SECTION 5 - COMMUNITY OUTREACH

PUBLIC PARTICIPATION PROCESS

The Public Participation Plan (PPP) submitted on March 1, 2004 outlined the roles of the steering committee, stakeholder groups, and the general public in developing the watershed management plan and how the information would be used during the decision-making process.

The goal of the PPP was to effectively involve stakeholders and the public throughout the watershed management planning process so that they contribute during the process and understand the plan recommendations to gain support for implementation. Key stakeholders in the watershed were identified. Materials for stakeholders to use, to educate their constituents was developed. Lastly, the plan sought to obtain useful, measurable social feedback information throughout the public participation process.

One criteria was that the Public Participation Process needed to be flexible to allow for changes along the way. Obtaining sufficient public input on watershed projects takes creativity, persistence, and commitment. While the PPP for this watershed outlines specific activities that were to be completed, the activities were modified as needed to improve public participation.

The following list summarizes the main venues in which public involvement will be sought.

- Public Briefing
- Stakeholder Workshops
- Focus Groups
- Report to Municipal Officials

There have been 5 **stakeholder meetings** for the Middle Flint River Watershed. One meeting was used for a **focus group** with the superintendents of the school districts to discuss nested jurisdiction. Attendance has been very good for all the stakeholder meetings. Concurrently 4 **public meetings** were held. Due to the poor attendance to the public meetings, the workgroup for the Middle Flint decided to use a survey to solicit public opinion. A citizen survey was developed based on a survey done in the Anchor Bay Watershed. The Survey was mailed to 600 residents, 450 of those were riparian landowners and was limited to residential properties. 73 residents responded to the survey. Below are the survey results and public comments. The reports to the municipal officials have not been done at this time. Part of reporting to the **Municipal officials** was education. The Public Education survey was recently given to the elected and appointed municipal officials. This was to determine what their educational needs were. It is planned to go out to the Municipalities within the upcoming months. Updates have been developed to discuss what all the workgroups and subcommittees are doing.

Middle Flint Survey Results Responces to Survey **25**
Kearsley Creek

with 1 being most important and 5 being the least important:

Rank the following goals with a score of 1 to 5,	**1**	**2**	**3**	**4**	**5**	**Did not rank**
Remove paper/trash/debris in the river and tributaries to improve its appearance	9	2	4	4	2	2
Better control soil erosion and limit sediments entering the water.	2	6	9	1	3	1
Improve habitat conditions for fish and wildlife in the water	6	7	5	1	1	2
Minimize excessive flows that cause flooding, bank erosion and habitat loss	8	4	6	2	1	1
Encourage investments in land along water for recreation/wildlife protection	5	4	2	4	5	
Expand public education about the benefits of protecting the MFRW	4	4	4	2	6	1
Better control sources of fertilizer reaching the Watershed & the Great Lakes	7	5	6	1	1	2
Remove sources of human waste in the Watershed that threaten public health	14	3		1	3	3
Protect the quality and accessibility of drinking water (wells)	12	4	2		3	1
Increase community planning to address development & protection of water qual	5	8	3	4		

Are there any other goals that you feel should be included in this list? Please indicate any additional goals you would like to see added. How would you rank them from 1 (most important) to 5 (least important)?

What issues concerning the management of the Middle Flint River Watershed are most important to you?

What is the single most important improvement to the Watershed and its tributaries that you would like to see?

What types of information about the Middle Flint Watershed interest you most? (Check as many as apply)

Water quality	17	How I can volunteer to help restore Watershed	5
Bacteria levels	13	How businesses can prevent pollution	8
Fish and wildlife	11	How homeowners can help prevent pollution	6
Parks and public recreation areas	5	Other	

Which of the following is the best approach to keep you informed regarding the progress in developing a plan to restore the Middle Flint River Watershed?

Public meetings/workshops	5		
Newspaper articles	9	Direct mailings to your home or business	12
Cable TV	2	Community newsletters	3
Web page	4	Other (specify) . EMAIL	1

Middle Flint Survey Results **Responces to Survey 18**
Thread Creek

with 1 being most important and 5 being the least important:

Rank the following goals with a score of 1 to 5,	**1**	**2**	**3**	**4**	**5**	**Did not rank**
Remove paper/trash/debris in the river and tributaries to improve its appearance	6	1	5	1	2	2
Better control soil erosion and limit sediments entering the water.	1	6	5	2		2
Improve habitat conditions for fish and wildlife in the water	4	3	1	5		2
Minimize excessive flows that cause flooding, bank erosion and habitat loss	2	5	5	3		2
Encourage investments in land along water for recreation/wildlife protection	1	2	4	3	4	1
Expand public education about the benefits of protecting the MFRW	2	4	5	3		2
Better control sources of fertilizer reaching the Watershed & the Great Lakes	2	6	2	3	1	2
Remove sources of human waste in the Watershed that threaten public health	10	1		2	2	2
Protect the quality and accessibility of drinking water (wells)	9	2			3	2
Increase community planning to address development & protection of water qual	3	5	3	3	1	2

Are there any other goals that you feel should be included in this list? Please indicate any additional goals you would like to see added. How would you rank them from 1 (most important) to 5 (least important)?

What issues concerning the management of the Middle Flint River Watershed are most important to you?

What is the single most important improvement to the Watershed and its tributaries that you would like to see?

What types of information about the Middle Flint Watershed interest you most? (Check as many as apply)

Water quality	14	How I can volunteer to help restore Watershed	3
Bacteria levels	12	How businesses can prevent pollution	4
Fish and wildlife	6	How homeowners can help prevent pollution	8
Parks and public recreation areas	5	Other: Flooding	1
		insect control	1
		Stream bank restoration	1

Which of the following is the best approach to keep you informed regarding the progress in developing a plan to restore the Middle Flint River Watershed?

Public meetings/workshops	2		
Newspaper articles	10	Direct mailings to your home or business	10
Cable TV	3	Community newsletters	
Web page	2	Other (specify)	

Middle Flint Survey Results **Responces to Survey 17**
Swartz Creek

with 1 being most important and 5 being the least important:

Rank the following goals with a score of 1 to 5,	**1**	**2**	**3**	**4**	**5**	**Did not rank**
Remove paper/trash/debris in the river and tributaries to improve its appearance	8	1	3		2	
Better control soil erosion and limit sediments entering the water.	6	3	4	1		
Improve habitat conditions for fish and wildlife in the water	2	6	3	3	1	
Minimize excessive flows that cause flooding, bank erosion and habitat loss	6	3	5	1		
Encourage investments in land along water for recreation/wildlife protection	1	3	4	3	3	
Expand public education about the benefits of protecting the MFRW	4	2	5	1	2	
Better control sources of fertilizer reaching the Watershed & the Great Lakes	5	5	3		1	
Remove sources of human waste in the Watershed that threaten public health	16					
Protect the quality and accessibility of drinking water (wells)	16	1		1		
Increase community planning to address development & protection of water qual	5	3	4		1	

Are there any other goals that you feel should be included in this list? Please indicate any additional goals you would like to see added. How would you rank them from 1 (most important) to 5 (least important)?

What issues concerning the management of the Middle Flint River Watershed are most important to you?

What is the single most important improvement to the Watershed and its tributaries that you would like to see?

What types of information about the Middle Flint Watershed interest you most? (Check as many as apply)

Water quality	14	How I can volunteer to help restore Watershed	3
Bacteria levels	9	How businesses can prevent pollution	4
Fish and wildlife	4	How homeowners can help prevent pollution	7
Parks and public recreation areas	4	Other	

Which of the following is the best approach to keep you informed regarding the progress in developing a plan to restore the Middle Flint River Watershed?

Public meetings/workshops	3		
Newspaper articles	6	Direct mailings to your home or business	7
Cable TV	5	Community newsletters	5
Web page	1	Other (specify) _____	

Middle Flint Survey Results Responces to Survey **13**
Random Sampling

with 1 being most important and 5 being the least important:

Rank the following goals with a score of 1 to 5,	**1**	**2**	**3**	**4**	**5**	**Did not rank**
Remove paper/trash/debris in the river and tributaries to improve its appearance	4	4	3		2	1
Better control soil erosion and limit sediments entering the water.	2	2	2	1	3	1
Improve habitat conditions for fish and wildlife in the water	5	1	2	3	2	1
Minimize excessive flows that cause flooding, bank erosion and habitat loss	3	2	4	1	2	1
Encourage investments in land along water for recreation/wildlife protection	1	5	2		3	1
Expand public education about the benefits of protecting the MFRW	2	2	3	1	2	1
Better control sources of fertilizer reaching the Watershed & the Great Lakes	7	1	1	1	1	1
Remove sources of human waste in the Watershed that threaten public health	10	1			1	1
Protect the quality and accessibility of drinking water (wells)	10	1			1	1
Increase community planning to address development & protection of water qual	2	6	1	1	1	1

Are there any other goals that you feel should be included in this list? Please indicate any additional goals you would like to see added. How would you rank them from 1 (most important) to 5 (least important)?

What issues concerning the management of the Middle Flint River Watershed are most important to you?

What is the single most important improvement to the Watershed and its tributaries that you would like to see?

What types of information about the Middle Flint Watershed interest you most? (Check as many as apply)

Water quality	12	How I can volunteer to help restore Watershed	3
Bacteria levels	9	How businesses can prevent pollution	8
Fish and wildlife	9	How homeowners can help prevent pollution	7
Parks and public recreation areas	3	Other	

Which of the following is the best approach to keep you informed regarding the progress in developing a plan to restore the Middle Flint River Watershed?

Public meetings/workshops			
Newspaper articles	4	Direct mailings to your home or business	6
Cable TV	3	Community newsletters	2
Web page	3	Other (specify) . EMAIL	1

Middle Flint Survey Results Responces to Survey **73**
Totals

with 1 being most important and 5 being the least important:

Rank the following goals with a score of 1 to 5,	**1**	**2**	**3**	**4**	**5**	**Did not rank**
Remove paper/trash/debris in the river and tributaries to improve its appearance	27	8	15	5	8	5
Better control soil erosion and limit sediments entering the water.	11	17	20	5	6	4
Improve habitat conditions for fish and wildlife in the water	17	17	11	12	4	5
Minimize excessive flows that cause flooding, bank erosion and habitat loss	19	14	20	7	3	4
Encourage investments in land along water for recreation/wildlife protection	8	14	12	10	15	2
Expand public education about the benefits of protecting the MFRW	12	12	17	7	10	4
Better control sources of fertilizer reaching the Watershed & the Great Lakes	21	17	12	5	4	5
Remove sources of human waste in the Watershed that threaten public health	50	5	0	3	6	6
Protect the quality and accessibility of drinking water (wells)	47	8	2	1	7	4
Increase community planning to address development & protection of water qual	15	22	11	8	3	3

Are there any other goals that you feel should be included in this list? Please indicate any additional goals you would like to see added. How would you rank them from 1 (most important) to 5 (least important)?

What issues concerning the management of the Middle Flint River Watershed are most important to you?

What is the single most important improvement to the Watershed and its tributaries that you would like to see?

What types of information about the Middle Flint Watershed interest you most? (Check as many as apply)

Water quality	57	How I can volunteer to help restore Watershed	14
Bacteria levels	43	How businesses can prevent pollution	24
Fish and wildlife	30	How homeowners can help prevent pollution	28
Parks and public recreation areas	17	Other	1

Which of the following is the best approach to keep you informed regarding the progress in developing a plan to restore the Middle Flint River Watershed?

Public meetings/workshops	5		
Newspaper articles	13	Direct mailings to your home or business	25
Cable TV	5	Community newsletters	20
Web page	7	Other (specify) . EMAIL	2

Table 5-1 Meeting Dates

	Surface Water Advisory Committee	Monitoring and Mapping	Public Education and Participation	BMP Committe	Work Group	Stakeholders Workshops	Combined Stakeholder/ Public Meetings
September 2004		20th			2nd		
October 2004		5th &13th	25th				
November 2004	17th		29th				
December 2004	15th						
January 2005			3rd & 19th			31st	
February 2005	16th		7th				
March 2005	23rd		2nd & 21st				
April 2005	20th		18th &25th				
May 2005	18th		5th & 17th			23rd	
June 2005					29th (2)		
July 2005					27th (2)		
August 2005	17th				31st (2)		29th (2)
September 2005	21st			10th & 24th	28th (2)		
October 2005	19th				26th (2)		
November 2005	16th						30th (2)
December 2005							
January 2006	18th		23rd		4th (2) & 23rd		
February 2006	15th		27th				1st (2)
March 2006	15th		20th				
April 2006	19th						
May 2006	17th		15th		31st		
June 2006	21st		19th				
July 2006			17th				
August 2006						2nd	
September 2006	20th		18th				
October 2006	18th		16th		25th		
November 2006	22nd						
December 2006	20th		18th				
January 2007	17th		22nd				
February 2007	21st		26th		16th		
March 2007	28th		19th				
April 2007	18th	23rd					
May 2007	16th		21st	15th			
June 2007	20th	5th		19th			
July 2007		24th	16th	17th			
August 2007				21st			
September 2007	19th	25th	17th	18th			
October 2007	17th		15th				

SECTION 6 - CHALLENGES AND GOALS

As more and more people live, work and interact within a watershed, maintaining a healthy, sustainable environment becomes a challenge. To address these challenges, goals and objectives are developed to direct the actions within the watershed that will improve and protect the environment.

The purpose of this chapter is to:

1. Outline the water quality issues discussed in Chapter 4, summarize public and stakeholder concerns, and identify which pollutants are perceived to be of most concern.
2. Define designated uses and identify the impaired or threatened water bodies within the watershed that do not meet their designated uses.
3. Define and identify the watershed desires identified through the stakeholder workshops.
4. List the goals and objectives and identify how they were developed.

"Water is the most critical resource of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land."

- Luna Leopold

Photo Courtesy:
FRWC River Cleanup

WATER QUALITY ISSUES AND CONCERNS

It is important to distinguish between water quality issues and water quality concerns. Water quality issues are those water quality problems that have been identified through water quality monitoring, macroinvertebrate and fish sampling, and habitat surveys. Water quality concerns are problems that are observed or perceived to exist by residence and stakeholders within the watershed. **Note**: stakeholders in the Middle Flint River vary from lake associations to stakeholders that represent the whole County to stakeholders that represent an entire watershed such as the FRWC. All efforts were made to make sure the concerns were specifically for the Middle Flint River.

Water Quality Issues

Water quality issues were extrapolated from chapters 3 & 4 are listed below:

- The loss of open space land by development to Residential and Commercial property
- Shortage of Wetlands, either naturally or through human intervention
- The availability and demand on the sewer and water systems
- Potential danger to endangered species
- Restriction on fish consumption due to pollutants
- Potential pollutant loading from developed land

Water Quality Concerns

Water quality concerns were solicited from the public and stakeholders though a series of workshops and meetings, Described in Section 5.

A list of the public's concerns is provided below:

- Flooding Problems
- Concerns Affecting Drainage Ditches
- Parking Lot Spills
- Landfill Runoff/Groundwater Leachate
- Car Wash
- Groundwater pumping, irrigation affecting local wells
- Over-fertilization
- Sedimentation and soil erosion
- Source of Funding to Address the Above Concerns
- Wetland Destruction
- Need for Ordinance and Permit Compliance Enforcement for Environmental Protections
- Development Concerns
- Negative Public Perception of Flint River
- Need for Cooperation with Health Department
- Lack of Citizen and Municipal Education
- Lack of access to recreational opportunities

The concerns identified by the stakeholders are ranked and presented below. The public and stakeholders ranked their concerns to determine which issues they felt were more important. Each Concern is labeled as Rural (R), Urban (U) or Both (B) to indicate where in the watershed the concern is of most relevance.

1. Funding (B)
2. Education for planning commissions and zoning boards-municipals, government officials (B)
3. Need innovative ideas and solutions implemented locally-pilot project w/education component (B)
4. Sanitary Connections to storm sewer (U)
5. Education for builders and developers (B)
6. Stormwater treatment with BMPs must be maintained (U)
7. Streets directly discharge into river within minutes of rain events (U)
8. Flooding due to new development (B)
9. Master Gardeners-Volunteer Work link to projects (U)
10. Promote education at a publicly planned event (B)
11. Time of Sale Homeowner Packet (U)
12. Education (B)
13. More recreational opportunities (B)

DESIGNATED USES IN THE STATE

The Michigan Department of Environmental Quality (MDEQ), acting under authority of the federal Clean Water Act, aims to make waters in the state meet certain designated uses (State of Michigan, 1999):

- Agricultural Water Supply
- Public Water Supply
- Other Aquatic Life / Wildlife
- Industrial Water Supply
- Warm water Fishery
- Partial Body Contact
- Coldwater Fisheries (specifically identified waterbodies only)
- Total Body Contact (May 1st – October 31st)
- Navigation

Source: NCSU, 2004.

Example Pollutants Affecting Designated Uses

Agricultural Water Supply
- Hydrology (too little flow)
- Excess nutrients
- Toxic contaminants

Industrial Water Supply
- Hydrology (too little flow)
- Suspended solids

Public Water Supply
- Excess nutrients (nitrates)
- Pesticide contaminants

Warm Water Fishery
- Sediment
- Hydrology (flow variability)
- Dissolved oxygen (too little)

Cold Water Fishery
- Sediment
- Hydrology (flow variability)
- Dissolved oxygen (too little)

Other Aquatic Life / Wildlife
- Sediment
- Pesticides
- Temperature

Partial Body Contact
- Pathogens
- Nutrients

Total Body Contact
- Pathogens
- Nutrients

Navigation
- Obstructions

Source: MDEQ, 2000.

The designated uses are intended to:

- Protect health and public welfare
- Enhance and maintain the quality of water
- Protect the state's natural resources
- Meet the requirements of state and federal law (including international agreements)

One of the first things people envision when discussing water quality is drinking water. It is extremely important for communities to have a clean source of drinking water that is free from contaminants.

Communities in the subwatershed use groundwater for drinking water supplies, and although the designated uses apply to surface waters, the uses also help protect groundwater-drinking supplies because these two water sources are implicitly linked.

Contaminants in water can also affect human health when the water is used to irrigate food sources, when fish living in these waters are eaten, or when humans come in contact with these waters through swimming or boating.

While human health is the most important reason for protecting these resources, the designated uses are also intended to protect wildlife, commerce, and recreation. For example:

- The 'warmwater and coldwater fisheries' uses also ensure healthy fish populations, increases recreational enjoyment of fishing, and ensures a thriving fishing industry that results in fishing related consumer spending, travel, and tourism.
- The 'industrial water supply' use ensures that businesses have an inexpensive and sustainable process water supply that helps keep them competitive and providing jobs to Michigan's citizens.
- The 'navigation' use ensures that the state's waterways are passable and the 'body contact' uses ensure that people can safely swim. These uses contribute to the lure of many travelers vacationing during the summer.

Two locations in the Middle Flint Watershed are designated coldwater fisheries. These locations include the Kearsley Creek from Oakland County Line (T5N, R8E, Sect 1) upstream and the Thread Creek from Bristol Road (T7N, R7E, Sect 33) upstream to Groveland Road in Oakland County (T7N, R8E, Sect 5)

Designated Uses Not Being Met

As a result of the State's defined designated uses and the water quality data and impairments discussed in Section 4, the following designated uses are not being met:

- **Warm Water Fishery** in the Flint River, Heron Lake, Thread Lake, and Thread Creek, all other inland lakes, reservoirs and impoundments, due to PCBs and/or mercury in fish material
- **Partial Body Contact** in the Flint River, Potters Lake, Burdick Drain, and the Middle Branch of the Flint River due to untreated sewage discharge (pathogens)
- **Total Body Contact** in the Flint River, Potters Lake, Burdick Drain, and the Middle Branch of the Flint River due to untreated sewage discharge (pathogens)
- **Public Water Supply** in the Flint River due to untreated sewage discharge as noted in *The Flint Journal* and the Genesee County Health Department.
- **Habitat modification** in the Swartz Creek and Gilkey Creek due to channelization and insufficient habitat to support an acceptable biological community.

Threatened Designated Uses

Additionally, the following designated uses are being met but are threatened (meaning they may not be met in the foreseeable future) or insufficient documentation exist to classify items listed below as *designated uses not being met*:

- **Navigation** in the Flint River (may want to include Kearsley, Swartz and Thread), is limited by physical obstructions such as downed trees or sandbars.
- **Other Aquatic life / Wildlife** in Heron Lake and Thread Lake based on the presence of PCBs and / or mercury in fish material (implying the potential for these pollutants to bioaccumulate in other organisms)
- **Partial Body Contact** in the Crooked Lake due to high levels of E. Coli (pathogens)
- **Total Body Contact** in the Crooked Lake due to high levels of E. Coli (pathogens)

Meeting the state-defined designated uses is important to meet legal requirements to protect public health, provide a high quality of life, and protect natural resources. Programs such as the MDEQ TMDL program seek to obtain the restoration of these uses with the ultimate goal of restoring and maintaining the chemical, physical, and biological integrity of the state's waters.

It is important to note that the assessments presented herein are subject to change. Additional data, new pollution sources, changing use locations, and updated water quality standards all may affect the assessment. Waterbodies may be listed or de-listed on Michigan's 303d or 305b list, and the associated status of designated uses may change. Below is a summary of the impaired waterbodies in the Middle Flint River Watershed:

Table 6-1 Impaired Waterbodies in the Middle Flint River Watershed

Water body ID	Water body Name	Water body Description	Water body Type	Water body Size	Water body Unit of Size	PROBLEM	TMDL YR
210414D	Burdick Drain	Enters NE part of Potters Lake after crossing Davison Rd. & Olgelthorp Rd., Elba Twp. SE ¼ of the SW ¼ of sec. 6 (T7N, R9E)	River	0.50	M	Pathogens Rule 100	2004
210409D	Flint River (Entire Watershed)	Shiawassee River Confluence upstream to include all tributaries	River	847	M	FCA-PCB's	2010
210414F	Heron Lake	NW of Austin Corner & NW of Valley/Wildwood Lakes	Lake	132	A	Fish Tissue-Mercury	2011
210413F	Potters Lake	Vicinity of Elba Township	Lake	160	A	Pathogens Rule 100	2004
210414U	Thread Creek	Thread Lake upstream to Genesee and Oakland County line	River	26	M	FCA-PCB's	2010
210414F	Thread Lake	Upstream of Rt. 475. Vicinity of Flint	Lake	82	A	FCA-PCB's	2010
210414J	W. Br. Swartz Creek	Swartz Creek confluence upstream	River	17	M	Habitat modification-channelization	
210414H	Swartz Creek	Thread Creek confluence upstream	River	68	M	Habitat modification-channelization	
210414X	Kearsley Reservoir	Flint River confluence just upstream of Western Road	Impoundment	250	A	FCA-PCB's	2010
210414G	Gilkey Creek	Flint River confluence	River	12	M	Habitat modification-channelization	

Through the revision process, the watershed plan will be updated l address any new TMDL's as they become available

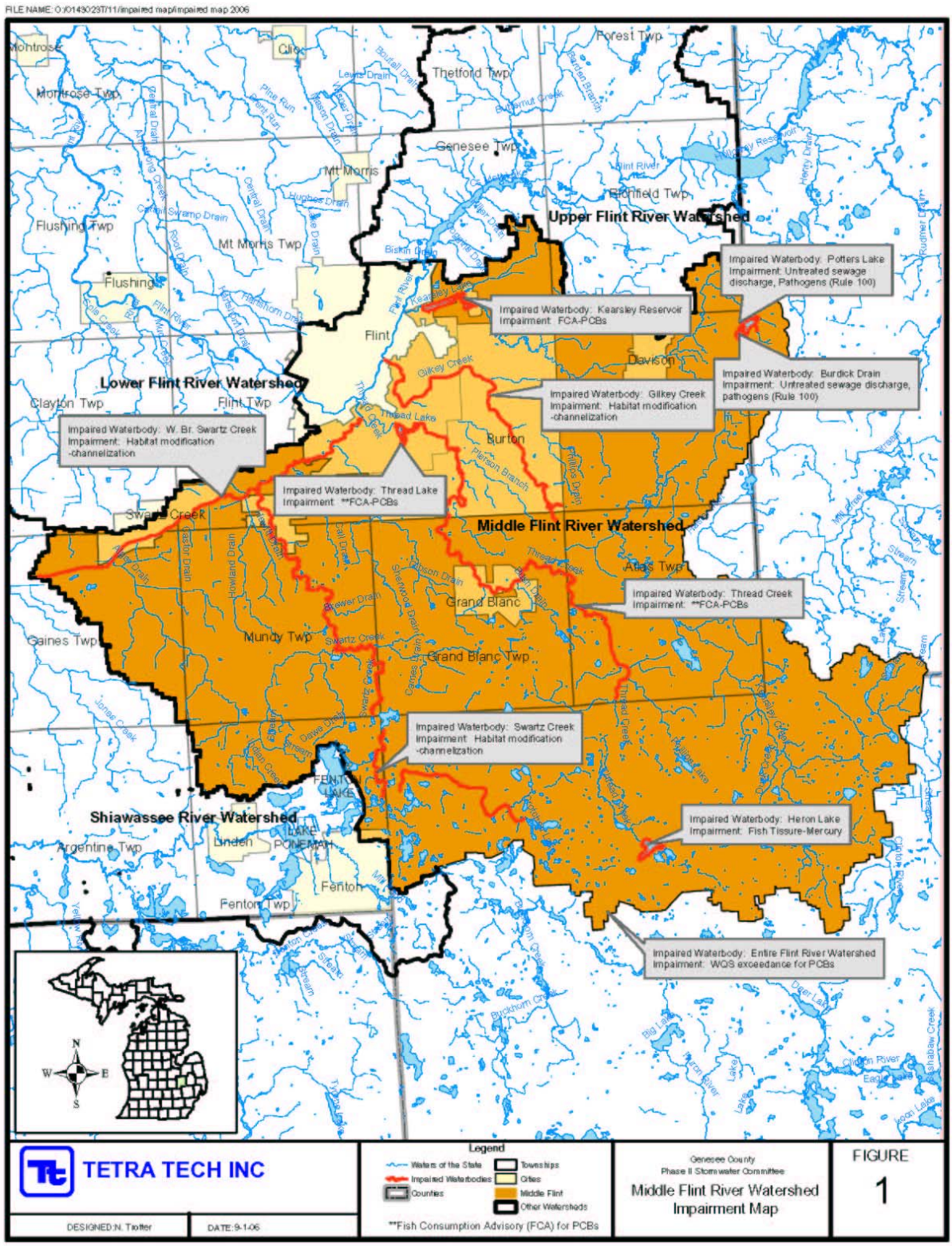


Figure 6-1 Impaired Waterbodies

WATERSHED DESIRES

The term “watershed desire” is meant to invoke a vision of what watershed stakeholders would like their watershed to look like. The watershed planning committee members and the stakeholders have participated in determining goals and desires for the watershed, such as, developing a recreational trail along the river.

During the public participation process, the public was given the opportunity to express their watershed desires. The public identified the following watershed desires:

- Provide Demonstration projects for Bio-retention, Low Impact Development
- Enhanced recreational opportunity: (Access/opportunities)
  - Fishing/ Hunting: increase access and opportunities
- Coordinate with Michigan Lakes & Streams Program
- Enact Wetland Protection Ordinances & require County Road Commission to address impacts from Road projects.
- Change Local and County development standards and goals
- Protect natural features when developing new sites
- Restore/ prevent bank erosion, reestablish stream bank buffers

GOALS AND OBJECTIVES

Identified known pollutants, water quality concerns and desires of the public and stakeholders were used to develop a set of goals and objectives. The goals reflect the mission statement and are accompanied by a set of objectives and actions which when implemented will assist in meeting the corresponding goal. The actions associated with these objectives are listed in Section 8. Goals 1 through 5 were developed by the desires and concerns of the public and stakeholders during goal and objective development. Permit requirements were taken into account and make up Goals 6 through 8. The watershed management plan as a whole must contain the following:

- An assessment of the nature and status of the watershed ecosystem (Section 3 and 4)
- Long-term goals to include the protection of designated uses of the receiving waters and compliance with TMDLs (Sections 6 and 8)
- Short-term objectives (Sections 6 and 8)
- Action items to achieve goals and objectives (Section 8)
- The benefit and cost of the action items (Section 8)
- A responsible party, schedule, and evaluation mechanism for each action item (Section 8)

Minimum Permit Requirements

The objectives in this plan meet the Watershed-Based NPDES Permit requirements, but because of the significant public and stakeholder response, many additional objectives are included in the plan to expand on voiced desires. These additional objectives go beyond the jurisdictional permit requirements.

Because the Watershed-Based NPDES Permit has broad requirement language, and because of the implication that any implemented objective, directly or indirectly, must help protect the designated uses of the receiving water body, it was necessary to include the requirements from other sources. These sources include the U.S. Environmental Protection Agency (US-EPA) Storm Water Phase II Final Rule requirements and the Michigan Jurisdictional-Based NPDES Permit. These two sources were chosen because the Watershed-Based NPDES Permit is based on their requirements.

The Federal and State requirements as well as each specific Watershed-Based NPDES Permit requirement was reviewed to assure that at least one objective correlated with it. In the section below, each goal is prioritized according to what stakeholders deemed important. In Section 8, objectives are included in the table under each goal. A 'Yes' indicates that the objective fulfills one or more permit requirements at a minimum level. A 'No' indicates that the objective is considered beyond the minimum requirement of the permit, or that it extends a general effort beyond the minimum requirement of the permit, and may be eligible for certain types of grant funds. During goal and objective development, it became clear that some objectives fulfill minimum requirements, some objectives go beyond the minimum requirements, and some objectives are difficult to categorize. Discretion was used to determine how the uncategorical objectives are classified.

Note that each goal and objective should be considered in association with other goals and objectives, as applicable. For example, one of the aims of Goal 1 is to remove sources of pollutants including sedimentation. Goal 3 is to reduce impacts from peak flows and high volumes. Objective 3a addresses both of these goals. Through a Stormwater Ordinance, pollutants such as sediment can be reduced or removed and also reduce peak flows and high volumes.

Goal 1: Protect Public Health

This aim of Goal 1 is to remove sources of **P**athogens, **N**utrients, and **S**edimentation that threaten public health and recreation. It also seeks to:
1) Protect **D**rinking water supply (groundwater recharge areas)
2) Reduce **I**nfiltration and inflow to decrease sanitary sewage overflows

Objectives Associated with Goal 1:

a. Draft, adopt and implement Time of sale septic ordinance: **P,N**
b. Deliver homeowner education at time of sale (public education about Septic, lawn, leaves, grass, carwash, etc) **P,N,S**
c. Draft, adopt and implement Disconnect footing drains from sanitary sewers ordinance **I**
d. Identify existing wellhead protection programs **D**
e. Draft, adopt & implement a ordnance to test Drinking water well at time of sale **D**
f. Map arsenic Levels for drinking wells **D**

Goal 2: Establish Watershed Stewardship Awareness and Responsibility among the Public

Goal 2 aims to increase public participation and the **U**nderstanding of their role in protecting the watershed. It seeks to promote the Flint River as a viable public **R**esource (i.e. dispel the myth of poor water quality in the Flint River to bring people back to the river). The Goal also recognizes the need for improved **C**ommunication of existing water quality and potential threats to public must occur to promote this goal.

Objectives Associated with Goal 2:

a. Educate public about 7 required education elements. **R, C, P, N, S, O**
b. Undertake a Direct mailing to riparian land owners (Rivers/Lakes) **U, R, C, N, O**
c. Partner with existing household hazardous waste program committee to increase awareness and use **U,**
d. Enhance existing benthic monitoring Program (see Section 4) **U, R, C, O**
e. Enhance existing project GREEN Program (see Section 7) **U, R, C, O**
f. Conduct a Stream Crossing watershed survey with photography **C**
g. Conduct Hot Spot water quality monitoring as needed **C**

Goal 3: Reduce Impacts from Peak Flow and High Volumes

This goal seeks to minimize excessive **F**lows that cause flooding, bank erosion and habitat loss. This will be accomplished through environmentally friendly drain maintenance, community planning, ordinance development, and water quality monitoring. Establish minimum standards for stormwater infrastructure design countywide.

Objectives Associated with Goal 3:

a. Draft, adopt and implement a county Storm Water Ordinance **F, P,N,S**
b. Pursue restoration projects on natural watercourses **F, W, S**
c. Preserve existing floodplains and wetlands from being filled or developed **F, N, S**
d. Monitor Water Quantity to measure hydraulic change within watercourse **F**
e. Produce demonstration projects for Low Impact Development. **F, N, S, U**

Goal 4: Create, Restore, and Enhance Recreational Use

This goal seeks to restore and enhance recreational uses through a variety of specific **O**bjectives**.**

Objectives Associated with Goal 4:

a. Promote Local Recreational Opportunities **O**
b. Protect /Expand Parks Trails and River Walk System **O**

Goal 5: Restore and Protect Aquatic Life, Wildlife, and Habitat

Goal 5 aims to restore and protect aquatic life, **W**ildlife and habitat by protecting high quality wetlands and floodplains. Also of interest are areas with **T**hreatened and endangered species and protect against invasive species.

Objectives Associated with Goal 5:

a. Establish vegetative buffer areas adjacent to sensitive areas **W, N, S**
b. Protect key locations of threatened and endangered species and habitat **T**

Goal 6: Conduct Municipal Good Housekeeping Activities

This goal is comprised of the permit requirements on the permitees' good housekeeping activities. Goal 6 aims to directs communities to undertake activities that manage their operations and activities in a manner that considers stormwater runoff and the pollution and flow associated with it. It is also intended to have local jurisdictions "lead by example" in an effort to change how stormwater is managed in the private sector as well.

Objectives Associated with Goal 6:

a. Ensure Maintenance activities, schedules, and inspection procedures for storm water structural controls are appropriate
b. Implement controls for reducing or eliminating the discharges of pollutants from streets, roads, highways, parking lots, and maintenance.
c. Institute procedures for the proper disposal of operation and maintenance waste from the separate storm water drainage system (dredge spoil, accumulated sediments, floatables, and other debris) by street sweeping, catch basin clean out and vacuuming debris.
d. Ensure that flood management projects assess the impacts on the water quality of the receiving waters.
e. Reduce the discharge of pollutants related to application of pesticides, herbicides, and fertilizers applied in the permitees regulated area.

Goal 7: Adopt requirements for Post Construction Controls

This goal is comprised of the permit requirements on how the permitees handle third party or private development within their jurisdiction. It directs permitees to ensure that there are stormwater controls on private land and that there are provisions for their future maintenance.

Objectives Associated with Goal 7:

a. Evaluate and implement site appropriate, cost-effective structural and nonstructural best management practices (BMPs) that prevent or minimize the impacts on water quality.
b. Establish long-term operation and maintenance practices for storm water BMPs on private property.

Goal 8: Plan for long-term sustainability of the Phase II program

This last goal is intended to establish an institutional structure and to seek financial resources necessary to sustain the Phase II program.

Objectives Associated with Goal 8:

a. Secure funding available for implementation.
b. Institutionalize the committee structure.

PUTIING IT ALL TOGETHER

Table 6-2: Concerns, Desires, Goals & Objectives of the Middle Flint River Watershed

Concerns	**Goal_Objective**
Funding	1b, 8a
Education for planning commissions and zoning boards-municipals, government officials	1a & c, 2a, 3a & e, 6a-e, goal 7a-b
Need innovative ideas and solutions implemented locally-pilot project w/education component	3e
Sanitary Connections to storm sewer	IDEP
Education for builders and developers	3a, 7a-b
Stormwater treatment with BMPs must be maintained	3a, 6a-e, 7a-b
Streets directly discharge into river within minutes of rain events	3a, 6b-d
Flooding due to new development	3a, 7a-b
Master Gardeners-Volunteer Work link to projects	2a
Promote education at a publicly planned event	2a
Time of Sale Homeowner Packet	1b
Education	1b, 2a-c, 6a-e, 7a-b
More recreational opportunities	4a-b
Desires	
Provide Demonstration projects for Bio-retention, Low Impact Development	3e
Enhanced recreational opportunity: (Access/opportunities)	4a-b
Fishing/ Hunting: increase access and opportunities	4a-b
Coordinate with Michigan Lakes & Streams Program	5a-c
Enact Wetland Protection Ordinances & require County Road Commission to address impacts from Road projects.	3c
Change Local and County development standards and goals	3a, 7a-b
Protect natural features when developing new sites	3a, 7a-b
Restore/ prevent bank erosion, reestablish stream bank buffers	3b, 5a

SECTION 7 - WATERSHED PLANNING PROCESS

Under County Public Improvement Act (PA 342, 1939) in Section 10, the communities of Genesee County have signed a contract to supply time and money to Developing the Watershed plan and implementation. Phase II communities within the Middle Flint Watershed but outside Genesee have made other arrangements for implementation to satisfy their Certificate of Coverage.

Figure 7-1 Organizational Chart

Besides the watershed workgroup there are several other committees that are responsible for various aspects of the planning and implementation. The Middle Flint River Watershed is one of five watershed within Genesee under this committee. Because of this many of the decisions and timelines are county wide.

The **Advisory Committee** is the decision making body made up of those communities that have signed a contract. This group is responsible for voting on the proposed implementations developed by the subcommittees and workgroups. The members of the Advisory Committee were split into one of three groups to serve on one of the subcommittees. The **Public Education and Participation Subcommittee** is responsible for the development of the Public Education Plan. The **Construction**

Standards and Practices Subcommittee is responsible for establishing a unified review process and adopting a standard for best management practices. The **Monitoring and Mapping Subcommittee** is responsible for the methods that are going to be used to monitor the water for improvement or degradation. Each of these groups have workgroups made up of stakeholders, the public, and the municipal officials.

Public Education Plan
EPA Required Elements

- Encourage Public to report Illicit Discharges or improper disposal into storm sewer
- Education of public on the availability, location and requirements of facilities for disposal or drop off of:
  - Household Hazardous Waste
  - Grass Clippings
  - Leaf Litter
  - Motor Vehicle Fluids
- Public education concerning application and disposal of pesticides and fertilizers
- Public education concerning materials and procedures for residential car washing
- Public education concerning the ultimate discharge point & potential impacts from the separate storm water drainage system serving their place of residence
- Public education for citizen responsibility and stewardship
- Public education concerning management of riparian lands to protect water quality

PUBLIC EDUCATION PLAN

The Public Education Subcommittee is responsible for the complete storm water education plan. The committee works with the Genesee County drain office and U of M's Center for Applied Environmental Research (CAER) Department to draft the Education Plan. Using the Michigan Department of Environmental Quality's (MDEQ) required elements as a starting point the committee has been working on the following items:

- Identify existing programs and organizations that are already educating on required elements
- Identify gaps in existing programs
- Develop baseline survey of
  - General publics knowledge
  - Focus groups knowledge
  - Quantify behaviors that need to be changed
  - Marketing preferences and influences
  - Demographics
- Identify target audiences and the behaviors that need to be changed.
- Draft Media Campaign
- Implementing the Website and resources for the educational campaign

The Public Education Workgroup developed a table of existing education programs that could possibly meet some or all our education requirements. More importantly the table can identify those requirements that are not being met at all. It is the intent of the Advisory Committee and the Public Education Workgroup to partner with existing programs whenever possible.

With the help of U of M CAER the Public Education Workgroup developed a baseline survey; 300+ random residents within Genesee County have responded to the survey by phone. Also the survey was sent in written form to the planning Boards and Elected officials for all Genesee County Communities. This will assist the Public Education workgroup in determining what education is needed for the communities. The results from the public survey are compiled below except the fill in responses. *The final results of the survey will be summarized and made available to the public on the Center for Applied Environmental Research (CAER) website at www.umflint-outreach/caer*

Storm Water Education Planning Project Survey Results

1) In your opinion, whose job is it to maintain the quality of the water in your community?

_____

2) Is your residence connected to a municipal sewer system or does it include a septic system? (check only one)

79.8% Sewer *20.2% Septic* *0.0% Don't Know*

3) Regarding the maintenance of the vehicles you own…how often do you…

	Every time it is done 1	2	3	4	Never 5
Change your own oil?	*15.4%*	*3.5%*	*4.6%*	*3.5%*	*73.5%*
Change your own antifreeze?	*14.8%*	*2.5%*	*4.6%*	*1.8%*	*76.4%*
Change you transmission fluid?	*10.9%*	*2.1%*	*2.5%*	*1.4%*	*83.2%*
Change your own brake fluid?	*12.6%*	*3.9%*	*3.2%*	*0.4%*	*80.0%*

4) How many cars do you have in the household? 42.5% have 2 cars

5) On average, how many times per year do you wash your cars? _____Times per year

0=6.7%, 1-5=17%, 12= 10.2%, 24=8.1%, 52=8.8%

6) Are they washed at ? *57% At a car wash 6.8% At home 36.2% Both*

→6 a) If you answered at home or both

	Always	Usually	Sometimes	Never
How often do you wash your car in the driveway?	*25.4%*	*10.5%*	*57.9%*	*6.1%*
How often do you wash your car in the street?	*0.9%*	*0%*	*4.4%*	*94.7%*
How often do you wash your car on the lawn or other unpaved surface?	*4.4%*	*7%*	*14.9%*	*73.7%*

7) On a scale of 1 to 5, with 1 being *Very likely* and 5 being *not likely at all*, if you learned that your typical car washing behavior is **not** the recommended method for protecting the waterways in your community, how likely would you be to change?

Very Likely 1	2	3	4	Not likely at all 5
68.3%	*11.1%*	*7.6%*	*2.7%*	*10.3%*

8) On a scale of 1 to 5, with 1 being Very Concerned (VC) and 5 being Not Concerned At All *(NCAA)*, how concerned would you be if you saw your neighbor do each of the following…

	VC 1	2	3	4	NCAA 5
Dumping liquid chemical waste to the dirt/lawn?	*87.9%*	*6.8%*	*2%*	*<1%*	*2.6%*
Dumping liquid chemical waste into a storm drain on the street?	*89.3%*	*4.6%*	*3.6%*	*<1%*	*2%*
Dumping liquid chemical waste onto his driveway?	*79.7%*	*11.4%*	*4.2%*	*<1%*	*3.9%*
Dumping used oil from vehicles on his driveway?	*80.1%*	*9.2%*	*5.9%*	*1.6%*	*3.3%*
Dumping used oil from vehicles on his lawn?	*83.7%*	*6.8%*	*3.9%*	*2%*	*3.6%*
Dumping used oil from vehicles into a storm drain?	*90.2%*	*4.9%*	*1.3%*	*1%*	*2.6%*
Pushing grass clippings into a pile at the curb?	*25.5%*	*7.5%*	*19.3%*	*8.2%*	*39.7%*
Raking leaves into a pile on the street?	*24.3%*	*6.2%*	*17.4%*	*9.5%*	*42.6%*
Raking leaves into a ditch?	*33.1%*	*11.9%*	*12.3%*	*5.6%*	*37.1%*
Burn leaves	*47.9%*	*8.9%*	*13.8%*	*3%*	*26.6%*
Dumping travel trailer waste into drain sewers?	*86.8%*	*4%*	*3.3%*	*1.3%*	*4.6%*
Dumping travel trailer waste onto a roadside?	*85.4%*	*5.3%*	*2.6%*	*2%*	*4.6%*
Dumping household cleaning products into a storm drain in the street	*84.4%*	*6.3%*	*3.6%*	*1.3%*	*43%*
Dumping household cleaning products into a sink or toilet	*43.9%*	*6%*	*15.6%*	*9%*	*25.6%*
Dumping household cleaning products onto the dirt/grass.	*62.8%*	*9.6%*	*11%*	*6.3%*	*10.3%*
Disposing of animal manure by burying	*24.8%*	*6.7%*	*13.4%*	*7.7%*	*47.3%*
Disposing of animal manure by throwing in ditch	*49.5%*	*11.5%*	*11.2%*	*4.7%*	*23.1%*
Disposing of animal manure by throwing in garbage	*24.7%*	*6.8%*	*10.8%*	*8.1%*	*49.5%*
Don't dispose of animal waste (leave where it falls)	*56.1%*	*10.8%*	*9.8%*	*7.1%*	*16.2%*

9) Which of the following possible methods of disposal is recommended for each of the following materials?
   Unused garden pesticides? _____
   Unused garden fertilizers? _____
   Antifreeze? _____
   Used engine oil? _____
   Animal manure/pet waste? _____
   Latex paint? _____
   Oil based paint? _____
   Household cleaning products? _____

10) If you discovered that your current method of disposal of these products was different than what is recommended, which of the following is most accurate? (check one)
    a) *35.1%* I would comply with the recommendations, regardless of cost (e.g. disposal fees)
    b) *49.8%* I would comply with the recommendations if there were little or no cost associated
    c) *12.7%* I would comply with the recommendations only if there was no cost associated
    d) *2.4%* I would not comply with the recommendations.

11) If you discovered that your current method of disposal of these products was different that what is recommended, which of the following is most accurate? (check one)
    a) *52.2%* I would comply with the recommendations regardless of inconvenience
    b) *36.1%* I would comply with the recommendations as long as there is little inconvenience
    c) *10.0%* I would comply with the recommendations only if it is convenient
    d) *1.7%* I would not comply with the recommendations.

12) On a scale of 1 to 5, 1=*Very Convenient* and 5=*Not convenient at all,* how convenient do you think each of the following would be for you to use as a drop off site for your hazardous household waste?

	VC 1	2	3	4	NC 5
Local township/city hall	*66%*	*10.3%*	*9%*	*1.7%*	*12.4%*
Local water treatment plant	*34.3%*	*8.1%*	*12.7%*	*7.4%*	*37.5%*
County extension office (MSUE)	*21.0%*	*9.8%*	*12%*	*9.4%*	*47.8%*
Local Business	*70.7%*	*13.4%*	*3.8%*	*0.7%*	*11.4%*
Local University	*42.8%*	*13.1%*	*16.6%*	*5.9%*	*21.7%*
County Heath Department	*38.9%*	*10.9%*	*15.8%*	*6.7%*	*27.7%*
Local fire station	*78.3%*	*12.1%*	*1.7%*	*1%*	*6.9%*

a. If you have a question about how to dispose of a product you suspect is hazardous, how likely are you to find out the recommended method of disposal? (circle one)

Very likely 1	2	3	4	Not likely at all 5
67%	11.7%	8.9%	4.1 %	8.2%

13) Who would you contact to find out a recommended method of disposal for a product?

_____

14) On a scale of 1 to 5, 1=*Very Convenient* and 5=*Not convenient at all,* how convenient do you think each of the following would be as a place or method to find out this information?

	VC 1	2	3	4	NCAA 5
Internet	*58.3%*	*7.6%*	*6.9%*	*1%*	*26.2%*
Telephone Hotline	*77.2%*	*11%*	*3.4%*	*1.4%*	*6.9%*
Educational flyers/mailers	*49.1%*	*15.7%*	*17.8%*	*6.3%*	*11.1%*
Radio	*43.3%*	*14.9%*	*16.3%*	*7.6%*	*18%*
Local Paper	*47.1%*	*15.6%*	*14.9%*	*4.5%*	*18%*
Place of purchase	*62.1%*	*11.9%*	*9.8%*	*5.3%*	*10.9%*
As part of local news broadcasting	*49.8%*	*14.5%*	*19.7%*	*6.2%*	*9.7%*
Product label	*79.6%*	*9%*	*5.5%*	*0%*	*5.9%*
Community/school newsletter	*41.9%*	*16.3%*	*13.5%*	*10%*	*18.3%*
Billboard	*39.1%*	*13.5%*	*17%*	*10.4%*	*20.1%*

15) Are fertilizers, pesticides, herbicides used on your home's landscape?

46.5% yes *44.1%* no *8.3%* Don't know *1.0%* N/A

If yes

→16 a) How many times per year do you estimate these products are applied to your yard? _____times per year

0=1.5% *1=19.8%* *2=32.1%* *3=19.1%* *4=10.7%* *>4=16.8%*

→16 b) Who applies these products?

34.8 % you *21.2%* A member of your household *43.9%* A lawn care professional

→16 c) How do you determine things like **what** needs to be applied, when the products should be applied and how much to apply to your yard?

_____

16) Does your community have an ordinance regarding fertilizer application?

7.7% yes *92.3%* no *0%* Don't Know

17) What two bodies of water are located closest to your home?
Approximately how far away is each of these from your home?

Name of body of water:	Distance from home:
1) _____	_____
2) _____	_____

18) On a scale of 1 to 5, with 1 being *A great deal* and 5 being *None at all ,* in your opinion, how much responsibility do each of the following have in maintaining a community's water quality?

	A Great Deal 1	2	3	4	None 5
Area Businesses	*69.3%*	*12.0%*	*8.1%*	*6.0%*	*4.6%*
Residents whose homes are located directly on a body of water	*80.9%*	*7.4%*	*4.2%*	*3.9%*	*3.5%*
Residents who live in a home located within 1Mile of a body of water	*59.2%*	*21.3%*	*11.3%*	*4.3%*	*3.9%*
Residents who live in a home located more than 1Mile from a body of water	*44.3%*	*16.8%*	*22.1%*	*7.5%*	*9.3%*
Elected officials in a community	*82%*	*9.2%*	*5.6%*	*1.1%*	*2.1%*
The Environmental Protection Agency (EPA)	*89.8%*	*4.6%*	*1.8%*	*1.1%*	*2.8%*
The Department of Environmental Quality (DEQ)	*89.3%*	*4.3%*	*2.9%*	*.7%*	*2.9%*
Local law enforcement	*51.4%*	*16.5%*	*18%*	*5.6%*	*8.5%*
The Department of Natural Resources (DNR)	*82.1%*	*10%*	*3.2%*	*2.1%*	*2.5%*
Local Conservation/Environmental groups	*75.6%*	*11.8%*	*7.2%*	*2.5%*	*2.9%*
County Drain Commissioner	*89.2%*	*6.8%*	*2.2%*	*0%*	*1.8%*
County Health Department	*84.4%*	*7.8%*	*4.3%*	*1.4%*	*2.1%*

20) On a scale of 1 to 5, 1 being *Very Confident* and 5 being *Not Confident At All*, how confident are you that you understand the concept of a "watershed"? Very Confident Not Confident at all

1	2	3	4	5
18.9%	*11.1%*	*20.7%*	*7.8%*	*41.5%*

21) Is your residence located in a watershed? *12.0%* yes *23.9%* no *64.1%*Don't know

If yes,

21a)→Which one? _____

21b)→How do you know this? _____

22) If hazardous chemicals are dumped into the street, where does that material ultimately end up?

_____

23) Can you think of any other places they may end up?_____

24) On a scale of 1 to 5, with 1 being *Very Much* and 5 being *Not at all*, please indicate how much you would trust information about stormwater pollution from each of the following sources:

	Very Much 1	2	3	4	Not at all 5
Michigan Department of Environmental Quality	*67.4%*	*13.6%*	*13.6%*	*0.7%*	*4.8%*
Drain Commissioner's Office	*48.7%*	*18.6%*	*22.6%*	*4.3%*	*5.7%*
UM-Flint	*60.5%*	*18.1%*	*13.4%*	*2.9%*	*5.1%*
Local Government	*27.2%*	*16.8%*	*31.9%*	*10%*	*14%*
Conservation District	*46.8%*	*26.8%*	*16.4%*	*2.2%*	*7.8%*
Private Companies	*8.9%*	*8.9%*	*27.5%*	*21.8%*	*32.9%*
County Extension Service	*40.6%*	*23.0%*	*20.3%*	*6.5%*	*9.6%*
Flint River Watershed Coalition	*44.5%*	*19.1%*	*17.2%*	*6.6%*	*12.5%*
County Health Department	*58.6%*	*20.5%*	*12.6%*	*4.3%*	*4.0%*

25) In your opinion, which of the following age groups MOST needs to learn more about protecting local waterways?

37.4% Elementary age children (0 to 11)
32.4% Middle and high school age children (11 to 18)
18.1% Young adults 19 – 25
10.3% Adults 26-55
1.8% Adults > 55

26) Have you spent leisure time on a water body in Genesee County in the past 12 months?

27.1% yes *72.9%* no *0%* Don't Know

→***If yes,*** What water bodies? _____

	Yes	No
Do you canoe or kayak in Genesee County?	*15.6%*	*84.4%*
Do you fish in Genesee County?	*48.1%*	*51.9%*
Do you boat, water ski, or use personal watercraft in Genesee County?	*54.5%*	*45.5%*
Do you hike along shorelines or stream banks in Genesee County?	*48.1%*	*51.9%*
Do you swim in Genesee County lakes or streams?	*48.1%*	*51.9%*

27) Regarding the quality of the water in the lakes, rivers, and streams in your community…is it…(please select one)
2.9% Getting much better
22.1% Getting somewhat better
37.3 Staying the same
25.0% Getting somewhat worse
12.7% Getting much worse
0.0% *Don't know*

28) Which ONE of the following do you think contributes the **most** pollution to lakes, rivers and streams in the community where you live?
9.4% Wastewater treatment plant discharges
36.7% Factories / industrial discharges
17.6% Stormwater (rainwater) runoff into storm drains and roadside ditches
30.3% Sewage overflows
6.0% Dirt eroded from stream banks and surrounding areas

29) Where does stormwater (rainwater) go after it enters a storm drain or roadside ditch in your community? _____

30) On a scale of 1 to 5, with 1 being Strongly Agree and 5 being Strongly Disagree, please indicate your level of agreement with the following statement:

	Strongly Agree 1	2	3	4	Strongly Disagree 5
"The quality of local streams where I live affects Saginaw Bay."	*47.0%*	*11.6%*	*15.3%*	*6.0%*	*20.1%*
"The quality of local streams where I live affects the Great Lakes."	*55.8%*	*8.8%*	*14.2%*	*6.5%*	*14.6%*

31) Is your residence located directly on a…

	Yes	No	Don't Know
Lake?	*1.4%*	*98.6%*	*0*
Wetland?	*4.6%*	*95.4%*	*0*
Swamp?	*3.9%*	*96.1%*	*0*
Marsh?	*1.4%*	*98.6%*	*0*
River?	*2.5%*	*97.5%*	*0*
Stream?	*5.0%*	*95.0%*	*0*
Road Ditch?	*27.0%*	*73.0%*	*0*

32) How many people live in your household? _____# of people
1=*17.4%* 2=*31.7%* 3=*20.3%* 4=*14.6%* 5=*8.5%* >5=*7.5%*

33) Are there any children under the age of 18 living in your household? *45.2%* yes *54.8%* no
→***If yes,*** What are their ages? _____

34) What is the highest level of education you have completed? (check one)
2.2% Less than high school
*30.1%*High School
*35.8%*Some college
*21.9%*Undergraduate degree
2.2% Some Graduate courses
7.9% Graduate degree

35) Do you own or rent your home? *74.6%* own *25.4%* rent

36) Do you live in a single-family residence or a multiple family dwelling (e.g. an apartment building)? (check one) *87.5%* single family *12.5%* multiple family

Currently the Public Education Committee is in the implementation phase. Target audiences are identified for the required elements. The survey results provide a baseline for knowledge about the watershed and also help direct the development of the media campaign. In chapter 8 there are several action items that came out of the public/ stakeholder goals and concerns. These action items will be integrated into the overall media campaign. The media campaign is being developed on a countywide basis and will be implemented on behalf of those Phase II Communities that have signed an Act 342 contract. Details of programs and implementation is in the annual report submitted to the MDEQ.

MONITORING AND MAPPING

The Monitoring and Mapping Committee evaluated a list of possible monitoring activities that can be used. Example activities that were discussed include:

- Aesthetic monitoring via canoe trip
- Biomonitoring
- Benthic monitoring
- Frog and toad monitoring (MDNR)
- Stream crossing watershed survey with photograph
- Water quality monitoring
- Photographic survey
- Meta/toxin/hydrocarbon constituents monitoring
- Observation by walking the streams

After reviewing their various options with their costs, advantages and disadvantages the Monitoring and Mapping Committee chose the following 5 options to monitor the water quality within the Middle Flint River Watershed.

<u>Benthic Macroinvertebrate Monitoring</u>

- Since the Flint River Watershed Coalition (FRWC) is already doing this at approximately 30 sites (some of them outside the areas we're looking at) we should look at promoting, enhancing and expanding the current activity through:
  -Advertising
  -Purchasing equipment
  -Providing volunteers
  -Providing a place to summarize information
  -Expanding to more parts of the watershed
  -Providing funding for administrative costs (current coordinator is a volunteer)
  -Updating volunteer training
  -Adding sampling sites
  -Correlate all information (from all 5 monitoring activities) onto one centralized mapping site
- Have a joint meeting between the FRWC board members and members of this committee to assess the limitations of the current program and see where we could improve the quality of the program. This falls in line with the philosophy of partnering with existing community programs to comply with the NPDES Phase II Permit.
- Get public involved in collecting data.

- Brent Nickola explained how benthic macroinvertebrates are good indicators of the quality of water in a stream.
- Set the timeframe of Spring 2005 to determine what enhancements are most needed by FRWC and how they may be implemented.
- Deciding what percentage of the available funds should be allocated for this.

Basic Water Quality Monitoring

- Will test for Dissolved Oxygen, Fecal Coliform, Biochemical oxygen demand (BOD), Temperature, total Phosphorus, Nitrate, total solids, turbidity and pH
- "Snapshot" of the water quality
- Great for public involvement
  -School classes
  -Scouting groups
  -Senior citizens
  -Project GREEN (Global Rivers Environmental Education Network)
- Use same sights as for macroinvertebrate testing

Frog and Toad Survey

- DNR (Department of Natural Resources) program already in place
- Enhance program or fill gaps
- Use available data

Stream Crossing Watershed Survey with Photographs

- DEQ (Department of Environmental Quality) has procedure that they recommend
- Can be built into already existing municipal efforts
  -Mostly GCRC and GCDC

- 1,100 crossings in Genesee County
  -DEQ suggests 30% of crossings
- Drain office will handle the data base
- Results must be measurable
- Includes IDEP (Illicit Discharge Elimination Program)

Hot Spot Water Quality Monitoring

- Done by professionals

DESIGN REVIEW PROCESS & BMP'S

Standards and Practices Subcommittee is responsible for establishing a unified review process and adopting a standard for best management practices. This group did much of their work in 2003. The below proposed review process was developed to allow environmental concerns to be addressed prior to the design phase. Currently many environmental concerns are treated as an afterthought if they are even considered in the design.

PROPOSED FUNCTIONAL FLOW OF PROJECT REVIEW FOR STORMWATER COMPLIANCE

INTRODUCTION

A county-wide ordinance will be developed to specify the general guidelines for stormwater management in new developments and significant changes. The following document outlines the major events and their sequence constituting the review process for a construction project that requires a permit.

STEP 1: Pre Development
For each project, developers, their designated design representatives (engineers or architects), representatives from the County Road Commission, Health Department, municipal officials (zoning, planner, engineer, DPW, building official), and Drain Commissioner's office (Water and Waste Services and Surface Water) will attend a pre-planning conference. The purpose will be to provide design standards, development guidelines, and to identify the type of information developers and their representatives must furnish to comply with the new development procedures. Communication between the project designer and developer, as well as the relevant local officials and developer are two key components of this framework.

Note: different scheduling scenarios will be required for each development type (e.g., PUD, plat, mobile home park, site plans). Each development type has been provided a specific flow chart.

Inputs
- Location map
- Development description I Verbal with supporting maps (conceptual)
- 2 ft contour map
- Federal Wetland map -NWI (National Wetland Inventory)
- Drainage district ID
- Aerials - Genesee County Planning Commission - 1" = 200' w/ ¼ mile buffer around site
- Zoning Map
- Soils Map (from County soil survey)
- Floodplain maps - FEMA & Available plats
- Traffic & utility information, including: sanitary, storm, water supply, gas, electric, road width, existing capacity

Outputs
Design Standards & Specifications, including:
- BMP Specifications
- Construction Standards and Methods
- Current fee & meeting schedules
- Permit Applications

STEP 2: Conceptual Site Plan
Review of the conceptual site plan for approval at County level by the appropriate personnel in Water & Waste Services, soil erosion, surface water, and the Road Commission and Health Department. Comments are returned to the owner/client and designer.

STEP 3: Coordination Review
- Designer
- Owner/Client
- Reviewers from agencies

NOTE: Review of BMP compliance will occur at the same time as the review of the construction prints.

STEP 4: Municipal Review
Guided by Zoning and general ordinances (design standards)
Local planning commission members will be educated about the new construction standards, and will be given a checklist for reference during site plan review.

STEP 5: Site Plan Approval
- Submit construction plans and documents for approval
- Obtain Permits: Federal, State, and County
- Obtain Building Permit from municipality

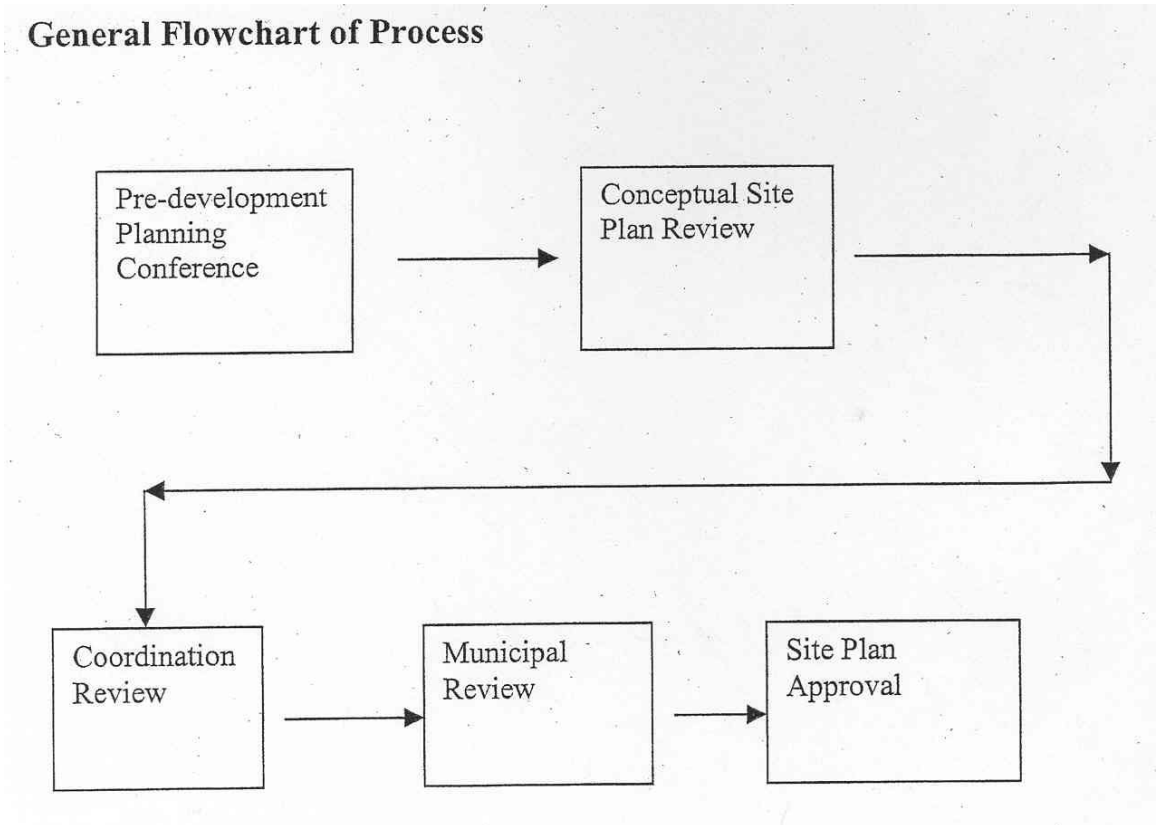


Figure 7-2 Flowchart for new development

Another responsibility of the BMP committee was to review available BMP's for both new construction and good housekeeping of existing sites. Currently once a private storm system is installed there is no mechanism to ensure that it is properly maintained.

The BMP sub-committee has adopted the Soil Erosion & Sedimentation Control Guidebook from the Michigan Department of Management and Budget as the basis for the BMP requirements. Below are amendments to individual BMP's to bring those best management practices into line with existing County requirements.

- E4: If the back slope of the Terrace is to be used as an access point the minimum width for the back slope will be 15' not 6'.
- E7: Temporary seeding should be applied to any areas that have earth changes that have been initiated but will not be completed within 2 weeks or disturbed areas on a site that have been cleared but are not worked for more than a week.
- E8: If preferable vegetation is proposed such as indigenous planting will be reviewed & approved on an individual site basis.
- E12: Filter fabric is required for riprap areas. If riprap smaller than that specified in the Guidebook is to be used then the riprap must be mortared together in place.
- E14: In addition to the Energy Dissipater choices provided, a spillway or drop structure may be used as an acceptable energy dissipater either in combination with the other methods outlined in the Guidebook or as a stand-alone measure.
- E15 & E16: Slope drains will be designed to have a non-erosive velocity at the discharge point.
- ES31: The distance between check dams will be such that the bottom of the upstream check dam will be at the same elevation as the top of the downstream check dam as Referenced in CD-exhibit 1 of the MDEQ guidebook for BMP's.
- ES32: the upstream sump for the Stone filter berm will be sized to accommodate the sediment for the contributing area by using The Universal Soil Loss Equation in Developing Areas. Reference Appendix 2D of the MDEQ guidebook for BMP's.
- ES35: For dewatering, an acceptable alternative to the gravel inlet protection could be a floated inlet with a filter bag.
- S55: The minimum requirements considered acceptable for permanent and temporary sediment basin design include:
    - Capacity of basin must be designed to be equal or greater to the volume of the sediment expected to be trapped at the site plus the volume of the 10-year rain event. The Oakland County Surface Area Method or The MDEQ BMP Guidebook: SB-5 Basin Capacity can be modified to meet this requirement. Other methods may be submitted with supporting documentation for consideration. Permanent basins will be designed to be dry. Temporary basins will be filled and stabilized once the construction site is stabilized, and prior to release of soil erosion permit.
- S56: The Sediment Trap length to width ratio shall be 5:1 not 2:1.
- S57: Grass Buffer/Filter Strip shall be a minimum of 30' from top of bank or edge of critical resource area.

Below are additional BMP Guidelines that are not addressed in the Soil Erosion & Sedimentation Control Guidebook.

- Stand Pipe: Should be designed to filter sediment. This structure should not to be designed as the outlet restrictor. Rim should be set at the elevation of the 10-year storage. The overflow cover will have to be designed to pass the design flow.
- Excavated drop inlet sediment trap The MDEQ BMP Guidebook: Fil-6. An acceptable alternative to weep holes is edge drain set within a sand or stone bedding.
- Equipment Maintenance & Storage The MDEQ BMP Guidebook: EMS
- Stockpile Location: Must be set away from any critical areas or steep grades. Appropriate Filter and or Seeding BMP's to be applied.
- Vortex Separator: To separate debris from discharge.
- Oil & Grit Separator: This BMP is not to be used as a sediment basin during construction. Specific systems with supporting documentation may be submitted for approval. General Criteria:
    - Planning considerations: Should serve impervious areas of less than 1 acre or per manufacturers recommendation.
    - Design: supporting documentation will need to show method & capacity of suspended solids removed and buoyant contaminants removed. Low flow capacity of system and method used to bypass the high flow.
- Outlet: From the MDEQ BMP Guidebook; There should be no overfall from the end of the pipe/outlet to the outlet structure (i.e. the pipe/outlet should not be suspended above the outlet structure)
- Detention Basins: The MDEQ BMP Guidebook: EDB
- Underground detention basins: Specific systems with supporting documentation may be submitted for approval. General Criteria
    - Cleanout is needed for maintenance.
- Infiltration Basins with underdrain: The MDEQ BMP Guidebook: IB.
- Construction Access Roads:
- Street Sweeping:
- Parking Lot Storage in Recessed Landscape

A Maintenance Schedule for the following permanent BMP's should be developed and included in the site plan or construction drawings to implement once the construction is complete.

- ES31Check Dams: Should be checked annually. Accumulated upflow sediment removed and any noted problems repaired.
- ES32 Stone Filter Berm: Should be checked annually. Accumulated upflow sediment removed and any noted problems repaired.
- ES37 Diversion Ditch: Sediment removed and any noted problems repaired.
- ES39 Streambank biostabilization: Should be checked annually. Check for additional eroding or deteriorating of the anchors or trees. Replace trees or anchors as needed.
- ES41 Wattles: Should be checked annually. Periodic pruning and replanting of live stake may be required.
- S55 Sediment Basin: Annual inspection. Keep outlet clear of debris and excess vegetation. Remove sediment when the design volume exceeds 50% of the sediment expected to be trapped.

- S57 Buffer Strip: Should be checked annually. Clip unwanted and invasive vegetation.
- Stand Pipe: Annual inspection. Keep outlet clear of debris and excess vegetation and any noted problems repaired.
- Excavated drop inlet sediment trap Annual inspection. Keep outlet clear of debris and excess vegetation and any noted problems repaired.
- Vortex Separator: Clean out bi-annually or as recommended by manufacturer.
- Oil & Grit Separator: Clean out bi-annually or as recommended by manufacturer.
- Detention basin: Annual inspection. Keep outlet clear of debris and excess vegetation and any noted problems repaired. Proper disposal of contaminants
- Underground detention basins: Annual inspection. Jet and vacuum any excess debris or sediment and any noted problems repaired.
- Catchbasins: Annual inspection. Keep outlet clear of debris and excess vegetation. Clean sumps and any noted problems repaired.

STATE OF MICHIGAN

DMB Infrastructure Services, Design and Construction Division
Soil Erosion and Sedimentation Control Program

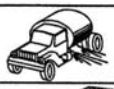
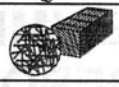
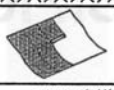
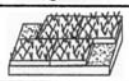
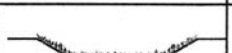
SOIL EROSION AND SEDIMENTATION CONTROL GUIDEBOOK

DETAILS AND SPECIFICATIONS

February 2002

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

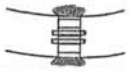
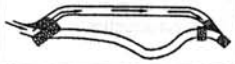
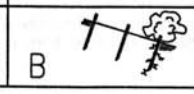
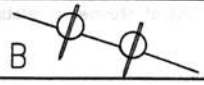
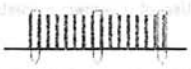
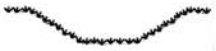
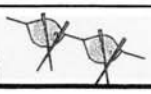
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
EROSION CONTROLS			
E1	SELECTIVE GRADING AND SHAPING		To reduce steep slopes and erosive velocities.
E2	GRUBBING OMITTED		For use on steep slopes to prevent rilling, gullying, and reduce sheet flow velocity or where clear vision corridors are necessary.
E3	SLOPE ROUGHENING AND SCARIFICATION		Where created grades cause increased erosive velocites. Promotes infiltration and reduces runoff velocity.
E4	TERRACES		On relatively long slopes up to 8% grades with fairly stable soils.
E5	DUST CONTROL		For use on construction sites, unpaved roads, etc. to reduce dust and sedimentation from wind and construction activities.
E6	MULCH		For use in areas subject to erosive surface flows or severe wind or on newly seeded areas.
E7	TEMPORARY SEEDING		Stabilization method utilized on construction sites where earth change has been initiated but not completed within a 2 week period.
E8	PERMANENT SEEDING		Stabilization method utilized on sites where earth change has been completed (final grading attained).
E9	MULCH BLANKETS		On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
E10	SODDING		On areas and slopes where immediate stabilization is required.
E11	VEGETATED CHANNELS		For use in created stormwater channels. Vegetation is used to slow water velocity and reduce erosion within the channel.
E12	RIPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
E13	GABION WALLS		On newly created or denuded stream banks to reduce velocity until permanent stabilization is achieved or on existing banks to retard erosive velocities.
E14	ENERGY DISSIPATOR		Where the energy transmitted from a concentrated flow of surface runoff is sufficient to erode receiving area or watercourse.
E15	TEMPORARY SLOPE DRAIN		Where surface runoff temporarily accumulates or sheet flows over the top of a slope and must be conveyed down a slope in order to prevent erosion.
E16	SLOPE DRAIN		Where concentrated flow of surface runoff must be permanently conveyed down a slope in order to prevent erosion.

B = BIOENGINEERING

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

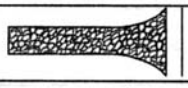
S–E–S–C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E17	CELLULAR CONFINEMENT SYSTEMS		Used on steep slopes and high velocity channels.
E18	PLASTIC SHEETS		Used on exposed slopes, seeded areas, new ditch bottoms, and areas subject to surface runoff and erosion. Used as a liner in temporary channels and to stabilize stockpiles.
E19	TEMPORARY DRAINAGEWAY/ STREAM CROSSING		Use on construction sites where stream/drainageway crossings are required.
E20	TEMPORARY BYPASS CHANNEL		Use within existing stream corridors when existing flow cannot be interrupted, and at culvert and bridge repair sites
E21	LIVE STAKING	 B	In areas requiring protection of slopes against surface erosion and shallow mass wasting.
	EROSION / SEDIMENT CONTROLS		
ES31	CHECK DAM		Used to reduce surface flow velocities within constructed and existing flow corridors.
ES32	STONE FILTER BERM		Use primarily in areas where sheet or rill flow occurs and to accommodate dewatering flow.
ES33	FILTER ROLLS	 B	In areas requiring immediate protection of slopes against surface erosion and gully formation and for perimeter sediment control.
ES34	SAND FENCE		For use in areas susceptible to wind erosion, especially where the ground has not yet been stabilized by other means.
ES35	DEWATERING		Use where construction activities are limited by the presence of water and dry work is required.
ES36	DIVERSION DIKE/BERM		Within existing flow corridors to address or prevent erosion and sedimentation, or on disturbed or unstable slopes subject to erosive surface water velocities.
ES37	DIVERSION DITCH		In conjunction with a diversion dike, or where diversion of upslope runoff is necessary to prevent damage to unstabilized or disturbed construction areas.
ES38	COFFERDAM/SHEET PILINGS		Constructed along or within water corridor or waterbody to provide dry construction area.
ES39	STREAMBANK BIOSTABILIZATION	 B	For use along banks where stream and riparian zones may have difficulty recovering from the long-term effects of erosion.
ES40	POLYMERS		To minimize soil erosion and reduce sedimentation in water bodies by increasing soil particle size.
ES41	WATTLES	 B	In areas requiring protection of slopes against surface erosion and gully formation.

B = BIOENGINEERING

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S–E–S–C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
	SEDIMENT CONTROLS		
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S52	CATCH BASIN SEDIMENT GUARD		Use in or at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS		Used at every point where construction traffic enters or leaves a construction site.
S54	TIRE WASH		For use on construction sites where vehicular traffic requires sediment removed from its tires in highly erosive areas.
S55	SEDIMENT BASIN		At the outlet of disturbed areas and at the location of a permanent detention basin.
S56	SEDIMENT TRAP		In small drainage areas, along construction site perimeters, and above check dams or drain inlets.
S57	VEGETATED BUFFER/FILTER STRIP		Use along shorelines, waterways, or other sensitive areas. Slows velocity, reduces sediment load, and reduces erosion in areas of sheet flow.
S58	INLET PROTECTION FABRIC DROP		Use at stormwater inlets, especially at construction sites.
S59	INLET PROTECTION FABRIC FENCE		Use at stormwater inlets, especially at construction sites.
S60	INLET PROTECTION STONE		Use around urban stormwater inlets.

B = BIOENGINEERING