Nine Minimum Controls – No. 9

9.0 MONITORING TO CHARACTERIZE CSO IMPACTS AND EFFICACY OF CSO CONTROLS

EPA's NMC Guidance explains that the ninth NMC "involves visual inspections and other simple methods to determine the occurrence and apparent impacts of CSOs" and "is the precursor to the more extensive characterization and monitoring efforts to be conducted as part of the LTCP."

9.1 INTRODUCTION

The NMC are technology-based controls, applied on a site-specific basis, to reduce the magnitude, frequency, and duration of CSOs. The implementation of the NMC establishes the baseline conditions upon which the LTCP will be developed.

Monitoring is specifically included as the ninth NMC. The ninth NMC is titled "Monitoring to Characterize CSO Impacts and Efficacy of CSO Controls".

Implementation of this control would typically involve the following activities:

- Mapping the drainage area for the CSS, including the locations of all CSO outfalls and receiving waters.
- Identifying, for each receiving water body, designated and existing uses, applicable water quality criteria, and whether water quality standards (WQS) are currently being attained for both wet weather and dry weather.
- Developing a record of overflow occurrences (number, volume, frequency, and duration).
- Compiling existing information on water quality impacts associated with CSOs (e.g., beach closings, evidence of floatables wash-ups, fish kills, sediment accumulation, and the frequency, duration, and magnitude of instream WQS violations)."
- Developing a long-term monitoring plan for the LTCP.

9.2 IMPLEMENTATION OF THE NINTH MINIMUM CONTROL

9.2.1 Mapping the CSS and Its Drainage Area

Fort Wayne's geographic information system (GIS) contains graphic information on all the sewers and sewer structures, including CSO regulators and discharge points, that the City operates and on all waters that receive discharges from its sewer system. The City's GIS also

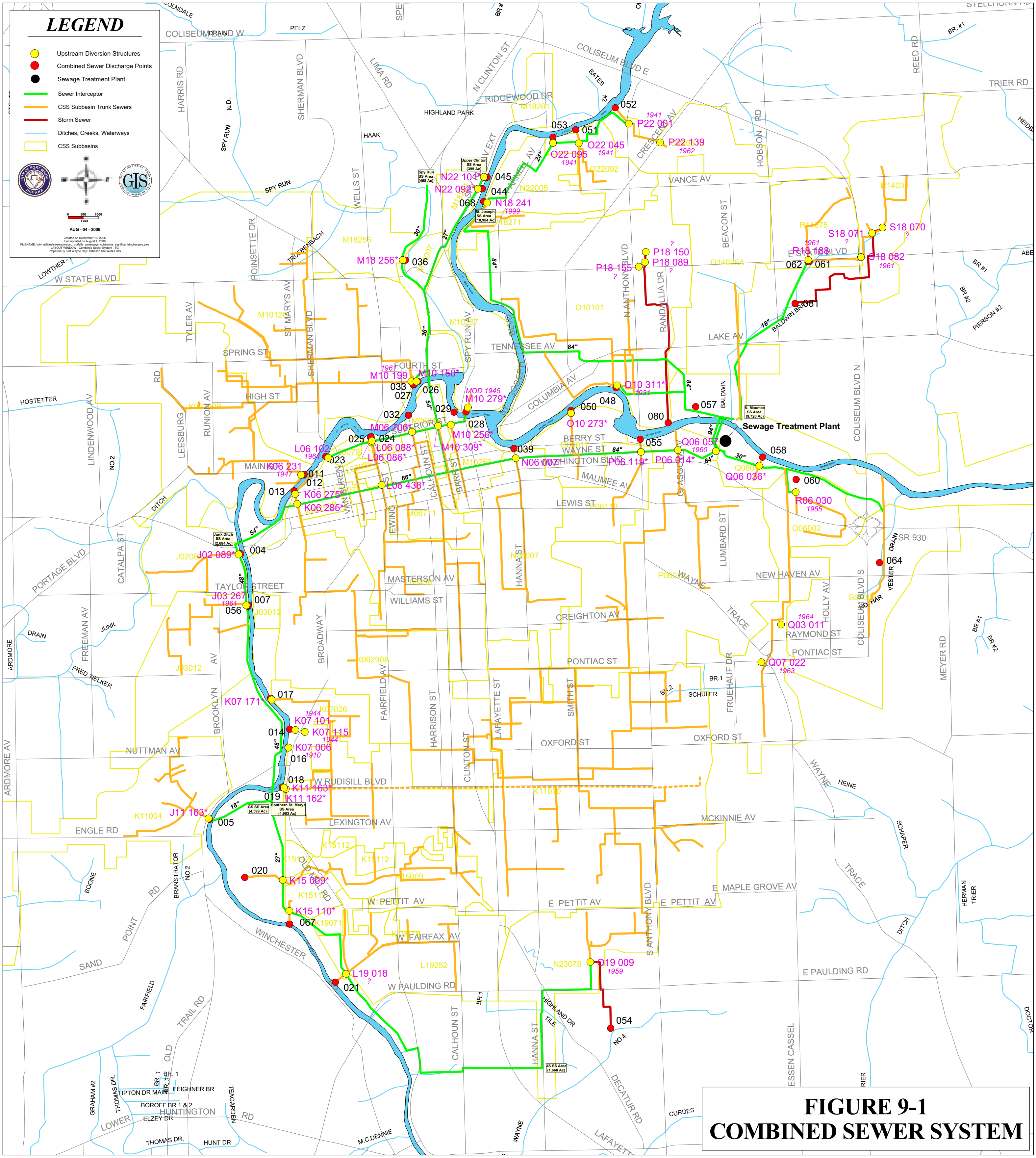

FIGURE 9-1
COMBINED SEWER SYSTEM

contains information on sewer type (sanitary, storm, or combined), size, construction material, and age. This information has been used to delineate the areas served by major branches of each type of sewer. Figure 9-1 shows the CSS drainage subbasins, CSS trunk sewers, regulators, interceptors, CSO discharge points, and the water bodies that receive CSO discharges. This figure is typical of the type of maps that can be produced by the City's GIS.

9.2.2 Identification of Designated and Existing Uses, Water Quality Criteria, and Compliance Status

All waters of the State of Indiana have been given fishable/swimmable use designations. For waters in the Great Lakes Basin, which includes the receiving waters of the City's CSS, the designated uses are described in 327 IAC 2-1.5-5. The applicable water quality standards (WQS) can be found in 327 IAC 2-1.5-8. Indiana's integrated water monitoring and assessment reports show that existing WQS are not being met at all times in receiving waters of the CSS. A more detailed discussion of this issue can be found in Exhibit I-1.

As detailed at Chapter 2 of the City's LTCP, the City has long conducted (in cooperation with IDEM) monthly water quality monitoring at six locations, an upstream and downstream location for each river, throughout the year. The City supplements its monthly sampling during the recreational season with weekly monitoring at the same six locations. Additionally, the City completed two significant river water quality sampling and characterization programs to further characterize receiving waters. A summary of these two programs and identified WQS excursions can be found in Exhibit I-2.

9.2.3 Monitoring of CSO Discharges

The City has been visually inspecting its regulators and associated discharge points in compliance with the requirements of an Administrative Order issued by U.S. EPA in 2003. The number and size of wet weather events that caused overflows in 2006 at each regulator are summarized in Exhibit I-3. Also in compliance with the aforementioned Administrative Order, a metering program has been implemented to measure overflow volume and duration with respect to 39 CSO outfalls. Pump data is used to determine the duration and volume of discharges at another_5_CSO outfalls. The 2006 results of this program are summarized in Exhibit I-4.

9.2.4 Compilation of Information on Water Quality Impacts From CSO Discharges

The information that exists on water quality impacts is not specific to CSOs. There is evidence of floatable trash (plastic bottles, aluminum cans, styrofoam, etc.) accumulating around bridges and riverbanks. The floatable trash, however, does not seem to be concentrated around or just downstream of CSO discharge points. This is discussed and illustrated in greater detail in Chapter 6 of the CSO Operations Plan. Indiana has issued fish advisories for CSO receiving waters, but the advisories are applicable upstream of the CSOs as well as downstream. A copy of the most recent fish advisory can be found in Exhibit I-5. Although several river sampling programs have been undertaken, the frequency, duration, and magnitude of instream WQS excursions can only be estimated and CSOs are not the only cause of these excursions. The City's rivers have been analyzed for fish advisory. Mercury and PCBs are the fish tissue contaminants identified. Both the 2004 and 2006 303(d) reports list only PCBs for a fish advisory. The City has tested CSOs and did not find PCBs present. This indicates that fish advisories are not a result of CSOs. There are no beaches in the area and, consequently, no beach closures occur. No fish kills have been reported in the sewer system's receiving waters for at least 10 years. Sediment accumulation has not caused or created any reported problems.

9.2.5 Summary of Findings

The City's review of existing information indicates that the sewer system's receiving waters do not meet all WQS all of the time. The water bodies assessed by the State of Indiana generally fully support aquatic life, partially support fish consumption, but do not support primary contact recreation at all times. Mercury and PCBs have been found in the tissue of some fish. River sampling has found a small number of exceedences for the CCC limits for cadmium, copper, and lead. No CMC exceedences were found. The collected data indicate that CSOs are not a significant source of these pollutants. Indeed, to the extent CSOs are a contributing source at all, the contribution is minor. Bacteria exceedences were found to be relatively frequent and applicable to all receiving waters. CSOs are a significant, but not only, contributing source of this pollutant.

9.2.6 Developing a Long-Term Monitoring Plan for the LTCP

Because the LTCP is based on more detailed knowledge of the CSS and receiving waters than is necessary to implement the NMC, the extent of characterization for the LTCP development is more sophisticated. The system components that must be examined as part of the LTCP's long-term monitoring plan include the CSS, combined sewage and CSOs, and the receiving waters. The process for examining these components can be broken into the following elements as described in the LTCP:

- Compilation and Analysis of Existing Data

- Combined Sewer System and Receiving Water Monitoring
- Combined Sewer System and Receiving Water Modeling

9.3 RECORDKEEPING

The City intends to continue CSO inspections and monitoring and as well as its ongoing monitoring for reported fish kills and advisories. The City further intends to continue its ongoing river water quality monitoring program. Annual results of the monitoring required by the ninth NMC will be kept with Exhibit I-7.

DIRECTORY FOR APPENDIX I
(Items Presented in Order of Appearance in Appendix I)

EXHIBIT I-1

Integrated Water Monitoring and Assessment Report Findings

The information on the following pages is derived from Indiana's integrated water monitoring and assessment reports provided by Indiana Department of Environmental Management (IDEM) from both 2002 and 2004. Detailed information and maps of waterbodies assessed for WQS are included in this document for both 2002 and 2004.

There are two sections to this document. The first section includes detailed information on each waterbody segment. This includes waterbody segment name, waterbody segment ID, basin and size, level of designated use support, pollutants of concern and stressors. Information for both 2002 and 2004 are compared and summarized in this section. The second section includes a detailed map of the monitored waterbody segments along Spy Run Creek, and the St. Joseph, St. Mary's and Maumee Rivers. The map shows comparison of the six waterbodies assessed for designated use, pollutants of concern, and stressors.

Of the six areas assessed, two waterbodies show a change in monitoring results from 2002 to 2004. Waterbody segment INA0463_T1003 on the St. Mary's River contained inorganics which was a moderate stressor in 2002. Inorganics were not found in 2004. More information was needed in 2004 to assess nutrient level. Waterbody segment INA0465_T1002 of the St. Mary's River fully supported aquatic life in 2002, however this section was not assessed for aquatic life in 2004.

FINDINGS BY WATERBODY SEGMENT

Integrated Water Monitoring and Assessment Report Findings

Waterbody Name: St. Joseph River
Waterbody segment ID: INA03A4_M1042

Basin: Great Lakes
Size: 3 miles

Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCB's & Hg
PCBs: M
Mercury: M

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCB's & Hg
PCBs: M
Mercury: M

Waterbody segment INA03A4_M1042 of the St. Joseph River fully supports aquatic life. This section of the St. Joseph River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Joseph River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. Primary contact for recreational use is not assessed.

Integrated Water Monitoring and Assessment Report Findings

Waterbody Name: St. Mary's River
Waterbody segment ID: INA0463_T1003

Basin: Great Lakes
Size: 6.2 miles

Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*; FCA for PCBs & Hg
PCBs: M
Mercury: M
Nutrients: T
Pathogens: H

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*; FCA for PCBs & Hg

Integrated Water Monitoring and Assessment Report Findings

PCBs: M
Mercury: M
Other Inorganics: M
Pathogens: H

Waterbody segment INA0463_T1003 of the St. Mary's River fully supports aquatic life. This section of the St. Mary's River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Mary's River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. *E. Coli* is the indicator measure for bacteria and is rated as a high cause/stressor for pathogens. Primary contact for recreational use is not supported. More information is needed to assess nutrient stressors in 2004. Inorganics were found in 2002, but not in 2004.

Integrated Water Monitoring and Assessment Report Findings

Waterbody Name: St. Mary's River
Waterbody segment ID: INA0465_T1002

Basin: Great Lakes
Size: 4.4 miles

Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support				X
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCBs & Hg
PCBs: M
Mercury: S

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support				X
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCBs and Hg
PCBs: M

Mercury: S

Waterbody segment INA0465_T1002 of the St. Mary's River was not assessed for support of aquatic life or primary contact. This section of the St. Mary's River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Mary's River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with PCBs being a moderate stressor and mercury being a slight stressor.

Integrated Water Monitoring and Assessment Report Findings

Waterbody Name: Spy Run Creek
Waterbody segment ID: INA0466_T1013

Basin: Great Lakes
Size: 19.9 miles

Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support			N	
Fish Consumption				X
Primary Contact				X

Pollutants of concern: Impaired biotic communities
Biotic Community Status: M

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support			N	
Fish Consumption				X
Primary Contact				X

Pollutants of concern: Impaired Biotic Community

Integrated Water Monitoring and Assessment Report Findings

Biotic Community Status: M

Waterbody segment INA0466_T1013 of the Spy Run Basin does not support the designated use for aquatic life. An Impaired Biotic Community (IBC) means that a waterbody's aquatic life differs from the expectation of water that was unaffected by human activity. The Spy Run Creek was assessed for IBC and was found to be a moderate stressor. Designated use for fish consumption and primary contact were not assessed.

Integrated Water Monitoring and Assessment Report Findings

Waterbody Name: St. Mary's River
Waterbody segment ID: INA0466_T1022

Basin: Great Lakes
Size: 0.5 miles

Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCBs & Hg
PCBs: M
Mercury: M
Pathogens: H

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCBs and Hg

Integrated Water Monitoring and Assessment Report Findings

PCBs: M
Mercury: M
Pathogens: H

Waterbody segment INA0466_T1022 of the St. Mary's River fully supports aquatic life. This section of the St. Mary's River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Mary's River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. *E. Coli* is the indicator measure for bacteria and is rated as a high cause/stressor for pathogens. Primary contact for recreational use is not supported in this waterbody segment.

Integrated Water Monitoring and Assessment Report Findings

Waterbody Name: Maumee River
Waterbody segment ID: INA0511_M1007

Basin: Great Lakes
Size: 8.7 miles

Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCB & Hg
PCBs: M
Mercury: M
Pathogens: M

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCB & Hg
PCB's: M
Mercury: M

Pathogens: M

Waterbody segment INA0511_M1007 of the Maumee River fully supports aquatic life. This section of the Maumee River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the Maumee River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. *E. Coli* is the indicator measure for bacteria and is rated as a moderate cause/stressor for pathogens. Primary contact for recreational use is not supported in this waterbody segment.

FINDINGS BY DESIGNATED USE

EXHIBIT I-2

Water Quality Excursion Summary

WATER QUALITY EXCURSION SUMMARY

Two significant river sampling programs have been undertaken on Fort Wayne's sewer system's receiving waters. The first study was conducted in 1996 by Malcolm Pirnie to Characterize the Impact of Combined Sewer Overflows (CSOs) on the St. Mary's, St. Joseph and Maumee Rivers. The most recent study was conducted in spring of 2005 on the relief channel in the Maumee River and two of the tributaries (Spy Run Creek and Baldwin Ditch). The purpose of the 2005 study is to characterize the impacts of CSOs on the tributaries and the relief channel. Parameters of the sampling programs are shown in Table 1.

TABLE 1
SAMPLING PROGRAM PARAMETERS

Data Source	Locations	Frequency	Years	Parameters	Parameter Group
Malcolm Pirnie	6	11 dry weather samples (8/6 – 11/3) 4 rain events - 12 grab samples per event at each site	1996	22	TSS, $CBOD_5$, total phosphorus, NH_3-N, E. Coli, fecal coliform, pH, DO, total cyanide, hardness, volatiles, PCBs, pesticides, temp, metals - Cd, Cr, Cu, Pb, Hg, Ni, Ag, & Zn
City of Fort Wayne	9	2 dry weather samples (3/29) and (4/15) 2 rain events - **5/13** (sample 5/13, 5/14, 5/15, 5/16) - **5/19** (sample 5/19, 5/20, 5/21, 5/22)	2005	15	DO, NH_3-N, pH, TDS, TSS, E. Coli, Phosphorus, $CBOD_5$, metals - Ag, Cd, Cr, Cu, Pb, Ni, Zn

1996 SAMPLING PROGRAM

The first sampling program was conducted in 1996 by Malcolm Pirnie. Samples were taken from six sites for both dry and wet weather events. Table 2 shows the sampling locations used in this study.

TABLE 2
SAMPLING LOCATIONS

Sampling Site	**River**	**Location on River**
Mayhew Rd. Bridge	St. Joseph	Significantly upstream of CSOs
Ferguson Rd. Bridge	St. Mary's	Significantly upstream of CSOs
Landin Rd. Bridge	Maumee	Downstream of CSOs and tributaries
Tennesee Ave. Bridge	St. Joseph	Near confluence & downstream of CSOs
Harrison St. Bridge	St. Mary's	Near confluence & downstream of tributaries and CSOs
Anthony Blvd. Bridge	Maumee	Near confluence and upstream of Pond outfalls

The sampling data can be found in Appendix A and Appendix C of "Impact Characterization of Combined Sewer Overflows" completed by Malcolm Pirnie in September 1998. The dry weather sampling results show that the three rivers meet Water Quality Standards (WQS) for most parameters.

Water Quality Excursion Summary

The Indiana Administrative Code states that the "Criterion Continuous Concentration" (CCC) is an estimate of the highest concentration of material an aquatic community can be exposed to indefinitely. The "Criterion Maximum Concentration" (CMC) is an estimate of the highest concentration of material an aquatic community can "briefly" be exposed to. Although there were CCC excursions during dry weather, there were no CMC excursions. The frequency of CCC excursions do not indicate this is a chronic condition. Table 3 shows CCC WQS excursions during dry weather.

TABLE 3
DRY WEATHER WQS EXCURSIONS

Parameter	Date	Time	Location	Hardness (mg/l $CaCO_3$)	CCC Allowable (ug/l)	Actual (ug/l)
Cadmium	8/6/96	12:55 p.m.	Tennessee @ St. Joseph	328	6.2	13
Copper	10/16/96	11:10 a.m.	Harrison @ St. Mary's	308	24	26

E. Coli is the indicator organism for pathogens. E. Coli standards are 125 colonies per 100 ml, based on a geometric mean of 5 samples over a 30-day period and a maximum E. Coli count of 235 colonies per 100 ml in any one sample. Averages of E. Coli samples during dry weather are listed below:

- Mayhew at St. Joseph = 90 colonies/100 ml
- Tennessee at St. Joseph = 106 colonies/100 ml
- Ferguson at St. Mary's = 240 colonies/100 ml
- Harrison at St. Mary's = 314 colonies/100 ml
- Anthony at Maumee = 192 colonies/100 ml
- Landin at Maumee = 238 colonies/100 ml

Wet weather sampling results did not differ that much from the dry weather sampling results for WQS excursions. Both cadmium and copper exceeded CCC WQS for wet weather. Again, cadmium and copper exceeded CCC limits, but did not exceed CMC limits indicating this is not a chronic condition. Table 4 shows CCC WQS excursions for cadmium and copper during wet weather.

TABLE 4
WET WEATHER WQS EXCURSIONS

Parameter	Event	Date	Time	Location	Hardness (mg/l $CaCO_3$)	CCC Allowable (ug/l)	Actual (ug/l)
Cadmium	1	9/21/96	7:35 p.m.	Mayhew @ St. Joseph	302	5.9	10
Cadmium	1	9/22/96	4:15 p.m.	Tennessee @ St. Joseph	266	5.3	10
Copper	2	9/27/96	9:30 a.m.	Harrison @ St. Mary's	217	18	20

The wet weather sampling results show that E. Coli counts increased significantly at all six sites. E. Coli exceeded WQS at all six sampling sites during all 4 wet weather events. The Maumee River levels were higher than the St. Mary's and St. Joseph Rivers with the highest concentration at Anthony Blvd., near the confluence, for events 3 and 4. The average E. Coli concentrations for each wet weather event at each site is listed below in Table 5.

TABLE 5
AVERAGE WET WEATHER E. COLI CONCENTRATIONS

River Sampling Site	Event 1	Event 2	Event 3	Event 4
Mayhew at St. Joseph	413	1,444	341	427
Tennessee at St. Joseph	2,599	2,381	650	1,158
Ferguson at St. Mary's	800	5,070	1,238	610
Harrison at St. Mary's	14,823	20,957	2,785	6,779
Anthony at Maumee	7,078	7,312	11,270	7,379
Landin at Maumee	2,292	9,198	1,134	2,758

2005 SAMPLING PROGRAM

The most recent water quality study was conducted by the City of Fort Wayne in Spring 2005. The purpose of the 2005 study is to characterize the impacts of CSOs on the tributaries and the relief channel. A relief channel was constructed by the Army Corps of Engineers to assist in flood relief. In addition to the relief channel, two tributaries, Spy Run Creek and Baldwin Ditch were also evaluated for CSO affects on them. Sampling sites along the Baldwin Ditch, Spy Run Creek, the Maumee River and the Maumee Relief Channel were analyzed during both dry and wet weather events. Locations of each sampling site are listed below. A diagram of the sampling points can be found in figures 1-6.

Baldwin U = Upstream Baldwin Ditch
Baldwin D = Downstream Baldwin Ditch
Spy Run U = Upstream Spy Run Creek
Spy Run D = Downstream Spy Run Creek
Relief RCD-1 = The Maumee relief channel where Baldwin ditch enters the relief channel and upstream of the rock dam
Relief RC-4 = Downstream of the rock dam and upstream of Pond 3 outfall in the relief channel
River MR-6 = Parallel to RC-4 in the Maumee River
Lower Relief LRC-5 = Downstream of Coliseum Bridge
River MR-7 = Downstream of Coliseum Bridge

The sampling data can be found in Appendix A.

The two dry weather sampling days were conducted on 3/29/05 and 4/15/05. Ammonia did not meet WQS for one dry sampling event on relief channel at RCD-1. This site is located at the end of Baldwin Ditch. There is very little flow through the Baldwin Ditch during dry weather and the stream passes through a goose populated area. The highest E. Coli sample was upstream on the Baldwin Ditch which exceeded WQS for all dry weather samples. Baldwin Ditch also exceeded WQS at the downstream sampling site for 50% of the dry weather samples collected. E. Coli exceeded WQS on both the upstream and downstream sampling sites on the Spy Run Creek for 50% of the dry weather samples collected.

Data was collected from two significant wet weather events. Sampling took place on the day of each rain event and three consecutive days following to show the effect of CSOs during wet weather events. Table 6 shows the days samples were collected.

Water Quality Excursion Summary

TABLE 6
WET WEATHER SAMPLING DATES

Rain Event	Days Sampled
May 13, 2005	May 13, 14, 15, & 16
May 19, 2005	May 19, 20, 21, & 22

For wet weather events, increased ammonia-nitrate concentrations were present at RCD-1. This is most likely due to the Baldwin Ditch along with the pooling effect upstream of the rock dam. NH_3-N did not meet WQS at Relief RCD-1 for events 1 and 2. NH_3-N was also high at this site during dry weather sampling. Copper exceeded CCC WQS during the first rain event at the downstream sampling site on the Spy Run Creek. All other metals tested met WQS.

As expected, higher concentrations of E. Coli were present after wet weather events. Both upstream and downstream sites on the Baldwin ditch exceeded WQS and had the highest E. Coli concentration for each wet weather event. RCD-1 also had high E. Coli concentrations and exceeded WQS for each wet weather event. Both upstream and downstream sites on the Spy Run Creek exceeded WQS during each wet weather event except once, which was upstream. The lowest E. Coli concentration was sampled at MR-7 and LRC-5 along with MR-6 and RC-4. E. Coli concentrations are found to be similar in both the relief channel and the main channel of the Maumee River.

The main channel and the relief channel displayed similar values for each parameter tested during both dry and wet weather events. This data supports that the main channel and the relief channel of the Maumee River share similar water quality characteristics.

EXHIBIT I-3

MINIMUM RAIN EVENT TRIGGERING CSO's
year: 2004

Monitoring Point	Overflow Events			Events that Caused Overflows	Correlation	Related Rain Gauge Site
	events	total	percent	min.		
4	15	75	20%	> .3"	poor	Study
5	32	70	46%	> .2"	good	Study
7*		0			good	Study
11	9	66	14%	> 1.0"	good	Study
12*		0			good	Study
13a	12	78	15%	> .25"	poor	City-County Bldg.
13b**		?				Fairfield
14a	3	88	3%	> .5"	poor	Fairfield
14b	1	88	1%	> .5"	good	Fairfield
16	3	88	3%	> 2.0"	good	Fairfield
17	39	88	44%	> .1"	fair	Fairfield
18	52	92	57%	> .01"	good	Harrison
19	36	92	39%	> .1"	fair	Harrison
20a	37	89	42%	> .2"	good	Harrison
21	56	92	61%	> .01"	good	Harrison
23	32	65	49%	> .1"	good	City-County Bldg.
24	21	65	32%	> .3"	poor	City-County Bldg.
25	31	65	48%	> .2"	good	City-County Bldg.
26	10	67	15%	> .1"	poor	Tecumseh
27*		0			good	Little Turtle
28	25	72	35%	>.1"	poor	Tecumseh
29a	27	65	42%	> .2"	fair	City-County Bldg.
29b	37	65	57%	> .1"	good	City-County Bldg.
32	40	65	62%	> .1"	good	City-County Bldg.
33	38	67	57%	> .1"	good	Little Turtle
36	8	67	12%	> .3"	poor	Tecumseh
39**		?				City-County Bldg.
44	12	67	18%	> .4"	poor	Little Turtle
45	14	67	21%	> .4"	poor	Little Turtle
48	34	66	52%	>.1"	fair	Tecumseh
50	21	78	27%	> .1"	poor	City-County Bldg.
51	19	72	26%	> .2"	poor	Tecumseh
52a	15	72	21%	> .1"	poor	Tecumseh

MINIMUM RAIN EVENT TRIGGERING CSO's
year: 2004

Monitoring Point	Overflow Events			Events that Caused Overflows	Correlation	Related Rain Gauge Site
	events	total	percent	min.		
52b	32	72	44%	> .1"	fair	Tecumseh
53	21	72	29%	> .2"	poor	Tecumseh
54	9	32	28%	> .3"	fair	Irwin
55a	35	78	45%	> .02"	poor	City-County Bldg.
56	14	66	21%	> .5"	fair	Study
57a**		?				Bunche
57b	34	89	38%	> .01"	fair	Fairfield
58	17	84	20%	> .2"	poor	Adams
60	36	85	42%	> .1"	fair	Adams
61	36	72	50%	> .1"	fair	Tecumseh
62	15	78	19%	> .2"	poor	Tecumseh
64a	27	75	36%	> .25"	fair	Bunche
64b		0			good	Bunche
67	23	89	26%	>.3"	poor	Harrison Hills
68	11	72	15%	> .5"	poor	Tecumseh
P18-089	4	72	6%	> 1.0"	fair	Tecumseh
P18-150	14	72	19%	> .4"	poor	Tecumseh
P18-155	9	72	13%	> .1"	poor	Tecumseh

* tide gate manually operated
** can't visually inspect

EXHIBIT I-4

2007 Indiana Fish Consumption Advisory

Streams and Rivers

Location	Species	Fish Size (Inches)	Contaminant	Group
All Indiana Rivers and Streams				
All Counties (unless specified otherwise)	**Carp**	15-20	☐	3
		20-25	☐	4
		25+	☐	5
Aboit Creek				
Allen County	Creek Chub	Up to 5		1
Anderson River	Black Buffalo	25+	☐	3
Perry County	Bluegill	Up to 7		1
	Carp	22+	☐○	2
Spencer County	Channel Catfish	13+	☐	3
Beanblossom Creek				
Monroe County	Channel Catfish	13+	☐	3
Big Blue River				
Henry County	Carp	19-24	☐	3
		24+	☐	4
	Rock Bass	4-7	☐	3
		7+	☐	4
	White Sucker	8-10	☐	3
		10+	☐	4
Rush County	Carp	19-24	☐	3
		24+	☐	4
Shelby County	Carp	19-24	☐	3
		24+	☐	4
	Golden Redhorse	Up to 18	☐	3
		18+	☐	4
	Northern Hogsucker	9-10	☐	3
		10+	☐	4
	River Redhorse	14+	☐	3
	Rock Bass	4+	☐	3
	Smallmouth Bass	15+	☐	3
Johnson County	Carp	19-24	☐	3
		24+	☐	4
	Longear Sunfish	5+	☐	3
	Northern Hogsucker	8-10	☐	3
		10+	☐	4
	Rock Bass	7+	☐	3
	Smallmouth Bass	5-8	☐	3
		8+	☐	4
Big Camp Creek				
Jefferson County	Longear Sunfish	Up to 5		1
Big Creek				
Jefferson County	Longear Sunfish	Up to 5		1
Big Monon Creek				
White County	Longear Sunfish	Up to 4		1
	White Sucker	Up to 10		1
Big Pine Creek				
Warren County	Black Redhorse	Up to 13		1
	Flathead Catfish	Up to 10		1
	Longear Sunfish	Up to 5		1
	Smallmouth Bass	11+	☐	3
Big Raccoon Creek				
Parke County	Black Redhorse	Up to 11		1
	Carp	Up to 22	☐○	2
		22+	☐○	3
Blue River	Carp	28-29	○	2
Harrison County	Channel Catfish	15+	☐	3
	Longear Sunfish	Up to 5		1
	Rock Bass	Up to 7		1
	Shorthead Redhorse	17+	☐	3
	Spotted Bass	10+	☐	3
Buck Creek	Longear Sunfish	5-6	☐	3
Delaware County		6+	☐	4
	White Sucker	14+	☐	3
Cedar Creek	Carp	Up to 22	☐○	2
Allen County	River Chub	4+	☐	3
	Channel Catfish	18+	☐	3
Christiana Creek				
Elkhart County	Northern Hogsucker	Up to 14		1
	Rock Bass	Up to 7		1
	Yellow Bullhead	Up to 9		1
Clear Creek				
Monroe County	**ALL SPECIES**	**ALL**	☐	5
Clear Creek				
Whitley County	Creek Chub	Up to 7		1
Crooked Creek				
Steuben County	Carp	23+	☐	2
Deer Creek				
Carroll County	Carp	Up to 19	☐○	2
		19+	☐	3
	Longear Sunfish	Up to 5		1
	Smallmouth Bass	10+	☐	3

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(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (Inches)	Contaminant	Group

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Eagle Creek	**Channel Catfish**	Up to 20	☐	3
Marion County		20-23	☐	4
		23+	☐	**5**
	White Sucker	13+	☐	3
Easterday Ditch				
Kosciusko County	Carp	Up to 23	☐○	2
		23+	☐	3
East Fork of White Lick Creek				
Hendricks County	Creek Chub	9+	☐	3
	Northern Hogsucker	11+	☐	3
	Yellow Bullhead	10+	☐	3
East Fork of White River				
Bartholomew County	Carp	Up to 18		1
		18-23	☐	2
		23+	☐	3
	Flathead Catfish	Up to 13		1
		24+	☐	3
	Golden Redhorse	13+	☐	3
Jackson County	Bigmouth Buffalo	18+	☐	3
	Carp	Up to 18		1
		18-23	☐	2
		23+	☐	3
	Channel Catfish	Up to 14		1
	Flathead Catfish	Up to 13		1
	Golden Redhorse	14-16	☐	3
		16+	☐	4
	Silver Redhorse	22+	☐	3
	Smallmouth Bass	13+	☐	3
	Smallmouth Buffalo	19-26	☐	3
		26+	☐	4
Lawrence County	**Channel Catfish**	Up to 15	☐	3
		15-21	☐	4
		21+	☐	**5**
	Freshwater Drum	10+	☐	3
	Bigmouth Buffalo	Up to 18	☐	3
		18+	☐	4
	Flathead Catfish	10-16	☐	3
		16+	☐	4
	Largemouth Bass	Up to 11	☐	3
		11-14	☐	4
		14+	☐	**5**
	Longear Sunfish	3+	☐	3
	River Carpsucker	15+	☐	3
	Sauger	14+	☐	3

East Fork of White River Cont.				
Lawrence County Cont.	**Shorthead Redhorse**	Up to 14	☐	3
		14-16	☐	4
		16+	☐	**5**
	Smallmouth Buffalo	Up to 15	☐	4
		15+	☐	**5**
	Spotted Sucker	17+	☐	3
	Striped Bass	22+	☐	4
Martin County	Carp	Up to 23	☐	3
		23+	☐	4
	Channel Catfish	12-19	☐	3
		20+	☐	4
	Freshwater Drum	10+	☐	3
	Longear Sunfish	3+	☐	3
	Shorthead Redhorse	Up to 14	☐	3
		14-16	☐	4
		16+	☐	**5**
	Smallmouth Buffalo	Up to 15	☐	4
		15+	☐	**5**
Dubois County	Carp	22-24	☐	3
		24+	☐	4
	Channel Catfish	19+	☐	3
	Flathead Catfish	24+	☐○	3
	Longear Sunfish	4+	☐	3
East Fork of Whitewater River				
Wayne County	Channel Catfish	12-16	☐	3
		16+	☐	4
	Longear Sunfish	Up to 6		1
	Northern Hogsucker	Up to 9		1
East Fork of Wildcat Creek				
Howard County	Carp	Up to 23	☐○	2
		23+	☐	3
Eel River (West Fork White River Basin)				
Greene County	Sauger	18+	☐	3
Eel River (Upper Wabash River Basin)				
Whitley/Wabash/Miami/Cass Counties				
Consumption of fish from the Eel River should be limited to no more than one meal per month (Group 3) for the general population and NO CONSUMPTION by the at-risk population. Exceptions to this advice for the general population are listed below.				
	Bluegill	6+	☐	4
	Carp	24+	☐	4

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Location	Species	Fish Size (inches)	Contaminant	Group
Elkhart River				
Elkhart County	Rock Bass	9+	☐	3
	Smallmouth Bass	17+	☐	3
	White Sucker	16+	☐	3
Elkhorn Creek				
Randolph County	Creek Chub	Up to 3		1
Elliot Ditch				
Tippecanoe County	**ALL SPECIES**	**ALL**	☐	**5**
Fall Creek	Carp	19-22	☐	3
Madison County		22+	☐	4
	Channel Catfish	Up to 22	☐	3
		22+	☐	4
	Rock Bass	7+	☐	3
	Smallmouth Bass	15+	○☐	3
Fall Creek (Upstream of Geist Reservoir)				
Hamilton County	Carp	16-23	☐	2
		23+	☐	3
	Channel Catfish	25+	☐	3
Marion County	**Carp**	Up to 20	☐	4
		20+	☐	**5**
	Channel Catfish	Up to 18	☐	3
		18-20	☐	4
		20+	☐	**5**
	Largemouth Bass	14+	☐	3
Flatrock River				
Rush County	Longear Sunfish	All		1
Shelby County	Carp	22-23	☐○	2
		23+	☐	3
	Flathead Catfish	Up to 18		1
	Longear Sunfish	All		1
Bartholomew County	Longear Sunfish	All		1
Galena River (South Branch)				
LaPorte County	Creek Chub	Up to 7	☐	3
Graham Creek				
Jennings County	Longear Sunfish	Up to 6		1

Location	Species	Fish Size (inches)	Contaminant	Group
Great Miami River				
Dearborn County	**Carp**	16-20	☐	4
		20+	☐	**5**
	Channel Catfish	Up to 15	☐	4
		15+	☐	**5**
	Largemouth Bass	16+	☐	3
	White Crappie	8-11	☐	3
		11+	☐	4
Hanna Creek	Carp	Up to 16		1
Union County		16+	☐○	2
Honey Creek				
White County	Largemouth Bass	20+	☐○	3
Indian Creek (Whitewater Basin)				
Union County	Carp	Up to 9		1
		9+	○	2
Indian Creek (Ohio River Valley)				
Harrison County	Flathead Catfish	Up to 13		1
	Longear Sunfish	Up to 6		1
Iroquois River				
Jasper/Newton Counties	Carp	Up to 19		1
		28+	☐	3
	Channel Catfish	Up to 18		1
	Golden Redhorse	Up to 15		1
	Rock Bass	Up to 6		1
	Shorthead Redhorse	Up to 12		1
Juday Creek				
St. Joseph County	White Sucker	17+	☐	3
Kankakee River				
LaPorte/Lake/Newton Counties	Bigmouth Buffalo	22+	☐	3
	Black Crappie	Up to 10		1
	Bluegill	Up to 6		1
	Quillback	15+	☐	3
	Rock Bass	Up to 8		1
	Shorthead Redhorse	Up to 13		1
	Silver Redhorse	20+	☐	3
	Smallmouth Buffalo	22-28	☐	3
		28-32	☐	4
		32+	☐	5
	White Crappie	Up to 9		1

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Location	Species	Fish Size (Inches)	Contaminant	Group
Killbuck Creek	Carp	19-23	□	2
Madison County		23+	□	3
	Longear Sunfish	5-6	□	3
		6+	□	4
	Smallmouth Bass	13+	□	3
Kilmore Creek	Carp	Up to 12		1
Clinton County	Creek Chub	Up to 7		1
Kokomo Creek				
Howard County	**ALL SPECIES**	**ALL**	□	**5**
Laughery Creek				
Dearborn/Ohio Counties	Carp	All	□○	2
Dearborn	White Crappie	Up to 10		1
Little Blue River (Ohio River Basin)				
Crawford County	Bluegill	Up to 7		1
	Carp	Up to 23		1
	Channel Catfish	16+	□	3
	Freshwater Drum	18+	□	3
	Largemouth Bass	Up to 10		1
		18+	□	3
	Sauger	14+	□	3
	White Crappie	Up to 9		1
Little Blue River				
Shelby County	Northern Hogsucker	11+	□	3
Little Calumet River				
Lake County	**Carp**	**ALL**	□	**5**
	White Sucker	Up to 11		1
	Yellow Bullhead	Up to 10		1
Porter County	Black Buffalo	All	□	3
	Bluegill	Up to 7		1
	Carp	Up to 22	□	3
		23+	□	4
	Flathead Catfish	All	□	3
Little Mississinewa River				
Randolph County	**ALL SPECIES**	**ALL**	□	**5**
Little Pigeon Creek	Bluegill	Up to 5		1
Warrick County	Channel Catfish	17+	□	3
	Freshwater Drum	19+	□	3
	Largemouth Bass	11+	□	3
	Sauger	18+	□	3
Little Pipe Creek				
Miami County	Creek Chub	Up to 5		1
Little Salt Creek				
Lawrence County	Longear Sunfish	Up to 4		1

Location	Species	Fish Size (Inches)	Contaminant	Group
Little Sugar Creek/East Fork White River Basin				
Hancock County	Creek Chub	All	□	3
Little Sugar Creek/Walnut Fork Sugar Creek to Sugar Creek				
Montgomery County	**ALL**	**ALL**	□	**5**
Maumee River				
Allen County	Bigmouth Buffalo	20+	□	3
	Carp	Up to 20	□	4
		20-22	□	**5**
	Channel Catfish	14-16	□	3
		16+	□	4
	Freshwater Drum	All	□	3
	Largemouth Bass	9+	□	3
	River Redhorse	12-14	□	3
		14+	□	4
	Rock Bass	7-8	□	3
		8+	□	4
	Sauger	24+	□	3
	Shorthead Redhorse	14-16	□	3
		16+	□	4
	Walleye	Up to 21	□	4
		21+	□	**5**
Middle Fork Wildcat Creek				
Tippecanoe County	Black Redhorse	Up to 10		1
	Carp	Up to 22	□○	2
		22+	□○	3
	Golden Redhorse	Up to 10		1
Mill Creek				
Fulton County	Creek Chub	Up to 5		1
Mississinewa River				
Consumption of fish from the Mississinewa River should be limited to no more than one meal per month (Group 3) for the general population and NO CONSUMPTION by the at-risk population. Exceptions to this advice for the general population are listed below:				
Randolph County	**Carp**	Up to 18	□	4
		18+	□	**5**
	Channel Catfish	Up to 15	□	4
		15+	□	**5**
	Green Sunfish	**3+**	□	**5**
	Quillback	15+	□	4
	Smallmouth Bass	14+	□	4

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Location	Species	Fish Size (inches)	Contaminant	Group
Mississinewa River Cont.				
Randolph County Cont.	White Crappie	10+	□	4
	White Sucker	10+	□	4
Delaware County	Carp	21+	□	4
	Channel Catfish	21+	□	4
	Quillback	15+	□	4
	White Sucker	10+	□	4
Grant County	Carp	21+	□	4
	Channel Catfish	24+	□	4
	Flathead Catfish	17+	□	4
	Quillback	13+	□	4
	White Sucker	10+	□	4
Miami County	**Carp**	15-20	□	**3**
		20-25	□	4
		25+	□	**5**
Mud Creek				
Fulton County	Creek Chub	Up to 7		1
	White Sucker	Up to 11		1
Muddy Fork of Sand Creek				
Decatur County	Black Redhorse	15+	○	3
	Largemouth Bass	6-11	□	3
		11+	□	4
	Longear Sunfish	Up to 4		1
	Northern Hogsucker	6-10	□	3
		10+	□	4
	White Sucker	10-12		1
Muscatatuck River				
Jackson/Washington Counties	Bigmouth Buffalo	26+	□	3
	Carp	23+	○	3
	Channel Catfish	Up to 21		1
	Smallmouth Buffalo	23+	□○	3
North Fork Salt Creek				
Brown County	Carp	23+	○	2
	Longear Sunfish	All		1
North Fork Vernon Fork Muscatatuck River				
Jennings County	Carp	20+	○	2
	Longear Sunfish	All		1

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Location	Species	Fish Size (inches)	Contaminant	Group
Otter Creek				
Vigo County	Black Redhorse	14+	□	3
	Spotted Bass	8+	○	3
Paw Paw Creek				
Miami County	Creek Chub	Up to 7		1
	White Sucker	Up to 10		1
Patoka River				
Dubois County	Bigmouth Buffalo	21+	○	3
	Channel Catfish	19+	□	3
Gibson County	Black Buffalo	25+	□	3
	Channel Catfish	18+	□	3
	Flathead Catfish	20+	□	3
Pike County	Freshwater Drum	22+	□	3
Pigeon Creek (St. Joseph River Basin)				
Steuben County	Carp	21-25	□	3
		25+	□	4
Pigeon Creek (Ohio River Basin)				
Vanderburgh County	Channel Catfish	11-13	□	3
		14+	□	4
	Flathead Catfish	Up to 18	□	3
	Freshwater Drum	19+	□	3
Pigeon River				
LaGrange County	Hornyhead Chub	Up to 6		1
	Rock Bass	Up to 8		1
Pipe Creek				
Madison County	White Sucker	12+	□	3
Miami County	Creek Chub	Up to 7		1
	White Sucker	Up to 10		1
Pleasant Run Creek				
Lawrence County	**ALL SPECIES**	**ALL**	□	**5**
Prairie Creek				
Boone County	Creek Chub	6-7	□	3
Richland Creek				
Monroe/Greene/Owen Counties	Black Redhorse	13+	□	3
	Creek Chub	5-7	□	3
		7+	□	4
	Freshwater Drum	15+	□	3
	Largemouth Bass	13+	□	3
	Longear Sunfish	6+	□	3
	Rock Bass	7+	□	3
	Spotted Bass	12+	□	3
	White Sucker	8-11	□○	3
		11+	□	4

Location	Species	Fish Size (Inches)	Contaminant	Group
Rock Creek				
Huntington County	Carp	20+	○	2
	Longear Sunfish	Up to 4		1
Salamonie River				
Jay/Blackford/ Huntington/ Wabash Counties	Carp	Up to 19		1
		19+	□○	2
	Freshwater Drum	Up to 11		1
	Golden Redhorse	Up to 11		1
	Rock Bass	Up to 6		1
	Spotted Sucker	Up to 10		1
	White Crappie	Up to 7		1
	White Sucker	Up to 10		1
Salt Creek Monroe County** (tailwaters of Monroe Reservoir Dam to Clear Creek)				
	Freshwater Drum	Up to 16	□	4
		16+	□	**5**
	Striped Bass	12+	□	3
	Walleye	15-21	□	3
		21+	□	4
Salt Creek Monroe County (confluence of Clear Creek to Lawrence County)				
Lawrence County	**ALL SPECIES**	**ALL**	□	**5**
***This listing is based on limited data. It should be noted that fish migrate. Fish not sampled from these waters may migrate from the confluence of Clear Creek and Salt Creek, 1.3 miles south. Those water bodies have No Consumption advisories. Future sampling of the Salt Creek tailwaters below the Monroe Reservoir Dam is planned for more comprehensive results*				
Sand Creek				
Decatur/Jackson/Jennings Counties	Black Redhorse	Up to 7		1
	Carp	13-27	○	2
		27+	○	3
	Longear Sunfish	Up to 4		1
	Northern Hogsucker	Up to 8		1
	River Carpsucker	Up to 12		1
	White Sucker	Up to 8		1
	Yellow Bullhead	10-12	□	3
		12+	□	4
Silver Creek				
Floyd County	Carp	21-25	□	3
		25+	□	4
	Channel Catfish	Up to 10		1
	Freshwater Drum	18+	□	3
	Longear Sunfish	Up to 5		1

Location	Species	Fish Size (Inches)	Contaminant	Group
South Fork Wildcat Creek				
Clinton/Tippecanoe Counties	Black Redhorse	13+	□	3
	Carp	Up to 18	□	2
		18-26	□	3
		26+	□	4
	Channel Catfish	19+	□	3
	Creek Chub	7+	□	3
	Golden Redhorse	11+	□	3
	Longear Sunfish	4+	□	3
	Rock Bass	7+	□	3
	Smallmouth Bass	10+	□	3
	White Sucker	12+	□	3
Stony Creek				
Hamilton County	**ALL SPECIES**	**ALL**	□	**5**
Stouts Creek				
Monroe County	Creek Chub	8+	□	3
St. Joseph River (Lake Erie Basin)				
Allen County	Black Crappie	9-11	□	3
		11+	□	4
	Black Redhorse	13-16	□	3
		16+	□	4
	Carp	Up to 20	□	2
	Channel Catfish	16+	□	3
	Golden Redhorse	12-13	□	3
		13+	□	4
	Largemouth Bass	Up to 11		1
	Rock Bass	7-9	□	3
		9+	□	4
	Spotted Sucker	Up to 14		1
	White Crappie	Up to 11		1
St. Joseph River (Lake Michigan Basin)				
Elkhart County	Bluegill	Up to 8		1
	Carp	25-28	□	3
		28+	□	4
	Channel Catfish	29+	□○	3
	Golden Redhorse	17+	□	3
	Northern Hogsucker	15+	□	3
	Rock Bass	Up to 7		1

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St. Joseph River (Lake Michigan Basin) Cont.				
Elkhart County Cont.	Shorthead Redhorse	15-17	□	3
		17+	□	4
	Walleye	18+	□	3
	White Sucker	Up to 14		1
St. Joseph County (Baugo Bay Area)	Bluegill	Up to 8		1
	Channel Catfish	Up to 22	□	3
		22+	□	4
	Largemouth Bass	Up to 13		1
	Rock Bass	Up to 8		1
	White Sucker	Up to 14		1
St. Joseph County	Black Redhorse	16-18	□	3
		18+	□	4
	Bluegill	Up to 7	□	3
		7+	□	4
	Carp	Up to 20	□	4
	Channel Catfish	All	□○	4
	Golden Redhorse	**All**	□	5
	Largemouth Bass	14+	□	3
	Quillback	18+	□	3
	Rainbow Trout (also known as Steelhead)	25-31	□	3
		31+	□	4
	Shorthead Redhorse	15-19	□	3
		19+	□	4
	Smallmouth Bass	9+	□	3
	White Sucker	14-16	□	3
	Yellow Bullhead	Up to 10	□	2
St. Marys River				
Allen County	Black Redhorse	15+	□	3
	Carp	Up to 20	□	3
		20+	□	4
	Channel Catfish	13-15	□	3
		15+	□	4
	Largemouth Bass	Up to 15	□○	3
		15+	□	4
	Silver Redhorse	17+	□	3
	White Sucker	11+	□	3

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Sugar Creek (East Fork White River Basin)				
Hancock/Johnson/Shelby Counties	Black Redhorse	9-16		1
	Carp	Up to 24	○	2
		24+	○	3
	Longear Sunfish	Up to 5		1
	Northern Hogsucker	Up to 11		1
Sugar Creek, Walnut Fork				
Montgomery County				
All fish in this upstream portion of the Walnut Fork of Sugar Creek should be limited to no more than one meal per week (Group 2) for the general population. Exceptions to this advice for the general population are listed.				
	Black Redhorse	Up to 14	□	3
		14+	□	4
Sugar Creek (Middle Wabash River Basin)				
Montgomery County - Upstream of I-74				
All fish upstream of I-74 are located well above the known PCB contamination sources. They have been found to be much lower in contaminants. Follow the General Safe Eating Guidelines. Exceptions to this are listed.				
	Black Redhorse	Up to 13		1
	Longear Sunfish	Up to 6		1
Montgomery County - I-74 to State Road 32				
Consumption of any fish from this reach of Sugar Creek should be limited to no more than six meals per year (Group 4) for the general population and NO CONSUMPTION by the at-risk population. Exceptions to this advice for the general population are listed.				
	Black Redhorse	**13+**	□	5
	Channel Catfish	**14+**	□	5
	Freshwater Drum	**13+**	□	5
	Rock Bass	**9+**	□	5
	Smallmouth Bass	**9+**	□	5
Montgomery County - State Road 32 to Parke County including stream reaches along Shades and Turkey Run State Parks				
Consumption of any fish from this portion of Sugar Creek should be limited to no more than one meal per month (Group 3) for the general population and NO CONSUMPTION of any fish by the at-risk population. Exceptions to this advice for the general population are listed.				
	Black Redhorse	15+	□	4
	Channel Catfish	Up to 13	□	2
		20+	□	4
	Flathead Catfish	23+	□	4
	Rock Bass	All	□	2
	Shorthead Redhorse	Up to 13	□	2
		15+	□	4
	Smallmouth Bass	19+	□	4

Location	Species	Fish Size (inches)	Contaminant	Group
Sugar Creek (Middle Wabash River Basin) (Cont.)				
Parke County to the Wabash River				
Consumption of any fish from this portion of Sugar Creek should be limited to no more than one meal per week (Group 2) for the general population and limited consumption of one meal per month of any fish for the at-risk population. Exceptions to this advice for the general population are listed.				
	Black Redhorse	14+	☐	3
	Channel Catfish	13-20	☐	3
		20+	☐	4
	Freshwater Drum	16+	☐	3
	Sauger	17+	☐	3
	Smallmouth Bass	15+	☐	3
	Spotted Bass	15+	☐	4
Tanners Creek				
Dearborn County	Bluegill	Up to 6		1
	Carp	19-21	☐○	2
		21+	☐	3
	Largemouth Bass	Up to 13		1
		17+	☐○	3
Tippecanoe River				
Kosciusko County (Oswego to State Road 15)				
	Bluegill	Up to 5		1
	Carp	Up to 23	☐	2
		23+	☐	3
	Longear Sunfish	Up to 5		1
	Rock Bass	Up to 6		1
	Warmouth	Up to 6		1
Kosciusko County (Downstream of State Road 15)				
	Bluegill	6+	☐	3
	Carp	20-27	☐	3
		27+	☐	4
	Redhorse Species	16-18	☐	3
		18+	☐	4
Fulton County	Carp	Up to 24	☐○	2
		24+	☐	3
Pulaski County	Carp	16-25	☐○	2
		25+	☐	3
	Longear Sunfish	Up to 4		1
Carroll County	Carp	21-22	☐○	2
		22+	☐	3
Trail Creek				
LaPorte County	Brown Trout	18+	☐	3
	Carp	Up to 23	☐	4
		23+	☐	5
	Rock Bass	10+	☐	3

Location	Species	Fish Size (inches)	Contaminant	Group
Trail Creek Cont.				
LaPorte County Cont.	Smallmouth Bass	14-19	☐	3
		19+	☐	4
	Walleye	18-27	☐	3
		27+	☐	4
Travers Ditch				
Fulton County	Blacknose Dace	Up to 2		1
Unnamed Tributary of Eel River				
Miami County	Creek Chub	Up to 3		1
Wabash River				
Adam and Wells Counties	Channel Catfish	21+	☐	3
	Freshwater Drum	Up to 12		1
	Golden Redhorse	Up to 13		1
	White Crappie	Up to 9		1
Huntington and Wabash Counties	Blue Sucker	21-26	☐	3
		26+	☐	4
	Freshwater Drum	Up to 12		1
	White Bass	11-21	☐○	3
		21+	☐	4
Miami, Cass, Carroll, and Tippecanoe *(upstream of Lafayette)* Counties	Black Redhorse	19+	☐	3
	Blue Sucker	21-26	☐	3
		26+	☐	4
	Channel Catfish	15+	☐	3
	Sauger	13+	☐	3
	Shorthead Redhorse	15+	☐	3
	Smallmouth Buffalo	Up to 20	☐	3
		20+	☐	4
Tippecanoe *(downstream from Lafayette)*, Fountain, Warren, Vermillion and Parke Counties	Bigmouth Buffalo	18+	☐	3
	Blue Sucker	21-26	☐	3
		26+	☐	4
	Carpsuckers	Up to 13	☐	3
		13-19	☐	4
		19+	☐	**5**
	Channel Catfish	Up to 20	☐	3
		20+	☐	4
	Flathead Catfish	21+	☐	3
	Paddlefish	34+	☐	3
	Sauger	13+	☐	3
	Smallmouth Buffalo	Up to 20	☐	3
		20+	☐	4

General Population ○ = **Mercury** ☐ = **PCBs**
Group 1 = Unlimited meals Group 2 = 1 meal/week Group 3 = 1 meal/month
Group 4 = 1 meal/2 months Group 5 = DO NOT EAT
(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (Inches)	Contaminant	Group
Wabash River Cont.				
Vigo, Sullivan and Knox Counties	Bigmouth Buffalo	21-24	☐	3
		24+	☐	4
	Blue Sucker	21-26	☐	3
		26+	☐	4
	Carpsuckers	17+	☐	3
	Channel Catfish	13-22	☐	3
		22+	☐	4
	Flathead Catfish	21+	☐	3
	Freshwater Drum	16+	☐	3
	Paddlefish	34+	☐	3
	Sauger	13+	☐	3
	Shovelnose Sturgeon	30+	☐	3
	Striped/Wiper Bass	10-12	☐	3
		12+	☐	4
Gibson and Posey Counties	Bigmouth Buffalo	21-24	☐	3
		24+	☐	4
	Blue Sucker	21-26	☐	3
		26+	☐	4
	Bluegill	Up to 6		1
	Carpsuckers	17+	☐	3
	Channel Catfish	20+	☐	3
	Flathead Catfish	21+	☐	3
	Freshwater Drum	16+	☐	3
	Paddlefish	34+	☐	3
	Sauger	13+	☐	3
	Shovelnose Sturgeon	30+	☐	3
	Striped/Wiper Bass	10-12	☐	3
		12+	☐	4
	White Bass	11-21	☐	3
		21+	☐	4
Wea Creek				
Tippecanoe County	**ALL SPECIES**	**ALL**	☐	**5**
West Fork of White River				
Randolph County	Carp	18-22	☐	2
		22+	☐	3
	Channel Catfish	14-16	☐	3
		16+	☐	4
	Creek Chub	8+	☐	3
	Longear Sunfish	5+	☐	3

General Population	O = **Mercury**	☐ = **PCBs**
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Group 4 = 1 meal/2 months	Group 5 = DO NOT EAT	

(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (Inches)	Contaminant	Group
West Fork of White River Cont.				
Randolph County Cont.	Quillback	13-18	☐	3
		18+	☐	4
	Spotted Sucker	11-13	☐	3
		13+	☐	4
Delaware County	Black Bullhead	9+	☐	3
	Black Redhorse	14-16	☐	3
		16+	☐	4
	Channel Catfish	14-16	☐	3
		16+	☐	4
	Largemouth Bass	10-15	☐O	3
		15+	☐	4
	Quillback	13-18	☐	3
		18+	☐	4
	Spotted Sucker	11-13	☐	3
		13+	☐	4
	White Sucker	15+	☐	3
Madison County	Green Sunfish	6+	☐	3
	Spotted Sucker	11+	☐	3
Hamilton County	**Carp**	Up to 17	☐	3
		17-20	☐	4
		20+	☐	**5**
	Largemouth Bass	11-17	☐O	3
		17+	☐	4
	Longear Sunfish	4-9	☐	3
		9+	☐	4
	Quillback	13-18	☐	3
		18+	☐	4
Marion County (Upstream of Broad Ripple Dam)	Largemouth Bass	11-16	☐	3
		16+	☐	4
Marion County (Downstream of Broad Ripple Dam)	Bluegill	Up to 6		1
	Carp	Up to 19	☐	4
		19+	☐	**5**
	Channel Catfish	12-17	☐	3
		17+	☐	4
	Flathead Catfish	13-15	☐O	3
		15+	☐	4
	Largemouth Bass	17+	☐	3
	River Carpsucker	14-17	☐	3
		17+	☐	4
	Quillback	13-18	☐	3
		18+	☐	4
	Smallmouth Bass	11+	☐	3
	Spotted Bass	11-13	☐	3
		13+	☐	4

Location	Species	Fish Size (Inches)	Contaminant	Group
West Fork of White River (Cont.)				
Morgan County	Black Redhorse	15-16	□	3
		16+	□	4
	Carp	16-27	□	3
		27+	□	4
	Channel Catfish	16-22	□	3
		22+	□	4
	Flathead Catfish	Up to 30	□	4
		30+	□	5
	Largemouth Bass	16+	□	3
	Quillback	13-18	□	3
		18+	□	4
	River Carpsucker	14-17	□	3
	Smallmouth Bass	15-17	□	3
		17+	□	4
	Spotted Bass	11-13	□	3
		13+	□	4
	Spotted Sucker	11-13	□	3
		13+	□	4
Owen County	Bigmouth Buffalo	24+	□	3
	Channel Catfish	15+	□	3
	Freshwater Drum	15+	□	3
	Quillback	13-18	□	3
		18+	□	4
	River Carpsucker	15+	□	3
	Sauger	Up to 14	□	3
		14+	□	4
	Spotted Bass	11+	□	3
	Spotted Sucker	11-13	□	3
		13+	□	4
	White Bass	14-15	○□	3
		15+	□	4
Greene County	Bigmouth Buffalo	20+	□	3
	Channel Catfish	14-16	□	3
		16+	□	4
	Quillback	18+	□	3
	River Carpsucker	15+	□	3
	Spotted Sucker	11-13	□	3
		13+	□	4
Daviess County	Bigmouth Buffalo	19+	□	3
	Channel Catfish	18+	□	3
	Flathead Catfish	14+	□	3

Location	Species	Fish Size (Inches)	Contaminant	Group
West Fork of White River (Cont.)				
Daviess County Cont.	Quillback	13-18	□	3
		18+	□	4
	Spotted Sucker	11-13	□	3
		13+	□	4
	White Bass	14-15	□○	3
		15+	□	4
White River				
Pike/Gibson Counties	Bigmouth Buffalo	25+	□	3
	Channel Catfish	18+	□	3
	Flathead Catfish	16+	□	3
	Largemouth Bass	17+	○	3
	Quillback	13-18	□	3
		18+	□	4
	Smallmouth Bass	12+	○	3
	Smallmouth Buffalo	18-22	□	3
		22+	□	4
	Spotted Bass	9+	□	3
	Spotted Sucker	11-13	□	3
		13+	□	4
White Lick Creek				
Hendricks County	Channel Catfish	22+	□	3
	Smallmouth Bass	14+	□	3
Morgan County	Channel Catfish	22+	□	3
	Smallmouth Bass	12+	□	3
Whitewater River (Greens Fork, Martindale Creek, Middle Fork, Nolands Fork, West Fork)				
Wayne/Fayette/	Black Redhorse	22+	○	3
Franklin/Dearborn Counties	Carp	19-25	□○	2
		25+	□○	3
	Channel Catfish	20+	□	3
	Freshwater Drum	15+	□	3
	Golden Redhorse	Up to 14		1
	Longear Sunfish	Up to 5		1
	Northern Hogsucker	Up to 9		1
	Rock Bass	Up to 7		1
	Smallmouth Bass	Up to 10		1
	White Sucker	Up to 10		1

General Population ○ = **Mercury** □ = **PCBs**

Group 1 = Unlimited meals Group 2 = 1 meal/week Group 3 = 1 meal/month

Group 4 = 1 meal/2 months Group 5 = DO NOT EAT

(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (inches)	Contaminant	Group
Whitewater River (West Fork of the East Fork)				
Wayne County	White Sucker	Up to 7		1
Wildcat Creek				
Howard County (Upstream of the Waterworks Dam in Kokomo)				
	Bluegill	Up to 6		1
	Carp	Up to 21	☐	3
	Longear Sunfish	Up to 5		1
	Rock Bass	Up to 6		1
Howard County (Downstream of the Waterworks Dam in Kokomo)				
	All Species	**ALL**	☐	**5**
Carroll County	**All Species**	**ALL**	☐	**5**
Consumption of fish from the Wildcat Creek in Tippecanoe County should be limited to no more than one meal every two months or six meals per year (Group 4) for the general population and NO CONSUMPTION for the at-risk population. Exceptions to this advice for the general population are listed below.				
Tippecanoe County	Black Bass Species	10+	☐	3
	Carp	**ALL**	☐	**5**
	Carpsucker	12-13	☐	3
	Channel Catfish	Up to 22	☐	3
	Flathead Catfish	**18+**	☐	**5**
	Freshwater Drum	**16+**	☐	**5**
	Golden Redhorse	12-14	☐	3
	Longear Sunfish	Up to 5	☐	3
	Shorthead Redhorse	**13+**	☐	**5**
	White Bass	**ALL**	☐	**5**
Wilson Ditch				
Miami County	Creek Chub	Up to 5		1
Young's Creek				
Johnson County	Northern Hogsucker	10+	☐	3

General Population ○ = **Mercury** ☐ = **PCBs**
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(For women and children, please refer to the Guidelines on page 5.)

EXHIBIT I-5

Partial Monitoring Plan

INTRODUCTION

The steps for developing a monitoring plan are:

1. Define the short- and long- term objectives
2. Decide whether to use a model
3. Identify data needs
4. Identify sampling criteria
5. Develop data management and analysis procedures
6. Address implementation issues

OBJECTIVES

The objectives of a monitoring plan are to:

1. Evaluate the effectiveness of the Nine Minimum Controls (NMC).
2. Define the CSS's hydraulic response to rainfall.
3. Determine CSO flows and pollutant concentrations/loadings.
4. Evaluate the impact of CSOs on receiving water quality.
5. Support model input, calibration, and verification.
6. Support the review and revision, as appropriate, of WQS.
7. Evaluate and select long-term CSO control alternatives.

Objective #1 will be the subject of this partial monitoring plan. The other objectives will be addressed in the CSO LTCP.

MODEL STRATEGY

No model will be used to evaluate the effectiveness of the NMC.

DATA NEEDS

The list of questions below help identify the data needs.

- Have dry weather overflows been eliminated?
- Has wet weather flow to the POTW increased?
- Has the level of rainfall needed to cause CSOs increased?

The following data is required to answer these questions.

- Rain Event Data: start time, total volume, duration, & maxima intensity
- Runoff Event Data: Date of runoff event
- Overflow Event Data: start time & duration
- WPCP Flow Data: Daily plant influent volume

SAMPLING CRITERIA

Duration

Runoff event data need to be collected every day of the year. During warmer periods rain event data can be used. During periods when freezing occurs visual inspections will have to be made. Overflow event data and WPCP flow data will also need to be collected every day of the year.

Location

Overflow event data will need to be collected at all regulators where significant overflows occur. Rain event data will need to be collected through out the combined sewer system (CSS) for the months April through November and from the Fort Wayne International Airport for the months of December through March. WPCP flow data will need to be collected at the headworks of the WPCP.

Frequency

Rain event data and overflow event data will need to be collected continuously. WPCP flow and runoff event data can be collected daily.

Pollutants

Only flow volume will need to be collected.

Data Management

Rain event data, runoff event data, and overflow event data will be collected and processed and saved by WPC Maintenance as described in the CSO Monitoring Program procedures. WPCP influent flow data will be collected by WPCP operators and recorded on their monthly reports.

Analysis

- Rain events will be defined as ending at the beginning of the first 6 hour dry period following its start. Overflow events for each regulator will be matched with the rain events that caused them. If an overflow event is not associated with a rain event then it will be identified as a dry weather overflow (DWO). If an overflow event continues long after the rain event ends it will be investigated to determine if it is a DWO. The number of DWOs that occurred during a year will be determined and compared to previous annual DWO totals.

- Total annual WPCP influent volume will be compared to previous annual volumes to see if it increases.
- Rain events will be defined as ending at the beginning of the first 6 hour dry period following its start. All rain data collected between April 1 and November 30 will be grouped into rain events. Overflow events for each regulator will be matched with the rain events that caused them. The smallest rain event that caused an overflow event for each regulator will be identified and compared with those identified in previous years to determine if the rain event size is increasing.
- Fort Wayne's rivers have been analyzed for a fish advisory. Mercury and PCBs are the fish tissue contaminants identified the 2004 303(d) Report lists only PCBs as a fish advisory. The proposed 2006 303(d) Report lists only PCBs as a fish tissue contaminant. The City has tested CSOs and did not find PCBs present. This concludes that fish advisories are not a result of CSOs.

Implementation issues

All data is currently being collected and all implementation issues are described in the appropriate program's written procedures.

EXHIBIT I-6

2006 Regulator Metering Summary

The City of Fort Wayne has 43 Combined Sewer Overflow discharge points. The flow at 33 of these points is measured with flow meters. The flow at 5 of these points is pumped into the receiving waters and measured using run time meters. Three of the sites (007, 012, & 027) are gravity discharge points that are only used when the adjacent pump station is completely down.

The durations and volumes for the 38 sites that are metered are presented on the attached spreadsheet. The spreadsheet lists the discharge points in numerical order, ranks its volume and duration relative to the other metered sites, and gives each site's total volume and duration for 2006.

	Volume		Duration	
CSO OUTFALL NO.	Rank	Total (MG)	Rank	Total (HRS)
4	16	15.282	10	405.25
5	4	192.772	3	1074.40
7	37	0.000	37	0.00
11	12	24.305	33	57.34
12	28	4.294	36	6.07
13	7	52.626	29	70.25
14	36	0.021	30	66.50
16	37	0.000	37	0.00
17	13	23.387	27	79.25
18	1	768.937	8	678.25
19	32	1.277	34	41.75
20	6	59.329	6	795.00
21	26	5.050	31	64.00
23	21	9.424	23	98.25
24	24	7.001	35	24.75
25	25	6.282	26	80.75
26	3	246.642	4	880.00
27	37	0.000	37	0.00
28	20	11.061	24	88.53
29	30	2.841	25	81.50
32	9	39.786	13	328.00
33	2	309.327	5	857.67
36	27	4.722	28	75.25
39	19	14.267	17	221.75
44	34	0.433	22	100.50
45	35	0.184	21	107.50
48	5	130.496	7	770.71
50	15	17.680	15	239.00
51	29	2.907	32	58.00
52	23	7.863	14	326.80
53	22	8.488	1	5459.00
54	18	15.034	2	1312.20
55	11	28.812	11	402.75
56	8	40.650	12	378.04
57	37	0.000	37	0.00
58	33	1.127	18	167.75
60	17	15.080	20	135.75
61	14	21.382	16	223.50
62	10	32.888	19	144.50
64	31	2.461	9	598.00
67	37	0.000	37	0.00
68	37	0.000	37	0.00
P10-001	37	0.000	37	0.00
		2124.118		