Appendix A

Stormwater Problem Area Survey

Sample and Results

<iframe src="https://www.googletagmanager.com/ns.html?id=GTM-NGMP3BG" height="0" width="0" style="display:none;visibility:hidden"></iframe>

Storm Water Problem Areas

1. Please fill out your contact information:

Name	
Municipality	
Address	
City/Town	
State/Provinc	
ZIP/Postal Code	
Email Address	
Phone Number	

2. Do you have any issues with overbank (stream) flooding?

- ◯ Yes
- ◯ No

3. Do you have any issues with storm sewer/roadway flooding?

- ◯ Yes
- ◯ No

4. Do you have any issues with localized flooding/standing water?

- ◯ Yes
- ◯ No

5. Do you have any issues with stream bank erosion?

- ◯ Yes
- ◯ No

6. Do you have any issues with stream sedimentation?

- ◯ Yes
- ◯ No

7. Do you have any issues with sediment runoff?

- ◯ Yes
- ◯ No

8. Do you have any issues with urban runoff?

- ◯ Yes
- ◯ No

9. If you chose "yes" to any of the above questions please reference the question numbers, and describe the suspected causes for each of the issues:
Example Answer: #4 - Roadway flooding caused by under-maintained storm drains.

10. Please describe any proposed solutions either formally proposed or suggested to any of the above issues:

Next

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See how easy it is to create a survey.

Privacy & Cookie Policy

Storm Water Problem Areas

11. Are there watershed wide or local storm water problems emerging since the the Act 167 Plan was implemented?

- Yes
- No

12. If you answered "Yes", please explain what issues emerged:

13. What areas related to storm water management do you see pertinent that the plan does not address properly, i.e. water quality, stream bank erosion?

14. How would you improve the ordinance, or which sections should be revised, i.e. "Maintenance provisions, etc"?

15. Are there items that municipalities and citizens would want addressed to improve management of runoff?

16. What training or educational needs do you need to help in implementation of the Plan and ordinance?

17. What aspects of storm water could you use additional instruction, i.e. stormwater plan review, computations, BMP's, alternative site development ideas?

Prev Done

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See how easy it is to create a survey

2021 Stormwater Hotspot Survey Results

Map ID (Figure IV-1)	Stormwater Problem Description	Type	Latitude	Longitude
0	Flooding of the low area during periods of heavy rain due to inability of conveyance pipes to handle the flow.	Localized Flooding	40.999213	-75.199135
1	Flooding along channel of tributary stream probably due to inadequate storm sewer size downstream of pipe that crosses North 5th Street.	Sewer / Roadway Flooding	41.008871	-75.206493
2	box culvert washed out.	Sewer / Roadway Flooding	41.078866	-75.582569
3	Runoff during large storm events overwhelms the unnamed tributary along Neola Road. Additionally stormwater from Theresa Lane combines and the PennDOT owned pipe beneath Rt. 209 is insufficient.	Stream Flooding	40.935420	-75.314134
4	Storm water came up and over my driveway causing a tremendous loss of dirt, trees and gravel, in danger of losing part of paved driveway	Localized Flooding	41.069782	-75.132910
5	Stormwater coming onto property. Storm pipes get clogged water flows down hill beside the road.	Localized Flooding	40.950186	-75.354621
6	Street flooding; minor flooding in parking lots and basements.	Sewer / Roadway Flooding	40.983968	-75.200166
7	Collection points need to be cleaned out	Sewer / Roadway Flooding	41.152006	-75.367940
8	Glenbrook East Apartments (82 Waverly drive) is often flooded by the Pocono Creek. It flooded in 2020 and on August 22nd/23rd, 2021. The 2021 flood was worse than 2020. Residents had to be evacuated both times.	Stream Flooding	40.982001	-75.200316
9	Numerous yards and basements flooded. Retention Pond not large enough and pump and conveyance system not large enough to handle the large amount of rainfall.	Localized Flooding	41.008449	-75.174612
10	Conveyance system not large enough to handle large rainfalls	Sewer / Roadway Flooding	41.008220	-75.183514
11	Road flooding due to the Brodhead creek being higher than the outfall.	Sewer / Roadway Flooding	40.990157	-75.181517
12	Roadway fully engulfed in water	Sewer / Roadway Flooding	40.977626	-75.426491

Map ID (Figure IV-1)	Stormwater Problem Description	Type	Latitude	Longitude
13	The north bound lane of road floods along Independence dr SR447 during storm events. Ponding creates hazardous driving (i.e., deep water impedes braking and splashing blinds driver)	Sewer / Roadway Flooding	41.003155	-75.154650
14	During large storms the streams will rise above the banks and flood Warner Rd all the way out to Rt 611 even sometimes flooding learn Rd.	Stream Flooding	41.030796	-75.303563
15	Flooding on Rt 447 and on private properties due to historical rerouting of flow and inadequate capacity of watercourse	Stream Flooding	41.026729	-75.197173
16	This is one of the most flooded areas in Pocono. Water runoff from the fill and properties on Archer Lane. Learn Roads generally will completely flood 2-3 times a year, causing it to close down. Much of the aggregate and debris from the hill will fill	Sewer / Roadway Flooding	41.037078	-75.302618
17	This is a stormwater runoff issue for years. Floods the road, shoulders and is very dangerous in the winter as it floods the road and causes it to be flooded and freezes	Sewer / Roadway Flooding	41.020400	-75.282797
18	During hard rainstorms, the river will flood outside of the banks and wing walls. Causes the road to shut down many times. Along with dangerous debris that will jam up the bridge.	Stream Flooding	41.023575	-75.303404
19	Stormwater runoff off of the hill and overload the drainbox. causing flooding on both entrances to Beehler & Serfass Rd, sometimes flooding both lanes of 611	Sewer / Roadway Flooding	41.021439	-75.297073
20	Water runoff from the hill, will flood the roads and intersection. And riddles the roads with debris. Causing 3 roads to be closed during flooding.	Sewer / Roadway Flooding	41.008721	-75.281360
21	Lower Sierra View	Sewer / Roadway Flooding	40.990576	-75.447598
22	The Highlands	Sewer / Roadway Flooding	40.966250	-75.460463

Map ID (Figure IV-1)	Stormwater Problem Description	Type	Latitude	Longitude
23	Woods Crossing/Country Terrace	Localized Flooding	40.974602	-75.406587
24	547 White Birch Drive	Sewer / Roadway Flooding	40.976468	-75.391378
25	343 Kennel Road	Sewer / Roadway Flooding	40.938892	-75.381501
26	1324 Route 115 (Hugharts)	Sewer / Roadway Flooding	40.917433	-75.353445
27	814 Frable Road	Sediment Runoff	40.921686	-75.375176
28	Bush Lane	Localized Flooding	40.921624	-75.411519
29	When there are heavy rains, the three areas listed above, the creeks go over the roads and cause flooding.	Localized Flooding	41.174622	-75.274545
30	When it rains heavy Route 115 is flooded out and the shoulder is washed out. Penndot and the contractor that widened Rt 115 have fixed the shoulders several times when they wash out.	Sewer / Roadway Flooding	41.053862	-75.533376
31	Roadway flooding after heavy rain	Sewer / Roadway Flooding	41.028568	-75.334753
32	Roadway flooding after heavy rain	Sewer / Roadway Flooding	40.984821	-75.315322
33	over tops pipe in heavier rain events	Sewer / Roadway Flooding	41.108819	-75.156261
34	pipe over tops in heavy storm events	Sewer / Roadway Flooding	41.079078	-75.176267
35	two 18 inch pipes recieve over flow from a tributary that feed east stroudsburg reservoir	Localized Flooding	41.076587	-75.174464
36	water over tops bridge in storm events on primrose dr	Sewer / Roadway Flooding	41.056419	-75.103185

Appendix B

Public and Watershed Plan Advisory Committee Participation and Comments

Lori Kerrigan

From: Monroe County Conservation District <monroecd+ptd.net@ccsend.com>
Sent: Thursday, January 28, 2021 3:52 PM
To: lkmccd@ptd.net
Subject: You're Invited: Act 167 Stormwater WPAC Meeting

MONROE COUNTY CONSERVATION DISTRICT

MONROE COUNTY PLANNING COMMISSION

Monroe County, Pennsylvania
ACT 167 Stormwater Planning Meeting



The Monroe County Conservation District and Monroe County Planning Commission would like to invite you to participate in the Act 167 Watershed Plan Advisory Committee (WPAC) kickoff meeting to discuss stormwater management in your watershed on **Wednesday, February 24, 2021 at 10am.**

WPAC is an important advisory committee to the Act 167 Watershed update required per Section 5(a) of Act 167. Each watershed plan is required to be reviewed and any additional revisions be made at least every 5 years after its initial adoption. Plan updates are needed to maintain effective management of stormwater and protect water quality throughout the watershed.

Please register here by February 11, 2021 to reserve your spot!

MONROE COUNTY CONSERVATION DISTRICT

MONROE COUNTY PLANNING COMMISSION

ACT 167 Stormwater COG Meeting

Agenda

Monday, July 26, 2021 at 10am

1. Short Overview of Storm Water and Watershed Management
2. Intro to Act 167 requirements and obligations under the act
3. Where are we today and what needs updating
4. Watershed Plan Advisory Committee
    a. Role
    b. Participants
    c. Subcommittees
5. Timeline
6. Next Steps

Lori Kerrigan

From: Monroe County Conservation District <bbmccd+ptd.net@ccsend.com>
Sent: Thursday, July 15, 2021 10:45 AM
To: lkmccd@ptd.net
Subject: ACT 167 Municipal Stormwater_Zoning Officer Training Opportunity

MONROE COUNTY CONSERVATION DISTRICT



ACT 167 Municipal Stormwater Training for Zoning Officers and Inspectors

The Monroe County Conservation District and Monroe County Planning Commission would like to invite Zoning Officers and Inspectors to participate in the Act 167 Watershed Educational stormwater management Series Starting July 26 – August 3rd

Act 167 Watershed Planning maintains effective management of stormwater and protect water quality throughout the watershed.

Please register by July 15, 2021 for this week-long series!
https://www.mcconservation.org/721act167stormwater821.html

Municipal "Short" Webinar Series for Zoning and Inspectors

- How Does Permeable Pavement Work?
- Why Do Engineers Invent Floods
- Green Infrastructure- Inspiration from other cities
- Long Term Nitrate Removal Riparian Buffers
- Large Woody Debris for Stream Restoration
- Stormwater Basin Retrofitting
- Post Construction Stormwater Management Inspections

For more information, or if you have questions, please contact Lori Kerrigan, Head Resource Conservationist, at MCCD @ lkmccd@ptd.net or call 570-629-3060.

Lori Kerrigan

Subject: FW: Public, FB, Stormwater Takeover_Shorts_Series
Attachments: public stormwater takeover links.docx

Water, water everywhere, and not a drop to drink !

Stormwater Shorts FACE BOOK Webinar Series

The Monroe County Conservation District and Monroe County Planning Commission would like to invite you to participate in the Act 167 Watershed Educational Stormwater Series

Act 167 Watershed Planning maintains effective management of stormwater and protect water quality throughout the watershed.

This week-long series is FREE to the Public on Face Book!

July 26 August 2nd

Stormwater Short Webinar Series

- **Stormwater-basics**
- **Why-should-I care-about-stormwater**
- **How-can-I control-stormwater-on-my-property**
- **Why-does-my-community-flood-more-than-it-used-to**
- **What-are-stormwater-pollutants**
- **How-can-I-be-a-good-stormwater-neighbor**
- **Where does the Stormwater Go**

For more information, or if you have questions, please contact Lori Kerrigan, Head Resource Conservationist, at MCCD @ lkmccd@ptd.net or call 570-629-3060.

Lori Kerrigan

From: Lori Kerrigan <lkmccd@ptd.net>
Sent: Friday, January 28, 2022 8:59 AM
To: 'a.velopolcek@eldredtwp.org'; 'acanfield@tobyhannatwppa.gov'; 'ammccd@ptd.net'; 'apwc.nepa@gmail.com'; 'arehrig@lehightownship.com'; 'becky.smith@eaststroudsburgboro.org'; 'bill@angrymechanics.com'; 'brian@smithfieldtownship.com'; 'carbmgr@ptd.net'; 'cmartinelli@chestnuthilltwp-pa.gov'; 'cmeinhart@monroecountypa.gov'; 'crickard@waynecountypa.gov'; 'ctmccd@gmail.com'; 'dalbright@chestnuthilltwp-pa.gov'; 'davidbodnar@carboncounty.net'; 'dhorton@bcrawater.com'; 'dwgboro@ptd.net'; 'dwilliams@waynecountypa.gov'; 'dwmccd@ptd.net'; 'EMasker@coolbaughtwp.org'; 'eratbaird@frontiernet.net'; 'executive@brodheadwatershed.org'; 'gchristine@monroecountypa.gov'; 'grogalsky@verizon.net'; 'hamtwp@ptd.net'; 'info@jacksontwp-pa.gov'; 'info@kiddertownship.org'; 'jav45@psu.edu'; 'jbohman@pa.gov'; 'jknecht@waynecountypa.gov'; 'jones@pennfuture.org'; 'julia@smithfieldtownship.com'; 'kdixon@mstownship.com'; 'khmccd@ptd.net'; 'kidder.admin@pa.metrocast.net'; 'L.freshcorn@dwgpa.gov'; 'ltroutman@phlt.org'; 'mayor@mountpocono-pa.gov'; 'mclewell@mstownship.com'; 'MKeegan@monroecountypa.gov'; 'mlong@pikepa.org'; 'mmrozinski@pikepa.org'; 'mquinn@stroudsburgboro.com'; 'Mthompson@coolbaughtwp.org'; 'mwmccd@ptd.net'; 'Pam@barretttownship.com'; 'planning@pikepa.org'; 'polktwp@ptd.net'; 'pricetownship@verizon.net'; 'reda@paradisetownship.com'; 'rhill@monroecountypa.gov'; 'rojevin@pa.gov'; 'rosstwp@ptd.net'; 'rtroscianecki@gmail.com'; 'rwielebinski@poconopa.gov'; 'shkleiner@pa.gov'; 'slaverdure@monroecountypa.gov'; 'smith.b.l@att.net'; 'steve.tambini@drbc.gov'; 'stroud17@ptd.net'; 'stroudjs@ptd.net'; 'stroudpa@ptd.net'; 'tctcwa@hotmail.com'; 'thritsick@pa.gov'; 'tunksec@longpondpa.com'; 'ZONING@POLKTWP.ORG'; 'dobie@ptd.net'; 'jacob@smithfieldtownship.com'; 'smcglynn@sfmconsultingllc.org'; 'money@mstownship.com'; 'vjc1@psu.edu'; 'carbtech@ptd.net'; 'rpt5342@psu.edu'; David Hooker
Subject: Action Item: Internal WPAC_DEP comment_ Act 167 Renewal
Attachments: Tobyhanna Act 167 Draft Plan 1.2022.pdf; Brodhead McMichaels Act 167 Draft.1.2022.pdf

Importance: High

Follow Up Flag: Follow up
Due By: Wednesday, February 23, 2022 4:00 PM
Flag Status: Flagged

Good Morning WPAC members !

Thanks to all the hard work and outreach of our WPAC technical and educational subcommittees we have compiled the Final Draft for Renewal of both the Tobyhanna and Brodhead McMichaels Stormwater Management Plans. These plans were previously adopted resolution of the County Commissioners and Approved by DEP in 1997 and 2006, respectively.

Our next step for compliance with the Stormwater Management Act, 1978 – No. 167 prior to adoption and public hearing is for the WPAC, which is comprised of the official planning agencies, governing body of each municipality , the County Planning Commission and regional planning agencies (an then some) to ***review for consistency with other plans and programs affecting the watershed***. Per the Act, all such reviews shall be submitted to the department (DEP and

DRBC) with the proposed plan. MCCD will act as the clearing house for these comments and will provide them to DEP when the plan is submitted.

Please provide all comments as official correspondence to lkmccd@ptd.net by **March 1, 2022.**

We sincerely appreciate all the efforts of the WPAC group for sticking with us through this long awaited renewal.

All the Best,
Lori

Lori A. Kerrigan, CPESC
Technical Section Supervisor,
Head Resource Conservationist
Monroe County Conservation District
8050 Running Valley Road
Stroudsburg, PA 18360
http://www.mcconservation.org
570-629-3060
570-629-3063 fax



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Notice Publish Date:
Wednesday, March 02, 2022

Notice Content

PUBLIC NOTICE The Monroe County Board of Commissioners and Watershed Plan Advisory Committee (WPAC) will hold a public hearing on the Act 167 Storm Water Management Brodhead Creek, McMichaels Creek, 2006 and Tobyhanna Creek, 1997 Plan Renewal, on Wednesday March 16, 2002 at 9:00 a.m. at the Monroe County Commissioners Office, Public Meeting Room 203, Monroe County Administrative Center, One Quaker Plaza, Stroudsburg, PA 18360 Under the Storm water Management Act of 1978 update of the plans is required per Section 5(a) Act 167. Each watershed plan is required to be reviewed at least every five (5) years after its initial adoption. Plan reviews are needed to maintain effective management of storm water and water quality throughout the county, identify new storm water issues in the community, provide protection of infrastructure and assets, maintain consistency with the County Hazard Mitigation Plan and increase eligibility for emergency funding from FEMA and PEMA. The WPAC, with representatives from each municipality, along with our state and local partners, has worked this past year to update the Plans to account for high tunnel farming practices, updated and new technology BMPs, consistency with 25 Pa. Code Chapter 102. Erosion and Sediment Control, and to provide updated release rate district mapping. Municipalities required to adopt Draft Plan renewals in the Brodhead Creek and McMichaels Creek Watershed are contained within seventeen (17) municipalities in Monroe County and one municipality in Pike County as follows: Barrett, Paradise, Chestnuthill, Coolbaugh, East Stroudsburg, Greene (Pike County) Smithfield, Hamilton, Jackson, Middle Smithfield, Mt. Pocono, Pocono, Price, Ross, Stroud, Stroudsburg, Tobyhanna, and Tunkhannock. The Tobyhanna Creek, encompasses the northwest portion of Monroe County and portions of eastern Carbon County and southern Wayne County is contained within four Municipalities in Monroe County, one Municipality in Carbon County and one Municipality in Wayne County: Coolbaugh, Mount Pocono, Tobyhanna, Tunkhannock, Kidder (Carbon County), Lehigh (Wayne County). If you require special accommodations to attend this meeting, please contact the Chief Clerk at 570-517-3102. Greg F. Christine, Chief Clerk/Administrator PUBLISH: 03/02/2022

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PUBLIC HEARING
MONROE COUNTY BOARD OF COMMISSIONERS
AND
WATERSHED PLAN ADVISORY COMMITTEE
MARCH 16, 2022

The Monroe County Board of Commissioners and Watershed Plan Advisory Committee held a public hearing on the Act 167 Storm Water Management Brodhead Creek, McMichaels Creek, 2006 and Tobyhanna Creek 1997 Plan Renewal, on Wednesday March 16, 2022 at 9:00 a.m. at the Monroe County Commissioners Office, Public Meeting Room 203, Monroe County Administrative Center, One Quaker Plaza, Stroudsburg, PA 18360. Members present were: Sharon S. Laverdure, Commissioner, W. Michael Johnson, Brodhead Watershed Association (BWA), Craig Todd, BWA, Drew Wagner, Monroe County Conservation District (MCCD), David Hooker, MCCD, Kristina Heaney, District Manager of MCCD, Lori Kerrigan, MCCD, and John Christy, Commissioner.

Commissioner Laverdure called the meeting to order at 9:05 a.m. Commissioner Laverdure asked if there was any public comments or questions. Commissioner Christy asked how the new Act 167 plan relates to the current storm water management plan. Lori Kerrigan, MCCD, replied Act 167 plan address storm water management within Monroe County. The MS4 permit is included in the plan. Kristina Haney, MCCD, stated as part of the process and according to the Act there is a Watershed Planning Advisory Committee includes all the municipalities and representatives and have been meeting since 2021.

Craig Todd, BWA, and Michael Johnson BWA testified that they support the current Act 167 plan/ordinance recognizing that there is still a process involving other agencies. The ordinance contains all the primary provisions that were very successful. He reviewed some of provisions in the ordinance.

Kristina Haney, explained that the Commissioners will have to adopt a resolution renewing the Act 167 Plan, then it has to be approved by Department of Environmental Protection and Department of Community and Economic Development. Then the plan has to be approved by the municipalities.

There was no public comment. Commissioner Laverdure closed the hearing at 9:24 a.m.

Sharon S. Laverdure
Sharon Laverdure, Commissioner

701 Main Street, Suite 405
Stroudsburg, PA 18360

Phone: 570-517-3100
Fax: 570-517-3858
mcpc@monroecountypa.gov
www.monroecountypa.gov

MONROE COUNTY PLANNING COMMISSION

May 5, 2022

Lori A. Kerrigan, Technical Section Supervisor
Monroe County Conservation District
8050 Running Valley Road
Stroudsburg, Pa 18360

Re: Tobyhanna Creek Watershed Act 167 Stormwater Management Plan Update
Brodhead McMichaels Creek Watershed Act 167 Stormwater Management Plan Update
MCPC Review #84-22

Dear Ms. Kerrigan:

The Monroe County Planning Commission has reviewed the above noted plan updates. This office has worked closely with the Monroe County Conservation District throughout the development process of this plan update and we appreciate being given the opportunity to provide input on the plans and look forward to facilitating its implementation and adoption.

The proposed Act 167 Plan Updates are generally consistent with the Monroe 2030 Comprehensive Plan, December 2014, with respect to supporting its goal and policies regarding stormwater issues and water quality throughout the watershed areas within the county.

If you have any questions or if we can be of further service to you, please feel free to contact me.

Sincerely yours,

Christine Meinhart-Fritz
Director

CMF/ebk

R-20224 4/20

MONROE COUNTY BOARD OF COMMISSIONERS

RESOLUTION

ACT 167 STORMWATER MANAGEMENT PLAN RENEWALS BRODHEAD CREEK AND MCMICHAEL CREEK WATERSHED, AND THE TOBYHANNA CREEK WATERSHED

WHEREAS, the Storm Water Management Act 167 of 1978 provides for the regulation of land and water use for flood control and storm water management, requires the Department to designate watersheds, and that each county will prepare and adopt a watershed storm water management plan and renew or update said plan every five (5) years for each designated watershed; and

WHEREAS, the Brodhead and McMichaels, and the Tobyhanna Creek Watershed Storm Water Management Plans were previously adopted resolution of the County Commissioners and approved by DEP in 1978, 1988, 1997, respectively, and Brodhead McMichaels Updated in 2006; and.

WHEREAS, the purpose of the Brodhead and McMichaels, and the Tobyhanna Creek Watershed Storm Water Management Plans are to protect public health and safety and to prevent or mitigate the adverse impacts related to the conveyance of excessive rates and volume of storm water runoff by providing for the management of storm water runoff, control of erosion and sediment pollution and control of non-point source pollution; and

WHEREAS, design criteria and standards of storm water management systems and facilities within the Brodhead and McMichaels, and Tobyhanna Watershed shall utilize the criteria and standards as found in the watershed storm water management plans; and

NOW, THEREFORE, BE IT RESOLVED that the Monroe County Board of Commissioners hereby adopt the Brodhead and McMichaels, and the Tobyhanna Creek Watershed, Act 167 Storm Water Management Plans, including all appendices and prior modeling, and forward the Plan to the Pennsylvania Department of Environmental Protection and Department of Community and Economic Development for approval.

MONROE COUNTY BOARD OF COMMISSIONERS

Sharon S. Laverdure

Sharon S. Laverdure, Chairman

John R. Moyer, Vice Chairman

John D. Christy, Commissioner

ATTEST:

Shirley Fee & Nancy Coldreck
23 Compass Road
Waretown, NJ 08758
or to their attorney,
Sarah Wilson, Esq.,
515 Broad Street,
Milford, PA 18337.
42/44B(30)

PUBLIC NOTICE
Request for Proposal
Road Paving
Pocono Woodland Lakes POA
Call or email for Bid Package
generalmanager@thewoodlander.com
570-296-8511
42/43B(10)

CO-ADMINISTRATOR NOTICE LETTERS OF ADMINISTRATION
The Estate of **Shirley Faerman** deceased late of 22 Barry Park Ct. Searington, NY 11507 was raised in the Pike County Register of Wills on May 4, 2022.
Letters of Administration on the above estate have been granted to the undersigned. All persons indebted to the said estate are requested to make payment, and those having claims to present the same without delay to:
Brian Faerman
as Co-Administrator of the Ancillary Estate of Shirley Faerman
410 Broad St.
Milford, PA 18337
Or their attorney,
Nicholas J, McIntyre,

.com

Date
DINGMAN TWP. BOARD OF SUPERVISORS
Karen Kleist,
Sec/Treas.
John H. Klemeyer,
Solicitor
42/43B(86)

EXECUTRIX NOTICE
Estate of **Angel Luis Moreno**, deceased, late of 107 Meath Ln., Dingmans Ferry, PA 18328.
Letters Testamentary on the above Estate having been granted to the undersigned, all persons indebted to the said Estate are requested to make payment, and those having claims to present the same, without delay to:
Michelle Sudol
107 Meath Ln.
Dingmans Ferry, PA 18328,
Executrix.
42/44P(23)

PUBLIC NOTICE NOTICE TO BIDDERS
NOTICE IS HEREBY GIVEN that sealed bids will be received by Blooming Grove Township, Pike County, 488 Route 739, Blooming Grove, PA 18428, for the **MADDEN ROAD BRIDGE REPAIR PROJECT**. Bids will be submitted and updated online via the PennBid™ Program until 2:00 PM, June 6, 2022. Bids will

bid documents or the project in general should be submitted to the Engineer no later than 4:30 PM, May 31, 2022.
Jo-Anna Donahue
Blooming Grove Township
42/43B(112)

PUBLIC NOTICE
The Pike County Commissioners will hold a Public Hearing on the Brodhead & McMichaels Creeks Act 167 Stormwater Management Plan Renewal on Wednesday, June 1, 2022 at 10:30 a.m. at the Commissioners' Meeting Room, Pike County Administration Building, 506 Broad Street, Milford PA 18337.
Under the Stormwater Management Act of 1978, an update of the plan is required per Section 5(a) Act 167. Each watershed plan is required to be reviewed at least every 5 years after its initial adoption. Plan reviews are needed to maintain effective management of stormwater and water quality throughout the county, identify new stormwater issues in the community, provide protection of infrastructure and assets, maintain consistency with the County Hazard Mitigation Plan and increase eligibility for emergency

Community Planning Office, 837 US Route 6, Unit 3, Shohola, PA 18458; and at the Pike County Commissioners Office, 506 Broad Street, Milford, PA 18337.
43B(30)

EXECUTOR NOTICE LETTERS TESTAMENTARY
Estate of **Anna Klebes**, deceased, late of 103 Ness Rd. Dingmans Ferry, PA 18328, was raised on April 7, 2022.
Letters Testamentary on the above estate have been granted to the undersigned. All persons indebted to the said estate are requested to make payment, and those having claims to present the same without delay to:
Edward A. Klebes, III as Executor of the Estate of Anna Klebes a/k/a Ann Klebes
127 Council Rd.
East Stroudsburg, PA 18302
Or contact the attorney for the Estate, Nicholas J. McIntyre, Esq., of Zimmerman & Ohliger, LLC, located at
410 Broad Street,
Milford, PA 18337.
43/45P(36)

PUBLIC NOTICE NOTICE TO BIDDERS
SEALED PROPOSALS will be accepted

accept or reject any and/or all proposals or portions thereof, and to delete projects and or portions of the project depending on budgetary constraints and to waive any technicalities deemed to be in the best interested of the Borough. The contract contains an Escalator Clause for quantities of bituminous material of less than 100 tons of asphalt cement.
Matamoras Borough,
Marianne Brown,
Secretary
10 Avenue I
Matamoras, PA 18336
43/44B(110)

PUBLIC NOTICE
NOTICE TO RESIDENTS OF MATAMORAS AND PARTS OF WESTFALL TOWNSHIP
The Matamoras Municipal Authority will begin flushing their hydrants on May 22, 2022. Flushing will be done between the hours of 7:00 PM and 2:00 AM each day until completed. Water may be discolored during this period. Apologizes for any inconvenience this may cause; hydrant flushing is done as part of the regular maintenance of the water distribution system.
43B(25)

PUBLIC NOTICE

claims are directed to present the same without delay to this attorney within twelve (12) months from the

the Clerk of the Court of Common Pleas of Pike County, Orphans' Court Division, a particular statement

tne provi
Business
tion Law
amended

State Police Report

B. GROVE — Pennsylvania State Police at Blooming Grove have announced the following activities.

If anyone has any information on any of the incidents that have occurred below, please contact the Pennsylvania State Police at Blooming Grove at (570) 226-1862 or (570) 226-5718.

Officer Jamison Warner reported a Burglary (Commercial Force) on May 13 at 9 a.m. on Upper Crossroad, Dyberry Township, Wayne County.

The person(s) involved include the Victom, 72, Female.

This station is investigating the report of a burglary at the Cross Roads Self Storage, Dyberry Twp, Wayne County. The victim reported that on 5/13/22, they were contacted and advised that the lock was missing on their storage unit. When they checked, they found several containers from the unit missing. Some of the items reported missing were WWII medals and burial flags of their family, baseball card collection, and an antique BMM movie projector.

Anyone with possible information is requested to contact PSP Honesdale, 570-253-7126.

Investigation is ongoing.

Officer P. Quinn reported Criminal Mischief on May 14 5:51 a.m. on Route 402, Blooming Grove Township,

Pike County.

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Pike Cty Library Bus T

MILFORD – "We're On the Road Again!" After a lon
due to Covid restrictions, the Friends of the Pike County
brary are resuming their bus trips.

On May 25, our bus will depart at 8 a.m. from the
parking lot in Milford, bound for Doylestown, PA. Our tra
visit the Fonthill Castle, and the Mercer Museum, with a l
at the charming Water Wheel Tavern (EST. 1714).

On June 22, our bus will pull out of Key Foods park
a.m., bound for the Reading Market Terminal in Philadel
traveler will be on their own for the day, free to dine, sh
the museums until 4 p.m.

A fun day at Coney Island will begin at 8 a.m., July 6 as
parts Key foods Parking lot, heading for the Boardwalk. Ea
is 'on their own', for the day, free to have fun and explore

Every member of the Friends of PCPL has already r
Spring Newsletter with complete reservation information.
tine at 570-233-0322 for more information, or check out
website at pcpl.org.

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HELP WANTED CONTINUED

SECURITY GUARDS
Legion Security is looking for immediate hire unarmed security

LEGALS CONTINUED

Esq.,
410 Broad Street,
Milford, PA 18337
42/44B(34)

PUBLIC NOTICE

Notice is hereby given that the Board of Supervisors of the Township of Dingman will hold a hearing upon and consider for adoption an ordinance regulating sewage holding tanks, a summary of which is below. Said Hearing will be held at 7:00 pm on June 7, 2022 at the Dingman Township Building, 118 Fisher Lane, Milford, PA. The full text of the proposed amendment can be viewed at the Township Offices, at dingmantownship.org, the offices of the Pike County Dispatch, 105 W Catherine St, Milford, & the Law Library of the Pike County Courthouse, Broad Street, Milford.

HOLDING TANK ORDINANCE

AN ORDINANCE OF DINGMAN TOWNSHIP, PIKE COUNTY, PENNSYLVANIA, PROVIDING FOR AND REGULATING USE OF HOLDING TANKS AND IMPOSING FINES FOR VIOLATIONS OF THIS ORDINANCE.

Section 1. Purposes
Section 2. Definitions
Section 3. Right and Privileges Granted
Section 4. Rules and Regulations
Section 5. Rules & Regulations to b in Conformity with Applicable Law
Section 6. Rates and Charges
Section 7. Exclusiveness of Rights & Privileges

LEGALS CONTINUED

be publicly read at the Board of Supervisors meeting at approximately 6:00 PM.

All documents and solicitation details are available at no cost at PennBid™ - https://pennbid.procureware.com. Click on the "Solicitations" then "View" tabs.

Bids must be accompanied by a certified check or bid bond issued by a Surety licensed to conduct business in the Commonwealth of Pennsylvania, in the amount of at least 10 percent (10%) of the total bid.

The successful bidder will be required to furnish and pay for a Satisfactory Performance and Payment Bond and Labor and Material Bond in an amount of 100% of the contract amount. A Certificate of Insurance, showing proof of Workers Compensation Coverage, must also be submitted.

The project will require minimum wages and salaries to meet the PA Prevailing Wage requirements. The Contractor must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, national origin or handicap.

Award of the Contract, will be to the lowest responsible bidder, but the Owner reserves the unqualified right to reject any or all bids and to waive any informalities permitted by law. Bids may be held by the Township for a period of 60 days from

LEGALS CONTINUED

funding from FEMA and PEMA.

The Watershed Planning Committee, with representatives from each municipality, along with our state and local partners, has worked this past year to update the Plan to account for high tunnel farming practices, updated and new technology BMPs, consistency with 25 Pa. Code Chapter 102. Erosion and Sediment Control, and to provide updated release rate district mapping. Municipalities required to adopt Draft Plan renewals in the Brodhead Creek and McMichaels Creek Watershed are contained within seventeen (17) municipalities in Monroe County and one municipality in Pike County as follows: Barrett, Paradise, Chestnuthill, Coolbaugh, East Stroudsburg, Greene (Pike County) Smithfield, Hamilton, Jackson, Middle Smithfield, Mt. Pocono, Pocono, Price, Ross, Stroud, Stroudsburg, Tobyhanna, Tunkhannock. The Draft Plan can be found for review online at https://www.mcconservation.org/act-167-plans-and-maps.html, and hard copy viewing available at the Pike County Commissioners office, Pike County Office of Community Planning, and the Greene Township offices.

43B(100)

PUBLIC NOTICE

The second public meeting on Pike

LEGALS CONTINUED

by Matamoras Borough until 3:00 p.m., on Tuesday June 14, 2022 at the Matamoras Municipal Building, 10 Ave I Matamoras PA 18336 for the following in place paving projects:

Project #1:
• 312 Tons Superpave 9.5mm Scratch Course
• 771 Tons Superpave 9.5mm 180LB/SY Wearing Course

All materials must meet PennDOT Publication 408 Specifications and Standards. Bidders must be PennDOT prequalified and must supply proof of prequalification.

Proposals must be on forms provided by the Borough. Proposal forms, specifications and bid information can be obtained at the Matamoras Borough Office at the above address or by calling 570-491-4771 Monday through Friday, between the hours of 8:30 a.m. to 3:30 p.m.

A MANDATORY Pre-Bid meeting will be held at 10:00 a.m. on Thursday June 2, 2022 at the Matamoras Borough Office Building on 10 Avenue I, Matamoras PA, 18336, all interested bidders MUST attend. For further information contact Harry Prey at 570-491-4771, between the hours of 8:00 a.m. to 3:30 p.m. Monday through Friday.

All bids must be accompanied by a certified check or bid bond in the amount of ten (10%) percent of the bid made payable to

LEGA CONTIN

A PUBLIC ING WILL B ON JUNE 9, 7:30 PM E THE SH TOWNSHIP OF SUPER AT 159 TWIN ROAD, SH PA, REGA THE A TION OF C. LEWIS T SOLIDATE IN WALKER SHORES C NITY. TAX 049.04-05-37 049.04-05-38 43/

PUBLIC NO

A PUBLIC ING WILL B ON JUNE 9, 7:30 PM B THE SH TOWNSHIP OF SUPER AT 159 TWIN ROAD, SH PA, REGA THE A TION OF W BEKISZ TO SOLIDATE 7 IN WALKER SHORES MUNITY. TA NUMBERS: 06-60, 04 81, 049.02 049.02-06-83, 049.02-06-84. 43/

ADMINISTRA NOTIC

Estate of **Mar Bertino** who mary residen **311 Avenue amoras, P vania, 18336 County**, dece **PETER BE JESSIE BE JORJA BE** and **BERNA KOUTSIALIS** been appoint **PERSONAL**

Broadhead & McMichaels Creek Act 167 Plan
Public Hearing

June 1, 2022 – 10:30am

Pike County Administration Building

1. Call Hearing to Order

2. Announcements
    a. Introductions
    b. Draft Plan available for review
        i. Online
        ii. Pike County Commissioners Office
        iii. Pike County Community Planning Office
    c. Advertised in Pike County Dispatch on May 19, 2022

3. Public Comments

4. Close Hearing

Broadhead and McMichael's Creek
Act 167 Public Hearing
June 1, 2022 10:30am
Pike County Administration Building

Public Hearing Minutes
Broadhead and McMichael's Creek Act 167 Public Hearing was held June 1st, 2022. It was called to order at 10:31 AM in the Pike County Commissioners Administration Building Meeting room.

The meeting was called to order by Michael Mrozinski, Pike County Planning Director. In attendance was Lori Kerrigan, Head Resource Conservationist and Drew Wagner, PE Hydraulic Engineer from the Monroe County Conservation District. Pike County Commissioners Matthew Osterberg, Ron Schmalzle, and Tony Waldron were also in attendance. There was no public in attendance.

The draft plan was available for review online and at the Pike County Commissioner's Office and the Pike County Office of Community Planning. It was advertised in the Pike County Dispatch on May 19, 2022, and the Tri-County Independent on May 17, 2022. Michael Mrozinski called for any comments or questions. No verbal or written comments were received in the Pike County Commissioner's office or Pike County Planning office and there were no comments at the public hearing. The public hearing was closed at 10:36 AM

Respectfully Submitted,
Michael Mrozinski, Pike County Planning Director

PIKE COUNTY COMMISSIONERS

PIKE COUNTY ADMINISTRATION BUILDING
506 BROAD STREET
MILFORD, PA 18337
570-296-7613
FAX: 570-296-6055

MATTHEW M. OSTERBERG
RONALD R. SCHMALZLE
ANTHONY WALDRON
} COMMISSIONERS

GARY R. ORBEN
CHIEF CLERK

THOMAS F. FARLEY, ESQUIRE
COUNTY SOLICITOR

RESOLUTION NO. 22-22
ACT 167 STORMWATER MANAGEMENT PLAN RENEWAL
BRODHEAD AND MCMICHAEL CREEKS WATERSHED

WHEREAS, the Storm Water Management Act 167 of 1978 provides for the regulation of land and water use for flood control and storm water management, requires the Department to designate watersheds, and that each county will prepare and adopt a watershed stormwater management plan and renew or update said plan every five (5) years for each designated watershed; and

WHEREAS, the purpose of the Brodhead and McMichaels Creek Watershed Storm Water Management Plan is to protect public health and safety and to prevent or mitigate the adverse impacts related to the conveyance of excessive rates and volume of storm water runoff by providing for the management of storm water runoff, control of erosion and sediment pollution, and control of non-point source pollution; and

WHEREAS, design criteria and standards of storm water management systems and facilities within the Brodhead and McMichaels Watershed shall utilize the criteria and standards as found in the watershed stormwater management plan;

NOW, THEREFORE, BE IT RESOLVED that the Pike County Board of Commissioners hereby adopt the Brodhead and McMichaels Creek Watershed, Act 167 Storm Water Management Plan, including all appendices and prior modeling, and direct Monroe County to forward the Plan to the Pennsylvania Department of Environmental Protection and Department of Community and Economic Development for approval.

Duly presented and adopted by the Pike County Board of Commissioners, Pike County, Pennsylvania on June 1, 2022.

BOARD OF COMMISSIONERS OF PIKE COUNTY

Matthew M. Osterberg, Chairman

Ronald R. Schmalzle, Vice Chairman

R. Anthony Waldron, Commissioner

Attest:

Gary R. Orben, Chief Clerk
June 1, 2022

From: Kovach, David [DRBC] <David.Kovach@drbc.gov>
Sent: Tuesday, April 19, 2022 4:03 PM
To: Drew Wagner
Subject: RE: [EXTERNAL] Brodhead and McMichales Creek Act 167 Plan

Drew,
I did review the plan. It appears that projects completed in accordance with the Brodhead and McMichael Creek Act 167 Plan and associated Ordinance, BMP's, and references therein would continue to meet DRBC's Special Protection Waters (SPW) requirement for a Non-point Source Pollution Control Plan (NPSPCP) for all projects requiring DRBC Compact Section 3.8 Approval that are located in the drainage area to SPW. I do note that the DRBC's requirement for a NPSPCP has no exemptions from a Drainage Plan as detailed in Section 402; although, it is unlikely that such projects would require an approval from the DRBC and thereby would be rare. In such cases, DRBC would still require a NPSPCP as part of its own review.

David Kovach P.G.
Project Review Manager
Delaware River Basin Commission
25 Cosey Road
West Trenton, NJ 08628-0360
609-477-7264

CHESTNUTHILL TOWNSHIP

P.O. Box 243, 271 Route 715
Brodheadsville, PA 18322
Phone: 570-992-7247
Fax: 570-992-2225

www.chestnuthilltwp-pa.gov
email: info@chestnuthilltwp-pa.gov

Pride In Chestnuthill

Date: March 1, 2022

Monroe County Conservation District
c/o Lori Kerrigan
8050 Running Valley Road
Stroudsburg, PA 18360

Re: Model ACT 167 Stormwater Management Ordinance Review

Dear Monroe County Conservation District,

Per your request, our Township engineer Christopher McDermott has reviewed the Model ACT 167 Stormwater Management Ordinance sent on January 28, 2021, for consistency with other plans and programs affecting the watershed.

Please see the attached document with his comments.

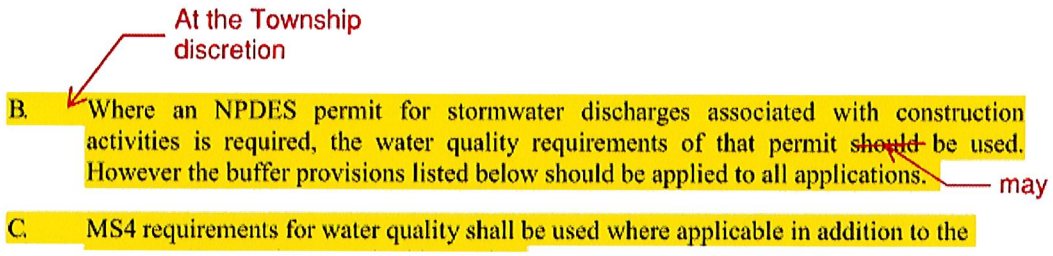
Sincerely,

David Albright

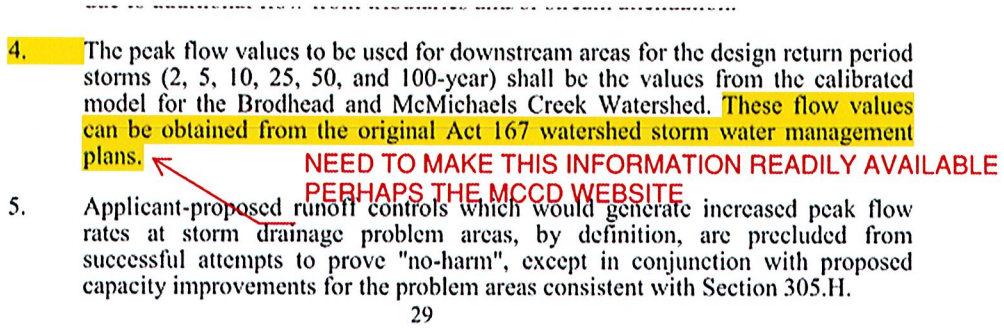
Township Manager

Chris McDermott's comments on the proposed Model Act 167 Stormwater Management Ordinance revisions are as follow :

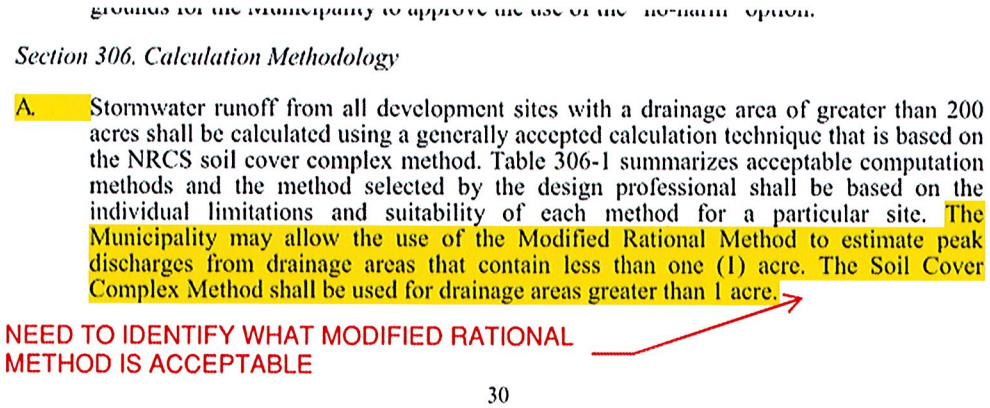
Page 19:



Page 29:



Page 30:



Page 31:

shall be computed using Manning's equation.

E. Calculations using the Modified Rational Method shall be based on a common time of concentration for all contributing areas to a discharge point in both the predevelopment and post development runoff conditions.

F. Hydrograph volumes generated by the Modified Rational Method for routing through control (detention and infiltration) facilities should be comparable to hydrograph volumes generated by the TR-55 methodology. The ascending and descending limbs of the hydrograph generated by the Modified Rational method should be adjusted in order to provide a comparable hydrograph volume.

31 NEED TO IDENTIFY WHAT MODIFIED RATIONAL METHOD IS ACCEPTABLE

MONROE COUNTY CONSERVATION DISTRICT
Conserving Natural Resources for the Future
Technical Section Tel (570) 629-3060 • Environmental Education Tel (570) 629-3061
8050 Running Valley Road • Stroudsburg, PA 18360 • Fax (570) 629-3063 • www.mcconservation.org

TO: Chestnuthill Township Supervisors

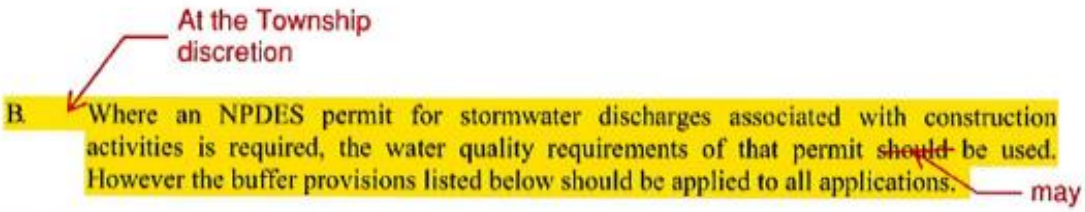
CC: David Albright, Township Manager; Chris McDermott, Township Engineer

FROM: Monroe County Conservation District

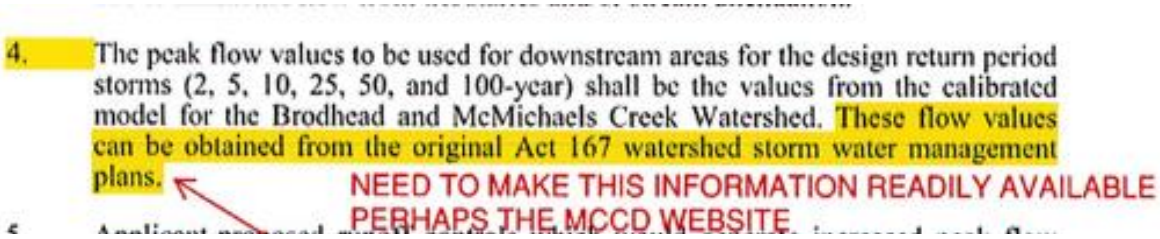
DATE: April 19, 2022

RE: **Comment Responses**
Brodhead Creek and McMichael Creek Watershed Act 167
Stormwater Management Plan Renewal

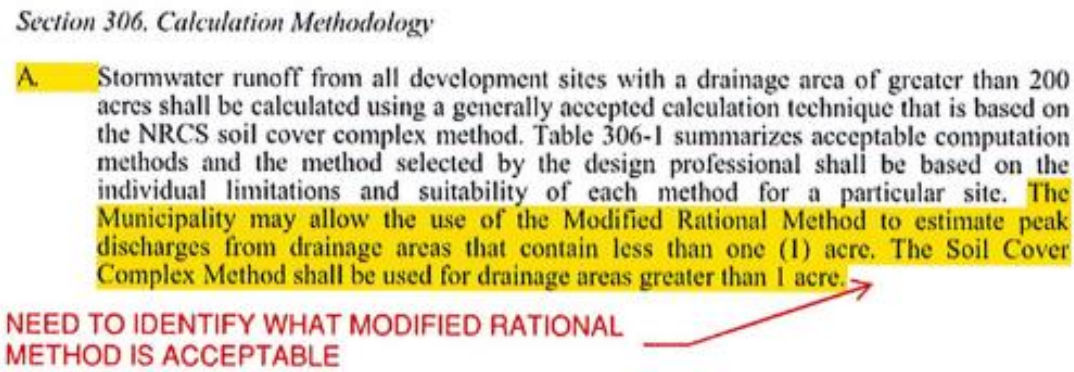
We appreciate your feedback on the proposed Act 167 Plan Renewal for the Brodhead Creek and McMichael Creek Watershed. Our responses to your comments are below in italics.



In an effort to make reviews consistent, the Technical committee agreed that where an NPDES permit was required that the water quality components of the NPDES permit were greater than the requirements in the Act 167 Model Ordinance and would therefore satisfy the water quality requirements of the Plan.



The information is available on the MCCD website.



The accepted rational method should be the method which most closely replicates the volumes generated from the SCS method.

March 1, 2022
Project No: 10205.398

Via email: lkmccd@ptd.net

Monroe County Conservation District
8050 Running Valley Road
Stroudsburg Pa, 18301

ATTENTION: LORI KERRIGAN, TECHNICAL SECTION SUPERVISOR

SUBJECT: Act 167 Ordinance Draft Comments

Dear Lori:

Thank you for providing the draft of the updated Act 167 Stormwater Management Ordinance (Draft Ordinance) to the Borough of East Stroudsburg. As requested, we offer the following questions and comments regarding the draft ordinance provided.

1. **Consistency with the NPDES permit program** – Several revisions have been included in the Draft Ordinance to update sections of the previous Act 167 Ordinance, prepared prior to current NPDES permit requirements, for consistency with NPDES requirements. We recommend that, with the goal of consistency between the Draft Ordinance and the NPDES permit requirements, the documents be even further coordinated to include items such as the required infiltration volumes, minimum infiltration basin drain times, stormwater management agreements and as built plan requirements to name a few.

2. **Consistency with the DEP 2022 Model Stormwater Ordinance**. – Municipalities in the MS4 program are required to adopt a stormwater ordinance consistent with the DEP 2022 Model Stormwater Ordinance. An email from DEP comments that municipalities in the MS4 program will be required to "blend" the DEP model and the Act 167 ordinance to meet both requirements. In the Brodhead Creek watershed, a substantial number of municipalities are included in the MS4 program. It seems appropriate to blend this Draft Ordinance with the DEP 2022 Model Stormwater Ordinance for consistency upfront rather than requiring each municipality to perform the "blend" on an individual basis. While there may be specific MS4 requirements that may not apply to all municipalities, the goal should be to provide overall consistency in ordinance format and content between the local municipalities.

3. **DRBC Review of the Draft Ordinance** – The ordinances under the current Brodhead-McMichael's Creek Act 167 Plan satisfy the Delaware River Basin Commission (DRBC) Non-Point Source Pollution Control (NPSPCP) requirements. It is critical that any updated Act 167 Stormwater Management Ordinance to be adopted, continue to satisfy the DRBC to meet nonpoint source pollution requirements, which is a condition for local Municipalities and Authorities providing water and sewer service to meet under their Dockets. It has been indicated

the Draft Ordinance has been forward to the DRBC for comment. It must be confirmed that the DRBC will accept the proposed Draft Ordinance to meet the requirements for non-point source pollution if adopted by the municipalities.

The aforementioned comments are related to the general format and content of the Draft Ordinance. We would be glad to discuss the draft ordinance in more detail related to these comments if desired.

Sincerely,

RKR HESS, A DIVISION OF UTRS, INC.



Nathan Oiler, P.E.
Director of Land Development Engineering Services

cc: East Stroudsburg Council (*via email*)
Sam D'Alessandro, East Stroudsburg Zoning Officer (*via email*)
John Prevoznik (*via email*)
Monroe County Planning Commission (*via email*)
David Kovach, Manager of Permit Review Program – DRBC (*via email*)

P:\PA\Monroe Co\East Stroudsburg Bor_Authorities\East Stroudsburg Bor\ESB Projects 10205 Series\10205.398 Strmwtr Ord Rev\Project Info\Correspondence\2022-2-28 Act 167 Ordinance Comments.docx

MONROE COUNTY
CONSERVATION DISTRICT
Conserving Natural Resources for the Future
Technical Section Tel (570) 629-3060 • Environmental Education Tel (570) 629-3061
8050 Running Valley Road • Stroudsburg, PA 18360 • Fax (570) 629-3063 • www.mcconservation.org

TO: East Stroudsburg Borough Council

CC: Nate Oiler, PE – Township Engineer, Sam D'Alessandro – Zoning Officer, John Prevoznik

FROM: Monroe County Conservation District

DATE: April 19, 2022

RE: **Comment Responses**
Brodhead Creek and McMichael Creek Watershed Act 167
Stormwater Management Plan Renewal

We appreciate your feedback on the proposed Act 167 Plan Renewal for the Brodhead Creek and McMichael Creek Watershed. Our responses to your comments are provided below in *italics*:

1. Consistency with the NPDES permit program – Several revisions have been included in the Draft Ordinance to update sections of the previous Act 167 Ordinance, prepared prior to current NPDES permit requirements, for consistency with NPDES requirements. We recommend that, with the goal of consistency between the Draft Ordinance and the NPDES permit requirements, the documents be even further coordinated to include items such as the required infiltration volumes, minimum infiltration basin drain times, stormwater management agreements and as built plan requirements to name a few.

   Coordination between Chapter 102 NPDES requirements and this Act 167 plan have been carefully considered with an eye to forthcoming NPDES program and guidance changes. This update was completed to come into compliance with the 5 year renewal requirement of the Act. Further plan and model ordinance revisions will be forthcoming as the program changes are rolled out to maintain consistency.

2. Consistency with the DEP 2022 Model Stormwater Ordinance. – Municipalities in the MS4 program are required to adopt a stormwater ordinance consistent with the DEP 2022 Model Stormwater Ordinance. An email from DEP comments that municipalities in the MS4 program will be required to "blend" the DEP model and the Act 167 ordinance to meet both requirements. In the Brodhead Creek watershed, a substantial number of municipalities are included in the MS4 program. It seems appropriate to blend this Draft Ordinance with the DEP 2022 Model Stormwater Ordinance for consistency upfront rather than requiring each municipality to perform the "blend" on an individual basis. While there may be specific MS4 requirements that may not apply to all municipalities, the goal should be to provide overall consistency in ordinance format and content between the local municipalities.

   After discussion with DEP MS4 program, it was determined that an optional section would be included in the plan and model ordinance to assist those MS4 municipalities.

3. DRBC Review of the Draft Ordinance – The ordinances under the current Brodhead- McMichael's Creek Act 167 Plan satisfy the Delaware River Basin Commission (DRBC) Non- Point Source Pollution Control (NPSPCP) requirements. It is critical that any updated Act 167 Stormwater Management Ordinance to be adopted, continue to satisfy the DRBC to meet nonpoint source pollution requirements, which is a condition for local Municipalities and Authorities providing

water and sewer service to meet under their Dockets. It has been indicated the Draft Ordinance has been forward to the DRBC for comment. It must be confirmed that the DRBC will accept the proposed Draft Ordinance to meet the requirements for non-point source pollution if adopted by the municipalities.

DRBC has provided their concurrence.

50 YEARS HanoverEngineering

3355 Route 611 • Suite 1 • Bartonsville, PA 18321-7822
Phone: 570.688.9550 • Fax: 570.688.9768 • HanoverEng.com

February 28, 2022

Ms. Michelle Arner
Zoning & Codes Officer
Jackson Township Planning Commission
PO Box 213
Reeders, PA 18352

RE: Update Model Act 167 Review
Jackson Township, Monroe County
Hanover Project JT22-19

Dear Ms. Arner:

Per the Supervisor's request, we have reviewed the revised Model Act 167 Ordinance and offer the following comments:

1. Section 303.A – For projects that require an NPDES permit, the water quality requirements of that permit should be used, per Section 303.B. However, the water quality criteria described in Section 303.A requires reducing the 2-year post-development flow rates to the pre-development 1-year flow rates, and to reduce the infiltration to take a minimum of 24 hours to dewater. The peak flow rate reduction of 2 year post- to 1-year pre-development for flow rates is handled through enactment of the Sub-Area Map (Appendix D), so it is unnecessary to include here for water quality purposes, especially since it is not applicable for "no detention" areas.

   Furthermore, this section also requires the infiltration to occur within a minimum of 24 hours. In Hydrologic Soil Groups A and B, this will not be practical. A typical standard depth for infiltration volume retention is one foot. To dewater over 24 hours, the infiltration rate would have to be slower than 0.5 inches per hour. The soils naturally infiltrate faster than 0.5 inches per hour, so limiting infiltration to have to occur slower than 0.5 inches per hour does not match the natural infiltration process and would require bringing in clay soils to mix in with the in-situ soils. I recommend eliminating this section altogether and follow the requirements for an NPDES permit.

2. Section 303.G – I recommend removing the word infiltration and replacing it with "discharge to surface or ground water", as this language is used in previous sections of the ordinance, and it is a better description for what is intended by this section. This revision should also be made to sections 304.A.3.d, and 307.B.

3. Section 303.K.3 and 303.K.4 – These sections reference a variance for buffers. However, there is no process described for applying for and obtaining a "variance". This term hints at a zoning hearing board decision, but I would recommend a waiver process, not just for

buffer requirement relief, but for any section of the ordinance. A process should be described whereas the planning commission reviews the waiver request, makes a recommendation to the board of supervisors/commissioners/council, and they would vote on approval or disapproval of the requested waiver.

4. Section 304.A.4 – The calculation methodology here is different from the calculations for an NPDES permit. I recommend removing Section 4 or revise it to match PADEP requirements for the NPDES permit, which includes infiltration of the difference in the 2-year 24-hour storm event using the SCS Method for volume calculation. Other caveats, such as 20% of existing impervious must be assumed to be meadow in good condition and all pervious surfaces must be assumed to be meadow in good condition for all pre-development volume calculations must be included here, as well. The goal, as I understand it, is to have one set of requirements for peak flow rate and volume calculations. Therefore, no matter if an NPDES is required, the requirements for this permit should still be utilized.

5. Section 304.B.2 – The requirements for the infiltration testing should reference the current version of the PADEP BMP Manual, not an ASTM section.

6. Section 305.A – A more legible and distinct map for the Sub-area mapping should be provided. Mapping provided online does not have road labels, stream labels or other features shown that would help in identifying the project site location. Perhaps these could be uploaded to the PADEP EMap GIS system as a shapefile.

7. Section 306.A – The SCS method is great for volume calculation, but it often is dramatically over-conservative for peak flow rate calculation. However, using the modified rational method with an artificially high time of concentration as required in Section 306.E would result in much lower (and probably under-conservative) peak flow rates.

8. Section 307.C – The requirement for one-foot of freeboard should be limited to centralized detention basins, or basins exceeding 3 feet in height. A one-foot deep rain garden should not have to be more than doubled in size to accommodate this arbitrary requirement.

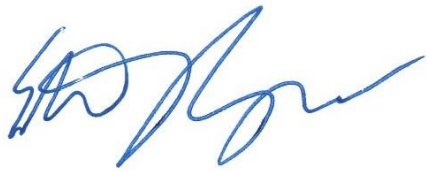
9. Section 403.A.4 – There should be some form of exemption here. Requiring Conservation District approval for a single family residence that happens to go over 5,000 square feet of impervious coverage due to driveway length (for instance) on top of requiring engineering and permit fees for stormwater design and permit preparation for the same seems to be over-regulation, especially if they are under one acre of earth disturbance.

10. Section 405.C – This section should also include exemption language.

Thank you for the opportunity to review this model ordinance. If you have any questions, please contact the undersigned.

Respectfully,

HANOVER ENGINEERING



Salvatore J. Caiazzo, PE
Township Engineer

Cc: Renee Miller, Jackson Township Secretary
Lori Kerrigan, Monroe County Conservation District

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MONROE COUNTY
CONSERVATION DISTRICT
Conserving Natural Resources for the Future

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TO: Jackson Township Supervisors

CC: Michelle Arner, Salvatore Caiazzo, PE Township Engineer

FROM: Monroe County Conservation District

DATE: April 19, 2022

RE: **Comment Responses**
Brodhead Creek and McMichael Creek Watershed Act 167
Stormwater Management Plan Renewal

We appreciate your feedback on the proposed Act 167 Plan Renewal for the Brodhead Creek and McMichael Creek Watershed. Our responses to your comments are below in italics.

1. Section 303.A – For projects that require an NPDES permit, the water quality requirements of that permit should be used, per Section 303.B. However, the water quality criteria described in Section 303.A requires reducing the 2-year post-development flow rates to the pre-development 1-year flow rates, and to reduce the infiltration to take a minimum of 24 hours to dewater. The peak flow rate reduction of 2 year post- to 1-year pre-development for flow rates is handled through enactment of the Sub-Area Map (Appendix D), so it is unnecessary to include here for water quality purposes, especially since it is not applicable for "no detention" areas.

   NPDES permitted sites will follow the water quality provisions of the NPDES Permit as indicated by the model ordinance. Water quality standards for those projects which do not require an NPDES permit need to be included in the model ordinance and plan. Reducing the flow rate from the 2 year storm to the 1 year storm helps to increase runoff attenuation in the BMP which provides time for total suspended solids to settle out in order to address the water quality component.

   Furthermore, this section also requires the infiltration to occur within a minimum of 24 hours. In Hydrologic Soil Groups A and B, this will not be practical. A typical standard depth for infiltration volume retention is one foot. To dewater over 24 hours, the infiltration rate would have to be slower than 0.5 inches per hour. The soils naturally infiltrate faster than 0.5 inches per hour, so limiting infiltration to have to occur slower than 0.5 inches per hour does not match the natural infiltration process and would require bringing in clay soils to mix in with the in-situ soils. I recommend eliminating this section altogether and follow the requirements for an NPDES permit.

   The requirement of this section is for provisions to be made so that the discharge from the facility takes a minimum of 24 hours to drain from the facility, measured from the point where the maximum volume of water is achieved. Discharge of this runoff may be through a combination of discharge from the outlet structure, infiltration or evapotranspiration. Eliminating this section and strictly applying the NPDES water quality requirements would add additional design and BMP requirements for the

smaller projects which do not currently exist. Additionally, a detailed analysis of the design requirements is beyond the scope of this plan renewal.

2. Section 303.G – I recommend removing the word infiltration and replacing it with "discharge to surface or ground water", as this language is used in previous sections of the ordinance, and it is a better description for what is intended by this section. This revision should also be made to sections 304.A.3.d, and 307.B.

   Acknowledged and incorporated.

3. Section 303.K.3 and 303.K.4 – These sections reference a variance for buffers. However, there is no process described for applying for and obtaining a "variance". This term hints at a zoning hearing board decision, but I would recommend a waiver process, not just for buffer requirement relief, but for any section of the ordinance. A process should be described whereas the planning commission reviews the waiver request, makes a recommendation to the board of supervisors/commissioners/council, and they would vote on approval or disapproval of the requested waiver.

   The Zoning Hearing Board has exclusive jurisdiction to hear appeals related to stormwater enforcement for activities not associated with Subdivision and Land Development or PRD's. Appeals related to stormwater enforcement for activities associated with Subdivision and Land Development or PRD's go to the governing body. See MPC Sections 909.1(a)(8) and 909.1.(b)(6). We would recommend discussing this with your Township Solicitor prior to adoption.

4. Section 304.A.4 – The calculation methodology here is different from the calculations for an NPDES permit. I recommend removing Section 4 or revise it to match PADEP requirements for the NPDES permit, which includes infiltration of the difference in the 2- year 24-hour storm event using the SCS Method for volume calculation. Other caveats, such as 20% of existing impervious must be assumed to be meadow in good condition and all pervious surfaces must be assumed to be meadow in good condition for all pre-development volume calculations must be included here, as well. The goal, as I understand it, is to have one set of requirements for peak flow rate and volume calculations. Therefore, no matter if an NPDES is required, the requirements for this permit should still be utilized.

   Eliminating this section and strictly applying the NPDES requirements would add additional design and BMP requirements for the smaller projects which do not currently exist.

5. Section 304.B.2 – The requirements for the infiltration testing should reference the current version of the PADEP BMP Manual, not an ASTM section.

   Acknowledged and incorporated.

6. Section 305.A – A more legible and distinct map for the Sub-area mapping should be provided. Mapping provided online does not have road labels, stream labels or other features shown that would help in identifying the project site location. Perhaps these could be uploaded to the PADEP EMap GIS system as a shapefile.

The Sub-area mapping has been updated. An on-line GIS resource is available.

7. Section 306.A – The SCS method is great for volume calculation, but it often is dramatically over-conservative for peak flow rate calculation. However, using the modified rational method with an artificially high time of concentration as required in Section 306.E would result in much lower (and probably under-conservative) peak flow rates.

   The SCS method was selected to maintain consistency with PA DEP calculation methodology. The modified rational method was included to allow the designer to utilize this method and adjust its parameters to achieve a similar stormwater facility volume when compared to SCS. This was done so that a comparable sized facility would be provided for the project regardless of the methodology used.

8. Section 307.C – The requirement for one-foot of freeboard should be limited to centralized detention basins, or basins exceeding 3 feet in height. A one-foot deep rain garden should not have to be more than doubled in size to accommodate this arbitrary requirement.

   Acknowledged and incorporated.

9. Section 403.A.4 – There should be some form of exemption here. Requiring Conservation District approval for a single family residence that happens to go over 5,000 square feet of impervious coverage due to driveway length (for instance) on top of requiring engineering and permit fees for stormwater design and permit preparation for the same seems to be over-regulation, especially if they are under one acre of earth disturbance.

   This section does not require review and approval by the Conservation District. It states that any reviews or approvals obtained from the Conservation District should be provided with the Drainage Plan. The requirement for review is found in Section 405.C

10. Section 405.C – This section should also include exemption language.

    A written E&S plan is required for all earth disturbances greater than 5,000sqft. Review and approval of E&S plans by the Conservation District ensures compliance with PA DEPs Chapter 102 regulations.

Memo

TO: Stroud Township Supervisors

CC: Daryl Eppley, Manager; Todd Weitzmann, Solicitor

FROM: Donna Alker, P.E., Staff Engineer/Planning Administrator

DATE: February 11, 2022

RE: Brodhead Creek and McMichael Creek Watershed
Act 167 Stormwater Management Plan Renewal

The Monroe County Conservation District has provided final draft copy of the Act 167 Stormwater Management Plan Renewal to all municipalities in the WPAC to review for consistency with other plans and programs prior to public notice and adoption. Based on my review, I have the following comments:

1. Several of the comments, below involve recommendations that will make the proposed Act 167 Plan easier to understand and more useful, including comments related to: logical plan organization; consistency with respect to the terminology used; use of accurate titles of referenced documents; the availability of the referenced documents; and clearly worded standards. Much of the poor organization and wording is carried over from the previous plan. This update is an opportunity to improve upon that plan.
2. I continue to recommend that the PADEP 2022 Model Stormwater Ordinance be used as a template for the model ordinance in the Act 167 Plan Update. PADEP stated its intention in publishing the 2022 Model Stormwater Ordinance as a model for counties to use in the development of Act 167 recommended ordinances. The 2022 Model Stormwater Ordinance also contains language that meets the regulatory requirements for MS4's. In my opinion, the language and organization of the 2022 Model Stormwater Ordinance is a significant improvement over the model ordinances in the current and proposed Act 167 Plan Updates. Any provisions related specifically to the MS4 regulatory requirements could be made optional for Non-MS4 municipalities.
3. Page 7 - The status of municipal adoption of the 2003 Stormwater Management Ordinance is only listed for 9 of the 17 municipalities in the Brodhead/McMichael watershed. The status for the other 8 municipalities should be listed. If the others have not adopted the ordinance, it should be listed that way or the wording should be changed to state "the following municipalities have adopted the 2003 Stormwater Management Ordinance".
4. Pages 7 & 8 – There are references to the Pocono Creek Pilot Study, the Pocono Creek Study and the Pocono Creek Plan. My understanding is the final report resulting from the pilot study is titled "Framework for Sustainable Watershed Management – Pocono Creek", dated May 2009. The references should be changed to refer to the final report. Terms used should be consistent.
5. Page 10 – The technical track dates noted as "In progress" and January 2022" need to be updated.
6. Page 12 – In the 2nd paragraph following Table IV-1, the statement "the stormwater management ordinance provisions to reduce post-development peak rates to pre-development peak rates" is not completely accurate. There is a large area in the watershed where peak rates are not required to be reduced or are required to be reduced below the pre-development rates. The sentence that follows that should be expanded to note where in the watershed the existing conditions peak flows were to be maintained. I believe it was to maintain peak flows in major watercourses.
7. Page 14 - The word "their" in Paragraph B should be "its".

8. Page 19 – Paragraph b references the requirements in the model ordinance, which is the reverse of how it should be. The model ordinance should be based on the Act 167 Plan provisions. If there are general water quality requirements or goals on which the ordinance provisions are based, they should be stated in the Act 167 Plan.
9. Page 19 – the second paragraph of b – The objective should be to promote settlement of pollutants by detaining the proposed conditions 2-year storm to the existing conditions 1-year storm. The detention requirement is the method to achieve the objective.
10. Page 22 – Toward the end of the second paragraph there is a reference to a figure in the model ordinance. The reference should only be to Figure V-5 in Appendix D of the Act 167 Plan. There shouldn't be two separate maps to show the same information. The ordinance should refer to the map in the plan.
11. Table V-2 – The description for District C refers to Section 305.H, which is a section in the model ordinance rather than the plan. There shouldn't be references to the model ordinance since the model ordinance is meant to be based on the plan, not the other way around.
12. Page 23 – The map reference in the paragraph below the table should reference the map in the Plan not the map in the model ordinance.
13. Tables V-3, V-4 and V-5 are included in the Management District Concept section, however, they also apply to water quality and volume control and should be moved to a more general section.
14. Table V-3 – The heading states the ultimate goal as matching existing conditions, however in some cases the requirement is to change the conditions, such as in the Provisional Direct Discharge District C.
15. Page 25 and 29 – The reference to "Pennsylvania's PaDEP BMP Manual" should be changed to the actual title of the document, "Pennsylvania Stormwater Best Management Practices Manual", unless the abbreviated term is included in a definitions section. The date of the manual should also be referenced.
16. Table V-4
    a. Under the "Calculation Methodology" heading the provision should be reworded to state "Standard paramenters shall be set in the Model Ordinance".
    b. Under the heading "Discharge of Accelerated Runoff", the meaning of the required standard is unclear. Does it mean stormwater runoff shall be safely discharged into existing conditions drainage patterns and storm sewers without adversely affecting properties or causing channel scouring and erosion, or is there more to it?
    c. Under the heading "Inappropriate Outlets", the DEP Guidance Document and FAQ referenced should be included in an Appendix to the Plan.
    d. Under the heading District C, the reference should be to the map included in the Act 167 Plan rather than a map in the model ordinance. The meaning of the required standard is not clear. Does it mean runoff shall be safely discharged to an existing conveyance system of adequate capacity, or is there more to it?
    e. Under the heading "Wetlands", the required standard is not clear.
    f. Under the heading "Recharge/Infiltration/Retention", the wording of the required standard should be revised for clarity. The way the standard is worded it seems to imply a preference for subsurface BMP's, which is not the goal. Better wording might be "Infiltration and retention BMP's are preferred over standard detention basins, where soil and physical conditions permit. Impacts on subsurface mines pools and Karst areas must be evaluated before recommending this practice".
    g. Under the heading "Water Quality", a reference to the section that states how to calculate WQv must be provided.
17. Table V-5
    a. The standard under the heading "Erosion and Sediment Pollution Control" is not clear.
    b. Under the heading "Roof Drains, Residential/Commercial", the standard should say "prevent roof drains from directly discharging to …"

c. Under the heading "Pervious Surfaces", the second sentence needs to be reworded for clarity.
d. The heading "Structures" should be changed to "Stormwater BMP's".
e. The term "critical steep slopes", used under the heading "Slopes", is not defined.
f. Under the heading "Stream Bank Protection", the wording in the benefits column needs to be revised as the flow will be reduced not the storms.

18. Page 29 - It's not clear if the paragraph at the top of the page is intended to be part of Table V-5. Those provisions should be moved to a more general section, as should Table V-5. See Comment 16, above. The model ordinance note is poorly worded.
19. Page 29 – Section D should be titled "Runoff Control Techniques". The use of the word "Alternative" leads one to believe the techniques in this section are alternative to techniques in some other section.
20. Tables V-6, V-8, V-9 and V-10 should be replaced with a reference to the Pennsylvania Stormwater Best Management Practice Manual.
21. Pages 43 & 44 – In Paragraphs 3 and 6, the references to Sections 302, 303, and 304 are references to sections in the model ordinance. The references to those sections should be deleted from the language in the body of the Plan. They should only appear in the language of the model ordinance.
22. It's awkward to include the model ordinance within the body of the Act 167 Plan. My recommendation is to include it as an appendix and reference it in Paragraph D on Page 113. If it is to remain in the body, the page numbering for the Act 167 Plan should not restart at 1 for the model ordinance, it should follow page numbering of the Act 167 Plan.
23. Page 113 – Paragraph D the reference should be to the "Model Act 167 Stormwater Management Ordinance", which is the title of the model ordinance, rather than "Brodhead Creek and McMichaels Creek Watershed –Act 167 Stormwater Management Ordinance".
24. Page 114 – In Paragraph 3, I believe the term "cost bases" should be "cost basis".
25. Page 115 – There is a reference to an Obstruction Map in Paragraph G.1. A copy of that map should be included in the Plan and a reference to its location should be added to this section is needed.
26. Page 117 – The mention of Wayne and Carbon Counties in the third paragraph is in error as the watershed does not extend into those counties.
27. Appendix A – It would be helpful to include some location information for the stormwater hotspots listed in the table in addition to the longitude and latitude.
28. Appendix C – In the Monroe County Municipal Stormwater Management Ordinance Status List, the buffer information for Stroud Township must be revised. The buffer requirements are found in Chapter 23 of the Township Code, the Stormwater Management Chapter. 150' buffers for stream and wetlands (100' inner buffer and 50' outer buffer) are required. The buffer requirements in the Zoning Ordinance were superseded by the 2010 Stormwater Ordinance.
29. Appendix C – The purpose of the sample municipal ordinance matrix is not clear. Was it intended that the matrix be filled in and included in the plan?
30. The inset on Figure IV-1 should show the hotspot numbers.
31. Figure V-5, the management district map is somewhat better than the map included with the 2003 plan but is still inferior to the maps included in the original Brodhead Creek and McMichaels Creek Act 167 Plans. The original maps more clearly showed the underlying USGS map with roads, contour lines, etc.
32. A definitions section should be added to the Plan. There is a definitions section in the model ordinance but not in the Plan.
33. Model Ordinance Page 19 – The West Nile Virus Guidance referenced in Paragraph I should be included in an appendix to the model ordinance. It may be better to require minimizing the potential for mosquito production be considered in the design of wetlands and wet basins in accordance with that reference rather say "Biology shall be incorporated".
34. The meaning of the information shown in brackets in bold red text in the model ordinance should be set forth.

35. Model Ordinance Page 27 – The requirement isn't always to control peak runoff to the existing conditions rate. In District C peak rates may be increased. In the B Districts a reduction of peak rates is required. The new sentence should be reworded.
36. Model Ordinance Page 29 – The flow values referenced in G.4 should be included in an Appendix in the updated Act 167 Plan.
37. The applicability of the method described in Appendix E of the model ordinance should be set forth in the body of the model ordinance.

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TO: Stroud Township Supervisors

CC: Daryl Eppley, Manager; Todd Weitzmann, Solicitor; Donna Alker, P.E., Staff Engineer/Planning Administrator

FROM: Monroe County Conservation District

DATE: April 19, 2022

RE: **Comment Responses**
Brodhead Creek and McMichael Creek Watershed Act 167
Stormwater Management Plan Renewal

We appreciate your feedback on the proposed Act 167 Plan Renewal for the Brodhead Creek and McMichael Creek Watershed. Our responses to your comments are below in italics.

1. Several of the comments, below involve recommendations that will make the proposed Act 167 Plan easier to understand and more useful, including comments related to: logical plan organization; consistency with respect to the terminology used; use of accurate titles of referenced documents; the availability of the referenced documents; and clearly worded standards. Much of the poor organization and wording is carried over from the previous plan. This update is an opportunity to improve upon that plan.
   At this time, our goal is to renew the Act 167 Plan in order to meet the requirements of the Act. Our intention is to pursue a more detailed, comprehensive update in the future.

2. I continue to recommend that the PADEP 2022 Model Stormwater Ordinance be used as a template for the model ordinance in the Act 167 Plan Update. PADEP stated its intention in publishing the 2022 Model Stormwater Ordinance as a model for counties to use in the development of Act 167 recommended ordinances. The 2022 Model Stormwater Ordinance also contains language that meets the regulatory requirements for MS4's. In my opinion, the language and organization of the 2022 Model Stormwater Ordinance is a significant improvement over the model ordinances in the current and proposed Act 167 Plan Updates. Any provisions related specifically to the MS4 regulatory requirements could be made optional for Non-MS4 municipalities.
   Evaluating the restructuring of the Model Ordinance to be consistent with the 2022 Model Ordinance will be part of the comprehensive update effort referenced above. We will address the differences in the organization of the documents as we move forward with updating the plan.

   We created a separate ordinance for MS4 municipalities that includes the regulatory requirements found in Article VII of the 2022 Model Ordinance.

3. Page 7 - The status of municipal adoption of the 2003 Stormwater Management Ordinance is only listed for 9 of the 17 municipalities in the Brodhead/McMichael watershed. The status for the other 8 municipalities should be listed. If the others have not adopted the ordinance, it should be listed that way or the wording should be changed to state "the following municipalities have adopted the 2003 Stormwater Management Ordinance".
   This table has been removed from the plan.

4. Pages 7 & 8 -There are references to the Pocono Creek Pilot Study, the Pocono Creek Study and the Pocono Creek Plan. My understanding is the final report resulting from the pilot study is titled "Framework for Sustainable Watershed Management- Pocono Creek", dated May 2009. The references should be changed to refer to the final report. Terms used should be consistent.
Terminology has been updated for consistency.

5. Page 10 - The technical track dates noted as "In progress" and January 2022" need to be updated.
The table has been updated with the current status of each goal.

6. Page 12 - In the 2nd paragraph following Table IV-1, the statement "the stormwater management ordinance provisions to reduce post-development peak rates to pre-development peak rates" is not completely accurate. There is a large area in the watershed where peak rates are not required to be reduced or are required to be reduced below the pre-development rates. The sentence that follows that should be expanded to note where in the watershed the existing conditions peak flows were to be maintained. I believe it was to maintain peak flows in major watercourses.
This statement has been updated to:

"Although the land use of the watershed has become more urbanized since the original Plan adoptions, the storm water management ordinance provisions to reduce post-development peak rates to pre-development peak rates of runoff have been implemented where it was found to be necessary."

7. Page 14 - The word "their" in Paragraph B should be "its".
The statement is referring to standards and criteria, making the plural possessive "their" correct.

8. Page 19 - Paragraph b references the requirements in the model ordinance, which is the reverse of how it should be. The model ordinance should be based on the Act 167 Plan provisions. If there are general water quality requirements or goals on which the ordinance provisions are based, they should be stated in the Act 167 Plan.
The reference to the model ordinance has been removed. The water quality requirements and goals on which the ordinance provisions are based are outlined in the Plan.

9. Page 19 - the second paragraph of b - The objective should be <u>to promote settlement of pollutants</u> by detaining the proposed conditions 2-year storm to the existing conditions 1-year storm. The detention requirement is the method to achieve the objective.
This statement has been updated to:

"For the water quality volume (WQv), the objective is to promote settlement of pollutants through detaining the proposed conditions' 2- year, 24-hour design storm to the existing conditions 1-year flow using the SCS Type II distribution."

10. Page 22-Toward the end of the second paragraph there is a reference to a figure in the model ordinance. The reference should only be to Figure V-5 in Appendix D of the Act 167 Plan. There shouldn't be two separate maps to show the same information. The ordinance should refer to the map in the plan.
The model ordinance reference has been removed.

The model ordinance is the working piece of the Plan and will typically be viewed separately from the Plan contents once municipalities have adopted it. For ease of use, the Watershed Management District Map is being kept in both the Plan contents and in the model ordinance.

11. Table V-2 -The description for District C refers to Section 305.H, which is a section in the model ordinance rather than the plan. There shouldn't be references to the model ordinance since the model ordinance is meant to be based on the plan, not the other way around.
Comment Acknowledged.

12. Page 23 -The map reference in the paragraph below the table should reference the map in the Plan not the map in the model ordinance.
This statement has been updated to reference the map in the Plan.

13. Tables V-3, V-4 and V-5 are included in the Management District Concept section, however, they also apply to water quality and volume control and should be moved to a more general section.
These tables relate to the content in Table V-2, which is why they are included in this section.

14. Table V-3 - The heading states the ultimate goal as matching existing conditions, however in some cases the requirement is to change the conditions, such as in the Provisional Direct Discharge District C.
The direct discharge district and other districts are meant to match existing timing of the watershed which matches existing conditions of the watershed.

15. Page 25 and 29- The reference to "Pennsylvania's PaDEP BMP Manual" should be changed to the actual title of the document, "Pennsylvania Stormwater Best Management Practices Manual", unless the abbreviated term is included in a definitions section. The date of the manual should also be referenced.
The abbreviation in this statement has been changed to the full title of the document.

16. Table V-4
    a. Under the "Calculation Methodology" heading the provision should be reworded to state "Standard parameters shall be set in the Model Ordinance."
    The standard has been updated to reflect this change.

    b. Under the heading "Discharge of Accelerated Runoff', the meaning of the required standard is unclear. Does it mean stormwater runoff shall be safely discharged into existing conditions drainage patterns and storm sewers without adversely affecting properties or causing channel scouring and erosion, or is there more to it?
    There are instances where there could be an increase in runoff, i.e. "excess accelerated stormwater runoff." For example, projects located in Management District C. If there is such an increase, this accelerated runoff needs to be discharged in a manner which does not adversely affect properties or cause channel scouring and erosion, as stated in the standard and District C criteria. An applicant would need to provide an analysis indicating this objective is being met, such as a downstream hydraulic capacity analysis per District C criteria outlined in Table V-2.

    c. Under the heading "Inappropriate Outlets", the DEP Guidance Document and FAQ referenced should be included in an Appendix to the Plan.
    Since the FAQ is a living document, any updates to it would require us to restart the process of submitting the Act 167 plan renewal in order to have the most up-to-date document in our plan. For that reason, it is referenced in the Plan as "as amended."

    d. Under the heading District C, the reference should be to the map included in the Act 167 Plan rather than a map in the model ordinance. The meaning of the required standard is not clear. Does it mean runoff shall be safely discharged to an existing conveyance system of adequate capacity, or is there more to it?
    The standard has been updated to reference Figure V-5. Correct, the standard states that runoff shall be safely discharged to an existing conveyance system of adequate capacity. Per the Plan "Those areas designated in Figure V-5 as being in District C shall safely discharge runoff directly into an existing conditions conveyance system with no detention or attenuation of greater than the 5-year storm, if the system has the capacity."

e. Under the heading "Wetlands", the required standard is not clear.
The standard has been updated to "Network with administrative and regulatory agencies involved with work within wetland areas to help promote the protection of those resources."

f. Under the heading "Recharge/Infiltration/Retention", the wording of the required standard should be revised for clarity. The way the standard is worded it seems to imply a preference for subsurface BMP's, which is not the goal. Better wording might be "Infiltration and retention BMP's are preferred over standard detention basins, where soil and physical conditions permit. Impacts on subsurface mines pools and Karst areas must be evaluated before recommending this practice".
This standard has been updated to reflect the suggested changes.

g. Under the heading "Water Quality", a reference to the section that states how to calculate WQv must be provided.
Reference to Section V.B.2.b. added.

17. Table V-5
    a. The standard under the heading "Erosion and Sediment Pollution Control" is not clear.
    The standard has been updated to "Network with administrative and regulatory agencies involved with earth disturbance activities."

    b. Under the heading "Roof Drains, Residential/Commercial", the standard should say "prevent roof drains from directly discharging to ... "
    The word "directly" has been added.

    c. Under the heading "Pervious Surfaces", the second sentence needs to be reworded for clarity.
    The second sentence has been removed.

    d. The heading "Structures" should be changed to "Stormwater BMP's".
    The heading has been updated to reflect the suggested change.

    e. The term "critical steep slopes", used under the heading "Slopes", is not defined.
    The word critical has been removed from the standard.

    f. Under the heading "Stream Bank Protection", the wording in the benefits column needs to be revised as the flow will be reduced not the storms.
    The wording has been updated to reflect the suggested change.

18. Page 29 - It's not clear if the paragraph at the top of the page is intended to be part of Table V-5. Those provisions should be moved to a more general section, as should Table V-5. See Comment 16, above. The model ordinance note is poorly worded.
The sequence is intentional as Table V-5 references standards and criteria associated with BMP's. The model ordinance note has been updated.

19. Page 29- Section D should be titled "Runoff Control Techniques". The use of the word "Alternative" leads one to believe the techniques in this section are alternative to techniques in some other section.
Alternative is referring to non-structural controls as opposed to traditional structural controls, as described in the first paragraph of Section D.

20. Tables V-6, V-8, V-9 and V-10 should be replaced with a reference to the Pennsylvania Stormwater Best Management Practice Manual.
These tables have been removed a reference to the BMP manual has been added.

21. Pages 43 & 44- In Paragraphs 3 and 6, the references to Sections 302, 303, and 304 are references to sections in the model ordinance. The references to those sections should be deleted from the language in the body of the Plan. They should only appear in the language of the model ordinance.
These references have been removed.

22. It's awkward to include the model ordinance within the body of the Act 167 Plan. My recommendation is to include it as an appendix and reference it in Paragraph D on Page 113. If it is to remain in the body, the page numbering for the Act 167 Plan should not restart at 1 for the model ordinance, it should follow page numbering of the Act 167 Plan.
The ordinance has been moved out of the body of the text and into an appendix.

23. Page 113 - Paragraph D the reference should be to the "Model Act 167 Stormwater Management Ordinance", which is the title of the model ordinance, rather than "Brodhead Creek and McMichaels Creek Watershed -Act 167 Stormwater Management Ordinance".
The title has been updated.

24. Page 114-In Paragraph 3, I believe the term "cost bases" should be "cost basis".
This has been corrected.

25. Page 115 - There is a reference to an Obstruction Map in Paragraph G.1. A copy of that map should be included in the Plan and a reference to its location should be added to this section is needed.
The obstruction map is included in previous plans and included here by reference.

26. Page 117 - The mention of Wayne and Carbon Counties in the third paragraph is in error as the watershed does not extend into those counties.
This has been corrected.

27. Appendix A - It would be helpful to include some location information for the stormwater hotspots listed in the table in addition to the longitude and latitude.
Coordinates are the most accurate location information for these stormwater hotspots as there are not addresses associated with each site.

28. Appendix C - In the Monroe County Municipal Stormwater Management Ordinance Status List, the buffer information for Stroud Township must be revised. The buffer requirements are found in Chapter 23 of the Township Code, the Stormwater Management Chapter. 150' buffers for stream and wetlands (100' inner buffer and 50' outer buffer) are required. The buffer requirements in the Zoning Ordinance were superseded by the 2010 Stormwater Ordinance.
Comment acknowledged

29. Appendix C -The purpose of the sample municipal ordinance matrix is not clear. Was it intended that the matrix be filled in and included in the plan?
Prior to adoption by the Municipality, the matrix should be completed.

30. The inset on Figure IV-1 should show the hotspot numbers.
The inset has been updated with the hotspot reference numbers.

31. Figure V-5, the management district map is somewhat better than the map included with the 2003 plan but is still inferior to the maps included in the original Brodhead Creek and McMichaels Creek Act 167 Plans. The original maps more clearly showed the underlying USGS map with roads, contour lines, etc.
The interactive version of Figure V-5 is available on our website. This mapping is referenced in the 4th paragraph of Section II.A
https://www.mcconservation.org/act-167-renewal-documents-ndash-for-public-notice.html

32. A definitions section should be added to the Plan. There is a definitions section in the model ordinance but not in the Plan.
Comment Acknowledged.

33. Model Ordinance Page 19- The West Nile Virus Guidance referenced in Paragraph I should be included in an appendix to the model ordinance. It may be better to require minimizing the potential for mosquito production be considered in the design of wetlands and wet basins in accordance with that reference rather say "Biology shall be incorporated".
It was the Technical Committees desire to remove this material and include a reference to the previous plan.

34. The meaning of the information shown in brackets in bold red text in the model ordinance should be set forth.
Those bracketed sections are to be filled in by each municipality

35. Model Ordinance Page 27 -The requirement isn't always to control peak runoff to the existing conditions rate. In District C peak rates may be increased. In the B Districts a reduction of peak rates is required. The new sentence should be reworded.
Comment addressed

36. Model Ordinance Page 29- The flow values referenced in G.4 should be included in an Appendix in the updated Act 167 Plan.
It was the Technical Committees desire to remove this material and include a reference to the previous plan.

37. The applicability of the method described in Appendix E of the model ordinance should be set forth in the body of the model ordinance.
Comment Addressed

1155 Red Fox Road | East Stroudsburg | Pennsylvania 18301
Ph: 570-223-5082 | Fax: 570-223-5086
www.smithfieldtownship.com

March 1, 2022

Monroe County Conservation District
c/o Lori Kerrigan, CPESC
8050 Running Valley Rd
Stroudsburg, PA 18360

RE: Act 167 Update Comments

Dear Ms. Kerrigan:

Per the requirements of the Act 167 Update process, Smithfield Township conveys this letter with our comments on the draft Brodhead Creek & McMichael Creek Watershed Stormwater Management Plan.

Smithfield Township is pleased that the plan provides for a renewal of the existing policy and makes critical updates to Best Management Practices. Given increased development in Smithfield and pending MS-4 requirements, we are pleased to assist in supporting this plan, and have no further comments on the stormwater management plan.

If you have any questions regarding our comments, please do not hesitate to contact the Township office.

Sincerely,

Jacob A. Pride

Jacob A. Pride
Chairman, Board of Supervisors

Lori Kerrigan

From: Bohman, John D <jbohman@pa.gov>
Sent: Tuesday, March 1, 2022 11:28 AM
To: Lori Kerrigan
Subject: RE: [External] RE: Action Item: Internal WPAC_DEP comment_ Act 167 Renewal

Lori, thank you for including me. I just completed my review and I didn't have any comments/changes.

Take care,

John Bohman | Senior Civil Engineer Supervisor – Permit Coordinator
PA Department of Transportation **|** Engineering District 5-0
1002 Hamilton Street **|** Allentown, PA 18101
Phone: 610.871.4578 **|** Fax: 610.871.4122
www.pa.gov

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Appendix C

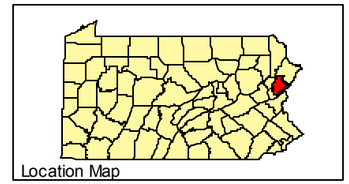
Municipal Ordinance Matrix

(Reserved for Future Updates Upon Plan Adoption)

Appendix D

Maps





Basemap
Brodhead-McMichaels Watershed
Monroe County, PA

ACT 167
Stormwater Management
Plan Update
Phase II

Figure II-1

Map Legend

- Watershed Boundaries
- Municipal Boundaries
- County Boundaries
- Roads
- Railroads
- Streams
- Lakes
- Townships
- Boroughs

Prepared For:
Monroe County Planning Commission
&
Monroe County Conservation District

Notes:

Portions of these maps were generated from existing data sources as listed below. This existing data was utilized for base mapping purposes and is shown on the maps for spatial reference only. This data did not enter into any computations or affect the reliability of the hydrologic analysis. Borton-Lawson Engineering has found some inaccuracies in some of this data and has corrected the data in locations where these discrepancies were obvious, however, it was not a part of this Act 167 Plan to correct all the base data.

Data Sources:
Roads - PennDOT
Streams, Lakes - PennDOT
Municipal Boundaries - PennDOT

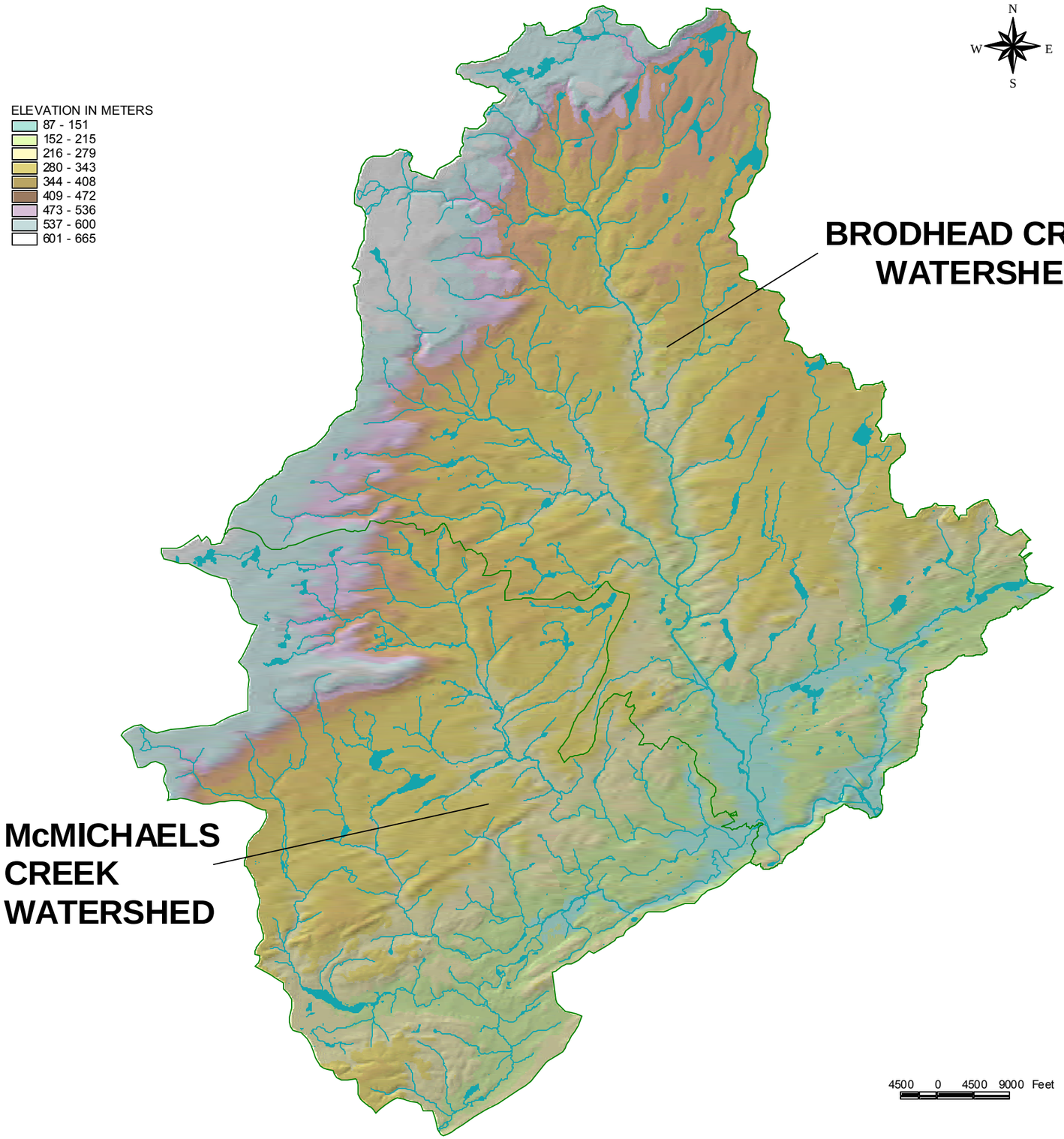
Borton Lawson ENGINEERING

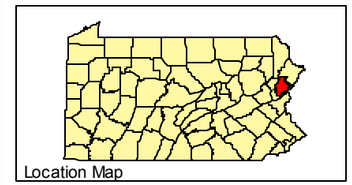
613 Baltimore Drive
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Wilkes-Barre, PA 18702
570-821-1999 Fax 570-821-1990

6814 Chrisphalt drive
Suite 200
Bath, PA 18014
610-837-5916 Fax 610-837-5918

World Wide Web : http://www.borton-lawson.com

Prepared By: PAR	Checked By:
Project Number: 2001-1014-00	Date: August 2003





Digital Elevation Model

Brodhead-McMichaels Watershed
Monroe County, PA

ACT 167
Stormwater Management
Plan Update
Phase II

Figure II-2

Map Legend

- Watershed Boundaries
- Streams
- Lakes

Prepared For:

Monroe County Planning Commission
&
Monroe County Conservation District

Notes:

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Streams, Lakes - PennDOT
Municipal Boundaries - PennDOT

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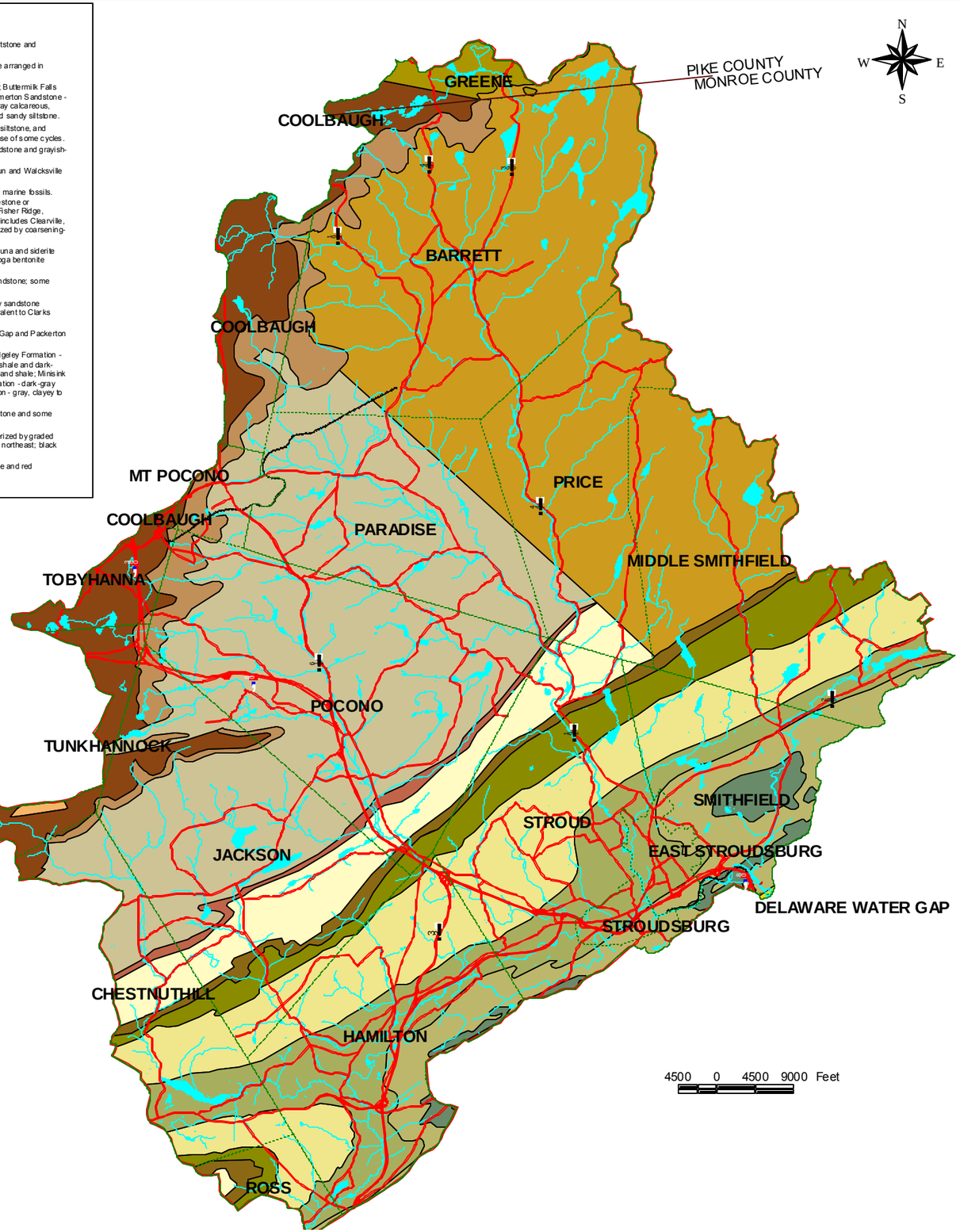
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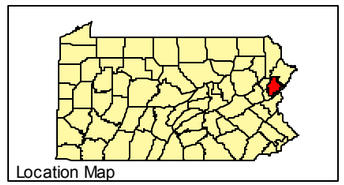
World Wide Web : http://www.borton-lawson.com

Prepared By: PAR	Checked By:
Project Number: 2001-1014-00	Date: August 2003

GEOLOGIC FORMATIONS

- Beaverdam Member of Catskill Fm - Alternating olive-gray siltstone and sandstone; marine fossils.
- Bloomsburg Fm - Grayish-red siltstone, shale, and sandstone arranged in fining-upward cycles.
- Buttermilk Falls thru Esopus Fm Undiv - In descending order; Buttermilk Falls Limestone - gray fossiliferous limestone and black chert; Palmerton Sandstone - massive white siliceous sandstone; Schoharie Formation - gray calcareous, argillaceous siltstone; Esopus Formation - gray silty shale and sandy siltstone.
- Duncannon Member of Catskill Fm - Grayish-red sandstone, siltstone, and claystone in fining-upward cycles; conglomerate occurs at base of some cycles.
- Long Run Member of Catskill Fm - Gray and grayish-red sandstone and grayish-red siltstone and claystone in fining-upward cycles.
- Long Run and Walcksville Member - Combination of Long Run and Walcksville Member descriptions.
- Mahantango Fm - Gray, brown, and olive shale and siltstone; marine fossils. Includes following members, in descending order: Tully - limestone or calcareous shale; Sherman Ridge, Montebello (sandstone), Fisher Ridge, Dalmatia, and Turkey Ridge. In south-central Pennsylvania, includes Clearville, Frame, Chaneysville, and Gander Run Members. Characterized by coarsening-upward cycles.
- Marcellus Fm - Black, carbonaceous shale; sparse marine fauna and siderite concretions. Contains local limestone ("Purcell") member. Tioga bentonite included at base in eastern Pennsylvania.
- Packerton Member of Catskill Fm - Greenish-gray to gray sandstone; some laterally persistent conglomerate beds in lower part.
- Poplar Gap Member of Catskill Fm - Gray and light-olive-gray sandstone conglomerate containing intermittent red beds; laterally equivalent to Clarks Ferry, Sawmill Run, and Berry Run Members.
- Poplar Gap and Packerton Member - Combination of Poplar Gap and Packerton Member descriptions.
- Ridgeley Fm-Coeymans Fm Undiv - In descending order: Ridgeley Formation - white siliceous sandstone; Shriver Chert - grays iltstone and shale and dark-gray chert; Port Ewen Shale - dark-gray calcareous siltstone and shale; Minisink Limestone - dark-gray clayey limestone; New Scotland Formation - dark-gray fossiliferous shale and clayey limestone; Coeymans Formation - gray, clayey to sandy limestone.
- Townsensing Member of Catskill Fm - Dominantly gray sandstone and some siltstone; freshwater fossils.
- Trimmers Rock Fm - Olive-gray siltstone and shale, characterized by graded bedding; marine fossils; some very fine grained sandstone in northeast; black shale of Harrell Formation at base in Susquehanna Valley.
- Walcksville Member of Catskill Fm - Greenish-gray sandstone and red siltstone and claystone in fining-upward cycles.





Geology
Brodhead-McMichaels Watershed
Monroe County, PA

ACT 167
Stormwater Management
Plan Update
Phase II

Figure II-3

Map Legend

- Watershed Boundaries
- Municipal Boundaries
- County Boundaries
- Roads
- Railroads
- Streams
- Lakes

Prepared For:

Monroe County Planning Commission
&
Monroe County Conservation District

Notes:

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Data Sources:
Roads - PennDOT
Streams, Lakes - PennDOT
Municipal Boundaries - PennDOT

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World Wide Web : http://www.borton-lawson.com

Prepared By: PAR	Checked By:
Project Number: 2001-1014-00	Date: August 2003

STORMWATER HOT SPOTS

2021 SURVEY RESPONSES

MONROE COUNTY, PENNSYLVANIA

FIGURE IV-1

- Localized Flooding
- Sediment Runoff
- Stream Flooding
- Sewer / Roadway Flooding

0 2 4 Miles

1:200,000

N W E S

The County of Monroe makes no express or implied warranties concerning the release of this information. The County of Monroe is unaware of the use or uses to be made of this data. Consequently, the County of Monroe does not warrant this data as fit for any particular purpose.

MONROE 2030

www.monroecountypa.gov

PREPARED BY:

Monroe County Planning Commission

701 Main Street, Suite 405

Stroudsburg, PA 18360

(570) 517-3100

mcpc@monroecountypa.gov

January 2022

22-002

MANAGEMENT DISTRICTS
BRODHEAD - MCMICHAEL WATERSHEDS
MONROE COUNTY, PENNSYLVANIA

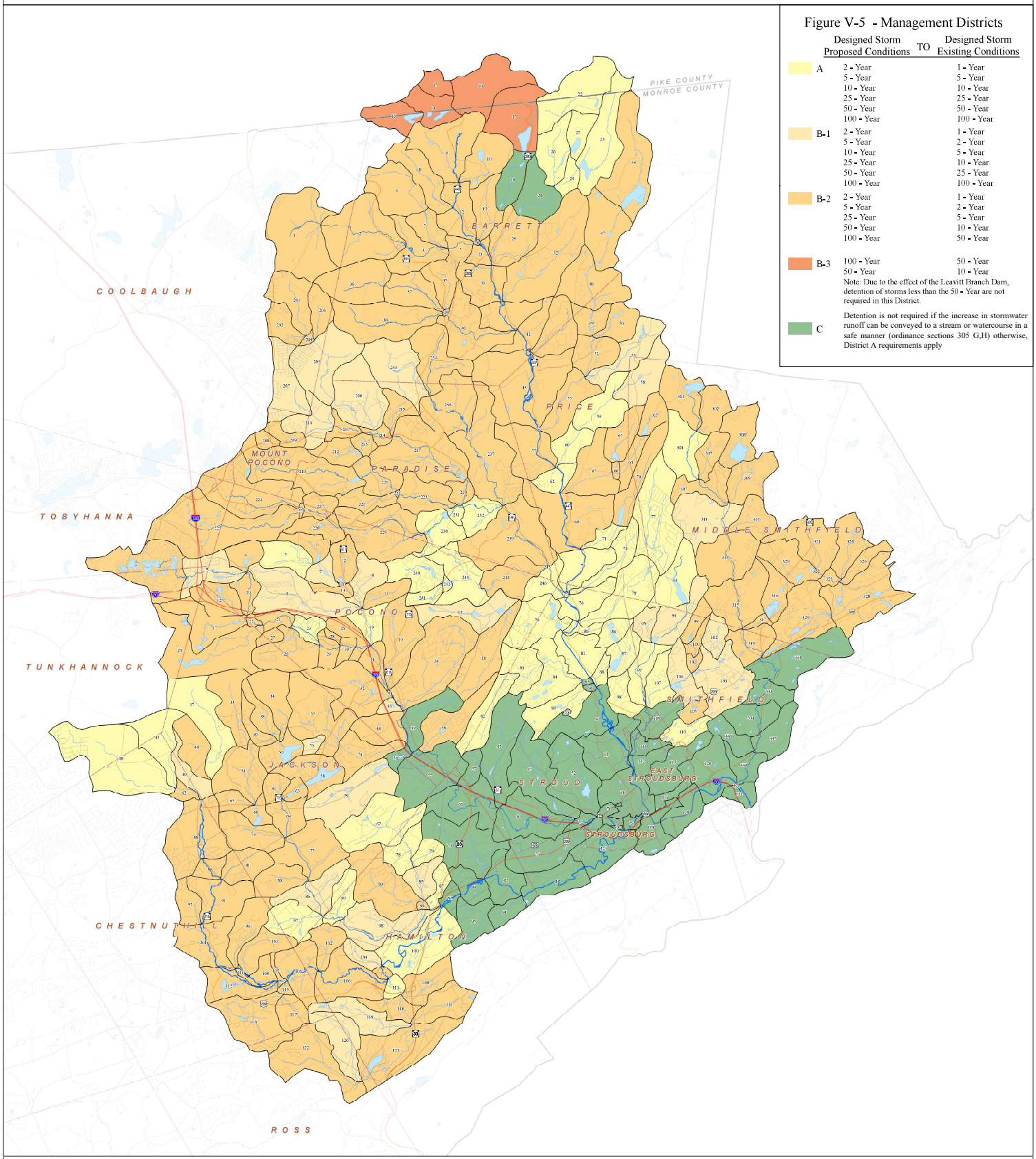


Figure V-5 - Management Districts

	Designed Storm Proposed Conditions	TO	Designed Storm Existing Conditions
A	2 - Year		1 - Year
	5 - Year		5 - Year
	10 - Year		10 - Year
	25 - Year		25 - Year
	50 - Year		50 - Year
	100 - Year		100 - Year
B-1	2 - Year		1 - Year
	5 - Year		2 - Year
	10 - Year		5 - Year
	25 - Year		10 - Year
	50 - Year		25 - Year
	100 - Year		100 - Year
B-2	2 - Year		1 - Year
	5 - Year		2 - Year
	25 - Year		5 - Year
	50 - Year		10 - Year
	100 - Year		50 - Year
B-3	100 - Year		50 - Year
	50 - Year		10 - Year

Note: Due to the effect of the Leavitt Branch Dam, detention of storms less than the 50 - Year are not required in this District.

C — Detention is not required if the increase in stormwater runoff can be conveyed to a stream or watercourse in a safe manner (ordinance sections 305 G,H) otherwise, District A requirements apply

N W E S

1:48,000

0 2 4
Miles

Legend

- Subwatershed Boundary
- County Boundary
- Municipal Boundary
- Waterbody
- Stream
- Interstate
- US Traffic Route
- PA Traffic Routes
- Ramps
- State Routes
- Municipal Roads
- Private Roads
- Private Driveways
- Trails

The County of Monroe makes no express or implied warranties concerning the release of this information. The County of Monroe is unaware of the use or uses to be made of this data. Consequently, the County of Monroe does not warrant this data as fit for any particular purpose.

MONROE 2030

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PREPARED BY:

Monroe County Planning Commission
1 Quaker Plaza, Room 106
Stroudsburg, PA 18360
(570) 517-3100
mcpc@monroecountypa.gov

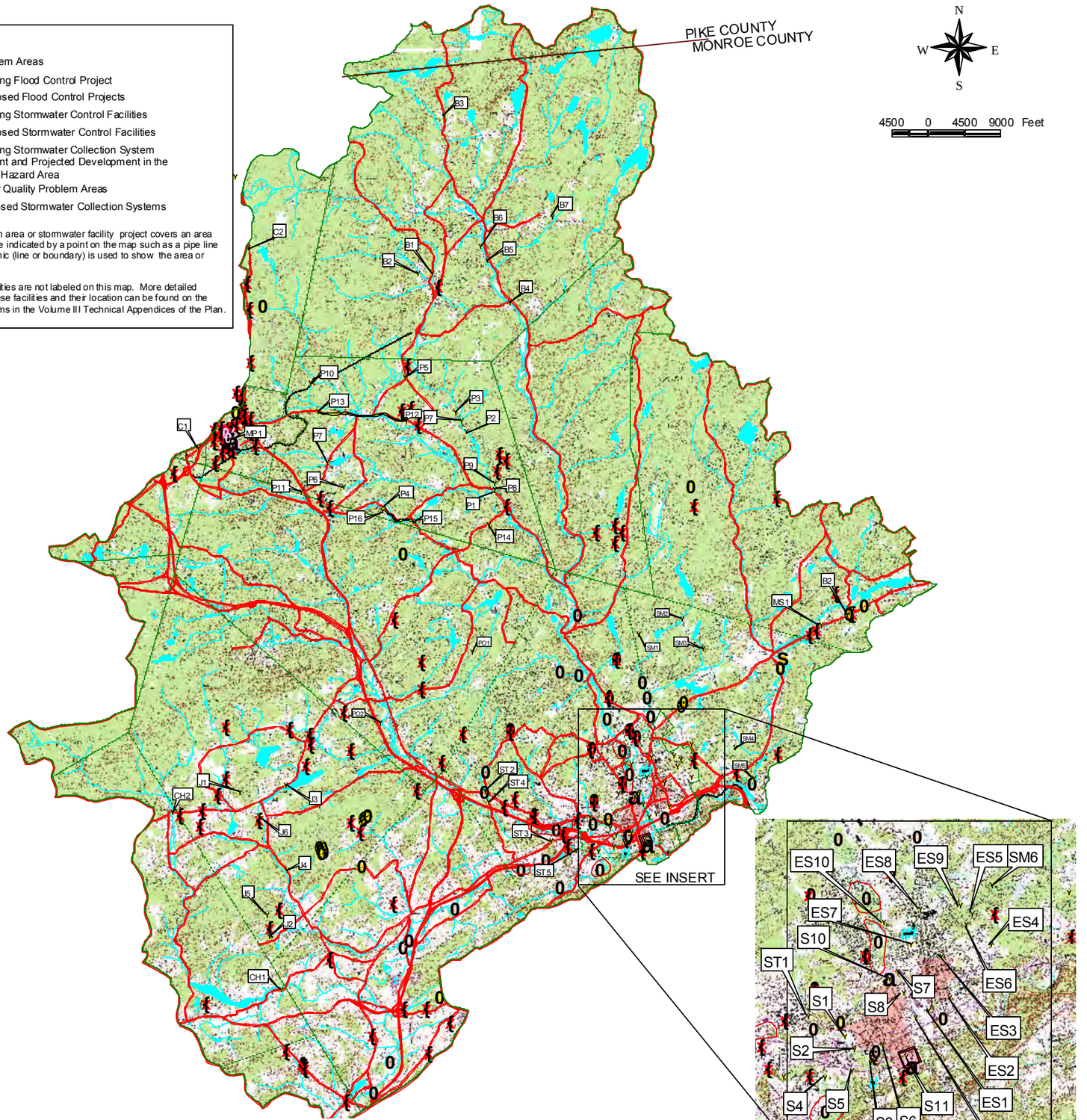
June 2021

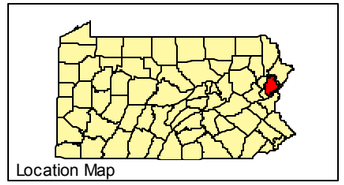
Legend

- Problem Areas
- Existing Flood Control Project
- Proposed Flood Control Projects
- Existing Stormwater Control Facilities
- Proposed Stormwater Control Facilities
- Existing Stormwater Collection System
- Present and Projected Development in the Flood Hazard Area
- Water Quality Problem Areas
- Proposed Stormwater Collection Systems

Note: If a problem area or stormwater facility project covers an area larger than can be indicated by a point on the map such as a pipe line or region, a graphic (line or boundary) is used to show the area or project limits.

Storm water facilities are not labeled on this map. More detailed information of these facilities and their location can be found on the problem area forms in the Volume III Technical Appendices of the Plan.





Problem Areas

Brodhead-McMichaels Watershed Monroe County, PA

ACT 167
Stormwater Management
Plan Update
Phase II

Figure VI-1

Map Legend

- Watershed Boundaries
- Municipal Boundaries
- County Boundaries
- Roads
- Railroads
- Streams
- Lakes

Prepared For:

Monroe County Planning Commission
&
Monroe County Conservation District

Notes:

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World Wide Web : http://www.borton-lawson.com

Prepared By: PAR	Checked By:
Project Number: 2001-1014-00	Date: August 2003

Appendix E

DEP Levee Data

Bureau Of Waterways Engineering
Rachel Carson State Office Building
P. O. Box 8460
Harrisburg, PA 17105-8460

FAX TRANSMITTAL SHEET

TO: Paul DeBarry **FAX NO.** 610-837-5918

PHONE NO. 610-837-5917

FROM: Joseph G. Capasso

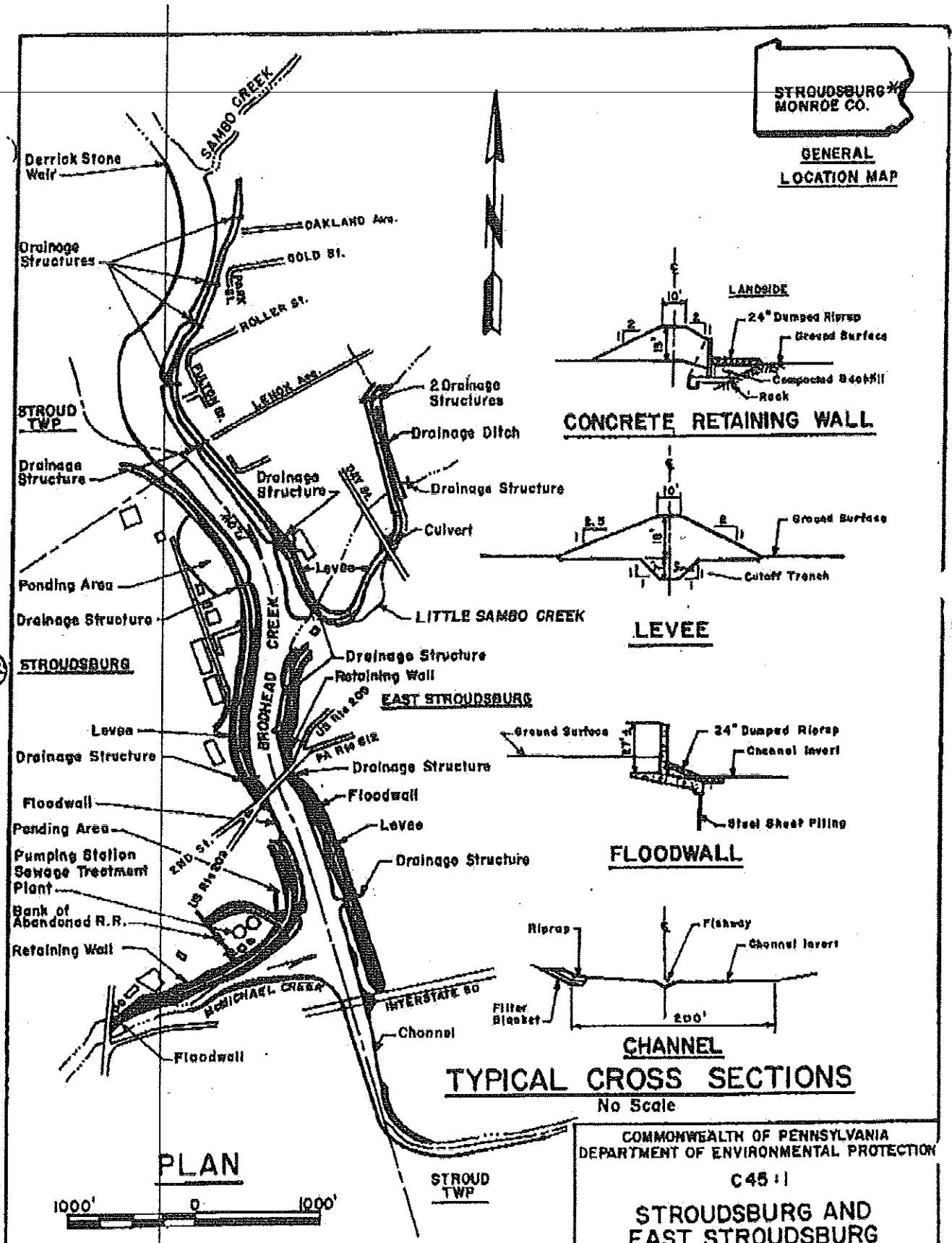
OFFICE PHONE NO. (717) 787-3411

FAX NO. 717-772-0409

NUMBER OF PAGES NOT INCLUDING COVER SHEET: 4

DATE: Thursday, August 28, 2003

SPECIAL INSTRUCTIONS TO RECEIVER:



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

C45:1

STROUDSBURG AND EAST STROUDSBURG FLOOD PROTECTION

AUG. 28. 2003 11:05AM WATERWAYS ENGINEERING-7177720409 NO. 291 P. 2

STROUDSBURG AND EAST STROUDSBURG FLOOD PROTECTION, C45:1

LOCATION: Brodhead, McMichael and Little Sambo Creeks, Stroudsburg and East Stroudsburg Boroughs and Stroud Township, Monroe County

QUADRANGLE: Stroudsburg, **Latitude:** 40°59'00", **Longitude:** 75°11'30"

SPONSOR: Boroughs of Stroudsburg and East Stroudsburg

PROJECT DESCRIPTION: This project consisted of the improvement of 11,800 feet of earth channel, including widening, cleaning, and realignment; construction of 16,000 feet of earth levees, including 15 drainage structures equipped with emergency sluice gates; construction of 560 feet of reinforced concrete floodwall and 390 feet of concrete retaining wall; and construction of both a sanitary sewage and storm water pumping station. Channel slopes were protected with rock riprap at critical areas. Two ponding areas were provided to allow interior runoff to collect during high stream stages.

Improvements to the interior drainage system and installation of staff gauges were completed in 1964.

DESIGNER: Fridy, Gauker, Truscott and Fridy, Inc., Philadelphia, Pa.
CONTRACT NO.: C45:1 **PERMIT NO.:** 13627
BID OPENING: May 13, 1960 **CONTRACT AWARD:** May 31, 1960
LOW BIDDER: Elmhurst Contracting Co., Corona, N.Y
PROJECT COMPLETED: October 9, 1962 **CONSTRUCTION COST:** $1,591,233.77

DRAINAGE CRITERIA:	DRAINAGE AREA	FLOOD OF RECORD (August 19, 1955)	FIS 100-YEAR DISCHARGE
Brodhead Creek:			
Below McMichael Creek	258 SM	68,800 CFS	36,000 CFS
Above McMichael Creek	146 SM	----------	26,000 CFS
McMichael Creek:	107 SM	5,740 CFS	10,300 CFS

Maximum Channel Bottom Width: 220 FT
Levee Top Width: 10 FT
Land Slope 1V to 2H
Stream Slope 1V to 2.5H
Pumping Station:
Sewage - 2 Pumps at 100 gallons per minute (GPM) each
Storm Water - 2 Pumps at 800 gallons per minute (GPM) each

QUANTITIES:

902,375 C.Y.	Excavation (All Types)	16 EA.	Drainage Structures
506,770 C.Y.	Rolled Embankment	1 EA.	Sewage Pumping Station
39,230 S.Y.	Dumped Riprap	1 EA.	Storm Pumping Station
3,260 C.Y.	Concrete	38 AC.	Seeding

Project turned over to sponsor for operation and maintenance on October 17, 1962.

AUG. 28. 2003 11:05AM WATERWAYS ENGINEERING-1111/2099

STROUDSBURG LEVEE STABILIZATION PROJECT, C45:1, DGS 180-27

PROJECT DESCRIPTION: Riprap was placed on the left bank levee from the Gold Street area upstream to Sambo Creek. Rock riprap was also placed from the bottom of the existing riprap down to a depth of 5 feet below the channel invert on the remaining length of levee. A control structure was installed across the channel invert to minimize future degradation of Brodhead Creek.

DESIGNER: Department

CONTRACT NO.: DGS 180-27.1 **PERMIT NO.:** Unknown

BID OPENING: May 14, 1980 **CONTRACT AWARD:** June 25, 1980

LOW BIDDER: Allegheny Mountain Construction Co., Galeton, Pa.

PROJECT COMPLETED: April 14, 1981 **CONSTRUCTION COST:** $923,000.00

DESIGN CRITERIA:
Same as Stroudsburg and East Stroudsburg Flood Protection.

QUANTITIES:

68,000	C.Y.	Excavation
21,500	S.Y.	18-Inch Riprap
10,000	S.Y.	20-Inch Riprap
25,000	C.Y.	Filter Blanket

Appendix F

Model Stormwater Ordinance for Municipalities with No MS4's

MODEL ACT 167 STORMWATER MANAGEMENT ORDINANCE

FINAL INSERT DATE

PLEASE HAVE YOUR SOLICITOR REVIEW THE ENCLOSED ORDINANCE AND CHECK THE APPLICABILITY OF ALL SECTIONS TO YOUR MUNICIPALITY

STORMWATER MANAGEMENT

ORDINANCE

ORDINANCE NO. INSERT #

[Municipal Name] , [County Name]

COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

Date , 20 add

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ARTICLE I- GENERAL PROVISIONS

Section 101. Statement of Findings

The Governing Body of **[Insert Municipality]** finds that:

A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.

B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety, welfare, and the protection of the people of **[Insert Municipality]** and all the people of the Commonwealth, their resources, and the environment.

C. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed poses a threat to surface and groundwater quality.

D. Through project design, impacts from stormwater runoff can be minimized to maintain the natural hydrologic regime, and sustain high water quality, groundwater recharge, stream baseflow and aquatic ecosystems. The most cost effective and environmentally advantageous way to manage storm water runoff is through nonstructural project design, minimizing impervious surfaces and sprawl, avoiding sensitive areas (i.e. buffers, floodplains, steep slopes), and designing to topography and soils to maintain the natural hydrologic regime.

E. To effectively monitor the maintenance of base flow within the watershed, a tracking of consumptive use including storm water discharges and groundwater withdrawals is critical to complying with anti-degradation, the Act's goals and policy, and the regulatory requirement to maintain base flow and stream health.

Section 102. Purpose

The purpose of this Ordinance is to promote the public health, safety, and welfare within the Brodhead and McMichaels Creek watersheds by maintaining the natural hydrologic regime and minimizing the impacts described in Section 101 of this Ordinance through provisions designed to:

A. Promote alternative project designs and layout that minimizes impacts to surface and ground water.

B. Promote nonstructural BMP's.

C. Minimize increases in stormwater volume.

D. Minimize impervious surfaces.

E. Manage accelerated runoff and erosion and sedimentation problems at their source by regulating activities that cause these problems during construction.

F. Utilize and preserve the existing natural drainage systems.

G. Encourage recharge of groundwater where appropriate and prevent degradation of groundwater quality.

H. Address the quality and quantity of stormwater discharges from the development site.

I. Maintain existing baseflow and quality of streams and watercourses in the Municipality and the Commonwealth

J. Preserve and restore the flood carrying capacity of streams.

K. Provide proper maintenance of all permanent stormwater management facilities that are constructed in the Municipality.

L. Provide performance standards and design criteria for watershed-wide stormwater management and planning.

Section 103. Statutory Authority

The Municipality is empowered to regulate land use activities that affect runoff, surface and groundwater quality and quantity by the authority of the Act of October 4, 1978 32 P.S., P.L. 864 (Act 167) Section 680.1 et seq., as amended, the "Stormwater Management Act" (hereinafter referred to as "the Act"), and the Water Resources Management Act of 2002, as amended, Municipalities Planning Code, Act of 1968, P.L.805, No.247, as amended, Second Class Township Code, 53 PS Section 66501 et seq., 66601 et seq. and the Borough Code 53 PS Section 46201 et seq..

Section 104. Applicability/Regulated Activities

This Ordinance shall apply to those areas of the Municipality that are located within the Brodhead and McMichaels Creek Watersheds, as delineated on the mapping in Appendix D which is hereby adopted as part of this Ordinance.

This Ordinance shall only apply to permanent nonstructural and structural stormwater management Best Management Practices (BMP's) constructed as part of any of the "Regulated Activities" listed in this Section.

This Ordinance contains only the stormwater management performance standards and design criteria that are necessary or desirable from a watershed-wide perspective. Local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.) shall continue to be regulated by the applicable Municipal Ordinances and applicable State Regulations.

The Municipality may, after consultation with DEP, approve alternative methods for meeting the State Water Quality Requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, State law including but not limited to the Clean Streams Law and the Pennsylvania Stormwater BMP Manual as revised.

The following activities are defined as "Regulated Activities" and shall be regulated by this Ordinance:

A. Land development.
B. Subdivisions.
C. Alteration of the natural hydrologic regime.
D. Construction of/or additional impervious or semi-pervious surfaces (driveways, parking lots, roads).

E. Construction of new buildings or additions to existing buildings.
F. Redevelopment of a site which will increase runoff or change a discharge point. Any redevelopment that does not increase the runoff must still comply with Sections 303 (Water Quality and Streambank Erosion Requirements) and 304 (Ground Water Recharge).
G. Diversion piping or encroachments in any natural or man-made channel.
H. Nonstructural and structural storm water management BMP's or appurtenances thereto.
I. Stream enhancement or restoration projects.

Section 105. Repealer

Any ordinance or ordinance provision of the Municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

Section 106. Severability

Should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 107. Compatibility with Other Ordinance Requirements

Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

ARTICLE II-DEFINITIONS

Section 201. Interpretation.

For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.

B. The word "includes" or "including" shall not limit the term to the specific example, but is intended to extend its meaning to all other instances of like kind and character.

C. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, unit of government, or any other similar entity.

D. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.

E. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used, occupied or maintained.

Section 202 - Definitions

Accelerated Erosion - The removal of the surface of the land through the combined action of man's activity and the natural processes of a rate greater than would occur because of the natural process alone.

Agricultural Activities - The work of producing crops and raising livestock including tillage, plowing, disking, harrowing, pasturing and installation of conservation measures. For purposes of regulation by this Ordinance construction of new buildings or impervious area is not considered an agricultural activity.

Alteration - As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the changing of surface conditions by causing the surface to be more or less impervious; land disturbance.

Applicant - A person who has filed an application for approval to engage in any “Regulated Activities” as defined in Section 104 of this Ordinance.

Bankfull – The channel at the top-of-bank or point where water begins to overflow onto a floodplain.

Base Flow – The portion of stream flow that is sustained by ground water discharge.

Bioretention – A storm water retention area which utilizes woody and herbaceous plants and soils to remove pollutants before infiltration occurs.

Best Management Practice (BMP) - Stormwater structures, facilities and techniques to control, maintain or improve the quantity and quality of surface runoff and groundwater recharge.

BMP Manual - Pennsylvania Stormwater Best Management Practices Manual (Stormwater BMP Manual), Commonwealth of Pennsylvania, Department of Environmental Protection, No 363-0300-002 (December 2006), as amended and updated.

Buffer – The area of land immediately adjacent to any wetland, lake, pond, vernal pond, or stream, measured perpendicular to and horizontally from the delineated edge of the wetland, lake, pond, or vernal pond, or the top-of-bank on both sides of a stream.

Channel Erosion - The widening, deepening, and headward cutting of small channels and waterways, caused by stormwater runoff or bankfull flows.

Cistern - An underground reservoir or tank for storing rainwater.

Conservation District - The Monroe or Pike County Conservation District.

Consumptive Water Use – That part of water removed from the immediate water environment not available for other purposes such as water supply, maintenance of stream flows, water quality, fisheries and recreation, as opposed to water that is used non-consumptively, which is returned to a surface water, where practicable, and/or to groundwater.

Culvert - A structure with appurtenant works, which carries water under or through an embankment or fill.

Dam - An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid, or a refuse bank, fill or structure for highway, railroad or other purposes which does or may impound water or another fluid or semifluid.

Department – The Pennsylvania Department of Environmental Protection.

Designee - The agent of the Monroe or Pike County Planning Commission, Monroe or Pike County Conservation District and/or agent of the Governing Body involved with the administration, review or enforcement of any provisions of this Ordinance by contract or memorandum of understanding.

Design Professional (Qualified) – A Pennsylvania Registered Professional Engineer, Registered Landscape Architect or a Registered Professional Land Surveyor trained to develop stormwater management plans.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of stormwater management systems.

Detention Basin - An impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Development Site - The specific tract of land for which a Regulated Activity is proposed.

Diffused Drainage Discharge – Drainage discharge not confined to a single point location or channel, such as sheet flow or shallow concentrated flow.

Disturbed Areas – Land area where an earth disturbance activity is occurring or has occurred.

Downslope Property Line - That portion of the property line of the lot, tract, or parcels of land being developed located such that overland or pipe flow from the site would be directed towards it.

Drainage Conveyance Facility - A Stormwater Management facility designed to transmit stormwater runoff and shall include channels, swales, pipes, conduits, culverts, storm sewers, etc.

Drainage Easement - A right granted by a Grantor to a Grantee, allowing the use of private land for stormwater management purposes.

Drainage Permit - A permit issued by the Municipal Governing Body after the drainage plan has been approved.

Drainage Plan - The documentation of the stormwater management system, if any, to be used for a given development site, the contents of which are established in Section 403.

Earth Disturbance – A construction or other human activity which disturbs the surface of land, including, but not limited to, clearing and grubbing, grading, excavations, embankments, agricultural plowing or tilling, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth materials.

Emergency Spillway – A conveyance area that is used to pass peak discharge greater than the maximum design storm controlled by the storm water facility.

Encroachment – A structure or activity that changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water.

Erosion - The movement of soil particles by the action of water, wind, ice, or other natural forces.

Erosion and Sediment Control Plan - A site specific plan that is designed to minimize accelerated erosion and sedimentation during construction.

Exceptional Value Waters – Surface waters of high quality which satisfy Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, § 93.4b(b) (relating to anti- degradation).

Existing Conditions - The initial condition of a project site prior to the proposed alteration. If the initial condition of the site is undeveloped land, the land use shall be considered as "meadow" unless the natural land cover is proven to generate lower Curve Numbers (CN) or Rational "C" value.

FEMA-The Federal Emergency Management Agency

Flood - A temporary condition of partial or complete inundation of land areas from the overflow of streams, rivers, and other waters of this Commonwealth.

Floodplain – The lands adjoining a river or stream that have been or may be expected to be inundated by flood waters in a 100-year frequency flood.

Floodway - The channel of the watercourse and those portions of the adjoining floodplains, which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed - absent evidence to the contrary - that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

Forest Management/Timber Operations - Planning and activities necessary for the management of forest land with no change of land use proposed. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting and reforestation.

Freeboard - A vertical distance between the elevation of the design high-water and the top of a dam, levee, tank, basin, swale, or diversion berm. The space is required as a safety margin in a pond or basin.

Grade - A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein. (To) Grade - to finish the surface of a roadbed, top of embankment or bottom of excavation.

Grassed Waterway - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to convey surface water.

Groundwater Recharge - Replenishment of existing natural underground water supplies without degrading groundwater quality.

HEC-HMS - The U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC) - Hydrologic Modeling System (HMS) computer program.

High Quality Waters – Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying Pennsylvania Code Title 25 Environmental Protection, Chapter 93 Water Quality Standards, § 93.4b(a).

High Tunnel – A structure which meets the following:

(i) Is used for the production, processing, keeping, storing, sale or shelter of an agricultural commodity as defined in Section 2 of the Act of December 19, 1974 (P.L. 973, No. 319), known as the "Pennsylvania Farmland and Forest Land Assessment Act of 1974" or for the storage of agricultural equipment and supplies.

(ii) Is constructed consistent with all of the following:

a. Has a metal, wood or plastic frame.
b. When covered, has a plastic, woven textile, or other flexible covering.
c. Has a floor made of soil, crushed stone, matting, pavers or a floating concrete slab.

Hydrologic Regime (natural) – The hydrologic cycle or balance that sustains quality and quantity of storm water, baseflow, storage, and groundwater supplies under natural conditions.

Hydrologic Soil Group - A classification of soils by the Natural Resources Conservation Service, formerly the Soil Conservation Service, into four runoff potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much more runoff.

Impervious Surface - A surface that prevents the percolation of water into the ground such as rooftops, pavement, sidewalks, driveways, gravel drives, roads and parking, and compacted fill, earth or turf to be used as such.

Impoundment - A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

Infill – Development that occurs on smaller parcels that remain undeveloped but are within or very close proximity to urban areas. The development relies on existing infrastructure and does not require an extension of water, sewer or other public utilities.

Infiltration – For stormwater to pass through the soil from the surface.

Infiltration Structures - A structure designed to direct runoff into the underground water (e.g., French drains, seepage pits, seepage trench, etc.).

Inlet - The upstream end of any structure through which water may flow.

Land Development - (i) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure or (b) the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features; (ii) A subdivision of land; (iii) development in accordance with Section 503(1.1)of the PA Municipalities Planning Code.

Limiting zone - A soil horizon or condition in the soil profile or underlying strata which includes one of the following:

(i) A seasonal high water table, whether perched or regional, determined by direct observation of the water table or indicated by soil mottling.

(ii) A rock with open joints, fracture or solution channels, or masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.

(iii) A rock formation, other stratum or soil condition which is so slowly permeable that it effectively limits downward passage of water.

Lot - A part of a subdivision or a parcel of land used as a building site or intended to be used for building purposes, whether immediate or future, which would not be further subdivided. Whenever a lot is used for a multiple family dwelling or for commercial, institutional or industrial purposes, the lot shall be deemed to have been subdivided into an equivalent number of single family residential lots as determined by estimated sewage flows.

Main Stem (Main Channel) - Any stream segment or other runoff conveyance facility used as a reach in the Brodhead and McMichaels hydrologic model.

Management District - Those subareas in which some type of detention is required to meet the plan requirements and the goals of Act 167.

Manning Equation (Manning formula) - A method for calculation of the velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

Municipality – **[Municipal Name]**, **[Monroe or Pike]** County, Pennsylvania.

Natural Hydrologic Regime - see Hydrologic Regime (natural)

Non-point Source Pollution - Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

Nonstructural BMPs – Methods of controlling stormwater runoff quantity and quality, such as innovative site planning, impervious area and grading reduction, protection of natural depression areas, temporary ponding on site and other techniques

NRCS - Natural Resource Conservation Service (previously SCS).

Open Channel - A drainage element in which stormwater flows within an open surface. Open channels include, but shall not be limited to, natural and man-made drainage ways, swales, streams, ditches, canals, and pipes flowing partly full.

Outfall - Point where water flows from a conduit, stream, or drain.

Outlet - Points of water disposal from a stream, river, lake, tidewater or artificial drain.

Parent Tract – The parcel of land from which a land development or subdivision originates, existing as of the date of municipal adoption of the original Brodhead and McMichaels Creek Ordinance.

Parking Lot Storage - The use of parking areas as temporary impoundments with controlled release rates during rainstorms.

Peak Discharge - The maximum rate of stormwater runoff from a specific storm event.

Penn State Runoff Model (calibrated) - The computer-based hydrologic modeling technique adapted to the Brodhead and McMichaels watersheds for the Act 167 Plan. The model has been "calibrated" to reflect actual recorded flow values by adjoining key model input parameters.

Pipe - A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Planning Commission - The Planning Commission of **[Municipal Name]**.

PMF - Probable Maximum Flood - The flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in any area. The PMF is derived from the probable maximum precipitation (PMP) as determined based on data obtained from the National Oceanographic and Atmospheric Administration (NOAA).

Practicable Alternative – An alternative that is available and capable of being implemented after taking into consideration cost, existing technology and logistics in light of overall project purposes.

Predevelopment – Undeveloped/Natural Condition. See Existing Conditions.

Pretreatment – Techniques employed in structural and nonstructural stormwater BMPs to provide storage or filtering to help trap coarse materials and other pollutants before they enter the system, but not necessarily meet the water quality volume requirements of Section 303.

Rational Formula - A rainfall-runoff relation used to estimate peak flow.

Recharge Area – Undisturbed surface area or depression where stormwater collects, and a portion of which infiltrates and replenishes the underground and groundwater.

Record Drawings - Original documents revised to suit the as-built conditions and subsequently provided by the Design Professional (Qualified) to the Applicant. The Design Professional takes the Contractor's as-builts, reviews them in detail with his/her own records for completeness, then either turns these over to the Applicant or transfers the information to a set of reproducibles, in both cases for the Applicant's permanent records."

Redevelopment – Any construction, alteration, or improvement exceeding 5,000 square feet of impervious surface on sites where existing land use is commercial, industrial, institutional, or multifamily residential.

Regulated Activities - Actions or proposed actions that have an impact on stormwater runoff quality and quantity and that are specified in Section 104 of this Ordinance.

Release Rate - The reduction of post development peak rates of runoff from a site or subarea to

existing conditions peak rates of runoff to protect downstream areas.

Retention Basin - A structure in which stormwater is stored and not released during the storm event. Retention basins do not have an outlet other than recharge and must infiltrate stored water in no more than 4 days.

Return Period - The average interval, in years, within which a storm event of a given magnitude can be expected to recur.

Riser - A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

Rooftop Detention - Temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff - Any part of precipitation that flows over the land surface.

SALDO – Subdivision and Land Development Ordinance.

Sediment Basin - A barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other material transported by water during construction.

Sediment Pollution - The placement, discharge or any other introduction of sediment into the waters of the Commonwealth.

Sedimentation - The process by which mineral or organic matter is accumulated or deposited by the movement of water or air.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the underground and groundwater.

Sheet Flow - Runoff that flows over the ground surface as a thin, even layer.

Soil-Cover Complex Method - A method of runoff computation developed by the NRCS that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN).

Source Water Protection Areas (SWPA) – The zone through which contaminants, if present, are likely to migrate and reach a drinking water well or surface water intake.

Special Protection Watersheds - Watersheds for which the receiving waters are exceptional value (EV) or high quality (HQ) waters.

Spillway – A conveyance that is used to pass the peak discharge of the maximum design storm controlled by the stormwater facility.

Storage Indication Method - A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage) with outflow defined as a function of storage volume and depth.

Storm Frequency - The number of times that a given storm "event" occurs or is exceeded on the average in a stated period of years. See "Return Period".

Storm Sewer - A system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources, but excludes domestic sewage and industrial wastes.

Stormwater - The surface runoff generated by precipitation reaching the ground surface.

Stormwater Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff quality and quantity. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

Stormwater Management Plan - The plan for managing those land use activities that will influence stormwater runoff quality and quantity and that would impact the Brodhead and McMichaels Watersheds adopted by Monroe County and Pike County as required by the Act of October 4, 1978, P.L. 864, (Act 167), and known as the "Brodhead and McMichaels Watershed Act 167 Stormwater Management Plan".

Stormwater Management Site Plan - The plan prepared by the Applicant or his representative indicating how stormwater runoff will be managed at the particular site of interest according to this Ordinance.

Stream - A watercourse.

Stream Enclosure - A bridge, culvert or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of this Commonwealth.

Subarea (Subwatershed) - The smallest drainage unit of a watershed for which stormwater management criteria have been established in the Stormwater Management Plan.

Subdivision - The division or re-division of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership, or building or lot development: Provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

Swale - A low lying stretch of land which gathers or carries surface water runoff.

Timber Operations - See Forest Management.

Time-of-Concentration (Tc) - The time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

Watercourse - A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

Waters of the Commonwealth - Rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

Wellhead - The point at which a groundwater well bore hole meets the surface of the ground.

Wellhead Protection Area - The surface and subsurface area surrounding a water supply well, well field, spring or infiltration gallery supplying a public water system, through which contaminants are reasonably likely to move toward and reach the water source

Wetland - Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

ARTICLE III-STORMWATER MANAGEMENT

Section 301. General Requirements

A. Applicants proposing Regulated Activities in the Brodhead and McMichaels Creek Watersheds which do not fall under the exemption criteria shown in Section 402 shall submit a drainage plan consistent with the Brodhead and McMichaels Creek Watershed Stormwater Management Plan to the Municipality for review. These criteria shall apply to the total proposed development even if development is to take place in stages

B. The Applicant is required to perform an alternatives analysis to find practicable alternatives to the surface discharge of stormwater, the creation of impervious surfaces and the degradation of waters of the Commonwealth, and must maintain as much as possible the natural hydrologic regime

C. The Drainage Plan must be designed through an alternatives analysis consistent with the sequencing provisions of Section 302 to ensure maintenance of the natural hydrologic regime and to promote groundwater recharge and protect groundwater and surface water quality and quantity. The Drainage Plan designer must proceed sequentially in accordance with Article III of this Ordinance.

D. Stormwater drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as modified by stormwater management facilities or open channels consistent with this Ordinance.

E. The existing points of concentrated drainage that discharge onto adjacent property shall not be altered in any manner which could cause property damage without permission of the affected property owner(s) and shall be subject to any applicable discharge criteria specified in this Ordinance.

F. Areas of existing diffused drainage discharge shall be subject to any applicable discharge criteria in the general direction of existing discharge, whether proposed to be concentrated or maintained as diffused drainage areas, except as otherwise provided by this Ordinance. If diffused drainage discharge is proposed to be concentrated and discharged onto adjacent property, the Applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other impacts will result from the concentrated discharge.

G. Where a development site is traversed by existing watercourses, drainage easements shall be provided conforming to the line of such watercourses. The terms of the easement shall conform to the stream buffer requirements contained in Section 303.K.7 of this Ordinance.

H. Any stormwater management facilities regulated by this Ordinance that would be located in or adjacent to waters of the Commonwealth or wetlands shall be subject to approval by PaDEP through the Joint Permit Application process, or, where deemed appropriate by PaDEP, the General Permit process. When there is a question whether wetlands may be involved, it is the responsibility of the Applicant or his agent to show that the land in question cannot be classified as wetlands, otherwise approval to work in the area must be obtained from PaDEP.

I. Any stormwater management facilities regulated by this Ordinance that would be located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).

J. Infiltration of runoff through seepage beds, infiltration trenches, etc., where soil conditions permit, and the minimization of impervious surfaces to the extent permitted by the Municipality's Zoning Ordinance, are encouraged to reduce the size or eliminate the need for detention facilities or other structural BMPs.

K. Roof drains shall not be connected to streets, sanitary or storm sewers, or roadside ditches in order to promote overland flow and infiltration/percolation of stormwater where advantageous to do so. Considering potential pollutant loading, roof drain runoff in most cases will not require pretreatment.

L. All stormwater runoff, other than roof top runoff discussed in Section K. above, shall be treated for water quality prior to discharge to surface or groundwater.

Section 302. Non-Structural Project Design (Sequencing to Minimize Stormwater Impacts)

A. The design of all Regulated Activities shall include the following steps in sequence to minimize stormwater impacts.

1. The Applicant is required to find practicable alternatives to the surface discharge of stormwater, the creation of impervious surfaces and the degradation of waters of the Commonwealth, and must maintain as much as possible the natural hydrologic regime of the site.

2. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes.

3. All practicable alternatives to the discharge of stormwater are presumed to have less adverse impact on quantity and quality of waters of the Commonwealth unless otherwise demonstrated.

B. The Applicant shall demonstrate that they designed the Regulated Activities in the following sequence to minimize the increases in stormwater runoff and impacts to water quality:

1. Prepare an Existing Resource and Site Analysis Map (ERSAM), showing environmentally sensitive areas including, but not limited to, steep slopes, ponds, lakes, streams, wetlands, hydric soils, vernal ponds, flood plains, buffer areas, hydrologic soil groups A and B (areas conducive to infiltration), any existing recharge areas and any other requirements outlined in the municipal Subdivision and Land Development Ordinance.

2. Establish buffers in accordance with Section 303.K

3. Prepare a draft project layout avoiding earth disturbance in sensitive areas identified in Section 302.B.1 and minimizing total site earth disturbance as much as possible. The ratio of the disturbed area to the entire site area and measures taken to minimize earth disturbance shall be included on the ERSAM.

4. Identify site specific predevelopment drainage areas, discharge points, recharge areas to be preserved and hydrologic soil groups A and B to be utilized for recharge.

5. Evaluate Nonstructural Stormwater Management Alternatives
   a. Minimize earth disturbance
   b. Minimize impervious surfaces
   c. Break up large impervious surfaces.

6. Satisfy the Water Quality and Streambank Erosion Requirements outlined in Section 303.

7. Satisfy Groundwater Recharge (infiltration) requirements of Section 304 and provide for stormwater treatment prior to infiltration.

8. Determine the Management District where the site is located (Appendix D) and conduct a predevelopment runoff analysis.

9. Prepare final project design to maintain predevelopment drainage areas and discharge points, to minimize earth disturbance and impervious surfaces, and to reduce runoff to the maximum extent possible.

10. Conduct a post development runoff analysis based on the final design and meet the release rate, the overbank flow and extreme event requirements of Section 305.

11. Manage any remaining runoff through treatment prior to discharge, as part of detention, bioretention, direct discharge or other structural control

After completion of Section 302, proceed to Section 303

Section 303. Water Quality and Streambank Erosion Requirements

In addition to the performance standards and design criteria requirements of this Ordinance, the Applicant SHALL comply with the following water quality requirements of this Article.

A. For water quality and streambank erosion, the objective is to design a water quality BMP to detain the proposed conditions 2-year, 24-hour design storm to the existing conditions 1-year flow using the SCS Type II distribution. Additionally, provisions shall be made (such as adding a small orifice at the bottom of the outlet structure) so that the proposed conditions 1- year storm takes a minimum of 24 hours to drain from the facility from a point where the maximum volume of water from the 1-year storm is captured. (i.e., the maximum water surface elevation achieved in the facility.) At the same time, the objective is not to attenuate the larger storms in "no detention" areas (District C). This can be accomplished by configuration of the outlet structure not to control the larger storms, or by a bypass or channel to divert only the 2-year design storm into the basin or divert flows in excess of the 2-year storm away from the basin.

   Where practicable, wet basins shall be utilized for water quality control and shall meet the requirements found in the PA Stormwater BMP manual as revised.

   Release of water can begin at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility). The design of the facility shall consider and minimize the chances of clogging and sedimentation. Orifices smaller than 3 inches diameter are not recommended. However, if the Design Professional can provide proof that the smaller orifices are protected from clogging by use of trash racks, etc., smaller orifices may be permitted.

B. Where an NPDES permit for stormwater discharges associated with construction activities is required, the water quality requirements of that permit should be used. However the buffer provisions listed below should be applied to all applications.

C. MS4 requirements for water quality shall be used where applicable in addition to the water quality requirements in this Section.

D. In selecting the appropriate BMPs or combinations thereof, the Applicant SHALL consider the following:

1. Total contributing area.
2. Permeability and infiltration rate of the site soils.
3. Slope and depth to bedrock.
4. Depth to seasonal high water table.
5. Proximity to building foundations and well heads.
6. Erodibility of soils.
7. Land availability and configuration of the topography
8. Peak discharge and required volume control.
9. Stream bank erosion.
10. Efficiency of the BMPs to mitigate potential water quality problems.
11. The volume of runoff that will be effectively treated.
12. The nature of the pollutant being removed.
13. Maintenance requirements.
14. Creation/protection of aquatic and wildlife habitat.
15. Recreational value.

E. The temperature and quality of water and streams shall be maintained through the use of temperature sensitive BMPs and stormwater conveyance systems.

F. The Applicant shall consider the guidelines found in the PaDEP BMP Manual (latest edition) for constructed wetlands, where proposed.

G. Pretreatment in accordance with Sections 301.K and 301.L shall be provided.

H. Streambank restoration projects shall include the following:

1. No restoration or stabilization projects may be undertaken without examining the fluvial geomorphology of stable reaches above and below the unstable reach.

2. Restoration project design must consider maintenance of stability in the adjacent stable reaches of the stream channel.

3. An Erosion and Sediment Control Plan approved by the Conservation District must be provided by the Applicant.

4. All applicable State and Federal permits must be obtained.

I. Biology shall be incorporated into the design of all wet basins in accordance with the West Nile Virus Guidance found in Appendix E of the 2003 plan update.

J. To accomplish the above, the Applicant SHALL submit original and innovative designs to the Municipal Engineer for review and approval. Such designs may achieve the water

quality objectives through a combination of BMPs (Best Management Practices).

K. Buffers

1. In addition to the other requirements of Section 303, buffers shall be provided in accordance with this Section.

2. Where resource buffers overlap, the more restrictive requirements shall apply.

3. Pre-existing Lots or Parcels/Development in Outer Buffers - In the case of legally pre- existing lots or parcels (approved prior to the effective date of this Ordinance) where the useable area of a lot or parcel lies within an outer buffer area, rendering the lot or parcel unable to be developed in accordance with the allowable use per Municipal Zoning, the development may only be permitted by variance as provided in Section **[INSERT]** of the Municipality's **[INSERT]**.Ordinance.

4. Improvements to Existing Structures in Outer Buffers - The provisions of this Section 303.K do not require any changes or improvements to be made to lawfully existing structures in buffers. However, when any substantial improvement to a structure is proposed which results in a horizontal expansion of that structure, the improvement may only be permitted by variance as provided in Section **[INSERT]**of the Municipality's **[INSERT]** Ordinance.

5. Wetlands and Vernal Ponds

a. Wetland Identification – wetlands shall be identified in accord with the most current U.S. Army Corps of Engineers Manual for Identifying and Delineating Wetlands, properly flagged and surveyed on site to ensure they are protected.

Wetlands in an artificial watercourse – wetlands contained within the banks of an artificial watercourse shall not be considered for buffer delineation purposes.

- Wetlands in a natural watercourse – where wetlands are contained within the banks of a natural watercourse, only the stream buffer shall apply.

b. Wetland and Vernal Pond Buffer Delineation – A **[50]** foot inner buffer and **[100]** foot outer buffer, measured perpendicular to and horizontally from the edge of the delineated wetland or vernal pond for a total distance of **[150]** feet, shall be maintained for all wetlands and vernal ponds.

i. Inner Buffer – Measured perpendicular to and horizontally from the edge of the delineated wetland or vernal pond, for a distance of **[50]** feet.

- Stormwater conveyance required by the **[insert Municipality]**, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP and passive unpaved stable trails shall be permitted. No other earth disturbance, grading, filling, buildings,

structures, new construction, or development shall be permitted.

- The area of the inner buffer altered by activities permitted in accord with Section 303.K.5.b.i shall be minimized to the greatest extent practicable

ii. Outer Buffer – Measured perpendicular to and horizontal from the outer edge of the inner buffer for a distance of **[100]** feet, resulting in a total buffer of **[150]**.feet.

- Stormwater conveyance required by the Township/Borough, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP, roads constructed to existing grade, unpaved trails, and limited forestry activities that do not clear cut the buffer (e.g. selective regeneration harvest) in accord with a forestry management plan shall be permitted provided no buildings are involved, and those activities permitted under Sections 303.K.3 and 303.K.4.

- No more than twenty **[20]** percent of the cumulative outer buffer on the subject parcel shall be altered by the activities permitted in accordance with Section 303.K.5.b.ii.

6. Lakes and Ponds

a. There is no outer buffer around lakes and ponds

b. Lake and Pond Buffer Delineation – A **[150]** foot buffer measured perpendicular to and horizontally from the edge of any water body, shall be maintained around any water body.

c. Permitted Activities/Development - Stormwater conveyance required by the Township/Borough, buffer maintenance and restoration, the correction of hazardous conditions, lake front views, boat docks and unpaved trails shall be permitted provided no buildings are involved.

d. The area of the buffer impacted by activities permitted in Section 303.K.6.c. shall not exceed thirty-five **[35]** percent of the buffer on the subject parcel.

7. Streams

a. Stream Buffer Delineation – A **[50]** foot inner buffer and **[100]** foot outer buffer, measured perpendicular to and horizontally from the top-of-bank on both sides of any stream, for a total distance of **[150]** feet, shall be maintained on both sides of any stream. See Figure 303.1.

i. Inner Buffer – Measured perpendicular to and horizontally from the top-of- bank of the stream for a distance of **[50]** feet.

- Stormwater conveyance required by the

Township/Borough, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP, fish hatcheries, wildlife sanctuaries and boat launch sites constructed so as not to alter the flood plain cross section, and unpaved trails shall be permitted providing no buildings are involved. No other earth disturbance, grading, filling, buildings, structures, new construction, or development shall be permitted

- The area of the inner buffer altered by activities permitted in accord with Section 303.K.7.a.i shall be minimized to the greatest extent practicable.

ii. Outer Buffer – Measured perpendicular to and horizontally from the outer edge of the inner buffer for a distance of **[100]** feet resulting in a total buffer of **[150]** feet.

- Stormwater conveyance required by the **[Insert Municipality]**, buffer maintenance and restoration, the correction of hazardous conditions, agricultural activities, plant nurseries, parking lots constructed to existing grade, temporary fairs and carnivals, accessory uses for residential purposes, private sportsmen's club activities, athletic facilities, orchards, wildlife sanctuaries, boat launch sites, roads constructed to existing grade, stream crossings permitted by DEP and unpaved trails and limited forestry activities that do not clear cut the buffer (e.g. selective regeneration harvest) in accord with a forestry management plan shall be permitted provided no buildings are involved.

- In areas of the outer buffer which are not wetlands, vernal ponds or slopes of more than **[15]** percent, stormwater management facilities which improve water quality of stormwater discharge shall be permitted unless prohibited by other Township/Borough or state requirements. No other earth disturbance, grading, filling buildings, structures, new construction, or development shall be permitted

- No more than **[twenty (20)]** percent of the cumulative outer buffer on the subject parcel shall be altered by the activities permitted in accordance with Section 303.K.7.ii.

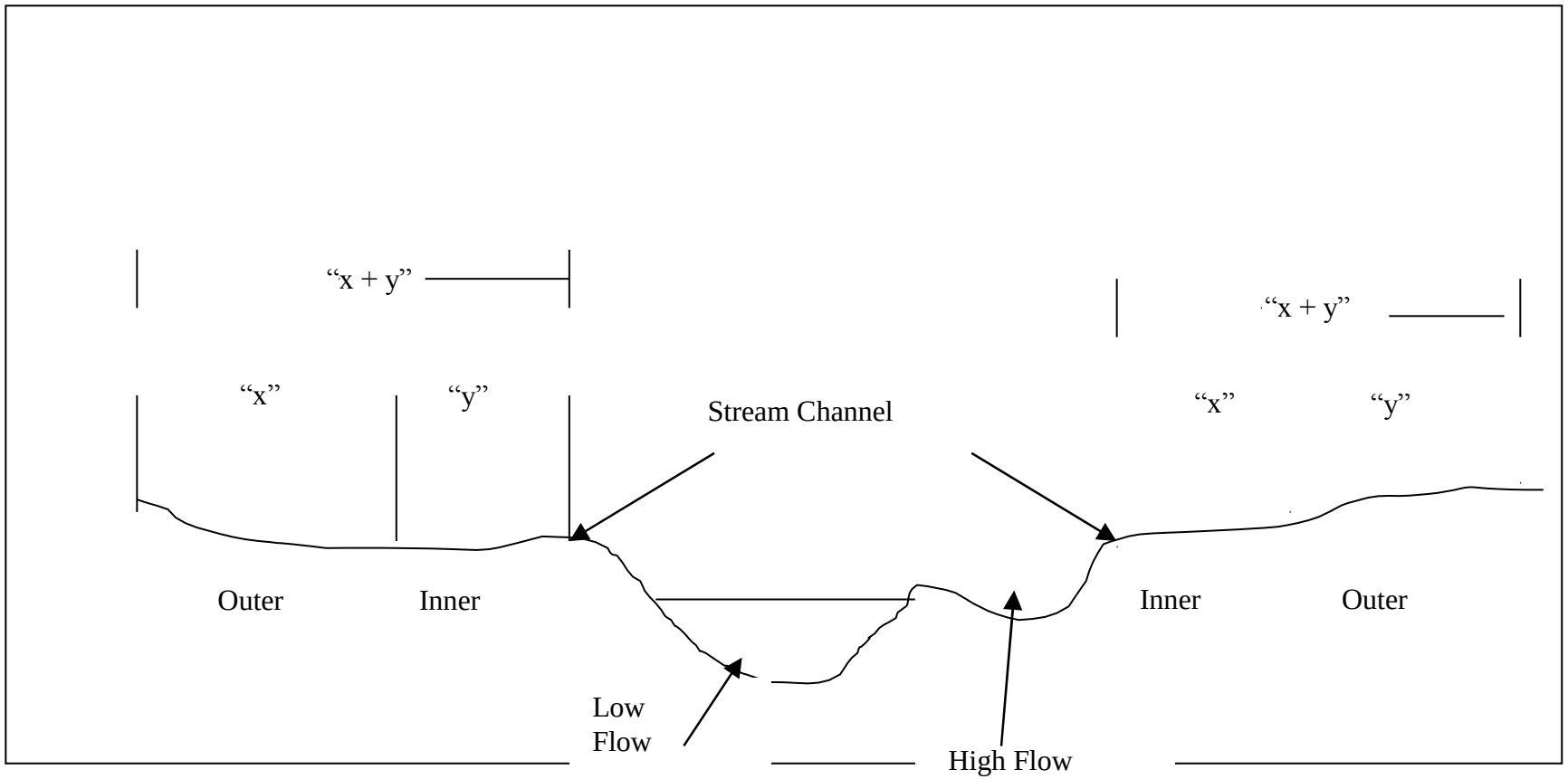


Figure 303.1 Stream Buffer

Section 304 Groundwater Recharge (Infiltration/Recharge/Bioretention)

Maximizing the ground water recharge capacity of the area being developed is required. Design of the infiltration/recharge stormwater management facilities shall give consideration to providing ground water recharge to compensate for the reduction in the percolation that occurs when the ground surface is disturbed or impervious surface is created. It is recommended that roof runoff be directed to infiltration BMPs which may be designed to compensate for the runoff from parking areas. These measures are required to be consistent with Section 102, and take advantage of utilizing any existing recharge areas.

A. Infiltration BMPs shall meet the following minimum requirements:

1. Where a NPDES permit for stormwater discharges associated with construction activities is required, the volume control requirement of that permit should be met unless the volume control requirement in this plan is greater.

2. Maximum Infiltration Requirements:

a. Regulated activities will be required to recharge (infiltrate), where practicable, a portion of the runoff created by the development as part of an overall stormwater management plan designed for the site. The volume of runoff to be recharged shall be determined from Sections 304.4.a. or 304.4.b, depending upon demonstrated site conditions.

3. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:

a. A minimum depth of 24 inches between the bottom of the BMP and the limiting zone.

b. An infiltration and/or percolation rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the Applicant's design professional.

c. The recharge facility shall be capable of completely infiltrating the recharge volume within 4 days.

d. Pretreatment in accordance with Sections 301.K and 301.L shall be provided prior to infiltration.

4. The size of the recharge facility shall be based upon the following volume criteria:

a. NRCS Curve Number equation.

The NRCS runoff shall be utilized to calculate infiltration requirements (P) in inches. For zero runoff:

$$P = I \text{ (Infiltration) (in.)} = (200 / CN) - 2 \qquad \text{Equation: 304.1}$$

Where: CN=SCS (NRCS) curve number of existing conditions contributing to the recharge facility.

This equation is displayed graphically in, and the infiltration requirement can be determined from, Figure 304.1.

The recharge volume required would therefore be computed as:

Re_v(c.f.)=[I (in)* impervious area (s.f.)]/12 Equation: 304.2
Where: I= infiltration requirements (in.)

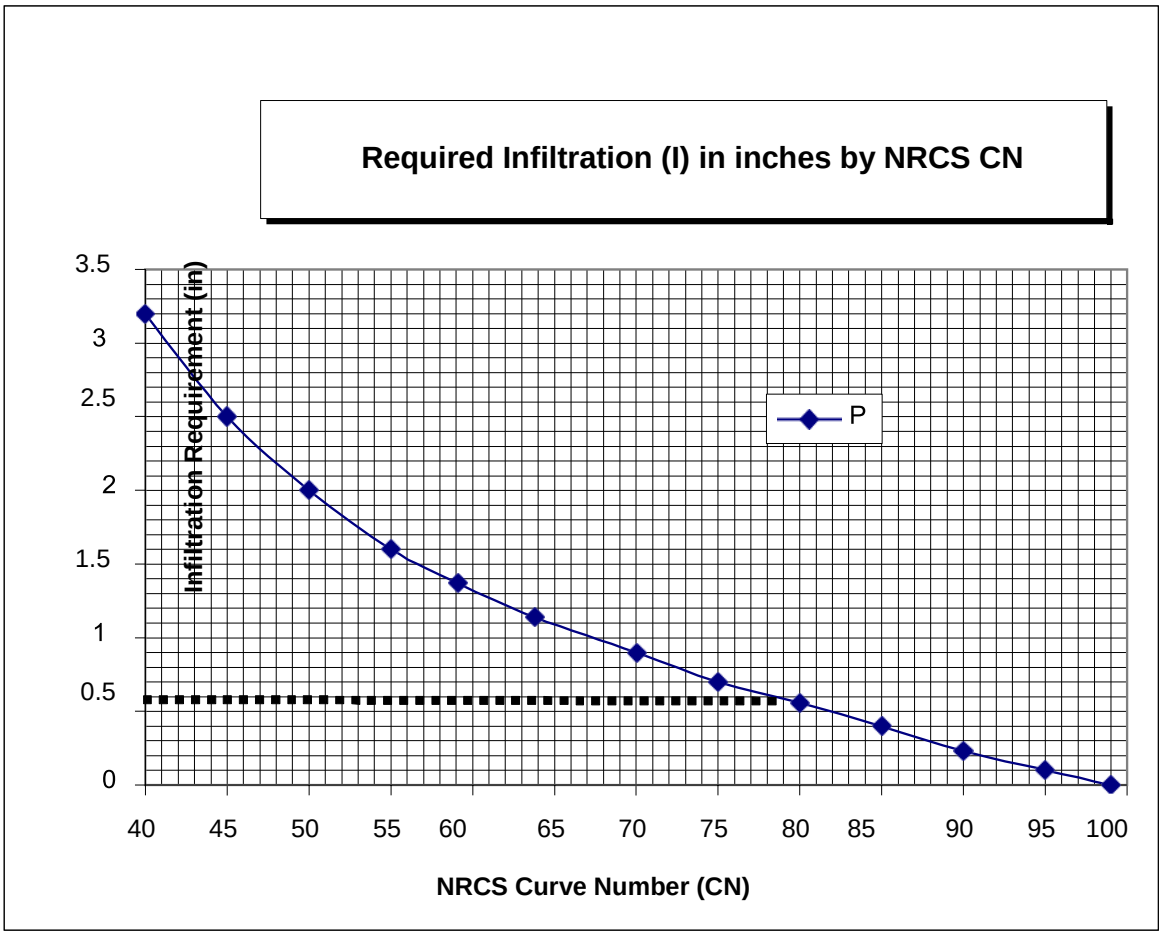


Figure 304.1. Infiltration requirement based upon NRCS Curve Number.

b. Annual Recharge – Water Budget Approach

It has been determined that infiltrating 0.6 inches of runoff from the post development impervious areas will aid in maintaining the hydrologic regime of the watershed. A minimum of 0.6 inches of rainfall shall be infiltrated from all impervious areas, up to an existing site condition curve number of 77. Above a curve number of 77, Equation 304.1 or the curve in Figure 304.1 shall be used to determine the Infiltration requirement and Equation 304.2 shall be used to determine the recharge volume.

The recharge volume (Re_v) required would therefore be computed as:
Re_v=[(0.6 or I, whichever is less) * impervious area] / 12

B. Soils - A detailed soils evaluation of the project site shall be required where practicable to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified design professional, and at a minimum, address soil permeability, depth to bedrock and subgrade stability. The general process for designing the infiltration BMP shall be:

1. Analyze hydrologic soil groups as well as natural and man-made features within the watershed to determine general areas of suitability for infiltration practices.

2. Provide site-specific infiltration test results (at the level of the proposed infiltration surface) in accord with ASTM Guide No. D5126 or other method as described in the PA DEP Stormwater BMP Manual as amended to determine the appropriate hydraulic conductivity rate.

3. Design the infiltration structure for the required storm volume based on field determined capacity at the level of the proposed infiltration surface.

4. If on-lot infiltration structures are proposed by the Applicant's design professional, it must be demonstrated to the Municipality that the soils are conducive to infiltrate on the lots identified.

C. Stormwater Hotspots – A stormwater hotspot is defined as a land use activity that generates higher concentrations of hydrocarbons, trace metals or toxicants than are found in typical stormwater runoff, based on monitoring studies. Table 304.1 provides samples of designated hotspots. If a site is designated as a hotspot, it has important implications for how stormwater is managed. First and foremost, untreated stormwater runoff from hotspots cannot be allowed to infiltrate into groundwater where it may contaminate water supplies. Therefore, the Re_v requirement is NOT applied to development sites that fit into the hotspot category, but the requirements of Section 304.A should be met. Second, a greater level of stormwater treatment may be needed at hotspot sites to prevent pollutant discharge after construction. EPA's NPDES stormwater program requires some industrial sites to prepare and implement a stormwater pollution prevention plan.

Table 304.1 – Classification of Stormwater Hotspots

The following land uses and activities are samples of stormwater hotspots:
• Vehicle salvage yards and recycling facilities
• Fleet storage areas (bus, truck, etc.)
• Public works storage areas
• Facilities that generate or store hazardous materials

Extreme caution shall be exercised where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate the groundwater. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration/recharge facility and perform a hydrogeologic justification study if necessary. The infiltration requirement in High Quality/Exceptional Value waters shall be subject to the Department's Chapter 93 Antidegradation Regulations. The municipality may require the installation of an impermeable liner in detention basins where the possibility of groundwater contamination exists. A detailed hydrogeologic investigation may be required by the Municipality.

The Municipality shall require the Applicant to provide safeguards against groundwater contamination for uses which may cause groundwater contamination, should there be a mishap or spill**.**

D. Extreme caution shall be exercised where infiltration is proposed in Source Water Protection Areas or that may affect a wellhead or surface water intake.

E. Recharge/infiltration facilities shall be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

Upon completion of Section 304, proceed to Sections 305, 306 and 307

Section 305. Stormwater Management Districts

A. The Brodhead and McMichaels Creek Watershed has been divided into stormwater management districts as shown on the Watershed Map in Appendix D. The Management District Map is also available on the Monroe County Conservation District's website.

Standards for managing runoff from each subarea in the Brodhead and McMichaels Creek Watershed for the various design storms are shown in Table 305.1. Development sites located in each of the A and B Districts must control proposed conditions peak runoff rates to existing conditions peak runoff rates for the design storms in accord with Table 305.1. District C may allow increases in post development flows where adaquate downstream conveyances exist.

In addition to the requirements specified in Table 305.1 below, the Water Quality and Streambank Erosion Requirements (Section 303), Groundwater Recharge (Section 304), and Erosion and Sediment Control Requirements (Section 308) shall be implemented.

TABLE 305.1 –Peak Runoff Rate Requirements

District		Proposed conditions	(reduce to)	Existing conditions
A		2 – year		1 – year
		5 – year		5 – year
		10 – year		10 – year
		25 – year		25 – year
		50- year		50- year
		100-year		100-year
B-1		2 – year		1- year
		5 – year		2 – year
		10 – year		5 – year
		25 – year		10 – year
		50- year		25- year
		100-year		100-year
B-2		2 – year		1- year
		5 – year		2 – year
		25 – year		5 – year
		50- year		10- year
		100 – year		50 – year
B-3		50- year		10- year
		100 – year		50 – year
C		Provisional Direct Discharge District - Development sites which can discharge directly to the main channel or major tributaries or indirectly to the main channel through an existing stormwater drainage system (i.e., storm sewer or tributary) **which meets the "Downstream Hydraulic Capacity Analysis" in Section 305 H and is shown by the design professional to not cause a downstream problem, may allow an increase in flow as long as no downstream harm is demonstrated.** However, sites in District C shall comply with the criteria for Water Quality and Streambank Erosion (Ordinance Section 303); and Groundwater Recharge (Ordinance Section 304). If the proposed conditions runoff is intended to be conveyed by an existing stormwater drainage system to the main channel, **assurance must be provided that such system has adequate capacity to convey the increased peak flows or will be provided with improvements to furnish the required capacity.** When adequate capacity of the downstream system does not exist and will not be provided through improvements, the proposed conditions peak rate of runoff must be controlled to the existing conditions peak rate as required in District A provisions (i.e.,10-year proposed conditions flows to 10 year existing conditions flows) for the specified design storms.		

B. General - Proposed conditions peak rates of runoff from any Regulated Activity shall not exceed the peak release rates of runoff prior to development for the design storms specified on the Stormwater Management District Watershed Map (Appendix D) and Section 302, of this Ordinance.

C. District Boundaries - The boundaries of the Stormwater Management Districts are shown on an official map that is available for inspection at the municipal office. A copy of the

official map at a reduced scale is included in the Ordinance Appendix D. The exact location of the Stormwater Management District boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours (or most accurate data required) provided as part of the Drainage Plan.

D. Sites Located in More Than One District - For a proposed development site located within two or more stormwater management district category subareas, the peak discharge rate from any subarea shall meet the requirements of Table 305.1 for each discharge point from the site. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea.

E. Off-Site Areas - Off-site areas that drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site.

F. Site Areas - Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area utilizing stormwater management measures shall be subject to the Management District Criteria. In other words, undisturbed areas bypassing the stormwater management facilities would not be subject to the Management District Criteria.

G. "No Harm" Option - For any proposed development site not located in a provisional direct discharge district, the Applicant has the option of using a less restrictive runoff control (including no detention) if the Applicant can prove that "no harm" would be caused by discharging at a higher runoff rate than that specified by the Stormwater Management Plan. The "no harm" option is used when an Applicant can prove that the proposed hydrographs can match existing hydrographs, or if it can be proved that the proposed conditions will not cause increases in peaks at all points downstream. Proof of "no harm" must be shown based upon the following "Downstream Impact Evaluation" which shall include a “downstream hydraulic capacity analysis" consistent with Section 305.H to determine if adequate hydraulic capacity exists. The Applicant shall submit to the Municipality this evaluation of the impacts due to increased downstream stormwater flows in the watershed.

1. The Hydrologic Regime of the site must be maintained.

2. The "Downstream Impact Evaluation" shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications due to the proposed development upon a dam, highway, structure, natural point of restricted streamflow or any stream channel section, established with the concurrence of the Municipality.

3. The evaluation shall continue downstream until the increase in flow diminishes due to additional flow from tributaries and/or stream attenuation.

4. The peak flow values to be used for downstream areas for the design return period storms (2, 5, 10, 25, 50, and 100-year) shall be the values from the calibrated model for the Brodhead and McMichaels Creek Watershed. These flow values can be obtained from the original Act 167 watershed storm water management plans.

5. Applicant-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas, by definition, are precluded from successful attempts to prove "no-harm", except in conjunction with proposed capacity improvements for the problem areas consistent with Section 305.H.

6. A financial distress shall not constitute grounds for the Municipality to approve the use of the “no-harm” option.

7. Downstream capacity improvements may be provided as necessary to achieve the "no harm" option.

8. Any "no harm" justifications shall be submitted by the Applicant as part of the Drainage Plan Requirements per Article IV of this Ordinance.

H. "Downstream Hydraulic Capacity Analysis" - Any downstream hydraulic capacity analysis conducted in accordance with this Ordinance shall use the following criteria for determining adequacy for accepting increased peak flow rates:

1. Existing natural or man-made channels or swales must be able to convey the increased runoff associated with a 2-year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP *Erosion and Sediment Pollution Control Program Manual*.

2. Existing natural or man-made channels or swales must be able to convey increased 25- year return period runoff without creating any hazard to persons or property.

3. Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area must be designed in accordance with DEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased 25-year return period runoff.

I. Hardship Option - The Stormwater Management Plan and its standards and criteria are designed to maintain existing conditions peak flows and volumes throughout the Brodhead and McMichaels Creek watershed as the watershed becomes developed. There may be certain instances, however, where the standards and criteria established are too restrictive for a particular Applicant. The existing drainage network in some areas may be capable of safely transporting slight increases in flows without causing a problem or increasing flows elsewhere. If an Applicant cannot meet the stormwater standards due to lot conditions or if conformance would become a hardship to an Applicant, the hardship option may be applied. A financial distress shall not constitute grounds for the Municipality to approve the use of the hardship option. The Applicant would have to plead his/her case to the Governing Body with the final determination made by the Municipality. Any Applicant’s pleading the "hardship option" will assume all liabilities that may arise due to exercising this option. A financial distress shall not constitute grounds for the Municipality to approve the use of the “no-harm” option.

Section 306. Calculation Methodology

A. Stormwater runoff from all development sites with a drainage area of greater than 200 acres shall be calculated using a generally accepted calculation technique that is based on the NRCS soil cover complex method. Table 306-1 summarizes acceptable computation methods and the method selected by the design professional shall be based on the individual limitations and suitability of each method for a particular site. The Municipality may allow the use of the Modified Rational Method to estimate peak discharges from drainage areas that contain less than one (1) acre. The Soil Cover Complex Method shall be used for drainage areas greater than 1 acre.

TABLE 306-1
Acceptable Computation Methodologies For Stormwater Management Plans

METHOD	METHOD DEVELOPED BY	APPLICABILITY
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
PSRM	Penn State University	Applicable where use of a hydrologic computer model is desirable or necessary; simpler than TR-20 or HEC-1.
Modified Rational Method commercial computer package based on Rational Method)	Emil Kuichling (1889)	For sites less than 1 acre, or (or as approved by the Municipality and/or Municipal Engineer).
Other Methods	Varies	Other computation methodologies approved by the Municipality and/or Municipal Engineer.

B. All calculations consistent with this Ordinance using the soil cover complex method shall use the appropriate design rainfall depths for the various return period storms consistent with current NOAA Atlas 14 Point Precipitation Frequency Estimates. If a hydrologic computer model such as PSRM or HEC-1 is used for stormwater runoff calculations, then the duration of rainfall shall be 24 hours. The SCS Type II Rainfall Distribution shall be utilized for the rainfall distribution.

C. For the purposes of existing conditions flow rate determination, undeveloped land shall be considered as "meadow" in good condition, unless the natural ground cover generates a lower Curve Number (CN) or Rational 'C' value, as listed in Tables B-1 or B-32 in Appendix B of this Ordinance.

D. All calculations using the Modified Rational Method shall use rainfall intensities consistent with appropriate times-of-concentration for overland flow and return periods from the current NOAA Atlas 14 Point Precipitation Frequency Estimates. Times-of-concentration for overland flow shall be calculated using the methodology presented in Chapter 3 of Urban Hydrology for Small Watersheds, NRCS, TR-55 (as amended or replaced from time to time by NRCS). Times-of- concentration for channel and pipe flow shall be computed using Manning's equation.

E. Calculations using the Modified Rational Method shall be based on a common time of concentration for all contributing areas to a discharge point in both the predevelopment and post development runoff conditions.

F. Hydrograph volumes generated by the Modified Rational Method for routing through control (detention and infiltration) facilities should be comparable to hydrograph volumes generated by the TR-55 methodology. The ascending and descending limbs of the hydrograph generated by the Modified Rational method should be adjusted in order to provide a comparable hydrograph volume.

G. Runoff Curve Numbers (CN) for both existing and proposed conditions to be used in the soil cover complex method shall be obtained from Table B-1 in Appendix B of this Ordinance. Due to limitations of the TR-55 methodology, a minimum weighted Curve Number of 40 shall be utilized for the calculations.

H. Runoff coefficients (C) for both existing and proposed conditions for use in the Modified Rational method shall be obtained from Table B-2 in Appendix B of this Ordinance.

I. The designer shall consider that the runoff from proposed sites graded to the subsoil will not have the same runoff conditions as the site under existing conditions, even after placement of topsoil and/or seeding. The designer may increase his proposed condition "CN" or "C" to better reflect proposed soil conditions.

J. Where uniform flow is anticipated, the Manning equation shall be used for hydraulic computations, and to determine the capacity of open channels, pipes, and storm sewers. Values for Manning's roughness coefficient (n) shall be consistent with Table B-3 in Appendix B of the Ordinance.

K. Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this Ordinance using any generally accepted hydraulic analysis technique or method.

L. The design of any stormwater detention facilities intended to meet the performance standards of this Ordinance shall be verified by routing the design storm hydrograph through these facilities using the Storage-Indication Method. The Municipality may approve the use of any generally accepted full hydrograph approximation technique that shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.

Section 307. Other Requirements

A. Any stormwater facility located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).

B. Pretreatment in accordance with Sections 301.K and 301.L shall be provided prior to infiltration.

C. Any stormwater management facility (i.e., BMP, detention basin) designed to store / treat runoff from the 100 year storm and requiring a berm or earthen embankment required or regulated by this Ordinance shall be designed to provide an emergency spillway to handle the discharge of flows up to and including the inflow to the facility from the 100- year proposed conditions, considering the primary outlet control structure(s) are blocked. The height of embankment must provide a minimum one (1) foot of freeboard above the maximum pool elevation computed when the facility functions for the 100-year proposed conditions inflow. Should any stormwater management facility require a dam safety permit under PaDEP Chapter 105, the facility shall be designed in accordance with Chapter 105 and meet the regulations of Chapter 105 concerning dam safety which may be required to pass storms larger than the 100-year event.

D. Any facilities that constitute water obstructions (e.g., culverts, bridges, outfalls, or stream enclosures), and any work involving wetlands governed by PaDEP Chapter 105 regulations (as amended or replaced from time to time by PaDEP), shall be designed in accordance with Chapter 105 and will require a permit from PaDEP.

E. Any other drainage conveyance facility that does not fall under Chapter 105 regulations

must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm with a minimum 1.0 foot of freeboard measured below the lowest point along the top of the roadway. Any facility that constitutes a dam as defined in PaDEP Chapter 105 regulations may require a permit under dam safety regulations. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.

F. Any drainage conveyance facility and/or channel not governed by Chapter 105 Regulations, must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm. Conveyance facilities to or exiting from stormwater management facilities (i.e., detention basins) shall be designed to convey the design flow to or from that structure. Roadway crossings located within designated floodplain areas must be able to convey runoff from a 100-year design storm. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.

G. Storm sewers must be able to convey proposed conditions runoff from a **[25]**-year design storm without surcharging inlets, where appropriate.

H. Adequate erosion protection shall be provided along all open channels, and at all points of discharge.

I. The design of all stormwater management facilities shall incorporate sound engineering principles and practices. The Municipality reserves the right to disapprove any design that would result in the construction of or continuation of a stormwater problem area.

Upon completion of Section 307, proceed to Section 308

Section 308. Erosion and Sediment Control Requirements

A. Any earth disturbance must be conducted in conformance with PA Title 25, Chapter 102, "Erosion and Sediment Control."

B. Additional erosion and sediment control design standards and criteria that must be or are recommended to be applied where infiltration BMPs are proposed shall include the following:

1. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum infiltration capacity.

2. Infiltration BMPs shall not be constructed nor receive runoff until the entire contributory drainage area to the infiltration BMP has achieved final stabilization.

ARTICLE IV-DRAINAGE PLAN REQUIREMENTS

Section 401. General Requirements

For any of the activities regulated by this Ordinance, the preliminary or final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any earth disturbance may not proceed until the Applicant or his/her agent has received written approval of a Drainage Plan from the Municipality and an adequate Erosion and Sediment Control Plan review by the Conservation District.

Section 402. Drainage Plan Submission Exemptions

A. Exemptions

The following land use activities are exempt from the Drainage Plan submission requirements of this Ordinance:

1. Use of land for gardening for home consumption.

2. Agriculture when operated in accordance with a Conservation Plan or Erosion and Sediment Control Plan (E&S) found adequate by the Conservation District.

3. Forest Management operations which are following the Department of Environmental Protection's management practices contained in its publication "Soil Erosion and Sedimentation (E&S) Control Guidelines for Forestry" and are operating under an approved E&S Plan and must comply with stream buffer requirements in Section 303 and flood plain management requirements.

4. Impervious Surface - Any Regulated Activity that has less than 5,000 square foot of impervious surface and/or meets the following exemption criteria is exempt from the plan submittal provisions of this Ordinance. These criteria shall apply to the total development even if development is to take place in phases. The date of the original Brodhead and McMichaels Municipal Ordinance adoption shall be the starting point from which to consider tracts as “parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered. Impervious areas existing on the "parent tract" prior to adoption of this Ordinance shall not be considered in cumulative impervious area calculations for exemption purposes.

5. High Tunnels shall be exempt from the provisions of this Ordinance if:

   a. The High Tunnel or its flooring does not result in an impervious area exceeding 25% of all structures located on the owners total contiguous land area; and

   b. The High Tunnel meets one of the following:

      i. The High Tunnel is located at least 100 feet from any perennial stream or watercourse, public road or neighboring property line.

      ii. The High Tunnel is located at least 35 feet from any perennial stream or watercourse, public road or neighboring property line and located on land with a slope not greater than 7%.

iii. The High Tunnel is supported with a buffer or diversion system that does not directly drain into a stream or other watercourse managing storm water runoff in a manner consistent with requirements of this Ordinance and the Act of April 18, 2018 P.L. 91, No. 15, and the Act of October 4, 1978 (P.L. 864, No 167).

B. Additional exemption criteria includes:

1. Exemption responsibilities – An exemption shall not relieve the Applicant from implementing such measures as are necessary to protect the public health, safety, and property. An exemption shall not relieve the Applicant from providing adequate stormwater management for Regulated Activities to meet the purpose of this Ordinance; however, drainage plans will not have to be submitted to the Municipality. Please see Appendix E for the procedure to follow those projects that meet the exemption requirements.

2. This exemption shall not relieve the Applicant from meeting the requirements for watersheds draining to Exceptional Value (EV) waters and Source Water Protection Areas (SWPA): requirements for Nonstructural Project Design (Section 302) Water Quality and Streambank Erosion (Section 303), and Groundwater Recharge (Section 304).

3. Drainage Problems - If a drainage problem is documented or known to exist downstream of, or expected from the proposed activity, then the Municipality may require a Drainage Plant Submittal.

4. Parent Tracts – Ordinance criteria shall apply to the total development even if development is to take place in phases. The date of the Municipal Ordinance adoption from the original Brodhead and McMichaels Creek Act 167 Plans shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered.

Section 403. Drainage Plan Contents

The Drainage Plan shall consist of a general description of the project including sequencing items described in Section 302, calculations, maps, and plans. A note on the maps shall refer to the associated computations and erosion and sediment control plan by title and date. The cover sheet of the computations and erosion and sediment control plan shall refer to the associated maps by title and date. All Drainage Plan materials shall be submitted to the Municipality in a format that is clear, concise, legible, neat, and well organized; otherwise, the Drainage Plan shall not be accepted for review and shall be returned to the Applicant.

The following items shall be included in the Drainage Plan:

A. General

1. General description of the project including those areas described in Section 302**.**

2. General description of permanent stormwater management techniques, including construction specifications of the materials to be used for stormwater management facilities.

3. Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.

4. An Erosion and Sediment Control Plan, including all reviews and letters of adequacy obtained by the Conservation District.

5. A general description of nonpoint source pollution controls.

B. Maps

Map(s) of the project area shall be submitted on **[24-inch x 36-inch sheets]** and/or shall be prepared in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Monroe County. If the Subdivision and Land Development Ordinance (SALDO) has more stringent criteria then the more stringent criteria shall apply. The contents of the map(s) shall include, but not be limited to:

1. The location of the project relative to highways, municipalities or other identifiable landmarks.

2. Existing and final contours at intervals of two feet. In areas of steep slopes (greater than 15 percent), five-foot contour intervals may be used.

3. Existing streams, lakes, ponds or other Waters of the Commonwealth within the project area.

4. Other physical features including flood hazard boundaries, buffers, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the site.

5. The locations of all existing and proposed utilities, sanitary sewers, and water lines within fifty (50) feet of property lines.

6. The location(s) of public water supply wells and surface water intakes as well as their source water protection areas.

7. Soil names and boundaries.

8. Limits of earth disturbance, including the type and amount of impervious area that would be added.

9. Proposed structures, roads, paved areas, and buildings.

10. The name of the development, the name and address of the Applicant of the property, and the name of the individual or firm preparing the plan.

11. The date of submission.

12. A graphic and written scale of one (1) inch equals no more than fifty (50) feet; for tracts of twenty (20) acres or more, the scale shall be one (1) inch equals no more than one hundred (100) feet.

13. A north arrow.

14. The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.

15. Existing and proposed land use(s).

16. A key map showing all existing man-made features beyond the property boundary that would be affected by the project.

17. Location of all open channels.

18. Overland drainage patterns and swales.

19. A fifteen foot wide access easement to and around all stormwater management facilities that would provide ingress to and egress from a public right-of-way.

20. The location of all erosion and sediment control facilities.

21. A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off-site. All off-site facilities shall meet the performance standards and design criteria specified in this Ordinance.

22. A statement, signed by the Applicant, acknowledging that any revision to the approved Drainage Plan must be approved by the Municipality and that a revised E&S Plan must be submitted to the Conservation District for a determination of adequacy.

23. The following signature block for the Design Engineer:

    I, (Design Engineer), on this date (date of signature), hereby certify that the Drainage Plan meets all design standards and criteria of the Brodhead and McMichael Creek Watershed Act 167 Stormwater Management Ordinance."

C. Supplemental Information

1. A written description of the following information shall be submitted.

    a. The overall stormwater management concept for the project designed in accordance with Section 302.
    b. Stormwater runoff computations as specified in this Ordinance.
    c. Stormwater management techniques to be applied both during and after development.
    d. Expected project time schedule.
    e. Development stages (project phases) if so proposed.
    f. An operation and maintenance plan in accordance with Section 702 of this Ordinance.

2. An erosion and sediment control plan.

3. The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.

4. A Declaration of Adequacy and Highway Occupancy Permit from the PennDOT District Office when utilization of a PennDOT storm drainage system is proposed.

D. Stormwater Management Facilities

1. All stormwater management facilities must be located on a plan and described in detail.

2. When groundwater recharge methods such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown.

3. All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

Section 404. Plan Submission

The Municipality shall require receipt of a complete plan, as specified in this Ordinance.

For any activities that require an NPDES Permit for Stormwater Discharges from Construction Activities, or a PaDEP Joint Permit Application, or a PennDOT Highway Occupancy Permit, or any other permit under applicable state or federal regulations, or are regulated under Chapter 105 (Dam Safety and Waterway Management) or Chapter 106 (Floodplain Management) of PaDEP's Rules and Regulations, the proof of application for said permit(s) or approvals shall be part of the plan. The plan shall be coordinated with the state and federal permit process and the municipal SALDO review process.

A. For those Regulated Activities which require SALDO approval, the Drainage Plan and ERSAM shall be submitted by the Applicant as part of the Preliminary Plan submission.

B. For those Regulated Activities that do not require SALDO approval, See Section 401, General Requirements.

C. Six (6) copies of the Drainage Plan shall be submitted and distributed as follows:

1. **[Two (2)]** copies to the Municipality accompanied by the requisite Municipal Review Fee, as specified in this Ordinance.

2. **[Two (2)]** copies to the Conservation District.

3. **[One (1)]** copy to the Municipal Engineer.

4. **[One (1)]** copy to the County Planning Commission.

D. Any submissions found incomplete shall not be accepted for review and shall be returned to the Applicant with a notification in writing of the specific manner in which the submission is incomplete.

Section 405. Drainage Plan Review

A. The Municipal Engineer shall review the Drainage Plan for consistency with the adopted Brodhead and McMichael Creek Watershed Act 167 Stormwater Management Plan.

B. The Municipal Engineer shall review the Drainage Plan for any subdivision or land development against the municipal subdivision and land development ordinance provisions not superseded by this Ordinance.

C. The E & S Plan shall be reviewed by the County Conservation District and found adequate to meet the requirements of PaDEP's Chapter 102 regulations prior to Municipal approval of the Drainage Plan.

D. For Regulated Activities specified in Section 104 of this Ordinance, the Municipal Engineer shall notify the Municipality in writing, within **[ninety (90)]** calendar days,

whether the Drainage Plan is consistent with the Stormwater Management Plan.

1. Should the Drainage Plan be determined to be consistent with the Stormwater Management Plan, the Municipal Engineer will forward a letter of consistency to the Municipal Secretary, who will then notify the Developer.

2. Should the Drainage Plan be determined to be inconsistent or noncompliant with the Stormwater Management Plan, the Municipal Engineer shall forward a letter to the Municipal Secretary with a copy to the Applicant citing the reason(s) and specific Ordinance sections for the inconsistency or noncompliance. Inconsistency or noncompliance may be due to inadequate information to make a reasonable judgment as to compliance with the stormwater management plan. Any Drainage Plans that are inconsistent or noncompliant may be revised by the Applicant and resubmitted consistent with this Ordinance. The Municipal Secretary shall then notify the Developer of the Municipal Engineer's findings. Any disapproved Drainage Plans may be revised by the Developer and resubmitted consistent with this Ordinance.

E. For Regulated Activities specified in Section 104 of this Ordinance, which require a building permit, the Municipal Engineer shall notify the Enforcement Officer in writing, whether the Drainage Plan is consistent with the Stormwater Management Plan and forward a copy of the approval/disapproval letter to the Applicant. Any disapproved drainage plan may be revised by the Applicant and resubmitted consistent with this Ordinance.

F. For Regulated Activities specified in Section 104 of this Ordinance that require an NPDES Permit Application, PaDEP and the Conservation District may consider the Municipal Engineer's review comments in determining whether to issue a permit.

G. The Municipality shall not grant approval or grant preliminary approval to any subdivision or land development for Regulated Activities specified in Sections 104 of this Ordinance if the Drainage Plan has been found to be inconsistent with the Stormwater Management Plan, as determined by the Municipal Engineer. All required permits from PaDEP must be obtained prior to approval of any subdivision or land development.

H. No municipal permits shall be issued for any Regulated Activity specified in Section 104 of this Ordinance if the Drainage Plan has been found to be inconsistent with the Stormwater Management Plan, as determined by the Municipal Engineer, or without considering the comments of the Municipal Engineer shall be issued. All required permits from PaDEP must be obtained prior to issuance of a building permit.

I. The Applicant shall be responsible for completing Record Drawings of all stormwater management facilities included in the approved Drainage Plan. The Record Drawings and an explanation of any discrepancies with the design plans shall be submitted to the Municipal Engineer for final approval. In no case shall the Municipality approve the Record Drawings until the Municipality receives a copy of an approved or amended Declaration of Adequacy and/or Highway Occupancy Permit from the PennDOT District Office, NPDES Permit, and any applicable permits or approvals, from PaDEP or the Conservation District.

J. The Municipality's approval of a Drainage Plan shall be valid for a period not to exceed **[five (5)]** years, commencing on the date that the Municipality signs the approved

Drainage Plan. If stormwater management facilities included in the approved Drainage Plan have not been constructed, or if constructed, and record drawings of these facilities have not been approved within this **[five (5)]** year time period, then the Municipality may consider the Drainage Plan disapproved and may revoke any and all permits. Drainage Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 407 of this Ordinance.

Section 406. Modification of Plans

A. A modification to a Drainage Plan under review by the Municipality for a development site that involves a change in stormwater management facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or that is necessary because soil or other conditions are not as stated on the Drainage Plan as determined by the Municipal Engineer, shall require a resubmission of the modified Drainage Plan consistent with Section 404 of this Ordinance and be subject to review as specified in Section 405 of this Ordinance.

B. A modification to an already approved or disapproved Drainage Plan shall be submitted to the Municipality, accompanied by the applicable Municipal Review and Inspection Fee. A modification to a Drainage Plan for which a formal action has not been taken by the Municipality shall be submitted to the Municipality, accompanied by the applicable Municipal Review and Inspection Fee.

Section 407. Resubmission of Disapproved Drainage Plans

A disapproved Drainage Plan may be resubmitted, with the revisions addressing the Municipal Engineer's concerns documented in writing and addressed to the Municipal Secretary in accordance with Section 404 of this Ordinance and distributed accordingly and be subject to review as specified in Section 405 of this Ordinance. The applicable Municipal Review and Inspection Fee must accompany a resubmission of a disapproved Drainage Plan.

Section 408. Authorization to Construct and Term of Validity

The Municipality’s approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Municipality may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 407 within the term of validity, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 405 of this Ordinance.

ARTICLE V-INSPECTIONS

Section 501. Schedule of Inspections

A. The Municipal Engineer or his municipal designee shall inspect all phases of the installation of the permanent stormwater management facilities as deemed appropriate by the Municipal Engineer.

B. During any stage of the work, if the Municipal Engineer or his municipal designee determines that the permanent stormwater management facilities are not being installed in accordance with the approved Stormwater Management Plan, the Municipality shall revoke any existing permits or other approvals and issue a cease and desist order until a revised Drainage Plan is submitted and approved, as specified in this Ordinance.

C. A final inspection of all stormwater management facilities shall be conducted by the Municipal Engineer or his municipal designee and to confirm compliance with the approved Drainage Plan prior to the issuance of any Occupancy Permit.

ARTICLE VI-FEES AND EXPENSES

Section 601. Municipality Drainage Plan Review and Inspection Fee

Fees shall be established by the Municipality to defray plan review and construction inspection costs incurred by the Municipality. All fees shall be paid by the Applicant at the time of Drainage Plan submission. Review and Inspection Fee Schedule shall be established by resolution of the municipal Governing Body based on the size of the Regulated Activity and based on the Municipality's costs for reviewing Drainage Plans and conducting inspections pursuant to Section 501. The Municipality shall periodically update the Review and Inspection Fee Schedule to ensure that review costs are adequately reimbursed.

Section 602. Expenses Covered by Fees

The fees required by this Ordinance shall at a minimum cover:

A. Administrative costs.

B. The review of the Drainage Plan by the Municipality and the Municipal Engineer.

C. The site inspections.

D. The inspection of stormwater management facilities and drainage improvements during construction.

E. The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the Drainage Plan.

F. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

ARTICLE VII-CONSTRUCTION AND MAINTENANCE RESPONSIBILITIES

Section 701. Performance Guarantee

A. For subdivisions and land developments the Applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as: 1) Required by the approved Drainage Plan equal to or greater than the full construction cost of the required controls or 2) in the amount and method of payment provided for in the Subdivision and Land Development Ordinance.

B. For other Regulated Activities, the Municipality may require a financial guarantee from the Applicant.

C. At the completion of the project, and as a prerequisite for the release of the performance guarantee, the Applicant or his representatives shall:

1. Provide a certification of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.

2. Provide a set of record drawings.

D. After the Municipality receives the certification, a final inspection shall be conducted by the Municipal Engineer or designee to certify compliance with this Ordinance.

Section 702. Maintenance Responsibilities

A. The Drainage Plan for the development site shall contain an operation and maintenance plan prepared by the Applicant and approved by the Municipal Engineer. The operation and maintenance plan shall outline required routine maintenance actions and schedules necessary to insure proper operation of the facility(ies).

B. The Drainage Plan for the development site shall establish responsibilities for the continuing operation and maintenance of all proposed stormwater control facilities, consistent with the following principles:

1. If a development consists of structures or lots which are to be separately owned and in which streets, sewers or other public improvements are to be dedicated to the Municipality, stormwater control facilities may also be dedicated to and maintained by the Municipality (the Municipality is not obligated to accept ownership).

2. If a development site is to be maintained in a single ownership or if streets, sewers or other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities may be the responsibility of the Applicant or private management entity.

C. The Governing Body, upon recommendation of the Municipal Engineer, shall make the final determination on the continuing maintenance responsibilities prior to approval of the Drainage Plan. The Governing Body reserves the right to accept the ownership and operating responsibility for any or all of the stormwater management controls.

Section 703. Maintenance Agreement for Privately Owned Stormwater Facilities

A. Prior to approval of the site's Drainage Plan, the Applicant shall sign and record the Maintenance Agreement contained in Appendix A which is attached and made part hereof, covering all stormwater control facilities that are to be privately owned.

B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The Maintenance Agreement shall be subject to the review and approval of the Municipal Solicitor and Governing Body.

Section 704. Municipal Stormwater Maintenance Fund

A. Persons installing stormwater storage facilities shall be required to pay a specified amount to the Municipal Stormwater Maintenance Fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:

1. If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by the Municipality for a period of **[ten (10) years]**, as estimated by the Municipal Engineer. After that period of time, inspections will be performed at the expense of the Municipality.

2. If the storage facility is to be owned and maintained by the Municipality, the deposit shall cover the estimated costs for maintenance and inspections for **[ten (10) years].** The Municipal Engineer will establish the estimated costs utilizing information submitted by the Applicant.

3. The amount of the deposit to the fund shall be converted to present worth of the annual series values. The Municipal Engineer shall determine the present worth equivalents, which shall be subject to the approval of the Governing Body.

B. If a storage facility is proposed that also serves as a recreation facility (e.g., ballfield, lake), the Municipality may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.

C. If at some future time a storage facility (whether publicly or privately owned) is eliminated due to the installation of storm sewers or other storage facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

D. Long-Term Maintenance – The Municipality may require Applicants to pay a fee to the Municipal Stormwater Maintenance Fund to cover long term maintenance of stormwater control and best management practices.

E. Stormwater Related Problems - The Municipality may require Applicants to pay a fee to the Municipal Stormwater Maintenance Fund to cover stormwater related problems which may arise from the land development and earth disturbance

ARTICLE VIII-ENFORCEMENT AND PENALTIES

Section 801. Right-of-Entry

Upon presentation of proper credentials, duly authorized representatives of the Municipality may enter at reasonable times upon any property within the Municipality to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

Section 802. Notification

In the event that a person fails to comply with the requirements of this Ordinance, or fails to conform to the requirements of any permit issued hereunder, the Municipality shall provide written notification of the violation. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violation(s). Failure to comply within the time specified shall subject such person to the penalty provisions of this Ordinance. All such penalties shall be deemed cumulative and shall not prevent the Municipality from pursuing any and all remedies. It shall be the responsibility of the Applicant of the real property on which any Regulated Activity is proposed to occur, is occurring, or has occurred, to comply with the terms and conditions of this Ordinance.

Section 803. Enforcement

The Municipal Governing Body is hereby authorized and directed to enforce all of the provisions of this Ordinance. All inspections regarding compliance with the Drainage Plan shall be the responsibility of the Municipal Engineer or other qualified persons designated by the Municipality.

A. Design Plans - A set of design plans approved by the Municipality shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made by the Municipality or designee during construction.

B. Adherence to Approved Plan - It shall be unlawful for any person, firm or corporation to undertake any Regulated Activity under Section 104 on any property except as provided for in the approved Drainage Plan and pursuant to the requirements of this Ordinance. It shall be unlawful to alter or remove any control structure required by the Drainage Plan pursuant to this Ordinance or to allow the property to remain in a condition which does not conform to the approved Drainage Plan.

C. Hearing - Prior to revocation or suspension of a permit and at the request of the Applicant, the Governing Body will schedule a hearing to discuss the non-compliance if there is no immediate danger to life, public health or property. The expense of a hearing shall be the Applicant's responsibility.

D. Suspension and Revocation of Permits

1. Any permit issued by the Municipality may be suspended or revoked for:

a. Non-compliance with or failure to implement any provision of the permit.

b. A violation of any provision of this Ordinance or any other applicable law, ordinance, rule or regulation relating to the project.

c. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or

nuisance, pollution or which endangers the life or property of others.

2. A suspended permit shall be reinstated by the Governing Body when:

   a. The Municipal Engineer or his Municipal designee has inspected and approved the corrections to the stormwater management and erosion and sediment pollution control measure(s), or the elimination of the hazard or nuisance, and/or;

   b. The Governing Body is satisfied that the violation of the Ordinance, law, or rule and regulation has been corrected.

3. A permit that has been revoked cannot be reinstated. The Applicant may apply for a new permit under the procedures outlined in this Ordinance.

E. Occupancy Permit

An occupancy permit shall not be issued unless the certification of completion pursuant to Section 701 A has been approved by the Municipality. The occupancy permit shall be required for each lot owner and/or Applicant for all subdivisions and land development in the Municipality.

Section 804. Public Nuisance

A. The violation of any provision of this Ordinance is hereby deemed a Public Nuisance.

B. Each day that a violation continues shall constitute a separate violation.

Section 805. Penalties

A. Anyone violating the provisions of this Ordinance shall be subject to a fine of not more than $**[INSERT]** for each violation, recoverable with costs, or imprisonment of not more than **[INSERT]** days, or both. Each day that the violation continues shall be a separate offense

B. In addition, the Municipality may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

Section 806. Appeals

A. Any person aggrieved by any action of the Municipality or its designee may appeal to the Municipality's **[Governing Body or Zoning Hearing Board]** (per MPC Section 909.1(a)(8 and 909.1(b)(6))within **[thirty (30)]** days of that action.

B. Any person aggrieved by any decision of **[the Municipality's Governing Body or Zoning Hearing Board]** may appeal to the County Court of Common Pleas in the County where the activity has taken place within **[thirty (30) days]** of the Municipal decision.

APPENDIX A
STANDARD STORMWATER FACILITIES MAINTENANCE AND MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20_, by and between _____, (hereinafter the "Landowner"), and [Municipal Name], [County Name] County; Pennsylvania, (hereinafter "Municipality");

WITNESSES:

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of _____ County, Pennsylvania, Deed Book _____ at Page _____, (hereinafter "Property").

WHEREAS, the Landowner is proceeding to build and develop the Property; and

WHEREAS, the Subdivision/Land Management Plan (hereinafter "Plan") for the _____ Subdivision which is expressly made a part hereof, as approved or to be approved by the Municipality, provides for detention or retention of stormwater within the confines of the Property; and

WHEREAS, the Municipality and the Landowner, his successors and assigns agree that the health, safety, and welfare of the residents of the Municipality require that on-site stormwater management facilities be constructed and maintained on the Property: and

WHEREAS, the Municipality requires, through the implementation of the _____ Watershed Stormwater Management Plan, that stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, his successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Landowner, his successors and assigns, in accordance with the terms, conditions and specifications identified in the Plan.

2. The Landowner, his successors and assigns, shall maintain the stormwater management facilities in good working condition, acceptable to the Municipality so that they are performing their design functions

3. The Landowner, his successors and assigns, hereby grants permission to the Municipality, his authorized agents and employees, upon presentation of proper identification, to enter upon the Property at reasonable times, and to inspect the stormwater management facilities whenever the Municipality deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structures, pond areas, access roads, etc. When inspections are conducted, the Municipality shall give the Landowner, his successors and assigns, copies of the inspection report with findings and evaluations.

At a minimum, maintenance inspections shall be performed in accordance with the following schedule:

- Annually for the first 5 years after the construction of the stormwater facilities,
- Once every 2 years thereafter, or
- During or immediately upon the cessation of a 100 year or greater precipitation event.

4. All reasonable costs for said inspections shall be borne by the Landowner and payable to the Municipality.

5. The owner shall convey to the municipality easements and/or rights-of-way to assure access for periodic inspections by the Municipality and maintenance, if required.

6. In the event the Landowner, his successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the Municipality, the Municipality may enter upon the Property and take such necessary and prudent action to maintain said stormwater management facilities and to charge the costs of the maintenance and/or repairs to the Landowner, his successors and assigns. This provision shall not be construed as to allow the Municipality to erect any structure of a permanent nature on the land of the Landowner, outside of any easement belonging to the Municipality. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.

7. The Landowner, his successors and assigns, will perform maintenance in accordance with the maintenance schedule for the stormwater management facilities including sediment removal as outlined on the approved schedule and/or Subdivision/Land Development Plan.

8. In the event the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like on account of the Landowner's or his successors' and assigns' failure to perform such work, the Landowner, his successors and assigns, shall reimburse the Municipality upon demand, within 30 days of receipt of invoice thereof, for all costs incurred by the Municipality hereunder. If not paid within said 30-day period, the Municipality may enter a lien against the property in the amount of such costs, or may proceed to recover his costs through proceedings in equity or at law as authorized under the provisions of the_____Code.

9. The Landowner, his successors and assigns, shall indemnify the Municipality and his agents and employees against any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the Municipality for the construction, presence, existence or maintenance of the stormwater management facilities by the Landowner, his successors and assigns.

10. In the event a claim is asserted against the Municipality, his agents or employees, the Municipality shall promptly notify the Landowner, his successors and assigns, and they shall defend, at their own expense, any suit based on such claim. If any judgment or claims against the Municipality, his agents or employees shall be allowed, the Landowner, his successors and assigns shall pay all costs and expenses in connection

therewith.

11. In the advent of an emergency or the occurrence of special or unusual circumstances or situations, the Municipality may enter the Property, if the Landowner is not immediately available, without notification or identification, to inspect and perform necessary maintenance and repairs, if needed, when the health, safety or welfare of the citizens is at jeopardy. However, the Municipality shall notify the landowner of any inspection, maintenance, or repair undertaken within 5 days of the activity. The Landowner shall reimburse the Municipality for his costs.

This Agreement shall be recorded among the land records of

_[County Name] County, Pennsylvania and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL) For the Municipality:

_____

(SEAL) For the Landowner:

_____

ATTEST:

_____ (City, Borough, Township) County of [County Name]

_____, Pennsylvania

I,_____, a Notary Public in and for the County and State aforesaid, whose commission expires on the_____day of_____, 20_, do hereby certify that _____ whose name(s) is/are signed to the foregoing Agreement bearing date of the_____day of_____, 20_, has acknowledged the same before me in my said County and State.

GIVEN UNDER MY HAND THIS_____day of_____, 20__.

_____

NOTARY PUBLIC

(SEAL)

APPENDIX B
STORMWATER MANAGEMENT DESIGN CRITERIA

Table B-1

Runoff Curve Numbers Based on Land Use and HSG

Cover Type and Hydrologic Condition	CNs for hydrologic soil group A	B	C	D
Open Space (lawns, parks, golf courses, cementeries, landscaping, etc.)				
Poor condition (grass cover on <50% of the area)	68	79	86	89
Fair condition (grass cover on 50% to 75% of the area	49	69	79	84
Good condition (grass cover on >75& of the area)	39	61	74	80
Impervious Areas:				
Open water bodies: lakes, wetlands, ponds, etc**.**	100	100	100	100
Paved parking lots, roofs, driveways, etc. or other similar impervious surfaces	98	98	98	98
Porous Pavement and Pavers:				
Porous Pavement / Concrete on minimum 12" Clean Aggregate Base	40	40	66	70
Porous Pavers/ Pavement/Concrete Walks with min. 6" Clean Aggregate Base	40	52	75	80
Non-Impervious Driving Surfaces:				
Gravel	94	97	97	97
Dirt	88	93	94	94
Cultivated Agricultural Lands				
Row Crops (good), e.g., corn, sugar beets, soy beans	64	75	82	85
Small grain (good), e.g., wheat, barley, flax	60	72	80	84
Meadow (continuous grass, protected from grazing, and generally mowed for hay):	30	58	71	78
Brush (brush-weed-grass mixture, with brush the major element):				
Poor (<50% ground cover)	48	67	77	83
Fair (50% to 75% ground cover)	35	56	70	77
Good (>75% ground cover)	30	48	65	73
Woods:				
Poor (forest litter, small trees, and brush are destroyed by heavy grazing or regular burning)	45	66	77	83
Fair (woods are grazed but not burned, and some forest litter covers the soil)	36	60	73	79
Good (woods are protected from grazing, and litter and brush adequately cover the soil)	30	55	70	77

[1] Composite CNs for Residential , Commercial and Industrial Uses shall be computed based on the applicable values provided in this Table

[2] If Weighted CN is less than 40, use CN=40 for runoff computations.

[3] Designer shall submit justification for the use of CN values not specified in the above Table

Table B-2
Runoff Coefficients for the Rational Formula
By Land Use, Hydrologic Soil Group and Overland Slope (%)

Hydrologic Soil Group (HSG)	**A**			**B**			**C**			**D**		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated Land	0.08 (a)	0.13	0.16	0.11	0.15	0.21	0.01	0.19	0.28	0.18	0.23	0.31
	0.14 (b)	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Open Space/Lawn	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Meadow	0.05	0.10	0.14	0.05	0.13	0.19	0.12	0.17	0.24	0.16	0.21	0.28
	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Impervious Surfaces (including	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
dirt, gravel)	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

(a) Runoff coefficients for storm recurrence intervals less than 25 years.
(b) Runoff coefficients for storm recurrence intervals of 25 years or more

Source: "Recommended Hydrologic Procedures for Computing Urban Runoff from Small Watersheds in Pennsylvania" Pennsylvania DER #609-12/90

TABLE B-3

Roughness Coefficients (Manning's "n") For Overland Flow (U.S. Army Corps Of Engineers, HEC-1 Users Manual)

Surface Description	n		
Dense Growth	0.4	-	0.5
Pasture	0.3	-	0.4
Lawns	0.2	-	0.3
Bluegrass Sod	0.2	-	0.5
Short Grass Prairie	0.1	-	0.2
Sparse Vegetation	0.05	-	0.13
Bare Clay-Loam Soil (eroded)	0.01	-	0.03
Concrete/Asphalt - very shallow depths (less than 1/4 inch)	0.10	-	0.15
- small depths (1/4 inch to several inches)	0.05	-	0.10

Roughness Coefficients (Manning's "n") For Channel Flow

Reach Description	n
Natural stream, clean, straight, no rifts or pools	0.03
Natural stream, clean, winding, some pools or shoals	0.04
Natural stream, winding, pools, shoals, stony with some weeds	0.05
Natural stream, sluggish deep pools and weeds	0.07
Natural stream or swale, very weedy or with timber underbrush	0.10
Concrete pipe, culvert or channel	0.012
Corrugated metal pipe	0.012-0.027(1)
High Density Polyethylene (HDPE) Pipe	
Corrugated	0.021-0.029(2)
Smooth Lined	0.012-0.020(2)

(1) Depending upon type, coating and diameter
(2) Values recommended by the American Concrete Pipe Association, check Manufacturer's recommended value.

APPENDIX C
SAMPLE DRAINAGE PLAN APPLICATION AND FEE SCHEDULE

(To be attached to the "land subdivision plan or development plan review application or "minor land subdivision plan review application")

Application is hereby made for review of the Stormwater Management and Erosion and Sedimentation Control Plan and related data as submitted herewith in accordance with the _____Township Stormwater Management and Earth Disturbance Ordinance.

_____Final Plan_____Preliminary Plan_____Sketch

Plan Date of Submission_____Submission No._____

1. Name of subdivision or development_____

2. Name of Applicant_____Telephone No._____ (if corporation, list the corporation's name and the names of two officers of the corporation)
   _____Officer 1

   _____Officer 2

   Address_____

   Zip_____

Applicants interested in subdivision or development
(if other than property owner give owners name and address)

3. Name of property owner_____Telephone No._____

   Address_____

   Zip_____

4. Name of engineer or surveyor_____Telephone No._____

   Address_____
   Zip_____

5. Type of subdivision or development proposed:

____ Single-Family Lots	____ Townhouses	____ Commercial(Multi-Lot)
____ Two Family Lots	____ Garden Apartments	____ Commercial (One-Lot)
____ Multi-Family Lots	____ Mobile-Home Park	____ Industrial (Multi-Lot)
____ Cluster Type Lots	____ Campground	____ Industrial (One-Lot)
____ Planned Residential	____ Other	____ Development

6. Linear feet of new road proposed_____L.F.

7. Area of proposed and existing conditions impervious area on entire tract.

   a. Existing (to remain)_____S.F.____% of Property

   b. Proposed _____S.F.____% of Property

8. Stormwater

   a. Does the peak rate of runoff from proposed conditions exceed that flow which occurred for existing conditions for the designated design storm? _____

   b. Design storm utilized (on-site conveyance systems) (24 hr.)_____ No. of Subarea_____

      Watershed Name_____

      Explain:_____

      _____

      _____

   c. Does the submission and/or district meet the release rate criteria for the applicable subarea?_____

   d. Number of subarea(s) from Ordinance Appendix D of the Brodhead and McMichael Creek Watershed Stormwater Management Plan._____

   e. Type of proposed runoff control_____

   f. Does the proposed stormwater control criteria meet the requirement/guidelines of the Stormwater Ordinances?_____

      If not, what variances/waivers are requested?_____ Reasons Why:

      _____

      _____

   g. Does the plan meet the requirements of Article iii of the Stormwater Ordinances?_

      If not, what variances/waivers are requested?_____ Reasons Why:

      _____

      _____

   h. Was TR-55, June 1986 utilized in determining the time of concentration?

      _____

   i. What hydrologic method was used in the stormwater computations?

      _____

j. Is a hydraulic routing through the stormwater control structure submitted?

_____

k. Is a construction schedule or staging attached?_____

l. Is a recommended maintenance program attached?_____

9. Erosion and Sediment Pollution Control (E&S):

a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the_____County Conservation District?_____

b. Total area of earth disturbance_____S.F.

10. Wetlands

a. Have the wetlands been delineated by someone trained in wetland delineation?___

b. Have the wetland lines been verified by a state or federal permitting authority?___

c. Have the wetland lines been surveyed?_____

d. Total acreage of wetland within the property _____

e. Total acreage of wetland disturbed_____

f. Supporting documentation_____

11. Filing

a. Has the required fee been submitted?_____ Amount:_____

b. Has the proposed schedule of construction inspection to be performed by the Applicant's engineer been submitted?_____

c. Name of individual who will be making the inspections_____

d. General comments about stormwater management at the development:

_____

_____

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF [County Name] .

On this the day of , 20 , before me, the undersigned officer, personally appeared who being duly sworn, according to law, deposes and says that owners of the property described in this application and that the application was made with knowledge and/or direction and does hereby agree with the said application and to the submission of the same.

Property Owner

My Commission Expires , 20
Notary Public

THE UNDERSIGNED HEREBY CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF THE INFORMATION AND STATEMENTS GIVEN ABOVE ARE TRUE AND CORRECT.

SIGNATURE OF APPLICANT

//

(**Information Below This Line To Be Completed By The Municipality**)

(Name of) Municipality official submission receipt:

Date complete application received: Plan Number:

Fees: Date fees paid: Received by:

Official submission receipt date: Received by:

Municipality

Drainage Plan Proposed Schedule of Fees

Subdivision name_____ Submittal No._____

Owner_____ Date_____

Engineer_____

1. Filing fee	$_____
2. Land use	
2a. Subdivision, campgrounds, mobile home parks, and multi-family dwelling where the units are located in the same local watershed.	$_____
2b. Multi-family dwelling where the designated open space is located in a different local watershed from the proposed units.	$_____
2c. Commercial/industrial.	$_____
3. Relative amount of earth disturbance 3a. Residential	
road <500 l.f.	$_____
road 500-2,640 l.f.	$_____
road >2,640 l.f.	$_____
3b. Commercial/industrial and other	
impervious area <3,500 s.f.	$_____
impervious area 3,500-43,460 s.f.	$_____
impervious area >43,560 s.f.	$_____
4. Relative size of project	
4a. Total tract area <1 ac	$_____
1-5 ac	$_____
5-25 ac	$_____
25-100 ac	$_____
100-200 ac	$_____
>200 ac	$_____
5. Stormwater control measures	
5a. Detention basins & other controls which require a review of hydraulic routings ($ per control).	$_____
5b. Other control facilities which require storage volume calculations but no hydraulic routings. ($ per control)	$_____
6. Site inspection ($ per inspection)	$_____
Total	$_____

All subsequent reviews shall be 1/4 the amount of the initial review fee unless a new application is required as per Section 406 of the stormwater Ordinance. A new fee shall be submitted with each revision in accordance with this schedule.

APPENDIX D
STORMWATER MANAGEMENT DISTRICT WATERSHED MAP

Management District Map Fly Page

APPENDIX E

EXISTING VACANT LOTS IN RECORDED SUBDIVISIONS

METHOD OF STORAGE COMPUTATION AND EXAMPLE LOT LAYOUTS

STEP 1.

Determine Impervious Surfaces

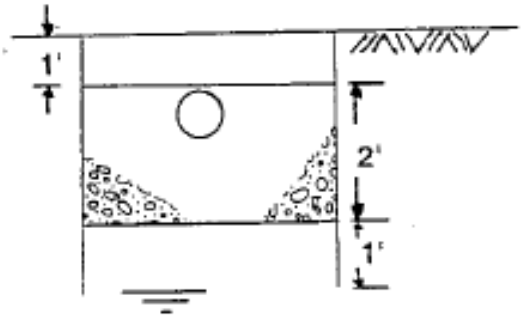
House Roof 1	12 X 48 =	576
House Roof 2	12 X 48 =	576
Deck***	12 X 18 =	216
Deck	4 X 24 =	96
Drive	12 X 50 =	600
Garage	12 X 12 =	144
		2,208 S.F.

STEP 2.

Required storage volume from Figure 1 = 505 cubic feet

STEP 3.

Refer to soil log for septic system. Indicates mottling at 48 inches. The percolation rate is 96 minutes/inches. Therefore, from Figure 2, choose seepage trenches for each rain gutter outlet.



STEP 4.

Determine length of trench required - use 6-inch perforated pipe.

GUTTER OUTLET	REQ'D VOL.(C.F.) FROM FIGURE 1	DEPTH OF AGGREGATE FT.	TRENCH WIDTH FT.
1	118	2	3
2	118	2	3
3	30	2	3

GUTTER OUTLET	VOLUME OF STORAGE* PER FT. OF TRENCH	VOLUME OF STORAGE** PER FT. OF PIPE	TOTAL	TOTAL LENGTH OF TRENCH REQ'D (FT.)
1	2.1	0.2	2.3	118/2.3 = 51
2	2.1	0.2	2.3	118/2.3 = 51
3	2.1	0.2	2.3	30/2.3 = 13

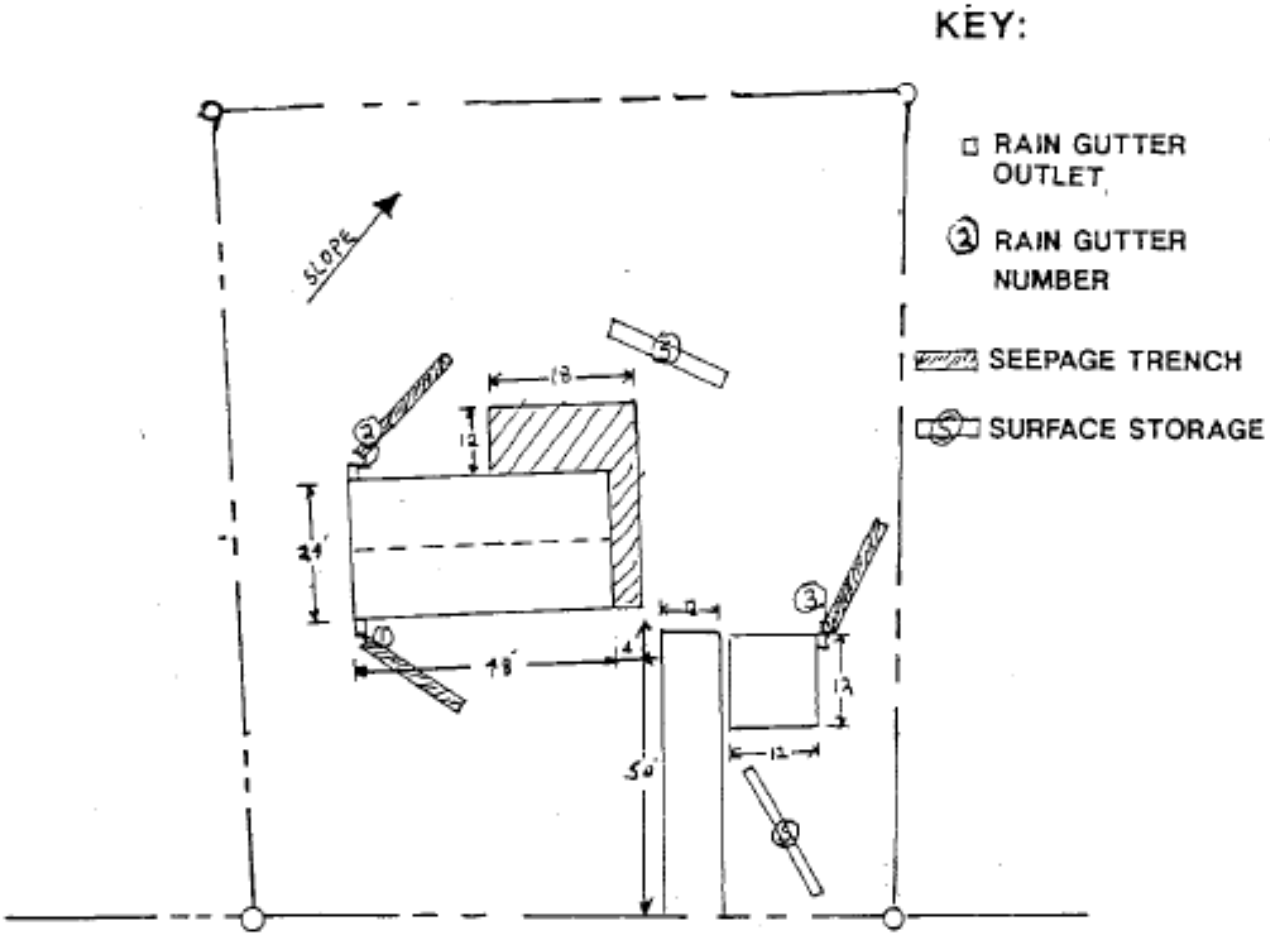
* From Table 5
** From Table 6
*** Wood decks with spacing between boards are exempt from the calculations.

STEP 5.

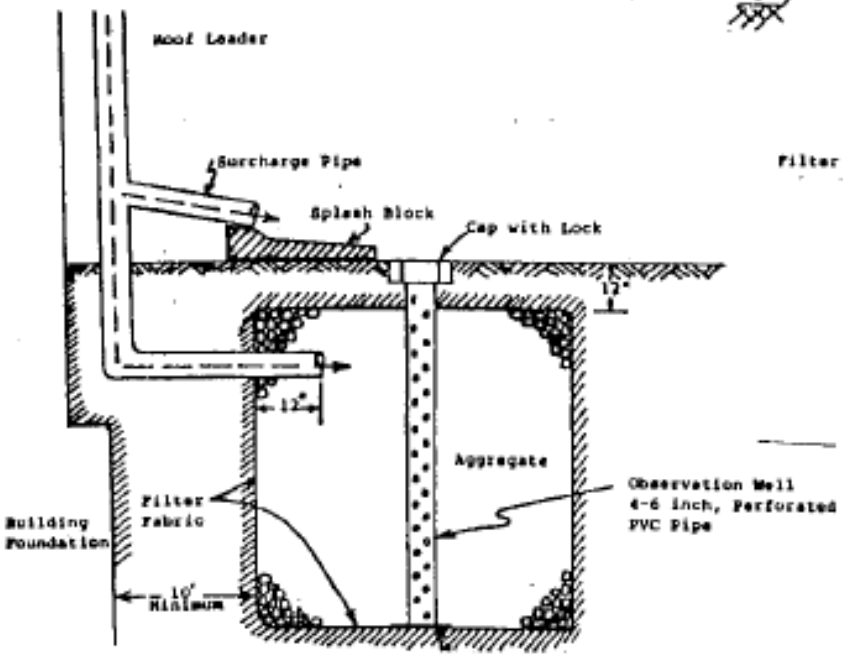
Determine remainder of impervious surfaces which requires detention and required storage volume from Figure 2.

Deck	312 S.F.	912 S.F. = 185 C.F. of Storage
Drive	600 S.F.	
	912 S.F.	

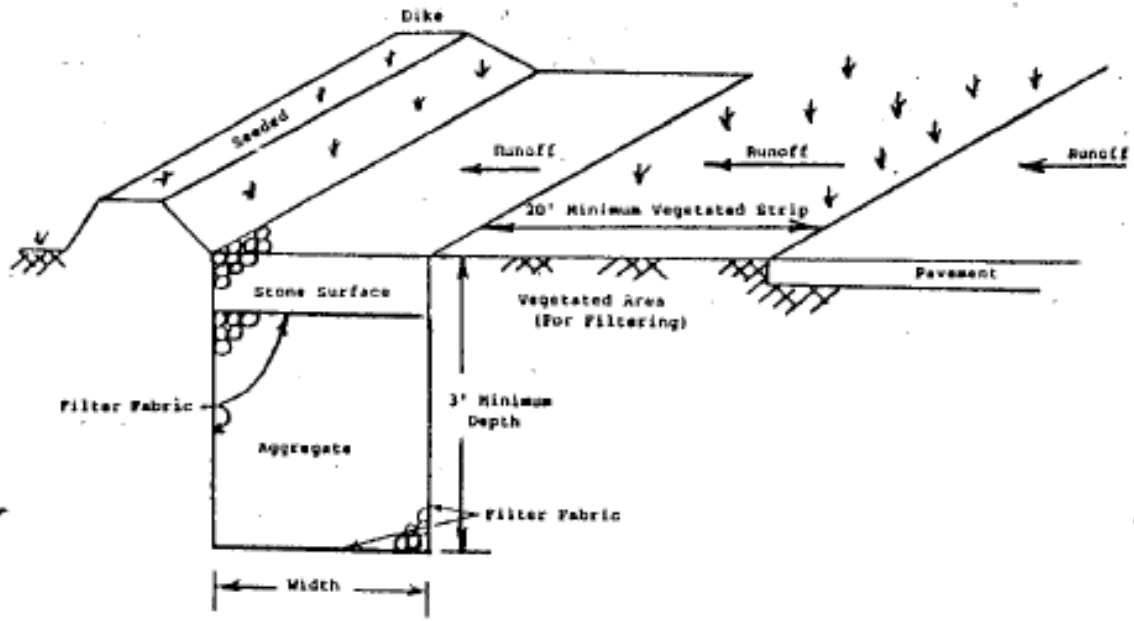
Use trench 6' wide by 1' deep x 31 feet long or 2 - 6' x 1' x 16' trenches in locations shown on plan.



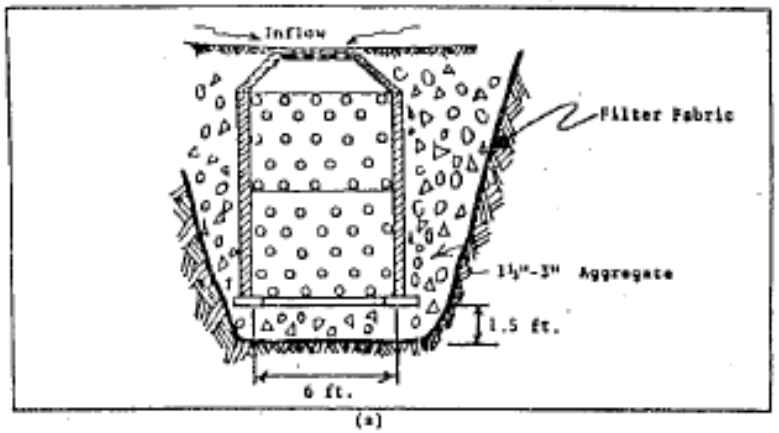
TYPICAL LOT LAYOUT



Typical Dry Well Cross Section



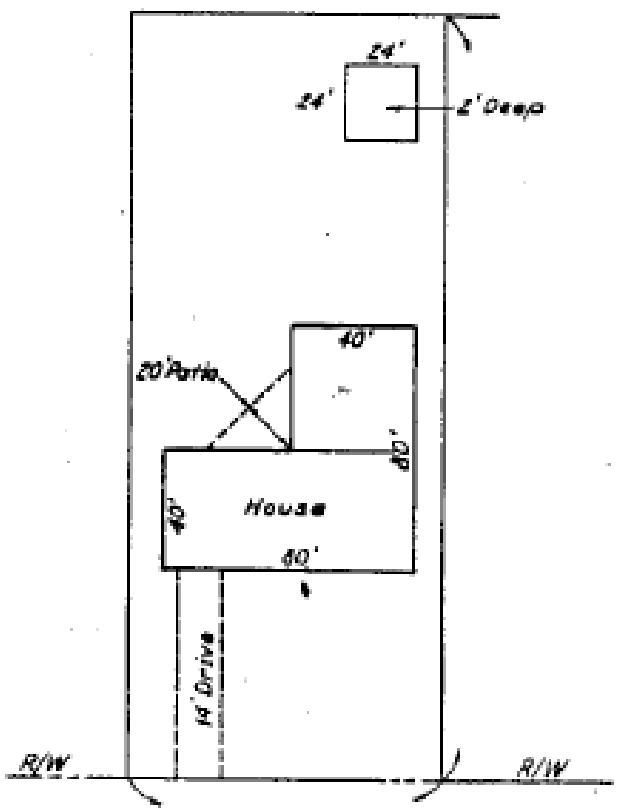
Typical Section of Infiltration Trenches
Modified after Frederick Co., MD. (1979)



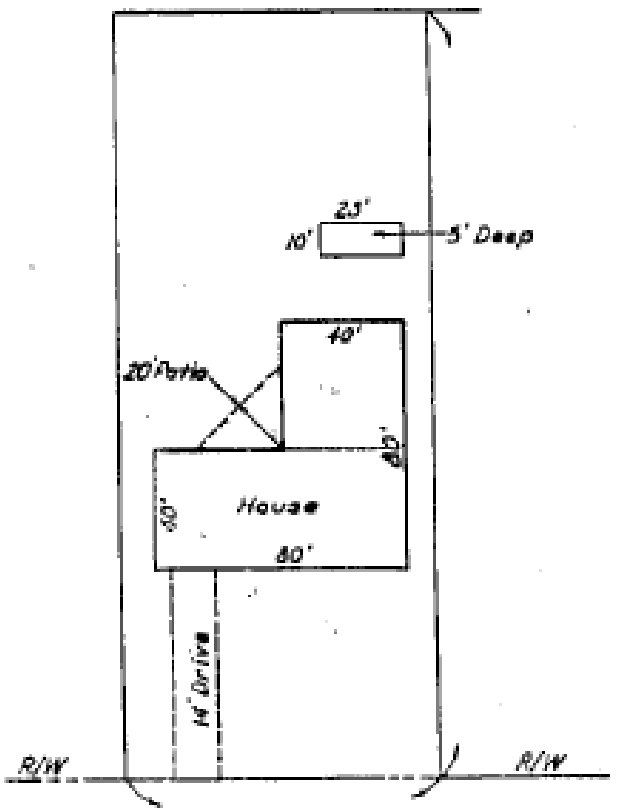
(a)

Source: Modified from Sullivan (1981)

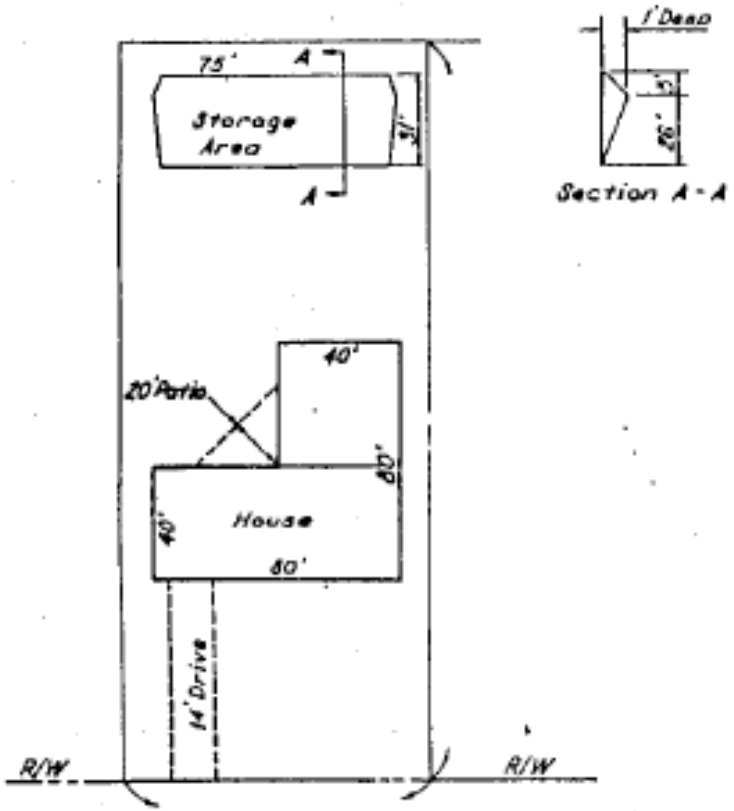
ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO.3
POND STORAGE



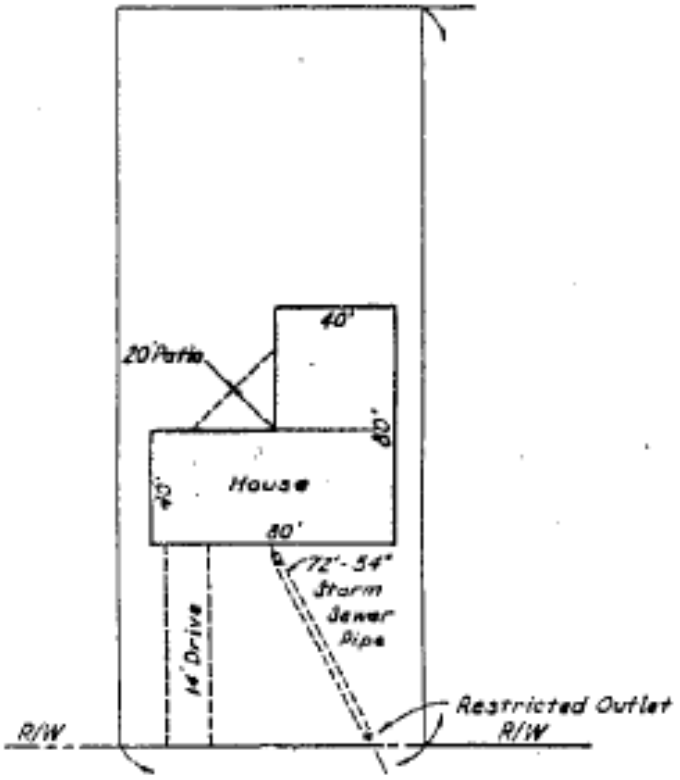
ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO. 4
UNDERGROUND TANK STORAGE



ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO. 1
SURFACE STORAGE



ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO. 2
OVERSIZED STORM SEWER PIPE



Appendix G

Model Stormwater Ordinance for Municipalities with MS4's

ACT 167 MODEL STORMWATER MANAGEMENT ORDINANCE

FINAL INSERT DATE

PLEASE HAVE YOUR SOLICITOR REVIEW THE ENCLOSED ORDINANCE AND CHECK THE APPLICABILITY OF ALL SECTIONS TO YOUR MUNICIPALITY

STORMWATER MANAGEMENT

ORDINANCE

ORDINANCE NO. INSERT #

[Municipal Name] , [County Name]

COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

Date , 20 add

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ARTICLE I- GENERAL PROVISIONS

Section 101. Statement of Findings

The Governing Body of **[Insert Municipality]** finds that:

A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.

B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety, welfare, and the protection of the people of **[Insert Municipality]** and all the people of the Commonwealth, their resources, and the environment.

C. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed poses a threat to surface and groundwater quality.

D. Through project design, impacts from stormwater runoff can be minimized to maintain the natural hydrologic regime, and sustain high water quality, groundwater recharge, stream baseflow and aquatic ecosystems. The most cost effective and environmentally advantageous way to manage storm water runoff is through nonstructural project design, minimizing impervious surfaces and sprawl, avoiding sensitive areas (i.e. buffers, floodplains, steep slopes), and designing to topography and soils to maintain the natural hydrologic regime.

E. To effectively monitor the maintenance of base flow within the watershed, a tracking of consumptive use including storm water discharges and groundwater withdrawals is critical to complying with anti-degradation, the Act's goals and policy, and the regulatory requirement to maintain base flow and stream health.

Section 102. Purpose

The purpose of this Ordinance is to promote the public health, safety, and welfare within the Brodhead and McMichaels Creek watersheds by maintaining the natural hydrologic regime and minimizing the impacts described in Section 101 of this Ordinance through provisions designed to:

A. Promote alternative project designs and layout that minimizes impacts to surface and ground water.

B. Promote nonstructural BMP's.

C. Minimize increases in stormwater volume.

D. Minimize impervious surfaces.

E. Manage accelerated runoff and erosion and sedimentation problems at their source by regulating activities that cause these problems during construction.

F. Utilize and preserve the existing natural drainage systems.

G. Encourage recharge of groundwater where appropriate and prevent degradation of groundwater quality.

H. Address the quality and quantity of stormwater discharges from the development site.

I. Maintain existing baseflow and quality of streams and watercourses in the Municipality and the Commonwealth

J. Preserve and restore the flood carrying capacity of streams.

K. Provide proper maintenance of all permanent stormwater management facilities that are constructed in the Municipality.

L. Provide performance standards and design criteria for watershed-wide stormwater management and planning.

Section 103. Statutory Authority

The Municipality is empowered to regulate land use activities that affect runoff, surface and groundwater quality and quantity by the authority of the Act of October 4, 1978 32 P.S., P.L. 864 (Act 167) Section 680.1 et seq., as amended, the "Stormwater Management Act" (hereinafter referred to as "the Act"), and the Water Resources Management Act of 2002, as amended, Municipalities Planning Code, Act of 1968, P.L.805, No.247, as amended, Second Class Township Code, 53 PS Section 66501 et seq., 66601 et seq. and the Borough Code 53 PS Section 46201 et seq..

Section 104. Applicability/Regulated Activities

This Ordinance shall apply to those areas of the Municipality that are located within the Brodhead and McMichaels Creek Watersheds, as delineated on the mapping in Appendix D which is hereby adopted as part of this Ordinance.

This Ordinance shall only apply to permanent nonstructural and structural stormwater management Best Management Practices (BMP's) constructed as part of any of the "Regulated Activities" listed in this Section.

This Ordinance contains only the stormwater management performance standards and design criteria that are necessary or desirable from a watershed-wide perspective. Local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.) shall continue to be regulated by the applicable Municipal Ordinances and applicable State Regulations.

The Municipality may, after consultation with DEP, approve alternative methods for meeting the State Water Quality Requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, State law including but not limited to the Clean Streams Law and the Pennsylvania Stormwater BMP Manual as revised.

The following activities are defined as "Regulated Activities" and shall be regulated by this Ordinance:

A. Land development.
B. Subdivisions.
C. Alteration of the natural hydrologic regime.
D. Construction of/or additional impervious or semi-pervious surfaces (driveways, parking lots, roads).

E. Construction of new buildings or additions to existing buildings.
F. Redevelopment of a site which will increase runoff or change a discharge point. Any redevelopment that does not increase the runoff must still comply with Sections 303 (Water Quality and Streambank Erosion Requirements) and 304 (Ground Water Recharge).
G. Diversion piping or encroachments in any natural or man-made channel.
H. Nonstructural and structural storm water management BMP's or appurtenances thereto.
I. Stream enhancement or restoration projects.

Section 105. Repealer

Any ordinance or ordinance provision of the Municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

Section 106. Severability

Should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 107. Compatibility with Other Ordinance Requirements

Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

ARTICLE II-DEFINITIONS

Section 201. Interpretation.

For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.

B. The word "includes" or "including" shall not limit the term to the specific example, but is intended to extend its meaning to all other instances of like kind and character.

C. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, unit of government, or any other similar entity.

D. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.

E. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used, occupied or maintained.

Section 202 - Definitions

Accelerated Erosion - The removal of the surface of the land through the combined action of man's activity and the natural processes of a rate greater than would occur because of the natural process alone.

Agricultural Activities - The work of producing crops and raising livestock including tillage, plowing, disking, harrowing, pasturing and installation of conservation measures. For purposes of regulation by this Ordinance construction of new buildings or impervious area is not considered an agricultural activity.

Alteration - As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the changing of surface conditions by causing the surface to be more or less impervious; land disturbance.

Applicant - A person who has filed an application for approval to engage in any “Regulated Activities” as defined in Section 104 of this Ordinance.

Bankfull – The channel at the top-of-bank or point where water begins to overflow onto a floodplain.

Base Flow – The portion of stream flow that is sustained by ground water discharge.

Bioretention – A storm water retention area which utilizes woody and herbaceous plants and soils to remove pollutants before infiltration occurs.

Best Management Practice (BMP) - Stormwater structures, facilities and techniques to control, maintain or improve the quantity and quality of surface runoff and groundwater recharge.

BMP Manual - Pennsylvania Stormwater Best Management Practices Manual (Stormwater BMP Manual), Commonwealth of Pennsylvania, Department of Environmental Protection, No 363-0300-002 (December 2006), as amended and updated.

Buffer – The area of land immediately adjacent to any wetland, lake, pond, vernal pond, or stream, measured perpendicular to and horizontally from the delineated edge of the wetland, lake, pond, or vernal pond, or the top-of-bank on both sides of a stream.

Channel Erosion - The widening, deepening, and headward cutting of small channels and waterways, caused by stormwater runoff or bankfull flows.

Cistern - An underground reservoir or tank for storing rainwater.

Conservation District - The Monroe or Pike County Conservation District.

Consumptive Water Use – That part of water removed from the immediate water environment not available for other purposes such as water supply, maintenance of stream flows, water quality, fisheries and recreation, as opposed to water that is used non-consumptively, which is returned to a surface water, where practicable, and/or to groundwater.

Culvert - A structure with appurtenant works, which carries water under or through an embankment or fill.

Dam - An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid, or a refuse bank, fill or structure for highway, railroad or other purposes which does or may impound water or another fluid or semifluid.

Department – The Pennsylvania Department of Environmental Protection.

Designee - The agent of the Monroe or Pike County Planning Commission, Monroe or Pike County Conservation District and/or agent of the Governing Body involved with the administration, review or enforcement of any provisions of this Ordinance by contract or memorandum of understanding.

Design Professional (Qualified) – A Pennsylvania Registered Professional Engineer, Registered Landscape Architect or a Registered Professional Land Surveyor trained to develop stormwater management plans.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of stormwater management systems.

Detention Basin - An impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Development Site - The specific tract of land for which a Regulated Activity is proposed.

Diffused Drainage Discharge – Drainage discharge not confined to a single point location or channel, such as sheet flow or shallow concentrated flow.

Disturbed Areas – Land area where an earth disturbance activity is occurring or has occurred.

Downslope Property Line - That portion of the property line of the lot, tract, or parcels of land being developed located such that overland or pipe flow from the site would be directed towards it.

Drainage Conveyance Facility - A Stormwater Management facility designed to transmit stormwater runoff and shall include channels, swales, pipes, conduits, culverts, storm sewers, etc.

Drainage Easement - A right granted by a Grantor to a Grantee, allowing the use of private land for stormwater management purposes.

Drainage Permit - A permit issued by the Municipal Governing Body after the drainage plan has been approved.

Drainage Plan - The documentation of the stormwater management system, if any, to be used for a given development site, the contents of which are established in Section 403.

Earth Disturbance – A construction or other human activity which disturbs the surface of land, including, but not limited to, clearing and grubbing, grading, excavations, embankments, agricultural plowing or tilling, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth materials.

Emergency Spillway – A conveyance area that is used to pass peak discharge greater than the maximum design storm controlled by the storm water facility.

Encroachment – A structure or activity that changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water.

Erosion - The movement of soil particles by the action of water, wind, ice, or other natural forces.

Erosion and Sediment Control Plan - A site specific plan that is designed to minimize accelerated erosion and sedimentation during construction.

Exceptional Value Waters – Surface waters of high quality which satisfy Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, § 93.4b(b) (relating to anti- degradation).

Existing Conditions - The initial condition of a project site prior to the proposed alteration. If the initial condition of the site is undeveloped land, the land use shall be considered as "meadow" unless the natural land cover is proven to generate lower Curve Numbers (CN) or Rational "C" value.

FEMA-The Federal Emergency Management Agency

Flood - A temporary condition of partial or complete inundation of land areas from the overflow of streams, rivers, and other waters of this Commonwealth.

Floodplain – The lands adjoining a river or stream that have been or may be expected to be inundated by flood waters in a 100-year frequency flood.

Floodway - The channel of the watercourse and those portions of the adjoining floodplains, which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed - absent evidence to the contrary - that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

Forest Management/Timber Operations - Planning and activities necessary for the management of forest land with no change of land use proposed. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting and reforestation.

Freeboard - A vertical distance between the elevation of the design high-water and the top of a dam, levee, tank, basin, swale, or diversion berm. The space is required as a safety margin in a pond or basin.

Grade - A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein. (To) Grade - to finish the surface of a roadbed, top of embankment or bottom of excavation.

Grassed Waterway - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to convey surface water.

Groundwater Recharge - Replenishment of existing natural underground water supplies without degrading groundwater quality.

HEC-HMS - The U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC) - Hydrologic Modeling System (HMS) computer program.

High Quality Waters – Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying Pennsylvania Code Title 25 Environmental Protection, Chapter 93 Water Quality Standards, § 93.4b(a).

High Tunnel – A structure which meets the following:

(i) Is used for the production, processing, keeping, storing, sale or shelter of an agricultural commodity as defined in Section 2 of the Act of December 19, 1974 (P.L. 973, No. 319), known as the "Pennsylvania Farmland and Forest Land Assessment Act of 1974" or for the storage of agricultural equipment and supplies.

(ii) Is constructed consistent with all of the following:

a. Has a metal, wood or plastic frame.
b. When covered, has a plastic, woven textile, or other flexible covering.
c. Has a floor made of soil, crushed stone, matting, pavers or a floating concrete slab.

Hydrologic Regime (natural) – The hydrologic cycle or balance that sustains quality and quantity of storm water, baseflow, storage, and groundwater supplies under natural conditions.

Hydrologic Soil Group - A classification of soils by the Natural Resources Conservation Service, formerly the Soil Conservation Service, into four runoff potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much more runoff.

Impervious Surface - A surface that prevents the percolation of water into the ground such as rooftops, pavement, sidewalks, driveways, gravel drives, roads and parking, and compacted fill, earth or turf to be used as such.

Impoundment - A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

Infill – Development that occurs on smaller parcels that remain undeveloped but are within or very close proximity to urban areas. The development relies on existing infrastructure and does not require an extension of water, sewer or other public utilities.

Infiltration – For stormwater to pass through the soil from the surface.

Infiltration Structures - A structure designed to direct runoff into the underground water (e.g., French drains, seepage pits, seepage trench, etc.).

Inlet - The upstream end of any structure through which water may flow.

Land Development - (i) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure or (b) the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features; (ii) A subdivision of land; (iii) development in accordance with Section 503(1.1)of the PA Municipalities Planning Code.

Limiting zone - A soil horizon or condition in the soil profile or underlying strata which includes one of the following:

(i) A seasonal high water table, whether perched or regional, determined by direct observation of the water table or indicated by soil mottling.

(ii) A rock with open joints, fracture or solution channels, or masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.

(iii) A rock formation, other stratum or soil condition which is so slowly permeable that it effectively limits downward passage of water.

Lot - A part of a subdivision or a parcel of land used as a building site or intended to be used for building purposes, whether immediate or future, which would not be further subdivided. Whenever a lot is used for a multiple family dwelling or for commercial, institutional or industrial purposes, the lot shall be deemed to have been subdivided into an equivalent number of single family residential lots as determined by estimated sewage flows.

Main Stem (Main Channel) - Any stream segment or other runoff conveyance facility used as a reach in the Brodhead and McMichaels hydrologic model.

Management District - Those subareas in which some type of detention is required to meet the plan requirements and the goals of Act 167.

Manning Equation (Manning formula) - A method for calculation of the velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

Municipality – **[Municipal Name]**, **[Monroe or Pike]** County, Pennsylvania.

Natural Hydrologic Regime - see Hydrologic Regime (natural)

Non-point Source Pollution - Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

Nonstructural BMPs – Methods of controlling stormwater runoff quantity and quality, such as innovative site planning, impervious area and grading reduction, protection of natural depression areas, temporary ponding on site and other techniques

NRCS - Natural Resource Conservation Service (previously SCS).

Open Channel - A drainage element in which stormwater flows within an open surface. Open channels include, but shall not be limited to, natural and man-made drainage ways, swales, streams, ditches, canals, and pipes flowing partly full.

Outfall - Point where water flows from a conduit, stream, or drain.

Outlet - Points of water disposal from a stream, river, lake, tidewater or artificial drain.

Parent Tract – The parcel of land from which a land development or subdivision originates, existing as of the date of municipal adoption of the original Brodhead and McMichaels Creek Ordinance.

Parking Lot Storage - The use of parking areas as temporary impoundments with controlled release rates during rainstorms.

Peak Discharge - The maximum rate of stormwater runoff from a specific storm event.

Penn State Runoff Model (calibrated) - The computer-based hydrologic modeling technique adapted to the Brodhead and McMichaels watersheds for the Act 167 Plan. The model has been "calibrated" to reflect actual recorded flow values by adjoining key model input parameters.

Pipe - A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Planning Commission - The Planning Commission of **[Municipal Name]**.

PMF - Probable Maximum Flood - The flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in any area. The PMF is derived from the probable maximum precipitation (PMP) as determined based on data obtained from the National Oceanographic and Atmospheric Administration (NOAA).

Practicable Alternative – An alternative that is available and capable of being implemented after taking into consideration cost, existing technology and logistics in light of overall project purposes.

Predevelopment – Undeveloped/Natural Condition. See Existing Conditions.

Pretreatment – Techniques employed in structural and nonstructural stormwater BMPs to provide storage or filtering to help trap coarse materials and other pollutants before they enter the system, but not necessarily meet the water quality volume requirements of Section 303.

Rational Formula - A rainfall-runoff relation used to estimate peak flow.

Recharge Area – Undisturbed surface area or depression where stormwater collects, and a portion of which infiltrates and replenishes the underground and groundwater.

Record Drawings - Original documents revised to suit the as-built conditions and subsequently provided by the Design Professional (Qualified) to the Applicant. The Design Professional takes the Contractor's as-builts, reviews them in detail with his/her own records for completeness, then either turns these over to the Applicant or transfers the information to a set of reproducibles, in both cases for the Applicant's permanent records."

Redevelopment – Any construction, alteration, or improvement exceeding 5,000 square feet of impervious surface on sites where existing land use is commercial, industrial, institutional, or multifamily residential.

Regulated Activities - Actions or proposed actions that have an impact on stormwater runoff quality and quantity and that are specified in Section 104 of this Ordinance.

Release Rate - The reduction of post development peak rates of runoff from a site or subarea to

existing conditions peak rates of runoff to protect downstream areas.

Retention Basin - A structure in which stormwater is stored and not released during the storm event. Retention basins do not have an outlet other than recharge and must infiltrate stored water in no more than 4 days.

Return Period - The average interval, in years, within which a storm event of a given magnitude can be expected to recur.

Riser - A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

Rooftop Detention - Temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff - Any part of precipitation that flows over the land surface.

SALDO – Subdivision and Land Development Ordinance.

Sediment Basin - A barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other material transported by water during construction.

Sediment Pollution - The placement, discharge or any other introduction of sediment into the waters of the Commonwealth.

Sedimentation - The process by which mineral or organic matter is accumulated or deposited by the movement of water or air.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the underground and groundwater.

Sheet Flow - Runoff that flows over the ground surface as a thin, even layer.

Soil-Cover Complex Method - A method of runoff computation developed by the NRCS that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN).

Source Water Protection Areas (SWPA) – The zone through which contaminants, if present, are likely to migrate and reach a drinking water well or surface water intake.

Special Protection Watersheds - Watersheds for which the receiving waters are exceptional value (EV) or high quality (HQ) waters.

Spillway – A conveyance that is used to pass the peak discharge of the maximum design storm controlled by the stormwater facility.

Storage Indication Method - A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage) with outflow defined as a function of storage volume and depth.

Storm Frequency - The number of times that a given storm "event" occurs or is exceeded on the average in a stated period of years. See "Return Period".

Storm Sewer - A system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources, but excludes domestic sewage and industrial wastes.

Stormwater - The surface runoff generated by precipitation reaching the ground surface.

Stormwater Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff quality and quantity. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

Stormwater Management Plan - The plan for managing those land use activities that will influence stormwater runoff quality and quantity and that would impact the Brodhead and McMichaels Watersheds adopted by Monroe County and Pike County as required by the Act of October 4, 1978, P.L. 864, (Act 167), and known as the "Brodhead and McMichaels Watershed Act 167 Stormwater Management Plan".

Stormwater Management Site Plan - The plan prepared by the Applicant or his representative indicating how stormwater runoff will be managed at the particular site of interest according to this Ordinance.

Stream - A watercourse.

Stream Enclosure - A bridge, culvert or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of this Commonwealth.

Subarea (Subwatershed) - The smallest drainage unit of a watershed for which stormwater management criteria have been established in the Stormwater Management Plan.

Subdivision - The division or re-division of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership, or building or lot development: Provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

Swale - A low lying stretch of land which gathers or carries surface water runoff.

Timber Operations - See Forest Management.

Time-of-Concentration (Tc) - The time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

Watercourse - A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

Waters of the Commonwealth - Rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

Wellhead - The point at which a groundwater well bore hole meets the surface of the ground.

Wellhead Protection Area - The surface and subsurface area surrounding a water supply well, well field, spring or infiltration gallery supplying a public water system, through which contaminants are reasonably likely to move toward and reach the water source

Wetland - Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

ARTICLE III-STORMWATER MANAGEMENT

Section 301. General Requirements

A. Applicants proposing Regulated Activities in the Brodhead and McMichaels Creek Watersheds which do not fall under the exemption criteria shown in Section 402 shall submit a drainage plan consistent with the Brodhead and McMichaels Creek Watershed Stormwater Management Plan to the Municipality for review. These criteria shall apply to the total proposed development even if development is to take place in stages

B. The Applicant is required to perform an alternatives analysis to find practicable alternatives to the surface discharge of stormwater, the creation of impervious surfaces and the degradation of waters of the Commonwealth, and must maintain as much as possible the natural hydrologic regime

C. The Drainage Plan must be designed through an alternatives analysis consistent with the sequencing provisions of Section 302 to ensure maintenance of the natural hydrologic regime and to promote groundwater recharge and protect groundwater and surface water quality and quantity. The Drainage Plan designer must proceed sequentially in accordance with Article III of this Ordinance.

D. Stormwater drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as modified by stormwater management facilities or open channels consistent with this Ordinance.

E. The existing points of concentrated drainage that discharge onto adjacent property shall not be altered in any manner which could cause property damage without permission of the affected property owner(s) and shall be subject to any applicable discharge criteria specified in this Ordinance.

F. Areas of existing diffused drainage discharge shall be subject to any applicable discharge criteria in the general direction of existing discharge, whether proposed to be concentrated or maintained as diffused drainage areas, except as otherwise provided by this Ordinance. If diffused drainage discharge is proposed to be concentrated and discharged onto adjacent property, the Applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other impacts will result from the concentrated discharge.

G. Where a development site is traversed by existing watercourses, drainage easements shall be provided conforming to the line of such watercourses. The terms of the easement shall conform to the stream buffer requirements contained in Section 303.K.7 of this Ordinance.

H. Any stormwater management facilities regulated by this Ordinance that would be located in or adjacent to waters of the Commonwealth or wetlands shall be subject to approval by PaDEP through the Joint Permit Application process, or, where deemed appropriate by PaDEP, the General Permit process. When there is a question whether wetlands may be involved, it is the responsibility of the Applicant or his agent to show that the land in question cannot be classified as wetlands, otherwise approval to work in the area must be obtained from PaDEP.

I. Any stormwater management facilities regulated by this Ordinance that would be located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).

J. Infiltration of runoff through seepage beds, infiltration trenches, etc., where soil conditions permit, and the minimization of impervious surfaces to the extent permitted by the Municipality's Zoning Ordinance, are encouraged to reduce the size or eliminate the need for detention facilities or other structural BMPs.

K. Roof drains shall not be connected to streets, sanitary or storm sewers, or roadside ditches in order to promote overland flow and infiltration/percolation of stormwater where advantageous to do so. Considering potential pollutant loading, roof drain runoff in most cases will not require pretreatment.

L. All stormwater runoff, other than roof top runoff discussed in Section K. above, shall be treated for water quality prior to discharge to surface or groundwater.

Section 302. Non-Structural Project Design (Sequencing to Minimize Stormwater Impacts)

A. The design of all Regulated Activities shall include the following steps in sequence to minimize stormwater impacts.

1. The Applicant is required to find practicable alternatives to the surface discharge of stormwater, the creation of impervious surfaces and the degradation of waters of the Commonwealth, and must maintain as much as possible the natural hydrologic regime of the site.

2. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes.

3. All practicable alternatives to the discharge of stormwater are presumed to have less adverse impact on quantity and quality of waters of the Commonwealth unless otherwise demonstrated.

B. The Applicant shall demonstrate that they designed the Regulated Activities in the following sequence to minimize the increases in stormwater runoff and impacts to water quality:

1. Prepare an Existing Resource and Site Analysis Map (ERSAM), showing environmentally sensitive areas including, but not limited to, steep slopes, ponds, lakes, streams, wetlands, hydric soils, vernal ponds, flood plains, buffer areas, hydrologic soil groups A and B (areas conducive to infiltration), any existing recharge areas and any other requirements outlined in the municipal Subdivision and Land Development Ordinance.

2. Establish buffers in accordance with Section 303.K

3. Prepare a draft project layout avoiding earth disturbance in sensitive areas identified in Section 302.B.1 and minimizing total site earth disturbance as much as possible. The ratio of the disturbed area to the entire site area and measures taken to minimize earth disturbance shall be included on the ERSAM.

4. Identify site specific predevelopment drainage areas, discharge points, recharge areas to be preserved and hydrologic soil groups A and B to be utilized for recharge.

5. Evaluate Nonstructural Stormwater Management Alternatives
   a. Minimize earth disturbance
   b. Minimize impervious surfaces
   c. Break up large impervious surfaces.

6. Satisfy the Water Quality and Streambank Erosion Requirements outlined in Section 303.

7. Satisfy Groundwater Recharge (infiltration) requirements of Section 304 and provide for stormwater treatment prior to infiltration.

8. Determine the Management District where the site is located (Appendix D) and conduct a predevelopment runoff analysis.

9. Prepare final project design to maintain predevelopment drainage areas and discharge points, to minimize earth disturbance and impervious surfaces, and to reduce runoff to the maximum extent possible.

10. Conduct a post development runoff analysis based on the final design and meet the release rate, the overbank flow and extreme event requirements of Section 305.

11. Manage any remaining runoff through treatment prior to discharge, as part of detention, bioretention, direct discharge or other structural control

After completion of Section 302, proceed to Section 303

Section 303. Water Quality and Streambank Erosion Requirements

In addition to the performance standards and design criteria requirements of this Ordinance, the Applicant SHALL comply with the following water quality requirements of this Article.

A. For water quality and streambank erosion, the objective is to design a water quality BMP to detain the proposed conditions 2-year, 24-hour design storm to the existing conditions 1-year flow using the SCS Type II distribution. Additionally, provisions shall be made (such as adding a small orifice at the bottom of the outlet structure) so that the proposed conditions 1- year storm takes a minimum of 24 hours to drain from the facility from a point where the maximum volume of water from the 1-year storm is captured. (i.e., the maximum water surface elevation achieved in the facility.) At the same time, the objective is not to attenuate the larger storms in "no detention" areas (District C). This can be accomplished by configuration of the outlet structure not to control the larger storms, or by a bypass or channel to divert only the 2-year design storm into the basin or divert flows in excess of the 2-year storm away from the basin.

   Where practicable, wet basins shall be utilized for water quality control and shall meet the requirements found in the PA Stormwater BMP manual as revised.

   Release of water can begin at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility). The design of the facility shall consider and minimize the chances of clogging and sedimentation. Orifices smaller than 3 inches diameter are not recommended. However, if the Design Professional can provide proof that the smaller orifices are protected from clogging by use of trash racks, etc., smaller orifices may be permitted.

B. Where an NPDES permit for stormwater discharges associated with construction activities is required, the water quality requirements of that permit should be used. However the buffer provisions listed below should be applied to all applications.

C. MS4 requirements for water quality shall be used where applicable in addition to the water quality requirements in this Section.

D. In selecting the appropriate BMPs or combinations thereof, the Applicant SHALL consider the following:

1. Total contributing area.
2. Permeability and infiltration rate of the site soils.
3. Slope and depth to bedrock.
4. Depth to seasonal high water table.
5. Proximity to building foundations and well heads.
6. Erodibility of soils.
7. Land availability and configuration of the topography
8. Peak discharge and required volume control.
9. Stream bank erosion.
10. Efficiency of the BMPs to mitigate potential water quality problems.
11. The volume of runoff that will be effectively treated.
12. The nature of the pollutant being removed.
13. Maintenance requirements.
14. Creation/protection of aquatic and wildlife habitat.
15. Recreational value.

E. The temperature and quality of water and streams shall be maintained through the use of temperature sensitive BMPs and stormwater conveyance systems.

F. The Applicant shall consider the guidelines found in the PaDEP BMP Manual (latest edition) for constructed wetlands, where proposed.

G. Pretreatment in accordance with Sections 301.K and 301.L shall be provided.

H. Streambank restoration projects shall include the following:

1. No restoration or stabilization projects may be undertaken without examining the fluvial geomorphology of stable reaches above and below the unstable reach.

2. Restoration project design must consider maintenance of stability in the adjacent stable reaches of the stream channel.

3. An Erosion and Sediment Control Plan approved by the Conservation District must be provided by the Applicant.

4. All applicable State and Federal permits must be obtained.

I. Biology shall be incorporated into the design of all wet basins in accordance with the West Nile Virus Guidance found in Appendix E of the 2003 plan update.

J. To accomplish the above, the Applicant SHALL submit original and innovative designs to the Municipal Engineer for review and approval. Such designs may achieve the water

quality objectives through a combination of BMPs (Best Management Practices).

K. Buffers

1. In addition to the other requirements of Section 303, buffers shall be provided in accordance with this Section.

2. Where resource buffers overlap, the more restrictive requirements shall apply.

3. Pre-existing Lots or Parcels/Development in Outer Buffers - In the case of legally pre- existing lots or parcels (approved prior to the effective date of this Ordinance) where the useable area of a lot or parcel lies within an outer buffer area, rendering the lot or parcel unable to be developed in accordance with the allowable use per Municipal Zoning, the development may only be permitted by variance as provided in Section **[INSERT]** of the Municipality's **[INSERT]**.Ordinance.

4. Improvements to Existing Structures in Outer Buffers - The provisions of this Section 303.K do not require any changes or improvements to be made to lawfully existing structures in buffers. However, when any substantial improvement to a structure is proposed which results in a horizontal expansion of that structure, the improvement may only be permitted by variance as provided in Section **[INSERT]**of the Municipality's **[INSERT]** Ordinance.

5. Wetlands and Vernal Ponds

a. Wetland Identification – wetlands shall be identified in accord with the most current U.S. Army Corps of Engineers Manual for Identifying and Delineating Wetlands, properly flagged and surveyed on site to ensure they are protected.

Wetlands in an artificial watercourse – wetlands contained within the banks of an artificial watercourse shall not be considered for buffer delineation purposes.

- Wetlands in a natural watercourse – where wetlands are contained within the banks of a natural watercourse, only the stream buffer shall apply.

b. Wetland and Vernal Pond Buffer Delineation – A **[50]** foot inner buffer and **[100]** foot outer buffer, measured perpendicular to and horizontally from the edge of the delineated wetland or vernal pond for a total distance of **[150]** feet, shall be maintained for all wetlands and vernal ponds.

i. Inner Buffer – Measured perpendicular to and horizontally from the edge of the delineated wetland or vernal pond, for a distance of **[50]** feet.

- Stormwater conveyance required by the **[insert Municipality]**, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP and passive unpaved stable trails shall be permitted. No other earth disturbance, grading, filling, buildings,

structures, new construction, or development shall be permitted.

- The area of the inner buffer altered by activities permitted in accord with Section 303.K.5.b.i shall be minimized to the greatest extent practicable

ii. Outer Buffer – Measured perpendicular to and horizontal from the outer edge of the inner buffer for a distance of **[100]** feet, resulting in a total buffer of **[150]**.feet.

- Stormwater conveyance required by the Township/Borough, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP, roads constructed to existing grade, unpaved trails, and limited forestry activities that do not clear cut the buffer (e.g. selective regeneration harvest) in accord with a forestry management plan shall be permitted provided no buildings are involved, and those activities permitted under Sections 303.K.3 and 303.K.4.

- No more than twenty **[20]** percent of the cumulative outer buffer on the subject parcel shall be altered by the activities permitted in accordance with Section 303.K.5.b.ii.

6. Lakes and Ponds

a. There is no outer buffer around lakes and ponds

b. Lake and Pond Buffer Delineation – A **[150]** foot buffer measured perpendicular to and horizontally from the edge of any water body, shall be maintained around any water body.

c. Permitted Activities/Development - Stormwater conveyance required by the Township/Borough, buffer maintenance and restoration, the correction of hazardous conditions, lake front views, boat docks and unpaved trails shall be permitted provided no buildings are involved.

d. The area of the buffer impacted by activities permitted in Section 303.K.6.c. shall not exceed thirty-five **[35]** percent of the buffer on the subject parcel.

7. Streams

a. Stream Buffer Delineation – A **[50]** foot inner buffer and **[100]** foot outer buffer, measured perpendicular to and horizontally from the top-of-bank on both sides of any stream, for a total distance of **[150]** feet, shall be maintained on both sides of any stream. See Figure 303.1.

i. Inner Buffer – Measured perpendicular to and horizontally from the top-of- bank of the stream for a distance of **[50]** feet.

- Stormwater conveyance required by the

Township/Borough, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP, fish hatcheries, wildlife sanctuaries and boat launch sites constructed so as not to alter the flood plain cross section, and unpaved trails shall be permitted providing no buildings are involved. No other earth disturbance, grading, filling, buildings, structures, new construction, or development shall be permitted

- The area of the inner buffer altered by activities permitted in accord with Section 303.K.7.a.i shall be minimized to the greatest extent practicable.

ii. Outer Buffer – Measured perpendicular to and horizontally from the outer edge of the inner buffer for a distance of **[100]** feet resulting in a total buffer of **[150]** feet.

- Stormwater conveyance required by the **[Insert Municipality]**, buffer maintenance and restoration, the correction of hazardous conditions, agricultural activities, plant nurseries, parking lots constructed to existing grade, temporary fairs and carnivals, accessory uses for residential purposes, private sportsmen's club activities, athletic facilities, orchards, wildlife sanctuaries, boat launch sites, roads constructed to existing grade, stream crossings permitted by DEP and unpaved trails and limited forestry activities that do not clear cut the buffer (e.g. selective regeneration harvest) in accord with a forestry management plan shall be permitted provided no buildings are involved.

- In areas of the outer buffer which are not wetlands, vernal ponds or slopes of more than **[15]** percent, stormwater management facilities which improve water quality of stormwater discharge shall be permitted unless prohibited by other Township/Borough or state requirements. No other earth disturbance, grading, filling buildings, structures, new construction, or development shall be permitted

- No more than **[twenty (20)]** percent of the cumulative outer buffer on the subject parcel shall be altered by the activities permitted in accordance with Section 303.K.7.ii.

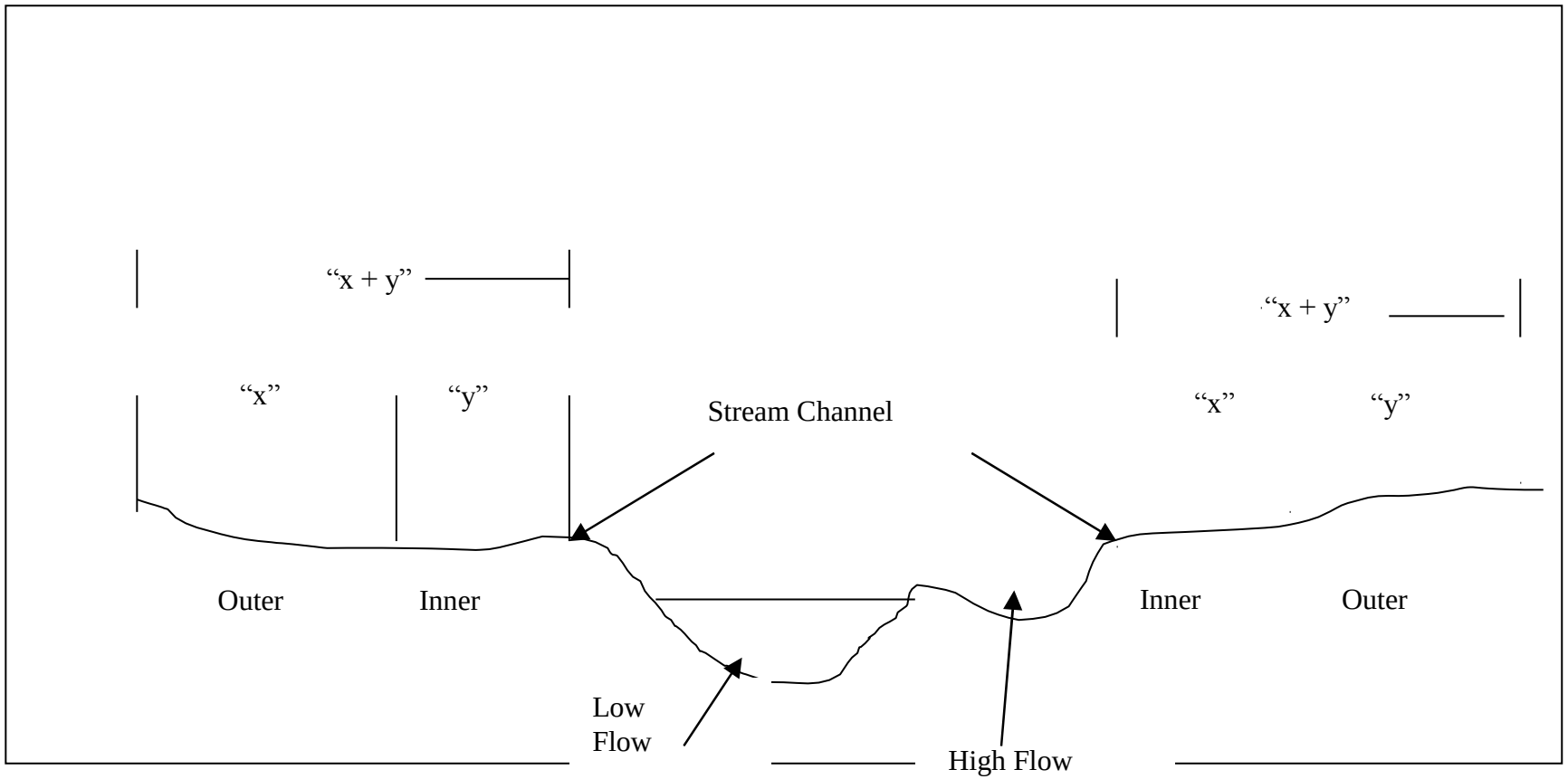


Figure 303.1 Stream Buffer

Section 304 Groundwater Recharge (Infiltration/Recharge/Bioretention)

Maximizing the ground water recharge capacity of the area being developed is required. Design of the infiltration/recharge stormwater management facilities shall give consideration to providing ground water recharge to compensate for the reduction in the percolation that occurs when the ground surface is disturbed or impervious surface is created. It is recommended that roof runoff be directed to infiltration BMPs which may be designed to compensate for the runoff from parking areas. These measures are required to be consistent with Section 102, and take advantage of utilizing any existing recharge areas.

A. Infiltration BMPs shall meet the following minimum requirements:

1. Where a NPDES permit for stormwater discharges associated with construction activities is required, the volume control requirement of that permit should be met unless the volume control requirement in this plan is greater.

2. Maximum Infiltration Requirements:

a. Regulated activities will be required to recharge (infiltrate), where practicable, a portion of the runoff created by the development as part of an overall stormwater management plan designed for the site. The volume of runoff to be recharged shall be determined from Sections 304.4.a. or 304.4.b, depending upon demonstrated site conditions.

3. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:

a. A minimum depth of 24 inches between the bottom of the BMP and the limiting zone.

b. An infiltration and/or percolation rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the Applicant's design professional.

c. The recharge facility shall be capable of completely infiltrating the recharge volume within 4 days.

d. Pretreatment in accordance with Sections 301.K and 301.L shall be provided prior to infiltration.

4. The size of the recharge facility shall be based upon the following volume criteria:

a. NRCS Curve Number equation.

The NRCS runoff shall be utilized to calculate infiltration requirements (P) in inches. For zero runoff:

$$P = I \text{ (Infiltration) (in.)} = (200 / CN) - 2 \qquad \text{Equation: 304.1}$$

Where: CN=SCS (NRCS) curve number of existing conditions contributing to the recharge facility.

This equation is displayed graphically in, and the infiltration requirement can be determined from, Figure 304.1.

The recharge volume required would therefore be computed as:

Re_v(c.f.)=[I (in)* impervious area (s.f.)]/12 Equation: 304.2
Where: I= infiltration requirements (in.)

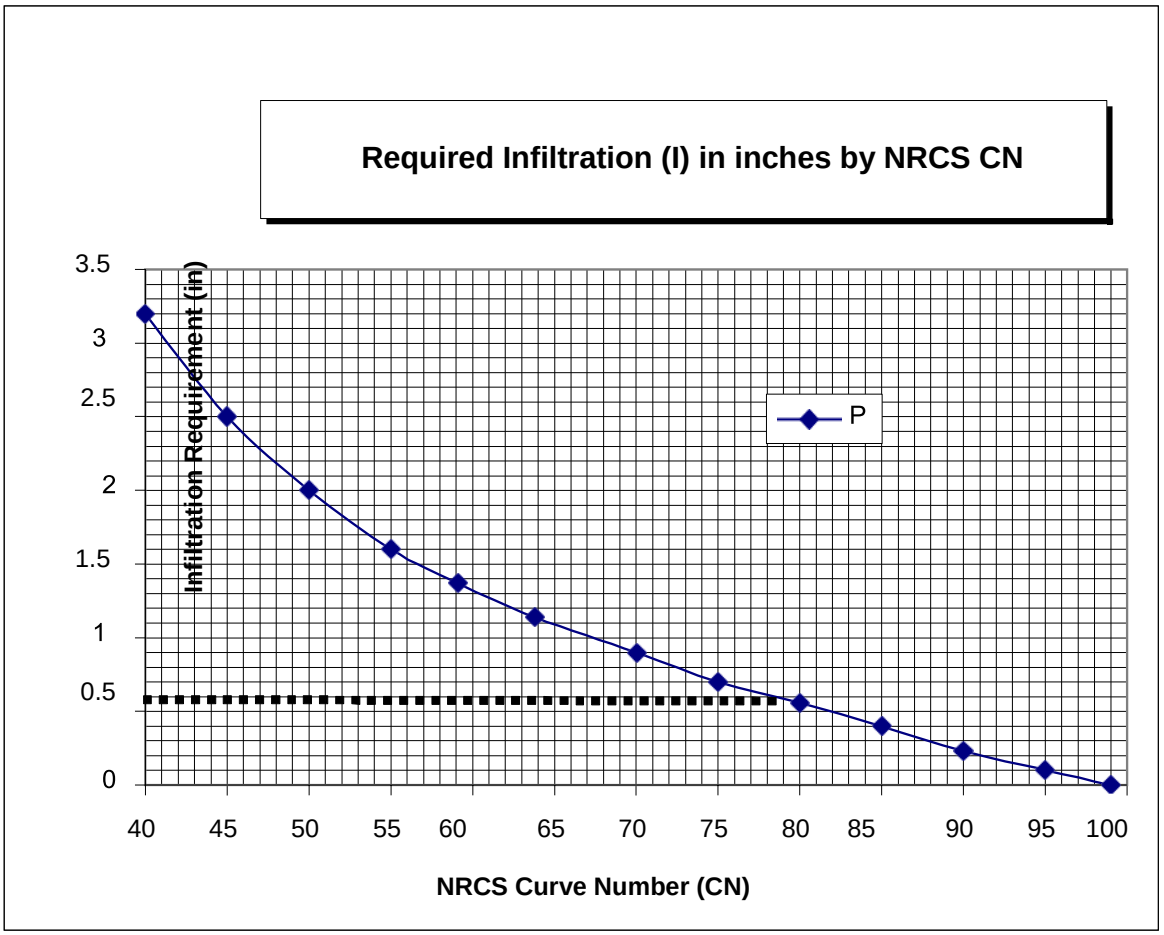


Figure 304.1. Infiltration requirement based upon NRCS Curve Number.

b. Annual Recharge – Water Budget Approach

It has been determined that infiltrating 0.6 inches of runoff from the post development impervious areas will aid in maintaining the hydrologic regime of the watershed. A minimum of 0.6 inches of rainfall shall be infiltrated from all impervious areas, up to an existing site condition curve number of 77. Above a curve number of 77, Equation 304.1 or the curve in Figure 304.1 shall be used to determine the Infiltration requirement and Equation 304.2 shall be used to determine the recharge volume.

The recharge volume (Re_v) required would therefore be computed as:
Re_v=[(0.6 or I, whichever is less) * impervious area] / 12

B. Soils - A detailed soils evaluation of the project site shall be required where practicable to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified design professional, and at a minimum, address soil permeability, depth to bedrock and subgrade stability. The general process for designing the infiltration BMP shall be:

1. Analyze hydrologic soil groups as well as natural and man-made features within the watershed to determine general areas of suitability for infiltration practices.

2. Provide site-specific infiltration test results (at the level of the proposed infiltration surface) in accord with ASTM Guide No. D5126 or other method as described in the PA DEP Stormwater BMP Manual as amended/ treat runoff from the 100 year storm to determine the appropriate hydraulic conductivity rate.

3. Design the infiltration structure for the required storm volume based on field determined capacity at the level of the proposed infiltration surface.

4. If on-lot infiltration structures are proposed by the Applicant's design professional, it must be demonstrated to the Municipality that the soils are conducive to infiltrate on the lots identified.

C. Stormwater Hotspots – A stormwater hotspot is defined as a land use activity that generates higher concentrations of hydrocarbons, trace metals or toxicants than are found in typical stormwater runoff, based on monitoring studies. Table 304.1 provides samples of designated hotspots. If a site is designated as a hotspot, it has important implications for how stormwater is managed. First and foremost, untreated stormwater runoff from hotspots cannot be allowed to infiltrate into groundwater where it may contaminate water supplies. Therefore, the Re_v requirement is NOT applied to development sites that fit into the hotspot category, but the requirements of Section 304.A should be met. Second, a greater level of stormwater treatment may be needed at hotspot sites to prevent pollutant discharge after construction. EPA's NPDES stormwater program requires some industrial sites to prepare and implement a stormwater pollution prevention plan.

Table 304.1 – Classification of Stormwater Hotspots

The following land uses and activities are samples of stormwater hotspots:
• Vehicle salvage yards and recycling facilities
• Fleet storage areas (bus, truck, etc.)
• Public works storage areas
• Facilities that generate or store hazardous materials

Extreme caution shall be exercised where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate the groundwater. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration/recharge facility and perform a hydrogeologic justification study if necessary. The infiltration requirement in High Quality/Exceptional Value waters shall be subject to the Department's Chapter 93 Antidegradation Regulations. The municipality may require the installation of an impermeable liner in detention basins where the possibility of groundwater contamination exists. A detailed hydrogeologic investigation may be required by the Municipality.

The Municipality shall require the Applicant to provide safeguards against groundwater contamination for uses which may cause groundwater contamination, should there be a mishap or spill**.**

D. Extreme caution shall be exercised where infiltration is proposed in Source Water Protection Areas or that may affect a wellhead or surface water intake.

E. Recharge/infiltration facilities shall be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

Upon completion of Section 304, proceed to Sections 305, 306 and 307

Section 305. Stormwater Management Districts

A. The Brodhead and McMichaels Creek Watershed has been divided into stormwater management districts as shown on the Watershed Map in Appendix D. The Management District Map is also available on the Monroe County Conservation District's website.

Standards for managing runoff from each subarea in the Brodhead and McMichaels Creek Watershed for the various design storms are shown in Table 305.1. Development sites located in each of the A and B Districts must control proposed conditions peak runoff rates to existing conditions peak runoff rates for the design storms in accord with Table 305.1. District C may allow increases in post development flows where adaquate downstream conveyances exist.

In addition to the requirements specified in Table 305.1 below, the Water Quality and Streambank Erosion Requirements (Section 303), Groundwater Recharge (Section 304), and Erosion and Sediment Control Requirements (Section 308) shall be implemented.

TABLE 305.1 –Peak Runoff Rate Requirements

District		Proposed conditions	(reduce to)	Existing conditions
A		2 – year		1 – year
		5 – year		5 – year
		10 – year		10 – year
		25 – year		25 – year
		50- year		50- year
		100-year		100-year
B-1		2 – year		1- year
		5 – year		2 – year
		10 – year		5 – year
		25 – year		10 – year
		50- year		25- year
		100-year		100-year
B-2		2 – year		1- year
		5 – year		2 – year
		25 – year		5 – year
		50- year		10- year
		100 – year		50 – year
B-3		50- year		10- year
		100 – year		50 – year
C		Provisional Direct Discharge District - Development sites which can discharge directly to the main channel or major tributaries or indirectly to the main channel through an existing stormwater drainage system (i.e., storm sewer or tributary) **which meets the "Downstream Hydraulic Capacity Analysis" in Section 305 H and is shown by the design professional to not cause a downstream problem, may allow an increase in flow as long as no downstream harm is demonstrated.** However, sites in District C shall comply with the criteria for Water Quality and Streambank Erosion (Ordinance Section 303); and Groundwater Recharge (Ordinance Section 304). If the proposed conditions runoff is intended to be conveyed by an existing stormwater drainage system to the main channel, **assurance must be provided that such system has adequate capacity to convey the increased peak flows or will be provided with improvements to furnish the required capacity.** When adequate capacity of the downstream system does not exist and will not be provided through improvements, the proposed conditions peak rate of runoff must be controlled to the existing conditions peak rate as required in District A provisions (i.e.,10-year proposed conditions flows to 10 year existing conditions flows) for the specified design storms.		

B. General - Proposed conditions peak rates of runoff from any Regulated Activity shall not exceed the peak release rates of runoff prior to development for the design storms specified on the Stormwater Management District Watershed Map (Appendix D) and Section 302, of this Ordinance.

C. District Boundaries - The boundaries of the Stormwater Management Districts are shown on an official map that is available for inspection at the municipal office. A copy of the

official map at a reduced scale is included in the Ordinance Appendix D. The exact location of the Stormwater Management District boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours (or most accurate data required) provided as part of the Drainage Plan.

D. Sites Located in More Than One District - For a proposed development site located within two or more stormwater management district category subareas, the peak discharge rate from any subarea shall meet the requirements of Table 305.1 for each discharge point from the site. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea.

E. Off-Site Areas - Off-site areas that drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site.

F. Site Areas - Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area utilizing stormwater management measures shall be subject to the Management District Criteria. In other words, undisturbed areas bypassing the stormwater management facilities would not be subject to the Management District Criteria.

G. "No Harm" Option - For any proposed development site not located in a provisional direct discharge district, the Applicant has the option of using a less restrictive runoff control (including no detention) if the Applicant can prove that "no harm" would be caused by discharging at a higher runoff rate than that specified by the Stormwater Management Plan. The "no harm" option is used when an Applicant can prove that the proposed hydrographs can match existing hydrographs, or if it can be proved that the proposed conditions will not cause increases in peaks at all points downstream. Proof of "no harm" must be shown based upon the following "Downstream Impact Evaluation" which shall include a “downstream hydraulic capacity analysis" consistent with Section 305.H to determine if adequate hydraulic capacity exists. The Applicant shall submit to the Municipality this evaluation of the impacts due to increased downstream stormwater flows in the watershed.

1. The Hydrologic Regime of the site must be maintained.

2. The "Downstream Impact Evaluation" shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications due to the proposed development upon a dam, highway, structure, natural point of restricted streamflow or any stream channel section, established with the concurrence of the Municipality.

3. The evaluation shall continue downstream until the increase in flow diminishes due to additional flow from tributaries and/or stream attenuation.

4. The peak flow values to be used for downstream areas for the design return period storms (2, 5, 10, 25, 50, and 100-year) shall be the values from the calibrated model for the Brodhead and McMichaels Creek Watershed. These flow values can be obtained from the original Act 167 watershed storm water management plans.

5. Applicant-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas, by definition, are precluded from successful attempts to prove "no-harm", except in conjunction with proposed capacity improvements for the problem areas consistent with Section 305.H.

6. A financial distress shall not constitute grounds for the Municipality to approve the use of the “no-harm” option.

7. Downstream capacity improvements may be provided as necessary to achieve the "no harm" option.

8. Any "no harm" justifications shall be submitted by the Applicant as part of the Drainage Plan Requirements per Article IV of this Ordinance.

H. "Downstream Hydraulic Capacity Analysis" - Any downstream hydraulic capacity analysis conducted in accordance with this Ordinance shall use the following criteria for determining adequacy for accepting increased peak flow rates:

1. Existing natural or man-made channels or swales must be able to convey the increased runoff associated with a 2-year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP *Erosion and Sediment Pollution Control Program Manual*.

2. Existing natural or man-made channels or swales must be able to convey increased 25- year return period runoff without creating any hazard to persons or property.

3. Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area must be designed in accordance with DEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased 25-year return period runoff.

I. Hardship Option - The Stormwater Management Plan and its standards and criteria are designed to maintain existing conditions peak flows and volumes throughout the Brodhead and McMichaels Creek watershed as the watershed becomes developed. There may be certain instances, however, where the standards and criteria established are too restrictive for a particular Applicant. The existing drainage network in some areas may be capable of safely transporting slight increases in flows without causing a problem or increasing flows elsewhere. If an Applicant cannot meet the stormwater standards due to lot conditions or if conformance would become a hardship to an Applicant, the hardship option may be applied. A financial distress shall not constitute grounds for the Municipality to approve the use of the hardship option. The Applicant would have to plead his/her case to the Governing Body with the final determination made by the Municipality. Any Applicant’s pleading the "hardship option" will assume all liabilities that may arise due to exercising this option. A financial distress shall not constitute grounds for the Municipality to approve the use of the “no-harm” option.

Section 306. Calculation Methodology

A. Stormwater runoff from all development sites with a drainage area of greater than 200 acres shall be calculated using a generally accepted calculation technique that is based on the NRCS soil cover complex method. Table 306-1 summarizes acceptable computation methods and the method selected by the design professional shall be based on the individual limitations and suitability of each method for a particular site. The Municipality may allow the use of the Modified Rational Method to estimate peak discharges from drainage areas that contain less than one (1) acre. The Soil Cover Complex Method shall be used for drainage areas greater than 1 acre.

TABLE 306-1
Acceptable Computation Methodologies For Stormwater Management Plans

METHOD	METHOD DEVELOPED BY	APPLICABILITY
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
PSRM	Penn State University	Applicable where use of a hydrologic computer model is desirable or necessary; simpler than TR-20 or HEC-1.
Modified Rational Method commercial computer package based on Rational Method)	Emil Kuichling (1889)	For sites less than 1 acre, or (or as approved by the Municipality and/or Municipal Engineer).
Other Methods	Varies	Other computation methodologies approved by the Municipality and/or Municipal Engineer.

B. All calculations consistent with this Ordinance using the soil cover complex method shall use the appropriate design rainfall depths for the various return period storms consistent with current NOAA Atlas 14 Point Precipitation Frequency Estimates. If a hydrologic computer model such as PSRM or HEC-1 is used for stormwater runoff calculations, then the duration of rainfall shall be 24 hours. The SCS Type II Rainfall Distribution shall be utilized for the rainfall distribution.

C. For the purposes of existing conditions flow rate determination, undeveloped land shall be considered as "meadow" in good condition, unless the natural ground cover generates a lower Curve Number (CN) or Rational 'C' value, as listed in Tables B-1 or B-32 in Appendix B of this Ordinance.

D. All calculations using the Modified Rational Method shall use rainfall intensities consistent with appropriate times-of-concentration for overland flow and return periods from the current NOAA Atlas 14 Point Precipitation Frequency Estimates. Times-of-concentration for overland flow shall be calculated using the methodology presented in Chapter 3 of Urban Hydrology for Small Watersheds, NRCS, TR-55 (as amended or replaced from time to time by NRCS). Times-of- concentration for channel and pipe flow shall be computed using Manning's equation.

E. Calculations using the Modified Rational Method shall be based on a common time of concentration for all contributing areas to a discharge point in both the predevelopment and post development runoff conditions.

F. Hydrograph volumes generated by the Modified Rational Method for routing through control (detention and infiltration) facilities should be comparable to hydrograph volumes generated by the TR-55 methodology. The ascending and descending limbs of the hydrograph generated by the Modified Rational method should be adjusted in order to provide a comparable hydrograph volume.

G. Runoff Curve Numbers (CN) for both existing and proposed conditions to be used in the soil cover complex method shall be obtained from Table B-1 in Appendix B of this Ordinance. Due to limitations of the TR-55 methodology, a minimum weighted Curve Number of 40 shall be utilized for the calculations.

H. Runoff coefficients (C) for both existing and proposed conditions for use in the Modified Rational method shall be obtained from Table B-2 in Appendix B of this Ordinance.

I. The designer shall consider that the runoff from proposed sites graded to the subsoil will not have the same runoff conditions as the site under existing conditions, even after placement of topsoil and/or seeding. The designer may increase his proposed condition "CN" or "C" to better reflect proposed soil conditions.

J. Where uniform flow is anticipated, the Manning equation shall be used for hydraulic computations, and to determine the capacity of open channels, pipes, and storm sewers. Values for Manning's roughness coefficient (n) shall be consistent with Table B-3 in Appendix B of the Ordinance.

K. Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this Ordinance using any generally accepted hydraulic analysis technique or method.

L. The design of any stormwater detention facilities intended to meet the performance standards of this Ordinance shall be verified by routing the design storm hydrograph through these facilities using the Storage-Indication Method. The Municipality may approve the use of any generally accepted full hydrograph approximation technique that shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.

Section 307. Other Requirements

A. Any stormwater facility located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).

B. Pretreatment in accordance with Sections 301.K and 301.L shall be provided prior to infiltration.

C. Any stormwater management facility (i.e., BMP, detention basin) designed to store runoff and requiring a berm or earthen embankment required or regulated by this Ordinance shall be designed to provide an emergency spillway to handle the discharge of flows up to and including the inflow to the facility from the 100- year proposed conditions, considering the primary outlet control structure(s) are blocked. The height of embankment must provide a minimum one (1) foot of freeboard above the maximum pool elevation computed when the facility functions for the 100-year proposed conditions inflow. Should any stormwater management facility require a dam safety permit under PaDEP Chapter 105, the facility shall be designed in accordance with Chapter 105 and meet the regulations of Chapter 105 concerning dam safety which may be required to pass storms larger than the 100-year event.

D. Any facilities that constitute water obstructions (e.g., culverts, bridges, outfalls, or stream enclosures), and any work involving wetlands governed by PaDEP Chapter 105 regulations (as amended or replaced from time to time by PaDEP), shall be designed in accordance with Chapter 105 and will require a permit from PaDEP.

E. Any other drainage conveyance facility that does not fall under Chapter 105 regulations

must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm with a minimum 1.0 foot of freeboard measured below the lowest point along the top of the roadway. Any facility that constitutes a dam as defined in PaDEP Chapter 105 regulations may require a permit under dam safety regulations. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.

F. Any drainage conveyance facility and/or channel not governed by Chapter 105 Regulations, must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm. Conveyance facilities to or exiting from stormwater management facilities (i.e., detention basins) shall be designed to convey the design flow to or from that structure. Roadway crossings located within designated floodplain areas must be able to convey runoff from a 100-year design storm. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.

G. Storm sewers must be able to convey proposed conditions runoff from a **[25]**-year design storm without surcharging inlets, where appropriate.

H. Adequate erosion protection shall be provided along all open channels, and at all points of discharge.

I. The design of all stormwater management facilities shall incorporate sound engineering principles and practices. The Municipality reserves the right to disapprove any design that would result in the construction of or continuation of a stormwater problem area.

Upon completion of Section 307, proceed to Section 308

Section 308. Erosion and Sediment Control Requirements

A. Any earth disturbance must be conducted in conformance with PA Title 25, Chapter 102, "Erosion and Sediment Control."

B. Additional erosion and sediment control design standards and criteria that must be or are recommended to be applied where infiltration BMPs are proposed shall include the following:

1. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum infiltration capacity.

2. Infiltration BMPs shall not be constructed nor receive runoff until the entire contributory drainage area to the infiltration BMP has achieved final stabilization.

ARTICLE IV-DRAINAGE PLAN REQUIREMENTS

Section 401. General Requirements

For any of the activities regulated by this Ordinance, the preliminary or final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any earth disturbance may not proceed until the Applicant or his/her agent has received written approval of a Drainage Plan from the Municipality and an adequate Erosion and Sediment Control Plan review by the Conservation District.

Section 402. Drainage Plan Submission Exemptions

A. Exemptions

The following land use activities are exempt from the Drainage Plan submission requirements of this Ordinance:

1. Use of land for gardening for home consumption.

2. Agriculture when operated in accordance with a Conservation Plan or Erosion and Sediment Control Plan (E&S) found adequate by the Conservation District.

3. Forest Management operations which are following the Department of Environmental Protection's management practices contained in its publication "Soil Erosion and Sedimentation (E&S) Control Guidelines for Forestry" and are operating under an approved E&S Plan and must comply with stream buffer requirements in Section 303 and flood plain management requirements.

4. Impervious Surface - Any Regulated Activity that has less than 5,000 square foot of impervious surface and/or meets the following exemption criteria is exempt from the plan submittal provisions of this Ordinance. These criteria shall apply to the total development even if development is to take place in phases. The date of the original Brodhead and McMichaels Municipal Ordinance adoption shall be the starting point from which to consider tracts as “parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered. Impervious areas existing on the "parent tract" prior to adoption of this Ordinance shall not be considered in cumulative impervious area calculations for exemption purposes.

5. High Tunnels shall be exempt from the provisions of this Ordinance if:

    a. The High Tunnel or its flooring does not result in an impervious area exceeding 25% of all structures located on the owners total contiguous land area; and

    b. The High Tunnel meets one of the following:

        i. The High Tunnel is located at least 100 feet from any perennial stream or watercourse, public road or neighboring property line.

        ii. The High Tunnel is located at least 35 feet from any perennial stream or watercourse, public road or neighboring property line and located on land with a slope not greater than 7%.

iii. The High Tunnel is supported with a buffer or diversion system that does not directly drain into a stream or other watercourse managing storm water runoff in a manner consistent with requirements of this Ordinance and the Act of April 18, 2018 P.L. 91, No. 15, and the Act of October 4, 1978 (P.L. 864, No 167).

B. Additional exemption criteria includes:

1. Exemption responsibilities – An exemption shall not relieve the Applicant from implementing such measures as are necessary to protect the public health, safety, and property. An exemption shall not relieve the Applicant from providing adequate stormwater management for Regulated Activities to meet the purpose of this Ordinance; however, drainage plans will not have to be submitted to the Municipality. Please see Appendix E for the procedure to follow those projects that meet the exemption requirements.

2. This exemption shall not relieve the Applicant from meeting the requirements for watersheds draining to Exceptional Value (EV) waters and Source Water Protection Areas (SWPA): requirements for Nonstructural Project Design (Section 302) Water Quality and Streambank Erosion (Section 303), and Groundwater Recharge (Section 304).

3. Drainage Problems - If a drainage problem is documented or known to exist downstream of, or expected from the proposed activity, then the Municipality may require a Drainage Plant Submittal.

4. Parent Tracts – Ordinance criteria shall apply to the total development even if development is to take place in phases. The date of the Municipal Ordinance adoption from the original Brodhead and McMichaels Creek Act 167 Plans shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered.

Section 403. Drainage Plan Contents

The Drainage Plan shall consist of a general description of the project including sequencing items described in Section 302, calculations, maps, and plans. A note on the maps shall refer to the associated computations and erosion and sediment control plan by title and date. The cover sheet of the computations and erosion and sediment control plan shall refer to the associated maps by title and date. All Drainage Plan materials shall be submitted to the Municipality in a format that is clear, concise, legible, neat, and well organized; otherwise, the Drainage Plan shall not be accepted for review and shall be returned to the Applicant.

The following items shall be included in the Drainage Plan:

A. General

1. General description of the project including those areas described in Section 302**.**

2. General description of permanent stormwater management techniques, including construction specifications of the materials to be used for stormwater management facilities.

3. Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.

4. An Erosion and Sediment Control Plan, including all reviews and letters of adequacy obtained by the Conservation District.

5. A general description of nonpoint source pollution controls.

B. Maps

Map(s) of the project area shall be submitted on **[24-inch x 36-inch sheets]** and/or shall be prepared in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Monroe County. If the Subdivision and Land Development Ordinance (SALDO) has more stringent criteria then the more stringent criteria shall apply. The contents of the map(s) shall include, but not be limited to:

1. The location of the project relative to highways, municipalities or other identifiable landmarks.

2. Existing and final contours at intervals of two feet. In areas of steep slopes (greater than 15 percent), five-foot contour intervals may be used.

3. Existing streams, lakes, ponds or other Waters of the Commonwealth within the project area.

4. Other physical features including flood hazard boundaries, buffers, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the site.

5. The locations of all existing and proposed utilities, sanitary sewers, and water lines within fifty (50) feet of property lines.

6. The location(s) of public water supply wells and surface water intakes as well as their source water protection areas.

7. Soil names and boundaries.

8. Limits of earth disturbance, including the type and amount of impervious area that would be added.

9. Proposed structures, roads, paved areas, and buildings.

10. The name of the development, the name and address of the Applicant of the property, and the name of the individual or firm preparing the plan.

11. The date of submission.

12. A graphic and written scale of one (1) inch equals no more than fifty (50) feet; for tracts of twenty (20) acres or more, the scale shall be one (1) inch equals no more than one hundred (100) feet.

13. A north arrow.

14. The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.

15. Existing and proposed land use(s).

16. A key map showing all existing man-made features beyond the property boundary that would be affected by the project.

17. Location of all open channels.

18. Overland drainage patterns and swales.

19. A fifteen foot wide access easement to and around all stormwater management facilities that would provide ingress to and egress from a public right-of-way.

20. The location of all erosion and sediment control facilities.

21. A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off-site. All off-site facilities shall meet the performance standards and design criteria specified in this Ordinance.

22. A statement, signed by the Applicant, acknowledging that any revision to the approved Drainage Plan must be approved by the Municipality and that a revised E&S Plan must be submitted to the Conservation District for a determination of adequacy.

23. The following signature block for the Design Engineer:

    I, (Design Engineer), on this date (date of signature), hereby certify that the Drainage Plan meets all design standards and criteria of the Brodhead and McMichael Creek Watershed Act 167 Stormwater Management Ordinance."

C. Supplemental Information

1. A written description of the following information shall be submitted.

    a. The overall stormwater management concept for the project designed in accordance with Section 302.
    b. Stormwater runoff computations as specified in this Ordinance.
    c. Stormwater management techniques to be applied both during and after development.
    d. Expected project time schedule.
    e. Development stages (project phases) if so proposed.
    f. An operation and maintenance plan in accordance with Section 702 of this Ordinance.

2. An erosion and sediment control plan.

3. The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.

4. A Declaration of Adequacy and Highway Occupancy Permit from the PennDOT District Office when utilization of a PennDOT storm drainage system is proposed.

D. Stormwater Management Facilities

1. All stormwater management facilities must be located on a plan and described in detail.

2. When groundwater recharge methods such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown.

3. All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

Section 404. Plan Submission

The Municipality shall require receipt of a complete plan, as specified in this Ordinance.

For any activities that require an NPDES Permit for Stormwater Discharges from Construction Activities, or a PaDEP Joint Permit Application, or a PennDOT Highway Occupancy Permit, or any other permit under applicable state or federal regulations, or are regulated under Chapter 105 (Dam Safety and Waterway Management) or Chapter 106 (Floodplain Management) of PaDEP's Rules and Regulations, the proof of application for said permit(s) or approvals shall be part of the plan. The plan shall be coordinated with the state and federal permit process and the municipal SALDO review process.

A. For those Regulated Activities which require SALDO approval, the Drainage Plan and ERSAM shall be submitted by the Applicant as part of the Preliminary Plan submission.

B. For those Regulated Activities that do not require SALDO approval, See Section 401, General Requirements.

C. Six (6) copies of the Drainage Plan shall be submitted and distributed as follows:

1. **[Two (2)]** copies to the Municipality accompanied by the requisite Municipal Review Fee, as specified in this Ordinance.

2. **[Two (2)]** copies to the Conservation District.

3. **[One (1)]** copy to the Municipal Engineer.

4. **[One (1)]** copy to the County Planning Commission.

D. Any submissions found incomplete shall not be accepted for review and shall be returned to the Applicant with a notification in writing of the specific manner in which the submission is incomplete.

Section 405. Drainage Plan Review

A. The Municipal Engineer shall review the Drainage Plan for consistency with the adopted Brodhead and McMichael Creek Watershed Act 167 Stormwater Management Plan.

B. The Municipal Engineer shall review the Drainage Plan for any subdivision or land development against the municipal subdivision and land development ordinance provisions not superseded by this Ordinance.

C. The E & S Plan shall be reviewed by the County Conservation District and found adequate to meet the requirements of PaDEP's Chapter 102 regulations prior to Municipal approval of the Drainage Plan.

D. For Regulated Activities specified in Section 104 of this Ordinance, the Municipal Engineer shall notify the Municipality in writing, within **[ninety (90)]** calendar days,

whether the Drainage Plan is consistent with the Stormwater Management Plan.

1. Should the Drainage Plan be determined to be consistent with the Stormwater Management Plan, the Municipal Engineer will forward a letter of consistency to the Municipal Secretary, who will then notify the Developer.

2. Should the Drainage Plan be determined to be inconsistent or noncompliant with the Stormwater Management Plan, the Municipal Engineer shall forward a letter to the Municipal Secretary with a copy to the Applicant citing the reason(s) and specific Ordinance sections for the inconsistency or noncompliance. Inconsistency or noncompliance may be due to inadequate information to make a reasonable judgment as to compliance with the stormwater management plan. Any Drainage Plans that are inconsistent or noncompliant may be revised by the Applicant and resubmitted consistent with this Ordinance. The Municipal Secretary shall then notify the Developer of the Municipal Engineer's findings. Any disapproved Drainage Plans may be revised by the Developer and resubmitted consistent with this Ordinance.

E. For Regulated Activities specified in Section 104 of this Ordinance, which require a building permit, the Municipal Engineer shall notify the Enforcement Officer in writing, whether the Drainage Plan is consistent with the Stormwater Management Plan and forward a copy of the approval/disapproval letter to the Applicant. Any disapproved drainage plan may be revised by the Applicant and resubmitted consistent with this Ordinance.

F. For Regulated Activities specified in Section 104 of this Ordinance that require an NPDES Permit Application, PaDEP and the Conservation District may consider the Municipal Engineer's review comments in determining whether to issue a permit.

G. The Municipality shall not grant approval or grant preliminary approval to any subdivision or land development for Regulated Activities specified in Sections 104 of this Ordinance if the Drainage Plan has been found to be inconsistent with the Stormwater Management Plan, as determined by the Municipal Engineer. All required permits from PaDEP must be obtained prior to approval of any subdivision or land development.

H. No municipal permits shall be issued for any Regulated Activity specified in Section 104 of this Ordinance if the Drainage Plan has been found to be inconsistent with the Stormwater Management Plan, as determined by the Municipal Engineer, or without considering the comments of the Municipal Engineer shall be issued. All required permits from PaDEP must be obtained prior to issuance of a building permit.

I. The Applicant shall be responsible for completing Record Drawings of all stormwater management facilities included in the approved Drainage Plan. The Record Drawings and an explanation of any discrepancies with the design plans shall be submitted to the Municipal Engineer for final approval. In no case shall the Municipality approve the Record Drawings until the Municipality receives a copy of an approved or amended Declaration of Adequacy and/or Highway Occupancy Permit from the PennDOT District Office, NPDES Permit, and any applicable permits or approvals, from PaDEP or the Conservation District.

J. The Municipality's approval of a Drainage Plan shall be valid for a period not to exceed **[five (5)]** years, commencing on the date that the Municipality signs the approved

Drainage Plan. If stormwater management facilities included in the approved Drainage Plan have not been constructed, or if constructed, and record drawings of these facilities have not been approved within this **[five (5)]** year time period, then the Municipality may consider the Drainage Plan disapproved and may revoke any and all permits. Drainage Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 407 of this Ordinance.

Section 406. Modification of Plans

A. A modification to a Drainage Plan under review by the Municipality for a development site that involves a change in stormwater management facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or that is necessary because soil or other conditions are not as stated on the Drainage Plan as determined by the Municipal Engineer, shall require a resubmission of the modified Drainage Plan consistent with Section 404 of this Ordinance and be subject to review as specified in Section 405 of this Ordinance.

B. A modification to an already approved or disapproved Drainage Plan shall be submitted to the Municipality, accompanied by the applicable Municipal Review and Inspection Fee. A modification to a Drainage Plan for which a formal action has not been taken by the Municipality shall be submitted to the Municipality, accompanied by the applicable Municipal Review and Inspection Fee.

Section 407. Resubmission of Disapproved Drainage Plans

A disapproved Drainage Plan may be resubmitted, with the revisions addressing the Municipal Engineer's concerns documented in writing and addressed to the Municipal Secretary in accordance with Section 404 of this Ordinance and distributed accordingly and be subject to review as specified in Section 405 of this Ordinance. The applicable Municipal Review and Inspection Fee must accompany a resubmission of a disapproved Drainage Plan.

Section 408. Authorization to Construct and Term of Validity

The Municipality’s approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Municipality may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 407 within the term of validity, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 405 of this Ordinance.

ARTICLE V-INSPECTIONS

Section 501. Schedule of Inspections

A. The Municipal Engineer or his municipal designee shall inspect all phases of the installation of the permanent stormwater management facilities as deemed appropriate by the Municipal Engineer.

B. During any stage of the work, if the Municipal Engineer or his municipal designee determines that the permanent stormwater management facilities are not being installed in accordance with the approved Stormwater Management Plan, the Municipality shall revoke any existing permits or other approvals and issue a cease and desist order until a revised Drainage Plan is submitted and approved, as specified in this Ordinance.

C. A final inspection of all stormwater management facilities shall be conducted by the Municipal Engineer or his municipal designee and to confirm compliance with the approved Drainage Plan prior to the issuance of any Occupancy Permit.

ARTICLE VI-FEES AND EXPENSES

Section 601. Municipality Drainage Plan Review and Inspection Fee

Fees shall be established by the Municipality to defray plan review and construction inspection costs incurred by the Municipality. All fees shall be paid by the Applicant at the time of Drainage Plan submission. Review and Inspection Fee Schedule shall be established by resolution of the municipal Governing Body based on the size of the Regulated Activity and based on the Municipality's costs for reviewing Drainage Plans and conducting inspections pursuant to Section 501. The Municipality shall periodically update the Review and Inspection Fee Schedule to ensure that review costs are adequately reimbursed.

Section 602. Expenses Covered by Fees

The fees required by this Ordinance shall at a minimum cover:

A. Administrative costs.

B. The review of the Drainage Plan by the Municipality and the Municipal Engineer.

C. The site inspections.

D. The inspection of stormwater management facilities and drainage improvements during construction.

E. The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the Drainage Plan.

F. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

ARTICLE VII-CONSTRUCTION AND MAINTENANCE RESPONSIBILITIES

Section 701. Performance Guarantee

A. For subdivisions and land developments the Applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as: 1) Required by the approved Drainage Plan equal to or greater than the full construction cost of the required controls or 2) in the amount and method of payment provided for in the Subdivision and Land Development Ordinance.

B. For other Regulated Activities, the Municipality may require a financial guarantee from the Applicant.

C. At the completion of the project, and as a prerequisite for the release of the performance guarantee, the Applicant or his representatives shall:

1. Provide a certification of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.

2. Provide a set of record drawings.

D. After the Municipality receives the certification, a final inspection shall be conducted by the Municipal Engineer or designee to certify compliance with this Ordinance.

Section 702. Maintenance Responsibilities

A. The Drainage Plan for the development site shall contain an operation and maintenance plan prepared by the Applicant and approved by the Municipal Engineer. The operation and maintenance plan shall outline required routine maintenance actions and schedules necessary to insure proper operation of the facility(ies).

B. The Drainage Plan for the development site shall establish responsibilities for the continuing operation and maintenance of all proposed stormwater control facilities, consistent with the following principles:

1. If a development consists of structures or lots which are to be separately owned and in which streets, sewers or other public improvements are to be dedicated to the Municipality, stormwater control facilities may also be dedicated to and maintained by the Municipality (the Municipality is not obligated to accept ownership).

2. If a development site is to be maintained in a single ownership or if streets, sewers or other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities may be the responsibility of the Applicant or private management entity.

C. The Governing Body, upon recommendation of the Municipal Engineer, shall make the final determination on the continuing maintenance responsibilities prior to approval of the Drainage Plan. The Governing Body reserves the right to accept the ownership and operating responsibility for any or all of the stormwater management controls.

Section 703. Maintenance Agreement for Privately Owned Stormwater Facilities

A. Prior to approval of the site's Drainage Plan, the Applicant shall sign and record the Maintenance Agreement contained in Appendix A which is attached and made part hereof, covering all stormwater control facilities that are to be privately owned.

B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The Maintenance Agreement shall be subject to the review and approval of the Municipal Solicitor and Governing Body.

Section 704. Municipal Stormwater Maintenance Fund

A. Persons installing stormwater storage facilities shall be required to pay a specified amount to the Municipal Stormwater Maintenance Fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:

1. If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by the Municipality for a period of **[ten (10) years]**, as estimated by the Municipal Engineer. After that period of time, inspections will be performed at the expense of the Municipality.

2. If the storage facility is to be owned and maintained by the Municipality, the deposit shall cover the estimated costs for maintenance and inspections for **[ten (10) years].** The Municipal Engineer will establish the estimated costs utilizing information submitted by the Applicant.

3. The amount of the deposit to the fund shall be converted to present worth of the annual series values. The Municipal Engineer shall determine the present worth equivalents, which shall be subject to the approval of the Governing Body.

B. If a storage facility is proposed that also serves as a recreation facility (e.g., ballfield, lake), the Municipality may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.

C. If at some future time a storage facility (whether publicly or privately owned) is eliminated due to the installation of storm sewers or other storage facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

D. Long-Term Maintenance – The Municipality may require Applicants to pay a fee to the Municipal Stormwater Maintenance Fund to cover long term maintenance of stormwater control and best management practices.

E. Stormwater Related Problems - The Municipality may require Applicants to pay a fee to the Municipal Stormwater Maintenance Fund to cover stormwater related problems which may arise from the land development and earth disturbance

ARTICLE VIII – PROHIBITIONS

Section 801. Prohibited Discharges and Connections

A. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter a regulated small MS4 or to enter the surface waters of this Commonwealth is prohibited.

B. No person shall allow, or cause to allow, discharges into a regulated small MS4, or discharges into waters of this Commonwealth, which are not composed entirely of stormwater, except (1) as provided in paragraph C below and (2) discharges authorized under a state or federal permit.

C. The following discharges are authorized unless they are determined to be significant contributors to pollution of a regulated small MS4 or to the waters of this Commonwealth:

1. Discharges or flows from firefighting activities.

2. Discharges from potable water sources including water line flushing and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).

3. Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.

4. Diverted stream flows and springs.

5. Non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps.

6. Non-contaminated HVAC condensation and water from geothermal systems.

7. Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.

8. Non-contaminated hydrostatic test water discharges, if such discharges do not contain detectable concentrations of TRC.

D. In the event that the municipality or DEP determines that any of the discharges identified in Subsection C significantly contribute pollutants to a regulated small MS4 or to the waters of this Commonwealth, the municipality or DEP will notify the responsible person(s) to cease the discharge.

Section 802. Roof Drains and Sump Pumps

Roof drains and sump pumps shall discharge to infiltration or vegetative BMPs wherever feasible.

Section 803. Alteration of Stormwater Management BMPs

No person shall modify, remove fill, landscape, or alter any stormwater management BMPs, facilities, areas, or structures that were installed as a requirement of this Ordinance without the written approval of the Municipality.

ARTICLE IX-ENFORCEMENT AND PENALTIES

Section 901. Right-of-Entry

Upon presentation of proper credentials, duly authorized representatives of the Municipality may enter at reasonable times upon any property within the Municipality to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

Section 902. Notification

In the event that a person fails to comply with the requirements of this Ordinance, or fails to conform to the requirements of any permit issued hereunder, the Municipality shall provide written notification of the violation. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violation(s). Failure to comply within the time specified shall subject such person to the penalty provisions of this Ordinance. All such penalties shall be deemed cumulative and shall not prevent the Municipality from pursuing any and all remedies. It shall be the responsibility of the Applicant of the real property on which any Regulated Activity is proposed to occur, is occurring, or has occurred, to comply with the terms and conditions of this Ordinance.

Section 903. Enforcement

The Municipal Governing Body is hereby authorized and directed to enforce all of the provisions of this Ordinance. All inspections regarding compliance with the Drainage Plan shall be the responsibility of the Municipal Engineer or other qualified persons designated by the Municipality.

B. Design Plans - A set of design plans approved by the Municipality shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made by the Municipality or designee during construction.

C. Adherence to Approved Plan - It shall be unlawful for any person, firm or corporation to undertake any Regulated Activity under Section 104 on any property except as provided for in the approved Drainage Plan and pursuant to the requirements of this Ordinance. It shall be unlawful to alter or remove any control structure required by the Drainage Plan pursuant to this Ordinance or to allow the property to remain in a condition which does not conform to the approved Drainage Plan.

D. Hearing - Prior to revocation or suspension of a permit and at the request of the Applicant, the Governing Body will schedule a hearing to discuss the non-compliance if there is no immediate danger to life, public health or property. The expense of a hearing shall be the Applicant's responsibility.

E. Suspension and Revocation of Permits

1. Any permit issued by the Municipality may be suspended or revoked for:

   a. Non-compliance with or failure to implement any provision of the permit.

   b. A violation of any provision of this Ordinance or any other applicable law, ordinance, rule or regulation relating to the project.

   c. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or

nuisance, pollution or which endangers the life or property of others.

2. A suspended permit shall be reinstated by the Governing Body when:

   a. The Municipal Engineer or his Municipal designee has inspected and approved the corrections to the stormwater management and erosion and sediment pollution control measure(s), or the elimination of the hazard or nuisance, and/or;

   b. The Governing Body is satisfied that the violation of the Ordinance, law, or rule and regulation has been corrected.

3. A permit that has been revoked cannot be reinstated. The Applicant may apply for a new permit under the procedures outlined in this Ordinance.

F. Occupancy Permit

An occupancy permit shall not be issued unless the certification of completion pursuant to Section 701 A has been approved by the Municipality. The occupancy permit shall be required for each lot owner and/or Applicant for all subdivisions and land development in the Municipality.

Section 904. Public Nuisance

A. The violation of any provision of this Ordinance is hereby deemed a Public Nuisance.

B. Each day that a violation continues shall constitute a separate violation.

Section 905. Penalties

A. Anyone violating the provisions of this Ordinance shall be subject to a fine of not more than $**[INSERT]** for each violation, recoverable with costs, or imprisonment of not more than **[INSERT]** days, or both. Each day that the violation continues shall be a separate offense

B. In addition, the Municipality may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

Section 906. Appeals

A. Any person aggrieved by any action of the Municipality or its designee may appeal to the Municipality's **[Governing Body or Zoning Hearing Board]** (per MPC Section 909.1(a)(8 and 909.1(b)(6))within **[thirty (30)]** days of that action.

B. Any person aggrieved by any decision of **[the Municipality's Governing Body or Zoning Hearing Board]** may appeal to the County Court of Common Pleas in the County where the activity has taken place within **[thirty (30) days]** of the Municipal decision.

APPENDIX A
STANDARD STORMWATER FACILITIES MAINTENANCE AND MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20_, by and between _____, (hereinafter the "Landowner"), and [Municipal Name], [County Name] County; Pennsylvania, (hereinafter "Municipality");

WITNESSES:

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of _____ County, Pennsylvania, Deed Book _____ at Page _____, (hereinafter "Property").

WHEREAS, the Landowner is proceeding to build and develop the Property; and

WHEREAS, the Subdivision/Land Management Plan (hereinafter "Plan") for the _____ Subdivision which is expressly made a part hereof, as approved or to be approved by the Municipality, provides for detention or retention of stormwater within the confines of the Property; and

WHEREAS, the Municipality and the Landowner, his successors and assigns agree that the health, safety, and welfare of the residents of the Municipality require that on-site stormwater management facilities be constructed and maintained on the Property: and

WHEREAS, the Municipality requires, through the implementation of the _____ Watershed Stormwater Management Plan, that stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, his successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Landowner, his successors and assigns, in accordance with the terms, conditions and specifications identified in the Plan.

2. The Landowner, his successors and assigns, shall maintain the stormwater management facilities in good working condition, acceptable to the Municipality so that they are performing their design functions

3. The Landowner, his successors and assigns, hereby grants permission to the Municipality, his authorized agents and employees, upon presentation of proper identification, to enter upon the Property at reasonable times, and to inspect the stormwater management facilities whenever the Municipality deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structures, pond areas, access roads, etc. When inspections are conducted, the Municipality shall give the Landowner, his successors and assigns, copies of the inspection report with findings and evaluations. At a minimum, maintenance inspections shall be performed in accordance with the following schedule:

- Annually for the first 5 years after the construction of the stormwater facilities,
- Once every 2 years thereafter, or
- During or immediately upon the cessation of a 100 year or greater precipitation event.

4. All reasonable costs for said inspections shall be borne by the Landowner and payable to the Municipality.

5. The owner shall convey to the municipality easements and/or rights-of-way to assure access for periodic inspections by the Municipality and maintenance, if required.

6. In the event the Landowner, his successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the Municipality, the Municipality may enter upon the Property and take such necessary and prudent action to maintain said stormwater management facilities and to charge the costs of the maintenance and/or repairs to the Landowner, his successors and assigns. This provision shall not be construed as to allow the Municipality to erect any structure of a permanent nature on the land of the Landowner, outside of any easement belonging to the Municipality. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.

7. The Landowner, his successors and assigns, will perform maintenance in accordance with the maintenance schedule for the stormwater management facilities including sediment removal as outlined on the approved schedule and/or Subdivision/Land Development Plan.

8. In the event the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like on account of the Landowner's or his successors' and assigns' failure to perform such work, the Landowner, his successors and assigns, shall reimburse the Municipality upon demand, within 30 days of receipt of invoice thereof, for all costs incurred by the Municipality hereunder. If not paid within said 30-day period, the Municipality may enter a lien against the property in the amount of such costs, or may proceed to recover his costs through proceedings in equity or at law as authorized under the provisions of the _____ Code.

9. The Landowner, his successors and assigns, shall indemnify the Municipality and his agents and employees against any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the Municipality for the construction, presence, existence or maintenance of the stormwater management facilities by the Landowner, his successors and assigns.

10. In the event a claim is asserted against the Municipality, his agents or employees, the Municipality shall promptly notify the Landowner, his successors and assigns, and they shall defend, at their own expense, any suit based on such claim. If any judgment or claims against the Municipality, his agents or employees shall be allowed, the Landowner, his successors and assigns shall pay all costs and expenses in connection therewith.

11. In the advent of an emergency or the occurrence of special or unusual circumstances or situations, the Municipality may enter the Property, if the Landowner is not immediately available, without notification or identification, to inspect and perform necessary maintenance and repairs, if needed, when the health, safety or welfare of the citizens is at jeopardy. However, the Municipality shall notify the landowner of any inspection, maintenance, or repair undertaken within 5 days of the activity. The Landowner shall reimburse the Municipality for his costs.

This Agreement shall be recorded among the land records of

_____[County Name] County, Pennsylvania and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL) For the Municipality:

_____

(SEAL) For the Landowner:

_____

ATTEST:

_____ (City, Borough, Township) County of [County Name], Pennsylvania

I,_____, a Notary Public in and for the County and State aforesaid, whose commission expires on the_____day of_____, 20_, do hereby certify that _____ whose name(s) is/are signed to the foregoing Agreement bearing date of the_____day of_____, 20_, has acknowledged the same before me in my said County and State.

GIVEN UNDER MY HAND THIS_____day of_____, 20__.

NOTARY PUBLIC

(SEAL)

APPENDIX B
STORMWATER MANAGEMENT DESIGN CRITERIA

Table B-1

Runoff Curve Numbers Based on Land Use and HSG

Cover Type and Hydrologic Condition	CNs for hydrologic soil group A	B	C	D
Open Space (lawns, parks, golf courses, cementeries, landscaping, etc.)				
Poor condition (grass cover on <50% of the area)	68	79	86	89
Fair condition (grass cover on 50% to 75% of the area	49	69	79	84
Good condition (grass cover on >75& of the area)	39	61	74	80
Impervious Areas:				
Open water bodies: lakes, wetlands, ponds, etc**.**	100	100	100	100
Paved parking lots, roofs, driveways, etc. or other similar impervious surfaces	98	98	98	98
Porous Pavement and Pavers:				
Porous Pavement / Concrete on minimum 12" Clean Aggregate Base	40	40	66	70
Porous Pavers/ Pavement/Concrete Walks with min. 6" Clean Aggregate Base	40	52	75	80
Non-Impervious Driving Surfaces:				
Gravel	94	97	97	97
Dirt	88	93	94	94
Cultivated Agricultural Lands				
Row Crops (good), e.g., corn, sugar beets, soy beans	64	75	82	85
Small grain (good), e.g., wheat, barley, flax	60	72	80	84
Meadow (continuous grass, protected from grazing, and generally mowed for hay):	30	58	71	78
Brush (brush-weed-grass mixture, with brush the major element):				
Poor (<50% ground cover)	48	67	77	83
Fair (50% to 75% ground cover)	35	56	70	77
Good (>75% ground cover)	30	48	65	73
Woods:				
Poor (forest litter, small trees, and brush are destroyed by heavy grazing or regular burning)	45	66	77	83
Fair (woods are grazed but not burned, and some forest litter covers the soil)	36	60	73	79
Good (woods are protected from grazing, and litter and brush adequately cover the soil)	30	55	70	77

[1] Composite CNs for Residential , Commercial and Industrial Uses shall be computed based on the applicable values provided in this Table

[2] If Weighted CN is less than 40, use CN=40 for runoff computations.

[3] Designer shall submit justification for the use of CN values not specified in the above Table

Table B-2
Runoff Coefficients for the Rational Formula
By Land Use, Hydrologic Soil Group and Overland Slope (%)

Hydrologic Soil Group (HSG)	**A**			**B**			**C**			**D**		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated Land	0.08 (a)	0.13	0.16	0.11	0.15	0.21	0.01	0.19	0.28	0.18	0.23	0.31
	0.14 (b)	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Open Space/Lawn	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Meadow	0.05	0.10	0.14	0.05	0.13	0.19	0.12	0.17	0.24	0.16	0.21	0.28
	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Impervious Surfaces (including	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
dirt, gravel)	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

(a) Runoff coefficients for storm recurrence intervals less than 25 years.
(b) Runoff coefficients for storm recurrence intervals of 25 years or more

Source: "Recommended Hydrologic Procedures for Computing Urban Runoff from Small Watersheds in Pennsylvania" Pennsylvania DER #609-12/90

TABLE B-3

Roughness Coefficients (Manning's "n") For Overland Flow (U.S. Army Corps Of Engineers, HEC-1 Users Manual)

Surface Description	n		
Dense Growth	0.4	-	0.5
Pasture	0.3	-	0.4
Lawns	0.2	-	0.3
Bluegrass Sod	0.2	-	0.5
Short Grass Prairie	0.1	-	0.2
Sparse Vegetation	0.05	-	0.13
Bare Clay-Loam Soil (eroded)	0.01	-	0.03
Concrete/Asphalt - very shallow depths (less than 1/4 inch)	0.10	-	0.15
- small depths (1/4 inch to several inches)	0.05	-	0.10

Roughness Coefficients (Manning's "n") For Channel Flow

Reach Description	n
Natural stream, clean, straight, no rifts or pools	0.03
Natural stream, clean, winding, some pools or shoals	0.04
Natural stream, winding, pools, shoals, stony with some weeds	0.05
Natural stream, sluggish deep pools and weeds	0.07
Natural stream or swale, very weedy or with timber underbrush	0.10
Concrete pipe, culvert or channel	0.012
Corrugated metal pipe	0.012-0.027(1)
High Density Polyethylene (HDPE) Pipe	
Corrugated	0.021-0.029(2)
Smooth Lined	0.012-0.020(2)

(1) Depending upon type, coating and diameter
(2) Values recommended by the American Concrete Pipe Association, check Manufacturer's recommended value.

APPENDIX C
SAMPLE DRAINAGE PLAN APPLICATION AND FEE SCHEDULE

(To be attached to the "land subdivision plan or development plan review application or "minor land subdivision plan review application")

Application is hereby made for review of the Stormwater Management and Erosion and Sedimentation Control Plan and related data as submitted herewith in accordance with the _____Township Stormwater Management and Earth Disturbance Ordinance.

_____Final Plan_____Preliminary Plan_____Sketch

Plan Date of Submission_____Submission No._____

1. Name of subdivision or development_____

2. Name of Applicant_____Telephone No._____ (if corporation, list the corporation's name and the names of two officers of the corporation)
   _____Officer 1

   _____Officer 2

   Address_____

   Zip_____

Applicants interested in subdivision or development
(if other than property owner give owners name and address)

3. Name of property owner_____Telephone No._____

   Address_____

   Zip_____

4. Name of engineer or surveyor_____Telephone No._____

   Address_____
   Zip_____

5. Type of subdivision or development proposed:

____ Single-Family Lots	____ Townhouses	____ Commercial(Multi-Lot)
____ Two Family Lots	____ Garden Apartments	____ Commercial (One-Lot)
____ Multi-Family Lots	____ Mobile-Home Park	____ Industrial (Multi-Lot)
____ Cluster Type Lots	____ Campground	____ Industrial (One-Lot)
____ Planned Residential	____ Other	____ Development

6. Linear feet of new road proposed_____L.F.

7. Area of proposed and existing conditions impervious area on entire tract.

   a. Existing (to remain)_____S.F.____% of Property

   b. Proposed _____S.F.____% of Property

8. Stormwater

   a. Does the peak rate of runoff from proposed conditions exceed that flow which occurred for existing conditions for the designated design storm? _____

   b. Design storm utilized (on-site conveyance systems) (24 hr.)_____ No. of Subarea_____

      Watershed Name_____

      Explain:_____

      _____

      _____

   c. Does the submission and/or district meet the release rate criteria for the applicable subarea?_____

   d. Number of subarea(s) from Ordinance Appendix D of the Brodhead and McMichael Creek Watershed Stormwater Management Plan._____

   e. Type of proposed runoff control_____

   f. Does the proposed stormwater control criteria meet the requirement/guidelines of the Stormwater Ordinances?_____

      If not, what variances/waivers are requested?_____ Reasons Why:

      _____

      _____

   g. Does the plan meet the requirements of Article iii of the Stormwater Ordinances?_

      If not, what variances/waivers are requested?_____ Reasons Why:

      _____

      _____

   h. Was TR-55, June 1986 utilized in determining the time of concentration?

      _____

   i. What hydrologic method was used in the stormwater computations?

      _____

   j. Is a hydraulic routing through the stormwater control structure submitted?

_____

k. Is a construction schedule or staging attached?_____

l. Is a recommended maintenance program attached?_____

9. Erosion and Sediment Pollution Control (E&S):

a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the_____County Conservation District?_____

b. Total area of earth disturbance_____S.F.

10. Wetlands

a. Have the wetlands been delineated by someone trained in wetland delineation?___

b. Have the wetland lines been verified by a state or federal permitting authority?___

c. Have the wetland lines been surveyed?_____

d. Total acreage of wetland within the property _____

e. Total acreage of wetland disturbed_____

f. Supporting documentation_____

11. Filing

a. Has the required fee been submitted?_____ Amount:_____

b. Has the proposed schedule of construction inspection to be performed by the Applicant's engineer been submitted?_____

c. Name of individual who will be making the inspections_____

d. General comments about stormwater management at the development:

_____

_____

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF [County Name] .

On this the day of , 20 , before me, the undersigned officer, personally appeared who being duly sworn, according to law, deposes and says that owners of the property described in this application and that the application was made with knowledge and/or direction and does hereby agree with the said application and to the submission of the same.

Property Owner

My Commission Expires , 20
Notary Public

THE UNDERSIGNED HEREBY CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF THE INFORMATION AND STATEMENTS GIVEN ABOVE ARE TRUE AND CORRECT.

SIGNATURE OF APPLICANT

//

(**Information Below This Line To Be Completed By The Municipality**)

(Name of) Municipality official submission receipt:

Date complete application received: Plan Number:

Fees: Date fees paid: Received by:

Official submission receipt date: Received by:

Municipality

Drainage Plan Proposed Schedule of Fees

Subdivision name_____ Submittal No._____

Owner_____ Date_____

Engineer_____

1. Filing fee $_____

2. Land use
   2a. Subdivision, campgrounds, mobile home parks, and multi-family dwelling where the units are located in the same local watershed. $_____
   2b. Multi-family dwelling where the designated open space is located in a different local watershed from the proposed units. $_____
   2c. Commercial/industrial. $_____

3. Relative amount of earth disturbance 3a. Residential
   road <500 l.f. $_____
   road 500-2,640 l.f. $_____
   road >2,640 l.f. $_____
   3b. Commercial/industrial and other
   impervious area <3,500 s.f. $_____
   impervious area 3,500-43,460 s.f. $_____
   impervious area >43,560 s.f. $_____

4. Relative size of project
   4a. Total tract area <1 ac $_____
   1-5 ac $_____
   5-25 ac $_____
   25-100 ac $_____
   100-200 ac $_____
   >200 ac $_____

5. Stormwater control measures
   5a. Detention basins & other controls which require a review of hydraulic routings ($ per control). $_____
   5b. Other control facilities which require storage volume calculations but no hydraulic routings. ($ per control) $_____

6. Site inspection ($ per inspection) $_____

Total $_____

All subsequent reviews shall be 1/4 the amount of the initial review fee unless a new application is required as per Section 406 of the stormwater Ordinance. A new fee shall be submitted with each revision in accordance with this schedule.

APPENDIX D
STORMWATER MANAGEMENT DISTRICT WATERSHED MAP

Management District Map Fly Page

APPENDIX E

EXISTING VACANT LOTS IN RECORDED SUBDIVISIONS

METHOD OF STORAGE COMPUTATION AND EXAMPLE LOT LAYOUTS

STEP 1.

Determine Impervious Surfaces

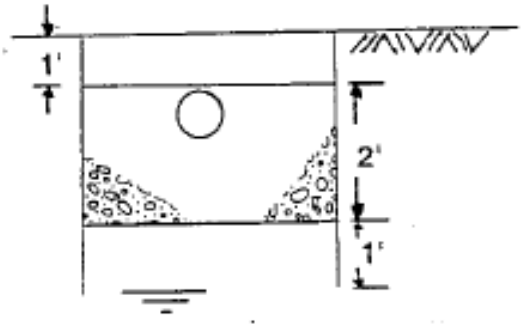
House Roof 1	12 X 48 =	576
House Roof 2	12 X 48 =	576
Deck***	12 X 18 =	216
Deck	4 X 24 =	96
Drive	12 X 50 =	600
Garage	12 X 12 =	144
		2,208 S.F.

STEP 2.

Required storage volume from Figure 1 = 505 cubic feet

STEP 3.

Refer to soil log for septic system. Indicates mottling at 48 inches. The percolation rate is 96 minutes/inches. Therefore, from Figure 2, choose seepage trenches for each rain gutter outlet.



STEP 4.

Determine length of trench required - use 6-inch perforated pipe.

GUTTER OUTLET	REQ'D VOL.(C.F.) FROM FIGURE 1	DEPTH OF AGGREGATE FT.	TRENCH WIDTH FT.
1	118	2	3
2	118	2	3
3	30	2	3

GUTTER OUTLET	VOLUME OF STORAGE* PER FT. OF TRENCH	VOLUME OF STORAGE** PER FT. OF PIPE	TOTAL	TOTAL LENGTH OF TRENCH REQ'D (FT.)
1	2.1	0.2	2.3	118/2.3 = 51
2	2.1	0.2	2.3	118/2.3 = 51
3	2.1	0.2	2.3	30/2.3 = 13

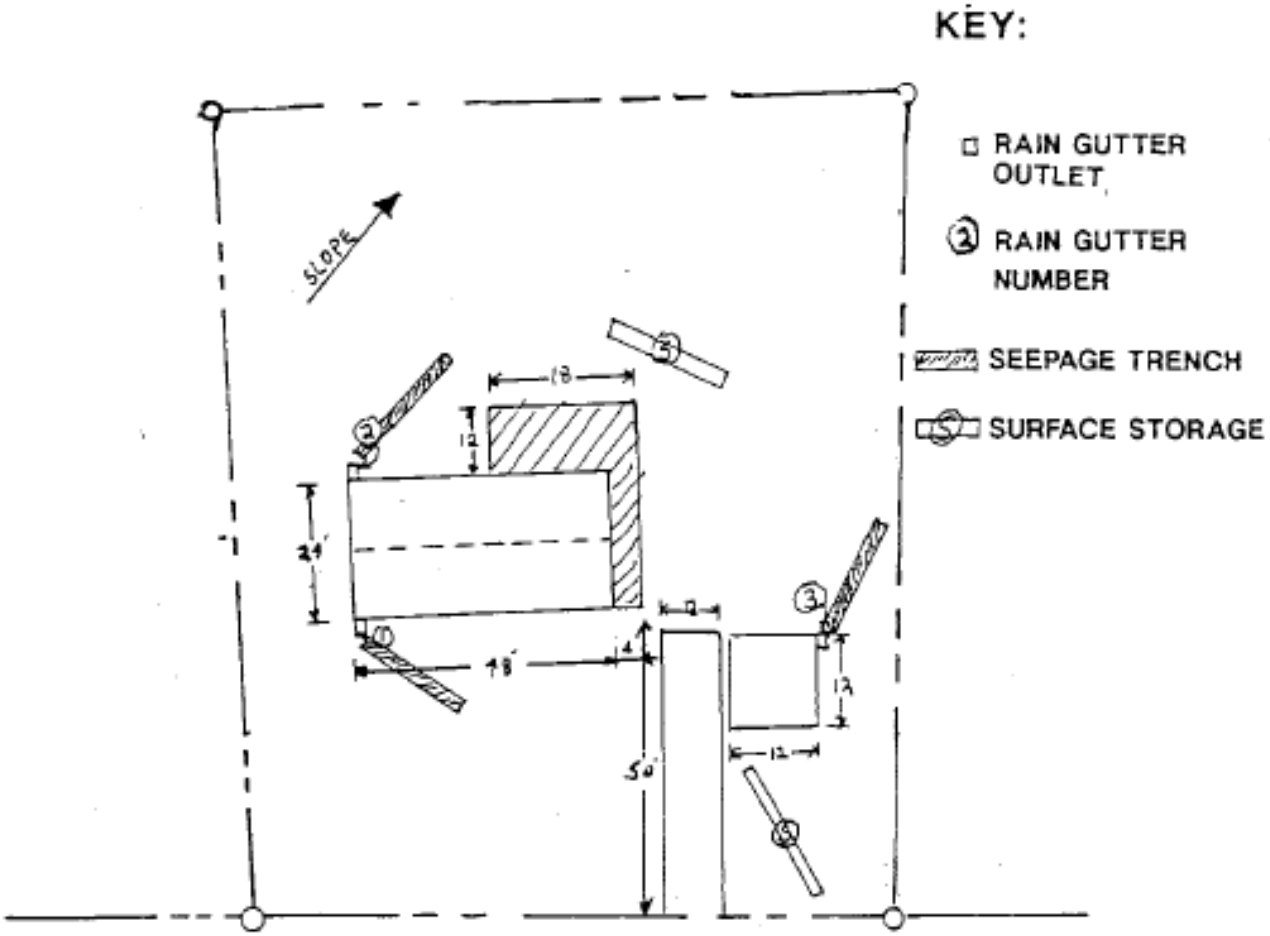
* From Table 5
** From Table 6
*** Wood decks with spacing between boards are exempt from the calculations.

STEP 5.

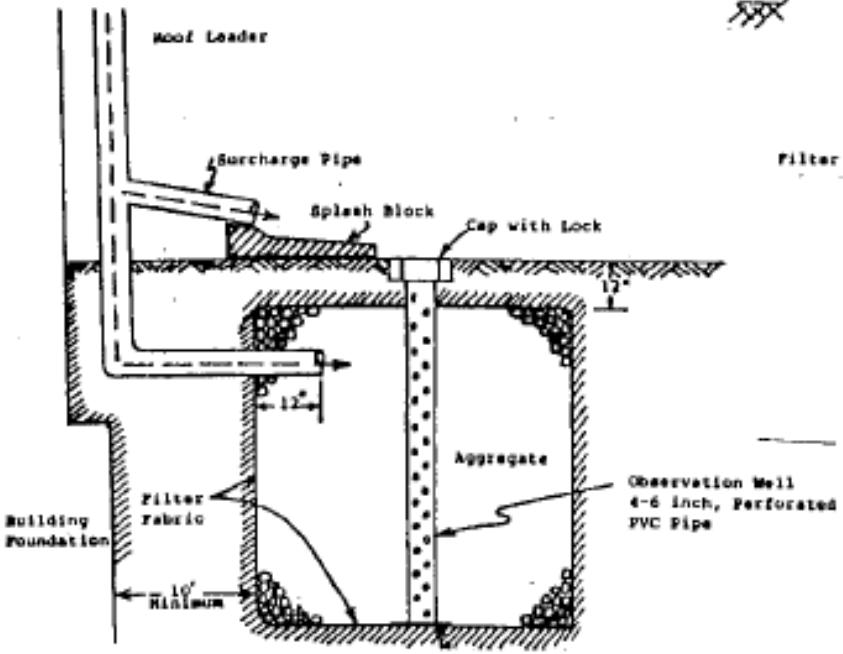
Determine remainder of impervious surfaces which requires detention and required storage volume from Figure 2.

Deck	312 S.F.	912 S.F. = 185 C.F. of Storage
Drive	600 S.F.	
	912 S.F.	

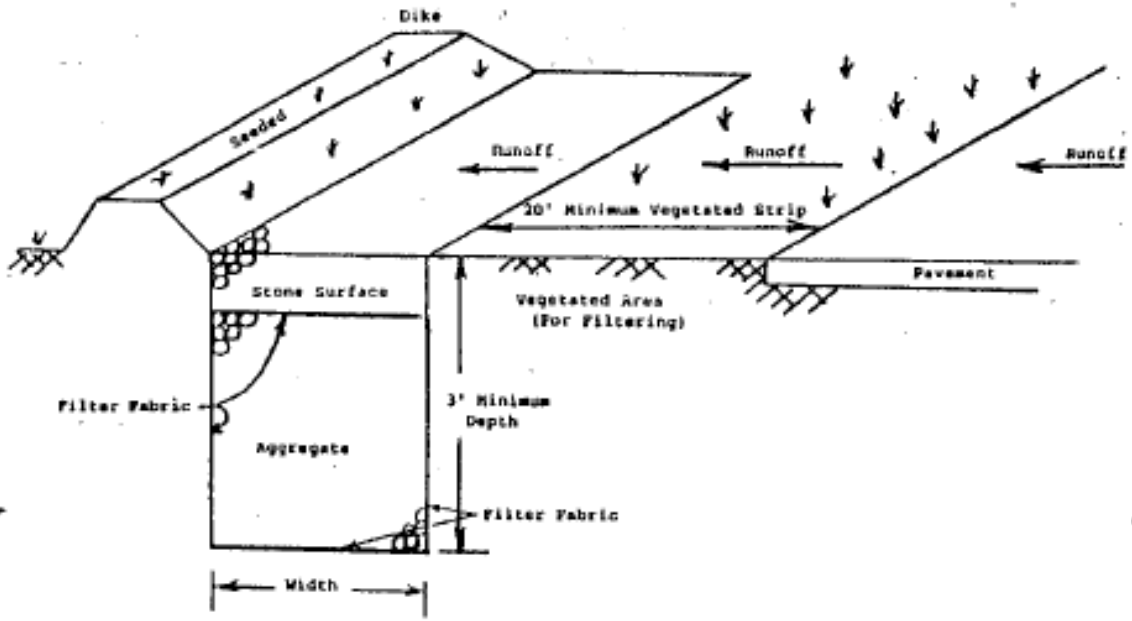
Use trench 6' wide by 1' deep x 31 feet long or 2 - 6' x 1' x 16' trenches in locations shown on plan.



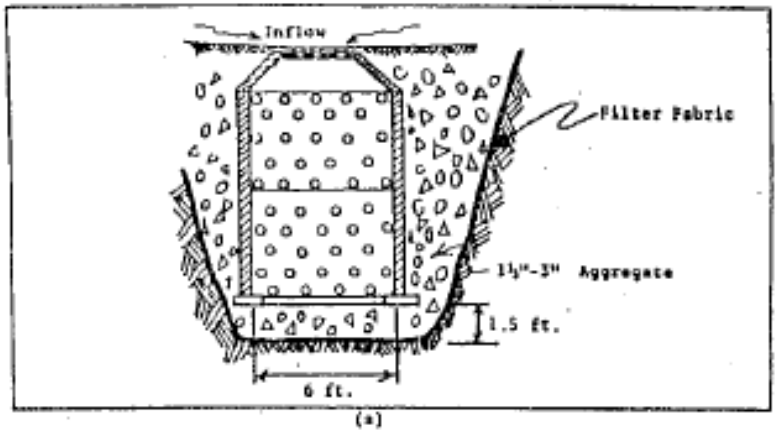
TYPICAL LOT LAYOUT



Typical Dry Well Cross Section



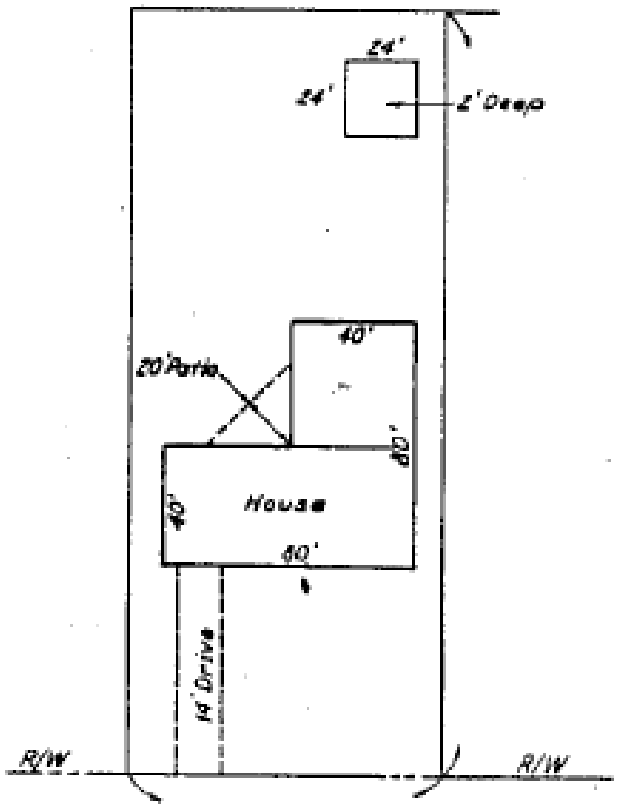
Typical Section of Infiltration Trenches
Modified after Frederick Co., MD. (1979)



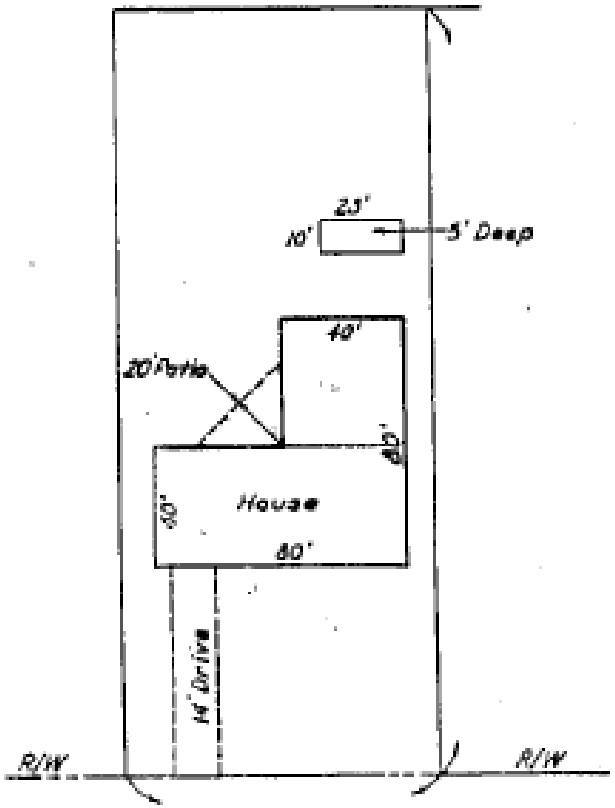
(a)

Source: Modified from Sullivan (1981)

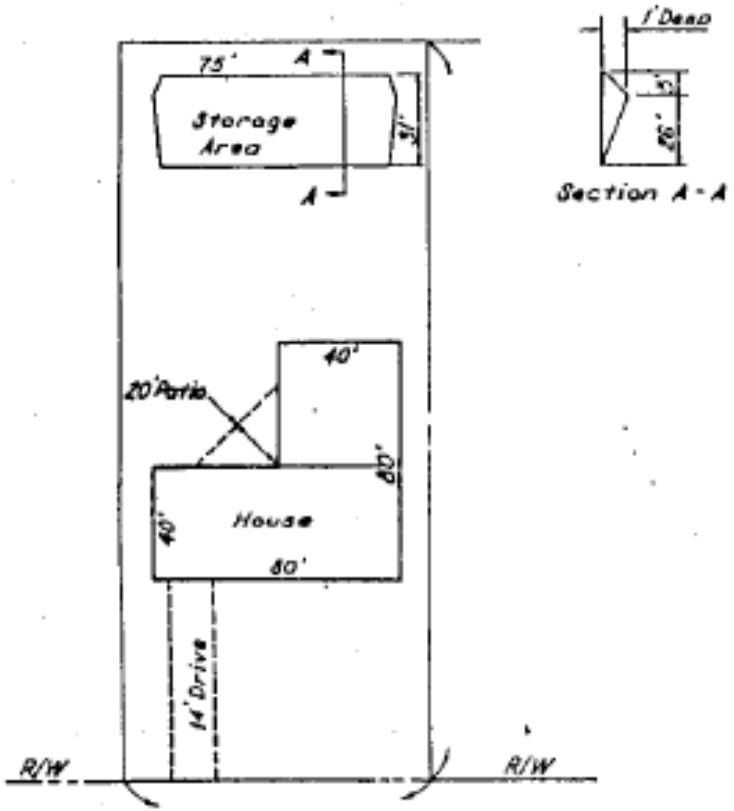
ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO.3
POND STORAGE



ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO. 4
UNDERGROUND TANK STORAGE



ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO. 1
SURFACE STORAGE



ON-SITE STORM WATER MANAGEMENT
ALTERNATE NO. 2
OVERSIZED STORM SEWER PIPE

