	.09	=	6.1
			FOTALS		.66		45.1
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEF INDEX	_	UALITY TING		68.3
					Med	iy	m

Date <u>6 / 1 / 06</u> MM DD YY	End Tim	ime:	_	# Students					
Certified Monitors' Nar	nes	<u></u>	·····	_ Volunteer ID_					
Organization Name	Organization Name								
Watershed Name Watershed #									
		Stream/River Name <u>Patoka River - Seitz Bridge</u> Site ID <u>#13</u> (Please do not abbreviate.) (Above ID numbers are required.)							
Strëam/River Name 📕	Atoka Rij (Please do	not abbreviate.)	tz Bridg	€Site ID# (Above ID n	umbers are required.)				
Strëam/River Name <u>/</u> Current Weather	Clear/Sunny		Hz Bridg	e Site ID (Above ID n □ Rain (Steady)	umbers are required.)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test F	Results]	Q-Value	1	Weighting	1	Calculation
	6 mg/L				Factor		
Dissolved Oxygen	66 % saturation		68.6	Х	.18	=	12.4
<i>E</i> . coli	200 colonies/100mL		37	х	.17	=	6.3
рH	7.26 units		92	х	.12	=	11.0
B.O.D. 5	mg/L			Х	.12	1	
H ₂ O Temp Change	change in °C			х	.11	8	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	mg/L		93	х	.10	=	9.3
Turbidity	20 NTU's		62	X	.09	=	5.6
		_م بر سور	FOTALS	L.	,66		44.6
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69					UALITY TING		67.6
					Medi	41	

......

www.HoosierRiverwatch.com

Date <u>6 / 1 / 06</u> MM DD YY		ime:			
Certified Monitors' Nan	nes				
Organization Name					
Watershed Name			W	atershed #	
Stream/River Name		not abbreviate.)	e		Mumbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	🛛 Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

	Test Results	7	Q-Value	1	Weighting	1	Calculation
	6,5 mg/L				Factor		
	Dissolved Oxygen73% saturation		80.3	X	.18	=	14.5
	E. coli colonies/100ml	-	49	х	.17	=	8.3
	pH 7,3 units		92	х	.12	=	11.0
	B.O.D. 5 mg/L			х	.12	=	
	H ₂ O Temp Change change in °C			х	.11	=	
	Total Phosphate mg/L			х	.11	=	
	Nitrate (NO ₃) /· 8 mg/L		91	х	.10	=	9.1
	Turbidity 19 NTU's		64	x	.09	=	.5.8
_			TOTALS	L	,66	L	48.7
0	Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%	,	WATER	20	UALITY TING		73.8
L		Good					

www.HoosierRiverwatch.com
Date <u>6 / 1 / 06</u> Begin Time MM DD YY End Time Certified Monitors' Names	_ (am/pm)	# Adults # Students Volunteer ID
Organization Name		Organization Nares
Watershed Name	Wate	ershed #
Stream/River Name <u>Beaver Creek</u> (Please do not abbreviate.)	2 3 9 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Site ID # 14 A (Above ID numbers are required.)
Current Weather	Showers	Rain (Steady) 🛛 Storm (Heavy)
Weather in Past 48 hrs. Clear/Sunny Overcast	□ Showers □	Rain (Steady) Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results7mg/L	Q-Value	Weighting Factor	Calculation
Dissolved Oxygen % saturation	90.4	X .18	= 16.3
E. coli	mL <u>42</u>	X .17	= 7.1
pH 7.34 units	92	X .12	= 11.0
B.O.D. 5 mg/L	non	X .12	B.0.0.8
H ₂ O Temp Change change in°C	in square	X	di Morteno i
Total Phosphate mg/L	Ppos	X	
Nitrate (NO ₃)	93	X .10	= 9.3
Turbidity <u>17</u> NTU's	66	X .09	=
TOTALS	TOTALS	.66	49.6
Excellent 90 - 100% Bad 25 - 49 Good 70 - 89% Very Bad 0 - 24 Medium 50 - 69% 100% 100%	WATER	QUALITY RATING	75.2
		Goog	1

Date <u>6 / 1 / 06</u> MM DD YY	_		(am/pm) (am/pm)					
Certified Monitors' Nan	108		· · · · · · ·	Volunteer ID				
Organization Name								
Watershed Name Watershed #								
Stréam/River Name Jaspen Lake - Outfall Site ID #15 (Please do not abbreviate.) (Above ID numbers are required								
Current Weather	Clear/Sunny	Overcast	Showers	🛛 Rain (Steady)	☐ Storm (Hea∨y)			
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)			

WATER QUALITY INDEX (WQI) You may perform as many of the following tests as you wish; however, at least 6 must be completed

to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test .	Results]	Q-Value	1	Weighting	1	Calculation
Discolused Owner	<u> </u>		27	v	Factor		4.9
Dissolved Oxygen	<u> </u>		4	Х	.18	=	
E. coli	C colonies/100mL		_98_	Х	.17	=	16.7
рН	7.54 units		93	х	.12	=	11.2
B.O.D. 5	mg/L			Х	.12	=	
H ₂ O Temp Change	change in°C			Х	.11	=	WYEYSAMILE
Total Phosphate	mg/L			Х	.11	=	
Nitrate (NO ₃)	<u></u>		91	X	.10	=	9.1
Turbidity	<u>15</u> NTU's		68	X	.09	=	6.1
		-	FOTALS		,66		48.0
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEI INDEX	-	UALITY ATING		72.7
					Good		

Date <u>6</u> / <u>1</u> / <u>06</u> MM DD YY Certified Monitors' Names Organization Name	End Tim	me:	(am/pm)			
Watershed Name			Watershed #			
Stream/River Name		Run not abbreviate.)		Site ID (Above ID n	tumbers are required.)	
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)	
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)	

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test K	Results mg/L		Q-Value]	Weighting Factor	1	Calculation
Dissolved Oxygen	46 % saturation		37.8	x	.18	=	6.8
<i>E</i> . coli	ZZ5 colonies/100mL		36	х	.17	=	6.1
рН	7.12 units		91	х	.12	11	10,9
B.O.D. 5	mg/L			x	.12	Π.	· · · · · · · · · · · · · · · · · · ·
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L		-	х	.11	=	
Nitrate (NO ₃)	0,9 mg/L		94	х	.10	=	9.4
Turbidity	19NTU's		69	×	.09	=	5.8
			TOTALS		,66		39.0
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	• • •		RA	UALITY TING		59.1	
		1	anto Ender		Medi	41	77

9:30 Ar3 Stream Na and Site II		TOKA Riv 1	ER		Water	Temp 16
Current Weather: Clear		Overcast	Showers Showers	Rain (Sto		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	110 11			110	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L			-		none
E. Coli	colonies/ 100 mL	0			0	< 235 colonies/ 100 mL
рН	units	7.77		and a second	7.77	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C	-		_	-	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L				- Aller	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L
Transparency (Tube)	cm	>60			>60.	
Furbidity (from charit use in database entry)	NTU/JTU	- Control of			< 15	none
Orthop hosphate	mg/L	0.04			0.04	none
Ammonia Nitrogen	mg/L	0.05			0.05	.076 mg/L (at pH 7, 20°C)
rotal Solids	mg/L					
Other						

72

E

^e 10:30AM Stream N and Site I	mical N ame CAN D #	E CREE				Temp /4.
Current Weather: Clear Clear in past 48 hrs: Clear	r/Sunny	Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)
	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				102	Avg > 5 mg/ > 4 mg/L
	mg/L	10	11	1	105	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	67			67	< 235 colonies/ 100 mL
рН	units	7.50			7,50	Avg 6-9
Temp at Your Site Distream (1 mi) Temp Temperature Change	°C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO3)	mg/L	0			6	< 44 mg/L
Transparency (Tube)	cm	>60			> 60	none
Turbidity (from charit use in database entry)	NTU/JTU				< 15	
Orthophosphate	mg/L	0.24			0.24	none
Ammonia Nitrogen	mg/L	6			0	.076 mg/L (at pH 7, 20=C)
Total Solids	mg/L	-				
Other FLOW		4.31 CFS			4.31 CFS	
Other						

e 5-9-06 Che e 10:50 AM Stream N and Site	ame DIL	and the second se	EEK	rk She		Temp /3.5
Current Weather: Clear eather in past 48 hrs: Clear	No. of Concession, Name	Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
Avaroga Sconding	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L			gë enumos rigim	105	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	33		dinsteo m 001	33	< 235 colonies/ 100 mL
рН	units	7.77		etine.	7.77	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				ulle nod Tali (o) (assact)	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			f grin 1	estar a	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0	5.62	digen (0	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60			>60 <15	none
Orthophosphate	mg/L	0.2	40	-viiau	0.2	none
Ammonia Nitrogen	mg/L	0.	3.1	3.0m	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			Sem .		ilos Inos
Other FLOW	2.86 CFS				2.86 CFS	Annar 18
Other						

72

0 /		onitori	-	rk She	et Air T	emp o	°C
me //:20 Stream Na and Site II	0.1	is CREEK ty			Wate	r Temp 14.5	°C
Current Weather: Clear Weather in past 48 hrs: Clear	/Sunny	Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
	Units	Sample	Sample 2	Sample 3	Average	State Standard	
Dissolved Oxygen (DO)	% Saturation mg/L				107	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		-			none	
<i>E</i> . Coli	colonies/ 100 mL	0			0	< 235 colonies/ 100 mL	
рН	units	7.74			7.74	Avg 6-9	
Temp at Your Site Upstream(1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
Total Phosphate	mg/L		*	е. – е.		< .04 mg/L (in Lake Michigan)	
Nitrate (NO3)	mg/L	0.22			0.22	< 44 mg/L	
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			>60 <15	none	
Orthophosphate	mg/L	0.2			0.2	none	
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
Total Solids	mg/L						
Other FLOW	5.66 CFS			×	5.66 CFS.		
Other							

e 9:15 Am and Site	ID #5		K	Cit ali	Water	Temp 21.5
Handald in the set of the second set of	Cardin (Print)	Overcast	Showers Showers	Rain (S	teady)	Storm (Heavy) Storm (Heavy)
	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation				140+	Avg > 5 mg/ > 4 mg/L > 7 mg/L
	mg/L	13	13		15	for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	200	NA (1997) 1	075600. 9.001	200	< 235 colonies/ 100 mL
рН	units	8.64		inu		Avg 6-9
Temp at Your Site 	°C		_	2		< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Agen	e Crarle a	< .04 mg/L (In Lake Michigan)
Nitrate (NO ₃)	mg/L	2.64		Jen	2.64	< 44 mg/L
Transparency (Tube)	cm	>60			>60.	none
Turbidity (from chart use in database entry)	NTU/JTU		en de la com		< 15	
Orthophosphate	mg/L	0	0.5		0	none
Ammonia Nitrogen	mg/L	0.		Deal -	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			- mg-		lid2.leto7
Other FLOW	ins.	2.14 CFS		133	2.14 CFS	010.97
· · · ·						

Date	0-7-06 CHE	mical N			rk She	et Air T	emp	°C
Time	//:50 Stream N and Site I			EK		Wate	r Temp_21.5	°C
We		r/Sunny	Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)	
		Units	Sample	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation				140+	Avg > 5 mg/L > 4 mg/L	
		mg/L	17			17.	> 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	E. Coli	colonies/ 100 mL	100	100		100	< 235 colonies/ 100 mL	
	рН	units	9.87			9.87	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
ŀ	Total Phosphate	mg/L					< .04 mg/L (In Lake Michigan)	
1	Nitrate (NO ₃)	mg/L	1.14			1.14	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	56			56 16	none	
C	Orthophosphate	mg/L	0,3			0.3	none	
1	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20=C)	
Г	Fotal Solids	mg/L						
c	Other FLOW	0.89 CFS				0.89 CFS		
c	Dther							

2 1

5-9-06 Che 12:30 Stream N and Site			IFR	ता हा		r Temp 16
Current Weather: Clear reather in past 48 hrs: Clear	r/Sunny	Overcast	Showers Showers	Rain (S	and the second second	Storm (Heavy) Storm (Heavy)
ageneration ageneration	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation			((110	Avg > 5 mg/L > 4 mg/L
Alon of	mg/L	11	DA .	1.50 M	a the sec	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	33	5.85	Anciesci (5804	33	< 235 colonies/ 100 mL
рН	units	7.87	e 🤇 💡	elcir d	7.87	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C			- <u>-</u>		< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Spm'	orard .	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	6	0,158	1.610	0.1	< 44 mg/L
Transparency (Tube)	cm	>60	aver.	ma.	>60.	Transpage
Turbidity (from chart use In database entry)	NTU/JTU				< 15	none
Orthophosphate	mg/L	0.2	0.2 .		0.2	none
Ammonia Nitrogen	mg/L	0	0	i gro	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			.ngm		Roth Soll
Other						San Star
Other						Tanta

Date	6-1-06 CHE		lonitori		rk She	et Air T	emp	°C
Time	9:55 Am Stream Na and Site I		ON CREEK 8			Wate	r Temp 22,5	°C
We	Current Weather: Clear eather in past 48 hrs: Clear	r/Sunny 🛃	Overcast Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	10			115	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		-			none ·	
	E. Coli	colonies/ 100 mL	225			225	< 235 colonies/ 100 mL	
	рН	units	7,50	2		7.50	Avg 6-9	
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	o oC					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0,93			0,93	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			760 215	none	
	Orthophosphate	mg/L	0.6			0.6	none	
/	Ammonia Nitrogen	mg/L	0			D	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
0	Other FLOW	4.19 CES				4.19 CFS		
c	Other							

e5-9-06 Che Stream N and Site	lame LE15	TNER CRE	and the second se	ork She		Temp 16.5
Current Weather:	ar/Sunny	Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
and Second Second	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	12		2 20042 0 00	122	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	/33	31	610100 11.07	133	< 235 colonies/ 100 mL
рН	units	7.86		eitra)	7.86	Avg 6-9
Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	∘C	_			07.00 12.007 (< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Door 1	eise	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	3.52	X	.lsgm	3,52	< 44 mg/L
Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	>60			>60 215	none
Orthophosphate	mg/L	0	10.	Japes	0	none
Ammonia Nitrogen	mg/L	0		.Nom	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			April		808 6107
Other <u>FLOW</u>	0.728 CFS				0.728 CFS.	Canor
Other						There

Date	/ //				rk She		emp °C
Time	1:15 PM and Site I		MED TRIB	UTARY TO	PATOKA RI	Wate	r Temp 🏹 🛛 °C
We	Current Weather: Clear		Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L				120	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
	E. Coli	colonies/ 100 mL	300	9 A.		300	< 235 colonies/ 100 mL
	pH	units	8.18			8.18	Avg 6-9
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L		Ξ.			< .04 mg/L (in Lake Michigan)
	Nitrate (NO3)	mg/L	4.4			4.4	< 44 mg/L
	Transparency (Tube) Turbidity (from chaft use in database entry)	cm NTU/JTU	>60			760 415	none
-	Orthophosphate	mg/L	0.5			0.5	none
	Ammonia Nitrogen	mg/L	0	1		0	.076 mg/L (at pH 7, 20°C)
-	Total Solids	mg/L					
	Other FLOW		0.36 CFS			0.36 CFS.	
C	Other						

eather in past 48 hrs: Clear/Sunny Overcest Statute Units Sample Sample Sample Sample Average Dissolved Oxygen (DO) Saturation //// ///// ////////////////////////////////////	• 10:15 AM and Site		and the second se			Wate	r Temp 🏒
UnitsUnits123AverageStandaDissolved Oxygen (DO)Saturation/////////////////////// $Avg > 5m < 3m <$							Storm (Heavy) Storm (Heavy)
Dissolved Oxygen (DO)Saturation 100 100 100 Avg DO (original) - DO.after 5 days BOD 5-day (difference) 100 100 100 100 E. Colicolonies/ 100 mL 150 1500 1500 2235 		Units	Sample	-		Average	State Standard
mg/L lo lo lo $s/mg/L$ Avg DO (original) – DO after 5 days BOD 5-day (difference) mg/L $=$ $=$ $=$ mg/L $=$ $=$ $=$ $=$ $=$ $E. Coli$ $colonies/100 mL$ $l50$ $l50$ $l50$ pH units 7.57 7.57 $restriction modelpHunits7.57restriction modelrestriction modelpHunits7.57restriction modelrestriction modelremp at Your Site– Upstream(1m) TempTotal Phosphatemg/Lrestriction modelrestriction modelNitrate (NO3)mg/Ll, l/4l, l/4l. l/4restriction modelNitrate (NO3)mg/Ll, l/4sloonsloonTurbidity (from charit usein database entry)mg/Lo, lo, lo, lOrthophosphatemg/Lo, lo, lo, lo, lAmmonia Nitrogenmg/Lo, lo, lo, lo, lOthop (Figure 6, front)o, lo, lo, lo, l$	Berry Barrissing				Sides (9	116	Avg > 5 mg/ > 4 mg/L
$\begin{array}{c c c c c c c c c c c c c c c c c c c $,	mg/L	10	10		den.	> 7 mg/L for trout
E. ColiColonies/ 100 mL150150150colonies 100 mLpHunits 7.57 7.57 $Avg 6.9$ Temp at Your Site - Upstream(1mi)Temp Temperature Change \circ C $Total Phosphatemg/LNitrate (NO3)mg/L1.14/Transparency (Tube)Turbidity (from chart usein database entry)cm>60>60Orthophosphatemg/L0.60.6Orthophosphatemg/L0.10.10.1Orthophosphatemg/L0.10.10.1Orthophosphatemg/L0.10.10.1Orthophosphatemg/L0.10.10.1Orthophosphatemg/L0.10.10.1Output0.66mg/L0.660.66Output0.660.660.66Output0.660.660.66Output0.660.660.66$	- DO after 5 days	mg/L	-				none
Temp at Your Site	E. Coli		150		10251	150	< 235 colonies/ 100 mL
Upstream (1 mi) Temp Temperature Change \circ C $ <$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ <td>рН</td> <td>units</td> <td>7.57</td> <td></td> <td></td> <td>7.57</td> <td>Avg 6-9</td>	рН	units	7.57			7.57	Avg 6-9
Total Phosphatemg/Lmg/L	- Upstream (1 mi) Temp	°C			3	qaaliirai) Toosottoo	< 2° F in a trout
Transparency (Tube) Turbidity (from chart use in database entry)cm>60>60noneNTU/JTUNTU/JTUnoneOrthophosphatemg/L0.60.60.6noneAmmonia Nitrogenmg/L0.10.10.1.076 mg/LTotal Solidsmg/L0.660.660.66.076 mg/L	Computering and the	mg/L				9181	< .04 mg/L (in Lake Michigan)
Turbidity (from chart use in database entry)NTU/JTU< 15noneOrthophosphatemg/L0.60.6noneAmmonia Nitrogenmg/L0.10.10.1Total Solidsmg/L0.660.660.66	Nitrate (NO ₃)	mg/L	1.14			1.14	< 44 mg/L
Ammonia Nitrogen mg/L 0,1 .076 mg/L Total Solids mg/L 0.66 0.66 0.66	Turbidity (from chart use		>60			>60 < 15	none
Ammonia Nitrogen mg/L 0, / (at pH 7, 20°C) Total Solids mg/L 0.66 0.66	Orthophosphate	mg/L	0.6			0.6	none
0.66 0.66	Ammonia Nitrogen	mg/L	0.1			0,1	.076 mg/L (at pH 7, 20°C)
0.66 0.66	Total Solids	mg/L		1 2 5 1	-		
Other FLOW CFS CFS	Other FLOW	and the second				0.66 CFS	

72

Date	6-1-06 Che	mical N	Nonitori	ing Wo	rk She	et Air To	emp	°C
Time	D: 40 AM and Site			EEK		Wate	r Temp 27	°C
		r/Sunny	Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)	y.
		Units	Sample	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation				87	Avg > 5 mg/L > 4 mg/L	
		mg/L	7	7		7.15	> 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L				_	none	
	E. Coli	colonies/ 100 mL	25	а А		25	< 235 colonies/ 100 mL	
	pH	units	9.70	9.54		9.6	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L	s.				< .04 mg/L (in Lake Michlgan)	
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	760			>60 < 15	none	
	Orthophosphate	mg/L	0			0	none	•
	Ammonia Nitrogen	mg/L	D			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L	· .					
	Other FLOW		7.69 CFS			7.64 CFS		
¢	Other							

wers Rain (Steady) Storm (Heavy) wers Rain (Steady) Storm (Heavy) nple Sample Average 3 Average State 4 666 Avg > 5 mg/L 4 666 Avg > 5 mg/L 5 7 mg/L for trout 1 200 none 2 200 Avg 6-9 2 7,26 So F 2 - - 1 7,26 Avg 6-9 - - - 1 0 stream - - -
23AverageStandard 2 3 666 4 mg/L $> 4 \text{ mg/L}$ $> 4 \text{ mg/L}$ $> 7 \text{ mg/L}$ 7 mg/L 7 mg/L 200 200 235 $colonies/$ 200 $7,26$ $A vg 6-9$ $< 5^{\circ} \text{ F}$ $20 \text{ Fin a trout stream}}$ $< .04 \text{ mg/L}$
66 >4 mg/L 7 mg/L for trout none <235 200 <235 200 <235 200 <235 200 <235 200 <235 200 <25° 7,26 Avg 6-9 <5° F <2° F in a trout stream <.04 mg/L
image: second
200 <235
200 colonies/ 100 mL 7,26 Avg 6-9 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
<2° F in a trout stream <.04 mg/L
<.04 mg/L (in Lake Michican)
/, / < 44 mg/L
301 management
2 D
0.4 none
.076 mg/L (at pH 7, 20°C)
Light
torits.

72

H

Date	6-1-00 Che		\onitori	~	ork She	et Air T	emp	°C
Time	and Site I		KA RIVEN	2		Wate	r Temp 22	°C
We	Current Weather: Clear eather in past 48 hrs: Clear	r/Sunny	Overcast Overcast	Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation				73	Avg > 5 mg/L > 4 mg/L	
T		mg/L	6.5	6.5	1	6.5	> 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	E. Coli	colonies/ 100 mL	75			75	< 235 colonies/ 100 mL	
	рН	units	7.30			7.30	Avg 6-9	
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L		2			< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	1.8			1.8	< 44 mg/L	
	Transparency (Tube)	cm	34	34		34.		
	Turbidity (from chart use in database entry)	NTU/JTU				19	none	
	Orthophosphate	mg/L	0.4			0.4	none	
	Ammonia Nitrogen	mg/L	0 -			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other					м.		
	Other							

the 12:50 Stream N and Site I		A CREEK	1	94 . Of a	Water	Temp 25
Current Weather: Clea		Overcast [Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
endi ^{re} Telsensyn ^e llensyn ^e	Units	Sample	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation			er et ce	83	Avg > 5 mg/L > 4 mg/L
toot of	mg/L	7	7	Nom	7	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-				none
E. Coli	colonies/ 100 mL	125		daulan h GAr	125	< 235 colonies/ 100 mL
рН	units	7.34	125	cin.	7.34	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C				8/10 1007	< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			Jun	attra	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	1.1	32	.nem	1.1	< 44 mg/L
Transparency (Tube)	cm	45	45	mo	45	
Turbidity (from chart use in database entry)	NTU/JTU				17	none
Orthophosphate	mg/L	0.6		Alam .	0.6	none
Ammonia Nitrogen	mg/L	0		Par	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			.bem		allog loroi
Other			1.0			

Date			onitori		rk Shee	2t Air Te	əmp	°C
Time	Il:10Am Stream Na and Site IE		R LAKE	OUTFALL		Wate	r Temp 25	°C
	Current Weather: Clear/ eather in past 48 hrs: Clear/S		Overcast	Showers Showers	Rain (St		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	3	3		37	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	E. Coli	colonies/ 100 mL	0			0	< 235 colonies/ 100 mL	
	рН	units	7,54			7.54	Avg 6-9	
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	۰C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	1.6			1.6	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			760 215	none	
	Orthophosphate	mg/L	0,1			0,1	none	•
	Ammonia Nitrogen	mg/L	0,1 -	9		0.1	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other FLOW		0.28 CFS			D. 28 CFS		
	Other							<u>s</u> i.

e /: 30 Pm and Site		MET RUN 16	a chian	GI et	Water	r Temp 23
Current Weather: Clear eather in past 48 hrs: Clear	r/Sunny	Overcast Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)
nebrietzi eganwa e	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L		4	ender g	46	Avg > 5 mg/L > 4 mg/L > 7 mg/L
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	7 	- -			for trout
<i>E</i> . Coli	colonies/ 100 mL	225		striction In OCT	225	< 235 colonies/ 100 mL
рН	units	7.12	NYA .	aimu	7.12	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			mon	9134	< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0,70	1.14	.lem	0.9	< 44 mg/L
Transparency (Tube) Turbidity (from chaft use In database entry)	cm NTU/JTU	37	38		37.5	none
Orthopho sphate	mg/L	1.0	1.5	1.5	1.33	none
Ammonia Nitrogen	mg/L	0.5	0.4	Nom	0.45	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			3pm 1		Note: Solle
Other FLOW		7.23 CFS			7.23 CFS	
						and the second designed as

72

Date	/		onitori	ng Wo	rk She	et Air To	emp	°C
Time	4 Pm Stream Na and Site II		ANK IONIZEO	WATER		Wate	r Temp NA	°C
We	Current Weather: Clear ather in past 48 hrs: Clear		Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)	
		Units	Sample	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	NA			NA	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	*
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	E. Coli	colonies/ 100 mL	0			0	< 235 colonies/ 100 mL	
	рН	units	NA			NA	Avg 6-9	
	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	۰C		_			< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L	0				< .04 mg/L (in Lake Michigan)	
4	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760			>60 215	none	*
	Orthoph osphate	mg/L	0			0	none	ž
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L. (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							

Date	0 /	and the second sec	and the second se	ng Wo	rk She	et Air T	emp	°C
Time	e 3:30 Pm Stream Na and Site II		ANK NIZED WA	TER		Wate	r Temp	°C
W	Current Weather: Clear eather in past 48 hrs: Clear/	· ·	Overcast Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)	
		Units	Sample	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	NA				Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — DO after 5 days BOD 5-day (difference)	mg/L			-		none	
	E. Coli	colonies/ 100 mL	0	· · ·		0.	< 235 colonies/ 100 mL	
	рН	units	NA			NA	Avg 6-9	
\mathbf{O}	Temp at Your Site <u>Upstream (1 mi) Temp</u> Temperature Change	°C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L		•			< .04 mg/L (in Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60			760 215	none	
	Orthophosphate	mg/L	0			D	none	•
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
)	Other							à

72

H

′.

ADVA	NCED CHEMI	CAL M	ONITORIN	IG DATA SHI	EET
Date <u>119906</u> MM DD YY Certified Monitors' Nar	Begin Time _ End Time _ nes	:	(am/pm)	# Adults # Students Volunteer ID_	more left her bergeren
Organization Name		(25.64	and the second s		
Watershed Name	er Elle stevens Li	1280	X	Vatershed #	10/02/04/05/04
Stream/River Name	Patoka Riv	ien	ensis 21 - spie	Once	1
strangen in the same to set the set	(Please do not ab	previate.)		(Above ID 1	numbers are required.)
Current Weather	Clear/Sunny	vercast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.		vercast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results	Q-Value		Weighting Factor	3	Calculation
10.5 mg/L Dissolved Oxygen 98 % saturation	98.4	x	.18	=	17.71
E. coli Ocolonies/100mL	98	x	.17	=	16.7
pH <u>7.23</u> units	92	x	.12	=	11.04
B.O.D. 5 mg/L	6 maria	х	.12	=	nto quast o
H ₂ O Temp Change change in °C	Nom	х	.11	=	Mappine Ist
Total Phosphate mg/L	Anna A	х	.11	=	(<u>(1)4) etc</u> rif
Nitrate (NO ₃)	98	X	.10	=	9.8
Turbidity 15 NTU's	68	x	.09	=	6.1
and a second s	TOTALS		.66	L	61.35
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%	WATE INDEX	R Q	the same start and and start and the	-	9.3

Date <u>11 1 9 1 0 6</u> MM DD YY	Begin T End Tim	ime:	(am/pm) (am/pm)					
Certified Monitors' Names	·			Volunteer ID				
Organization Name								
Watershed Name	Watershed Name Watershed #							
Stream/River Name		not abbreviate.)			2 numbers are required.)			
Current Weather	Clear/Sunny	Overcast	□ Showers	🛛 Rain (Steady)	Storm (Heavy)			
Weather in Past 48 hrs.		D Overcast	□ Showers	Rain (Steady)	Storm (Heavy)			

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

	Test 1	Test Results			1	Weighting]	Calculation
	Dissolved Oxygen	<u></u> mg/L <u></u> % saturation		97.5	х	Factor	=	17.55
	E. coli	colonies/100mL	4	56	х	.17	=	9.52
	рН	7.24 units		92	х	.12	=	11.04
	B.O.D. 5	mg/L			х	.12	Π.	
	H ₂ O Temp Change change in °C				х	.11	=	
	Total Phosphate mg/L			· · · · · · · · · · · · · · · · · · ·	х	.11	=	
	Nitrate (NO ₃)	<u> </u>		96	х	.10	=	9.6
	Turbidity	<u>NTU's</u>		68	x	.09	=	6.1
_				FOTALS	_	. 66		53.81
0	Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%			WATEI INDEX	R Q	UALITY TING Good		81.53

Date <u>11, 9, 06</u> MM DD YY	have been	Time : ne :	and the second state of th	# Adults # Students	Date 10 9
Certified Monitors' Nat	nes			Volunteer ID	
Organization Name				5645	Creetization
Watershed Name	- Esdensters		м	Vatershed #	Wetenhed Nuo
Stream/River Name	Dillon (Please do	Creek not abbreviate.)		Site ID (Above ID r	3 numbers are required.)
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	D Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test R	esults	Q-Value		Weighting		Calculation
	10.5 mg/L	Jam		Factor		
Dissolved Oxygen	94 % saturation	97	х	.18	1	17.46
E. coli	200 colonies/100mL	37	x	.17	=	6.3
рН	7.43 units	93	x	.12	=	11.16
B.O.D. 5	mg/L		x	.12	=	8.0.0.9
H ₂ 0 Temp Change _	change in °C	terla	х	.11	-	duei, p'H
Total Phosphate	mg/L		х	.11	=	Total Phas
Nitrate (NO ₃)	. 62 mg/L	95.5	х	.10	4	9.55
Turbidity	15_NTU's	68	x	.09	=	6.1
	101415	TOTALS	L	. 66	L	50.57
Excellent 90 - 100% Food 70 - 89% Medium 50 - 69%	Very Bad 0 - 24%	WATEI INDEX		UALITY TING		76.62
				60	00	d

Date <u>//, 9,06</u> MM DD YY	Begin T End Tim	`ime:	(am/pm) (am/pm)				
Certified Monitors' Nar	mes		•	Volunteer ID			
Organization Name							
Watershed Name Watershed #							
Stream/River Name	Davis (Please do	Creek not abbreviate.)		Site ID (Above ID r	4 numbers are required.)		
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)		
Weather in Past 48 hrs.	Clear/Sunny	C Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)		

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test 1	Results	1	Q-Value	1	Weighting		Calculation
	/0.5 mg/L		0.5		Factor		
Dissolved Oxygen	97 % saturation		98	х	.18	=	17.64
E. coli	colonies/100mL		48	х	.17	=	
рН	7.50 units		93	х	.12	=	11.2
B.O.D. 5	mg/L			х	.12	.=	· · · · · · · · · · · · · · · · · · ·
H ₂ O Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			Х	.11	=	
Nitrate (NO ₃)	1.23 mg/L		93	х	.10	=	9.3
Turbidity	Turbidity 15 NTU's			х	.09	=	6.1
	h	- -	FOTALS		.66		52.4
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%			WATE INDEX				79.39
		-			60	00	d

Date <u>11 9 06</u> MM DD YY	Begin 7 End Tin	Lime:	(am/pm) (am/pm)	#Adults # Students	Date (1 / 9 MAX 00
Certified Monitors' Na	mes	lease in a second		Volunteer ID	inoM boitaisO 👔
Organization Name				5015	Crgnoization N
Watershed Name	* bederen W		м	Vatershed #	Watecided Nam
Stream/River Name	Sugar (Please do	Creek	1 4 4 1 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Site ID (Above ID 1	6 numbers are required.)
Current Weather Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	☐ Rain (Steady) □ Rain (Steady)	☐ Storm (Heavy) ☐ Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results	Q-Value	1.55	Weighting Factor		Calculation
<u> </u>	98.5	x	.18	=	17.73
, E. coli /20 colonies/100mL	43.4	x	.17	=	7.38
pH 7.18 units	92	х	.12	=	11.04
B.O.D. 5 mg/L	Ngm	х	.12	=	s.o.o.a
H ₂ O Temp Change change in °C	ofiseto	х	.11	=	th _i O Temp
Total Phosphate mg/L	fight more	х		=	Total Plan
Nitrate (NO ₃) <u>3.96</u> mg/L	70	х	.10	4	7.00
Turbidity 15 NTU's	68	x	.09	=	6.1
TOTALS	TOTALS	L	.66	L	49.25
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69% 100% 100%	WATER	R/	UALITY ATING	and the second division of the second divisio	74.62

Date 11 1 9 106 MM DD YY	Begin Ti End Time	me:			
Certified Monitors' Nar	nes			Volunteer ID	
Organization Name					
Watershed Name			Ψ	Vatershed #	
Stream/River Name	Patoka (Please do r	River not abbreviate.)		Site ID (Above ID 1	7 numbers are required.)
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

	Test 1		Q-Value	1	Weighting	1	Calculation	
		<u>9.5</u> mg/L				Factor		
	Dissolved Oxygen 8 8 % saturation			94	Х	.18	=	16.92
ľ	E. coli	colonies/100mL		51	х	.17	=	8.67
	рН	7.56 units		92	х	.12	=	11.04
	B.O.D. 5			X	.12	Η.		
	H ₂ O Temp Change change in °C				х	.11	=	
1	Total Phosphate	mg/L			х	.11	=	
1	Nitrate (NO ₃)	mg/L		98	х	.10	=	9.8
-	Turbidity	/ <u>5</u> NTU's		68	x	.09	=	6.1
_				FOTALS	-	.66	L	52.53
G	xcellent 90 - 100 ood 70 - 89 Iedium 50 - 69	% Very Bad 0-24%						79.59
M				INDEX	RA			17.37 d

Date <u>// 9 / 0 6</u> MM DD YY Certified Monitors' Name	End Tim	ime: e:	(am/pm) (am/pm)	# Adults # Students _ Volunteer ID_	Date // 2 Mic do Certified Month
Organization Name					Orianzario N
Watershed Name	agrierote -		Wa	tershed #	navi badersad // A
Strëam/River Name Ur	(Please do	not abbreviate.)	to Patoka	Riv Site ID	/ 10 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Res	sults	Q-Value	al.	Weighting		Calculation
	10.5 mg/L			Factor		
Dissolved Oxygen	105 % saturation	98	X	.18	=	17.64
E. coli	160 colonies/100mL	40	х	.17	=	6.8
рН	7.48 units	93	x	.12	=	11.15
B.O.D. 5	mg/L	Ngat	х	.12	.=	8.0.D.6
H ₂ O Temp Change	change in °C	rierto	x		=	qmsT Q ₁ 1
Total Phosphate	mg/L	<u>Num</u>	х		=	Total Phos
Nitrate (NO ₃)	<u>4,4</u> mg/L	68	х	.10	4	6.8
Turbidity 80	15_NTU's	68	x	.09	=	6.1
	10000000000000000000000000000000000000	TOTALS	-	.66	L	48.5
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Bad 25 - 49% Very Bad 0 - 24%	WATEI		UALITY		73.48
				600	od	

Date 11, 9, 06 MM DD YY	Begin T End Tim	ime:	(am/pm) (am/pm)		
Certified Monitors' Nar	nes	· · ·	•	Volunteer ID	
Organization Name					
Watershed Name			W	atershed #	
Stream/River Name	Leistn (Please do	er Crei not abbreviate.)	e K	Site ID (Above ID r	9 numbers are required.)
Current Weather	Clear/Sunny	Overcast	☐ Showers	🛛 Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	D Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results		Q-Value	1	Weighting		Calculation
10.5 mg/L				Factor		
Dissolved Oxygen % saturation		99.2	х	.18	=	17.86
E. coli 80 colonies/100	mL .	48	х	.17	=	8.16
pH 7.38 units		93	х	.12	=	11.16
B.O.D. 5 mg/L			х	.12	=	
H ₂ O Temp Change change in°C			х	.11	=	
Total Phosphate mg/L			х	.11	=	
Nitrate (NO ₃) 7.04 mg/L		59	х	.10	=	5.9
Turbidity 15 NTU's		68	x	.09	=	6.1
	/	TOTALS	L.	. 66		49.18
Excellent 90 - 100% Bad 25 - 49 Good 70 - 89% Very Bad 0 - 24 Medium 50 - 69%			-		-	74.52 d

Date /// 9 / 0 6 MM DD YY	End Tim	ime: e:	(am/pm) (am/pm)	# Adults # Students	Pate 1/2 MM 00
Certified Monitors' Nar	nes			Volunteer ID	
Organization Name				dan 2	Organization M
Watershed Name	bagron K		W	atershed #	Watersteed Nam
Stream/River Name	Pinnic.	A REAL PROPERTY AND A REAL	K	Site ID	1.5 0 00000
· · · · · · · · · · · · · · · · · · ·	(Please do	not abbreviate.)		(Above ID 1	numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results mg/L	Q-Value	439	Weighting Factor		Calculation
Dissolved Oxygen% saturation	98.5	х	.18	្ឋ	17.73
<i>E. coli</i> colonies/100mL	45	х	.17	=	7.7
pH	90	х	.12	=	10.8
B.O.D. 5 mg/L	1 <u>500 (</u>	х	.12	=	a.o.p. s
H ₂ O Temp Change change in°C	18/h	х	.11	=	cimeT O _s H
Total Phosphate mg/L	6g.n	x	.11	=	Total Phoe
Nitrate (NO ₃) <u>2.64</u> mg/L	87	x	.10	=	8.7
Turbidity <u>15</u> NTU's	68	x	.09	=	6.1
TOTALS S.S. 2414	TOTALS	L	. 66	L	51.03
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%	WATEI	R Q	UALITY TING Good	-	77.32

Date 11 9 06 MM DD YY		ime:			
Certified Monitors' Nar	mes			Volunteer ID	
Organization Name					
Watershed Name				atershed #	
Stream/River Name	Polson (Please do	Creek not abbreviate.)		Site ID (Above ID 1	8 numbers are required.)
Current Weather	Clear/Sunny	Overcast	□ Showers	🛛 Rain (Steady)	Storm (Heavy)
Weather in Past 48 hrs.	Clear/Sunny	C Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

	Test Results			Q-Value		Weighting Factor		Calculation
Dis	solved Oxygen	mg/L % saturation		98.7	x	.18	=	17.77
<i>E</i> . c	E. coli colonies/100mL			63	х	.17	=	10.71
рН		7.37 units		93	х	.12	=	11.16
B.O	0.D.5	mg/L			x	.12	Ξ.	
H₂O	Temp Change	change in°C			х	.11	=	
Tota	al Phosphate	mg/L		· .	х	.11	=	
Nitr	ate (NO ₃)	3.52 mg/L		17.5	х	.10	=	7.75
Turt	pidity	NTU's		68	x	.09	=	6.1
				FOTALS	L	. 66	L	53.49
'Excel Good Medi	70 - 89	% Very Bad 0 - 24%		WATEI INDEX	R Q	UALITY TING		81.05

Date /////0/06 Begin Time : MM DD YY End Time :	(am/pm) (am/pm)	# Adults # Students	Deta (/ / / /
Certified Monitors' Names		_ Volunteer ID	Cardined Mona
Organization Name	and some data the state of the state of the second s	oma	Organization
Watershed Name	Wat	tershed #	Watershed Nu
Stream/River Name <u>Calumet Rur</u> (Please do not abbreviate.)	1	Site ID (Above ID n	umbers are required.)
Current Weather 🗹 Clear/Sunny 🗘 Overcast	□ Showers	Rain (Steady)	Storm (Heavy)

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results	Sector (C-Variate	Q-Value	e la la	Weighting		Calculation
2	5.75 _{mg/L}			Factor		
	53 % saturation	45.1	х	.18	=	8.12
<i>E</i> . coli/	00 colonies/100mL	45	х	.17	=	7.7
рН	7.0_ units	90	х	.12	=	10.8
B.O.D. 5	mg/L	ligent	х	.12	=	8.0.0.8
H ₂ O Temp Change	change in°C	aiseb	х	.11	=	gmaT O H
Total Phosphate	mg/L	hen	х		-	conti tefor
Nitrate (NO ₃)	97 mg/L	94	х	.10	=	9.4
Turbidity	18_NTU's	64	x	.09	=	5.76
	TOTALS	TOTALS	L	.66	L	41.78
	ad 25 - 49% ery Bad 0 - 24%	WATEI INDEX	_	UALITY TING		63.30.

Date 11 / 10 / 06 MM DD YY	Begin T End Tim	ime:	(am/pm) (am/pm)	# Adults # Students					
Certified Monitors' Nar	nes	·····		Volunteer ID					
Organization Name	<i>2</i>								
Watershed Name	Watershed Name Watershed #								
Stream/River Name	Patok (Please do	a Rive not abbreviate.)	2	Site ID (Above ID 1	14 numbers are required.)				
Current Weather	Clear/Sunny	Overcast	☐ Showers	🛛 Rain (Steady)	Storm (Heavy)				
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

	Test Results]	Q-Value	1	Weighting	1	Calculation
		8.5 mg/L				Factor		
	Dissolved Oxygen	% saturation		86.9	х	.18	=	15.64
	E. coli	colonies/100mL		42	х	.17	=	7.14
	рH	7.28 units		92	х	.12	=	11.04
	B.O.D. 5	mg/L			х	.12	.=	·
	H ₂ 0 Temp Change	change in°C			х	.11	=	
•	Total Phosphate	mg/L			х	.11	=	
	Nitrate (NO ₃)	<u>2.2</u> mg/L		89	х	.10	=	8.9
-	Furbidity	/ 8NTU's		64	x	.09	=	5.76
TOTALS						.66	L	48.48
C	xcellent 90 - 100 ood 70 - 89 Iedium 50 - 69		WATER QUALITY INDEX RATING 73.445					
L		1	600d					
Date <u>////06</u> MM DD YY Certified Monitors' Nat	End Tim	ime :: ne ::		# Adults # Students Volunteer ID	ad MM			
---	-------------	----------------------------	-------------	--	------------------------	--	--	
Organization Name				2013	V gonizinton V			
Watershed Name	Waterships		Watershed #					
Stream/River Name	Beaver	Creek	11.12	Site ID	14A			
exitibat de surguran er soor	(Please do	not abbreviate.)		(Above ID 1	numbers are required.)			
Current Weather	Clear/Sunny	Overcast	Showers	Rain (Steady)	Storm (Heavy)			
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)			

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Rest		Q-Value	1 di	Weighting		Calculation
	/0.0 mg/L	-		Factor		
Dissolved Oxygen	9 2 % saturation	96	X	.18	=	17.28
, E. coli	60 colonies/100mL	51	x	.17	=	8.67
рН	7.25 units	92	х	.12	=	11.04
B.O.D. 5	mg/L	50m	х	.12	=	8.0.0.5
H ₂ O Temp Change	change in °C	iento	х	.11	=	NO Temp
Total Phosphate	mg/L	hen <u>hen</u>	х		=	Total Phot
Nitrate (NO ₃)	<u>3.1</u> mg/L	83.5	х	.10	=	8.35
Turbidity	15_NTU's	68	x	.09	=	6.1
1. S.	TOTAES	TOTALS	L	.66	L	51.44
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Bad 25 - 49% Very Bad 0 - 24%			UALITY TING		77.94
1000000 J0 - 0970				60	00	L

Date // / 0 / 0 6 MM DD YY	0.	ime:		# Adults # Students						
Certified Monitors' Nar	nes			Volunteer ID	· · · ·					
Organization Name										
Watershed Name Watershed #										
Stream/River Name 🦯	Stream/River Name Patoka River - Seitz Bridge Site ID 13 (Please do not abbreviate.) (Above ID numbers are required.)									
Current Weather	Clear/Sunny	Overcast	□ Showers	🛛 Rain (Steady)	Storm (Heavy)					
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)					

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results]	Q-Value	1	Weighting		Calculation
<u>9.5</u> mg/L Dissolved Oxygen <u>88</u> % saturation		94		Factor		16.92
			Х	.18	=	
E. coli colonies/100mL		56	Х	.17	=	9.52
pH7.46 units		93	х	.12	=	11.16
B.O.D. 5 mg/L			х	.12	.=	
H ₂ O Temp Change change in °C			Х	.11	=	
Total Phosphate7.46 mg/L			Х	.11	=	
Nitrate (NO ₃)		94	х	.10	=	9.4
Turbidity <u>17</u> NTU's		66	X	.09	=	5.94
	_ 7	TOTALS		. 66		52.94
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%		WATEI INDEX	R Q	UALITY TING	_	80.21

Date // / 0 / 0 6 MM DD YY	Begin T End Tim	ime:	(am/pm) (am/pm)	# Adults # Students	Data <u>AL</u> opera		
Certified Monitors' Nar	mes		•	Volunteer ID	linoM beititied Monit		
Organization Name				STIL	T Organization N		
Watershed Name	barlarsita?	A	Watershed #				
Stream/River Name	Teder (Site ID			
e mipero a costatura ca contra.	(Please do	not abbreviate.)		(Above ID 1	numbers are required.)		
Current Weather	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)		
Weather in Past 48 hrs.	Clear/Sunny	Overcast	□ Showers	Rain (Steady)	Storm (Heavy)		

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Res		Q-Value	223	Weighting Factor		Calculation
 Dissolved Oxygen	9.5 mg/L 102 % saturation	98.6	x	.18	-	17.75
, <i>E</i> . coli	60_colonies/100mL	51	x	.17	=	8.67
рН	7.53 units	93	x	.12	=	11.16
B.O.D. 5	mg/L	5gm	x	.12	.=	8.0.0.5
H ₂ O Temp Change	change in°C	narta <u>Jam</u>	х	.11	=	Hang Tamp
Total Phosphate	mg/L	<u>Ngra</u>	х	.11	=	Total Phoe
Nitrate (NO ₃)	13.2 mg/L	46	х	.10	=	4.6
Turbidity	15 NTU's	68	x	.09	=	6.1
	2 LATOT	TOTALS	L	.66	L	48.28
Excellent 90 - 100% Good 70 - 89% Medium 50 - 69%	Bad 25 - 49% Very Bad 0 - 24%	WATER	R Q	UALITY TING		73.15
10010111 50 0570	Law many series	antina and an and an an		600	d	

Date // / / 0 / 6 MM DD YY		ime:	-	# Adults # Students					
Certified Monitors' Nan	nes		1•1	Volunteer ID					
Organization Name									
Watershed Name			М	atershed #					
Stream/River Name	Creek not abbreviate.)		Site ID (Above ID r	12. numbers are required.)					
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)				
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)				

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test Results	Q-Vali	ie	Weighting		Calculation
<u>9.5</u> mg/L			Factor		
Dissolved Oxygen 90 % saturation	95	_ X	.18	=	17.1
E. coli 40 colonies/100mL	56	_ X	.17	=	9.52
pH7.76 units	88	_ X	.12	Π	10.56
B.O.D. 5 mg/L		_ X	.12	<mark></mark>	
H ₂ O Temp Change change in °C		_ X	.11	=	
Total Phosphatemg/L		×	.11	=	
Nitrate (NO ₃) -53 mg/L	96	x	.10	=	9.6
Turbidity 15 NTU's	68	X	.09	=	6.1
	TOTAL	S	. 66	L	52.88
Excellent 90 - 100% Bad 25 - 49% Good 70 - 89% Very Bad 0 - 24% Medium 50 - 69%	WAI		UALITY ATING	Ļ	80.12

Date <u>// / / 0 6</u> MM DD YY Certified Monitors' Nar	End Tim	ime:	(am/pm) (am/pm)	# Students	5		
Organization Name							
Watershed Name Watershed #							
Stream/River Name	Jaspen	not abbreviate.)	Outfor		15 numbers are required.)		
Current Weather	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)		
Weather in Past 48 hrs.	Clear/Sunny	Overcast	☐ Showers	Rain (Steady)	Storm (Heavy)		
	The second s						

WATER QUALITY INDEX (WQI)

You may perform as many of the following tests as you wish; however, at least 6 must be completed to obtain a Total Water Quality Index value. Divide the total of the *Calculation* column by the total of the *Weighting Factor* column to obtain the Water Quality Index rating.

Test 1	Results	1	Q-Value	1	Weighting	1	Calculation
	10.5 mg/L				Factor		
Dissolved Oxygen	9 9 % saturation		98.7	X	.18	=	17.77
E. coli	colonies/100mL		63	х	.17	=	10.71
рН	7.80 units		87	х	.12	=	10.44
B.O.D. 5	mg/L		-	x	.12	Ξ.	
H ₂ 0 Temp Change	change in°C			х	.11	=	
Total Phosphate	mg/L			х	.11	=	
Nitrate (NO ₃)	1.98 mg/L		90	х	.10	=	9.0
Turbidity	18_NTU's		64	x	.09	=	5.76
		- - -	FOTALS	L	.66	L	53.68
Excellent 90 - 100 Good 70 - 89 Medium 50 - 69	% Very Bad 0 - 24%		WATEI INDEX	R Q	-		81.3-3-
	· · · · · · · · · · · · · · · · · · ·	1			6000	L	

te 11-9-06	Chei	nical /	Nonitor	ing Wo	rk She	et	Air Temp
	Stream Na and Site I		PATOKA	RIVER	g gesiter	V	Vater Temp 12.5
Current Weather /eather in past 48 hrs		/Sunny	Overcast	Showers Showers	☐ Rain (\$ ☐ Rain (\$	Steady) Steady)	Storm (Heavy) Storm (Heavy)
main St		Units	Sample 1	Sample 2	Sample 3	Avera	ge State Standard
Dissolved Oxyge	n (DO)	% Saturation		98.3%	2000	98%	> 7 mg/L
		mg/L	10.5	10.47		10.0	for trout
Avg DO (origi — <u>DO after 5 day</u> BOD 5-day (diffe	/s	mg/L	· <u></u>				none
E. Coli	5	colonies/ 100 mL	0	Ys.L	eline	0	< 235 colonies/ 100 mL
рН		units	7.23	7.75		7.23	3 Avg 6-9
Temp at Your Upstream (1 mi) Temperature Chai	Гетр	۰C					< 5° F < 2° F in a trout stream
Total Phosphate		mg/L					<.04 mg/L (in Lake Michigan)
Nitrate (NO ₃)		mg/L	0	0.31		0,3	/← / <44 mg/L
Transparency (Tub	e)	cm	760		LINE AND	760	ine on violen
Turbidity (from char in databas	t use e entry)	NTU/JTU	<15	2.4	a en antes	215	none
Orthophosphate		mg/L	0	5		0	none
Ammonia Nitroger		mg/L	0	0	inger.	0	.076 mg/L (at pH 7, 20+C)
Total Solids		mg/L			:Ng/II		ofe Sofids
Other ConDuction	ity		0.164			0.164	(ne <u>stan</u> a) ara
Other						Unit	

* YSi DATA

72

Stream	mical N					Temp	°C
Time 9:40AM and Site		Cane	Creek	2	Wat	er Temp _{/0.88}	°C
Current Weather: Clea	r/Sunny	Overcast Overcast	Showers		(Steady)	Storm (Heavy) Storm (Heavy)	
	Units	Sample 1	Sample 2	Sample	Average	State Standard	
Dissolved Oxygen (DO)	% Saturation mg/L	95% 10.5	98%		95%. 105 11	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
<i>E</i> . Coli	colonies/ 100 mL	40			40	< 235 colonies/ 100 mL	
рН	units	7.24	7.47		7.24	Avg 6-9	
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
Total Phosphate	mg/L				9	< .04 mg/L (In Lake Michigan)	
Nitrate (NO ₃)	mg/L	0.44	0.82		0.89	< 44 mg/L	
Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	> 60 2 15	10.0		>60 215-	none	
Orthophosphate	mg/L	0			0	none	
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
Total Solids	mg/L						
Other <u>CONDUCTIVITY</u>			0.209		0.209		
Other							

* YSI DAFA

ime 10:15 A M and Site		Dillo	n Cre	ek	Wate	r Temp /6
Current Weather: Clea	ar/Sunny] Overcast [] Overcast [Showers Showers		Steady)	Storm (Heav Storm (Heav
12 12 manual sures	Units	Sample 1	Sample 2	Sample 3	Average	State Standa
Dissolved Oxygen (DO)	% Saturation	94%	97.4	tener (O	94%	Avg > 5 m > 4 mg > 7 mg
In Place Instru	mg/L	10.5	10.8		10.5	for tro
Avg DO (original) — DO after 5 days			-			none
BOD 5-day (difference)	mg/L					
E. Coli	colonies/ 100 mL	200		603 603	200	< 235 colonies 100 mL
рН	units	7.43	7.47	nu	7.43	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C				THE NUCY : CODATES	< 5° F < 2° F in a trou stream
Total Phosphate	mg/L			en l	elark	< .04 mg/ (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0.62	0.92	Ngen i	0.92	< 44 mg/l
Transparency (Tube)	cm	260	35	1912	>60.	n voqanar
Turbidity (from chart use in database entry)	NTU/JTU	215	3.4		215	none
Orthophosphate	mg/L	0.3		Ngen	0.3	none
Ammonia Nitrogen	mg/L	0	0	ligm	0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L			hộm		allo2 lato
Other CONDUCTIVITY		0.202			0.202	n O neut
Other						

100

72

* YSi DATA

	Stream N	mical N					Temp	°C
	Current Weather: Clear Current Weather: Clear Clear Clear		Overcast Overcast	Showers	Rain (Steady)	er Temp /2.07 Storm (Heavy) Storm (Heavy)	
		Units	Sample	1	Sample	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	978 10.5	100		972	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL	80			80	< 235 colonies/ 100 mL	
	рН	units	7.50	7,50		7.50	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C	<u> </u>				< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L	45 8		×		< .04 mg/L (In Lake Michigan)	. ,
	Nitrate (NO ₃)	mg/L	1.23	1.17		1.17*	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	760 <15	1.6		>60 <15	none	
-	Orthophosphate	mg/L	.02			0.02	none	•
,	Ammonia Nitrogen	mg/L	0 .			0	.076 mg/L (at pH 7, 20°C)	
1	Total Solids	mg/L						
c	Other <u>Conductivity</u>		1	0.180		0.180		
c	Other							ia d

te //-9-06 Che ne //:25 Stream M and Site	and the second se	Suga	1 Cre	ek	Wate	r Temp /4.0
Current Weather:	ar/Sunny	Overcast [Overcast [Showers Showers	Rain (S		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	103%	100.4		103%	Avg > 5 mg/L > 4 mg/L
, gen (= -)	mg/L	10.5 10.5	10.16		10.5	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	120	A Vale		120	< 235 colonies/ 100 mL
рН	units	7.18	7.12		7.18	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L				Start	< .04 mg/L (In Lake Michigan)
Nitrate (NO ₃)	mg/L	3.96	3.6		3.6 * 3.94	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60 <15	0.8	Contract of the second	>60.	none
Orthophosphate	mg/L	0			0	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L. (at pH 7, 20°C)
Total Solids	mg/L				1	Cheff .
Other CONDUCTIVITY			0,194		0.194	Caper
Other						

72

www.HoosierRiverwatch.com

* YSi DATA

* TURKEY BARNS BEING CLEANED OUT

θ /2:20 Pry and Site		PATOKA	RIVER		Wate	or Temp /2.0
Current Weather:	r/Sunny	Overcast Overcast	Showers	Rain (S	teady)	Storm (Heavy) Storm (Heavy)
	Units	Sample 1	7	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	88?	88%		88%	Avg > 5 mg/l > 4 mg/L
	mg/L	9.5	9.6		95	> 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	60			60	< 235 colonies/ 100 mL
рН	units	7.56	7.53		7.56	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0	1.33		1.33 × -0	< 44 mg/L
Transparency (Tube)	cm	>60			>60.	
Turbidity (from chart use In database entry)	NTU/JTU	515	8.5		< 15-	none
Orthophosphate	mg/L	0			0	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other <u>Conductivity</u>			0.180		0.180	

* YSI DATA

72

۰.

		Overcast [Showers Showers	Rain (S Rain (S	teady)	Storm (Heavy)
eather in past 48 hrs: Clea	r/Sunny 🗹 Units	Sample 1	Sample 2	4	Average	State Standard
Dissolved Oxygen (DO)	% Saturation	105%.	96%	,	105%	Avg > 5 mg/ > 4 mg/L > 7 mg/L
	mg/L	10.5	9.5		19.2	for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-				none
E. Coli	colonies/ 100 mL	160			160	< 235 colonies/ 100 mL
рН	units	7.48	7.24	and a	7.48	Avg 6-9
Temp at Your Site Upstream (1.mi) Temp	°C			-	_	< 5° F < 2° F in a trout stream
Temperature Change Total Phosphate	mg/L					<.04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	>4.4	9.3		9.3 *	< 44 mg/L
Transparency (Tube)	cm	>60			>60.	
Turbidity (from chart use in database entry)	NTU/JTU	< 15	4.6		>60	none
Orthophosphate	mg/L	0.5			0.5	none
Ammonia Nitrogen	mg/L	0.			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other CONDUCTIVITY			0.253		0.253	

* Ysi DATA

72

-

Date	Stream N	ame	Nonitor Leist		ork She		emp °C
	Current Weather:		Overcast [Overcast [Showers Showers	Rain (S	Steady)	Storm (Heavy) Storm (Heavy)
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L	0 10.5	103.0 10.3		10/	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
	<i>E</i> . Coli	colonies/ 100 mL	80			80	< 235 colonies/ 100 mL
	рН	units	7.38	7,23		7.38	Avg 6-9
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
	Nitrate (NO3)	mg/L	7.04	5.0		5.0 ×	< 44 mg/L
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	760 215	3.0		>60 < 15	none
	Orthophosphate	mg/L	0.5			0.5	none
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
1	Fotal Solids	mg/L					
C	Other <u>Conductivity</u>			0,238		0.238	
C	Other						

72

www.HoosierRiverwatch.com

¥ Ysi DATA

Time 2:10PM Stream		Pinni	ck Cr	eek	Wate	r Temp 19
	ear/Sunny	Overcast	Showers Showers		Steady)	Storm (Heav Storm (Heav
And Assessed Leansard I old	Units	Sample 1	Sample 2	Sample 3	Average	Stat Stand
Dissolved Oxygen (DO)	% Saturation	103	103		103	Avg > 5 (> 4 mg > 7 mg
	mg/L	10.5	10.43	(00) 0	10,5	for tro
Avg DO (original) — <u>DO after 5 days</u>						none
BOD 5-day (difference)	mg/L		Ann	- Constant	and a second second	
<i>E</i> . Coli	colonies/ 100 mL	100	- Sectore		100	< 235 colonie 100 ml
рН	units	7.69	7.62		7.69	Avg 6-
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C			l see	MOY IN OWN	< 5° F < 2° F in a trou stream
Total Phosphate	mg/L		Japa	- / -	elsagedes.	< .04 mg (in Lake Michigan)
Nitrate (NO ₃)	mg/L	2.64	3.48		3.48	< 44 mg/
Transparency (Tube)	cm	>60	- mo	- (2.)	>60.	
Turbidity (from chart use in database entry)	NTU/JTU	<15	1.4		215	none
Orthophosphate	mg/L	0	.Bom		0	none
Ammonia Nitrogen	mg/L	0	hipes	7	0	.076 mg/l (at pH 7, 20°C
Total Solids	mg/L		nga.		abitos t	0T
Other Conductivity		S .	0.211	1. Tom	0.211	10

* YSi DATA

72

Date	Cherr	ical M	onitorir	ng Wor	rk Shee	et Air	Temp °(
-	Stream Nar	ne	Polson			Wa	iter Temp 14.14 °C
	2:45 and Site ID Current Weather: Clear/S ather in past 48 hrs: Clear/S	Sunny	Dvercast	Showers Showers	Rain (Ste		Storm (Heavy) Storm (Heavy)
Γ		Units	Sample 1	Sample 2	Sample 3	Averag	e State Standard
	Dissolved Oxygen (DO)	% Saturation mg/L	99%. 10.0	00,1 0,3		99% 10.0	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		-			=
	E. Coli	colonies/ 100 mL	20			20	colonies/ 100 mL
	рН	units	7.37	7.35		7.37	
	Temp at Your Site Upstream (1 mi) Temp	۰C			_		< 5° F < 2° F in a trout stream
	Temperature Change Total Phosphate	mg/L	: sin				< .04 mg/L (in Lake Michigan)
	Nitrate (NO ₃)	mg/L	3.52	5.25		5.25	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	>60 215	2.9		>60	none
	Orthophosphate	mg/L	0.5			0.5	none
	Ammonia Nitrogen	mg/L	0.			0	.076 mg/L (at pH 7, 20°C)
	Total Solids	mg/L					
	Other <u>Conductivity</u>			0.233	r	0.23	3
	Other						

72

* YSi DATA

	tream Nam nd Site ID		UPLICATE	in LAB	Manufata and	V	Water Temp	NA
Current Weather: Weather in past 48 hrs:	Clear/Su	unny	Overcast [Overcast [Showers Showers	Rain (S		Storm (H	
alla <mark>nonce prover nation</mark> on annation		Units	Sample	Sample 2	Sample 3	Avera		tate
Dissolved Oxyger	n (DO)	% Saturation mg/L		108	122 10		> 4	> 5 mg/ l mg/L r mg/L r trout
Avg DO (origin — <u>DO after 5 day</u> BOD 5-day (differ	s	mg/L						one
E. Coli		colonies/ 100 mL	NA		30(80 061	NA	cold	235 onies/ 0 mL
рН		units	7.24		(m)	7.29	Avg	g 6-9
Temp at Your S Upstream (1 mi) Tr Temperature Chan	emp	۰C				ant in T oTGa eustari	= <2 in a	5° F 2° F trout eam
Total Phosphate		mg/L			80	91	< .04 (in I Mich	mg/L Lake Ngan)
Nitrate (NO ₃)		mg/L	3.96		lipro	3.96	< 44	mg/L
Transparency (Tube Turbidity (from chart In database	use N	cm TU/JTU	NA NA		(11:0 3.1.17:4 4.1.17:4	NA NA	no	ne
Orthophosphate		mg/L	0.4	S	2001	0.4	noi	ne
Ammonia Nitrogen		mg/L	6	s I	ligar	0	.076 r (at pH 7,	-
Total Solids		mg/L			Jugin		Solice	hato
Other								
Other		-						

72

Date	11-9-06 Cher	nical N	onitori	ng Wo	rk She	et Air	Temp	°C
	Stream Na and Site I	ame	LANK				ter Temp	°C
	Current Weather:	/Sunny	Overcast Overcast	Showers Showers	Rain (Si		Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	NA			NA	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	8
	<i>E</i> . Coli	colonies/ 100 mL	NA	· ·		NA	< 235 colonies/ 100 mL	
	рН	units	NA			NA	Avg 6-9	
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	°C					< 5° F < 2° F in a trout stream	
	Total Phosphate	mg/L					< .04 mg/L. (In Lake Michigan)	
	Nitrate (NO ₃)	mg/L	0			0	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use In database entry)	cm NTU/JTU	NA NA			NA. NA	none	
ſ	Orthophosphate	mg/L	0			0	none	
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other							
	Other							

te 11-10-06 Che	mical A	Nonitori	ng Wo	ork She	et A	lir Temp
ne 8:45 Am and Site		Calum	et R	un	M	Vater Temp 12.67
Current Weather: Clea Veather in past 48 hrs: Clea		Overcast	Showers Showers	<u> </u>	Steady) Steady)	Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Avera	ge State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	53% 5,5	6.0	53.6 5.75	53	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
<i>E</i> . Coli	colonies/ 100 mL	100			100	< 235 colonies/ 100 mL
рН	units	7.0		7.06	7.0	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					<.04 mg/L (In Lake Michigan)
Nitrate (NO ₃)	mg/L	0.97		3.4	3.4 *	< 44 mg/L
Transparency (Tube)	cm	42			42.	
Turbidity (from chart use in database entry)	NTU/JTU	18		8.3	18	none
Orthophosphate	mg/L	0.8			0.8	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other <u>CONDUCTIVITY</u>				0.260	0.260	
Other						

72

www.HoosierRiverwatch.com

* Ysi DAFA

$\frac{11-10-04}{11-10-04}$ Stream Na and Site I	ame/	Patok	the second se	ork She		r Temp /2,46
Current Weather:		Overcast Overcast	Showers Showers	$\square Rain (S) \\ \square Rain (S) \\ \forall S i$		Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	1	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	79°2 8.5	8.5	83.2 8.86	79%	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-				none
E. Coli	colonies/ 100 mL	140		6	140	< 235 colonies/ 100 mL
рН	units	7.28		7.32	7.28	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	∘C					< 5° F < 2° F in a trout stream
Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	2.2		2.96	2.46*	< 44 mg/L
Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	42 18		14.8	42. 18	none
Orthophosphate	mg/L	0.30			0.30	none
Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other ConDuctivity				0,196	0.196	
Other						

72

X YSI DAYA

Time 9:45 Ar3 Stream N and Site I	ame D 14A	Bea	ver C	reek	Wate	r Temp
Current Weather: Clear Weather in past 48 hrs: Clear		Overcast	Showers Showers	in the second second	Steady)	Storm (Hea Storm (Hea
	Units	Sample 1	Sample 2	Sample 3	Average	Stand
Dissolved Oxygen (DO)	% Saturation	92%	D. D. D. D. D.	92.3	92%	Avg > 5 > 4 m > 7 m
	mg/L	10		9.84	10.9	for ti
Avg DO (original) — <u>DO after 5 days</u>	entra estructura					nor
BOD 5-day (difference) <i>E</i> . Coli	mg/L colonies/ 100 mL	60	Notes Line		60	< 23 colon 100
рН	units	7.25	5	7.16	7.25	Avg
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C				dic neoy n <u>— Londor</u> armsdo an	< 5° < 2° in a tr strea
Total Phosphate	mg/L		-	<u>9</u> m	ajartés	< .04 r (in La Michig
Nitrate (NO ₃)	mg/L	3.1	N 1 -	4.1	4.1*	< 44 n
Transparency (Tube)	cm	>60	0.	10	- (edul) yo a	a rejant
Turbidity (from chart use In database entry)	NTU/JTU	215	01	10.0	415	non
Orthophosphate	mg/L	0.5	5	par 1	a nate	none
Ammonia Nitrogen	mg/L	0	3	çm i .	riegon14	.076 m (at pH 7, 2
Total Solids	mg/L			12m		lo2 le
Other CONDUCTIVITY				0.166	0.166	

* YSi DATA

Det			Anitan	ing M/c	nk Sha	ot Air T	emp °(Ċ			
Dat	Stream Name DALL Provide Stream Name DALL Provide Stream Name										
1111	10,20 Min and Site I		Patoka					-			
		r/Sunny	Overcast	Showers	Rain (S		Storm (Heavy) Storm (Heavy)				
vv	eather in past 48 hrs: Clear		Overcast	YSI			_				
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard				
	Dissolved Oxygen (DO)	% Saturation	889.	88.6		88%	Avg > 5 mg/L > 4 mg/L > 7 mg/L				
		mg/L	9.5	9.44		72	for trout				
	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L		_			none				
	<i>E</i> . Coli	colonies/ 100 mL	40			40	< 235 colonies/ 100 mL				
	рН	units	7.46	7.45		7.46	Avg 6-9				
	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream				
	Total Phosphate	mg/L					<.04 mg/L (in Lake Michigan)	ć			
	Nitrate (NO ₃)	mg/L	1.1	2.3		2.3*	< 44 mg/L				
	Transparency (Tube)	cm	52			52.					
	Turbidity (from chart use in database entry)	NTU/JTU	17	12.7		1.7	none				
	Orthophosphate	mg/L	0			0	none				
	Ammonia Nitrogen	mg/L	0.			0	.076 mg/L (at pH 7, 20°C)				
	Total Solids	mg/L									
	Other <u>Conductivity</u>		5	0.193		0.193					
	Other										

72

* YSi DAVA

Stream Na	ime		r Cre	ork She	A CONTRACTOR	r Temp / 3
Current Weather: Clear ther in past 48 hrs: Clear	/Sunny	Overcast Overcast	Showers Showers	Rain (S	1. · · · · · · · · · · · · · · · · · · ·	Storm (Heavy) Storm (Heavy)
	Units	Sample 1	Sample 2	Sample 3	Average	State Standarc
Dissolved Oxygen (DO)	% Saturation	102	100.4		102%	Avg > 5 mg/ > 4 mg/L > 7 mg/L
	mg/L	9.5	10.48		72	for trout
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none
E. Coli	colonies/ 100 mL	60			60	< 235 colonies/ 100 mL
ЪН	units	7,53	7.5%		7.53	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp emperature Change	۰C				20-02-92 	< 5° F < 2° F in a trout stream
otal Phosphate	mg/L	1			6.6	<.04 mg/L (in Lake Michigan)
litrate (NO ₃)	mg/L	13.2	7.4		7.4 *	< 44 mg/L
ransparency (Tube)	cm	>60	S (m)	$d = \begin{bmatrix} -iei \\ i & i \end{bmatrix}$	>60.	Turbiciti.
urbidity (from chart use in database entry)	NTU/JTU	< 15	1.6		L15	none
rthophosphate	mg/L	0.6			0.6	none
mmonia Nitrogen	mg/L	0.		1	0	.076 mg/L (at pH 7, 20°C)
otal Solids	mg/L					
ther CONDUCTIVITY			0,254		0.259	
otal Solids			0,254			(a

72

•

* Ysi DATA

Ctracm M	ame	Nonitori Beav				mp r Temp _{/3.2.9}
Current Weather: Clear Current 48 hrs: Clear	r/Sunny	Overcast	Showers Showers	Rain (S		Storm (Heavy)
ana (Secold) 👔 Com (Marin	Units	Sample 1	Sample 2	Sample 3	Average	State Standard
Dissolved Oxygen (DO)	% Saturation mg/L	90g 9.5	9.5	97.4	903	Avg > 5 mg/L > 4 mg/L > 7 mg/L
Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L	-	-			for trout none
E. Coli	colonies/ 100 mL	40	100		40	< 235 colonies/ 100 mL
рН	units	7.76			7.76	Avg 6-9
Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C	<u> </u>				< 5° F < 2° F in a trout stream
Total Phosphate	mg/L			0000 000		<.04 mg/L (in Lake Michigan)
Nitrate (NO ₃)	mg/L	0,53	200	2,23	2.23	< 44 mg/L
Transparency (Tube)	cm	>60			>60.	n nan
Turbidity (from chart use In database entry)	NTU/JTU	4.15	< 10	4.4	760. <15	none
Orthophosphate	mg/L	0.5	> urou	N John S	0.5	none
Ammonia Nitrogen	mg/L	0.	36		0	.076 mg/L (at pH 7, 20°C)
Total Solids	mg/L					
Other Conductivity				0,138	0.138	
Other						

X YSI DATA

Dat			onitor	ing Wo	rk She		· · ·	°C
Tim	Ile 12:50 MB and Site I	ame D 15	Jaspe	er hak	e Outt	all Wate	er Temp 13.11	°C
O,	Current Weather: V Clear Veather in past 48 hrs: V Clear	/Sunny	Overcast [Showers Showers	Rain (Si	eady)	Storm (Heavy) Storm (Heavy)	
		Units	Sample 1	Sample 2	Sample 3	Average	State Standard	
	Dissolved Oxygen (DO)	% Saturation mg/L	99% 10.5	100.4 10.57		99% 10.5	Avg > 5 mg/L > 4 mg/L > 7 mg/L for trout	
•	Avg DO (original) — <u>DO after 5 days</u> BOD 5-day (difference)	mg/L					none	
	<i>E</i> . Coli	colonies/ 100 mL	20			20	< 235 colonies/ 100 mL	
	рН	units	7.80	7.90		7.80	Avg 6-9	
\bigcirc	Temp at Your Site Upstream (1 mi) Temp Temperature Change	۰C					< 5° F < 2° F in a trout stream	
0	Total Phosphate	mg/L					< .04 mg/L (in Lake Michigan)	
-	Nitrate (NO ₃)	mg/L	1.98	3.25		3.25	< 44 mg/L	
	Transparency (Tube) Turbidity (from chart use in database entry)	cm NTU/JTU	48	3.9		48 18	none	
	Orthophosphate	mg/L	0.5			0.5	none	•
	Ammonia Nitrogen	mg/L	0			0	.076 mg/L (at pH 7, 20°C)	
	Total Solids	mg/L						
	Other ConDuctivity		-	0.191		0.191		
\ominus	Other							

72

* YSi DATA

.

. • •

.

PATOKA RIVER PROJECT	
Date $5/9/2002$ Time 10:0	
Site ID	
Velocity/Average <u>0,69 ft/s</u>	
CFS <u>4.3</u> /	
Channel Cross-section:	
$\begin{bmatrix} & & & & & & & & & & & & & & & & & & &$	$6.29 \times .69 = 4.306$

Date <u>5/4/</u>	- 1949	Time_	10: 116 am	
Stream Name	Dillon			
Site ID	3			
Velocity/Averag	e <u>0.33 (</u>	$\mathcal{V}_{\mathcal{S}}$	-	
CFS 2.3	516			

Channel Cross-section:



12/03

	Stream Nan Site ID Velocity/Av	$\frac{9/2006}{10}$ ne <u>Davis (</u> 4 verage <u>0,47</u> 66 ft ³ /5	reek		
	Channel Cr	oss-section:			
2/0.8	12/0.7 14/0.5 18/0.8 18/0.74	<u>20</u> 0.6022			

L

□ 2/0. ↓/0. □ 6/0. □ 0/0. 1010

00 660 A . L.68 Grovel / Rock ----101 Time 9:20 1.5.1 Stream Name Piunick Guck 2/3 4/.52 6/1,02 8/ Channel Cross-section: Velocity/Average D.JZ +-Site ID # S CFS 21/4 Date 6-1-06 E 10

1.10

Date	5/9/200K	_ Time _	11:46am	
Stream Na	ame <u>Sugar</u>	<u>(reek</u>		
Site ID	<u> </u>			
Velocity/A	Average <u>0.33</u>	<u> {}{</u>	-	
CFS(). 89	_		

Channel Cross-section:



155			د. -	Gravel)5117	, 5× 18= 8.92	· 8 10/-2/ 13/5- 17/6+			
Date 6-1-06 Time 9:55	Stream Name Folger	Site ID # A	Velocity/Average	CFS 4.19	Channel Cross-section:	of 21/3 4/36 4/6 8/.8			



Date <u>5/1/06</u> Time <u>1:50</u>

Stream Name Leistner

Site ID _____

Velocity/Average ______

CFS ______ 8

Channel Cross-section:



Date <u>5/9/66</u> Time <u>1/00</u>

Stream Name WAY! Correct

Site ID _____

Velocity/Average _______

CFS _________

Channel Cross-section:



W.4 2 W.4 2),22 W.5

435×8=3,48 (5 ve Je) RGG) -1 10:2 0 a Time 61.79 PATOKA RIVER PROJECT 61 4/6 Stream Name $7_{c}A$ Channel Cross-section: Velocity/Average ¥. Date 6-1-06 3.9 CFS D. 66 Site ID 8 0 h


PATOKA RIVER PROJECT

ukazay

6

1

0

D	ate <u>6-</u> /	1-06	Time <u>11:125</u>	
St	tream Name	Jasper	· .	
		# 15		
v	elocity/Aver	age	**************************************	Sou d/silt
С	FS D	7.75		2m 1/3/1
	hannel Cross			71 × 8= 5,68
$)$ φ	Y ³ /,	6 4/11	1.14 80	*
				┥╴╪╼╂┾╾┟╍╅╤╂╞╌┫╧┿╌┨┲┥╌┝╌┫╵┝╼╖┾┾╪┯╴ ┷┾╤┽╪┝┙╪╅╞╎╴┥╼┾┍┨┥╛┍╉╎┙┝╼╋┿┱┾
		┥┥┥┥┥	┥┥┥┥┥┥┥┥┥ ┼┟╎┥┥┥┥┥┥┥┥┥	
╵┠╍┋╾╡╾╡╼┨╴┨╴┨╴┫╴		┥┥┥┥┥┊╴╡╶┨╶┤╶┤╶┤ ╶╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴	┿╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋╋	
		┥┥┥┥┽╎╎┿┿┼┿┿ ┥┥┥┥╷╴╴	┿╋╋╋╋╋╋╋╋╋╋╋╋╋╋	
	┝╋╋	┋╉╉╋╡╋╋	┥┥╃╶┟╸┇╶┨╌┾╼╋╸┧╼╡╌╀╍┝╼┫╺╉╺╋ ┅┿╍┨╾┠╍┫╌┽╌╎╴╟┅╪╼╊╼┥╍┨╌╉╼╇	
	┝┥┽┼┼┼┼┼┼┼	<mark>┥┥╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸╸</mark>		

Т

T

1

 \top

_

11

ĺ



Date 6-1-06	Time	Time / : 30	
Stream Name Colum	e f		
Site ID # 16	1		
Velocity/Average . 57			
CFS 7.23		10	t-C
Channel Croce-certion.			1 1 1

Channel Cross-Secuol.

1 9/2 19/2 12/2 12/2 13/2 13/0 9/1, 2 19/2 12/1, 3 19/0, 9 15/0 + --+ + Ŧ 1.32 6/ + 20 21.3 4/3 + + T 0 5

.

Appendix C Quality Assurance Project Plan

A server and the serv

A start of the sta

QUALITY ASSURANCE PLAN

FOR

PATOKA RIVER WATERSHED DUBOIS CO., INDIANA ARN A305-4-129

Prepared by

Four Rivers RC&D Area, Inc. and the Dubois Co. Soil & Water Conservation District for

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

February 17, 2005

Approved by:

Dubois Co. SWCD:		
	Jack Welp, Chair, SWCD	Date
Project Mgr		
	Judy Gray, Pres. Four Rivers RC&D, Inc.	Date
WMS QA		
Officer	Betty Ratcliff	Date
WMS Sec.		
Chief	Linda Schmidt	Date
Planning		
Branch Chief	Martha Clark Mettler	Date

.

Table of Contents

Section	L Contraction of the second	Page
	Introduction	3
I	Project Description	4
II	Project Organization and Responsibility	5
III	Data Quality Objectives	7
IV	Sampling Procedures	8
V	Custody Procedures	8
VI	Calibration Procedures and Frequency	9
VII	Analytical Procedures	9
VIII	Internal Quality Control Measures	9
IX	Data Reduction, Validation and Reporting	9
Х	Performance and System Audits	10
XI	Preventive Maintenance	10
XII	Data Quality Assessment	11
XIII	Corrective Action	11
XIV	QA Reporting	11
XV	References	12

Appendices

А

В

13

Location Maps:

- 1. Location of project area in state of Indiana
- 2. Sample site locations within project area

Hoosier Riverwatch Volunteer Stream Monitoring Training Manual instructions (Hach Surface Waters Kit) including chemical monitoring worksheet for recording data

Introduction

The Dubois Co. Soil & Water Conservation District, in cooperation with Four Rivers Resource Conservation & Development Area, Inc., has received a Section 319 grant from the Indiana Department of Environmental Management to assist with the development of a watershed mgt. plan for Patoka River. The grant will be used in partnership with other assistance afforded by the Soil & Water Conservation District, IDNR- Division of Soil Conservation; USDA Natural Resources Conservation Service; concerned citizens; and local representatives of government and business. The SWCD meets regularly to plan activities for improving the overall health of the watershed, and quality of life for the people who live and work there.

Section I: Project Description

Historic Background

The watershed area covered by this QAPP drains approximately 80,000 acres of Dubois County, IN. This portion of hydrologic unit code 05120209 lies between Patoka Lake Reservoir and the city of Jasper, and is the 11 digit HUC 05120209020. The 2004 303(d) list shows Patoka Basin sub-watersheds as impaired for e-coli. The significance of this watershed lies in the fact that Jasper withdraws and treats drinking water from the Patoka River just upstream of the city. At least 37 animal feeding operations exist in this watershed. The grant associated with this QAPP was written out of concern for the drinking water resource and overall watershed health.

Project Objectives

The main objective of the grant project is to gather and research data on the watershed and to construct a Watershed Management Plan to prioritize future land treatment projects in the area.

Project Site

See Appendix A: Map 1 and Map 2.

Sampling Points

See Map 2 for sampling locations. Description of sampling points:

- 1. 05120209020010- Patoka R.-Lost Ridge; S. Cuzco Rd. first sampling point downstream of Patoka Lake Reservoir
- 2. 05120209020020- Dillon Cr.-Cane Cr; E. Cuzco Rd. southernmost tributary originating in Orange Co.
- 3. 05120209020020- Dillon Cr.-Cane Cr; Cuzco-Norton Rd. northern tributary originating in Orange Co.
- 4. 05120209020030- Davis Cr; W. Cuzco Rd. X SR 56
- 5. 05120209020050- Poison Cr.- Bauer Cr; Dubois-Patoka Lake Rd., eastern tributaries
- 6. 05120209020030- Davis Cr; SR 56, northern tributary
- 7. 05120209020040- Patoka R.- Dubois; Dubois Rd.
- 8. 05120209020050- Poison Cr.- Bauer Cr; N. Celestine Rd. western tributaries
- 9. 05120209020040- Patoka R.-Dubois; SR 545, tributary north of town of Dubois
- 10. 05120209020040- Patoka R.-Dubois; SR 56, western tributary
- 11.05120209020070- Beaver Cr.; Jasper-Dubois Rd. east tributary
- 12.05120209020070- Beaver Cr.; Jasper-Dubois Rd. outfall from lake
- 13.05120209020060- Patoka R.- Lond Ditch; CR 175 E, downstream of NPDES
- 14.05120209020060- Patoka R.- Lond Ditch; CR 300 N, main channel
- 15.05120209020080- Calumet Run; Jasper-Dubois Rd. south tributary

16.05120209020080- Calumet Run; Jasper-Kellerville Rd., last tributary before water plant intake.Sample sites will be further described by latitude/longitude obtained from GPS or Internet website, i.e. www.topozone.com

Sampling Design

Sampling will be accomplished spring and fall of 2005 at each site (see Map 2). water temperature, dissolved oxygen, dissolved oxygen saturation, *E.coli*, pH, orthophosphate, nitrate, ammonia nitrogen and turbidity readings will be measured at each site - reflecting both high and low flow conditions. . Data will be reduced and entered in a database system for ease of analysis. All sites are located near bridges or roads, affording access to the monitoring points.

Project Schedule

April 1, 2005- 1st round of monitoring commences; samples collected from 16 sites within the watershed and analyzed for dissolved oxygen, DO saturation, e. coli, pH, orthophosphate, nitrate, ammonia nitrogen and turbidity.

May 1 thru June 30, 2005- data reduced and entered into database; water quality reports generated and distributed to interested parties; Data report submitted to IDEM; internal audit by SWCD personnel.

September 1, 2005- 2nd round of sampling commences; samples collected from 16 sites within the watershed and analyzed for dissolved oxygen, DO saturation, e. coli, pH, orthophosphate, nitrate, ammonia nitrogen and turbidity.

October 1 thru November 30, 2005- data reduced and entered into database; water quality reports generated and distributed to interested parties; final Data report submitted to IDEM; internal audit by SWCD personnel.

Section II: PROJECT ORGANIZATION & RESPONSIBILTY

The QA Manager for IDEM's Watershed Management Section is responsible for reviewing and approving the Quality Assurance Project Plan (QAPP) and reviewing QA reports for this project.

The IDEM QA Manager is:

Betty Ratcliff 100 N Senate Ave. PO Box 6015 Indianapolis, IN 46206-6015 317/234-1424 bratclif@dem.state.in.us

2. ..

he IDEM project manager is responsible for monitoring the project's progress and processing invoices and match forms.

The IDEM Project Manager is: Pamela Brown 100 N Senate Ave. PO Box 6015 Indianapolis, IN 46206-6015 317/232-6566 <u>Ibieberi@dem.state.in.us</u>

Four Rivers Resource Conservation & Development Area Inc. is the contractor responsible for financial and administrative oversight of this project. The RC&D is a 501(c) 3 organization managed by a board of officers. The RC&D Coordinator is responsible for the day-to-day operation of the group.

The president of Four Rivers RC&D is: Responsible for overall leadership of RC&D Judy Gray 112 S. Lakeview Dr. Petersburg, IN 47567 812/354-6120 rivers4@sigecom.net

The coordinator of Four Rivers RC&D is:

Dave Elgin 112 S. Lakeview Dr. Petersburg, IN 47567 812/354-6120 rivers4@sigecom.net

Sampling will be accomplished by Practical Resource Management:

Joe Craig 2156 East State Rd 356 Petersburg, IN 47567 812-354-3880

Anotheov. The values in the water of mustic toble above represent the best deciracy besulate with the methods used. Accordicy in the field will be done to

Section III: DATA QUALITY AND OBJECTIVES

The following table illustrates the precision, accuracy, and measurement range for dissolved oxygen, DO saturation, *E.coli*, pH, temperature, orthophosphate, nitrate, ammonia nitrogen and turbidity.

Data Quality Objectives for Water Chemistry Measurements

Parameter	Field Method	-	Field Accuracy*	Range
Measurement				_
Dissolved	Hach model	+/- 20%	+/- 1 mg/L	0 to 17 mg/L
oxygen, high	OX-2P			
range				
Dissolved	Hach model	+/- 20%	+/- 0.02 mg/L	0.2 to 0.4 mg/L
oxygen, low	OX-2P			
range				
E.coli	Coliscan	+/- 20%	+/- 100	0 to TNTC* cfu
	easygel		colonies	too numerous to count
PH	Hach EN50081	+/- 20%	+/- 0.2 pH	0 to 14 pH
			units	
Temperature	Hach model	+/- 20%	+/- 0.5	-5 to + 45
	26763,armored		degrees C	degrees Celcius
Orthophosphate	Hach model	+/- 20%	+/- 10%	0 to 1 mg/L
	PO-24	"	"	0 to 5 mg/L
		"	"	0 to 50 mg/L
Nitrate***	Hach model NI-	+/- 20%	+/- 10%	0 to 1 mg/L
	11	"	"	0 to 10 mg/L
		ű	"	0 to 50 mg/L
Ammonia	Hach model NI-	+/- 20%	+/- 10%	0 to 3.0 mg/L
Nitrogen	SA			
Turbidity	Turbidity tube	+/- 20%	+/- 10 NTU	0 to 100 NTU

***range used varies according to presence of nitrate in sample

<u>Precision:</u> Field replications will be collected. Relative Percent Difference (RPD) is the method used for chemical measurements.

$$RPD = \frac{(C - C')}{(C + C')/2} \times 100\%$$

<u>Accuracy</u>: The values in the water chemistry table above represent the best accuracy possible with the methods used. Accuracy in the field will be done by

measured blanks. Strict adherence to these methods will ensure the best possible accuracy in field measurements. See table on page 9.

<u>Completeness</u>: A minimum of 80% completeness will be necessary to meet the goals of the project.

% completeness = <u>(number of valid measurements obtained)</u> x 100 (Number of measurements expected)

<u>Representativeness</u>: Sites selected are representative of some of the major land uses and conditions in the watershed, which has a diverse topology due to human disturbance.

<u>Comparability:</u> Where possible, comparison with other studies conducted by the City of Jasper Water Department and the town of Dubois Wastewater Management Plant.

Section IV: SAMPLING PROCEDURES

Water chemistry sampling will consist of dissolved oxygen, DO saturation, *E.coli*, pH, water temperature, orthophosphate, nitrate, ammonia nitrogen and turbidity. Sampling will be accomplished with a Hach Surface Waters test kit, model 27120-00, which meets the Data Quality Objectives for the listed parameters (Table in Section III). The instructions contain a list of reagents, parameters and procedures (Appendix B). The manufacture directions were revised by Hoosier Riverwatch to clarify procedures. Samples will be taken from near midstream; and when possible, samples will be collected at the same time of day during each of the sampling events. Actual water withdrawal from the stream will be accomplished by using a sampling tube.

Sample analysis may be completed on-site, or, samples may be collected in appropriate glass containers for later analysis. Other than dissolved oxygen, DO saturation, temperature, pH and turbidity, which must be done on-site, samples will be placed on ice and analyzed within 24 hours. Samples for E.coli will be collected in the designated containers, transported to the office and incubated, then analyzed.

Section V: CUSTODY PROCEDURES

If analysis is done on-site, then the data will be entered on a field data sheet (Appendix C). If analysis is to be done at the office, samples will be collected in appropriate containers, labeled with site ID, date and time of collection, iced, (except where noted above), and transported. Max Holding Time, Samples should be analyzed within 6 h after sampling and within 2 h from receipt of sample in lab for compliance or 24 h for routine monitoring(Standard Methods, 20th ed Section 9060B): however, a 6 h holding time for all samples is highly recommended (Myers and Sylvester, 1997). Analyses will be completed within 24 hours of collection, if it goes over 24 hours the results should probably be rejected. All results will be entered on field data sheets, which will be maintained at the Four Rivers RC&D office.

Section VI: CALIBRATION PROCEDURES & FREQUENCY

The only equipment requiring calibration is the pH meter. The pH meter will be calibrated using a pH standard of 7.0 before each site is tested. (See Appendix B)

Section VII: ANALYTICAL PROCEDURES

Water chemistry parameters will be analyzed with a Hach Surface Waters Kit for dissolved oxygen, DO saturation, pH, temperature, orthophosphate, nitrate and ammonia nitrogen. *E.coli* bacteria will be analyzed using Coliscan Easygel. The samples will be incubated at 35 degrees C. Turbidity will be measured using a viewing tube marked in centimeter units. Analytical methods specific to each of the chemical tests can be found in Appendix B.

Section VIII: QUALITY CONTROL PROCEDURES

Strict adherence to procedures is paramount.

QC checks for water chemistry	Frequency
field replicates	One for every 20 samples
equipment calibration	before sampling each site
lab duplicates	No
reference standards	Yes, pH 7 before sampling each site
control samples	One for every 20 samples
spiked samples	n/a
method blanks	One for every 20 samples
Calibration curves	n/a
spiked duplicates	n/a

Section IX: DATA REDUCTION, VALIDATION & REPORTING

Data validation

The sample technician will review the data for accuracy in mathematics and recording and validate it. Sample results outside of the typical ranges expected for each chemical test (see Appendix B) will be considered outliers, and repeat samples analyzed. If the results of the repeat sample are also out of range, and no extenuating circumstances exist, the results will be considered valid.

Data reduction

Parameter	unit of field measurement	equation used
dissolved oxygen	drops of reagent	1 drop = 1 mg/L
% d.o. saturation	•••••••••••••••••••••••••••••••••••••••	read from table
РН	PH units	read directly from meter
Temperature	degrees C	Read directly
Ecoli	colony forming unit (cfu) per 100 mL	100/mL sample x cfu
Phosphate	mg/L	Depends on range
Nitrate	mg/L	Depends on range
Ammonia nitrogen	mg/L	Read directly
Turbidity	Cm	ntu read from table

Data reporting

The data collected under this QAPP will be reported periodically to the SWCD supervisors and staff. Other Farm Service Center staff, including IDNR and USDA-NRCS employees will also have access to the data as needed.

Section X: PERFORMANCE & SYSTEM AUDITS

Oversight of QAPP compliance will be the responsibility of the Dubois Co. SWCD. Judi Brown, a certified Hoosier Riverwatch Volunteer Trainer, will conduct an internal systems audit every six months during the project (see Sec. I, project schedule) Judi will be ensuring that the quality control procedures are being followed. IDEM reserves the right to conduct external audits.

Section XI: PREVENTIVE MAINTENANCE

The sample technician will ensure that all equipment is properly cleaned, stocked with supplies, and maintained. See Appendix B for a list of required materials.

Sample containers, and all glassware will be thoroughly cleaned and stored in accordance with the manufacturer's instructions. See "How to Clean and Care for Equipment" in Appendix B. Cleaning and handling procedures for glassware used in the orthophosphate test will be followed. (see Appendix B) Other glassware not covered under these procedures will be rinsed regularly with isopropyl alcohol and rinsed with distilled water. Out-of-date reagents will be discarded properly. Extra batteries will be kept on-hand for the pH meter.

Section XII: DATA QUALITY ASSESSMENT

Precision

Assessment of Chemical Data

Precision will be calculated using the RPD formula as found in Section III. Precision will be determined every 6 months. If the tests have been repeated with consistent results, the data are accepted. One replicate sample is collected for every 20 samples.

Accuracy/Bias

Assessment of Chemical Data

If the QA checks in Section VIII have been followed, inaccuracy and bias are assumed to be minimal. Using the guidelines in Section III, and Section IX, repeat tests will be done if the results are not within the normal range. However, wide variations may be possible in a watershed of this magnitude If results is between 3 and 5 times the blank contamination the result is (J) estimated. If results is less than 3 times the blank result is (R) rejected. If result is greater than 5 times blank contamination it is not flagged. All data sheets will be reviewed for outliers that have somehow been included among the valid data, and if found, they will be discarded as invalid.

Completeness

As discussed in Section III, the goal is 80% completeness. In this case, the data will be accepted without qualification.

Section XIII: CORRECTIVE ACTION

Adhering to the QA procedures outlined in Sections III and VIII will eliminate systemic and precision problems. However, if a pH reading appears to be out of the normal range for a particular site, the meter will be re-calibrated, and/or the batteries replaced, and the test repeated. For all other tests, if a particular result appears out of range, the sample will be checked for contamination, irregularities, out-of-date reagents, etc. Once this is done, a repeat sample will be analyzed. If the anomaly persists, the results will be accepted.

Section XIV: QUALITY ASSURANCE REPORTS TO MANAGEMENT

All results will be recorded on a computer system, and summarized on a quarterly basis. Quality Assurance progress will be reported to IDEM in each quarterly report. Data and quality assurance will be submitted in a final report to IDEM in hard copy and electronic form.

Section XV: REFERENCES CITED

Hartman, Lyn and Mandy Burk. Volunteer Stream Monitoring Training Manual. 2nd edition, November 2000 Indiana Dept. of Natural Resources-Division of Soil Conservation and Purdue University Dept. of Agronomy.

Appendices

- A Location Maps
- B Hoosier Riverwatch Volunteer Stream Monitoring Training Manual Instructions, including data sheets: advanced chemical





Appendix D Endangered & Threatened Species

provinsi in the second se

Marchine at 221825

2004/1.000.0000

gyaniaaaga addid u

A VELLEY OF REAL PROPERTY OF A

Static manual Mata

of Stanger (AMERICAN)

ener e annance e e

Endangered Species

Several threatened and endangered species have been identified in the county and may exist in the watershed. Many species are aquatic or depend on the waterways of the watershed for habitat or food. The species, their state designation, preferred habitat, and any known threats specific to the watershed are listed below.

Crustacean

Indiana Crayfish State Rare Habitat: The optimum habitat for Indiana Crayfish is medium-sized streams containing riffles and rock pools. The maximum depth is reported as 50 cm and slow-medium flow is preferred. Good habitat streams generally have a minimum forested riparian width of a few meters.

Threats: Coal Mining, Stream channelization and clearing, and otherwise poor water quality threaten the Indiana Crayfish.

Mussels

Habitat: Mussels, in general, require medium to larger rivers with gravel bottoms and a medium to low gradient. The larvae are parasitic on fish and some host specificity exists.

Threats: Sedimentation of gravel beds, low dissolved oxygen, diseases, and no host for larvae.

The following species are known to exist in Dubois County:

Eastern Panshell Pearlymussel	State Endangered
Longsolid	State Endangered
Pyramid Pigtoe	State Endangered
Ohio Pigtoe	State Species of Special Concern
Kidneyshell	State Species of Special Concern

Insects

Cocoa Clubtail State Endangered Habitats: Medium-sized rivers with alternating sand and gravel substrate.

Threats: Low dissolved oxygen, sedimentation in substrates and waterways used for egglaying and larval development.

Fish

Spotted Darter

State Species of Special Concern

Habitat: This species requires large unpolluted streams, spending most of its time in deep riffles, or pools just downstream, where a gravel-rubble bottom predominates, and bottom current velocity is low.

Threats: Channel alteration, sedimentation, reduction in insect populations (95% of its food)

Tippecanoe Darter Habitat: This little darter prefers riffle areas four to 20 inches deep, in clean rivers and large creeks with a bottom of pea-sized, clean gravel and a high bottom current velocity.

Snakes & Reptiles

Western Cottonmouth State Endangered Habitat: Swampy flatwood swamps and floodplains. Only reported population in Indiana found at Buffalo Flats

Threats: Habitat alteration, wetland draining

Copperbelly Water Snake State Endangered Habitat: Shrub swamps, emergent wetlands, and floodplain forests. Also, open waters with shallow edge. Utilizes upland forests during sensitive periods (shedding, birthing)

Threats: draining of wetlands and habitat alterations. Copperbellies often rely on high water table floodplain areas during winter hibernation to reduce the chances of freezing. Fish feed on tadpoles and thus can reduce food supply if introduced to copperbelly habitats.

Plants

Bog BluegrassState EndangeredHabitat: Bog Bluegrass is found in wet meadows, wet woods, swamps, bogs, and
alongside streams. It is often found in association with moss tussocks and alder species.It prefers partially-shaded areas and is absent from completely shaded areas.

Threats: Drainage of wetlands, grazing, and overgrowth through natural succession.

Howe Sedge State Endangered Habitat: Exists in a variety of open, moist situations in acidic substrates; sphagnum bogs, shrub borders, clearings in wet woods, thickets. Howe Sedge requires partial shade.

Threats: Drainage of wetlands, grazing, and overgrowth through natural succession.

Featherfoil State Threatened Habitat: Exists in frequently flooded swamps and floodplains. Uproots at some point in life cycle and becomes free floating. Threats: Wetland draining

4

·