Carroll County Maryland

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM
DISCHARGE PERMIT

ANNUAL REPORT
JULY 15, 2013

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Carroll County
NPDES ANNUAL REPORT

July 15, 2013

CARROLL COUNTY, MARYLAND
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)
PERMIT

Preface

This document summarizes Carroll County, Maryland's compliance efforts taken in response to conditions attached to the National Pollutant Discharge Elimination System Permit No. 99-DP-3319 (MD0068331) issued for the County's municipal storm sewer systems. Permit No. 99-DP-3319 is the third generation of the permit required under Section 1342 (p) of the Clean Water Act (ref.: USC, Title 33, Ch. 26, Sub. Ch. IV). It is in response to the specific requirements in 40CRF122.42(c). This report covers activities occurring during the permit year from June 30, 2012 through July 1, 2013.

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Part I. Identification

A. Current Permit Number

F. 99-DP-3319 (MD0068331)

B. Permit Area

1. Phase I Compliance (unincorporated areas of Carroll County)

The above-referenced permit covers stormwater discharges from the municipal separate storm sewer systems (MS4) located in the unincorporated areas of Carroll County, Maryland. It excludes areas within the County outside the jurisdiction of County government, i.e., land area within the limits of Carroll County's incorporated municipalities as well as those owned by the State Highway Administration (SHA) and the Federal government. All references in the report to municipalities refer to those located within Carroll County.

2. Phase II Compliance (incorporated areas within Carroll County)

Discharges from systems located within the eight incorporated Carroll County municipalities are covered under General Permit No. 03-IM-5500 (currently pending reissue). Each of the municipalities in Carroll County has filed the ***Notice of Intent*** to comply with this permit. Carroll County government works cooperatively with the municipalities to assist them with tasks necessary to comply with that general permit. Sections of this annual report reflect the progress made by each of the municipalities. The General Permit was effective on April 14, 2003 and expired on April 14, 2008. Per Maryland Department of the Environment (MDE), the current General Permit will be in force until a replacement is issued.

C. Effective date:

July 14, 2005

D. Expiration Date:

July 14, 2010

The current National Pollutant Discharge Elimination System (NPDES) MS4 Permit for Carroll County will be in force until a replacement is issued by the MDE. Carroll County received a draft version of the next-generation NPDES MS4 permit on November 17, 2010 from MDE for comment. Upon staff review, interaction with MDE, and input from the Carroll County Board of Commissioners, a detailed response letter was submitted to MDE on February 18, 2011.

The County received a second draft permit on October 14, 2011. Staff from the County and MDE met on November 30, 2011 to discuss various aspects of the October 14, 2011 draft. A subsequent third draft permit was received by the County, via e-mail, on January 13, 2012. The County met with MDE staff to discuss the third draft on July 24, 2012. The draft permit is currently pending tentative determination by MDE

Part II. Definitions

Terms used in the Carroll County permit are defined in relevant chapters of the Code of Federal Regulations (CFR) or the Code of Maryland Regulations (COMAR). Terms not defined in CFR or COMAR shall have the meanings attributed by common use, unless the context in which they are used clearly requires a different meaning.

Part III. Standard Permit Conditions

A. Permit Administration

The legal responsibility for maintaining the conditions included in this permit lies with the Carroll County Board of Commissioners. The Commissioners have delegated responsibility to the Carroll County Department of Land Use, Planning, and Development (LUPD) to provide administrative and technical implementation of the NPDES MS4 permit. The Deputy Director, of the LUPD, provides direct administration of the permit. An organizational chart for LUPD can be found in Appendix A.

LUPD has one dedicated position, NPDES Compliance Specialist, assigned to the NPDES MS4 program. The NPDES Compliance Specialist is jointly funded by Carroll County and the eight incorporated municipalities. Under the direction of the Deputy Director, the NPDES Compliance Specialist implements the NPDES MS4 program requirements. Key responsibilities for this position include:

- Liaison to the Maryland Department of the Environment;
- Coordinate, manage and implement Phase I and II permit regulation requirements in accordance with Federal, state and local laws;
- Coordinate with County/municipal personnel, other government officials, and citizens regarding NPDES compliance issues;
- Coordinate illicit-discharge inspections and routine surveys with County/municipal personnel to discover and eliminate pollutant sources;
- Design, coordinate, and maintain Geographic Information System (GIS) and Global Positioning System (GPS) applications for NPDES MS4 compliance; and
- Coordinate development of compliance education, training, and outreach programs.

The County/municipal working relationship effectively eliminates the political boundaries as a watershed planning consideration. This working relationship has made compliance with the NPDES MS4 requirements more purposeful and effective.

The Bureau of Resource Management (BRM) provides vital NPDES MS4 operational and technical support, including fieldwork, GIS mapping, monitoring, inspections, compliance, watershed management and various other responsibilities. The BRM holds the primary responsibility for external environmental compliance through the administration of Carroll County Government land development related environmental codes, ordinances and standards. These include stormwater management, floodplain management, forest conservation, landscape

enhancement, water resource management, grading, erosion and sediment control, and storm sewer systems management.

Individual compliance with various permits lies with County agencies or municipalities that oversee the facilities. Coordination with these agencies and LUPD regarding NPDES compliance remains a priority. In addition, the County continues to work jointly with the municipalities to ensure ongoing implementation of compliance responsibilities. Any future changes in the organization of the administration of this permit will be reported to MDE.

B. Legal Authority

Continuation of Established Authority – The legal authority established under the first generation of this permit remains in place. Chapter 105 of the Carroll County Code, Environmental Management of Storm Sewer Systems, provides Carroll County and the municipalities with a practical and effective tool that establishes effective standards to protect the integrity of the storm sewer systems in the County.

C. Source Identification

The sources of pollutants in stormwater and the systems which convey the runoff are to be identified. Carroll County maintains staffing dedicated to NPDES MS4 compliance efforts concentrating on those that affect storm drain system delineation and facility compliance. GIS and GPS are employed to assist in mapping and data analysis. These tools are used to identify drainage systems exhibiting stormwater quality deficiencies and to complete detailed watershed assessments so effective restoration plans may be developed when necessary.

1. Storm Drain System Mapping & Database (County and Municipalities)

Initial or baseline storm drain system mapping for the unincorporated and incorporated areas is complete. The completion dates for baseline storm drain system mapping related to each of the eight municipalities are shown in Table 1. Mapping updates continue for both County and municipal storm drain systems using the County's GIS. Mapping for both the County and municipalities utilize detailed as-built surveys of newly submitted storm sewer systems in digital format as required through the development process. Other sources for data capture include; archives, field data collection, and inspections performed by staff allocated to support and advance the system delineation effort.

Storm drain as-built plan data continues to be input into the GIS system. With additional plan input, field mapping, verification efforts and staff allocations, the initial baseline mapping for Westminster was completed June 2013.

Table 1
Baseline Storm Drain System Mapping Status
Phase II NPDES MS4 Jurisdictions

Municipality	Status Of Baseline Storm Drain System Mapping	Periodic Updates & Verification
Hampstead	Complete	7/9/13
Manchester	Complete	7/10/13
Mt. Airy	Complete	1/21/13
New Windsor	Complete	7/3/13
Sykesville	Complete	7/12/13
Taneytown	Complete	6/25/13
Union Bridge	Complete	7/3/13
Westminster	Complete	6/17/13

The Carroll County MS4 Geo-database includes numerous layers, such as stormwater facilities, storm drain pipes, stormwater structures, drainage areas, etc. The stormwater structures sub-layers include inlets, manholes, risers, end sections and outfalls. The NPDES outfalls (used for field screening) for the County, are maintained in the Stormwater Structures layer, which currently contains 1,634 outfalls of which 283 are major outfalls that may be potentially screened for illicit discharges.

Major outfalls are defined in industrial land use areas as pipes 12” or greater or from a single conveyance other than a pipe draining 2 acres or more discharging to waters of the U.S. In non-industrial land use areas pipes 36” or greater or from a single conveyance other than a pipe draining 50 acres or more discharging to the Waters of the U.S. are considered major outfalls.

A comprehensive review involving classification and re-numbering of each outfall was performed during this permit year. Storm drain mapping and attribute data for each municipality was merged into the stormwater structures layer update. One centralized GIS storm drain mapping system and geodatabase for the Phase I and II jurisdictions now exists. GIS maps and related database information will be distributed to the municipalities as updates are completed. The NPDES MS4 geodatabase and other information are included with this report in CD format as Appendix B.

2. Urban Best Management Practices (Stormwater Management Facility Data)

The BRM manages stormwater management facility data for County and municipal jurisdictions in a centralized stormwater management database. The database contains information related to facility location, ownership, review and approvals, drainage area, inspections, along with additional information. This is the basis for NPDES GIS application mapping of stormwater management Best Management Practices (BMP’s).

Mapping of stormwater facilities and associated data within all incorporated municipalities is complete. There are 866 “as-built” certified and approved stormwater facilities throughout the County and municipal jurisdictions. All facilities and drainage areas have been mapped with associated data in various watersheds.

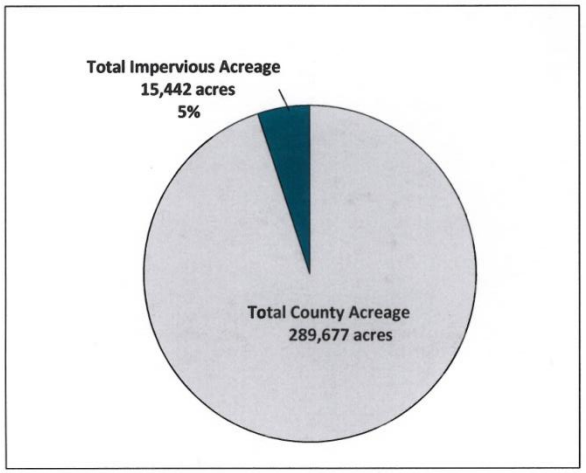
As development projects are constructed, the stormwater facilities and their drainage areas are mapped and linked to data entered into the County's database. In addition, as stormwater facilities are retrofitted as a best management practice, the database will be updated.

The attached CD (Appendix B) includes the County stormwater management database, map of newly added stormwater facilities in the County.

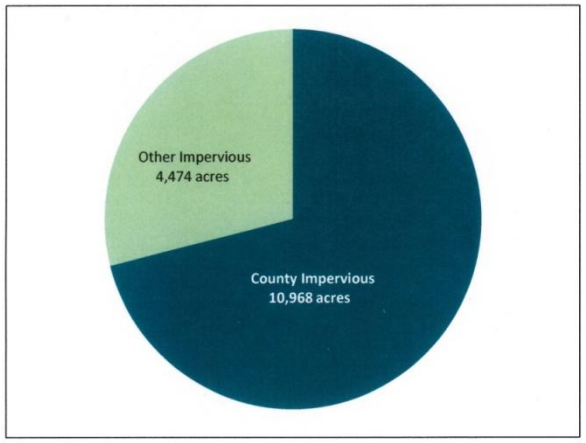
3. Impervious Surfaces

The County continues to improve the accuracy of its impervious surface mapping via enhanced computer analysis in combination with extensive field reconnaissance. Much of the improved field mapping is in conjunction with storm drain system identification and delineation as required in Part I.C.1. of the permit. Carroll County has approximately 453 square miles or 289,677 acres. The total impervious coverage as currently mapped is approximately 15,442 acres. This includes impervious acres associated with State/Federal lands, Phase II municipalities and areas related to the unincorporated regulated lands of this permit. The total impervious coverage in Carroll County is roughly 5% with the permitted area related to this permit being only 3.2 %. As shown in Figure 1, not all impervious acres within the unincorporated County or municipalities are considered regulated as Phase I or II. Impervious acres created since 2004 are considered to be ESD to the MEP, meeting current standards and therefore not in need of restoration.

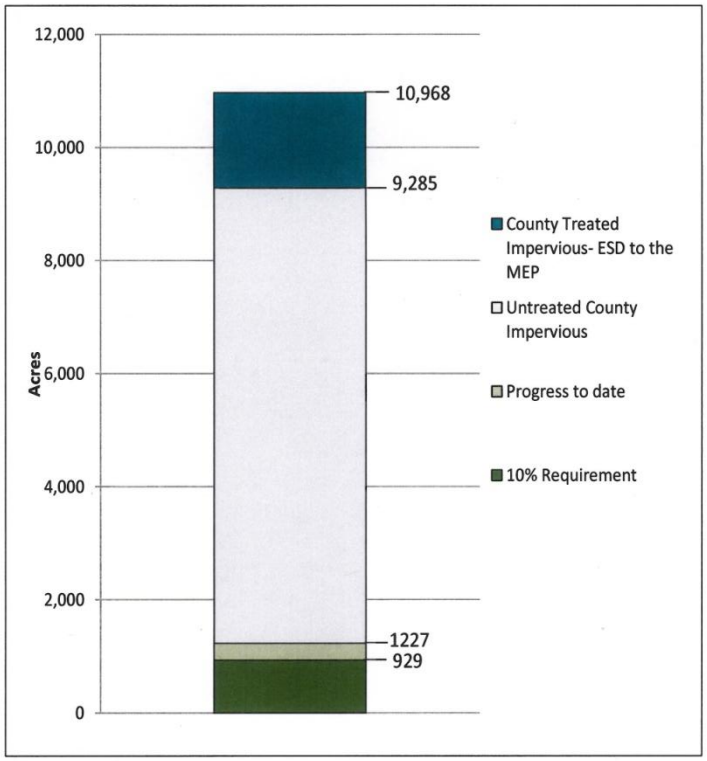
The 2011 and 2012 annual reports provided impervious acres to be considered for restoration. In the 2011 report a total potential restoration acres of 9,285 was identified, which per the existing permit would require 929 acres (10%) restoration with an additional 929 acres to be planned as future permit requirements, for a total of 1,858 acres (20%). In 2012, the County reported a reduction in the total acres to 6,449 based on documentation related to the rural, disconnected nature of impervious surfaces in certain areas. The County requested the difference, 2,836 acres, be considered treated. Discussions with the State continue on this request with the County developing a response and additional documentation related to treatment levels in these areas identified in the 2012 annual report. Therefore the Watershed Restoration level reported in Part III G. is based on the original 9,285 acres. The county requests to reserve the right to adjust the impervious baseline to be restored to the 2011 annual report, 6,449 acres, in the future with MDE's concurrence.



Carroll County Total Impervious Acres



Breakdown of Impervious Acres in Carroll County



Carroll County Impervious Acres Treatment Breakdown

Figure 1

4. Monitoring Locations and Watershed Restoration

The BRM is responsible for monitoring and watershed assessment efforts required under the NPDES MS4 permit. These efforts include the survey and verification of existing conditions, and the performance of site and natural resource assessments including those involving potential hazards. That responsibility is integral to the NPDES MS4 program, as the results of that work provide the means for measurement of the program's efforts. The BRM performs watershed assessments in support of the development of Watershed Management Plans. Staff identifies watershed restoration opportunities and implements watershed improvement projects. (See Sections D, F & G for detailed information)

a. Environmental Inspections

The Environmental Inspections Services Division (EISD) of the BRM remains responsible for all inspections and enforcement actions necessary to ensure that the conditions established in review, approval, and permitting phases are met. EISD also supports County NPDES responsibilities by providing stormwater management facility maintenance inspections and assistance with illicit-discharge inspections. During the permit year EISD performed a total of 6,665 environmental inspections.

b. Resource Easement Tracking

The BRM maintains GIS data layers of all environmental easements established during the development process. These easements have specific conditions which provide protection measures to the delineated resources. The easements are perpetual and are dedicated to the Board of County Commissioners and/or municipality in certain cases. Those easements include forest conservation, floodplain, and water resource protection. Certain water resource easements are associated with stream systems on developed property based on variable-width criteria. Currently the County holds easements on approximately 3,485 acres for forest conservation, 548 acres for floodplain, and 1,607 acres for water resource protection. All easements are subject to inspection and monitoring for compliance.

5. Phase II NPDES MS4 Compliance (municipalities: minimum control measures)

A cooperative arrangement continues between the County Commissioners and the governments of the County's eight incorporated municipalities regarding Phase II NPDES MS4 implementation and compliance. Carroll County continues to work cooperatively with each of the municipalities to assist them in maintaining their compliance with the Municipal General Permit. County staff meets regularly with municipal representatives regarding Phase II compliance. Assistance categories include pollution prevention plan development as needed, illicit-discharge inspections, BMP functional-compliance inspections, maintenance inspections, system mapping, and training.

Table 2 provides population estimates for the County and eight municipalities as of May 31, 2013.

Table 2
Carroll County Population Estimates
Municipal and Unincorporated

INCORPORATED MUNICIPALITY	POPULATION (1)
Hampstead	6,333
Manchester	5,135
Mount Airy (2)	9,581 (5,796)
New Windsor	1,406
Sykesville	4,597
Taneytown	6,777
Union Bridge	977
Westminster	18,775
Total CC Incorporated Area Population	*49,797*
Total CC Unincorporated Area Population	*119,652*
Total Carroll County Population	***169,449***

(1) Based on Carroll County Population estimates dated 6/6/13.
(2) Carroll County works with Mount Airy to manage the entirety of the incorporated area, including the Frederick County portion of the municipality. The number shown in parentheses is the population that resides in Carroll County.

The County has worked cooperatively with each of the municipalities implementing a variety of Phase II compliance tasks, including system mapping and illicit-discharge inspections. Table 3 provides the status of permit requirements for municipal facilities with NPDES industrial stormwater permits. A work plan for each permit year is developed by the County to facilitate Phase II jurisdiction compliance.

Table 3
Carroll County NPDES Phase II Municipalities
NPDES MD Industrial General Permit No. 02-SW Status

Municipality	Applicable	Facility	Status	MDE Registration Number	Expires	Comment
Hampstead	Yes	Public Works Facility (PWF) 4031 Gill Avenue	NE	11NE2213	03/31/2017	
Hampstead	Yes	PWF -S. West Alley (Larry Hentz PWF)	NE	11NE2214	03/31/2017	
Manchester	Yes	PWF 3351 Victory Street	NE	10NE2201	12/14/2015	
Manchester WWTP	No	Waste Water Treatment Plant (WWTP)	N/A			Exempt/Less than 1.0 MGD
Mount Airy	Yes	PWF 215 Prospect Road	NE	11NE2257	03/31/2016	
Mount Airy WWTP	Yes	WWTP – 7245 Ridge Road	NE	11NE2258	03/31/2016	
New Windsor	No	PWF	N/A			VERSAR Report – Non SIC Code/No Fleet Mgmt
New Windsor	No	WWTP	N/A			Exempt/Less than 1.0 MGD
Sykesville	Yes	PWF 7547 Main Street	NE	11NE2255	03/31/2016	
Taneytown	Yes	PWF Ball Park Road	NE	11NE2263	03/21/2016	
Taneytown WWTP	Yes	WWTP – Whippoorwill Drive	NOI	02SW1743		SWPPP in Place
Union Bridge WWTP	No	WWTP – Bucher John Road	N/A			Exempt/Less than 1.0 MGD
Westminster	Yes	Westminster Public Works Maintenance Facility (Streets Department) 105 Railroad Avenue	NOI	02SW2292	60 days after Permit No. 02-SW	SWPPP in Place
Westminster	Yes	Westminster Public Works (Utilities Department) Old Manchester Road	NOI In Progress	Pending	Permit No. 02-SW	SWPPP in Place NOI Application in Progress
Westminster WWTP	Yes	WWTP 1161 Old New Windsor Pike	NOI	02SW2252	Permit No. 02-SW	SWPPP in Place

NE – No Exposure Certification (Not An Exemption – Maintain No Exposure/Good Housekeeping Practices)
N/A – Not Applicable (Maintain MS4 Good Housekeeping Practices)
NOI – Notice of Intent – Stormwater Pollution Prevention Plan (SWPPP) Required. Maintain Plan, Inspections, Training & Records

The municipalities and County have a formal arrangement to provide other services that support Phase II compliance. Table 4 shows the assignment of responsibilities for review, inspection, and bonding for each municipality.

Table 4
Review, Inspection, and Bonding: Assignment of Responsibilities

Carroll County Code and Activity	Hampstead	Manchester	Mount Airy	New Windsor	Sykesville	Taneytown	Union Bridge	Westminster
Floodplain								
Review*	C/C	C/C	C/C	C/C	C/C	N/A	M	C/M
Bond	N/A	N/A	N/A	N/A	N/A	N/A	M	N/A
Inspection	C	C	C	C	C	N/A	M	C
Easement	C	C	C	C	C	N/A	M	M
Grading								
Review*	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/C
Bond	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inspection	C	C	C	C	C	C	C/C	C
Sediment Control								
Review*	SCD/S	SCD/S	SCD/S	SCD/S	SCD/S	SCD/S	SCD/S	SCD/S
Bond	C	C	M	C	M	M	C	C
Inspection	C	C	C	C	M/C	C	C	C
Stormwater Management								
Review*	C/C	C/C	C/C	C/C	C/C	M	M	C/M
Bond	C	C	M	M/C	M	M	M	M
Inspection	C	C	C	M/C	M/C	M	M	C
Easement	C	M	M	M	M	M	M	M
Landscape								
Review*	C	C/C	C/M	C	C/M	C/C	M	M
Bond	C	C	M	C	M	C	M	M
Inspection	C	C	M	C	M	C	M	M
Forest Conservation								
Review*	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/C
Bond	C	C	C	C	C	C	C	C
Inspection	C	C	C	C	C	C	C	C
Easement	C	C	C	C	C	C	C	C
Water Resources								
Review*	C/No Code	C/C	C/C	C/C	C/C	C/ No Code	M	CO/ No Code
Bond	N/A	N/A	N/A	N/A	N/A	N/A	M	N/A
Inspection	N/A	C	N/A	C	C	N/A	M	N/A
Easement	N/A	C	M	C	C	N/A	M	N/A

Key: C = County M = Municipality S = State SCD = Carroll Soil Conservation District

* Review performed by / whose code
Source: Carroll County Bureau of Resource Management

Table 5 provides results of a questionnaire distributed to each municipality that requested information specific to the requirements of the Municipal General Permit. The results are used in the annual training session to assist in the identification of what may be required of the municipalities.

Table 5

Municipality General Permit Questionnaire (2012-2013)

#	Hampstead	Manchester	Mt Airy	New Windsor	Sykesville	Taneytown	Union Bridge	Westminster
1.	TC-2nd Tues. @ 7:30 p.m. P&Z-4th Wed. @ 7:00 p.m.	TC 2nd Tues. P&Z 3rd Tues.	TC 1st Mon. @ 7:30pm P&Z Last Mon. @ 7:00pm	TC 1st Wed. PC 4th Tues.	TC 2nd & 4th Mon., except June, July, August & Dec. 2nd Mon. only P&Z 1st Mon.	TC 2nd Mon w/Workshop Wed. before TC; P&Z - Last Mon. of the month	TC 4th Mon. P&Z 3rd Thurs.	TC 2nd & 4th Mon. P&Z 2nd Thurs.
2.	Yes - Hampstead Day HBA Expo	Yes Manchester Day June 1, 2013 Fire Department Carnival July 1 - 6	May Festival – 3rd weekend in May; Fall Festival – 1st weekend in October	No	Fall Festival, Christmas Open House, Summer Concerts in the Park, Fine Arts & Wine Festival, Movies at South Branch Park	Yes – Spring Into Spring Movies In The Park Christmas Tree Lighting Wine Festival Band Festival	No	Flower & Jazz Fallfest Summer Concerts in the Park
3.	Yes		Beautification Committee plants trees	Yes	Yes	Tree Plantings	Yes	Storm drain stenciling; Arbor Week tree plantings Park tree plantings.
4.	Yes	Yes	Yes	No	Yes Local Events	No	No	Yes
5.	Yes – Oil & Antifreeze	Yes	Yes oil & Antifreeze	No	Yes	Yes – Oil Only	No	Yes- oil only
6.	Yes	Yes	Yes Bi-weekly	Yes	Yes - Leaf	Yes	Yes	Yes
7.	Yes	Yes	Yes Bi-weekly	Yes	Yes	Yes	Yes	Yes
8.	Yes	Yes	Yes – Mountairymd.org	Yes	Yes	Yes	Yes	Yes
9.	Yes	Yes	Yes	Yes - County	In Progress	Yes	No	Yes
10.	Yes	Yes	Yes	No	No	Yes	No	WWTP, Street Dept. Utilities
11.	Yes	Not Formal	Yes	No	Yes	No	Yes	Yes

1. When are the Town Council (TC) and Planning Commission (P&Z) meetings held?
2. Is there a Municipality fair or other Municipality-wide event held?
3. Has the Municipality had any volunteer efforts that would benefit water quality, i.e., storm drain stenciling, tree planting, etc.?
4. Does the Municipality have an information booth at the Fireman's Carnival and/or at any local fair?
5. Does the Municipality have an oil, antifreeze or gasoline recycling program?
6. Does the Municipality do regular leaf pick-up or street sweeping?
7. Does the Municipality provide for yard waste pick-up?
8. Does the Municipality have a website used for information and/or a newsletter distributed to residents?
9. Has the Municipality adopted the Storm Sewer Ordinance?
10. Does the Municipality have any adopted pollution prevention plans?
11. Does the Municipality use Integrated Pest Management (IPM) for landscape management?

a. Public Education and Outreach

The eight municipalities have education and outreach systems currently in place. Each has an elected council and a appointed planning commission that disseminate information to their residents as part of their mission. Each municipality has information available to the public and on display regarding the NPDES MS4 Permit. Brochures and pamphlets include; "National Pollutant Discharge Elimination System – Storm Water Pollution Prevention in Your Municipality", "After The Storm – A Citizen's Guide to Understanding Stormwater" and "Make Your Home the Solution to Stormwater Pollution." Information is also made available at fairs, municipal events, and in the classroom by County and municipal staff. The number of events has increasingly offered expanded opportunities for public education and outreach related to NPDES MS4 and stormwater pollution.

Municipality websites link to the County's "Protecting Carroll County Waters" NPDES MS4 webpage which was implemented in June 2012. The web page contains various resource information pertinent to both Phase I and Phase II jurisdictions including a County pollution compliance phone number is available to the general public for reporting dumping and spills.

b. Public Involvement and Participation

The municipalities represent the concentrated population centers in Carroll County. Coordinating Phase I with Phase II NPDES MS4 efforts strengthens the basic NPDES MS4 management principle which is a primary impetus for this permit. As the municipalities do represent County population hubs, they are the most densely developed areas with the most commercial/industry uses. The municipal planning commissions and their councils serve as consistent forums for the public involvement and participation process. Residents are encouraged to attend and offer input. Numerous development and environmental issues are regularly brought to these meetings and are often resolved in an open discussion format. Currently, the County and many municipalities televise these meetings.

Authority to approve new development plans rests with each individual municipality. Questions and concerns often lead to specific conditions being placed on approvals. In addition, as the County provides review services to all of the municipalities, County personnel often become involved in problem resolution. Lastly, in many cases, the municipalities operate either under adopted County Code or under their own authority with text similar to County Code. This helps to create consistency within the review process and with enforcement.

c. Illicit Discharge and Elimination

One of the responsibilities within the Phase II agreement with the municipalities involves illicit-discharge monitoring and elimination. Carroll County adopted an ordinance titled "Environmental Management of Storm Sewer Systems" that has been incorporated as Chapter 105 of the Carroll County Code. (This Code may be reviewed on the County's website at ccgovernment.carr.org. Click on Government, Department of the County Attorney, and under Links to Other Documents, click on "Code of Public Local Laws & Ordinances"). This chapter establishes methods of controlling the introduction of illicit discharges or pollutants into the

County's separate storm sewer system (CS4) in order to comply with requirements of this permit. This ordinance has been adopted by all of the municipalities in order that they may benefit from the added level of protection that it provides.

The adoption of the ordinance provides each municipality with the enforcement authority, either solely or in conjunction with the County, necessary to comply with Phase II program requirements. Table 6 reflects the adoption status of Carroll County Code, Chapter 105, by the municipalities and the responsible enforcement authority.

Table 6
Municipal Adoption and Enforcement
Of Carroll County Code Chapter 105
Environmental Management Of Storm Sewer Systems

Town	Enforcement Authority
Hampstead	County
Manchester	County
Mt. Airy	Town/County
New Windsor	County
Sykesville	Town
Taneytown	City
Union Bridge	Town
Westminster	City

An Illicit Discharge Detection and Elimination (IDDE) document entitled "Illicit Discharge Detection and Elimination Manual" was developed during the permit year to address IDDE problems. This document acts as a guidance manual for Carroll County Government and municipalities of Carroll County.

The current Carroll County MS4 permit includes a requirement for the County to perform 100 illicit discharge inspections of major outfalls each permit year. MDE has agreed to allow the 100 inspections to be distributed among incorporated and unincorporated areas of the County, thus satisfying both Phase I and II responsibilities. Carroll County has performed 102 field screenings with 37 of the inspections performed within the municipalities. The number of municipal inspections was based on the number of major outfalls per municipality divided by 3 for tri-annual frequency.

In addition to these annual routine inspections, municipal public works employees are trained to perform visual inspections of storm drain systems as they go about their workday. Illicit discharges may also be observed by trained County personnel while performing various inspections such as grading and sediment control, stormwater facility, or flooding issues.

Suspected illicit discharges by routine outfall inspection, via visual observations or through reported complaints are investigated through the County BRM EISD. This division closely coordinates with the respective municipality on elimination if an incident proves to be an illicit discharge. An investigation summary and the outfall inspection distribution map for the current permit year is located in Appendix D of this report.

d. Construction Site Runoff

Each municipality has adopted an MDE-approved ordinance to control erosion and sediment during construction. They have adopted the County Code language and rely on County staff for enforcement. The County amended Chapter 121, Grading, Erosion, and Sediment Control, to address the recently adopted changes to the Maryland Standards and Specifications for Soil Erosion and Sediment Control. The Board of Commissioners adopted revision to Chapter 121 related to soil erosion and sediment control on December 11, 2012.

The Soil Conservation District performs the necessary plan review for both County and municipal projects. The County program is approved and regularly reviewed by MDE. As long as that situation remains constant and the County performs the enforcement function consistent with MDE standards, the municipalities will remain in compliance with Phase II requirements related to construction site runoff.

e. Post Construction Stormwater Management

Just as with erosion and sediment control, each of the municipalities has an MDE sanctioned and approved stormwater management program. The City of Westminster and Town of Hampstead have adopted their own stormwater management ordinances. The Towns of Manchester, Mount Airy, New Windsor, and Sykesville have all adopted the County ordinance by reference. Each of those six municipalities relies on the County to review and approve stormwater management plans. The City of Taneytown and Town of Union Bridge also have an MDE-approved stormwater management program. In addition to having adopted their own ordinance, they have hired a contractor to provide construction inspection services. As with Section (4) above, as long as the municipalities have approved stormwater management programs, each remains in compliance with Phase II program requirements.

f. Pollution Prevention and Good Housekeeping

This category encompasses a variety of measurable actions which includes: pollution prevention, street sweeping, inlet cleaning, employee training, and recycling efforts. Table 5 and Appendix C include tabular information supplied by the municipalities on actions taken that reflect the conditions of the General Permit. As pollution prevention and good housekeeping are the most encompassing of requirements, the data is organized and presented in such a manner. The data are requested of each municipality yearly and are used to help municipal personnel in the regularly scheduled workshops and training sessions that are designed to support compliance of the General Permit.

The reported categories include the following:

- **Mapping** – Having a useable storm sewer system map helps in compliance and maintenance responsibilities. The County has furnished updated storm drain maps to nearly all municipalities for their use.
- **Street Sweeping** – All but two of the municipalities reported that they regularly sweep their streets. Only Sykesville and New Windsor indicated that they do not

have a regular program. Three indicated that they do so with municipal personnel and municipal equipment. Two utilize contractors, and one chose to rely on a local business that supplies the service free of charge. Each was able to indicate the method of sweeping and the disposition of collected material as well as the street miles swept. Please see Appendix C for details.

- **Storm Drain and Inlet Cleaning** – Each of the municipalities were able to furnish information on drainage system and inlet cleaning. Five of the municipalities indicated that this is a regular service, and three clean in response to complaints or clogging problems. They also furnished information on how they performed the task, how often the cleaning was performed and material disposal method. Details on the reported information for this and the other categories are included in Appendix C.

g. Stormwater BMP Database

The NPDES database is included on a CD-ROM as Appendix B. A map of newly permitted stormwater management facilities is also included in Appendix B of this report.

D. Discharge Characterization

1. Introduction

a. Purpose

Carroll County is required to conduct a discharge characterization as part of its NPDES permit conditions for the purpose of evaluating the efficacy of stormwater management. This component consists of monitoring the discharge from a stormwater management facility as well as impacts to the receiving water body as described below. The state of Maryland has developed a database of discharge data collected by several permit holders in order to characterize stormwater runoff associated with various stormwater management efforts.

The discharge characterization is implemented through the Assessment of Controls (Part III.H.) of the permit, which delineates specific data collection and analysis efforts to be undertaken. Carroll County has been collecting data in support of this program component since August 2000 downstream of the stormwater management facility associated with the Air Business Center just north of Westminster. This stormwater management facility was originally constructed as a wet pond in 1979 and was retrofitted as a wet pond with forebay to provide water quality, recharge volume, and channel volume protection in 2008.

b. Study Area and Requirements

The discharge characterization is completed in a first order stream that is a tributary to the West Branch of the North Branch Patapsco River. The location of the watershed where monitoring is conducted within the county is shown in Figure 2, while the location of the monitoring stations and other watershed features are shown in Figure 3. The study area is located near the topographic divide separating the eastern and western piedmont physiographic provinces. As shown in Figure 2, the unnamed tributary drains the upper-most extent of first order tributary and is located in the Liberty Reservoir watershed.

The Air Business Center regional stormwater management facility discharges via a constructed outfall to a small stream that travels southeast to the confluence with the West Branch. The stream receives the majority of water from the pond, with contribution from overland flow from the drainage basin during precipitation events. A new stormwater management pond at the West Branch Trade Center has been constructed adjacent to and east of the Air Business Center stormwater management facility. This facility drains to the stream, just downstream of the outfall station.

c. Program Elements

The discharge characterization consists of three primary data collection efforts to assess the effectiveness of the stormwater controls on stream health: physical monitoring, chemical monitoring, and biological monitoring. This data is collected at the two monitoring stations shown in Figure 2**,** where the cumulative effects of watershed restoration efforts can be best assessed.

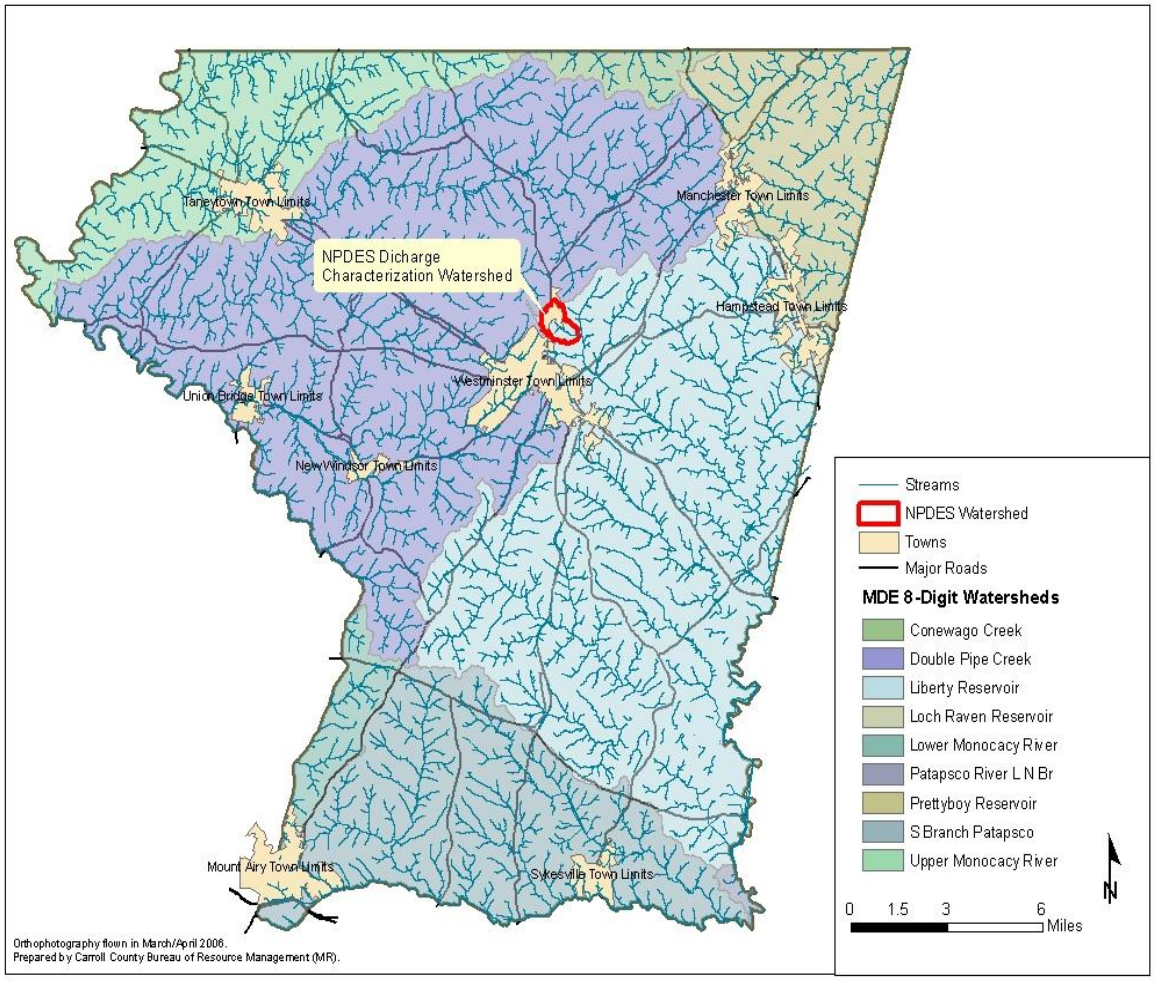


Figure 2: Carroll County NPDES Discharge Characterization Location

Figure 3: NPDES Discharge Characterization Watershed

Physical monitoring is conducted in the spring of each reporting year and consists of the following elements:

- Geomorphic stream assessment to include an annual comparison of permanently monumented stream channel cross-sections and a stream profile to evaluate channel stability; and
- A stream habitat assessment for assessing areas of aggradation and degradation; and
- Analysis of the effects of rainfall discharge rates, stage, and continuous flow on geometry (if needed).

Chemical monitoring is completed throughout the reporting year and requirements consist of the following elements:

- Samples of eight storm events at each monitoring location, with at least two occurring each calendar year quarter. During extended dry periods, base-flow samples are collected one time per month.

- Sampling is completed with automated equipment to include pH and temperature, and each storm limb is characterized.
- Laboratory analysis is completed for a number of chemical constituents and Event Mean Concentrations (EMCs) calculated and reported.
- Continuous flow data is collected at the in-stream monitoring station and used to calculate annual and seasonal pollutant loads being exported from the watershed.

Biological monitoring is completed in the spring of the reporting year and consists of the following elements:

- Assessment of benthic macro-invertebrates at both monitoring stations to assess stream health; and
- Completion of a spring habitat assessment.

2. Data Collection and Analysis Methods

a. Climatological

The climate of Carroll County is characterized as temperate and moderately humid (Meyer and Beall, 1958). Based on a weather station located in Westminster and operated by the Carroll County Government according to National Weather Service Standards, the average annual temperature is 53° Fahrenheit (F) based on analysis of the past 30 year record. The mean monthly temperature ranges from 31° F January to 76° F in July (NWS, 2011).

b. Hydrologic

In order to understand the hydrologic regime at this first order watershed, it is necessary to collect continuous stream discharge data. To that end, both stations are equipped with instrumentation to collect continuous stream discharge data. The outfall station has dedicated electric power and is equipped with an ISCO model 4250 flow meter and a model 3700 portable sampler. The outfall station is also equipped with a model 674 precipitation gauge. This station was not operational for a portion of the reporting period, as described in section 3b.

The in-stream station is also equipped with dedicated ISCO flow measuring and sampling equipment and is powered by a deep cycle, 12 volt marine battery. An ISCO model 6712 portable sampler and model 4230 bubbler-type flow meter are deployed at this station.

Hydrology data collection at the in-stream station consists of a stilling well, staff plate, and bubbler assembly which is part of the ISCO flow meter. The instrument converts the hydrostatic pressure required to maintain the bubble rate. This pressure is proportional to the stream stage. County staff regularly collects stage-discharge data to relate stream stage to discharge.

The hydrology data collection at the outfall station consists of a dedicated stage/velocity meter anchored to the outfall pipe. The logging device uses Manning's equation and input from the sensor to convert stage to discharge. The pipe discharge stage is regularly checked to verify the instrumentation is functioning properly.

Flowlink Version 5.1 software by ISCO is used to complete hydrologic data analysis. Data collected at the monitoring stations is downloaded to a laptop computer via serial communication. New hydrologic data is appended to the existing data record for each station. Discharge and stage hydrographs are prepared using this software. In addition, it is used to calculate both annual and seasonal flows.

c. Physical

During the spring of 2013, Carroll County conducted a geomorphologic assessment for the entire stream reach, from the outfall of the Air Business Park stormwater management facility, to the confluence with the West Branch. As required, survey points were again collected at the six permanent, monumented cross-sections determined to be representative of each stream reach. At each of these monumented cross-sections, the County survey department collected data for bank slope, toe, stream edges, channel bottoms, and tops.

The County survey crew continues to collect data at each of the 28 segments (approximately 200-foot intervals) along the same stream reach. The data collected for this effort are similar to the data collected at the six (6) monumented cross-sections, describing the stream channel cross-section. The survey crew collected data for the stream channel bottom at the thalweg, the edge of water at each bank, and the top of each stream bank.

A Level 1 geomorphologic stream assessment has been conducted on the entire stream reach to assess potential geomorphologic changes to the stream. This assessment consisted of two major components: an assessment of stream channel changes, and an interpretation of these changes.

The assessment of stream channel changes involves determining channel segment characteristics and assessing dimensional changes. The assessment evaluations include an interpretation of changes in channel response, manifested through a comparative evaluation of channel geometry changes, including cross-sectional dimensions, in the context of the physical setting.

d. Chemical

Carroll County continues to contract with Martel Laboratories, Inc., in Baltimore, MD to conduct all of the sample collection and lab analyses. The sampling program consists of a first flush component for total petroleum hydrocarbons, bacteriological constituents, and physical parameters as well as chemical parameters collected during each of the three storm limbs. Table 7 includes the required parameters for laboratory analysis, the laboratory method, and the corresponding method reporting limit.

The County continues to use the same type of storm event monitoring equipment manufactured by ISCO, Inc. to comply with this component of the NPDES permit. The In-stream station is equipped with an ISCO Model 6712 auto sampler, whereas the Outfall station has an ISCO Model 3700 auto sampler. The Outfall sampler is paced with an ISCO Model 4250 level flow meter, while the In-stream sampler is paced using an ISCO Model 4230 bubbler flow meter. Personnel from Martel labs continue to collect both base flow and storm flow events in the same manner as in previous years. The flow monitoring and the EMC calculations methods are the same as those used last year. Martel Labs continues to send results via e-mail to the County

where the new records are appended to the existing MS Access database. Event dates are shown in Table 8.

Due to technical errors and equipment failure, as described in Section 3b, when storm flow samples could not be collected, monthly base-flow samples were taken.

Table 7
Laboratory Methods and Detection Limits for Parameters Tested

Parameter Tested	Method	Reporting Limit
	First Flush Sample	
pH	EPA 150.1	
Temperature	EPA 170.1	
Specific Conductance	EPA 120.1	1.0 µmhos/cm
Total Petroleum Hydrocarbons	EPA 1664	5.0 mg/L
Escherichia Coli	SM 9223B	2.0 organisms/ 100mL
	Limb Samples	
Nitrate/Nitrite Nitrogen	SM 4500NO3-H	0.02 mg/L
Biochemical Oxygen Demand	SM 5210B	1.0 mg/L
Total Copper	EPA 200.8	2.0 µg/L
Total Lead	EPA 200.8	2.0 µg/L
Total Zinc	EPA 200.8	10.0 µg/L
Total Kjeldahl Nitrogen	SM 4500NH3-C	0.5 mg/L
Total Phosphorus	SM 4500P-E	0.01 mg/L
Total Suspended Solids	SM 2540D	1.0 mg/L

Table 8
2012 – 2013 NPDES Discharge Characterization Sampling Events

Event #	Event Date	Event Type	Rainfall Total (Inch)	Rainfall Duration (Hour)
2012-04	4/30/2012	Base Flow	0	0
2012-05	5/31/2012	Base Flow	0	0
2012-06	6/30/2012	Base Flow	0	0
2012-07	7/31/2012	Base Flow	0	0
2012-08	8/30/2012	Base Flow	0	0
2012-09	9/18/2012	Storm	1.96	18
2012-10	10/26/2012	Base Flow	0	0
2012-11	11/29/2012	Base Flow	0	0
2012-12	12/20/2012	Storm	0.4	12
2013-01	1/30/2013	Storm	4.67	20
2013-02	2/26/2013	Storm	1.1	12

e. Biological

Two monitoring sites corresponding to the Outfall and In-stream stations have been characterized since the 2000 reporting period. The 75-meter sampling sites, shown in Figure 4, were not randomly selected. Results from the data gathered over the years, reflects change in stream conditions downstream of the regional stormwater management facility.

Data collection, macro-invertebrate identification, and analytical methods were taken from Maryland Biological Stream Survey (MBSS) guidance manuals (Sampling Manual Field Protocols, 2010 (http://www.dnr.state.md.us/streams/pdfs/ea-07-01b_fieldRev2011.pdf). The BRM continues to contract with DNR to identify and enumerate all benthic macro invertebrate samples. The samples were processed and identified by, Ellen Friedman, MD DNR principal taxonomist with over 20 years of identification experience. The assessment of spring habitat also utilized guidance from the 2010 Maryland Biological Stream Survey (MBSS) Sampling Manual: Field Protocols.

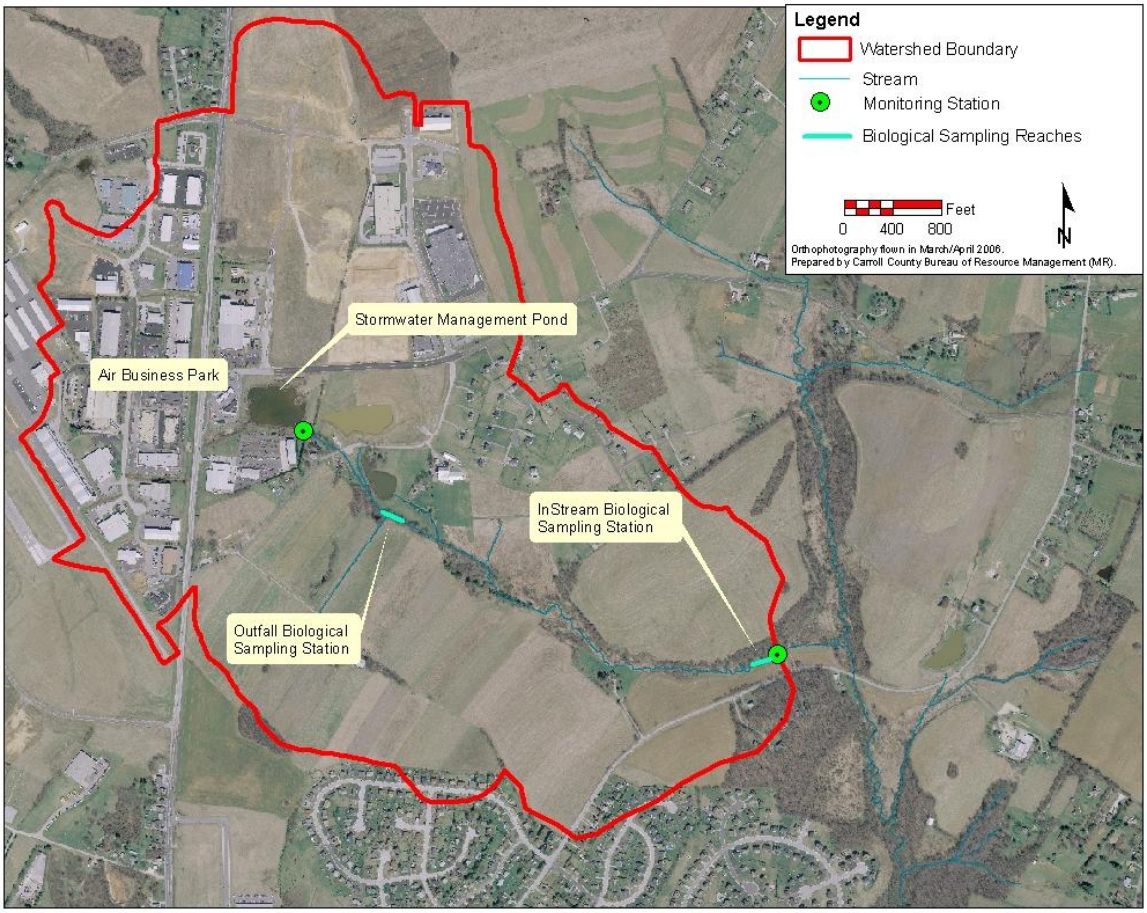


Figure 4: Biological Monitoring Station Locations

3. Results and Discussion

a. Climatological

Precipitation data is summarized by month in Figure 5 along with monthly summaries for the previous reporting period and the 30-year average monthly precipitation. Overall, the 2012 -2013 reporting period experienced 4.94 inches above the 30-year average annual precipitation.

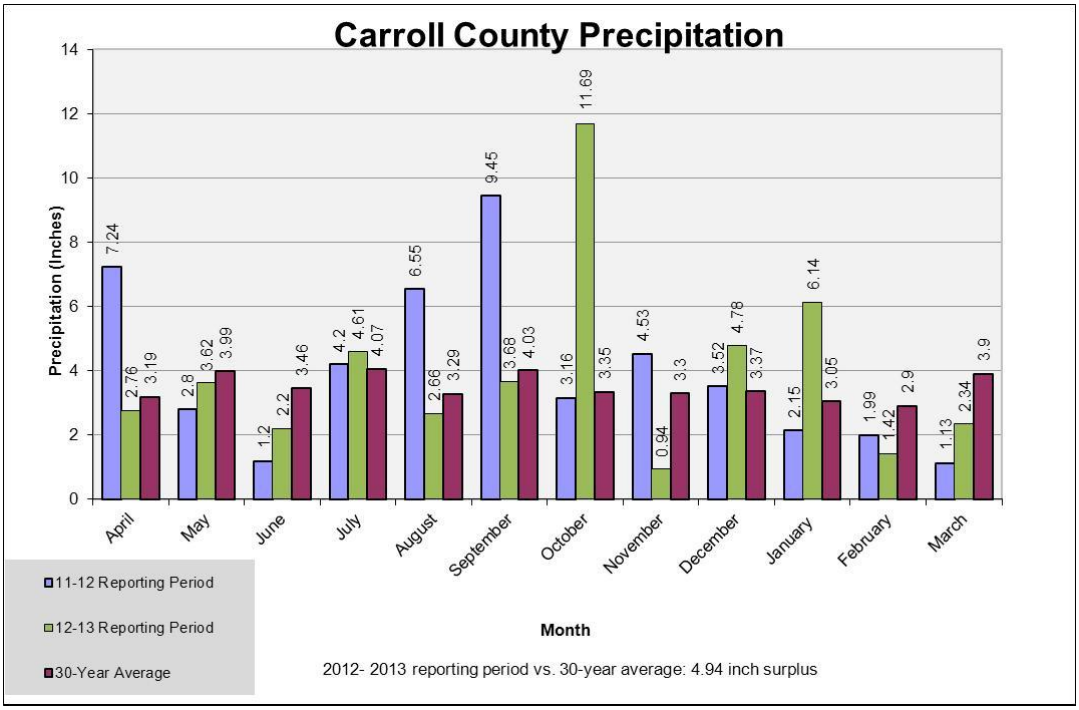


Figure 5: Monthly Precipitation Summary for the Reporting Period

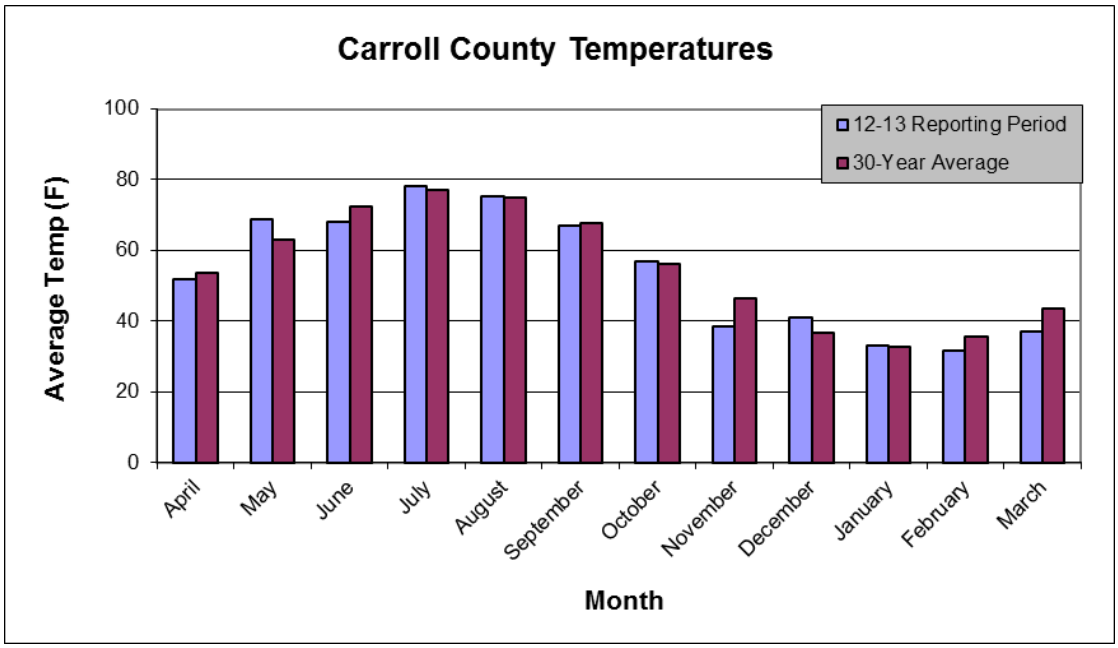


Figure 6: Monthly Temperature Summary for the Reporting Period

Mean monthly temperatures are summarized in Figure 6 and are compared to the 30-year average monthly temperature. Overall, the 2012-2013 season mean monthly temperatures did not largely vary from the 30-year average.

b. Hydrologic

Hydrographs have been prepared showing the stage and discharge at both the outfall and in-stream stations for the reporting period. Outfall station stage and discharge are shown in Figures 7 and 8 respectively. In-stream station stage and discharge are shown in Figures 9 and 10, respectively.

Normal baseflow for the in-stream station is approximately 0.4 feet. A comparison of the stage hydrographs for the two stations indicates that storage by the stormwater facility results in peak flows less than 0.4 feet in all except two storms; October 20, 2012, when 6.92 inches of rain fell and the stage rose to 1.57 feet; and January 31, 2013, when 3.63 inches of rain fell and the stage rose to 1.1 feet.

The in-stream station experienced high stage during three storm events. During the event on October 29, 2012, stage rose to 2.64 feet, approximately 0.13 feet above bankfull. Stage also exceeded 1.5 feet during storms on June 1, 2012 at 1.82 feet; and January 31, 2013 at 2.2 feet. For these events, precipitation was 0.63 inches, and 3.63 inches respectively.

Equipment failures or errors occurred at the outfall station from May 9 through August 24, 2012. This time period included a technical error in data storage and failure of the flow meter sensor. Therefore data and analysis are not available for this time period.

To compare pre-retrofit to post-retrofit stage hydrographs at the outfall station, a hydrogaph of stage for the period April 01, 2007 through December 31, 2007 was prepared as shown in Figure 11. Pre–retrofit, stage exceeded 0.5 feet during 13 separate events, indicating that retrofit efforts have resulted in a decrease in the number of high discharge, high energy events.

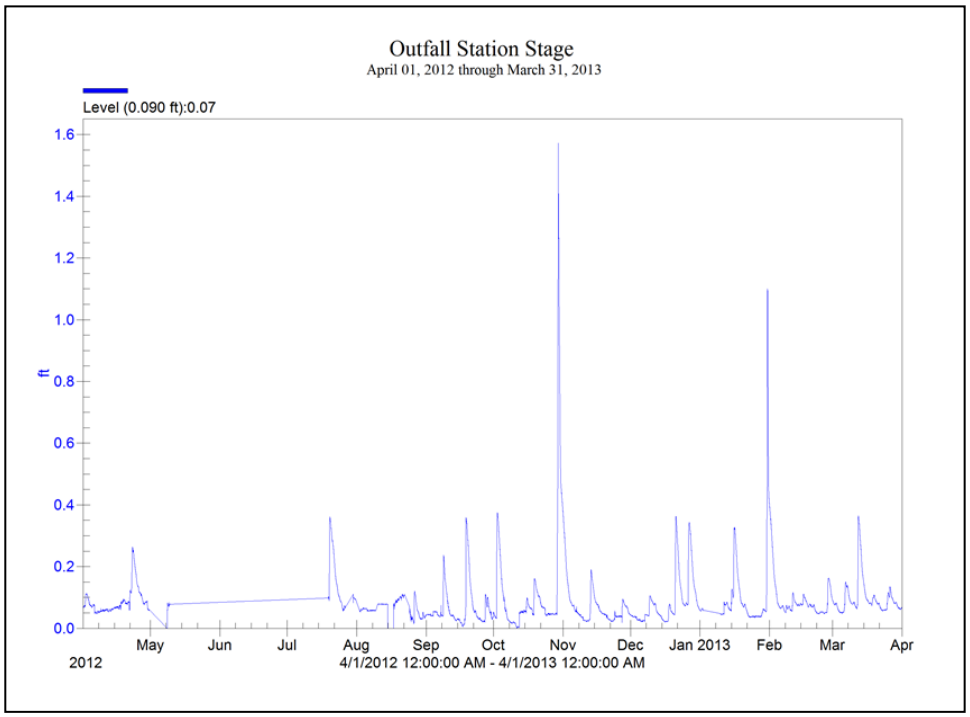


Figure 7: Hydrograph of Outfall Station Stage

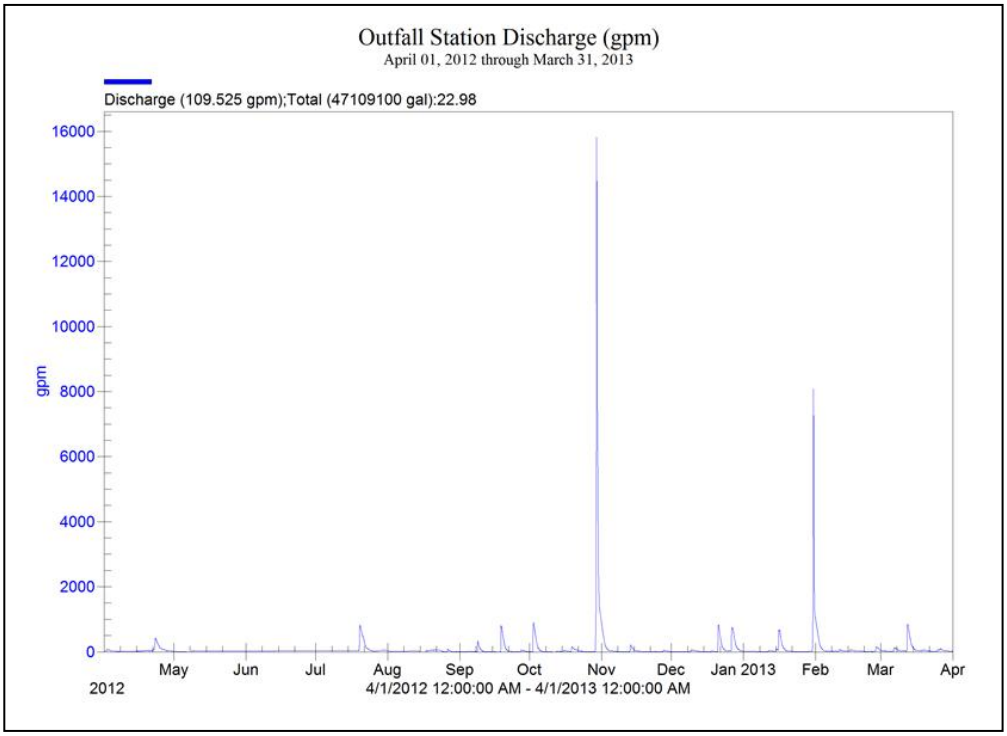


Figure 8: Hydrograph of Outfall Station Discharge

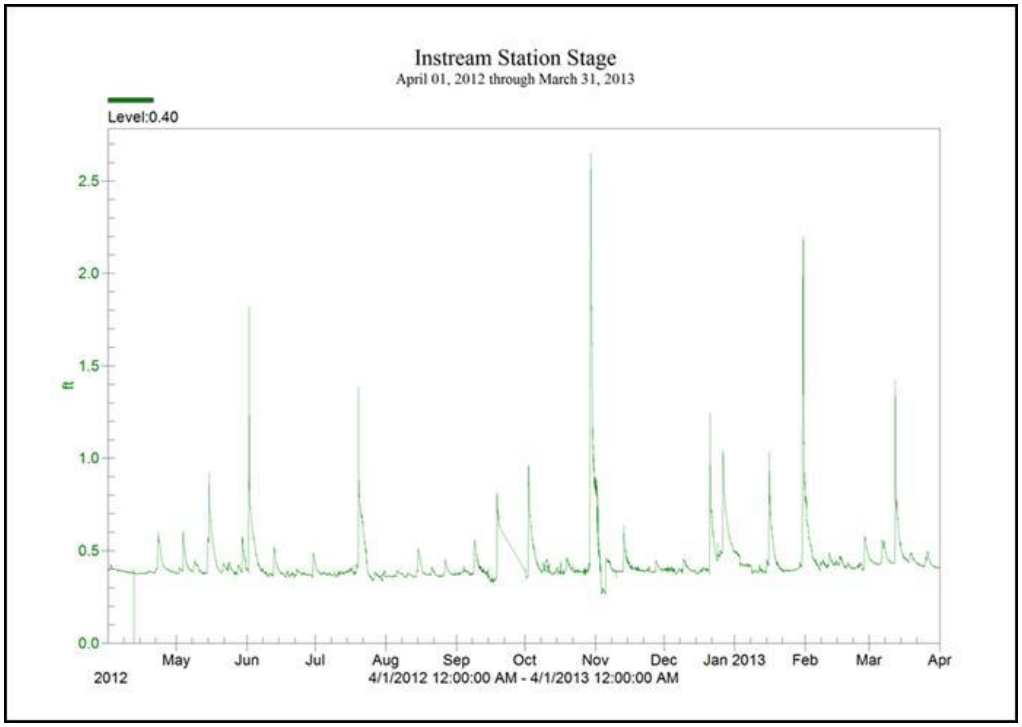


Figure 9: Hydrograph of In-stream Station Stage

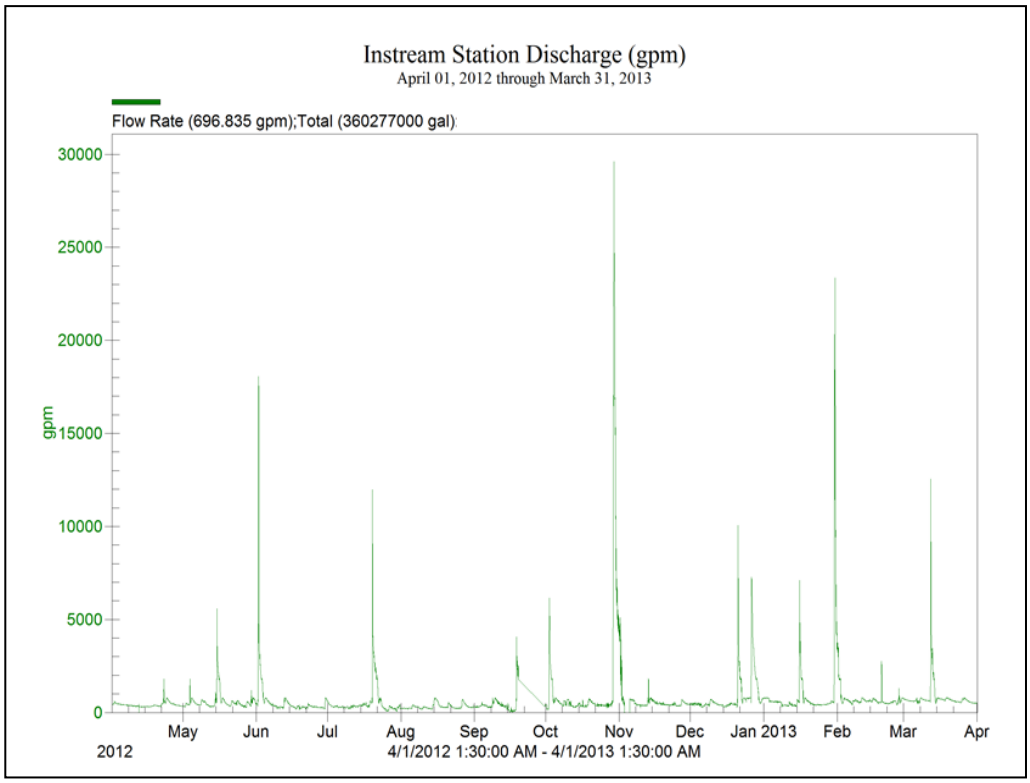


Figure 10: Hydrograph of In-stream Station Discharge

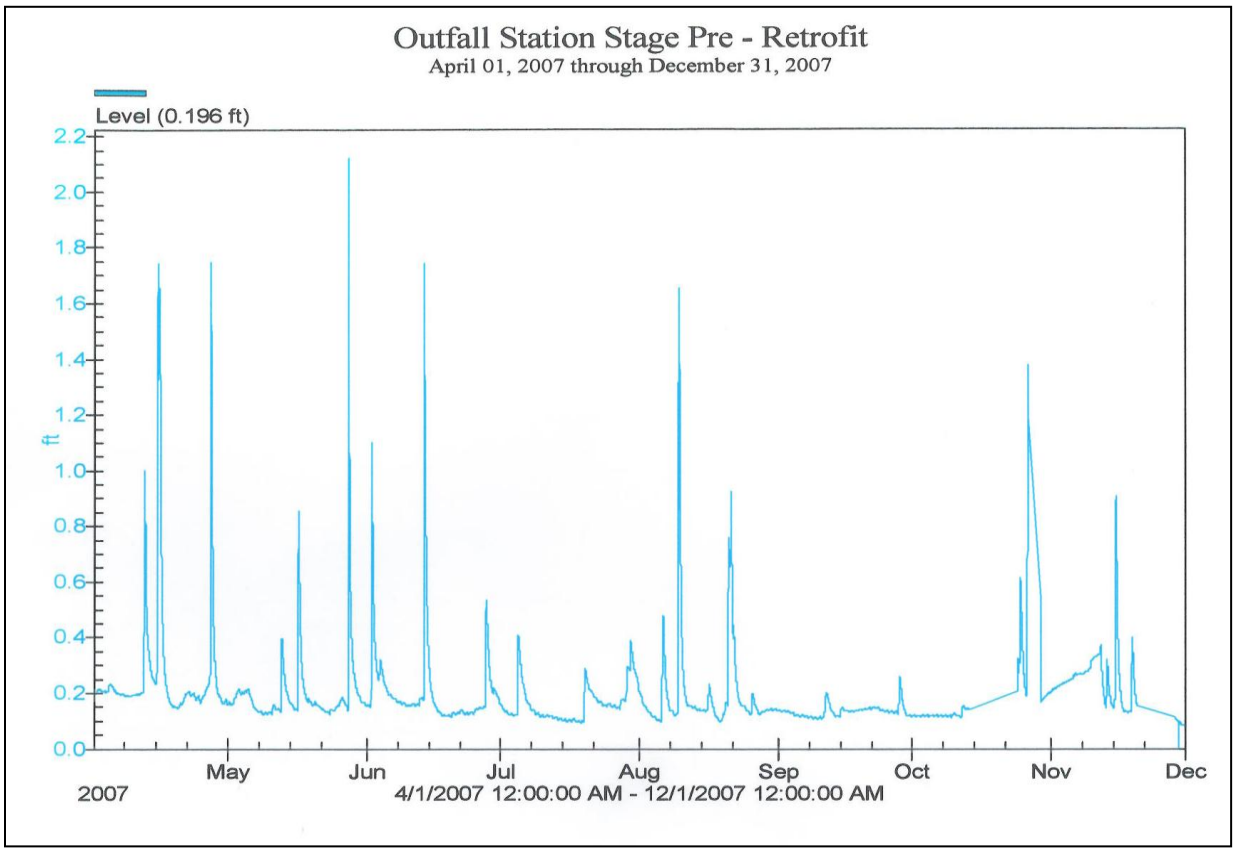


Figure11: Hydrograph of Outfall Stage Pre - Retrofit

c. Physical

(1) **Monumented Cross Sections -** The physical stream assessment consists of evaluating the six monumented cross sections and 28 sections for stream physical character, shape, and slope. Physical data collection stations are shown in Figure 12.

Results from this year's monumented, cross-section data collection are provided in Appendix E. Since this monitoring effort is in part designed to detect changes to the stream system over time, staff compared results from this year, at the six permanent cross-sections with results from 2000, the initial year this type of monitoring was initiated.

There does not appear to be large-scale degradation or aggradation of the stream channel in the last thirteen years. At Cross Section 1, located approximately 500 feet downstream of the pond outfall, the left bank has moved approximately two feet to the west, but has not experienced any down-cutting. The right edge has been aggraded at this location and now has a much steeper bank. This section is located approximately 200 feet downstream of a road culvert, and just upstream of the input location from the West Branch Stormwater Management Pond.

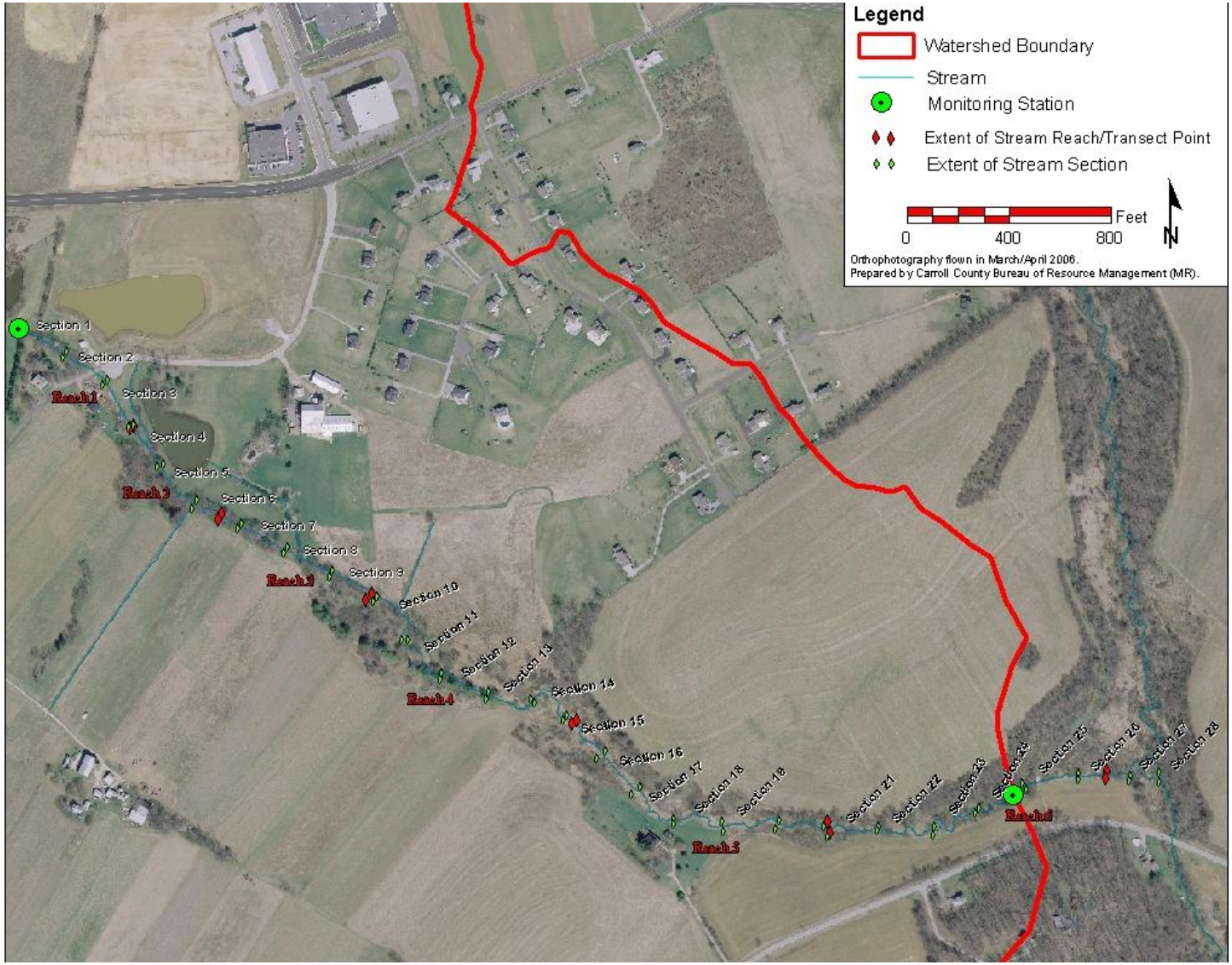


Figure 12: Physical Data Collection Stations

Cross Sections 2 and 3 are generally unchanged since 2000, with only minor changes in stream channel shape. Section 4, located approximately 65 feet downstream of a series of bends and two draws, shows evidence of aggradation of the channel since 2000. The channel bottom and associated floodplain have been elevated by almost one (1) foot since 2000. In the past year, the channel bottom has widened slightly cutting the left bank. Section 5 is essentially unchanged since 2000. However, the right bank has moved west by approximately one foot while the left bank has moved east to narrow the channel slightly.

Consistent with past findings, analysis at monumented Cross Section 6 indicates that the stream channel has widened by four (4) feet since 2000, extending from a width of five (5) feet to a width of nine (9) feet. This width is unchanged during the past several years. This monumented cross-section is located approximately 200 feet upstream of the confluence on a straight reach of stream that precedes a series of bends. As is discussed below, this region of the stream has the steepest slope and corresponding highest energy for stream bank erosion. Bank soils in this area are of the Manor Series, which is characterized as highly erodible (USDA, 1969).

(2) **Cross Section Stations** – Figure 13 depicts the longitudinal profile of the stream based on results of survey at the 28 cross-section locations. Also included in this figure are stream gradient calculations for the 2012 and 2003 report years for reference. These locations are spaced at approximate 200-foot intervals for consistent gradient calculations. Overall, the slope of the stream channel is gentle, only exceeding 2% at Station 28. Very little change in gradient has occurred over the years as evidenced by comparing the 2003 to 2013 data.

In this figure, increases in gradient between stations are indicative of higher energy and potential for increased channel scour. Station 28 is representative of this type of environment. The cross-section at this location shows bank erosion over the past year, but the channel bottom has not shown evidence of significant scour as shown in the small change in gradient between 2003 and 2013.

Conversely, decreases in gradient between stations are indicative of low energy and potential deposition. Station 14 is indicative of this type of gradient, with a very gentle 0.03% slope and channel bottom deposition. The 2012 cross-section indicated that the right bank had aggraded almost one foot in the past year and the filling of almost 2 feet of stream on the right side. The 2013 cross-section indicates a gently sloped right bank. This feature change may be due to bank sloughing and the cause of the observed aggraded stream channel. This section is located about 250 feet upstream of monumented reach 4, which also showed evidence of aggradation in the channel consistent with a low-energy environment.

Table 9 (Cross-Section Station Survey Data) shows the gradient between each of the 28 stations for the period 2007 through 2013. Overall, little change is occurring in the stream channel geometry, based on an analysis of the 28 stream channel cross-sections. However, since the stream has two (2) small tributaries, varying bends and straight segments, as well as a number of soils series represented along the channel, it is important to monitor the physical characteristics of the stream channel over time.

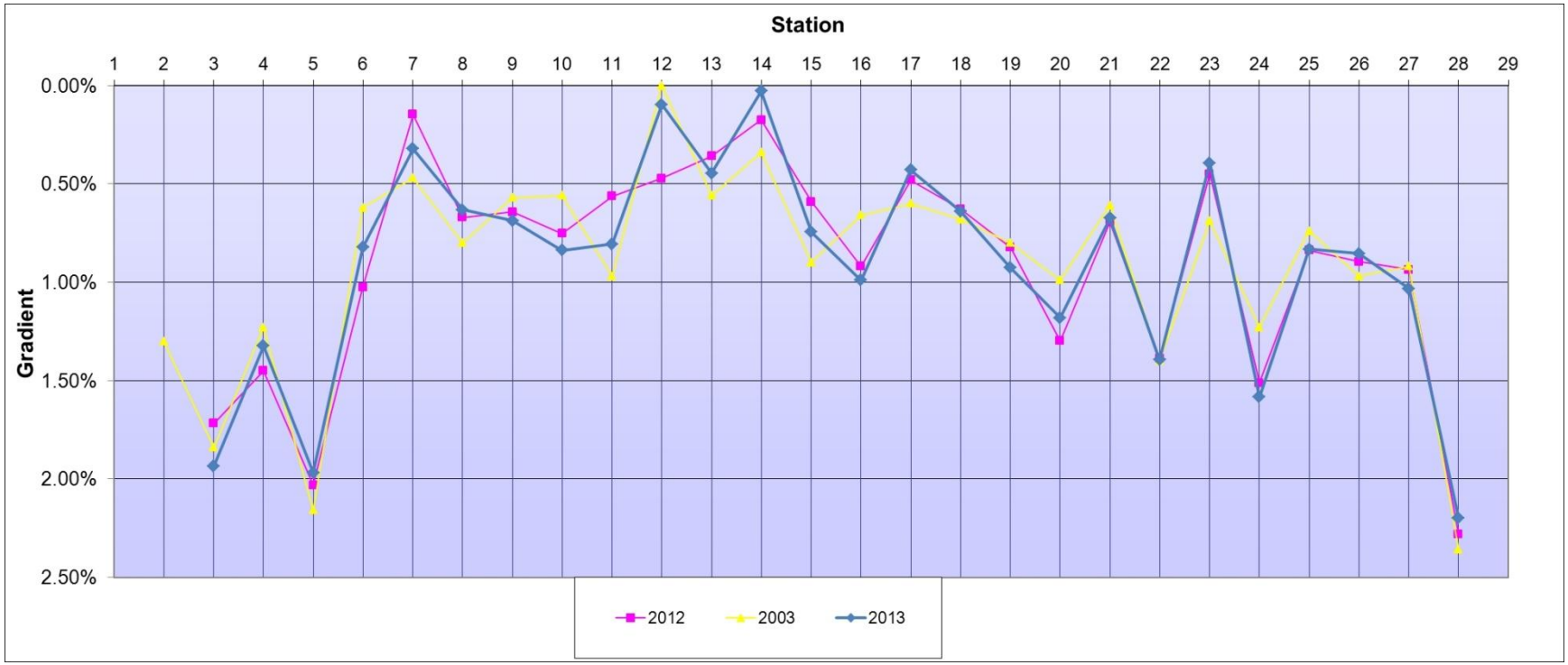


Figure 13: Stream Station Gradient

Table 9: Cross Section Station Survey Results 2007 through 2013

		Cummulative Distance (feet)	2013		2012		2011		2010		2009		2008		2007	
Station Number	Station Distance (feet)		Elevation	Gradient	Elevation	Gradient	Elevation	Gradient	Elevation	Gradient	Elevation	Gradient	Elevation	Gradient	Elevation	Gradient
1	N/A								730.89		730.89		730.89		730.65	
2	200.78	201	728.06		728.04		728.09		728.01	1.43%	728.04	1.42%	728.01	1.43%	727.97	1.33%
3	192.75	394	724.33	1.94%	724.73	1.72%	724.60	1.81%	724.58	1.78%	724.38	1.90%	724.56	1.79%	724.44	1.83%
4	197.97	592	721.71	1.32%	721.86	1.45%	722.05	1.29%	722.06	1.27%	721.64	1.38%	721.49	1.55%	721.29	1.59%
5	194.54	786	717.88	1.97%	717.91	2.03%	717.84	2.16%	717.78	2.20%	717.81	1.97%	717.81	1.89%	717.86	1.76%
6	201.90	988	716.22	0.82%	715.84	1.03%	716.56	0.63%	716.73	0.52%	716.56	0.62%	716.61	0.59%	716.54	0.65%
7	196.20	1184	715.59	0.32%	715.55	0.15%	715.56	0.51%	715.58	0.59%	715.67	0.45%	715.70	0.46%	715.64	0.46%
8	204.08	1388	714.30	0.63%	714.18	0.67%	714.23	0.65%	714.28	0.64%	714.38	0.63%	714.24	0.72%	714.22	0.70%
9	200.57	1589	712.92	0.69%	712.89	0.64%	712.93	0.65%	712.80	0.74%	712.89	0.74%	712.78	0.73%	712.79	0.71%
10	198.22	1787	711.26	0.84%	711.40	0.75%	711.61	0.67%	711.59	0.61%	711.80	0.55%	711.66	0.57%	711.38	0.71%
11	198.63	1986	709.66	0.81%	710.28	0.56%	709.81	0.91%	709.93	0.84%	710.07	0.87%	710.06	0.81%	710.06	0.66%
12	203.42	2189	709.46	0.10%	709.32	0.47%	709.14	0.33%	709.16	0.38%	709.22	0.42%	709.58	0.24%	709.48	0.29%
13	197.40	2386	708.58	0.45%	708.61	0.36%	708.60	0.27%	708.46	0.35%	709.02	0.10%	709.04	0.27%	709.12	0.18%
14	177.04	2564	708.53	0.03%	708.30	0.18%	708.20	0.23%	708.17	0.16%	708.11	0.51%	707.88	0.66%	707.95	0.66%
15	143.74	2707	707.46	0.74%	707.45	0.59%	707.54	0.46%	707.02	0.80%	707.06	0.73%	707.06	0.57%	706.89	0.74%
16	203.15	2910	705.45	0.99%	705.58	0.92%	705.62	0.95%	705.44	0.78%	705.64	0.70%	705.55	0.74%	705.17	0.85%
17	195.26	3106	704.61	0.43%	704.64	0.48%	704.92	0.36%	704.78	0.34%	704.78	0.44%	704.48	0.55%	704.24	0.48%
18	192.58	3298	703.38	0.64%	703.43	0.63%	703.52	0.73%	703.62	0.60%	703.42	0.71%	703.27	0.63%	703.38	0.45%
19	191.83	3490	701.60	0.93%	701.85	0.82%	701.81	0.89%	701.75	0.97%	701.75	0.87%	701.48	0.93%	701.57	0.94%
20	214.23	3704	699.07	1.18%	699.07	1.30%	698.98	1.32%	698.90	1.33%	698.94	1.31%	698.92	1.19%	698.81	1.29%
21	191.45	3896	697.78	0.67%	697.74	0.69%	697.80	0.62%	697.73	0.61%	697.75	0.62%	697.69	0.64%	697.75	0.55%
22	204.29	4100	694.93	1.40%	694.91	1.39%	695.08	1.33%	694.70	1.48%	694.76	1.46%	694.78	1.42%	694.76	1.46%
23	220.23	4320	694.06	0.40%	693.92	0.45%	693.94	0.52%	693.90	0.36%	693.81	0.43%	693.73	0.48%	693.64	0.51%
24	190.59	4511	691.04	1.58%	691.04	1.51%	691.19	1.44%	691.17	1.43%	691.08	1.43%	691.10	1.38%	691.03	1.37%
25	206.54	4717	689.32	0.83%	689.31	0.84%	689.39	0.87%	689.35	0.88%	689.38	0.82%	689.41	0.82%	689.45	0.76%
26	215.51	4933	687.48	0.85%	687.38	0.90%	687.43	0.91%	687.38	0.91%	687.50	0.87%	687.59	0.84%	687.69	0.82%
27	204.12	5137	685.37	1.03%	685.47	0.94%	685.51	0.94%	685.44	0.95%	685.52	0.97%	685.45	1.05%	685.57	1.04%
28	111.36	5248	682.92	2.20%	682.93	2.28%	682.81	2.42%	682.80	2.37%	682.82	2.42%	682.70	2.47%	682.74	2.54%

d. Chemical

(1) Physical Water Data

Results of physical analyses of the sampling events for the in-stream and outfall stations are presented below in Tables 10 and 11, respectively.

Table 10: In-stream Station Physical Water Data

Event #	PH	Water Temp (F)	Conductivity
2012-04	7.8	53	330
2012-05	7.5	72	290
2012-06	7.5	71	320
2012-07	7.6	71	310
2012-08	7.4	66	270
2012-09	7.2	64	340
2012-10	9	60	260
2012-11	7.2	45	270
2012-12	7	46	300
2013-01	7.5	49	270
2013-02	7.7	44	350

Table 11: Outfall Station Physical Water Data

Event	PH	Water Temp (F)	Conductivity
2012-04	8.8	56	450
2012-05	8.1	77	260
2012-06	8.4	79	240
2012-07	7.7	80	200
2012-08	8.6	75	190
2012-09	9.5	70	200
2012-10	8.8	61	220
2012-11	8.6	42	200
2012-12	8.3	45	300
2013-01	8.2	48	600
2013-02	9	43	660

The outfall station generally experienced higher water temperature, conductance, and pH values when compared to the in-stream station. Temperature differences ranged from 9°F during baseflow sampling events on July 31, 2012, and August 30, 2012, to 1°F during multiple sampling dates. The higher temperatures are most likely due to two main physical factors. First, solar heating of the pond surface is increasing outfall water temperature in spite of the fact that

the retrofit included a drain from the base of the pond. Second, cool groundwater inputs to the stream between the outfall and in-stream stations may be moderating the in-stream water temperature.

Conductance at the Outfall station ranged from 190 mOhm/cm to 660 mOhm/cm. The in-stream conductance readings ranged from 260 mOhm/cm to 350 mOhm/cm. The Outfall station recorded higher conductivity readings during the winter and spring. This is most likely due to road salting operations in the urbanized watershed that drains to the pond.

Outfall station pH readings range from 9.5 to 7.7, with an average pH of 8.54. The In-stream station ranges from 9.0 to 7.0, with an average pH of 7.58. Higher pH readings at the outfall may be due to local goose populations that have nested near the stormwater facility and natural biological activity occurring within the pond.

(2) Event Mean Concentrations (EMC)

Event Mean Concentrations (EMCs) were calculated by the County, based on results of analytical sampling and continuous flow measurements. Sampling and continuous flow measuring methodologies are presented above.

EMC ranges for data collected during the reporting period for each analyte from the Outfall station are provided in Table 12, while EMC ranges for data collected during the reporting period for each analyte from the In-stream station are presented in Table 13.

The EMCs used for these tables are those at the detection limit for each analyte. EMC ranges for all analyses performed at the outfall station for the 2008 through 2013 reporting periods are shown in Table 14 by reporting year. EMC ranges for all analyses performed at the in-stream station for the 2008 through 2013 reporting periods are shown in Table 15 by reporting year.

Table 12
Outfall EMC Range for the Reporting Period

OUTFALL		RANGE	
ANALYTE	UNITS	MIN	MAX
Biological Oxygen Demand	mg/L	4.00	12.00
TKN	mg/L	0.04	2.80
NO2/NO2	mg/L	0.03	1.04
Phosphorus	mg/L	0.03	0.19
TSS	mg/L	5.00	60.15
Copper	µg/L	2.00	6.23
Lead	µg/L	2.00	2.00
Zinc	µg/L	10.00	40.70
TPH	mg/L	5.00	5.00

Table 13
In-stream EMC Range for the Reporting Period

INSTREAM		RANGE	
ANALYTE	UNITS	Min	Max
Biological Oxygen Demand	mg/L	4.00	7.00
TKN	mg/L	0.13	1.51
NO2/NO2	mg/L	0.82	6.80
Phosphorus	mg/L	0.01	0.48
TSS	mg/L	1.00	169.71
Copper	µg/L	2.00	9.46
Lead	µg/L	2.00	4.20
Zinc	µg/L	10.00	38.50
TPH	mg/L	5.00	7.00

Table 14
Outfall Station EMC Ranges for 2008 through 2013 Reporting Periods

OUTFALL	UNITS	2008		2009		2010		2011		2012		2013	
ANALYTE		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Biological Oxygen Demand	mg/L	2.00	14.00	2.00	8.00	3.00	7.00	2.00	38.40	3.00	38.27	4.00	12.00
TKN	mg/L	0.50	2.20	0.50	2.10	0.70	2.04	0.67	3.10	0.50	1.70	0.04	2.80
NO2/NO2	mg/L	0.02	0.72	0.14	0.85	0.05	1.01	0.02	0.99	0.04	1.20	0.03	1.04
Phosphorus	mg/L	0.04	0.38	0.05	0.09	0.03	0.19	0.03	0.73	0.04	0.21	0.03	0.19
TSS	mg/L	4.00	85.84	5.00	51.50	3.00	39.68	3.00	276.18	4.00	43.00	5.00	60.15
Copper	µg/L	2.00	9.06	2.00	5.71	2.00	4.79	2.00	7.29	2.00	4.29	2.00	6.23
Lead	µg/L	2.00	84.50	2.00	2.00	2.00	2.23	2.00	5.22	2.00	2.00	2.00	2.00
Zinc	µg/L	10.00	89.10	13.00	28.61	10.00	43.79	10.00	39.53	12.70	34.48	10.00	40.70
TPH	mg/L	1.00	5.00	5.00	5.30	0.56	5.00	0.31	5.00	0.54	6.00	5.00	5.00

Table 15
In-stream Station EMC Ranges for 2008 through 2013 Reporting Period

INSTREAM	UNITS	2008		2009		2010		2011		2012		2013	
ANALYTE		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Biological Oxygen Demand	mg/L	2.00	14.00	2.00	8.00	1.00	6.08	1.00	21.61	1.00	31.00	4.00	7.00
TKN	mg/L	0.50	2.20	0.50	2.10	0.50	2.29	0.50	2.03	0.50	1.86	0.13	1.51
NO2/NO2	mg/L	0.02	0.72	0.14	0.85	1.80	7.10	0.04	7.90	1.70	10.00	0.82	6.80
Phosphorus	mg/L	0.04	0.38	0.05	0.09	0.02	0.39	0.05	0.59	0.06	2.29	0.01	0.48
TSS	mg/L	4.00	85.84	5.00	51.50	4.00	193.00	1.00	292.40	3.00	198.35	1.00	169.71
Copper	µg/L	2.00	9.06	2.00	5.71	2.00	7.90	2.00	11.48	2.00	7.60	2.00	9.46
Lead	µg/L	2.00	84.50	2.00	2.00	2.00	3.73	2.00	7.08	2.00	4.04	2.00	4.20
Zinc	µg/L	10.00	89.10	13.00	28.61	10.00	38.30	10.00	38.96	10.00	39.50	10.00	38.50
TPH	mg/L	1.00	5.00	5.00	5.30	0.34	5.00	0.34	12.40	0.50	5.00	5.00	7.00

(3) Annual Pollutant Loads

A discharge hydrograph was created for the reporting period for the in-stream station based on continuous discharge monitoring conducted at this station. Baseflow is delineated on this hydrograph coinciding with a discharge rate of 700 gallons per minute (gpm). Therefore, all discharge greater than 700 gpm were considered storm flow.

Calculation of the total annual loads passing the in-stream station for each constituent were then completed converting the results from either micrograms per liter or milligrams per liter, to pounds per gallon. This result is multiplied by the annual flow in gallons to yield the total annual mass in pounds (Table 16). The total discharge volumes do not include periods of equipment failure or other error, as discussed in section 3b of this section.

Table 16
Annual Pollutant Loads at the In-stream Station

Discharge		BOD load lb/year	TKN load lb/year	N02/N03 load lb/year	Phosphorus load lb/year	TSS load lb/year	Copper load lb/year	Lead load lb/year	Zinc load lb/year	TPH load lb/year
180,558,073	BASEFLOW									
		6,028.47	904	9,344	75.36	7,536	3.01	3.01	22.61	7,536
174,563,099	STORM									
		7,955.65	1,239	1,901	590.12	223,683	9.90	5.45	47.60	7,285

(4) Seasonal Pollutant Loads

Seasonal pollutant load estimates for the in-stream station are provided in Table 17**.** These loads are calculated by deriving seasonal median concentrations for constituents and multiplying by the seasonal flow at the in-stream station.

Results indicate that approximately 70% of the annual phosphorus load occurred during the winter months when discharge volumes were high and only storm samples were collected.

The total suspended solids results indicate that 90% of this load was also delivered during the winter season and associated with higher discharges. This is to be expected since suspended solids are related to storm flows and erosion.

Table 17
Seasonal Pollutant Load Calculations for the In-stream Station

Discharge	SEASON	BOD load lb/year	TKN load lb/year	NO2/NO3 load lb/year	Phosphorus load lb/year	TSS load lb/year	Copper load lb/year	Lead load lb/year	Zinc load lb/year	TPH load lb/year
43,946,600	SPRING									
		1,467	220	2,348	51.36	3,668	0.734	0.734	5.03	1,834
74,814,580	SUMMER									
		2,498	812	2,997	37.47	3,747	1.249	1.249	13.11	3,122
127,225,536	FALL									
		4,248	531	6,584	21.24	3,186	2.315	2.124	16.14	5,310
109,134,456	WINTER									
		5,548	774	1,922	264.17	114,975	6.723	2.910	27.92	4,555

(5) Biological

A complete list of species found at each site and the frequency of their occurrence can be found in Appendix F. MBSS scoring criteria for the genus level benthic macro invertebrate Index of Biotic Integrity (IBI) for the Eastern Piedmont region of Maryland are shown in Table 18. An IBI score was calculated for each station by dividing the total score by the six metrics used for this index, thus deriving an average IBI score. Then, a corresponding narrative rating for each station was determined in accordance with Maryland Biological Stream Survey standards, which is shown in Table 19.

Table 18
MBSS Scoring Criteria for Genus Level Index of Metrics for the Piedmont Region

	Score		
	5	3	1
Number of Taxa	≥25	15-24	<15
Number of EPT	≥11	5.0-10.0	<5
Number Ephemroptera	≥4	2.0-3.0	<2
% Intolerant Urban (Tolerance values 0-3)	≥51	12.0-50	<12
% Chironomidae	≤4.6	4.7-63	>63
% Clingers	≥74	31-73	<31

Table 19
Average IBI Score Range, Corresponding Narrative Ratings, and Interpretations

IBI Score Range	Corresponding Narrative Rating	Interpretation
4.0-5.0	**Good**	Comparable to reference streams considered to be minimally impacted.
3.0-3.9	**Fair**	Comparable to reference conditions, but some aspects of biological integrity may not resemble the qualities of these minimally impacted streams.
2.0-2.9	**Poor**	Significant deviation from reference conditions, with many aspects of biological integrity, not resembling the qualities of these minimally impacted streams, indicating some degradation.
1.0-1.9	**Very Poor**	Strong deviation from reference conditions, with most aspects of biological integrity, not resembling the qualities of these minimally impacted streams, indicating severe degradation.

In 2013, the average biological assessment score for the outfall MBSS monitoring site was 2.67, as seen in Table 20. This result corresponds to a narrative rating of poor. The average biological assessment score for the in-stream MBSS monitoring site was 3.33, as seen in Table 21. This score corresponds to a narrative rating of fair.

Table 20
IBI Score for outfall Station

Metric	Result	Score
Number of Taxa	26	5
Number of EPT	0	1
Number Ephemroptera	0	1
% Intolerant Urban	22	3
% Chironomidae	38	3
% Clingers	61	3
	Total Score	***16***
	Average	***2.67***
	Result	**Poor**

Table 21
IBI Score for In-stream Station

Metric	Result	Score
Number of Taxa	26	5
Number of EPT	2	1
Number Ephemroptera	6	5
% Intolerant Urban	9	1
% Chironomidae	30	3
% Clingers	82	5
	Total Score	***20***
	Average	***3.33***
	Result	***Fair***

From 2001 to 2013, the outfall monitoring site has remained in very poor to poor condition. Scores for the in-stream station have varied greatly, with 2011 yielding the lowest score in 12 years. Results from 2013 indicate continued improvement. The trend in IBI for each station during the period 2001 through 2013 is shown graphically in Figure 14.

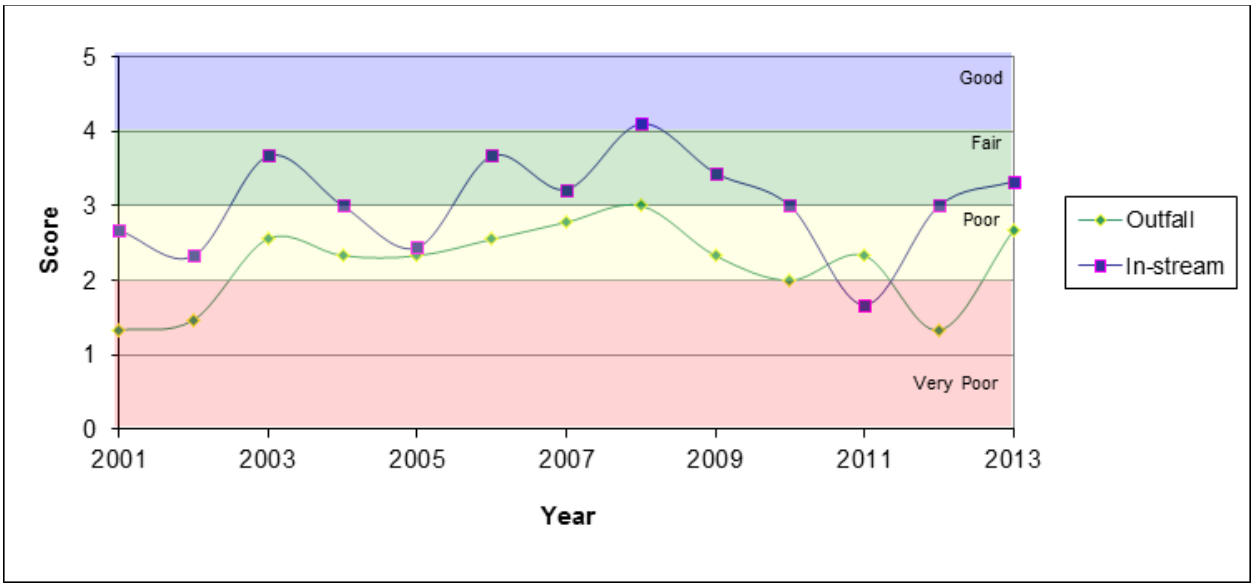


Figure 14: Macroinvertebrate IBI Analysis 2001-2013

A large percentage of *Chironomidae* species, along with few or no *Ephemeroptera*, *Plecoptera* or *Trichoptera* species, at both sites contributed to low scores.

The 2013 spring habitat assessment total score for the outfall station was 62 out of 160. This result equates to 39% of the highest possible score. The spring habitat assessment total score for the in-stream station was 91 out of 160. This result equates to 57% of the highest possible score. These results are summarized in Table 22.

Table 22
Spring Habitat Assessment Results 2013

PARAMETER	Outfall	Instream
Instream Habitat	6- marginal	10- sub-optimal
Epifaunal Substrate	8- sub-optimal	11- sub-optimal
Velocity/Depth Diversity	8- marginal	12- sub-optimal
Pool/Glide/Eddy Quality	5- marginal	10- sub-optimal
Riffle/Run Quality	6- marginal	11- sub-optimal
Embeddedness	6-marginal	10- marginal
Shading	6- marginal	10- marginal
Trash Rating	17- optimal	18- optimal
Total Score (max. of 160)	62	91
Score (Percent)	39	57

The total habitat assessment scores at the in-stream station have mostly increased since 2009. Scores at the outfall station do not appear to be forming any trends. Habitat assessments are subjective and do not consider stream gradient or geographic location. It is more likely that slight differences among scores are a result of the difficulties inherent in maintaining consistency

using this qualitative assessment. Changes over time in habitat assessment scores, given as a percentage, are shown in Figure 15.

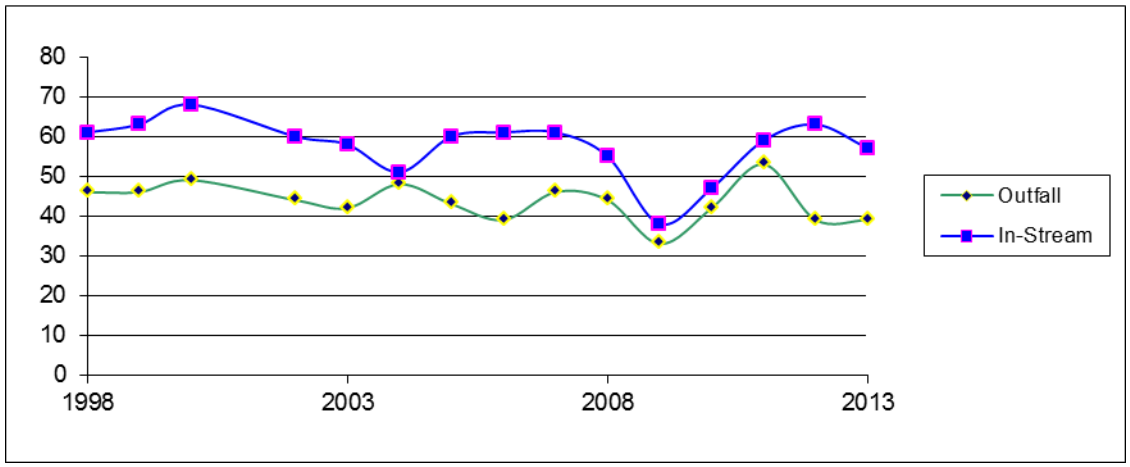


Figure 15: Habitat Assessment Scores As A Percentage Of The Total Score

Areas of eroded banks, little vegetative protection, and high levels of embeddedness contribute to the overall "marginal" rating for the outfall site. These characteristics can also be seen in the channel geomorphology within this stream segment: a straight channel of nearly constant depth and velocity that is slowly scouring the channel bottom over time.

The majority of scores for the in-stream site resulted in a "sub-optimal" ranking. Low diversity in stream velocity, depth, and flow regime contributed to the "marginal" scores for the in-stream site.

4. Proposed Changes to Monitoring Locations

a. Purpose

Carroll County is required to conduct a discharge characterization, as part of NPDES permit conditions, for the purpose of evaluating the efficacy of stormwater management. This component consists of monitoring the discharge from a stormwater management facility as well as impacts to the receiving water body. Since August 2000, Carroll County has been collecting data, downstream of the stormwater management facility associated with the Air Business Center just north of Westminster. This stormwater management facility was originally constructed as a wet pond in 1979 and was retrofitted as a wet pond with forebay to provide water quality, recharge volume, and channel volume protection in 2008.

The goal of this data collection was to assist the State of Maryland in developing a database of discharge data in order to characterize stormwater runoff associated with various stormwater management efforts. After 13 years of monitoring, the County is proposing a new site and stormwater management facility to evaluate.

b. Study Area

(1) The Greens of Westminster

The Greens of Westminster stormwater management facility discharges via a constructed outfall to a first order stream that is a tributary to Meadow Branch, which lies within the Double Pipe Creek Watershed (02140304). The facility's watershed is 138.5 acres with 39.9 impervious acres. Figure 16 shows these watershed features and a location map. The stream receives the majority of water from the pond, with contribution from overland flow from the drainage basin during precipitation events. The existing stormwater management pond was construction in the mid-80's. Planning is currently underway to bring the pond up to current standards. Construction is anticipated to begin in 2016.

Two years of pre-retrofit monitoring, as described in the Assessment of Controls (Part III.H.) of the permit, is proposed approximately 200 feet downstream of the stormwater facility outfall. Chemical data and continuous flow data will be monitored. After construction, monitoring will resume in order to compare stream conditions and water quality before and after construction. During the period of pre-construction, a geomorphic assessment will be undertaken annually, then biennially in subsequent years. The assessment will analyze the tributary to its confluence with Meadow Branch, which is approximately 3200 feet. A site for benthic sampling near the outfall will be selected and analyzed annually.

If permitted by property owners, a monitoring station to analyze the impacts to the receiving water body will be installed approximately 2500 feet from the outfall station. An additional benthic sampling site will be selected near this station. If permission to construct a monitoring station is not granted, the County proposes monitoring an additional stormwater facility outfall as described in the next section.

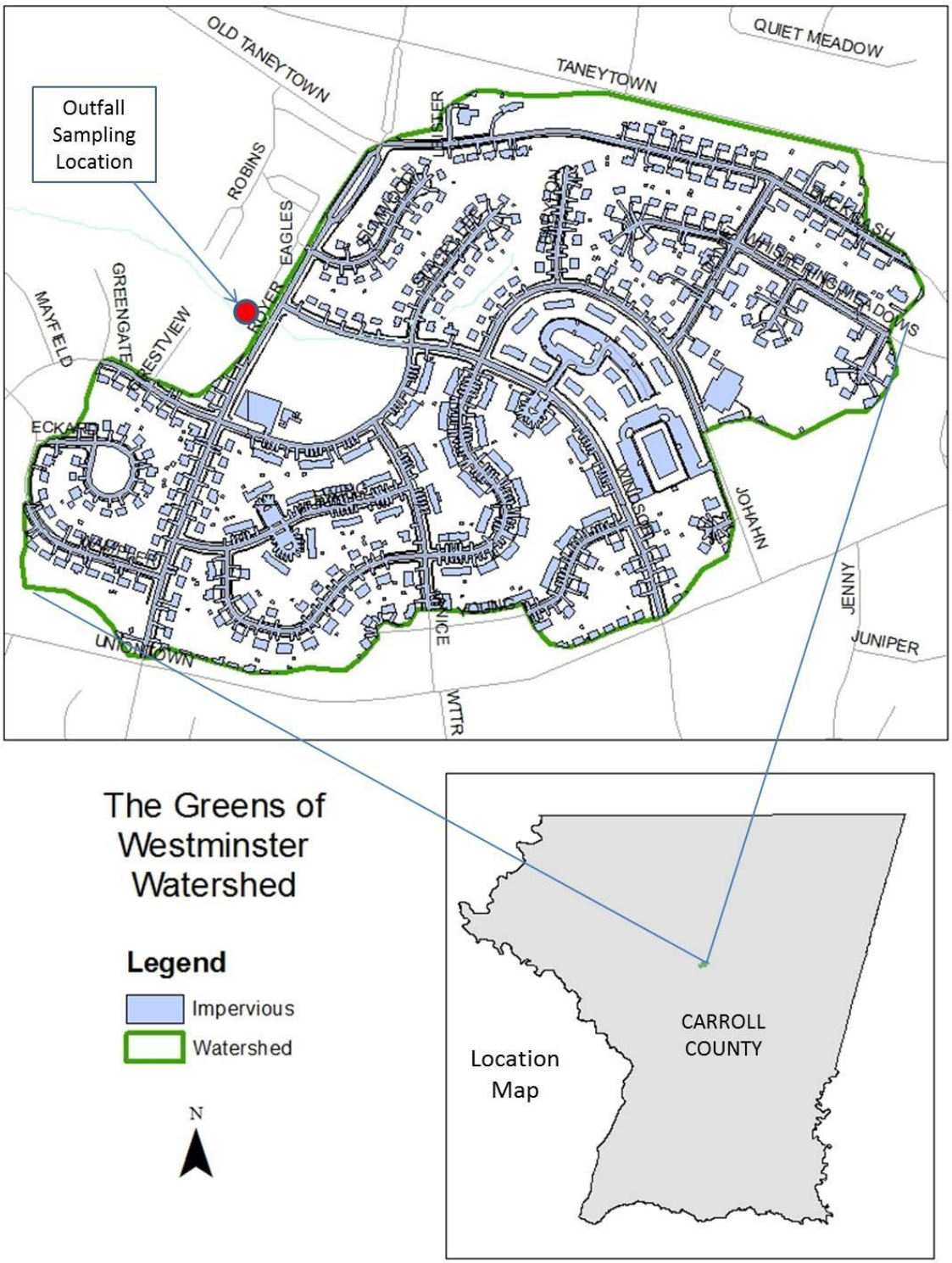


Figure 16: Location Map and Watershed Features

(2) Manchester/ Route 27 Alternatives

A future stormwater management facility is proposed to treat discharges via a constructed outfall to a first order stream that is a tributary to Big Pipe Creek, which lies within the Double Pipe Creek Watershed (02140304). The planned facility's watershed is 99.2 acres with 23.8 impervious acres. Figure 17 shows these watershed features and a location map. Planning is currently underway and construction is anticipated to begin in 2016.

Two years of pre-retrofit monitoring, as described in the Assessment of Controls (Part III.H.) of the permit, is proposed approximately 100 feet downstream of the future stormwater facility outfall. This monitoring will include chemical and continuous flow data. After construction, monitoring will resume in order to compare stream conditions and water quality before and after construction. During the period of pre-construction, a geomorphic assessment will be undertaken annually, then biennially in subsequent years. The assessment will analyze the tributary for 1000 feet from the outfall. A site for benthic sampling within this area will also be selected and analyzed annually.

Program Elements

The discharge characterization is implemented via the Assessment of Controls (Part III.H.) of the permit, which delineates specific data collection and analysis efforts to be undertaken. No additional changes are requested at this time.

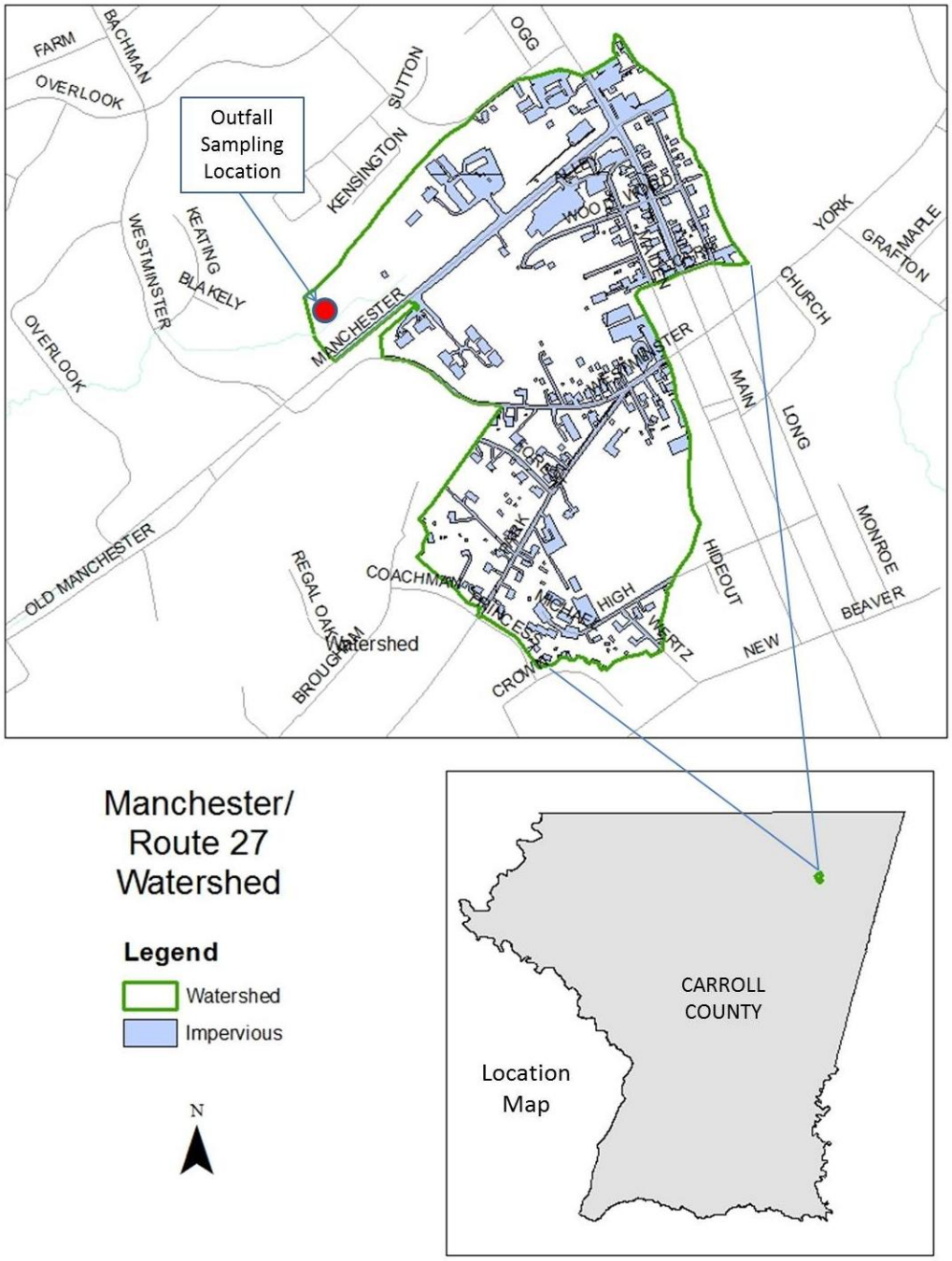


Figure 17: Location Map and Watershed Features

E. Management Programs

1. Stormwater Management

The County stormwater management program is the responsibility of the BRM within LUPD and implemented via Chapter 191 of the Carroll County Code of Public Local Laws and Ordinances. Design and review are the responsibility of the Program Engineer and the Stormwater Management Review Assistant. Carroll County consists of 289,677 acres of land, of which 11,453 acres are treated with stormwater management practices. This equates to 4.0% of the county's land area. Review and approval of stormwater management during the period of June 1, 2012, through May 31, 2013, consisted of 339 plans reviewed and 137 approved as-built inspections. There were no programmatic changes undertaken during the reporting period.

Residential stormwater management facilities and storm sewer systems in unincorporated areas are owned by the County Commissioners. Commercial and industrial facilities are maintained by the property owners. Database information on facilities located in Carroll County and an updated map are contained in Appendix B of this report.

Inspections of these facilities are handled by the EISD. Each facility is inspected every three years, with letters sent to the owner indicating the condition of the facility and the amount of time allowed for compliance to be achieved, if necessary. In the case of County-owned structures, the notice is sent to the Bureau of Facilities. The EISD performed 310 inspections this year, resulting in 118 corrective actions. Follow-up inspections are performed to ensure compliance has been achieved in a timely matter. As of this date 100 of those facilities have been brought into compliance. In cases where violations still exist, Notices of Violations are sent, allowing an additional amount of time to resolve issues. During the period of June 1, 2012, to May 31, 2013, 3 Notices of Violations were issued. The remaining 15 have been notified and ESID is awaiting corrective action.

2. Erosion and Sediment Control

The EISD of the BRM is responsible for inspection and enforcement of all related codes. MDE has delegated sediment control enforcement authority to Carroll County through June 30, 2015. Inspections statistics relating to building permits, grading permits, and forest-harvest grading permits during the reporting timeframe were as follows:

- 130 grading permits issued
- 1,841 sediment control inspections

All inspections are recorded, with notices sent for both violations and compliance. In 7 cases, Stop Work Orders were posted for severe violations, which in most instances required compliance within 36 hours.

As part of the NPDES permit requirement, grading permits issued with earth disturbance in excess of one (1) acre are reported to MDE quarterly.

During this reporting year, two (2) "responsible personnel certification" classes were held with 103 people in attendance. These classes were held on November 15, 2012 and May 7, 2013. "Green cards" were issued to 88 participants and database information was sent to MDE as required by the permit.

3. Illicit Discharge and Elimination

This program is administered by the BRM with outfall screening inspections in the County performed by the EISD and the NPDES Compliance Specialist. Major outfall screening maps were developed to assist the inspection staff with locating the outfalls. Currently outfall selections emphasize screening areas in the County with greater illicit discharge potential such as commercial and industrial land use areas, densely populated areas, and aging sewer infrastructure areas.

EISD staff participated in annual IDDE inspection training on November 27, 2012 prior to the inspection season. Current operating procedures were reviewed. These procedures will be reviewed, updated, and further developed for future use in the next permit year.

Visual inspections are performed to determine the condition of the outfall area, the existence of illicit discharges, and the condition of the storm drain system. If an illicit non-stormwater flow is determined, a notification is sent to the owner regarding corrective actions needed to alleviate the discharge violation per County Code, Chapter 105; Environmental Management of Storm Sewer System. If the problem is severe enough to warrant immediate correction, then an investigation begins immediately by inspection staff. If the results of a non-stormwater flow inspection or investigation are inconclusive, additional screenings may be prescribed as appropriate. Depending on the nature of the discharge, the case may be forwarded to an appropriate agency to resolve, such as the Carroll County Bureau of Permits and Inspections. When structural damage or maintenance needs are observed, the observations are reported to the suitable County agency or municipality.

Illicit discharge inspections must be conducted within both Phase I and Phase II jurisdictions. Based on previous discussions with MDE, it is understood that the required 100 inspections per permit year include Phase I areas in the unincorporated area and the Phase II areas in the incorporated municipalities. Staff conducted 102 routine outfall screenings with 65 in the County and 37 in the municipalities. Outfall screenings were distributed among seven watersheds as follows: Prettyboy (5), Loch Raven (2), Liberty (35), Patapsco River – South Branch (26), Lower Monocacy (6), Double Pipe Creek (24) and the Upper Monocacy River (4) (see outfall Map Appendix D). A total of three screenings required further investigative action, with one potential illicit discharge. Of the 102 inspections, 22 structural or maintenance observations were forwarded to the Carroll County Bureau of Roads; and 8 were sent to various municipalities.

Complaint driven illicit discharge/dumping events reported by the public or other agencies are also investigated by the EISD. A stormwater pollution phone line with NPDES information was added in June 2012 to the County website for easier reporting by the public. Complaint driven investigations are summarized in Appendix D.

4. County Property Management

Carroll County owns and operates a number of facilities that are classified as industrial. These facilities principally support the County's responsibilities to provide public infrastructure management, including: water and wastewater treatment, solid waste management, roads and facility maintenance, vehicle maintenance, and airport operations. Based on COMAR and the qualifications in 40 CFR 122, seven of the facilities require coverage under a General Industrial Storm Water NPDES permit. Table 23 below shows the status for those County facilities registered under the "Maryland General Discharge Permit for Storm Water Associated With Industrial Activities – Discharge Permit No. 02-SW." Throughout the permit year, a comprehensive evaluation of each Stormwater Pollution Prevention Plan (SWPPP) occurred for each facility resulting in updates and/or revisions for implementation and greater effectiveness for which they were designed.

Table 23
County NPDES Industrial Permitted Facilities Status - July 15, 2013*

Carroll County Facility	NOI Registration #	SWPPP Status	Responsibility/ Signatory
Regional Airport	02SW 1755	Current	Dept. of Public Works
Maintenance Facility **	02SW 1861	Current	Dept. of Public Works
Northern Landfill & Transfer Station	02SW 0660	Current	Dept. of Public Works
Hood's Mill Landfill (Capped/Closed) & Transfer Station	02SW 0661	Current	Dept. of Public Works
Hodges Landfill (Capped/Closed)	02SW 0664	Current	Dept. of Public Works
John Owings Landfill (Capped/Closed)	02SW 0665	Current	Dept. of Public Works
Bark Hill Landfill (Capped/Closed)	02SW 0662	Current	Dept. of Public Works

*MD General Discharge Permit For Storm Water Associated With Industrial Activities: Discharge Permit No. 02-SW
** SWPPP Includes BMP/Addendums for Salt Dome/Barn Operations (CMF, Bark Hill, Winfield, Hodges)

5. Road Maintenance (Including storm sewer system maintenance)

County storm sewer systems are inspected regularly, with maintenance performed on inlets and outfalls, as needed. The maintenance includes structural repairs, inlet cleaning, and outfall stabilization. The BRM supplies the Bureau of Roads Operations with up-to-date information on the conditions of storm drain systems countywide including a spreadsheet noting outfall maintenance needs discovered during IDDE screenings. This information is then used as a basis for regular inspection and maintenance reported to the NPDES Compliance Specialist.

The County Bureau of Road Operations does not use pesticides or herbicides for any road maintenance activities. All roadside maintenance efforts utilize manual or mechanical methods. The overall management of noxious weed occurrences along road right-of-ways and on private properties is implemented via an agreement with the Maryland Department of Agriculture

(MDA). Employees from MDA perform spot spraying along County right-of-ways as well as private lands for a fee.

Carroll County continues to develop alternative deicing and reduced-salt programs. The Bureau of Roads Operations' staff regularly participates in conferences and workshops that cover de-icing alternatives as part of the agenda. The County is continuing with a winter deicing program that emphasizes equipment maintenance, calibration and training in the fall and utilizes a process of pre-wetting salt use for more effective and efficient application.

6. Public Education

Public education takes many forms to ensure the citizens have access to information regarding environmental programs as well as general household environmental management. The County actively utilizes cable TV resources to place public service information on the television.

Carroll County also continues to make available information on County environmental programs and issues. Individuals are encouraged to report any evidence of illicit discharge or illegal dumping. Citizens can call the non-emergency Carroll County stormwater pollution phone line at 410-386-2210. Carroll County regularly informs contractors of their responsibility to secure an NPDES permit at construction sites. In addition, development review applicants are informed of the applicability of any state or federal permit to their project or facility. In connection with discharge complaints, facilities suspected of needing to secure an NPDES or other permit not administered by the County are referred to the applicable agency for investigation.

Carroll County Department of Public Works has a successful Solid Waste Recycling Program with an extensive public education web site under "Living Here" for its citizens.

In this reporting year, Carroll County again hosted residential household hazardous waste drop-off events for County residents. Two events took place during this annual reporting period, held on November 3, 2012 and April 13, 2013. These events also include a service to shred any paper records. Events such as these provide County residents a safe means of disposing of residual household chemicals, shredding of un-needed documents, and an opportunity to learn many ways in which to protect the environment. Collection of unused prescription and non-prescription drug "drop off" can be made to designated law enforcement agencies. The County also hosted a rain barrel and composting event on April 27, 2013 to provide rain barrels and composting bins to residents at reduced cost.

In Carroll County staff is continuously involved in environmental education efforts. LUPD staff regularly volunteer to speak at schools, community organizations, club meetings, and other venues in an effort to ensure that good and timely environmental information is available to the community. The Department website provides useful information on programs available to County residents and others.

The numbers of specific public education venues have increased during this permit year providing additional opportunities to distribute information related to stormwater management, water quality and other various environmental issues:

FALL SCHEDULE

- October 20th Taneytown Harvest Festival

SPRING SCHEDULE

- March 14th Envirothon Aquatic Education Instruction – High School Level
- April 20th Tree Planting/Environmental Education Day – Sykesville/Warfield Complex
- April 24th Envirothon Aquatic Education Instruction – High School Level
- April 22nd Earth Day–Carroll Hospital Center LUPD Share Table with Andrea/ Solar Farms
- April 27th Pretty Boy Reservoir/Watershed Day – Pretty Boy Dam Area
- May 5th Charlottes Quest Nature Center Spring Fest – Manchester
- May 10th Cherry Branch Stream Buffer Planting – Union Bridge
- May 11th Westminster Flower & Jazz Festival – Westminster
- May 17th Community Town Hall Forum – NPDES Program Overview and Stormwater Fee Education

SUMMER SCHEDULE

- July 27th thru August 2nd 4H FFA County Fair – Carroll County @ Westminster (Revise specific dates)

Carroll County continues to provide an open forum on environmental issues and concerns through its Environmental Advisory Council. This Commissioner-appointed citizen board meets monthly to address County and citizens' topics related to various environmental issues.

The Water Resource Coordination Council was formed in February 2007 through a cooperative partnership and by formal joint resolution to discuss and address issues related to water resources. This Council, composed of representatives from the eight municipalities, the County, and the Carroll County Health Department, discuss and collaborate on pertinent issues related to water, wastewater, and stormwater management. The monthly meetings provide an excellent venue for members to coordinate on various current issues. The Council took the lead in coordinating and developing the Water Resource Element, a joint document that the County and seven municipalities adopted. The Council discusses NPDES technical and administrative issues on a regular basis. The forum provides a much needed coordination mechanism for NPDES efforts across jurisdictional boundaries. Currently the Council also served as the local Watershed Implementation Plan (WIP) team for the development of Phase II WIP, and continues in this role to address WIP issues and tasks as they arise.

A dedicated NPDES webpage entitled "Protecting Carroll County Waters" found on the Carroll County Government website provides basic stormwater pollution prevention and education information with links to EPA and MDE NPDES related sites for additional information available to the public.

7. Compliance Status

County reorganization over the past several years found personnel and responsibilities in transition in numerous areas including those related to permit compliance. To strengthen and

guide NPDES compliance efforts, an annual work plan was developed. The work plan outlined tasks to ensure key permit requirements are met, including areas of training and inspections.

Annual NPDES training occurred in November of 2012 for County Public Works management/ supervisory level, SWPPP team members and Risk Management personnel responsible for permit compliance through SWPPP implementation. The training included an overview of the NPDES program, MS4 and industrial permitting requirements, and an instructional video covering Illicit Discharge Detection and Elimination, good housekeeping and spill prevention. These training records are kept and maintained by the County LUPD. Annual training is scheduled for July at each permitted facility for County employees having the possibility of interfacing with stormwater pollution in their work duties. Training includes classroom instruction and practical application. These training records are kept on-site at each facility. (During the permit year, visual, routine and annual inspections are being implemented for new plans and/or performed and recorded per each facility-specific SWPPP.) Inspection records are maintained on-site at each facility location.

On May 20, 2013 the County received a final EPA MS4 Program Inspection Report conducted in late April 2012.

8. External Management Review

During this permit year, URS Corporation provided outside technical support and assistance with SWPPP development including, Hood's Mill Landfill and Transfer Station and updates to both Carroll County Regional Airport and Maintenance Facility.

9. Permit Database

The Department maintains a computerized database of permits issued to the County. The system provides easy access to all of the permits for which Carroll County is responsible. It includes an e-mail notification system that alerts the responsible individual when commitments are pending, including permit renewals.

F & G. Watershed Restoration (F)/Watershed Assessment and Planning (G)

The above-referenced sections of the permit provide conditions for watershed improvements directed toward mitigation of impervious surfaces and water quality. Sections F.2 and F.3 require the restoration of 10% of the County's potential impervious acreage for mitigation covering the permit period (2005 – 2010) and the planning of 10% to be included in future permitting. As discussed Part I C.3., Impervious Surfaces, the County is in discussions with the State related to rural area impervious treatment. The county will use the 2011 acreage, 9,285 acres, as the baseline unincorporated impervious. Therefore 929 acres would be 10%, with an additional 10% planning number being 1858 acres.

Carroll County continues to vigorously apply its efforts at watershed restoration, i.e., impervious surface mitigation and water quality improvement. Projects are designed, managed and

implemented by LUPD, BRM through a capital improvement program: Watershed Assessment and Improvement National Pollutant Discharge Elimination System (NPDES). Funding levels for operating (administrative/technical functions) as well as capital (engineering and construction) is discussed in detail in Part III I. Projects are identified via the watershed assessment process. The current status of watershed planning can be found in Figure 18. This figure identifies the watershed along with the status of stream corridor assessments, watershed assessments, and the development of watershed restoration plans.

MAJOR WATERSHED	WATERSHED #	WATERSHED NAME	SCA	WATERSHED ASSESSMENT	WATERSHED RESTORATION
Liberty Reservoir	1046	Snowden's Run	2009-2010	2013	
	1047	Liberty Reservoir	2011-2012	2013	
	1048	Roaring Run/Board Run	2011-2012	2013	
	1049	Little Morgan Run	2011-2012	2013	
	1050	Morgan Run	2011-2012	2013	
	1051	West Branch Patapsco River	2011-2012	2013	
	1052	East Branch Patapsco River	2011-2012	2013	
	1053	Morgan Run	2011-2012	2013	
	1054	Morgan Run	2011-2012	2013	
	1055	Little Morgan Run	2011-2012	2013	
	1056	Middle Run	2011-2012	2013	
	1057	Beaver Run	2011-2012	2013	
	1058	Deep Run	2011-2012	2013	
	1059	East Branch Patapsco River	2011-2012	2013	
	1060	Aspen Run	2011-2012	2013	
	1061	Cranberry Branch	2011-2012	2013	
	1062	West Branch Patapsco River	2011-2012	2013	
Prettyboy Reservoir	0313	Poplar Run	2010-2011	2012	
	0314	Georges/Murphy Run	2010-2011	2012	
	0315	Grave/Indian Run	2010-2011	2012	
	0316	Gunpowder Falls	2010-2011	2012	
	0317	South Branch Gunpowder Falls	2010-2011	2012	
S Branch Patapsco	1020	South Branch Patapsco River	2013		
	1021	Piney Run	2003	2010	
	1022	South Branch Patapsco River	2013		
	1023	Piney Run	2003	2010	
	1024	Piney Run	2003	2010	
	1025	South Branch Patapsco River	2013		
	1026	Tuckers Branch	2013		
	1028	South Branch Patapsco River	2013		
	1029	Middle Run	2013		
	1030	Gillis Falls	2013		
	1031	Gillis Falls	2013		
		Completed			
		In Progress			

Figure 18. Status of Watershed Planning, Carroll County Maryland

The County continues to plan, design, and implement restoration projects including the following:

- Rehabilitation and upgrade of older existing stormwater management facilities to current standards;
- management of existing untreated impervious areas; and
- stream buffer tree planting initiatives.

The current status of restored impervious acres in Carroll County is depicted in Figure 19. The green line in Figure 19 indicates restoration acres, which as of July 2013 is approximately 1,227. The yellow line represents acres of impervious surface which are currently in design for restoration. The orange line represents future projects. The current restored acres equal approximately 13% of the 9,285 baseline acres. Figure 20 depicts the total drainage area acres treated by the restoration projects. Currently a total of 2,739 acres of drainage area have received water quality treatment to current standards via restoration projects.

The County completed, during the permit year 2012 – 2013, a total of 5 stormwater retrofit projects equaling 84 acres of treated imperviousness and 246 acres of treated drainage area. In addition 3 tree plantings associated with stream buffer enhancement were performed resulting in 5 acres equivalent acres of impervious treated. Specific projects completed (green), in design (yellow), and planned (orange) can be found in Table 24. An estimate of pollutant load reductions associated with select completed projects can be found in Table 25.

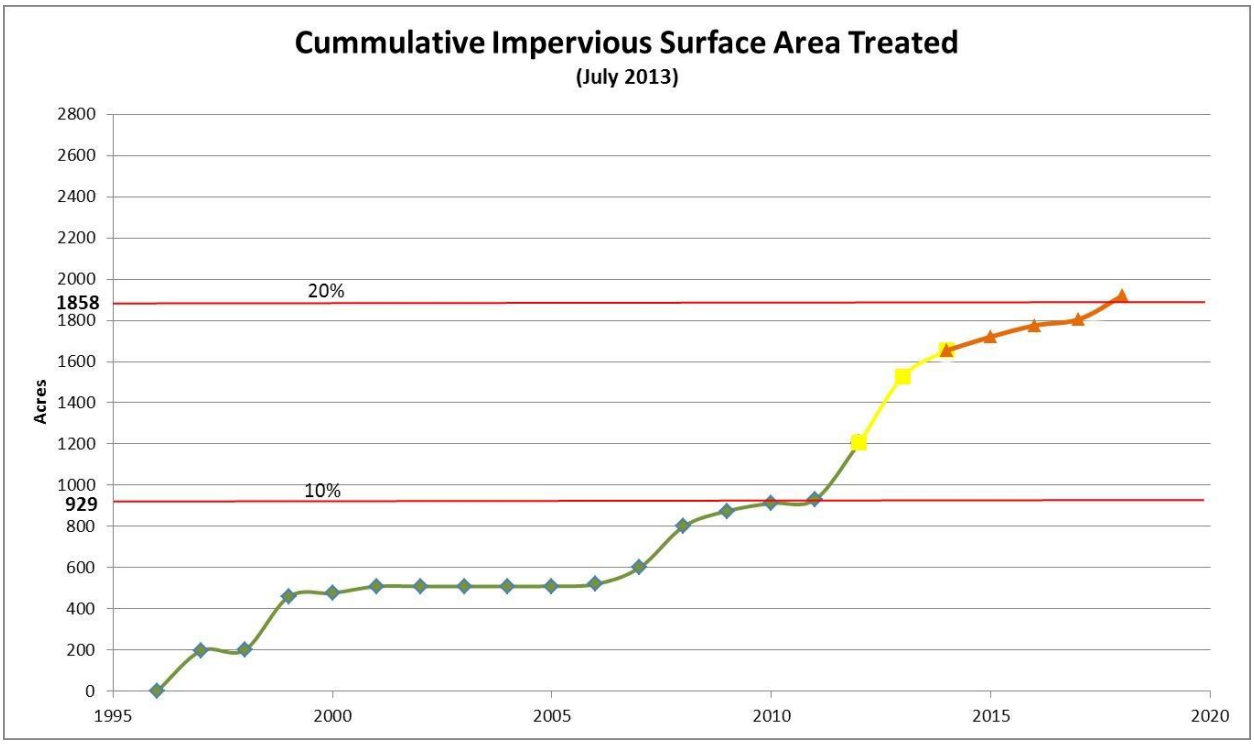


Figure 19. Impervious Surface Acres Treated For Constructed, Designed, And Planned Projects

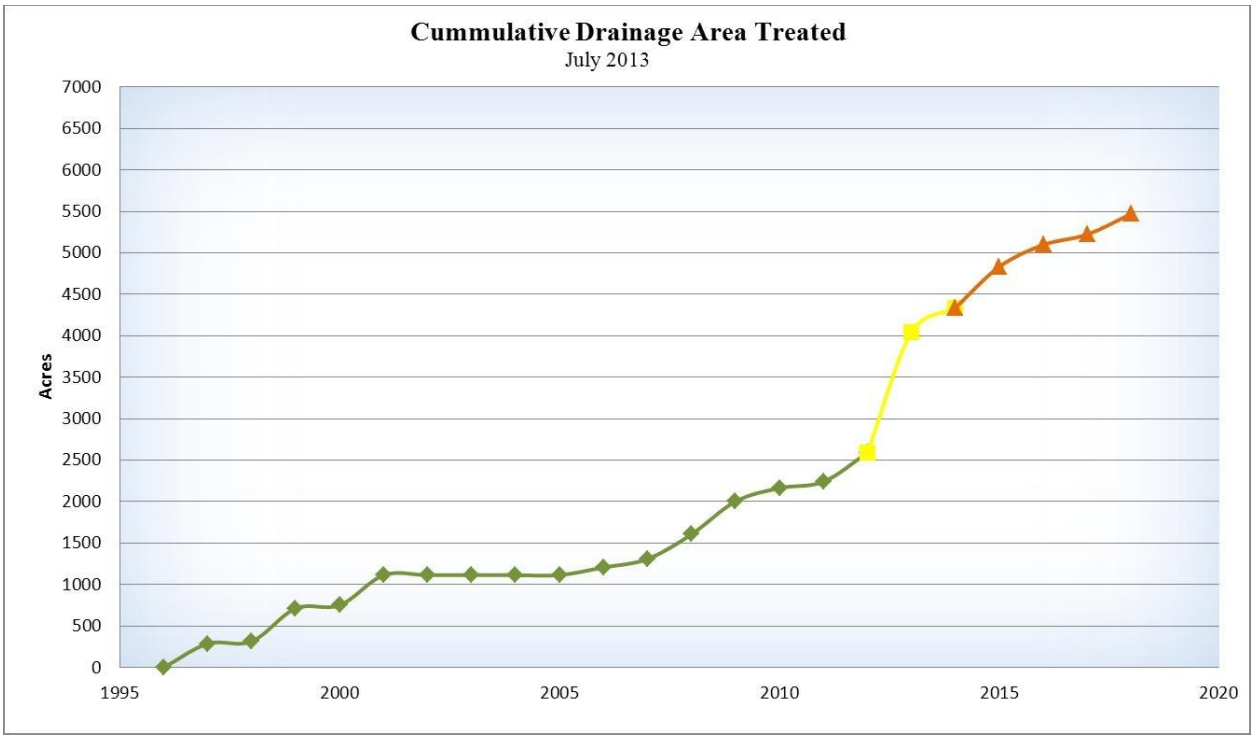


Figure 20. Drainage Area In Acres Treated For Construction, Design, And Planned Projects.

Table 24
Listing of Watershed Restoration Efforts, July 2013
NPDES

Year	Project Name	Project Type	Drainage Area	Project Status	County Treated Impervious	MDE8NAME
1996	Winter Street Shallow Marsh	Wetland Planting	0.00	Completed	0.00	Liberty Reservoir
1997	Longwell County Park Channel Restoration	Restoration	211.20	Completed	142.80	Liberty Reservoir
1997	Longwell County Park Wetland	Shallow Marsh	76.80	Completed	53.76	Liberty Reservoir
1998	Carroll County Times Channel Reconstruction	Restoration	6.60	Completed	0.50	Liberty Reservoir
1998	Carroll County Times SWM Retrofit	Dry Detention Pond	10.26	Completed	3.02	Liberty Reservoir
1998	East Middle School Water Quality Facility	Shallow Marsh	10.18	Completed	0.80	Liberty Reservoir
1999	Carroll County District Court	Retrofit	1.96	Completed	0.00	Liberty Reservoir
1999	Piney Run Channel Reconstruction	Restoration	397.04	Completed	258.07	Loch Raven Reservoir
2000	Carroll County MPC Parking Mgmt.	Retrofit	0.60	Completed	0.60	Liberty Reservoir
2000	Carroll County Times	Retrofit	0.30	Completed	0.30	Liberty Reservoir
2000	Carroll County Times Addition	Retrofit	6.80	Completed	0.00	Liberty Reservoir
2000	Piney Run Buffer Project	Riparian Buffer	0.00	Completed	0.40	Loch Raven Reservoir
2000	Ralph Street Facility	Water Quality Marsh	29.50	Completed	16.50	Liberty Reservoir
2001	Hampstead Valley 3 Dry Retention	Riser Structure Construction	79.19	Completed	32.27	Loch Raven Reservoir
2001	North Woods Trail Dry Retention Facility	Outfall Modification	236.80	Completed	0.00	Loch Raven Reservoir
2001	Roberts Field Wet Retention Pond Retrofit	Riser Structure Modification	47.20	Completed	0.00	Loch Raven Reservoir
2005	Eldersburg Elementary School	Retrofit	1.45	Completed	1.00	Liberty Reservoir
2006	Chung Project	Channel Stabilization	92.00	Completed	10.00	S Branch Patapsco
2007	Winfield Fire Department Addition	New Construction	3.13	Completed	0.22	S Branch Patapsco
2007	Englar Business Park	Retrofit	95.00	Completed	80.00	Liberty Reservoir
2007	Marriott Wood I Facility #1	Replace	3.00	Completed	0.56	Liberty Reservoir
2008	Neale Court Storm Drain	Retrofit	3.23	Completed	0.64	S Branch Patapsco

Year	Project Name	Project Type	Drainage Area	Project Status	County Treated Impervious	MDE8NAME
2008	Hickory Ridge	Retrofit	23.75	Completed	4.80	Liberty Reservoir
2008	Bateman SWM Pond	New Construction	47.25	Completed	7.40	Liberty Reservoir
2008	Marriott Wood I Facility #2	Retrofit	7.12	Completed	2.04	Liberty Reservoir
2008	Marriott Wood II	Retrofit	11.62	Completed	1.92	Liberty Reservoir
2008	Westminster Airport Pond	Retrofit	204.84	Completed	182.31	Liberty Reservoir
2008	Piney Run Planting (Filbe)	Buffer Planting	47.20	Completed	1.14	S Branch Patapsco
2008	Elderwood Village	Retrofit	15.28	Completed	4.94	Liberty Reservoir
2008	Collins Estate	Retrofit	32.68	Completed	6.36	Liberty Reservoir
2008	Arthur Ridge	Retrofit	51.17	Completed	5.14	S Branch Patapsco
2009	Rickell Property Tree Planting	Tree Planting	4.72	Completed	0.57	Double Pipe Creek
2009	Oklahoma II Foothills	Retrofit	23.72	Completed	6.06	Liberty Reservoir
2009	Oklahoma Phase I	Retrofit	24.44	Completed	7.27	Liberty Reservoir
2009	Deer Park Tree Planting	Buffer Planting	16.28	Completed	0.57	Liberty Reservoir
2009	Piney Run Planting (Bank Site)	Buffer Planting	23.84	Completed	2.09	S Branch Patapsco
2009	Arbor Valley Planting (Piney Run)	Buffer Planting	56.55	Completed	2.89	S Branch Patapsco
2009	Edgewood	Retrofit	38.00	Completed	12.12	Liberty Reservoir
2009	South Carroll High School - Fine Arts Addition	New Construction	28.19	Completed	14.32	S Branch Patapsco
2009	Naganna Pond	New Construction	24.50	Completed	10.00	Liberty Reservoir
2009	High Point	Retrofit	9.40	Completed	1.82	Liberty Reservoir
2010	Brimfield	Retrofit	34.69	Completed	17.23	S Branch Patapsco
2010	Hoff Pond	New Construction	77.30	Completed	2.98	Liberty Reservoir
2010	Piney Run Planting (Bank Site #2)	Buffer Planting	21.40	Completed	11.79	S Branch Patapsco
2010	Heritage Heights	Retrofit	21.40	Completed	4.10	Liberty Reservoir
2010	Campus Heights	Seepage Wetland System	27.98	Completed	5.71	Liberty Reservoir
2010	Quail Meadows	Retrofit	55.40	Completed	14.50	Liberty Reservoir
2010	Harvest Farms 1A	Retrofit	43.80	Completed	11.25	S Branch Patapsco
2010	Parrish Park	Retrofit	94.23	Completed	18.20	S Branch Patapsco
2010	Clipper Hills - Gardenia	Retrofit	33.19	Completed	11.08	S Branch Patapsco
2010	Clipper Hills - Hilltop	Retrofit	43.82	Construction	13.40	S Branch Patapsco
2010	Sun Valley	Retrofit	12.80	Completed	3.27	Liberty Reservoir
2012	Chrisman Property	New Construction	6.75	Construction	1.60	Liberty Reservoir
2013	Prettyboy Tree Plantings	Buffer Planting	15.69	Completed	1.06	Prettyboy Reservoir
2013	Lower Monocacy Tree Planting	Buffer Planting	11.85	Completed	4.09	Lower Monocacy

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Year	Project Name	Project Type	Drainage Area	Project Status	County Treated Impervious	MDE8NAME
2013	Bennett Cerf Tree Planting	Buffer Planting		Completed	0.25	Liberty Reservoir
2009	Westminster High School	New Construction	115.00	Construction	42.12	Liberty Reservoir
2013	Benjamin's Claim	Retrofit	47.10	Design	15.78	S Branch Patapsco
2013	Septic Pumping (updated yearly)			Completed	172.00	
	Totals		**2665.19**		**1225.61**	
2013	Westminster Community Pond	New Construction	250.22	Design	43.92	Liberty Reservoir
2013	Sullivan Road Regional Facility-Phase II	New Construction	67.38	Design	39.49	Liberty Reservoir
2013	Sullivan Road Regional Facility-Phase III	Retrofit	43.30	Design	15.36	Liberty Reservoir
2013	Finksburg Industrial Park	Retrofit	61.40	Design	22.12	Liberty Reservoir
2013	Windemere	Retrofit	457.00	Concept	93.00	Liberty Reservoir
2013	Friendship Overlook/Diamond Hills Section 2	Retrofit	82.01	Design	18.11	Double Pipe Creek
2013	Diamond Hills Section 5	Retrofit	51.80	Design	16.26	Liberty Reservoir
2013	Carrolltowne 2B	Retrofit	34.61	Design	10.38	S Branch Patapsco
2013	Carrolltowne Gemini Drive	Retrofit	87.73	Concept	34.43	S Branch Patapsco
2014	Elderwood Village Parcel B/Oklahoma 4 Ph IV	Retrofit	206.88	Design	87.28	Liberty Reservoir
2014	Eldersburg Estates 3-5	Retrofit	29.00	Design	10.50	S Branch Patapsco
2014	Miller/Watts	Retrofit	34.60	Design	24.90	Liberty Reservoir
2015	Jantz	New Construction	289.00	Concept	25.00	Double Pipe Creek
	Totals		**1694.93**		**440.75**	
2012	Melstone Valley	Retrofit	165.00		8.00	S Branch Patapsco
2014	Matthews Meadow	Retrofit	26.30		6.60	Liberty Reservoir
2015	Shannon Run/Hawks Ridge	Retrofit	208.00		41.00	S Branch Patapsco
2016	Eden Farms La Triomphe	Retrofit	168.00		35.00	Liberty Reservoir
2016	Whispering Valley Phase 4	Retrofit	95.00		19.00	Prettyboy Reservoir
2017	Squires	Retrofit	38.00		10.00	Liberty Reservoir
2017	Braddock Manor West	Retrofit	29.00		4.15	S Branch Patapsco
2017	Hunter's Crossing Section 2 #2	Retrofit	23.50		5.43	S Branch Patapsco
2017	Small Crossing/Versa Property	Retrofit	35.50		10.60	Prettyboy Reservoir
2018	Central Maryland (Dry Facility)	Retrofit	62.90		45.00	Liberty Reservoir
2018	Central Maryland (Wet Facility)	Retrofit	87.50		38.30	Liberty Reservoir

Year	Project Name	Project Type	Drainage Area	Project Status	County Treated Impervious	MDE8NAME
2018	Candice Estates	New Construction	39.00	Design	13.00	Lower Monocacy
2018	Springmount Estates	New Construction	60.00	Concept	20.00	Liberty Reservoir
	Totals		**1037.70**		**256.08**	
	Totals		**5397.82**		**1922.44**	

Table 25
Water Quality Improvements - Watershed Restoration Projects

					Pounds Reduced		
PROJECT NAME	LOCATION	MDE8NAME	DRAINAGE AREA	IMPERVIOUS AREA	TSS (lbs/year)	Total Phophorus (lbs/year)	Total Nitrogen (lbs/year)
Hickory Ridge	Velvet Run Drive	Liberty Reservoir	23.75	4.80	3.36	17.50	184.62
Bateman SWM Pond	Patapsco Road	Liberty Reservoir	47.25	7.40	5.88	32.14	364.86
Marriott Wood I Facility #2	Edenbrooke Court	Liberty Reservoir	7.12	2.04	1.04	4.23	28.02
Marriott Wood II	Fawn Haven Court	Liberty Reservoir	11.62	1.92	1.25	5.67	44.92
Westminster Airport Pond	Magna Way	Liberty Reservoir	204.84	182.31	51.26	173.14	438.10
Elderwood Village	Monroe Avenue	Liberty Reservoir	15.28	4.94	2.40	9.58	60.44
Collins Estate	Collins Avenue	Liberty Reservoir	32.68	6.36	3.81	16.79	126.88
Arthur Ridge	Laval Drive	S Branch Patapsco	51.17	5.14	3.35	16.53	97.97
Oklahoma II Foothills	Snowdens Run Road and Forest Lane	Liberty Reservoir	23.72	6.06	3.22	13.46	92.91

					Pounds Reduced		
PROJECT NAME	LOCATION	MDE8NAME	DRAINAGE AREA	IMPERVIOUS AREA	TSS (lbs/year)	Total Phophorus (lbs/year)	Total Nitrogen (lbs/year)
Oklahoma Phase I	Stillwater Court	Liberty Reservoir	24.44	7.27	3.64	14.77	96.32
Edgewood	Caren Drive and Cecil Way	Liberty Reservoir	38.00	12.12	2.40	9.58	60.44
Naganna Pond	Bethel Road	Liberty Reservoir	24.50	10.00	4.49	17.20	98.09
High Point	Oklahoma Road	Liberty Reservoir	9.40	1.82	1.30	6.83	72.98
Brimfield	Brimfield Circle	S Branch Patapsco	34.69	17.23	8.69	38.34	281.28
Hoff Pond	Bethel Road	Liberty Reservoir	77.30	2.98	5.26	29.06	293.27
Campus Heights	Campus Court	Liberty Reservoir	27.98	5.71	3.77	14.61	30.98
Quail Meadows	Fox Sedge Court	Liberty Reservoir	55.40	14.50	5.72	23.80	108.60
Heritage Heights	Advisory Court	Liberty Reservoir	21.40	4.10	2.48	10.94	83.05
Harvest Farms 1A	Cable Drive	S Branch Patapsco	43.80	11.25	4.47	18.68	85.80

					Pounds Reduced		
PROJECT NAME	LOCATION	MDE8NAME	DRAINAGE AREA	IMPERVIOUS AREA	TSS (lbs/year)	Total Phophorus (lbs/year)	Total Nitrogen (lbs/year)
Parrish Park	Caren Drive and Ryon Court	S Branch Patapsco	94.23	18.20	8.22	36.21	182.89
Sun Valley	Iroquois Drive Woodbine, MD	S Branch Patapsco	12.80	3.27	1.43	10.29	100.28
Clipper Hills Gardenia	Gardenia Street Eldersburg, MD	S Branch Patapsco	33.19	11.08	5.32	21.12	131.49
Clipper Hills Hilltop	MacBeth Drive Eldersburg, MD	S Branch Patapsco	43.82	13.40	6.63	26.81	172.90
Chrisman Property	Wilda Drive Westminster, MD	Liberty Reservoir	6.75	1.60	0.88	3.72	26.37
Westminster High School	MD Route 32 S Westminster, MD	Liberty Reservoir	115.00	42.12	19.58	76.48	457.70
Benjamin's Claim	Jay Road Eldersburg, MD	S Branch Patapsco	47.10	15.78	7.56	30.03	186.62
Total			1,127.23	413.40	167.40	677.49	3,907.79

Note *Nutrient reductions were derived from MDE's "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated – Guidance for NPDES Stormwater Permits" June (Draft) 2011.

H. Assessment of Controls

The requirements of this section have been included in Section D. Discharge Characterization.

I. Program Funding

The fiscal analysis illustrates how Carroll County continues program funding for compliance with Permit No. 99-DP-3319 (MD0068331). The analysis is intended to fulfill condition III.G.1 of the permit.

Carroll County employees have received no increases in salary since the last report. The only changes to this fiscal assessment have occurred in duty realignments, position upgrades, or title changes. Therefore information reported is the same as found in the 2012 Annual Report.

1. Operational Expenses

a. Specific Position Responsibilities

The following information estimates time spent by each Carroll County Government position on tasks related to compliance with the NPDES permit. In reality, due to the fact that the permit requires Carroll County to maintain an adequate stormwater management and the erosion and sediment control program, the totality of those elements of the budget should be included. However, since the stormwater management program is required by legislation and the Erosion and Sediment Control Program has been accepted by Carroll County by delegation, only a percentage related to NPDES compliance other than those programs has been reported. Each contributing function is identified by job title and indicates a percentage of time spent compared to their overall responsibilities. These expenditures are the sum of salary and fringe.

(1) **Deputy Director, Department of Land Use, Planning & Development** - The following general tasks are performed by the Deputy Director of Land Use, Planning & Development requiring approximately **30%** of the position's time:

- Administration of the permit;
- Report writing and compilation responsibility;
- Monitoring of project progress; and
- Any other necessary activity to ensure compliance.

*Total estimated expenditures ~**$31,850.00***

(2) **Chief, Bureau of Resource Management** –The following general tasks are performed by the Bureau Chief, requiring approximately **75%** of the position's time.

- Coordinates the BRM staff to perform tasks required under permit;
- Oversees and monitors the project progress; and
- Participates in watershed assessment process.

*Total estimated expenditure ~ **$68,905.00***

(3) **NPDES Compliance Specialist** – This position is **100%** dedicated to the NPDES MS4 compliance effort. The salary is funded through an agreement with the municipalities related to Phase II compliance. The position is responsible for the following tasks:

- Phase I and II storm sewer system mapping;
- Phase II illicit discharge elimination inspections;
- Liaison to the Maryland Department of the Environment;
- Coordinate, manage and implement Phase I and II permit regulation requirements in accordance with Federal, state and local laws;
- Coordinate with County/municipal personnel, other government officials, and citizens regarding NPDES compliance issues;
- Coordinate illicit-discharge inspections and routine surveys with County/municipal personnel to discover and eliminate pollutant sources;
- Design, coordinate, and maintain Geographic Information System (GIS) and Global Positioning System (GPS) applications for NPDES MS4 compliance; and
- Coordinate development of compliance education, training, and outreach programs.

Total estimated expenditure ~ ***$64,510.00***

(4) **Administrative Office Associate I -** The following general tasks are performed by the Administrative Office Associate I, requiring approximately **30%** of the position's time:

- Administrative support for the Deputy Director;
- Maintaining compliance deadline tickler system;
- Assisting in the preparation of Annual Report; and
- Tracking expenditures for NPDES projects.

Total estimated expenditure ~ ***$27,476.64***

(5) **Office Associate IV -** The following general tasks are performed by the Office Associate, requiring approximately **5%** of the position's time essentially in coordination of BRM staff support for the permit.

- Management of data base; and
- Coordination and scheduling of trainings.

Total estimated expenditure ~ ***$2,051.00***

(6) **Office Associate III -** The following general tasks are performed by the Office Associate supporting the inspection staff, requiring approximately **10%** of the position's time:

- Schedules environmental inspections, types related correspondence; and
- Tracks investigations related to compliance actions.

Total estimated expenditure ~ ***$4,736.62***

(7) Division Head – Environmental Inspection Services Division - The following are general tasks that are performed by the Division Head related to NPDES compliance. This requires approximately **30%** of the position's time:

- Phase I illicit discharge inspections;
- Coordination of regular site inspections;
- Phase I stormwater management facility maintenance inspections; and
- Stormwater management facility maintenance and other related enforcement action.

*Total estimated expenditure ~**$21,178.34***

(8) Environmental Inspectors (4 total) - The following general tasks are performed by the Environmental Inspectors related to NPDES compliance. They require approximately **25%** of one inspector's time:

- Regular illicit discharge inspections; and
- Field investigations.

*Total estimated expenditure (for all four inspectors) **$52,703.00***

(9) Stormwater Management Program Engineer - The following general tasks are performed by the Stormwater Management Program Engineer related to NPDES compliance. They require approximately 4**0%** of the position's time:

- Design activities on special projects; and
- Technical assistance related to permit compliance.

*Total estimated expenditure ~ **$49,970.00***

(10) Stormwater Management Review Assistant - The following are general tasks performed by the Stormwater Management Review Assistant related to NPDES compliance. They require approximately 6**0%** of the position's time:

- Maintenance inspections;
- Review of SWM plan submittals;
- Field monitoring of special projects; and
- Database management.

*Total estimated expenditure ~ **$54,717.00***

(11) Watershed Management Specialist - The following are general tasks performed by the Watershed Management Specialist related to NPDES compliance. The tasks require approximately 8**0%** of the position's time:

- Biological and physical data collection, interpretation, and reporting;
- Technical assistance;
- Watershed management planning and coordination for restoration activities; and
- Coordination and facilitation of local watershed groups.

*Total estimated expenditure ~ **$47,306.00***

(12) Watershed Restoration Specialist - The following are general tasks performed by the Watershed Restoration Specialist related to NPDES compliance. These tasks require approximately **80%** of the position's time:

- Design of stormwater management retrofit projects;
- Field management and contractor oversight during construction of stormwater retrofit projects;
- GIS data management; and
- General technical assistance.

Total estimated expenditure ~ ***$47,305.44***

(13) Groundwater Technician - The following are general tasks performed by the Groundwater Technician related to NPDES compliance. These tasks require approximately **80%** of the position's time:

- Watershed management planning;
- Biological and physical data collection, interpretation, and reporting; and
- Technical assistance.

Total Estimated expenditure ~ ***$42,916.00***

(14) Water Resource Technician - The following are general tasks performed by the Water Resource Technician related to NPDES compliance. These tasks require approximately **100%** of the position's time:

- GIS data input; and
- Field delineation of storm drains, drainage areas, and best management practices.

Total Estimated expenditure ~ ***$53,645.00***

(15) Water Resource Specialist - The following are general tasks performed by the Water Resource Specialist to NPDES compliance. These tasks require approximately **80%** of the position's time:

- Coordination and facilitation of local watershed groups;
- Watershed management planning; and
- Biological and physical data collection, interpretation, and reporting.

Total Estimated expenditure ~ ***$30,440.00***

(16) Floodplain Management Specialist - The following are general tasks performed by the Floodplain Management Specialist related to NPDES compliance. These tasks require approximately **80%** of the position's time:

- GIS data input;
- Field delineation of storm drains, drainage areas, and best management practices; and
- Prepares GIS maps and information for watershed planning.

Total estimated expenditure ~ ***$51,608.00***

(18) **Forest Conservation Specialist -** The following are general tasks performed by the Forest Conservation Specialist related to NPDES compliance. These tasks require approximately **10%** of the position's time:

- Provides technical assistance with buffer and tree plantings on public and private properties; and
- Watershed Management Planning.

Total estimated expenditure ~ ***$6,589.00***

The total estimated salary expenditure for personnel in the 2012/2013 permit year $657,907.04

b) New Position – The two positions listed below have been approved by the Board of commissioners and will be added to staff within the BRM during Fiscal Year 2014. The positions will be dedicated to work items associated with NPDES compliance.

Watershed Grant Analysis - This position will be responsible for securing financial assistance through various sources (i.e. non-profit organizations, State/Federal, private). Working with homeowners on small projects associated with the grants and reporting associated with any grants received. This position will also be responsible for newsletters and website information for keeping the public informed about the County's efforts related to improving our water quality. (**100%** of this positions time will be NPDES related.)
Estimated Cost: ***$48,004.32***

Water Resource Specialist - The following are general tasks performed by the Water Resource Specialist to NPDES compliance. (Approximately **80%** of this positions time will be NPDES)

- Coordination and facilitation of local watershed groups;
- Watershed management planning; and
- Biological and physical data collection, interpretation, and reporting.

Estimated Cost: ***$54,436.20***

c) Supplies and Contract Services

General supplies necessary to support the NPDES MS4 program for 2012/2013 permit year including educational and training materials, signs, banner, chairs for education booth, registration for community events, storm water video.
$2,077.00

Test kits and strips for outfall monitoring, chemicals, physical and biological monitoring analysis for the 2012/2013 permit year.
$8,825.33

Total expenditures for supplies and contract services in the operating budget for 012/2013 permit year. $10,902.51

d) Stormwater Pond Maintenance

The annual maintenance cost of ***$120,614.19*** for County stormwater management facilities was necessary to meet NPDES compliance.

Contractor Cost for 2011/2012	***$19,939.50***
County Labor Cost +30%	***$21,364.69***
Equipment (same no change)	***$79,040.00***
Total maintenance cost for stormwater management facilities in permit year 2012/2013	***$120,344.19***

$778,251.23 Total Operating expenditures for 2012/2013 permit year

2. Capital Expense

A capital budget was established early in the program to support compliance needs for the County's NPDES MS4 permit responsibilities. Capital expenditures in this program are principally associated with the permit's Watershed Assessment and Restoration requirements.

Watershed Assessment and Improvement project appropriation for 2012/2013 permit year: ***$3,045,000.00***

Capital expenditures for the program by year as well as total to date can be found in Table 26. Table 27 and Table 28 provides the approved 2014 – 2019 Community Investment Plan estimates for program funds. It is important to note that funding beyond the current year FY14 is subject to future budget review and approval processes. Therefore no guarantee is made to future appropriations beyond FY14.

Table 26
Carroll County, Maryland –Total NPDES MS4 Capital Expenditures
July 15, 2005 through May 30, 2013

Permit Year	Capital Expenditure
7/15/05 to 6/30/06	$36,040.19
7/1/06 to 6/30/07	$53,593.00
7/1/07 to 6/30/08	$1,978,829.14
7/1/08 to 5/30/09	$816,823.30
7/1/09 to 5/30/10	$1,744,986.91
7/1/10 to 6/30/11	$672,479.04
7/1/10 – 6/30/11	$23,269.00
7/1/11 to 6/30/12	$1,635,671.32
7/1/12 to 6/30/13	$1,012,067.26
Total permit expenditures, to date	***$7,973,759.16***

- Capital expenditures beginning in 2008 and subsequent years include project costs associated with the Stormwater Management Facility Maintenance Program.

Table 28; Environmental Compliance is being used to fund the items listed below:

URS - Assistance with SWPPP and SPCCP plans for County facilities:

Maintenance Center - July 1, 2012 – December 2012	**$14,218.94**
Carroll County Regional Airport	**$10,178.00**
Hoods Mill Landfill	**$ 2,189.05**
	$26,585.99

$1,038,653.25 Total Capital expenditures for 2012/2013 permit year

Approved Community Investment Plan 2014 – 2019

Table 27
Watershed Assessment and Improvement (NPDES)

	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	Prior Allocation	Balance to Complete	Total Project Cost
Engineering/Design	295,000	150,000	165,000	170,000	175,000	175,000			**1,130,000**
Land Acquisition									**0**
Site Work									**0**
Construction	2,750,000	2,883,000	3,000,000	3,180,000	3,300,000	3,500,000			**18,613,000**
Equipment/Furnishings									**0**
Other									**0**
EXPENDITURES									
TOTAL	**3,045,000**	**3,033,000**	**3,165,000**	**3,350,000**	**3,475,000**	**3,675,000**	**0**	**0**	**19,743,000**

Table 28
Environmental Compliance

	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	Prior Allocation	Balance to Complete	Total Project Cost
Engineering/Design									**0**
Land Acquisition									**0**
Site Work									**0**
Construction	75,000	75,000	75,000	75,000	75,000	75,000			**450,000**
Equipment/Furnishings									**0**
Other									**0**
EXPENDITURES									
TOTAL	**75,000**	**75,000**	**75,000**	**75,000**	**75,000**	**75,000**	**0**	**0**	**450,000**

Part IV. Special Programmatic Conditions

Carroll County staff members participate in many inter-jurisdictional efforts related to stormwater management, reservoir protection, water supply management, water reuse and other water issues. These efforts involve numerous entities but not limited to the Baltimore Metropolitan Reservoir Management Agreement, Maryland Tributary Teams, Stormwater Management regulation updates, water reuse regulation development and update, and various other initiatives. Participation in regional and statewide management and protection issues will continue to be a priority to Carroll County.

Staff has a very close working relationship with the local Soil Conservation District Board. County and District staff coordinate efforts on projects as well as provide technical assistance to one another. This has been a very important relationship for Carroll County where projects are located in the urban/rural fringe areas.

Carroll County has been an active participant regarding the Bay TMDL efforts. Staff has attended general and regional meetings as well participated in webinars offered by the EPA and MDE. The County via the Water Resource Coordination Council participated in discussions and development of Phase II Watershed Implementation Plan efforts, and continues to address issues related to the WIP as may arise.

APPENDICES

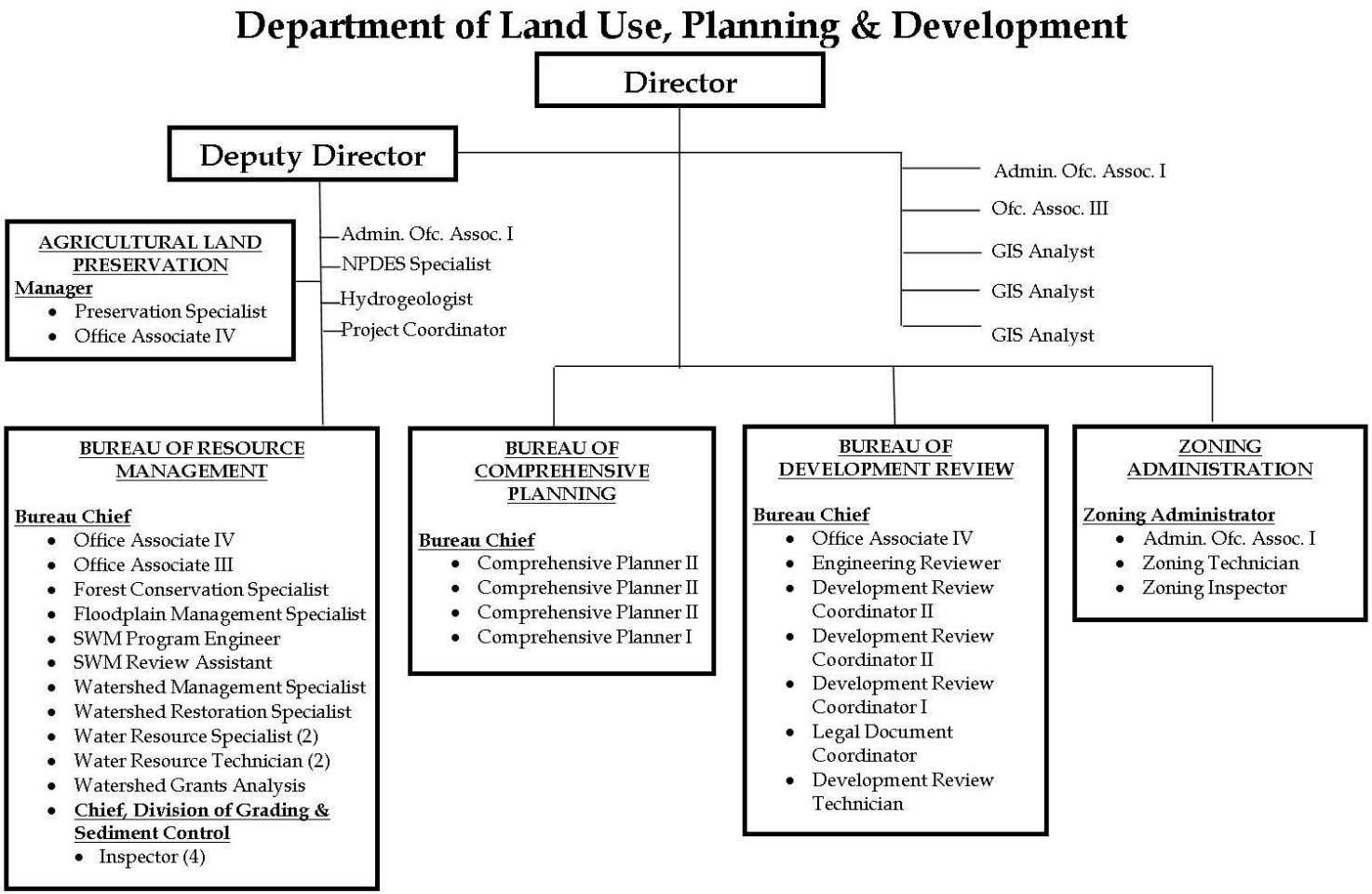
Carroll County
NPDES ANNUAL REPORT

July 15, 2013

Appendix A

Land Use, Planning & Development

Organizational Chart

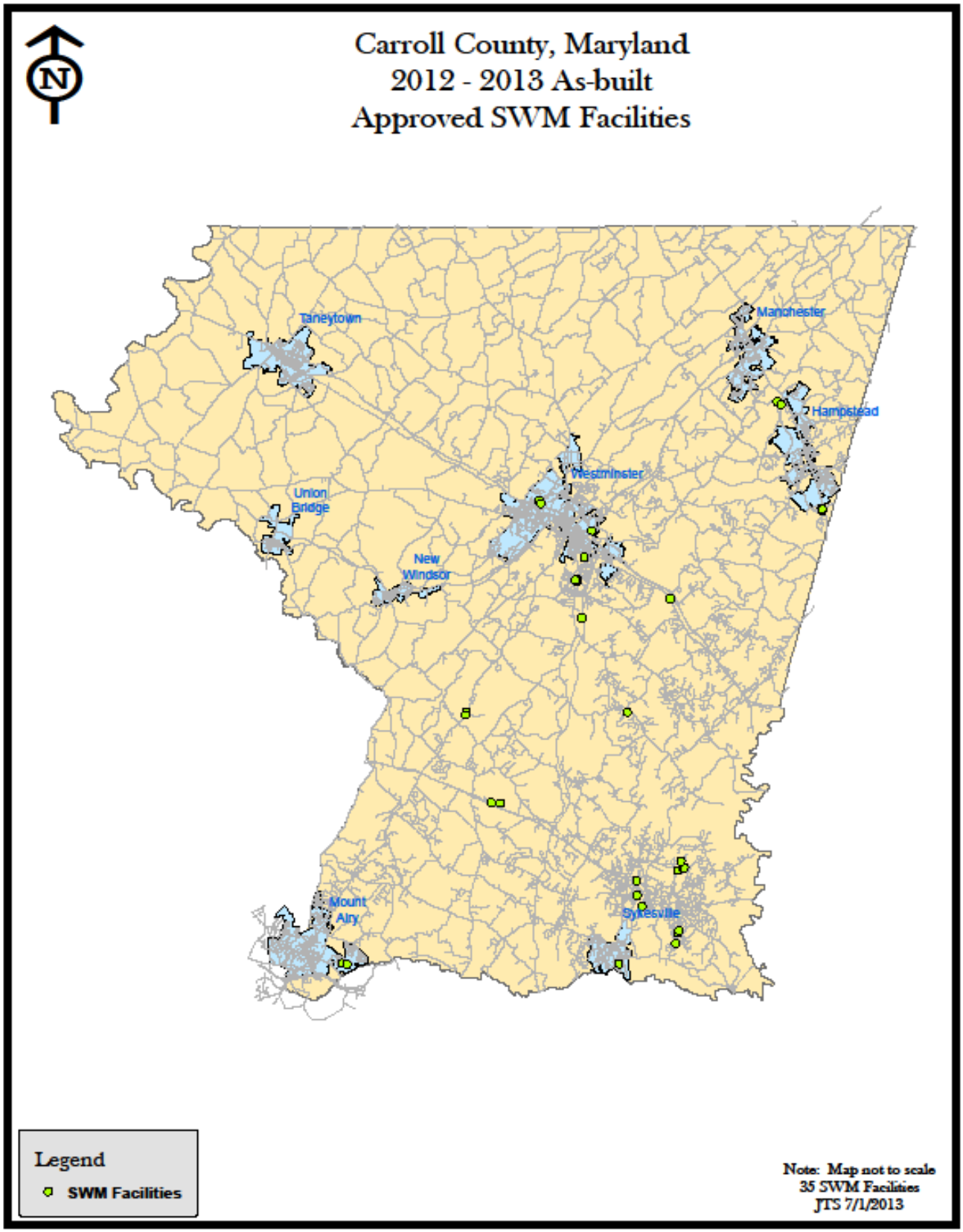

Department of Land Use, Planning & Development
Director
Deputy Director
Admin. Ofc. Assoc. I
Ofc. Assoc. III
GIS Analyst
GIS Analyst
GIS Analyst
AGRICULTURAL LAND PRESERVATION
Manager
Preservation Specialist
Office Associate IV
Admin. Ofc. Assoc. I
NPDES Specialist
Hydrogeologist
Project Coordinator
BUREAU OF RESOURCE MANAGEMENT
Bureau Chief
Office Associate IV
Office Associate III
Forest Conservation Specialist
Floodplain Management Specialist
SWM Program Engineer
SWM Review Assistant
Watershed Management Specialist
Watershed Restoration Specialist
Water Resource Specialist (2)
Water Resource Technician (2)
Watershed Grants Analysis
Chief, Division of Grading & Sediment Control
Inspector (4)
BUREAU OF COMPREHENSIVE PLANNING
Bureau Chief
Comprehensive Planner II
Comprehensive Planner II
Comprehensive Planner II
Comprehensive Planner I
BUREAU OF DEVELOPMENT REVIEW
Bureau Chief
Office Associate IV
Engineering Reviewer
Development Review Coordinator II
Development Review Coordinator II
Development Review Coordinator I
Legal Document Coordinator
Development Review Technician
ZONING ADMINISTRATION
Zoning Administrator
Admin. Ofc. Assoc. I
Zoning Technician
Zoning Inspector

Appendix B

COUNTY STORMWATER MANAGEMENT FACILITIES 2013

AND

COUNTY NPDES MS4 DATABASE CD


Carroll County, Maryland
2012 - 2013 As-built
Approved SWM Facilities
N
Taneytown
Manchester
Hampstead
Westminster
Union Bridge
New Windsor
Mount Airy
Sykesville
Legend
SWM Facilities
Note: Map not to scale
35 SWM Facilities
JTS 7/1/2013

APPENDIX C

INCORPORATED MUNICIPALITY QUESTIONNAIRE DATA

Carroll County, Maryland Phase II NPDES MS4 Government QUESTIONNAIRE
July 2013 Report

Appendix C

Questions	City of Taneytown	City of Westminster	Town of Hampstead	Town of Manchester	Town of Mt. Airy	Town of New Windsor	Town of Sykesville	Town of Union Bridge
A. PUBLIC EDUCATION AND OUTREACH								
1. Has your municipality adopted a goal toward providing public education and outreach?	**No**	**Yes**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
2. Is the municipality's web site used for environmental education and outreach?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
3. Are there links on the web site to sites such as MDE, EPA, the Center for Watershed Protection? If so, which web sites:	**Yes, none listed**	**Yes, MDE**	**Yes, MDE, EPA, EPA/NPDES, Protecting Carroll County Waters**	**Yes, MDE, CC Gov., EPA, AWWA, TMDL**	**Yes – www.mountairymd.org/Waterand Sewer Commission**	**No**	**Yes Carroll Co. Govt. & State of MD**	**Yes, EPA - NPDES**
4. Does your municipality sponsor a regular event where environmental information may be available for residents? If yes, please name the event and when it occurs:	**Yes All links included in protecting Carroll County Waters**	**Yes, Fallfest – 9/27/12 – 9/30/12 & Flower and Jazz 5/11/13**	**Yes, Hampstead Day, Hampstead Business Expo,**	**Yes – Charlottes Quest Nature Center, Springfest 1st Sunday in May**	**Yes Chili Cook-off May Fest.**	**National Night Out**	**Yes – Fall Festival in October by Sykesville Tree Planting & Environmental Education 4/20/13**	**No**
B. PUBLIC PARTICIPATION AND INVOLVEMENT								
1. Has your municipality adopted a goal toward providing public education and outreach?	**No**	**Yes**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
2. Does your municipality sponsor regular events such as storm drain stenciling, tree plantings, etc? If YES, please indicate the type of event and if any occurred over the past year (6/1/08 - 5/31/09)	**No**	**Yes, Arbor Week tree plantings, stencil storm drains & collection of trash from SWMP & streams**	**Yes, Tree planting, none last year, One next fall (29 trees)**	**Yes, Tree Planting @ Nature Center spring/ fall; storm drain stenciling all year by Boy Scouts & DPW.**	**Yes, Tree planting in Watkins & East/West Parks parks**	**Yes, Leaf Vacum, Yard trim collection Stencil curbs & inlets,**	**No**	**No**
3. Please outline what opportunities residents have for public participation and involvement in municipal affairs or events:	**Mayor & City Council Meetings and Workshops Planning & Zoning meetings,**	**City Council Meetings, Tree Commission Meetings, Plsnning & Zoning Mtg. & Annual Clean-up Days.**	**Can assist at tree plantings**	**Monthly Town meetings; Monthly Planning/Zoning meetings; Tree Commission Parks Foundation**	**Information booth @ all downtown festivals. Water & Sewer Commission**	**Blank**	**Serve on Council, Commissions, Committees. Town events always need volunteers to help.**	**Attend Council Meetings & Planning and Zoning Meetings newsletters**
C. ILLICIT DISCHARGE, DETECTION/ELIMINATION								
1. Has your municipality adopted an ordinance that provides the required authority for system and illicit discharge control and enforcement? If so, please provide the County with a copy. If NO, when is adoption planned:	**Yes, copy sent to County in the past, no changes since that submission**	**Yes**	**Yes, copy sent to County in the past, no changes since that submission**	**Yes, copy sent to County in the past, no changes since that submission**	**Yes, Town has adopted the County SWM Ordinance**	**No**	**Yes, copy sent to County in the past, no changes since that submission**	**Yes, same as County**
2. Are your crews currently trained to report water quality problems and illicit discharges they see when they are cleaning?	**Yes**	**Yes**	**Yes – 11/2/12 County 9/8/12 Internal**	**Yes 3/14/13**	**Yes**	**Yes - April 2013**	**Yes staff (2) had Training in 2012 PW Staff training 5/30/13**	**No Crews**
D. CONSTRUCTION SITE RUNOFF CONTROL								
1. Has your municipality adopted an ordinance that	**Yes, copy**	**Yes, copy**	**Yes, copy**	**Yes, copy has**	**Yes, Town**	**Yes, a copy has**	**Yes, a copy**	**Yes, governed by**

Carroll County, Maryland Phase II NPDES MS4 Government QUESTIONNAIRE
July 2013 Report **Appendix C**

Questions	City of Taneytown	City of Westminster	Town of Hampstead	Town of Manchester	Town of Mt. Airy	Town of New Windsor	Town of Sykesville	Town of Union Bridge
provides the required authority for erosion and sediment control? If so, please provide the County with a copy. If NO, when is adoption planned:	**provided to County in past**	**provided to County in past**	**provided to County in past**	**been provided to County in the past**	**complies with and adopts Co. Ordinance**	**been provided to the County in the past**	**has been provided to the County in the past**	**the County Ordinance, which applies to Town.**
2. Does the County provide plan review, inspection & enforcement services under the ordinance? If NO, who provides enforcement:	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
E. POST CONSTRUCTION RUNOFF CONTROL								
1. Has your municipality adopted an ordinance that provides the required authority for stormwater management? If so, please provide the County with a copy. If NO, when is adoption planned:	**Yes, copy provided to County in past**	**Yes, copy provided to County in past**	**Yes, copy has been provided to the County in the past**	**Yes, copy provided to County in past**	**Yes, copy has been provided to County in the past**	**Yes, copy has been provided to County in the past**	**Yes, a copy has been provided to the County in the past**	**Yes, , a copy has been provided to the County in the past**
2. Does the County provide review, inspection and enforcement services under the ordinance? If NO, who provides enforcement:	**No City of Taneytown**	**Yes**	**Yes**	**Yes**	**Yes – co. provides all implementation to the proper ordinances**	**Yes**	**Yes**	**No, Town Retained consultant**
F. POLLUTION PREVENTION, GOOD HOUSEKEEPING								
1. Mapping	**County provides per Town County agreement**	**County provides per Town County agreement**	**County provides per Town County agreement**	**County provides per Town County agreement**	**County provides per Town County agreement**	**County provides per Town County agreement**	**County provides per Town County agreement**	**County provides per Town County agreement**
2. Would you provide a separate list of industrial facilities within your town limits that may have the potential to discharge in to the storm sewer system?	**Evapco Inc.** **Flowserv Pump Corp.**	**List attached**	**Hampstead Car Wash**	**Manchester Auto Parts, Longview nursing home, Rohrbaughs Bus Co. & Caltriders Garage**	**No list attached**	**New Windsor Middle School.**	**No industrial facilities in Town limits.**	**Lehigh Cement, Stambaugh's Inc., Maryland Midland Railway Tucks Service Center**
3. Street Sweeping								
a. Does your community have a current street sweeping program?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**
If NO, skip to F. # 4; if YES, please answer the following questions:								
b. Is your program performed by municipal personnel or by a contractor?	**Contractor**	**Municipal personnel**	**Contractor**	**Municipal personnel**	**Municipal personnel**	**N/A**	**N/A**	**Done by Lehigh Cement Co. for the Town at No Charge**
c. If work is performed by municipal personnel, does your municipality own its own equipment, or is it leased or rented?	**Left blank**	**Own Equipment**	**Left blank**	**Own equipment**	**Own equipment**	**N/A**	**N/A**	**N/A**
d. Please select what street sweeping equipment is most commonly used in your community. List all appropriate:	**Mechanical brush with vacuum assist**	**Mechanical brush sweeper; Mechanical brush w/ vacuum assist; side walk litter sweeper**	**Sweeper - Mechanical Brush**	**Mechanical brush sweeper Sweeper vacuum**	**Mechanical brush**	**N/A**	**N/A**	**Mechanical brush with vacuum assist**
e. If owned, please indicate the number of each type of street sweeper that is part of the fleet used in your community:	**N/A**	**(1) Mechanical brush; (1) mechanical**	**N/A**	**Sweeper Mechanical brush**	**Mechanical brush**	**N/A**	**N/A**	**N/A**

Carroll County, Maryland Phase II NPDES MS4 Government QUESTIONNAIRE
July 2013 Report **Appendix C**

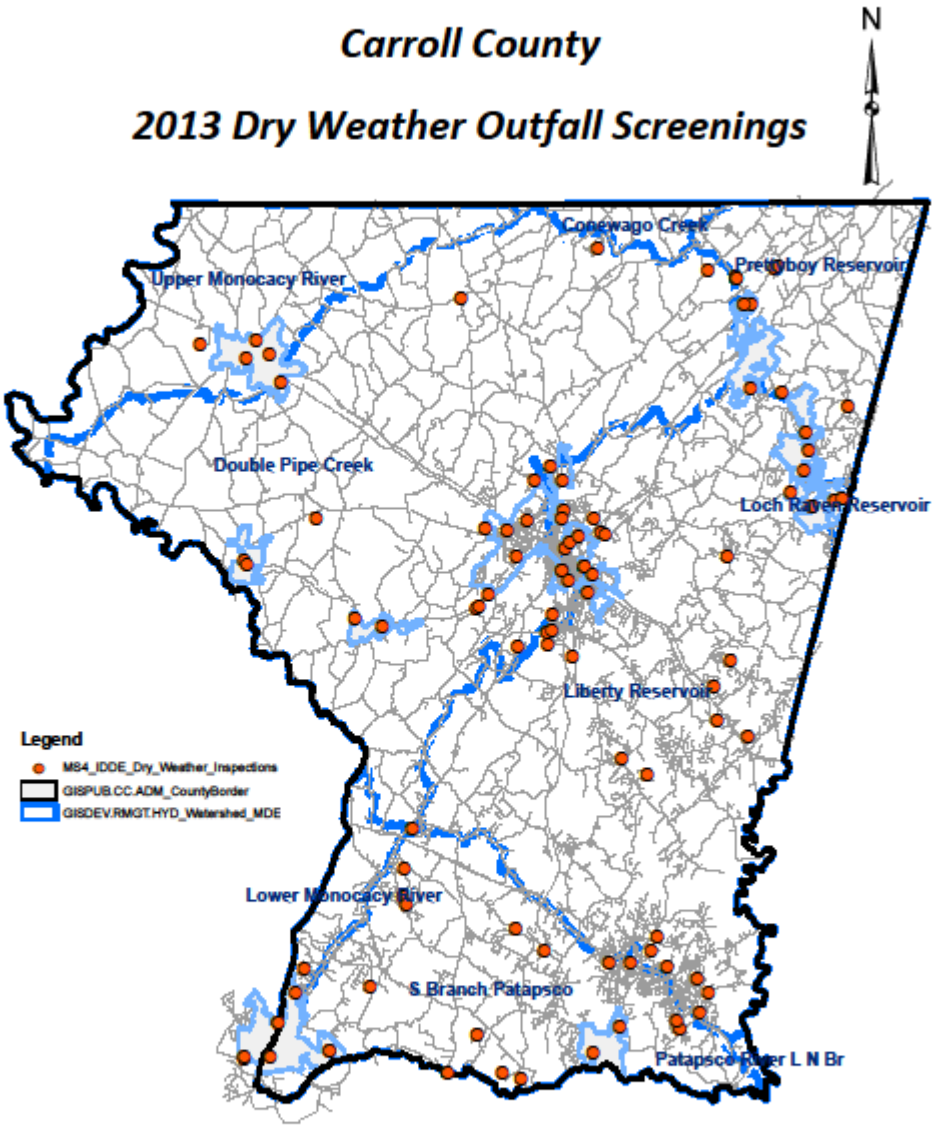
Questions	City of Taneytown	City of Westminster	Town of Hampstead	Town of Manchester	Town of Mt. Airy	Town of New Windsor	Town of Sykesville	Town of Union Bridge
		brush with vacuum assist; (1) side walk sweeper		**Sweeper: Vacuum**				
f. Do you also target any of the following specific pollutant sources as part of the street sweeping program?	**Litter (paper products, glass, metal & other road hazards), leaves, sediment/dirt**	**Litter (paper products, glass, metal & other road hazards), leaves sediment/dirt**	**Litter (paper products, glass, metal & other road hazards), leaves, sediment/dirt**	**Litter (paper products, glass, metal & other road hazards Leaves**	**Litter (paper products, glass, metal & other road hazards), leaves,**	**N/A**	**N/A**	**None targeted**
g. Can you provide an estimate of the proportion of public streets in your community that are swept at least on an annual basis?	**70%**	**70%**	**90%**	**95%**	**80%**	**N/A**	**N/A**	**25%**
h. Do you have an estimate of the total length of streets in your community?	**30 miles**	**63**	**21.66 miles**	**19.75 miles**	**50 miles**	**N/A**	**N/A**	**4.2 miles**
i. If so, can you estimate the approximate total length of streets in your community that are swept at least once a year?	**Left blank**	**55**	**18 miles**	**18.75 miles**	**30 miles**	**N/A**	**N/A**	**1 mile**
j. Can you estimate the sum total of linear miles swept during this Year?	**Left Blank**	**780 miles**	**Blank**	**≈14.86 miles**	**blank**	**N/A**	**N/A**	**No**
k. Do you schedule sweeping to pick-up de-icing material and winter debris in the early spring?	**Yes**	**Yes**	**Yes**		**Yes**		**N/A**	**No**
l. Briefly describe how you dispose of material collected from the street sweeper.	**Carroll County Landfill**	**Load onto roll off dumpster, then landfill**	**Landfill**	**Landfill and Town Fill Dirt Area**	**Blank**	**N/A**	**N/A**	**Taken care of by Lehigh Cement Co.**
m. Do you have an estimate of the weight or volume of sediments collected from street sweeping?	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**N/A**	**N/A**	**No**
n. If you utilize Town personnel, do you have a training program for street sweeper operators?	**N/A**	**Yes**	**N/A**	**Yes**	**Yes**	**N/A**	**N/A**	**N/A**
o. Do you have any data on the average sweeping cost per mile?	**$$85 Hr.**	**No**	**No**	**No**	**NO**	**N/A**	**N/A**	**No, no charge to town**
p. Can you estimate or measure the volume of materials collected annually during street sweeping operations either in pounds, tons, or cubic yards? Amount of materials collected:	**37 cubic yards**	**90.74 tons**	**8-10 Tons**	**Weight 151,000 Pounds**	**20 Tons**	**N/A**	**N/A**	**N/A**
4. Storm Drain and Inlet Cleaning								
a. Does your community clean out storm drains and/or inlets?	**Yes, cleanouts are regularly scheduled**	**Yes, but only in response to complaints or clogging problems**	**Yes, cleanouts are regularly scheduled**	**Yes, but only in response to complaints or clogging problems**	**Yes, cleanouts are regularly scheduled**	**Yes Only in response to complaints or clogging**	**Yes, cleanouts are regularly scheduled**	**Yes, cleanouts are regularly scheduled**
b. Please provide how many storm drains and/or inlets are cleaned out annually in your community, OR select a range from the following list: What % of the total inlets does this number represent?	**1 – 50** **80%**	**1 – 50** **34 Inlets** **4%**	**150 to 200** **95%**	**130 representing 90% of total # of inlets**	**1 - 50**	**1 – 50** **10%**	**100 to 150 range**	**1 to 50 range**
c. Can you estimate the total proportion of all storm drains and/or inlets that are cleaned out on an annual basis?	**Left Blank**	**4% of combined**	**25% Storm Drain** **90% Inlets**	**50%**	**40% combined**	**10%**	**100% storm drain**	**10% storm drain**
d. Based on the storm drains and/or inlets that are cleaned out, what is the typical "clean out" frequency?	**Approximate - 3 times/yr.**	**Seldom, if ever**	**Once a years**	**Once every 2 years**	**Twice a years**	**Once every 3 -5 years**	**Once a year**	**Twice a year**

Carroll County, Maryland Phase II NPDES MS4 Government QUESTIONNAIRE
July 2013 Report **Appendix C**

Questions	City of Taneytown	City of Westminster	Town of Hampstead	Town of Manchester	Town of Mt. Airy	Town of New Windsor	Town of Sykesville	Town of Union Bridge
e. What method or equipment is most commonly used to clean out storm drains and/or inlets?	**Manual, Vacuum**	**Manual; Hydraulic-suction cleaner; Vacuum Bucket Loaders**	**Manual**	**Manual, Bucket loaders**	**Manual**	**Manual**	**Manual**	**Manual**
f. Briefly Describe how you dispose of material collected from storm drain and/or inlet cleanouts.	**Carroll County landfill**	**Taken to landfill**	**Landfill**	**Trash and litter is separated from sediment, sediment is then added to fill dirt fill site. Leaves collected are also mixed with fill dirt.**	**Landfill**	**Placed in yard waste dumpster and taken to Landfill**	**Put with recycling yard waste**	**Material placed on Town-owned land**
g. What is the best estimate of annual expenditures for the storm drain cleanout program, to include inlets (labor, equipment, etc.)?	**Don't know**	**$1,806.00 Total Cost/Year $53.12 per storm**	**$3 – 4 thousand cost/year**	**$11,500 total cost/year; with $165.00 cost per storm drain cleanout**	**Blank**	**Don't know.**	**$3,500.00 Total cost/ year**	**Don't know**
h. Can you provide a weight or tonnage for collected materials?	**No**	**11.75 tons**	**4.25 Tons**	**3,955 Ponds**	**20 tons**	**N/A**	**10-15 tons**	**No**

Appendix D

ILLICIT DISCHARGE



Outfall Screenings by Watershed

Double Pipe Creek	24	Liberty Reservoir	35
Loch Raven Reservoir	2	Lower Monocacy River	6
Pretty Boy Reservoir	5	South Branch Patapsco River	26
Upper Monocacy River	4		

2012-2013 Illicit Discharges

Table:
Illicit Discharge Complaints Processed from July 16, 2012 - June 30, 2013

Case No	Complaint/Date	Action Taken	Status	Jurisdiction/Location
PD-13-0001	Citizen reported old rusted tanks and tires in stream. 5/06/2013	EISD investigation. Old Scattered debris 40 years plus apparently left by past owners. Old rusted water pressure tanks and tires observed. Referral to CC Public Works for stream cleanup.	On Carroll County Public Works July work schedule.	Carroll County, Ash Grove Court, Eldersburg at end of pumping station driveway along and in stream.
PD-13-0002	Town of Mt. Airy reported local towing company towing vehicles spilling fluids onto street. 6/13/2013	Mt Airy contacted MDE Hazardous Material and Oil Spills phone line (Environmental Crimes Unit) and reported incident. Case delegated to Oil Operations Permitting Division for Field Investigation	Carroll County NPDES Specialist followed up with MDE. Awaiting MDE investigation. Carroll County EISD to perform site visit following protocol for local compliance.	1001 Ridgeville Road, Mount Airy, Md.
PD-13-0003	City of Westminster reported observation of occasional car washing activity and wastewater draining from an outside washing location at an auto-body shop into storm drain inlets. 7/03/2013.	City of Westminster Zoning Enforcement Officer in cooperation with County NPDES Compliance Specialist will contact owner to discuss voluntary compliance to terminate activity.	Awaiting City of Westminster.	278 E. Main Street, Westminster, MD

ATTACNT "T"

CARROLL COUNTY GOVERNMENT
Bureau of Resource Management
Environmental Inspection Services Division
225 North Center Street
Westminster, Maryland 21157
Stormwater Pollution Phone Line: 410-386-2210

Incident ID # : ___

Stormwater Pollution / Illicit Discharge Incident Report Form

Responder Information:

Call Taken By: _____ Call Date: _____

Call Time: _____ Precipitation (inches) in past 24-48 Hours: _____

Caller Information:

Name: _____

Address: _____

_____

City: _____ State: _____ Zip Code: _____

Phone: _____ Alt. Phone: _____

Incident Information/About the Discharge:

Incident Date: _____ Incident Time: _____

Incident Location / Where did the discharge take place? (Address, Road, Landmarks etc.)

_____
_____
_____

What did you see? (Please be as detailed as possible (discharge, dumping, spill etc.)

_____
_____
_____

Identify the people involved or describe the people you saw.

_____
_____
_____

Describe the vehicles involved (tag numbers, color, make, model, business markings. etc.)

_____
_____
_____

Attachment U
Carroll County Illicit Discharge Incident Response Form

Incident ID#:			
Field Investigation __ Initial __Follow-up		Date:	Time:
Investigator(s):		Election District:	
Nearest Receiving Tributary:		Watershed:	
Northing: Easting:	**Jurisdiction:** ___ Municipality:		___ County
Closest Street Address:			
Nearby Landmark/Street Intersection etc.:			
General Description of Suspected Illicit Discharge Indicators:			

Field Investigation Check Off (check all that apply) Photographs: ___ Yes ___No

Primary Location Description	**Secondary Location Description: ___Storm Drain Network ___ Drainage Area**		
☐ Stream corridor *(In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☐ Upland area *(Land not adjacent to stream)*	☐ Near storm drain	☐ Near other water source (storm water pond, wetland, etc.):	

Upland Problem Indicator Description

☐ Dumping	☐ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other: _____	

Stream Corridor Problem Indicator Description

Odor	☐ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "General Description" section above		
Appearance	☐ "Normal"	☐ Oil sheen	☐ Cloudy	☐ Suds
	☐ Other: Describe in "General Description" section above			
Floatables	☐ None:	☐ Sewage (toilet paper, etc.)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "General Description" section above			

Allowable Discharges: Discharges not subject to enforcement action per CC Chapter 105 – Environmental Management of Storm Sewer System Ordinance **(Circle # if applicable)**

1. Water line flushing or other potable water sources
2. Landscape irrigation or lawn watering
3. Permitted diverted stream flows
4. Rising groundwater (springs/seeps)
8. Air conditioning condensation
9. Springs
10. Non-commercial washing of vehicles
11. Natural riparian habitat or wetland flows

5. Groundwater infiltration to storm drains	12. Fire-fighting activities
6. Uncontaminated pumped groundwater	13. Any water source not containing pollutants
7. Uncontaminated discharge from foundation drains or pumps	14. Permitted discharges under another NPDES permit

Investigation Findings

Incident Report Valid: YES / NO	Response Required: YES / NO

A) Invalid Report or No Response Required – Rationale:

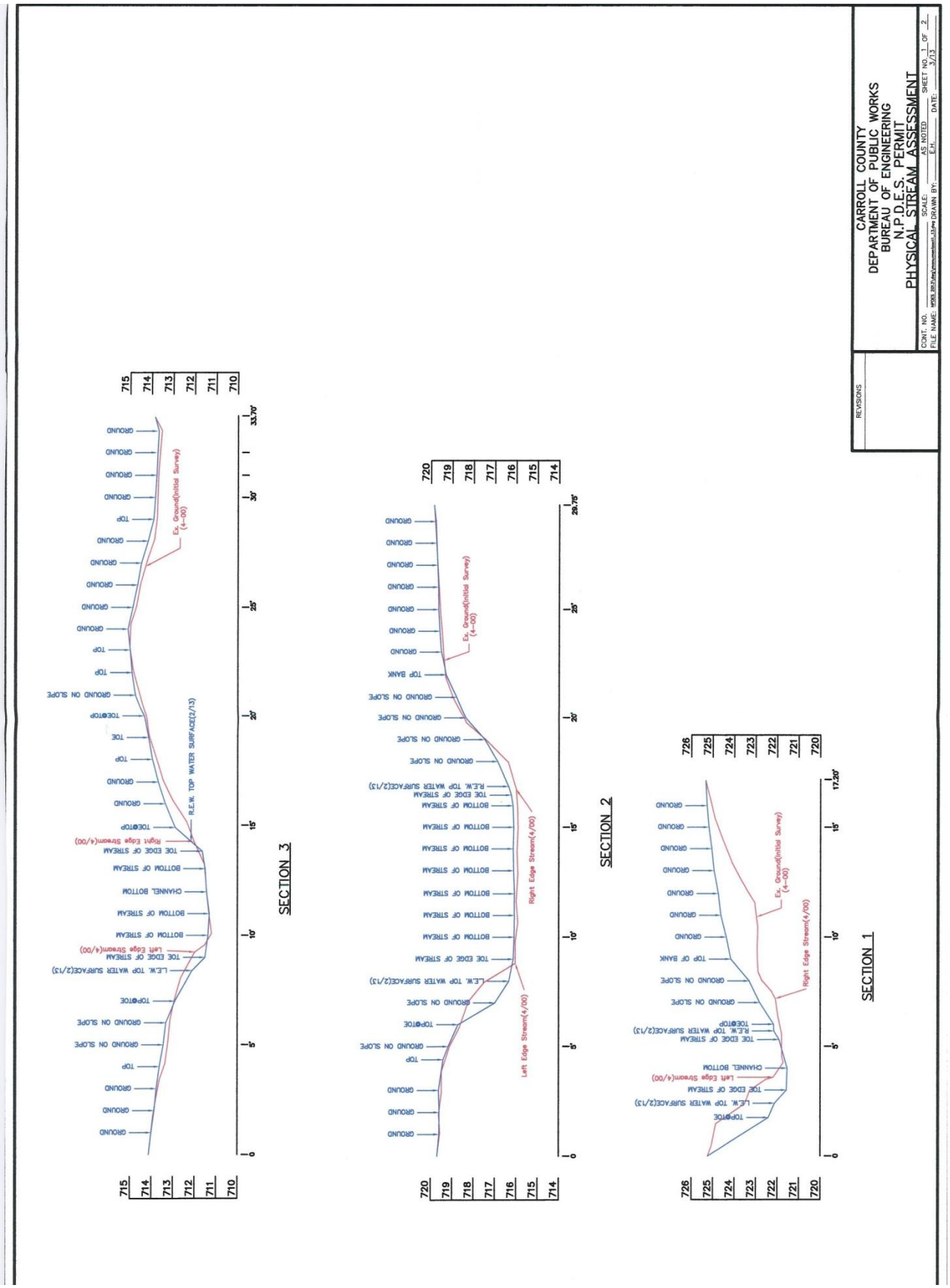
B) Valid Incident Report but No Response Required – Rationale:

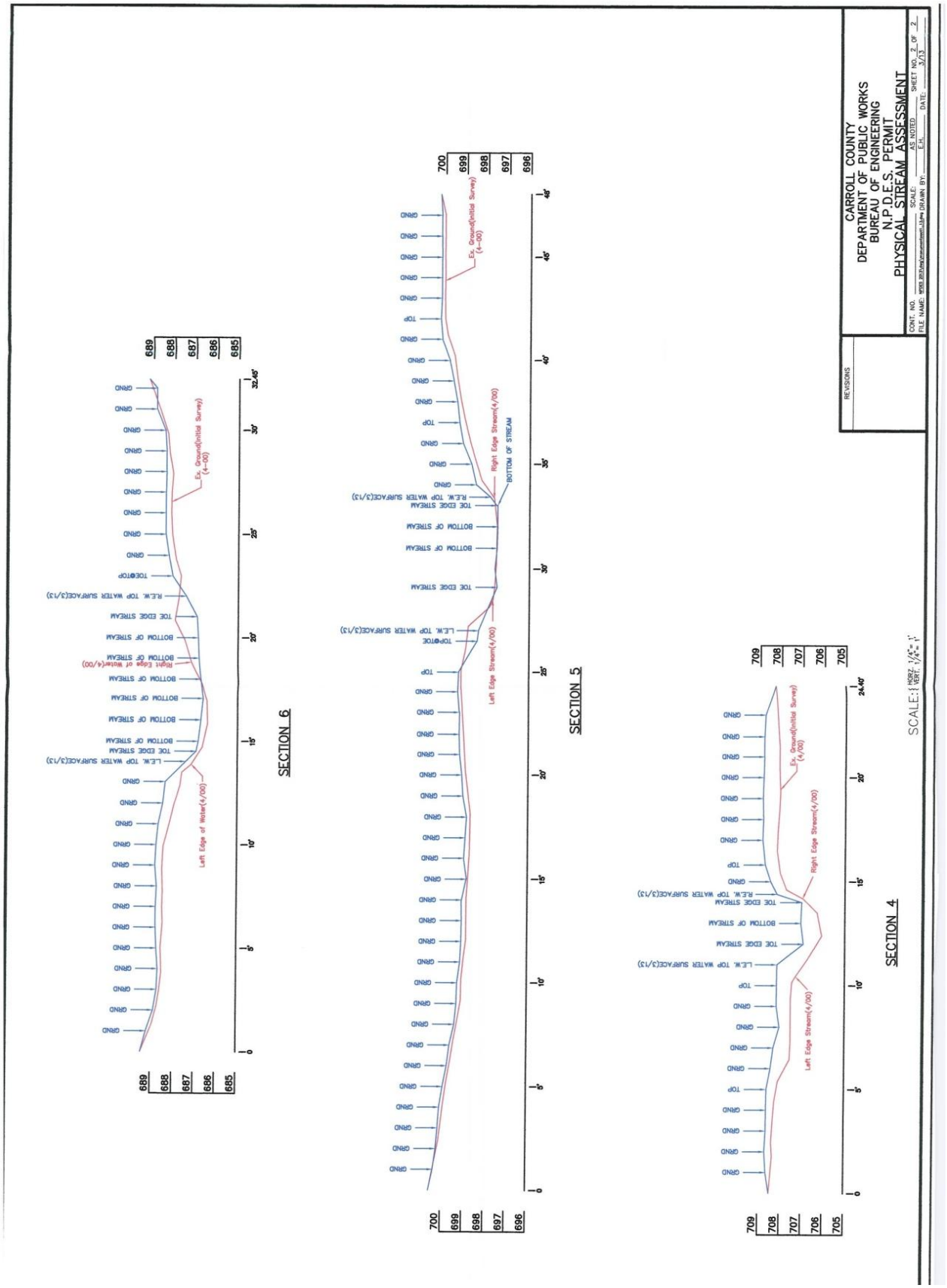
C) Valid Report, Response Required – Rationale:

Response:

Appendix E

Stream Cross Sections


CARROLL COUNTY
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
N.P.D.E.S. PERMIT
PHYSICAL STREAM ASSESSMENT
REVISIONS
CONT. NO.
FILE NAME:
SCALE: AS NOTED
DRAWN BY: E.H.
SHEET NO. 1 OF 2
DATE: 3/13
SECTION 1
SECTION 2
SECTION 3
Ex. Ground(Initial Survey) (4-00)
Right Edge Stream(4/00)
Left Edge Stream(4/00)
R.E.W. TOP WATER SURFACE(2/13)
L.E.W. TOP WATER SURFACE(2/13)
TOE EDGE OF STREAM
BOTTOM OF STREAM
CHANNEL BOTTOM
TOE@TOP
TOP@TOE
GROUND ON SLOPE
TOP BANK
TOP
GROUND
TOE
726
725
724
723
722
721
720
719
718
717
716
715
714
713
712
711
710
0
5'
10'
15'
20'
25'
29.75'
17.20'
30'
33.70'


CARROLL COUNTY
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
N.P.D.E.S. PERMIT
PHYSICAL STREAM ASSESSMENT
REVISIONS
CONT. NO.
FILE NAME:
SCALE: AS NOTED
DRAWN BY: E.H.
SHEET NO. 2 OF 2
DATE: 5/13
SECTION 6
SECTION 5
SECTION 4
Ex. Ground(Initial Survey) (4-00)
Left Edge of Water(4/00)
Right Edge of Water(4/00)
Left Edge Stream(4/00)
Right Edge Stream(4/00)
BOTTOM OF STREAM
L.E.W. TOP WATER SURFACE(3/13)
R.E.W. TOP WATER SURFACE(3/13)
TOE EDGE STREAM
BOTTOM OF STREAM
TOE@TOP
TOP
GRND
SCALE: HORZ. 1/4"= 1' VERT. 1/4"= 1'

Appendix F

Taxonomic Identification of 2013 Benthic Macro Invertebrate Results

Taxonomic Identification of 2012-2013 Macroinvertebrate Results

Order	Family	Taxon	Outfall	Instream
Coleoptera	Dytiscidae	DYTISCIDAE	1	
Coleoptera	Elmidae	ELMIDAE		2
Coleoptera	Elmidae	Optioservus		5
Coleoptera	Elmidae	Stenelmis	44	11
Coleoptera	Ptilodactylidae	Anchytarsus		4
Diptera	Ceratopogonidae	CERATOPOGONIDAE	2	1
Diptera	Ceratopogonidae	Probezzia	1	
Diptera	Chironomidae	Chaetocladius	1	
Diptera	Chironomidae	Corynoneura	1	
Diptera	Chironomidae	Diamesa	11	2
Diptera	Chironomidae	Hydrobaenus	1	1
Diptera	Chironomidae	Limnophyes	1	
Diptera	Chironomidae	Micropsectra	8	
Diptera	Chironomidae	Nanocladius	4	
Diptera	Chironomidae	Orthocladiinae		1
Diptera	Chironomidae	Orthocladius	1	
Diptera	Chironomidae	Parametriocnemus	6	2
Diptera	Chironomidae	Paraphaenocladius	2	2
Diptera	Chironomidae	Polypedilum	1	14
Diptera	Chironomidae	Rheocricotopus		2
Diptera	Chironomidae	Rheotanytarsus		3
Diptera	Chironomidae	Sympotthastia	1	
Diptera	Chironomidae	Tanypodinae	1	
Diptera	Chironomidae	TANYTARSINI		2
Diptera	Chironomidae	Tanytarsus	4	
Diptera	Chironomidae	Thienemannimyia Group	4	1
Diptera	Chironomidae	Tvetenia	1	6
Diptera	Empididae	Hemerodromia		2
Diptera	Simuliidae	Prosimulium		2
Diptera	Simuliidae	Simulium	4	
Diptera	Simuliidae	Stegopterna	20	1
Diptera	Tipulidae	Antocha		3
Ephemeropte	Baetidae	Diphetor		5
Ephemeropte	Leptophlebiidae	LEPTOPHLEBIIDAE		1
Trichoptera	Hydropsychidae	Cheumatopsyche	3	28
Trichoptera	Hydropsychidae	Hydropsyche	2	7
Trichoptera	Limnephilidae	Ironoquia	1	
Trichoptera	Philopotamidae	Chimarra		9
Trichoptera	Uenoidae	Neophylax		2
Tricladida	Dugesiidae	Cura	1	
		Total	127	119