APPENDIX D

MASTER STORMWATER POLLUTION PREVENTION PROGRAM

Master Stormwater Pollution Prevention Plan

HUDSON VALLEY WINE VILLAGE

191-200 Blue Point Road
Town of Lloyd
Ulster County, New York 12528
November 19, 2012

THE Chazen COMPANIES®
Engineers
Environmental Professionals
Land Surveyors
Landscape Architects
Planners

Prepared for:

Hudson Valley Wine Village, Inc.
17 East 74th Street
New York, New York 10021

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PREPARER OF THE SWPPP

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 29.45 of the Penal Law."

Name[1]: Richard H. Chazen, PE

Title: Principal

License No.: 057818

Date: November 19, 2012

[1] This is a signature of an officer of the corporation authorized in policy or decision making functions of the corporation.

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1.0 EXECUTIVE SUMMARY

This Master Stormwater Pollution Prevention Plan (SWPPP) has been prepared to support the state environmental quality review (SEQR) of the proposed Hudson Valley Wine Village (HVWV) project. The intent of this Master SWPPP is to provide sufficient documentation for an overall SEQR determination, and to serve as the baseline for final SWPPPs that will be prepared for the various phases of the proposed development, as approved during the future site plan and subdivision permitting processes. As such, this document is intended to provide peak discharge rates to be maintained in the post-development state and provide an overview of green infrastructure practices that may or may not be included in the final designs of the development. This report is not intended to be a final engineering document as certain detailed aspects of the project are likely to change during site plan review processes. Portions of the design were advanced to substantiate regulatory compliance determinations and to provide input pertinent to the environmental assessment of impacts of the proposed project. Final stormwater facility designs will be advanced in support of and during future site plan and subdivision permitting processes.

The methodology used to develop this Master SWPPP shall be adhered to for the preparation of future SWPPPs for each phase of development. Stormwater quality and quantity controls identified for this Master SWPPP are preliminary in nature and are intended to demonstrate their location, approximate size, and design concept. Detailed analysis of these practices must be performed, and their design refined/detailed as part of the future permitting processes.

The stormwater analysis identified herein follows the *NYS Standards and Specifications for Erosion and Sediment Control, the "NYS Stormwater Management Design Manual, dated August 2010" (Manual) and the USDA Technical Release No. 20.* This Master SWPPP and analysis are an integral part of the project's natural resource management plan which takes into consideration existing parameters of site topography, soils, erosion potential, surface waters, their connectivity and water quality of receiving water bodies.

Stormwater mitigation measures primarily involve preventing soil erosion and sedimentation resulting from stormwater run-off during and after construction. During construction, this is accomplished by sequencing site disturbance activities to establish erosion controls, minimize disturbed areas, maintain existing vegetation as much as possible, and stabilize newly disturbed areas as soon as possible. Stormwater pollutant controls utilized during construction will include temporary sediment barriers and sediment traps designed in accordance with the "*NYS Standards and Specifications for Erosion and Sediment Control*". Stormwater pollutant controls utilized after construction will include stormwater quality control facilities designed in accordance with the Manual.

Land development can also have an effect on site hydrology. Impervious areas such as rooftops, roads, driveways, and parking lots can cause rainfall to rapidly convert into stormwater runoff. Increases in runoff can cause stream bank erosion and floodplain expansion. To mitigate these impacts, stormwater quantity controls will be implemented to capture and release run-off at less than or equal to pre-development discharge rates. A hydrologic and hydraulic analysis was performed using computer modeling to determine the pre-development discharge rates from the

project site. A conceptual stormwater management system was developed in accordance with the requirements of the Manual.

1.1 Project Description

The Hudson Valley Wine Village (HVWV) project site is located in the Town of Lloyd in Ulster County, New York. A location map of the site has been provided in Appendix G, as Figure 1.

The property on which the HVWV development is proposed consists of 429± acres of primarily undeveloped land under the ownership of Hudson Valley Wine Village Inc. These parcels are located along the east side of NYS Route 9W at the intersection of Blue Point Road.

Hudson Valley Wine Village, Inc. is proposing an integrated development project to be built over a 20-year period. The project has three primary components: residential, the Tuscan Village Conference Center, and a light industrial/manufacturing park. These elements are described in more detail as follows:

Residential

- 584 apartment units consisting of one and two bedroom units are proposed in three story buildings.
- 282 two and three bedroom townhouse units are proposed as two story residential units with parking located in front of the residences. Three clusters of townhomes are proposed on the property.
- 50 single-family dwellings are proposed within the southeastern portion of the site.

Tuscan Village Conference Center and Commercial Component

The proposed Hudson Valley Wine Village project includes the operation of the Tuscan Village Conference Center (TVCC) with an associated hotel overlooking the Hudson River. The conference center is planned to include a restaurant along with commercial office/retail space. The TVCC will use some of the existing structures on the property that were most recently operated as the Regent Champagne Cellars into the last decade of the 20th century.

Light Industrial/Manufacturing

- Approximately 405,212 SF of light industrial, manufacturing, and/or institutional space is proposed within the southwest portion of the HVWV project site.

This type of project is included in Table 2 of Appendix B of GP-0-10-001; and the project site is not located in one of the watersheds listed in Appendix C of GP-0-10-001. Therefore, this Master SWPPP identifies post-construction stormwater management practices as well as erosion and sediment controls that are required for development of this site.

This project is located within the Town of Lloyd regulated, traditional land use control Municipal Separate Stormwater Sewer System (MS4). Therefore, an MS4 SWPPP Acceptance Form is required to accompany NOIs submitted to the NYSDEC in conjunction with future phase of development.

Runoff from the project site will discharge to the Hudson River, which is not included in the list of Section 303(d) water bodies included in Appendix E of GP-0-10-001.

Project construction activities will consist primarily of site grading, paving, building construction and the installation of storm drainage, water supply, sewage collection and public utility infrastructure necessary to support the proposed development. Construction phase pollutant sources anticipated at the site are disturbed (exposed) soil, vehicle fuels and lubricants, chemicals associated with building construction, and building materials. Without adequate control, there is the potential for each type of pollutant to be transported by stormwater.

1.2 Stormwater Pollution Controls

The conceptual measures outlined herein will be designed to provide both quality and quantity controls by treating and detaining runoff prior to its discharge off site. These measures will be designed and evaluated in accordance with the following standards and guidelines:

- New York State Stormwater Management Design Manual, dated August 2010
- New York State Standards and Specifications for Erosion and Sediment Control (August 2005).

Multiple types of stormwater controls may be used to treat the water quality volume produced from the proposed development

Pre-development surface runoff rates have been evaluated for the 1-, 10-, and 100-year 24-hour storm events. Comparison of pre- and post-development watershed conditions will be performed in conjunction with future permitting of the individual phases of development. The peak rate of runoff from the project site will not be increased from predevelopment conditions; therefore, the project will not have a significant adverse impact on the adjacent or downstream properties or receiving watercourses.

The proposed stormwater collection system consisting of pipes, open drainage ways and on-site stormwater management facilities will adequately collect, treat, and convey the stormwater.

Stormwater quality will be enhanced through the implementation of the proposed stormwater management facilities, erosion and sediment control measures and maintenance practices outlined herein.

The entity responsible for the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) will be identified during the regulatory review, approval, and permitting process for each future phase of development.

1.3 Conclusion

This project is subject to the requirements of the Town of Lloyd regulated MS4. As such, GP-0-10-001 coverage will be effective five (5) business days from the date the NYSDEC receives the complete NOI and signed "MS4 SWPPP Acceptance" form.

It is our opinion that the proposed development will not adversely impact adjacent or downstream properties if the stormwater management facilities are properly constructed and maintained in accordance with the requirements outlined herein and to be included during the approval and permitting process for each specific area.

2.0 SWPPP IMPLEMENTATION RESPONSIBILITIES

A summary of the responsibilities and obligations of all parties involved with compliance with the NYSDEC SPDES General Permit GP-0-10-001 conditions is outlined in the subsequent sections. For a complete listing of the definitions, responsibilities, and obligations, refer to the SPDES General Permit GP-0-10-001 presented in Appendix A.

2.1 Definitions

1. "General SPDES Permit" means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

2. "Owner" or "Operator" means the person, persons, or legal entity that owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications. There may be occasions during the course of a project in which there are multiple Owners/Operators, all of which will need to file and maintain the appropriate SWPPP documents and plans, including without limitation, the Notice of Intent (NOI) and Notice of Termination (NOT).

3. "Owner's/Operator's Engineer" shall be that person or entity retained by an Owner/Operator to design and oversee the implementation of the SWPPP.

4. "Contractor" shall be that person or entity identified as such in the construction contract with the Owner/Operator. The term "Contractor" shall also include the Contractors authorized representative, as well as any and all subcontractors retained by the Contractor.

5. "Qualified Inspector" means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, 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 licensed 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 an individual performing a site inspection has received four (4) hours of training, endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity in proper erosion and sediment control principles. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect shall receive four (4) hours of training every three (3) years.

   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.

6. "Qualified Professional" means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, licensed 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 in order to prepare a SWPPP that conforms to the Department's technical standards. 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.

7. "Trained Contractor" means an employee from a contracting (construction) company that has received four (4) hours of training, which has been endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity, in proper erosion and sediment control principles. 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 that meets the "Qualified Inspector" qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), 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).

   The "Trained Contractor" will be responsible for the day-to-day implementation of the SWPPP.

2.2 Owner's/Operator's Responsibilities

1. Retain the services of a "Qualified Professional", as defined under Section 2.1, to provide the services outlined in Section 2.3 "Owner/Operator's Engineer's Responsibilities".

2. Have an authorized corporate officer sign the completed NOI. A copy of the completed NOI is included in Appendix B.

3. Submit the signed NOI along with the MS4 SWPPP acceptance form to the following:

NOTICE OF INTENT	
NYS DEC, Bureau of Water Permits	Town of Lloyd
625 Broadway, 4th Floor	Code Enforcement & Stormwater Officer
Albany, New York 12233-3505	12 Church Street
	Highland, NY 12528

4. Pay the required initial and annual fees upon receipt of invoices from NYSDEC. These invoices are generally issued in the fall of each year. The initial fee is calculated as $100.00 per acre disturbed plus $600.00 per acre of net increase in impervious cover, and the annual fee is $100.00.

5. Retain the services of an independent certified materials testing and inspection firm operating under the direction of a licensed Professional Engineer to perform regular tests, inspections, and certifications of the construction materials used in the construction of all post-construction stormwater management practices.

6. Retain the services of a NYS licensed land surveyor to perform an as-built topographic survey of the completed post-construction stormwater management facilities.

7. Prior to the commencement of construction activity, identify the contractor(s) and subcontractor(s) that will be responsible for implementing the erosion and sediment control measures and stormwater management practices described in the SWPPP. Have each of these contractors and subcontractors identify at least one "Trained Contractor", as defined under Section 2.1 that will be responsible for the implementation of the SWPPP. Ensure that the Contractor has at least one "Trained Contractor" on site on a daily basis when soil disturbance activities are being performed.

8. Schedule a pre-construction meeting that shall include the Town of Lloyd representative, Owner's/Operator's Engineer, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of the SWPPP.

9. Require the Contractor to fully implement the SWPPP prepared for the site by the Owner/Operator's Engineer to 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.

10. Forward a copy of the NOI Acknowledgement Letter received from the regulatory agency to the Owner's/Operator's Engineer for project records, and to the Contractor for display at the job site.

11. Maintain a copy of the General Permit (GP-0-10-001), NOI, NOI Acknowledgement Letter, SWPPP, MS4 SWPPP Acceptance Form, inspection reports, Spill Prevention, Countermeasures, and Cleanup ("SPCC") Plan, inspection records, and other required records on the job site so that they may be made available to the regulatory agencies.

12. Post at the site, in a publicly accessible location, a copy of the General Permit (GP-0-10-001), a signed copy of the NOI, the NOI Acknowledgement Letter, MS4 SWPPP Acceptance Form, and on a monthly basis a summary of the site inspection activities.

13. Prepare a written summary of projects status with respect to compliance with the general permit at a minimum frequency of every three months during which coverage under the permit exists. The summary should address the status of achieving the overall goal of the SWPPP. The summary shall be maintained at the site in a publicly accessible location.

14. Prior to submitting a Notice of Termination, 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 practice(s) that are privately owned, the Owner/Operator has a deed restriction in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

15. Submit a Notice of Termination (NOT) form (see Appendix B) within 48 hours of receipt of the Owner's/Operator's Engineer's certification of final site stabilization to the following:

    NOTICE OF TERMINATION

NYS DEC, Bureau of Water Permits	Town of Lloyd
625 Broadway, 4th Floor	Code Enforcement & Stormwater Officer
Albany, New York 12233-3505	12 Church Street
	Highland, NY 12528

16. Request and receive all SWPPP records from the Owner's/Operator's Engineer and archive those records for a minimum of five years after the NOT is filed.

17. Require the implementation of the Post-Construction Inspections and Maintenance procedures outlined in Appendix F.

18. The NOI, SWPPP, and inspection reports required by GP-0-10-001 are public documents that the Owner/Operator must make available for review and copying by any person within five (5) business days of the Owner/Operator receiving a written request by any such person to review the NOI, SWPPP, or inspection reports. Copying of documents will be done at the requester's expense.

19. The Owner/Operator must keep the SWPPP current at all times. At a minimum, the Owner/Operator shall amend the SWPPP:

    a) Whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater discharges from the project 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; and

    c) To address issues or deficiencies identified during an inspection by the "Qualified Inspector," the Department, or other Regulatory Authority.

2.3 Owner's/Operator's Engineers Responsibilities

1. Prepare the SWPPP using good engineering practices, best management practices, and in compliance with all federal, state, and local regulatory requirements.

2. Prepare the Notice of Intent (NOI) form (see Appendix B), sign the "SWPPP Preparer Certification" section of the NOI, and forward to Owner/Operator for signature.

3. Provide copies of the SWPPP to the Town of Lloyd once all signatures and attachments are complete.

4. Prepare a construction Site Log Book to be used in maintaining a record of all inspection reports generated throughout the duration of construction.

5. Participate in a pre-construction meeting with the Town of Lloyd representative, Owner/Operator, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of the SWPPP.

6. Enter Contractor's information in Section 2.5 "SWPPP Participants" once a Contractor is selected by the Owner/Operator.

7. Conduct an initial assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment control measures described within the SWPPP have been adequately installed and implemented to ensure overall preparedness of the site.

8. Provide on-site inspections to determine compliance with the SWPPP. Site inspections shall occur at an interval of at least once every seven-calendar days. If this project involves the disturbance of greater than five acres of soil at any one time, site inspections shall occur at an interval of at least twice every seven-calendar days, with the inspections separated by a minimum of at least two full calendar days. A written inspection report shall be provided to the Owner/Operator and general contractor within one business day of the completion of the inspection, with any deficiencies identified. A sample inspection form is provided in Appendix D.

9. Review the Contractor's SWPPP records on a periodic basis to ensure compliance with the requirements for daily reports and inspections and maintenance logs.

10. Maintain the construction Site Log Book throughout the duration of construction.

11. Update the SWPPP each time there is a significant modification to the pollution prevention measures or a change of the principal Contractor working on the project who may disturb site soil.

12. Based on the as-built survey and material testing certifications performed by others, perform evaluations of the completed stormwater management facilities to determine whether they were constructed in accordance with the SWPPP.

13. Conduct a final site assessment and prepare a certification letter to the Owner/Operator indicating that, upon review of the material testing and inspection reports prepared by the firm retained by the Owner/Operator, review of the completed topographic survey, and evaluation of the completed stormwater management facilities, the stormwater management facilities have been constructed substantially in accordance with the contract documents and should function as designed.

14. Prepare the Notice of Termination (NOT). Sign the NOT Certifications VI (Final Stabilization) and VII (Post-construction Stormwater Management Practices), and forward the NOT to the Owner/Operator for his signature on Certification VIII (Owner/Operator Certification).

15. Transfer the SWPPP documents, along with all NOI's, permit certificates, NOT's, construction Site Log Book, and written records required by the General Permit to the Owner/Operator for archiving.

2.4 Contractor's Responsibilities

1. Sign the SWPPP Contractor's Certification Form contained within Appendix C and forward to the Owner's/Operator's Engineer for inclusion in the Site Log Book.

2. Identify at least one Trained Contractor that will be responsible for implementation of the SWPPP. Ensure that at least one Trained Contractor is on site on a daily basis when soil disturbance activities are being performed.

3. Provide the names and addresses of all subcontractors working on the project site. Require all subcontractors who will be involved with construction activities that will result in soil disturbance to identify at least one Trained Contractor that will be on site on a daily basis when soil disturbance activities are being performed; and to sign a copy of the Contractor's Certification Form and forward to the Owner's/Operator's Engineer for inclusion into the Site Log Book. This information must be retained as part of the Site Log Book.

4. Maintain a Spill Prevention and Response Plan in accordance with requirements outlined in Section 5.4 of the SWPPP. This plan shall be provided to the Owner's/Operator's Engineer for inclusion in the Site Log Book.

5. Participate in a pre-construction meeting, which shall include the Town of Lloyd representative, Owner/Operator, Owner's/Operator's Engineer, and all sub-contractors to discuss responsibilities as they relate to the implementation of the SWPPP.

6. If Contractor plans on utilizing adjacent properties for material, waste, borrow, or equipment storage areas, or if Contractor plans to engage in industrial activity other than construction (such as operating asphalt and/or concrete plants) at the site, Contractor shall submit appropriate documentation to the Owner's/Operator's Engineer so that the SWPPP can be modified accordingly.

7. Implement site stabilization, erosion and sediment control measures, and other requirements of the SWPPP.

8. In accordance with the requirements in the most current version of the NYS Standards and Specifications for Erosion and Sediment Control, conduct inspections of erosion and sediment control measures installed at the site to ensure that they remain in effective operating condition at all times. Prepare and retain written documentation of inspections as well as of all repairs/maintenance activities performed. This information must be retained as part of the Site Log Book.

9. Maintain a record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated, until such time as the NOT is filed. A log for keeping such records is provided in Appendix E.

10. Begin implementing corrective actions within one business day of receipt of notification by the Qualified Inspector that deficiencies exist with the erosion and sedimentation control measures employed at the site. Corrective actions shall be completed within a reasonable time frame.

2.5 SWPPP Participants

1. Owner's/Operator's Engineer: James J. Connors, P.E.
   The Chazen Companies
   547 River Street
   Troy, New York 12180
   Phone: (518) 273-0055
   Fax: (518) 273-8391

2. Owner/Operator: Hudson Valley Wine Village, Inc.
   17 East 74th Street
   New York, New York 10021
   Phone: (203) 325-3310
   Fax: None

3. Contractor[2]:

   Name and Title: _____

   Company Name: _____

   Mailing Address: _____

   _____

   Phone: _____

   Fax: _____

[2] Contractor's information to be entered once the Contractor has been selected.

3.0 SITE CHARACTERISTICS

3.1 Land Use and Topography

The 429± acre Hudson Valley Wine Village project site is primarily undeveloped land, a portion of which is located on a bluff overlooking the Hudson River. A total of just more than two (2) acres of the overall project site is made up of roads, buildings, and other paved surfaces from previous uses. The remaining 427± acres are primarily forest and meadow.

The project site contains a number of structures that were built by the Hudson Valley Wine Company. The Hudson Valley Wine Company building, constructed by Alexander Bolognesi beginning in 1904, were modeled after an Italian manor and designed in the Italian Romanesque style. In addition to the buildings serving the winery, the Bolognesi family maintained residential structures for their many tenant farmers, who lived and worked on the property. Many of these structures remain, however, not all are within the boundaries of the Hudson Valley Wine Village property. Several modern residential structures on Blue Point Road are located on outparcels, and are not part of the proposed project.

These buildings were more recently owned and operated by the Regent Champagne Cellars until the last decade of the 20th century. This business ceased operations and now the HVWV project site is a mix of overgrown orchards, vineyards, woodland, and open lawn areas that have been maintained by mowing. Blue Point Road currently ends at the Hudson Valley Wine Company buildings, but historically it continued east to the river's edge. Dirt roads and trails provide access to the former vineyards and fields.

The topography within the project area is described as undulating and rolling foothills. The land surface rises from 10' (3 m) Above Mean Sea Level (AMSL) at the edge of the Hudson River to 200' (60 m) AMSL at the crest of the bluff. The land then levels to the west with elevations along the western boundary varying from 280' to 320' (85 to 97.5 m) AMSL.

3.2 Soils and Groundwater

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey for Ulster County was reviewed and provided surficial soil conditions for the study area. The SCS identified the presence of multiple soil types. Soil data as provided by the SCS is presented in Table 1.

Table 1: USDA Soil Data

Map Symbol & Description	Hydrologic Soil Group	Permeability (inches/hour)	Erosion Factor K	Depth to Water Table (feet)	Depth to Bedrock (inches)
BnC – Bath-Nassau Complex, 8 to 25 percent slopes	C	0.6-2.0	0.20-0.24	2-6+	10-40
BOD – Bath-Nassau-Rock outcrop complex, hilly	C	0.6-2.0	0.20-0.24	2-6+	10-40
FW – Fresh Water Marsh	N/A	N/A	N/A	N/A	N/A
LY – Lyons-Atherton complex, very stony	B,D	0.6-2.0	N/A	0-0.5	>60
MgB – Mardins-Nassau Complex, 3 to 8 percent slopes	C	0.6-2.0	0.20-0.24	1.5-6+	10-40
NBF – Nassau-Bath-Rock outcrop complex, very hilly	C	0.6-2.0	0.20-0.24	2-6+	10-40+
VSB – Volusia very stony soils, gently sloping	C	0.6-2.0	0.24	0.5-1.5	>60

Upon review of the soil data presented in Table 1, the project site contains soils with a soil slope phase of E or F. However, these soils are not tributary to waters of the state classified as AA or AA-s. Furthermore, it is anticipated that less than one acre of disturbance will occur within these soils, which are located along the steep slopes of the Hudson River. Therefore, Sections I.D.6 and I.D.7 do not apply to the project and will not need to apply for an individual permit.

The Soil Conservation Service defines the hydrologic soil groups as follows:

- Type A Soils: Soils having a high infiltration rate and low runoff potential when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a moderate rate of water transmission.

- Type B Soils: Soils having a moderate infiltration rate when thoroughly wet and consisting mainly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately course textures. These soils have a moderate rate of water transmission.

- Type C Soils: Soils having a low infiltration rate when thoroughly wet and consisting chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine-to-fine texture. These soils have a low rate of water transmission.

- Type D Soils: Soils having a very low infiltration rate and high runoff potential when thoroughly wet. These soils consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very low rate of water transmission.

The soils map for the study area is presented in Appendix G, as Figure 2.

3.3 Watershed Designation

The project site is not located in a restricted watershed identified in Appendix C of GP-0-10-001.

3.4 Receiving Water Bodies

The nearest natural classified water bodies into which runoff from the project site will discharge are NYSDEC unidentified streams, which discharges into the Hudson River and the Hudson River.

The unidentified streams are classified by NYSDEC as Class C watercourses, and are not included in the Section 303(d) list of impaired waters found in Appendix E of GP-0-10-001. The Hudson is classified by NYSDEC as a Class A water course, and is also not included in the Section 303(d) list of impaired waters found in Appendix E of GP-0-10-001.

3.5 Aquifer Designation

The project site is not located over a US EPA designated Sole Source aquifer; nor is it located over a Primary or Principal aquifer listed in the NYSDEC Technical and Operational Guidance Series (TOGS) 2.1.3 (1980).

3.6 Wetlands

Wetlands depicted on the accompanying plan set were delineated on the site by Crawford and Associates Engineering, PC most recently in April 2009. Ecological Solutions, LLC field checked the delineated wetlands on this property and obtained the Jurisdictional Determination for the Applicant from the US Army Corps of Engineers (USACE). The NYSDEC also reviewed the wetlands on the property and verified that there are no potential State jurisdictional wetlands on the property. The results of the site inspection indicate that a total of twenty (20) separate wetlands exhibiting wetland hydrology, soils, and vegetation are present on the property. Isolated wetlands identified on the site include wetlands A, B, C, D, F, O, R, U, and X. These wetlands encompass a total of approximately 35± acres of the 429± acre property.

The proposed development of the property may require a Federal Section 404 Nationwide Permit #29 for development activities if there will be placement of fill in jurisdictional wetlands on the property. Any permits will be advanced in support of and during future site plan and subdivision permitting processes.

No NYSDEC Article 24 Freshwater Wetland Permit or Section 401 water Quality Certification is required since there are no jurisdictional NYS wetlands on the property.

The regulated wetlands on the property will continue to provide the same functional benefits after completion of the proposed development of the property including: maintenance of flood plains; erosion and storm control; control of pollution and sedimentation; provision of area for wildlife habitat; and provision of areas for passive and active recreational use.

Short-term physical impacts to regulated wetlands on the property will be avoided by the use of erosion control measures throughout the property especially in critical areas adjacent to regulated wetlands. Regulated watercourse will not be impacted as a result of the proposed development.

3.7 Flood Plains

According to the National Flood Insurance Program Flood Insurance Rate Map (FIRM), for Ulster County, New York, Community Panel Number 780 and 790, a total of 426 acres of the HVWV project site is outside the 100-year and 500-year flood plain. This area accounts for 99.4 percent of the overall project site. Approximately 2.7 acres of the project site are located within the 100-year flood plain. This part of the property is located along the southeastern boundary of the project site between the bluff and railroad, no disturbance is proposed in this area.

3.8 Listed, Endangered, or Threatened Species

Preliminary investigation for listed endangered or threatened species on or near the site let to A Summer Woodland Bat Survey was completed by Bat Conservation and Management, Inc., from July 25 through July 28th, 2011. The survey was sent to the U.S. Fish & Wildlife Service for review and comment

3.9 Historic Places

A Phase 1A Literature Review and Sensitivity Analysis and Phase 1B Archaeological Field Reconnaissance Survey was completed by CITY/SCAPE: Cultural Resource Consultants in June 2012 and has been submitted as part of the project's Generic Environmental Impact Statement (GEIS).

The stormwater discharges from the project site will not adversely impact downstream properties so long as the stormwater management practices have been constructed in accordance with the SWPPP.

3.10 Rainfall Data

Rainfall data utilized in the modeling and analysis were interpolated from maps presented in Chapter 4 of the NYSDEC Stormwater Management Design Manual, dated August 2010, and in the National Weather Service (NWS) Technical Paper 40 (TP-40), *Rainfall Frequency Atlas of the United States for Durations from 30 minutes to 24 Hours and Return Periods from 1 to 100 Years* (1961). Rainfall data specific to the portion of Ulster County under consideration, for various 24-hour storm events, is presented in Table 2:

Table 2: Rainfall Data

Storm Event Return Period	24-Hour Rainfall (inches)
1-year	2.9
10-year	5.5
100-year	8.0

These values were used to evaluate the pre-development stormwater runoff characteristics.

4.0 CONSTRUCTION SEQUENCE

This project has not received written approval from the Town of Lloyd allowing the disturbance of more than five acres of land at any one time. As this integrated development project is to be built over a 20-year period, every effort will be made to phase construction in such a way that no more than 5 acres will be disturbed at any one time. However, it is likely that some areas of construction will require a waiver to be approved by the Town of Lloyd to allow disturbance of more than 5 acres at any one time. If and when required, said waiver(s) will be requested during the regulatory review and permitting process for each specific area.

Should the waiver request be denied by the Town of Lloyd, the contractor shall limit the area of disturbance to less than five acres of disturbance at any given time. The contractor shall prepare and submit to the Owner's/Operator's Engineer a sequencing plan that identifies the progression of construction through the site. This sequencing plan must be retained as part of the Site Log Book.

An "Erosion and Sediment Control Plan" and an "Erosion and Sediment Control Plan Prior to Construction" and waiver request will need to identify the major construction activities that are the subject of each specific waiver request. The order (or sequence) in which major activities are expected to begin shall be presented on the drawings, though each activity will not necessarily be completed before the next begins. In addition, said activities may occur in a different order if necessary to maintain adequate erosion and sediment control. If this is the case, the contractor shall notify the Owner's/Operator's Engineer overseeing the implementation of the SWPPP for the specific phase of development.

The Contractor will be responsible for implementing the erosion and sediment control measures identified on said plans. The Contractor may designate those tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing the controls and ensuring their proper function remains with the Contractor.

5.0 CONSTRUCTION-PHASE POLLUTION CONTROL

Each SWPPP prepared, as part of a future phase of development, shall identify the temporary and permanent erosion and sediment control measures that will be incorporated into the design of each phase of the project. Said measures will be implemented during construction, to minimize soil erosion and control sediment transport off-site, and after construction, to control the quality and quantity of stormwater runoff from the developed site.

Erosion control measures, designed to minimize soil loss, and sediment control measures, intended to retain eroded soil and prevent it from reaching water bodies or adjoining properties, shall be developed in accordance with the following documents:

- NYSDEC SPDES General Permit for Stormwater Discharges From Construction Activity, Permit No. GP-0-10-001 (effective January 29, 2010 through January 28, 2015)

- New York State Standards and Specifications for Erosion and Sediment Control, NYSDEC (August 2005)

The SWPPPs and accompanying plans shall outline the construction schedule for implementing the erosion and sediment control measures. The SWPPPs and accompanying plans shall include limitations on the duration of soil exposure, criteria and specifications for placement and installation of the erosion and sediment control measures, a maintenance schedule, and specifications for the implementation of erosion and sediment control practices and procedures.

Temporary and permanent erosion and sediment control measures that shall be applied during construction shall generally include:

1. Minimizing soil erosion and sedimentation by stabilization of disturbed areas and by removing sediment from construction-site discharges.

2. Preservation of existing vegetation as much as possible. Following the completion of construction activities in any portion of the site permanent vegetation shall be established on all exposed soils.

3. Site preparation activities shall be planned to minimize the area and duration of soil disruption.

4. Permanent traffic corridors shall be established and “routes of convenience” shall be avoided.

5.1 Temporary Erosion and Sediment Control Measures

The temporary erosion and sediment control measures described in the following sections provide information for measures that may be appropriate for use in the design of future phases. The specific measures to be implemented for each phase of development shall be clearly identified in the future SWPPP and construction documents.

5.1.1 Stabilized Construction Entrance

Prior to construction, stabilized construction entrances will be installed, to reduce the tracking of sediment onto public roadways.

Construction traffic must enter and exit the site at the stabilized construction entrance. The intent is to trap dust and mud that would otherwise be carried off-site by construction traffic.

The entrance shall be maintained in a condition, which will control tracking of sediment onto public rights-of-way or streets. When necessary, the placement of additional aggregate atop the filter fabric will be done to assure the minimum thickness is maintained. All sediments and soils spilled, dropped, or washed onto the public rights-of-way must be removed immediately. Periodic inspection and needed maintenance shall be provided after each substantial rainfall event.

5.1.2 Dust Control

Water trucks shall be used as needed during construction to reduce dust generated on the site. Dust control must be provided by the general Contractor to a degree that is acceptable to the Owner, and in compliance with the applicable local and state dust control requirements.

5.1.3 Temporary Soil Stockpile

Materials, such as topsoil, will be temporarily stockpiled (if necessary) on the site during the construction process. Stockpiles shall be located in an area away from storm drainage, water bodies and/or courses, and will be properly protected from erosion by a surrounding silt fence barrier.

5.1.4 Silt Fencing

Prior to the initiation of and during construction activities, a geotextile filter fabric (or silt fence) will be established along the down slope perimeter of areas to be disturbed as a result of the construction that lie up gradient of watercourses or adjacent properties. These barriers may extend into non-impact areas to provide adequate protection of adjacent lands.

Clearing and grubbing will be performed only as necessary for the installation of the sediment control barrier. To facilitate effectiveness of the silt fencing, daily inspections and inspections immediately after significant storm events will be performed by site personnel. Maintenance of the fence will be performed as needed.

5.1.5 Temporary Seeding

Areas undergoing clearing or grading and any areas disturbed by construction activities where work has temporarily or permanently ceased shall be stabilized with temporary vegetative cover within seven days from the date the soil disturbance activity ceased.

5.1.6 Stone Inlet Protection Barrier

Concrete blocks surrounded by wire mesh and crushed stone will be placed around both existing catch basins and proposed catch basins once they have been installed, to keep sediment from entering the catch basins and storm sewer system. During construction, crushed stone shall be replaced as necessary to ensure proper function of the structure.

5.1.7 Erosion Control Blanket

Erosion control blankets shall be installed on all disturbed or proposed slopes exceeding 3:1. Erosion control blankets provide temporary erosion protection, rapid vegetative establishment, and long-term erosion resistance to shear stresses associated with high runoff flow velocities associated with steep slopes.

5.1.8 Stone Check Dams

Stone check dams will be installed within drainage ditches to reduce the velocity of stormwater runoff, to promote settling of sediment, and to reduce sediment transport offsite.

Sediment accumulated behind the stone check dam will be removed as needed to allow the channel to drain through the stone check dam and prevent large flows from carrying sediment over or around the dam. Stones shall be replaced as needed to maintain the design cross section of the structures.

5.1.9 Temporary Sediment Trap

Temporary sediment traps, where required, shall be constructed to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed areas and to protect drainage ways, properties, and rights-of-way.

Accumulated sediment shall be removed from the trap when it reaches 50 percent of the design capacity and shall not exceed 50 percent. Sediment shall not be placed downstream from the embankment, adjacent to a stream, or floodplain.

Temporary sediment traps shall be designed to provide 3,600 cf. of storage per acre of tributary watershed.

5.1.10 Temporary Diversion Swales

Temporary diversion swales shall be used to divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff from disturbed areas into sediment traps.

5.1.11 Dewatering Operations

Dewatering will be used to intercept sediment-laden stormwater or pumped groundwater and allow it to settle out of the pumped discharge prior to being discharged from the site. Water from dewatering operations shall be treated to eliminate the discharge of sediment and other

pollutants. Water resulting from dewatering operations shall be directed to temporary sediment traps, or dewatering devices, such as the Dandy Dewatering Bag, manufactured by Mirafi Geosynthetics. Temporary sediment traps and dewatering bags will be provided, installed and maintained at down-gradient locations to control sediment deposits.

5.2 Permanent Erosion and Sediment Control Measures

The permanent erosion and sediment control measures described in the following sections provide information for measures that may be appropriate for use in the design of future phases. The specific measures to be implemented for each phase of development shall be clearly identified in the future SWPPP and construction documents.

5.2.1 Establishment of Permanent Vegetation

Disturbed areas that will be vegetated must be seeded in accordance with future contract documents. The type of seed, mulch, and maintenance measures described in the contract documents shall be followed.

All areas at final grade must be seeded and mulched within 14 days after completion of the major construction activity. All seeded areas should be protected with mulch.

Final site stabilization will be achieved when all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of 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.

5.2.2 Rock Outlet Protection

Rock outlet protection shall be installed at the locations indicated and detailed on the future contract documents. The installation of rock outlet protection will reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving watercourse or water body.

5.2.3 Permanent Turf Reinforcement

Permanent turf reinforcement mats (TRMs) provide long-term erosion protection and vegetation establishment assistance while permanently reinforcing vegetation. TRMs shall be installed where specified on the contract documents and as required. TRM's provide two key advantages. First, their unique fiber shape and 3-D pattern create a thick matrix of voids that trap seed, soil and water in place for quicker, thicker vegetation growth. Secondly, they provide additional reinforcement that doubles your vegetation's natural erosion protection abilities by remaining a permanent part of the application, anchoring mature plants to the soil for superior, long-term erosion resistance.

5.3 Other Pollutant Controls

Control of sediments has been described previously. Other aspects of the SWPPP are listed below:

5.3.1 Solid and Liquid Waste Disposal

No solid or liquid waste materials, including building materials, shall be discharged from the site with stormwater. All solid waste, including disposable materials incidental to any construction activities, must be collected and placed in containers. The containers shall be emptied periodically by a licensed trash disposal service and hauled away from the site.

Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary in order to ensure that they do not discharge from the site. As an example, special care must be exercised during equipment fueling and servicing operations. If a spill occurs, it must be contained and disposed of so that it will not flow from the site or enter groundwater, even if this requires removal, treatment, and disposal of soil. In this regard, potentially polluting substances should be handled in a manner consistent with the impact they represent.

5.3.2 Sanitary Facilities

Temporary sanitary facilities will be provided by the Contractor throughout each construction phase. They must be utilized by all construction personnel and will be serviced by a licensed commercial Contractor. These facilities must comply with state and local sanitary or septic system regulations.

5.3.3 Water Source

Non-stormwater components of site discharge must be clean water. Water used for construction, which discharges from the site, must originate from a public water supply or private well approved by the Health Department. Water used for construction that does not originate from an approved public supply must not discharge from the site; such water can be retained in the ponds until it infiltrates and/or evaporates.

5.4 Construction Housekeeping Practices

During each construction phase, the general Contractor will implement the following measures:

5.4.1 Material Stockpiles

Material resulting from the clearing and grubbing operation will be stockpiled up slope from adequate sedimentation controls.

5.4.2 Equipment Cleaning and Maintenance

The general Contractor will designate areas for equipment cleaning, maintenance, and repair. The general Contractor and subcontractors will utilize those areas. The areas will be protected by a temporary perimeter berm.

5.4.3 Detergents

The use of detergents for large-scale washing is prohibited (i.e., vehicles, buildings, pavement surfaces, etc.)

5.4.4 Spill Prevention and Response

A Spill Prevention and Response Plan shall be developed for the site by the Contractor for each phase of construction. The plan shall detail the steps needed to be followed in the event of an accidental spill and shall identify contact names and phone numbers of people and agencies that must be notified.

The plan shall include Material Safety Data Sheets (MSDS) for all materials to be stored on-site. All workers on-site will be required to be trained on safe handling and spill prevention procedures for all materials used during construction. Regular tailgate safety meetings shall be held and all workers that are expected on the site during the week shall be required to attend.

5.4.5 Concrete Wash Areas

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in specifically designated diked and impervious washout areas that have been prepared to prevent contact between the concrete wash and storm water. Waste generated from concrete wash water shall not be allowed to flow into drainage ways, inlets, receiving waters or highway right of ways, or any location other than the designated Concrete Wash Areas. Proper signage designating the "Concrete Wash Areas" shall be placed near the facility. Concrete Wash Areas shall be located at minimum 100 linear feet from drainage ways, inlets and surface waters.

The hardened residue from the Concrete Wash Areas will be disposed of in the same manner as other non-hazardous construction waste materials. Maintenance of the wash area is to include removal of hardened concrete. Facility shall have sufficient volume to contain all the concrete waste resulting from washout and a minimum freeboard of 12 inches. Facility shall not be filled beyond 95% capacity and shall be cleaned out once 75% full unless a new facility is constructed. The Contractor will be responsible for seeing that these procedures are followed.

Saw-cut Portland Cement Concrete (PCC) slurry shall not be allowed to enter storm drains or watercourses. Saw-cut residue should not be left on the surface of pavement or be allowed to flow over and off pavement.

Each phase of construction may require the use of multiple concrete wash areas. All concrete wash areas will be located in an area where the likelihood of the area contributing to storm water discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to stormwater discharges.

5.4.6 Material Storage

Construction materials shall be stored in dedicated staging areas. The staging areas shall be located in an area that minimizes the impacts of the construction materials effecting stormwater quality.

Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the site, treated, and disposed of at an approved solid waste or chemical disposal facility.

6.0 POST-CONSTRUCTION STORMWATER CONTROL

The goals of this Stormwater Management Plan are to analyze the peak rate of runoff under pre-development conditions, to maintain the pre-development rate of runoff in order to minimize impacts to adjacent or downstream properties, and to minimize the impact to the quality of runoff exiting the site.

The NYS Stormwater Management Design Manual, dated August 2010 provides both water quality and water quantity objectives to be met by projects requiring a "Full SWPPP". These objectives will be met by applying stormwater control practices to limit peak runoff rates and improve the quality of runoff leaving the developed site for each future phase of development.

6.1 Stormwater Control Practices

Stormwater runoff from the proposed development will be collected and conveyed to the quantity and quality control system(s) described herein through a combination of closed storm sewers and open stormwater conveyance systems.

The closed storm sewer network, consisting of catch basins, drainage manholes, high density polyethylene piping (HDPE), and/or reinforced concrete piping (RCP), and/or corrugated metal pipe (CMP), will be designed to safely convey peak rates of discharge to the stormwater management facilities required to support each phase of development, as required by the NYSDEC Stormwater Management Design Manual and the Town of Lloyd.

The open stormwater conveyance system, consisting of roadside ditches, grass lined swales, riprap lined swales, and major culvert crossings, will be designed to safely convey peak rates of runoff to the stormwater management facilities required to support each phase of development, as required by the NYSDEC Stormwater Management Design Manual and the Town of Lloyd.

The stormwater quantity and quality control systems described in the following sections may be incorporated into the stormwater management plan for each future phase of development. Design calculations for the specific measures will be included in the future SWPPPs prepared in support of the site plan or subdivision permitting process.

6.1.1 Micropool Extended Detention Pond (P-1)

The micropool extended detention pond is an effective means of removing pollutants and will provide a high pollutant removal rate for stormwater runoff. According to the NYSDEC publication Reducing the Impacts of Stormwater Runoff from New Development, high pollutant removal from extended detention ponds is primarily attributed to the permanent pool of water that provides gravity settling of sediment, chemical flocculation and biological uptake of pollutants.

Sediment forebays will capture sediment and floatable trash/debris prior to entering the pond. The pond is landscaped with a variety of plantings including emergents and woody shrubs, with each type of planting corresponding to the water depth. An aquatic bench will maximize the biological uptake of pollutants.

Micropool Extended Detention Pond(s) (P-1) when integrated will be designed according to the criteria set forth in Section 6.1 "Stormwater Ponds" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.2 Wet Pond (P-2)

Wet ponds typically consist of two general components - a forebay and a permanent wet pool. The forebay provides pretreatment by capturing coarse sediment particles in order to minimize the need to remove the sediments from the primary wet pool. The wet pool serves as the primary treatment mechanism and where most of the retention capacity exists.

When sized to store the water quality volume, a pond system will retain all of the water from storms that generate runoff less than or equal to the water quality volume and result in a significantly increased period of time available for treatment. For storms that generate runoff greater than the water quality volume, wet ponds still provide a reduced level of treatment through conventional settling and filtration for the additional runoff volume that is conveyed through the pond. When properly designed, the permanent pool reduces the velocity of incoming water to prevent re-suspension of particles and promote settling of newly introduced suspended solids. The energy dissipating and treatment properties of the permanent pool are enhanced by aquatic vegetation, which is an essential part of the stormwater pond design.

Wet Pond(s) (P-2) when integrated will be designed according to the criteria set forth in Section 6.1 "Stormwater Ponds" of the NYS Stormwater Management Design Manual, dated August 2003.

6.1.3 Wet Extended Detention Pond (P-3)

Wet extended detention ponds are very similar to wet ponds with the exception that their design is more focused on attenuating peak runoff flows. As a result, more storage volume is committed to managing peak flows as opposed to maximizing the wet pool depth. The configuration of the outfall structure may also differ from typical wet pond designs to provide additional storage volume above the level of the permanent pool.

Wet extended detention ponds can be used to attenuate the peak flow and provide quality treatment by sedimentation, chemical flocculation, and biological removal. Wet extended detention ponds are designed for a contributing drainage area of 25 acres or more. Sediment forebays will capture sediment and floatable trash/debris prior to entering the pond. The pond is landscaped with a variety of plantings including emergents and woody shrubs, with each type of planting corresponding to the water depth. An aquatic bench will maximize the biological uptake of pollutants.

Wet Extended Detention Pond(s) (P-3) when integrated will be designed according to the criteria set forth in Section 6.1 "Stormwater Ponds" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.4 Multiple Pond System (P-4)

Multiple pond systems consist of several wet pools that are constructed in a series following a forebay. The advantage of these systems is that they can improve treatment efficiency by better simulating plug flow conditions as compared to a single large wet pool. Also, these systems can reduce overall maintenance needs since more frequent maintenance would be performed within the first pool cells as opposed to the large, primary pool. The disadvantage of these systems is that they typically require more land area to treat the same water quality volume.

Multiple Pond System(s) (P-4) when integrated will be designed according to the criteria set forth in Section 6.1 "Stormwater Ponds" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.5 Pocket Pond (P-5)

Wet ponds typically consist of two general components - a forebay and a permanent wet pool. The forebay provides pretreatment by capturing coarse sediment particles in order to minimize the need to remove the sediments from the primary wet pool. The wet pool serves as the primary treatment mechanism and where most of the retention capacity exists. Wet ponds can be sized for a wide range of watershed sizes, if adequate space exists

A variation of the conventional wet pond is as a pocket pond. The term "pocket" refers to a pond or wetland that has such a small contributing drainage area (between one to five acres) that little or no base flow is available to sustain water elevations during dry weather. Instead, water elevations are heavily influenced, and in some cases maintained, by a locally high water table. Because of these smaller drainage areas and the resulting lower hydraulic loads of pocket ponds, outlet structures can be simplified and often do not have safety features such as emergency spillways and low level drains.

Pocket ponds can be used to attenuate the peak flow and provide quality treatment by sedimentation, chemical flocculation, and biological removal. Sediment forebays will capture sediment and floatable trash/debris prior to entering the pond. The pocket pond is landscaped with a variety of plantings including emergents and woody shrubs, with each type of planting corresponding to the water depth. An aquatic bench will maximize the biological uptake of pollutants.

Pocket Pond(s) (P-5) when integrated will be designed according to the criteria set forth in Section 6.1 "Stormwater Ponds" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.6 Infiltration Trench (I-1)

Infiltration practices reduce runoff volume, remove fine sediment and associated pollutants, recharge groundwater, and provide partial attenuation of peak flows for storm events equal to or less than the design storm. Infiltration practices are appropriate for small drainage areas, but can also be used for larger multiple lot applications, in contrast to rain gardens and dry wells, which are primarily intended for single lots.

Infiltration trenches are shallow, excavated, stone-filled trenches in which stormwater is collected and infiltrated into the ground. Infiltration trenches can be constructed at a ground surface depression to intercept overland flow or can receive piped runoff discharged directly into the trench. Runoff gradually percolates through the bottom and sides of the trench, removing pollutants through sorption, trapping, straining, and bacterial degradation or transformation.

Soil testing data consisting of deep and falling head permeability tests in support of the design of the proposed dry well(s) will be provided as part of the future site plan or subdivision permitting process.

Infiltration Trench(s) (I-1) when integrated will be designed where feasible according to the criteria set forth in Section 6.3 "Stormwater Infiltration" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.7 Infiltration Basin (I-2)

Infiltration practices reduce runoff volume, remove fine sediment and associated pollutants, recharge groundwater, and provide partial attenuation of peak flows for storm events equal to or less than the design storm. Infiltration practices are appropriate for small drainage areas, but can also be used for larger multiple lot applications, in contrast to rain gardens and dry wells, which are primarily intended for single lots.

Infiltration basins are stormwater impoundments designed to capture and infiltrate the water quality volume over several days, but do not retain a permanent pool. Infiltration basins can be designed as off-line devices to infiltrate the water quality volume and bypass larger flows to downstream flood control facilities or as combined infiltration/flood control facilities by providing detention above the infiltration zone. The bottom of an infiltration basin typically contains vegetation to increase the infiltration capacity of the basin, allow for vegetative uptake, and reduce soil erosion and scouring of the basin.

Soil testing data consisting of deep and falling head permeability tests in support of the design of the proposed dry well(s) will be provided as part of the future site plan or subdivision permitting process.

Infiltration Basin(s) (I-2) when integrated will be designed where feasible according to the criteria set forth in Section 6.3 "Stormwater Infiltration" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.8 Dry Wells (I-3)

Dry wells treat stormwater runoff through soil infiltration, adsorption, trapping, filtering, and bacterial degradation. The use of dry wells is applicable for small drainage areas with low sediment or pollutant loadings and where soils are sufficiently permeable to allow reasonable rates of infiltration.

According to the NYSDEC technical standard publication NYS Stormwater Management Design Manual, dated August 2010, rooftop runoff is the only type of drainage area that can be diverted to dry wells. Dry wells are sized to capture and treat the water quality volume generated by

rooftop runoff. Stormwater volumes in excess of the water quality volume can be transported directly to a detention facility. A catch basin with a sump provides pre-treatment of stormwater prior to entering the dry well.

Soil testing data consisting of deep and falling head permeability tests in support of the design of the proposed dry well(s) will be provided as part of the future site plan or subdivision permitting process.

Dry Well(s) (I-3) when integrated will be designed where feasible according to the criteria set forth in Section 6.3 "Stormwater Infiltration" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.9 Surface Sand Filter (F-1)

Sand filters have been demonstrated to be effective in removing many of the common pollutants found in urban stormwater runoff, especially those found in particle form. Sand filters work by receiving the water quality volume and settling out the heavier sediment in the pretreatment basin. Water flows to and is spread over the sand filter, where pollutants are either trapped or strained out. Filtered runoff may be collected and returned to the conveyance system, or allowed to partially infiltrate into the soil.

Pre-treatment practice will be sized to handle 25% (40% - where paved surfaces are sanded) of the treatment volume prior to discharging to the filter.

Surface Sand Filter(s) (F-1) when integrated will be designed where feasible according to the criteria set forth in Section 6.4 "Stormwater Filtering Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.10 Underground Sand Filter (F-2)

An underground filter is similar to a surface filter except that the sand or other media and under drains are installed below grade in a vault. Underground filters are intended to address the spatial constraints that can be found in intensely developed urban areas where the drainage areas are highly impervious, such as parking lots. They can be used on small, urban sites where space is at a premium and where the soils or groundwater concerns would not support an infiltration device.

Stormwater filtering systems capture and temporarily store the WQv and pass it through a filter bed of sand, organic matter, soil, or other media. Filtered runoff may be collected and returned to the conveyance system, or allowed to partially infiltrate into the soil. The structure is also equipped with an overflow weir for runoff volumes in excess of the water quality volume.

The pre-treatment practice will be sized to handle 25% (40% - where paved surfaces are sanded) of the treatment volume prior to discharging to the filter.

Underground Sand Filter(s) (F-2) when integrated will be designed where feasible according to the criteria set forth in Section 6.4 "Stormwater Filtering Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.11 Perimeter Sand Filter (F-3)

The perimeter sand filter is an underground vault sand filter that was originally developed in Delaware (also known as the "Delaware Sand Filter") for use around the perimeter of parking lots. The system contains two parallel chambers and a clear well. Overland flow enters the first chamber through slotted grates, which acts as a sedimentation chamber. Water then flows over weirs into the second chamber, which contains the filter media. Filtered water is collected by an under drain system and flows into a clear well before discharging to the storm drain system.

The pre-treatment practice will be sized to handle 25% (40% - where paved surfaces are sanded) of the treatment volume prior to discharging to the filter.

Perimeter Sand Filter(s) (F-3) when integrated will be designed where feasible according to the criteria set forth in Section 6.4 "Stormwater Filtering Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.12 Organic Filter (F-4)

Similar to a surface sand filter, except the bedding material is comprised a peat-sand mixture or leaf compost. Organic filters work by receiving the water quality volume and settling out the heavier sediment in the pretreatment basin. Water flows to and is spread over the organic filter, where pollutants are either trapped or strained out. Filtered runoff may be collected and returned to the conveyance system, or allowed to partially exfiltrate into the soil.

The pre-treatment practice will be sized to handle 25% (40% - where paved surfaces are sanded) of the treatment volume prior to discharging to the filter.

The Organic Filters(s) (F-4) when integrated will be designed where feasible according to the criteria set forth in Section 6.4 "Stormwater Filtering Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.13 Bioretention (F-5)

Bioretention systems are shallow landscaped depressions commonly located in parking lot islands or within small pockets in residential areas that receive stormwater runoff. Stormwater flows into the bioretention area, ponds on the surface, and gradually infiltrated into the soil bed. Pollutants are removed by a number of processes, such as adsorption, filtration, volatilization, ion exchange, and decomposition. Filtered runoff can either be allowed to infiltrate into the surrounding soil, functioning as an infiltration basin or rainwater garden or collected by an under drain system and discharged to the storm sewer system or directly to receiving waters, functioning like a surface sand filter. Runoff from larger storms is generally diverted past the bioretention area to the storm drain system.

Bioretention Area(s) (F-5) when integrated will be designed where feasible according to the criteria set forth in Section 6.4 "Stormwater Filtering Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.14 Dry Swale (O-1)

Dry swales are designed to temporarily hold the water quality volume of a storm in a pool or series of pools created by permanent check dams at culverts or driveway crossings. The soil bed consists of native soils or highly permeable fill material, underlain by an under drain system. Pollutants are removed through sedimentation, nutrient uptake, and infiltration.

Dry Swale(s) (O-1) when integrated will be designed where feasible according to the criteria set forth in Section 6.5 "Open Channel Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.15 Wet Swale (O-2)

Wet swales temporarily store and treat the entire water quality volume. However, unlike dry swales, wet swales are constructed directly within existing soils and are not underlain by a soil filter bed or under drain system. Wet swales store the water quality volume within a series of cells within the channel, which may be formed by berms or check dams and may contain wetland vegetation. The pollutant removal mechanisms in wet swales are similar to those of stormwater wetlands, which rely on sedimentation, adsorption, and microbial breakdown. Water quality swales can be used in place of curbs, gutters, and storm drain systems on residential and commercial sites to enhance pollutant removal and provide limited groundwater recharge, flood control, and channel protection benefits.

Wet Swale(s) (O-2) when integrated will be designed where feasible according to the criteria set forth in Section 6.5 "Open Channel Systems" of the NYS Stormwater Management Design Manual, dated August 2010.

6.1.16 Underground Stormwater Detention System

Underground stormwater detention systems store and detain stormwater runoff in order to meet water quantity control requirements. Stormwater is stored in subsurface vaults and/or a system of large diameter interconnected storage pipes. Stored water is then released directly back into natural waters at rates designed to reduce peak run-off flows during post development storms. Underground stormwater storage provides minimal stormwater quality benefits, but can be an effective component of a development's overall stormwater management plan.

6.1.17 Hydrodynamic Separators

Hydrodynamic separators accelerate the separation of floating and settling pollutants from stormwater through the use of a vortex. These pre-fabricated devices come in the form of an underground manhole or vault. The devices have no moving parts and are typically fabricated from concrete and marine grade aluminum.

During operation, stormwater runoff enters the unit tangentially to promote a gentle swirling motion in a treatment chamber. As stormwater circles within the chamber, settable solids fall into a sump and are retained. Buoyant debris, oil, and grease rise to the surface and are separated from the water as it flows under a baffle wall. Finally, treated water exits the treatment chamber through a flow control orifice located behind the baffle wall.

During low-flow conditions all runoff is diverted into the treatment chamber by a flow partition. At higher flow rates, a portion of the runoff spills over the flow partition and is diverted around the treatment chamber to prevent re-suspension and washout of previously trapped pollutants. Water that spills over the partition flows into a head equalization chamber above the treatment chamber outlet. As the head equalization chamber fills, the head differential driving flow through the treatment chamber collapses. The result is that flow rates in the treatment chamber remain relatively constant even as total flow rates increase substantially. This configuration further reduces the potential for re-suspension or washout.

According to Chapter 9 of the NYS Stormwater Management Design Manual, dated August 2010, hydrodynamic separators have been approved for use as a pretreatment system in new and redevelopment projects or as a primary treatment system on redevelopment projects.

6.1.18 Infiltration Chambers

Most proprietary stormwater management infiltration practices operate similarly to traditional infiltration basins (NYSDEC design variant I-2). These practices reduce runoff volume, remove fine sediment and associated pollutants, recharge groundwater, and provide partial attenuation of peak flows for storm events equal to or less than the design storm. Infiltration practices are appropriate for small drainage areas, but can also be used for larger multiple lot applications, in contrast to rain gardens and dry wells, which are primarily intended for single lots.

Proprietary stormwater management infiltration systems are designed to capture and infiltrate the water quality volume, but do not retain a permanent pool. These systems are typically designed to infiltrate the water quality volume as well as to provide detention above the infiltration zone to attenuate peak volumes of larger storm events to meet flood control requirements.

6.1.19 Sedimentation Chambers

Sedimentation chambers when incorporated into the design will provide pre-treatment prior to the primary filtering practices. Sedimentation chambers provide pre-treatment by trapping sediment and allowing it to settle out. They are sized to accommodate a fraction of the Water Quality Volume, depending on the type of stormwater quality practice being used.

6.1.20 Plunge Pools

Plunge pools may be utilized to assist in the trapping of incoming sediment and taking up of nutrients prior to reaching the primary filtering practices. They will be sized to capture 25% (40% where parking lots are sanded) of the water quality volume.

6.1.21 Rain Gardens

The rain garden is a stormwater management practice intended to manage and treat small volumes of stormwater runoff from impervious surfaces using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression. This practice is most commonly used in residential land use settings. The method is a variation on bioretention and combines physical filtering and adsorption with bio-geochemical processes to remove pollutants. Rain gardens are a simplified version of bioretention and are designed as a passive filter system

without an under drain connected to the storm drain system. A gravel drainage layer is typically used for dispersed infiltration. Rainwater is directed into the garden from residential roof drains, driveways and other hard surfaces. The runoff temporarily ponds in the garden and seeps into the soil over one to two days. The system consists of an inflow component, a shallow pending area over a planted soil bed, mulch layer, gravel filter chamber, attractive shrubs, grasses and flowers, and an overflow mechanism to convey larger rain events to the storm drain system or receiving waters.

6.1.22 Green Roofs

Green roofs consist of a layer of vegetation and soil installed on top of a conventional flat or sloped roof (Figure 5.45). The rooftop vegetation captures rainwater allowing evaporation and evapotranspiration processes to reduce the amount of runoff entering downstream systems, effectively reducing stormwater runoff volumes and attenuating peak flows. Green roof designs are characterized as *extensive* or *intensive*, depending on storage depth. *Extensive* green roofs have a thin soil layer and are lighter, less expensive and generally require low maintenance. *Intensive* green roofs often have pedestrian access and are characterized by a deeper soil layer with greater weight, higher capital cost, increased plant diversity and more maintenance requirements.

6.1.23 Stormwater Planters

Stormwater planters are small landscaped stormwater treatment devices that can be placed above or below ground and can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve water quality, similar to rain gardens and green roofs. Three versions of stormwater planters include contained planters, infiltration planters and flow-through planters.

6.2 Runoff Reduction Volume

Land use change and development in the watershed increases the volume of runoff. Reductions in the amount of runoff from new development accomplished through the implementation of a storm water management plan for the site will play an important role in the success or failure of the watershed wide stormwater management plan. Runoff reduction techniques such as: preservation of natural resources; reduction of impervious cover; conservation; and incorporation of green infrastructure such as bio-retention, trees, green roofs, planters, porous pavers, cisterns, etc. can be a valuable part of any stormwater management plan. Volume reduction techniques manage, reduce, and treat stormwater and maintain and restore natural hydrology by infiltration, evapo-transpiration, and capture and reuse of stormwater. Volume reduction techniques by themselves typically are not sufficient to provide adequate attenuation of stormwater runoff, but they do decrease the size of the peak runoff rate reduction facilities.

6.2.1 NYSDEC Requirements

The NYS Stormwater Management Design Manual states that runoff reduction shall be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapo-transpiration of 100-percent of the post-development water quality volumes to the maximum extent practical. If the

runoff reduction volume (RRv) is greater than the WQv, then the designer has already met the requirement for WQv by applying runoff reduction techniques.

Projects that cannot meet 100-percent of the runoff reduction requirement due to physical or hydraulic conditions of the site must provide a justification that evaluates each of the green infrastructure planning and reduction techniques, presented in Chapter 5 of the Manual, and identify the limitations of the site according to which application of the criterion is not feasible. Projects that do not achieve runoff reduction requirements must, at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the site. The percent reduction is based upon the Hydrologic Soil Group (HSG) of the site and is defined as Specific Reduction Factor (S). Section 4.3 of the Manual defines the Runoff Reduction Volume as:

$$RRv = \frac{[(P)(Rv^*)(Ai)]}{12}$$

Where:
- RRv = Runoff Reduction Volume (in acre-feet)
- P = 90% Rainfall Event Number
- Ai = Measured impervious cover targeted for infiltration. Ai = (S)(A)
- Rv^* = 0.05+0.009(I)
- I = Impervious Cover (Percent) = 100%
- S = Hydrologic Soil Group (HSG) Specific Reduction Factor where:

HSG A = 0.55	HSG C = 0.30
HSG B = 0.40	HSG D = 0.20

Those projects not meeting 100-percent runoff reduction are subject to the minimum RRV, and must incorporate additional stormwater management practices to address water quality treatment.

6.2.2 Evaluation of Green Infrastructure Planning Techniques

6.2.2.1 Preservation of Undisturbed Areas

Description: Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain.

Evaluation: Large swaths of the project parcel will remained undisturbed. The project may propose a permanent conservation of some of these areas.

6.2.2.2 Preservation of Buffers

Description: Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.

Evaluation: The wetlands onsite will be bordered predominantly by undisturbed land, lawn areas for the townhouse backyards, and grass-lined drainage swales. These areas will be refined during the detailed design, regulatory review and permitting process for each specific area.

6.2.2.3 Reduction of Clearing and Grading

Description: Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.

Evaluation: Clearing and grading for the current proposed development will be limited to the area to be developed. The Plans shows the areas to be cleared and graded and the limits of disturbance for the project. . These areas will be refined during the detailed design, regulatory review and permitting process for each specific area.

6.2.2.4 Locating Sites in Less Sensitive Areas

Description: Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.

Evaluation: The proposed development has been located to avoid where possible wetlands, steep slopes and archeologically sensitive areas. Most of these areas will remain undisturbed. Some small area of wetlands to be disturbed will be mitigated on other areas of the site. . These areas will be refined during the detailed design, regulatory review and permitting process for each specific area.

6.2.2.5 Conservation Design

Description: Use clustering, conservation design or open space design to reduce impervious cover, preserve open space and protect water resources.

Evaluation: This project proposes the development of townhouses, apartment buildings and clustered single-family homes along with light industrial uses.

6.2.2.6 Soil Restoration

Description: Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post construction practices.

Evaluation: Full soil restoration is proposed for all areas of disturbance that will not become hardscape. All areas will be stabilized with seed & mulch, and landscaped areas will be provided.

6.2.2.7 Roadway Reduction

Description: Minimize roadway widths and lengths to reduce site impervious area

Evaluation: Pavement on site has been reduced to the extent practical to serve the intended use. Emergency and sanitation vehicle maneuverability prohibit any further reduction of roadway area on the site.

6.2.2.8 Sidewalk Reduction

Description: Minimize sidewalk lengths and widths to reduce site impervious area

Evaluation: Sidewalks have been eliminated from along the proposed roadways in portions of the site in order to reduce site impervious area.

6.2.2.9 Driveway Reduction

Description: Minimize driveway lengths and widths to reduce site impervious area

Evaluation: Driveways lengths and widths have been reduced to the minimum size needed to provide parking for two vehicles outside of each garage. Permeable surfaces for sidewalks will be evaluated during the detailed design, regulatory review and permitting process for each specific area.

6.2.2.10 Cul-De-Sac Reduction

Description: Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.

Evaluation: Several loop roads are proposed where traditionally cul-de-sacs would have been proposed

6.2.2.11 Building Footprint Reduction

Description: Reduce the impervious footprint for residences and commercial building by using alternate or taller buildings while maintaining the same floor to area ratio.

Evaluation: The proposed townhouses and clustered single-family homes have a minimal footprint by utilizing two story floor plans. The apartment building complexes are multistory again minimizing their footprint.

6.2.2.12 Parking Reduction

Description: Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.

Evaluation: The parking layouts are according to town code. It is foreseeable that some of the parking areas will be reduced when specific uses are contemplated for the light industrial phases of the project. The feasibility of utilizing porous pavement for parking lots will also be

investigated during the detailed design, regulatory review and permitting process for each specific area.

6.3 Stormwater Quantity Analysis

This report presents the pre-development features and conditions associated with the rate of surface water runoff within the study area. Drainage patterns, drainage structures, soil types, and ground cover types have been considered in this study. The methodology used to develop this Master SWPPP shall be adhered to for the preparation of future SWPPPs for each phase of development. Stormwater quality and quantity controls identified for this Master SWPPP are preliminary in nature and are intended to demonstrate their location, approximate size, and design concept. Detailed analysis of these practices must be performed, and their design refined/detailed as part of the future permitting processes.

6.3.1 NYSDEC Requirements

The NYS Stormwater Management Design Manual, dated August 2010 requires that projects meet three separate stormwater quantity criteria:

1. The Channel Protection (CPv) requirement is designed to protect stream channels from erosion. This is accomplished by providing 24 hours of extended detention for the 1-year, 24-hour storm event. The Manual defines the CPv detention time as the center of mass detention time through each stormwater management practice.

2. The Overbank Flood Control (Qp) requirement is designed to prevent an increase in the frequency and magnitude of flow events that exceed the bank-full capacity of a channel, and therefore must spill over into the floodplain. This is accomplished by providing detention storage to ensure that, at each design point, the post-development 10-year 24-hour peak discharge rate does not exceed the corresponding pre-development rate.

3. The Extreme Flood Control (Qf) requirement is designed to prevent the increased risk of flood damage from large storm events, to maintain the boundaries of the pre-development 100-year floodplain, and to protect the physical integrity of stormwater management practices. This is accomplished by providing detention storage to ensure that, at each design point, the post-development 100-year 24-hour peak discharge rate does not exceed the corresponding pre-development rate.

6.3.2 Methodology

In order to demonstrate that detention storage requirements will be met, the NYS Stormwater Management Design Manual, dated August 2010 requires that a hydrologic and hydraulic analysis of the pre- and post-development conditions be performed using the Natural Resources Conservation Service Technical Release 20 (TR-20) and Technical Release 55 (TR-55) methodologies. HydroCAD, developed by HydroCAD Software Solutions LLC of Tamworth, New Hampshire, is a Computer-Aided-Design (CAD) program for analyzing the hydrologic and hydraulic characteristics of a given watershed and associated stormwater management facilities.

HydroCAD uses the TR-20 algorithms and TR-55 methods to create and route runoff hydrographs. HydroCAD was used to analyze the pre-development condition for this Master SWPPP.

HydroCAD has the capability of computing hydrographs (which represent discharge rates characteristic of specified watershed conditions, precipitation, and geologic factors) combining hydrographs and routing flows though pipes, streams and ponds. HydroCAD can also calculate the center of mass detention time for various hydraulic features. Documentation for HydroCAD can be found on their website: http://www.hydrocad.net/.

For this analysis, the watershed and drainage system was broken down into a network consisting of three types of components as described below:

1. Sub-catchment: A relatively homogeneous area of land, which produces a volume and rate of runoff unique to that area.

2. Reach: Uniform streams, channels, or pipes that convey stormwater from one point to another.

3. Pond: Natural or man-made impoundment, which temporarily stores stormwater runoff and empties in a manner determined by its geometry and the hydraulic structure located at its outlets.

4. Link: A link is used to interconnect several routing diagrams. The Time lag, translates the outflow hydrograph(s) by the specified amount. In our case the link is used to translates the peak flow to the design point farther within the model. The Time lags were calculated as Tc calculations.

Subcatchments, reaches, ponds and links are represented by hexagons, squares, triangles and broken squares respectively, on the watershed routing diagrams provided with the computations included in Appendix H.

The analysis of hydrologic and hydraulic pre-development condition was performed by dividing the tributary watershed into relatively homogeneous subcatchments. The separation of the watershed into subcatchments was dictated by watershed conditions, conceptual methods of collection, conveyance, and points of discharge. Watershed characteristics for each subcatchment were then assessed from United States Geological Service (USGS) 7.5-minute topographic maps, aerial photographs, a topographical survey, soil surveys, site investigations, and land use maps. The hydrologic and hydraulic analysis considered the SCS, Type II, 24-hour storm events identified in Table 2.

Future stormwater management facilities will be designed and evaluated in accordance with the NYS Stormwater Management Design Manual, dated August 2010 and local regulatory requirements.

Table 3: Design Events

Facility	24-hour Storm Event
Stormwater Management Facilities	1-year
Stormwater Management Facilities	10-year
	100-year
Flood Conditions	100-year

6.3.3 Description of Design Points

The study area consists of an overall watershed that encompasses approximately 620± acres and contains the 429± acre project site. The overall watershed was broken down into smaller watersheds, or subcatchments, to allow for analysis of runoff conditions at several locations throughout the study area. Each of these locations was defined as a Design Point (DP) in order to establish the pre-development rates of discharge that future phases of development must not exceed. Descriptions of each of the selected design points are provided below.

- Design Point 1: DP1 is located on the eastern side of NYS Route 9W where two culverts, a 4'x3.3' box culvert and 2'x1.6' box culvert, discharge under Route 9W. This runoff then continues south, combines with the waters at Design Point 9 and ultimately crosses NYS Route 9W again and discharges into the Hudson River.
    - Design Point 101: DP101 is located within the sub-catchments contributing to DP1. It is located along a property line of the proposed development and a neighboring parcel.
    - Design Point 102: DP102 is located within the sub-catchments contributing to DP1. It is located along a property line of the proposed development and a neighboring parcel.
    - Design Point 103: DP103 is located within the sub-catchments contributing to DP1. It is located along a property line of the proposed development and a neighboring parcel.
    - Design Point 104: DP104 is located within the sub-catchments contributing to DP1. It is located along a property line of the proposed development and a neighboring parcel.
- Design Point 2: DP2 is the major discharge point into the Hudson River. Runoff contributes to Wetland "VAA" located within the central portion of the site and ultimately discharges into the Hudson River via an on-site stream flowing west to east and under an existing railroad bridge.
    - Design Point 201: DP201 is located within the sub-catchments contributing to DP2. It is located at the top of the stream corridor where wetland "VAA" discharges.

- Design Point 3: DP3 is located at a buried culvert located in the northeast portion of the site at a point where a wetland discharges into an intermittent stream that flows from west to east down a steep embankment approximately into the Hudson River.

- Design Point 4: DP4 is located along the northern property line within Wetland "HA" and discharges off-site to the adjoining parcel to the north via overland flow. The runoff from DP4 eventually discharges to the Hudson River.

- Design Point 5: DP5 is also located along the northern property line and discharges off-site to the parcel to the north of the project parcel via overland flow. The runoff from DP5 eventually discharges to the Hudson River.

- Design Point 6: DP6 is located in the southeast portion of the site along the bluff above the Hudson River. Discharge from this point continues down a steep embankment then discharges into a wetland that discharges to the Hudson River under a railroad bridge.

- Design Point 7: Like DP6, DP7 is located in the southeast portion of the site along the bluff above the Hudson River. Discharge from this point continues east and combines with runoff from the adjacent parcel to the south of the project parcel via overland flow. This runoff eventually discharges to the Hudson River.

- Design Point 8: DP8 is located along the southern property line and discharges off-site to the adjoining parcel to the south via overland flow. This runoff eventually discharges to the Hudson River.

- Design Point 9: DP9 is located on the western side of NYS Route 9W where an existing 3'x2.6' box culvert crosses under the roadway. DP9 is south of Design Point 1. The flows under NYS Route 9W and ultimately discharges into the Hudson River.

- Design Point 10: Like DP6 and DP7, DP10 is located in the southeast portion of the site along the bluff above the Hudson River. Discharge from this point continues down a steep embankment then discharges into a wetland that discharges to the Hudson River via a railroad bridge.

6.3.4 Pre-development Watershed Conditions

The pre-development project site is covered predominantly by meadow, woods, wetlands, streams, pavement, and structures. Analysis of pre-development conditions considered existing drainage patterns, soil types, ground cover, and topography.

The contributing pre-development watershed areas were divided into eighteen sub-catchments, labeled ES1A thru ES1H, ES2A and ES2B, ES3, ES4, ES5, ES6, ES7, ES8, ES9 AND ES10. The Pre-Development Watershed Delineation Map has been provided in Appendix G as Figure3.

Limitations in the computer program and the lack of finer topography of the offsite drainage basins require some adjustments of the computer model. Specifically where drainage basins ES1C and ES1D cross under Route 9W in 3'x3' box culverts, the model discards all flow that

does not enter the culvert. The assumption is valid because there are several upstream ponding areas not accounted for in the model and the slope along route 9W encourages runoff to continue along the road edge to the south rather than breach the road then enter the project site. Additionally since there will be no change in the off-site drainage areas that will be modeled identically in the post and in the pre.

The results of the computer modeling used to analyze the overall watershed under pre-development conditions are presented in Appendix H. A summary of the pre-development watershed runoff rates at each design point is presented in Table 4.

6.3.5 Post-development Watershed Conditions

The post-development project site continues to have large areas of meadow, woods, wetlands and streams, with an overall increase in impervious surfaces associated with this development. The stormwater quality and quantity controls that have been presented in this Master SWPPP are preliminary in nature and intended to demonstrate their location, approximate size, and design concept. A post-development drainage area map has been prepared for this Master SWPPP to present how drainage patterns will be affected as a result of the development. This post-development drainage area map can be found in Appendix G as Figure 4.

Final post-development stormwater facility hydrologic and hydraulic models will be developed as part of the future permitting processes for each individual phase of development.

6.3.6 Performance Summary

A pre-development watershed conditions analysis was performed for all design points and storm events evaluated herein to establish the thresholds that shall be maintained under future development conditions at these points. For all design points and design storms, the peak rates of runoff identified in Table 4 shall not be exceeded under post-development condition. As such, the project will not have a significant adverse impact on the adjacent or downstream properties or receiving watercourses.

The results of the computer modeling used to analyze the pre-development watersheds are presented in Appendix H. Table 4 summarizes the results of this analysis.

Table 4: Summary of Pre-Development Peak Discharge Rates

Pre-Development Discharge Rate (cfs)			
Design Point (DP)	**1-year 24-hour storm event**	**10-year 24-hour storm event**	**100-year 24-hour storm event**
1	94.85	305.73	525.66
101	35.7	73.29	95.88
102	80.01	250.03	422.60
103	2.49	10.76	20.25
104	0.62	2.63	4.93
2	30.27	131.87	249.22
201	27.98	123.09	233.52
3	20.23	77.03	139.93
4	4.28	19.64	37.85
5	5.55	24.30	45.84
6	2.12	9.07	17.04
7	5.54	24.04	45.43
8	2.15	9.40	17.73
9	8.56	36.83	69.73
10	6.15	28.08	53.70

7.0 INSPECTIONS, MAINTENANCE, AND REPORTING

7.1 Inspection and Maintenance Requirements

7.1.1 Pre-Construction Inspection and Certification

Prior to the commencement of each phase of construction, the Owner's/Operator's Engineer shall conduct an assessment of the site and certify that the appropriate erosion and sediment control measures have been adequately installed and implemented. The Contractor shall contact the Owner's/Operator's Engineer once the erosion and sediment control measures have been installed.

7.1.2 Construction Phase Inspections and Maintenance

A Qualified Inspector, as defined in Appendix A of the General Permit GP-0-10-001, shall conduct regular site inspections between the time the SWPPP is implemented and final site stabilization. Site inspections shall occur at an interval of at least once every seven-calendar days. If this project involves the disturbance of greater than five acres of soil at any one time, site inspections shall occur at an interval of at least twice every seven-calendar days, with the inspections separated by a minimum of at least two full calendar days.

The purpose of site inspections is to assess performance of pollutant controls. Based on these inspections, the Qualified Inspector will decide whether it is necessary to modify the SWPPP, add or relocate sediment barriers, or whatever else may be needed in order to prevent pollutants from leaving the site via stormwater runoff. The general contractor has the duty to cause pollutant control measures to be repaired, modified, maintained, supplemented, or whatever else is necessary in order to achieve effective pollutant control.

Examples of particular items to evaluate during site inspections are listed below. This list is not intended to be comprehensive. During each inspection, the inspector must evaluate overall pollutant control system performance as well as particular details of individual system components. Additional factors should be considered as appropriate to the circumstances.

1. Locations where vehicles enter and exit the site must be inspected for evidence of off-site sediment tracking. A stabilized construction entrance will be constructed where vehicles enter and exit. This entrance will be maintained or supplemented as necessary to prevent sediment from leaving the site on vehicles.
2. Sediment barriers must be inspected and, if necessary, they must be enlarged or cleaned in order to provide additional capacity. All material from behind sediment barriers will be stockpiled on the up slope side. Additional sediment barriers must be constructed as needed.
3. Inspections will evaluate disturbed areas and areas used for storing materials that are exposed to rainfall for evidence of, or the potential for, pollutants entering the drainage system. If necessary, the materials must be covered or original covers must be repaired or supplemented. In addition, protective berms must be constructed, if needed, in order to contain runoff from material storage areas.

4. Grassed areas will be inspected to confirm that a healthy stand of grass is maintained. The site has achieved final stabilization once all areas are covered with building foundation or pavement, or have a stand of grass with at least 80 percent density. The density of 80 percent or greater must be maintained to be considered as stabilized. Areas must be watered, fertilized, and reseeded as needed to achieve this goal.
5. All discharge points must be inspected to determine whether erosion control measures are effective in preventing significant impacts to receiving waters.

The inspection reports must be completed entirely and additional remarks should be included if needed to fully describe a situation. An important aspect of the inspection report is the description of additional measures that need to be taken to enhance plan effectiveness. The inspection report must identify whether the site was in compliance with the SWPPP at the time of inspection and specifically identify all incidents of non-compliance.

Within one business day of the completion of an inspection, the Qualified Inspector shall notify the Owner/Operator and appropriate contractor (or subcontractor) of any corrective actions that need to be taken. The contractor (or subcontractor) shall begin implementing corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

In addition to the inspections performed by the Owner's/Operator's Engineer, the Contractor shall perform routine inspections that include a visual check of all erosion and sediment control measures. All inspections and maintenance shall be performed in accordance with the inspection and maintenance schedule provided on the accompanying plans. Sediment removed from erosion and sediment control measures will be exported from the site, stockpiled for later use, or used immediately for general non-structural fill.

It is the responsibility of the general contractor to assure the adequacy of site pollutant discharge controls. Actual physical site conditions or contractor practices could make it necessary to install more structural controls than are shown on the accompanying plans. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers.) Assessing the need for additional controls and implementing them or adjusting existing controls will be a continuing aspect of the SWPPP until the site achieves final stabilization.

7.1.3 Temporary Suspension of Construction Activities

For constructions phases where soil disturbance activities will be temporarily suspended (e.g. Winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the frequency of Qualified Inspector inspections can be reduced to once every 30 calendar days. Prior to reducing the frequency of inspections for any phase of development, the Owner/Operator shall notify the NYSDEC Region 3 stormwater contact person and the Town of Lloyd in writing.

7.1.4 Partial Project Completion

For constructions phases where soil disturbance activities have been shut down with partial phase completion, 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 phase being shutdown have been constructed in conformance with the SWPPP and are operational, the Qualified Inspector inspections can stop. Prior to the shutdown for any phase of development, the Owner/Operator shall notify the NYSDEC Region 3 stormwater contact person and the Town of Lloyd in writing.

If soil disturbance activities have not resumed within two years from the date of shutdown, a Notice of Termination (NOT) shall be properly completed and submitted to the NYSDEC for the specific phase of development.

7.1.5 Post-Construction Inspections and Maintenance

Inspections and maintenance of post-construction stormwater management practices shall be performed in accordance with Appendix F, when all disturbed areas are stabilized and all stormwater management systems are in place and operable.

7.2 Reporting Requirements

7.2.1 Inspection and Maintenance Reports

Inspection/maintenance reports shall be prepared prior to and during construction in accordance with the schedule outlined herein and in the SPDES General Permit GP-0-10-001 Part IV.C.2. The reports shall be prepared to identify and document the maintenance of the erosion and sediment control measures. A sample inspection form is provided in Appendix D.

Specifically, each inspection shall record the following information:

1. Date and time of inspection.

2. Name and title of person(s) performing inspection.

3. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection.

4. A description of the condition of the runoff at all points of discharge (including conveyance systems and overland flow) from the construction site. This shall include identification of any discharges of sediment from the construction site.

5. A description of the condition of all natural surface water bodies 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 water body.

6. Identification of all erosion and sediment control practices that need repair or maintenance.

7. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or repaired.

8. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection.

9. 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.

10. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).

11. Color photographs with date stamp, taken with a digital camera, which show the condition of all practices that have been identified as needing corrective action or have undergone corrective action, must be attached to the associated inspection report.

7.2.2 Site Log Book

The Owner/Operator shall retain a copy of the SWPPP prepared for each phase of development as required by NYSDEC SPDES General Permit GP-0-10-001 at the construction-site from the date of initiation of construction activities to the date of final stabilization.

During construction of each phase of development, the Owner's/Operator's Engineer shall maintain a record of all SWPPP inspection reports at the site in the Site Log Book. The Site Log Book for each phase of development shall be maintained on-site and made available to the permitting authority.

7.2.3 Post Construction Records and Archiving

Following construction of each phase of development, the Owner/Operator shall retain copies of the SWPPP, the complete construction Site Log Book, and records of all data used to complete the NOI to be covered by this permit, for a period of at least five years from the date that the site is finally stabilized. This period may be extended by the NYSDEC, at its sole discretion, at any time upon written notification.

Records shall be maintained of all post construction inspections and maintenance work performed in accordance with the requirements outlined in Appendix F.

Appendix A:
NYSDEC SPDES General Permit GP-0-10-001

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010 Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

Authorized Signature Date: January 28, 2010

Address: NYS DEC
Div. 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's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

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 Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They 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

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Part I. 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 (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and 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.

C. 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 D. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from *construction activities*.

(Part I. C)

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater *discharges* may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with water quality standards in Part I.B.

D. <u>Activities Which Are Ineligible for Coverage Under This General Permit</u> - All of the following are **<u>not</u>** 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 C.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, subparagraph K of this permit;

4. *Discharges* from *construction activities* that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

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 that:

    a. are tributary to waters of the state classified as AA or AA-s; and

(Part I. D. 6)

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and

   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

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 develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

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 develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form 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, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

(Part II. A)

3. This requirement does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

4. 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.

5. 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.

B. <u>Permit Authorization</u>

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 <u>all</u> of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act (SEQRA) have been satisfied, when SEQRA is applicable,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act (UPA)* (see 6 NYCRR Part 621) 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 Regional Office 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. an 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.B.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

(Part II. B. 3)

a. For *construction activities* that are not 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 NOI for *construction activities* with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

ii. Sixty (60) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has not been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

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 a complete NOI and signed "MS4 SWPPP Acceptance" form,

4. The Department may suspend or deny an *owner's or operator's* coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. 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.

C. 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.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-10-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department.

(Part II. C. 2)

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 MS4 (provided the 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. 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 been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

    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. 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.

(Part II. C)

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the *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 *MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *MS4* prior to commencing construction of the post-construction stormwater management practice.

D. Permit Coverage for Discharges Authorized Under GP-0-08-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), a*n owner or operator* of *construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. 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. 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.A.1.. 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.

   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. 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*.

(Part III. A)

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:

    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; and

    c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority.

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.

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.

(Part III. A. 6)

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 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 understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

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.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:

(Part III. A. 8)

a. Information on whether the stormwater discharge or *construction activities* would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the *owner or operator* fails to describe and implement such measures, the stormwater *discharge* is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

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 most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this 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;

(Part III. B. 1)

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), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; 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 the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, 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;

(Part III. B. 1)

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6., 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 most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

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 requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. 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 standards.

2. Post-construction stormwater management practice component - All construction projects 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 most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). If the Design Manual is revised during the term of this permit, an *owner or operator* must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

   Where post-construction stormwater management practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard.

   At a minimum, 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;

(Part III. B. 2)

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

d. Identification of any elements of the design that are not in conformance with the Design Manual. 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 standards;

e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

g. 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 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.g. above.

(Part III. C)

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. *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.

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 and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

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. Owner or Operator Maintenance Inspection Requirements

1. The *owner or operator* shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

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 *owner or operator* can stop conducting the maintenance inspections. The *owner or operator* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* 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.

(Part IV. C)

C. <u>Qualified Inspector Inspection Requirements</u> - 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. **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),
- 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, <u>with the exception of</u>:

    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 <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> 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 <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> 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 (5000) 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.

(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.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 Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the MS4 (provided the 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* <u>and</u> 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 Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the MS4 (provided the 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*, <u>and</u> 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.A.1..

(Part IV. C. 3)

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices 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 that need repair or maintenance;

    g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

    h. Description and sketch of areas that are disturbed 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 to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. 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 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.C.2., 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.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

(Part V. A. 2)

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.E.

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 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.

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 also have the MS4 sign the "MS4 Acceptance" statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4*, sign the "MS4 Acceptance" statement. The 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 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.3.

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:

(Part V. A. 5)

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 modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, 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 OF 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 site achieves *final stabilization*. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

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.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department 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.

(Part VII. A)

The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

B. Continuation of the Expired General Permit - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an *owner or operator* seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

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 make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation 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 the NOI, SWPPP or inspection reports. 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 other report, 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. 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. <u>Signatory Requirements</u>

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. 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.;

   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. <u>Property Rights</u> - 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. <u>Severability</u> - 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.

(Part VII. K)
K. <u>Denial of Coverage Under This Permit</u>

1. At its sole discretion, 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 Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, 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. Any *owner or operator* authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the *owner or operator* shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F).The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. 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. <u>Proper Operation and Maintenance</u> - 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. <u>Inspection and Entry</u> - The *owner or operator* shall allow the Department or an authorized representative of EPA, the State, 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:

(Part VII. M)

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).

N. Permit Actions - At the Department's sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. 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. 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 – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

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

Definitions

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.

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.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

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 authorizing a category of discharges.

Groundwater - 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.

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.

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) application, 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.

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).

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.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

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 Parts 700 et seq of this Title.

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, 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 in order to prepare a SWPPP that conforms to the Department's technical standard. 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.

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

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,
- Stream bank restoration projects (does not include the placement of spoil material),
- 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 makes 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.

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.

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 or underground 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.

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, 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* will be 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 and 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 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 • Bike paths and trails • Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics • Spoil areas that will be covered with vegetation • Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), 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 less than five acres and construction activities that include the construction or reconstruction of impervious area
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 (5000) square feet and one (1) acre of land.

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 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 townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- 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, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- 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 or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* <u>and</u> *alter the hydrology from pre to post development* conditions, <u>and</u> are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

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

Figure 1 - New York City Watershed East of the Hudson

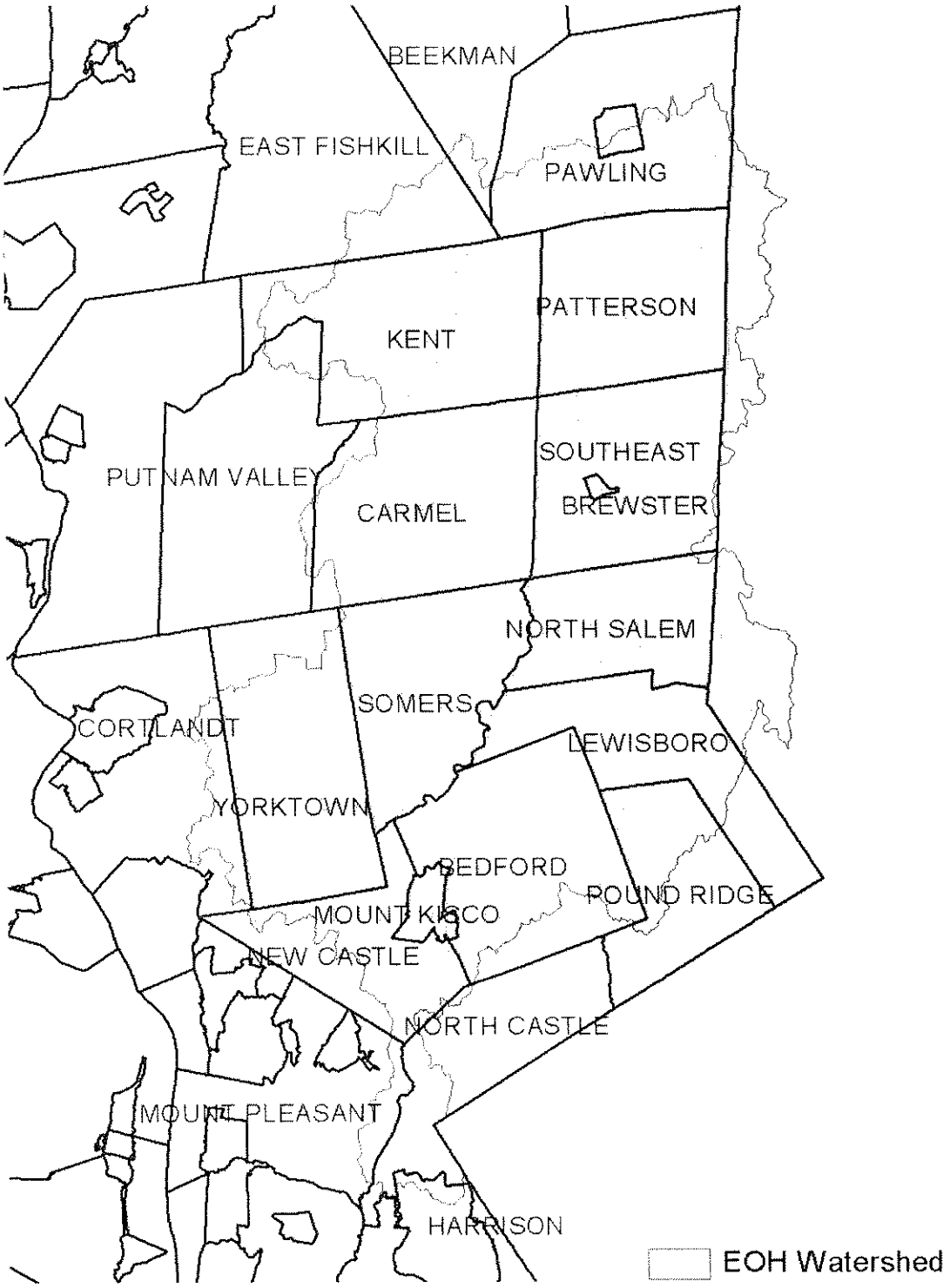


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

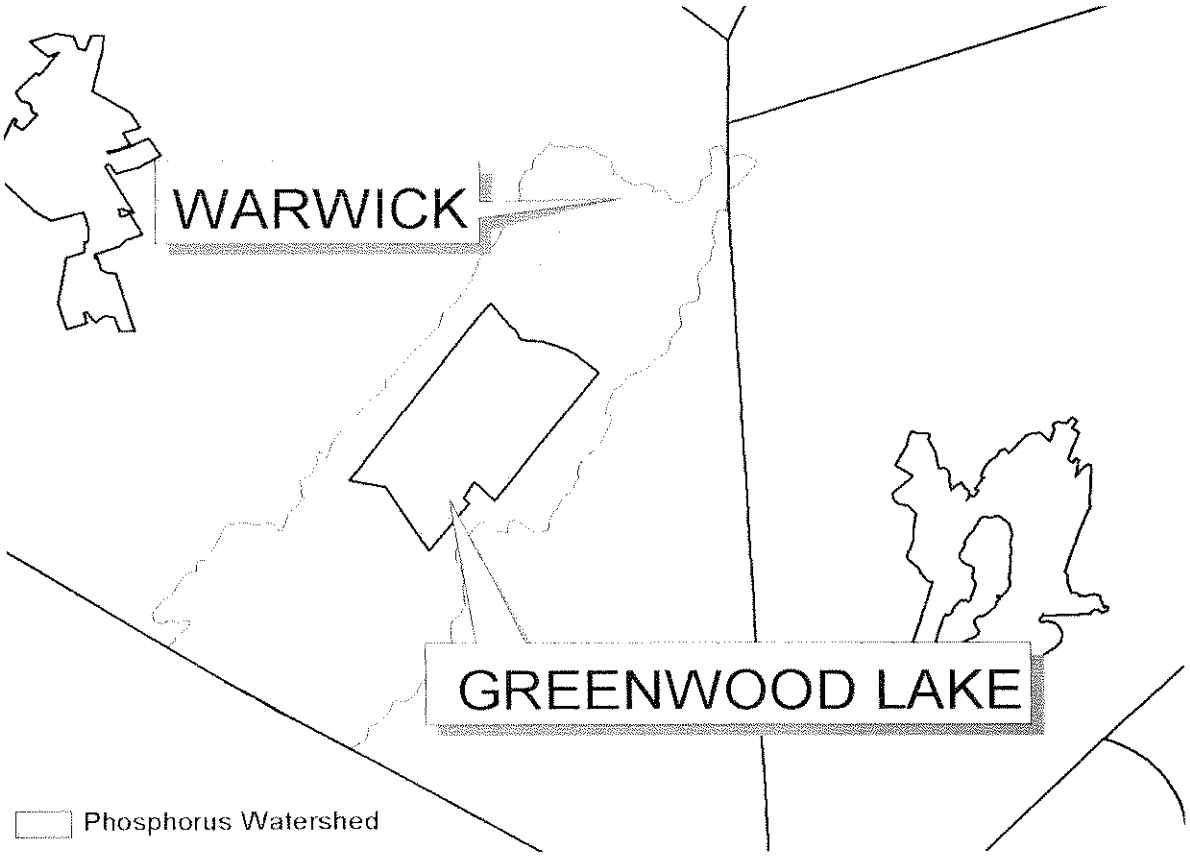
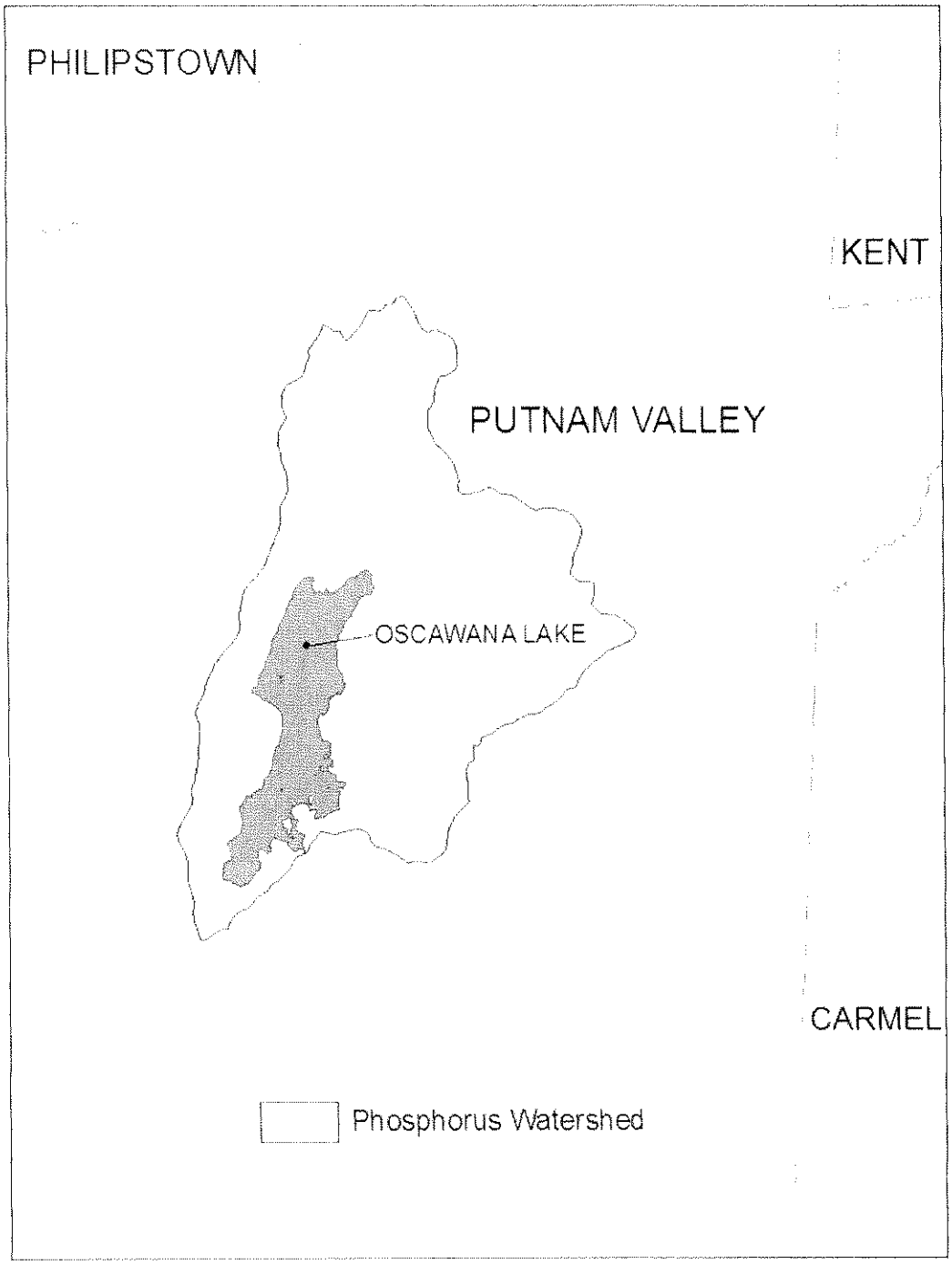


Figure 4 - Oscawana Lake Watershed



APPENDIX D

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

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivision construction activities 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 most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Beaver Lake
Broome	White Birch Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Dutchess	Rudd Pond
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county listed as Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Tonawanda Creek, Upper, and minor tribs
Genesee	Little Tonawanda Creek, Lower, and tribs
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs
Onondaga	Onondaga creek, Middle and tribs
Onondaga	Onondaga Creek, Upper, and minor tribs
Onondaga	Harbor Brook, Lower, and tribs
Onondaga	Ninemile Creek, Lower, and tribs
Onondaga	Minor tribs to Onondaga Lake
Ontario	Honeoye Lake
Ontario	Hemlock Lake Outlet and minor tribs
Ontario	Great Brook and minor tribs
Oswego	Lake Neatahwanta
Putnam	Oscawana Lake
Putnam	Lake Carmel
Queens	Jamaica Bay, Eastern, and tribs (Queens)
Queens	Bergen Basin
Queens	Shellbank Basin
Rensselaer	Snyders Lake
Richmond	Grasmere, Arbutus and Wolfes Lakes
Saratoga	Dwaas Kill and tribs
Saratoga	Tribs to Lake Lonely
Saratoga	Lake Lonely
Saratoga	Schuyler Creek and tribs
Schenectady	Collins Lake

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

Note: The list above identifies those waters from the final New York State "2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated May 26, 2008, that are impaired by silt, sediment or 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, PO BOX 220 WARRENSBURG, NY 12885-0220 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 ROAD AVON, 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 AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

Appendix B:
NYSDEC Forms

0669273036

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-0-10-001

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)
Hudson Valley Wine Village, Inc.

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

Owner/Operator Contact Person First Name
Andrew

Owner/Operator Mailing Address
34 Highline Trail South

City
Stamford

State: CT
Zip: 06902-

Phone (Owner/Operator): 203-325-3310
Fax (Owner/Operator): -

Email (Owner/Operator)
ahmax@optonline.net

FED TAX ID
- TBD (not required for individuals)

Project Site Information

Project/Site Name
Hudson Valley Wine Village

Street Address (NOT P.O. BOX)
191-200 Blue Point Road

Side of Street
○ North ○ South ● East ○ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town of Lloyd

State: NY
Zip: 12528-
County: Ulster
DEC Region: 3

Name of Nearest Cross Street
NYS Route 9W

Distance to Nearest Cross Street (Feet)
0

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

Tax Map Numbers
Section-Block-Parcel
96.3-2-8

Tax Map Numbers
96.3-1-29.1

Also: 96.3-1-28, 96.3-2-21, 96.3-1-18, 96.3-2-9

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): 587060

Y Coordinates (Northing): 4615058

2. What is the nature of this construction project?

○ **New Construction**

● **Redevelopment with increase in imperviousness**

○ **Redevelopment with no increase in imperviousness**

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

Pre-Development Existing Land Use	Post-Development Future Land Use
● FOREST	○ SINGLE FAMILY HOME
○ PASTURE/OPEN LAND	○ SINGLE FAMILY SUBDIVISION
○ CULTIVATED LAND	○ TOWN HOME RESIDENTIAL
○ SINGLE FAMILY HOME	● MULTIFAMILY RESIDENTIAL
○ SINGLE FAMILY SUBDIVISION	○ INSTITUTIONAL/SCHOOL
○ TOWN HOME RESIDENTIAL	○ INDUSTRIAL
○ MULTIFAMILY RESIDENTIAL	○ COMMERCIAL
○ INSTITUTIONAL/SCHOOL	○ MUNICIPAL
○ INDUSTRIAL	○ ROAD/HIGHWAY
○ COMMERCIAL	○ RECREATIONAL/SPORTS FIELD
○ ROAD/HIGHWAY	○ BIKE PATH/TRAIL
○ RECREATIONAL/SPORTS FIELD	○ LINEAR UTILITY (water, sewer, gas, etc.)
○ BIKE PATH/TRAIL	○ PARKING LOT
○ LINEAR UTILITY	○ CLEARING/GRADING ONLY
○ PARKING LOT	○ DEMOLITION, NO REDEVELOPMENT
○ OTHER	○ OTHER

Number of Lots

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

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ○ Yes ● No

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

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	Acreage To Be Disturbed	Existing Impervious Area Within Disturbed	Future Impervious Area Within Disturbed
429.0	189.9	15.6	

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

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

A	B	C	D
%	%	98 %	2 %

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

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

Start Date		End Date
10/01/2013	–	10/01/2033

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

Name

Hudson River

12a. Type of waterbody identified in Question 12?

- ○ Wetland / State Jurisdiction On Site (Answer 12b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 12b)
- ○ 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

12b. How was the wetland identified?

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

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ Yes ● No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ Yes ● No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ Yes ● No

16. 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?

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

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ● Yes ○ No ○ Unknown
(If No, skip question 19)

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

Town of Lloyd

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

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 Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) ● Yes ○ No
(If No, skip questions 23 and 27-35)

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? ○ Yes ○ No

This is a Master SWPPP, only pre developed conditions have been analyzed. Stormwater management areas have been identified but not sized. A SWPPP specific to each phase of development will be developed with the eventual overall project build-out sizing criteria in mind.

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
The Chazen Companies

Contact Name (Last, Space, First)
Connors, James J

Mailing Address
547 River Street

City
Troy

State
NY

Zip
12180-

Phone
518-273-0055

Fax
518-273-8391

Email
jconnors@chazencompanies.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-0-10-001. 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
James

MI
J

Last Name
Connors

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

This is a master SWPPP, site specific practices will be developed during each phase of development.

Water Quality and Quantity Control

Important: Completion of Questions 27-35 is not required if response to Question 22 is No.

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds
- ● Micropool Extended Detention (P-1)
- ● Wet Pond (P-2)
- ● Wet Extended Detention (P-3)
- ● Multiple Pond System (P-4)
- ● Pocket Pond (P-5)

Filtering
- ● Surface Sand Filter (F-1)
- ○ Underground Sand Filter (F-2)
- ○ Perimeter Sand Filter (F-3)
- ○ Organic Filter (F-4)
- ● Bioretention (F-5)
- ○ Other

Alternative Practice
- ● Rain Garden
- ○ Cistern
- ○ Green Roof
- ● Stormwater Planters
- ○ Permeable Paving (Modular Block)

Wetlands
- ○ Shallow Wetland (W-1)
- ○ Extended Detention Wetland (W-2)
- ○ Pond/Wetland System (W-3)
- ○ Pocket Wetland (W-4)

Infiltration
- ● Infiltration Trench (I-1)
- ● Infiltration Basin (I-2)
- ○ Dry Well (I-3)
- ○ Underground Infiltration System

Open Channels
- ● Dry Swale (O-1)
- ● Wet Swale (O-2)

Verified Proprietary Practice
- ● Hydrodynamic
- ○ Wet Vault
- ○ Media Filter

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

This is a master SWPPP, site specific practices will be developed for each phase of development as part of future design, regulatory review and permitting processes.

29. 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

To be determined

30. Provide the total water quality volume required and the total provided for the site.

WQv Required	WQv Provided
___.TBD acre-feet	___.TBD acre-feet

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required	CPv Provided
___.TBD acre-feet	___.TBD acre-feet

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development	Post-development
___.TBD CFS	___.TBD CFS

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development	Post-development
___.TBD CFS	___.TBD CFS

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. ___5 %

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. TBD %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. TBD

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems) 10

36. Identify other DEC permits that are required for this project.

DEC Permits

○ Air Pollution Control	○ Navigable Waters Protection / Article 15
○ Coastal Erosion	● Water Quality Certificate
○ Hazardous Waste	○ Dam Safety
○ Long Island Wells	● Water Supply
○ Mined Land Reclamation	○ Freshwater Wetlands/Article 24
● Other SPDES	○ Tidal Wetlands
○ Solid Waste	○ Wild, Scenic and Recreational Rivers
○ None	○ Stream Bed or Bank Protection / Article 15

○ Other

37. Does this project require a US Army Corps of Engineers Wetland Permit? ● Yes ○ No
If Yes, Indicate Size of Impact. 1.7

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ● Yes ○ No
(If No, skip question 39)

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

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. NYR

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 / /

New York State 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: Hudson Valley Wine Village, Inc.
2. Contact Person: Andrew Maxon
3. Street Address: 34 Highline Trail South
4. City/State/Zip: Stamford, Connecticut 06902
II. Project Site Information
5. Project/Site Name: Hudson Valley Wine Village
6. Street Address: 191-200 Blue Point Road
7. City/State/Zip: Town of Lloyd, Ulster County, New York
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: Town of Lloyd
12. MS4 SPDES Permit Identification Number: NYR20A _____
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

(NYS DEC - MS4 SWPPP Acceptance Form - January 2010)

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

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

5. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. ☐ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP.
***Date final stabilization completed** (month/year): _____

9b. ☐ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. ☐ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? ☐ yes ☐ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? ☐ yes ☐ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? ☐ yes ☐ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

- ☐ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
- ☐ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).
- ☐ For post-construction stormwater management practices that are privately owned, the deed of record has been modified to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.
- ☐ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? ☐ yes ☐ no
(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:
(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2010)

Appendix C:
Contractor's Certification Form

Stormwater Pollution Prevention Plan
Contractor or Subcontractor Certification Statement

Hudson Valley Wine Village
191-200 Blue Point Road
Town of Lloyd, Ulster County, New York

Each Contractor and Subcontractor that will be responsible for installing, constructing, repairing, inspecting and/or maintaining the erosion and sediment control practices and post-construction stormwater management control practices included in the SWPPP is required to complete and sign this Certification Statement before commencing any construction activity at the site. The completed Certification Statement(s) shall be maintained at the construction site in the Site Log Book.

Contracting Firm Information

Name: _____

Address: _____

_____

Telephone & Fax: _____

Contractor's Responsibilities Regarding SWPPP Implementation

_____

_____

Trained Contractor(s) [1] **Responsible for SWPPP Implementation** (Provide name, title, and date of last training)

_____

_____

Contractor or Subcontractor Certification[2]

I hereby certify 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 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 understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name: _____

Title/Position: _____

Signature: _____ Date: _____

[1] "Trained Contractor" means an employee from a contracting (construction) company that has received four (4) hours of training, which has been endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity, in proper erosion and sediment control principles. 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 that meets the "qualified inspector" qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), 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). The "Trained Contractor" will be responsible for the day to day implementation of the SWPPP.

[2] Signatory Requirements

a. For a corporation, this form shall be signed by (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principle 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, this form shall be signed by a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency, this form 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).

Appendix D:
SWPPP Inspection Report
(Sample Form)

Stormwater Pollution Prevention Plan
Inspection Report

Route 9D Professional Corporate Park
West Main Street (NYS Route 9D)
Town of Poughkeepsie, Dutchess County, New York

A Qualified Inspector[1] shall prepare an inspection report subsequent to each and every inspection, as required in Part IV.C of the SPDES General Permit GP-0-08-001. All sections of this report are to be completed.

1. Inspection Information

Inspection number: _____

Date and Time of Inspection: _____

Weather Conditions: _____

Soil Conditions (e.g. dry, wet, saturated): _____

2. Qualified Inspector Information

Printed Name: _____

Title / Position: _____

Signature: _____ Date: _____

3. On the included site plan, provide a sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection. Provide additional descriptions below if necessary.

_____

_____

_____

_____

_____

[1] A Qualified Inspector means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other Department endorsed individual(s). It also means someone working under the direct supervision of the licensed Professional Engineer or licensed 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 an individual performing a site inspection has received four (4) hours of training, endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity in proper erosion and sediment control principles no later than two (2) years from the date GP-0-08-001 was issued. After receiving the initial training, an individual working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect shall receive four (4) hours of training every three (3) years. 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.

4. In the following table, provide a description of the condition of the runoff at all points of discharge from the construction site, including conveyance systems (pipes, culverts, ditches, etc.) and overland flow. Identify any discharges of sediment from the construction site. Use additional sheets if necessary.

Description of Discharge Point	Condition of Runoff	Sediment Discharge Noted
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:
		yes / no Estimated Quantity:

5. For all discharge points where sediment discharge has been noted in the above table, provide a photograph of the discharge point with a detailed description of corrective actions that are required. Use additional sheets if necessary.

6. In the following table, provide checkmarks in the appropriate columns to indicate the condition of all erosion and sediment control practices at the site.

Erosion & Sediment Control Practice	Not Applicable	Functioning as designed	Needs repair or maintenance	Not installed properly
Stabilized construction entrance				
Temporary parking areas				
Construction vehicle wash areas				
Silt fence				
Temporary swales and berms				
Stone check dams				
Slope protection measures				
Dewatering operations				
Sediment traps				
Inlet protection measures				
Soil stockpiles				
Dust control measures				
Other:				
Other:				

7. For all erosion and sediment control practices identified in the above table as "needs repair or maintenance" or "not installed properly", provide a photograph of the deficient practice accompanied by a detailed description of corrective actions that are required. Use additional sheets if necessary.

8. In the following table, indicate the current phase of construction of all post-construction stormwater management practices and identify all construction that is not in conformance with the SWPPP and technical standards.

SWM Practice	Current Phase of Construction	Items not in conformance with the SWPPP

9. For all post-construction stormwater management practices which are identified in the above table as including "items not in conformance with the SWPPP", provide a photograph of the deficient practice with a detailed description of corrective action(s) that are required to correct the deficiencies. Use additional sheets if necessary.

Appendix E:
Record of Stabilization and Construction Activity Dates (Sample Form)

Site Stabilization & Construction Activities Dates

Hudson Valley Wine Village
190-200 Blue Point Road
Town of Lloyd, Ulster County, New York

Note: This form shall be completed by the Contractor and shall remain as part of the Storm water Pollution Prevention Plan that is to remain at the project site for the duration of construction.

A record of dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained until final site stabilization is achieved and the Notice of Termination is filed.

MAJOR GRADING ACTIVITIES:

Page ____ of ____

Description of Activity: _____

Contractor: _____

Location: _____

Start Date: _____ Finish Date: _____

Description of Activity: _____

Contractor: _____

Location: _____

Start Date: _____ Finish Date: _____

Description of Activity: _____

Contractor: _____

Location: _____

Start Date: _____ Finish Date: _____

Description of Activity: _____

Contractor: _____

Location: _____

Start Date: _____ Finish Date: _____

Description of Activity: _____

Contractor: _____

Location: _____

Start Date: _____ Finish Date: _____

Appendix F:
Post-Construction Inspections and Maintenance

POST CONSTRUCTION INSPECTIONS AND MAINTENANCE

1. SITE COVER

a. Inspections

Site cover and associated structures and embankments should be inspected periodically for the first few months following construction and then on a biannual basis. Site inspections should also be performed following all major (i.e., intense storms, thunder storms, cloud burst, etc.) storm events. Items to check for include (but are not limited to):

i. Differential settlement of embankments, cracking or erosion.

ii. Lack of vigor and density of grass turf.

iii. Accumulation of sediments or litter on lawn areas, paved areas, or within catch basin sumps.

iv. Accumulation of pollutants, including oils or grease, in catch basin sumps.

v. Damage or fatigue of storm sewer structures or associated components.

b. Mowing and Sweeping

Vegetated areas and landscaping should be maintained to promote vigorous and dense growth. Lawn areas should be mowed at least three times a year (more frequent mowing may be desired for aesthetic reasons). Resultant yard waste shall be collected and disposed of off-site.

Paved areas should be swept at least twice a year. Additional sweeping may be appropriate in the early spring for removal of deicing materials

c. Debris and Litter Removal

Accumulation of litter and debris should be removed during each mowing or sweep operation.

d. Structural Repair or Replacement

Components of the system which require repair or replacement should be addressed immediately following identification.

e. Catch Basins

The frequency for cleanout of catch basin sumps will depend on the efficiency of mowing, sweeping, and debris and litter removal. Sumps should be cleaned when accumulation of sediments are within six inches of the catch basin outlet pipe.

Disposal of material from catch basins sumps, drainage manholes, and trench drains shall be in accordance with local, state, and federal guidelines.

f. Grassed Swales

Swale maintenance will include periodic mowing, occasional spot reseeding and weed control to keep grass cover dense and vigorous. Resultant yard waste shall be collected and disposed of off-site. Application of fertilizers and pesticides should be restricted or limited.

g. Rip-rap Dissipation structures

Rip-rap used to dissipate energy from pipe outfalls shall be cleaned or replaced when it becomes overburdened with silt or sediment.

h. Winter Maintenance

To prevent impacts to storm water management facilities, the following winter maintenance limitations, restrictions, or requirements are recommended:

i. Remove snow and ice from inlet structures, basin inlet and outlet structures and away from culvert end sections.

ii. Snow removed from paved areas should not be piled at inlets/outlets of the storm water management basin.

iii. Use of deicing materials should be limited to sand and "environmentally friendly" chemical products. Use of salt mixtures should be kept to a minimum.

iv. Sand used for deicing should be clean, course material free of fines, silt, and clay.

v. Materials used for deicing should be removed during the early spring by sweeping and/ or vacuuming.

2. SURFACE DETENTION BASINS

a. Inspections

Detention Basins should be inspected periodically for the first few months after construction and then on an annual basis. Detention Basins should be inspected after major storm events to ensure inlets and outlets remain clear. Items to check for include (but are not limited to):

i. Differential settlement of embankments.

ii. Cracking, erosion, or seepage through embankments.

iii. Evidence of clogging at inlets or outlets.

iv. Erosion of the flow path through the detention basin.

v. Brush, shrub, or tree growth on embankments.

vi. Condition of the overflow spillway.

vii. Lack of vigor and density of grass turf on the basin embankments.

b. Mowing

The side slopes, embankments, inlets, and overflow spillways of the detention basins should be mowed at least three times a year and resultant yard wastes collected and disposed of off-site.

c. Debris and Litter Control

Removal of debris and litter should be accomplished during mowing operations. Inlet and outlet structures should be cleared of all debris and litter.

d. Structural repairs and Replacement

Components of the detention basin, which require repair or replacement, should be addressed immediately following identification.

e. Erosion Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the basin embankment or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification. Repair, replacement, or addition of rip-rap aprons, channels or embankments should be pursued as required.

f. Sediment removal

Sediments, which accumulate in the detention basin, should be removed periodically to prevent clogging of inlet or outlet structures. A typical clean-out cycle should be between 5 to 10 years with more frequent cleanings near inlet and outlet structures.

3. FOREBAYS AND WET POOLS

a. Inspections

Forebays and Wet Pools should be inspected periodically for the first few months after construction and then on an annual basis. Forebays and Wet Pools should be inspected following all major storm events. Items to check for include (but are not limited to):

i. Differential settlement of embankments.

ii. Cracking, erosion, or seepage through embankments.

iii. Erosion of the flow path through the facility.

iv. Brush, shrub, or tree growth on embankments.

v. Condition of the overflow spillway.

vi. Accumulation of sediment.

b. Mowing

Tree and brush growth must be prevented on basin embankments, side slopes, bottoms, and around inlets and the overflow spillway(s). Mowing of the embankments shall be at least three times a year unless more frequent mowing is required to control vegetative growth. Resultant yard waste shall be collected and disposed of off-site.

c. Debris and Litter Removal

Removal of debris and litter shall be accomplished during mowing operations. Inlet structures should be cleared of all debris and litter.

d. Structural Repairs and Replacement

Components of the forebay or wet pool, which require repair or replacement, should be addressed immediately following identification.

e. Erosion Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the basin embankment or around inlets or overflow outlets, and cracking should be stabilized and repaired immediately upon identification. Repair, replacement or addition of rip-rap aprons, channels or embankments should be pursued as required.

f. Sediment Removal

Cleanout frequency of Forebays and Wet Pools is dependent upon bottom cover, storage capacity, volume of inflow, and sediment load.

Sediment shall be removed from the Forebays and Wet Pools every 5 to 6 years or when accumulations reach 12 inches in depth. Monitoring the depth of sediments can be measured by installing permanent markers in the newly constructed facilities with a mark 12 inches above the permanent water surface. Markers should not be spaced more than 50 feet apart along the flow path through the facility. A log should be kept indicating the date that the facility was inspected and the distance to the bottom.

When sediment removal is required, the original grades depicted on the project drawings should be reestablished by a qualified contractor. If any of the impermeable material used in the construction of the basin bottom is removed it must be replaced with clean material consistent with the original material specifications.

4. AQUATIC BENCHES

a. Inspection

Aquatic Benches should be inspected periodically for the first few months after construction and then on an annual basis. Aquatic Benches should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking basin embankments for subsidence, erosion, cracking, tree growth, and the presence of burrowing animals.

ii. Health and vigor of wetland vegetation.

iii. Accumulation of sediment.

b. Mowing

Mowing is not desirable nor allowed in the Aquatic Benches. Trees and shrubs should be removed from around inlet and outlet structures. Removal should be biannual.

c. Debris, Trash and Litter Control

Debris, trash, and litter should be removed from the Aquatic Benches immediately upon discovery.

d. Erosion Control

Soil slumpage, erosion of the Aquatic Bench embankment or around inlets or outlets, and cracking should be stabilized and repaired immediately upon identification.

5. WET SWALES & DRY SWALES

a. Inspection

Wet and Dry Swales should be inspected periodically for the first few months after construction and then on an annual basis. Wet and Dry Swales shall be inspected after major storm events to ensure inlets and outlets remain clear. Items to check for include (but are not limited to):

i. Evidence of clogging within pea gravel diaphragm (if applicable).

ii. Evidence of erosion and formation of rills or gullies along swale side slopes.

iii. Erosion of the sand/soil bed of the swale.

iv. Evidence of clogging at inlets or outlets.

v. Brush, shrub or tree growth within swale.

vi. Condition of the overflow spillway.

vii. Condition of the check dams.

viii. Lack of vigor and density of plants/turf on the swale side slopes.

ix. If original grass species has been successfully established. If not, then plant an alternative grass species.

x. If wetland species for wet swale have been successfully established. If not, then replant.

b. Mowing

The side slopes, inlets, and overflow spillways of the swales should be mowed to maintain a height of 4 to 6 inches and resultant yard wastes shall be collected and disposed of off-site.

c. Debris and Litter Control

Removal of debris and litter should be accomplished during mowing operations. Inlet and outlet structures and pretreatment areas should be cleared of all debris and litter.

d. Structural repairs and Replacement

Components of the wet and dry swales, which include, but are not limited to, pretreatment check dams and outlet structures, which require repair or replacement, should be addressed immediately following identification.

e. Erosion Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the swale side slopes or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification.

f. Sediment Removal

Sediments, which accumulate in the wet or dry swales, should be removed periodically to prevent clogging of inlet or outlet structures. A typical clean-out cycle should occur when the sediment build up reaches 25% of the original swale depth; more frequent cleanings near inlet and outlet structures may be necessary.

6. HYDRODYNAMIC DEVICE

The hydrodynamic device is a confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the unit to perform maintenance or inspection.

a. Inspection

The hydrodynamic device shall be inspected every four months. The unit's internal components should be inspected for any signs of damage or any loosening of the bolts used to fasten the various components to the manhole structure and to each other.

Refer to attached Operations and Maintenance Guidelines, XXX Hydrodynamic Device for manufacturer's inspection and maintenance specifications.

Reference specific device used and include O & M guidelines from manufacturer's website.

b. Debris, Trash and Litter Control

The screen shall be power washed for the inspection. The floatables shall be removed and the sump cleaned when it has reached 50% capacity. The unit may require cleaning in the event of a spill of a toxic or foreign substance. At a minimum, the hydrodynamic device shall be pumped out at least once a year if the sump does not reach its 50% capacity.

c. Sediment removal

Disposal of material from the hydrodynamic device shall be in accordance with local, state, and federal guidelines.

7. UNDERGROUND DETENTION SYSTEM

a. Inspections

Underground detention systems should be inspected periodically for the first few months after construction and then on an annual basis. Underground detention systems should be inspected after major storm events to ensure inlets and outlets remain clear. Items to check for include (but are not limited to):

i. Measure the sediment buildup at each riser.

ii. Inspect each header, all laterals, inlets, and outlet pipes for sediment build up, obstructions or other problems. Cracking, erosion or seepage through embankments.

b. Debris and Litter Control

Inlet and outlet structures should be cleared of all debris and litter.

c. Structural repairs and Replacement

Components of the detention basin, which require repair or replacement, should be addressed immediately following identification.

d. Sedimentation Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with

vegetative practices or other erosion control practices when vegetative measures do not prove effective.

e. Sediment removal

Sediments, which accumulate in the underground detention system basin, should be removed when it reaches 4% of the pipe diameter to prevent clogging of the outlet. A typical clean-out cycle should be between 5 to 10 years with more frequent cleanings near inlet and outlet structures. The unit may require cleaning in the event of a spill of a toxic or foreign substance. Disposal of material from the underground detention systems shall be in accordance with local, state, and federal guidelines.

Underground detention systems are confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the systems to perform maintenance or inspection.

8. SURFACE SAND FILTER BED

a. Inspection

Surface sand filter beds should be inspected periodically for the first few months after construction and then on a monthly basis. Surface sand filter beds should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking embankments for subsidence, erosion, cracking, undesirable tree and shrub growth and the presence of burrowing animals.

ii. Check inlet for erosion.

iii. Check overflow weir for build up of sediment within rip-rap.

iv. Evidence of standing water (i.e. does it dewater between storms).

v. Health and vigor of vegetation.

vi. Accumulation of sediment.

vii. Evidence of clogging at inlets or outlets.

viii. Condition of the overflow spillway.

ix. Ensure grass is well established.

x. Ensure that no noticeable odors outside of facility.

xi. Ensure activities in pre-treatment practice minimize oil/grease entry to system.

b. Mowing

Tree and brush growth must be prevented on embankments, side slopes, bottoms and around inlets and the overflow spillway(s). Mowing shall be at least four

times a year unless more frequent mowing is required to control vegetative growth. Resultant yard waste shall be collected and disposed of off-site.

c. Debris, Trash and Litter Control

Removal of debris and litter shall be performed every six months or as necessary to keep the filter clean. Inlet should be cleared of all debris and litter.

d. Structural Repairs and Replacement

Components of the surface sand filter beds, which require repair or replacement, should be addressed immediately following identification. This may include the removal and replacement of topsoil, sand, gravel bedding, underdrains, and/or filter fabric that has become clogged. In addition, rip-rap for overflow weir shall be replaced when it has become overburden with sediment.

e. Erosion and Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the embankments or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification.

f. Sediment Removal

Sediments, which accumulate on the surface sand filter beds or within the outlet structure (i.e. overflow weir or pre-cast structure) should be removed annually to prevent clogging of the filter beds, inlet, or outlet structures. Disposal of material removed shall be in accordance with local, state, and federal guidelines

9. UNDERGROUND SAND FILTER BED

a. Inspection

Underground sand filter beds should be inspected periodically for the first few months after construction and then on a monthly basis. Underground sand filter beds should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Check inlet for erosion.

ii. Evidence of standing water (i.e. does it dewater between storms).

iii. Accumulation of sediment.

iv. Evidence of clogging at inlets or outlets.

v. Ensure that no noticeable odors outside of facility.

vi. Ensure activities in pre-treatment practice minimize oil/grease entry to system.

b. Debris, Trash and Litter Control

Removal of debris and litter shall be performed every six months or as necessary to keep the filter clean. Inlet should be cleared of all debris and litter.

c. Structural Repairs and Replacement

Components of the underground sand filter beds, which require repair or replacement, should be addressed immediately following identification. This may include the removal and replacement of top layer of washed gravel, sand bed, gravel bedding, underdrains, and/or filter fabric that has become clogged.

d. Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

e. Sediment Removal

Sediments, which accumulate on the underground sand filter beds should be removed annually to prevent clogging of the filter beds, inlet, or outlet structures. Disposal of material removed shall be in accordance with local, state, and federal guidelines

Underground sand filters are confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the systems to perform maintenance or inspection.

10. BIO-RETENTION AREAS

a. Inspection

Bio-retention areas should be inspected periodically for the first few months after construction and then on a monthly basis. Bio-retention areas should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking embankments for subsidence, erosion, cracking, undesirable tree and shrub growth and the presence of burrowing animals.

ii. Check inlet for erosion.

iii. Evidence of standing water (i.e. does it dewater between storms).

iv. Health and vigor of vegetation (trees, shrubs, grass, flowers, mulch).

v. Accumulation of sediment or yard waste.

vi. Evidence of clogging at inlets or outlets.

vii. Condition of the overflow spillway.

viii. Ensure grass is well established.

ix. Grass height not greater than six inches.

b. Mowing

Mow grass areas within bio-retention facility, so that grass height does not exceed 6-inches. Undesirable trees and shrubs should be removed. Resultant yard wastes shall be collected and disposed of off-site

c. Debris, Trash and Litter Control

Removal of debris and litter shall be accomplished during mowing operations. Inlet structures should be cleared of all debris and litter.

d. Structural Repairs and Replacement

Components of the bio-retention area, which require repair or replacement, should be addressed immediately following identification. This includes treating and or replacing diseased trees and shrub, fertilizing as necessary, replacing tree stakes and wires, replacing mulch where bare spots appear, replacing clogged underdrains, filter beds, and pea gravel diaphragm.

e. Erosion and Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the embankments or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification.

f. Sediment Removal

Sediments which accumulate in the bio-retention area should be removed annually to prevent clogging of inlet or outlet structures. Disposal of material removed from bio-retention area shall be in accordance with local, state, and federal guidelines.

11. UNDERGROUND FILTRATION SYSTEMS (VAULT AND CATCH BASIN FILTERS)

a. Inspection

Underground filtration system should be inspected periodically for the first few months after construction and then on a monthly basis. Underground filtration system should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Evidence of standing water (i.e. does it dewater between storms).

ii. Accumulation of sediment on floor of the chambers and on top of cartridges.

iii. Evidence of clogging at inlets or outlets.

iv. Ensure that no noticeable odors outside of facility.

v. Ensure activities in sediment chambers minimize oil/grease entry to system

Refer to attached XXX - Inspection and Maintenance Procedures and/or XXX - Operations and Maintenance for manufacturer's inspection and maintenance specifications.

Reference specific device used and include O & M guidelines from manufacturer's website.

b. Debris, Trash and Litter Control

Removal of debris and litter shall be performed every six months or as necessary to keep the filter clean. Inlet should be cleared of all debris and litter.

c. Structural Repairs and Replacement

Components of the underground filtration system, which require repair or replacement, should be addressed immediately following identification. This may include the removal and replacement of cartridges.

d. Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

e. Sediment Removal

Sediments, which accumulate on the floor of the chambers and top of the cartridges, should be removed annually to prevent clogging of the filter beds, inlet, or outlet structures. Disposal of material removed shall be in accordance with local, state, and federal guidelines. Chambers shall be checked bi-annually to ensure that they are working properly.

Underground filtration systems are confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the systems to perform maintenance or inspection.

12. RAIN GARDENS

a. Inspection

Rain gardens should be inspected periodically for the first few months and after construction and then on a monthly basis. Rain gardens should be inspected after all major storm events. Items to check for include (but are not limited to):

i. Checking embankments for subsidence, erosion, cracking, undesirable tree and shrub growth and the presence of burrowing animals.

ii. Check inlet for erosion.

iii. Evidence of standing water (i.e. does it dewater between storms).

iv. Health and vigor of vegetation (trees, shrubs, grass, flowers, mulch).

v. Accumulation of sediment or yard waste.

vi. Condition of the overflow spillway.

b. Debris, Trash and Litter Control

Removal of debris and litter shall be accomplished during mowing operations. Inlet structures should be cleared of all debris and litter.

c. Structural Repairs and Replacement

Components of the rain garden area, which require repair or replacement, should be addressed immediately following identification. This includes treating and or replacing diseased trees and shrub, fertilizing as necessary, replacing tree stakes and wires, replacing mulch where bare spots appear, replacing clogged underdrains (if applicable) and filter beds.

d. Erosion and Sediment Control

Sources of sedimentation, specifically eroded areas in upland drainage areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

Soil slumpage, erosion of the embankments or around inlets/outlets, and cracking should be stabilized and repaired immediately upon identification.

e. Sediment Removal

Sediments which accumulate in the rain garden should be removed annually to prevent clogging of the inlet or outlet structures. Disposal of material removed from rain garden area shall be in accordance with local, state and federal guidelines.

13. LEVEL SPREADERS

a. Inspection

Level spreaders should be inspected periodically for the first few months after construction and then on an annual basis. Level spreaders should also be inspected after major storm events to verify that they are functioning correctly. Items to check for include (but are not limited to):

i. Checking the level of the spreader lip for subsidence, erosion, cracking, undercutting, undesirable tree and shrub growth and the presence of burrowing animals.

ii. Evidence of erosion and formation of rills or gullies along swale and transition section side slopes.

iii. Evidence of standing water (i.e. does it dewater between storms).

iv. Health and vigor of vegetation surrounding and downstream of its discharge.

v. Accumulation of sediment behind the spread lip.

vi. Ensure grass and erosion control matting are well established.

vii. Ensure contributing areas are maintained to minimize sediment entry into spreader.

b. Mowing

Vegetation surrounding the level spreader should be mowed occasionally to control weeds and encroachment of woody vegetation. Any vegetation that "crowds" the level spreader should be removed. Fertilization should be done as necessary to keep the vegetation surrounding the level spreader healthy and dense.

c. Debris and Litter Control

Removal of debris and litter should be accomplished during mowing operations. Debris from behind the level lip and from inside the diversion structure should be cleared. Clippings should also be removed and disposed of outside the spreader and away from the spreader discharge area.

d. Structural Repairs and Replacement

If rilling has taken place surrounding the level spreader, the damage should be repaired and the area re-vegetated. If there is erosion near the ends of the level spreader lip, indicating stormwater has bypassed the lip, the soil shall be regraded to an elevation that is higher than the level spreader lip. Areas disturbed should be re-seeded, mulched, and watered until vegetation is well established. Provide lime and a one-time fertilizer application.

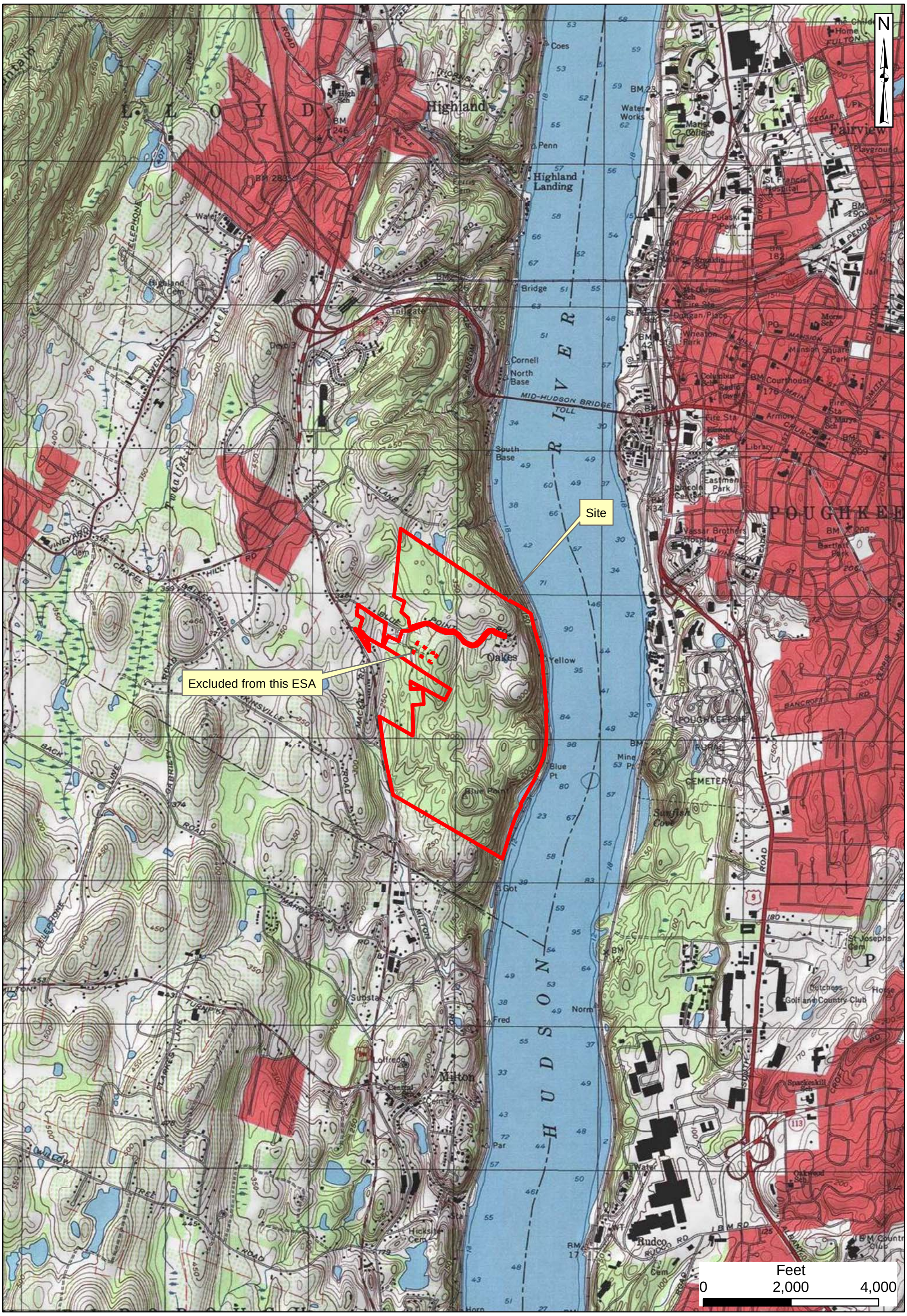
e. Erosion Control

Sources of sedimentation, specifically eroded areas in buffer areas, should be stabilized immediately upon identification. Stabilization should be with vegetative practices or other erosion control practices when vegetative measures do not prove effective.

f. Sediment Removal

Sediment should be removed from behind the level spreader lip and from inside the diversion structure on an annual basis, or as necessary to ensure the continued effectiveness of the practice.

Appendix G:
Figures



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Hudson Valley Wine Village Property

Figure 1 - Site Location Map

Blue Point Road and Route 9W
Town of Lloyd, Ulster County, New York

Source: USGS Topographic Map of the Poughkeepsie, New York Quadrangle, Dated 1995; NYS Department of Transportation 2009 Roads Dataset.

Drawn:	JLK
Date:	May 2012
Scale:	1:24,000
Project:	31024.01
Figure:	1

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Hudson Valley Wine Village

Soils Map

Town of Lloyd - Ulster County, New York

Drawn:	GHM
Date:	09/05/2012
Scale:	1:12,000
Project:	31024.01
Figure:	

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rev.	date	description

HUDSON VALLEY WINE VILLAGE
NYS ROUTE 9W

PRE-DEVELOPMENT DRAINAGE AREA MAP

TOWN OF LLOYD, ULSTER COUNTY, NEW YORK

designed KGA	checked
date 08/31/12	scale 1"=200'
project no. 31024.00	
sheet no. FIG.3	

Drawing Name: K:\31\31000-31099\31024_01\Eng\dwg\05_Fig3-4_PRE POST_31024_01.dwg
Xrefs Attached: XBASE_ENG-31024-00; HVWV_Parcels_Soils; XLAYOUT_31024-00_CHAZEN
Date Printed: Nov 19, 2012, 9:33pm

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HUDSON VALLEY WINE VILLAGE
NYS ROUTE 9W

POST-DEVELOPMENT DRAINAGE AREA MAP

TOWN OF LLOYD, ULSTER COUNTY, NEW YORK

designed KGA	checked
date 08/31/12	scale 1"=200'
project no. 31024.00	
sheet no. FIG.4	

Drawing Name: K:\J\31000-31099\31024_01\Eng\dwg\05_Fig3-4_PRE POST_31024_01.dwg
Xref's Attached: XBASE_END-31024-00; HVWV_Parcels_Soils; XLAYOUT_31024-00_CHAZEN
Date Printed: Nov 21, 2012; 10:06am

Appendix H:
Pre-Development Stormwater Modeling

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Tc breakdown 39

Summary for Subcatchment ES10:

Runoff = 6.15 cfs @ 12.30 hrs, Volume= 33,237 cf, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
103,882	65	Brush, Good, HSG C
542,720	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
646,602	69	Weighted Average
646,602		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0800	0.09		**Sheet Flow, 100' Sheet Woods @ .08** Woods: Dense underbrush n= 0.800 P2= 4.00"
2.0	190	0.1050	1.62		**Shallow Concentrated Flow, 190' Shallow Woods @ .105** Woodland Kv= 5.0 fps
2.2	103	0.0130	0.80		**Shallow Concentrated Flow, 103' Shallow Brush @ .013** Short Grass Pasture Kv= 7.0 fps
4.4	337	0.0640	1.26		**Shallow Concentrated Flow, 337' Shallow Woods @ .064** Woodland Kv= 5.0 fps
4.1	283	0.0270	1.15		**Shallow Concentrated Flow, 283' Shallow Brush @ .027** Short Grass Pasture Kv= 7.0 fps
31.9	1,013	Total			

Summary for Subcatchment ES1A:

Runoff = 21.50 cfs @ 12.59 hrs, Volume= 152,684 cf, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
87,200	98	Paved parking, HSG C
244,051	74	>75% Grass cover, Good, HSG C
132,366	80	>75% Grass cover, Good, HSG D
119,434	65	Brush, Good, HSG C
0	73	Brush, Good, HSG D
1,615,468	70	Woods, Good, HSG C
14,529	77	Woods, Good, HSG D
87,200	96	Gravel surface, HSG C
2,300,248	73	Weighted Average
2,213,048		96.21% Pervious Area
87,200		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	100	0.0412	0.07		**Sheet Flow, 100' Sheet Woods @ 0.042** Woods: Dense underbrush n= 0.800 P2= 4.00"
22.8	1,335	0.0380	0.97		**Shallow Concentrated Flow, 1,335' Shallow Woods @ 0.038** Woodland Kv= 5.0 fps
0.6	202	0.0170	5.77	153.81	**Parabolic Channel, 202' Channel Grass @ .017** W=20.00' D=2.00' Area=26.7 sf Perim=20.5' n= 0.040 Winding stream, pools & shoals
4.8	591	0.0159	2.04	136.16	**Parabolic Channel, 591' Channel Brush @ .0159** W=100.00' D=1.00' Area=66.7 sf Perim=100.0' n= 0.070 Sluggish weedy reaches w/pools
53.2	2,228	Total			

Summary for Subcatchment ES1B:

Runoff = 43.43 cfs @ 12.92 hrs, Volume= 415,702 cf, Depth= 0.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
319,991	98	Paved parking, HSG C
1,157,084	74	>75% Grass cover, Good, HSG C
62,247	80	>75% Grass cover, Good, HSG D
250,209	65	Brush, Good, HSG C
2,570	73	Brush, Good, HSG D
4,637,446	70	Woods, Good, HSG C
228,342	77	Woods, Good, HSG D
0	96	Gravel surface, HSG C
6,657,889	72	Weighted Average
6,337,898		95.19% Pervious Area
319,991		4.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.4	100	0.0200	0.05		**Sheet Flow, 100' Sheet Woods @ .02** Woods: Dense underbrush n= 0.800 P2= 4.00"
7.1	261	0.0150	0.61		**Shallow Concentrated Flow, 261' Shallow Woods @ .015** Woodland Kv= 5.0 fps
3.3	311	0.0110	1.57		**Shallow Concentrated Flow, 311' Shallow Grassed Waterwa** Grassed Waterway Kv= 15.0 fps
19.8	994	0.0280	0.84		**Shallow Concentrated Flow, 994' Shallow Woods @ .028** Woodland Kv= 5.0 fps
2.0	941	0.0360	8.02	106.96	**Parabolic Channel, 941' Channelized Stream @ .036** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.040 Winding stream, pools & shoals
7.8	1,331	0.0140	2.86	38.11	**Parabolic Channel, 1,331' Channelized Brush @ .014** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.070 Sluggish weedy reaches w/pools
0.5	142	0.0140	5.00	66.70	**Parabolic Channel, 142' Channelized Stream @ .014** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.040 Winding stream, pools & shoals
0.1	52	0.0580	6.59	8.09	**Pipe Channel, 52' Assumed 15" Assumed CMP @ .058** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.025 Corrugated metal
0.9	372	0.0270	6.95	92.63	**Parabolic Channel, 372' Channelized Stream @ .027** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.040 Winding stream, pools & shoals
0.1	25	0.0200	3.87	4.75	**Pipe Channel, 25' Assumed 15" Assumed CMP @ .02** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.025 Corrugated metal
1.5	484	0.0170	5.51	73.50	**Parabolic Channel, 484' Channelized Woods @ .017** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.040 Winding stream, pools & shoals
76.5	5,013	Total			

Summary for Subcatchment ES1C:

Runoff = 31.10 cfs @ 12.85 hrs, Volume= 269,483 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
416,434	98	Paved parking, HSG C
1,023,486	74	>75% Grass cover, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	65	Brush, Good, HSG C
0	73	Brush, Good, HSG D
2,108,870	70	Woods, Good, HSG C
0	77	Woods, Good, HSG D
60,331	96	Gravel surface, HSG C
3,609,121	75	Weighted Average
3,192,687		88.46% Pervious Area
416,434		11.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	100	0.0100	0.10		**Sheet Flow, 100' Sheet Grass @ .010** Grass: Dense n= 0.240 P2= 4.00"
11.1	783	0.0280	1.17		**Shallow Concentrated Flow, 783' Shallow Grass @ .028** Short Grass Pasture Kv= 7.0 fps
1.4	89	0.0450	1.06		**Shallow Concentrated Flow, 89' Shallow Woods @ .045** Woodland Kv= 5.0 fps
2.8	262	0.0500	1.57		**Shallow Concentrated Flow, 262' Shallow Grass Pasture @ .** Short Grass Pasture Kv= 7.0 fps
2.5	275	0.0150	1.84		**Shallow Concentrated Flow, 275' Shallow Grassed Waterwa** Grassed Waterway Kv= 15.0 fps
32.2	1,057	0.0120	0.55		**Shallow Concentrated Flow, 1,057' Shallow Woods @ .012** Woodland Kv= 5.0 fps
4.8	791	0.0060	2.75	9.17	**Parabolic Channel, 791' Channelized Grass @ .015** W=5.00' D=1.00' Area=3.3 sf Perim=5.5' n= 0.030 Stream, clean & straight
0.5	143	0.0140	4.43	13.92	**Pipe Channel, 143' 24" CMP @ .014** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
0.2	117	0.0680	11.11	37.04	**Parabolic Channel, 117' Channelized Straight Grass @ .068** W=5.00' D=1.00' Area=3.3 sf Perim=5.5' n= 0.025 Earth, grassed & straight
72.3	3,617	Total			

Summary for Subcatchment ES1D:

Runoff = 4.57 cfs @ 13.21 hrs, Volume= 51,113 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
43,978	98	Paved parking, HSG C
275,357	74	>75% Grass cover, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	65	Brush, Good, HSG C
0	73	Brush, Good, HSG D
0	70	Woods, Good, HSG C
0	77	Woods, Good, HSG D
406,158	72	Woods/grass comb., Good, HSG C
0	96	Gravel surface, HSG C
725,493	74	Weighted Average
681,515		93.94% Pervious Area
43,978		6.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.3	100	0.0400	0.07		**Sheet Flow, 100' Sheet Woods @ .04** Woods: Dense underbrush n= 0.800 P2= 4.00"
4.2	316	0.0630	1.25		**Shallow Concentrated Flow, 316' Shallow Woods @ .063** Woodland Kv= 5.0 fps
69.9	719	0.0006	0.17		**Shallow Concentrated Flow, 719' Shallow Grass Pasture @ .** Short Grass Pasture Kv= 7.0 fps
0.5	68	0.0060	2.12	2.60	**Pipe Channel, 68' 15" CMP @ .006** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.025 Corrugated metal
99.9	1,203	Total			

Summary for Subcatchment ES1E:

Runoff = 9.32 cfs @ 12.01 hrs, Volume= 21,498 cf, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
77,119	98	Paved parking, HSG C
94,341	74	>75% Grass cover, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	65	Brush, Good, HSG C
0	73	Brush, Good, HSG D
0	70	Woods, Good, HSG C
0	77	Woods, Good, HSG D
0	72	Woods/grass comb., Good, HSG C
0	96	Gravel surface, HSG C
171,460	85	Weighted Average
94,341		55.02% Pervious Area
77,119		44.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0710	0.22		**Sheet Flow, 100' Sheet Grass @ .071** Grass: Dense n= 0.240 P2= 4.00"
0.8	110	0.1050	2.27		**Shallow Concentrated Flow, 110' Shallow Grass @ .105** Short Grass Pasture Kv= 7.0 fps
0.8	503	0.0340	10.96	73.05	**Parabolic Channel, 503' Channelized Straight Grass @ .034** W=5.00' D=2.00' Area=6.7 sf Perim=6.7' n= 0.025 Earth, grassed & straight
0.1	46	0.0435	6.92	15.09	**Pipe Channel, 46' 20" CMP @ .0435** 20.0" Round Area= 2.2 sf Perim= 5.2' r= 0.42' n= 0.025 Corrugated metal
9.4	759	Total			

Summary for Subcatchment ES1F:

Runoff = 2.23 cfs @ 12.06 hrs, Volume= 6,068 cf, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
8,723	98	Paved parking, HSG C
38,072	74	>75% Grass cover, Good, HSG C
6,598	80	>75% Grass cover, Good, HSG D
0	65	Brush, Good, HSG C
0	73	Brush, Good, HSG D
5,067	70	Woods, Good, HSG C
10,357	77	Woods, Good, HSG D
0	96	Gravel surface, HSG C
68,817	78	Weighted Average
60,094		87.32% Pervious Area
8,723		12.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0280	0.15		**Sheet Flow, 100' Sheet Grass @ .028** Grass: Dense n= 0.240 P2= 4.00"
2.1	220	0.0600	1.71		**Shallow Concentrated Flow, 220' Shallow Grass @ .06** Short Grass Pasture Kv= 7.0 fps
0.2	146	0.0340	10.39	138.59	**Parabolic Channel, 146' Channelized Winding Grass @ .034** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030 Stream, clean & straight
13.5	466	Total			

Summary for Subcatchment ES1G:

Runoff = 1.36 cfs @ 12.35 hrs, Volume= 6,990 cf, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
23,880	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	65	Brush, Good, HSG C
0	73	Brush, Good, HSG D
51,285	70	Woods, Good, HSG C
0	77	Woods, Good, HSG D
0	96	Gravel surface, HSG C
75,165	79	Weighted Average
51,285		68.23% Pervious Area
23,880		31.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.5	100	0.0150	0.04		**Sheet Flow, 100' Sheet Woods @ .015** Woods: Dense underbrush n= 0.800 P2= 4.00"
0.5	37	0.0700	1.32		**Shallow Concentrated Flow, 37' Shallow Woods @ .07** Woodland Kv= 5.0 fps
0.2	136	0.0330	13.85	332.37	**Parabolic Channel, 136' Channelized Streatm @ .033** W=9.00' D=4.00' Area=24.0 sf Perim=12.6' n= 0.030 Stream, clean & straight
38.2	273	Total			

Summary for Subcatchment ES1H:

Runoff = 2.49 cfs @ 12.29 hrs, Volume= 12,606 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
229,395	70	Woods, Good, HSG C
229,395		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	100	0.0480	0.07		**Sheet Flow, 100' Sheet Woods @ .02** Woods: Dense underbrush n= 0.800 P2= 4.00"
6.7	387	0.0370	0.96		**Shallow Concentrated Flow, 261' Shallow Woods @ .015** Woodland Kv= 5.0 fps
30.3	487	Total			

Summary for Subcatchment ES1I:

Runoff = 0.62 cfs @ 12.16 hrs, Volume= 2,424 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
44,113	70	Woods, Good, HSG C
44,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	100	0.1000	0.09		**Sheet Flow, 100' Sheet Woods @ .02** Woods: Dense underbrush n= 0.800 P2= 4.00"
3.1	265	0.0837	1.45		**Shallow Concentrated Flow, 261' Shallow Woods @ .015** Woodland Kv= 5.0 fps
20.7	365	Total			

Summary for Subcatchment ES2A:

Runoff = 27.98 cfs @ 12.83 hrs, Volume= 259,121 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
8,746	98	Paved parking, HSG C
115,268	74	>75% Grass cover, Good, HSG C
477,265	65	Brush, Good, HSG C
4,111,824	70	Woods, Good, HSG C
2,241	98	Water Surface, HSG C
4,715,344	70	Weighted Average
4,704,357		99.77% Pervious Area
10,987		0.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.1	100	0.0240	0.05		**Sheet Flow, 100' Sheet Woods @ .024** Woods: Dense underbrush n= 0.800 P2= 4.00"
17.7	1,033	0.0380	0.97		**Shallow Concentrated Flow, 1033' Shallow Woods @ .038** Woodland Kv= 5.0 fps
1.5	68	0.0120	0.77		**Shallow Concentrated Flow, 68' Shallow Brush @ .012** Short Grass Pasture Kv= 7.0 fps
10.8	667	0.0420	1.02		**Shallow Concentrated Flow, 667' Shallow Woods @ .042** Woodland Kv= 5.0 fps
7.6	2,156	0.0290	4.75	31.64	**Parabolic Channel, 2,156' Channelized Brush @ .029** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.040 Winding stream, pools & shoals
68.7	4,024	Total			

Summary for Subcatchment ES2B:

Runoff = 9.17 cfs @ 12.23 hrs, Volume= 40,825 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
12,958	65	Brush, Good, HSG C
729,962	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
742,920	70	Weighted Average
742,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0550	0.07		**Sheet Flow, 100' Sheet Woods @ .055** Woods: Dense underbrush n= 0.800 P2= 4.00"
2.9	507	0.3320	2.88		**Shallow Concentrated Flow, 507' Shallow Woods @ .332** Woodland Kv= 5.0 fps
0.1	171	0.1990	21.81	436.19	**Trap/Vee/Rect Channel Flow, 171' V Channelized Stream @ .** Bot.W=0.00' D=2.00' Z= 5.0 '/' Top.W=20.00' n= 0.030 Stream, clean & straight
25.3	778	Total			

Summary for Subcatchment ES3:

Runoff = 20.23 cfs @ 12.45 hrs, Volume= 126,656 cf, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
68,292	98	Paved parking, HSG C
435,348	74	>75% Grass cover, Good, HSG C
58,432	65	Brush, Good, HSG C
846,134	70	Woods, Good, HSG C
30,103	98	Water Surface, HSG C
16,390	96	Gravel surface, HSG C
453,424	72	Woods/grass comb., Good, HSG C
1,908,123	73	Weighted Average
1,809,728		94.84% Pervious Area
98,395		5.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	100	0.0390	0.07		**Sheet Flow, 100' Sheet Woods** Woods: Dense underbrush n= 0.800 P2= 4.00"
7.0	465	0.0490	1.11		**Shallow Concentrated Flow, 465' Shallow Woods @ .049** Woodland Kv= 5.0 fps
1.9	93	0.0140	0.83		**Shallow Concentrated Flow, 93' Shallow Brush @ .014** Short Grass Pasture Kv= 7.0 fps
3.7	149	0.0180	0.67		**Shallow Concentrated Flow, 149' Shallow Woods @ .018** Woodland Kv= 5.0 fps
3.4	497	0.0270	2.46		**Shallow Concentrated Flow, 497' Shallow Grass Waterway @** Grassed Waterway Kv= 15.0 fps
0.1	100	0.0480	15.78	49.56	**Pipe Channel, 100' Assumed 24" Assumed HDPE Culvert @** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
2.6	473	0.0410	3.04		**Shallow Concentrated Flow, 473' Shallow Grassed Waterwa** Grassed Waterway Kv= 15.0 fps
0.3	305	0.0410	14.58	45.81	**Pipe Channel, 305' Assumed 24" Assumed HDPE Culvert @** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
44.6	2,182	Total			

Summary for Subcatchment ES4:

Runoff = 4.28 cfs @ 13.54 hrs, Volume= 60,505 cf, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
292,329	65	Brush, Good, HSG C
831,171	70	Woods, Good, HSG C
29,358	98	Water Surface, HSG C
24,228	72	Woods/grass comb., Good, HSG C
1,177,086	69	Weighted Average
1,147,728		97.51% Pervious Area
29,358		2.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	100	0.0350	0.06		**Sheet Flow, 100' Sheet Woods @ .035** Woods: Dense underbrush n= 0.800 P2= 4.00"
3.3	290	0.0860	1.47		**Shallow Concentrated Flow, 290' Shallow Woods @ .086** Woodland Kv= 5.0 fps
87.2	1,888	0.0005	0.36	4.81	**Parabolic Channel, 1,888' Channelized Stream @ .0005** W=20.00' D=1.00' Area=13.3 sf Perim=20.1' n= 0.070 Sluggish weedy reaches w/pools
117.2	2,278	Total			

Summary for Subcatchment ES5:

Runoff = 5.55 cfs @ 12.38 hrs, Volume= 32,508 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
1,327	65	Brush, Good, HSG C
532,334	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
57,900	72	Woods/grass comb., Good, HSG C
591,561	70	Weighted Average
591,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	100	0.0280	0.06		**Sheet Flow, 100' Sheet Woods @ .028** Woods: Dense underbrush n= 0.800 P2= 4.00"
6.0	196	0.0120	0.55		**Shallow Concentrated Flow, 196' Shallow Woods @ .012** Woodland Kv= 5.0 fps
1.7	252	0.2380	2.44		**Shallow Concentrated Flow, 252' Shallow Woods @ .238** Woodland Kv= 5.0 fps
36.9	548	Total			

Summary for Subcatchment ES6:

Runoff = 2.12 cfs @ 12.23 hrs, Volume= 9,443 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
0	65	Brush, Good, HSG C
171,838	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
171,838	70	Weighted Average
171,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8	100	0.0740	0.08		**Sheet Flow, 100' Sheet Woods @ .074** Woods: Dense underbrush n= 0.800 P2= 4.00"
2.3	316	0.2150	2.32		**Shallow Concentrated Flow, 316' Shallow Woods @ .215** Woodland Kv= 5.0 fps
1.9	130	0.0540	1.16		**Shallow Concentrated Flow, 130' Shallow Woods @ .054** Woodland Kv= 5.0 fps
1.3	147	0.1430	1.89		**Shallow Concentrated Flow, 147' Shallow Woods @ .143** Woodland Kv= 5.0 fps
25.3	693	Total			

Summary for Subcatchment ES7:

Runoff = 5.54 cfs @ 12.40 hrs, Volume= 33,041 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
0	65	Brush, Good, HSG C
601,269	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
601,269	70	Weighted Average
601,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	100	0.0310	0.06		**Sheet Flow, 100' Sheet Woods @ .031** Woods: Dense underbrush n= 0.800 P2= 4.00"
2.6	297	0.1410	1.88		**Shallow Concentrated Flow, 297' Shallow Woods @ .141** Woodland Kv= 5.0 fps
3.7	227	0.0410	1.01		**Shallow Concentrated Flow, 227' Shallow Woods @ .041** Woodland Kv= 5.0 fps
3.7	336	0.0920	1.52		**Shallow Concentrated Flow, 336' Shallow Woods @ .092** Woodland Kv= 5.0 fps
38.1	960	Total			

Summary for Subcatchment ES8:

Runoff = 2.15 cfs @ 12.35 hrs, Volume= 12,014 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
0	65	Brush, Good, HSG C
218,624	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
218,624	70	Weighted Average
218,624		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	100	0.0340	0.06		**Sheet Flow, 100' Sheet Woods @ .034** Woods: Dense underbrush n= 0.800 P2= 4.00"
3.3	359	0.1310	1.81		**Shallow Concentrated Flow, 359' Shallow Woods @ .131** Woodland Kv= 5.0 fps
4.2	290	0.0520	1.14		**Shallow Concentrated Flow, 290' Shallow Woods @ .052** Woodland Kv= 5.0 fps
34.5	749	Total			

Summary for Subcatchment ES9:

Runoff = 8.56 cfs @ 13.74 hrs, Volume= 130,050 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
15,058	98	Paved parking, HSG C
35,354	74	>75% Grass cover, Good, HSG C
140,696	65	Brush, Good, HSG C
2,172,425	70	Woods, Good, HSG C
0	98	Water Surface, HSG C
3,041	79	50-75% Grass cover, Fair, HSG C
2,366,574	70	Weighted Average
2,351,516		99.36% Pervious Area
15,058		0.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
58.2	100	0.0050	0.03		**Sheet Flow, 100' Sheet Woods @ .005** Woods: Dense underbrush n= 0.800 P2= 4.00"
38.5	365	0.0010	0.16		**Shallow Concentrated Flow, 365' Shallow Woods @ .001** Woodland Kv= 5.0 fps
13.3	177	0.0010	0.22		**Shallow Concentrated Flow, 177' Shallow Brush @ .001** Short Grass Pasture Kv= 7.0 fps
12.9	701	0.0330	0.91		**Shallow Concentrated Flow, 701' Shallow Woods @ .033** Woodland Kv= 5.0 fps
10.9	975	0.0450	1.48		**Shallow Concentrated Flow, 975' Shallow Brush @ .045** Short Grass Pasture Kv= 7.0 fps
2.0	123	0.0410	1.01		**Shallow Concentrated Flow, 123' Shallow Woods @ .041** Woodland Kv= 5.0 fps
135.8	2,441	Total			

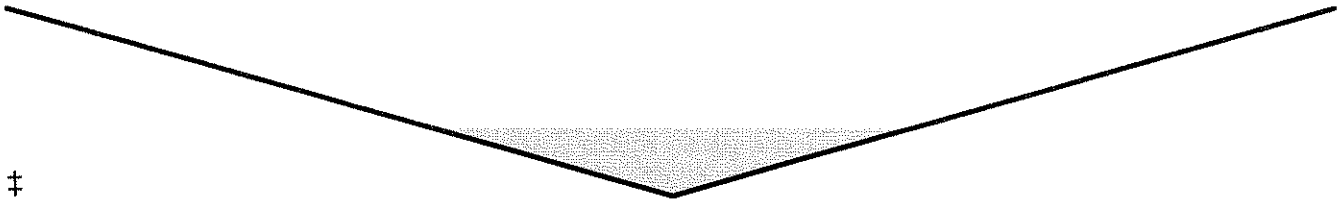
Summary for Reach 2R: Swale 2R

Inflow Area = 4,715,344 sf, 0.23% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 27.98 cfs @ 12.83 hrs, Volume= 259,121 cf
Outflow = 27.95 cfs @ 12.86 hrs, Volume= 259,121 cf, Atten= 0%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.72 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 5.58 fps, Avg. Travel Time= 3.3 min

Peak Storage= 2,844 cf @ 12.86 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 422.82 cfs

0.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 5.0 '/' Top Width= 20.00'
Length= 1,091.0' Slope= 0.1870 '/'
Inlet Invert= 204.00', Outlet Invert= 0.00'



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Summary for Reach DP1: Design Point #1

Inflow Area = 13,881,701 sf, 7.04% Impervious, Inflow Depth = 0.81" for 1-Year event
Inflow = 94.85 cfs @ 12.97 hrs, Volume= 938,569 cf
Outflow = 94.85 cfs @ 12.97 hrs, Volume= 938,569 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP10: Design Point #10

Inflow Area =	646,602 sf,	0.00% Impervious,	Inflow Depth =	0.62"	for 1-Year event
Inflow =	6.15 cfs @	12.30 hrs, Volume=	33,237 cf		
Outflow =	6.15 cfs @	12.30 hrs, Volume=	33,237 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP101: Design Point #101

Inflow Area =	4,478,596 sf,	11.01% Impervious,	Inflow Depth =	0.89"	for 1-Year event
Inflow =	35.70 cfs @	12.88 hrs, Volume=	333,655 cf		
Outflow =	35.70 cfs @	12.88 hrs, Volume=	333,655 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP102: Design Point #102

Inflow Area =	11,365,880 sf,	7.15% Impervious,	Inflow Depth =	0.80"	for 1-Year event
Inflow =	80.01 cfs @	12.92 hrs, Volume=	761,963 cf		
Outflow =	80.01 cfs @	12.92 hrs, Volume=	761,963 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP103: Design Point #103

Inflow Area =	229,395 sf,	0.00% Impervious,	Inflow Depth =	0.66"	for 1-Year event
Inflow =	2.49 cfs @	12.29 hrs, Volume=	12,606 cf		
Outflow =	2.49 cfs @	12.29 hrs, Volume=	12,606 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP104: Design Point #104

Inflow Area =	44,113 sf,	0.00% Impervious,	Inflow Depth =	0.66"	for 1-Year event
Inflow =	0.62 cfs @	12.16 hrs, Volume=	2,424 cf		
Outflow =	0.62 cfs @	12.16 hrs, Volume=	2,424 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Design Point #2

Inflow Area =	5,458,264 sf,	0.20% Impervious,	Inflow Depth =	0.66"	for 1-Year event
Inflow =	30.27 cfs @	12.83 hrs, Volume=	299,946 cf		
Outflow =	30.27 cfs @	12.83 hrs, Volume=	299,946 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP201: Design Point #201

Inflow Area = 4,715,344 sf, 0.23% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 27.98 cfs @ 12.83 hrs, Volume= 259,121 cf
Outflow = 27.98 cfs @ 12.83 hrs, Volume= 259,121 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP3: Design Point #3

Inflow Area = 1,908,123 sf, 5.16% Impervious, Inflow Depth = 0.80" for 1-Year event
Inflow = 20.23 cfs @ 12.45 hrs, Volume= 126,656 cf
Outflow = 20.23 cfs @ 12.45 hrs, Volume= 126,656 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP4: Design Point #4

Inflow Area = 1,177,086 sf, 2.49% Impervious, Inflow Depth = 0.62" for 1-Year event
Inflow = 4.28 cfs @ 13.54 hrs, Volume= 60,505 cf
Outflow = 4.28 cfs @ 13.54 hrs, Volume= 60,505 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP5: Design Point #5

Inflow Area = 591,561 sf, 0.00% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 5.55 cfs @ 12.38 hrs, Volume= 32,508 cf
Outflow = 5.55 cfs @ 12.38 hrs, Volume= 32,508 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP6: Design Point #6

Inflow Area = 171,838 sf, 0.00% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 2.12 cfs @ 12.23 hrs, Volume= 9,443 cf
Outflow = 2.12 cfs @ 12.23 hrs, Volume= 9,443 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP7: Design Point #7

Inflow Area = 601,269 sf, 0.00% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 5.54 cfs @ 12.40 hrs, Volume= 33,041 cf
Outflow = 5.54 cfs @ 12.40 hrs, Volume= 33,041 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP8: Design Point #8

Inflow Area =	218,624 sf,	0.00% Impervious,	Inflow Depth =	0.66"	for 1-Year event
Inflow =	2.15 cfs @	12.35 hrs, Volume=	12,014 cf		
Outflow =	2.15 cfs @	12.35 hrs, Volume=	12,014 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Reach DP9: Design Point #9

Inflow Area =	2,366,574 sf,	0.64% Impervious,	Inflow Depth =	0.66"	for 1-Year event
Inflow =	8.56 cfs @	13.74 hrs, Volume=	130,050 cf		
Outflow =	8.56 cfs @	13.74 hrs, Volume=	130,050 cf,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Pond 1PA: Sam Williams Box Culvert

Inflow Area =	4,409,779 sf,	10.98% Impervious,	Inflow Depth =	0.89"	for 1-Year event
Inflow =	35.49 cfs @	12.87 hrs, Volume=	327,586 cf		
Outflow =	35.49 cfs @	12.87 hrs, Volume=	327,586 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	33.88 cfs @	12.73 hrs, Volume=	324,471 cf		
Secondary =	3.95 cfs @	12.88 hrs, Volume=	3,115 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 293.08' @ 12.88 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	290.00'	**36.0" W x 36.0" H Box 3'W x 3'H Box Culvert** L= 38.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 290.00' / 289.00' S= 0.0263 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 9.00 sf
#2	Secondary	293.00'	**50.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=33.33 cfs @ 12.73 hrs HW=293.00' TW=292.31' (Dynamic Tailwater)
└─**1=3'W x 3'H Box Culvert** (Inlet Controls 33.33 cfs @ 3.70 fps)

Secondary OutFlow Max=3.94 cfs @ 12.88 hrs HW=293.08' TW=292.50' (Dynamic Tailwater)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.94 cfs @ 0.94 fps)

Summary for Pond 1PB: Catch Basin

Inflow Area =	4,409,779 sf,	10.98% Impervious,	Inflow Depth =	0.89"	for 1-Year event
Inflow =	35.49 cfs @	12.87 hrs, Volume=	327,586 cf		
Outflow =	35.49 cfs @	12.87 hrs, Volume=	327,586 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	35.49 cfs @	12.87 hrs, Volume=	327,586 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Peak Elev= 292.50' @ 12.87 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	289.00'	**30.0" Round 24" RCP** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 289.00' / 282.00' S= 0.0515 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=35.49 cfs @ 12.87 hrs HW=292.50' TW=0.00' (Dynamic Tailwater)
└─**1=24" RCP** (Inlet Controls 35.49 cfs @ 7.23 fps)

Summary for Pond 5P: Rt 9W Box Culvert

Inflow Area =	3,609,121 sf,	11.54% Impervious,	Inflow Depth =	0.90"	for 1-Year event
Inflow =	31.10 cfs @	12.85 hrs, Volume=	269,483 cf		
Outflow =	31.10 cfs @	12.85 hrs, Volume=	269,483 cf,	Atten= 0%,	Lag= 0.0 min
Discarded =	0.00 cfs @	0.00 hrs, Volume=	0 cf		
Primary =	31.10 cfs @	12.85 hrs, Volume=	269,483 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 312.24' @ 12.85 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	310.00'	**36.0" W x 36.0" H Box 3'W x 3'H Box Culvert** L= 55.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 310.00' / 309.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 9.00 sf
#2	Discarded	313.00'	**48.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=310.00' (Free Discharge)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Primary OutFlow Max=31.09 cfs @ 12.85 hrs HW=312.24' TW=0.00' (Dynamic Tailwater)
└─**1=3'W x 3'H Box Culvert** (Barrel Controls 31.09 cfs @ 6.18 fps)

Summary for Pond 6P: RT 9W Box Culvert

Inflow Area =	725,493 sf,	6.06% Impervious,	Inflow Depth =	0.85"	for 1-Year event
Inflow =	4.57 cfs @	13.21 hrs, Volume=	51,113 cf		
Outflow =	4.57 cfs @	13.21 hrs, Volume=	51,113 cf,	Atten= 0%,	Lag= 0.0 min
Discarded =	0.00 cfs @	0.00 hrs, Volume=	0 cf		
Primary =	4.57 cfs @	13.21 hrs, Volume=	51,113 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 293.61' @ 13.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	293.00'	**36.0" W x 36.0" H Box 3'W x 3'H Box Culvert** L= 64.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 293.00' / 292.00' S= 0.0156 '/' Cc= 0.900

n= 0.013 Concrete, trowel finish, Flow Area= 9.00 sf
#2 Discarded 296.00' **48.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=293.00' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Primary OutFlow Max=4.57 cfs @ 13.21 hrs HW=293.61' TW=0.00' (Dynamic Tailwater)
└**1=3'W x 3'H Box Culvert** (Inlet Controls 4.57 cfs @ 2.50 fps)

Summary for Link 1L: Link 1

Inflow Area = 3,609,121 sf, 11.54% Impervious, Inflow Depth = 0.90" for 1-Year event
Inflow = 31.10 cfs @ 12.85 hrs, Volume= 269,483 cf
Primary = 31.09 cfs @ 12.86 hrs, Volume= 269,483 cf, Atten= 0%, Lag= 0.5 min

Primary outflow = Inflow delayed by 0.5 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 2L: Link 2

Inflow Area = 725,493 sf, 6.06% Impervious, Inflow Depth = 0.85" for 1-Year event
Inflow = 4.57 cfs @ 13.21 hrs, Volume= 51,113 cf
Primary = 4.57 cfs @ 13.21 hrs, Volume= 51,113 cf, Atten= 0%, Lag= 0.1 min

Primary outflow = Inflow delayed by 0.1 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 3L: Link 3

Inflow Area = 4,409,779 sf, 10.98% Impervious, Inflow Depth = 0.89" for 1-Year event
Inflow = 35.49 cfs @ 12.87 hrs, Volume= 327,586 cf
Primary = 35.49 cfs @ 12.88 hrs, Volume= 327,586 cf, Atten= 0%, Lag= 0.3 min

Primary outflow = Inflow delayed by 0.2 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Link 4

Inflow Area = 4,478,596 sf, 11.01% Impervious, Inflow Depth = 0.89" for 1-Year event
Inflow = 35.70 cfs @ 12.88 hrs, Volume= 333,655 cf
Primary = 35.70 cfs @ 12.89 hrs, Volume= 333,655 cf, Atten= 0%, Lag= 0.4 min

Primary outflow = Inflow delayed by 0.4 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 5L: Link 5

Inflow Area = 229,395 sf, 0.00% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 2.49 cfs @ 12.29 hrs, Volume= 12,606 cf
Primary = 2.49 cfs @ 12.41 hrs, Volume= 12,606 cf, Atten= 0%, Lag= 7.3 min

Primary outflow = Inflow delayed by 7.3 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 6L: Link 6

Inflow Area = 11,365,880 sf, 7.15% Impervious, Inflow Depth = 0.80" for 1-Year event
Inflow = 80.01 cfs @ 12.92 hrs, Volume= 761,963 cf
Primary = 80.01 cfs @ 12.96 hrs, Volume= 761,963 cf, Atten= 0%, Lag= 2.5 min

Primary outflow = Inflow delayed by 2.5 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 7L: Link 7

Inflow Area = 44,113 sf, 0.00% Impervious, Inflow Depth = 0.66" for 1-Year event
Inflow = 0.62 cfs @ 12.16 hrs, Volume= 2,424 cf
Primary = 0.62 cfs @ 12.68 hrs, Volume= 2,424 cf, Atten= 0%, Lag= 31.0 min

Primary outflow = Inflow delayed by 31.1 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 8L: Link 8

Inflow Area = 171,460 sf, 44.98% Impervious, Inflow Depth = 1.50" for 1-Year event
Inflow = 9.32 cfs @ 12.01 hrs, Volume= 21,498 cf
Primary = 9.32 cfs @ 12.01 hrs, Volume= 21,498 cf, Atten= 0%, Lag= 0.1 min

Primary outflow = Inflow delayed by 0.1 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 9L: Link 9

Inflow Area = 11,537,340 sf, 7.72% Impervious, Inflow Depth = 0.81" for 1-Year event
Inflow = 80.63 cfs @ 12.96 hrs, Volume= 783,461 cf
Primary = 80.63 cfs @ 13.06 hrs, Volume= 783,461 cf, Atten= 0%, Lag= 6.0 min

Primary outflow = Inflow delayed by 6.0 min, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link 1L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	485	0.0412	16.00	448.07	**Trap/Vee/Rect Channel Flow, 485' Channelized Winding Grass** Bot.W=5.00' D=4.00' Z= 0.5 '/' Top.W=9.00' n= 0.030

0.5 Time Lag

Summary Link 2L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	80	0.025	8.91	118.84	**Parabolic Channel, 80' Channelized Winding Grass @ .025** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030

0.1 Time Lag

Summary Link 3L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	146	0.0342	10.42	139.00	**Parabolic Channel, 146' Channelized Winding Grass @ .034** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030

0.2 Time Lag

Summary for Subcatchment 4L: Link 4L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	204	0.0270	9.26	123.50	**Parabolic Channel, 204' Channelized Winding Grass @ .027** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030

0.4 Time Lag

Summary for Subcatchment 5L: Link 5L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	283	0.027	0.82		**Shallow Concentrated Flow, 283' Shallow Woods @ .027** Woodland Kv= 5.0 fps
0.1	25	0.020	3.87	4.75	**Pipe Channel, 25' Assumed 15" Assumed CMP @ .02** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.025 Corrugated metal
1.5	484	0.017	5.51	73.50	**Parabolic Channel, 484' Channelized Woods @ .017** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.040 Winding stream, pools & shoals

7.3 792 Time Lag

Summary for Subcatchment 6L: Link 6L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	1,287	0.0233	8.60	114.73	**Parabolic Channel, 1,287' Channelized Winding Grass @ .023** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030

2.5 Time Lag

Summary Link 7L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	712	0.0520	1.14		**Shallow Concentrated Flow, 712' Shallow Woods @ 0.052** Woodland Kv= 5.0 fps
15.3	895	0.038	0.97		**Shallow Concentrated Flow, 895' Shallow Woods @ 0.038** Woodland Kv= 5.0 fps
0.6	202	0.017	5.77	153.81	**Parabolic Channel, 202' Channel Grass @ .017** W=20.00' D=2.00' Area=26.7 sf Perim=20.5' n= 0.040 Winding stream, pools & shoals
4.8	591	0.0159	2.04	136.16	**Parabolic Channel, 591' Channel Brush @ .0159** W=100.00' D=1.00' Area=66.7 sf Perim=100.0' n= 0.070 Sluggish weedy reaches w/pools

31.1 Time Lag

Summary Link 8L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	163	0.1750	23.58	314.43	**Parabolic Channel, 163' Channelized Winding Grass @ .175** W=10.00' D=2.00' Area=13.3 sf Perim=11.0' n= 0.030

0.1 Time Lag

SummaryLink 9L

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	225	0.0200	6.26	166.83	**Parabolic Channel, 225' Channel Grass @ .020** W=20.00' D=2.00' Area=26.7 sf Perim=20.5' n= 0.040 Winding stream, pools & shoals
0.6	202	0.017	5.77	153.81	**Parabolic Channel, 202' Channel Grass @ .017** W=20.00' D=2.00' Area=26.7 sf Perim=20.5' n= 0.040 Winding stream, pools & shoals
4.8	591	0.0159	2.04	136.16	**Parabolic Channel, 591' Channel Brush @ .0159** W=100.00' D=1.00' Area=66.7 sf Perim=100.0' n= 0.070 Sluggish weedy reaches w/pools

6.0 Time Lag

Events for Reach DP1: Design Point #1

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	94.85	94.85	**0.00**	**0**
10-Year	305.73	305.73	0.00	0
100-Year	**525.66**	**525.66**	0.00	0

Events for Reach DP101: Design Point #101

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	35.70	35.70	**0.00**	**0**
10-Year	73.29	73.29	0.00	0
100-Year	**95.88**	**95.88**	0.00	0

Events for Reach DP102: Design Point #102

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	80.01	80.01	**0.00**	**0**
10-Year	250.03	250.03	0.00	0
100-Year	**422.60**	**422.60**	0.00	0

Events for Reach DP103: Design Point #103

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	2.49	2.49	**0.00**	**0**
10-Year	10.76	10.76	0.00	0
100-Year	**20.25**	**20.25**	0.00	0

Events for Reach DP104: Design Point #104

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	0.62	0.62	**0.00**	**0**
10-Year	2.63	2.63	0.00	0
100-Year	**4.93**	**4.93**	0.00	0

Events for Reach DP2: Design Point #2

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	29.42	29.42	**0.00**	**0**
10-Year	127.86	127.86	0.00	0
100-Year	**243.04**	**243.04**	0.00	0

Events for Reach DP201: Design Point #201

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	26.75	26.75	**0.00**	**0**
10-Year	116.33	116.33	0.00	0
100-Year	**220.83**	**220.83**	0.00	0

Events for Reach DP3: Design Point #3

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	20.23	20.23	**0.00**	**0**
10-Year	77.03	77.03	0.00	0
100-Year	**139.93**	**139.93**	0.00	0

Events for Reach DP4: Design Point #4

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	4.02	4.02	**0.00**	**0**
10-Year	18.28	18.28	0.00	0
100-Year	**35.14**	**35.14**	0.00	0

Events for Reach DP5: Design Point #5

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	4.42	4.42	**0.00**	**0**
10-Year	19.42	19.42	0.00	0
100-Year	**36.76**	**36.76**	0.00	0

Events for Reach DP6: Design Point #6

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	1.94	1.94	**0.00**	**0**
10-Year	8.39	8.39	0.00	0
100-Year	**15.78**	**15.78**	0.00	0

Events for Reach DP7: Design Point #7

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	4.51	4.51	**0.00**	**0**
10-Year	19.75	19.75	0.00	0
100-Year	**37.47**	**37.47**	0.00	0

Events for Reach DP8: Design Point #8

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	2.15	2.15	**0.00**	**0**
10-Year	9.40	9.40	0.00	0
100-Year	**17.73**	**17.73**	0.00	0

Events for Reach DP9: Design Point #9

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	7.26	7.26	**0.00**	**0**
10-Year	30.77	30.77	0.00	0
100-Year	**58.17**	**58.17**	0.00	0

Events for Reach DP10: Design Point #10

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	5.34	5.34	**0.00**	**0**
10-Year	24.56	24.56	0.00	0
100-Year	**47.19**	**47.19**	0.00	0

Job: Hudson Valley Wine Village
Job No.: 31024.01
Description: Pre-Development Drainage Area Map Calculations
Prep. By: KA Date: 10/29/2012
Check By: MM Date: 11/19/2012

	ES1A					
	High	Low	Length	Method	Surface	Slope
1	291.2	287	100	Sheet Flow	Dense Woods	0.042
2	287	236.9	1335	Shallow Concentrated	Woods	0.038
3	236.9	233.4	202	Channelized	Grass	0.017
4	233.4	224	591	Channelized	Brush	0.016

	ES1B					
	High	Low	Length	Method	Surface	Slope
1	384	382	100	Sheet Flow	Dense Woods	0.020
2	382	378	261	Shallow Concentrated	Woods	0.015
3	378	374.5	311	Shallow Concentrated	Grassed Waterway	0.011
4	374.5	347	994	Shallow Concentrated	Woods	0.028
5	347	313	941	Channelized	Woods	0.036
6	313	295	1331	Channelized	Brush	0.014
7	295	293	142	Channelized	Woods	0.014
8	293	290	52	Culvert	Assumed 15" CMP	0.058
9	290	280	372	Channelized	Woods	0.027
10	280	279.5	25	Culvert	Assumed 15" CMP	0.020
11	279.5	271.5	484	Channelized	Woods	0.017

	ES1C					
	High	Low	Length	Method	Surface	Slope
1	383	382	100	Sheet Flow	Grass	0.010
2	382	360	783	Shallow Concentrated	Grass Pasture	0.028
3	360	356	89	Shallow Concentrated	Woods	0.045
4	356	343	262	Shallow Concentrated	Grass Pasture	0.050
5	343	339	275	Shallow Concentrated	Grassed Waterway	0.015
6	339	326.8	1057	Shallow Concentrated	Woods	0.012
7	326.8	322	791	Channelized	Nat Stream Clean	0.006
8	322	320	143	Pipe	24" CMP	0.014
9	320	312	117	Channelized	Grass	0.068
10	312	311.75	55	Culvert	3.2'W x 3.1'H Box Culvert	

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ES1D

	High	Low	Length	Method	Surface	Slope
1	322	318	100	Sheet Flow	Dense Woods	0.040
2	318	298	316	Shallow Concentrated	Woods	0.063
3	298	293.7	719	Shallow Concentrated	Grass	0.006
4	293.7	293.3	68	Pipe	15" CMP	0.006
5	293.3	292	64	Pipe	3'W x .7'H Box Culvert	0.020

ES1E

	High	Low	Length	Method	Surface	Slope
1	307.6	300.5	100	Sheet Flow	Grass	0.071
2	300.5	289	110	Shallow Concentrated	Grass	0.105
3	289	272	503	Channelized	Grass	0.034
4	272	270	46	Pipe	20" CMP	

ES1F

	High	Low	Length	Method	Surface	Slope
1	298	295.2	100	Sheet Flow	Grass	0.028
2	295.2	282	220	Shallow Concentrated	Grass	0.060
3	282	277	146	Channelized	Grass	0.034

466

ES1G

	High	Low	Length	Method	Surface	Slope
1	298.6	297.1	100	Sheet Flow	Woods	0.015
2	297.1	294.5	37	Shallow Concentrated	Woods	0.070
3	294.5	290	136	Channelized	Earth	0.033

ES1H

	High	Low	Length	Method	Surface	Slope
1	336.7	331.8	100	Sheet Flow	Woods	0.049
2	331.8	317.4	487	Shallow Concentrated	Woods	0.030

ES1I

	High	Low	Length	Method	Surface	Slope
1	348.2	338.2	100	Sheet Flow	Woods	0.100
2	338.2	316	265	Shallow Concentrated	Woods	0.084

ES2A

	High	Low	Length	Method	Surface	Slope
1	336.7	334.3	100	Sheet Flow	Dense Woods	0.024
2	334.3	294.8	1033	Shallow Concentrated	Woods	0.038
3	294.8	294	68	Shallow Concentrated	Brush	0.012
4	294	266	667	Shallow Concentrated	Woods	0.042
5	266	204	2156	Channelized	Brush & Pools	0.029

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	ES2B					
	High	Low	Length	Method	Surface	Slope
1	208	202.5	100	Sheet Flow	Dense Woods	0.055
2	202.5	34	507	Shallow Concentrated	Woods	0.332
3	34	0	171	Channelized	Stream	0.199

	ES3					
	High	Low	Length	Method	Surface	Slope
1	332.9	329	100	Sheet Flow	Woods	0.039
2	329	306	465	Shallow Concentrated	Woods	0.049
3	306	304.7	93	Shallow Concentrated	Brush	0.014
4	304.7	302	149	Shallow Concentrated	Woods	0.018
5	302	288.8	497	Shallow Concentrated	Grass Waterway	0.027
6	288.8	284	100	Channelized	Culvert	0.048
7	284	264.5	473	Shallow Concentrated	Grass Waterway	0.041
8	264.5	252	305	Channelized	Culvert	0.041

	ES4					
	High	Low	Length	Method	Surface	Slope
1	356.5	353	100	Sheet Flow	Woods	0.035
2	353	328	290	Shallow Concentrated	Woods	0.086
3	328	327.1	1888	Channelized	Stream/Ponds	0.000

	ES5					
	High	Low	Length	Method	Surface	Slope
1	341.2	338.4	100	Sheet Flow	Woods	0.028
2	338.4	336	196	Shallow Concentrated	Woods	0.012
3	336	276	252	Shallow Concentrated	Woods	0.238

	ES6					
	High	Low	Length	Method	Surface	Slope
1	314.4	307	100	Sheet Flow	Woods	0.074
2	307	239	316	Shallow Concentrated	Woods	0.215
3	239	232	130	Shallow Concentrated	Woods	0.054
4	232	211	147	Shallow Concentrated	Woods	**0.143**

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	ES7					
	High	Low	Length	Method	Surface	Slope
1	312.5	309.4	100	Sheet Flow	Woods	0.031
2	309.4	267.4	297	Shallow Concentrated	Woods	0.141
3	267.4	258	227	Shallow Concentrated	Woods	0.041
4	258	227	336	Shallow Concentrated	Woods	0.092

	ES8					
	High	Low	Length	Method	Surface	Slope
1	321.4	318	100	Sheet Flow	Woods	0.034
2	318	271	359	Shallow Concentrated	Woods	0.131
3	271	256	290	Shallow Concentrated	Woods	0.052

	ES9					
	High	Low	Length	Method	Surface	Slope
1	265.2	264.7	100	Sheet Flow	Dense Woods	0.005
2	264.7	264.4	365	Shallow Concentrated	Woods	0.001
3	264.4	264.2	177	Shallow Concentrated	Brush	0.001
4	264	241	701	Shallow Concentrated	Woods	0.033
5	241	197	975	Shallow Concentrated	Brush	0.045
6	197	192	123	Shallow Concentrated	Woods	0.041

	ES10					
	High	Low	Length	Method	Surface	Slope
1	262	254	100	Sheet Flow	Dense Woods	0.080
2	254	234	190	Shallow Concentrated	Woods	0.105
3	234	232.7	103	Shallow Concentrated	Brush	0.013
4	232.7	211.1	337	Shallow Concentrated	Woods	0.064
5	211.1	203.5	283	Shallow Concentrated	Brush	0.027

	L1					
	High	Low	Length	Method	Surface	Slope
1	311.75	290	485	Channelized	Grass	0.045

	L2					
	High	Low	Length	Method	Surface	Slope
1	292	290	80	Channelized	Grass	0.025

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	L3						
	High	Low	Length	Method	Surface	Slope	
1	282	277	146	Channelized	Grass	0.034	Continues into ES1F

	L4					
	High	Low	Length	Method	Surface	Slope
3	277	271.5	204	Channelized	Grass	0.027

	L5						
	High	Low	Length	Method	Surface	Slope	
1	211.1	203.5	283	Shallow Concentrated	Brush	0.027	
10	280	279.5	25	Culvert	Assumed 15" CMP	0.020	Continues into ES1B
11	279.5	271.5	484	Channelized	Woods	0.017	

	L6					
	High	Low	Length	Method	Surface	Slope
1	271.5	241.5	1287	Channelized	Woods	0.023

	L7						
	High	Low	Length	Method	Surface	Slope	
1	316	279	712	Shallow Concentrated	Woods	0.052	
2	279	236.9	895	Shallow Concentrated	Woods	0.038	Continues into ES1A
3	236.9	233.4	202	Channelized	Grass	0.017	
4	233.4	224	591	Channelized	Brush	0.016	

	L8					
	High	Low	Length	Method	Surface	Slope
1	270	241.5	163	Channelized	Woods	0.175

	L9						
	High	Low	Length	Method	Surface	Slope	
1	241.5	236.9	225	Channelized	Woods	0.020	
3	236.9	233.4	202	Channelized	Grass	0.017	Continues into ES1A
4	233.4	224	591	Channelized	Brush	0.016	