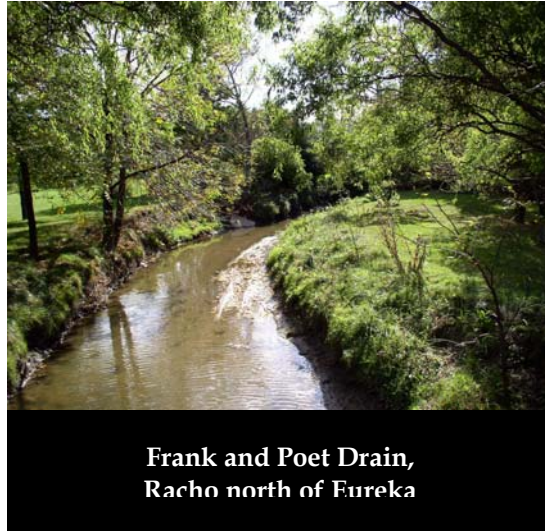




**7. METHODS/
MILESTONES TO
MEASURE PROGRESS**



Chapter Contents

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Numeric Targets Anticipated in a Future CDR TMDL

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Watershed Plan Review and Revision

In order to evaluate the effectiveness of this Watershed Management Plan and its implementation, methods to measure progress are described here. These methods are important in determining whether the activities being performed are sufficient in reaching the goals of the plan. If the activities in the plan are found not be sufficient, the plan can be revised to make it more effective. Not only will measuring progress assist in finding deficiencies in the plan, but it will also help demonstrate which activities are successful. Measuring progress will be done by both qualitative and quantitative techniques.



7.1 QUALITATIVE EVALUATION TECHNIQUES

Qualitative measurements are important in determining changes in behavior and visible changes in the Watershed. Surveys, participation records, and meeting/workshop evaluations can all be used to gauge whether activities aimed at public education and outreach are effective. Better survey results, an increase in participation, and favorable meeting/workshop evaluations can all be an indication of a greater understanding by the public on watershed-related issues. Results that don't yield improvements will signal that current activities and/or publicity methods should be improved. One of the main foci of evaluating changes in public understanding and behavior will be the use of the 2004 Regional Water Quality Survey that was performed by SEMCOG and the Southeast Michigan Partners for Clean Water. The purposes of the survey were to provide a benchmark to gauge the effectiveness of regional and local public outreach campaigns, leverage resources, and provide the opportunity to compare results from different areas of the SEMCOG region. A four-page survey and cover letter were mailed to a stratified random sample of 10,800 households in the SEMCOG planning area, which includes the City of Detroit along with Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties¹. Results were given specifically for the Downriver Wayne County area. A comparable future survey will help gauge any changes that result as part of the actions of this Watershed Management Plan.

Visible changes in the watershed can also be used as an indication of progress in the Watershed. Stream surveys can identify riparian and aquatic improvements and help identify recreational opportunities. BMP implementation can also be documented visibly, with the number and location of BMPs recorded.

Table 7-1 summarizes the qualitative methods to measure progress that will be used.

¹ ETC Institute, SEMCOG Regional Water Quality Survey Findings Report, September 2004.

Table 7-1. Summary of Qualitative Methods to Measure Progress

Evaluation Method	Program/Project	What is Measured and/or Goals Addressed	Measurable Goals	Implementation
Public Surveys	Public education or involvement	Awareness; Knowledge; Behaviors; Attitudes; Concerns	Increase in the number of completed surveys showing greater awareness, more concerns, increase in knowledge	Pre- and post-survey recommended (SEMCOG survey utilized as pre-survey). Repetition on regular basis to show trends.
Ordinance Adoption	Adoption of such ordinances as wetland protection, open space preservation, natural features, tree conservation, etc.	Number of ordinances passed	Increase in the passage of stormwater related ordinances	Track ordinance adoptions through the watershed advisory group. Also report positive and negative aspects.
Stream Surveys	Identify riparian and aquatic improvements, identify recreational opportunities	Habitat; Flow; Erosion; Recreation;	Increase in habitat; decrease in erosion; increase in recreation	Identify parameters to evaluate. Record observations. Summarize findings to identify sites needing observation
Written Evaluations	Public meeting or group education or involvement project	Awareness; Knowledge	Increase in number of written evaluations with positive comments	Post-event participants complete brief evaluations that ask what was learned, what was missing, what could be done better. Evaluations completed on site.
Visual Documentation	Structural and vegetative BMP installations, retrofits	Aesthetics. Pre-and post-conditions	Increase in number of structural and vegetative BMPs & retrofits	Provides visual evidence. Photographs can be used in public communication materials
Phone call/ complaint records	Education efforts, advertising of contact number for complaints/ concerns	Number and types of concerns. Location of problem areas (including flooding occurrences, debris in streams, drain blockages)	Increase in number of calls and complaints to show an increase in awareness & concern	Track calls and complaints and responses.
Participation tracking	Public involvement and education projects	Number of people participating. Geographic distribution of participants.	Increase in participation at events	Track participation by attendance.

Table adapted from Lower One Rouge Watershed SWAG, 2001



7.2 QUANTITATIVE EVALUATION TECHNIQUES

In addition to qualitative measures of program implementation and success, quantitative measures will also be required to assess progress toward, and attainment of, water quality targets for the Combined Downriver Watershed. As described previously, portions of the CDR are identified as failing to meet Michigan water quality standards (WQS) for the protection of warm water aquatic life. Development of Total Maximum Daily Load (TMDL) water quality targets and quantifiable pollutant load reductions are planned for 2007. Because of similarities in land use, water quality problems exhibited, and geographic setting, it is reasonable to assume that future TMDL targets and the associated quantitative measures of success for the CDR will mirror those set forth in the TMDL for the neighboring Ecorse Creek Watershed. Quantitative measures to monitor success are described below and summarized in Table 7-2.

7.2.1. Numeric Targets Anticipated in a Future Combined Downriver TMDL

Aquatic Life

The Ecorse Creek TMDL establishes habitat assessment scores and scores rating the community composition and diversity of benthic macroinvertebrates as the primary measures of water quality improvements in the watershed. The health of macroinvertebrate communities within the Ecorse Creek drainage will be assessed by the Michigan Department of Environmental Quality (MDEQ) using Procedure 51 assessment and scoring.^{2,3}

The Ecorse Creek TMDL establishes reproducible ratings of “acceptable” scores throughout the watershed. An acceptable score correlates to a cumulative score of -4 or greater for the macroinvertebrate multimetric index. Achievement of the water quality standard for the protection of warm water aquatic life will be determined by reproducible acceptable scores in two consecutive years of monitoring. Habitat quality of the stream will also be assessed using Procedure 51 protocols. A habitat score of 65 has been established as the minimum target for in-stream habitat conditions. These same targets have been established for the Upper Grand River as well. Future TMDL targets in the CDR Watershed are anticipated to be the same.

Suspended Solids

TMDLs for the Ecorse Creek and Upper Grand River established a numeric target for mean, annual, in-stream TSS concentrations of less than or equal to 80 mg/l during wet weather and snowmelt events, as a secondary means of documenting the re-attainment of designated uses. Again, it is anticipated these same targets will be established for the Combined Downriver Watershed.

7.2.2 Other Numeric Targets Established by State Statute

Pathogens/Bacteria

Rule 62 of the Michigan Water Quality Standards (Part 4 of Act 451)⁴ limits the concentration of microorganisms in surface waters of the state and surface water discharges. Waters of the state which are protected for total body contact recreation must meet limits of 130 *E. coli* per 100 milliliters (ml) water as a 30-day average and

² MDEQ. 2002. Qualitative Biological and Habitat Survey Protocols for Wadable Streams and Rivers. P51. MDEQ, Surface Water Quality Division, Lansing, Michigan. Revised May, 28, 2002.

³ MDEQ. May 1996 Revision. Update of P51. Metric Scoring and Interpretation. MDEQ Report #MI/DEQ/SWQ-96/068

⁴ http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&Admin_Num=32301041&Dpt=EQ&RngHigh=



300 *E. coli* per 100 ml water at any time. These limits apply to the season during which most body-contact activities would take place; May 1 through October 31.

The Upper Grand River, in south-central Michigan, exhibits similar water quality impairments as those found in the CDR: high sediment loads, and low dissolved oxygen concentrations attributed to sediment oxygen demand. Although unknown at this time, it is suspected that the CDR, like other southeastern Michigan urban waterways, also exhibits elevated concentrations of *E. coli* bacteria. The TMDL established for the Upper Grand River sets the state WQS 30-day geometric mean of 130 *E. coli*/100 mL as the maximum allowable value. It is reasonable to anticipate that *E. coli* limits in the CDR will be similar if it is found that the watershed violates water quality standards for bacteria.

Dissolved Oxygen (DO)

Rule 64 of the Michigan Water Quality Standards (Part 4 of Act 451)⁵ states that surface waters protected for warm water fish and aquatic life must meet a minimum dissolved oxygen standard of 5 mg/l. As described previously (Chapter 3) field work in 2004 indicated that the warm water minimum of 5 mg/L DO was violated at several locations monitored.

Although failure to meet the protection of aquatic life designated use has largely been attributed to flashy hydrology and high sediment yield, low oxygen concentrations may also be limiting both fish and macroinvertebrate populations. DO concentrations should be measured as part of the other MDEQ monitoring activities to ensure this standard is met throughout the watershed.

7.2.3. Additional Quantitative Measures

Flow Stability

As described in Chapter 3, the comparison of mean monthly high flows to mean monthly low flows can be used as an index of flow stability.⁶ There are no established U.S. Geological Survey (USGS) stream gages within the Combined Downriver Watershed. The CDWIC recommends that one or more gages be established, maintained, and monitored by the USGS and that periodic analysis of stream gage data for the Combined Downriver Watershed be used to determine a baseline ratio of mean monthly high flows to mean monthly low flows and to determine if watershed plan implementation results in an improvement (reduction) in this ratio value.

Method and Frequency of Monitoring Activities

MDEQ water quality sampling and Procedure 51 assessment, conducted as part of MDEQ's standard rotating, 5-year cycle of basin monitoring will be the primary means of determining attainment of TMDL target endpoints. However, MDEQ resources are limited and municipalities within the Combined Downriver Watershed are encouraged to expand upon the frequency and geographic coverage of the MDEQ's monitoring through support of the Downriver Stream Team, Wayne County, and/or other entities. Stream Team, Wayne County and/or other entity results should be provided to the MDEQ to help inform and prioritize the selection of 5-year cycle sampling locations for that agency. Evaluation of stream flow dynamics

⁵http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&Admin_Num=32301041&Dpt=E Q&RngHigh=

⁶ Hay-Chmielewski, E.M., P.W. Seelbach, G.E. Whelan, and D.B. Jester, Jr. 1995. Huron River Assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report Number 16. Ann Arbor, Michigan.

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should be conducted by the CDWIC, in coordination with the USGS, on a periodic basis.

Table 7-2. Summary of Quantitative Methods to Measure Progress

Watershed Plan Goal		Parameter Measured	Current Condition	Measurable Goal/Target	Evaluation Method	Implementation
1.	Reduce Stream Flow Variability	Stream Discharge, Flow Variability	Unstable hydrology assumed given imperviousness, Mean Monthly High: Mean Monthly Low Flow Ratio unknown	Reduced ratio of mean monthly high flows to mean monthly low flows	Analysis of stream gage records	Coordinate with USGS to establish recording stream gage(s) in CDR Watershed, review in 4 th year of each permit cycle and 5-year review and revision of watershed plan
2.	Reduce Flooding	Stream Discharge, Flow Variability	Frequent flooding	Reduced flooding frequency and monetary damages,	Review of flood damage claims filed with FEMA,	Review FEMA flood claims in 4 th year of each permit cycle and 5-year review/ revision cycle for watershed plan
3.	Increase Public Education, Understanding, and Participation Regarding Watershed Issues	Measures primarily qualitative, described in Table 7-1				
4.	Improve Water Quality	Macro-invertebrate Community Composition	Poor	“Acceptable” macroinvertebrate scores > -4 in two or more consecutive years of monitoring	MDEQ Procedure 51	MDEQ rotating, 5-year watershed monitoring cycle and annual MDEQ sampling per Biota TMDL Coordinate with Stream Team to augment MDEQ data collection and sampling network
4.	Improve Water Quality	Total Suspended Solids (TSS)	Highly turbid even in dry weather (visual observations 2004),	< 80 mg/L annual average for wet weather flows	MDEQ rotating, 5-year watershed monitoring cycle sampling, IDEP monitoring and WCDOE sampling, Stream Team monitoring	Coordinate with WCDOE to expand Illicit Discharge Identification and Elimination Program (IDEP) to the CDR Watershed and to expand monitoring to include TSS
7.	Protect, Enhance, and Restore In-Stream Habitat		Wet weather concentrations as high as 220 mg/L			Coordinate with Stream Team to augment data collection and sampling network, including wet weather TSS monitoring

Watershed Plan Goal		Parameter Measured	Current Condition	Measurable Goal/Target	Evaluation Method	Implementation
4.	Improve Water Quality	Dissolved Oxygen (DO)	Localized violations of Michigan Water Quality Standard	> 5 mg/L	MDEQ rotating, 5-year watershed monitoring cycle sampling, IDEP monitoring and WCDOE sampling, Stream Team monitoring	MDEQ rotating, 5-year watershed monitoring cycle
			Measured DO concentrations as low as 1.73 mg/L			Coordinate with Stream Team to augment MDEQ data collection and sampling network
7.	Protect, Enhance, and Restore In-Stream Habitat	Phosphorous (P)	Measured Total P concentrations from 0.07-0.194 mg/L	≤ 0.1 mg/L		
5.	Protect Public Health	<i>E. coli</i> bacteria	Unknown (lack of data)	< 130 <i>E. coli</i> /100 mL (30-day geometric mean), <300 <i>E. coli</i> cfu/100 mL any individual sample	MDEQ rotating, 5-year watershed monitoring cycle sampling, WCDOE sampling, Stream Team monitoring	MDEQ to conduct sampling in 2006 for future TMDL, Coordinate with Stream Team and WCDOE to expand sampling and sampling network in the CDR Watershed (5 to 10 year cycle)
6.	Preserve, Increase, and Enhance Recreational Opportunities	Open Space Acquisition/Protection	2,445 acres of "Cultural, Outdoor Recreation, and Cemetery" (4.5%)	Increase over Current Conditions	GIS analysis, Report acres of Open Space/Parks Protected	Work with SEMCOG to analyze changes as municipal master plans and regional GIS coverage are updated
7.	Protect, Enhance, and Restore In-Stream Habitat	In-Stream Habitat	Fair to Poor: unstable hydrology, sedimentation and high embeddeness,	"Marginal" habitat scores ≥ 96	MDEQ Procedure 51	MDEQ rotating, 5-year watershed monitoring cycle and annual MDEQ sampling per Biota TMDL
			general lack of in-stream habitat			Coordinate with Stream Team to augment MDEQ data collection and sampling network
8.	Watershed Management Sustainability	Institutional Relationships, Dollars Committed to Watershed Management	Temporary Inter-Municipality Committee Established, MOA to expire with completion of WMP	≥80% participation of watershed communities	Annual records of Watershed Assembly participation and budget contributions	Communities to discuss Watershed Assembly or other watershed institutional arrangements, decide on best option, and implement as appropriate

Watershed Plan Goal		Parameter Measured	Current Condition	Measurable Goal/Target	Evaluation Method	Implementation
9.	Preserve & Protect Critical Areas	Acres of Wetland, Woodland, Riparian Buffer or Other Open Space Protected or Restored	Current projections show a majority of open space (52%) lost by 2030	Increase acreage of riparian buffer; Slow rate of loss of open space to more intensive land uses	GIS analysis, number of new programs/ conservation easements, report acres of farmland protected	Work with SEMCOG to analyze changes as municipal master plans and regional GIS coverage are updated

7.3 WATERSHED PLAN REVIEW AND REVISION

These measures are intended to track progress toward the attainment of designated and desired uses, water quality standards, and other watershed management plan goals. As noted previously, pollutant reduction estimates from the modeled best management practices do not achieve a 50% reduction in total suspended solids; the expected target to be established in a TMDL for the Combined Downriver Watershed. Other best management practices and communities' programs are expected to add to these water quality improvements. Likewise, the actual metrics anticipated in the scheduled TMDL are in-stream measures of habitat quality, macroinvertebrate diversity and abundance, and wet weather water quality concentrations; not the actual quantification of suspended solids removed.

Periodic assessment and review will therefore be required to determine whether implementation is on-track and whether the plan is having the desired efficacy. The CDR communities' Phase II Storm Water Certificate of Coverage and the 5-year permit cycle provide a natural mechanism for framing these periodic reviews. Activities and successful completion of scheduled tasks will need to be reviewed and reported annually, but the Watershed Plan itself should be reviewed, in the final year of each 5-year permit cycle, and revised if deemed necessary by that review.

Watershed Plan revisions may be triggered by the completion of major projects; the availability of new water quality, flow, inventories, or other information; by major natural events such as significant flooding in the watershed; because of changes in laws or regulations; by changes in the drainage area; or other significant events. It is anticipated that periodic reviews would be the responsibility of a dedicated watershed organization such as those discussed in Chapter 8.

In order to help track the completion of projects, Table 7-3 summarizes the total number of entities that are either committing to an action (Phase II management alternatives) or desire to perform an action (Non-Phase II management alternatives).



Table 7-3. Management Alternatives - Number of Entities
(Page 1 of 6)

LEGEND			
✓	Currently Doing		
●	Short-term		
○	Intermediate-term		
□	Long-term		

Type	Management Alternative	Entities													# of Entities				
		Brownstown Twp	Gibraltar	Grosse Ile Twp	Huron Twp	Riverview	Romulus	Southgate	Taylor	Woodhaven	W-B School District	Wyandotte	Wayne County	WCAA	Currently Doing	Short-term	Intermediate-term	Long-term	
PHASE II MANAGEMENT ALTERNATIVES																			
Structural	Construct retention/extended detention basins for new developments (W.C. SW ordinance or similar)	✓	✓	✓	□	✓	✓	✓	✓	✓				✓	✓	10	0	0	1
Vegetative	Install grassed swales where possible	✓	□	✓	○	✓	✓	●	✓	✓					n/a	6	1	1	1
Managerial - Ordinances & Policies	Develop no dumping ordinance	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	●	10	1	0	0	
	Review and update storm water management requirements for new developments and redevelopment, as appropriate	✓	✓	✓			✓	●		✓			✓	n/a	6	1	0	0	
	Adopt/enforce Wayne County time-of-sale septic system ordinance or similar ordinance	●		●	●		✓		●				✓	n/a	2	4	0	0	
	Review and revise SESC policies and program practices	□	✓		●	✓	✓	✓	✓	✓			✓	✓	8	1	0	1	
	Enforce or consider adoption of Wayne Co Storm Water Ordinance	✓	✓	✓	●	✓	✓	✓	□	●		✓	✓	n/a	8	2	0	1	
Managerial - Practices	Review & revise drain maintenance and restoration procedures, as appropriate	✓			✓		●		✓					n/a	3	1	0	0	
	Routinely sweep public streets & public parking lots	✓	●		✓		✓	□	✓	✓		✓		●	6	2	0	1	
Managerial - Public Education	Regular storm water-related information on cable TV	✓	●	✓	○		✓	✓	●	✓		✓		n/a	6	2	1	0	
	Send out watershed-related press releases	✓	✓	✓	○		●	●	✓	●		✓	✓	✓	7	3	1	0	
	Provide watershed education	✓	✓	✓	●	✓	✓	✓	✓	✓	●	✓	✓	✓	11	2	0	0	
	Trash management education to the public	✓	✓	✓	●		✓	✓	✓	✓	●	✓	✓	✓	10	2	0	0	
	Outreach program to educate homeowners about the proper operation/ maintenance of their septic systems	□		✓	●				●				✓	n/a	2	2	0	1	
	Pet waste management education to the public	●	✓	✓	●		✓	●	□	✓		✓		n/a	5	3	0	1	
	Lawn and garden maintenance information to the public	✓	✓	✓	●	✓	✓	✓	✓	✓	●		✓	n/a	9	2	0	0	
	Distribute/display SE Michigan Partners for Clean Water Materials	✓				✓		✓	✓	✓			✓		7	0	0	0	
	Watershed-related articles in Newsletter/ Magazine	✓	✓	✓	○	✓		✓	✓					✓	7	0	1	0	
	Post watershed-related news and/or educational materials on Entity website	✓	✓	✓	○	✓		✓	✓	✓	●	✓	✓	●	9	2	1	0	
	Watershed-related informational displays	✓	✓	✓		✓		✓	✓	✓			✓	●	8	1	0	0	
	River Crossing and Entering Watershed Signage	✓			□	✓		□	✓	✓	●		✓	n/a	5	1	1	2	

Table 7-3. Management Alternatives - Number of Entities
(Page 2 of 6)

LEGEND			
✓	Currently Doing		
●	Short-term		
○	Intermediate-term		
□	Long-term		

Type	Management Alternative	Entities											# of Entities					
		Brownstown Twp	Gibraltar	Grosse Ile Twp	Huron Twp	Riverview	Romulus	Southgate	Taylor	Woodhaven	W-B School District	Wyandotte	Wayne County	WCAA	Currently Doing	Short-term	Intermediate-term	Long-term
(PEP cont.)	Storm Drain Curb Marker Program	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12	0	0	0
	Promote reporting system for illicit discharges	✓	✓	✓	○	✓	✓	●	✓	✓	●	✓	✓	✓	10	2	1	0
	Household Hazardous Waste Collection Site/Day	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a	11	0	0	0	
	Yard Waste Collection and/or Recycling	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a	11	0	0	0	
	Educate contractors on erosion and sedimentation control during school construction activities										●							
	Watershed-related educational brochures and published articles to the public	✓	✓	✓	●	✓	✓	✓	✓	✓		✓	✓	●	10	2	0	0
Managerial - Illicit Discharge Elimination	Outfall screening program	●	✓	✓	●	●	●	□	✓	●	●	✓	✓	✓	6	6	1	1
	Develop a reporting system/ follow-up plan for illicit connections	✓	✓	✓	●	●	✓	●	✓	●	●	✓	✓	●	7	6	0	0
	Perform smoke/dye testing in areas of concern	●	✓		✓		✓	●	✓	□	●	✓	✓	●	6	4	0	1
	Trace illicit connections	✓	✓	✓	✓	✓	✓	✓	✓	✓	●	✓	✓	✓	12	1	0	0
	Follow-up enforcement for non-correction of illicit discharges	✓				✓		✓	✓	✓	●	✓	✓	n/a	7	1	0	0
	Staff training to identify illicit discharges	✓	✓	✓	✓	✓	✓	○	✓	✓	●	✓	✓	✓	11	1	1	0
	Review legal authority to implement IDEP	✓			✓	✓			✓	✓		✓	n/a	6	0	0	0	
	Develop adequate legal authority, if necessary	✓			✓	✓			✓			✓	n/a	5	0	0	0	
	Minimize seepage from sanitary sewers	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a	✓	✓	✓	12	0	0	0
	Minimize seepage from on-site sewage disposal systems	✓	✓	✓	●	✓	✓	✓	✓	n/a	n/a	n/a	✓	n/a	8	1	0	0
	Investigate feasibility/benefit of conducting water quality monitoring	✓			○	✓		○	✓				✓	4	0	2	0	
	Update outfall and/or drainage system map based on field observations	✓	✓	✓	●	✓	✓	✓	✓	✓	●	✓	✓	✓	11	0	0	0
	Inventory, identify, and address ownership of significant storm water conveyances	✓			✓	✓			✓	✓		✓	n/a	6	0	0	0	
	Develop and implement procedure to identify and record outfalls from new construction	✓			●	✓			✓	✓	●	✓	✓	6	2	0	0	
NON-PHASE II MANAGEMENT ALTERNATIVES																		
Desired Projects																		
Replace Undersized Bridges & Culverts	Frank & Poet Drain Remove Culverts & Crossings		○										○	0	0	2	0	
	Replace culvert(s) Huntington Drain N of Sibley Road					□								0	0	0	1	
	Blakely Drain at Beech Daly Road bridge replacement								✓					1	0	0	0	
	Frank & Poet Drain (replace/remove) culvert btwn Seaway & I-75								□					0	0	0	1	

Table 7-3. Management Alternatives - Number of Entities
(Page 3 of 6)

LEGEND	
✓	Currently Doing
●	Short-term
○	Intermediate-term
□	Long-term

Type	Management Alternative	Entities											# of Entities					
		Brownstown Twp	Gibraltar	Grosse Ile Twp	Huron Twp	Riverview	Romulus	Southgate	Taylor	Woodhaven	W-B School District	Wyandotte	Wayne County	WCAA	Currently Doing	Short-term	Intermediate-term	Long-term
Bank Stabilization/Restoration	VanCleaf Drain between Telegraph & I-75	□													0	0	0	1
	Blakely drain between I-75 and Allen Road	□													0	0	0	1
	Brownstown Creek between Telegraph & Twp boundary	□													0	0	0	1
	Brownstown Creek Chatham Park Area	□													0	0	0	1
	Branch No. 1 of Brownstown Creek (Twp Hall)	○										○			0	0	2	0
	Thorofare Canal at Township-owned properties in Grosse Ile			□											0	0	0	1
	Grosse Ile Township - shoreline stabilization in natural areas of the Township			□											0	0	0	1
	Goetske Drain between Middlebelt and Telegraph				□										0	0	0	1
	Northern sections of islands (2) that comprise City (Gibraltar)		□												0	0	0	1
	Huntington Drain at Reflection Pond N of Sibley Rd					□									0	0	0	1
	Blakely Drain at McLouth Park					□						□			0	0	0	2
	Frank & Poet Drain at Riverview Golf Course					□						□			0	0	0	2
	Frank & Poet Drain at former State Regional Center							□							0	0	0	1
	Frank & Poet Drain at confluence with Sutliff & Kenope							□							0	0	0	1
	Frank & Poet Drain west of Dix-Toledo							□							0	0	0	1
	Frank & Poet Drain at Gibraltar Trade Center								○			○			0	0	2	0
	Frank & Poet Drain at Southland Mall								○			○			0	0	2	0
	Blakely Drain in City park, S of Van Horn Road									□					0	0	0	1
	Brownstown Creek between Hall Rd and I-75\									□		□			0	0	0	2
	Brownstown Creek north of West Road									□					0	0	0	1
Detroit River a Bishop Park											□			0	0	0	1	
Detroit River at Wyandotte Shores Golf Course											□			0	0	0	1	
Drain on west side of WCAA property												□		0	0	0	1	
Improve Hydraulic Capacity	VanCleaf Drain between Telegraph & I-75	□													0	0	0	1
	Blakely Drain debris build up				□										0	0	0	1
	Homer Drain near RR crossing, W of I-275				□										0	0	0	1
	Frank & Poet Drain debris and sediment build up at RR culverts		□												0	0	0	1
	Frank & Poet Drain debris build up (Riverview Highlands)					□									0	0	0	1
	Bevins Drain W of Kennebec Park debris build up					□									0	0	0	1
	Mulberry Woods Storm Drain debris build up					□									0	0	0	1
	Frank & Poet Drain at Seaway Road, S of Eureka								□						0	0	0	1
	Blakely Drain from King Rd to Van Horn									□					0	0	0	1
	Frank & Poet Drain on south side of WCAA property												○		0	0	1	0
	Frank & Poet Drain debris and sediment build up (Trenton)											□			0	0	0	1

Table 7-3. Management Alternatives - Number of Entities
(Page 4 of 6)

LEGEND
 ✓ Currently Doing
 ● Short-term
 ○ Intermediate-term
 □ Long-term

Type	Management Alternative	Entities											# of Entities					
		Brownstown Twp	Gibraltar	Grosse Ile Twp	Huron Twp	Riverview	Romulus	Southgate	Taylor	Woodhaven	W-B School District	Wyandotte	Wayne County	WCAA	Currently Doing	Short-term	Intermediate-term	Long-term
Increase Floodplain	Brownstown Creek Chatham Park Area	□													0	0	0	1
	Sutliff & Kenope Drain daylighting (Nature Center)						□								0	0	0	1
	Blakely Drain north of RR, S of West Rd								□						0	0	0	1
Storm water detention / retention	Ford property S of Pennsylvania, W Telegraph	□													0	0	0	1
	Expand basin in Airport Commerce Park			□											0	0	0	1
	School District Bus Garage property			□											0	0	0	1
	Expand/enhance basin on Airport property (Grosse Ile)			□											0	0	0	1
	Former Regional Center N of Pennsylvania						□								0	0	0	1
	Brownstown Creek, S of Van Horn, W of Allen Road								□						0	0	0	1
	Dredge Pond 4 to remove accumulated sediment												□		0	0	0	1
	Dredge Pond 6 to remove accumulated sediment												□		0	0	0	1
Additional	Improve clarifier at Airport property (Grosse Ile)			□											0	0	0	1
	Purchase land for open space preservation			□											0	0	0	1
	Implement Downriver Linked Greenways Initiative	□	□	□	○	□	□	□	□	□	□				0	0	1	9
	Extend local bike paths			□											0	0	0	1
	Pinnacle Project SW BMPs				□		□								0	0	0	2
	Detroit River Comprehensive Master Plan												○		0	0	1	0
	Benthic monitoring												○		0	0	1	0
	Physical stream survey												○		0	0	1	0
	Raingarden and/or bioretention swales												□		0	0	0	1
	Identify and Map Natural Features												○		0	0	1	0
	Riparian Corridor Management												○		0	0	1	0
	Illicit Connection Elimination for Wayne County Downriver Communities												○		0	0	1	0
	Establish Monitoring Program												○		0	0	1	0
	Hydrographic survey of Gibraltar canals		○												0	0	1	0
	Dredging of Gibraltar canals		○												0	0	1	0
Wildlife Refuge Hdqtrs Ecosystem Restoration												○		0	0	1	0	
Additional Phase II Actions																		
Structural	Install porous pavement at appropriate sites	□	□	○	○			○		□					0	0	3	3
	Construct infiltration basins/trenches at strategic locations	□	□	✓	□			○		□			✓		2	0	1	4
	Inventory & stabilize eroding streambanks	○	○	□	□		□						✓	✓	2	0	2	3
	Install catch basin inserts at strategic locations	□	□		□		✓		✓						2	0	0	3
	Install dry ponds at strategic locations	○	✓		□	✓		✓	✓	✓					5	0	1	1
	Use fallen woody debris for bank stabilization and habitat	○	○	✓	□										1	0	2	1
	Create off-line areas for biota, where feasible	□		✓	□			□	□				n/a		1	0	0	4
	Replace undersized bridges and culverts		□		✓		✓		✓	□					3	0	0	2

Table 7-3. Management Alternatives - Number of Entities
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LEGEND			
✓	○	●	□
Currently Doing	Short-term	Intermediate-term	Long-term

Type	Management Alternative	Entities											# of Entities					
		Brownstown Twp	Gibraltar	Grosse Ile Twp	Huron Twp	Riverview	Romulus	Southgate	Taylor	Woodhaven	W-B School District	Wyandotte	Wayne County	WCAA	Currently Doing	Short-term	Intermediate-term	Long-term
Vegetative	Install & maintain riparian buffers	✓	□		○			○	✓	✓	✓				4	0	2	1
	Construct bioretention areas, where feasible	○	○	□	□			○	□	✓					1	0	3	3
	Constructed wetlands, where feasible	□			□		✓	✓	✓	□			✓	n/a	4	0	0	3
	Restore/ expand/improve existing wetlands, where feasible	○	□	✓	□		✓	○	✓	□				n/a	3	0	2	3
	Install woody debris or habitat structures at strategic locations	□			□				✓	□					1	0	0	3
	Install vegetative buffer around impoundments, where possible	✓	○	○	□		✓	□	✓	✓				n/a	4	0	2	2
Managerial - Ordinances & Policies	Work w/ County to revise W.C. storm water ordinance to make more applicable to redevelopment in urban areas	○	○	○				○	○					n/a	0	0	5	0
	Open space preservation in zoning and master planning	✓	✓	✓	✓		✓	●	✓					n/a	6	1	0	0
	Incorporate low impact design planning	□	○		●		✓	○						n/a	1	1	2	1
	Incorporate riparian corridor in community zoning & land-use plans	○		✓	●		□	○	□				○		1	1	3	2
	Implement phosphorous fertilizer reduction ordinances	□	□		●			□	✓					n/a	1	1	0	3
	Adopt natural features ordinance	○	○	✓				○	○					n/a	1	0	4	0
	Review and revise grading and land clearing policies	○	✓	✓	●		✓	○	✓					n/a	4	1	2	0
	Adopt Native Landscaping Ordinance	○	○		●		✓	○	○					n/a	1	1	4	0
	Review and revise parking requirements for new development/redevelopment	○	✓	✓	✓		✓	○	○	✓				n/a	5	0	3	0
	Enact wetland and/or natural features protection ordinances	✓	✓	✓	□			✓	□					n/a	4	0	0	2
Implement private roads ordinances (narrower streets)	○	✓		✓			□						n/a	2	0	1	1	
Managerial - Practices	Work w/ County to revise drain maintenance procedures to reduce the destruction of habitat and stream vegetation	○	□		✓				○			○			1	0	3	1
	Implement pet waste collection program to supply the public with convenient disposal places for pet waste	□	○	○	□			□	□	○			n/a	0	0	3	4	
	Eliminate roof drains directly connected to impervious surfaces, where possible	○	□	□	□			□	□	□			○	0	0	2	6	
Managerial - Studies & Inventories	Municipal mapping of wetlands	□	□	□	✓			□	□				n/a	1	0	0	5	
	Water quality monitoring	○	□		●			□	□					0	1	1	3	
	Investigate opportunities for recreational areas	✓	□	✓	●		✓	✓	□		○		n/a	4	1	1	2	
	Flow monitoring	□			✓				✓					2	0	0	1	
	Evaluate areas suitable for dredging to increase hydraulic capacity of drains	○	○			✓	○		□				○	1	0	4	1	
	Inventory areas lacking storm water detention for retrofit opportunities	○	□		●		○		□	□				n/a	0	1	2	3
Initiate hydrologic and hydraulics studies to determine sources contributing to flooding	○	□		●		✓		✓	○					2	1	2	1	

Table 7-3. Management Alternatives - Number of Entities
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LEGEND			
✓	●	○	□
Currently Doing	Short-term	Intermediate-term	Long-term

Type	Management Alternative	Entities											# of Entities				
		Brownstown Twp	Gibraltar	Grosse Ile Twp	Huron Twp	Riverview	Romulus	Southgate	Taylor	Woodhaven	W-B School District	Wyandotte	Wayne County	WCAA	Currently Doing	Short-term	Intermediate-term
Managerial - Public	Program to increase awareness and use of rain barrels	○	○				□	○	○	□		○	n/a	0	0	5	2
	Establish BMP case studies	○	□	✓	□		○		○	○		✓		2	0	4	2
	Maintain watershed webpage	○	○	○			○		✓	✓		✓	✓	4	0	4	0
Managerial - Coordination & Funding	Create an ordinance body to ensure consistency of ordinances between the Downriver communities	○	□	□	●		□	□	✓	○			n/a	1	1	2	4
	Meet w/ County and/or MDOT to coordinate drain maintenance	○			✓		○	○	✓	✓				3	0	3	0
	Establish long-term committee of community/entity representatives to promote implementation of the WMP	○	○	□	●			□	✓	○		✓		2	1	3	2
	Create partnerships with institutions, schools, and private sector to promote a collaborative effort in watershed management	○	○	□	●		○	✓	✓	✓		✓		4	1	3	1
	Seek alternative funding sources	○	○	○	●		○	○	✓	○		✓		2	1	6	0
	Create a funding source for land acquisition and protection	○	□	✓	□			□	□					1	0	1	4
	Create law to allow illicit discharge enforcement as a source of revenue	□	○	○	●		□	□	○	○			n/a	0	1	4	3
	Work w/ Stream Team and others for citizen monitoring	○	○	○	●		□	✓	✓	○		✓		3	1	4	1