Elkay Drive Commercial Building

Town of Chester
Orange County, New York

Stormwater Pollution Prevention Plan

Narrative

PIETRZAK & PFAU ENGINEERING & SURVEYING, PLLC
262 GREENWICH AVENUE
GOSHEN, NEW YORK 10924

P&P No. 19139.01
January 2020
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APPENDICES

I. Executive Summary

This report shall serve as the stormwater pollution prevention plan for Elkay Drive Commercial Building. The proposed project is located south of Elkay Drive in the Town of Chester, Orange County, New York. The property is currently identified as Section 6 Block 1 Lot 69.4 on the Town of Chester Tax Map. The total site area is approximately 2.77± acres. The project is located in the Industrial Park (IP) zoning district.

The project is located near the end of Elkay Drive at a cul-de-sac. A stone swale runs along the outer edge of the cul-de-sac and the northern boundary of the property. Durland Hill rises from the south, creating steep slopes in the southern portion of the property.

This project includes the construction a 30,500 sq. ft light industrial building. Parking in front of the buildings will be provided in the form of 27 parking spaces. Two loading docks will be provided on the western side of the building for tractor trailer access. Access to the property will be made from Elkay Drive from the north and west. A dumpster enclosure will be included. The building shall be served by a proposed well and septic system.

The drainage design for this project has been incorporated to provide the appropriate water quality treatment to the stormwater runoff, utilize proposed runoff reduction practices, and ensure there are no adverse impacts to the downstream areas of the project site. In order to meet these goals, a TR-20 hydraulic analysis of the stormwater runoff has been prepared utilizing HydroCAD Stormwater Modeling software. The software was used to analyze the Channel Protection (1 year), Overbank Flood (10 year), and Extreme Storm (100 year) storm events in accordance with the New York State Stormwater Management Design Manual. Based on this analysis, the proposed design provides the required stormwater mitigation to ensure that no adverse impact will occur to downstream areas due to the construction of the proposed project.

II. Design Point Designation

Two (2) separate design points were defined to analyze the stormwater peak flow runoff of the project. The first design point, Design Point 1 as identified in the Hydro-Cad model, is defined as the existing catch basin located at the northeastern corner of the project, near the proposed northern entrance to the project. Stormwater from this point flows from an existing stone swale into the catch basin, which then flows off-site.

The second design point, Design Point 2 as identified in the Hydro-Cad model, is defined as the catch basin located northeast of the project at the intersection of Elkay Drive. Stormwater runoff from this point continues to flow offsite.

III. Existing Conditions

As previously mentioned, Elkay Drive Commercial Building is located south of Elkay Drive in the Town of Chester, Orange County, New York.

The soils located within the drainage basins studied on the project site have been identified in accordance with the United States Department of Agriculture Orange County Soils Survey. The site consists of 0.6% soils from Hydrologic Soil Group A and 99.4% soils from Hydrologic Soil Group D. The soils located in the project basin are Hoosic gravelly sandy loam, Mardin gravelly silt loam, Raynham silt loam, and rock outcrop-Nassau complex. (See Appendix 7 for further information on these particular soils.)

The existing ground cover of the project parcel consists of wooded area with underbrush along the northern edge of the property along Elkay Drive. The site then transitions to open meadow in the southern portion of the property as elevations increase.

Topography on this site consists of slopes in the 0% to 10% range (9.9% of site), 10% to 15% (39.3% of site), and 15% or greater range (50.8% of site).

In modeling the existing site for the drainage analysis, the drainage area was taken to consist of two (2) separate drainage basins. The first existing drainage basin, identified in the Hydro-Cad Output as Subcatchment 1S, includes approximately 5.30± acres of on-site and off-site land (See Appendix 4 for Drainage Basin Mapping). This area is made up of approximately 0.20 acres of impervious area, 2.43 acres of non-grazed meadow in fair condition, and 2.68 acres of woods in fair condition. This area is tributary to the previously defined Design Point 1.

The second existing drainage basin, identified in the Hydro-Cad Output as Subcatchment 2S, includes approximately 5.51± acres of on-site and off-site land. This area is made up of approximately 0.61 acres of impervious area, 2.57 acres of non-grazed meadow in fair condition, 1.74 acres of woods in fair condition, 0.54 acres of grass cover in fair condition on Hydrologic Soil Group D, and 0.05 acres of grass cover in fair condition on Hydrologic Soil Group A. This area is tributary to the previously defined Design Point 2.

IV. Proposed Conditions

In modeling the project site for the proposed condition, the site was taken to consist of four (4) separate drainage basins.

The first drainage basin, still identified in the Hydro-Cad Output as Subcatchment 1S, has been reduced to contain approximately 4.70± acres of on-site and off-site land due to the proposed project. This area is made up of approximately 0.26 acres of impervious area, 1.15 acres of non-grazed meadow in fair condition, 2.59 acres of woods in fair condition, and 0.69 acres of grass cover in fair condition. This area is tributary to the previously defined Design Point 1.

The second drainage basin, still identified in the Hydro-Cad Output as Subcatchment 2S, has been reduced to contain approximately 1.89± acres of on-site land and off-site land due to the proposed project. This area is made up of approximately 0.61 acres of impervious area, 0.61 acres of woods in fair condition, 0.62 acres of grass cover in fair condition on Hydrologic Soil Group D, and 0.05 acres of grass cover in fair condition on Hydrologic Soil Group A. This area is tributary to the previously defined Design Point 2.

Due to the proposed project improvements, drainage infrastructure and site grading, two (2) additional drainage basins have been delineated for the proposed conditions of the analysis.

The third drainage basin is identified in the Hydro-Cad Output as Subcatchment 3S. Subcatchment 3S contains approximately 1.07± acres of on-site land. This area consists of approximately 0.77 acres of impervious surfaces from proposed pavement and roofs, 0.24 acres of grass cover in fair condition, and 0.06 acres of gravel road. This area is tributary to one (1) Type I-2 Infiltration Basin. The Infiltration Basin is defined as Type I-2 Infiltration Basin 3P in the Hydro-Cad model.

The fourth drainage basin is identified in the Hydro-Cad Output as Subcatchment 4S. Subcatchment 4S contains approximately 3.17± acres of on-site and off-site land. This area consists of approximately 0.36 acres of impervious surfaces from proposed pavement and roofs, 1.20 acres of woods in fair condition, 1.02 acres of non-grazed meadow in fair condition, and 0.59 acres of grass cover in fair condition. This area is tributary to one (1) Type P-5 Pocket Pond. The Pocket Pond is defined as P-5 Pocket Pond 4P in the Hydro-Cad model.

V. Stormwater Management

As previously stated, one of the goals of the drainage design for this project is to ensure there are no adverse impacts to downstream areas. To meet this goal, one (1) Type I-2 Infiltration Basin, and one (1) Type P-5 Pocket Pond will be utilized to collect and treat stormwater runoff and provide peak flow attenuation for the design points studied for this project. A Hydro-Cad TR-20 analysis was performed for both the existing and proposed conditions for the Channel Protection (1 year), Overbank Flood (10 year), and Extreme storm (100 year) storm events to ensure no adverse impacts will occur to downstream areas.

The proposed Type I-2 Infiltration Basin will collect the stormwater runoff from Subcatchment 3S, as defined in the Proposed Conditions above. This basin has been designed in accordance with Section 6.1 of the New York State Stormwater Management Design Manual to provide the required pretreatment volume, Water Quality volume and provide peak flow attentuation. The pretreatment sedimentation basin has been sized to provide 100% of the water quality volume for Subcatchment 3S. The pond has been designed with 3 horizontal to 1 vertical (3:1) interior side slopes. The pond will have a bottom pond elevation of 512.0' and a pretreatment bottom elevation of 510.0'. The pond will control the overflow stormwater from Subcatchment 3S by utilizing one (1) proposed Outlet Control Structure (OCS-1) and is proposed to outlet via a 18" HDPE pipe into a stormwater management system which outlets into Design Point 2. The outlet control structure is designed to control all design storm events studied by allowing stormwater flow to be released over time. Additionally, a twenty (20) foot wide emergency overflow broad crested weir has been incorporated into the pond design.

A proposed Type P-5 Pocket Pond will collect stormwater runoff from Subcatchment 4S, as defined in the Proposed Conditions above. This basin has been designed in accordance with Section 6.1 of the New York State Stormwater Management Design Manual to provide the required Water Quality volume and provide peak flow attentuation. The pond has been designed

with 2 horizontal to 1 vertical (2:1) interior side slopes. The pond will have a bottom pond elevation of 522.0' and a permanent pool elevation of 526.0'. The permanent pool has been designed to incorporate a 10' aquatic bench with 2 horizontal to 1 vertical (2:1) interior side slopes. The pond will control stormwater from Subcatchment 4S by utilizing one (1) proposed Outlet Control Structure (OCS-2) and is proposed to outlet via a 18" HDPE pipe into a stormwater management system which outlets to Design Point 2. The outlet control structure is designed to control all design storm events studied by allowing stormwater flow to be released over time. Additionally, a twenty (20) foot wide emergency overflow broad crested weir has been incorporated into the pond design.

As seen in the following tables, the proposed peak flow runoff from the project site has been mitigated to ensure that no adverse impacts will occur at the design point studied due to the proposed project's construction (See Appendix 5 and 6 for Hydro-CAD output).

Design Point 1			
Storm Event	Pre-Developed Peak Flow (cfs) Q out	Post-Developed Peak Flow (cfs) Q out	Change (cfs)
1 Year	3.68	3.85	0.17*
10 Year	10.71	10.57	-0.14
100 Year	24.17	23.08	-1.09

*Negligible increase

Design Point 2			
Storm Event	Pre-Developed Peak Flow (cfs) Q out	Post-Developed Peak Flow (cfs) Q out	Change (cfs)
1 Year	4.79	2.55	-2.24
10 Year	13.11	9.15	-3.96
100 Year	28.71	27.87	-0.84

Additionally, the table below has been provided showing the water surface elevations in the proposed stormwater ponds. The elevations presented in this table illustrates the results of the analysis for the 1, 10, and 100 year design storms. The elevations indicate that a minimum of one (1) foot of freeboard has been provided in the pond to protect against overtopping.

Proposed Type I-2 Infiltration Basin 3P		
Storm Event	Post-Developed Peak Water Surface Elevation	Freeboard (ft.) (Pond Berm at 517.00')
1 Year	513.35	3.65
10 Year	514.41	2.59
100 Year	515.37	1.63

Proposed Type P-5 Pocket Pond 4P		
Storm Event	Post-Developed Peak Water Surface Elevation	Freeboard (ft.) (Pond Berm at 531.00')
1 Year	528.38	2.62
10 Year	529.14	1.86
100 Year	529.98	1.02

VI. Stormwater Quality and Runoff Reduction

The stormwater water quality and runoff reduction for this project has been designed in accordance with the New York State Department of Environmental Conservation Stormwater Management Design Manual (SMDM) of January 2015. The five-step planning process outlined in the SMDM has been incorporated in the design of this project. These five steps include:

1. Site planning to preserve natural features and reduce impervious cover.
2. Calculation of the Water Quality Volume for the site.
3. Incorporation of Runoff Reduction Techniques and Standard SMPs with Runoff Reduction Volume (RRv) capacity.
4. Use of Standard SMPs, where applicable, to treat the portion of Water Quality Volume not addressed by runoff reduction techniques and Standard SMPs with RRv capacity.
5. Design of volume and peak rate control practices, where required.

Step one of the planning process includes the preservation of natural features and reduction of impervious coverage. Reduction of clearing and grading has been accomplished by the use of clearly delineated disturbance limit lines proposed on the project design plans.

Step two of the planning process was then completed and the Water Quality Volume (WQv) was calculated for the project site using the criteria in Chapter 4 of the Stormwater Management Design Manual. The required Water Quality Volume calculated for this project is 8,295 cubic feet (See Appendix 8 for Calculations and Supporting Data).

Step three of the process involves Runoff Reduction by incorporating the Runoff Reduction Techniques and Standard SMP's with RRv capacity outlined in the Stormwater Management Design Manual. The minimum Runoff Reduction Volume was then calculated utilizing the Specific Reduction Factor of the existing soil types located on the project site using the criteria in Chapter 4 of the design manual. The minimum RRv calculated for this project is 1,189 cubic feet (See Appendix 8 for Calculations and Supporting Data).

Runoff Reduction Technique RR-3 Tree Planting in accordance with Section 5.3.3 of the SMDM is proposed to capture stormwater runoff from impervious area in the project. A 100 square foot directly connected impervious area reduction is permitted for each new tree. This credit may be applied to the impervious area to the tree. In this project, 16 new tree plantings are applicable for this Runoff Reduction Technique. This results in 1,600 square feet of impervious area reduction. After recalculating project site impervious cover, the new required Water Quality Volume is 8,117 cubic feet, a reduction of 178 cubic feet.

The other Runoff Reduction Technique utilized for this project is the Type I-2 Infiltration Basin, a standard SMP with RRv capacity. The proposed Infiltration Basin has been designed based off of soil conditions observed during on-site testing. The Infiltration Basin includes a pretreatment basin which is designed to contain 100% of the Water Quality Volume as required by the Stormwater Management Design Manual. The basin has been designed to capture and temporarily store the tributary WQv before allowing it to infiltrate into the soil over a two-day period. The basin has been designed with on-site infiltration soils testing which demonstrated an infiltration rate of 22 inches per hour (0.030556 feet per minute). The proposed Infiltration Basin will provide 4,115 cubic feet of Water Quality Volume. Infiltration practices provide a 100 percent reduction of the Water Quality Volume that is treated by the device.

Utilizing step three of the design process, the Runoff Reduction Volume provided for the project is 4,488 cubic feet, which exceeds the required RRv of 1,189 cubic feet and is a 100 percent reduction of the Water Quality Volume.

Step four of the process involves applying Standard Stormwater Management Practices to address the remaining Water Quality Volume. In an effort to provide the highest amount of stormwater treatment and conform to the project site constraints, one (1) P-5 Pocket Pond has been designed. The Pocket Pond has been designed in accordance with Chapter 6 of the SMDM. Pocket Pond 4P is proposed to be between the eastern edge of the building and the eastern property line. The stormwater pond has been designed to capture and treat runoff exiting Subcatchment 4S and manage the pre-developed and post-developed peak flow rates for the project.

The remaining Green Infrastructure Runoff Reduction Techniques and standard SMP's with RRv capacity have been evaluated and determined to be infeasible for use with the proposed project. The existing site topography include steep slopes, poor hydrologic soils and restricted space. This along with cold climate concerns eliminates the possible incorporation of Sheetflow to Riparian Buffers, Disconnection of Rooftop Runoff, Stream Daylighting, Stormwater Planter, Rain Tank/Cisterns and also the use of Porous Pavement as a Runoff Reduction practice.

Step five of the process involves applying Volume and Peak Rate Control Practices. The downstream channel protection has been provided within the proposed ponds by providing a release rate of equal to or lesser value specified by the Stream Channel Protection Volume. Downstream channel protection for the infiltration basin via infiltration of the entire storm volume. The outflow from the pond for this storm event has been designed such that runoff will be discharged over a 24 hour period after the design storm event. The Overbank Flood (10 year storm event) and the Extreme Storm (100 year storm event) have been managed as outlined in the Stormwater Management section of this report.

Channel Protection Volume (CPv) Summary Table

Practice	Release Rate Required (cfs)	Release Rate Provided (cfs)
Infiltration Basin 3P	0.09	0.00
Pocket Pond 4P	0.15	0.14

VII. Erosion and Sediment Control

Full erosion and sediment control measures will be incorporated into the project construction. These practices will be in accordance with the requirements set forth in the most recent revision of the New York State Department of Environmental Conservation publication entitled "New York State Standards and Specifications for Erosion and Sediment Control".

Erosion Control Measures:

The following erosion control measures will be incorporated to minimize erosion potential:

- Filter fabric silt fence:
  Silt fence shall be used to control erosion from sheet flow on slopes not to exceed two horizontal to one vertical unless specified otherwise. Concentrated flows shall not be directed toward silt fence and spacing shall vary from 50' to 100' depending on slope steepness.

- Permanent and temporary seeding mixtures:
  Permanent and temporary seeding, mulch, fertilizer, soil amendments, and slope stabilization will be used on seeded areas. Land that is stripped of vegetation will be left bare for the shortest time possible. Any area that will remain cleared, but not under construction for 14 days or longer, will be seeded with a temporary mixture. Topsoil shall be stockpiled, stabilized with temporary seeding, and saved for reuse on the site.

- Slope Stabilization:
  All slopes shall be stabilized to minimize erosion. Slopes shall be stabilized with temporary seeding mixtures and straw mulch. Slopes in excess of four horizontal to one vertical shall be stabilized with jute netting and hydro-seed. Existing vegetation, which is not to be removed, will also act as filter strips to protect down-slope areas. Runoff will be diverted from newly graded areas to prevent erosion until a permanent ground cover has been established.

- Dust Control:
  Measures for dust control during construction shall be implemented as needed (daily water sprays will be used during dry conditions and Calcium Chloride will be used only if necessary). In addition to water sprays, temporary plantings will aid in minimizing dust.

- Temporary Diversion Swales:
  Temporary diversion swales shall be constructed to either divert clean stormwater runoff from newly graded areas or direct sediment laden runoff to a sediment trapping device.

- Channel Stabilization:
  Drainage channels and temporary diversion swales shall be stabilized with seed, jute netting or riprap, as specified, to minimize deterioration of the channel bed.

- Sediment Traps:
  Sediment traps shall be constructed in the location of the proposed pond and/or where specified on the approved plan set, and be of size and type specified to collect sediment from sediment laden stormwater runoff. Sediment traps shall be constructed downstream of disturbed areas and be in place prior to disturbance within the contributory area.

- Stabilized Construction Entrance:
  Town roads will be protected by installation of crushed stone blanket for cleaning construction vehicle wheels. Blankets shall be placed at any intersection of a construction road with a paved or publicly owned road. Stabilized construction entrances shall be installed in the location and be of size and type specified.

- Tree Protection:
  Trees to be preserved within areas of construction shall be protected. In areas of concentrated construction activity temporary fencing will be placed around the

driplines. In all other areas, construction workers will be directed to avoid the storing of equipment or soil under trees to be preserved, in order to prevent soil compaction. If necessary, trees will be preserved with tree wells in fill areas, and retaining walls in cut areas.

- Spill/Litter Prevention:
  All site construction debris is to be disposed of in an on-site dumpster. Construction chemicals are to be utilized in a manner to prevent soil contamination and are not to be left out overnight. Any spill shall be reported to the New York State Spill Hotline (1-800-457-7362). Federal and State law require the spiller, or responsible party, to notify government agencies and to contain, clean up, and dispose of any spilled/contaminated material in order to correct any environmental damage.

Erosion Control Sequence

Prior to any site disturbance, the developer and contractors should thoroughly review and become familiar with the approved erosion control plan. The installation of erosion control measures should begin with the most downstream device, then working upstream. When installing erosion control measures, the sequence should generally be as follows:

- Prior to commencing construction activities, the limits of clearing and grading shall be clearly marked. Perimeter silt fence and stabilized construction entrances shall be put in place.

- Upon completion of clearing and grubbing activities, topsoil shall be stripped from all areas to be disturbed and stockpiled. Stockpiled topsoil shall be stabilized by temporary seeding and surrounded with a perimeter silt fence.

- Temporary erosion control devices shall be installed prior to commencing earth moving activities. This includes the installation of sediment traps, diversion swales, and check dams beginning at the most downstream portions of the site and then working upstream.

- Immediately after completion of rough grading, remaining temporary erosion control shall be installed as specified, including additional silt fence, diversion swales, and check dams. Any areas not requiring further earth work shall be fine graded topsoiled and stabilized as early as possible.

Maintenance of Erosion Control Devices

The maintenance of erosion control devices will be the responsibility of the contractor. A critical part of an effective erosion control plan is a conscientious maintenance program. All erosion control devices will be cleaned and restored throughout construction to maintain their effectiveness. The Job Superintendent will monitor the condition of all devices and clean or replace them as conditions require, or as directed by the Town Engineer, Consulting Engineer, or Construction Duration Inspection. All erosion control devices shall be installed and maintained in

accordance with the approved plan, manufacturer's recommendations, and as directed by Town representatives including the Town Engineer, Highway Superintendent, and Building Inspector.

Specific maintenance shall include:

- Maintaining seeded areas including reseeding weak areas, regrading wash outs and fertilizing.
- Maintaining mulched areas including replacement of disturbed mulched areas.
- All devices shall be inspected after each rain and repaired as needed.
- Sediment shall be removed from behind silt fence when bulges start to occur and fencing reset to original condition.
- Outlets in sediment basins shall be free of silt and debris by hand raking and cleaning after each rain storm.
- Construction equipment shall not unnecessarily cross drainage swales. Crossing of drainage channels shall be by means of bridges, culverts or other approved methods.
- Culverts shall be maintained free of silt or debris.
- Tree protection fencing to be inspected daily during grading and finish grading operations.
- Daily water sprays will be used as needed or as directed by the Consulting Engineer or Village representatives. Water sprays will be used to prevent pollution from dust until construction is completed and soil cover is established.

Removal of Erosion Control Devices:

No erosion control structures shall be removed until all work upstream has been completed, stabilized, and approved by the Consulting Engineer and Town Representatives.

The removal of erosion control devices should generally be as follows:

- After construction, the temporary erosion control structures are to be removed in reverse order with the most upstream structure removed first and thence proceeding downstream.
- All hay bales (if any) shall be removed and properly disposed of off-site.
- All tree protection fencing shall be removed after adjacent areas have been graded, topsoiled, seeded, and vegetation has been established.

- All temporary construction culverts shall be removed and areas graded, topsoiled, and seeded.

- Any washouts shall be re-topsoiled and seeded.

VIII. Stormwater Infrastructure Maintenance:

Long term maintenance of all drainage pipes and treatment devices will be the responsibility of the Project Owner once construction of the project is completed.

Long term maintenance shall include the following:

Inspection: The ponds and infrastructure should be inspected periodically for the first few months after construction and on an annual basis thereafter. The drainage infrastructure should also be inspected after major storm events to ensure that the orifices, if any and inlets remain open. Particular attention should be given to:

- Evidence of clogging

- Erosion of the flow path

- Condition of the embankments

- Condition of any spillways

- Accumulation of sediment at the culvert inlets and outlets, and in the proposed swales

- Erosion of bio-swales or riprap aprons

- Sources of erosion in the contributory drainage, which should be stabilized.

Debris and Litter Control: Removal of debris and litter should be accomplished during mowing operations. Particular attention should be given to removing debris and trash around inlets and outlets to prevent clogging.

Erosion Control: Eroding soils in drainage areas should be stabilized immediately with vegetative practices or other erosion control practices. Potential problems are erosion that may occur on the embankment, slopes, and any spillways. Also, attention should be given to repositioning protective riprap where appropriate.

Sediment Removal: Sediment should be removed periodically in order to preserve the available stormwater treatment capacity of the stormwater facilities and, to prevent inlets and outlets from becoming clogged. Also, unless removed, accumulated sediment may become unsightly. While more frequent clean-out may be needed around the inlets and outlets, a typical clean-out cycle for

the entire stormwater infrastructure should range from 5 to 6 years or after 25 percent of the water quality volume capacity has been lost. Sediment excavated from the facilities is not considered toxic or hazardous material, and can be safely disposed of by either land application or land filling.

Spill Prevention: The discharge of pollutants from spills and leaks shall be prevented. Any spill shall be reported to the New York State Spill Hotline (1-800-457-7362). Federal and State law require the spiller, or responsible party, to notify government agencies and to contain, clean up, and dispose of any spilled/contaminated material in order to correct any environmental damage.

CJP
19139.01 Elkay Drive Commercial Building SWPPP
01-2020
Rev. 03-2020

APPENDIX

APPENDIX 1

Stormwater Pollution Prevention Plan (SWPPP) Certifications

I. Owner/Operator Information:

PROJECT:	Elkay Drive Commercial Building
LOCATION:	Town of Chester Orange County, New York
RECORD OWNER:	1657 Management LLC
OWNER/APPLICANT ADDRESS:	P.O. Box 96 Monroe, NY, 10954
PROJECT SITE ADDRESS:	39 Elkay Drive Chester NY, 10918

II. Certifications:

Contractor and Subcontractor Certification:

I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the Storm Water Pollution Prevention Plan (SWPPP) and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations.

Contractor responsible for project oversight:

Contractor	Print Name & Title
Signature	Date
Name of Trained Contractor	Address: Phone:

Subcontractor responsible for onsite construction and maintenance of erosion and sediment control practices and post-construction stormwater management practices included in the SWPPP:

Subcontractor	Print Name & Title
Signature	Date
Name of Trained Contractor	Address: Phone:

Additional Subcontractors and responsibility:

Subcontractor	Print Name & Title
Signature	Date
Name of Trained Contractor	Address: Phone:
Subcontractor	Print Name & Title
Signature	Date
Name of Trained Contractor	Address: Phone:

APPENDIX 2

MS4 Stormwater Pollution Prevention (SWPPP) Acceptance Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information	
1. Owner/Operator Name:	1657 Management LLC
2. Contact Person:	
3. Street Address:	
4. City/State/Zip:	
II. Project Site Information	
5. Project/Site Name:	Elkay Drive Commercial Building
6. Street Address:	39 Elkay Drive
7. City/State/Zip:	Chester, NY 10918
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	
9. Title/Position:	
10. Date Final SWPPP Reviewed and Accepted:	
IV. Regulated MS4 Information	
11. Name of MS4:	
12. MS4 SPDES Permit Identification Number: NYR20A	
13. Contact Person:	
14. Street Address:	
15. City/State/Zip:	
16. Telephone Number:	

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

APPENDIX 3

Draft Notice of Intent (NOI)

0806372691

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR [ ][ ][ ][ ][ ][ ]
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
1657 MANAGEMENT LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
BROWN

Owner/Operator Contact Person First Name
STEVE

Owner/Operator Mailing Address
P.O. BOX 96

City
MONROE

State
NY

Zip
10949 - [ ][ ][ ][ ]

Phone (Owner/Operator)
[ ][ ][ ] - [ ][ ][ ] - [ ][ ][ ][ ]

Fax (Owner/Operator)
[ ][ ][ ] - [ ][ ][ ] - [ ][ ][ ][ ]

Email (Owner/Operator)

FED TAX ID
[ ][ ] - [ ][ ][ ][ ][ ][ ][ ] (not required for individuals)

Project Site Information

Project/Site Name
ELKAY DRIVE COMMERCIAL BUILDING

Street Address (NOT P.O. BOX)
ELKAY DRIVE

Side of Street
○ North ● South ○ East ○ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
CHESTER

State NY Zip 10918- County ORANGE DEC Region

Name of Nearest Cross Street
BLACK MEADOW ROAD

Distance to Nearest Cross Street (Feet)
1000

Project In Relation to Cross Street
○ North ● South ○ East ○ West

Tax Map Numbers
Section-Block-Parcel
6-1-69.4

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you must go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting): 560258

Y Coordinates (Northing): 4576856

2. What is the nature of this construction project?

● New Construction

○ Redevelopment with increase in impervious area

○ Redevelopment with no increase in impervious area

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ● PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME — Number of Lots
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ● COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
2.8	2.6	0.0	1.2

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ Yes ● No

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
1 %	0 %	0 %	99 %

7. Is this a phased project? ○ Yes ● No

8. Enter the planned start and end dates of the disturbance activities.

Start Date 07/01/2020 – End Date 07/01/2021

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

BLACK MEADOW CREEK

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ● Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ○ Yes ● No

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ○ Yes ● No

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ Yes ● No
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ Yes ○ No
If Yes, what is the acreage to be disturbed?

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ Yes ● No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ● Yes ○ No ○ Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

TOWN OF CHESTER

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ Yes ● No ○ Unknown

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ Yes ● No

19. Is this property owned by a state authority, state agency, federal government or local government? ○ Yes ● No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ Yes ● No

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ● Yes ○ No

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ● Yes ○ No
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ● Yes ○ No

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

PIETRZAK & PFAU ENGINEERING & SURVEYING

Contact Name (Last, Space, First)

PFAU, JOSEPH, J.

Mailing Address

262 GREENWICH AVENUE

City

GOSHEN

State NY Zip 10924 -

Phone 845 - 294 - 0606

Fax 845 - 294 - 0610

Email

pietrzakpfau@pietrzakpfau.com

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name JOSEPH **MI** J

Last Name PFAU

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

26. Select all of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ● Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ● Sediment Basin
- ○ Sediment Traps
- ● Silt Fence
- ● Stabilized Construction Entrance
- ● Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ● Temporary Stormdrain Diversion
- ● Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ● Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ✓ Temporary Swale
- ● Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ● Grade Stabilization Structure
- ● Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ● Retaining Wall
- ○ Riprap Slope Protection
- ● Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ○ **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ● **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- ● All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

		0	.	1	9	0	**acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area (acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1)		and/or	
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)		and/or	
● Tree Planting/Tree Pit (RR-3)		and/or	0.037
○ Disconnection of Rooftop Runoff (RR-4)		and/or	
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			
○ Rain Garden (RR-6)			
○ Stormwater Planter (RR-7)			
○ Rain Barrel/Cistern (RR-8)			
○ Porous Pavement (RR-9)			
○ Green Roof (RR-10)			
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			
● Infiltration Basin (I-2)			0.822
○ Dry Well (I-3)			
○ Underground Infiltration System (I-4)			
○ Bioretention (F-5)			
○ Dry Swale (O-1)			
Standard SMPs			
○ Micropool Extended Detention (P-1)			
○ Wet Pond (P-2)			
○ Wet Extended Detention (P-3)			
○ Multiple Pond System (P-4)			
● Pocket Pond (P-5)			0.356
○ Surface Sand Filter (F-1)			
○ Underground Sand Filter (F-2)			
○ Perimeter Sand Filter (F-3)			
○ Organic Filter (F-4)			
○ Shallow Wetland (W-1)			
○ Extended Detention Wetland (W-2)			
○ Pond/Wetland System (W-3)			
○ Pocket Wetland (W-4)			
○ Wet Swale (O-2)			

Table 2 - Alternative SMPs
(DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area (acres)
○ Hydrodynamic	
○ Wet Vault	
○ Media Filter	
○ Other [ ]	

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name

Manufacturer

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

0.103 acre-feet

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ Yes ● No

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

0.027 acre-feet

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

● Yes ○ No

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

0.090 acre-feet

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

0.193

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ● Yes ○ No

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

0.471 acre-feet

CPv Provided

0.471 acre-feet

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

● Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

23.82 CFS

Post-development

19.72 CFS

Total Extreme Flood Control Criteria (Qf)

Pre-Development

52.88 CFS

Post-development

50.95 CFS

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ● Yes ○ No

If Yes, Identify the entity responsible for the long term Operation and Maintenance

O	W	N	E	R																												

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- O Air Pollution Control
- O Coastal Erosion
- O Hazardous Waste
- O Long Island Wells
- O Mined Land Reclamation
- O Solid Waste
- O Navigable Waters Protection / Article 15
- O Water Quality Certificate
- O Dam Safety
- O Water Supply
- O Freshwater Wetlands/Article 24
- O Tidal Wetlands
- O Wild, Scenic and Recreational Rivers
- O Stream Bed or Bank Protection / Article 15
- O Endangered or Threatened Species(Incidental Take Permit)
- O Individual SPDES
- O SPDES Multi-Sector GP [N][Y][R][ ][ ][ ][ ][ ][ ]
- O Other [ ]
- ● None

41. Does this project require a US Army Corps of Engineers Wetland Permit? O Yes ● No
If Yes, Indicate Size of Impact. [ ][ ][ ][ ][ ].[ ]

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ● Yes O No
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? O Yes O No

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. [N][Y][R][ ][ ][ ][ ][ ][ ]

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

MI

Print Last Name

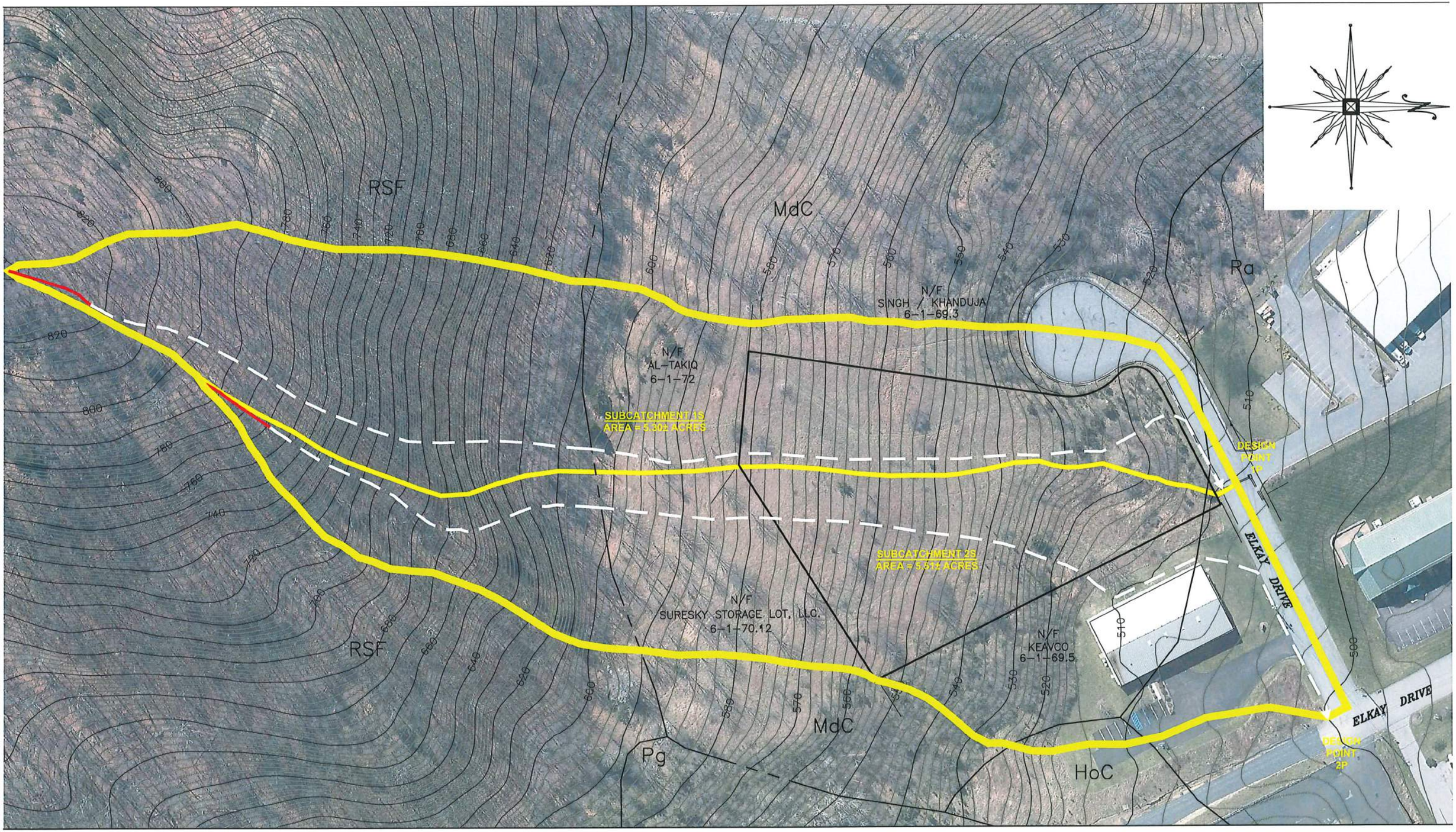
Owner/Operator Signature

Date

/ /

APPENDIX 4

Drainage Basin Maps



PIETRZAK & PFAU
ENGINEERING & SURVEYING, PLLC

262 GREENWICH AVENUE, SUITE A
GOSHEN, NEW YORK 10924
TEL: (845) 294-0606

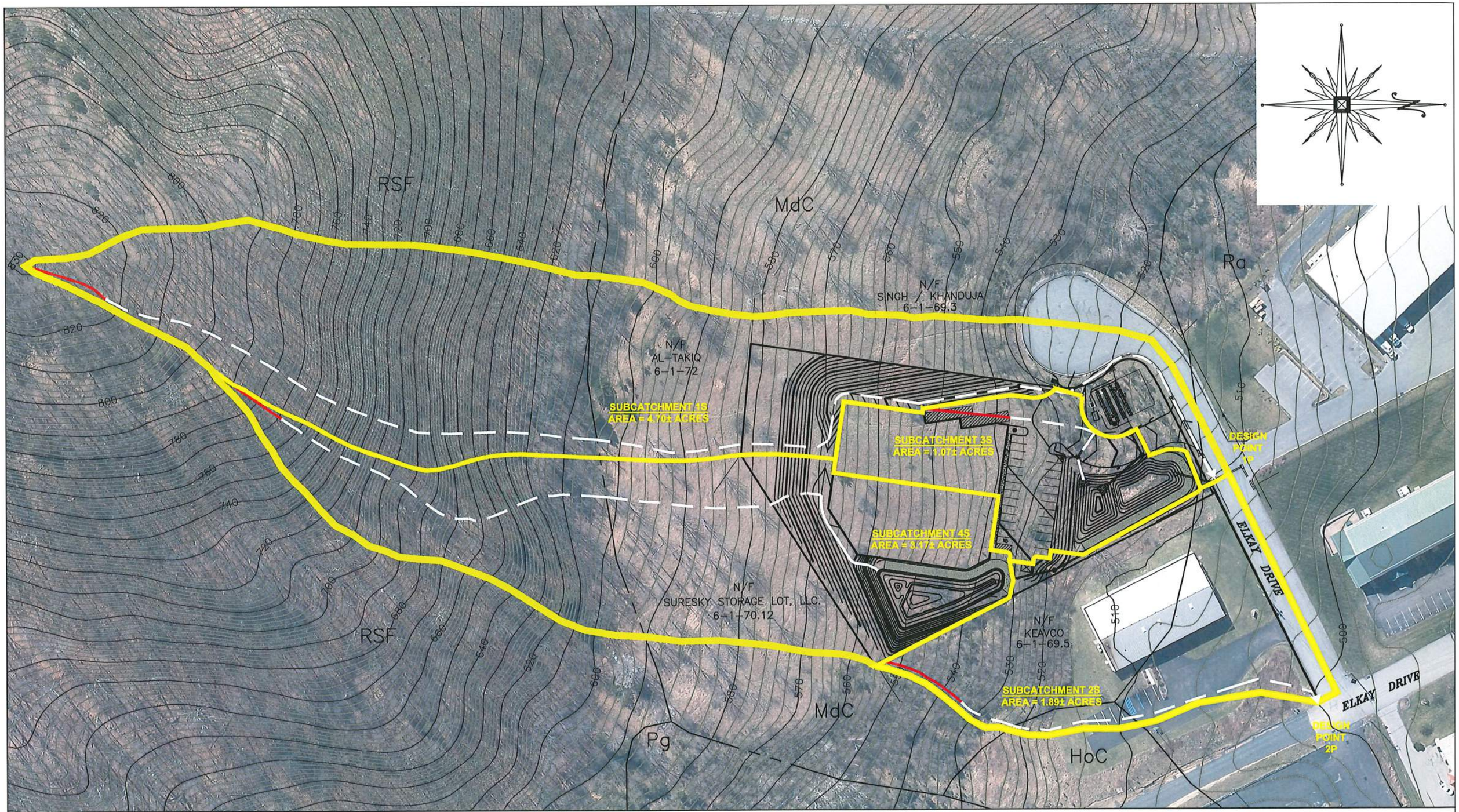
SCALE: 1"=100'

EXISTING CONDITIONS

TOWN OF CHESTER
COUNTY OF ORANGE, NEW YORK
SECTION 6 BLOCK 1 LOT 69.4

LEGEND

- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- DRAINAGE BASIN BOUNDARY
- SOILS LINE BOUNDARY



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TEL: (845) 294-0606

SCALE: 1"=100'

PROPOSED CONDITIONS

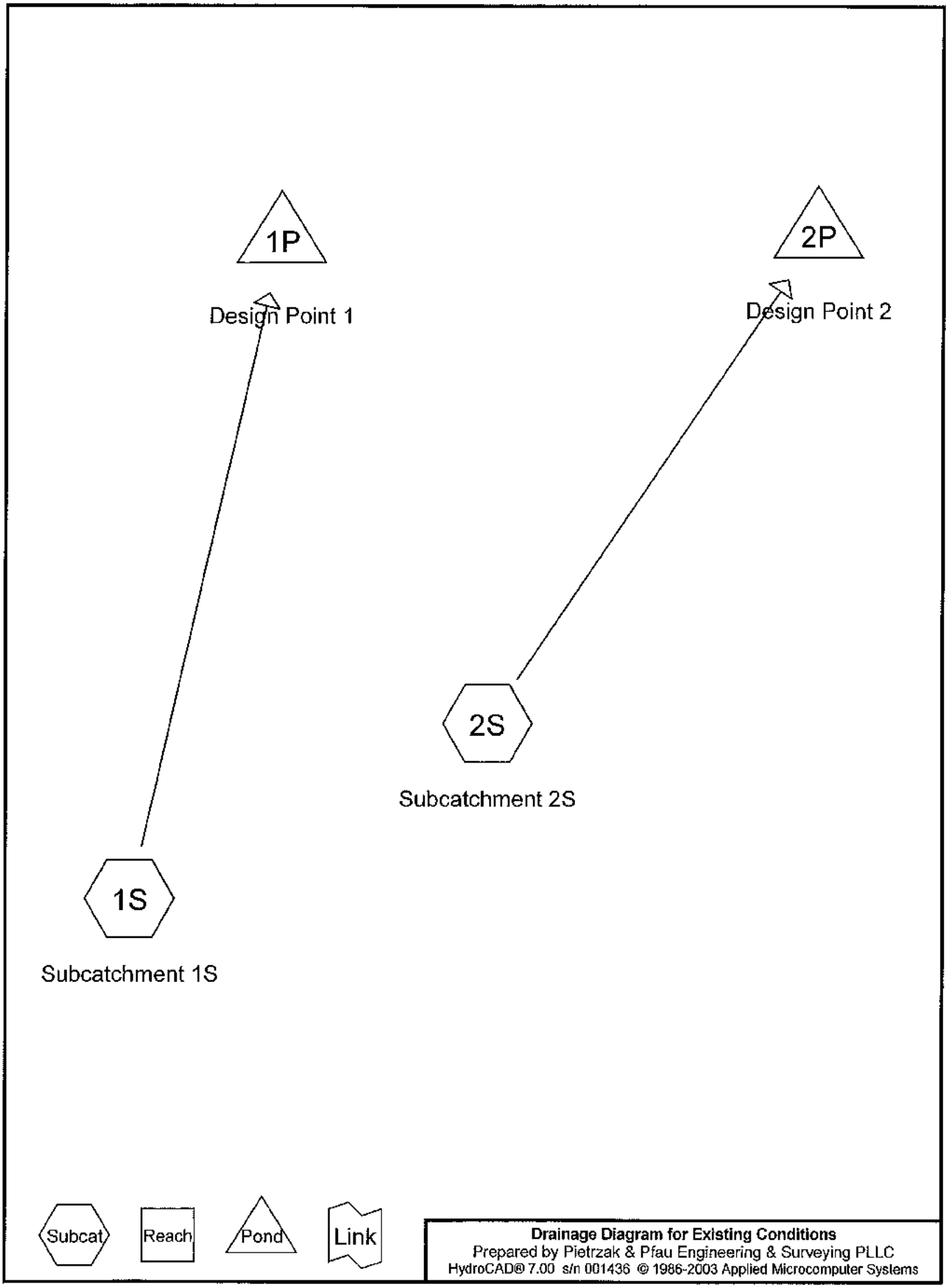
TOWN OF CHESTER
COUNTY OF ORANGE, NEW YORK
SECTION 6 BLOCK 1 LOT 69.4

LEGEND

- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- DRAINAGE BASIN BOUNDARY
- SOILS LINE BOUNDARY

APPENDIX 5

TR-20 Hydro-CAD Calculations – Existing Conditions



Drainage Diagram for Existing Conditions
Prepared by Pietrzak & Pfau Engineering & Surveying PLLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=5.303 ac Runoff Depth=0.93"
Flow Length=1,453' Tc=21.1 min CN=79 Runoff=3.68 cfs 0.413 af

Subcatchment 2S: Subcatchment 2S Runoff Area=5.511 ac Runoff Depth=1.05"
Flow Length=1,450' Tc=16.5 min CN=81 Runoff=4.79 cfs 0.481 af

Pond 1P: Design Point 1 Inflow=3.68 cfs 0.413 af
Primary=3.68 cfs 0.413 af

Pond 2P: Design Point 2 Inflow=4.79 cfs 0.481 af
Primary=4.79 cfs 0.481 af

Total Runoff Area = 10.814 ac Runoff Volume = 0.894 af Average Runoff Depth = 0.99"

Subcatchment 1S: Subcatchment 1S

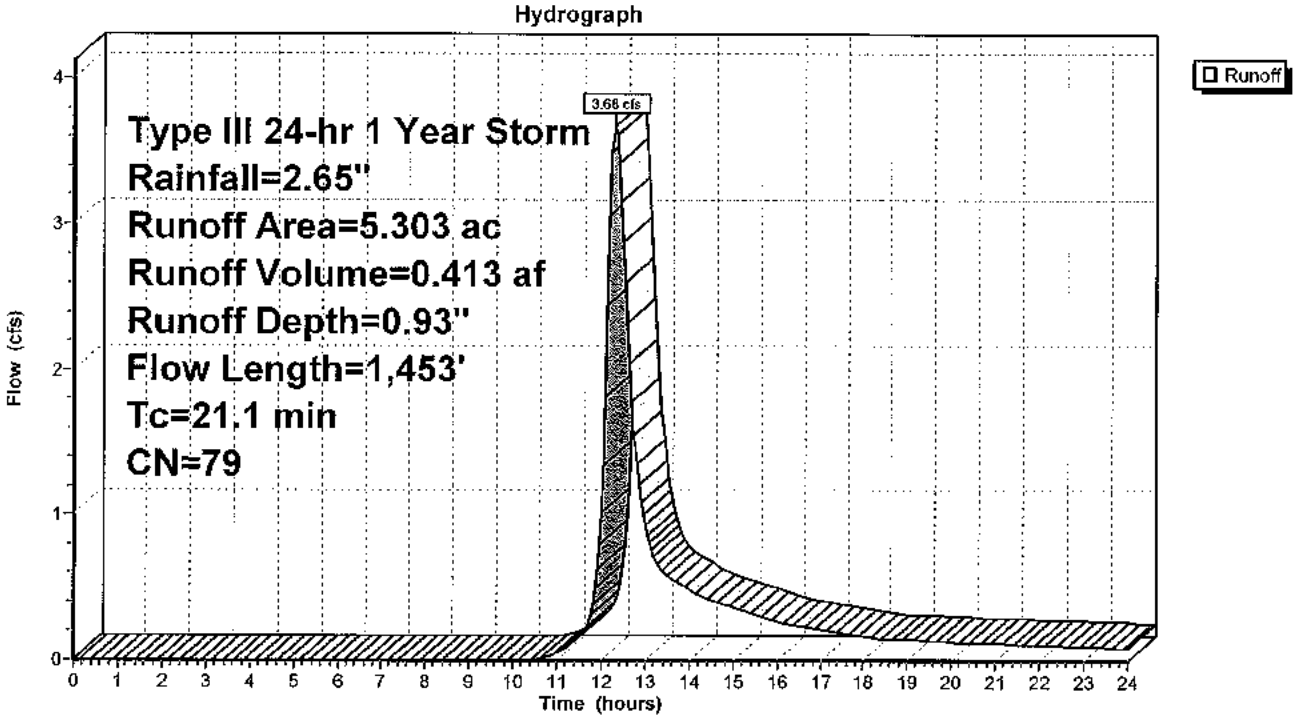
Runoff = 3.68 cfs @ 12.31 hrs, Volume= 0.413 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Year Storm Rainfall=2.65"

Area (ac)	CN	Description
0.198	98	Paved parking & roofs
2.430	78	Meadow, non-grazed, HSG D
2.675	79	Woods, Fair, HSG D
5.303	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
4.4	678	0.1327	2.5		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.1	80	0.0467	9.1	27.41	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
21.1	1,453	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

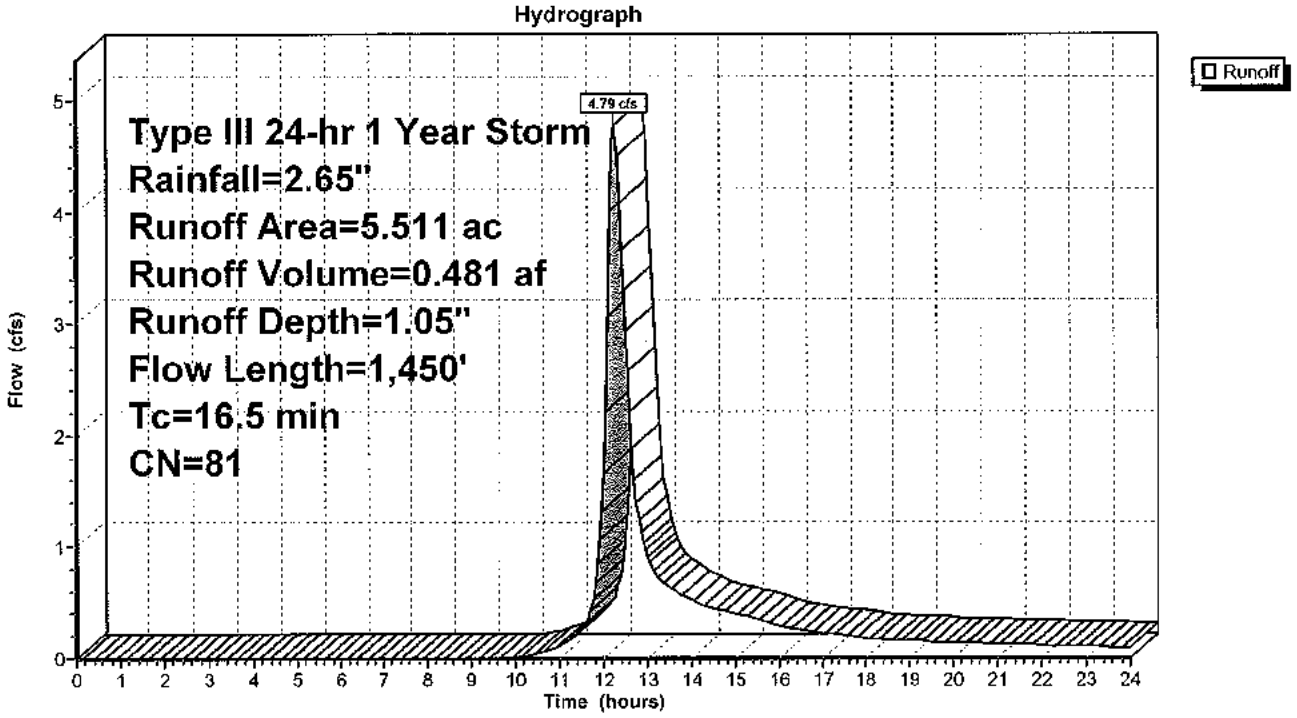
Runoff = 4.79 cfs @ 12.24 hrs, Volume= 0.481 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Year Storm Rainfall=2.65"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
1.741	79	Woods, Fair, HSG D
2.572	78	Meadow, non-grazed, HSG D
0.540	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
5.511	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
6.8	942	0.1080	2.3		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
16.5	1,450	Total			

Subcatchment 2S: Subcatchment 2S

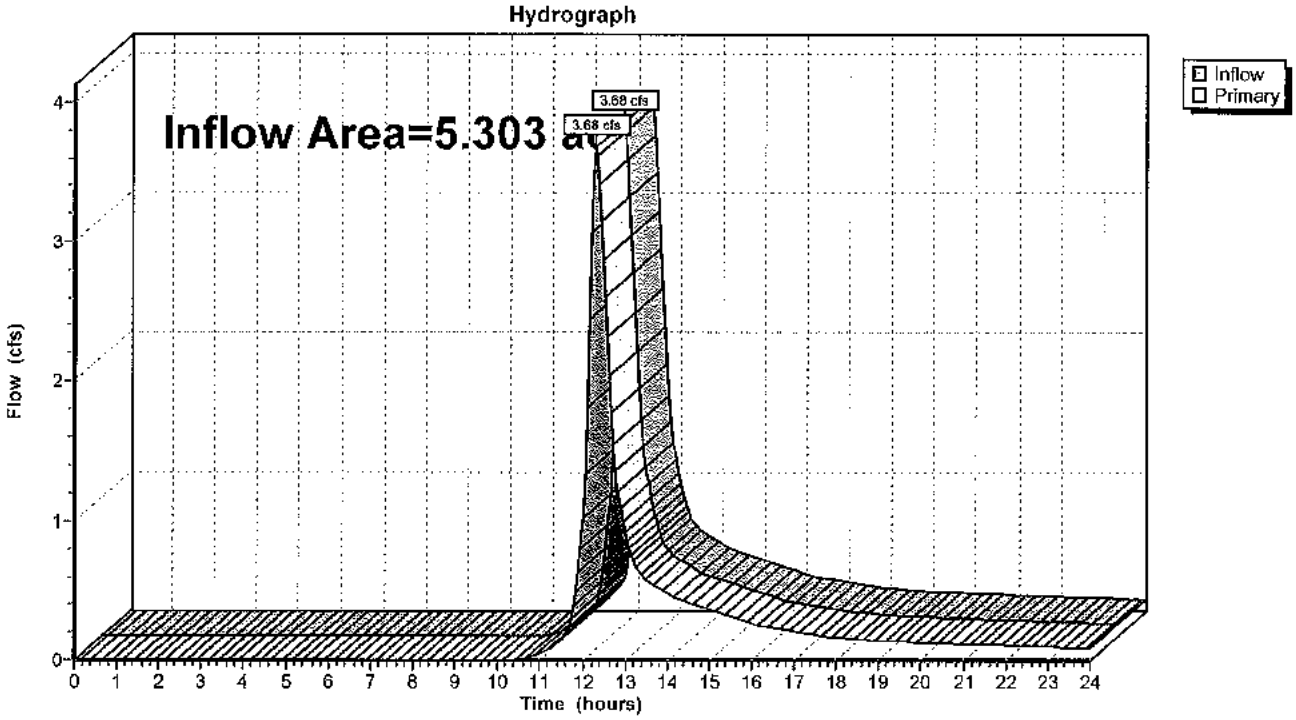


Pond 1P: Design Point 1

Inflow Area = 5.303 ac, Inflow Depth = 0.93" for 1 Year Storm event
Inflow = 3.68 cfs @ 12.31 hrs, Volume= 0.413 af
Primary = 3.68 cfs @ 12.31 hrs, Volume= 0.413 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

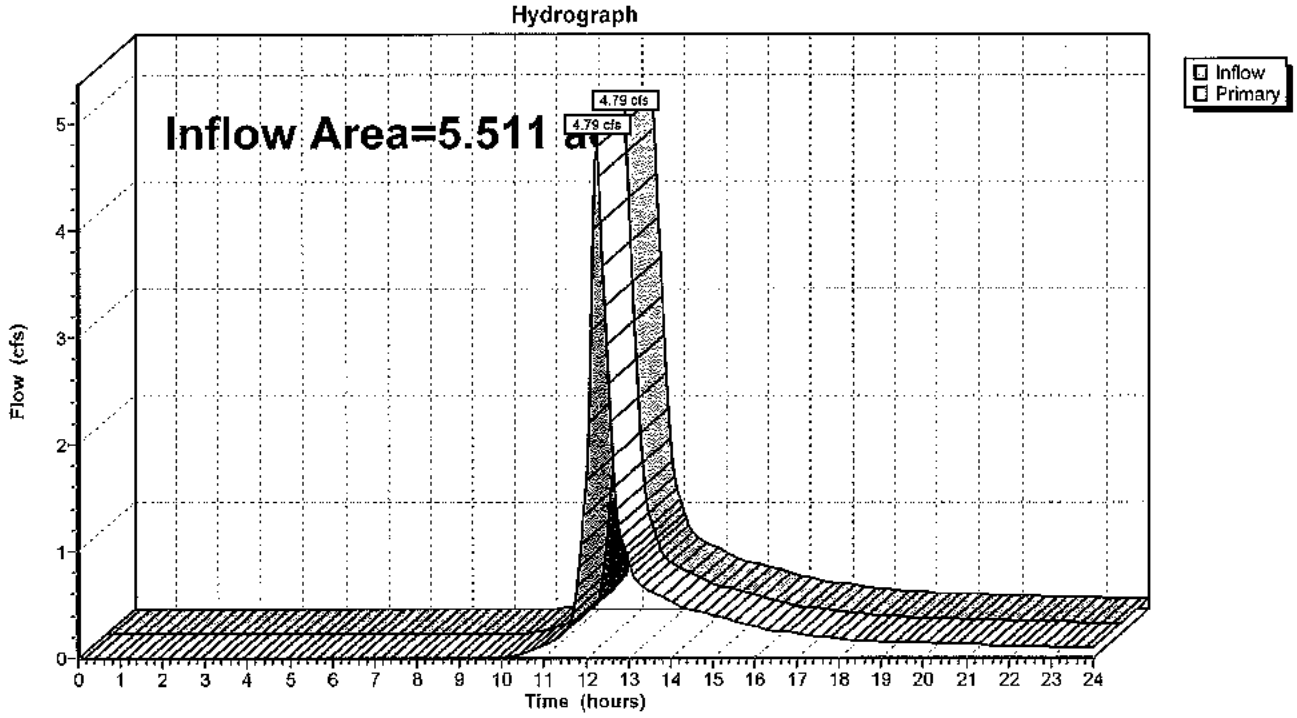


Pond 2P: Design Point 2

Inflow Area = 5.511 ac, Inflow Depth = 1.05" for 1 Year Storm event
Inflow = 4.79 cfs @ 12.24 hrs, Volume= 0.481 af
Primary = 4.79 cfs @ 12.24 hrs, Volume= 0.481 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=5.303 ac Runoff Depth=2.61"
Flow Length=1,453' Tc=21.1 min CN=79 Runoff=10.71 cfs 1.154 af

Subcatchment 2S: Subcatchment 2S Runoff Area=5.511 ac Runoff Depth=2.79"
Flow Length=1,450' Tc=16.5 min CN=81 Runoff=13.11 cfs 1.282 af

Pond 1P: Design Point 1 Inflow=10.71 cfs 1.154 af
Primary=10.71 cfs 1.154 af

Pond 2P: Design Point 2 Inflow=13.11 cfs 1.282 af
Primary=13.11 cfs 1.282 af

Total Runoff Area = 10.814 ac Runoff Volume = 2.436 af Average Runoff Depth = 2.70"

Subcatchment 1S: Subcatchment 1S

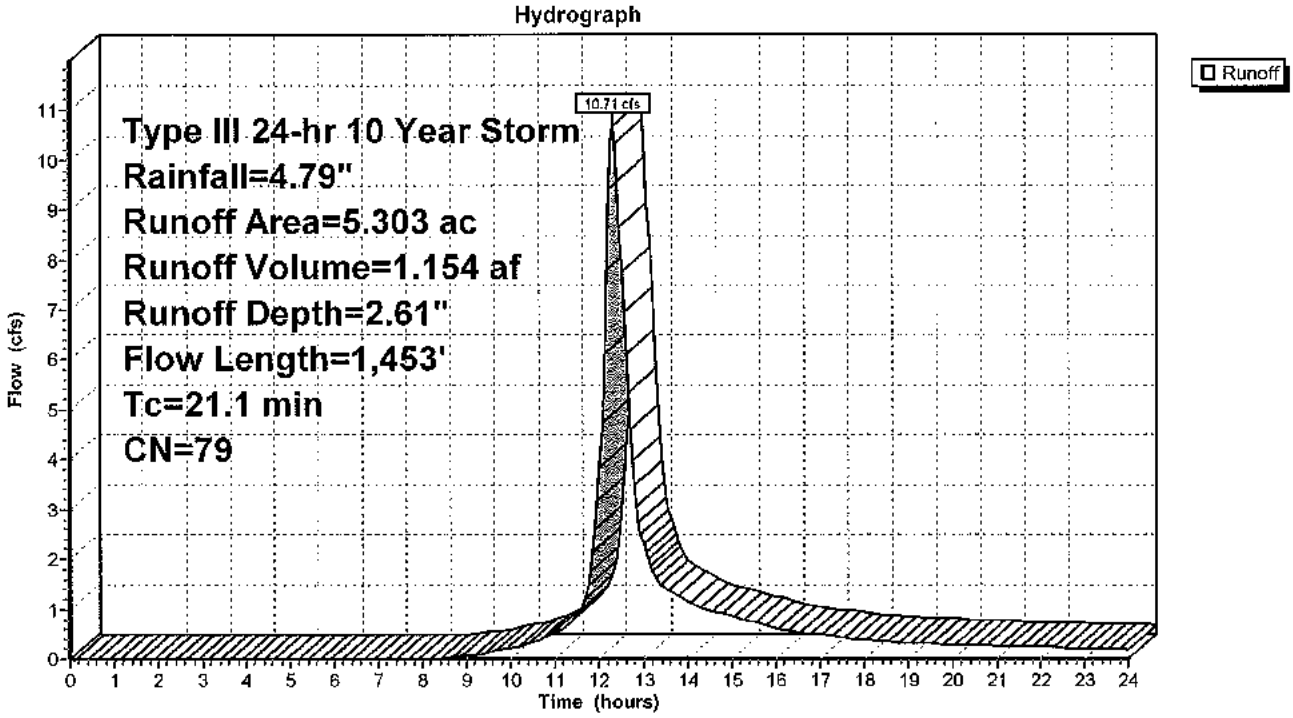
Runoff = 10.71 cfs @ 12.29 hrs, Volume= 1.154 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.79"

Area (ac)	CN	Description
0.198	98	Paved parking & roofs
2.430	78	Meadow, non-grazed, HSG D
2.675	79	Woods, Fair, HSG D
5.303	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
4.4	678	0.1327	2.5		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.1	80	0.0467	9.1	27.41	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
21.1	1,453	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

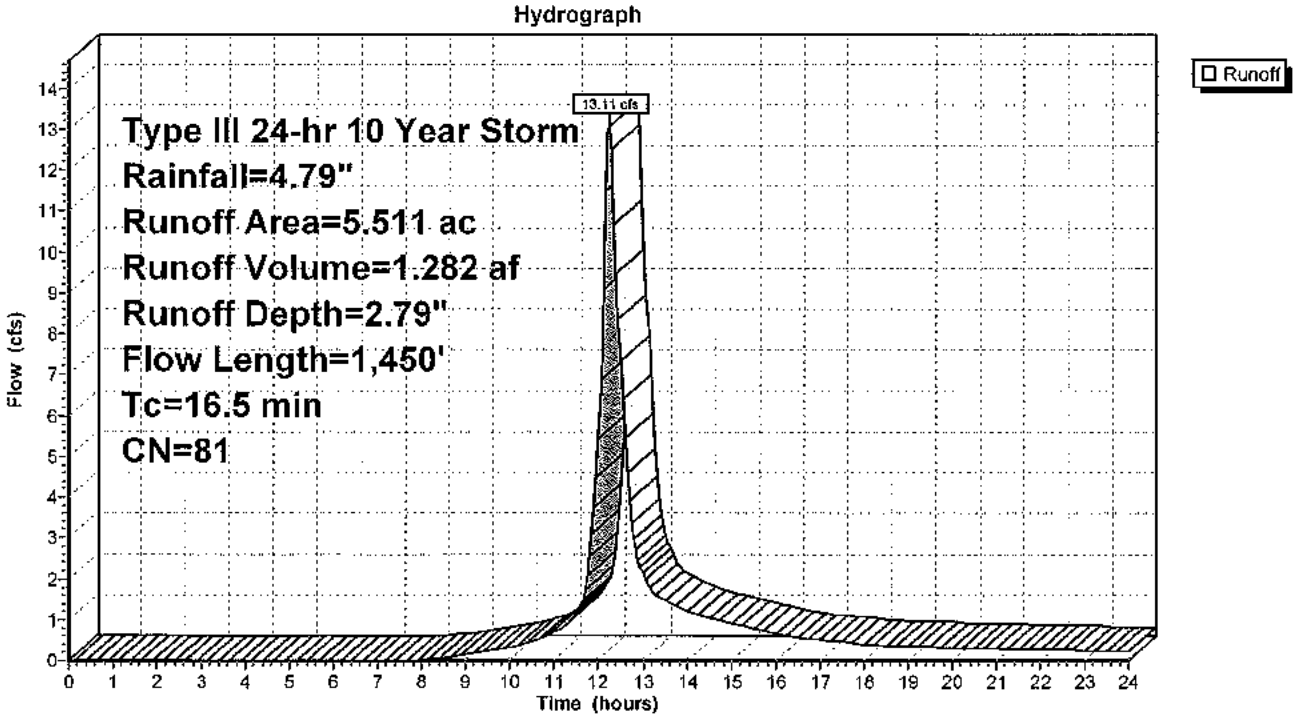
Runoff = 13.11 cfs @ 12.23 hrs, Volume= 1.282 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.79"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
1.741	79	Woods, Fair, HSG D
2.572	78	Meadow, non-grazed, HSG D
0.540	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
5.511	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
6.8	942	0.1080	2.3		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
16.5	1,450	Total			

Subcatchment 2S: Subcatchment 2S

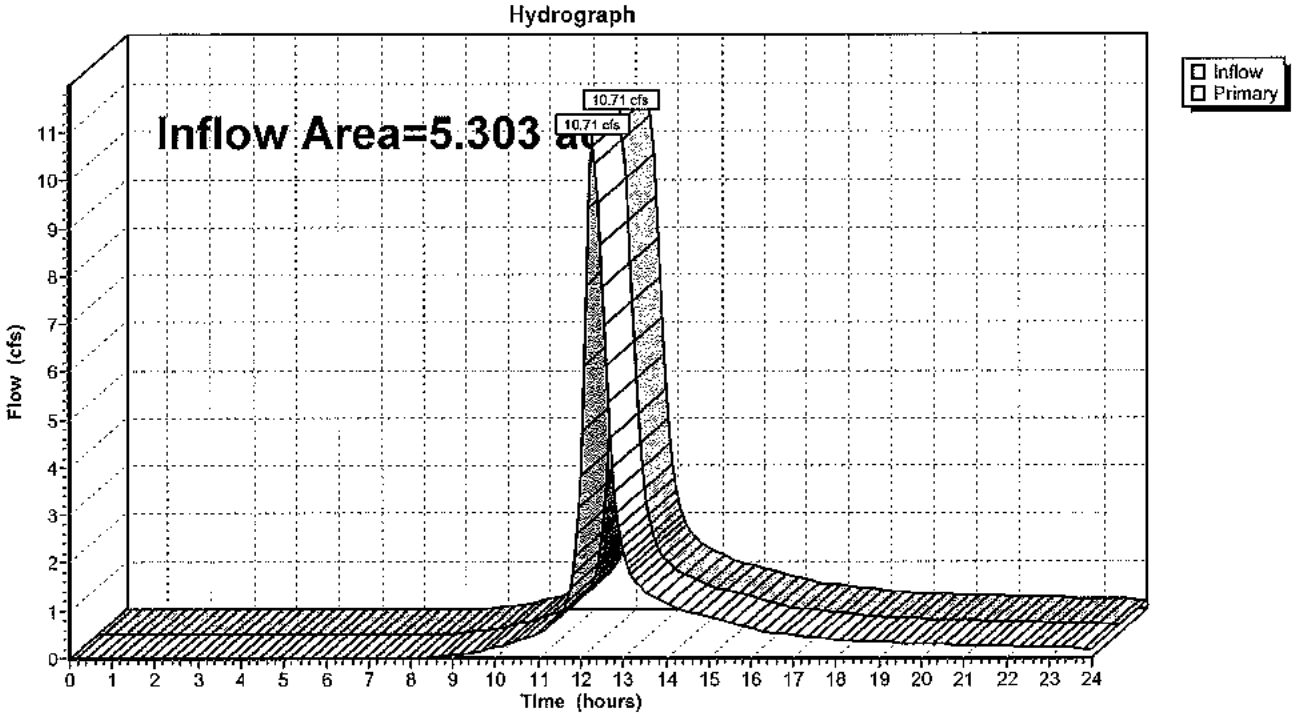


Pond 1P: Design Point 1

Inflow Area = 5.303 ac, Inflow Depth = 2.61" for 10 Year Storm event
Inflow = 10.71 cfs @ 12.29 hrs, Volume= 1.154 af
Primary = 10.71 cfs @ 12.29 hrs, Volume= 1.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

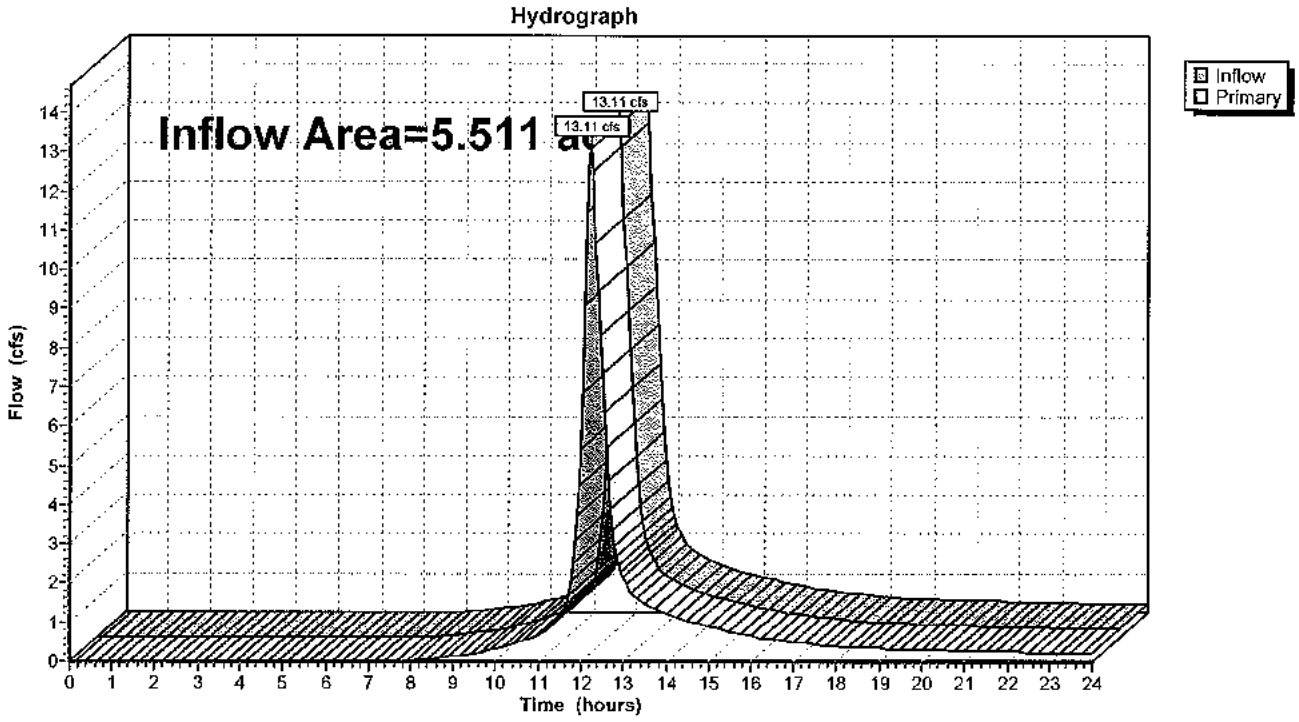


Pond 2P: Design Point 2

Inflow Area = 5.511 ac, Inflow Depth = 2.79" for 10 Year Storm event
Inflow = 13.11 cfs @ 12.23 hrs, Volume= 1.282 af
Primary = 13.11 cfs @ 12.23 hrs, Volume= 1.282 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=5.303 ac Runoff Depth=5.96"
Flow Length=1,453' Tc=21.1 min CN=79 Runoff=24.17 cfs 2.635 af

Subcatchment 2S: Subcatchment 2S Runoff Area=5.511 ac Runoff Depth=6.21"
Flow Length=1,450' Tc=16.5 min CN=81 Runoff=28.71 cfs 2.851 af

Pond 1P: Design Point 1 Inflow=24.17 cfs 2.635 af
Primary=24.17 cfs 2.635 af

Pond 2P: Design Point 2 Inflow=28.71 cfs 2.851 af
Primary=28.71 cfs 2.851 af

Total Runoff Area = 10.814 ac Runoff Volume = 5.487 af Average Runoff Depth = 6.09"

Subcatchment 1S: Subcatchment 1S

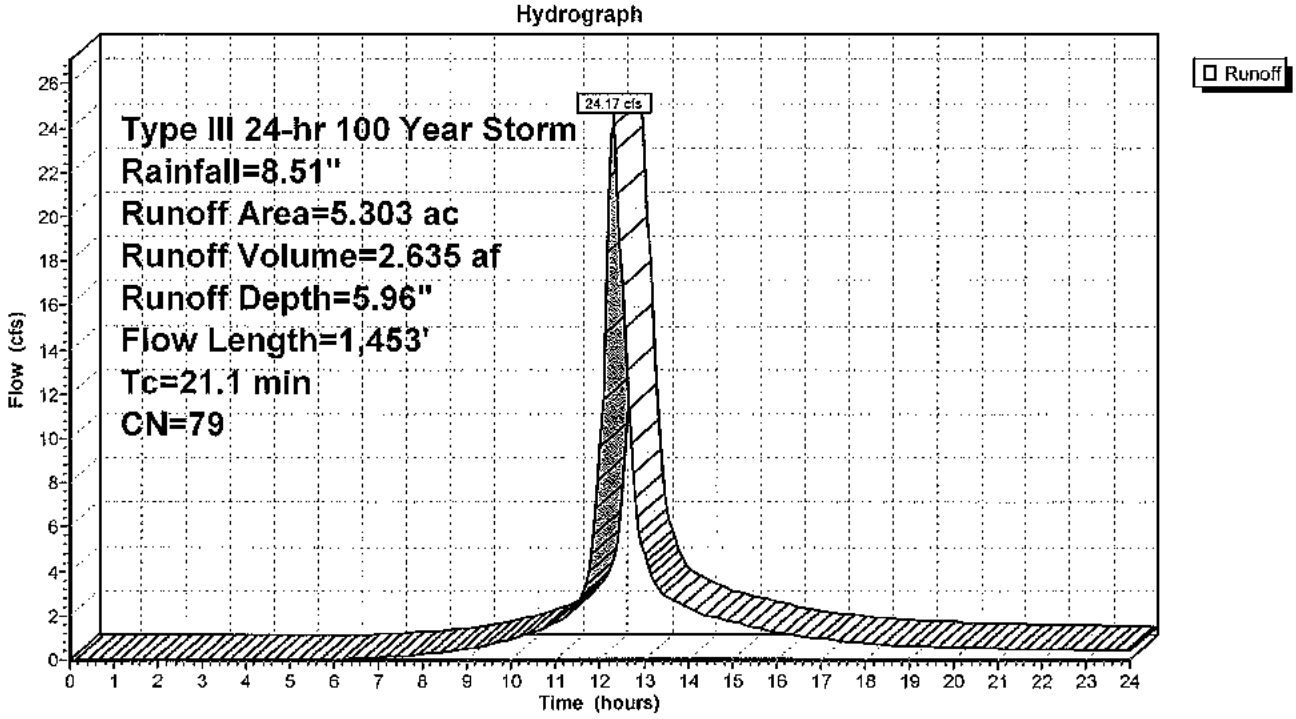
Runoff = 24.17 cfs @ 12.29 hrs, Volume= 2.635 af, Depth= 5.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=8.51"

Area (ac)	CN	Description
0.198	98	Paved parking & roofs
2.430	78	Meadow, non-grazed, HSG D
2.675	79	Woods, Fair, HSG D
5.303	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
4.4	678	0.1327	2.5		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.1	80	0.0467	9.1	27.41	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
21.1	1,453	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

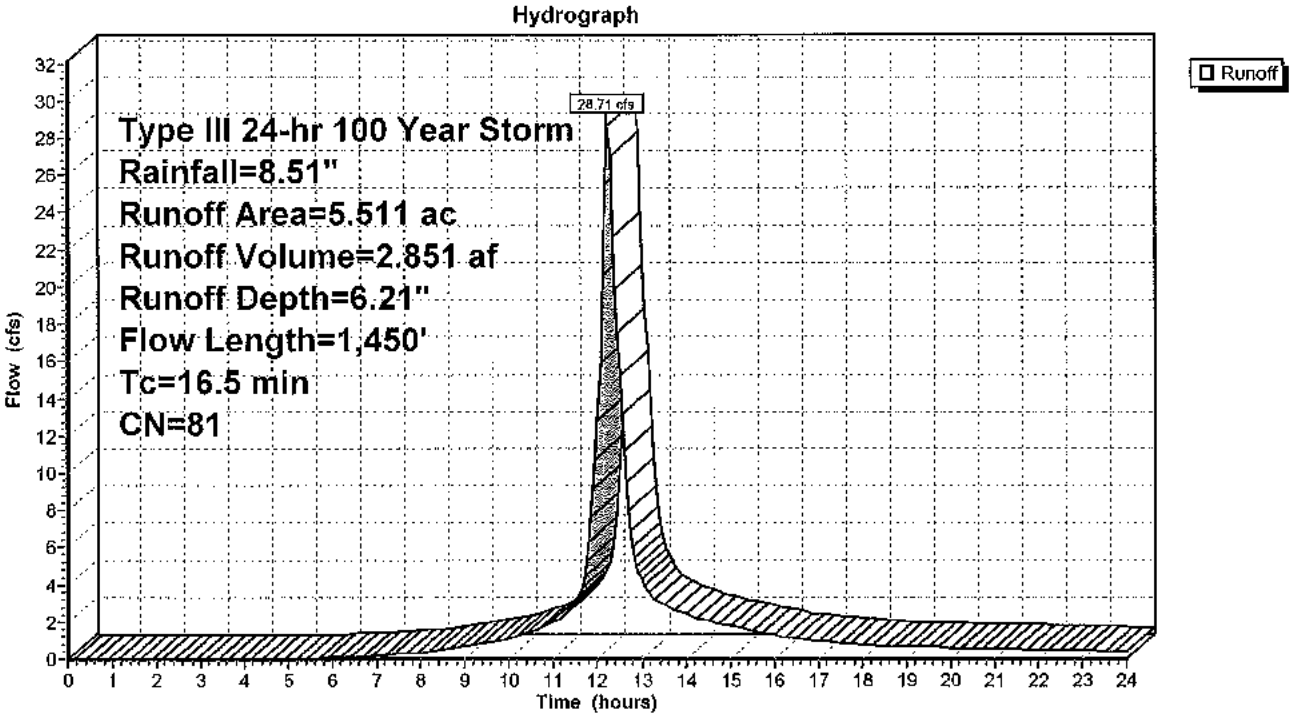
Runoff = 28.71 cfs @ 12.22 hrs, Volume= 2.851 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=8.51"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
1.741	79	Woods, Fair, HSG D
2.572	78	Meadow, non-grazed, HSG D
0.540	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
5.511	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
6.8	942	0.1080	2.3		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
16.5	1,450	Total			

Subcatchment 2S: Subcatchment 2S

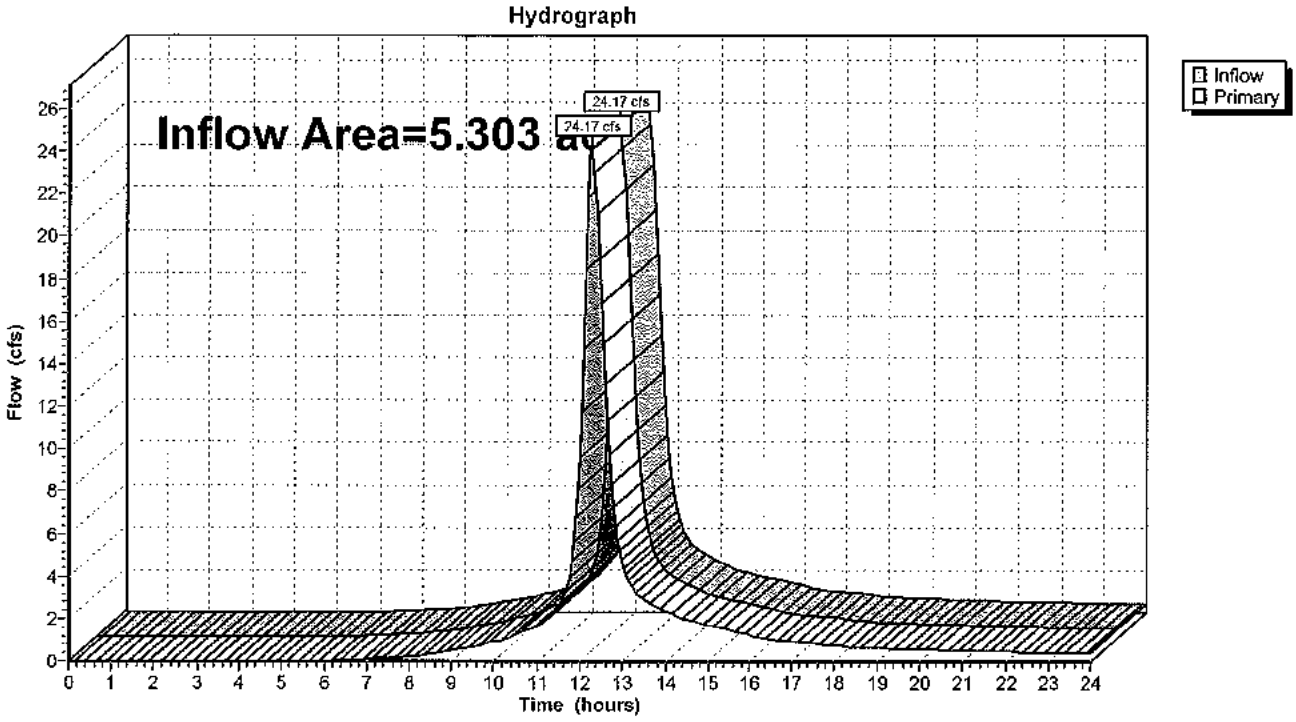


Pond 1P: Design Point 1

Inflow Area = 5.303 ac, Inflow Depth = 5.96" for 100 Year Storm event
Inflow = 24.17 cfs @ 12.29 hrs, Volume= 2.635 af
Primary = 24.17 cfs @ 12.29 hrs, Volume= 2.635 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

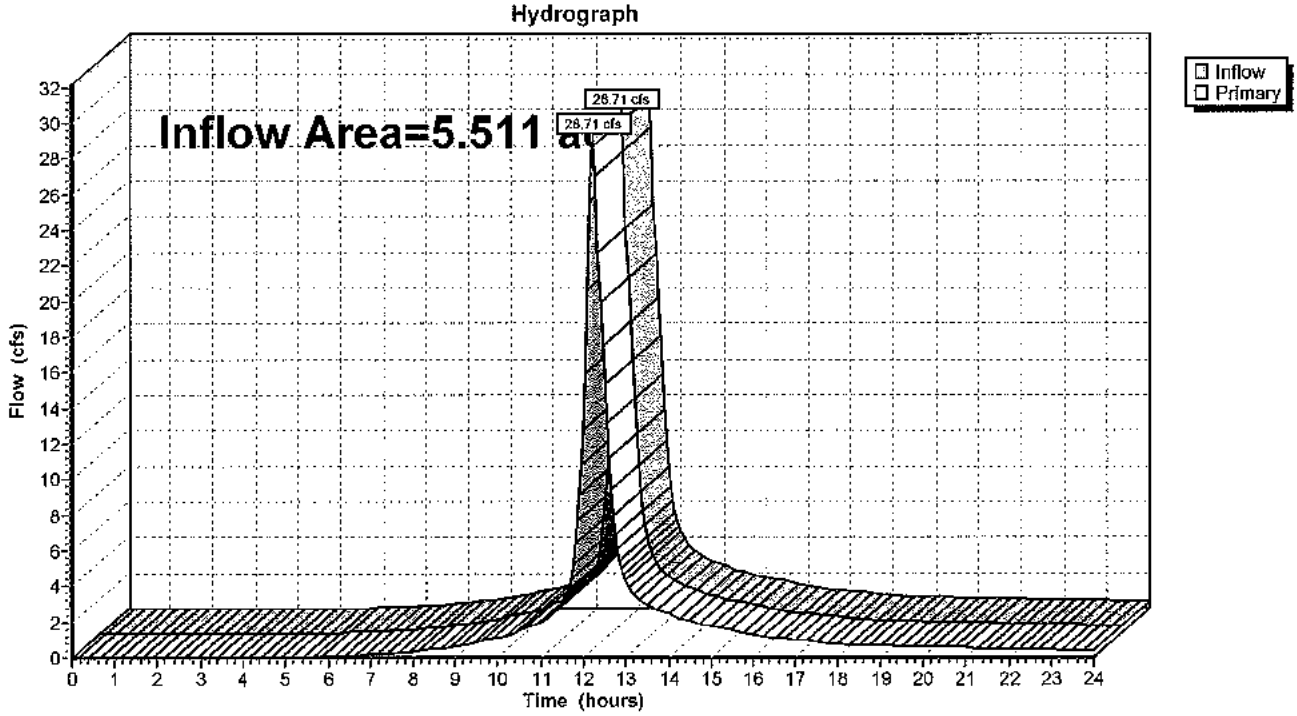


Pond 2P: Design Point 2

Inflow Area = 5.511 ac, Inflow Depth = 6.21" for 100 Year Storm event
Inflow = 28.71 cfs @ 12.22 hrs, Volume= 2.851 af
Primary = 28.71 cfs @ 12.22 hrs, Volume= 2.851 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=5.303 ac Runoff Depth=0.20"
Flow Length=1,453' Tc=21.1 min CN=79 Runoff=0.58 cfs 0.090 af

Subcatchment 2S: Subcatchment 2S Runoff Area=5.511 ac Runoff Depth=0.25"
Flow Length=1,450' Tc=16.5 min CN=81 Runoff=0.91 cfs 0.116 af

Pond 1P: Design Point 1 Inflow=0.58 cfs 0.090 af
Primary=0.58 cfs 0.090 af

Pond 2P: Design Point 2 Inflow=0.91 cfs 0.116 af
Primary=0.91 cfs 0.116 af

Total Runoff Area = 10.814 ac Runoff Volume = 0.206 af Average Runoff Depth = 0.23"

Subcatchment 1S: Subcatchment 1S

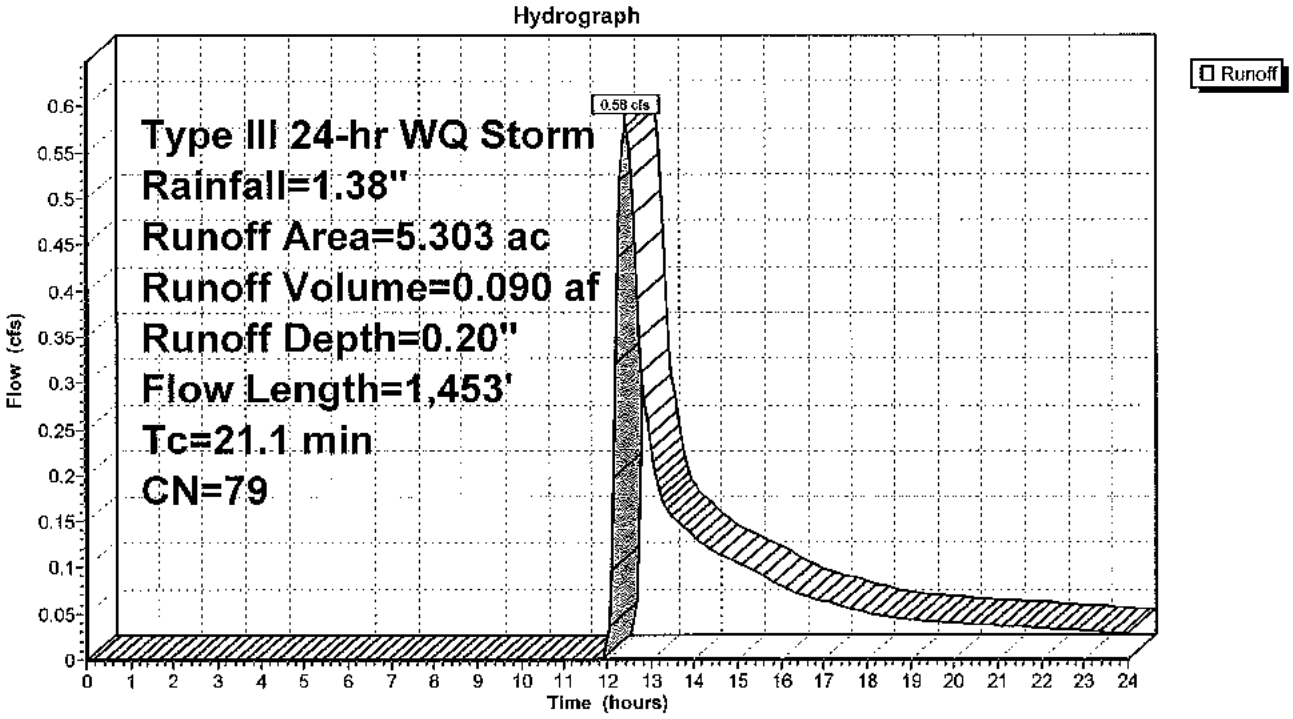
Runoff = 0.58 cfs @ 12.41 hrs, Volume= 0.090 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.38"

Area (ac)	CN	Description
0.198	98	Paved parking & roofs
2.430	78	Meadow, non-grazed, HSG D
2.675	79	Woods, Fair, HSG D
5.303	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
4.4	678	0.1327	2.5		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.1	80	0.0467	9.1	27.41	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
21.1	1,453	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

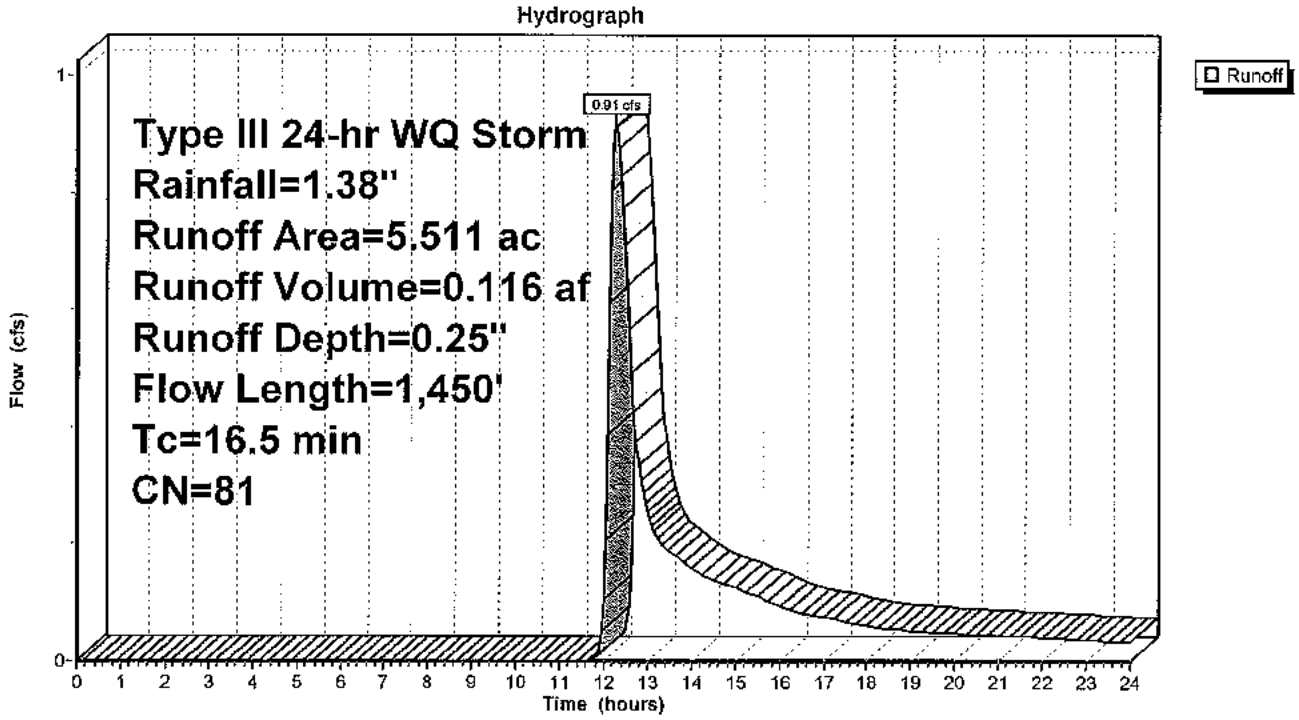
Runoff = 0.91 cfs @ 12.29 hrs, Volume= 0.116 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.38"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
1.741	79	Woods, Fair, HSG D
2.572	78	Meadow, non-grazed, HSG D
0.540	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
5.511	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
6.8	942	0.1080	2.3		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
16.5	1,450	Total			

Subcatchment 2S: Subcatchment 2S

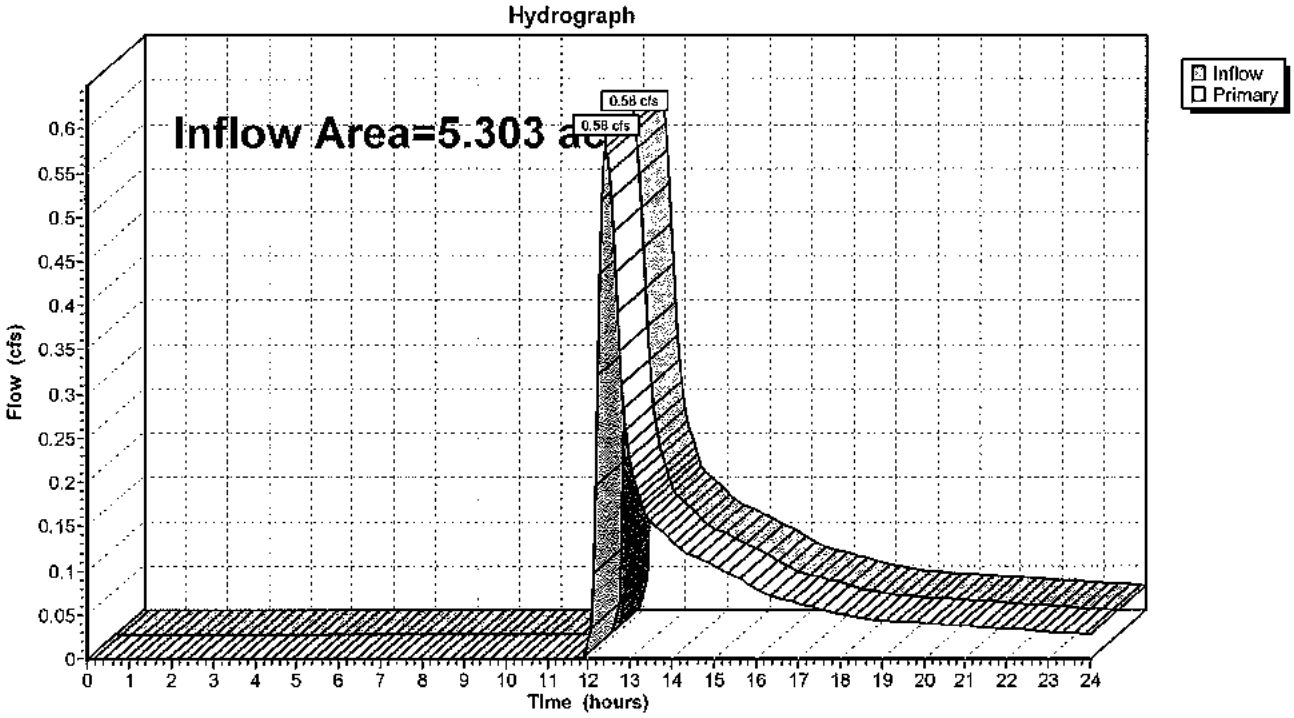


Pond 1P: Design Point 1

Inflow Area = 5.303 ac, Inflow Depth = 0.20" for WQ Storm event
Inflow = 0.58 cfs @ 12.41 hrs, Volume= 0.090 af
Primary = 0.58 cfs @ 12.41 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

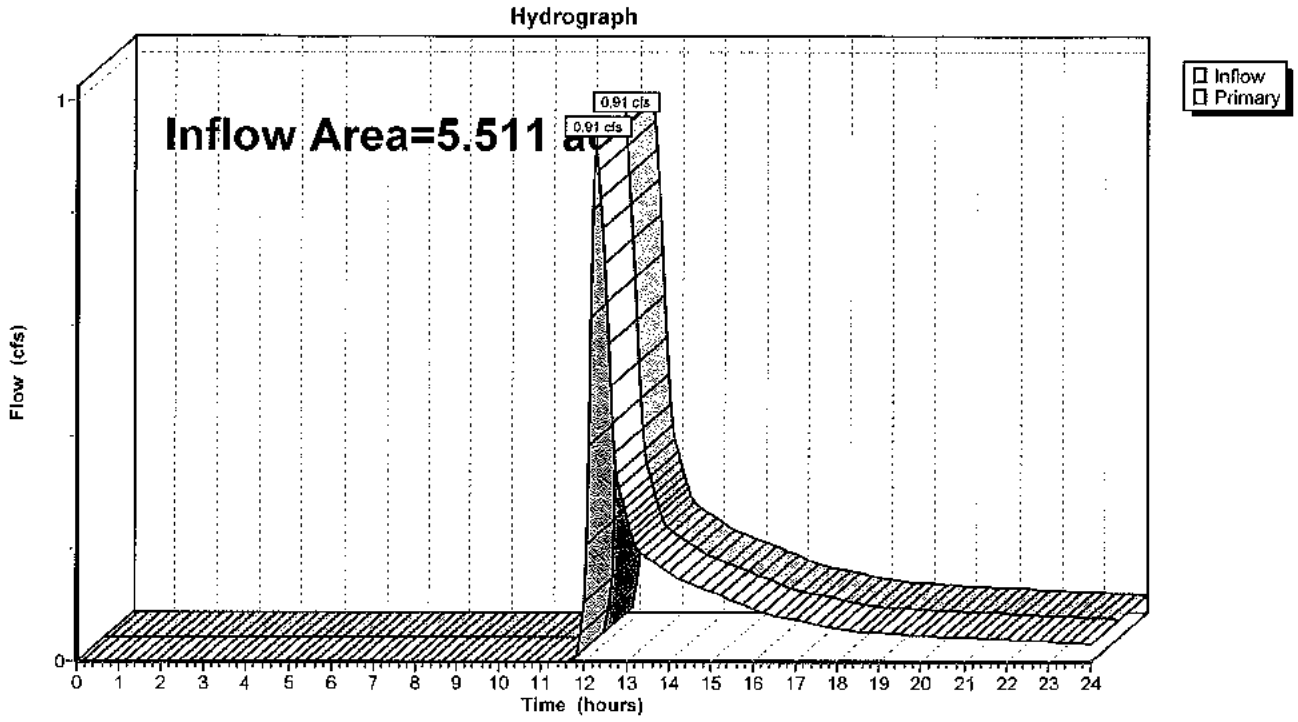


Pond 2P: Design Point 2

Inflow Area = 5.511 ac, Inflow Depth = 0.25" for WQ Storm event
Inflow = 0.91 cfs @ 12.29 hrs, Volume= 0.116 af
Primary = 0.91 cfs @ 12.29 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

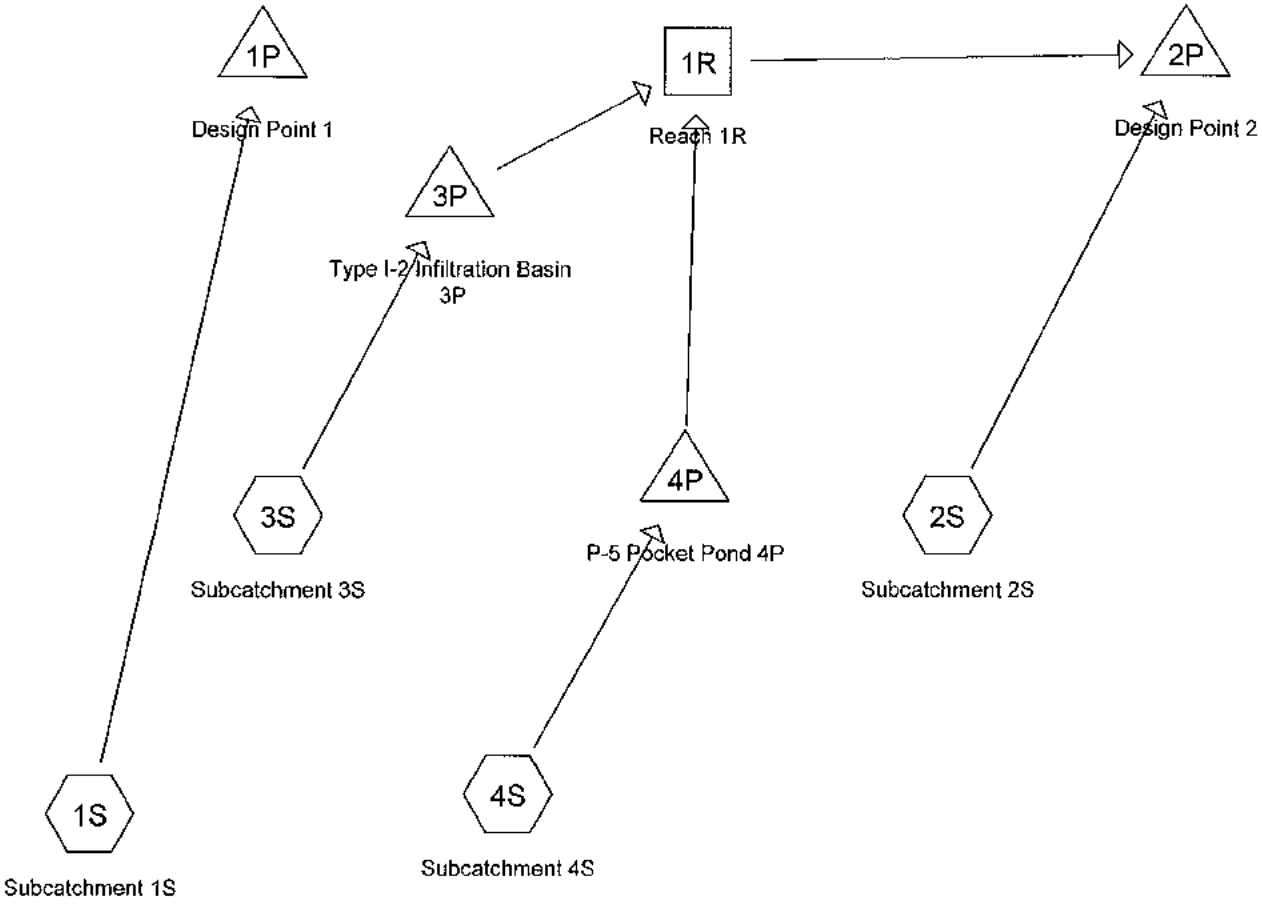
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



APPENDIX 6

TR-20 Hydro-CAD Calculations – Proposed Conditions



Subcat Reach Pond Link

Drainage Diagram for Proposed Conditions R1
Prepared by Pietrzak & Pfau Engineering & Surveying PLLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=4.696 ac Runoff Depth=1.05"
Flow Length=1,539' Tc=19.1 min CN=81 Runoff=3.85 cfs 0.409 af

Subcatchment 2S: Subcatchment 2S Runoff Area=1.885 ac Runoff Depth=1.36"
Flow Length=530' Tc=11.8 min CN=86 Runoff=2.48 cfs 0.214 af

Subcatchment 3S: Subcatchment 3S Runoff Area=1.065 ac Runoff Depth=2.01"
Flow Length=258' Tc=2.1 min CN=94 Runoff=2.66 cfs 0.179 af

Subcatchment 4S: Subcatchment 4S Runoff Area=3.165 ac Runoff Depth=1.11"
Flow Length=874' Tc=11.4 min CN=82 Runoff=3.36 cfs 0.292 af

Reach 1R: Reach 1R Peak Depth=0.08' Max Vel=3.7 fps Inflow=0.14 cfs 0.139 af
D=18.0" n=0.011 L=270.0' S=0.0352 '/' Capacity=23.29 cfs Outflow=0.14 cfs 0.138 af

Pond 1P: Design Point 1 Inflow=3.85 cfs 0.409 af
Primary=3.85 cfs 0.409 af

Pond 2P: Design Point 2 Inflow=2.55 cfs 0.352 af
Primary=2.55 cfs 0.352 af

Pond 3P: Type I-2 Infiltration Basin 3P Peak Elev=513.35' Storage=1,616 cf Inflow=2.66 cfs 0.179 af
Primary=0.00 cfs 0.000 af Secondary=0.75 cfs 0.179 af Outflow=0.75 cfs 0.179 af

Pond 4P: P-5 Pocket Pond 4P Peak Elev=528.38' Storage=8,123 cf Inflow=3.36 cfs 0.292 af
Outflow=0.14 cfs 0.139 af

Total Runoff Area = 10.811 ac Runoff Volume = 1.094 af Average Runoff Depth = 1.21"

Subcatchment 1S: Subcatchment 1S

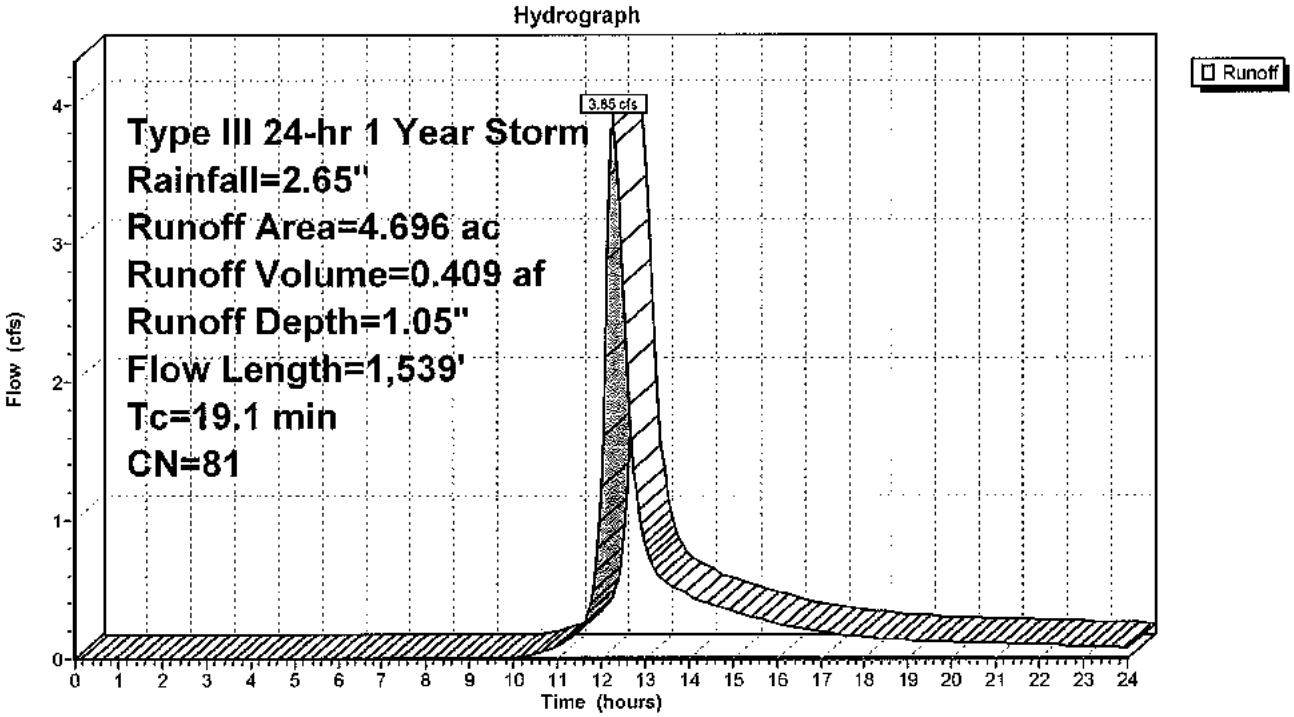
Runoff = 3.85 cfs @ 12.28 hrs, Volume= 0.409 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Year Storm Rainfall=2.65"

Area (ac)	CN	Description
0.262	98	Paved parking & roofs
1.152	78	Meadow, non-grazed, HSG D
2.589	79	Woods, Fair, HSG D
0.693	84	50-75% Grass cover, Fair, HSG D
4.696	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.5	267	0.1871	3.0		**Shallow Concentrated Flow, Grass Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.4	145	0.1384	5.6		**Shallow Concentrated Flow, Grass Swale** Grassed Waterway Kv= 15.0 fps
0.2	222	0.0465	15.1	26.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.4	210	0.0496	9.4	28.25	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
19.1	1,539	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

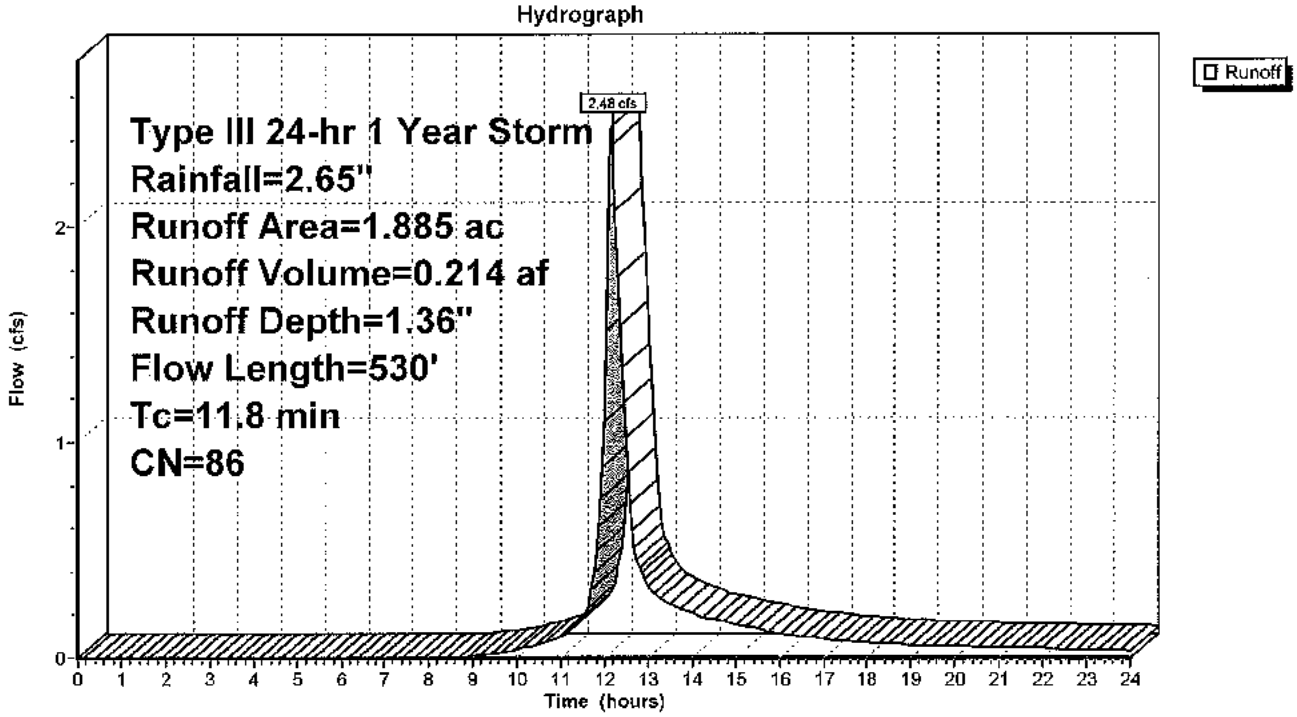
Runoff = 2.48 cfs @ 12.17 hrs, Volume= 0.214 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Year Storm Rainfall=2.65"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
0.617	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
0.610	79	Woods, Fair, HSG D
1.885	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.1800	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	66	0.1984	2.2		**Shallow Concentrated Flow, Shallow Concentrated Woods Flow** Woodland Kv= 5.0 fps
0.6	88	0.1178	2.4		**Shallow Concentrated Flow, Shallow Conceentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
0.7	175	0.0394	4.0		**Shallow Concentrated Flow, Shallow Concentrated Paved Flow** Paved Kv= 20.3 fps
1.1	101	0.0464	1.5		**Shallow Concentrated Flow, Shallow Concentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
11.8	530	Total			

Subcatchment 2S: Subcatchment 2S



Subcatchment 3S: Subcatchment 3S

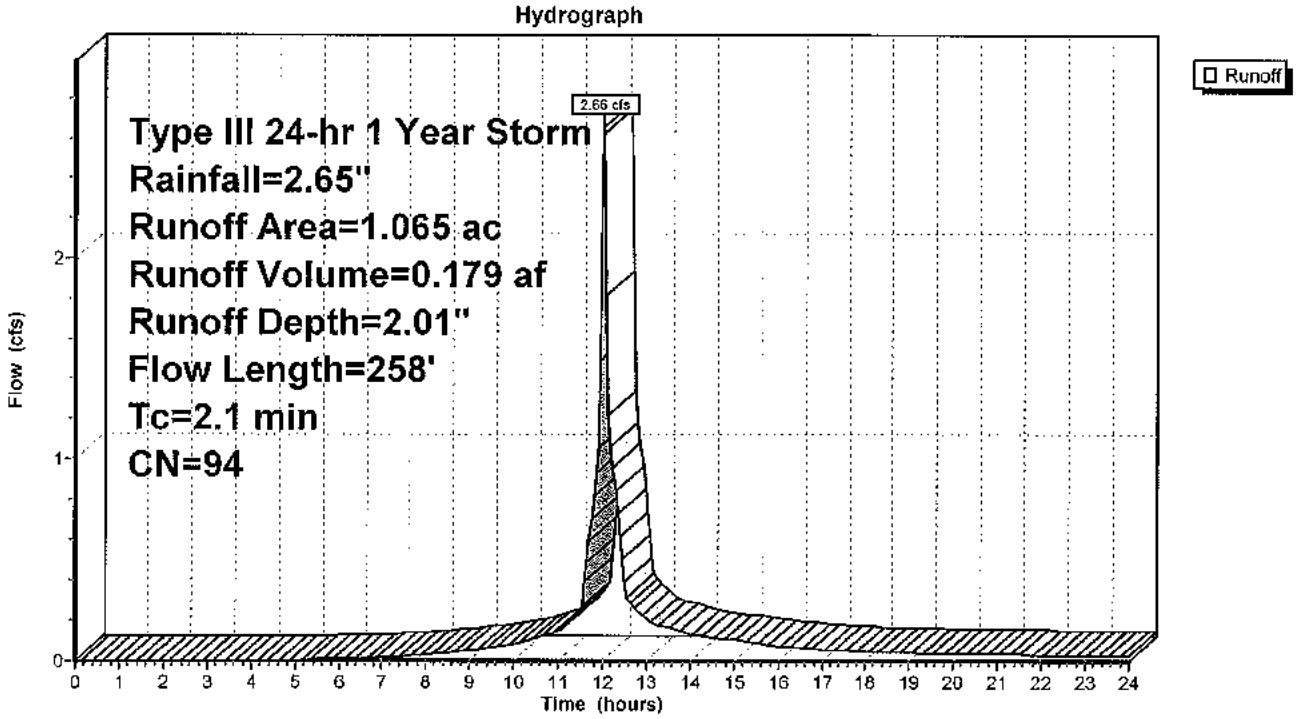
Runoff = 2.66 cfs @ 12.04 hrs, Volume= 0.179 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Year Storm Rainfall=2.65"

Area (ac)	CN	Description
0.767	98	Paved parking & roofs
0.243	84	50-75% Grass cover, Fair, HSG D
0.055	91	Gravel roads, HSG D
1.065	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0080	1.0		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.21"
0.4	98	0.0430	4.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
0.0	60	0.0830	20.2	35.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
2.1	258	Total			

Subcatchment 3S: Subcatchment 3S



Subcatchment 4S: Subcatchment 4S

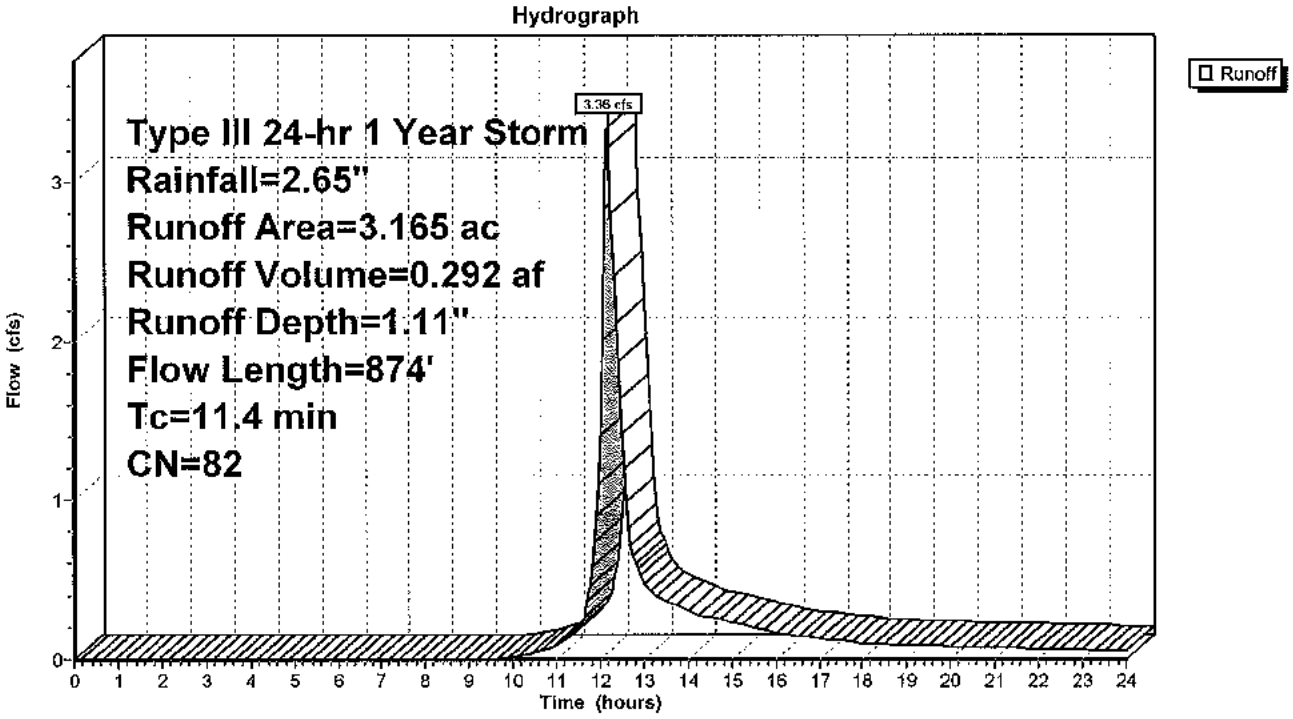
Runoff = 3.36 cfs @ 12.17 hrs, Volume= 0.292 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 Year Storm Rainfall=2.65"

Area (ac)	CN	Description
0.358	98	Paved parking & roofs
1.200	79	Woods, Fair, HSG D
1.021	78	Meadow, non-grazed, HSG D
0.586	84	50-75% Grass cover, Fair, HSG D
3.165	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.4	249	0.1878	3.0		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.3	117	0.1966	6.7		**Shallow Concentrated Flow, Swale Concentrated Flow** Grassed Waterway Kv= 15.0 fps
11.4	874	Total			

Subcatchment 4S: Subcatchment 4S



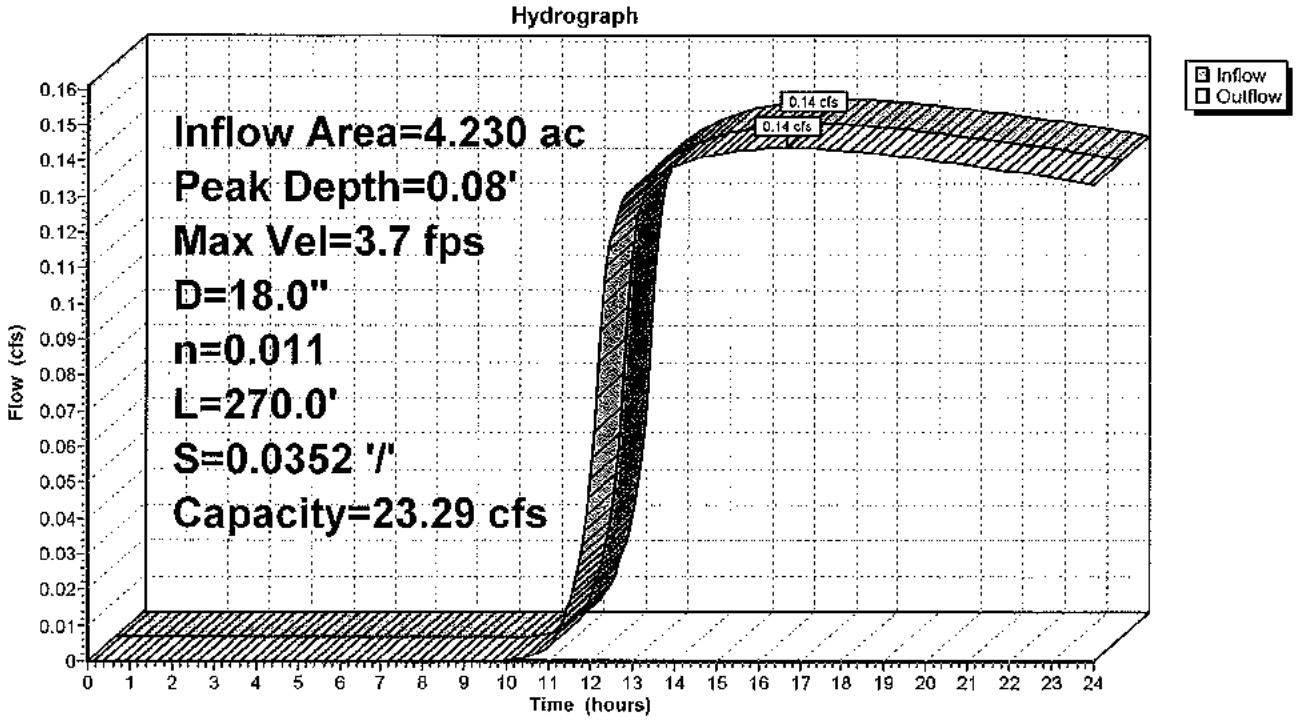
Reach 1R: Reach 1R

Inflow Area = 4.230 ac, Inflow Depth = 0.39" for 1 Year Storm event
Inflow = 0.14 cfs @ 16.64 hrs, Volume= 0.139 af
Outflow = 0.14 cfs @ 16.68 hrs, Volume= 0.138 af, Atten= 0%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.7 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 3.3 fps, Avg. Travel Time= 1.4 min

Peak Depth= 0.08' @ 16.66 hrs
Capacity at bank full= 23.29 cfs
Inlet Invert= 506.00', Outlet Invert= 496.50'
18.0" Diameter Pipe n= 0.011 Length= 270.0' Slope= 0.0352 '/'

Reach 1R: Reach 1R

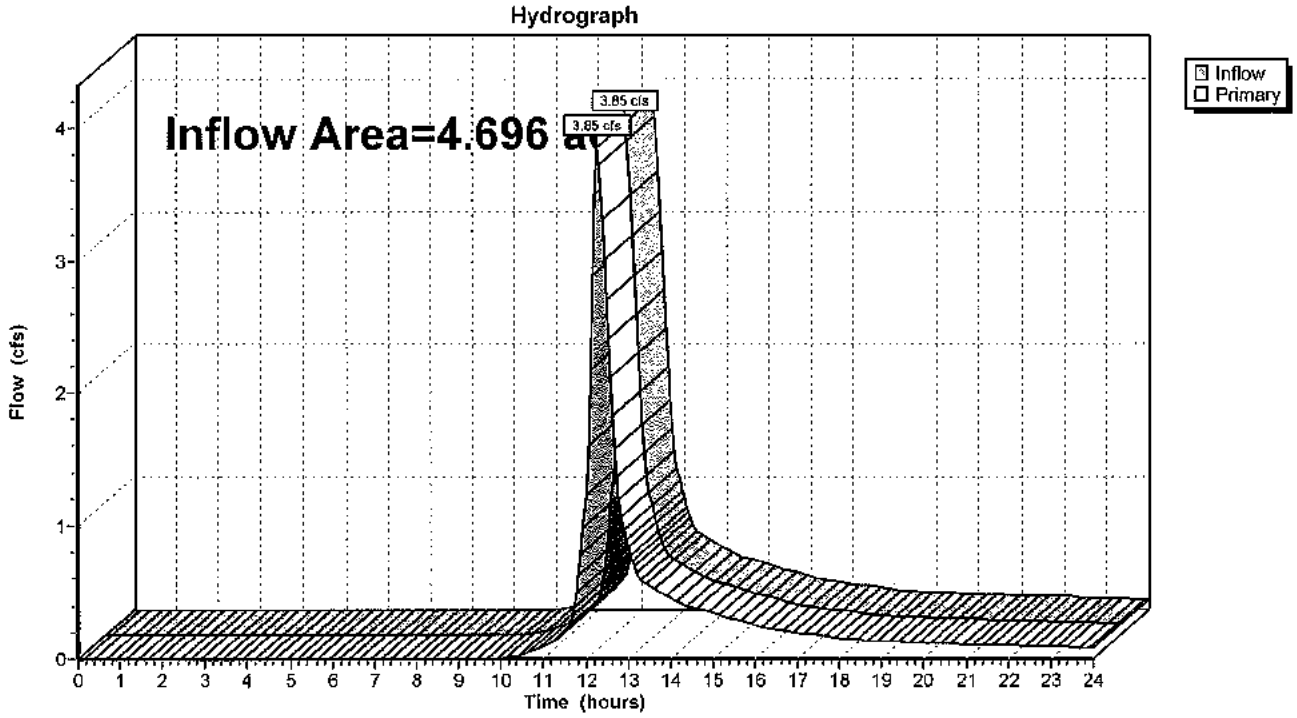


Pond 1P: Design Point 1

Inflow Area = 4.696 ac, Inflow Depth = 1.05" for 1 Year Storm event
Inflow = 3.85 cfs @ 12.28 hrs, Volume= 0.409 af
Primary = 3.85 cfs @ 12.28 hrs, Volume= 0.409 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

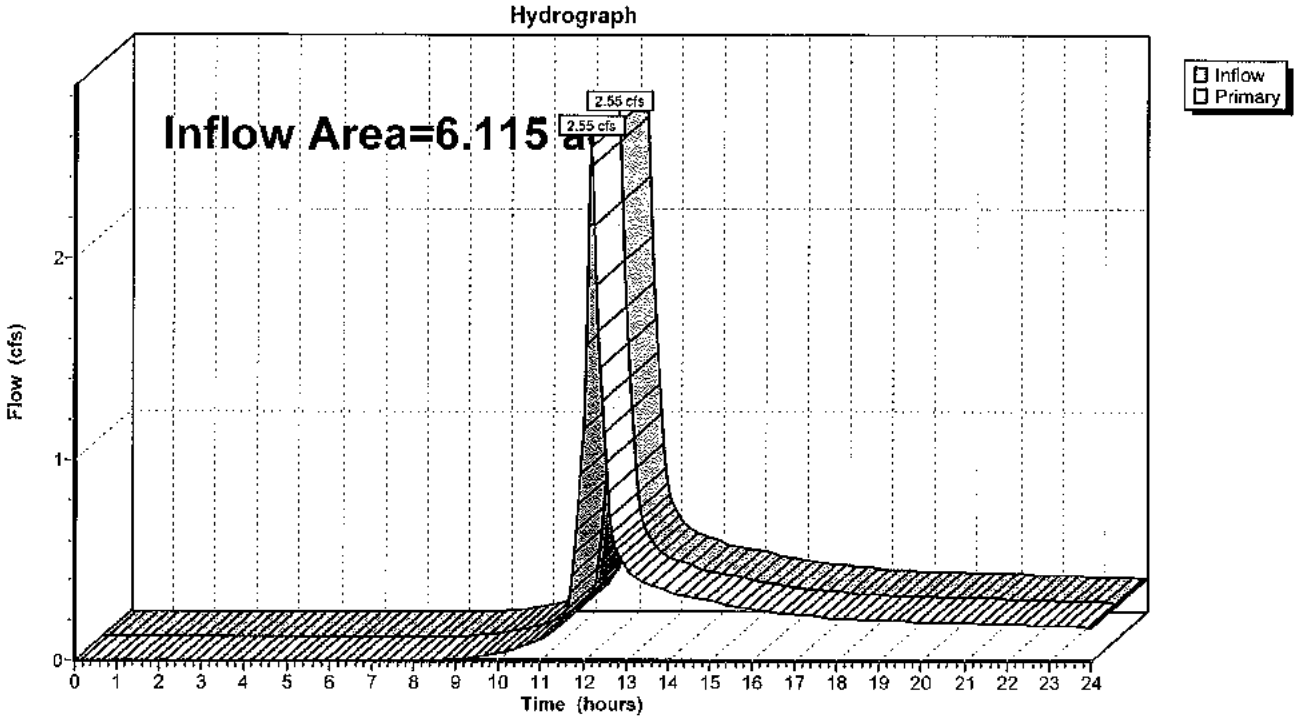


Pond 2P: Design Point 2

Inflow Area = 6.115 ac, Inflow Depth = 0.69" for 1 Year Storm event
Inflow = 2.55 cfs @ 12.17 hrs, Volume= 0.352 af
Primary = 2.55 cfs @ 12.17 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Pond 3P: Type I-2 Infiltration Basin 3P

Inflow Area = 1.065 ac, Inflow Depth = 2.01" for 1 Year Storm event
Inflow = 2.66 cfs @ 12.04 hrs, Volume= 0.179 af
Outflow = 0.75 cfs @ 12.34 hrs, Volume= 0.179 af, Atten= 72%, Lag= 18.3 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.75 cfs @ 12.34 hrs, Volume= 0.179 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 513.35' @ 12.34 hrs Surf.Area= 1,482 sf Storage= 1,616 cf
Plug-Flow detention time= 13.4 min calculated for 0.179 af (100% of inflow)
Center-of-Mass det. time= 13.1 min (802.9 - 789.8)

#	Invert	Avail.Storage	Storage Description
1	512.00'	16,221 cf	**Custom Stage Data (Irregular)** Listed below

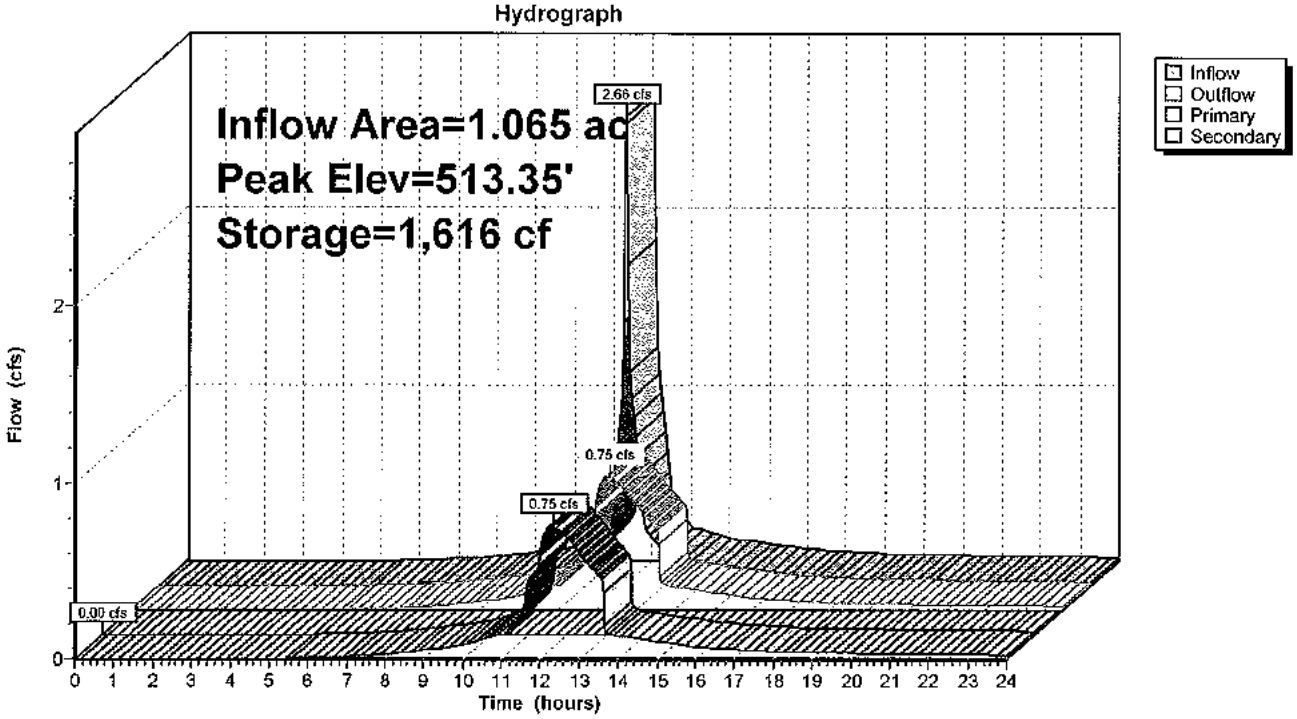
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
512.00	862	140.6	0	0	862
513.00	1,308	161.7	1,077	1,077	1,392
514.00	1,810	182.4	1,552	2,629	1,984
515.00	4,252	335.7	2,945	5,575	8,310
516.00	5,339	335.1	4,785	10,360	8,647
517.00	6,399	357.8	5,861	16,221	9,945

#	Routing	Invert	Outlet Devices
1	Secondary	0.00'	**0.030556 fpm Exfiltration over entire Surface area**
2	Primary	512.00'	**18.0" x 41.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.1220 '/' n= 0.011 Cc= 0.900
3	Device 2	514.00'	**3.0" Vert. Orifice/Grate** C= 0.600
4	Device 2	515.00'	**1.00' x 0.50' Vert. Orifice/Grate** C= 0.600
5	Device 2	516.00'	**4.00' x 2.50' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=512.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.75 cfs @ 12.34 hrs HW=513.35' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.75 cfs)

Pond 3P: Type I-2 Infiltration Basin 3P



Pond 4P: P-5 Pocket Pond 4P

Inflow Area = 3.165 ac, Inflow Depth = 1.11" for 1 Year Storm event
Inflow = 3.36 cfs @ 12.17 hrs, Volume= 0.292 af
Outflow = 0.14 cfs @ 16.64 hrs, Volume= 0.139 af, Atten= 96%, Lag= 268.7 min
Primary = 0.14 cfs @ 16.64 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 528.38' @ 16.64 hrs Surf.Area= 0 sf Storage= 8,123 cf
Plug-Flow detention time= 353.4 min calculated for 0.139 af (47% of inflow)
Center-of-Mass det. time= 229.9 min (1,079.3 - 849.4)

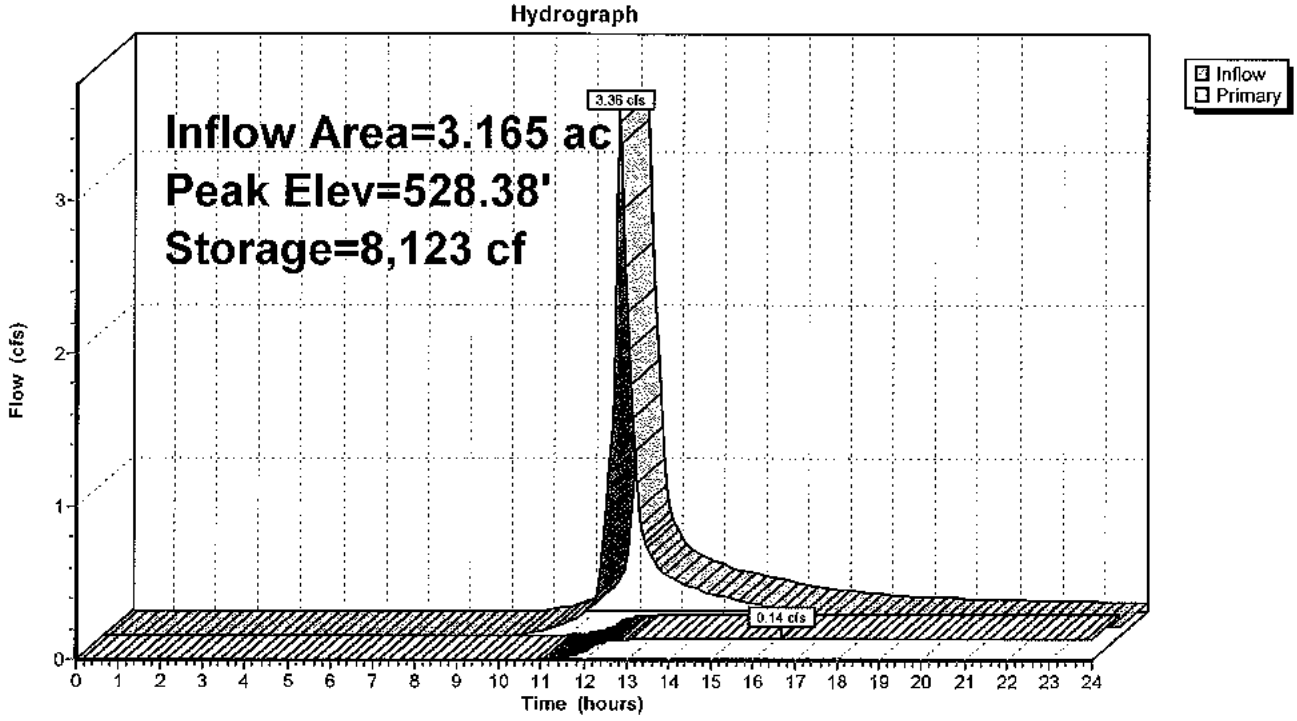
#	Invert	Avail.Storage	Storage Description
1	526.00'	21,141 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
526.00	0
528.00	6,409
530.00	15,527
531.00	21,141

#	Routing	Invert	Outlet Devices
1	Primary	524.00'	**18.0" x 265.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.0642 '/' n= 0.011 Cc= 0.900
2	Device 1	526.00'	**1.9" Vert. Orifice/Grate** C= 0.600
3	Device 1	528.40'	**2.50' x 1.60' Vert. Orifice/Grate** C= 0.600
4	Device 1	530.00'	**2.50' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=0.14 cfs @ 16.64 hrs HW=528.38' (Free Discharge)
└**1=Culvert** (Passes 0.14 cfs of 22.09 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 7.3 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: P-5 Pocket Pond 4P



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=4.696 ac Runoff Depth=2.79"
Flow Length=1,539' Tc=19.1 min CN=81 Runoff=10.57 cfs 1.092 af

Subcatchment 2S: Subcatchment 2S Runoff Area=1.885 ac Runoff Depth=3.27"
Flow Length=530' Tc=11.8 min CN=86 Runoff=5.88 cfs 0.513 af

Subcatchment 3S: Subcatchment 3S Runoff Area=1.065 ac Runoff Depth=4.10"
Flow Length=258' Tc=2.1 min CN=94 Runoff=5.19 cfs 0.364 af

Subcatchment 4S: Subcatchment 4S Runoff Area=3.165 ac Runoff Depth=2.89"
Flow Length=874' Tc=11.4 min CN=82 Runoff=8.91 cfs 0.761 af

Reach 1R: Reach 1R Peak Depth=0.49' Max Vel=10.8 fps Inflow=5.43 cfs 0.579 af
D=18.0" n=0.011 L=270.0' S=0.0352 '/' Capacity=23.29 cfs Outflow=5.43 cfs 0.579 af

Pond 1P: Design Point 1 Inflow=10.57 cfs 1.092 af
Primary=10.57 cfs 1.092 af

Pond 2P: Design Point 2 Inflow=9.15 cfs 1.092 af
Primary=9.15 cfs 1.092 af

Pond 3P: Type I-2 Infiltration Basin 3P Peak Elev=514.41' Storage=3,831 cf Inflow=5.19 cfs 0.364 af
Primary=0.13 cfs 0.006 af Secondary=1.43 cfs 0.358 af Outflow=1.55 cfs 0.364 af

Pond 4P: P-5 Pocket Pond 4P Peak Elev=529.14' Storage=11,621 cf Inflow=8.91 cfs 0.761 af
Outflow=5.31 cfs 0.574 af

Total Runoff Area = 10.811 ac Runoff Volume = 2.730 af Average Runoff Depth = 3.03"

Subcatchment 1S: Subcatchment 1S

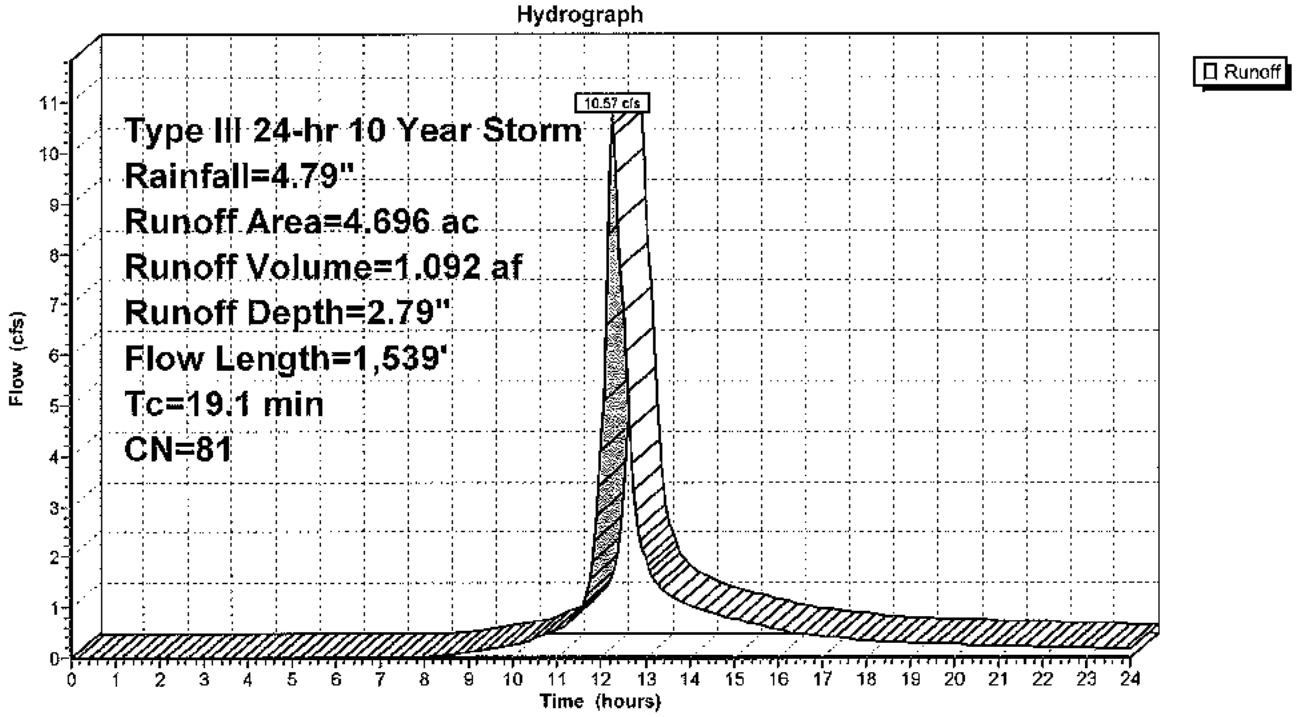
Runoff = 10.57 cfs @ 12.26 hrs, Volume= 1.092 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.79"

Area (ac)	CN	Description
0.262	98	Paved parking & roofs
1.152	78	Meadow, non-grazed, HSG D
2.589	79	Woods, Fair, HSG D
0.693	84	50-75% Grass cover, Fair, HSG D
4.696	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.5	267	0.1871	3.0		**Shallow Concentrated Flow, Grass Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.4	145	0.1384	5.6		**Shallow Concentrated Flow, Grass Swale** Grassed Waterway Kv= 15.0 fps
0.2	222	0.0465	15.1	26.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.4	210	0.0496	9.4	28.25	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
19.1	1,539	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

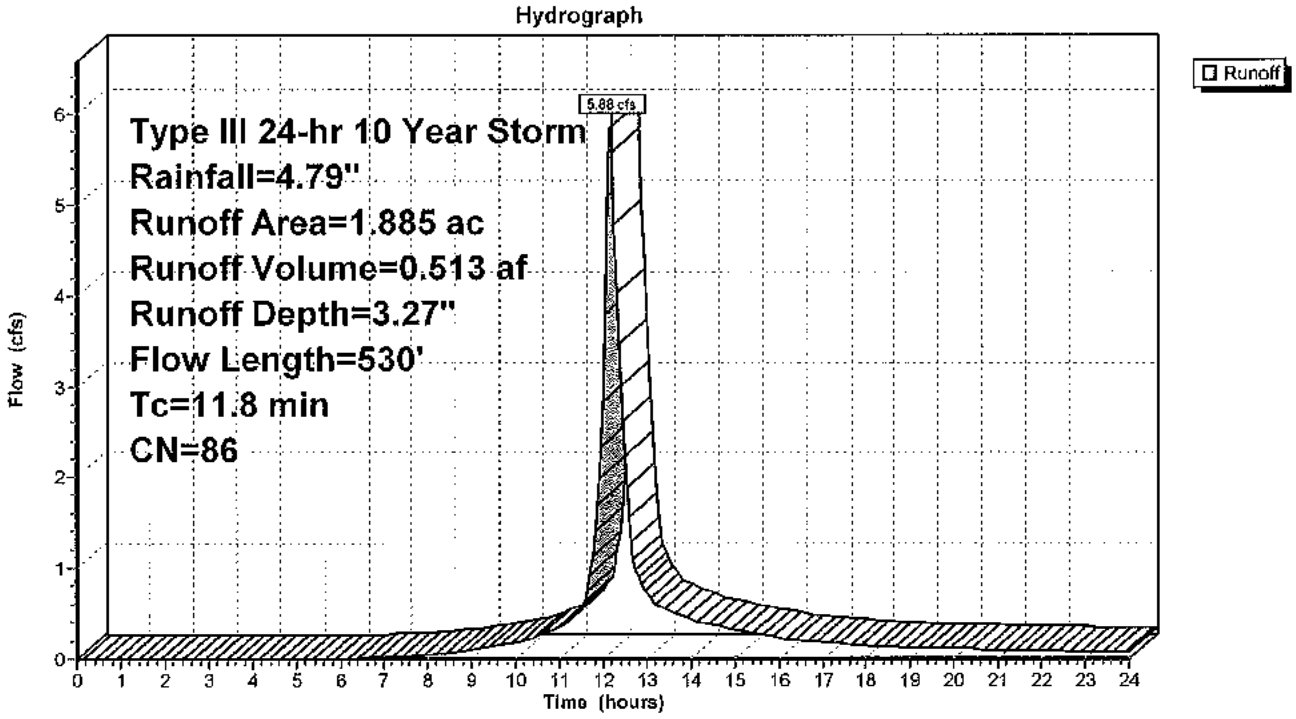
Runoff = 5.88 cfs @ 12.16 hrs, Volume= 0.513 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.79"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
0.617	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
0.610	79	Woods, Fair, HSG D
1.885	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.1800	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	66	0.1984	2.2		**Shallow Concentrated Flow, Shallow Concentrated Woods Flow** Woodland Kv= 5.0 fps
0.6	88	0.1178	2.4		**Shallow Concentrated Flow, Shallow Conceentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
0.7	175	0.0394	4.0		**Shallow Concentrated Flow, Shallow Concentrated Paved Flow** Paved Kv= 20.3 fps
1.1	101	0.0464	1.5		**Shallow Concentrated Flow, Shallow Concentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
11.8	530	Total			

Subcatchment 2S: Subcatchment 2S



Subcatchment 3S: Subcatchment 3S

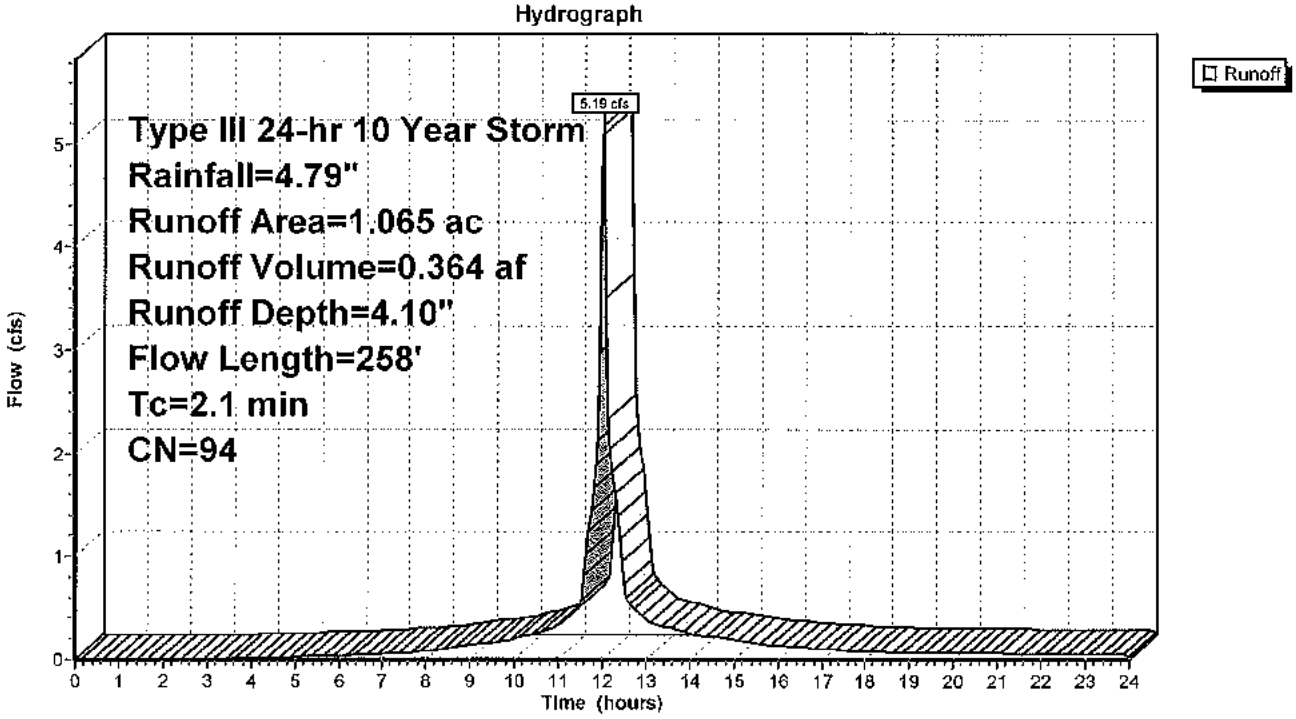
Runoff = 5.19 cfs @ 12.04 hrs, Volume= 0.364 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.79"

Area (ac)	CN	Description
0.767	98	Paved parking & roofs
0.243	84	50-75% Grass cover, Fair, HSG D
0.055	91	Gravel roads, HSG D
1.065	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0080	1.0		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.21"
0.4	98	0.0430	4.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
0.0	60	0.0830	20.2	35.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
2.1	258	Total			

Subcatchment 3S: Subcatchment 3S



Subcatchment 4S: Subcatchment 4S

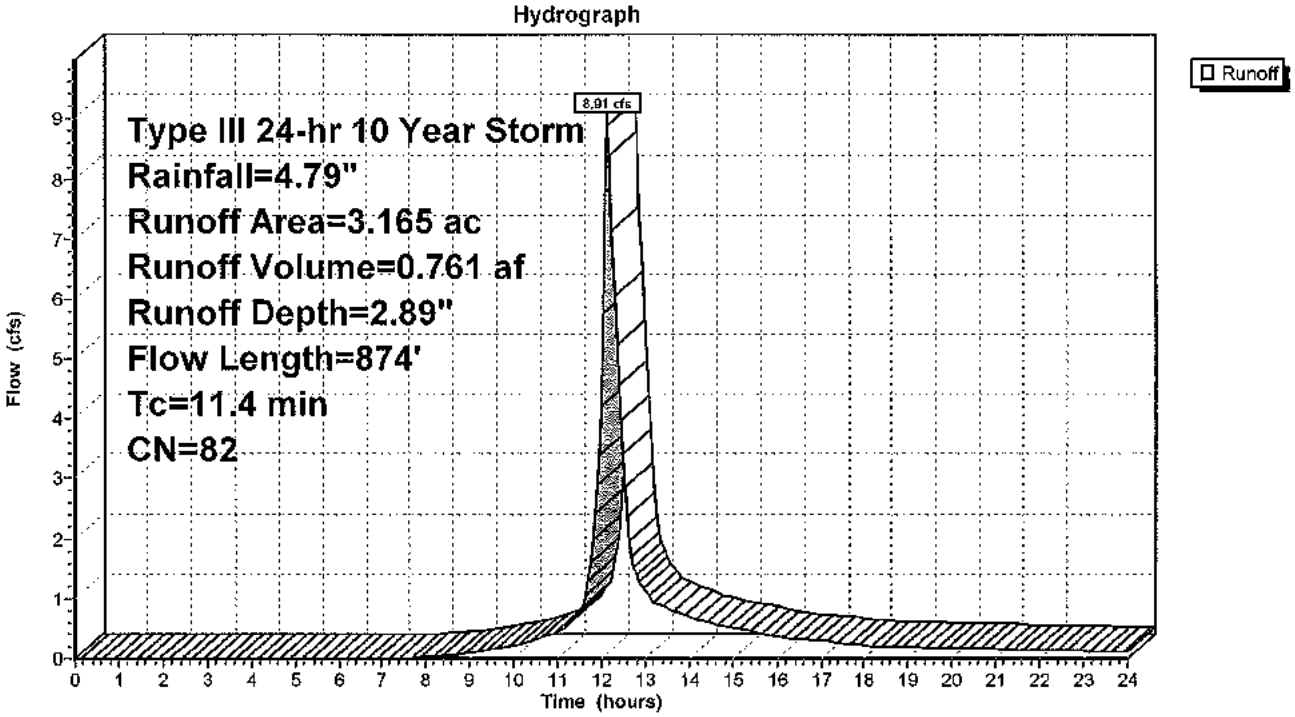
Runoff = 8.91 cfs @ 12.16 hrs, Volume= 0.761 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.79"

Area (ac)	CN	Description
0.358	98	Paved parking & roofs
1.200	79	Woods, Fair, HSG D
1.021	78	Meadow, non-grazed, HSG D
0.586	84	50-75% Grass cover, Fair, HSG D
3.165	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.4	249	0.1878	3.0		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.3	117	0.1966	6.7		**Shallow Concentrated Flow, Swale Concentrated Flow** Grassed Waterway Kv= 15.0 fps
11.4	874	Total			

Subcatchment 4S: Subcatchment 4S



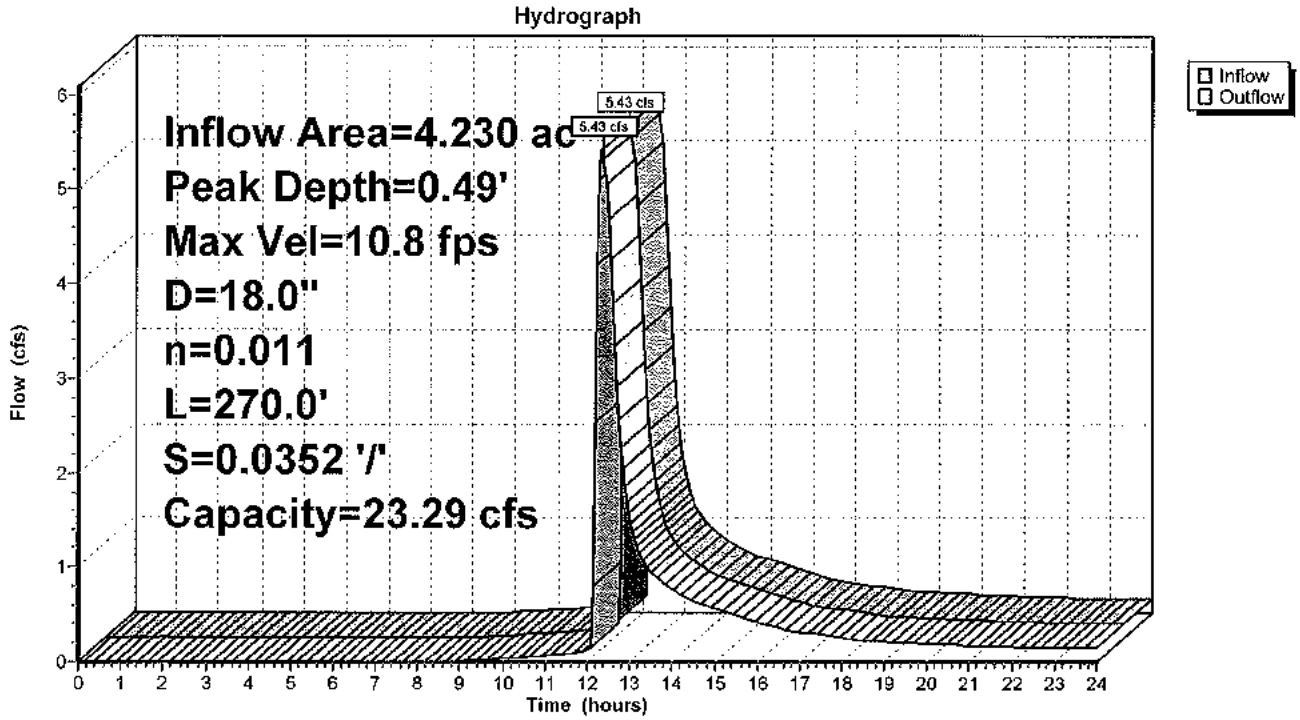
Reach 1R: Reach 1R

Inflow Area = 4.230 ac, Inflow Depth = 1.64" for 10 Year Storm event
Inflow = 5.43 cfs @ 12.35 hrs, Volume= 0.579 af
Outflow = 5.43 cfs @ 12.36 hrs, Volume= 0.579 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.8 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.2 fps, Avg. Travel Time= 1.1 min

Peak Depth= 0.49' @ 12.36 hrs
Capacity at bank full= 23.29 cfs
Inlet Invert= 506.00', Outlet Invert= 496.50'
18.0" Diameter Pipe n= 0.011 Length= 270.0' Slope= 0.0352 '/'

Reach 1R: Reach 1R

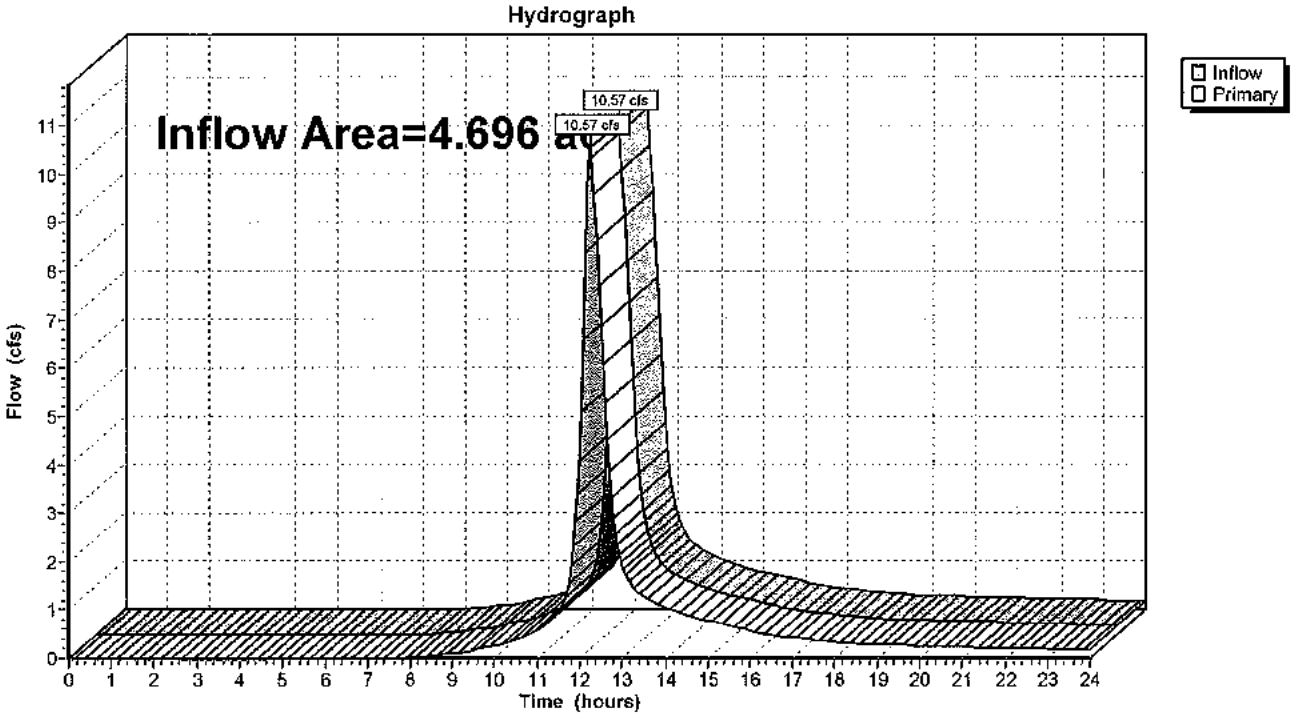


Pond 1P: Design Point 1

Inflow Area = 4.696 ac, Inflow Depth = 2.79" for 10 Year Storm event
Inflow = 10.57 cfs @ 12.26 hrs, Volume= 1.092 af
Primary = 10.57 cfs @ 12.26 hrs, Volume= 1.092 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

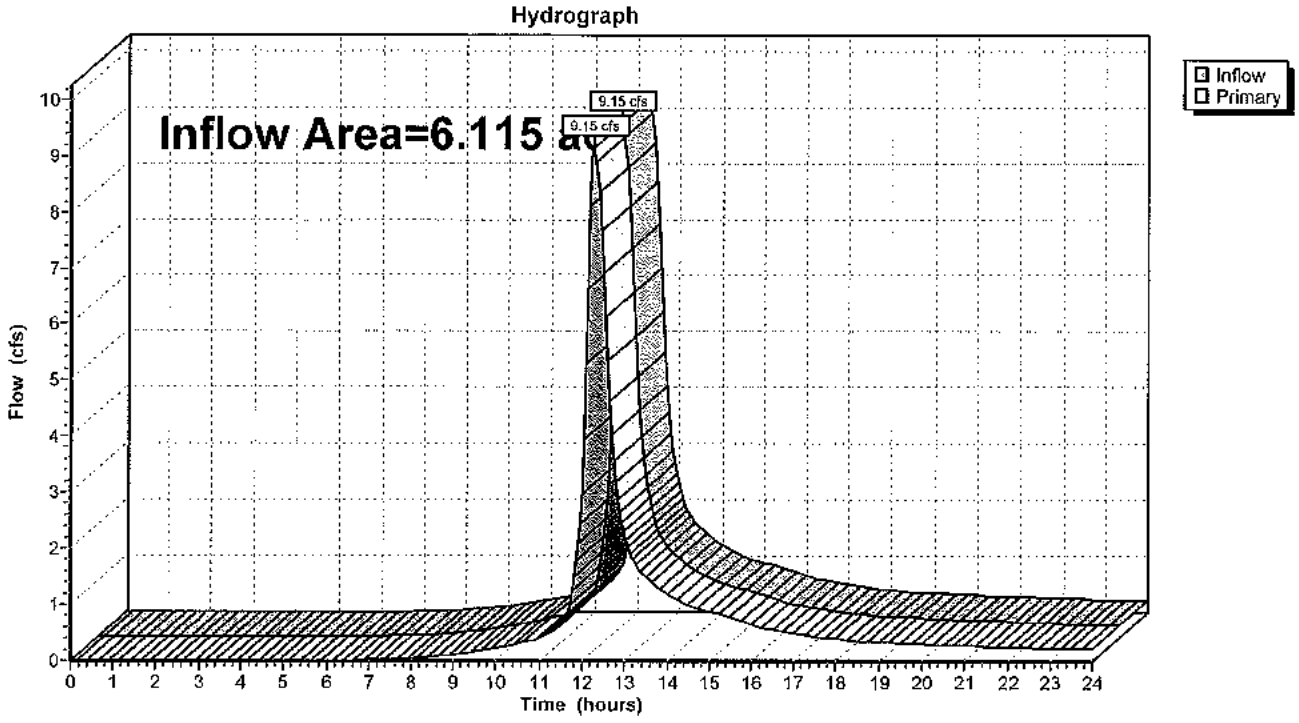


Pond 2P: Design Point 2

Inflow Area = 6.115 ac, Inflow Depth = 2.14" for 10 Year Storm event
Inflow = 9.15 cfs @ 12.29 hrs, Volume= 1.092 af
Primary = 9.15 cfs @ 12.29 hrs, Volume= 1.092 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Pond 3P: Type I-2 Infiltration Basin 3P

Inflow Area = 1.065 ac, Inflow Depth = 4.10" for 10 Year Storm event
Inflow = 5.19 cfs @ 12.04 hrs, Volume= 0.364 af
Outflow = 1.55 cfs @ 12.31 hrs, Volume= 0.364 af, Atten= 70%, Lag= 16.8 min
Primary = 0.13 cfs @ 12.31 hrs, Volume= 0.006 af
Secondary = 1.43 cfs @ 12.31 hrs, Volume= 0.358 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 514.41' @ 12.31 hrs Surf.Area= 2,806 sf Storage= 3,831 cf
Plug-Flow detention time= 21.8 min calculated for 0.363 af (100% of inflow)
Center-of-Mass det. time= 21.5 min (792.6 - 771.0)

#	Invert	Avail.Storage	Storage Description
1	512.00'	16,221 cf	**Custom Stage Data (Irregular)** Listed below

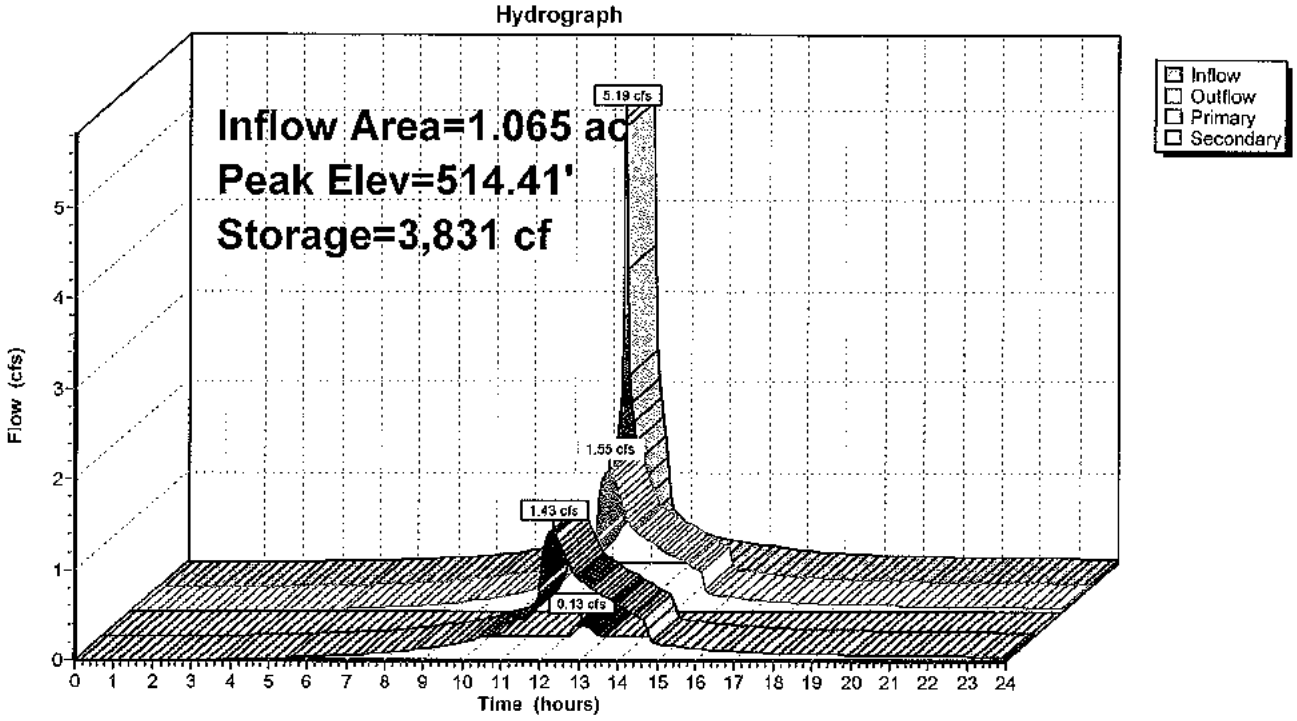
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
512.00	862	140.6	0	0	862
513.00	1,308	161.7	1,077	1,077	1,392
514.00	1,810	182.4	1,552	2,629	1,984
515.00	4,252	335.7	2,945	5,575	8,310
516.00	5,339	335.1	4,785	10,360	8,647
517.00	6,399	357.8	5,861	16,221	9,945

#	Routing	Invert	Outlet Devices
1	Secondary	0.00'	**0.030556 fpm Exfiltration over entire Surface area**
2	Primary	512.00'	**18.0" x 41.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.1220 '/' n= 0.011 Cc= 0.900
3	Device 2	514.00'	**3.0" Vert. Orifice/Grate** C= 0.600
4	Device 2	515.00'	**1.00' x 0.50' Vert. Orifice/Grate** C= 0.600
5	Device 2	516.00'	**4.00' x 2.50' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=0.13 cfs @ 12.31 hrs HW=514.41' (Free Discharge)
└**2=Culvert** (Passes 0.13 cfs of 14.93 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 0.13 cfs @ 2.6 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=1.43 cfs @ 12.31 hrs HW=514.41' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.43 cfs)

Pond 3P: Type I-2 Infiltration Basin 3P



Pond 4P: P-5 Pocket Pond 4P

Inflow Area = 3.165 ac, Inflow Depth = 2.89" for 10 Year Storm event
Inflow = 8.91 cfs @ 12.16 hrs, Volume= 0.761 af
Outflow = 5.31 cfs @ 12.35 hrs, Volume= 0.574 af, Atten= 40%, Lag= 11.6 min
Primary = 5.31 cfs @ 12.35 hrs, Volume= 0.574 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 529.14' @ 12.35 hrs Surf.Area= 0 sf Storage= 11,621 cf
Plug-Flow detention time= 143.8 min calculated for 0.573 af (75% of inflow)
Center-of-Mass det. time= 59.3 min (881.2 - 821.9)

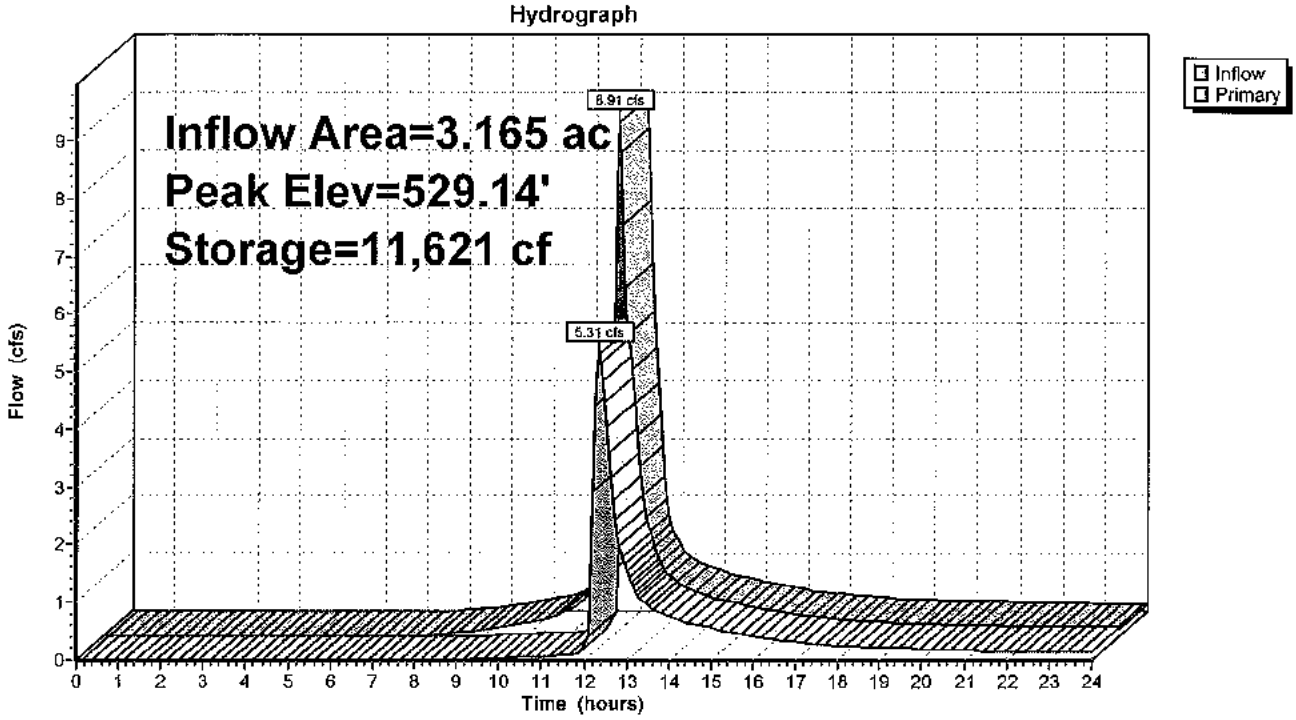
#	Invert	Avail.Storage	Storage Description
1	526.00'	21,141 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
526.00	0
528.00	6,409
530.00	15,527
531.00	21,141

#	Routing	Invert	Outlet Devices
1	Primary	524.00'	**18.0" x 265.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.0642 '/' n= 0.011 Cc= 0.900
2	Device 1	526.00'	**1.9" Vert. Orifice/Grate** C= 0.600
3	Device 1	528.40'	**2.50' x 1.60' Vert. Orifice/Grate** C= 0.600
4	Device 1	530.00'	**2.50' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=5.30 cfs @ 12.35 hrs HW=529.14' (Free Discharge)
└─**1=Culvert** (Passes 5.30 cfs of 24.32 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 8.4 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 5.13 cfs @ 2.8 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: P-5 Pocket Pond 4P



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=4.696 ac Runoff Depth=6.21"
Flow Length=1,539' Tc=19.1 min CN=81 Runoff=23.08 cfs 2.429 af

Subcatchment 2S: Subcatchment 2S Runoff Area=1.885 ac Runoff Depth=6.82"
Flow Length=530' Tc=11.8 min CN=86 Runoff=11.89 cfs 1.071 af

Subcatchment 3S: Subcatchment 3S Runoff Area=1.065 ac Runoff Depth=7.79"
Flow Length=258' Tc=2.1 min CN=94 Runoff=9.52 cfs 0.691 af

Subcatchment 4S: Subcatchment 4S Runoff Area=3.165 ac Runoff Depth=6.33"
Flow Length=874' Tc=11.4 min CN=82 Runoff=19.11 cfs 1.671 af

Reach 1R: Reach 1R Peak Depth=0.96' Max Vel=14.4 fps Inflow=17.26 cfs 1.523 af
D=18.0" n=0.011 L=270.0' S=0.0352 '/' Capacity=23.29 cfs Outflow=17.21 cfs 1.522 af

Pond 1P: Design Point 1 Inflow=23.08 cfs 2.429 af
Primary=23.08 cfs 2.429 af

Pond 2P: Design Point 2 Inflow=27.87 cfs 2.593 af
Primary=27.87 cfs 2.593 af

Pond 3P: Type I-2 Infiltration Basin 3P Peak Elev=515.37' Storage=7,350 cf Inflow=9.52 cfs 0.691 af
Primary=0.99 cfs 0.046 af Secondary=2.37 cfs 0.645 af Outflow=3.36 cfs 0.691 af

Pond 4P: P-5 Pocket Pond 4P Peak Elev=529.99' Storage=15,480 cf Inflow=19.11 cfs 1.671 af
Outflow=16.27 cfs 1.477 af

Total Runoff Area = 10.811 ac Runoff Volume = 5.861 af Average Runoff Depth = 6.51"

Subcatchment 1S: Subcatchment 1S

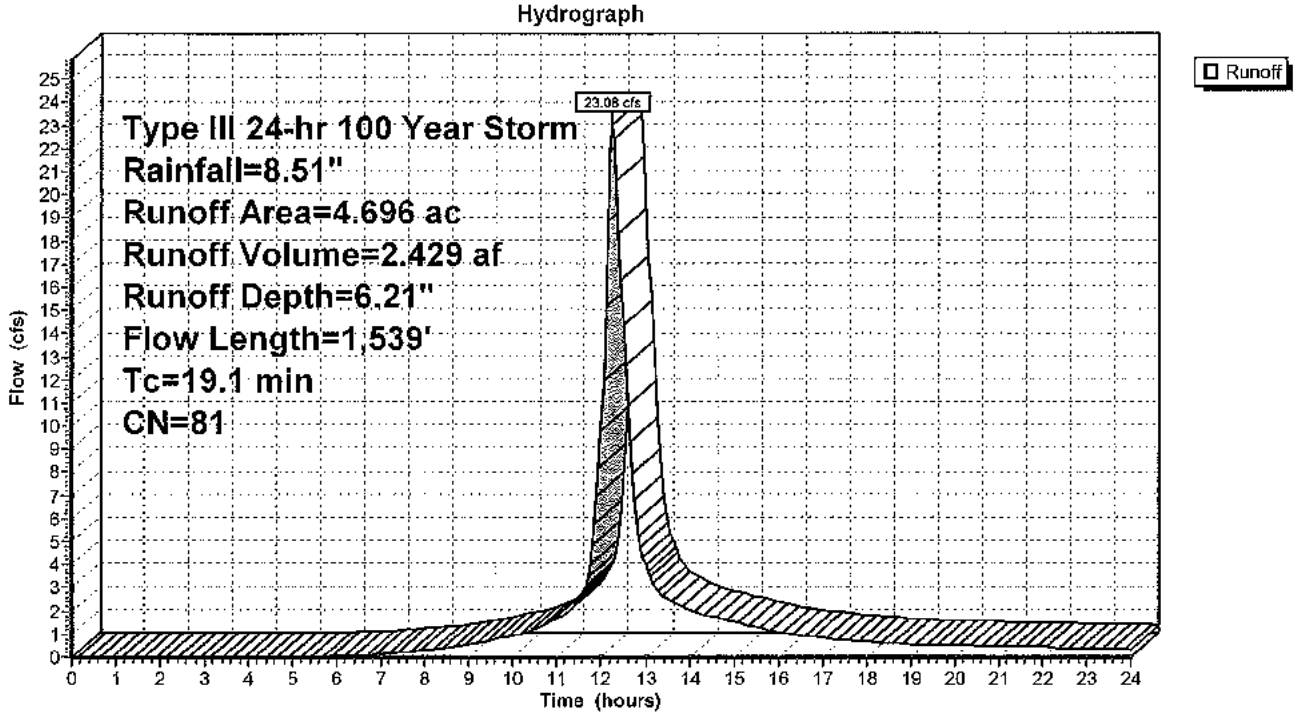
Runoff = 23.08 cfs @ 12.26 hrs, Volume= 2.429 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=8.51"

Area (ac)	CN	Description
0.262	98	Paved parking & roofs
1.152	78	Meadow, non-grazed, HSG D
2.589	79	Woods, Fair, HSG D
0.693	84	50-75% Grass cover, Fair, HSG D
4.696	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.5	267	0.1871	3.0		**Shallow Concentrated Flow, Grass Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.4	145	0.1384	5.6		**Shallow Concentrated Flow, Grass Swale** Grassed Waterway Kv= 15.0 fps
0.2	222	0.0465	15.1	26.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.4	210	0.0496	9.4	28.25	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
19.1	1,539	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

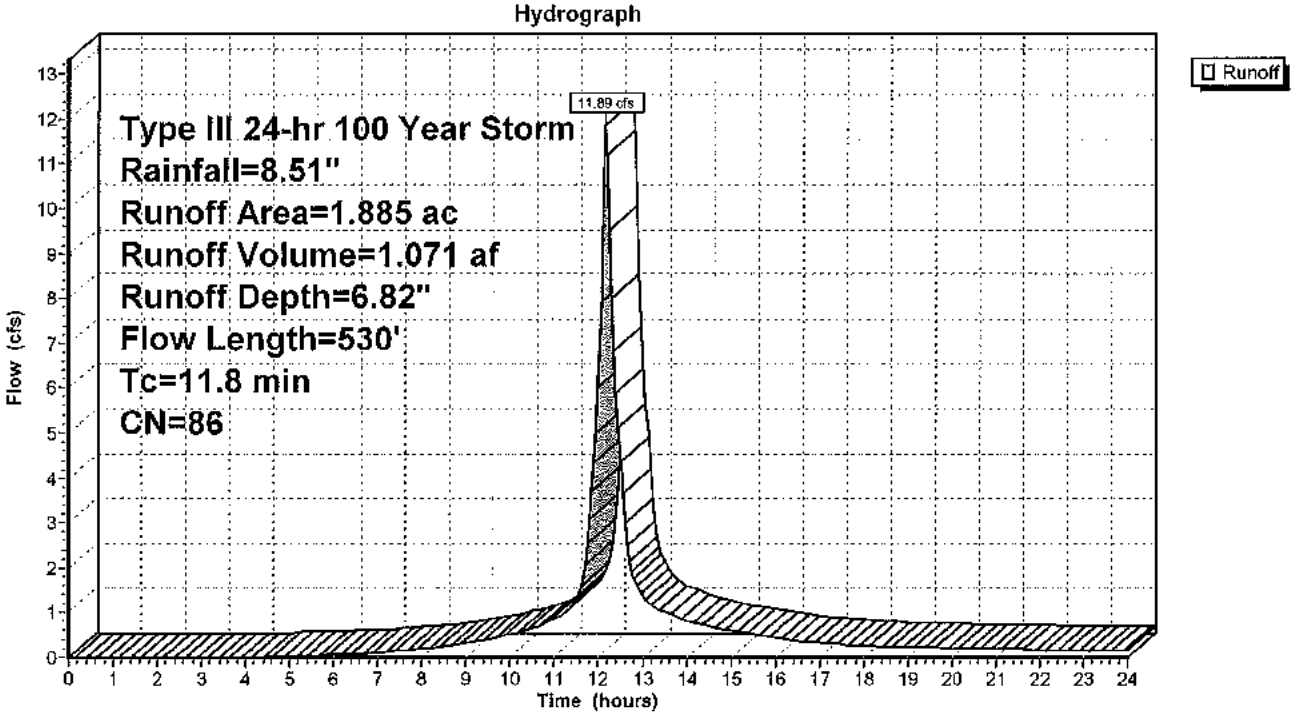
Runoff = 11.89 cfs @ 12.16 hrs, Volume= 1.071 af, Depth= 6.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=8.51"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
0.617	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
0.610	79	Woods, Fair, HSG D
1.885	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.1800	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	66	0.1984	2.2		**Shallow Concentrated Flow, Shallow Concentrated Woods Flow** Woodland Kv= 5.0 fps
0.6	88	0.1178	2.4		**Shallow Concentrated Flow, Shallow Conceentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
0.7	175	0.0394	4.0		**Shallow Concentrated Flow, Shallow Concentrated Paved Flow** Paved Kv= 20.3 fps
1.1	101	0.0464	1.5		**Shallow Concentrated Flow, Shallow Concentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
11.8	530	Total			

Subcatchment 2S: Subcatchment 2S



Subcatchment 3S: Subcatchment 3S

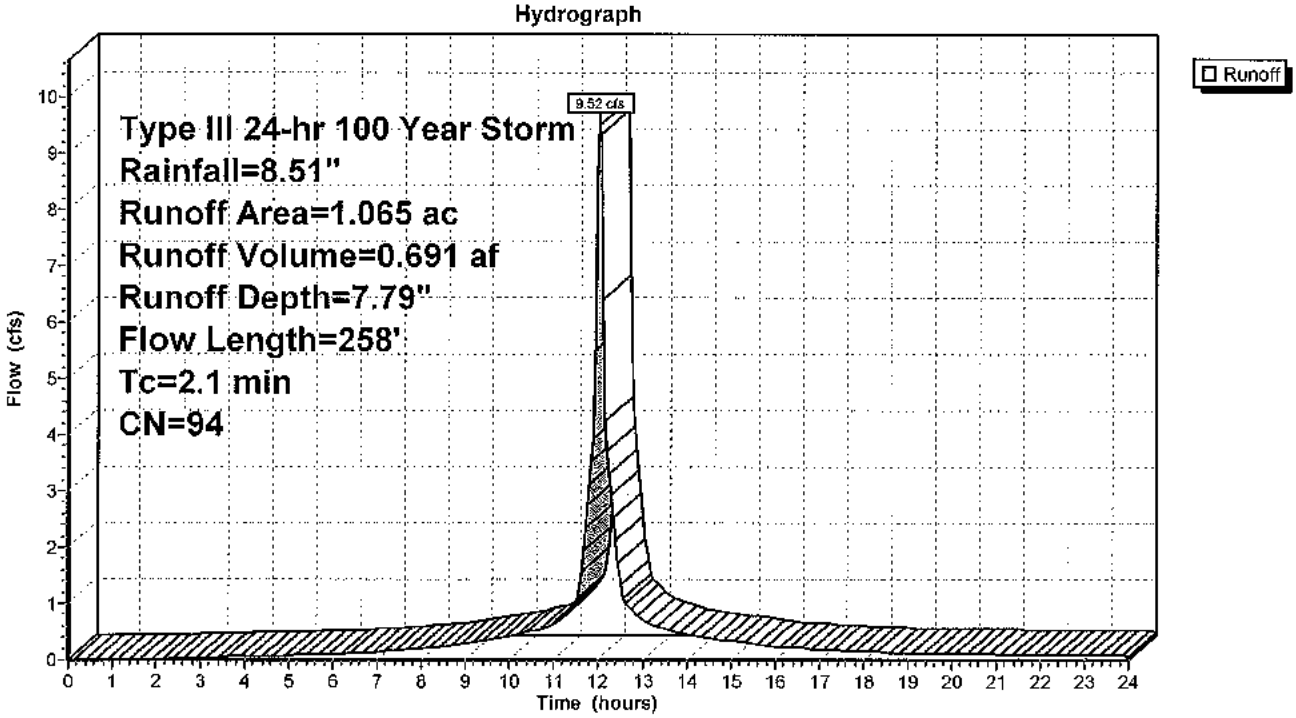
Runoff = 9.52 cfs @ 12.03 hrs, Volume= 0.691 af, Depth= 7.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=8.51"

Area (ac)	CN	Description
0.767	98	Paved parking & roofs
0.243	84	50-75% Grass cover, Fair, HSG D
0.055	91	Gravel roads, HSG D
1.065	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0080	1.0		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.21"
0.4	98	0.0430	4.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
0.0	60	0.0830	20.2	35.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
2.1	258	Total			

Subcatchment 3S: Subcatchment 3S



Subcatchment 4S: Subcatchment 4S

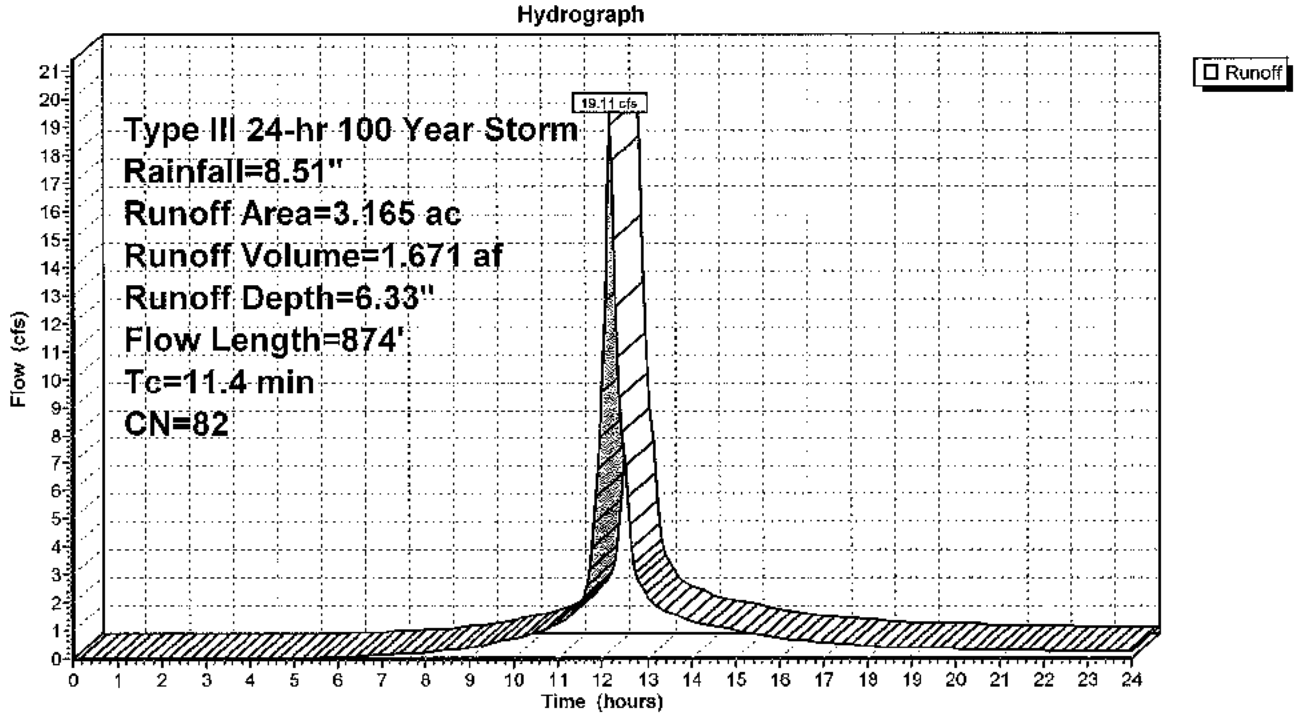
Runoff = 19.11 cfs @ 12.16 hrs, Volume= 1.671 af, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=8.51"

Area (ac)	CN	Description
0.358	98	Paved parking & roofs
1.200	79	Woods, Fair, HSG D
1.021	78	Meadow, non-grazed, HSG D
0.586	84	50-75% Grass cover, Fair, HSG D
3.165	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.4	249	0.1878	3.0		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.3	117	0.1966	6.7		**Shallow Concentrated Flow, Swale Concentrated Flow** Grassed Waterway Kv= 15.0 fps
11.4	874	Total			

Subcatchment 4S: Subcatchment 4S



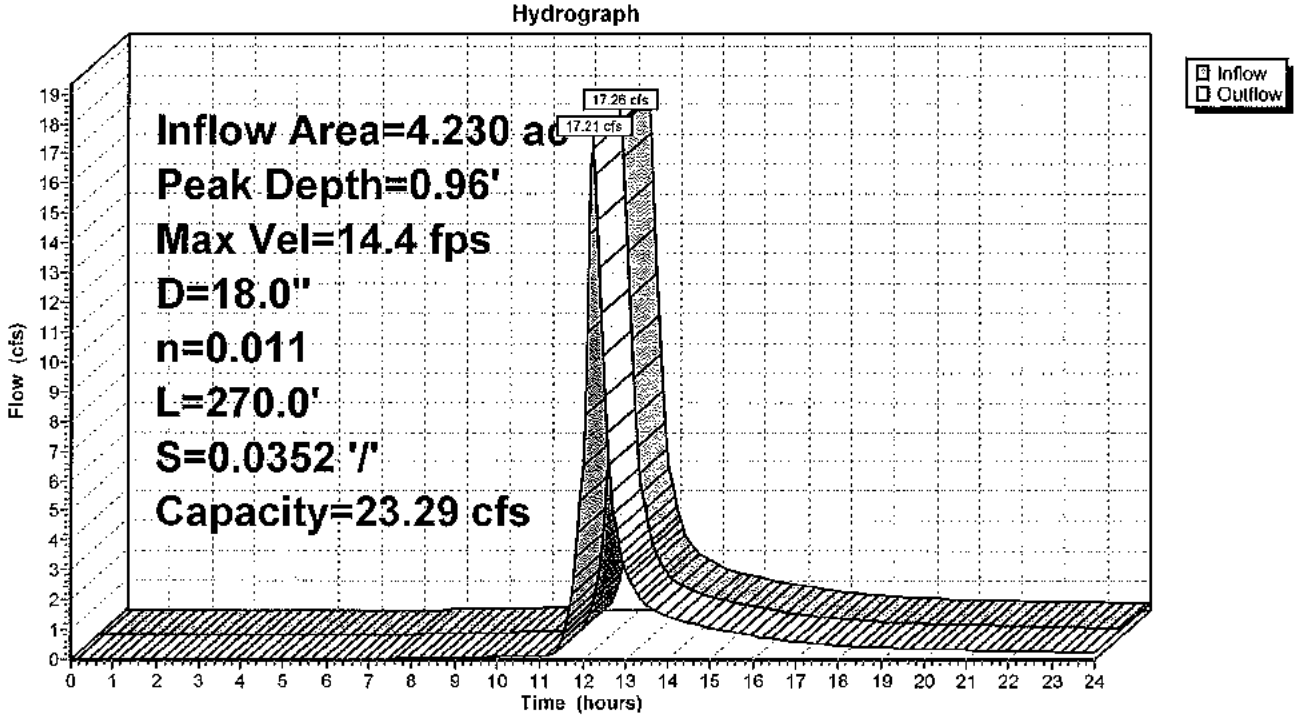
Reach 1R: Reach 1R

Inflow Area = 4.230 ac, Inflow Depth = 4.32" for 100 Year Storm event
Inflow = 17.26 cfs @ 12.23 hrs, Volume= 1.523 af
Outflow = 17.21 cfs @ 12.24 hrs, Volume= 1.522 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.4 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.9 fps, Avg. Travel Time= 0.9 min

Peak Depth= 0.96' @ 12.24 hrs
Capacity at bank full= 23.29 cfs
Inlet Invert= 506.00', Outlet Invert= 496.50'
18.0" Diameter Pipe n= 0.011 Length= 270.0' Slope= 0.0352 '/'

Reach 1R: Reach 1R

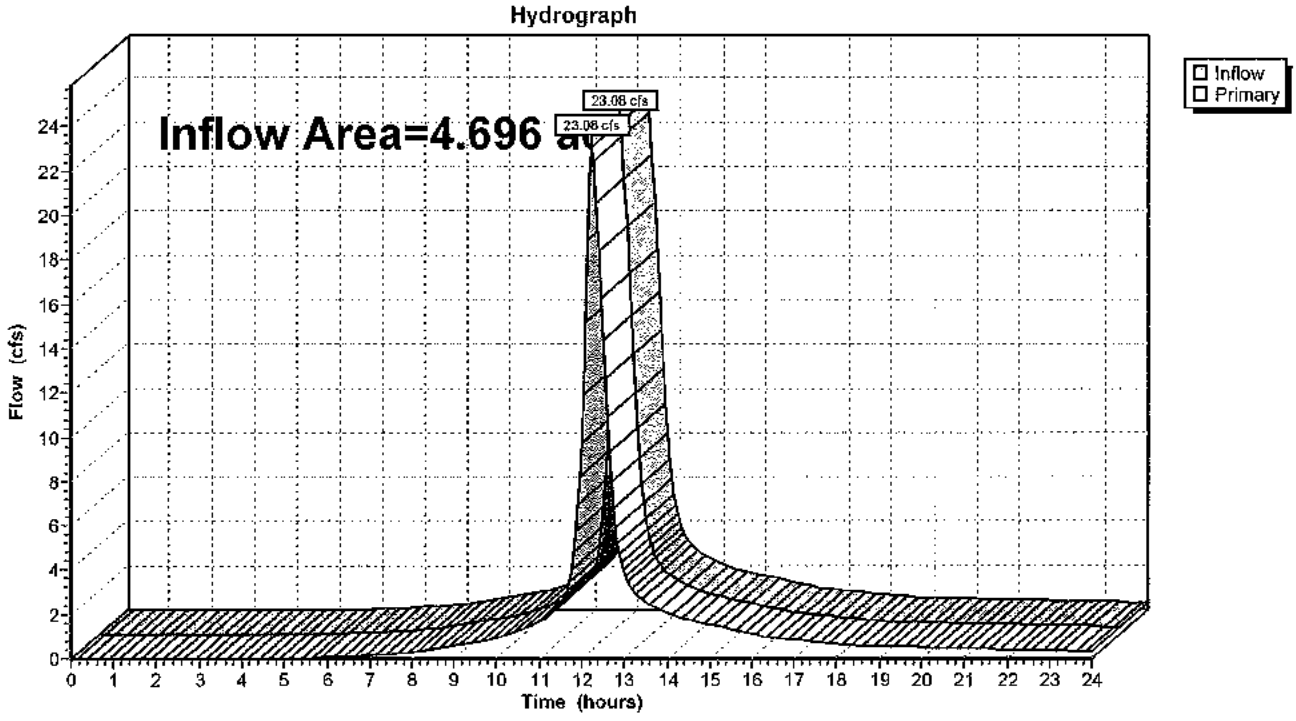


Pond 1P: Design Point 1

Inflow Area = 4.696 ac, Inflow Depth = 6.21" for 100 Year Storm event
Inflow = 23.08 cfs @ 12.26 hrs, Volume= 2.429 af
Primary = 23.08 cfs @ 12.26 hrs, Volume= 2.429 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

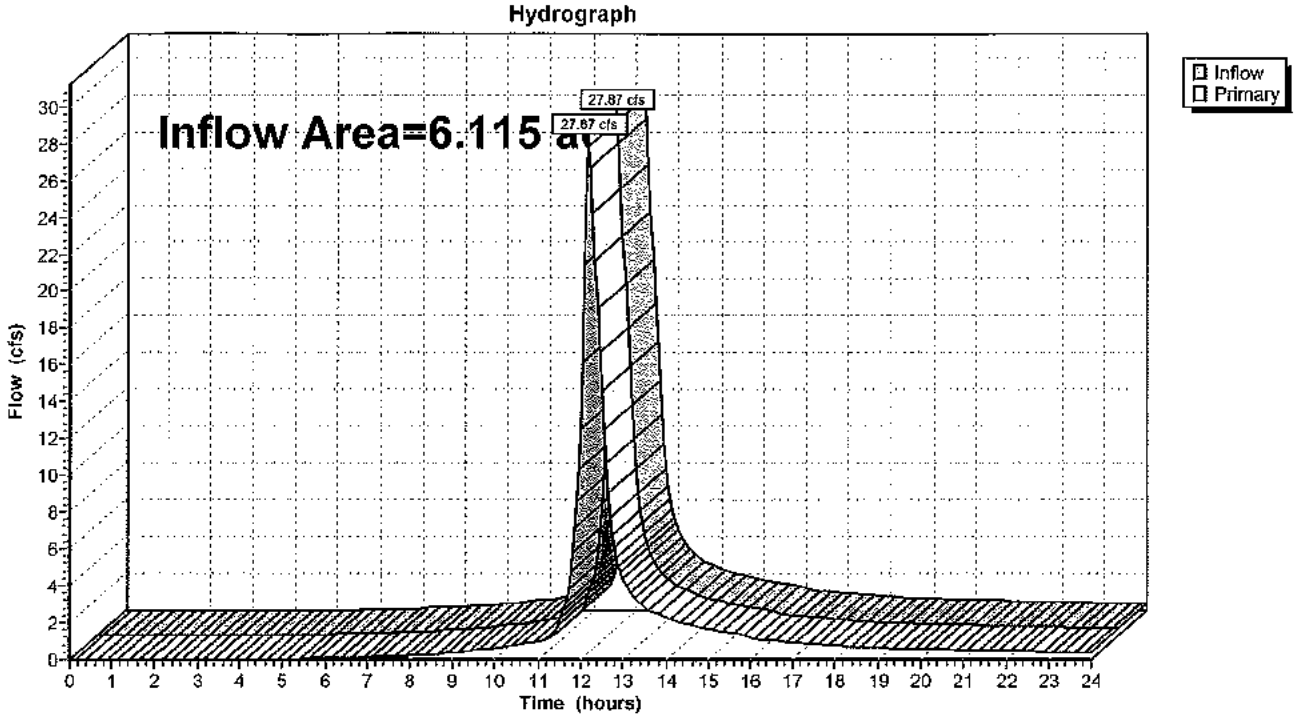


Pond 2P: Design Point 2

Inflow Area = 6.115 ac, Inflow Depth = 5.09" for 100 Year Storm event
Inflow = 27.87 cfs @ 12.21 hrs, Volume= 2.593 af
Primary = 27.87 cfs @ 12.21 hrs, Volume= 2.593 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Pond 3P: Type I-2 Infiltration Basin 3P

Inflow Area = 1.065 ac, Inflow Depth = 7.79" for 100 Year Storm event
Inflow = 9.52 cfs @ 12.03 hrs, Volume= 0.691 af
Outflow = 3.36 cfs @ 12.25 hrs, Volume= 0.691 af, Atten= 65%, Lag= 12.7 min
Primary = 0.99 cfs @ 12.25 hrs, Volume= 0.046 af
Secondary = 2.37 cfs @ 12.25 hrs, Volume= 0.645 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 515.37' @ 12.25 hrs Surf.Area= 4,655 sf Storage= 7,350 cf
Plug-Flow detention time= 25.2 min calculated for 0.690 af (100% of inflow)
Center-of-Mass det. time= 24.9 min (781.2 - 756.3)

#	Invert	Avail.Storage	Storage Description
1	512.00'	16,221 cf	**Custom Stage Data (Irregular)** Listed below

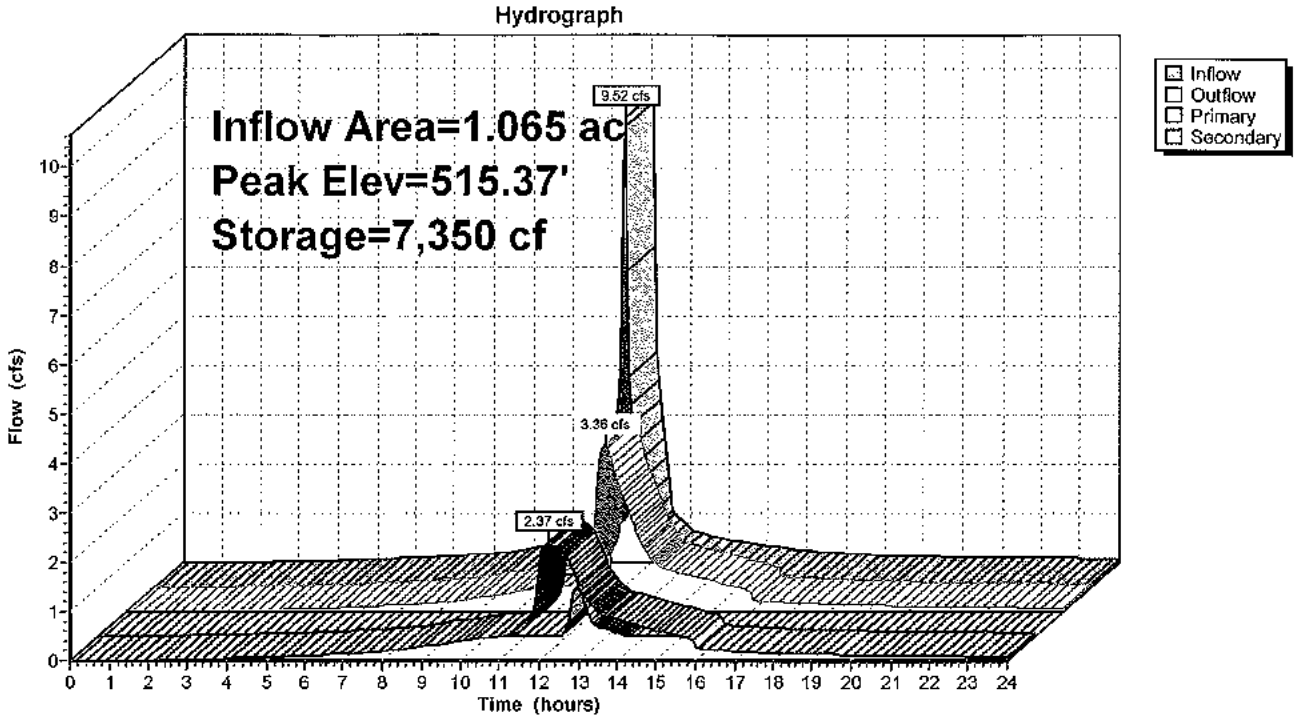
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
512.00	862	140.6	0	0	862
513.00	1,308	161.7	1,077	1,077	1,392
514.00	1,810	182.4	1,552	2,629	1,984
515.00	4,252	335.7	2,945	5,575	8,310
516.00	5,339	335.1	4,785	10,360	8,647
517.00	6,399	357.8	5,861	16,221	9,945

#	Routing	Invert	Outlet Devices
1	Secondary	0.00'	**0.030556 fpm Exfiltration over entire Surface area**
2	Primary	512.00'	**18.0" x 41.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.1220 '/' n= 0.011 Cc= 0.900
3	Device 2	514.00'	**3.0" Vert. Orifice/Grate** C= 0.600
4	Device 2	515.00'	**1.00' x 0.50' Vert. Orifice/Grate** C= 0.600
5	Device 2	516.00'	**4.00' x 2.50' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=0.99 cfs @ 12.25 hrs HW=515.37' (Free Discharge)
└**2=Culvert** (Passes 0.99 cfs of 18.78 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 0.26 cfs @ 5.4 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.72 cfs @ 2.0 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=2.37 cfs @ 12.25 hrs HW=515.37' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.37 cfs)

Pond 3P: Type I-2 Infiltration Basin 3P



Pond 4P: P-5 Pocket Pond 4P

Inflow Area = 3.165 ac, Inflow Depth = 6.33" for 100 Year Storm event
Inflow = 19.11 cfs @ 12.16 hrs, Volume= 1.671 af
Outflow = 16.27 cfs @ 12.23 hrs, Volume= 1.477 af, Atten= 15%, Lag= 4.6 min
Primary = 16.27 cfs @ 12.23 hrs, Volume= 1.477 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 529.99' @ 12.23 hrs Surf.Area= 0 sf Storage= 15,480 cf
Plug-Flow detention time= 89.2 min calculated for 1.473 af (88% of inflow)
Center-of-Mass det. time= 36.6 min (836.4 - 799.8)

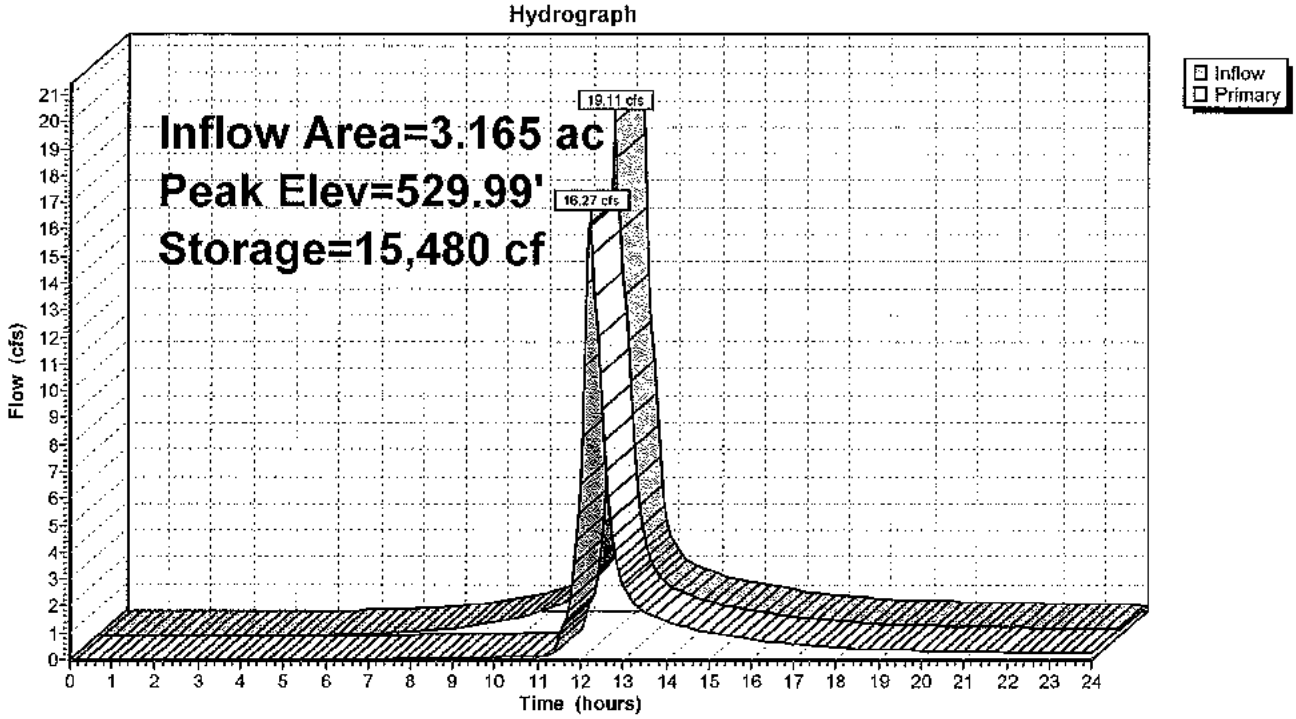
#	Invert	Avail.Storage	Storage Description
1	526.00'	21,141 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
526.00	0
528.00	6,409
530.00	15,527
531.00	21,141

#	Routing	Invert	Outlet Devices
1	Primary	524.00'	**18.0" x 265.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.0642 '/' n= 0.011 Cc= 0.900
2	Device 1	526.00'	**1.9" Vert. Orifice/Grate** C= 0.600
3	Device 1	528.40'	**2.50' x 1.60' Vert. Orifice/Grate** C= 0.600
4	Device 1	530.00'	**2.50' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=16.13 cfs @ 12.23 hrs HW=529.98' (Free Discharge)
↑—**1=Culvert** (Passes 16.13 cfs of 26.53 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 9.5 fps)
—**3=Orifice/Grate** (Orifice Controls 15.94 cfs @ 4.0 fps)
—**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: P-5 Pocket Pond 4P



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=4.696 ac Runoff Depth=0.25"
Flow Length=1,539' Tc=19.1 min CN=81 Runoff=0.74 cfs 0.099 af

Subcatchment 2S: Subcatchment 2S Runoff Area=1.885 ac Runoff Depth=0.41"
Flow Length=530' Tc=11.8 min CN=86 Runoff=0.69 cfs 0.065 af

Subcatchment 3S: Subcatchment 3S Runoff Area=1.065 ac Runoff Depth=0.83"
Flow Length=258' Tc=2.1 min CN=94 Runoff=1.13 cfs 0.074 af

Subcatchment 4S: Subcatchment 4S Runoff Area=3.165 ac Runoff Depth=0.28"
Flow Length=874' Tc=11.4 min CN=82 Runoff=0.70 cfs 0.074 af

Reach 1R: Reach 1R Peak Depth=0.06' Max Vel=2.8 fps Inflow=0.06 cfs 0.053 af
D=18.0" n=0.011 L=270.0' S=0.0352 '/' Capacity=23.29 cfs Outflow=0.06 cfs 0.053 af

Pond 1P: Design Point 1 Inflow=0.74 cfs 0.099 af
Primary=0.74 cfs 0.099 af

Pond 2P: Design Point 2 Inflow=0.70 cfs 0.118 af
Primary=0.70 cfs 0.118 af

Pond 3P: Type I-2 Infiltration Basin 3P Peak Elev=512.32' Storage=345 cf Inflow=1.13 cfs 0.074 af
Primary=0.00 cfs 0.000 af Secondary=0.51 cfs 0.074 af Outflow=0.51 cfs 0.074 af

Pond 4P: P-5 Pocket Pond 4P Peak Elev=526.49' Storage=1,572 cf Inflow=0.70 cfs 0.074 af
Outflow=0.06 cfs 0.053 af

Total Runoff Area = 10.811 ac Runoff Volume = 0.312 af Average Runoff Depth = 0.35"

Subcatchment 1S: Subcatchment 1S

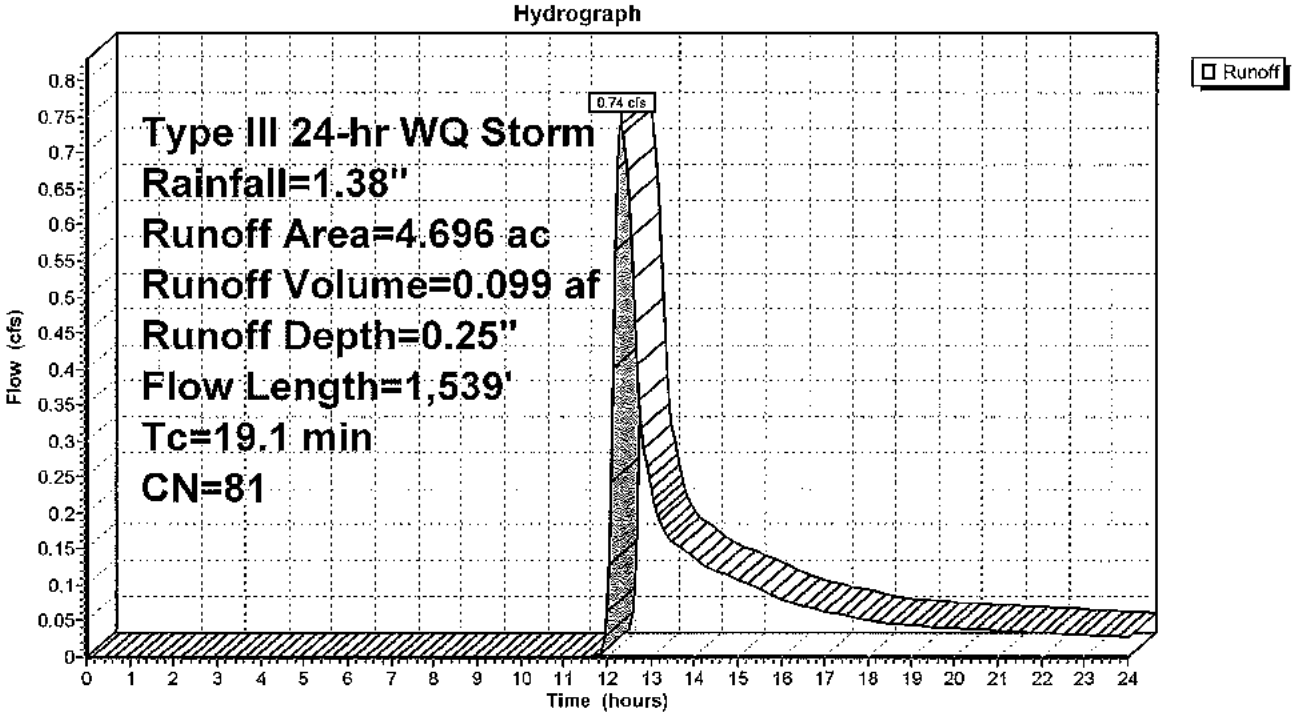
Runoff = 0.74 cfs @ 12.33 hrs, Volume= 0.099 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.38"

Area (ac)	CN	Description
0.262	98	Paved parking & roofs
1.152	78	Meadow, non-grazed, HSG D
2.589	79	Woods, Fair, HSG D
0.693	84	50-75% Grass cover, Fair, HSG D
4.696	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0659	0.1		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
3.3	595	0.3689	3.0		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.5	267	0.1871	3.0		**Shallow Concentrated Flow, Grass Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.4	145	0.1384	5.6		**Shallow Concentrated Flow, Grass Swale** Grassed Waterway Kv= 15.0 fps
0.2	222	0.0465	15.1	26.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
0.4	210	0.0496	9.4	28.25	**Channel Flow, Stone Swale** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.025
19.1	1,539	Total			

Subcatchment 1S: Subcatchment 1S



Subcatchment 2S: Subcatchment 2S

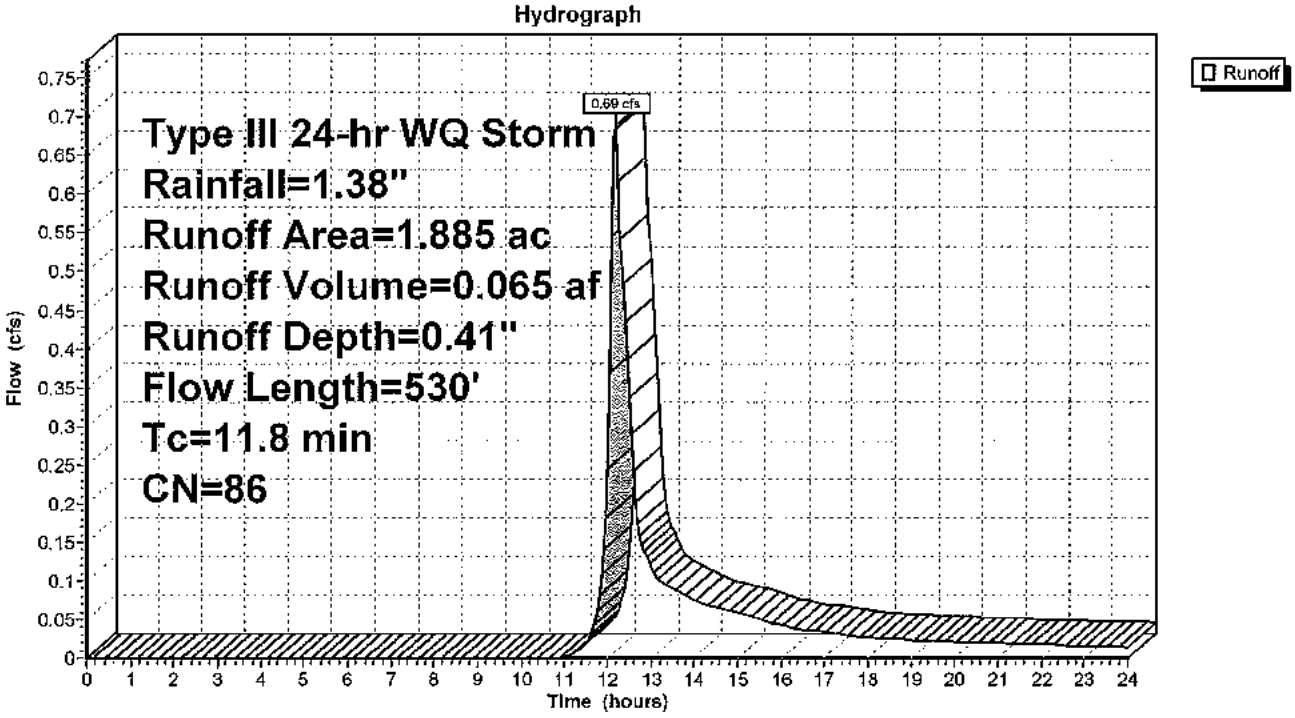
Runoff = 0.69 cfs @ 12.18 hrs, Volume= 0.065 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.38"

Area (ac)	CN	Description
0.608	98	Paved parking & roofs
0.617	84	50-75% Grass cover, Fair, HSG D
0.050	49	50-75% Grass cover, Fair, HSG A
0.610	79	Woods, Fair, HSG D
1.885	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.1800	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	66	0.1984	2.2		**Shallow Concentrated Flow, Shallow Concentrated Woods Flow** Woodland Kv= 5.0 fps
0.6	88	0.1178	2.4		**Shallow Concentrated Flow, Shallow Conceentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
0.7	175	0.0394	4.0		**Shallow Concentrated Flow, Shallow Concentrated Paved Flow** Paved Kv= 20.3 fps
1.1	101	0.0464	1.5		**Shallow Concentrated Flow, Shallow Concentrated Grass Flow** Short Grass Pasture Kv= 7.0 fps
11.8	530	Total			

Subcatchment 2S: Subcatchment 2S



Subcatchment 3S: Subcatchment 3S

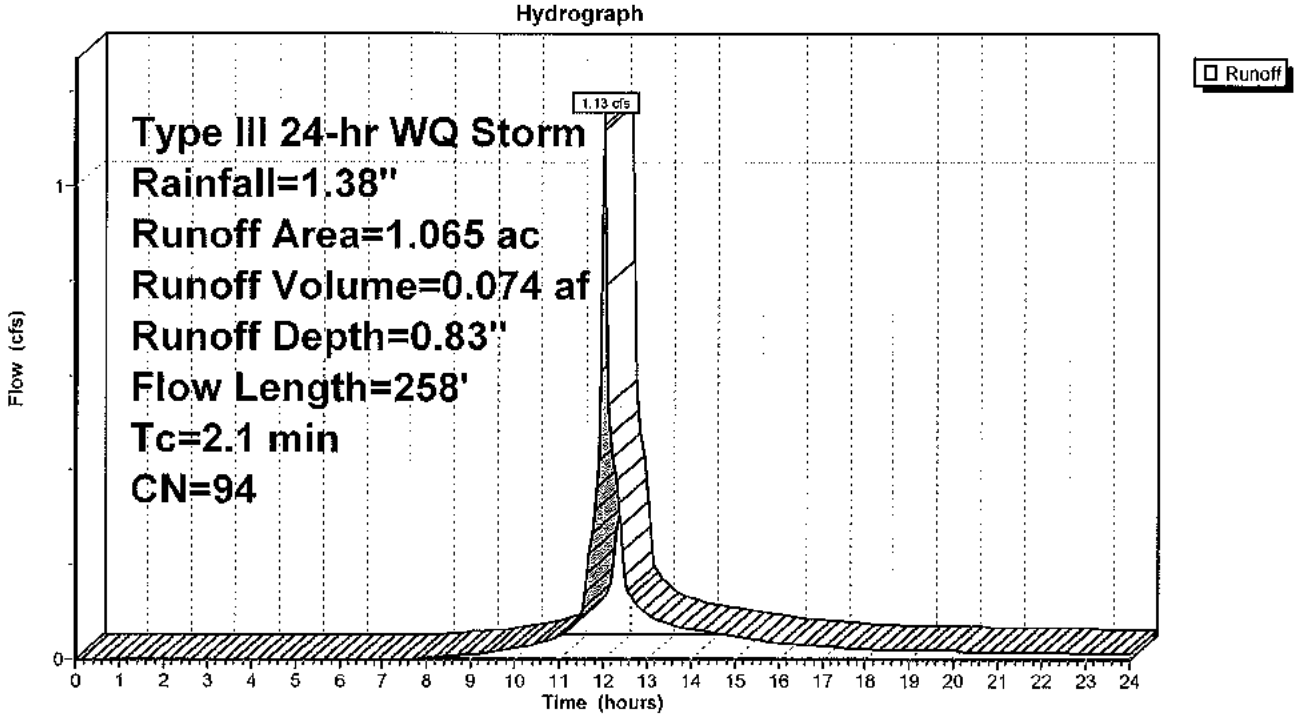
Runoff = 1.13 cfs @ 12.04 hrs, Volume= 0.074 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.38"

Area (ac)	CN	Description
0.767	98	Paved parking & roofs
0.243	84	50-75% Grass cover, Fair, HSG D
0.055	91	Gravel roads, HSG D
1.065	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0080	1.0		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.21"
0.4	98	0.0430	4.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
0.0	60	0.0830	20.2	35.77	**Circular Channel (pipe), Pipe Flow** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011
2.1	258	Total			

Subcatchment 3S: Subcatchment 3S



Subcatchment 4S: Subcatchment 4S

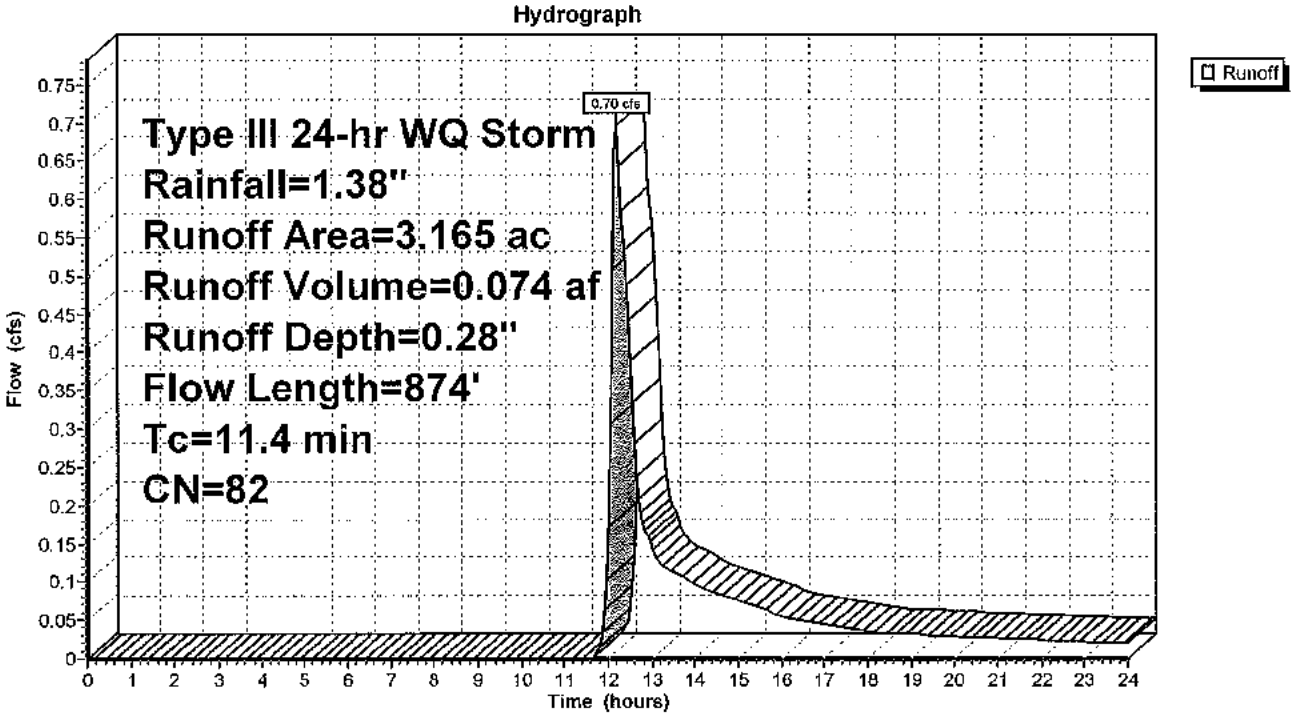
Runoff = 0.70 cfs @ 12.19 hrs, Volume= 0.074 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Storm Rainfall=1.38"

Area (ac)	CN	Description
0.358	98	Paved parking & roofs
1.200	79	Woods, Fair, HSG D
1.021	78	Meadow, non-grazed, HSG D
0.586	84	50-75% Grass cover, Fair, HSG D
3.165	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2716	0.2		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.21"
2.1	408	0.4097	3.2		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
1.4	249	0.1878	3.0		**Shallow Concentrated Flow, Meadow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
0.3	117	0.1966	6.7		**Shallow Concentrated Flow, Swale Concentrated Flow** Grassed Waterway Kv= 15.0 fps
11.4	874	Total			

Subcatchment 4S: Subcatchment 4S



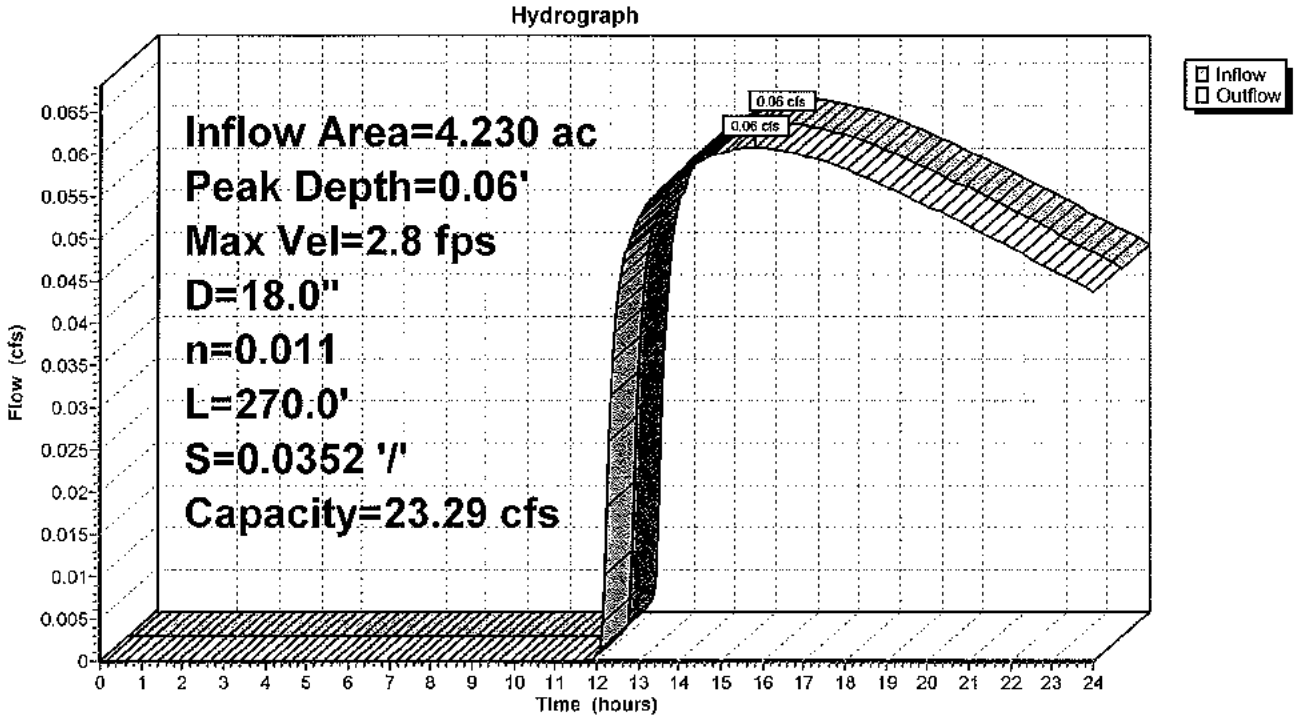
Reach 1R: Reach 1R

Inflow Area = 4.230 ac, Inflow Depth = 0.15" for WQ Storm event
Inflow = 0.06 cfs @ 15.78 hrs, Volume= 0.053 af
Outflow = 0.06 cfs @ 15.82 hrs, Volume= 0.053 af, Atten= 0%, Lag= 2.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.8 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 2.7 fps, Avg. Travel Time= 1.7 min

Peak Depth= 0.06' @ 15.80 hrs
Capacity at bank full= 23.29 cfs
Inlet Invert= 506.00', Outlet Invert= 496.50'
18.0" Diameter Pipe n= 0.011 Length= 270.0' Slope= 0.0352 '/'

Reach 1R: Reach 1R

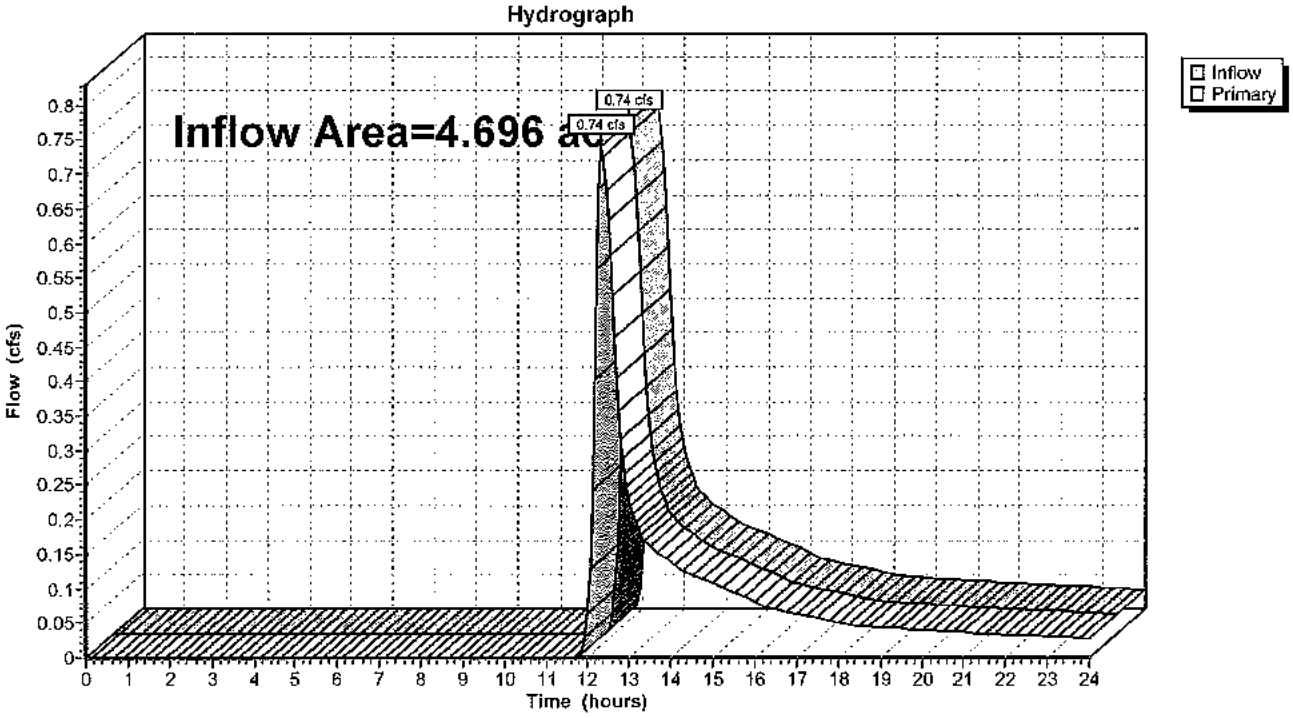


Pond 1P: Design Point 1

Inflow Area = 4.696 ac, Inflow Depth = 0.25" for WQ Storm event
Inflow = 0.74 cfs @ 12.33 hrs, Volume= 0.099 af
Primary = 0.74 cfs @ 12.33 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Design Point 1

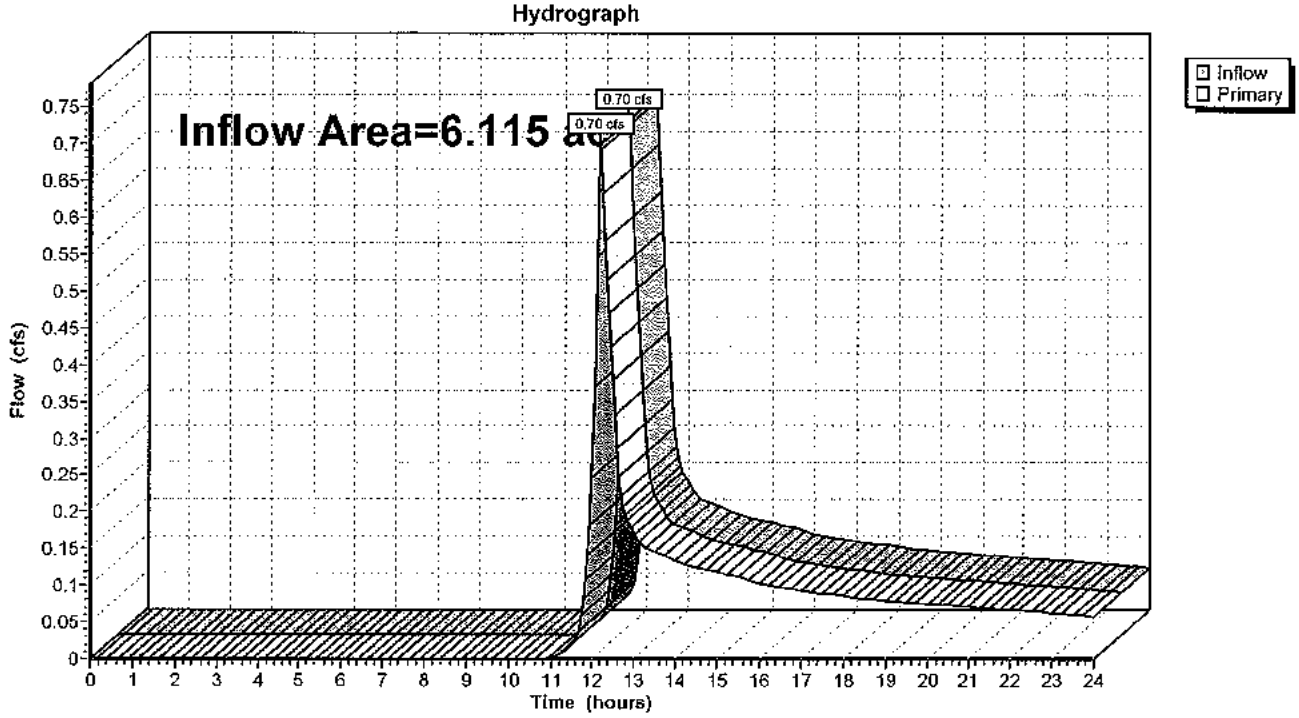


Pond 2P: Design Point 2

Inflow Area = 6.115 ac, Inflow Depth = 0.23" for WQ Storm event
Inflow = 0.70 cfs @ 12.18 hrs, Volume= 0.118 af
Primary = 0.70 cfs @ 12.18 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Design Point 2



Pond 3P: Type I-2 Infiltration Basin 3P

Inflow Area = 1.065 ac, Inflow Depth = 0.83" for WQ Storm event
Inflow = 1.13 cfs @ 12.04 hrs, Volume= 0.074 af
Outflow = 0.51 cfs @ 12.17 hrs, Volume= 0.074 af, Atten= 55%, Lag= 8.1 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.51 cfs @ 12.17 hrs, Volume= 0.074 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 512.32' @ 12.17 hrs Surf.Area= 1,005 sf Storage= 345 cf
Plug-Flow detention time= 4.2 min calculated for 0.074 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (818.7 - 814.8)

#	Invert	Avail.Storage	Storage Description
1	512.00'	16,221 cf	**Custom Stage Data (Irregular)** Listed below

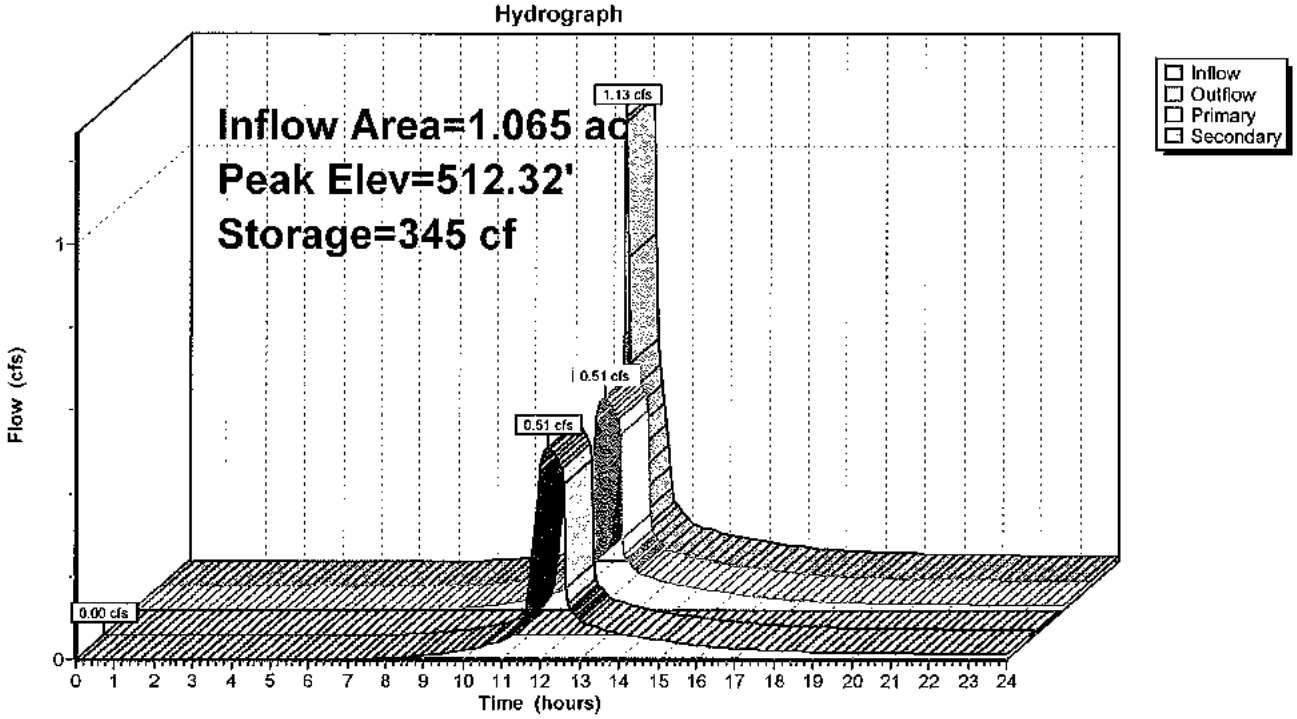
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
512.00	862	140.6	0	0	862
513.00	1,308	161.7	1,077	1,077	1,392
514.00	1,810	182.4	1,552	2,629	1,984
515.00	4,252	335.7	2,945	5,575	8,310
516.00	5,339	335.1	4,785	10,360	8,647
517.00	6,399	357.8	5,861	16,221	9,945

#	Routing	Invert	Outlet Devices
1	Secondary	0.00'	**0.030556 fpm Exfiltration over entire Surface area**
2	Primary	512.00'	**18.0" x 41.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.1220 '/' n= 0.011 Cc= 0.900
3	Device 2	514.00'	**3.0" Vert. Orifice/Grate** C= 0.600
4	Device 2	515.00'	**1.00' x 0.50' Vert. Orifice/Grate** C= 0.600
5	Device 2	516.00'	**4.00' x 2.50' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=512.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.51 cfs @ 12.17 hrs HW=512.32' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Pond 3P: Type I-2 Infiltration Basin 3P



Pond 4P: P-5 Pocket Pond 4P

Inflow Area = 3.165 ac, Inflow Depth = 0.28" for WQ Storm event
Inflow = 0.70 cfs @ 12.19 hrs, Volume= 0.074 af
Outflow = 0.06 cfs @ 15.78 hrs, Volume= 0.053 af, Atten= 91%, Lag= 215.0 min
Primary = 0.06 cfs @ 15.78 hrs, Volume= 0.053 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 526.49' @ 15.78 hrs Surf.Area= 0 sf Storage= 1,572 cf
Plug-Flow detention time= 288.5 min calculated for 0.053 af (71% of inflow)
Center-of-Mass det. time= 182.9 min (1,076.1 - 893.2)

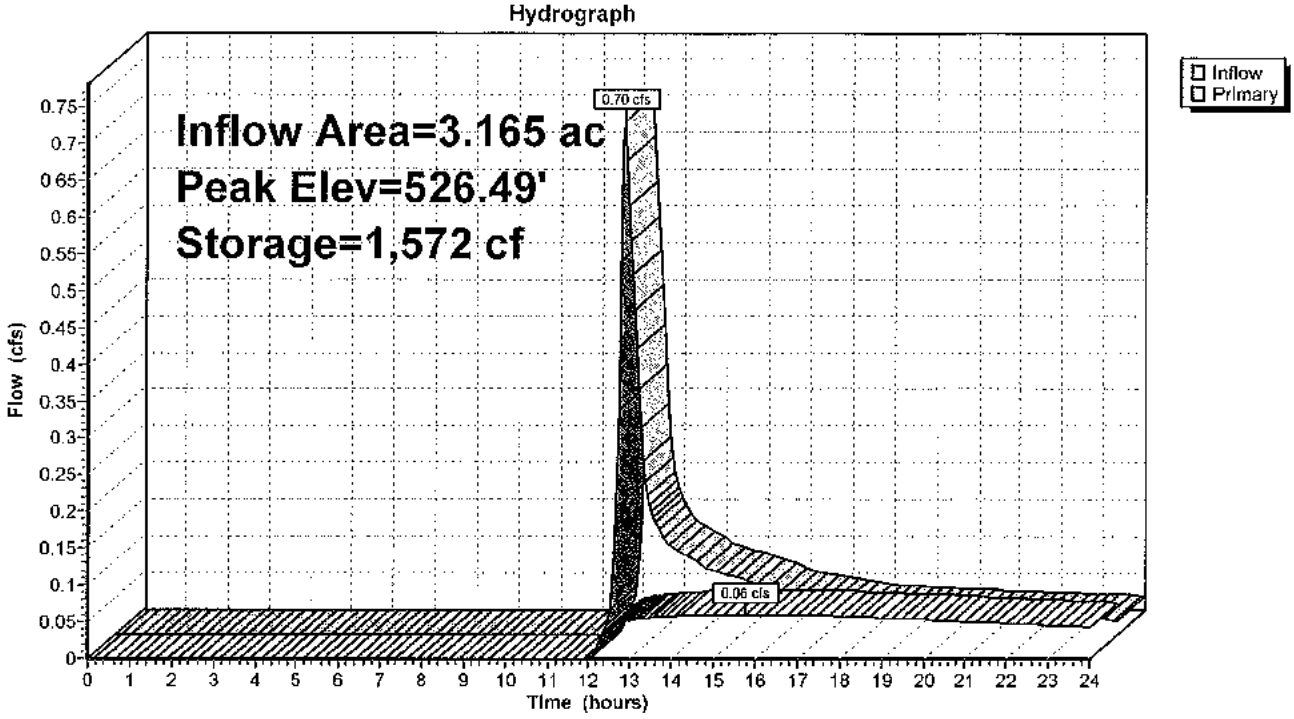
#	Invert	Avail.Storage	Storage Description
1	526.00'	21,141 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
526.00	0
528.00	6,409
530.00	15,527
531.00	21,141

#	Routing	Invert	Outlet Devices
1	Primary	524.00'	**18.0" x 265.0' long Culvert** RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 507.00' S= 0.0642 '/' n= 0.011 Cc= 0.900
2	Device 1	526.00'	**1.9" Vert. Orifice/Grate** C= 0.600
3	Device 1	528.40'	**2.50' x 1.60' Vert. Orifice/Grate** C= 0.600
4	Device 1	530.00'	**2.50' x 4.00' Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Primary OutFlow Max=0.06 cfs @ 15.78 hrs HW=526.49' (Free Discharge)
↑—**1=Culvert** (Passes 0.06 cfs of 15.31 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 3.1 fps)
—**3=Orifice/Grate** (Controls 0.00 cfs)
—**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: P-5 Pocket Pond 4P



APPENDIX 7

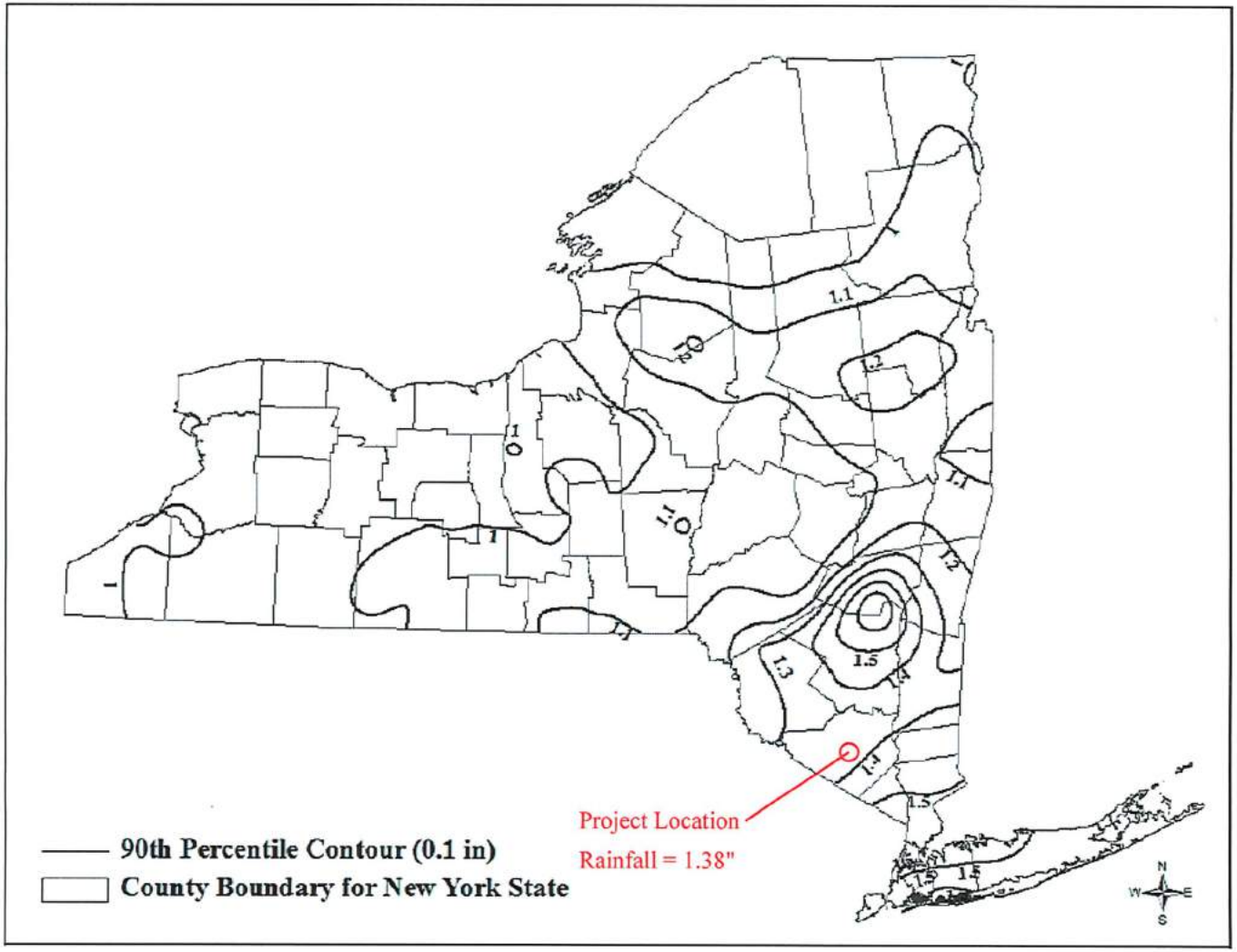
TR-20 Supporting Data

New York State Stormwater Management Design Manual

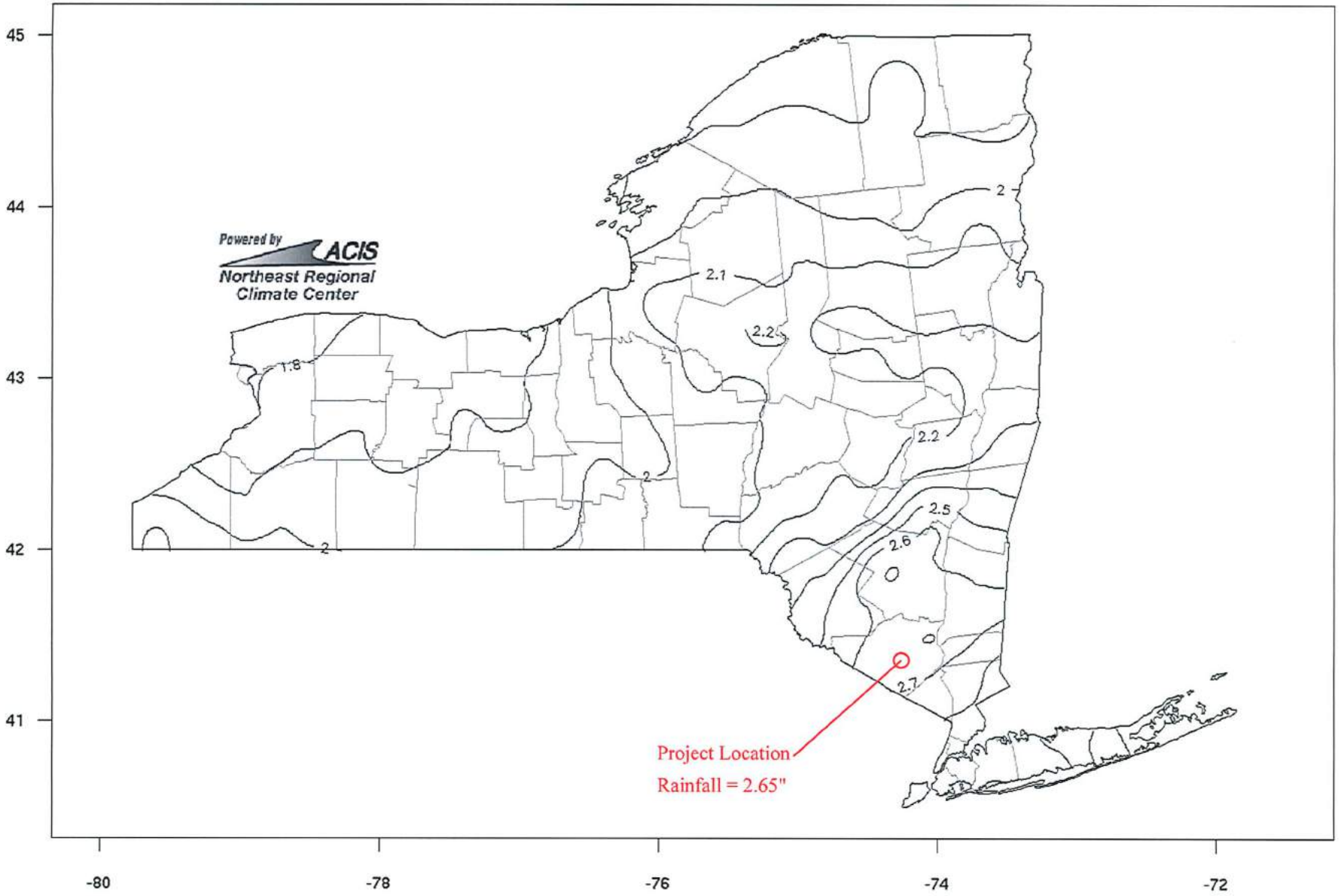
Chapter 4: Unified Stormwater Sizing Criteria

Section 4.2 Water Quality Volume (WQv)

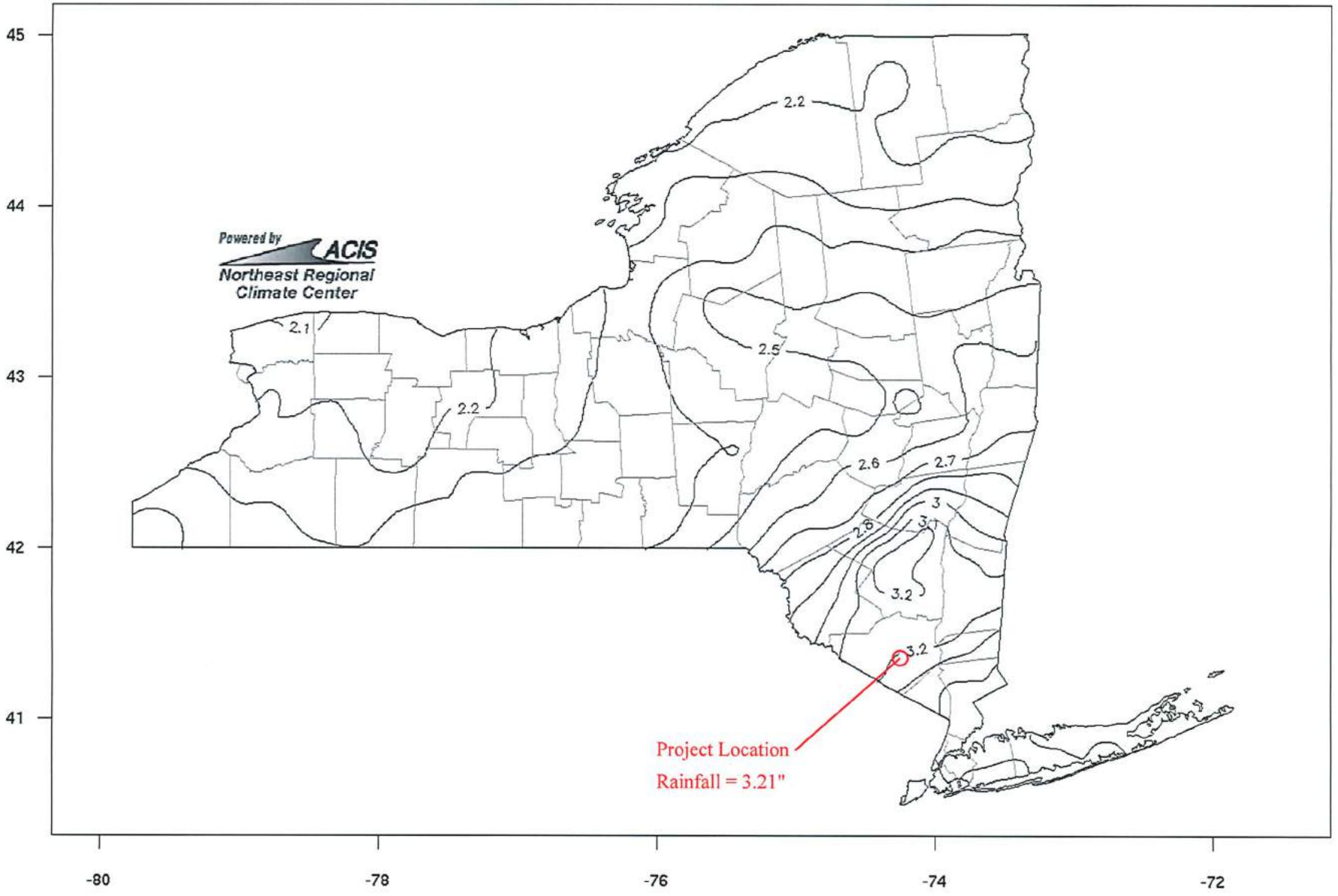
Figure 4.1: 90th Percentile Rainfall in New York State (NYSDEC, 2013)



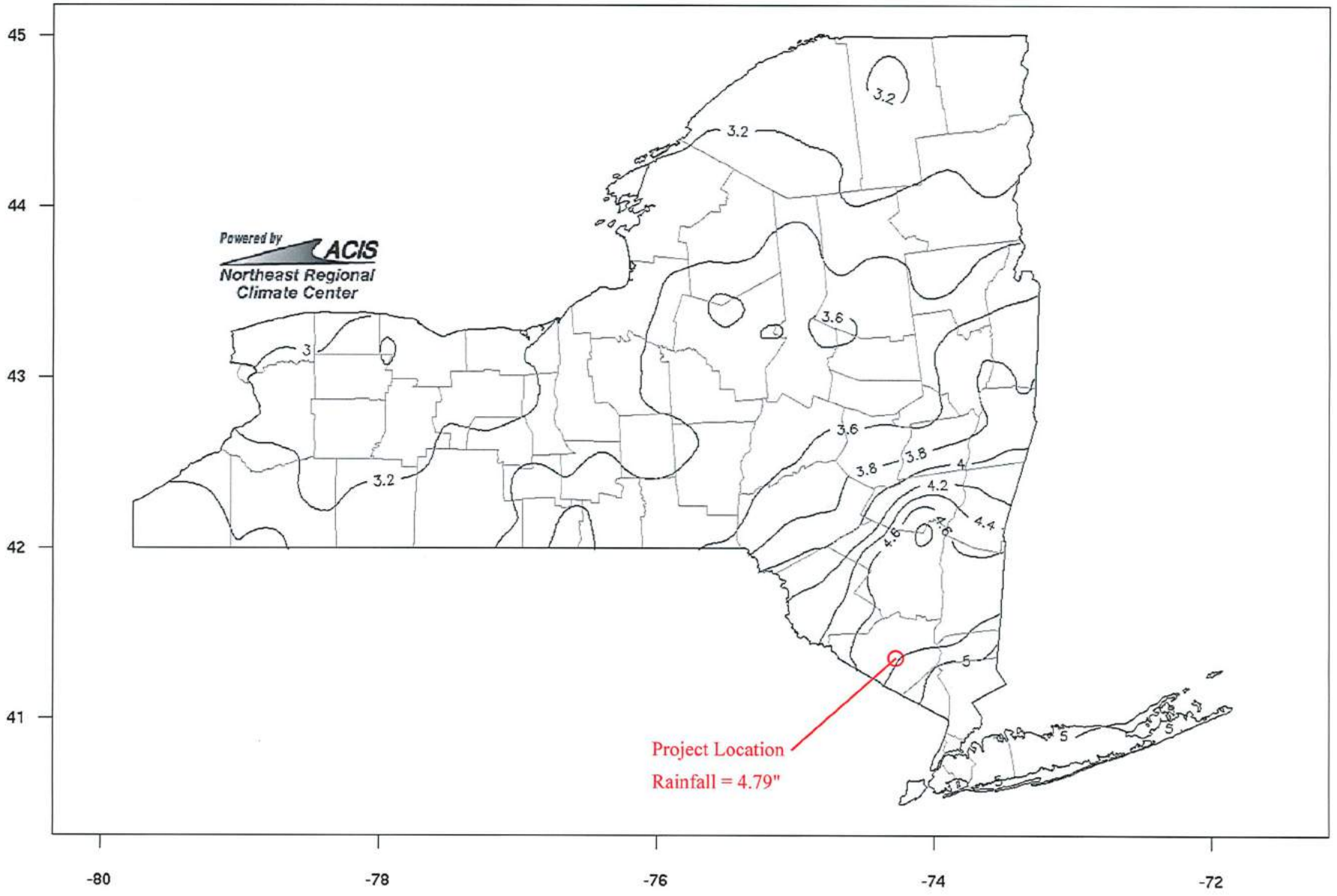
Extreme Precipitation Estimates
24hr 1yr



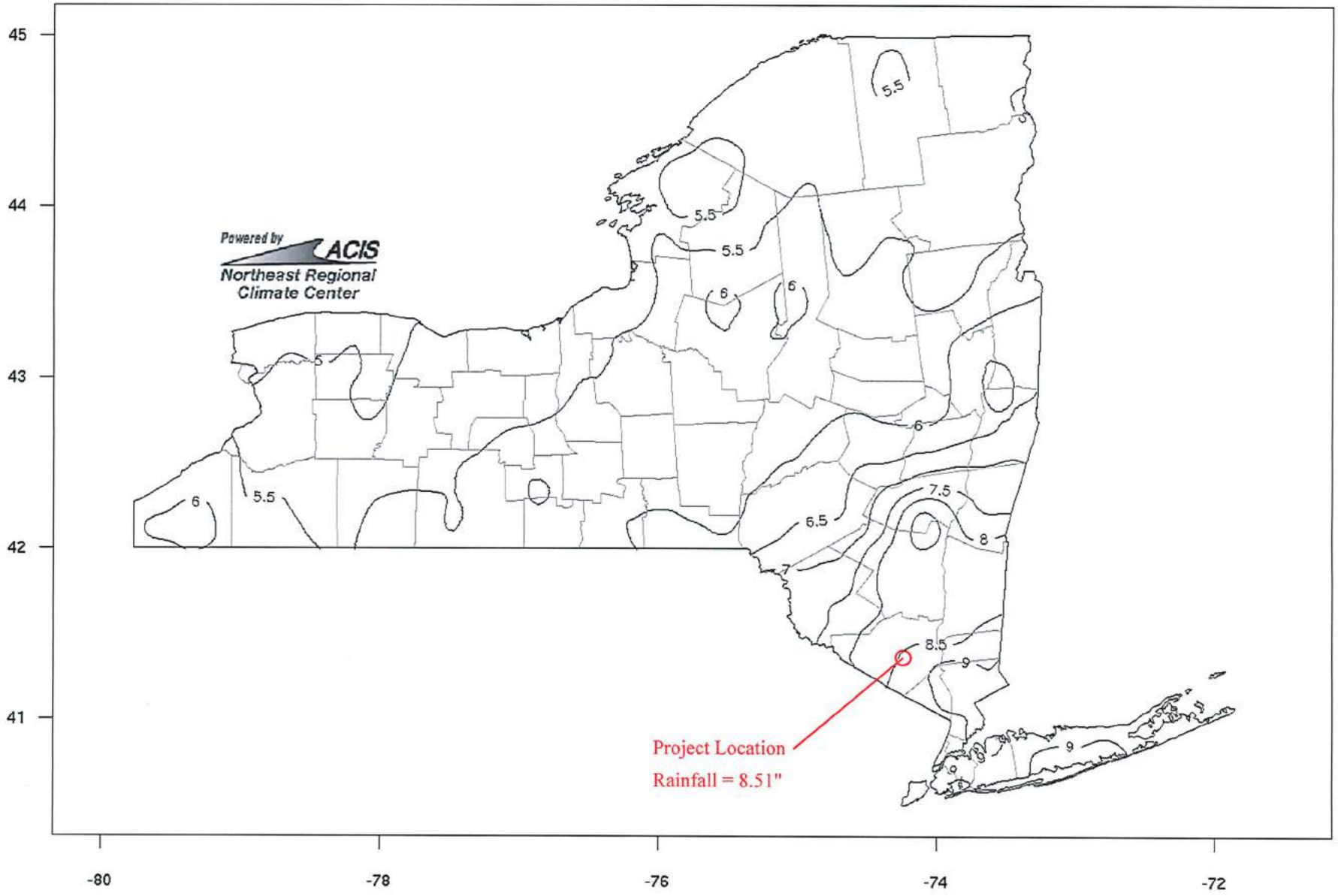
Extreme Precipitation Estimates
24hr 2yr



Extreme Precipitation Estimates
24hr 10yr



Extreme Precipitation Estimates
24hr 100yr



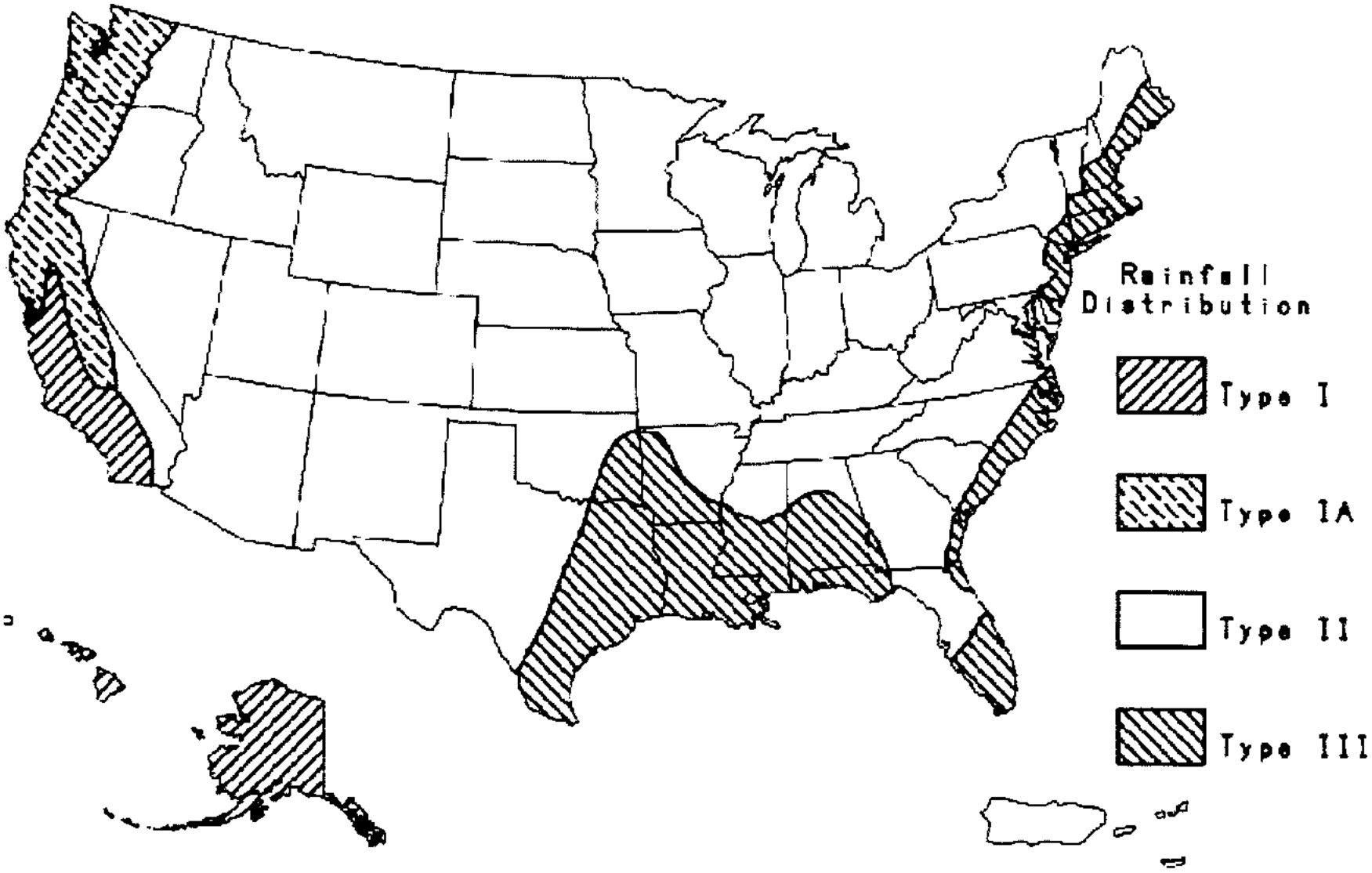


Figure B-2.—Approximate geographic boundaries for SCS rainfall distributions.

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	74.280 degrees West
Latitude	41.341 degrees North
Elevation	0 feet
Date/Time	Mon, 06 Jan 2020 16:53:14 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.51	0.63	0.82	1.03	1.28	**1yr**	0.89	1.20	1.46	1.79	2.18	2.65	3.06	**1yr**	2.35	2.94	3.39	4.08	4.72	**1yr**
2yr	0.39	0.61	0.75	0.99	1.25	1.56	**2yr**	1.08	1.45	1.78	2.18	2.65	3.21	3.66	**2yr**	2.84	3.52	4.04	4.75	5.40	**2yr**
5yr	0.46	0.72	0.90	1.20	1.54	1.94	**5yr**	1.33	1.79	2.23	2.74	3.33	4.03	4.63	**5yr**	3.57	4.46	5.09	5.87	6.64	**5yr**
10yr	0.52	0.81	1.02	1.39	1.81	2.29	**10yr**	1.56	2.10	2.64	3.26	3.96	4.79	5.54	**10yr**	4.24	5.33	6.07	6.90	7.76	**10yr**
25yr	0.60	0.95	1.21	1.68	2.24	2.87	**25yr**	1.93	2.60	3.32	4.10	5.00	6.02	7.02	**25yr**	5.32	6.75	7.66	8.54	9.55	**25yr**
50yr	0.68	1.09	1.39	1.95	2.63	3.40	**50yr**	2.27	3.06	3.95	4.88	5.95	7.16	8.41	**50yr**	6.33	8.09	9.14	10.04	11.18	**50yr**
100yr	0.77	1.24	1.60	2.27	3.09	4.03	**100yr**	2.67	3.59	4.69	5.82	7.08	8.51	10.07	**100yr**	7.54	9.68	10.92	11.80	13.10	**100yr**
200yr	0.87	1.42	1.84	2.64	3.65	4.78	**200yr**	3.15	4.23	5.58	6.93	8.44	10.14	12.07	**200yr**	8.97	11.61	13.05	13.89	15.36	**200yr**
500yr	1.04	1.71	2.23	3.23	4.53	5.98	**500yr**	3.91	5.25	7.01	8.73	10.64	12.78	15.34	**500yr**	11.31	14.75	16.53	17.22	18.97	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.30	0.46	0.56	0.75	0.93	1.11	**1yr**	0.80	1.09	1.23	1.56	2.02	2.27	2.58	**1yr**	2.01	2.48	2.78	3.79	4.28	**1yr**
2yr	0.38	0.59	0.72	0.98	1.20	1.45	**2yr**	1.04	1.42	1.64	2.10	2.61	3.11	3.54	**2yr**	2.75	3.41	3.90	4.63	5.26	**2yr**
5yr	0.43	0.66	0.81	1.12	1.42	1.68	**5yr**	1.23	1.64	1.91	2.45	3.07	3.72	4.28	**5yr**	3.30	4.12	4.74	5.46	6.21	**5yr**
10yr	0.47	0.72	0.89	1.24	1.60	1.88	**10yr**	1.38	1.84	2.15	2.75	3.47	4.25	4.89	**10yr**	3.76	4.70	5.48	6.18	6.98	**10yr**
25yr	0.53	0.81	1.01	1.44	1.89	2.17	**25yr**	1.63	2.12	2.51	3.22	4.06	5.01	5.86	**25yr**	4.44	5.64	6.62	7.30	8.15	**25yr**
50yr	0.59	0.89	1.11	1.60	2.15	2.44	**50yr**	1.85	2.38	2.81	3.64	4.60	5.65	6.75	**50yr**	5.00	6.49	7.66	8.32	9.19	**50yr**
100yr	0.65	0.98	1.23	1.78	2.44	2.72	**100yr**	2.11	2.66	3.18	4.11	5.21	6.35	7.79	**100yr**	5.62	7.49	8.87	9.45	10.33	**100yr**

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
200yr	0.73	1.09	1.39	2.01	2.80	3.05	200yr	2.42	2.98	3.58	4.67	5.92	7.16	8.99	200yr	6.34	8.65	10.30	10.76	11.62	200yr
500yr	0.85	1.26	1.63	2.36	3.36	3.55	500yr	2.90	3.47	4.22	5.55	7.04	8.37	10.90	500yr	7.41	10.48	12.59	12.80	13.62	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.55	0.68	0.91	1.12	1.35	1yr	0.96	1.32	1.56	1.97	2.41	2.86	3.32	1yr	2.53	3.19	3.67	4.30	5.10	1yr
2yr	0.41	0.63	0.78	1.05	1.30	1.55	2yr	1.12	1.52	1.77	2.26	2.80	3.36	3.82	2yr	2.97	3.67	4.22	4.93	5.64	2yr
5yr	0.50	0.77	0.96	1.32	1.68	1.99	5yr	1.45	1.95	2.27	2.91	3.63	4.36	4.95	5yr	3.86	4.76	5.46	6.31	7.08	5yr
10yr	0.59	0.91	1.13	1.58	2.04	2.44	10yr	1.76	2.38	2.76	3.55	4.44	5.38	6.15	10yr	4.76	5.91	6.69	7.60	8.49	10yr
25yr	0.75	1.13	1.41	2.01	2.65	3.19	25yr	2.29	3.12	3.62	4.66	5.78	7.09	8.08	25yr	6.27	7.77	8.75	9.75	10.80	25yr
50yr	0.88	1.34	1.67	2.41	3.24	3.81	50yr	2.80	3.73	4.42	5.69	7.05	8.77	9.94	50yr	7.77	9.56	10.73	11.77	12.98	50yr
100yr	1.05	1.59	1.99	2.87	3.94	4.65	100yr	3.40	4.55	5.39	6.95	8.61	10.87	12.24	100yr	9.62	11.77	13.14	14.22	15.61	100yr
200yr	1.25	1.88	2.38	3.44	4.80	5.68	200yr	4.14	5.55	6.59	8.49	10.50	13.51	15.07	200yr	11.95	14.49	16.10	17.16	18.80	200yr
500yr	1.57	2.34	3.02	4.38	6.23	7.37	500yr	5.38	7.21	8.59	11.07	13.65	18.00	19.80	500yr	15.93	19.04	21.07	22.02	24.04	500yr

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Orange County, New York

19139.01 Elkay Drive Commercial Building

January 21, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,660 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, New York
Survey Area Data: Version 20, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HoC	Hoosic gravelly sandy loam, 8 to 15 percent slopes	0.1	0.6%
MdC	Mardin gravelly silt loam, 8 to 15 percent slopes	6.2	57.1%
Ra	Raynham silt loam	0.8	7.2%
RSF	Rock outcrop-Nassau complex, very steep	3.8	35.1%
Totals for Area of Interest		**10.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Orange County, New York

HoC—Hoosic gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9vvm
Elevation: 100 to 1,100 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 5 inches: gravelly sandy loam
H2 - 5 to 25 inches: very gravelly sandy loam
H3 - 25 to 60 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 5 percent
Hydric soil rating: No

Fredon
Percent of map unit: 5 percent
Hydric soil rating: No

Castile
Percent of map unit: 5 percent
Hydric soil rating: No

Chenango
Percent of map unit: 5 percent
Hydric soil rating: No

MdC—Mardin gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2v30l
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Mardin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mardin

Setting
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile
Ap - 0 to 8 inches: gravelly silt loam
Bw - 8 to 15 inches: gravelly silt loam
E - 15 to 20 inches: gravelly silt loam
Bx - 20 to 72 inches: gravelly silt loam

Properties and qualities
Slope: 8 to 15 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ra—Raynham silt loam

Map Unit Setting

National map unit symbol: 9vwd
Elevation: 50 to 500 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Raynham, poorly drained, and similar soils: 50 percent

Raynham, somewhat poorly drained, and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raynham, Poorly Drained

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciolacustrine, eolian, or old alluvial deposits, comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 26 inches: silt loam
H3 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Raynham, Somewhat Poorly Drained

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciolacustrine, eolian, or old alluvial deposits, comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 26 inches: silt loam
H3 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Scio

Percent of map unit: 5 percent
Hydric soil rating: No

Unadilla

Percent of map unit: 5 percent
Hydric soil rating: No

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 5 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

RSF—Rock outcrop-Nassau complex, very steep

Map Unit Setting

National map unit symbol: 9vwy
Elevation: 600 to 1,800 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 60 percent

Nassau and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 35 to 45 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Description of Nassau

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 14 inches: very channery silt loam
H3 - 14 to 22 inches: unweathered bedrock

Properties and qualities

Slope: 35 to 45 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Arnot

Percent of map unit: 5 percent
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Hydric soil rating: No

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APPENDIX 8

Stormwater Quality and Runoff Reduction – Calculations & Supporting Data

Elkay Drive Commercial Building

Water Quality Volume (WQ_v) Calculation for Entire Project Drainage Area

Utilize 90% Rule:

$$WQ_v = [(P) (R_v) (A)] / 12$$

WQ_v = Water Quality Volume (acre-feet)
$R_v = 0.05 + 0.009 (I)$
I = Impervious Cover (Percent)
P = 90% Rainfall Event Number = 1.38 inches
A = Drainage Area in acres

Calculate Impervious Cover (%):

Drainage Area (A) =	10.81	acres
New Impervious area within Site Area =	1.24	acres

Impervious Cover (I) = 11.5 %

Calculate Volumetric Runoff Coefficient (R_v):

$$R_v = 0.05 + 0.009 (I)$$
R_v = 0.15

Use R_v -> 0.15

90% Rainfall Event Number Utilized:

P = 1.38 inches

Calculate Water Quality Volume:

$$WQ_v = [(P) (R_v) (A)] / 12$$

WQ_v = 0.190 acre-feet
= **8295** **ft^3**

Elkay Drive Commercial Building

Minimum Runoff Reduction Volume (RRv) Calculation

$$RRv = [(P) (R_v) (Ai)] / 12$$

RRv = Runoff Reduction Volume (acre-feet)

$R_v = 0.05 + 0.009 (I)$

(Where I = 100%)

I = Impervious Cover (Percent)

P = 90% Rainfall Event Number = 1.38 inches

Ai = Impervious Cover Targeted for Runoff Reduction = (S) (Aic)

Aic = Total Area of New Impervious Cover

S = Hydrologic Soil Group (HSG) Specific Reduction Factor

S for HSG A =0.55

S for HSG B =0.40

S for HSG C =0.30

S for HSG D =0.20

Calculate Specific Reduction Factor (S)

Total Drainage Area (A) =	10.81	acres
Total Area of HSG A	0.05	acres
Total Area of HSG B	0.00	acres
Total Area of HSG C	0.00	acres
Total Area of HSG D	10.76	acres

S = [(HSG A)(0.55) + (HSG B)(0.40) + (HSG C)(0.30) + (HSG D)(0.20)] / A

S = 0.2016

Calculate Impervious Cover Targeted for Runoff Reduction (Ai)

Ai = (S) (Aic)

Aic = Total Area of New Impervious Cover = 1.24 acres

Ai = 0.25 acres

Calculate Volumetric Runoff Coefficient (R_v):

$R_v = 0.05 + 0.009 (I)$

R_v = 0.95

90% Rainfall Event Number Utilized:

P = 1.38 inches

Calculate Minimum Runoff Reduction Volume:

$$RRv = [(P) (R_v) (Ai)] / 12$$

RRv = 0.027 acre-feet

RRv = 1189 ft^3

Elkay Drive Commercial Building

Runoff Reduction Volume (RR_v) Calculation Utilizing Tree Planting Technique

Number of Trees to be Planted on Project Site:

Total Applicable Trees = 16

Allowable Impervious Area Reduction per Newly Planted Tree:

Per page 5-60 of the New York State Stormwater Design Manual: A 100 square-foot directly connected impervious area reduction is permitted for each new tree. This credit may be applied to the impervious area adjacent to the tree. Therefore:

Area Reduction = Total Applicable Tree * 100 ft^2

Area Reduction =	1600	ft^2
Area Reduction =	0.037	acres

Re-Calculate Impervious Cover (%):

Drainage Area (A) =	10.77	acres
Impervious area within Site Area =	1.20	acres
Impervious Cover (I) =	11.2	%

Re-Calculate Volumetric Runoff Coefficient (R_v):

$$R_v = 0.05 + 0.009 (I)$$

R_v = 0.15

Use R_v -> 0.15

90% Rainfall Event Number Utilized:

P = 1.38 inches

Re-Calculate Water Quality Volume:

$$WQ_v = [(P) (R_v) (A)] / 12$$

WQ_v =	0.186	acre-feet
=	8117	ft^3

Elkay Drive Commercial Building

Infiltration Basin 3P Design (Pond 3P)

Step 1: Calculate the Water Quality Volume (WQ_v)

$$WQ_v = [(P) (R_v) (A)] / 12$$

WQ_v = Water Quality Volume (acre-feet)
P = 90% Rainfall Event Number = 1.38 inches
$R_v = 0.05 + 0.009 (I)$

A = Drainage Area =	1.07	acres*
Impervious area within A =	0.82	acres*
Impervious Cover (I) =	77.2	%*

* Ofssite Impervious Area Removed from Onsite Water Quality Calculations

WQ_v =	0.091	ac-ft
WQ_v =	3,973	ft^3

Step 2: Determine the minimum bottom area of the infiltration basin:

$$A = V_W/d_b$$

V_w = design volume	3,973	ft^3
d_b= depth of the basin	5.0	ft

Minimum A =	795	ft^2
Provided A =	862	ft^2

Step 3: Determine size of pretreatment:

Pretreatment size = 100% of the WQ_v =	3,973	ft^3
Provided size =	4,013	ft^3

Elkay Drive Commercial Building

Proposed Infiltration Basin 2P Channel Protection Volume Calculation

Step 1: Calculate Stream Channel Protection Volume (Cp_v):

Stream Channel Protection Volume (Cp_v) Calculated using HydroCAD Software:

Cp_v = 0.179 acre-feet

Step 2: Calculate Stream Channel Protection Volume (Cp_v) Release Rate:

Release Cp_v over a 24 hour period:

(Cp_v acre-feet * 43560 ft^2 / acre) / (24 hours * 3600 sec / hour)

Required Release Rate = 0.09 ft^3 / sec

Provided Release Rate = 0 ft^3 / sec

Note: The entire Cpv is infiltrated by the proposed Infiltration Basin

Elkay Drive Commercial Building

Total Runoff Reduction Volume (RRv) Contributed by Infiltration Basin Utilization:

Total RRv = 100% of the WQ_v provided by the practice

Infiltration Basin WQv =	4310.00	ft^3
Total Iniltration Basin RRv:	4310.00	ft^3

Total Infiltration Basin RRv =	**0.099**	**acre-feet**

Elkay Drive Commercial Building

Elkay Drive Commercial Building

Pocket Pond (P-5) Design for Remaining Water Quality Volume
Proposed Pond 4P

Step 1: Calculate the Remaining Water Quality Volume (WQ_v):

Utilize 90% Rule:

$$WQ_v = [\ (P)\ (R_v)\ (A)\ ] / 12$$

WQ_v = Water Quality Volume (acre-feet)

$R_v = 0.05 + 0.009\ (I)$

(Minimum Rv = 0.2 if $WQ_v > RR_v$)

I = Impervious Cover (Percent)

P = 90% Rainfall Event Number = 1.38 inches

A = Drainage Area in acres

Calculate Impervious Cover (%):

Drainage Area (A) =	3.17	acres
Impervious area within Site Area =	0.36	acres
Impervious Cover (I) =	11.3	%

Calculate Volumetric Runoff Coefficient (R_v):

$$R_v = 0.05 + 0.009\ (I)$$

R_v =	0.15	
Use R_v ->	0.20	

90% Rainfall Event Number Utilized:

P =	1.38	inches

Calculate Water Quality Volume:

$$WQ_v = [\ (P)\ (R_v)\ (A)\ ] / 12$$

WQ_v =	0.073	acre-feet
=	3171	ft^3

Elkay Drive Commercial Building

Pocket Pond (P-5) Design for Remaining Water Quality Volume
Proposed Pond 4P

Step 2: Calculate the Pond Forebay Pretreatment Volume:

Required Pretreatment Volume of 10% of the Required Water Quality Volume:

Pretreatment Forebay Volume = WQ_v * 0.10

Required Volume =	317	ft^3
Provided Volume =	332	ft^3

Step 3: Calculate the Permanent Pool Volume For a P-5 Pocket Pond:

P-5 Pond division of storage between permanent pool and extended detention is 100% / 0% respectively.:

Permanent Pool Volume = (WQ_v) * 100%

Required Volume=	3171	ft^3
Provided Volume =	3909	ft^3

Step 4: Calculate Stream Channel Protection Volume (Cp_v):

Stream Channel Protection Volume (Cp_v) Calculated using HydroCAD Software:

Cp_v = 0.292 acre-feet

Step 6: Calculate Stream Channel Protection Volume (Cp_v) Release Rate:

Release Cp_v over a 24 hour period:

(Cp_v acre-feet * 43560 ft^2 / acre) / (24 hours * 3600 sec / hour)

Required Release Rate =	0.15	ft^3 / sec
Provided Release Rate =	0.14	ft^3 / sec

Elkay Drive Commercial Building

Runoff Reduction Volume (RRv) Summary:

Total RRv Calculated =

Total RRv Required per Calculation =	8,295 ft^3
Minimum RRv Required per Calculation =	1,189 ft^3
RRv Provided Utilizing Tree Planting =	178 ft^3
RRv Provided Utilizing Infiltration Basin =	4,310 ft^3
Total RRv Provided=	4,488 ft^3

∴ Meets Minimum RRv Required, Utilized SMP for remaining RRv:

Remaining Required RRv:

Total RRv Required - RRv Provided Utilizing GI =	3,807 ft^3
WQv Provided Utilizing SMPs =	3,909 ft^3

APPENDIX 9

Soil Restoration

5.1.6 Soil Restoration

Description

Soil Restoration is a required practice applied across areas of a development site where soils have been disturbed and will be vegetated in order to recover the original properties and porosity of the soil. Healthy soil is vital to a sustainable environment and landscape. A deep, well drained soil, rich in organic matter, absorbs rainwater, helps prevent flooding and soil erosion, filters out water pollutants, and promotes vigorous plant growth that requires less irrigation, pesticides, and fertilizer.

Soil Restoration is applied in the cleanup, restoration, and landscaping phase of construction followed by the permanent establishment of an appropriate, deep-rooted groundcover to help maintain the restored soil structure. Soil restoration includes mechanical decompaction, compost amendment, or both.

Many runoff reduction practices need Soil Restoration measures applied over and adjacent to the practice to achieve runoff reduction performance. (See typical compacted soil in Figure 5.15). Consult individual profile sheets for specific design criteria.

Figure 5.14 Shows typical compacted soils that nearly reach the bulk density of concrete (Schueler et al 2000)

Key Benefits

- More marketable buildings and landscapes
- Less stormwater runoff, better water quality
- Healthier, aesthetically pleasing landscapes
- Increased porosity on redevelopment sites where impervious cover is converted to pervious
- Achieves performance standards on runoff reduction practices
- Decreases runoff volume generated and lowers the demand on runoff control structures
- Enhances direct groundwater recharge
- Promotes successful long-term revegetation by restoring soil organic matter, permeability, drainage and water holding capacity for healthy root system development of trees, shrubs and deep-rooted ground covers, minimizing lawn chemical requirements, plant drowning during wet periods, and burnout during dry periods

Typical Perceived Obstacles and Realities

- Higher cost due to soil restoration- *application of soil de-compaction and enhancement may have additional initial cost; however, they provide benefit in reducing the need for conveyance structures.*

- Space constraints and obstruction for use of equipment - *post construction space may limit the ability of some of the de-compaction equipment, however, alternative equipment and sensible planning help overcome this obstacle.*

Discussion

Tilling exposes compacted soil devoid of oxygen to air and recreates temporary air space. In addition, research has shown that the incorporation of organic compost, can greatly improve temporary water storage in the soil and subsequent runoff reduction through infiltration and evapotranspiration.

Soils that have a permanent high water table close to the surface (0-12 inches), either influenced by a clay or other highly impervious layer of material, may have bulk densities so naturally high that compaction has little added impact on infiltration (Lacey 2008). However, these soils will still benefit from the addition of compost. The water holding capacity, penetration, structural stability, and fertility of clay soils were improved with compost mixing (Avnimelech and Cohen 1988).

Table 5.3 describes various soil disturbance activities related to land development, soil types and the requirements for soil restoration for each activity. Soil Restoration or modification of curve numbers is a required practice. Restoration is applied across areas of a development site where soils have been compacted and will be vegetated according to the criteria defined in Table 5.3. If Soil Restoration is not applied according to these criteria, designers are required to:

a) Increase the calculated WQv by factoring in the compacted areas that have not been kept as impervious cover (including areas of cut or fill, heavy traffic areas on site, or Impervious Cover reduction in redevelopment projects unless aeration or full soil restoration is applied, per Table 5.3).

b) Change by one level the post-construction hydrologic soil group (HSG) to a less permeable group than the original condition. This is applied to all volumetric and discharge rate control computations.

Table 5.3 Soil Restoration Requirements			
Type of Soil Disturbance	**Soil Restoration Requirement**		**Comments/Examples**
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not required		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A &B	HSG C&D	Protect area from any ongoing construction activities.
	apply 6 inches of topsoil	Aerate* and apply 6 inches of topsoil	
Areas of cut or fill	HSG A &B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration **	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area
Redevelopment projects	Soil Restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.		

*Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.

** Per "Deep Ripping and De-compaction, DEC 2008".

Using this Practice

During periods of relatively low to moderate subsoil moisture, the disturbed subsoils are returned to rough grade and the following Soil Restoration steps applied:

1) Apply 3 inches of compost over subsoil

2) Till compost into subsoil to a depth of at least 12 inches using a cat-mounted ripper, tractor-mounted disc, or tiller, mixing, and circulating air and compost into subsoils

3) Rock-pick until uplifted stone/rock materials of four inches and larger size are cleaned off the site

4) Apply topsoil to a depth of 6 inches

5) Vegetate as required by approved plan.

Figure 5.15 Soil aerator implement

At the end of the project an inspector should be able to push a 3/8" metal bar 12 inches into the soil just with body weight. Figures 5.16 and 5.17 show two attachments used for soil decompaction. Tilling (step 2 above) should not be performed within the drip line of any existing trees or over utility installations that are within 24 inches of the surface.

COMPOST SPECIFICATIONS

Compost shall be aged, from plant derived materials, free of viable weed seeds, have no visible free water or dust produced when handling, pass through a half inch screen and have a pH suitable to grow desired plants.

Maintenance

A simple maintenance agreement should identify where Soil Restoration is applied, where newly restored areas are/cannot be cleared, who the responsible parties are to ensure that routine vegetation improvements are made (i.e., thinning, invasive plant removal, etc.). Soil compost amendments within a filter strip or grass channel should be located in public right of way, or within a dedicated stormwater or drainage easement.

Figure 5.16 Soil aerator implement

First year maintenance operations includes:

- Initial inspections for the first six months (once after each storm greater than half- inch)

- Reseeding to repair bare or eroding areas to assure grass stabilization
- Water once every three days for first month, and then provide a half inch of water per week during first year. Irrigation plan may be adjusted according to the rain event.
- Fertilization may be needed in the fall after the first growing season to increase plant vigor
- Ongoing Maintenance:

  Two points help ensure lasting results of decompaction:

  1) Planting the appropriate ground cover with deep roots to maintain the soil structure
  2) Keeping the site free of vehicular and foot traffic or other weight loads. Consider pedestrian footpaths. (Sometimes it may be necessary to de-thatch the turf every few years)

References/Further Resources

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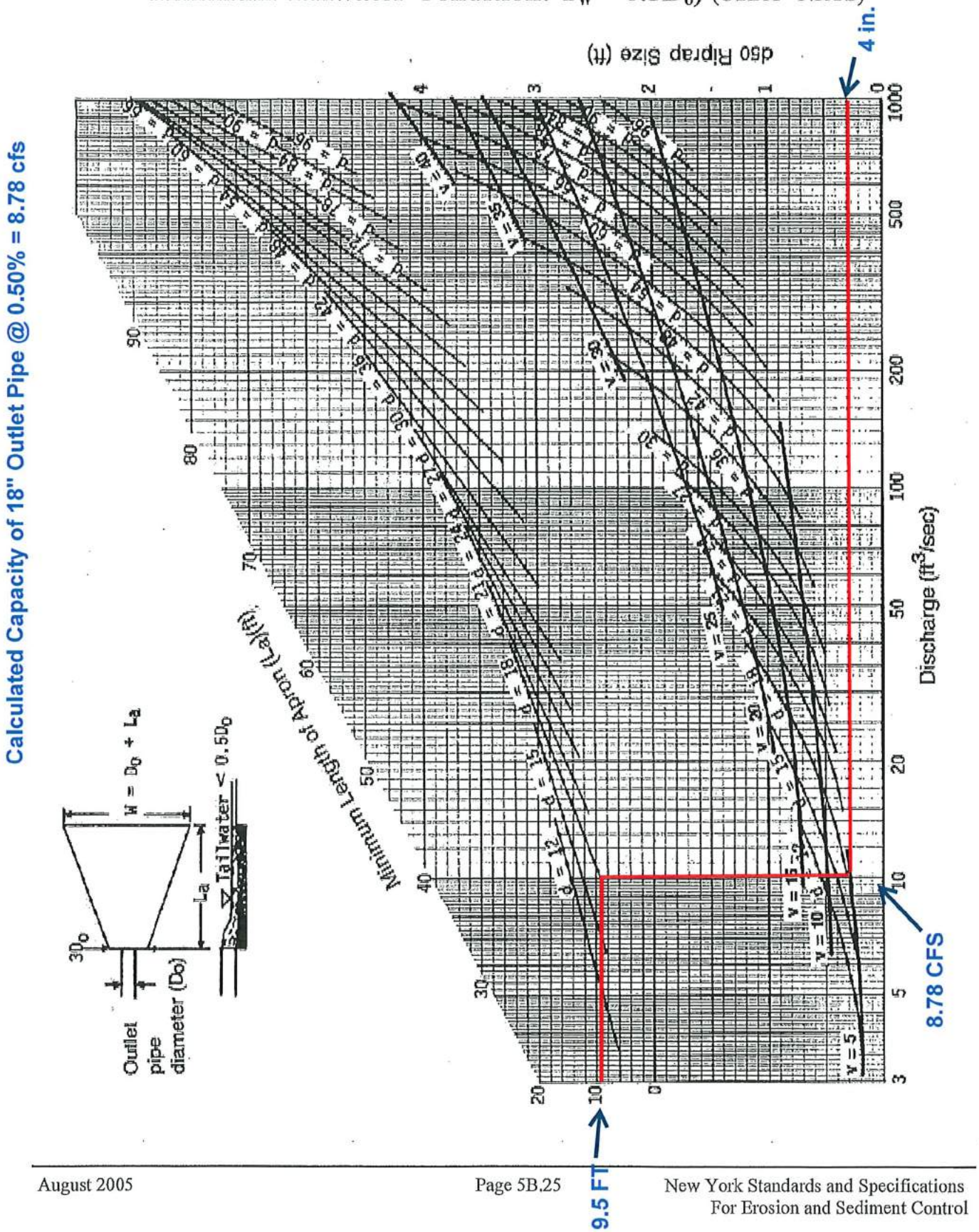
US Composting Council, www.compostingcouncil.org

APPENDIX 10

Outlet Protection Calculations

Figure 5B.12
Outlet Protection Design—Minimum Tailwater Condition
(Design of Outlet Protection from a Round Pipe Flowing Full, Minimum Tailwater Condition: $T_w < 0.5D_o$) (USDA - NRCS)



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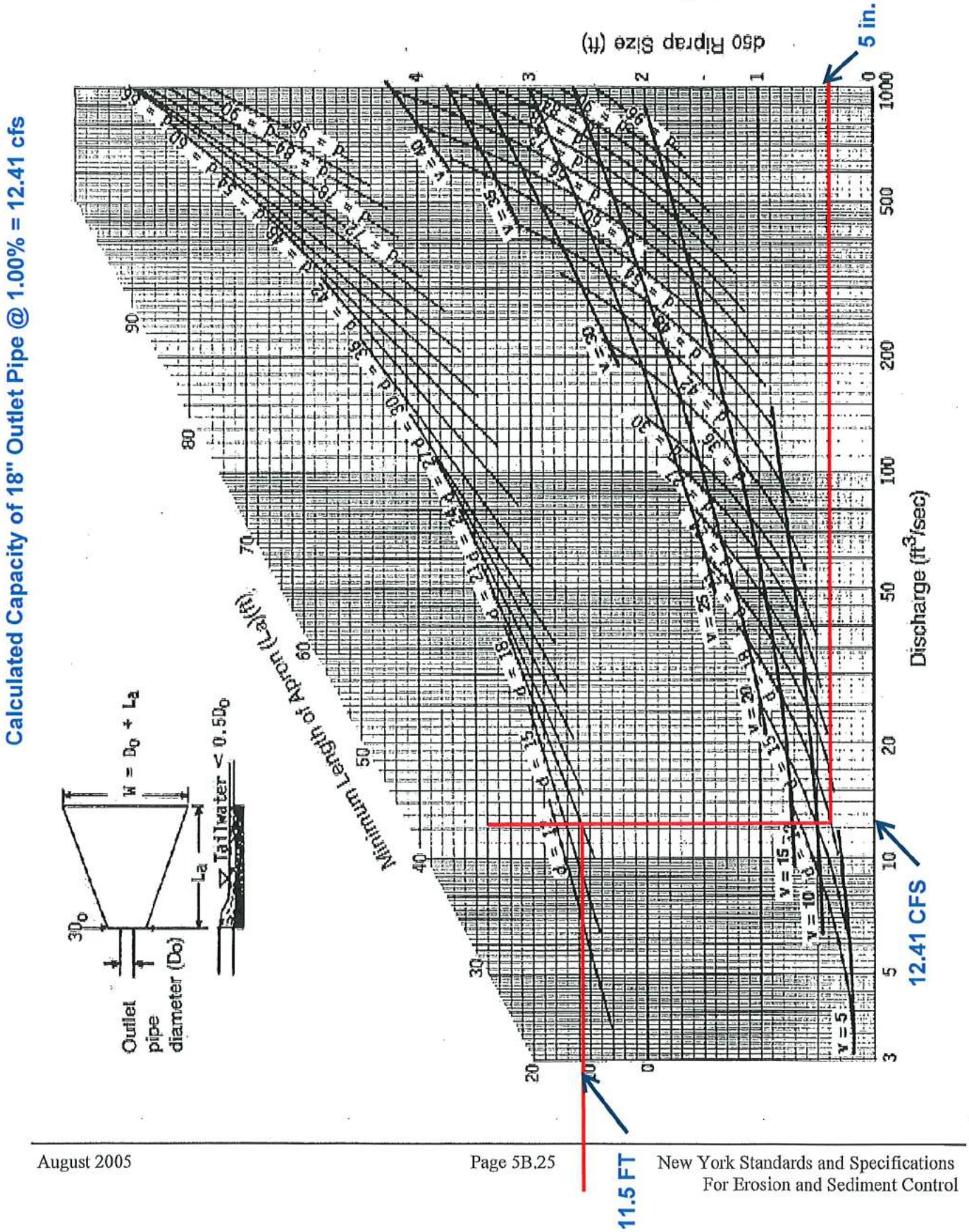

APPENDIX 11

Infiltration Soils Testing Results

PIETRZAK & PFAU, LLC

SOIL INFILTRATION TEST RESULTS

JOB NO.: 19139.01

PROJECT NAME: ELKAY DRIVE

DATE: 3/9/20

TOWN: CHESTER

WEATHER: SUNNY, HIGH 60s

COUNTY: ORANGE

PERFORMED BY: CJP

WITNESSED BY:

LOT NO.	TEST HOLE	DEPTH (IN.)		TEST RUN HR. 1	TEST RUN HR. 2	TEST RUN HR. 3	TEST RUN HR. 4	INFILTRATION RATE (IN.)	COMMENTS
1	1	24	FINISH	12:05	12:55	1:50	2:50	22"/hr	TEST CONDUCTED 60" BELOW EG
			START	11:25	12:05	12:55	1:50		
			TOTAL	24"	24"	24"	22"		
			FINISH						
			START						
			TOTAL						
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PIETRZAK & PFAU, LLC

DEEP TEST PIT RESULTS

JOB NO.: 19139.01

PROJECT NAME: ELKAY DRIVE
TOWN: CHESTER
COUNTY: ORANGE

DATE: 3/9/20
WEATHER: SUNNY, HIGH 60s
PERFORMED BY: MIGHTY MIDGET
WITNESSED BY: CJP

LOT NO.	TEST HOLE	SOILS DESCRIPTION		COMMENTS
1	1	0-6"	Topsoil	NO BR
		6-102"	Brown silty sand	NO BGW
				NO MOTTLING
	2	0-6"	Topsoil	NO BR
		6-60"	Clayey sand w/ large stones	NO GW
		60-78"	Brown silty sand	NO MOTTLING
		78-102"	Pea gravel w/ sand	

APPENDIX 12

State Pollutant Discharge Elimination System for Construction Activities
Construction Site Log Book

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name _____

Permit No. _____ **Date of Authorization** _____

Name of Operator _____

Prime Contractor _____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. **Directions:**

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

Inspector (print name)	**Date of Inspection**
Qualified Inspector (print name)	**Qualified Inspector Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA
[ ] [ ] [ ] Is construction site litter, debris and spoils appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA
[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ____% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
[ ] [ ] [ ] Manufactured insert fabric is free of tears and punctures.
[ ] [ ] [ ] Filter Sock is not torn or flattened and fill material is contained within the mesh sock.

Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
[ ] [ ] [ ] Sediment trap slopes and disturbed areas are stabilized.

Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
[ ] [ ] [ ] Sediment basin dewatering pool is dewatering at appropriate rate.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

APPENDIX 13

New York State Department of Environmental Conservation Permit No. GP-0-20-002

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP- 0-20-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2020 Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator

1-23-20

Authorized Signature Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a *point source* and therefore, pursuant to ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Table of Contents

Part 1. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(**14**)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

Discharges authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* ("SWPPP") the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharges*;

   (ii) Control stormwater *discharges*, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharges* from the site;

   (vi) Provide and maintain *natural buffers* around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharges*, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

   (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments

listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharges* from *dewatering* activities, including *discharges* from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharges*.** The following *discharges* are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. Sizing Criteria for New Development

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.

For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume ("Cpv"): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site discharges directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria ("Qp"): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria ("Qf"): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site discharges directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be

calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

c. Sizing Criteria for Redevelopment Activity

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or

(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or

(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or

(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) *Overbank* Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

d. Sizing Criteria for Combination of Redevelopment Activity and New Development

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharges* necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharges* authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharges* authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharges* will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharges*; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities.*

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharges* from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

operator has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

   a. Where the *discharges* from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharges* from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which are undertaken on land with no existing *impervious cover*; and

   c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

(i) No Affect
(ii) No Adverse Affect
(iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharges* from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. PERMIT COVERAGE

A. How to Obtain Coverage

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a regulated, traditional land use control MS4 must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.

3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4* . This exemption does not apply to *construction activities* subject to the New York City Administrative Code.

B. Notice of Intent (NOI) Submittal

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

C. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621), or the equivalent from another New York State agency, have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits

must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

c. the final SWPPP has been prepared, and

d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

   a. For *construction activities* that are <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4*:

      (i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

      (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has <u>not</u> been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

      (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

D. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination ("NOT") has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor's or subcontractor's certification statement (see Part III.A.6.), and all documentation necessary to demonstrate eligibility with this permit at the *construction site* until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land*

use control MS4, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site-specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements or consistent with Part VII.K..

5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator.*

6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

regulated, traditional land use control MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

E. Permit Coverage for Discharges Authorized Under GP-0-15-002

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of *a construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

F. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4,* the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.

2. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.B.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

3. Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or*

operator was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP, including construction drawings:

    a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*;

c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority; and

d. to document the final construction conditions.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   "I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with

the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharges* from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards.* Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection

schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the *construction site*; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. A Stormwater Modeling and Analysis Report that includes:
   (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

   (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

   (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

   (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

   (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

   (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall

begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- New York State Erosion and Sediment Control Certificate Program holder
- Registered Landscape Architect, or
- someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:

   a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located

in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

   b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

   c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.B.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site*, and all points of *discharge* from the *construction site*.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This shall include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector*. Pursuant to Part II.D.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.F. of this permit.

d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water

Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator.*

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field,

superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity.*

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall

include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the owner's or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A – Acronyms and Definitions

Acronyms

APO – Agency Preservation Officer
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
Cpv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DOW – Division of Water
EAF – Environmental Assessment Form
ECL - Environmental Conservation Law
EPA – U. S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review
SEQRA - State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property –means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "*Construction Activity(ies)*" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Construction Site – means the land area where *construction activity(ies)* will occur. See definition for "*Commence (Commencement of) Construction Activities*" and "*Larger Common Plan of Development or Sale*" *also.*

Dewatering – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a *construction site* by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system

and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or *point source*.

Embankment –means an earthen or rock slope that supports a road/highway.

Endangered or Threatened Species – see 6 NYCRR Part 182 of the Department's rules and regulations for definition of terms and requirements.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State;
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a *combined sewer*; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

Natural Buffer –means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Nonpoint Source - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's

SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Streambank – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and *nonpoint sources*. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for *point source* discharges, load allocations (LAs) for *nonpoint sources*, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed

training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1
Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other *agricultural building*, silo, stock yard or pen.

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Pond construction
- Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover
- Cross-country ski trails and walking/hiking trails
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development;
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path.
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics

Table 1 (Continued) CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established, and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

Table 2

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

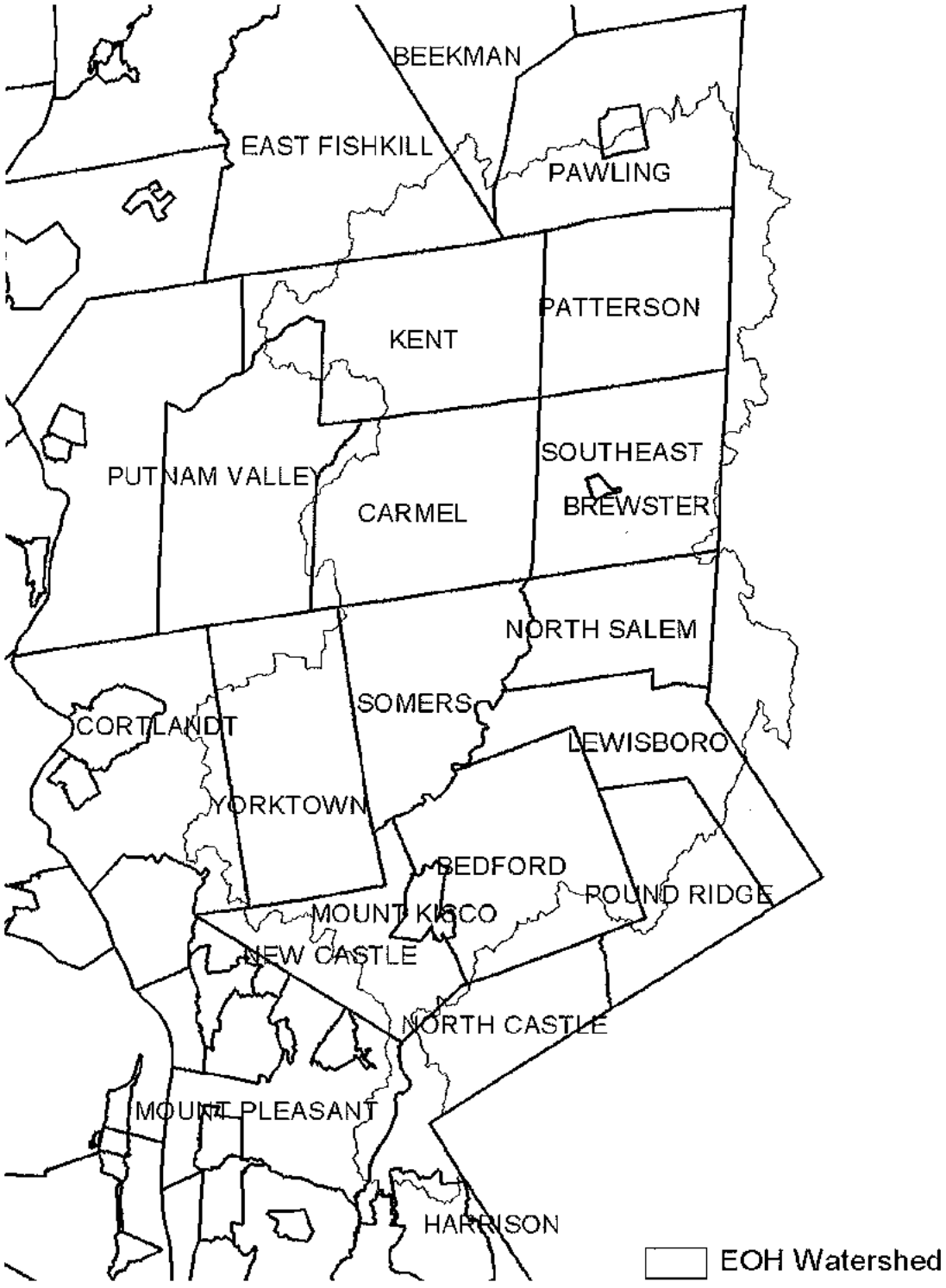


Figure 2 - Onondaga Lake Watershed

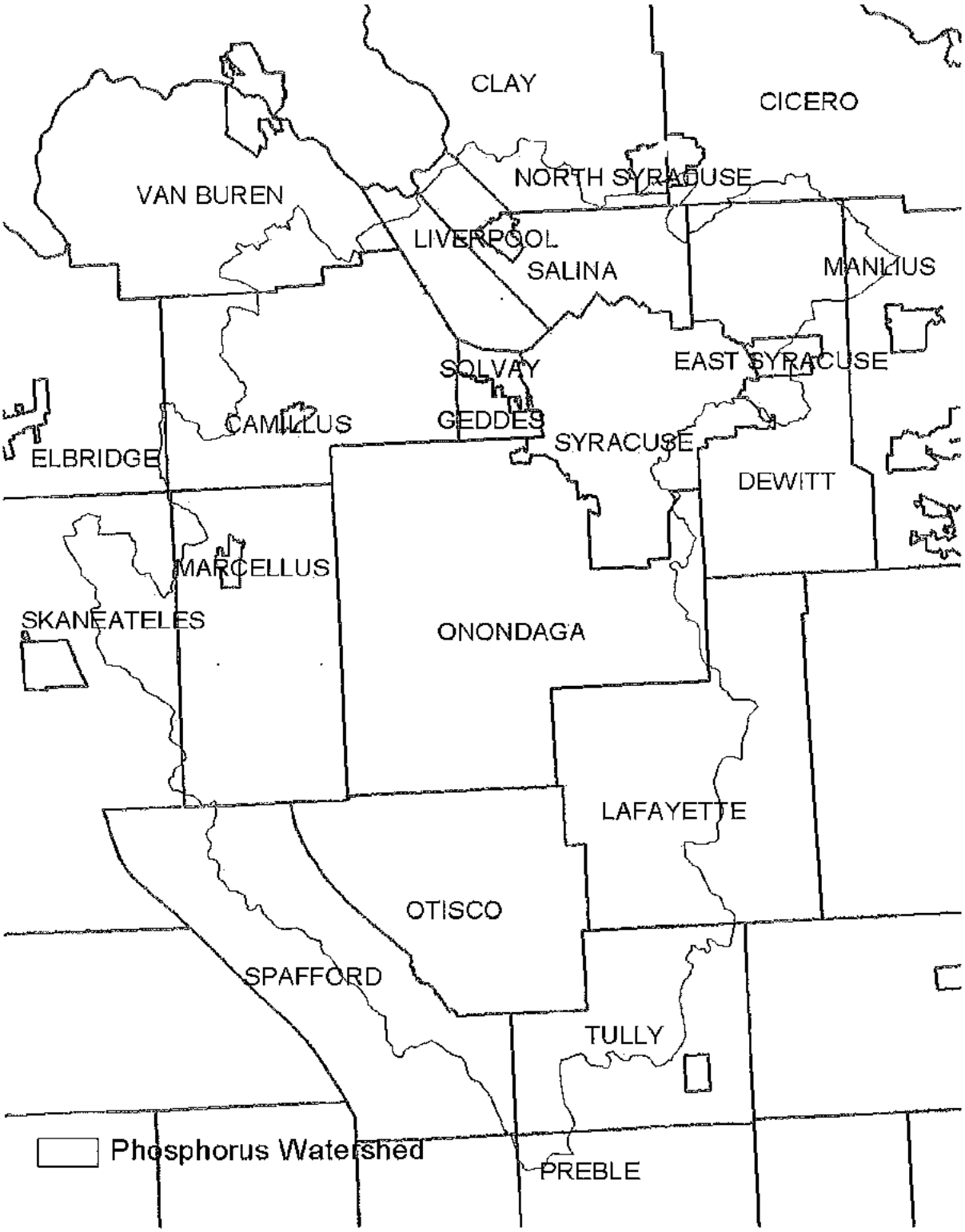


Figure 3 - Greenwood Lake Watershed

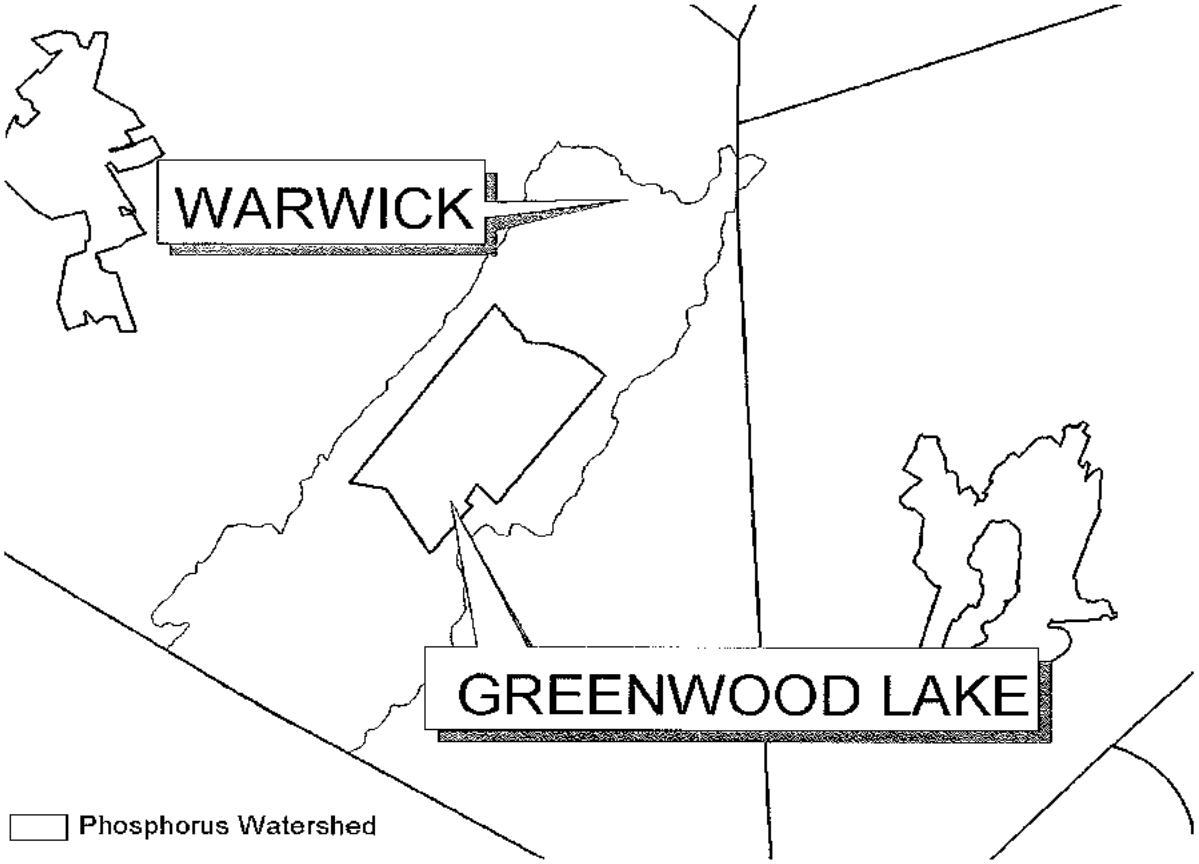


Figure 4 - Oscawana Lake Watershed

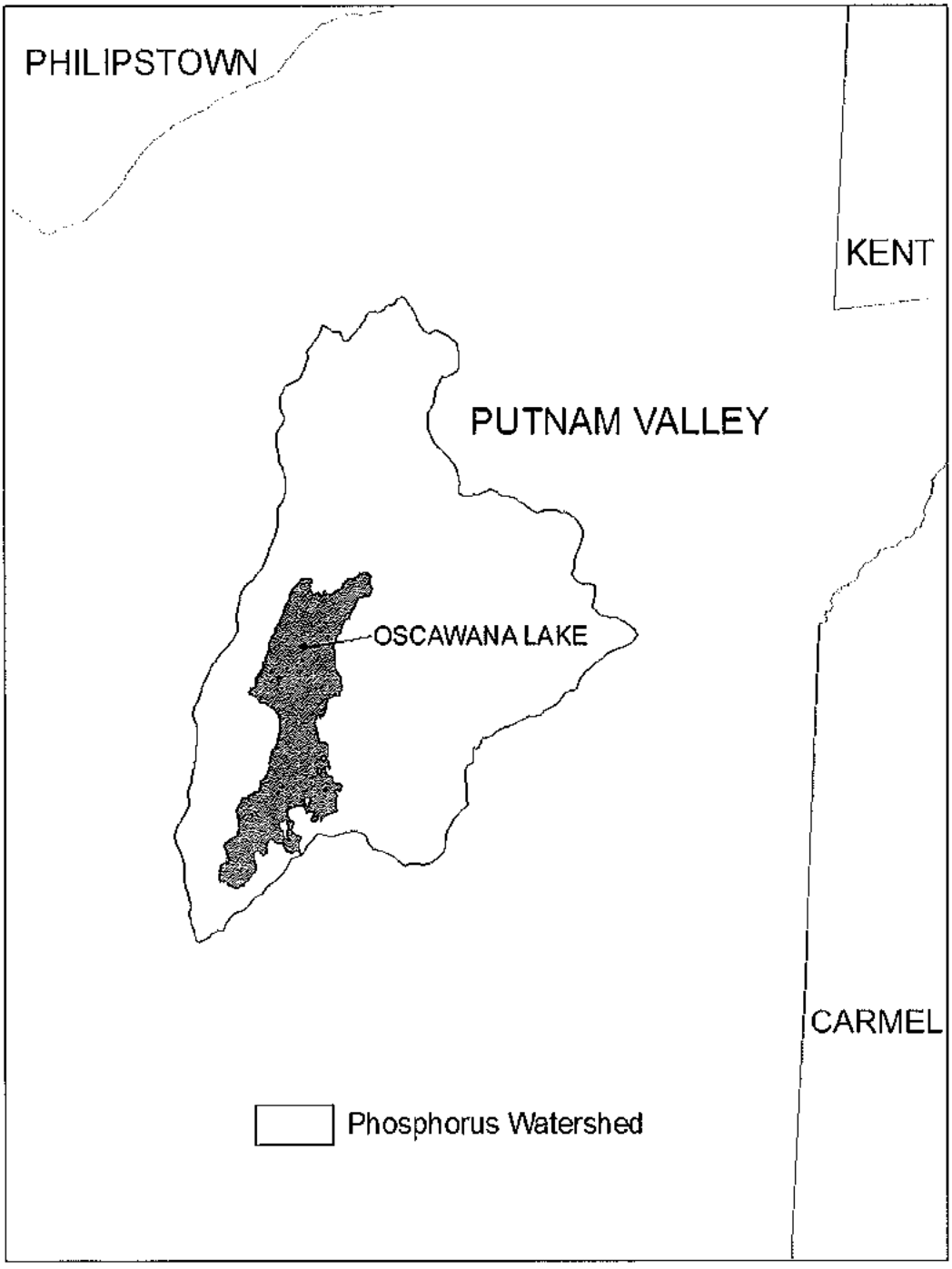
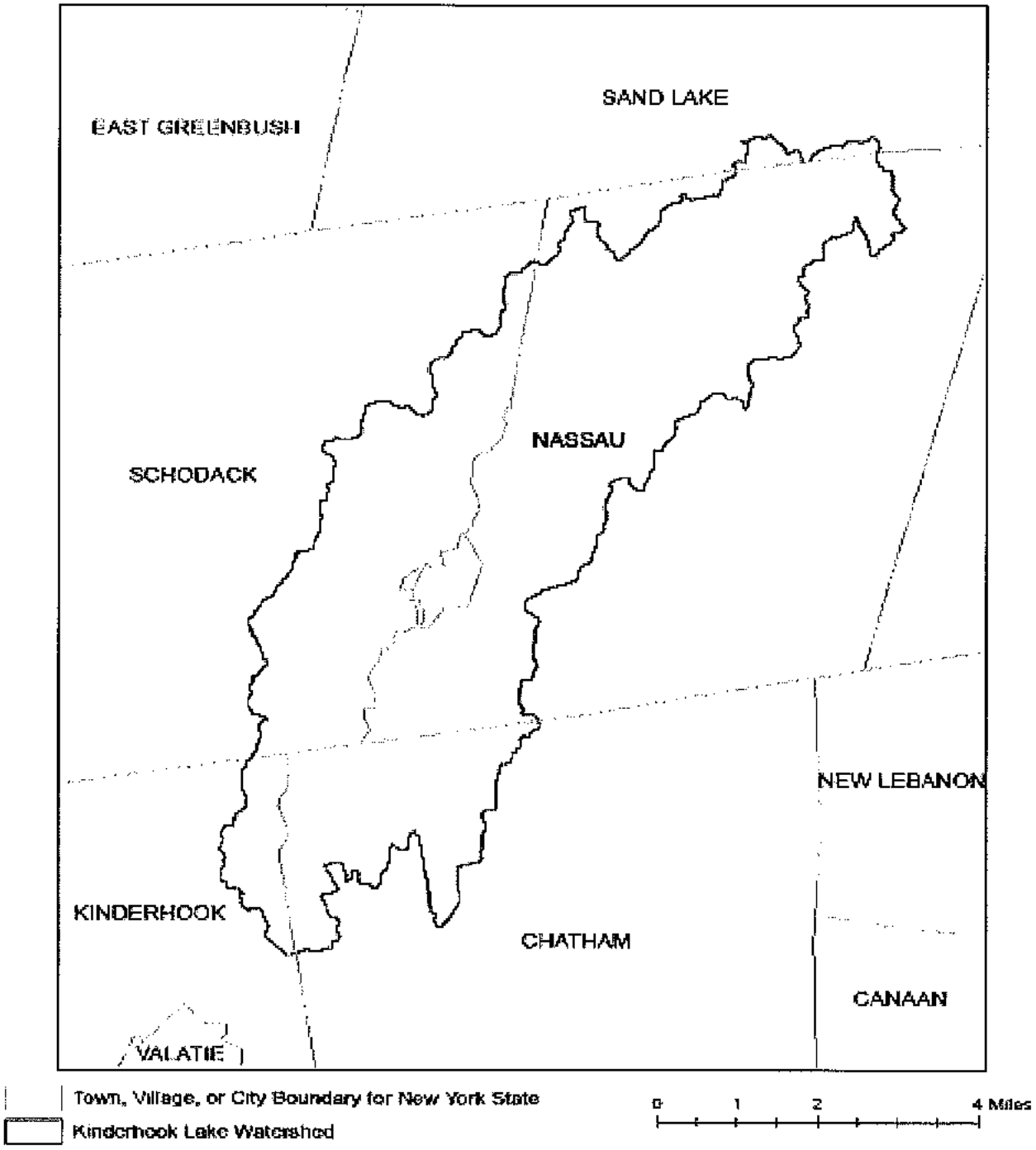


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Watersheds with Lower Disturbance Threshold

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C

APPENDIX E – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using "The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy" dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	Nutrients

APPENDIX F – List of NYS DEC Regional Offices

Region	Covering the following counties:	Division of Environmental Permits (DEP) Permit Administrators	Division of Water (DOW) Water (SPDES) Program
1	Nassau and Suffolk	50 Circle Road Stony Brook, NY 11790 Tel. (631) 444-0365	50 Circle Road Stony Brook, NY 11790-3409 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	100 Hillside Avenue, Suite 1W White Plains, NY 10603 Tel. (914) 428 - 2505
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1150 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	1115 State Route 86, Po Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Golf Course Road Warrensburg, Ny 12885-1172 Tel. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070