APPENDIX 19

DRAFT STORMWATER POLLUTION PREVENTION PLAN

Individual Stormwater Pollution Prevention Plan

For the

Phase 1(A) of the Modified Belleayre Resort at Catskill Park

Prepared By

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1.0 PROJECT REVIEW

This is an Individual Stormwater Pollution Prevention Plan (SWPPP) for Phase (1A) of the proposed Modified Belleayre Resort at Catskill Park (the Project). This SWPPP is for Phase (1A) construction of the Modified Project as defined and conceptually designed as part of the Agreement in Principle (AIP) September 5, 2007. This SWPPP for Phase (1A) construction includes detailed plans, descriptions and procedures to be reviewed by the NYSDEC Regional Water Engineer, and the format of this SWPPP will be used as a model for stormwater plan development and procedures for all subsequent phases of construction including Phase 1B which will be the next phase to be constructed. Construction of Phase (1A) shall not commence until submission to the Regional Water Engineer and authorization by the Department of the section of the SWPPP covering that specific phase. Submission to the Regional Water Engineer of any portion of the SWPPP, including detailed construction drawings, for authorization by the Department of any construction phase must be made at least 60 calendar days before construction of that phase is scheduled to commence. Construction of any subsequent phase of the project cannot commence until substantive completion of the previous phase, as determined by the Regional Water Engineer. Such construction cannot commence until receipt by the Regional Water Engineer of a statement from a licensed professional that the previous stage was completed and stabilized in accordance with the SWPPP.

There are a total of 3 phases planned for this project that will take up to 11 years to construct dependent on the selling of the detached lodging units. The first phase has two components, Phases 1A and 1B, which will be constructed separately. The hotel and the golf course were to be completed in the first phase of construction; however construction timing warranted breaking the first phase into 1(A) and 1(B). This SWPPP sets protocol for treatment of stormwater that will be followed in future Phases. This SWPPP was assembled according to the federal requirements in 40CFR 122.26 and in accordance with Article 17, Titles 7 and 8 and Article 70 of the Environmental Conservation Law. In this case, NYSDEC has exercised its discretion to require an individual SPDES permit application to cover both the construction and operation of the Modified Project. This SPDES Individual Permit application has an identification number of NY-027-0679 and NYSDEC # of 0-9999-00096/00005.

NYCDEP has authority to review and approve certain elements of the proposed project under its Watershed Regulations (15 RCNY, Sections 18-11) including the location and construction of impervious surfaces, and the preparation and implementation of a stormwater pollution prevention plan to control runoff both during and after construction. To date there has been extensive coordination of the stormwater plans for the Project with NYCDEP and this coordination will continue during the SEQRA review of the project. If this SWPPP needs to be revised, the permittee and the site contractor will make the required modifications within seven days of such notification and submit written certification to the notifying agencies that the changes have been implemented. A copy of the SWPPP will be kept available on site for review by regulatory agencies, engineers, and subcontractors.

This Project is in the New York City watershed and therefore is subject to additional regulations involving the review of phosphorus discharges. This Project is located in NYSDEC Regions 3 and 4.

2.0 POLLUTION PREVENTION TEAM

Pollution Prevention Team and Responsibilities

Dean Gitter, Owner Telephone: 845-688-7740

The Erosion Control Superintendent will be determined at a later date

The Construction Supervisor will be determined at a later date

3.0 SITE LOCATION

The Project is located in the Central Catskill region of New York State near the intersection of the boundaries of Delaware, Ulster and Greene Counties. The site is located approximately 35 miles west of the City of Kingston, which is off Exit 19 of the New York State Thruway. The 739 acres that comprise the site are located on either side of Ulster County Route 49A south and west of the hamlet of Highmount. The Project includes lands in the Town of Shandaken in Ulster County and lands in the Town of Middletown in Delaware County. The latitude and longitude of the site are 42^{o} 8’ 52”N, 74^{o} 29’ 51”W. See Appendix A for a location map.

3.1 Activities at the Facility

The Project contains a mix of commercial use and vacation resort uses that include recreational facilities, lodging, lodging-related commercial, spa, a conservation easement area and other areas to remain undeveloped. Each component of the proposed development is summarized below.

Wildacres Resort (Wildacres) is located on approximately 254 acres on the eastern side of the Project site with access from County Route 49A south of the Alpine Osteria and near the upper driveway to Belleayre Mountain Ski Center as well as access from Gunnison/Kraft Road. Development proposed for Wildacres includes a hotel building with 250 units and ancillary hotel uses (dining, spa and limited hotel-related commercial), 163 lodging units in multi-unit buildings operated by but detached from the hotel, and an 18-hole golf course. The existing buildings at the base of the former Highmount Ski Area will be adaptively reused as the Resort’s Wilderness Activity Center.

Highmount Spa Resort (Highmount) is located on approximately 237 acres with development proposed to the west of the former Highmount Ski Area with access proposed off Route 49A. Development proposed for Highmount includes a 120 unit hotel with spa facilities. Also located in the hotel/spa building are 53 fractional ownership lodging units”. A multi-level lodge building is proposed near the hotel/spa and will contain 27 fractional ownership lodging units. Sixteen (16) detached lodging units in 8 duplex buildings are also proposed.

The project will have its own central wastewater collection system through which wastewater will be sent to the Pine Hill wastewater treatment plant. The Pine Hill wastewater plant discharges into the Ashokan Reservoir watershed and is already subject to a waste-load allocation limit for the Ashokan total maximum daily load (TMDL).

During construction, one portable ready mix concrete plant will be located near the Golf Clubhouse at Wildacres and will produce concrete for the Wildacres portion of the Project for the first two years of construction. This concrete batch plant will have an associated rock crusher mill. At Highmount, a rock crusher will be located at the site of the Lodge building opposite the entrance road to the Hotel/Spa building. These plants will operate for the first 18 to 24 months of the Project. Typically the rock crushing operations would fall under SIC 1422-1429 and the concrete batch plants would fall under SIC 3271-3275 of the Multi-Sector General Permit for Industrial Discharges of Stormwater, however this Project will be covered by an Individual Permit for Stormwater Discharges. This Individual Permit will treat the rock crushing and the concrete batch plant activities similar to the Multi-Sector General Permit for Industrial Discharges, however we are not applying for a Multi-Sector General Permit for Industrial Stormwater Discharges.

This entire Project is divided into 3 separate Phases. Each phase has components within Highmount and Wildacres portions of the project. This SWPPP is for Phase (1A) only. Each Phase of this Project is divided into Locations. The first phase is divided into two components, Phase (1A) and Phase (1B.) Phase 1A has three Locations (1A, 1B and 1C that correspond to Wildacres main, Wildacres northeast and Highmount). Each individual Location is divided into Work Areas which will disturb around 5 acres at a time with the exception of the hotel construction. Individual Work Areas and Locations are shown on the Sediment and Erosion Control Plans and the Phasing Plan provided with the SDEIS. A more detailed discussion of the phasing of this Project is provided in Chapter 7 of this SWPPP.

This SWPPP is for the first phase (Phase (1A) of construction which will include: Wildacres hotel, 18 holes of the Highmount Golf Club, and the Highmount Spa Hotel. Future phases of work are discussed in Section 7.0 of this SWPPP.

3.2 Site Mapping

All of this information is discussed in this SWPPP or is shown on the mapping provided for the SDEIS**.**

Included	N/A	
☒	☐	Directions of Stormwater Flow;(**See subcatchment maps in Sheets L5.00-L5.13 of the SDEIS Map Set and see Stormwater Management Report Appendix C of this SWPPP.**)

☐	☒	Locations of all existing structural BMPs;(**There are no existing structural BMPs because the site is undeveloped.**)
☒	☐	Location of all water bodies;(**Existing waterbodies are shown on the Wetland Inventory Maps Sheets L2.06-L2.09 of the SDEIS**.)
☒	☐	Locations of potential pollutant sources identified under Part III.C.3 and where significant materials are exposed to precipitation;(**The staging areas are locations of potential sources of pollution that are exposed to precipitation. These are discussed in Section 4.2 of this SWPPP**.)
☐	☒	Location of major spills or leaks identified under Part III.C.4 have occurred;(**No spills or leaks have occurred on the Project Site because the site is undeveloped**.)
☒	☐	Location of the following Activities where such activities are exposed to precipitation: fueling stations; vehicle equipment maintenance and or cleaning area; loading and unloading areas; locations used for treatment, storage or disposal of wastes; and liquid storage tanks;(**The staging areas will be used to store fuel and other hazardous materials**.)
☒	☐	Locations of stormwater outfalls and an approximate outline of the area draining to each outfall or sufficient and an appropriate outline of the area draining to each outfall or sufficient density of flow arrows to show the drainage are outline;(**The stormwater outfalls (design points) are shown for the existing and proposed conditions on the Stormwater Modeling Diagrams, Sheets L5.00-L5.13 of the SDEIS and discussed in the Stormwater Management Report in Appendix C of this SWPPP.**)
☐	☒	Location and description of non-stormwater discharges, including but not limited to those listed in Part III.C.3;(**A discussion of the potential non-stormwater discharges is provided in Section 10 of this SWPPP**.)
☐	☒	Location of stormwater flows with significant potential for causing erosion;(**Currently, there are no locations on the property that have potential for significant erosion**.)
☒	☐	Locations of the following activities where such activities are exposed to precipitation: processing and storage areas; access roads; rail car and tracks; the location of transfer of substance in bulk; and machinery;(**The rock processing will be done outside in two**

designated areas (See sediment and Erosion Control Plans Sheets L3. 02-3.25 of the SDEIS map set.)

☒ ☐ Location and source of runoff from adjacent property containing significant quantities of pollutants of concern to the facility (the permittee may include an evaluation of how the quality of the stormwater running onto the facility impacts the facility's stormwater discharges). There is untreated runoff coming from the adjacent Belleayre Ski Center that enters this site in subcatchments 9 and 10. We will treat this additional runoff with post construction practices stormwater management practices.

The Sediment and Erosion Control drawings (L3.02-3.25 which are in the SDEIS) show the location of all temporary sediment and erosion control practices to be installed and maintained during construction and dewatering details of sediment basins. The Grading and Drainage Plans (Sheets L4.00-L4.09 provided in the SDEIS) shows the post-construction stormwater management practices.

3.3 Pre-development Site Conditions

Currently, the site is undeveloped and predominantly forested. A subcatchment map is provided in the Stormwater Modeling Diagrams (Sheets L5.00-L5.13 of the SDEIS) showing the pre-development drainage areas. Being that the site is undeveloped, currently there are no best management practices installed on the site.

3.4 Receiving Waters

This project is in the New York City watershed at the very headwaters of the Ashokan Reservoir (20 miles away) and the Pepacton Reservoir (14 miles away). Locally the site drains to Birch Creek and its tributaries in the eastern portion and to tributaries of Emory Brook in the western portion.

Only approximately 19 acres of this Project are in the Ashokan Reservoir drainage area. The remaining 719 acres are in the Pepacton Reservoir drainage area. The Pepacton Reservoir is not subject to a phosphorus restriction but is managed under a Total Maximum Daily Load.

At Wildacres Resort, which includes the Highmount Golf Club, there are two intermittent and unnamed tributaries to Emory Brook that pass through the project site. The intermittent tributary in the western portion of the site is crossed by three golf holes, 11, 13 and 16, while holes 2 and 8 cross the intermittent tributary in the eastern portion of the Wildacres Resort. Redundant erosion and sediment controls are planned throughout the proposed development especially near these intermittent tributaries. Stormwater will not be discharged directly to these tributaries. Neither of the Emory Brook tributaries were found to support trout during recent investigations. Emory Brook itself does support trout, but is located approximately 1,500 feet from the closest proposed golf hole.

The streams and wetlands identified onsite are shown on the mapping provided.

Along the railroad bed there will be a series of 15 discharge/design points from this project. Each discharge point will be assigned a SPDES discharge point identification number. There will be an additional two discharge points associated with the concrete batch plant and the rock crushing activities at the Highmount and Wildacres portions of the Project.

3.5 Municipal Separate Storm Sewer Systems (MS4)

This Project is not located within a regulated MS4 Community.

3.6 Other SPDES Permitted Discharges

Currently, there are no SPDES permitted discharges located on the Project Site.

3.7 Impervious Surface Estimate

The existing impervious area of this entire Project is 2.2% (See calculation below):

$$\frac{\text{(16 Acres impervious area) x 100}}{\text{739 Acres total area}} = \mathbf{2.2\%}$$

The proposed impervious area percentage of this entire site will be 3.5% (See calculation below):

$$\frac{\text{(21 Acres of impervious area) x 100}}{\text{739 Acres total area}} = 2.8\%$$

3.8 Soils

The USDA/NRCS soil survey manuals for Delaware and Ulster counties indicate that the soils identified onsite are the Elka, Halcott, Vly, Lairdsville, Lewbeach, Onteora, Suny, Tunkhannock, Willowemoc, Rock Outcrop and the Udorthent soil series. Table 1 below lists these soils and describes characteristics about each soil. Overall, the soils are predominantly stony glacial till soils derived from red shale and sandstone. Soil hydrologic groups are predominantly C and D with most of the development falling within the C areas. Deep hole test pits were performed throughout the site to confirm the USDA soil mapping and to define the soil boundaries better for the planning of the development. The Stormwater Management Report (Appendix C) provides a more detailed discussion of the soil evaluations that were conducted onsite.

Table 1. Soil Series Mapped in the Project Area and their Characteristics

Series Name	Depth	Drainage	Parent Material	Typical Location
Elka	Very Deep	Well Drained	Glacial till	Gently sloping to very steep mountainous uplands
Halcott	Shallow	Somewhat Excessively Drained	Glacial till	Nearly level to very steep areas on glaciated bedrock controlled uplands
Vly	Moderately Deep	Well to Somewhat Excessively Drained	Glacial till	Nearly level to very steep glaciated bedrock controlled uplands
Lairdsville	Moderately Deep	Moderately Well to Well Drained	Glacial till	Nearly level to steep glaciated bedrock controlled landforms
Lewbeach	Very Deep	Well Drained	Glacial till derived from sandstone, siltstone or shale	Gently sloping through steep hillsides and hilltops in the uplands
Onteora	Very Deep	Somewhat Poorly Drained	Glacial till derived from sandstone, siltstone or shale	Nearly level to steeply sloping uplands on till plains and the lower parts of hillsides in the uplands
Suny	Very Deep	Poorly Drained	Acidic glacial till derived from sandstone, siltstone or shale	Level or slightly depressed portions of glaciated uplands
Tunkhannock	Very Deep	Well to Somewhat Excessively Drained	Water-sorted glacial material derived from reddish sandstone, siltstone, and shale	Slopes from 0 to 60%
Willowemoc	Very Deep	Moderately Well Drained	Glacial till derived from sandstone, siltstone, and shale	Nearly level to moderately steep till plains and hillsides in uplands
Rock Outcrop	This soil type is best described as having bedrock at or very near to the ground surface			
Udorthent	This soil type is a disturbed soil that could have been cut or filled and can have variable characteristics			

4.0 SUMMARY OF POTENTIAL POLLUTANT SOURCES

4.1 Activities in Proposed Work Area

- Concrete batch plant
- Rock crushing activities
- Construction heavy equipment during operation and maintenance
- Fuel storage areas
- Grading and ground disturbance associated with construction

4.2 Pollutants

- For the concrete batch plant, possible pollutants include concrete dust from the concrete mixing activities, dust from trucks that transport the concrete where it is needed and storage of cement for the batch plant. This dust can affect the pH of the surrounding soil and any surface waters in the vicinity. The storage of dry cement will be covered and away from precipitation and stormwater.

- For the rock crushing activities, possible pollutants include dust and small particulates from the crushing activities and also from the trucks transporting the material. For the batch plant the cement arrives in sealed tanker like trucks and is discharged by compressed air into a sealed silo.

- For the construction equipment, possible pollutants include petroleum fluids such as gasoline, diesel fuel, oils and grease that could leak from construction equipment or could be spilled during maintenance performed on the equipment. All equipment will be regularly inspected for leaks and will be repaired as needed.

- The fuel storage areas will be confined to the staging areas as shown on the work plans. All tanks will be located at least 100 feet from any streams, wetlands or other sensitive environmental resources. Tanks will either be steel with an enclosure capable of holding 110% of the storage tank volume or of a Con-Store, concrete encased type typically employed by NYSDOT. Hydraulic oil and other oils will be stored in their original containers.

- For the grading and other ground disturbing activities, possible pollutants include sediment that could erode away from the disturbed areas during rain events. With this sediment, there could be a phosphorus load bound to the sediment that could pollute surrounding streams. Sediments themselves are a pollutant as a solid and may in part a color to the water. A detailed plan for the sediment and erosion control has been put together and is provided on sheets L3.02-3.23 of the SDEIS and is also discussed in Section 6.0 of this SWPPP.

There are no adjacent properties with runoff entering this property containing significant quantities of pollutants of concern for this facility. There are untreated runoff discharges from the NYS Belleayre Ski Center that enter the property in subcatchments 9 and 10.

4.3 Potential for Presence in Stormwater from Industrial Activities

The concrete batch plant will be located near the Golf Clubhouse at Wildacres and at the Lodge building opposite the entrance road to the Hotel/Spa building at Highmount. The rock crushing activities will be in the same location as the concrete batch plants. From the Grading and Drainage Plans and the Sediment and Erosion Control Plans (Sheets L4.00-L4.09 and L3.02-3.25 respectively, provided in for the SDEIS), the predicted flow direction of stormwater at the concrete batch plant at Wildacres will be north down the slope towards temporary sediment basins A3 and A4.

The predicted flow direction of stormwater at the rock crusher at Highmount will be north through a work area and eventually into sediment basin C1.

The rock crushing activities will be located as seen from the Grading and Drainage Plans and the Sediment and Erosion Control Plans. The predominant pollutant associated with rock crushing will be rock dust. If crushed rock is not hauled away within 7 days, the crushed rock will be stored in relatively flat areas and will have super silt fence installed on the downslope side to retain sediments washed from the stone piles. The rock storage areas will not be located within 100’ of any streams or wetlands unless a suitable sediment and erosion control practice, such as multiple layers of super silt fence, is installed and maintained in-between. A spray/irrigation system will be in place to spray water on the roads to prevent dust from becoming a problem during dry days. Water will be used sparingly so as not to create runoff.

The staging areas during the Phase (1A) construction will be located at the Front-9 Village, the Highmount Hotel and the Main Hotel. At these locations, the contractors will have fuel storage tanks to serve the equipment during construction. These tanks will be clearly marked and protected to prevent spillage. Tanks will either be steel with an enclosure capable of holding 110% of the storage tank volume or of a Con-Store, concrete encased type typically employed by NYSDOT. Hydraulic oil and other oils will be stored in their original containers. These tanks will be located at a minimum 100' from any streams, wetlands or other sensitive environmental resource. The contractors will also have fuel trucks that will be mobile during construction to fuel equipment.

5.0 SPILLS AND RELEASES

Currently, there have been no recorded spills of hazardous materials within the Project Site since the area is undeveloped. Materials and substances listed below are expected to be stored on-site as described:

Portable Sanitary Facilities

- Portable sanitary facilities, which contain chemical disinfectants (deodorants) will be located on-site, with the disinfectants held in the tank of the toilet.

Hazardous Products:

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

Petroleum Products:

- Petroleum for fueling vehicles will be stored in above ground storage tanks. Tanks will either be steel with an enclosure capable of holding 110% of the storage tank volume or of a Con-Store, concrete encased type typically employed by NYSDOT. Hydraulic oil and other oils will be stored in their original containers, in shipping trailers or trailers. Petroleum storage locations will be clearly marked as a fire hazard.
- Personnel should be familiar with the emergency contact information for the Pollution Prevention Team located in the beginning of this SWPPP.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite and in each vehicle and piece of motorized equipment. Equipment and materials may include but not be limited to absorbent pads, brooms, dust pans, mops, rags, gloves, goggles, activate clay, sand, sawdust, plastic bags and plastic and metal trash containers specifically for this purpose.
- The owner/operator of the facility shall instruct personnel that spillage of fuels, oils, and similar chemicals must be avoided and will have designated a single qualified spill remediation company to serve the site.
- Fuels, oils, and chemicals will be stored in appropriate and tightly capped containers. Containers shall not be disposed of on the project site.

- Fuels, oils, chemicals, material, equipment, and sanitary facilities will be stored/located away from trees and at least 100 feet from streams, wells, wet areas, and other environmentally sensitive sites.
- Dispose of chemical containers and surplus chemicals off the project site in accordance with label directions.
- Use tight connections and hoses with appropriate nozzles in all operations involving fuels, lubricating materials or chemicals.
- Use funnels when pouring fuels, lubricating materials or chemicals.
- Refueling and cleaning of construction equipment will take place at least 100' from any streams, wetlands or other sensitive environmental resources and preferably in parking areas to provide rapid response to emergency situations.
- All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Any vehicle leaking fuel or hydraulic fuel will be immediately scheduled for repairs and use will be discontinued until repairs are made.
- All onsite vehicles and motorized equipment with a fuel tank larger than 4 gallons will contain a spill kit including at a minimum: absorbent diapers, rubber gloves, plastic bags and a 5' x 5' sheet of plastic to contain spills and remove small amounts of contaminated soil.

Fertilizers:
- Fertilizers will not be stored in the same structure as petroleum products.
- Fertilizer will be stored in its original containers on pallets with water resistant coverings.
- Proper delivery scheduling will minimize storage time.
- Any damaged containers will be repaired immediately upon discovery and any released fertilizer will be recovered to the fullest extent practicable.

Paints:
- Paints and other similar materials will be stored in their original containers and all empty containers will be disposed of in accordance with label directions.
- All containers will be tightly sealed and stored when not required for use.
- Excess paint will not be discharged to the storm water system or wastewater system, but will be properly disposed of according to manufacturers' instructions or State and local regulations.

Concrete/Asphalt:
- Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water only at designated locations on the site which will be at least 100' from any streams, wetlands and other environmentally sensitive areas.
- Concrete and asphalt will be stored in the original delivery trucks.
- Dry cement for the concrete batch plant will be stored at the plant and will be under cover protected from precipitation and any stormwater flows.
- Asphalt trucks shall not discharge surplus asphalt on the site nor clean their trucks onsite.

5.1 Spill Cleanup Procedures

Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size.

- Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. Any spill in excess or suspected to be in excess of reportable limits will be reported to the NYSDEC Regional Spill Response Unit. Notification to the NYSDEC (1-800-457-7362) must be completed within two hours of the discovery of the spill.
- The Erosion Control Superintendent or designee will be contacted at the event of a spill and will supervise the cleanup of all spills onsite to document that they are cleaned up appropriately. Records of the spills will also be kept by the Erosion Control Superintendent or designee.
- All spills will be cleaned up immediately after discovery.
- If the spill is large in size and cannot be cleaned up by the construction contractors present, a qualified spill cleanup contractor (designated by the owner) will be contacted for clean-up.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with spilled substance.
- Barrels will be kept onsite to store contaminated soil from any spills that may occur onsite so that they can be hauled away and disposed of by the designated and qualified spill remediation company.

See Spill Response Report within Appendix B

6.0 STORMWATER CONTROLS

Listed below are the proposed sediment and erosion control practices, post-construction stormwater management practices and green infrastructure practices that will be implemented during and after construction:

Temporary Erosion and Sediment Controls

- Silt fence
- Bio logs or wattles
- Check dams
- Catch basin inlet protection
- Storm pipe outlet protection
- Sediment retention basins
- Stabilized construction entrance
- Diversion swales
- Water bars
- Rolled erosion control product/turf reinforcement mats

- Temporary and permanent seeding
- Wood fiber mulch
- Sod
- Liqui-Floc® liquid flocculent as approved by NYSDEC

Post Construction Stormwater Measures

- Micropool Extended Detention Stormwater Pond (P-1)
- Dry Swale (O-1)
- Bioretention (F-5)
- Wet Extended Detention Pond (P-3)

Green Infrastructure Practices for Runoff Reduction

- Conservation of Natural Areas
- Bioretention
- Green Roof
- Dry Swale
- Stormwater Planter
- Cistern/Irrigation Pond
- Porous Pavement

The Sediment and Erosion Control Plan provided in as Sheets L3.02-3.25 for the SDEIS shows specific locations where the sediment and erosion control practices are to be installed. Seed and mulch will be applied to bare or disturbed soil areas unless construction will resume in that area within 7 days. The locations of the post-construction stormwater management practices are shown on the Grading and Drainage Plans Sheets L4.00-L4.09 provided in the SDEIS. The stormwater management report is also provided in Appendix C that discusses the details of the post-construction stormwater management practices.

6.1 Sediment and Erosion Control Approach

Project construction will be phased over many years which limits the need to have larger areas of active construction in order to meet a shorter construction schedule. Section 7.0 of this SWPPP describes the project phasing and extended build out anticipated for the project. See the Phasing Plan (L3.00) and Construction Staging Plans (L3.01) provided in the SDEIS.

The proposed construction sequencing requires that a work area must be stabilized before work can begin on the next work area in the sequence. See the Erosion and Sediment Control Plans that are in the SDEIS. These plans illustrate the sediment basins proposed to be constructed to serve all of the work areas. These sediment basins have been designed to capture and hold runoff from the 10-year storm, six inches of rain in 24 hours, based on the assumption that the contributing areas to the sediment basins have a runoff coefficient equivalent to bare ground. The drainage area, storage volume required for the 10-year storm and the storage volume provided is included for each of the sediment basins shown on the EC plans. In almost all instances, the storage volume provided is greater than what is required for the 10-year storm.

An organic flocculant, Chitosan or Liqui-Floc®, will be used to reduce turbidity in the sediment basins and is discussed more in the following section. Information on the Liqui-Floc®, product is provided in Appendix D. The use of these flocculants has been approved by the NYSDEC staff and upheld in the Commissioner's interim decision. This flocculent has proven effective for the soils on the project site through bench tests performed on soil samples collected from the property. Laboratory tests specific to this project were performed to demonstrate that the flocculent is not toxic to aquatic organisms when used at the rates proposed to be used for this project.

Diversion swales have been designed where there are undisturbed (natural areas) contributing runoff towards the active work areas. These diversion swales will keep the uphill runoff from reaching the exposed soils in the active work area, greatly reducing the potential for erosion.

Other erosion control practices that will be utilized during construction and that are illustrated on the Erosion and Sediment Control Plans include perimeter silt fencing, bio logs or wattles, catch basin inlet protection, storm pipe outlet protection, check dams, water bars, rolled erosion control products, turf reinforcement mats, stabilized construction entrances, temporary and permanent seedings, wood fiber mulch and sod. Typical details for erosion control practices are shown on sheets L-8.00-8.03 in the drawing set.

The following provides a description of how these Sediment and Erosion Control plans will be implemented.

1. There will be a dedicated erosion control team of 4 to 6 people whose primary role will be repairing, maintaining and upgrading structural erosion control devices such as silt fence, construction fence and wattles. This crew will be equipped with all the necessary equipment and supplies necessary to effectively maintain the erosion control devices. The site work contractor will install all erosion controls and will also be responsible for maintaining the temporary sediment basins under the direction of the Erosion Control Superintendent.

2. This crew will be directed by the Erosion Control Superintendent who will be a Certified Professional Erosion Control Specialist. This Superintendent will have complete stop-work authority of all site earthwork contractors and will have the authority to utilize whatever construction equipment and manpower necessary to implement and repair erosion controls in a timely manner.

3. This Erosion Control Superintendent and the crew under his direction will not be employed by the site work contractor, but will be under independent contract to the developer and report directly to the developer's on-site representative.

4. The site work contractor, as directed by the Erosion Control Superintendent will be responsible for constructing and structurally maintaining the construction phase sediment retention basins that will be constructed site-wide

5. The Erosion Control Superintendent will be the single point of the contact for all issues related to on-site erosion and sediment control. This individual will be responsible for implementation of the construction pollution prevention plan, monitoring of the local water courses during the construction process, oversight on the progress of the construction project, and reporting to regulatory agencies and municipalities as per conditions of the permits and approvals issued for the project.

Given the complexity of the plan to construct the site it will be necessary to have a comprehensive process to share information on the construction process. A constant update of the construction process will be necessary. The contractors will have to closely monitor daily progress as it relates to all the construction tasks from site clearing to final grading. A common set of electronic plans will have to be maintained at a central location that is updated on a frequent basis in order to maintain accurate and up-to-date stormwater control reports.

Along with the administrative staff it can be anticipated that a significant amount of personnel time will have to be expended to carry out the monitoring requirements on the water courses and of the stormwater control facilities including the retention basins along with the perimeter controls. Status reports on erosion control facilities as well as the water quality monitoring data will have to be compiled at a central location. As a control mechanism, if the water quality of a water course is degraded during construction, it may be necessary to modify the work areas, increase temporary stabilization, or in some cases suspend work until the erosion issue is remediated. Therefore, it is necessary to collect the data and immediately utilize the data.

6.1.1 Liqui-Floc® and Dewatering of Sediment Basins

Temporary stormwater detention basins will be constructed throughout the area of construction and will be large enough to capture and hold all of the runoff from the 10-year design storm. The predominant soils in the vicinity of the Project Site are glacial till soils with a high percentage of clay and silty clay, which tend to be suspended in solution for extended periods of time. The use of sediment basins alone would likely result in a discharge that would exceed the turbidity limit (50 NTU, this limit was taken from the Draft, Environmental Protection Agency 40 CFR Part 450 Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category; Final Rule.) Therefore, after the runoff has been captured in retention basins it will be necessary to treat the captured water with an environmentally-friendly flocculent in order to reduce turbidity to below the 50 NTU limit. The basins will then be pumped out either to the irrigation pond or pumped into a dewatering dispersion pipe so that the basins will be ready to accept runoff from the next storm event. No stormwater will be pumped from the sediment basins that exceed the 50 NTU limit. If the water in the basins exceeds the 50 NTU limit, the water will be allowed to sit in the basin until the turbidity is lowered by settling.

The flocculent proposed for use on the Belleayre Resort project is a product called Liqui-Floc®, (a.k.a. Chitosan or Storm Klear), marketed by a company called Natural Site Solutions from Washington State. Liqui-Floc® is a natural product made from seafood shells that are a byproduct from food processing. Liqui-Floc® is a derivative of the chitin in the seafood shells. Liqui-Floc® has very low aquatic organism toxicity and completely biodegrades into carbon dioxide and water in 24 hours. Soil samples taken from the project site were tested using Liqui-Floc®. Solutions were made using the site soils to produce turbid water of 5,000, 1,000 and 100 turbidity units (NTU). These turbid soil solutions were then dosed with the flocculent to produce a Liqui-Floc® concentration of 1 ppm. Turbidity levels in the soil test solutions rapidly dropped following the application of Liqui-Floc® within one hour after adding the flocculent. Within one hour after applying Liqui-Floc® turbidity levels had dropped 93% in both the 5,000 NTU and 500 NTU turbid soil solutions. The use of chitosan was approved by the NYSDEC staff and upheld in the Commissioner's Interim Decision. DEIS Figure 3-15R, "Flocculent Delivery System", provided a schematic of how the basins will be treated with the flocculent and then pumped out.

As described in the DEIS, Chitosan has proven effective for the soils on the project site through bench tests performed on soil samples collected from the property. Laboratory tests were also performed at the time of the issues conference to demonstrate that Chitosan is not toxic to aquatic organisms when used at the rates proposed to be used for this project.

After a rainfall event, a crew will go around to each stormwater retention basins and add Liqui-Floc® in order to reduce turbidity levels to below 50 NTU. A staff gauge will be mounted in each sediment basin so that the depth of water can be correlated to a volume of sediment laden water to be treated. The amount of Liqui-Floc® will be added to each basin to provide an overall concentration from 0.5 to 1 mg/L. A mobile pumping system will be used to circulate the turbid water with the Liqui-Floc® water to ensure the treat water is mixed throughout the pond. After the Liqui-Floc® has reduced the turbidity to below 50 NTU; stormwater will be pumped out of the basins with a skimmer to remove the cleaner surface water first. The pump and discharge system will be equipped with a turbidity meter and an automatic shutoff valve system so that water pumped to the discharge system will not exceed the target turbidity levels.

Where feasible, basins will be pumped out to the irrigation ponds. Since water from the sediment basins will have already been treated with chitosan, there will be no need to treat the irrigation pond with chitosan. Of the proposed sediment basins in Phase 1, 5 basins (B1a, B2, B3, B5 and B6) will be pumped to the irrigation pond (also sediment basin B1.) Where this is not feasible due to distance and/or topography, the method to empty the remaining basins (basins A1, A2, A3, A4, A5, A6, A8, A9, A10, B4, B7, C1, and C2), will be to discharge the water via a dispersion pipe into undisturbed wooded areas below the basins. The wooded area will polish the stormwater to assure that effluent quality will meet the ambient conditions of the local watercourses and will also remove any residual Liqui-Floc® left in the treated water.

The Chitosan flocculent will not be added directly to the irrigation pond. Some sediment basins will be treated with the flocculent prior to discharge to the irrigation pond, however these sediment basins will be allowed to settle prior to pumping to the irrigation pond.

A plan has been developed that allows for the basin dewatering to occur at rates that are the same or less than runoff rates that occur under existing conditions. Dewatering the basins at these rates will prevent erosion in the forested areas below the dispersion pipe from which dewatering discharges will be made.

In order to address erosion concerns, additional analyses of existing hydrological conditions were performed and then compared to the proposed hydrological conditions with basin dewatering. Hydro CAD modeling was used to calculate existing runoff patterns from a 10 year storm at the drainage area of the proposed dewatering dispersion pipe locations. Design volumes of the proposed sediment basins and dewatering time periods were used to calculate proposed dewatering runoff patterns. Like other hydrological analyses of stormwater management, the underlying premise behind theses analyses is that if post-construction discharges are equal to or less than pre-construction discharges, then adverse impacts can be avoided. In other words, if dewatering discharge rates and dewatering discharge volumes are less than what is currently occurring on the site naturally without adverse effects, then dewatering will also not result in adverse effects. This can be achieved regardless of the soil and slope conditions below the dewatering dispersion pipes since these will remain unchanged.

Thirteen dewatering dispersion pipes constructed of perforated pipe wrapped with filter fabric (dispersion pipes) are proposed to be installed in undisturbed wooded areas downslope of proposed construction activities. Detail Sheet L-8.01 of the SDEIS has the Dispersion Pipe Construction Specifications. The locations of the dispersion pipes and what sediment basins will be pumped to them is shown on the Erosion and Sediment Control Drawings (L-3.02-3.25) of the SDEIS.

The proposed dispersion pipes will be located away from the areas to be disturbed during construction. The proposed stormwater basins have been designed to capture and hold runoff from the entire subcatchments that they serve, including areas of construction and undisturbed areas. Thus, during storm events no runoff from the areas above the dispersion pipes will reach the dispersion pipes or the undisturbed areas below them. All runoff will be captured in the basins and be discharged via the dispersion pipes after the storm event has passed.

The table below summarizes each sediment basin volume, their respective dispersion pipe, the proposed discharge rates to match the existing conditions and the time it would take to dewater the entire basin.

Table 2. Dispersion Pipes

Sediment Basin	Dispersion Pipe #	Full Sediment Basin Volume (ft^3)	Pumping Rate Required to Dewater Basin in 1 Hour (cfs)	Existing Average 10-yr Runoff Rate of Given Dispersion Pipe Area (cfs)	Hours to Dewater Basin at Existing Rate
A1	100	110,459	30.68	2.55	12
A2					
A3	103	37,055	30.68	3.51	9
A4	105,106	117,100	32.53	2.52	13
A5	119	150,175	41.72	3.50	12
A6	100	125,562	34.88	2.55	14
A8	110	32,285	8.97	0.77	12
A9	111	118,438	32.90	1.77	19
A10	111	64,987	18.05	1.32	14
B1-(Irrigation Pond)		336,587			N/A
B1a	pump to pond	25,148			N/A
B2	pump to pond	63,185			N/A
B3	pump to pond	62,481			N/A
B4	113	50,436	14.01	0.98	14
B5	pump to pond	65,680			N/A
B6	pump to pond	141,402			N/A
B7	115, 120	64,357	17.88	0.85	21
C1	116	254,006	70.56	1.86	38
C2	117	106,222	29.51	1.91	15

Dewatering the construction sediment basins in such a way will prevent the potential for erosion downslope of the proposed dewatering dispersion pipes regardless of slope and soil conditions.

One alternative to adding the Chitosan flocculent directly to the sediment basins is to utilize an engineered system brought onsite to process the water from the sediment basins. Such a system would pump water from the sediment basins, inject flocculent into the water at a metered rate, mix the solution and pass the treated water through settling process and finally sand filters to remove the sediment and any residual flocculent prior to discharge. This type of system would be designed and sized to adequately treat the water from the sediment basins and would discharge the treated stormwater through the same dispersion pipe system as described for the sediment basin treatment method as described above. The commercial availability and cost of such a system will determine if such a system can be utilized.

Use of Irrigation Pond During Construction for Dewatering

Recalling that for the first part of the phasing plan, only one work area in each Location will be under active construction at any given time, the following is the total volume of stormwater that would be pumped to the irrigation pond after a ten-year storm. This would allow Work Areas 1B.1, 1B.2, 1B.3 and 1B.4 to discharge their respective sediment basins to the irrigation pond (sediment basin B1) after a 10 year storm with volume left over. Below are calculations given in volumes of million gallons (MG)

basin B1a = 0.2 MG

basin B2 = 0.4 MG

basin B3 = 0.4 MG

This potential total would be 1.0 MG of water to be transferred to the irrigation pond after a 10 year storm. The capacity of the irrigation pond is 3.7 MG. Of this volume, 2.5 MG is required for a 10 year storm leaving 1.2 MG of additional storage. Therefore, there would potentially be a 0.2 MG of storage left in the pond if all of the basins were filled completely.

These areas will be stabilized and have the sediment basins removed until Work Area 1B. 5 can be disturbed. This sediment basin will only have a small amount of water contributing to the irrigation pond:

basin B5 = 0.5 MG

Sediment basin B5 will contribute 0.5 MG to the irrigation pond. Of the 1.2 MG of storage volume left in the irrigation pond, there will be 0.7 MG remaining after a 10 year storm. This area will have to be stabilized before moving into Work Area 1B.6.

For Work Area 1B.6, basin B6 will be dewatered into the irrigation pond when the other basins have all been stabilized and removed. The volume of water from the 10 year storm would be:

basin B6 = 1.1 MG

This brings the potential total to of 1.1 MG of water to the irrigation pond/sediment basin B1. The capacity of the irrigation pond is 3.7 MG. Of this volume, 2.5 MG is required for the irrigation pond. Therefore, there will be 0.1 MG of storage space in the irrigation pond after a 10 year storm after basin B6 is dewatered to the pond.

This revised approach to construction phase basin dewatering relies more on the use of the proposed irrigation pond as the place to which captured stormwater will be discharged. The irrigation pond (Sediment Basin B1) has the capacity of accepting a large volume of water during the construction phases of the project. At the same time, the irrigation pond is designed with 3.7 MG of storage capacity to which only 2.5 MG is required for storage of the 10 year storm. This is a finite capacity to store water. The role of the proposed irrigation pond in construction dewatering will obviously be dependent on actual rainfall conditions that occur during construction.

It is important that enough water be available in the irrigation pond when needed to water newly seeded and sodded areas in order to enable permanent vegetative establishment to provide erosion control. At the same time it is important that enough freeboard be maintained in the pond to so that it can still accept water when basins need to be dewatered.

Therefore, it is proposed that freeboard equivalent to 0.5 MG be maintained in the irrigation pond during construction. If necessary, the water level in the irrigation pond will be slowly lowered in order to maintain this freeboard. However, in order to avoid potential thermal loading impacts to local cold-water surface water resources, the levels in the irrigation pond may be lowered using the following measures;

1.) Any discharges from the irrigation pond drawing down the water level will be made via an intake located near the pond volume that will take the coldest water out of the irrigation pond,

2.) If it is necessary to pump water out of the irrigation pond in order to free up storage volume for future storm events, water will be pumped only to dispersion pipe 113 during dry weather conditions and not to exceed the rate of 0.984 cubic feet per second. No direct surface water discharges shall be permitted,

3.) Discharges to lower the irrigation pond water level will be done via the same dispersion pipe at the same rate or at a lower rate than those described above, in order to avoid potential erosion problems.

4.) When the irrigation lines are installed in the golf course, water can be pumped from the pond to the golf course as a method to drawdown the water.

6.1.2 Bonding or Other Surety

Prior to the commencement of any construction, and as security for the observance and performance by the applicant of its obligations under the erosion and sediment control plans and stormwater control plans prepared for the project in conformance with the applicable provisions of the Department and NYCDEP permits issued for the modified project alternative, the applicant will deliver to the Department and NYCDEP a performance bond, letter of credit, or other form of security acceptable to the Department and NYCDEP, issued by a bonding or surety company, bank, or other financial institution located and authorized to do business in the State of New York and otherwise approved by the Department and NYCDEP, in a principal amount equal to the estimated cost of implementing and complying with the SWPPP prepared for the project and the applicable provisions of the Department and NYCDEP permits during the period of construction of the project. This financial security is a requirement of the AIP.

6.1.3 Sequence of Activities for Construction

The Sediment and Erosion Control Plans included in the SDEIS contains the following typical erosion and sediment control sequencing.

<u>PRE-CONSTRUCTION AND SITE PREPARATION</u>

1. PRE CONSTRUCTION MEETING-PROTOCOL MAY BE MODIFIED BY DESIGNATED EROSION CONTROL SUPERINTENDENT
2. DEFINE INSPECTION SCHEDULE, REVIEW STORMWATER POLLUTION PREVENTION PLAN.
3. STAKEOUT ROAD CENTERLINE, CLEARING LIMITS, WETLANDS, AND STREAMS
4. INSTALL TREE PROTECTION AND WETLAND PROTECTION FENCE.
5. INSTALL STABILIZED CONSTRUCTION ENTRANCES AS SPECIFIED.
6. CUT AND REMOVE EXISTING TREES AND LOGS, DO NOT GRUB STUMPS.

<u>TEMPORARY RUNOFF AND DRAINAGE CONTROL</u>

7. HYDROSEED RYE ON CLEARED AREAS NOT INCLUDED IN INITIAL EARTHWORK CONSTRUCTION.
8. INSTALL PERIMETER EROSION CONTROL INCLUDING SILT FENCE, BIO-LOGS, EARTH BERMS, AND INLET PROTECTION AT EXISTING CULVERTS.
9. INSTALL WATER BARS IN LOCATIONS AS SPECIFIED BY ON-SITE EROSION AND SEDIMENT CONTROL SUPERINTENDENT.
10. INSTALL TEMPORARY CULVERTS INCLUDING INLET AND OUTLET PROTECTION, AND PERMANENT CULVERTS WHERE APPROPRIATE.

<u>EARTHWORK AND SITE CONSTRUCTION</u>

11. GRUB STUMPS IN SEDIMENT BASIN LOCATIONS, EXCAVATE SEDIMENT BASINS AND SHAPE TEMPORARY DIVERSION SWALES.

12. STABILIZE SEDIMENT BASINS AND DIVERSION SWALES.
13. INSTALL CHECKDAMS AS REQUIRED.
14. GRUB REMAINING STUMPS, BEGIN ROUGH GRADING.
15. INSTALL INFRASTRUCTURE, INCLUDING CATCH BASINS WITH INLET PROTECTION, GOLF COURSE IRRIGATION LINES, PIPING, AND PERMANENT DRAINAGE STRUCTURES WITH INLET AND OUTLET PROTECTION AS REQUIRED.
16. BUILD ROADWAYS AND STABILIZE.
17. PLACE ROAD SUBGRADE, STABILIZE, AND BUILD PERMANENT STORMWATER CONVEYANCE SWALES.

<u>TEMPORARY STABILIZATION OF WORK AREA</u>
18. SEED AND MULCH ALL BARE SOIL AREAS TO REMAIN UNDISTURBED FOR MORE THAN 7 DAYS.
19. APPLY ROLLED EROSION CONTROL PRODUCT OR HYDROSEED A MIXTURE OF WOOD FIBER MULCH WITH TACIFYING AGENT, TO ALL SLOPES 3:1 OR GREATER.
20. INSPECT ALL PERIMETER EROSION CONTROL AND REPAIR AS DIRECTED.
21. INSTALL/REPAIR ALL INLET AND OUTLET PROTECTION, PERIMETER SWALE STABILIZATION SUCH AS TURF REINFORCEMENT MATS, RIP RAP, AND CHECKDAMS.
22. REMOVE SEDIMENT FROM TRAPPING DEVICES

<u>PERMANENT STABILIZATION</u>
23. REPAIR/RE-SEED ALL BARE SPOTS.
24. CONSTRUCT PERMANENT STORMWATER BASINS, OR CONVERT SEDIMENT BASINS. STABILIZE SIDE SLOPES.
25. INSTALL SOD ON ALL AREAS AS SPECIFIED.
26. PAVE ROADS, INSTALL PROPOSED PLANT MATERIALS.
27. RECEIVE CERTIFICATION OF STABILIZATION FROM EROSION AND SEDIMENT CONTROL SUPERINTENDENT.
28. CLEAN ALL STORMWATER SYSTEMS OF SEDIMENT, TRASH, AND DEBRIS.
29. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS APPROVED BY THE EROSION AND SEDIMENT CONTROL SUPERINTENDENT.

6.1.4 Ski Trail and Lift Line Construction

Construction of the Ski Trail and the Lift Line in the Highmount portion of the project (Location 1.C) will be done after the earthwork for the hotel is completed but prior to construction of the hotel building. Clearing of the ski trails and lift line will progress in 1 acre blocks. A crew will proceed with cutting the trees, removing the wood, grubbing the stumps and chipping or burying the brush in a 1-acre portion. Water bars will be installed and disturbed areas stabilized with seed and mulch prior to moving to the next 1-acre area. The clearing crew will continue to work clearing and area, stabilizing it and then moving to the next area, until all the clearing is done.

When the clearing is done in an area, a grading crew will follow, grading the areas as needed. When grading is completed in an area, a mulching/stabilization crew will follow seeding and mulching disturbed areas and constructing and maintaining water bars. The grading crew and the clearing crews will work independently of each other.

A temporary work road will be used during construction to haul marketable timber from the work areas to the staging area. This work road will be open during the clearing and grading activities and shall implement water bars to control runoff.

No more than one acre of land will be exposed on any ski trail section at any time during the clearing and grading operations. Disturbed areas must be seeded and temporarily stabilized with mulch for vegetative growth before additional areas can be disturbed.

Clearing

- Clearing shall consist of the complete cutting and removal of all trees, down timber, brush and related growth within the designated areas. Poor risk trees within a distance equal to the total height of the tree from any ski trail or lift line may be felled and removed.
- Marketable timber in the area to be cleared can be harvested and sold. Removal of the timber must be done in such a manner to minimize soil disturbance. Timber can be staged at the base of the slope at the staging area for removal from site.
- Brush, limb wood, and other small woody debris can be chipped at their source if this appears to be more convenient and if it can be done without undue disturbance of the terrain.
    - Chips can be spread onsite however, to encourage vegetation growth through the mulch, it cannot be spread thicker than 2” deep.
- When completed, the designated areas shall be free of all brush, trees, and related growth.
- Machinery may not be operated outside the clearing limits without specific permission from the construction supervisor.
- Apply a hydroseed mixture of wood fiber mulch with tackifying agent to all slopes greater than 3:1.

Grading

- All clearing shall be graded according to a schedule which allows no more than one acre of land to be exposed on any trail section at any time between the grading and stabilization/mulching crews.
- Grading with the use of bulldozers and/or excavators shall consist of shaping the trails and will include the removal and/or burial of all stumps and large rocks and implementation of the appropriate erosion control methods.
- Topsoil may be stripped and stock piled for use during fine grading. Topsoil stock piles will have silt fence staked down on the downhill perimeter. If stock piles are to remain for more than a week, they will be mulched.
- Ledges, when they protrude above the desired grade, may be drilled and blasted where necessary to permit removal during rough grading.
- In areas of smooth surface ledge, or ledge just slightly below the natural surface, dozing will proceed so as not to disturb valuable existing overburden.
- The outside limits of trails are to remain clean and free of any disposed material except insofar as the material is needed for proper shaping or drainage.

- Care shall be exercised so as not to destroy woods growth and the root systems of trees bordering the trail.
- Water bars shall have a 2 - 5% longitudinal slope if stable outlet locations do not exist. Stabilized outlets will be constructed at the end of all water bars. All water bars will be checked at the termination of each work day to ensure their proper function and repaired as needed.
- Water bars, drainages, and culverts shall be extended beyond the cutting limits of the trail if this is required to prevent water from running back onto the trail surface.
- Apply a hydroseed mixture of wood fiber mulch with tackifying agent to all slopes greater than 3:1.
- Any washouts or related erosion will be repaired immediately.
- Strict erosion control measures shall be followed at all times. Traffic shall be confined to established work roads unless specific permission for other travel is received beforehand from the construction supervisor. All water bars on work roads shall be repaired to their proper condition at the end of each work day.

6.2 Post Construction Stormwater Management Practices

Post construction stormwater management practices to be utilized to treat the Water Quality Volume and detain peak storms when construction of an area is completed will consist of Micro-pool Extended Detention Stormwater Ponds (P-1), Dry Swales (O-1), Bioretention (F-5) and Wet Extended Detention Pond (P-3).

Also in addition to the post construction stormwater management practices, there will be Green Infrastructure Practices installed to reduce the Water Quality Volume. These Green Infrastructure Practices include: Conservation of Natural Areas, Bioretention, Green Roof, Dry Swale, Cistern/Irrigation Pond, Stormwater Planters and Porous Pavement.

Details of the post construction stormwater management practices are provided in the Details Sheets L8.0-L8.03 in the SDEIS and in the Stormwater Management Report provided in Appendix C of this SWPPP.

6.2.1 Soil Restoration

All compacted areas on the Project Site will receive soil restoration in the final stages of construction during the final landscaping. The following table discusses what soil restoration practices will be required depending on the type of soil disturbance. Seeding and mulching of the restored areas will be done soon after Soil Restoration is applied. A copy of the NYSDEC, 2008 De-Compaction Specifications are attached in Appendix E of this SWPPP.

Table 3. Soil Restoration Requirements

Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
Minimal Soil Disturbance	Restoration not permitted		Preservation of Natural Features
Areas where topsoil is stripped only-no change in grade	Restoration not required		Clearing and Grubbing
Areas of cut and fill	HSG A& B	HSG C & D	
	apply 6 inches of topsoil	Aerate* and apply 6 inches of topsoil	
Heavy traffic areas onsite (especially in a zone 5-25 feet around buildings, but not within a 5 foot perimeter around foundation walls)	HSG A& B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration**	
Areas where Runoff Reduction and/or infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area.

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

**Per "Deep Ripping and Decopmpaction, DEC 2008"

6.2.2 Posting of the Post Construction Stormwater Management Practices

An owner of a post-construction stormwater management practice, including the green infrastructure runoff reduction practices, shall erect or post, in the immediate vicinity of the stormwater management practice, a conspicuous and legible sign of not less than 18 inches by 24 inches (or 10"X12" for footprints smaller than 400 sf) bearing the following information:

STORMWATER MANAGEMENT PRACTICE - (*name of the practice*) Project Identification - (*SPDES Construction Permit #, other)* Must Be Maintained In Accordance With O&M Plan DO NOT REMOVE OR ALTER

Example:

STORMWATER MANAGEMENT PRACTICE – Rain Garden Project Identification - SPDES NYR10K123 Must Be Maintained In Accordance With O&M Plan DO NOT REMOVE OR ALTER

6.2.3 Enhanced Phosphorus Standards

This project is located in the New York City Watershed and is subject to phosphorus restrictions. The Ashokan reservoir watershed is phosphorus limited. Nineteen acres of this Project is proposed within the Ashokan reservoir watershed. The Pepacton reservoir watershed is a total maximum daily load (TMDL) reservoir for phosphorus. A majority of this Project (719 acres) is within the Pepacton reservoir watershed.

The NYCDEP requirement of redundant practices was not applied to the Project Site because there were no impervious surface percentages of the proposed development exceeding 20% draining to a Design Point.

An estimation of the total phosphorus and total suspended solids (TSS) loading for the Phase 1 of the Modified Belleayre Resort at Catskill Park was assembled to adequately describe the loading calculated from a “Simple Method.” The use of this method was approved in the Commissioner’s Interim Decision and was agreed upon by NYSDEC and NYCDEP.

Total phosphorus mass loads were calculated for existing and proposed conditions by assuming a loading rate for the cover types of a given design point (woods, impervious surface, fairway grass, and vacant land.) These values were taken from a variety of sources but primarily from NYCDEP documents, (all sources used are identified). These estimates were multiplied for the given acreages and the given covertype for the existing and proposed conditions to estimate a total mass load.

After the phosphorus mass load estimates were calculated for the existing and proposed conditions, a phosphorus reduction percentage was assumed for the various post-construction stormwater management practices proposed onsite. The proposed conditions phosphorus load that is treated by the specific post-construction stormwater management practice was then reduced to reflect the estimated mass phosphorus load assumed by the proposed Project. Section 6.3 summarizes the mass phosphorus estimated loading. Some assumptions in this model were made and are described below:

- The pervious pavement areas and dirt roads were assumed to be impervious.
- The Green Roofs were assumed to have no reduction in the phosphorus content of their respective subcatchments.

Section 6.3 contains the calculations of the existing and proposed mass phosphorus and TSS loads of the site and tables 6 through 9 summarizes the mass phosphorus and TSS reduction provided by the post-construction stormwater management practices for their respective subcatchments draining to a given design point. This value is then compared to the existing conditions to show the net change.

6.2.4 Hydraulic and Hydrologic Analysis

The program utilized for quantifying stormwater runoff rates and volumes was ***HydroCAD*** software (version 9.10), produced by HydroCAD Software Solutions, LLC. The SCS 24-hour Type II design storms for 1, 10, 25 and 100-year frequency rainfall were analyzed. The use of HydroCAD was approved by the Interim Decision of the Commissioner, NYSDEC and the NYCDEP.

- ✓ Hydrologic/hydraulic analysis for all structural components of the stormwater control system for the applicable design storms (see **Appendix C**).
- ✓ Comparison of post-development stormwater runoff conditions with pre-development conditions (see **Appendix C**).
- ✓ Dimensions, material specifications and installation details for each post-construction stormwater control practice (see **Sheets L8.0-L8.03 For Details**)

6.2.5 Comparison of Pre and Post Construction Stormwater Runoff

Stormwater Quantity. These calculations are based on the HydroCAD analysis.

Table 4. Peak Storm Flows and Channel Protection Volume

	Required	**Provided**
1 year, 24 hour storm (CPv)	8.23 AC FT	9.51 AC FT
	Pre Development	**Post Development**
10 year, 24 hour storm (Qp)	1,761.4 CFS	1,332.4 CFS
25 year, 24 hour storm	2,028.2 CFS	1,569.0 CFS
100 year, 24 hour storm (Qf)	2,859.4 CFS	2,318.3 CFS

Water Quality Volume Calculations

The following was utilized to determine water quality volume:

$$WQ_V = \frac{(P)\,(R_V)(A)}{12}$$

Where:
WQ_V= Water Quality Volume (acre/feet)
P = 90% Rainfall Event (1.0 inches for this area)
R_V = 0.05 + 0.009(I) where I is impervious cover in percent
A = Subcatchment area in acres

The required water quality volume for the entire site is calculated to be 4.88 ac-ft, whereas the provided water quality volume will be 12.41 ac-ft.

6.3 Stormwater Quality Discharges

6.3.1 Introduction and Method

This section of the SWPPP will discuss stormwater quality discharges from Wildacres and Highmount Spa. To assess the potential for new loadings of total phosphorus and total suspended solids, a calculation method was prepared based on the Washington Metropolitan Council of Governments (Schueler 1987) and NYCDEP Guidance for Phosphorus Offset Pilot Programs (1997).

This calculation protocol was submitted as a part of the issue conference hearing process in 2004 (Crossroads Ventures LLC 2004). Values utilized in the August 2004 submittal were used to prepare the loading estimates for the Wildacres project. Table 5, “Conversion and Loading Rates,” is modified from the August 2004 report to include additional loading rates for the post-construction condition. The existing condition or preconstruction loading rates have not been changed.

The variation in the reservoir concentration has been very small over the period of 1999-2008 (NYCDEP 2009). Continued use of the base loading estimates from the 2004 effort will be a satisfactory method to determine preconstruction loadings, since water quality in the reservoir has not fluctuated widely.

Prior analysis of stormwater flows using the direct calculation demonstrated that the largest influence on discharge quality was the variation in rainfall, and therefore, the volume of flow based on an average rainfall of 50.4 inches used in 2004 will continue to be used.

Treatment removal estimates were obtained from the NYSDEC Manual and various other sources. Over the past seven years, various studies have been completed to evaluate and understand removal capability of stormwater treatment devices. These studies have continued to find great variability in removal efficiency of stormwater devices, which in some cases can be accounted for by slightly different construction techniques, quality of construction, climatic differences, age of system, frequency of water quality measurements, and types of rainfall or rainfall intensity (Roseen et al. 2009).

The percent removal for TSS in the direct calculation is 80%, and for phosphorus 40% removal is utilized, as recommended in the NYSDEC Stormwater Design Manual (last revised August, 2010).

Table 5. Loading Rates, Conversion Factors, and Data Sources

Conversion Factors

1 µg/l = 0.001 g/m^3
1 lb = 0.4535 kg
1 acre = 4047 m^2
1 inch = 0.0254 m

Other Constants

Parameter	Value	Source
Annual Rainfall	50.0 in.	NYC DEP 1997
Runoff coefficient (vegetated)	0.64	
Runoff coefficient (impervious)	0.98	
Total Phosphorus (TP)		
Impervious TP concentration	0.26 mg/l	USEPA 1983, NYCDEP 1997
Forest TP concentration	0.02005 mg/l	
Vacant Land TP concentration	0.14 mg/l	
Golf course TP concentration	0.227 kg/acre/yr	NYCDEP 1997
Total Suspended Solids (TSS)		
Impervious TSS concentration	150 mg/l	USEPA 1983
Forest TSS concentration	37 mg/l	USEPA 1983
Landscape TSS concentration	37 mg/l	USEPA 1983
Golf Course TSS concentration	37 mg/l	USEPA 1983

A series of spreadsheets was organized to estimate the loading to each discharge point. In the Wildacres and Highmount project site, each discharge point is composed of multiple subcatchments. In each subcatchment there are varying levels of development and mixes of covertypes. Each covertype has a different loading rate that has to be evaluated separately. The project site has 16 discharge locations along the north side of Wildacres and Highmount Spa. Each of the discharge points is independent and does not flow along a common watercourse on the project property. Eventually, the discharges do reach Emory Brook.

The general form of the equation is:

Loading = Pollutant Concentration 3 Area 3 Rainfall 3 Runoff Factor

In some cases, input data from other computer models is used, as is the case for the loading from the golf course. In that case, the discharge rate has already incorporated rainfall and the runoff factor.

Table 5, "Loading Rates, Conversion Factors, and Data Sources," identifies the sources used in the spreadsheet.

Table 6. Direct Calculation of Mass Loading for Total Phosphorus

Pre Development		Post Development	
Design Point 1a Total acreage 4.64		Design Point 1a Total acreage 4.71	
Forest	0.22	Forest	0.21
(0.00002005kg/m3) (3.39acres* 4047m2) (1.27m) (0.64) = 0.22		(0.00002005kg/m3) (3.11acres* 4047m2) (1.27m) (0.64) = 0.21	
Impervious	0.30	Impervious	0.75
(0.00026kg/m3) (0.23acres* 4047m2) (1.27m) (0.98) = 0.3		(0.00026kg/m3) (0.57acres* 4047m2) (1.27m) (0.98) = 0.75	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.47	Vacant Land	0.47
(0.00014kg/m3) (1.02acres* 4047m2) (1.27m) (0.64) = 0.47		(0.00014kg/m3) (1.03acres* 4047m2) (1.27m) (0.64) = 0.47	
Total kg of P per year	**0.99**	**Total kg of P per year**	**1.43**

		-	
Pre Development		Post Development	
Design Point 2 Total acreage 39.11		Design Point 2 Total acreage 31.94	
Forest	2.32	Forest	1.38
(0.00002005kg/m3) (35.16acres* 4047m2) (1.27m) (0.64) = 2.32		(0.00002005kg/m3) (20.98acres* 4047m2) (1.27m) (0.64) = 1.38	
Impervious	1.16	Impervious	0.97
(0.00026kg/m3) (0.88acres* 4047m2) (1.27m) (0.98) = 1.16		(0.00026kg/m3) (0.74acres* 4047m2) (1.27m) (0.98) = 0.97	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	1.41	Vacant Land	4.71
(0.00014kg/m3) (3.06acres* 4047m2) (1.27m) (0.64) = 1.41		(0.00014kg/m3) (10.22acres* 4047m2) (1.27m) (0.64) = 4.71	
Total kg of P per year	**4.89**	**Total kg of P per year**	**7.06**

Table 6, continued.

Pre Development		Post Development	
Design Point 3 Total acreage 2.20		Design Point 3 Total acreage 0.71	
Forest	0.08	Forest	-
(0.00002005kg/m3) (1.28acres* 4047m2) (1.27m) (0.64) = 0.08		(0.00002005kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Impervious	0.12	Impervious	0.31
(0.00026kg/m3) (0.09acres* 4047m2) (1.27m) (0.98) = 0.12		(0.00026kg/m3) (0.24acres* 4047m2) (1.27m) (0.98) = 0.31	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.38	Vacant Land	0.22
(0.00014kg/m3) (0.83acres* 4047m2) (1.27m) (0.64) = 0.38		(0.00014kg/m3) (0.47acres* 4047m2) (1.27m) (0.64) = 0.22	
Total kg of P per year	**0.58**	**Total kg of P per year**	**0.53**

Pre Development		Post Development	
Design Point 4 Total acreage 10.00		Design Point 4 Total acreage 22.18	
Forest	0.43	Forest	0.15
(0.00002005kg/m3) (6.55acres* 4047m2) (1.27m) (0.64) = 0.43		(0.00002005kg/m3) (2.32acres* 4047m2) (1.27m) (0.64) = 0.15	
Impervious	0.28	Impervious	3.93
(0.00026kg/m3) (0.21acres* 4047m2) (1.27m) (0.98) = 0.28		(0.00026kg/m3) (3acres* 4047m2) (1.27m) (0.98) = 3.93	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	1.49	Vacant Land	7.76
(0.00014kg/m3) (3.24acres* 4047m2) (1.27m) (0.64) = 1.49		(0.00014kg/m3) (16.86acres* 4047m2) (1.27m) (0.64) = 7.76	
Total kg of P per year	**2.20**	**Total kg of P per year**	**11.84**

Table 6, continued.

<u>Pre Development</u>		<u>Post Development</u>	
Design Point 5 Total acreage 14.63		Design Point 5 Total acreage 9.41	
Forest	0.94	Forest	0.49
(0.00002005kg/m3) (14.25acres* 4047m2) (1.27m) (0.64) = 0.94		(0.00002005kg/m3) (7.37acres* 4047m2) (1.27m) (0.64) = 0.49	
Impervious	0.24	Impervious	0.21
(0.00026kg/m3) (0.18acres* 4047m2) (1.27m) (0.98) = 0.24		(0.00026kg/m3) (0.16acres* 4047m2) (1.27m) (0.98) = 0.21	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.09	Vacant Land	0.87
(0.00014kg/m3) (0.19acres* 4047m2) (1.27m) (0.64) = 0.09		(0.00014kg/m3) (1.88acres* 4047m2) (1.27m) (0.64) = 0.87	
Total kg of P per year	**1.27**	**Total kg of P per year**	**1.57**
<u>Pre Development</u>		<u>Post Development</u>	
Design Point 5a Total acreage 12.20		Design Point 5a Total acreage 13.04	
Forest	0.79	Forest	0.58
(0.00002005kg/m3) (11.94acres* 4047m2) (1.27m) (0.64) = 0.79		(0.00002005kg/m3) (8.77acres* 4047m2) (1.27m) (0.64) = 0.58	
Impervious	0.23	Impervious	0.07
(0.00026kg/m3) (0.17acres* 4047m2) (1.27m) (0.98) = 0.23		(0.00026kg/m3) (0.06acres* 4047m2) (1.27m) (0.98) = 0.07	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.04	Vacant Land	1.94
(0.00014kg/m3) (0.08acres* 4047m2) (1.27m) (0.64) = 0.04		(0.00014kg/m3) (4.21acres* 4047m2) (1.27m) (0.64) = 1.94	
Total kg of P per year	**1.06**	**Total kg of P per year**	**2.59**

Table 6, continued.

Pre Development		Post Development	
Design Point 6 Total acreage 58.77		Design Point 6 Total acreage 58.47	
Forest	3.71	Forest	2.35
(0.00002005kg/m3) (56.3acres* 4047m2) (1.27m) (0.64) = 3.71		(0.00002005kg/m3) (35.68acres* 4047m2) (1.27m) (0.64) = 2.35	
Impervious	2.76	Impervious	0.25
(0.00026kg/m3) (2.11acres* 4047m2) (1.27m) (0.98) = 2.76		(0.00026kg/m3) (0.19acres* 4047m2) (1.27m) (0.98) = 0.25	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.17	Vacant Land	10.41
(0.00014kg/m3) (0.36acres* 4047m2) (1.27m) (0.64) = 0.17		(0.00014kg/m3) (22.6acres* 4047m2) (1.27m) (0.64) = 10.41	
Total kg of P per year	**6.64**	**Total kg of P per year**	**13.01**

Pre Development		Post Development	
Design Point 6a Total acreage 41.78		Design Point 6A Total acreage 41.78	
Forest	2.48	Forest	2.48
(0.00002005kg/m3) (37.6acres* 4047m2) (1.27m) (0.64) = 2.48		(0.00002005kg/m3) (37.6acres* 4047m2) (1.27m) (0.64) = 2.48	
Impervious	2.42	Impervious	2.42
(0.00026kg/m3) (1.85acres* 4047m2) (1.27m) (0.98) = 2.42		(0.00026kg/m3) (1.85acres* 4047m2) (1.27m) (0.98) = 2.42	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	-
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0acres) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	1.07	Vacant Land	1.07
(0.00014kg/m3) (2.33acres* 4047m2) (1.27m) (0.64) = 1.07		(0.00014kg/m3) (2.33acres* 4047m2) (1.27m) (0.64) = 1.07	
Total kg of P per year	**5.97**	**Total kg of P per year**	**5.97**

Table 6, continued.

Pre Development		Post Development	
Design Point 7 Total acreage 148.77		Design Point 7 Total acreage 130.68	
Forest	8.95	Forest	6.66
(0.00002005kg/m3) (135.64acres* 4047m2) (1.27m) (0.64) = 8.95		(0.00002005kg/m3) (100.91acres* 4047m2) (1.27m) (0.64) = 6.66	
Impervious	2.02	Impervious	3.13
(0.00026kg/m3) (1.54acres* 4047m2) (1.27m) (0.98) = 2.02		(0.00026kg/m3) (2.39acres* 4047m2) (1.27m) (0.98) = 3.13	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	1.35
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (5.93acres) = 1.35	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	5.34	Vacant Land	9.88
(0.00014kg/m3) (11.59acres* 4047m2) (1.27m) (0.64) = 5.34		(0.00014kg/m3) (21.45acres* 4047m2) (1.27m) (0.64) = 9.88	
Total kg of P per year	**16.31**	**Total kg of P per year**	**21.02**

Pre Development		Post Development	
Design Point 8 Total acreage 95.97		Design Point 8 Total acreage 111.27	
Forest	5.99	Forest	3.03
(0.00002005kg/m3) (90.86acres* 4047m2) (1.27m) (0.64) = 5.99		(0.00002005kg/m3) (45.9acres* 4047m2) (1.27m) (0.64) = 3.03	
Impervious	2.35	Impervious	11.71
(0.00026kg/m3) (1.79acres* 4047m2) (1.27m) (0.98) = 2.35		(0.00026kg/m3) (8.94acres* 4047m2) (1.27m) (0.98) = 11.71	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	5.83
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (25.66acres) = 5.83	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	1.53	Vacant Land	14.17
(0.00014kg/m3) (3.32acres* 4047m2) (1.27m) (0.64) = 1.53		(0.00014kg/m3) (30.77acres* 4047m2) (1.27m) (0.64) = 14.17	
Total kg of P per year	**9.87**	**Total kg of P per year**	**34.74**

Table 6, continued.

Pre Development		Post Development	
Design Point 9 Total acreage 56.37		Design Point 9 Total acreage 45.92	
Forest	2.90	Forest	1.15
(0.00002005kg/m3) (43.98acres* 4047m2) (1.27m) (0.64) = 2.9		(0.00002005kg/m3) (17.41acres* 4047m2) (1.27m) (0.64) = 1.15	
Impervious	2.35	Impervious	6.51
(0.00026kg/m3) (1.79acres* 4047m2) (1.27m) (0.98) = 2.35		(0.00026kg/m3) (4.97acres* 4047m2) (1.27m) (0.98) = 6.51	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	1.66
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (7.3acres) = 1.66	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	4.88	Vacant Land	7.48
(0.00014kg/m3) (10.59acres* 4047m2) (1.27m) (0.64) = 4.88		(0.00014kg/m3) (16.25acres* 4047m2) (1.27m) (0.64) = 7.48	
Total kg of P per year	**10.13**	**Total kg of P per year**	**16.80**

Pre Development		Post Development	
Design Point 10 Total acreage 162.26		Design Point 10 Total acreage 157.34	
Forest	9.65	Forest	9.23
(0.00002005kg/m3) (146.3acres* 4047m2) (1.27m) (0.64) = 9.65		(0.00002005kg/m3) (140acres* 4047m2) (1.27m) (0.64) = 9.23	
Impervious	3.33	Impervious	3.61
(0.00026kg/m3) (2.54acres* 4047m2) (1.27m) (0.98) = 3.33		(0.00026kg/m3) (2.76acres* 4047m2) (1.27m) (0.98) = 3.61	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	0.11
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0.49acres) = 0.11	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	6.18	Vacant Land	6.49
(0.00014kg/m3) (13.42acres* 4047m2) (1.27m) (0.64) = 6.18		(0.00014kg/m3) (14.09acres* 4047m2) (1.27m) (0.64) = 6.49	
Total kg of P per year	**19.16**	**Total kg of P per year**	**19.44**

Table 6, continued.

Pre Development		Post Development	
Design Point 11 Total acreage 66.27		Design Point 11 Total acreage 89.65	
Forest	4.24	Forest	1.81
(0.00002005kg/m3) (64.24acres* 4047m2) (1.27m) (0.64) = 4.24		(0.00002005kg/m3) (27.4acres* 4047m2) (1.27m) (0.64) = 1.81	
Impervious	1.27	Impervious	20.87
(0.00026kg/m3) (0.97acres* 4047m2) (1.27m) (0.98) = 1.27		(0.00026kg/m3) (15.93acres* 4047m2) (1.27m) (0.98) = 20.87	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	3.76
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (16.57acres) = 3.76	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.49	Vacant Land	13.70
(0.00014kg/m3) (1.06acres* 4047m2) (1.27m) (0.64) = 0.49		(0.00014kg/m3) (29.74acres* 4047m2) (1.27m) (0.64) = 13.7	
Total kg of P per year	**6.00**	**Total kg of P per year**	**40.14**

Pre Development		Post Development	
Design Point 12 Total acreage 7.26		Design Point 12 Total acreage 5.40	
Forest	0.34	Forest	0.10
(0.00002005kg/m3) (5.12acres* 4047m2) (1.27m) (0.64) = 0.34		(0.00002005kg/m3) (1.47acres* 4047m2) (1.27m) (0.64) = 0.1	
Impervious	1.19	Impervious	1.60
(0.00026kg/m3) (0.9acres* 4047m2) (1.27m) (0.98) = 1.19		(0.00026kg/m3) (1.22acres* 4047m2) (1.27m) (0.98) = 1.6	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	0.01
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (0.05acres) = 0.01	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	0.57	Vacant Land	1.22
(0.00014kg/m3) (1.24acres* 4047m2) (1.27m) (0.64) = 0.57		(0.00014kg/m3) (2.66acres* 4047m2) (1.27m) (0.64) = 1.22	
Total kg of P per year	**2.10**	**Total kg of P per year**	**2.93**

Table 6, continued.

Pre Development		Post Development	
Design Point 16 Total acreage 18.79		Design Point 16 Total acreage 18.37	
Forest	1.19	Forest	0.49
(0.00002005kg/m3) (17.98acres* 4047m2) (1.27m) (0.64) = 1.19		(0.00002005kg/m3) (7.36acres* 4047m2) (1.27m) (0.64) = 0.49	
Impervious	1.06	Impervious	1.90
(0.00026kg/m3) (0.81acres* 4047m2) (1.27m) (0.98) = 1.06		(0.00026kg/m3) (1.45acres* 4047m2) (1.27m) (0.98) = 1.9	
Landscape	-	Landscape	-
(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00026kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0	
Golf Course	-	Golf Course	1.48
(0.227kg/Ac) * (0acres) = 0		(0.227kg/Ac) * (6.53acres) = 1.48	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.449kg/Ac) * (0acres) =0		(0.449kg/Ac) * (0acres) =0	
Vacant Land	-	Vacant Land	1.39
(0.00014kg/m3) (0acres* 4047m2) (1.27m) (0.64) = 0		(0.00014kg/m3) (3.03acres* 4047m2) (1.27m) (0.64) = 1.39	
Total kg of P per year	**2.25**	**Total kg of P per year**	**5.26**

Table 7. Summary of Total Phosphorus Loading

Design Point	Practices in Design Point Subcatchments	% P Removal from SW Practice	Annual Mass-P Loading from Direct Calculation for Proposed Conditions Design Point (kg)	Annual Mass-P Loading Broken into individual Subcatchments in Design Point (kg)	Annual Mass-P Discharge from SW Practice(s) Based Upon Subcatchment Area in Design Point (kg)	Annual Mass-P Discharge from SW Practice(s) in Design Point (kg)	Annual Mass-P Loading for Existing Conditions in Design Point (kg)	Net Change of Mass-P Loading (Proposed-Existing) (kg)
0.1a	Bioretention	40%	1.4	1.1	0.6	1.0	1.0	0.0
	Undisturbed	0%		0.4	0.4			
2	Undisturbed	0%	7.1	7.1	7.1	7.1	4.9	-2.2
3	Undisturbed	0%	0.5	0.5	0.5	0.5	0.6	
4	Green Roof/Pond	40%	11.8	4.1	2.5	7.3	2.2	5.1
	Dry swale	40%		1.0	0.6			
	Pond	40%		5.6	3.4			
	Undisturbed	0%		0.9	0.9			
5	Undisturbed	0%	1.6	1.6	1.6	1.6	1.3	0.3
5a	Undisturbed	0%	2.3	2.6	2.6	2.6	1.1	1.5
6	Undisturbed	0%	13.01	13.0	13.0	13.0	6.6	6.4
6a	Undisturbed	0%	6.0	6.0	6.0	6.0	6.0	0.0
7	Swale	40%	21.0	3.9	2.4	19.4	16.3	3.1
	Undisturbed	0%		17.0	17.0			
8	Pond	40%	34.7	14.5	8.7	25.2	9.9	15.3
	Dry Swale	40%		6.9	4.1			
	Bioretention	40%		2.4	1.4			
	Undisturbed	0%		11.0	11.0			
9	SW Planters	40%	16.8	1.1	0.7	12.3	10.1	2.2
	Swale	40%		1.2	0.7			
	Pond	40%		6.6	4.0			
	Undisturbed	0%		6.9	6.9			
10	Undisturbed	0%	19.4	19.4	19.4	19.4	19.2	0.2
11	Swale	40%	40.1	4.8	2.9	26.6	6.0	20.6
	Bioretention	40%		4.9	2.9			
	Pond	40%		24.3	14.6			
	Undisturbed	0%		6.2	6.2			
12	Undisturbed	0%	2.9	2.9	2.9	2.9	2.1	0.8
16	Bioretention	40%	5.3	3.4	2.0	3.9	2.3	1.7
	Undisturbed	0%		1.9	1.9			
		Total	**184.3**	**183.1**	**148.8**	**148.8**	**89.4**	**55.1**

Table 8. Direct Calculation of Mass Loading for TSS

Pre Development		Post Development	
Design Point 1a Total acreage 4.64		Design Point 1a Total acreage 4.71	
Forest	387.2	Forest	355.3
(0.037kg/m3) (3.39acres* 4047m2) (1.27m) (0.6) = 387.17		(0.037kg/m3) (3.11acres* 4047m2) (1.27m) (0.6) = 355.3	
Impervious	174.2	Impervious	430.2
(0.15kg/m3) (0.23acres* 4047m2) (1.27m) (0.98) = 174.19		(0.15kg/m3) (0.57acres* 4047m2) (1.27m) (0.98) = 430.22	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	115.9	Vacant Land	117.1
(0.037kg/Ac) * (1.02acres) * 4047m2) (1.27m) (0.6) = 115.91		(0.037kg/m3) * (1.03acres) =* 4047m2) (1.27m) (0.6) = 117.1	
Total TSS kg/Year	**677.3**	**Total TSS kg/Year**	**902.6**
Pre Development		Post Development	
Design Point 2 Total acreage 39.11		Design Point 2 Total acreage 31.94	
Forest	4,012.4	Forest	2,393.7
(0.037kg/m3) (35.16acres* 4047m2) (1.27m) (0.6) = 4012.36		(0.037kg/m3) (20.98acres* 4047m2) (1.27m) (0.6) = 2393.74	
Impervious	667.9	Impervious	559.9
(0.15kg/m3) (0.88acres* 4047m2) (1.27m) (0.98) = 667.89		(0.15kg/m3) (0.74acres* 4047m2) (1.27m) (0.98) = 559.85	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	349.0	Vacant Land	1,166.4
(0.037kg/Ac) * (3.06acres) * 4047m2) (1.27m) (0.6) = 349.04		(0.037kg/m3) * (10.22acres) =* 4047m2) (1.27m) (0.6) = 1166.41	
Total TSS kg/Year	**5,029.3**	**Total TSS kg/Year**	**4,120.0**

Table 8, continued.

Pre Development		Post Development	
Design Point 3 Total acreage 2.20		Design Point 3 Total acreage 0.71	
Forest	145.8	Forest	-
(0.037kg/m3) (1.28acres* 4047m2) (1.27m) (0.6) = 145.82		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Impervious	69.5	Impervious	178.5
(0.15kg/m3) (0.09acres* 4047m2) (1.27m) (0.98) = 69.52		(0.15kg/m3) (0.24acres* 4047m2) (1.27m) (0.98) = 178.51	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	94.2	Vacant Land	53.9
(0.037kg/Ac) * (0.83acres) * 4047m2) (1.27m) (0.6) = 94.2		(0.037kg/m3) * (0.47acres) =* 4047m2) (1.27m) (0.6) = 53.91	
Total TSS kg/Year	**309.5**	**Total TSS kg/Year**	**232.4**

Pre Development		Post Development	
Design Point 4 Total acreage 10.00		Design Point 4 Total acreage 22.18	
Forest	747.4	Forest	264.3
(0.037kg/m3) (6.55acres* 4047m2) (1.27m) (0.6) = 747.36		(0.037kg/m3) (2.32acres* 4047m2) (1.27m) (0.6) = 264.28	
Impervious	160.9	Impervious	2,269.7
(0.15kg/m3) (0.21acres* 4047m2) (1.27m) (0.98) = 160.92		(0.15kg/m3) (3acres* 4047m2) (1.27m) (0.98) = 2269.65	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	369.7	Vacant Land	1,923.5
(0.037kg/Ac) * (3.24acres) * 4047m2) (1.27m) (0.6) = 369.69		(0.037kg/m3) * (16.86acres) =* 4047m2) (1.27m) (0.6) = 1923.47	
Total TSS kg/Year	**1,278.0**	**Total TSS kg/Year**	**4,457.4**

Table 8, continued.

Pre Development			Post Development		
Design Point 5	Total acreage 14.63		Design Point 5	Total acreage 9.41	
Forest		1,625.9	Forest		841.3
(0.037kg/m3) (14.25acres* 4047m2) (1.27m) (0.6) = 1625.94			(0.037kg/m3) (7.37acres* 4047m2) (1.27m) (0.6) = 841.31		
Impervious		136.8	Impervious		120.6
(0.15kg/m3) (0.18acres* 4047m2) (1.27m) (0.98) = 136.75			(0.15kg/m3) (0.16acres* 4047m2) (1.27m) (0.98) = 120.55		
Landscape		-	Landscape		-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0			(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		
Golf Course		-	Golf Course		-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0			(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0		
Composite golf course and landscape loading		-	Composite golf course and landscape loading		-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0			(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		
Vacant Land		22.3	Vacant Land		214.4
(0.037kg/Ac) * (0.19acres) * 4047m2) (1.27m) (0.6) = 22.25			(0.037kg/m3) * (1.88acres) =* 4047m2) (1.27m) (0.6) = 214.43		
Total TSS kg/Year		**1,784.9**	**Total TSS kg/Year**		**1,176.3**

Pre Development			Post Development		
Design Point 5a	Total acreage 12.20		Design Point 5A	Total acreage 13.04	
Forest		1,362.8	Forest		1,001.0
(0.037kg/m3) (11.94acres* 4047m2) (1.27m) (0.6) = 1362.82			(0.037kg/m3) (8.77acres* 4047m2) (1.27m) (0.6) = 1000.98		
Impervious		130.7	Impervious		43.3
(0.15kg/m3) (0.17acres* 4047m2) (1.27m) (0.98) = 130.71			(0.15kg/m3) (0.06acres* 4047m2) (1.27m) (0.98) = 43.26		
Landscape		-	Landscape		-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0			(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		
Golf Course		-	Golf Course		-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0			(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0		
Composite golf course and landscape loading		-	Composite golf course and landscape loading		-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0			(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		
Vacant Land		9.5	Vacant Land		480.4
(0.037kg/Ac) * (0.08acres) * 4047m2) (1.27m) (0.6) = 9.47			(0.037kg/m3) * (4.21acres) =* 4047m2) (1.27m) (0.6) = 480.37		
Total TSS kg/Year		**1,503.0**	**Total TSS kg/Year**		**1,524.6**

Table 8, continued.

Pre Development		Post Development	
Design Point 6 Total acreage 58.77		Design Point 6 Total acreage 58.47	
Forest	6,424.4	Forest	4,071.1
(0.037kg/m3) (56.3acres* 4047m2) (1.27m) (0.6) = 6424.35		(0.037kg/m3) (35.68acres* 4047m2) (1.27m) (0.6) = 4071.13	
Impervious	1,591.9	Impervious	143.6
(0.15kg/m3) (2.11acres* 4047m2) (1.27m) (0.98) = 1591.91		(0.15kg/m3) (0.19acres* 4047m2) (1.27m) (0.98) = 143.56	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	41.0	Vacant Land	2,578.7
(0.037kg/Ac) * (0.36acres) * 4047m2) (1.27m) (0.6) = 40.96		(0.037kg/m3) * (22.6acres) =* 4047m2) (1.27m) (0.6) = 2578.69	
Total TSS kg/Year	**8,057.2**	**Total TSS kg/Year**	**6,793.4**

Pre Development		Post Development	
Design Point 6a Total acreage 41.78		Design Point 6A Total acreage 41.78	
Forest	4,290.4	Forest	4,290.4
(0.037kg/m3) (37.6acres* 4047m2) (1.27m) (0.6) = 4290.43		(0.037kg/m3) (37.6acres* 4047m2) (1.27m) (0.6) = 4290.43	
Impervious	1,396.2	Impervious	1,396.2
(0.15kg/m3) (1.85acres* 4047m2) (1.27m) (0.98) = 1396.23		(0.15kg/m3) (1.85acres* 4047m2) (1.27m) (0.98) = 1396.23	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0acres) =* 4047m2) (1.27m) (0.6) = 0	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	265.9	Vacant Land	265.9
(0.037kg/Ac) * (2.33acres) * 4047m2) (1.27m) (0.6) = 265.86		(0.037kg/m3) * (2.33acres) =* 4047m2) (1.27m) (0.6) = 265.86	
Total TSS kg/Year	**5,952.5**	**Total TSS kg/Year**	**5,952.5**

Table 8, continued.

Pre Development		Post Development	
Design Point 7 Total acreage 148.77		Design Point 7 Total acreage 130.68	
Forest	15,477.2	Forest	11,514.2
(0.037kg/m3) (135.64acres* 4047m2) (1.27m) (0.6) = 15477.21		(0.037kg/m3) (100.91acres* 4047m2) (1.27m) (0.6) = 11514.24	
Impervious	1,165.3	Impervious	1,804.5
(0.15kg/m3) (1.54acres* 4047m2) (1.27m) (0.98) = 1165.29		(0.15kg/m3) (2.39acres* 4047m2) (1.27m) (0.98) = 1804.52	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	676.8
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (5.93acres) =* 4047m2) (1.27m) (0.6) = 676.83	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	1,322.1	Vacant Land	2,447.2
(0.037kg/Ac) * (11.59acres) * 4047m2) (1.27m) (0.6) = 1322.13		(0.037kg/m3) * (21.45acres) =* 4047m2) (1.27m) (0.6) = 2447.22	
Total TSS kg/Year	**17,964.6**	**Total TSS kg/Year**	**16,442.8**

Pre Development		Post Development	
Design Point 8 Total acreage 95.97		Design Point 8 Total acreage 111.27	
Forest	10,367.7	Forest	5,236.9
(0.037kg/m3) (90.86acres* 4047m2) (1.27m) (0.6) = 10367.67		(0.037kg/m3) (45.9acres* 4047m2) (1.27m) (0.6) = 5236.85	
Impervious	1,353.9	Impervious	6,754.3
(0.15kg/m3) (1.79acres* 4047m2) (1.27m) (0.98) = 1353.93		(0.15kg/m3) (8.94acres* 4047m2) (1.27m) (0.98) = 6754.31	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	2,928.3
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (25.66acres) =* 4047m2) (1.27m) (0.6) = 2928.29	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	378.4	Vacant Land	3,511.3
(0.037kg/Ac) * (3.32acres) * 4047m2) (1.27m) (0.6) = 378.36		(0.037kg/m3) * (30.77acres) =* 4047m2) (1.27m) (0.6) = 3511.29	
Total TSS kg/Year	**12,100.0**	**Total TSS kg/Year**	**18,430.7**

Table 8, continued.

Pre Development		Post Development	
Design Point 9 Total acreage 56.37		Design Point 9 Total acreage 45.92	
Forest	5,018.5	Forest	1,986.0
(0.037kg/m3) (43.98acres* 4047m2) (1.27m) (0.6) = 5018.51		(0.037kg/m3) (17.41acres* 4047m2) (1.27m) (0.6) = 1986	
Impervious	1,353.9	Impervious	3,756.3
(0.15kg/m3) (1.79acres* 4047m2) (1.27m) (0.98) = 1353.91		(0.15kg/m3) (4.97acres* 4047m2) (1.27m) (0.98) = 3756.25	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	832.7
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (7.3acres) =* 4047m2) (1.27m) (0.6) = 832.65	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	1,208.8	Vacant Land	1,854.1
(0.037kg/Ac) * (10.59acres) * 4047m2) (1.27m) (0.6) = 1208.79		(0.037kg/m3) * (16.25acres) =* 4047m2) (1.27m) (0.6) = 1854.13	
Total TSS kg/Year	**7,581.2**	**Total TSS kg/Year**	**8,429.0**

Pre Development		Post Development	
Design Point 10 Total acreage 162.26		Design Point 10 Total acreage 157.34	
Forest	16,692.6	Forest	15,974.3
(0.037kg/m3) (146.3acres* 4047m2) (1.27m) (0.6) = 16692.6		(0.037kg/m3) (140acres* 4047m2) (1.27m) (0.6) = 15974.28	
Impervious	1,921.0	Impervious	2,085.6
(0.15kg/m3) (2.54acres* 4047m2) (1.27m) (0.98) = 1921.01		(0.15kg/m3) (2.76acres* 4047m2) (1.27m) (0.98) = 2085.56	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	55.8
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0.49acres) =* 4047m2) (1.27m) (0.6) = 55.78	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	1,531.2	Vacant Land	1,607.8
(0.037kg/Ac) * (13.42acres) * 4047m2) (1.27m) (0.6) = 1531.24		(0.037kg/m3) * (14.09acres) =* 4047m2) (1.27m) (0.6) = 1607.8	
Total TSS kg/Year	**20,144.9**	**Total TSS kg/Year**	**19,723.4**

Table 8, continued.

Pre Development		Post Development	
Design Point 11 Total acreage 66.27		Design Point 11 Total acreage 89.65	
Forest	7,329.7	Forest	3,126.1
(0.037kg/m3) (64.24acres* 4047m2) (1.27m) (0.6) = 7329.74		(0.037kg/m3) (27.4acres* 4047m2) (1.27m) (0.6) = 3126.14	
Impervious	732.9	Impervious	12,039.2
(0.15kg/m3) (0.97acres* 4047m2) (1.27m) (0.98) = 732.88		(0.15kg/m3) (15.93acres* 4047m2) (1.27m) (0.98) = 12039.23	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	1,891.1
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (16.57acres) =* 4047m2) (1.27m) (0.6) = 1891.09	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	121.4	Vacant Land	3,393.5
(0.037kg/Ac) * (1.06acres) * 4047m2) (1.27m) (0.6) = 121.4		(0.037kg/m3) * (29.74acres) =* 4047m2) (1.27m) (0.6) = 3393.52	
Total TSS kg/Year	**8,184.0**	**Total TSS kg/Year**	**20,450.0**

Pre Development		Post Development	
Design Point 12 Total acreage 7.26		Design Point 12 Total acreage 5.40	
Forest	584.1	Forest	168.0
(0.037kg/m3) (5.12acres* 4047m2) (1.27m) (0.6) = 584.06		(0.037kg/m3) (1.47acres* 4047m2) (1.27m) (0.6) = 168.01	
Impervious	683.7	Impervious	922.1
(0.15kg/m3) (0.9acres* 4047m2) (1.27m) (0.98) = 683.66		(0.15kg/m3) (1.22acres* 4047m2) (1.27m) (0.98) = 922.11	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	5.4
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (0.05acres) =* 4047m2) (1.27m) (0.6) = 5.4	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	141.6	Vacant Land	303.3
(0.037kg/Ac) * (1.24acres) * 4047m2) (1.27m) (0.6) = 141.58		(0.037kg/m3) * (2.66acres) =* 4047m2) (1.27m) (0.6) = 303.27	
Total TSS kg/Year	**1,409.3**	**Total TSS kg/Year**	**1,398.8**

Table 8, continued.

Pre Development		Post Development	
Design Point 16 Total acreage 18.79		Design Point 16 Total acreage 18.37	
Forest	2,051.5	Forest	839.6
(0.037kg/m3) (17.98acres* 4047m2) (1.27m) (0.6) = 2051.52		(0.037kg/m3) (7.36acres* 4047m2) (1.27m) (0.6) = 839.64	
Impervious	610.1	Impervious	1,095.8
(0.15kg/m3) (0.81acres* 4047m2) (1.27m) (0.98) = 610.08		(0.15kg/m3) (1.45acres* 4047m2) (1.27m) (0.98) = 1095.75	
Landscape	-	Landscape	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Golf Course	-	Golf Course	745.5
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (6.53acres) =* 4047m2) (1.27m) (0.6) = 745.47	
Composite golf course and landscape loading	-	Composite golf course and landscape loading	-
(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) (0acres* 4047m2) (1.27m) (0.6) = 0	
Vacant Land	-	Vacant Land	345.5
(0.037kg/Ac) * (0acres) * 4047m2) (1.27m) (0.6) = 0		(0.037kg/m3) * (3.03acres) =* 4047m2) (1.27m) (0.6) = 345.45	
Total TSS kg/Year	**2,661.6**	**Total TSS kg/Year**	**3,026.3**

Table 9. Summary of TSS Loading

Design Point	Practices in Design Point Subcatchments	% TSS Removal from SW Practice	Annual Mass-TSS Loading from Direct Calculation for Proposed Conditions Design Point (kg)	Annual Mass-TSS Loading Broken into individual Subcatchments in Design Point (kg)	Annual Mass-TSS Discharge from SW Practice(s) Based Upon Subcatchment Area in Design Point (kg)	Annual Mass-TSS Discharge from SW Practice(s) in Design Point (kg)	Annual Mass-TSS Loading for Existing Conditions in Design Point (kg)	Net Change of Mass-TSS Loading (Proposed-Existing) (kg)
1a	Bioretention	80%	903	506	101	498	677	-180
	Undisturbed	0%		396	396			
2	Undisturbed	0%	4,120	4,120	4,120	4,120	5,029	-909
3	Undisturbed	0%	232	232	232	232	310	
4	Green Roof/Pond	80%	4,457	1,112	222	1,324	1,278	47
	Dry swale	80%		515	101			
	Pond	80%		2,299	460			
	Undisturbed	0%		541	541			
5	Undisturbed	0%	1,176	1,176	1,176	1,176	1,785	-609
5a	Undisturbed	0%	1,525	1,525	1,525	1,525	1,503	22
6	Undisturbed	0%	6,793	6,793	6,793	6,7937323.7	8,057	-1,264
6a	Undisturbed	0%	5,952	5,953	5,953	5,953	5,953	0.0
7	Swale	80%	16,443	1,712	342	15,073	17,965	-2,892
	Undisturbed	0%		14,731	14,731			
8	Pond	80%	18,431	6,947	1,389	9,625	12,100	-2,475
	Dry Swale	80%		2,929	586			
	Bioretention	80%		1,130	226			
	Undisturbed	0%		7,423	7,423			
9	SW Planters	80%	8,429	657	131	4,909	7,581	-2,672
	Swale	80%		912	182			
	Pond	80%		2,832	566			
	Undisturbed	0%		4,029	4,029			
10	Undisturbed	0%	19,723	19,723	19,723	19,723	20,145	-421.5
11	Swale	80%	20,450	2,112	422	7,541	8,184	-643
	Bioretention	80%		2,430	486			
	Pond	80%		10,581	2,116			
	Undisturbed	0%		4,517	4517			
12	Undisturbed	0%	1,399	1,399	1,399	1,399	1,409	-11
16	Bioretention	80%	3,026	1,568	314	1,772	2,662	-889
	Undisturbed	0%		1,459	1459			
		Total	**113,060**	**112,249**	**81,664**	**81,664**	**9,4637**	**-12,897**

6.3.2 Results of Direct Calculation for TP and TSS

As described in section 6.3.1, above, the same procedures for estimating loading that was developed in 2004 are used in this direct calculation method. Table 6, “Direct Calculation of Mass Loading for Total Phosphorus,” presents the spreadsheet results for the individual calculation of TP discharge at each drainage point. Another table was assembled to compile the TP discharges for the existing and post-construction conditions. Table 7, “Summary of TP Loading,” provides the amount of TP discharges and types of treatment in each subcatchment. The reduction in TP as a result of stormwater treatment is found in this table.

Table 8, “Direct Calculation of Mass Loading for TSS” shows the spreadsheet results of the individual calculation of discharge at each drainage point. Table 9, “Summary of TSS Loading,” provides the amount of TSS discharges and types of treatment in each subcatchment. The reduction of TSS as a result of stormwater treatment is found in this table.

The predevelopment (existing condition) TP loading is estimated to be 89.4 kg/yr. Post-development, following treatment, the project loading for all drainage points is 148.8 kg/yr (Table 7). The post-development discharge of 148.8 kg/yr includes 97.4 kg/yr in runoff from undisturbed or minimally altered land. In the minimally altered areas, some cover type changes of forested areas to grassed/vacant areas increases the phosphorus export. Even though there is no new impervious area within the subcatchments, the transfer of lands from forested to grassed/vacant increases the phosphorus export making the undisturbed areas in the proposed conditions export more phosphorus than the existing conditions.

As part of the development of the project, an extensive network of stormwater control devices will be constructed. These devices will treat the stormwater runoff prior to discharge to the regulated stream at the site. Table 9 shows that the total pre-treatment TSS discharge is 94,637 kg/yr, and the post-treatment discharge is 81,664 kg/yr. Included in the post-treatment loading are 74,017 kg/yr discharged from undisturbed or minimally altered areas.

Phosphorus loadings in runoff were recalculated for the Modified Project. Under existing conditions it is estimated that the site produces 89.4 kg of phosphorus per year. Under the developed conditions, including the proposed stormwater management practices, phosphorus export in runoff is estimated to be 148.9 kg, or an increase of 55.1 kg per year. In comparison, total phosphorus export in runoff for the DEIS project was estimated to be 346 kg per year total with 139 kg per year previously generated at Wildacres.

6.3.3 Discussion

The Pepacton Reservoir has a Total Maximum Daily Load (TMDL) expressed as an annual load for TP. The TMDL is a tool to review the management of the reservoir and set goals to preserve the water quality of the reservoir. The Pepacton Reservoir is not phosphorus restricted since the TMDL management limit is approximately double the existing loading to the reservoir.

The estimated wastewater discharge is 111 kg/yr, which is a portion of the wasteload allocation already provided to the Pine Hill wastewater treatment plant as part of the Ashokan TMDL. The annual load from the Pine Hill wastewater treatment plant will increase by 111 kg/year.

The wastewater is discharged to the Ashokan basin and the stormwater is discharged to the Pepacton basin. As a component of stormwater discharge there is 5.24 kg/yr that is being transferred from the Ashokan to the Pepacton.

The existing loading of TP to the Pepacton basin is estimated as 37,327 kg/yr. The total Maximum Daily Load on an annual basis is 79,167 kg/yr. This load is split between wastewater treatment plant discharges or waste load allocation (WLA) of 386 kg/yr and load allocation (LA). From the TMDL 79,167 kg/yr a 10% margin of safety (MOS) is removed, along with wastewater treatment plant discharges, to establish the TMDL limit of 70,864 kg/yr. This leaves 70,864 kg/yr (load allocation), which is the amount of total phosphorus that can be added to the Pepacton Reservoir and maintain existing water quality (USEPA letter to NYSDEC, Oct. 17, 2000). The true estimate of new permissible loading (unallocated load) would be obtained by subtracting the existing loading (37,327 kg/yr) from the WLA of 70,864 kg/yr, yielding 33,537 kg/yr.

The estimated new loading from the Belleayre Resort is 148.8 kg/yr. This new load represents a 0.40% increase in the existing loading, and a 0.22% increase in the TMDL, or 0.44% of the unallocated loading. The new TP loading of 148.8 kg/yr includes 97.4 kg/yr from undisturbed areas. Removing the 97.4 kg/yr of TP from the 148.8 kg/yr total estimates the net new TP of 51.4 kg/yr. This net new TP load is 0.15% of the unallocated load.

Neither the new stormwater discharges post-treatment nor the net new phosphorus load will impact the overall TMDL for TP at the Pepacton Reservoir.

The TSS Discharges at the project will be reduced by 12,897 kg/yr (see Table 10). This reduction in loading should benefit both Emory Brook and the Delaware River, as well as the Pepacton Reservoir. Total Suspended Solids is not subject to at TMDL guidance value at the Pepacton Reservoir.

Table 10. Comparison of Pre- and Post-Construction Loading

	TP (kg/yr)	TSS (kg/yr)
Existing condition	89.4	94,637
Post-construction undisturbed areas	97.4	74,017
Post-construction treated discharge	148.9	81,664
Net new discharge, post-treatment	55.1	-12,897

6.4 Non-Structural BMPs

6.4.1 Good Housekeeping

The following good housekeeping and material management practices will be followed on site during construction to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

- Office Trailers, storage trailers or shipping containers will be clearly marked with the owner name, contact number and Hazard Placard.
- Materials will be brought on site in the minimum quantities required. If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.
- Garbage and any waste material will be removed from the site on a regular basis to keep the site clean.
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label. Material Safety Data Sheets (MSDS) will be retained where the related product is stored.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposal.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The site operator or a designee will inspect regularly to ensure proper use and disposal of materials on site.
- The site operator or a designee shall prohibit washing of tools, equipment, and machinery in or within 100 feet of any watercourse or wetland.

- If trucks or other facilities used for concrete production are to be washed, the wastewater from the washing will be recycled.
- Sweeping and dust control will be implemented in vicinity of the concrete batch plant and the rock crushing activities as needed.
- All above grade storage tanks are to be protected from vehicle damage by temporary barriers and will be inspected regularly for leaks.
- Excavation equipment involved with the construction will remain on the project site and will not regularly egress or ingress the site. Any trucks used to bring in materials or remove materials via municipal paved roads will do so over a stabilized construction entrance. If any off-site vehicle tracking occurs, the contractor will be directed to initiate, street sweeping program in the immediate vicinity of the site.
- All waste materials generated during construction will be disposed at a suitable landfill, or transfer station.
- Waste: Portable sanitary facilities will be made available to construction personnel and will be serviced regularly.

This project will not be a generator of hazardous waste and it is not anticipated that any hazardous waste will be generated during construction. If there are any materials generated, a licensed hazardous waste carrier will be contracted to dispose the hazardous material at a suitable disposal site. If hazardous materials are discovered during construction, the work will be stopped until the issue is resolved.

6.4.2 Construction/Erosion and Sediment Control Inspections

These are the inspection items that will be used to maintain erosion and sediment controls during construction. At least two maintenance inspection reports will be made each week with a minimum of two days separating the two inspections. The report form to be completed by the inspector is attached in **Appendix H.** Reports should be compiled and maintained on-site. A copy of all the inspection sheets will be kept onsite in this 3-ring binder during construction and be filed in accordance with the permit.

- The Erosion Control Superintendent will conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed to ensure overall preparedness of the site for commencement of construction. This Erosion Control Superintendent will be a qualified inspector (CPESC).

- The day-to-day erosion control activities on the site will be monitored by the Erosion Control Superintendent. The Erosion Control Superintendent and his crews will make ***at least two inspections every seven (7) days*** of erosion control devices. The Inspection Form is located at the end of this report and shall be completed in full at least twice a week.

- All measures will be maintained in good working order; if repair is necessary, it will be initiated within 24 hours of report.

- Silt fence will be inspected for depth of sediment, ripped fabric, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in ground.

- All temporary sediment basins should be inspected for stability and integrity ***at least once every seven (7) days***. Any structural failure in sediment basins or trenches that serve them will be repaired within 24 hours after detection. All temporary sediment basins or trenches shall be cleaned out when one foot of sediment or half the design depth of the trap has accumulated. All spoils shall be removed to a stabilized upland area, seeded and mulched.

- Seeded and planted areas will be inspected for bare spots, washouts, and healthy growth. If necessary, spot reseeding or sodding will be implemented.

6.5 References Cited in Section 6

Crossroads Ventures LLC. 2004. Total Phosphorus Loading Calculation and Comparison. August 2004, hearing exhibit 157, prepared by the LA Group, P.C.

NYCDEP. 1997. Guidance for Phosphorus Offset Pilot Programs. New York City Department of Environmental Protection, Bureau of Water Supply Quality and Protection, Engineering and Operations Division, Project Management Group.

NYCDEP. 2010. 2009 Watershed Water Quality Annual Report. New York City Department of Environmental Protection, Bureau of Water Supply, July 2010. 195 pp.

Roseen, R. M., T. P. Ballestero, J. J. Houle, P. Avellaneda, J. Briggs, G. Fowler, and R. Wildey. 2009. Seasonal performance variation for stormwater management systems in cold climate conditions. J. Environ. Eng. 135(3), 128-137.

Schueler, T. R. 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban Best Management Practices. Metropolitan Washington Council of Governments. 275 pp.

USEPA. 1983. Results of the National Urban Runoff Program. Volume 1 - Final Report. U.S. Environmental Protection Agency. Water Planning Division.

7.0 CONSTRUCTION PHASING

The overall phasing plan for project construction is illustrated on Sheets L3.00 and L3.01 of the SDEIS. **This SWPPP is for Phase (1A) only.**

Phase 1(A)
- Wildacres hotel, 10 holes of the Highmount Golf Club,
- Highmount Spa Hotel, the access road to the top of Highmount and the conference/clubhouse facilities at the old Leach Farm.

Phase 1(B)
- Construct remaining golf course holes

Phase 2
- The Lodge building at Highmount and the lower elevation detached units
- Wilderness Activities Center at old Highmount Ski Center buildings.

Phase 3
- Wildacres Front-9 Village and other detached lodging units
- Highmount higher elevation detached units.

The overall project is broken up into three physically separate construction projects, the main part of Wildacres south of Gunnison Road, the northeast corner of Wildacres north of Gunnison Road and Highmount. Each of these areas has a Phase 1, a Phase 2 and a Phase 3 component. Phase 1 has two components, Phases 1A and 1B which will be constructed separately. The hotel and the golf course were to be completed in the first phase of construction; however construction timing warranted breaking the first phase into 1(A) and 1(B). Within each of the phases, Locations have been established (Phase 1, Locations 1A, 1B and 1C.) Work areas are a subgroup of Locations (Phase 1, Location 1A, Work Areas 1A.1, 1A.2, 1A.3…). Generally, work areas are +/- 5 acres or less in size and one work area will be actively disturbed at any one given time in each of the 3 construction areas. The exceptions to the +/- 5 acre work area size cap are the areas of the two hotels.

The Sediment and Erosion Control Plans (Sheets L3.02-3.25 in the SDEIS) show the progression of work for Phase 1(A) construction. In these drawings Phase 1(A) construction in the main part of Wildacres is designated as Location 1A, the northeast corner of Wildacres is designated as Location 1B and Highmount is designated as Location 1C. The work areas are then sequentially numbered within 1A, 1B and 1C. Plan Sheets L3.02 through L3.20 show how the work progresses through the Wildacres portion of the Project. Plan sheets L3.21 through L3.25 show the construction phasing work areas at Highmount.

Table 11. Phase 1A and 1B Work Areas and Their Acreages.

Location 1.A			Location 1.B			Location 1.C		
Wildacres Main Parcel			Northeast Wildacres			Highmount		
Work Area	Acreage	Discharge Point	Work Area	Acreage	Discharge Point	Work Area	Acreage	Discharge Point
1A.1	5.2	9	1B.1	5.5	11	1C.1	9.7	4, 1a
1A.2	5.3	9, 8	1B.2	4.3	10, 11	1C.2	4.6	5
1A.3	4.6	9, 8	1B.3	4.6	11	1C.3	11.3	6
1A.4	16.3	10, 9, 8	1B.4	5	11	1C.4	1.0	3,4,5
1A.4a*	1.3	9	1B.5	3.7	11	1C.5	1.0	5,5A,6
1A.5*	3.1	9, 8	1B.6	4	16, 12	1C.6	1.0	6
1A.6*	2.6	7, 8	1B.7	5.1	16, 11, 12	1C.7	1.0	5,5A
1A.7*	2.9	7, 8	1B.8	5.5	16, 10, 11	1C.8	1.0	6
1A.8*	3.5	7,8				1C.9	1.0	2
1A.9*	3.6	7,8				1C.10	1.0	2
1A.10*	2.7	8				1C.11	0.9	2,5,5A,6
1A.11*	2.2	9				1C.12	1.0	6
1A.12*	3.7	9				1C.13	1.0	6
						1C.14	1.0	6
						1C.15	1.0	6
						1C.16	1.0	6
						1C.17	0.8	5,5A

*other work areas in 1A that will be opened then closed while Wildacres Hotel (1A.4) is open, total area not to exceed 20 acres at a time

7.1 Overall Construction Schedule

<u>Wildacres</u>

1. Wildacres Resort
   a. Install erosion control measures, grub, bury stumps, rough grade, install irrigation and drainage, final grade, temporarily stabilize (where necessary), and final stabilize golf holes 3 through 8, 10, 18 and the driving range.

b. Construct main access road through site, install binder course as soon as possible.

c. Cut 20 foot wide centerlines on internal roads and parking. Stabilize haul roads and other disturbed areas with ryegrass.

d. Blast rock for hotel, begin construction of hotel and golf clubhouse, golf maintenance building, potable water treatment facility, and off-site water and sewer lines. These components will all be completed by the summer of the third year. Set up and operate rock crusher and concrete batch plant at the practice range. These will operate for the first 18 to 24 months of construction.

e. Install utility infrastructure (water, wastewater, power and communications) in vicinity and along all roads.

f. In the first winter clear, but do not grub, remaining golf hole centerlines for remaining golf course construction.

2. Wildacres Resort

a. Continue hotel construction.

b. Install erosion control measures grub, bury stumps, rough grade, install irrigation and drainage, final grade, temporarily stabilize (where necessary) and final stabilize remaining golf holes.

c. Grub and bury stumps, grade, gravel, and install binder course on all internal roads and parking except the Front-9 Village.

d. Install utility infrastructure in vicinity and connect to all buildings under construction.

3. Wildacres Resort

a. Install top coat of asphalt on all roads and parking with binder course, landscape all completed buildings.

b. Open full golf course and hotel, golf clubhouse, and all associated buildings/amenities mid to late summer.

c. Construct access road and recreational amenities for the Front-9 nine Village

d. Rehabilitate existing Highmount Ski Area buildings as Wilderness Activity Center.

4. Wildacres Resort

a. Rehabilitate Marlowe Mansion

b. Build detached lodging units as they are sold.

<u>Highmount</u>

1. Highmount Spa Resort

a. Install erosion control measures, begin construction of entrance drive, and construct stormwater basins near County Route 49A.

b. Construct haul road along proposed access road location up to Hotel location, clear approximately 1/3 acre within hotel footprint to use as stockpile area for first work area excess cut material. Install erosion control around stockpile area.
c. Construct main access road to the vicinity of the entrances to the Hotel building and Lodge building install binder course as soon as possible.
d. Clear additional portion of Hotel footprint and Lodge footprint (no earthwork) for use as stockpile and staging areas, install erosion controls in stockpile areas.
e. Commence Hotel and Lodge site preparation, including blasting. Set up and operate rock crusher near the north end of the Lodge building footprint. This will operate for the first 12 to 18 months of construction.
f. Construct ski trails and lift line.
g. Commence Hotel building construction and stabilize prepared Lodge site.
h. Install utility infrastructure (water, wastewater, power and communications) in vicinity of Phase 1 and along all roads.
i. Continue and complete Hotel building construction.

2. Highmount Spa Resort
    a. Construct Lodge building.

3. Highmount Spa Resort
    a. Construct the detached lodging units.
    b. Rehabilitate Leach Farm buildings into additional conference/clubhouse space.

8.0 BMP MAINTENANCE

8.1 Sediment and Erosion Control Practices

Maintenance of sediment and erosion control practices will be done as follows:

- ✓ Silt fence – maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.
- ✓ Check dams – should be inspected after each rain event. Correct all damage immediately. If significant erosion has occurred between structures, a liner of stone or other suitable material should be installed. Remove sediment accumulated behind the dam as needed to allow channel to drain through the check dam and prevent large flows over the dam.
- ✓ Storm drain inlet protection (not including silt sacks) – inspect after each storm event. Remove sediment when 50 percent of the storage volume is achieved.
- ✓ Rock outlet protection – once a riprap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows for evidence of scour beneath the riprap. Repair should be immediate.

- ✓ Sediment retention ponds – sediment shall be removed and the ponds restored to the original dimensions when the sediment has accumulated to ½ of the design depth.
- ✓ Stabilized construction entrance – entrance shall be maintained in a condition which shall prevent tracking. This may require periodic top dressing with additional aggregate. All sediment tracked onto or spilled on public rights of way shall be removed immediately. When necessary, wheels must be cleaned to remove sediment prior to entrance on public rights of way. When washing is required, it shall be done in an area stabilized with aggregate.
- ✓ Diversion swales– after each rain event inspect swale and sideslopes for erosion. Repair and re-vegetate as necessary. Remove sediment when it blocks ¼ of the flow capacity.
- ✓ Water bars– periodically inspect for erosion damage and sediment accumulation. Inspect outlet areas and make repairs as needed to restore operation. Re-vegetate as needed.
- ✓ Rolled erosion control products, turf reinforcement mats– periodically inspect areas for failure especially after rain events. Repair as needed seeding underneath the mats. If vegetation does not grow adequately, reseed.
- ✓ Wood fiber mulch– periodically inspect mulched areas especially after rain events. Re-apply as needed.
- ✓ Sod– periodically inspect sodded areas and water frequently during dry weather. Replace dead sod.

Onsite inspections of sediment and erosion control practices will be done on a regular basis by the Erosion Control Superintendent. If any problems or failures are observed with the stormwater management devices, they will be repaired in a timely manner. All BMPs identified in this SWPPP will be maintained in effective operating condition. If site inspections identify BMPs that are not operating effectively, maintenance will be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of stormwater controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance will be scheduled and accomplished as soon as practicable.

8.2 Post Construction Stormwater Management Practices

Post-construction maintenance for this project will consist of at minimum regular inspections of permanent stormwater management facilities and steep slopes. The following procedures must be performed regularly on the appropriate structural stormwater management practices. These maintenance procedures are essential to assure continual performance of the stormwater management practices on the site.

Inspections and maintenance procedures performed will be recorded onto a Maintenance Log and will be kept for records. Appendix F has a copy of a Maintenance Log sheets that will be used.

Micropool Extended Detention Stormwater Pond

- Should be inspected twice a year and after heavy rain storms.
- Mow grass when it reaches 4-6 inches in height as needed.
- Regular litter control, to be performed as needed.
- Clean sediment out of entire basin when it is 50% full or every five to six years.
- Principal and emergency spillways must be inspected for structural integrity and must be cleaned of any obstructions.
- Outlets below spillways must be inspected for erosion, and obstructions to flow removed.
- Repair channelization with some type of geomat and reseed and mulch, or replace stone.

Dry Swale/Vegetated Swale

- Inspect the side slopes of channels to make sure side slopes remain stable.
- Inspect for scour, erosion, rodent holes and excessive sediment deposition.
- Inspect inlets and outlets for same as a. and b.
- Remove excess sediment when necessary.
- Repair any scours or erosion by using geomats or rolled erosion products to reinforce the surfaces.

Bioretention

- Sediment shall be cleaned out of the sedimentation chamber when it accumulates to a depth of more than six inches. The sediment chamber outlet device shall be cleaned/repaired when drawdown times exceed 36 hours.
- Trash and debris shall be removed as necessary.
- Any erosion in the surrounding area will be repaired and stabilized with seed and mulch as needed.
- Sediment shall be removed from the filter bed when the accumulation exceeds one inch. When the filtering capacity of the filter diminishes substantially (i.e., when water ponds on the surface of the filter bed for more than 48 hours), the top few inches of discolored material shall be removed and shall be replaced with fresh material. The removed sediments will be disposed of in an acceptable manner (i.e., landfill, land apply to uplands and seed and mulch).
- A stone drop (pea gravel diaphragm) of at least six inches shall be provided at the inlet of bioretention facilities for pretreatment.
- Areas devoid of mulch shall be re-mulched on an annual basis.
- Dead or diseased plant material shall be replaced.
- Vegetation height will be limited to 18 inches.

Wet Extended Detention Pond

- If a minimum coverage of 50% is not achieved in the planted wetland zones after the second growing season, a reinforcement planting is required.
- Principal and emergency spillways must be inspected for structural integrity and must be cleaned of any obstructions.
- Outlets below spillways must be inspected for erosion, and obstructions to flow removed.
- Repair channelization with some type of geomat and reseed and mulch, or replace stone.

Catch Basins

- Sediment removal with a vacuum truck should be done at least twice a year, preferably after spring runoff and then in early fall, or when they are at 50% capacity, whichever comes first.
- Any mechanical valves should be operated for inspection every two months.

Green Roof

- During the first two years, the green roof will need to be monitored, watered, fertilized and weeded regularly as plants become established.
- Roof drains should be cleared when soil substrate, vegetation or debris clog the drain inlet.
- Maintenance largely depends on the type of green roof system installed and the type of vegetation planted. Maintenance requirements in intensive systems are generally more costly and continuous, compared to extensive systems. The use of native vegetation is recommended to reduce plant maintenance in both extensive and intensive systems. An extensive green roof has a shallow planting media and typically a relatively uniform planting diversity. An intensive green roof has deeper planting media increased planting diversity and more maintenance requirements.
- Inspections should be conducted for plant establishment, leaks and other functional or structural concerns. Vegetation should be monitored for establishment and viability, particularly in the first two years.
- Replace dead, diseased or dying vegetation as needed.
- After the first two years, maintenance will consist of two visits per year for weeding of invasive species, and safety and membrane inspections.

Stormwater Planter

- Debris and trash removal should be conducted on a weekly or monthly basis, depending on likelihood of accumulation.
- Following construction, planters should be inspected after each storm event greater than 0.5 inches, and at least twice in the first six months.

Subsequently, inspections should be conducted seasonally and after storm events equal to or greater than the 1-year storm event.

- Routine maintenance activities include pruning and replacing dead or dying vegetation, plant thinning, and erosion repair.
- Since stormwater planters are not typically preceded by pre-treatment practices, the soil surface should be inspected for evidence of sediment build-up from the connected impervious surface and for surface ponding.
- Attention should be paid to additional seasonal maintenance needs as well as the first growing season.
- Any leaks in the piping that feeds the stormwater planters should be repaired as needed.

Porous Pavement

- Permeable pavements are highly susceptible to clogging and subject to owner neglect. Individual owners need to be educated to ensure that proper maintenance and winter operation activities will allow the system to function properly.
- During the winter, the spreading of sand or other particles for traction cannot be done. Also the use of salt should be avoided. If the area is to be plowed of snow, this should be done carefully so as not to upset the permeable pavement.
- Typical maintenance activities for permeable paving are summarized in the Table 12, below:

Table 12. Typical Maintenance Activities Associated with Permeable Pavement

Activity	**Schedule**
Ensure paving area is free of debris	Monthly
Ensure paving dewaters between storms	Monthly and after storms >0.5”
Ensure area is clean of sediments	Monthly
Mow upland and adjacent areas and seed bare areas	As needed
Vacuum sweep frequently to keep surface free of sediments	Typically 3 to 4 times a year
Inspect the surface for deterioration or spalling	Annually

Generally, routine vacuum sweeping and high-pressure washing (with proper disposal of removed material and washwater) can maintain infiltration rates when clogged or crusted material is removed. Signs can also be posted visibly within a permeable paving area to prevent such activities as resurfacing, the use of abrasives, and to restrict truck parking.

8.2.1 Mechanism of Operation and Maintenance

Crossroads Ventures, LLC will be responsible for the long term inspections and maintenance of all post-construction stormwater management facilities for this Project. Attached in Appendix G is a copy of a sample restrictive deed covenant which will be used in situations where a post-construction stormwater management practice is installed in an area which will be sold to another party. This legally binding document will be customized for each specific purpose as needed to ensure that the maintenance of all stormwater management practices is done appropriately.

9.0 TEMPORARY STABILIZATION FOR FROZEN CONDITIONS

The following temporary stabilization measures **MUST** be performed when construction is occurring during winter/frozen ground conditions. The following requirements do not supersede any other requirements of this SWPPP as they apply to non-frozen ground conditions.

- Perimeter erosion control **MUST** still be installed prior to earthwork disturbance as per this SWPPP.
- Any areas that cannot be seeded to turf by October 1 or earlier will receive a temporary seeding. The temporary seeding will consist of winter rye seeded at the rate of 120 pounds per acre (2.5 pounds per 1,000 square feet) or stabilized as per the temporary stabilization for winter construction/frozen conditions.
- Any area of disturbance that will remain inactive for a period of 7 consecutive days **MUST** be mulched. This includes any previously disturbed areas that are covered with snow.
- Mulch **MUST** consist of loose straw applied at the rate of 2 to 3 bales (90 to 100 pounds) per thousand square feet.
- Mulch may be applied uniformly over the area of bare soil or bare soil that is covered with snow. For the latter condition, mulch **MUST** be applied on top of snow.
- Using a tracked vehicle, mulch **MUST** be crimped into the bare soil/snow. The tracked vehicle **MUST** be driven across the mulched areas in at least two directions to maximize crimping of mulch into the soil/snow.
- If mulch gets blown off an area to a significant degree, the Erosion Control Superintendent **WILL** require that an area be re-mulched and this area **WILL** be included on the inspection checklist for the next inspection.
- If a particular area repeatedly experiences loss of mulch due to wind, then the Erosion Control Superintendent **WILL** require that an alternative method be used to secure the mulch in place. Such

alternatives may include the use of netting, tackifier or other methods deemed appropriate by the Erosion Control Superintendent.

- During periods when snow is melting and/or surface soils are thawing during daytime hours, mulched areas **MUST** be re-tracked (crimped) at least once every seven days or more frequently if directed by the Erosion Control Superintendent. Additional mulch may be required to obtain complete coverage of an area. Biodegradable erosion control matting may be required on steeper slopes.
- Additional stabilization measures for non-frozen ground conditions described in this SWPPP **WILL** be implemented at the time deemed appropriate by the Erosion Control Superintendent.
- During the winter season, if a site has been stabilized and soil disturbing activities have been suspended for the winter, twice weekly inspections can be suspended. However, monthly inspections must still be conducted. All normal twice weekly inspections must resume when soil disturbing activities resume.

10.0 CERTIFICATION OF NON-STORMWATER DISCHARGES

Currently, there are no "non-stormwater" discharges located within the proposed Project Site. A signed certification that all discharges (i.e., outfalls) have been tested or evaluated for the presence of non-stormwater is provided in Appendix H of this SWPPP.

One potential source of non-stormwater discharge that may occur during construction is washing from the concrete batch plant. The concrete batch plant will not discharge any wastewater from washing equipment or trucks unless a separate SPDES permit is obtained. If any wash water is generated from the concrete batch plant, it will be recycled back into the system.

One other potential source of non-stormwater discharges that may be encountered during construction is the application of water to roadways to control dust. This application of clean water to the roadways for dust control may be necessary in the vicinity of the rock crushing activities. This application of water will be kept to a minimum necessary in order to control dust and not be applied so that is causes runoff.

11.0 DOCUMENTATION OF PERMIT ELIGIBILITY RELATED TO ENDANGERD SPECIES

Wildlife studies have been conducted on the Project Site in order to document the absence of any threatened or endangered species onsite and also to characterize the wildlife present. No rare, threatened or endangered species were encountered on the site during the 2000 and 2004 site surveys. Additional wildlife survey work was performed on the project site in 2008. No rare, threatened or endangered species were encountered on the site during the 2008.

A letter was sent to the NYSDEC Natural Heritage Program from Terrestrial Environmental Specialists to request a search of their files for any records of threatened or endangered species located on or in proximity to the Project Site. In the response letter dated July 31, 2009, the Agency stated that there were no known occurrences of any rare or state-listed animals or plants, significant natural communities, or any other significant habitats on or in the immediate vicinity of the Project Site. An updated response letter was requested from NYNHP on February 10, 2011. Copies of these letters are provided in Appendix I.

12.0 DOCUMENTATION OF PERMIT ELIGIBILITY RELATED TO HISTORIC PLACES

NYS Office of Parks Recreation and Historic Preservation's (OPRHP's) review of the original project DEIS Stage 1B materials led them to state in their January 6, 2003 letter "OPRHP has no further issues regarding project ground disturbance and archeology: additional archeological study is not warranted." This same letter went on to state that it was OPRHP's opinion that the project would have no adverse effect on properties in or eligible for listing on the State and Natural Registers of Historic Places based on the condition that all work (interior and exterior) that is proposed for the historic structures on the project site shall be reviewed by OPRHP prior to the initiation of any construction activities. The historic structures that are referred to in OPRHP's January 6, 2003 letter were listed in OPRHP's June 12, 2000 letter and include the Marlowe Mansion (Wildacres Hotel in OPRHP's letter) and the Leach Farm.

On December 4, 2009 OPRHP issued a finding of No Adverse Effect for the modified project based on the same condition from 2003 that all work (interior and exterior) proposed for the Marlowe Mansion and Leach Farm historic structures be reviewed by OPRHP prior to the initiation of construction.

On April 9, 2010 OPRHP issued a letter stating that the proposed off-site utility work would have no adverse impacts on historic resources.

13.0 COPY OF PERMIT REQUIREMENTS

A copy of this NYSDEC Individual Permit will be included with this SWPPP when it is approved.

14.0 SIGNATURE AND PLAN REVIEW

Preparer Certification of Compliance with Federal, State, and Local Regulations

This Stormwater Pollution Prevention Plan was prepared in accordance with the New York State Department of Environmental Conservation SPDES Individual Permit for Stormwater Discharges specific to this Project. This SPDES Individual Permit implements the Federal Clean Water Act pertaining to stormwater discharges.

Signature: ________________________________

Name: ________________________________

Title: ________________________________

Date: ________________________________

Owner Pollution Prevention Plan Certification

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 or persons 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 210.45 of the Penal Law.

I understand that this Individual Permit requires at least twice weekly site inspections. These inspections shall be performed by the Erosion Control Superintendent, who will be a qualified inspector as defined by the General Permit. All inspections shall be reported to the owner/operator as identified on this SWPPP. A copy of all inspection reports shall be kept in this SWPPP for documentation of former inspection and maintenance.

Signature: ________________________________

Name: ________________________________

Title: ________________________________

Date: ________________________________

15.0 KEEPING SWPPP CURRENT

The permittee identified in this SWPPP may amend the SWPPP when there is a change in one or more of the following project components which has an effect on the potential for discharge of pollutants from stormwater runoff associated with construction activities:

- There is a change in design, construction, operation, or maintenance at the facility which may have an effect on the potential for the discharge of pollutants from the facility which has not otherwise been addressed in the SWPPP

- During inspections, monitoring, or investigations by facility personnel or by local, state, or federal officials it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants from sources identified under Part III.C.3., or is otherwise not achieving the general objectives of controlling pollutants in discharges from the facility.

- To identify a new subcontractor or personnel that will implement any part of the SWPPP.

The NYSDEC and the NYCDEP will be notified promptly of any changes to the SWPPP.

16.0 MONITORING, REPORTING AND RETENTION OF RECORDS

16.1 Monitoring Requirements

Unless otherwise directed under the Individual SPDES Permit limitations imposed by NYSDEC, the concrete batch plant and the rock crushing activities onsite will be monitored according to the parameters listed in Part VIII of the SPDES Industrial Permit for the specific industrial activity (GP-0-06-002.) Specifically, the rock crushing and concrete batch plant portions of Project will have at least one stormwater sample collected annually and monitored for parameters relating to their respective SIC. The specific numeric limitations for the stormwater associated with the concrete batch plant are a total suspended solids (TSS) limit of 100 mg/L, a pH limit of 6.0-9.0 and a total recoverable iron limit of 1 mg/L. The specific numeric limitations for the rock crushing operations onsite is 100 mg/L for TSS. Sampling will be done downslope of the operations in the swale that receives drainage from the area. These locations will be identified in the NY2C form for industrial discharges as 016 (concrete plant and rock crushing at Wildacres) and 017 (rock crushing at Highmount.)

During construction, inspections of the concrete batch plant and the rock crushing facilities will consist of at a minimum Quarterly Visual Monitoring, Annual Dry Weather Flow Monitoring, and Compliance Monitoring for Discharges Subject to Numerical Effluent Limitation Guidelines. These inspections will be conducted by the Erosion Control Superintendent. The concrete batch plant will be inspected while it is in operation. Inspection and sampling of these facilities will be terminated when the concrete batch plant and rock crushing work is terminated and the equipment has left the site.

Monitoring, Reporting of Monitoring Results and Annual Certification Reporting will be done in accordance with GP-0-06-002. Copies of the monitoring reports and records of monitoring information will be kept onsite with this SWPPP.

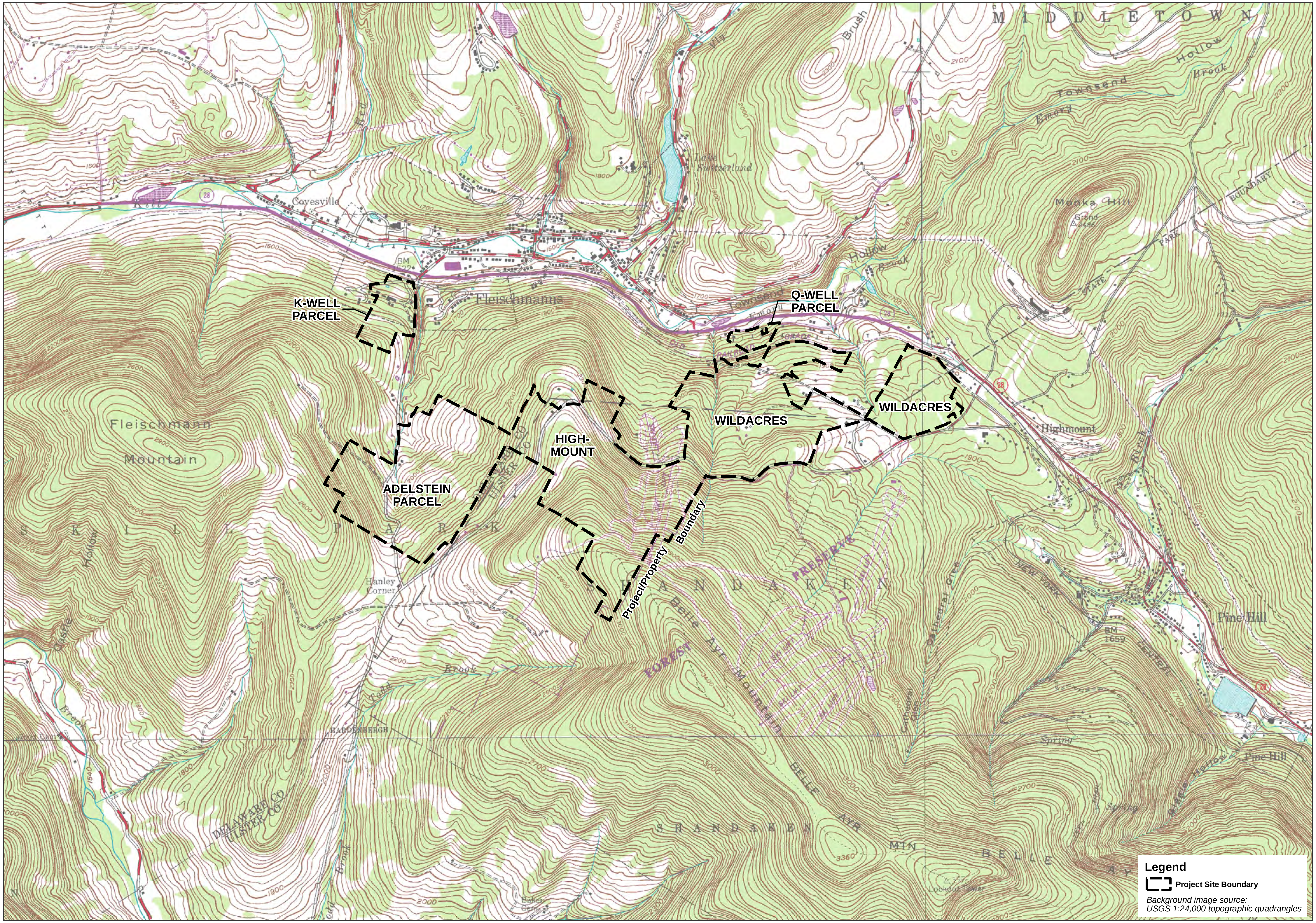
Post construction stormwater management practice monitoring will be done in accordance with the Individual SPDES permit issued by NYSDEC.

17.0 NOTICES

Work will not begin on this Project until the NYSDEC and the NYCDEP issue the applied for permits approving this SWPPP. Prior to work being started on this Project, the notifications required by the Individual SPDES permit will be provided to NYSDEC as well as those required by the NYCDEP permit. Once work is completed, the appropriate notices will be provided to the NYSDEC and NYCDEP.

APPENDIX A

General Location Map



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The Modified Belleayre Resort at Catskill Park

Wildacres Resort & The Highmount Spa Resort
Towns of Shandaken & Town of Middletown, New York

Title
USGS Site Location Map

Scale: 1:24,000
0 1,000 2,000
Feet

Project: 07074
Date: 03/09/2011
Figure:
1-2

APPENDIX B

Spill Response Report

SPILL RESPONSE REPORT

Within 1 hour of a spill discovery less than 2 gallons in volume the following must be notified:

Owner Name: **Dean Gitter**
Owner Phone Number: **845-688-7740**

Within 1 hour of a spill discovery greater than 2 gallons the following must be notified:

Owner Name: **Dean Gitter**
NYSDEC Spill Response Hotline 1-800-457-7362

Spill Response Contractor: ____

Material Spilled: ____
____
____

Approximate Volume: ____
____
____

Location: ____
____
____

Distance to nearest down gradient drainage: ______________________________
____
____

Distance to nearest down gradient open water: ______________________________
____
____

Temporary control measures in place: ______________________________
____
____

APPENDIX C

Stormwater Management Report and HydroCAD

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Stormwater

Management Design Report

for:

<u>The Modified Belleayre Resort at Catskill Park</u>

Towns of Shandaken and Middletown
Ulster and Delaware Counties
New York

<u>Applicant:</u>

Crossroads Ventures, LLC
PO Box 267
Mt. Tremper, NY 12457

<u>Prepared By:</u>

The LA Group
Landscape Architecture and Engineering, P.C.
40 Long Alley
Saratoga Springs, NY 12866
Attn. Mr. Kevin Franke
Project No. 07074

Preparation Date:
March 2012

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Appendices

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Tables

1.0 INTRODUCTION

This report describes the proposed stormwater management plan for the Modified Belleayre Resort at Catskill Park (the Project), and provides the criteria, methodologies and assumptions used to form the basis of the design. The proposed project includes the development of a resort hotels and spa facilities with recreational amenities on +/-739 acres of land to the west of the adjacent to the Belleayre Mountain Ski Center (BMSC), in the Towns of Shandaken and Middletown, New York. The currently proposed project represents a reduction of the originally proposed project, which included an additional 1,400 acres of lands on two parcels, known as the Adelstein and Big Indian parcels. These lands are no longer included in the plans for development, and therefore will remain undisturbed.

The goal of the proposed stormwater management plan is to incorporate stormwater management as part of the overall project design. This includes protecting the site's natural resources and environmentally sensitive areas, minimizing development impacts and impervious areas by using effective site planning principles, and incorporating design features that effectively manage stormwater runoff such as green roofs, bioretention areas and an irrigation pond that captures water for re-use. The plan utilizes these elements in order to achieve the primary goal of meeting water quality objectives, while at the same time mitigating potential impacts associated with increased stormwater runoff. Specifically, the objectives of the stormwater management plan are to enhance the quality of stormwater runoff to prevent water quality degradation, and preserve water quality in receiving water bodies including New York City water supply reservoirs, promote infiltration and evapotranspiration, and to prevent increased runoff from developed land to reduce the potential for flooding, erosion and flood damage.

The management plan was developed in accordance with the procedures presented in the AIP document 'Exhibit F, Stormwater Quantity and Quality Protocols'. Additionally, the plan incorporates the design standards established in The New York State Department of Environmental Conservation Stormwater Management Design Manual, (August, 2010), and the Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its sources, 10 NYCRR §128-3.9.

2.0 PROJECT LOCATION

The Project is located in the Central Catskill region of New York State near the intersection of the boundaries of Delaware County, Ulster County and Greene County. The site is located approximately 35 miles west of the City of Kingston, off Exit 19 of the New York State Thruway.

The project site includes lands in the Town of Shandaken in Ulster County and lands in the Town of Middletown in Delaware County, that are located west of the adjacent BMSC. The 739 acres that comprise the Modified Project site are located on either side of Ulster County Route 49A just south and west of the hamlet of Highmount. See Figure 1, Site Location Map, in Appendix A.

3.0 PROJECT DESCRIPTION

The Modified Project consists of two development areas; Wildacres Resort (Wildacres) and Highmount Spa Resort (Highmount). Wildacres is planned to be a 3.5-4 star, 4-season resort with a focus on different types of outdoor recreation including golf, skiing, tennis, hiking, etc. Highmount is planned to be a 5-star, 4-season resort focused on spa and wellness center facilities and providing ski-in/ski-out access to Belleayre Mountain Ski Center trails. In accordance with the AIP, there are two parcels of land that were part of the original project, but are no longer included within the scope of the Modified Project. The western portion of the project site, 203 acres known as the Adelstein parcel, has been put under a Conservation Easement granted to the City of New York. The AIP and the Modified Project also contemplate the conveyance of the Big Indian parcels containing approximately 1,189 acres of undeveloped land into public ownership and potential for eventual inclusion into the State Forest Preserve. Since there is no longer development proposed on these parcels, they are not included in this report. Refer to the Project Master Plan, sheets L-1.00 and L1.01 in the SDEIS plan set, for the overall Modified Project location and design.

Wildacres Resort (Wildacres) is located on approximately 254 acres on the eastern side of the Project site with access from County Route 49A south of the Alpine Osteria and near the upper driveway to BMSC as well as access from Gunnison/Kraft Road. The Wildacres Resort is made up of two large contiguous areas, defined as Wildacres East, (also called the Front-9 Village), and Wildacres West, (also called the West Village).

Wildacres West includes the following development components.

1. A 250-unit hotel with a footprint of 4.0 acres, that has nine levels that step down the existing hillside. Ancillary hotel uses include dining, spa services, tennis courts and limited hotel-related commercial. Parking for the hotel will be located within the building, and within an adjacent parking garage to the west.

2. Adaptive re-use of the existing Marlowe Mansion, to be utilized as a social club for detached lodging unit guests, and resort operational offices.

3. An 18-hole championship golf course, clubhouse, parking and maintenance facility. The clubhouse is attached to the hotel and the maintenance facility is located off of Gunnison Road near the 15th hole. The course itself is spread throughout both the west and east side of Wildacres. Surface parking is provided at the Clubhouse.

4. 2 and 3-bedroom detached lodging units in ~~eight~~nine and ten-unit buildings~~ called octoplexes~~. There are 7 ~~octoplexes~~lodging -buildings (~~56~~ 69 units) located on the main parcel near the hotel and Marlowe Mansion, collectively referred to as the West Village. Each unit includes garage parking plus surface parking spaces for guests.

Access to Wildacres West for the Golf Course and detached lodging units is off of County Route 49A west of the Hotel, and off of Gunnison Road. These access points are connected with an internal road that will be privately maintained. Access to the Hotel is across from the main access road/upper driveway to the BMSC and the proposed new Belleayre West lift.

Wildacres East includes the following development components.

1. A portion of the 18-hole golf course.
2. 2 and 3-bedroom detached lodging units in multiple-unit buildings clustered within the front 9 portion of the golf course. ~~Most of the units are housed in buildings that contain 8 units (octoplexes) and some are in buildings that contain 4 units (quadplexes). Five (5) octoplexes and 11 quadplexes (84 units),~~ There are 11 lodging buildings (94 units) collectively referred to as the Front-9 Village. Each unit includes garage parking plus surface parking spaces for guests.
3. Clubhouse and recreation amenities for the Front-9 Village, including a health club, swimming pool and tennis courts. Surface parking is provided adjacent to the Clubhouse.

Access to Wildacres East is off of County Route 49A in the vicinity of BMSC's lower parking lots.

Highmount Spa Resort (Highmount) is located on approximately 237 acres with development proposed to the south and west of the former Highmount Ski Area with access proposed off of County Route 49A. Development proposed for Highmount includes the following.

1. A 120 unit hotel with spa facilities and 53 "semi-detached lodging units" within the hotel.
2. A multi-level lodge building south of the hotel/spa that includes 27 "semi-detached" lodging units.
3. ~~Forty~~ Sixteen (~~40~~16) additional detached lodging units in ~~32~~ 8 buildings located along the access road to the Hotel~~and near the top of the former Highmount Ski Area~~.
4. An Auxiliary Conference/Clubhouse facility north of County Route 49A. This will be an adaptive reuse of some of the existing Leach Farm buildings.
5. A ski lift and trails, providing potential ski in/out connections to the old Highmount Ski Area and Belleayre Mountain.
6. A Wilderness Activity Center that will service both Wildacres and Highmount Resorts, located in existing buildings at the base of the former Highmount Ski Area that will be adaptively reused.

The driveway access off of County Route 49A will service the hotel/spa, lodge and all detached units. Parking for the hotel/spa and lodge will be within their respective buildings. Parking for the detached units will include ~~2-car garages at each single detached unit, (top of highmount) and~~ two (2) surface parking spaces per unit at each ~~detached duplex unit~~lodging building along the access road.

The Project will have its own central water supply system and the source of potable water will be wells that are located in the valley near NY Route 28. The K-well property is located off Todd Mountain Road and the Q-well or Quarry parcel is located off Moran Road. The Project will also have its own central wastewater collection system, and wastewater will be sent to the Pine Hill wastewater treatment plant.

4.0 EXISTING SITE CONDITIONS

Vegetation

Vegetation on the 739 acre project site is primarily beech-maple mesic forest present on approximately 588 acres, or nearly ¾ of the project site. The next most prevalent vegetation covertype is Hemlock-northern hardwoods forest at 72 acres, followed by open meadow, (ski slopes at old Highmount Ski Area), at 41 acres. These ski slopes had previously been mown at least several times each year, however maintenance is no longer being carried out and these slopes are beginning to undergo ecological succession. In addition to these primary vegetation cover types, there are a few seasonal residences and hotel/motels within and directly adjacent to the project site. The grounds around these buildings include areas of maintained lawns and landscape plantings of various trees and shrubs, and open areas with naturally occurring, non-maintained meadow grasses. Refer to Figure 2 in Appendix A, Ecological Communities, and the Existing Subcatchment Maps, sheets L5.00 and L5.01 in the SDEIS plan set, for surveyed vegetation and cover types.

Soils

Detailed mapping of the soils on and around where development is proposed was prepared by an LA Group certified soil scientists, based on extensive research and on-site investigations. Soils mapping for the project site is shown on the Soil Inventory Mapping, sheets L2.02 and L2.03 in the SDEIS plan set, and test pit data is summarized in Appendix H of this report. Additionally Appendix 12, "Soil Test Results", of the project DEIS includes a full inventory of test pit logs, percolation test results, as well as the laboratory reports from analyses of soil samples taken from the project site (sieve analyses and hydrometer testing).

The lands on and around the project site are mostly areas of shallow and moderately deep, very stony soils formed in glacial till derived from red shale and sandstone. There are some areas of deep glacial till soils that have a very firm fragipan. At the base of slopes along the outlet of small streams coming off the slopes there are some broad areas of very gravelly (actually channery and flaggy) glacial outwash. A few areas of the deep till do not have a fragipan. The soils on and around the site have a relatively moderate content of fine, colloidal material that do not settle out readily when they are in solution.

The mapped soils include Elka silt loam, Halcott, Halcott-Udorthents, Halcott-Vly complex, Lairdsville Silt Clay Loam, Lewbeach channery silt loam, Onteora-Suny complex, Rubble Land, Tunkhannock very channery loam, Vly-Elka complex, Vly Halcott complex, Vly channery silt loam and Willowemoc Channery silt loam. The Hydrologic Soil Groups for these soils are predominately C and D, with most of the developed area falling into Hydrologic Soil Group C.

Most of the Lewbeach soils were found to have a fragipan at a depth of 16 to 40 inches with bedrock typically not encountered in the generally seven to eight foot deep test pits. Percolation tests performed above the fragipan had percolation rates that ranged from 5 minutes 35 seconds to 27 minutes. Percolation tests within the fragipan typically had percolation rates that were greater than 60 minutes. Typically there was no evidence of seasonal high ground water in the Lewbeach soils.

The Vly soils did not have a fragipan but bedrock was usually contacted in test pits excavated in Vly soils. Depth to bedrock in Vly soils ranged from 24 inches to 72 inches. Percolation tests performed above the bedrock boundary layer ranged from 5 minutes 10 seconds to fourteen minutes two seconds.

Two test pits were excavated in Willowemoc soils and they, like the Lewbeach and Vly soils, had characteristics consistent with County soil survey descriptions. Fragipan depth ranged from 28 to 40 inches and bedrock was not encountered. Mottling at 28 inches is indicative of the seasonal high water that occurs from October to May.

The test pits in Halcott soil confirmed their shallow depth to bedrock. In the five test pits in Halcott soil the depth to bedrock ranged from 12 to 22 inches. As a result of the test pit work done on the site, the preliminary high intensity soils maps were revised to reflect a lesser amount of Halcott soils on the project site. Some of the areas originally mapped as Halcott rock outcropping were merely areas of other soils with large rock, rather than bedrock, on the soil surface.

A test pit excavated in Elka soils to confirm this mapping unit did confirm the correct soil series and characteristics described in the County soil survey. The characteristics include a bedrock depth greater than six feet and a very stony and channery soil profile.

Based on the extensive soil investigations, mapping and test pit confirmations, the silt/clay soils, fragipans, shallow depths to bedrock and seasonally high groundwater are limiting factors in the design of stormwater management facilities.

Hydrology

Overall, the site drains from south to north. Existing drainage patterns on the site and on adjacent contributing areas are illustrated on the Existing Subcatchment Plans, sheets L5.00 and L5.01 in the SDEIS plan set. These plans also including the watershed divide between the Ashokan and Pepacton watersheds (source: NYSDEC). Essentially all of the site is within the Pepacton watershed, with only a very small portion of the Wildacres site along the lower section of County Route 49A being within the Ashokan watershed. Additional wetland and watercourse mapping for the site is included on the Wetland Inventory, sheets L2.06-2.09 in the SDEIS plan set.

At Highmount, drainage currently runs as sheet flow overland from the high point at the top of the old ski area overland and is collected in drainage swales on the uphill side of County Route 49A. This drainage passes underneath County Route 49A via a number of culverts including a 52-inch concrete culvert near the base of the Highmount Ski Area.

At Wildacres West, existing runoff from lands south of County Route 49A, including the western portion of the Belleayre Mountain Ski Area and lands east of Highmount, is conveyed through culverts under Route 49A, runs in channelized streams through the property, collects in an east/west channel along the railroad corridor north of the site, and exits the channel via a number of culverts that pass under the railroad bed to the north.

At Wildacres east, drainage in the Pepacton watershed runs overland and is collected in the same channel along the railroad corridor, before it is conveyed through culverts under the railbed. Drainage in the Ashokan watershed also runs overland, and is collected in a roadside ditch on County Rt. 49A, which eventually drains to a 30” culvert under 49A to a ditch along Rt. 28.

There are three primary drainage courses through the site, all located at Wildacres. (See Wetland Inventory, sheets L2.06-2.09 in the SDEIS plan set). The first is an intermittent stream with a substrate consisting of rock, boulder and gravel that originates on State lands east of the former Highmount Ski Area and flows north through the Resort. This drainage is located within Wetland 16, and is a mapped intermittent tributary of the Bush Kill. To the east of the existing Wildacres Hotel (Marlowe Mansion) there is a second drainage that originates in a seepy area south of the Mansion. In the vicinity of the existing Hotel driveway seasonal or storm flow becomes channelized, then passes under the existing driveway and continues north and down the slope. This unmapped intermittent watercourse is identified as being within Wetlands 19-22.The third drainage originates on the western portion of the BMSC, crosses under County Rt. 49A, then flows as channelized drainage to the point where it enters the western corner of Wildacres East. This mapped intermittent tributary of the Bush Kill is within Wetland 24. The drainage then turns northwest and continues to the railroad corridor to the north. All three of the primary drainages are rocky, cobbly channels that convey storm flows and seasonal flows. Their locations and contributing watersheds are further illustrated on the Existing Subcatchment Plans, sheets L5.00-5.01 in the SDEIS plan set.

Topography

The topography within the portions of the project site proposed to be developed ranges from a maximum elevation of 3,100 feet above mean sea level (AMSL) near the top of the lift at the former Highmount Ski Center to a minimum elevation of 1,734 feet AMSL at the railroad corridor in the north corner of Wildacres West. Detailed topography information at 2 foot, 5 foot and 20 foot contour intervals is illustrated on the Existing Conditions Plans, sheets L2.00-2.01 in the SDEIS plan set. Detailed slope classifications are illustrated on the Slope Mapping, sheets L2.04-2.05 in the SDEIS plan set.

At Highmount, with the exception of the lands at its very top where grades are less steep, the former Highmount Ski Area consists of steep north-facing slopes with elevations ranging from a high point of approximately 3,400 feet down to 2,260 feet AMSL. To the west of the flatter lands at the top, elevations decrease via a combination of steep slopes and flatter plateaus, typical of the topography of mountains in the Catskills. The less steep areas at the top and the flatter plateaus are more suitable for development.

The Wildacres portions of the project site consist of areas of varying topography. Elevations in this area range from approximately 2,260 to 1,800 feet AMSL. On the western half topography is generally moderate, with the same combination of steep slopes and flatter plateaus mentioned above. The eastern side is generally flatter, and suitable for more dense development.

As per the AIP, proposed lodging units will be built only on slopes less than or equal to 20% and this will provide significant stormwater management benefits for this project. This commitment by Crossroads is an enhancement beyond current NYSDEC and NYCDEP regulatory standards for steep slope construction, and is consistent with the 'site planning as green infrastructure' goals for stormwater management outlined by NYSDEC.

Resource Mapping

Detailed mapping of existing conditions and environmental resources is provided in the SDEIS project plan set as noted in the sections above.

5.0 METHODOLOGY

The Stormwater Management Plan was developed in accordance with the procedures presented in the AIP document 'Exhibit F, Stormwater Quantity and Quality Protocols'. The plan incorporates the design standards established in The NYSDEC New York State Stormwater Management Design Manual, August, 2010 (SMDM), and the Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its sources, 10 NYCRR §128-3.9.

Stormwater Model and Analysis

As per the AIP, stormwater modeling was performed using the computer program HydroCAD (version 9.10) produced by HydroCAD Software Solutions, LLC, and all stormwater calculations were completed utilizing the SCS TR-20 and , TR-55 methods, widely accepted engineering practices, and recommended procedures listed in the SMDM. During a September 18, 2008 meeting with NYCDEP, NYSDEC and the NGO's it was again confirmed that the HydroCAD model was the proper model to use.

Storm Events Analyzed

The Type II storm is synthetic rainfall distribution that SCS has mapped for the project site, based on available National Weather Service duration-frequency data. Type II represents the most intense, short duration rainfall of the four different distributions, and is the design storm utilized in the stormwater model as per the AIP and as confirmed during a September 18, 2008 meeting with NYCDEP, NYSDEC and the NGO's.

The return interval storm events analyzed during the development of the plan are those specified in the AIP and in the August 2010 SMDM. However, because the 2007 AIP references the then-current SMDM that was subsequently updated, it was appropriate to update the rainfall amounts of the design storm events to be consistent with the 2010 SMDM.

The storm events analyzed are:

1. The 90% rainfall event totaling **1.1** inches as per Figure 4.1 of the SMDM, used as the basis for the DEC **Water Quality Volume** treatment goals. Since the modified project no longer includes the lands to the east of BMSC, the entire project site now falls directly under the 1.1" contour on the 90% rainfall map that is Figure 4.1 of the SMDM. This is a revision of the 1.3" event listed in Exhibit F of the AIP. See Figure 3 in Appendix A, showing the project site in the context of SMDM Figure 4.1

2. The 1-Year, Type II Design Storm having a 24-hour rainfall total of **2.8** inches as per Figure 4.4 of the Manual, used as the basis for **Channel Protection Volume** extended detention requirements. This storm event is also used to meet ***NYC DEP*** **Water Quality Volume** treatment goals. The precipitation map in the updated 2010 SMDM for the 1-yr storm event has been updated from the previous version, and therefore is different than the 3.5 inches listed in the AIP document 'Exhibit F'.

3. The 10-Year, Type II Design Storm having a 24-hour rainfall total of **6.0** inches, as per Figure 4.5 of the Manual, used as the basis for meeting the **Overbank Flood Control** Criteria. This map/figure did not change in the updated 2010 SMDM.

4. The 100-Year, Type II Design Storm having a 24-hour rainfall total of **8.0** inches as per Figure 4.6 of the Manual, used as the basis for meeting the **Extreme Flood Control** criteria. This map/figure did not change in the updated 2010 SMDM.

5. The 25-Year Design Storm having a 24-hour rainfall total of **6.5** inches. The inclusion of this storm is a local and NYC DEP requirement for peak rate attenuation.

Design Process

Once an environmental resources analysis of the project site is complete, the stormwater management design process begins with the identification of design points, typically located at points of confluence where flows can be easily measured, locations that are down gradient of proposed development, and as close as possible to the areas of proposed development. These are used to develop the subcatchment mapping, and ultimately to compare the rate and volume of runoff in the pre-development and post-development conditions. Once the subcatchment areas are defined, data is collected to determine both quantity and quality requirements. Using this data, the design is then developed in accordance with the SMDM 5-step process in order to meet the required goals.

The August 2010 SMDM includes a five-step process that integrates site planning and stormwater management, and requires the use of green infrastructure practices to treat stormwater. The five steps include;

1. Site planning to preserve natural features and reduce impervious cover,
2. Calculation of the initial Water Quality Volume for the site,
3. Providing Runoff Reduction by incorporation of green infrastructure techniques and standard stormwater management practices (SMP's) with Runoff Reduction Volume (RRv) capacity.
4. Using standard SMP's where applicable, to treat the portion of water quality volume (WQv) not addressed by green infrastructure techniques and standard SMP's with RRv capacity, and
5. Design of volume and peak rate control practices where required.

The original design of this overall project integrated site planning and stormwater management and incorporated green infrastructure practices such as green roofs and cisterning water for re-use, prior to the issuance of the 2010 SMDM update. The Modified Project continues the commitment to these practices and articulates the specific steps from the revised manual listed above. Specific aspects of the design and the process are included in more detail in the body of the report below.

6.0 PRE-DEVELOPMENT MAPPING AND ANALYSIS

Design Points were identified during fall of 2006 field investigations and inspected again in the spring of 2007. The locations of these design points are listed in the AIP Exhibit F, included in Appendix B. After the AIP was issued, additional discussions regarding the Design Points were held with DEC, DEP and the NGO's in September and November of 2008. The discussions addressed how the AIP design points would be analyzed in the context of a proposed stormwater management concept, based on the Modified Project. At the conclusion of the discussions the participants agreed that Design Points 1-6 would be moved closer to the proposed development at Highmount, to create the most accurate storm water model for the Modified Project. Based on these changes, the Design Points were re-numbered, and the adjusted locations were then field verified in October, 2008, by LA Group staff. Design Point 13 was eliminated based on these field investigations. The adjusted Design Points are listed below, and shown on the Existing Subcatchment Plans, sheets L5.00-5.01 in the SDEIS plan set.

Modified Project Design Points

Design Point	Structure Type	Location	Notes
1a	Drainage Ditch at Woods Road	+/-600' west of ex Leach Farm (below HM)	New Design Point
2	24" Culvert	Along Rte. 49A (below Highmount)	Previously DP 14
3	12" Culvert	Along Rte. 49A (below Highmount)	Previously DP 15
4	18" Culvert	Along Rte. 49A (East Side of Highmount)	Adjusted DP
5	18" Culvert	Along Rte. 49A (East Side of Highmount)	Adjusted DP
5a	12" Culvert	Along Rte. 49A (East Side of Highmount)	Adjusted DP
6	52" Culvert	Along Rte. 49A (Bottom of old ski area)	Adjusted DP
6a	28" Culvert	Along Rte. 49A (Bottom of old ski area)	Adjusted DP
7	36"x48" Culvert	At Railbed, ± 70' North of Gunnison Rd.	No Change
8	(2) 18" Culverts	At Railbed ± 190' North of Gunnison Rd.	No Change
9	24"x36" Culvert	At Railbed ± 890' North of Gunnison Rd.	No Change
10	60"x96" Stone Culvert	At Railbed, ± 1405' North of Gunnison Rd.	No Change
11	24"x36" Culvert	At Railbed, ± 2105' North of Gunnison Rd.	No Change
12	30" Culvert	Intersection of Van Loan Road & Rte. 49A	No Change
16	24" culvert	Intersection of Ulster Del. Trnpke & Rte. 49A	New Design Point

**Note: Design Point 13 was eliminated*

Based on these Design Points, individual subcatchments were derived from field observation and mapped data. The individual subcatchments include the following.

Cover Types

Areas of cover type are from the project site survey and vegetation community type mapping derived from field observation. These cover types were used to help determine runoff coefficients, and typically include impervious and vegetated areas.

Soils

Soils types and hydrologic soil groups are identified based on-site high intensity soils mapping and used in conjunction with the cover types to help determine runoff coefficients. Based on the collected soil data, Hydrologic Soil Group C is used throughout the existing analysis.

Time of Concentration Flow Paths

Time of concentration flow paths will begin with a sheet flow segment, transitioning to shallow concentrated flow and channel flow where these conditions exist. Specific flow paths and channel conditions are based on existing conditions mapping, survey and field observation, and the position and orientation of channels was verified using GPS positioning.

At Highmount, the site is divided into eight existing subcatchments, that terminate at design points 1a, 2, 3, 4, 5, 5a, 6 and6a located along County Route 49A. The eight subcatchments total approximately 183 acres of primarily wooded and meadow cover types, on Hydrologic Group C soils. There are also a few existing structures, driveways, and dirt access roads at the old Highmount ski area.

Wildacres West includes ten existing subcatchments that terminate at design points 7 through 9, and includes runoff from off-site lands to the south. The ten subcatchments total approximately 301 acres of primarily wooded cover type on Hydrologic C soils. Also included are some existing structures, driveways, meadow areas and wetland areas.

Wildacres East includes seventeen existing subcatchments that terminate at design points 10, 11, 12 and 16. Nine of the seventeen are on off-site lands including the western portion of BMSC and its access road, totaling approximately 90 acres. All seventeen subcatchments total approximately 254 acres of primarily wooded and meadow cover types on Hydrologic Group C soils. There are also existing structures, lawn areas, driveways and roads. Design points 12 and 16 include subcatchments that are within the Ashoken watershed. All other project subcatchments are within the Pepacton watershed. The total watershed area at Wildacres, (East and West), is 555 acres.

The existing subcatchments and their characteristics were entered into the HydoCAD model in order to create the pre-development condition that can be used as a baseline comparison for the post-development model. The existing peak discharge rates and volumes at each Design Point for the 10, 25 and 100-yr storm events are summarized in Table 7 in Appendix C. The WQv and 1-yr storm events are analyzed separately.

7.0 STORMWATER MANAGEMENT PLAN AND DESIGN PROCESS

The proposed project incorporates stormwater management as part of the overall project design. This includes protecting the site's natural resources and environmentally sensitive areas, minimizing development impacts and impervious areas by using effective site planning principles, and incorporating design features that effectively manage stormwater runoff such as green roofs, bioretention areas and an irrigation pond that captures water for re-use. The plan utilizes these elements in order to achieve the primary goal of meeting water quality objectives, while at the same time mitigating potential impacts associated with increased stormwater runoff. Specifically, the objectives of the stormwater management plan are to:

- Enhance the quality of stormwater runoff to prevent water quality degradation, and preserve water quality in receiving water bodies including New York City water supply reservoirs,
- Promote infiltration and evapotranspiration,
- Prevent increased runoff from developed land to reduce the potential for flooding, erosion and flood damage.

The plan is developed in accordance with the NYSDEC design criteria and process outlined in Section 5 above, and 10 NYCRR §128-3.9. Specific steps are described in detail later in the report. In general, stormwater is conveyed through a series of stabilized rip rap and grassed swales, storm pipes, culverts and in some cases sheet flow. It is collected, treated and attenuated in catch basins, micropool extended detention ponds, bioretention areas, dry swales, sections of porous pavement, stormwater planters, ~~a~~ wet extended detention ponds, including one that will function as a cistern for irrigation, and a green roof. Controlled release structures within the detention ponds regulate the rate at which stormwater is discharged. The existing soils limit the ability to use infiltration for treatment, so underdrains are included in the bioretention areas, dry swales and stormwater planters. The wet pond used to store irrigation water is an isolated man-made pond with a liner and is not associated with any of the watercourses on the project site. Sufficient freeboard will be maintained in the irrigation ponds so that required treatment and attenuation can be achieved.

Even though there are no direct discharges to Trout Waters, concerns relating to thermal loading were considered in the selection of stormwater management practices. This is one of the reasons Micropool Extended Detention Ponds are primarily used throughout the plan instead of other ~~stormwater ponds, (such as Wet Ponds~~treatment devices~~)~~, which could potentially result in increased stream temperatures. Only two Wet Extended Detention Ponds are utilized. The first is the irrigation Pond mentioned above, however since it will be used for irrigation, potential for stormwater discharges from the pond is greatly reduced. The second is at Highmount and ~~actually functions more like a large forebay since it will discharge directly into an adjacent Micropool Extended Detention Pond.~~functions both as a treatment device and decorative water feature. Using Bioretention and Dry Swales also helps, as it reduces the amount of stormwater that would be required to pond, and potentially warm, prior to being discharged. Even though 24 hours of extended detention of the 1 yr. storm event is required, using these practices and the Micropool Extended Detention Ponds minimize the potential for thermal loading.

Stormwater management devices will be vegetated with plant species adapted to survive in fluctuating hydrologic conditions, and all conveyances will have sufficient erosion protection including rolled erosion control products and/or grasses. Treated stormwater will be discharged at controlled rates to stabilized swales and existing channels and drainage ways throughout the site. Existing hydrologic patterns that include stormwater runoff from off-site areas located above the proposed development areas, are maintained to the maximum extent practicable. This is achieved by ensuring this runoff does not flow over proposed development areas, and allowing it to bypass disturbed areas and proposed stormwater management practices whenever possible.

By implementing these practices and creating positive drainage with effective site grading within each of the drainage areas, the proposed stormwater management systems are capable of minimizing erosion potential, treating stormwater runoff from developed project areas, and reducing post-development runoff rates from the 1, 10, 25 and 100-year storm.

The five steps outlined in the SMDM, (Site Planning to Preserve Natural Features, Water Quality Volume, Runoff Reduction Volume, Channel Protection Volume, and Overbank Flood and Extreme Flood Control), are discussed in the following sections.

Site Planning to Preserve Natural Features

On a larger scale, the preservation of land is a direct result of the AIP process which resulted in the Modified Project. In accordance with the AIP, the 203 acre Adelstein parcel has been placed in a Conservation Easement to the City of New York. The Conservation Easement allows for passive recreational activities on the property. The AIP and the Modified Project contemplate the conveyance of the Big Indian parcels containing approximately 1,189 acres of undeveloped land into public ownership and potential for eventual inclusion into the State Forest Preserve. The lands are contiguous with the Big Indian Wilderness Area and nearby the Shandaken Wild Forest. Together, the Adelstein parcel and the Big Indian parcels represent nearly 1,400 acres of lands to remain undisturbed and preserved as a result of the Modified Project.

As a result of the reduced project scope, the Modified Project entails development of approximately 235 acres as opposed to the 573 acres of development proposed under the original project. Similarly the Modified Project includes a total of ~~27~~ 21 acres of impervious surfaces as compared to the 85 acres of impervious surfaces proposed in the original project.

Specific to the current Modified Project, the design process considered site planning strategies that can be beneficial to a stormwater management plan. Some of these are listed in Table 3.1 in Chapter 3 of the SMDM. There are two categories, Preservation of Natural Resources and Reduction of Imperious Cover.

Preservation of Natural Resources includes:

- Preservation of Undisturbed Areas
- Preservation of Buffers
- Reduction of Clearing and Grading
- Locating Development in Less Sensitive Areas
- Open Space Design
- Soil Restoration

Reduction of Impervious Cover includes:

- Roadway Reduction
- Sidewalk Reduction
- Driveway Reduction
- Cul-de-sac Reduction

- Building Footprint Reduction
- Parking Reduction

These planning principles were included during the site design and concept refinement process at Wildacres and Highmount. Based on the existing site conditions and natural resource analysis included in Section 4 above, areas that are more suitable for development were identified, along with natural areas that should be preserved. Development was then clustered in the more suitable areas, (such as the flatter plateaus within the topography), slopes steeper than 20% were avoided, and other natural resource areas such as wetland and streams were preserved. This allows for significant open space, both as undeveloped natural areas and designed open space areas designated for recreation.

The buildings, being the largest components, are located in the flattest areas and designed to fit into the topography, to reduce as much as possible the necessary clearing and grading. Roads were then strategically located to connect the developed areas, using the same principles of avoiding sensitive areas and minimizing grading as much as possible. Potential impacts to wetland and stream buffer areas are also minimized by avoidance, spanning streams with bridges, and minimizing grading within buffer areas to the maximum extent practicable. Soils with high capacity for infiltration do not exist on the site, however the development of the golf course will include the installation of topsoil with a much higher infiltration potential, thereby increasing groundwater recharge. Post-construction soil restoration is also specified as part of the stormwater pollution prevention plan (SWPPP).

As part of the same planning process, impervious areas were also minimized. All cart paths for the golf course will be constructed of porous pavement. Even though the soils have limited infiltration capacity, this approach maximizes the opportunity for infiltration to occur. Many of the detached lodging units utilize narrow, shared driveways, and in ~~some~~ most cases parking underneath the units. Road widths are minimized as much as possible, based on the amount of anticipated traffic and the project components they serve. ~~Cul-de-sacs are designed with bioretention areas in the center and associated pavement minimized.~~ The Wildacres Hotel incorporates most of its parking within the footprint of the building (underground), and additional hotel parking is provided in a two-story parking garage, further reducing the necessary parking footprint. Roof terraces are planted to reduce the hotel's impervious area. The Highmount Hotel/Spa and adjacent lodge are designed with a green roof, essentially eliminating an ~~potential~~ impervious rooftop. Parking for the hotel/spa and lodge are again included within the footprint of the building eliminating more potential impervious area.

Proposed Subcatchment Mapping

Subcatchment mapping of the proposed project area was developed based on the previously identified design points and existing subcatchment mapping. The same methodology used in the development of the existing subcatchment mapping with regards to cover types, soils and time of concentration flow paths were used for the proposed mapping, based on the proposed development plan.

Cover types in the proposed conditions include forest, meadow and wetlands in the undisturbed areas, lawn areas, roads and paving, roof area and porous paving. The lawn areas are broken into two categories based on anticipated soils after construction. Hydrologic Group C soils are anticipated in all areas with the exception of the tees, greens and fairways on the golf course. These areas are anticipated as Hydrologic B soils, based on the high porosity requirements typical of the quality soils necessary to establish golf course quality grass on fairways, tees and greens. Soils for these golf course components consist of a sandy loam or loamy sand as defined by the USDA, sand, and may times gravel to facilitate subsurface drainage. Subsurface preparation for building fairways, tees and greens should begin 12"-18" below the anticipated finished grade. Benefits of using these course textured soils include less compaction and increased infiltration rates, which are crucial to maintaining healthy turf. The porous pavement golf cart paths were considered to be impervious (CN 98), as a conservative measure due to the limiting infiltration capacity of the existing soils. However, it is expected they will function as intended providing infiltration, resulting in a much lower CN value ranging anywhere between 50 and 90. Time of concentration flow paths are based on a combination of the existing topography and proposed grading, and sheet flow is limited to a distance of 100' as required.

At Highmount, the proposed watershed is divided into several subcatchments totaling approximately ~~192~~ 182 acres. ~~This total is +/-9 acres more than the existing condition and is a result of treating runoff associated with the proposed development near the top of the old Highmount ski area. In the proposed condition, runoff from the western portion of this development area is treated and discharged on the eastern side of the high point. In the existing condition, runoff from this small area flowed down the west side of the highpoint and did not reach any of the identified project design points.~~

At Wildacres, the proposed watershed is divided into several subcatchments totaling approximately ~~555~~ 558 acres. This is the same watershed area identified in the pre-development condition. In the proposed condition, proposed grading results in 2.5 acres of the 26 acres draining to the Ashoken reservoir under existing conditions now draining to the Pepacton reservoir.

The data collected during the subcatchment mapping process is then entered into the HydroCAD model and used as part of the basis for the stormwater management design.

Water Quality Volume Calculations

The required water quality volume (WQv) was calculated for each drainage area contributing to a design point, based on the proposed design. The calculation was performed in accordance with the equation presented in Table 4.1 in Chapter 4 of the Manual, utilizing both the 1.1 inch storm event required by DEC, and the 2.8 inch storm event required by DEP. The resulting volumes determined the amount of treatment required, and were then used as the basis for the Runoff Reduction Volume calculation required by NYSDEC. A summary of the WQv required by drainage area is included in Tables 1 and 3, Appendix C, and detailed supporting calculations can be found in Table 2, Water Quality Volume Calculation Table, also in Appendix C.

As part of the above calculation, the percent of impervious area within each drainage area is also calculated. This is used not only to determine the WQv, but also to identify additional DEP treatment requirements above and beyond what is required by DEC, in accordance with DEP's April 2010 updated regulations. Section 18-39(c)(6) of the April 2010 DEP regulations states that if impervious surfaces cover 20% or more of a drainage area for which stormwater practices are designed, runoff from that drainage area shall be treated by two different types of stormwater management practices in series. Based on our analysis of this DEP requirement and its relationship to DEC's SMDM requirements, it is our understanding that the calculation to determine the percentage of impervious area is performed at the design point which defines the contributing drainage area. There appears to be a potential correlation between the DEC design process and this DEP requirement, however the regulations do not include sufficient language or information about how the DEC and DEP calculations and process could integrate with one another.

Based on the above, all of the drainage areas in this project for which stormwater management practices are designed do not include impervious surfaces greater than 20% of the total drainage area. A summary of this information is in the DEP WQv summary, Table 2 in Appendix C, and supporting calculations can be found in the Water Quality Volume Calculation Table 3, in Appendix C.

Runoff Reduction Volume Calculations (RRv)

Section 4.3 of the SMDM states the RRv requirement can be accomplished by application of on-site green infrastructure techniques, standard stormwater management practices with runoff reduction capacity, and good operation and maintenance. If by using these techniques the calculated RRv is greater than the required WQv, the RRv requirement is met. If the RRv is less than the required WQv, then the design must at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the site. The percent reduction is based on the Hydrologic Soil Group of the site, and is determined by the Specific Reduction Factor (S). The Specific Reduction Factor (S) for this project is 0.30, based on the 'C' soils present.

Green Infrastructure Practices

Listed below are the green infrastructure techniques and standard stormwater management practices with runoff reduction capacity acceptable for runoff reduction, as noted in Tables 3.2 and 3.5 of the Manual, and an evaluation of its use within this project.

Conservation of Natural Areas

As described in the Site Planning section above, there are several natural areas throughout and around the project site that that have been protected. These natural areas are a critical component of the design, from both an environmental standpoint and an aesthetic standpoint. These areas provide context and setting for the Resort as a whole, integrating it with the surrounding landscape. These preserved areas at Wildacres and Highmount are clearly marked on the project plans, and designated for protection during construction as shown on the Erosion and Sediment Control Plans, sheets L3.02-3.21 in the SDEIS plan set. While these areas are clearly protected and will be maintained by the Resort, no conservation easements are planned.

In an effort to maintain the existing hydrology of the site as much as possible, runoff from these undisturbed areas does not flow into stormwater management practices (SMP's), before reaching the design points. These areas are included in the initial WQv calculation; however, since they do not drain to a Stormwater management Practice (SMP), the areas are not included in the adjusted WQv calculations, and no area reductions are taken for the RRv calculation.

Even though there are no conservation easements planned within Wildacres or Highmount, the 203-acre Adelstein parcel to the west of Highmount and County Route 49A has been placed in a Conservation Easement with the City of New York. This represents the protection and conservation of a significant parcel of land, adjacent to the project site. However since it is separate from the project site and not included in the site's watershed, it is not included or accounted for in the RRv calculation.

Sheetflow to Riparian Buffers/Filter Strips

This technique is not used for this Project primarily due to the slope requirements and the maximum length of overland flow restrictions in the SMDM. Most portions of the project site where this technique could be applied are steeper than the allowable maximum contributing slope ranging from 6%-15% Additionally as part of this plan, all runoff from developed areas is typically treated and attenuated prior to being discharged into these naturally occurring areas, so the natural hydrology can be maintained as much as possible.

Vegetated Open Swales

RRv is not applied for this technique due to site topography prohibiting the required design flows and flow depths, and exceeding slope requirements of 4 percent. However, vegetated swales are an integral part of the design with respect to stormwater conveyance. And in many cases, Dry Swales are used instead.

Tree Planting/Tree Box

There are several natural areas with existing trees that are being preserved, and an extensive tree planting plan is included as part of this project. However RRv is not applied for this technique due to limiting slope requirements of 5% for proposed trees and 6%-15% for existing trees and distance limitations based on proximity to impervious areas. There appears to be several other limiting factors related to the applicability of this technique, such as a correlation to Rooftop Disconnection, Sheet Flow to Filter Strip and Natural Conservation Areas, but it is not clear how all these factors and/or restrictions can be integrated into a project of this size and scope. This is another reason why this technique is not applied to the RRv calculation, however this appears to be a conservative measure based on the existing wooded areas to be preserved and the extensive tree planting plan.

Disconnection of Rooftop Runoff

RRv is not applied for this technique due to the limiting infiltration capabilities of the project site soils.

Stream Daylighting

An impervious area reduction is not taken for this practice because the project does not qualify as a re-development project as defined in the SMDM, and therefore stream daylighting is not an applicable practice. However in one location there is a culvert approximately 25' long that will be removed and replaced with bridge that will span a portion of a stream and the area where the culvert is removed.

Rain Garden

RRv is not applied for this technique. Rain gardens are typically applied within very small drainage areas usually associated with residential development. The contributing drainage areas for individual homes exceeds the maximum contributing area of 1,000 sf (for a rain garden), specified in SMDM. Instead, Bioretention practices are incorporated as part of the plan. In addition to this practice being more appropriate for larger contributing drainage areas, this results in fewer practices for a larger area which can simplify operations and maintenance.

Green Roof

The Highmount Hotel and Spa and adjacent Lodge building will be constructed with Green Roofs covering the entirety of the structures. This represents a significant reduction in impervious area, as the roofs are planned to total 8.5 acres in size. The Green Roof will be an 'intensive system', including a lightweight growing media with depths ranging from 12" to 36", a filter fabric type layer and drainage aeration layer. Excess water will be drained away in small collection pipes. The roof will contain a mix of herbaceous and low growing woody vegetation that will be regularly maintained. In the stormwater model, it is assumed that herbaceous lawn will cover the entire roof and the growing media will be 12" deep. Additional plantings and greater soil depths will increase the performance of the roof.

There are 2 possible ways to model the green roof within hydrocad. If you were to model the roof as a pond, you would include the storage within the growing media and drainage layer . The outlets would be exfiltration, representing surface water percolating through the growing media, and horizontal orifices at the bottom of the drainage layer to collect the water that exfiltrates through the growing media. After exploring this option and it's reaction within the model, it was decided that modeling the roof as a subcatchment only was the most accurate, and conservative method to use.

In the HydroCAD model, the green roof is modeled as a subcatchment with a specific CN value. The CN value was provided by the green roof manufacturer based on TR-55 calculations and data acquired from lab testing of green roof materials. The manufacturer also provided a runoff rate for certain storm events, based on the CN value of 72. We modeled the project scenario independently and found that the rates generated were consistent with the rates provided by the manufacturer. Based on the scenario above and the information provided by the manufacturer, it is our opinion that this is the most accurate way to model the green roof within HydroCAD. Refer to Appendix C for supporting calculations provided by the manufacturer.

The entire required WQv is applied towards the RRv. Refer to Table 4 in Appendix C for the Green Roof WQv calculations.

Stormwater Planters

The Wildacres Hotel will include a series of stormwater planters on the rooftop terraces. The planters are designed as flow through planters with a 12" ponding depth, 18" of soil media, a 12" gravel drainage layer and an underdrain. A small overflow pipe is included for larger storm events. Collectively, the planters will treat nearly an acre of impervious roof terrace, before discharging to a collection system. As a flow-through planter on 'C' soils, 45% of the provided WQv is applied towards the RRv. See sheet L8.01 in the SDEIS plan set for the planter detail, and the Stormwater Management Plans for the location.

Rain Tanks/Cisterns

There are no traditional rain tanks and cisterns proposed as part of this project. However, the proposed irrigation pond located in the Front-9 Village portion of Wildacres east will function exactly like a cistern, storing stormwater runoff for re-use as irrigation for the golf course. Forty five (45) acres of proposed development, including the Wildacres Hotel, adjacent parking garage, portions of the golf course and the entire Front-9 Village drain to the irrigation pond. The pond is designed as a 'traditional' stormwater management practice, (Wet Pond), with a static water elevation, and sufficient freeboard to store the entire WQv and attenuate the larger storm events. None of this storage is applied to the RRv because of the uncertainty of how the calculation would be applied, since the pond will function both as a treatment and attenuation device and a storage device for re-use.

Porous Pavement

The infiltration capacity of the existing soils is a limiting factor preventing the widespread use of porous pavement on this project. However, porous pavement will be used to construct all of the golf cart paths along the golf course. The cross section of the paving design, (See sheet L8.02 in the SDEIS plan set), will include a perforated underdrain in the event adequate infiltration is not realized. As a conservative measure, no storage credit is applied to the RRv and they are not used to provide WQv treatment, due to the limited infiltration capacity of the existing soil. Any runoff from the cart paths will infiltrate as the soils allow, then sheet flow across the golf course or other grassed areas into a stormwater management practice. However it is expected they will function as intended, providing infiltration and reducing runoff, since the construction of the cart paths in many areas will be in fill soils and infiltration will be realized. As a conservative measure, the CN value for all cart paths was set at 98.

Bioretention

Bioretention is a primary treatment device used throughout the project, used mostly to treat the WQv in small drainage areas with high percentages of impervious areas. The bioretention areas are designed with a 6" maximum ponding depth, an overflow pipe, a 48" depth of soil filter media, a 12" gravel drainage layer and an underdrain. In most cases where these practice are used, the WQv requirement for the DEC storm is met, and overflow from larger events is directed via the overflow pipe, or over a weir to a standard SMP for attenuation. In many cases the Bioretention areas are oversized and the WQv requirement for the DEP storm is met, and therefore in a few cases these practices meet the total RRv requirement for a specific drainage area. As a bioretention practice on ‘C’ soils, 40% of the provided WQv is applied towards the RRv.

Dry Swale

Dry Swales are used throughout the project primarily to convey and treat the WQv associated with runoff from the golf course, which in most cases is all pervious. The dry swales are designed with an 18” ponding depth, a 30” depth of soil filter media, a 12” gravel drainage layer and an underdrain. In almost all cases where these practice are used, the WQv requirement for the DEC storm and DEP storm is met. Overflow from larger events is either directed over a weir to a standard SMP for attenuation and additional treatment, or discharged to conveyance swales or existing drainage channels at a controlled rate to ensure adequate attenuation is provided. As an open channel practice on ‘C’ soils, 20% of the provided WQv is applied towards the RRv.

RRv Summary

The RRv goals and the minimum RRv requirements were calculated in accordance with the equations and methodologies presented in Section 4.3 of the Manual, utilizing the 1.1 inch storm event required by DEC. A summary of the WQv and RRv by drainage area is included in Tables 1 and 3 in Appendix C. Detailed supporting calculations can be found in Table 2, also in Appendix C. The calculations show that the minimum RRv is met in every drainage area, and in some area 100% of the RRv requirement is met. Justification evaluating the use of each green infrastructure technique and site limitations is presented in the paragraphs above. Based on this information the project meets the RRv requirements.

Remaining Water Quality Volume

Micropool Extended Detention Ponds (P-1) and Wet Extended Detention Ponds (P3) are used to treat the remaining WQv from the drainage areas contributing to those practices. In all cases, the WQv requirements for the DEC 1.1 inch storm and DEP 2.8 inch storm are met. The ponds are typically designed with a forebay, a micropool or permanent pool, and a controlled release structure that regulates discharge from the pond. Emergency spillways or weirs are also provided. See sheet L8.01 in the SDEIS plan set for details. Treated water is discharged from the ponds to conveyance swales or existing drainage channels at a controlled rate to ensure adequate attenuation. Detailed supporting calculations listing required and provided WQv can be found in Table 2, Appendix C. Based on the plans and supporting calculations, the necessary WQv for both the 1.1 inch (DEC) and 2.8" (DEP) storm events is provided, and therefore the requirements are met.

Volume and Peak Rate Control

Channel Protection Volume (CPv)

Stream Channel Protection Volume (CPv) requirements are designed to protect stream channels from erosion, by providing 24-hour (12-hour in trout waters) extended detention of the one-year, 24-hour storm event. For this project, the 1-year event is **2.8 inches** as per Figure 4.4 of the Manual. The required CPv is calculated utilizing the Plug Flow Calculation in HydroCAD (TR-20) or the figures and calculations, (TR-55) in Appendix B of the SMDM. The CPv requirements are typically met using Micropool Extended Detention Ponds and Wet Extended Detention to provide the necessary attenuation. A summary of the required and provided CPv and supporting calculations can be found in Tables 5 and 6, Appendix C. Where detailed calculations are not provided, refer to the plug flow detention time listed in the HydroCAD report (Appendices E, F and G). Based on the plans and supporting calculations, the CPv requirements are met.

Overbank Flood (Qp) and Extreme Flood (Qf) Control

The primary purpose of the Overbank Flood (Qp) control sizing criterion is to prevent an increase in the frequency and magnitude of out-of-bank flooding generated by urban development. It requires storage and attenuation of the 10-year, 24-hour storm to ensure post-development peak discharge rates do not exceed the pre-development condition. For this project, the 10-yr event is **6.0 inches**, as per Figure 4.5 of the SMDM.

In addition to DEC requirements, a local and DEP requirement is the analysis of the 25-Year Design Storm to ensure peak rate attenuation. For this project, the 25-yr event is **6.5 inches**.

The intent of the Extreme Flood (Qf) criteria is to (a) prevent the increased risk of flood damage from large storm events, (b) maintain the boundaries of the pre-development 100-year floodplain, and (c) protect the physical integrity of stormwater management practices. It requires storage and attenuation of the 100-year, 24-hour storm to ensure post-development peak discharge rates do not exceed the pre-development condition. For this project, the 100-yr event is **8.0 inches** as per Figure 4.6 of the SMDM.

For this project, the 25-year storm, Qp and Qf requirements listed above are met using Micropool Extended Detention Ponds (P-1), Wet ~~Extended Detention ponds~~Ponds, (P-~~3~~2) and standard Detention basins (no treatment, attenuation only) to provide the attenuation necessary to match the pre-development conditions. Stormwater is routed by conveyance swales, closed system piping or overland sheet flow to these Detention Ponds where it is stored for a period of time and released at a controlled rate through a controlled release structure, and/or over a broad crested weir. Treated storm water is typically discharged from the ponds directly to existing drainage courses, or to constructed conveyance swales that distribute the runoff to existing drainage courses. In most cases runoff cannot be discharged as sheet flow due to the presence of slopes over 10 percent. In all cases conveyance swales are constructed with a stabilized surface, such as grass, grass with turf reinforcement mat, cobbles or rip rap, designed to support anticipated velocities without experiencing erosion. The swale surface materials along with the proposed grading controls flow rates.

All of the project data and calculations mentioned in previous sections is collected and included in the HydroCAD model, to determine the peak rate flows at each of the design points in the post development condition. This information is then compared to the pre-development rates at each design point to ensure the pre-development peak discharge rates are not exceeded. Refer to Table 7, Appendix C, for a comparison of pre and post-development peak discharge rates and volumes. Based on this comparison, post-development peak discharge rates do not exceed the pre-development condition at any of the identified design points, and therefore the requirements are met.

Comprehensive Management Plan

Using the design process described above, the proposed techniques and stormwater management practices are incorporated into the overall project design. The Grading and Drainage Plans, supported by the Proposed Subcatchment mapping, (sheets L4.00-4.11 and L5.03-L5.15 in the SDEIS plan set), show how the specific components are integrated into the overall project. Specific descriptions are as follows.

~~On the upper portion of Highmount, runoff from proposed buildings and roads is collected as sheet flow in a series of bioretention areas, treated, and conveyed to a Micropool Extended Detention Pond west of the development area. The detention pond provides additional treatment, and also collects and treats runoff from adjacent areas that do not go through the bioretention areas. Conveyance to the treatment devices is via sheet flow, conveyance swales and a closed pipe and catch basin system. Stormwater collected in the detention pond is released through a controlled release structure with staged orifices to control flow rate, and an overflow weir, to a conveyance swale/pipe system, and eventually to an existing drainage channel that runs along the existing Highmount Ski Area access road and drains to Design Point 6.~~

Along the proposed ~~driveway~~ Highmount access road from County Route 49A to the ~~upper Highmount units~~Hotel, stormwater is primarily collected in catch basins and conveyed through a closed pipe system to the detention pond~~s~~ north of the proposed hotel. There is ~~one bioretention area that treats runoff from two of the buildings on the upper section of the driveway, and~~ one dry swale north of the hotel that treats runoff from the three buildings west of the Hotel and adjacent paved surfaces. ~~Treated runoff from both areas is returned to the storm drain system in the roadway. Uphill runoff from undisturbed areas directly uphill of the driveway is collected in roadside swales and also conveyed to the detention ponds north of the Hotel.~~ The green roof on the Hotel and Lodge are designed to infiltrate only rainfall that falls directly on the roof. Sheet flow from adjacent areas is directed around the roof areas, and does not enter the green roof system. Any potential overflow or drainage from the green roofs ~~constructed as part of the Hotel and Lodge buildings~~ will ~~also~~ be routed through the detention pond~~s~~ to the north. The ~~two~~ detention pond~~s~~ to the north ~~are~~ is ~~a combination of~~ a Wet Extended Detention Pond (P-3)~~ and a Micropool Extended Detention (P-1) pond designed in series~~. Runoff is directed ~~first~~ to the Wet Extended detention pond, which will function both as an aesthetic pond and an attenuation device, where it is treated and released at a controlled rate into an adjacent roadside ditch on Route 49A which leads to Design Point 4. ~~.~~ The pond is designed with a static water elevation and adequate freeboard to pass the 100-year storm event. ~~The pond will also function as a forebay for the adjacent Micropool Extended Detention Pond. Runoff flows over a broad crested weir from the P-3 to the P-1, where treatment and additional attenuation is achieved, and discharged to the adjacent roadside ditch on Route 49A which leads to Design Point 4.~~

The Leach Farm north of Route 49A utilizes a single bioretention area for treatment and attenuation. Flows are conveyed through a piping system from the building roof and paved areas to a stable outlet before it enters the bioretention area via surface flow. Once treated, stormwater is discharged to a drainage ditch along an existing woods road, which eventually drains to Design Point 1A.

Design Points 2 and 3 have minimal runoff directed to them in the proposed condition, mostly associated with undisturbed areas. Design Points 5, 5a and 6a also have very few changes as a result of the proposed condition, with no runoff from developed areas flowing to the points.

At Wildacres West, runoff is either directed to Design Points 7, 8 and 9, or to the irrigation pond located north of the Front-9 Village at Wildacres East. On the western side of Wildacres west, sheet flow over the proposed golf course is directed to dry swales using grading and shaping of the landform. Runoff is treated in the dry swales and discharged via standard conveyance swales to existing adjacent drainage courses. In this area, existing wooded areas including the existing riparian corridor are preserved to the maximum extent practicable.

Runoff from the first portion of the Wildacres West access road, (Route 49A to the first lodging building), is collected in a series of catch basins and roadside swales, treated in a bioretention area adjacent to the 18th tee, and released into a proposed roadside swale leading eventually to an existing drainage channel. Runoff from the central portion of the access road (first lodging building to the clubhouse), the lodging buildings, the golf course clubhouse and a portion of the clubhouse entry drive are also collected in catch basins and pipes, and conveyed in a closed system to micropool extended detention ponds adjacent to the driving range and the 16th fairway. Stormwater is treated and released from the ponds into conveyance swales, leading directly to an existing drainage course running through the center of the site. Golf course runoff from the central portion of the site is directed via sheet flow to dry swales using grading and shaping of the landform. Runoff is treated in the dry swales and discharged via standard conveyance swales to existing adjacent drainage courses. These areas drain to Design Points 8 and 9. Runoff from the eastern portion of the access road, (clubhouse to Gunnison Road), the clubhouse parking lot and the 1st hole are also collected in catch basins and roadside swales, and primarily conveyed to a micropool extended detention pond east of the 1st green. Runoff from the rooftop terraces of the Hotel is collected and treated in a series of built in, flow-through stormwater planters, and conveyed to the drainage system leading to the same pond east of the 1st green. Treated water is then released to an existing ditch on Gunnison Road that eventually drains to Design Point 9. The lower portion of the access road is treated in a dry swale behind the 1st green, and released to the same ditch on Gunnison Road.

With the exception of the rooftop terraces, runoff from the Hotel roof, the adjacent parking garage, areas south and east of the Hotel and the 9th hole, is conveyed to the irrigation pond at Wildacres east. Runoff is collected in piping systems and directed to a conveyance swale east of the 9th hole, then under Gunnison Road and the adjacent drainage course in a closed pipe, before being discharged to another surface swale that drains to the irrigation pond.

In the proposed condition, the watershed for Design Point 10 is almost entirely made up of areas outside of the project boundary. The primary drainage course that collects runoff from this watershed has a very small section that crosses the project site in the western corner of Wildacres east. There are no proposed stormwater management practices that discharge to this drainage course or Design Point 10.

At Wildacres East, a majority of the drainage area, along with the portions of Wildacres west noted above, is treated in the irrigation pond. Runoff from the Front-9 Village is directed via sheet flow to ~~two~~ a bioretention area~~s~~ in the boulevard of the access driveway, treated, and released through a pipe to the irrigation pond for additional treatment and attenuation. Runoff from the Front-9 Clubhouse and adjacent paved areas is collected in catch basins and also conveyed to the irrigation pond. Lawn areas adjacent to the pond and a portion of the 5th, 6th and 7th holes also drain to the pond. Runoff collected in the pond is stored for re-use as irrigation for the golf course. The pond is designed with sufficient freeboard to treat the required WQv, and provide the necessary attenuation for the 1, 10, 25 and 100-year storm events. Overflow from the pond in severe storm events is conveyed as sheet flow and shallow concentrated flow to a conveyance swale west of the 3rd green, where is it discharged into the existing drainage channel along the railroad bed at the north end of the property, and eventually drains to Design Point 11. Golf course runoff from the 3rd hole and areas north of the irrigation pond is directed via sheet flow to dry swales using grading and shaping of the landform. Runoff is treated in the dry swales and discharged via standard conveyance swales to existing drainage courses along the northern property boundary.

The southern portion of Wildacres east, composed primarily of 7th and 8th holes is the only part of the proposed project within the Ashokan Watershed. Runoff from the golf course is directed via sheet flow to a bioretention area adjacent to the 8th tee using grading and shaping of the landform. Runoff is treated in the bioretention area and discharged in a pipe to the existing drainage ditch along Route 49A. Overflow from larger storm events will be released over a weir into an adjacent detention basin where it will be attenuated and released at a controlled rate through a pipe into the same drainage ditch along Route 49A, which drains to Design Point 16. Design Point 12 includes only a very small portion of the project area located at the entrance to Wildacres East.

8.0 POST-CONSTRUCTION MAINTENANCE REQUIREMENTS

All operational phase stormwater management practices will be maintained in accordance with the project Stormwater Pollution Prevention Plan required by NYSDEC. This includes, but is not limited to, cleaning of sediment from drainage inlet sumps, removal of sediment from SMPs, cleaning conveyance piping and channels of obstructions, inspection and repair as required of any outlet control mechanisms, and repairing any other detriments in the design that is resulting in the facilities not functioning as intended in the design.

Sediment removed as part of detention basin maintenance will be used on site. As part of golf course maintenance, the application of very thin layers of coarse topdressing to the golf course turf is typical. Much of the materials that will accumulate in the SMP's will be sand from road sanding and other coarse materials. With proper amending, this type of material is suitable for use as topdressing on the golf course.

Two annual inspections will be conducted after completion of the project. They will take place in April and September of each year. Any necessary repairs will occur during the growing season. An annual report will be prepared to report on any maintenance or required repairs.

9.0 CONCLUSION

The stormwater management goals and objectives for this project listed in the introductory paragraph, specifically meeting water quality objectives while at the same time mitigating potential impacts associated with increased stormwater runoff, have been met. The goals are met through the use of thoughtful and careful site planning, preservation of the site's natural resources and environmentally sensitive areas, minimizing development impacts and impervious areas, and incorporating design features such as green infrastructure techniques and standard stormwater management practices that effectively manage stormwater runoff and compliment the overall project design.

Additionally, the information presented above, supporting calculations and project plans demonstrate that the project and associated stormwater management plan has been developed in accordance with the procedures presented in the AIP document 'Exhibit F, Stormwater Quantity and Quality Protocols', the New York State DEC Stormwater Management Design Manual, (August, 2010), and the Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its sources, 10 NYCRR §128-3.9.

10.0 REFERENCES

1. Urban Hydrology for Small Watersheds. Published by the U.S. Soil Conservation Service, Washington, D.C., June 1986.
2. HydroCAD (version 9.10) Stormwater Modeling Software, by HydroCAD Software Solutions, LLC.
3. NYSDEC Stormwater Management Design Manual. Published by the New York State Department of Environmental Conservation, Updated August 2010.
4. Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its sources, 10 NYCRR §128-3.9.

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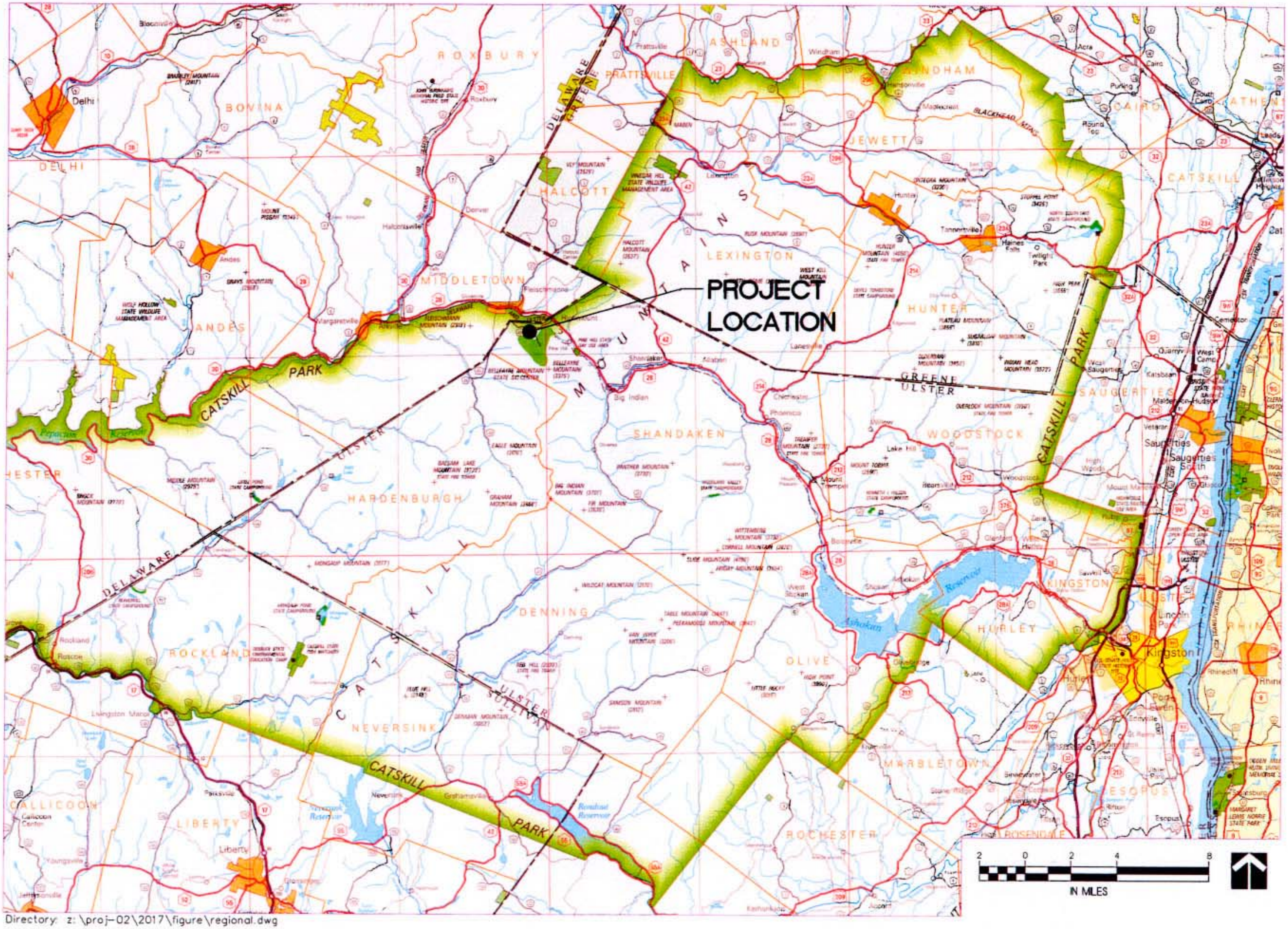
APPENDIX A

Figures



Directory: z:\proj-02\2017\figure\regional.dwg

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BELLEAYRE RESORT AT CATSKILL PARK

REGIONAL LOCATION MAP

Project: 00052
Date:

FIG. 1

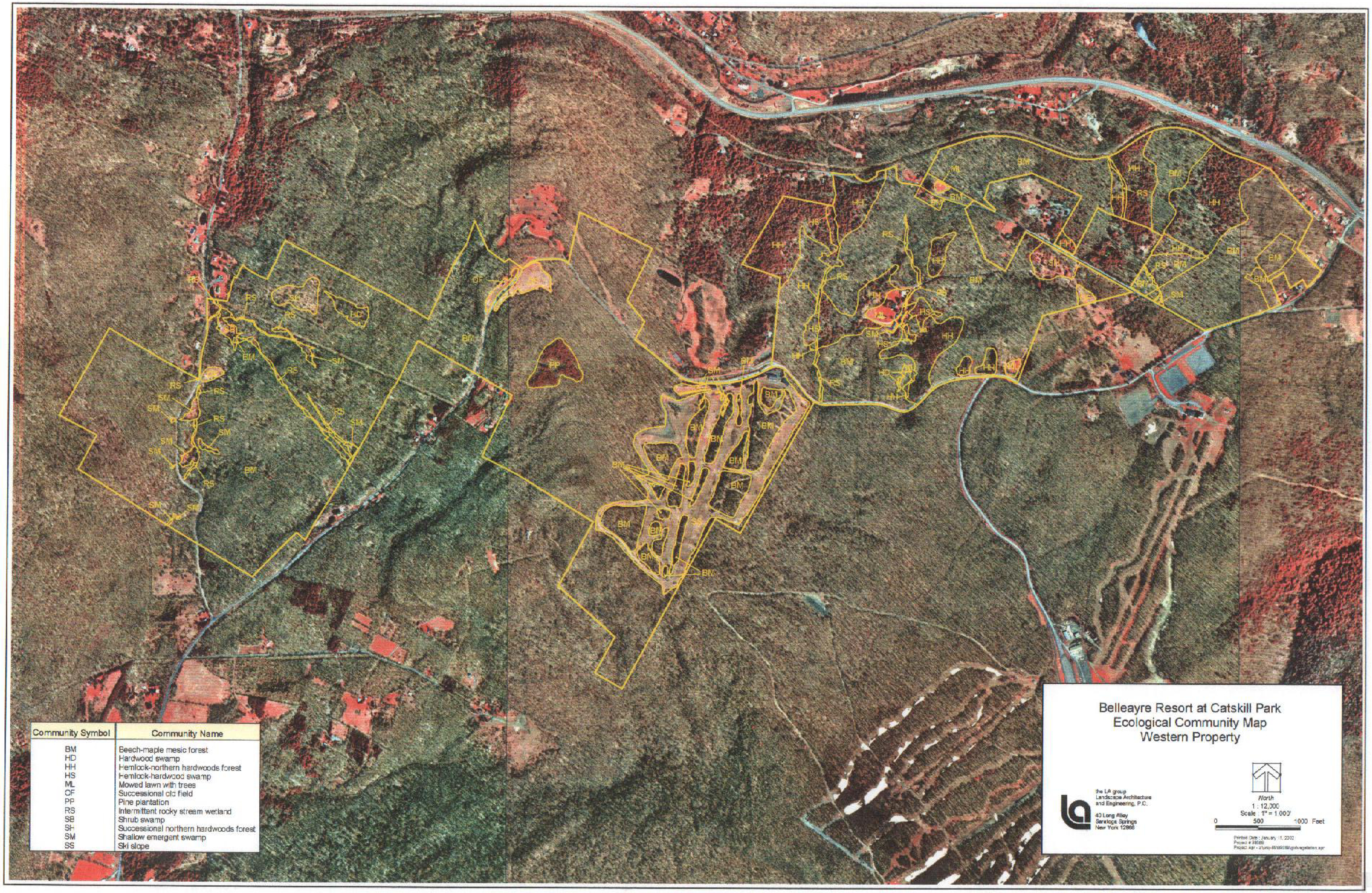
Belleayre Resort at Catskill Park
Ecological Community Map
Western Property
the LA group
Landscape Architecture
and Engineering, P.C.
40 Long Alley
Saratoga Springs
New York 12866
North
1 : 12,000
Scale : 1" = 1,000'
0
500
1000 Feet
Community Symbol
Community Name
BM Beech-maple mesic forest
HD Hardwood swamp
HH Hemlock-northern hardwoods forest
HS Hemlock-hardwood swamp
ML Mowed lawn with trees
OF Successional old field
PP Pine plantation
RS Intermittent rocky stream wetland
SB Shrub swamp
SH Successional northern hardwoods forest
SM Shallow emergent swamp
SS Ski slope

FIG. 2

90% Rainfall in New York State

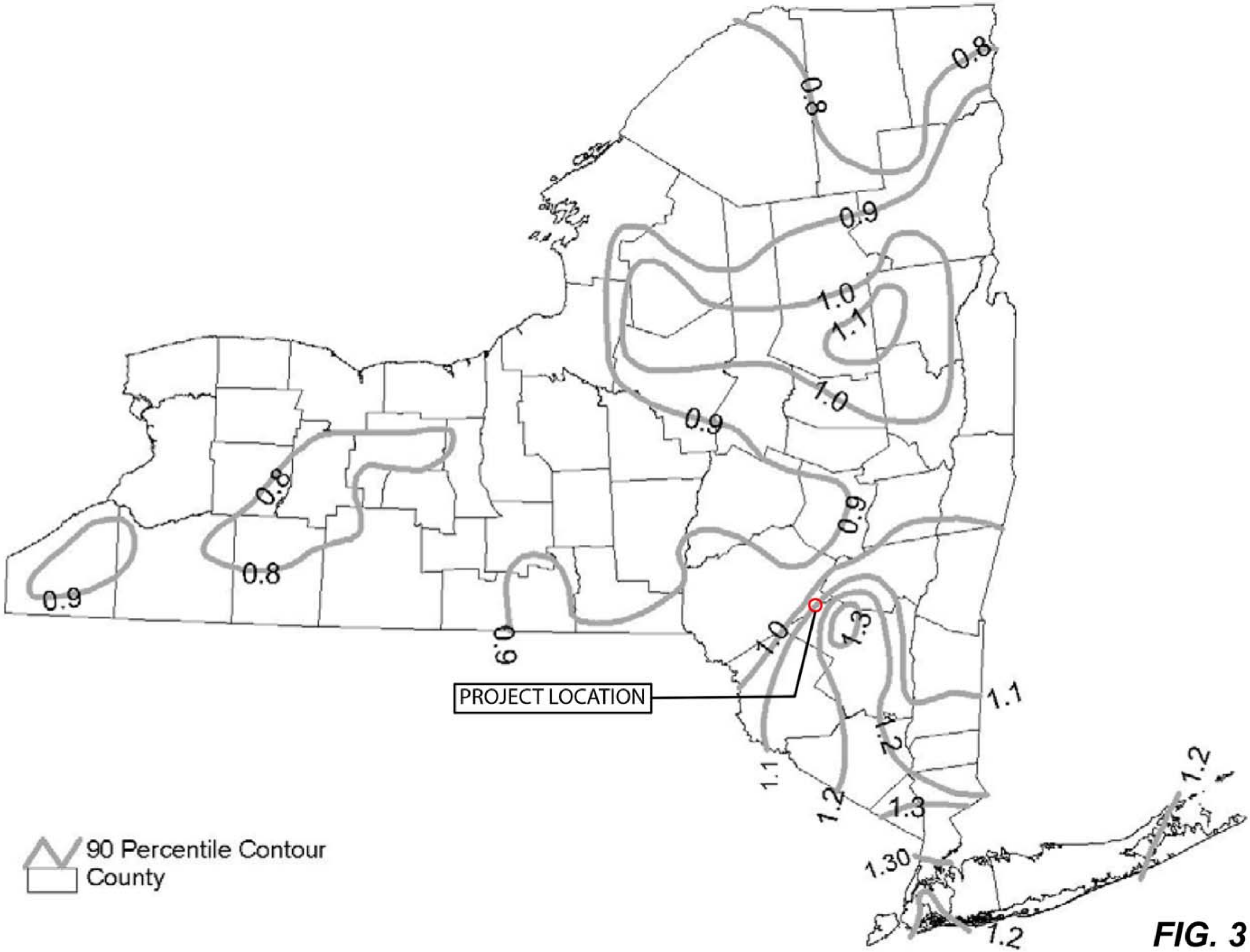

FIG. 3

APPENDIX B

AIP Exhibit F - ‘Stormwater Quantity and Quality Protocols’

‘AIP APPENDIX F’

CROSSROADS SETTLEMENT DISCUSSIONS
BELLEAYRE RESORT AT CATSKILL PARK
WILDACRES AND HIGHMOUNT
STORMWATER QUANTITY AND QUALITY PROTOCOLS

The following provides the proposed methodologies to be employed and assumptions that will be used for advancing stormwater management design[1] for Wildacres resort and the alternative development plan for the lands that were formerly Highmount Estates.

A. Model Used

The Stormwater Model that will be used is the; HydroCAD Stormwater Modeling System, Version 7.1 or higher, by Applied Microcomputer Systems. The SCS TR-20 method will be utilized.

B. Storms Analyzed

The intensity of rainfall varies considerably during a storm as well as over geographic regions. To represent various regions of the United States, SCS developed four rainfall distributions (I, IA, II, and III) from available National Weather Service duration-frequency data. Type II is the type of storm that SCS has mapped for the Crossroads assemblage. Type II represents the most intense, short duration rainfall of the four different distributions.

The storms analyzed are those specified in the August 2003 New York State Stormwater Management Design Manual (the Manual). Those storms are:

1. The Water Quality volume, the 90% rainfall event totaling 1.3 inches as per Figure 4.1 of the Manual.

2. The Channel Protection Volume, 1-Year, Type II Design Storm having a 24-hour rainfall total of 3.5 inches as per Figure 4.4 of the Manual.

3. The Overbank Flood Control Volume, 10-Year, Type II Design Storm having a 24-hour rainfall total of 6.0 inches, as per Figure 4.5 of the Manual.

4. The Extreme Storm, 100-Year, Type II Design Storm having a 24-hour rainfall total of 8.0 inches as per Figure 4.6 of the Manual.

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[1] This document, and all future stormwater design for the proposed project, will meet or exceed NYSDEC SPDES General Permit 02-01 requirements, the NYSDEC Design Guidelines, and the New York Standards and Specifications for Erosion and Sediment Control. As a result, general comments contained in Charles D. Silver’s documents “Technical Comments on the Camarda Park Proposal to the Town of Carmel, NY” dated July 1, 2005 and SEQRA Comments of the New York City Watershed Inspector General to the Town of Patterson Planning Board” dated September 25, 2006 will be met.

5. The 25-Year Design Storm having a 24-hour rainfall total of 6.5 inches. The inclusion of this storm is a local and DEP requirement and will be required as the project moves through the respective reviews.

C. Identification of Design Points

A revised pre-development model will be created for use in predicting stormwater runoff at the proposed Design Points. Revised Design Points have been identified at points of interest where flows can be easily determined, locations that are down gradient of proposed development, and as close as possible to the areas of proposed development. Revised Design Points were identified during fall of 2006 field investigations and inspected again in the spring of 2007.

Design Point	Structure Type	Location
1	Drop inlet with 24” Smooth Steel Pipe	± 380’ upgradient from mountain stream in village
2	Drop inlet with 24” Smooth Steel Pipe	± 720’ upgradient (east) from Design Point 1
3	Drop inlet with 24” Smooth Steel Pipe	± 1920’ upgradient (east) from Design Point 2
4	Drop inlet with 24” Smooth Steel Pipe	± 1040’ upgradient (east) from Design Point 3
5	Drop inlet with 24” Smooth Steel Pipe	± 1100’ upgradient (southeast) from Design Point 4
6	Drop inlet with 24” Smooth Steel Pipe	± 420’ upgradient (southeast) from Design Point 5
7	4’ x 3’ Stone Culvert	± 70’ downgradient (north) from Gunnison Road
8	(2) 18” Smooth Steel Pipes	± 190’ downgradient (north) from Gunnison Road
9	2’ x 3’ Stone Culvert	± 890’ downgradient (north) from Gunnison Road
10	5’ x 8’ Stone Culvert	± 1405’ downgradient (north) of Gunnison Road
11	2’ x 3’ Stone Culvert	± 2105’ downgradient (north) of Gunnison Road
12	CB w/ 24” CMP	At Intersection of Van Loan Road & Rte. 49A
13	12” Smooth Steel Pipe	Along Rte. 49A (below Highmount)
14	12” Smooth Steel Pipe	Along Rte. 49A (below Highmount)
15	12” Smooth Steel Pipe	Along Rte. 49A (below Highmount)

D. Pre-Development Subcatchment Mapping

Once the Design Points are chosen, individual subcatchments are derived from field observation and mapped data. The individual subcatchments include;

1. Areas of cover type taken from air photos and field observation, and vegetation community type mapping derived from field observation.

2. Soils types compiled from on-site high intensity soils mapping.

3. Time of concentration flow paths based on existing conditions and mapping. These will begin with a sheet flow segment, transitioning to shallow concentrated flow and channel flow where these conditions exist. Channel conditions were determined by field observation, and the position and orientation of channels was established using GPS data.

E. Proposed Flow Paths

The flow paths within each subcatchment have been field verified to include existing culvert sizes and pitches, the geometry, cover type and slope of existing swales or ditches and the condition of cover types for sheet flow and shallow concentrated flow components. Reach segments will be included to link individual subcatchments together to create a path to the individual design points. Reaches will be described in a similar fashion as the time of concentration segments. A separate reach will be described for every significant change in cover type, slope or geometry.

These factors will combine to create a pre-development HydroCAD Model that will accurately predict the existing hydrology.

F. Proposed Methodology

The proposed stormwater management plan for the sites will be developed in accordance with the guidelines established in the Manual and the Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its sources, 10 NYCRR §128-3.9. The primary design goal is to meet the water quality objectives as discussed in the Manual. In order to achieve the primary goal of meeting water quality objectives, while at the same time mitigating potential impacts associated with increased stormwater runoff, the design of the stormwater management system will follow the guidelines presented in the Manual and 10 NYCRR §128-3.9.

The proposed ponds will be located in close proximity to the golf course and other proposed facilities and in locations that provide the best opportunity for treatment and flow attenuation. Subcatchments will be created around areas that contribute to the individual basins or proposed points such as catch basins or culverts. The subcatchments will be linked by reaches, which will be modeled, including pipes, culverts, swales and any facilities that will transmit runoff. The proposed flows associated with the five design storms will be treated and attenuated at or below the pre-development rates at each design point.

G. Construction phasing

This project is being administered under an individual industrial permit for construction stormwater discharges. The permit will be issued following a detailed evaluation by NYSDEC. Specific discharge points will be identified for water quality monitoring. An annual report will be prepared to report on any necessary maintenance or repairs.

The individual stormwater permit process incorporates a control program for both construction and operational phases of the project. During construction, temporary basins will be sized for the 10-year event and clean water will be diverted or protected during construction. A rigorous phasing and subphasing program is being implemented that incorporates rapid revegetation. Enhanced stormwater controls, including reinforced silt fence, extensive use of rolled erosion control products, temporary tarps to cover soil, wood cellulose bonded fiber matrix products

(Eco Aegis, Eco Fibre, Soil Guard), along with an independent work force to repair temporary stormwater facilities will be implemented. These types of construction phase measures are conceptually presented in materials prepared by Charles Silver (see Footnote 1 on page 1).

The stormwater modeling is making use of extensive site-specific soils data and regional information on runoff quality and quantity.

The following goals will be met by the construction phasing and erosion control/sediment control program:

1. Land disturbance will be divided into small compartments that can be rapidly constructed and stabilized.

2. Where possible, water flowing from areas up-slope of construction will be diverted away or around exposed construction areas to limit erosion and pollutant loading into relatively clean water.

3. Construction will be sequenced to maximize immediate permanent stabilization and utilize effective temporary stabilization where and when necessary.

4. The extent of areas of unstabilized soils are reflected in the phasing plans attached as an exhibit to the Agreement in Principle. Unstabilized areas will always be protected with enhanced erosion control measures in place. Construction phasing will attempt to disturb only 15 to 18 acres per phase.

5. The erosion control program will dictate the construction sequencing.

   The construction phasing and erosion control plans will protect local surface water resources and the New York City drinking water supply, while at the same time allowing for the construction of the project to occur in a logical and controlled manner in a timeframe that does not make the construction of the project economically unfeasible.

   The golf course at Wildacres is proposed to be built in a two-year period. A substantial amount of sod is proposed to be used. If enough sod is available and the timing is correct, 9 holes are proposed to be opened in the second year of development.

   Central to the understanding of the overall process is the hierarchy of project phases, subphases or stages, and subcatchments.

   a. Phases – Phases represent various components of the Wild Acres project.

   b. Subphases or Stages – All subphases will have balanced cuts and fills. Some subphases will include the “transition areas” that tie together some contiguous golf holes (i.e., tee/green complexes, tee complexes, green complexes). It is important that these areas be graded at the same time in order to accurately create the golf course the way it was designed by the golf course architect.

c. Subcatchments – Each subphase includes subcatchments (which relate to the HydroCAD model). The subcatchments form the basis for designing the permanent and temporary, construction phase retention basins.

The phasing below describes a sequence for typical golf course construction. Simultaneously, work will continue at the hotel site.

Temporary sediment basins and other sediment controls will be installed in accordance with the construction details, stabilized and functional prior to mass earthwork.

d. General Construction Phases

(1) Construction stakeout and golf course centerline stakeout for entire phase.
(2) Centerline clearing for Subphase 1.
(3) Construction access and perimeter control for Subphase 1.
(4) Temporary basins rough grade and stabilized in Subphase 1.
(5) Tree harvest without grubbing in Subphase 1.
(6) Stump grub, fine grade stormwater basins and stormwater swales, stabilizing swales with rock or geotextile in Subphase 1.
(7) Rough and final grade Subphase 1.
(8) Install permanent irrigation lines in Subphase 1.
(9) 9A. Stabilize Subphase 1 with temporary measures as specified, and
(10) 9B. Perform Steps 2, 3 and 4 in the Subphase 2.
(11) Upon completion of temporary stabilization of Subphase 1, repeat Steps 5-8 in Subphase 2.
(12) After permanent irrigation lines are installed in Subphase 2 immediately topsoil, install irrigation heads and install permanent stabilization (sod/seed) in Subphase 2.
(13) Continue topsoiling and permanently stabilize into Subphase 1 which was previously temporarily stabilized.
(14) Perform Steps 2 and 3 in the Subphase 3.
(15) When a portion of Subphase 1 requires topsoiling and final stabilization, clear, but don't grub, a portion of Subphase 3.
(16) After Subphase 1 is completely permanently stabilized, construct Subphase 3 through temporary stabilization (Steps 4 through 9A).
(17) Continue construction through Subphases 4 then 5 and 6 using the same sequence described above for Subphases 1, 2 and 3.
(18) Upon establishment of permanent cover, remove temporary drainage swales and basins. Convert appropriate temporary basins to be utilized during operations to their permanent condition (by Subphase).
(19) Stabilize all remaining disturbed areas (by Subphase).
(20) Remove perimeter erosion control after vegetation stabilization is established (by Subphase).

Whenever disturbed soil in an area in excess of 5 acres is to be left open for more than 7 days, temporary surface stabilization measures, including rapid mulching will be applied. In areas of disturbed soil less than 5 acres in size, the 14-day requirement would apply. If irrigation water is not yet available near the completion of any subphase, apply temporary stabilization measures such as high tack wood fiber bonded matrix (tackifier) and move to next Subphase. Minimal areas will be disturbed, and by phasing the project in this manner, the construction sequence can limit exposed soils yet progress in a logical fashion.

It is anticipated that construction work will occur six days a week and many activities will occur 10-12 hours daily especially during June and July in order to accomplish this segmented construction process within the construction season.

H. Sediment and Erosion Control Protocol

Central to the construction phasing and erosion control plan are a number of factors designed to mitigate potential impacts commonly associated with construction projects that involve large amounts of earthwork activities. These include:

1. Perimeter erosion control will be installed at the current work area prior to site disturbance.

2. All of the relatively small compartments of construction and soil disturbance will have temporary sediment basins designed to capture and hold all runoff from a storm with the volume and intensity that can be expected to occur from a 10-year, 24-hour, type II storm.

3. The runoff water captured in the temporary stormwater basins will be treated with Chitosan® flocculent to reduce stormwater turbidity prior to dewatering the stormwater basins when deemed necessary by the Erosion Control Superintendent. The Erosion Control Superintendent will notify the Independent Stormwater Monitor (Independent Monitor) that Chitosan® is being used. Use of Chitosan® will conform to the following requirements:

   Water Treatment Chemical (WTC) Authorization
   (Draft SPDES Permit NY 027 0661)

   The permittee is authorized to use Storm Klear Liqui-Floc (chitosan acetate) during construction periods only, for the treatment of stormwater which accumulates in any stormwater management pond, provided the following conditions are met.

   Dosage – Runoff water collected in ponds shall be treated with chitosan based on the turbidity level and quantity of water being treated, at doses which result in a maximum concentration for the appropriate turbidity range, as follows:

Pond Turbidity	Maximum Pond Concentration (mg/l)
100-400	1.0
400-1400	1.1
1400-2400	1.2
2400-3400	1.3
3400-4400	1.4
4400-5000	1.5

Discharge – Stormwater treated with Storm Klear Liqui-Floc shall be discharged in accordance with the following requirements:

- No treated stormwater may be directly discharged to any surface water under any conditions.
- No treated stormwater may be discharged which exceeds a 50 NTU turbidity value, in any manner.
- Whenever possible, treated stormwater must be transferred from a stormwater management pond to an Irrigation Pond for future irrigation purposes.
- Stormwater which cannot be transferred to an Irrigation Pond, due to insufficient capacity or for any other reason, must be discharged to the ground (overland flow) at a location which is at least 300 feet from the nearest surface water, including intermittent streams, in an area which is fully vegetated at the disposal location and over the entire pathway to the surface water.
- Discharge of the treated stormwater to land must be performed in a manner which results in even and controlled distribution of the stormwater, and which will not result in scouring, channelization, or erosive velocities.

No other WTC may be used by the permittee without prior authorization, on a case-by-case basis, by the Department.

4. Temporary stabilization will be widely implemented during the construction process so that the amount of active construction and unstabilized soil never aggregates more than that presented in the construction phasing plans attached as an exhibit to the Agreement in Principle.

5. Erosion control measures and practices will be kept in place until the areas that they serve are permanently stabilized.

The following provides a description of how these plans will be implemented.

a. There will be a dedicated erosion control team of 4 to 6 people plus supervisory personnel (Erosion Control Superintendent), whose primary role will be repairing, maintaining and upgrading erosion control devices such as silt fence, construction fence and wattles. These crews will be equipped with all the necessary equipment and supplies necessary to effectively maintain the erosion control devices. The site work contractor will install all erosion controls and will also be responsible for maintaining the temporary sediment basins under the direction of the Erosion Control Superintendent.

b. These crews will be directed by the Erosion Control Superintendent who will be a Certified Professional in Erosion and Sediment Control. The Independent Monitor will have the stop-work authority set forth in the Agreement in Principle.

c. The Erosion Control Superintendent and the crew under their direction will not be employed by the site work contractor, but will be under independent contract to the developer and report directly to the developer's on-site representative.

d. The site work contractor, as directed by the Erosion Control Superintendent will be responsible for constructing and structurally maintaining the construction phase sediment retention basins that will be constructed site-wide.

e. The Erosion Control Superintendent will be the single point of contact for all issues related to on-site erosion and sediment control. This individual will be responsible for implementation of the construction pollution prevention plan, monitoring of the local watercourses during the construction process, and oversight on the progress of the construction project.

   Given the complexity of the plan to construct the site it will be necessary to have a comprehensive process to share information on the construction process. A constant update of the construction process will be necessary. The contractors will have to closely monitor daily progress as it relates to all the construction tasks from site clearing to final grading. A common set of electronic plans will have to be maintained at a central location that is updated on a frequent basis in order to maintain accurate and up-to-date stormwater control reports.

   Along with the administrative staff it can be anticipated that a significant amount of personnel time will have to be expended to carry out the monitoring requirements on the watercourses and of the stormwater control facilities including the retention basins along with the perimeter controls. Status reports on erosion control facilities as well as the water quality monitoring data will have to be compiled at a central location.

f. All contractors and subcontractors are required to sign the SWPPP and adhere to its protocol. This ensures deliberate implementation of stormwater controls as the SWPPP is a contractual agreement.

Overall project phasing designed to control erosion by limiting the amount of construction at any given time.

The following are measures proposed to mitigate potential erosion.

(1.) Construction will be phased over a multi-year time period so as to reduce the amount of disturbed soil at any given time. Work on subsequent Phases will not begin until the area in the previous Phase is stabilized. Likewise, work on a subsequent subphase or stage will not begin until the area in the previous stage is nearly all stabilized (last 5 acres being stabilized).

(2.) Temporary sediment basins will be located throughout the proposed development. These basins will be sized to capture and hold the runoff from a 10-year storm of 6 inches in 24 hours falling on bare soil.

(3.) Fairway drains will be installed during construction, and during construction these drains will consist of a perforated standpipe surrounded by a gravel/rock jacket all surrounded by perimeter silt fence. These fairway drains will be piped to temporary sediment basins that will be converted to operational phase basins. During final stabilization the silt fence and stone/gravel jacket will be removed, the standpipe cut flush with finished grade and a grate placed over the inlet to the drain pipe.

(4.) Any areas of disturbed soils or soil stockpiles that will not be worked on for a period of fourteen (14) consecutive days will be temporarily stabilized by hydroseeding with ryegrass and mulch. Preferred mulch materials are Eco Aegis® and Soil Guard®.

(5.) Sod will be used in many areas to provide more rapid stabilization. Approximately 50 acres of sod will be used for golf course construction.

(6.) Erosion control products will be chosen based on their suitability for the different slopes. Temporary stabilization will be widely utilized during the construction process to limit exposed soils in accordance with the phasing plan.

(7.) The permanent irrigation system will be used where and when necessary to supplement precipitation and promote rapid germination and rooting of seeded and sodded areas. If irrigation water is not yet available, apply temporary stabilization measures as specified and move to next stage.

(8.) NYCDEP will continue to monitor surface water on and around the Crossroads assemblage during and after construction. Any decreases in water quality that can be attributed to the proposed project will result in changes in construction or operations of the project in order to immediately restore local water quality.

(9.) All erosion control measures will be maintained in good working order; if repair is necessary, it will be initiated within 24 hours of report.

(10.) Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.

(11.) Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in ground.

(12.) All temporary sediment basins will be inspected for stability and integrity once a week or after a storm event of 0.5 inch or more. Any structural failure in sediment basins or trenches that serve them will be repaired within 24 hours after detection.

(13.) All temporary sediment basins or trenches shall be cleaned out when one foot of sediment or half the design depth of the trap has accumulated. All spoils shall be removed to a stabilized upland area.

(14.) Seeded and planted areas will be inspected for bare spots, washouts, and healthy growth. If necessary, spot reseeding or sodding will be implemented.

(15.) A maintenance inspection report will be made after each inspection. Reports will be compiled and maintained on-site.

I. Pollutant loading protocol

1. Sedimentation Basins

Temporary stormwater detention basins will be constructed throughout the area of construction and will be large enough to capture and hold all of the runoff from the 10-year design storm.

Where necessary as approved by the Independent Monitor, basins will be pumped out to the irrigation ponds. Where this is not feasible due to distance and/or topography, the method to empty these basins will be to discharge the water to a spreader pipe laid out in the undisturbed wooded areas below the basins. The spreader pipe will be a four to six inch perforated coil drain pipe with a filter fabric sock around the pipe. The filter fabric sock will reduce spray from the pipe and reduce the potential for undermining the pipe or creating erosion. The sock will also allow the system to act as a soaker hose. The wooded area will polish the stormwater to assure that effluent quality will meet the ambient conditions of the local watercourses. A plan has been developed that allows for the basin dewatering to occur at rates that are the same or less than runoff rates that occur under existing conditions. Dewatering the basins at these rates will prevent erosion in the forested areas below the level spreaders from which dewatering discharges will be made.

2. Water Quality

The project is located within the watershed of one of New York City's water supply reservoirs, the Pepacton Reservoir, therefore the impacts that may result from increased nutrient loading to this Reservoir will be evaluated. Two sources are considered to cumulatively contribute to the overall nutrient export that may be expected from the project development, golf course fertilization and stormwater runoff.

The goal of the project's stormwater management program is to manage runoff water quality to minimize nutrient or contaminant export or closely match pre-development stormwater quality. This will be accomplished by locating stormwater management facilities throughout the project site and by maintaining a low density of development.

The stormwater management system will be composed of appropriate practices for water quality maintenance such as ponds, filtering practices, infiltration practices, and channels. Open channels on slopes over 15% will be rock lined to better manage the velocity of the runoff by providing rough channels.

The proposed pond designs will provide for settling while at the same time minimizing standing water to avoid thermal impacts. The ponds tend to be narrow so that the water is shaded as much as possible. Each pond will have multiple outlets to allow for dispersion of the stormwater events accumulated runoff as well as allowing for infiltration of stormwater captured in the detention ponds. It is necessary to release the stormwater in order to avoid thermal loading associated with standing water and to avoid adverse impacts to local coldwater stream life.

3. Phosphorus Loading

To estimate phosphorus loading at Wildacres a direct calculation method was created using site-specific data collected by NYCDEP. The NYCDEP has operated a stream water quality gauging station on the Big Indian site since 2001. Data sets of stream flow and water quality data have been assembled and approved for use up through 2003. In August 2004, the last evaluation of phosphorus loading was complete.

To create the direct calculation, forest runoff characteristics from Big Indian in the undeveloped condition were utilized. To estimate the runoff quality for a developed site, NYCDEP 1997 (Guidance for Phosphorus Offset Pilot Program, March 1997) was consulted to obtain runoff values for developed areas.

The direct calculation found in the attached document "Total Phosphorus Loading Calculations and Comparisons," August 24, 2004 was determined to be the method with the greatest level of consensus among commenting parties.

This direct method calculation incorporates site specific and regional data. A comparison with the NYCDEP 1997 simple method was completed (see Table B, and pages 9 of 36, 13 of 36, 21 of 36, 25 of 36, 29 of 36, Table 3 and Figure 2).

4. DEP Pollutant Analysis

Pollutant loading analyses will also be performed in accordance with 10 NYCRR §128-3.9.

J. Post Construction Stormwater Controls

In general, stormwater control consisting of a series of road side swales, cross culverts, stormwater micropool extended detention basins and bioretention will be used to capture, convey and detain stormwater runoff from the developed portions of the project site. By creating positive drainage through site grading within each of the subcatchments, the proposed stormwater control systems are capable of reducing post-development runoff rates from a 1, 10, 25 and 100-year storm.

No existing surface waterbodies will be impounded. The ponds used to store irrigation water will be isolated dug ponds and not associated with any of the streams or brooks on the project site. Water levels in the ponds can be controlled by irrigation withdrawals and the amount of replenishment provided so that there is always reserve capacity in the ponds to accept runoff from storm events without the ponds discharging to surface water resources. Sufficient freeboard will be maintained in the irrigation ponds so that they can contain the runoff from the 100-year storm from the areas that drain to them.

The stormwater system for the proposed site will utilize on-site storage with outlet devices to regulate the stormwater discharge. The system is designed to discharge from the storage basins to the existing drainageways. The proposed peak runoff for the project is designed to not exceed the pre-development peak runoff conditions for the 1, 10, 25 and 100-year design storm event.

The majority of the stormwater will be directed through proposed detention basins which will control the release rate from the basins. The detention basins will also serve to capture stormwater contaminants and treat the water quality volume.

The objectives of the stormwater management plan will be to:

- Prevent increased runoff from developed land to reduce potential flooding and flood damage.
- Minimize the erosion potential from new construction.
- Increase water recharge.
- Enhance the quality of stormwater runoff to prevent water quality degradation and preserve water quality in receiving water bodies, including City water supply reservoirs.

These objectives will be accomplished through the implementation of the following:

1. Stormwater impacts associated with clearing and grading, along with the development of golf holes, roads and buildings will be mitigated. This will be achieved through the use of devices such as swales, roadside ditches, catch basins, pipes and micropool extended detention basins. The stormwater facilities will control the 25-year, Type II storm event while withstanding the discharge from a 100-year event.

2. The stormwater system for the proposed project will utilize on-site storage with outlet devices to regulate the stormwater discharge. The system will be designed to discharge from the storage basins to the existing drainageways. The proposed peak runoff for the project is designed to not exceed the pre-development peak runoff conditions for 1, 10, 25 and 100-year design event.

3. The stormwater management system for the project will be designed in accordance with the Manual and 10 NYCRR §128-3.9. This includes peak flow attenuation and water quality treatment through control of the water quality volume.

4. The majority of the stormwater will be directed through proposed ponds. These ponds will also serve to capture and treat water quality volume contaminants.

5. The drainage system will be designed so that it will not adversely affect downstream or adjacent properties.

6. A detailed site re-vegetation and stabilization plan will be developed that will re-establish vegetation quickly after final grade is achieved.

7. Implementation of the operational phase Stormwater Management Plan will result in no net increase in runoff volume to existing drainageways.

8. All operational phase stormwater ponds and bioretention will be maintained in accordance with Section 6.16 and 6.46 of the NYSDEC Stormwater Design Manual and the maintenance requirements included with the stormwater management design report. This includes such things as sediment removal, trash racks, and pond drains.

   Materials removed as part of detention basin maintenance will be used on site. As part of golf course maintenance, the application of very thin layers of coarse topdressing to the golf course turf is typical. Much of the materials that will accumulate in the detention basins will be sand from road sanding. Therefore this material will be suitable for topdressing material on the golf course.

Two annual inspections will be conducted after completion of the project. They will take place in April and September of each year. Any necessary repairs will occur during the growing season. An annual report will be prepared to report on any maintenance or required repairs.

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APPENDIX C

Supporting Calculations and Summary Tables

TABLE 1

The Belleayre Resort at Catskill Park
WQv and RRv Summary

Drainage Area 1a

	(cf)
DEC WQv req'd at Design Point	2,466
Adjusted DEC WQv req'd *	1,773
Additional Area reductions?	NO
Adjusted DEC WQv req'd	1,773
Minimum RRv	488
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	
Cistern	
Permeable Pavement	
Infiltration Area	
Bioretention Areas	2,080
Dry Swales	
Vegetated Swale	
Total Runoff Reduction	2,080
Is RRv>WQv?	YES
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	0
WQv provided in standard practices	0
Total WQv provided	5,200

After removal of areas not draining to an SMP

Drainage Area 4

	(cf)
DEC WQv req'd at Design Point	46,517
Adjusted DEC WQv req'd *	45,081
Additional Area reductions?	NO
Adjusted DEC WQv req'd	45,081
Minimum RRv	13,103
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	32,076
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	
Cistern	
Permeable Pavement	
Infiltration Area	
Bioretention Areas	0
Dry Swales	1,680
Vegetated Swale	
Total Runoff Reduction	33,756
Is RRv>WQv?	NO
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	11,324
WQv provided in standard practices	57,000
Total WQv provided	143,084

Drainage Area 7

	(cf)
DEC WQv req'd at Design Point	30,061
Adjusted DEC WQv req'd *	2,097
Additional Area reductions?	NO
Adjusted DEC WQv req'd	2,097
Minimum RRv	0
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	
Cistern	
Permeable Pavement	
Infiltration Area	
Bioretention Areas	
Dry Swales	3,200
Vegetated Swale	
Total Runoff Reduction	3,200
Is RRv>WQv?	YES
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	0
WQv provided in standard practices	0
Total WQv provided	16,000

Drainage Area 8

	(cf)
DEC WQv req'd at Design Point	42,048
Adjusted DEC WQv req'd *	28,686
Additional Area reductions?	NO
Adjusted DEC WQv req'd	28,686
Minimum RRv	5,769
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	
Cistern	
Permeable Pavement	
Infiltration Area	
Bioretention Areas	4,200
Dry Swales	7,433
Vegetated Swale	
Total Runoff Reduction	11,633
Is RRv>WQv?	NO
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	17,053
WQv provided in standard practices	60,500
Total WQv provided	117,882

The Belleayre Resort at Catskill Park

WQv and RRv Summary

Drainage Area 9	(cf)
DEC WQv req'd at Design Point	22,032
Adjusted DEC WQv req'd *	12,058
Additional Area reductions?	NO
Adjusted DEC WQv req'd	12,058
Minimum RRv	2,604
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	4,373
Cistern	
Permeable Pavement	
Infiltration Area	
Bioretention Areas	
Dry Swales	1,991
Vegetated Swale	
Total Runoff Reduction	6,364
Is RRv>WQv?	NO
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	5,694
WQv provided in standard practices	29,000
Total WQv provided	38,956

Drainage Area 11	(cf)
DEC WQv req'd at Design Point	62,775
Adjusted DEC WQv req'd *	51,403
Additional Area reductions?	NO
Adjusted DEC WQv req'd	51,403
Minimum RRv	12,566
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	
Cistern (Irrigation Pond)	38,449
Permeable Pavement	
Infiltration Area	
Bioretention Areas	7,200
Dry Swales	5,923
Vegetated Swale	
Total Runoff Reduction	51,571
Is RRv>WQv?	YES
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	-168
WQv provided in standard practices	126,551 *
Total WQv provided	212,614

**Cistern RRv subtracted from the the total WQv provided in the Irrigation Pond*

Drainage Area 16

	(cf)
DEC WQv req'd at Design Point	6,607
Adjusted DEC WQv req'd *	2,088
Additional Area reductions?	NO
Adjusted DEC WQv req'd	2,088
Minimum RRv	0
Runoff Reduction Volumes by GI Techniques	
GI Practice	RRv (cf)
Rain Garden	
Green Roof	
Stormwater Planter (infiltration)	
Stormwater Planter (flow through)	
Cistern	
Permeable Pavement	
Infiltration Area	
Bioretention Areas	2,757
Dry Swales	
Vegetated Swale	
Total Runoff Reduction	2,757
Is RRv>WQv?	YES
Is RRv>minimum RRv?	YES
Total WQv remaining to be treated	0
WQv provided in standard practices	0
Total WQv provided	6,893

TABLE 2

The Belleayre Resort at Catskill Park

Water Quality Volume Calcs

DESIGN POINT	DRAINAGE AREA (Ac)	Storm Device	Contributing Subcatchments		total size (sf)	total size (ac)	total imp (sf)	total imp (ac)	I %	DEP P	DEC P	Rv	Min. Rv	Req'd DEP WQv Acre Ft.	DEP-2.8" Req'd DEP WQv Cu.Ft.	DEC-1.1" Req'd DEC WQv Acre Ft.	Req'd DEC WQv Cu.Ft.	Provided WQv Cu.Ft.	Apply Min. Rv Req'd DEP WQv Cu.Ft.	Apply Min. Rv Req'd DEC WQv Cu.Ft.	Min. RRv Cu.Ft.	Ai (ac)	*RRv Cu.Ft.
1a	4.64	BIO B9	1a		17,305	0.40	10,000	0.23															
			1b		33,455	0.77	8,665	0.20															
				Total	50,760	1.17	18,665	0.43	37	2.8	1.1	0.381		0.10	4,512	0.04	1,773	5,200					2,080
		None/Undisturbed	1c		151,340	3.47	0	0.00															
Entire Drainage Area				**Total**	**202,100**	**4.64**	**18,665**	**0.43**	**9**	**2.8**	**1.1**	**0.133**		**0.14**	**6,277**	**0.06**	**2,466**						
Remove Untreated Areas				**Total**	**50,760**	**1.17**	**18,665**	**0.43**	**37**	**2.8**	**1.1**	**0.381**		**0.10**	**4,512**	**0.04**	**1,773**	**5,200**			488	0.13	2,080
2	31.94	None/Undisturbed																					
			14		1,295,561	29.74	32,278	0.74															
			450		95,865	2.20	8,620	0.20															
				Total	1,391,426	31.94	40,898	0.94															
				Total	1,391,426	31.94	40,898	0.94															
3	0.71	None/Undisturbed	453		12,482	0.29	8,020	0.18															
			455		18,390	0.42	2,272	0.05															
				Total	30,872	0.71	10,292	0.24															
4	22.18																						
		POND AB																					
		(Lodge Roof)	443		52,272	1.20	52,272	1.20															
				Total	52,272	1.20	52,272	1.20	100	2.8	1.1	0.950		0.27	11,587	0.10	4,552	11,284					4,552
		POND AD																					
		(Hotel Roof)	441		316,069	7.26	316,069	7.26															
				Total	316,069	7.26	316,069	7.26	100	2.8	1.1	0.950		1.61	70,062	0.63	27,524	66,400					27,524
		Dry swale Z	449a		45,670	1.05	26,150	0.60	57	2.8	1.1	0.565		0.14	6,024	0.05	2,367	8,400					1,680
		POND AC	434		19,166	0.44	0	0.00															
			439		72,310	1.66	13,896	0.32															
			440		33,976	0.78	1,742	0.04															
			445		12,505	0.29	7,680	0.18															
			444		28,241	0.65	19,361	0.44															
			446		55,919	1.28	12,389	0.28															
			447		11,692	0.27	10,130	0.23															
			449		8,350	0.19	8,350	0.19															
			449b		22,066	0.51	0	0.00															
			451		8,072	0.19	8,072	0.19															
			454a		13,080	0.30	13,080	0.30															
			452a		2,110	0.05	0	0.00															
			452		15,741	0.36	12,360	0.28															
			456		90,650	2.08	0	0.00															
				Total	393,878	9.04	107,060	2.46	27	2.8	1.1	0.295		0.62	27,078	0.24	10,638	57,000					
		None/Undisturbed	16		158,175	3.63	8,620	0.20															
				Total	158,175	3.63	8,620	0.20															
Entire Drainage Area				**Total**	**966,064**	**22**	**510,171**	**12**	**53**	**2.8**	**1.1**	**0.525**		**2.72**	**118,407**	**1.07**	**46,517**						
Remove Untreated Areas					**807,889**	**19**	**501,551**	**12**	**62**	**2.8**	**1.1**	**0.609**		**2.63**	**114,751**	**1.03**	**45,081**	**143,084**			13,103	3.45	33,756
% Impervious, with roof as pervious					**807,889**	**19**	**133,210**	**3**	**16**														

The Belleayre Resort at Catskill Park

Water Quality Volume Calcs

DESIGN POINT	DRAINAGE AREA (Ac)	Storm Device	Contributing Subcatchments		total size (sf)	total size (ac)	total imp (sf)	total imp (ac)	I %	DEP P	DEC P	Rv	Min. Rv	Req'd DEP WQv Acre Ft.	DEP-2.8" Req'd DEP WQv Cu.Ft.	DEC-1.1" Req'd DEC WQv Acre Ft.	Req'd DEC WQv Cu.Ft.	Provided WQv Cu.Ft.	Apply Min. Rv Req'd DEP WQv Cu.Ft.	Apply Min. Rv Req'd DEC WQv Cu.Ft.	Min. RRv Cu.Ft.	Ai (ac)	*RRv Cu.Ft.
5	9.41	None/Undisturbed	17		409,995	9.41	6,950	0.16															
				Total	409,995	9.41																	
5A	13.04	None/Undisturbed	18		568,023	13.04	2,494	0.06															
				Total	568,023	13.04																	
6	58.47																						
		None/Undisturbed	19		2,546,954	58.47	8,277	0.19															
				Total	2,546,954	58.47	8,277	0.19															
6A	41.78	None/Undisturbed	20		1,819,937	41.78	80,499	1.85															
				Total	1,819,937	41.78	80,499	1.85															
7	130.68	SWALE S	218		96,418	2.21	0	0.00															
				Total	96,418	2.21	0	0.00	0	2.8	1.1	0.050		0.03	1,125	0.01	442	4,200					840
		SWALE T	219		78,985	1.81	0	0.00															
				Total	78,985	1.81	0	0.00	0	2.8	1.1	0.050		0.02	921	0.01	362	3,000					600
		SWALE U	220		282,188	6.48	0	0.00															
				Total	282,188	6.48	0	0.00	0	2.8	1.1	0.050		0.08	3,292	0.03	1,293	8,800					1,760
		None/Undisturbed	2		18,469	0.42	4,400	0.10															
			35		532,030	12.21	15,783	0.36															
			200		3,328,419	76.41	14,331	0.33															
			306		207,204	4.76	0	0.00															
			307		122,324	2.81	0	0.00															
			308		346,246	7.95	0	0.00															
			309		316,725	7.27	13,610	0.31															
			315		363,440	8.34	0	0.00															
				Total	5,234,857	120.18	48,124	1.10															
Entire Drainage Area				**Total**	**5,692,448**	**130.68**	**48,124**	**1.10**	**1**	**2.8**	**1.1**	**0.058**		**1.76**	**76,518**	**0.69**	**30,061**						
Remove Untreated Areas					**457,591**	**10.50**	**0**	**0.00**	**0**	**2.8**	**1.1**	**0.050**		**0.12**	**5,339**	**0.05**	**2,097**	**16,000**			0	0.00	3,200

The Belleayre Resort at Catskill Park

Water Quality Volume Calcs

DESIGN POINT	DRAINAGE AREA (Ac)	Storm Device	Contributing Subcatchments		total size (sf)	total size (ac)	total imp (sf)	total imp (ac)	I %	DEP P	DEC P	Rv	Min. Rv	Req'd DEP WQv Acre Ft.	DEP-2.8" Req'd DEP WQv Cu.Ft.	DEC-1.1" Req'd DEC WQv Acre Ft.	Req'd DEC WQv Cu.Ft.	Provided WQv Cu.Ft.	Apply Min. Rv Req'd DEP WQv Cu.Ft.	Apply Min. Rv Req'd DEC WQv Cu.Ft.	Min. RRv Cu.Ft.	Ai (ac)	*RRv Cu.Ft.
8	110.69	POND L	1		53,980	1.24	30,818	0.71															
			2a		14,154	0.32	10,932	0.25															
			3		7,863	0.18	4,120	0.09															
			4		4,505	0.10	4,505	0.10															
			9a		3,427	0.08	2,405	0.06															
			10a		3,850	0.09	3,650	0.08															
			11c		16,077	0.37	11,345	0.26															
			12		2,940	0.07	2,610	0.06															
			14a		7,331	0.17	7,331	0.17															
			14b		11,402	0.26	8,075	0.19															
			15		14,991	0.34	12,389	0.28															
			16a		7,317	0.17	6,864	0.16															
			17a		4,370	0.10	3,040	0.07															
			18a		32,445	0.74	20,523	0.47															
			19a		3,974	0.09	2,920	0.07															
			21		4,574	0.11	3,330	0.08															
			22		18,606	0.43	13,274	0.30															
			23		31,919	0.73	0	0.00															
			24		176,265	4.05	0	0.00															
			25		3,751	0.09	2,740	0.06															
			26		3,645	0.08	2,740	0.06															
			302a		312,723	7.18	0	0.00															
			213		194,980	4.48	0	0.00															
				Total	935,088	21.47	153,611	3.53	16	2.8	1.1	0.198	**0.20**	1.00	43,637	0.39	17,143	44,000	43,637	17,143			
		POND K	59		7,222	0.17	7,222	0.17															
			62		64,444	1.48	0	0.00															
			63		230,281	5.29	961	0.02															
			65		17,261	0.40	8,740	0.20															
			14c		25,251	0.58	19,361	0.44															
				Total	319,208	7.33	16,923	0.39	5	2.8	1.1	0.098	**0.20**	0.34	14,896	0.13	5,852	16,500	14,896	5,852			
		Dry Swale O	223		192,957	4.43	23,966	0.55	12	2.8	1.1	0.162		0.17	7,284	0.07	2,862	9,800					1,960
		Dry Swale W	225		187,018	4.29	0	0.00	0	2.8	1.1	0.050		0.05	2,182	0.02	857	7,117					1,423
																0.00							
		Dry Swale M	211		208,648	4.79	0	0.00	0	2.8	1.1	0.050		0.06	2,434	0.02	956	9,663					1,933
		Dry Swale N	212		68,310	1.57	0	0.00	0	2.8	1.1	0.050		0.02	797	0.01	313	2,621					524
		Dry Swale Q	214		158,070	3.63	0	0.00	0	2.8	1.1	0.050		0.04	1,844	0.02	724	7,963					1,593
		Bio B4	27b		3,976	0.09	2,930	0.07															
			28a		4,060	0.09	3,090	0.07															
			30		2,719	0.06	2,010	0.05															
			31		2,909	0.07	2,160	0.05															
			32		3,581	0.08	2,640	0.06															
			33		3,736	0.09	2,780	0.06															
			35a		3,308	0.08	2,400	0.06															
			36		3,204	0.07	2,400	0.06															
			37		4,447	0.10	3,200	0.07															
			38		3,569	0.08	2,730	0.06															
			201		178,777	4.10	0	0.00															
				Total	214,286	4.92	26,340	0.60	12	2.8	1.1	0.161		0.18	8,031	0.07	3,155	10,500					4,200
		None/Undisturbed	137		31,485	0.72	0	0.00															
			300		725,511	16.66	3,267	0.08															
			301		110,744	2.54	0	0.00															
			302		206,187	4.73	0	0.00															
			303		105,534	2.42	0	0.00															
			304		231,982	5.33	0	0.00															
			305		169,650	3.89	0	0.00															
			310		157,211	3.61	7,355	0.17															
			311		331,749	7.62	2,085	0.05															
			316		443,073	10.17	5,340	0.12															
			316A		25,125	0.58	2,900	0.07															
				Total	2,538,251	58.27	20,947	0.48															
Entire Drainage Area				**Total**	**4,821,836**	**110.69**	**241,787**	**5.55**	**5**	**2.8**	**1.1**	**0.095**		**2.46**	**107,030**	**0.97**	**42,048**						
Remove Untreated Areas					**2,283,585**	**52.42**	**220,840**	**5.07**	**10**	**2.8**	**1.1**	**0.137**		**1.68**	**73,018**	**0.66**	**28,686**	**117,882**			5,769	1.52	11,633

The Belleayre Resort at Catskill Park

Water Quality Volume Calcs

DESIGN POINT	DRAINAGE AREA (Ac)	Storm Device	Contributing Subcatchments		total size (sf)	total size (ac)	total imp (sf)	total imp (ac)	I %	DEP P	DEC P	Rv	Min. Rv	Req'd DEP WQv Acre Ft.	DEP-2.8" Req'd DEP WQv Cu.Ft.	DEC-1.1" Req'd DEC WQv Acre Ft.	Req'd DEC WQv Cu.Ft.	Provided WQv Cu.Ft.	Apply Min. Rv Req'd DEP WQv Cu.Ft.	Apply Min. Rv Req'd DEC WQv Cu.Ft.	Min. RRv Cu.Ft.	Ai (ac)	*RRv Cu.Ft.
9	45.92																						
		SP1 - Storm Planter	60		42,950	0.99	36,970	0.85	86	2.8	1.1	0.825		0.19	8,265	0.07	3,247	9,718					4,373
		SWALE J	20A		27,573	0.63	910	0.02															
			20B		27,573	0.63	0	0.00															
			41		7,632	0.18	0	0.00															
			42		7,012	0.16	7,012	0.16															
			43		3,858	0.09	3,000	0.07															
			44		3,652	0.08	3,000	0.07															
				Total	77,300	1.77	13,922	0.32	18	2.8	1.1	0.212		0.09	3,825	0.03	1,503	5,628					1,126
		POND H	45		423,327	9.72	0	0.00															
			50		3,930	0.09	3,930	0.09															
			51		17,667	0.41	3,600	0.08															
			52		9,545	0.22	1,536	0.04															
			53		19,250	0.44	3,490	0.08															
			54		95,833	2.20	17,600	0.40															
			55		15,270	0.35	11,425	0.26															
			56		18,020	0.41	3,160	0.07															
			57		4,879	0.11	4,049	0.09															
				Total	607,721	13.95	48,790	1.12	8	2.8	1.1	0.122	**0.20**	0.65	28,360	0.26	11,142	29,000	28,360	11,142			
		SWALE X	226		108,684	2.50	0	0.00	0	2.8	1.1	0.050		0.03	1,268	0.01	498	4,328					866
		None/Undisturbed	5		92,020	2.11	6,836	0.16															
			6		389,580	8.94	18,130	0.42															
			6a		531,048	12.19	21,575	0.50															
			7		27,573	0.63	9,700	0.22															
			80		123,600	2.84	0	0.00															
				Total	1,163,821	26.72	56,241	1.29															
Entire Drainage Area					**2,000,476**	**45.92**	**155,923**	**3.58**	**8**	**2.8**	**1.1**	**0.120**		**1.29**	**56,083**	**0.51**	**22,032**						
Remove Untreated Areas					**836,655**	**19.21**	**99,682**	**2.29**	**12**	**2.8**	**1.1**	**0.157**		**0.70**	**30,694**	**0.28**	**12,058**	**38,956**			2,604	0.69	6,364
10	157.34	None/Undisturbed	9		1,465,881	33.65	21,606	0.50															
			10		1,429,132	32.81	23,435	0.54															
			500		1,350,926	31.01	29,185	0.67															
			501		186,481	4.28	1,002	0.02															
			502		189,050	4.34	1,437	0.03															
			503		130,680	3.00	0	0.00															
			504		1,320,521	30.31	13,939	0.32															
			511		87,120	2.00	0	0.00															
			512		56,628	1.30	0	0.00															
			600		369,868	8.49	9,670	0.22															
			601		267,502	6.14	10,498	0.24															
			DP Totals		6,853,789	157.34	110,772	2.54															

The Belleayre Resort at Catskill Park

Water Quality Volume Calcs

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11	89.65	SWALE A1	100a		50,494	1.16	0	0.00	0	2.8	1.1	0.050		0.01	589	0.01	231	2,680					536
		SWALE A2	100b		20,138	0.46	0	0.00	0	2.8	1.1	0.050		0.01	235	0.00	92	1,019					204
		SWALE A3	100c		33,000	0.76	0	0.00	0	2.8	1.1	0.050		0.01	385	0.00	151	1,938					388
		SWALE A4	100d		23,704	0.54	0	0.00	0	2.8	1.1	0.050		0.01	277	0.00	109	1,364					273
		SWALE A5	100e		64,786	1.49	0	0.00	0	2.8	1.1	0.050		0.02	756	0.01	297	3,030					606
		SWALE F1	111		89,380	2.05	0	0.00	0	2.8	1.1	0.050		0.02	1,043	0.01	410	4,350					870
		SWALE B	119		146,387	3.36	0	0.00	0	2.8	1.1	0.050		0.04	1,708	0.02	671	6,834					1,367
		SWALE G	125		161,159	3.70	0	0.00	0	2.8	1.1	0.050		0.04	1,880	0.02	739	8,399					1,680
		Bio B3	117		237,198	5.45	111,127	2.55	47	2.8	1.1	0.472		0.60	26,104	0.24	10,255	18,000					7,200
		POND IP	61		15,005	0.34	15,005	0.34															
			67		15,005	0.34	15,005	0.34															
			70A		20,212	0.46	7,200	0.17															
			70B		29,474	0.68	7,200	0.17															
			101		38,707	0.89	7,596	0.17															
			102		16,073	0.37	16,073	0.37															
			103		115,694	2.66	53,467	1.23															
			108		20,760	0.48	17,269	0.40															
			109		8,280	0.19	6,175	0.14															
			114		150,302	3.45	0	0.00															
			115		460,843	10.58	54,674	1.26															
			123		43,890	1.01	0	0.00															
			126		74,991	1.72	0	0.00															
			126A		8,000	0.18	0	0.00															
			127		448,894	10.31	0	0.00															
			128		6,878	0.16	6,878	0.16															
			129		13,760	0.32	13,760	0.32															
			130		39,147	0.90	9,220	0.21															
			131		28,363	0.65	17,500	0.40															
			131A		51,300	1.18	51,300	1.18															
			132		12,145	0.28	1,650	0.04															
			133		29,164	0.67	0	0.00															
			134		6,878	0.16	6,878	0.16															
			135		18,297	0.42	4,000	0.09															
			136		45,262	1.04	45,262	1.04															
			138		13,760	0.32	13,760	0.32															
				Total	1,731,083	40	369,872	8	21	2.8	1.1	0.242		2.25	97,869	0.88	38,449	165,000					38,449
		None/Undisturbed	12A		550,450	12.64	62,962	1.45															
			12B		655,932	15.06	0	0.00															
			28		141,352	3.24	0	0.00															
				Total	1,347,734	30.94	62,962	1.45															
Entire Drainage Area			**DP Totals**		**3,905,063**	**89.65**	**543,960**	**12.49**	**14**	**2.8**	**1.1**	**0.175**		**3.67**	**159,791**	**1.44**	**62,775**						
Remove Untreated Areas					**2,557,329**	**58.71**	**480,998**	**11.04**	**19**	**2.8**	**1.1**	**0.219**		**3.00**	**130,845**	**1.18**	**51,403**	**212,614**			12,566	3.31	51,571

The Belleayre Resort at Catskill Park

Water Quality Volume Calcs

DESIGN POINT	DRAINAGE AREA (Ac)	Storm Device	Contributing Subcatchments		total size (sf)	total size (ac)	total imp (sf)	total imp (ac)	I %	DEP P	DEC P	Rv	Min. Rv	Req'd DEP WQv Acre Ft.	DEP-2.8" Req'd DEP WQv Cu.Ft.	DEC-1.1" Req'd DEC WQv Acre Ft.	Req'd DEC WQv Cu.Ft.	Provided WQv Cu.Ft.	Apply Min. Rv Req'd DEP WQv Cu.Ft.	Apply Min. Rv Req'd DEC WQv Cu.Ft.	Min. RRv Cu.Ft.	Ai (ac)	*RRv Cu.Ft.
12	5.40	None/Undisturbed	27		68,054	1.56	25,722	0.59															
			27A		141,739	3.25	23,417	0.54															
			29		25,355	0.58	4,025	0.09															
				DP Totals	235,148	5.40	53,164	1.22															
16	18.37																						
		Bio B1	104		455,573	10.46	0	0.00	0	2.8	1.1	0.050		0.12	5,315	0.05	2,088	6,893					2,757
		None/Undisturbed	11		182,734	4.19	13,434	0.31															
			11A		57,739	1.33	2,726	0.06															
			11B		104,152	2.39	19,475	0.45															
				Total	344,625	7.91	35,635	0.82															
Entire Drainage Area				**DP Totals**	**800,198**	**18.37**	**35,635**	**0.82**	**4**	**2.8**	**1.1**	**0.090**		**0.39**	**16,819**	**0.15**	**6,607**						
Remove Untreated Areas					**455,573**	**10.46**	**0**	**0.00**	**0**	**2.8**	**1.1**	**0.050**		**0.12**	**5,315**	**0.05**	**2,088**	**6,893**			0	0.00	2,757

TABLE 3

The Belleayre Resort at Catskill Park

DEP WQv Summary

Drainage Area 1a

DEP WQv req'd	4,512	cf
Total WQv provided	5,200	cf
% of Impervious Area	9	%

Drainage Area 4

DEP WQv req'd	114,751	cf
Total WQv provided	143,084	cf
% of Impervious Area	16	%

Drainage Area 7

DEP WQv req'd	5,339	cf
Total WQv provided	16,000	cf
% of Impervious Area	1	%

Drainage Area 8

DEP WQv req'd	73,018	cf
Total WQv provided	117,882	cf
% of Impervious Area	5	%

Drainage Area 9

DEP WQv req'd	30,694	cf
Total WQv provided	38,956	cf
% of Impervious Area	8	%

Drainage Area 11

DEP WQv req'd	130,845	cf
Total WQv provided	212,614	cf
% of Impervious Area	14	%

Drainage Area 16

DEP WQv req'd	5,315	cf
Total WQv provided	6,893	cf
% of Impervious Area	4	%

Notes:

% impervious is calculated at the design point for each drainage area

TABLE 4

The Belleayre Resort at Catskill Park

Green Roof WQv Calculation

(From NYSDEC Stormwater Management Design Manual, Chapter 9)

WQv < Vsm + Vdl + (Dp x Agr)
Vsm=Agr x Dsm x *n* sm
Vdl=Agr x Ddl x *n* dl
where:
Vsm=volume of the soil mendia (cubic feet)
Vdl=volume of the drainage layer (cubic feet)
Agr=green roof surface area (Square feet)
Dsm=depth of the soil media (feet)
Ddl=depth of drainage layer (Feet)
Dp=Depth of ponding above surface (feet)
n sm=porosity of the soil media (~20%)
n dl=porosity of the drainage layer (~25%)
WQv=Water Quality Volume (cubic feet)

Assumptions:
Roof System is Hydrotech Garden Roof, by American Hydrotech Inc.
System will be an 'intensive' system, with no impervious surfaces.
12" soil media - 40% porosity/voids according to manufacturer soil specifications
2" drainage layer - stone with 40% porosity/voids
very minimal
Assume soil media has 35% porosity as conservative measure, to match stated retention capacity.
stone has 40% porosity

Highmount Hotel and Spa: 306,000 SF of Green Roof Area (10,000 SF excluded as sky lights)

Vsm (cf)	48,960
Vdl (cf)	9,792

Vsm (cf)	Vdl (cf)	Agr (sf)	Dsm (ft)	Ddl (ft)	Dp (ft)	*n* sm (%)	*n* dl (%)		**Wqv (cf)**	
48,960	9,792	306,000	1.00	0.08	0.025	0.16	0.40		**66,402**	**provided in roof**

Highmount Lodge: 52,000 SF of Roof Area

Vsm (cf)	8,320
Vdl (cf)	1,664

Vsm (cf)	Vdl (cf)	Agr (sf)	Dsm (ft)	Ddl (ft)	Dp (ft)	*n* sm (%)	*n* dl (%)		**Wqv (cf)**	
8,320	1,664	52,000	1.00	0.08	0.025	0.16	0.40		**11,284**	**provided in roof**

GARDEN ROOF® ASSEMBLY RUNOFF CURVE NUMBER

HYDROTECH

THE BELLEAYRE RESORT - HOTEL ROOF CONSISTS OF:

GARDEN ROOF® -	**269,724**	SF
'BARE' ROOF -	**29,969**	SF
TOTAL	299,693	SF

A THE GARDEN ROOF CAN HOLD .... **2.60** INCHES OF MOISTURE (SYSTEM TOTAL STORAGE - ANTECEDENT RAINFALL)
THE TOTAL MOISTURE STORAGE IS 58,347 CUBIC FEET (436,491 GALLONS).

B THE DESIGN 24-HR STORM IS .... **3.50** INCHES OF RAINFALL 2-YR
WHICH IS 87,410 CF (653,918 gallons)

THE GARDEN ROOF RUNOFF IS .... **0.90** INCHES (B - A)
C WHICH IS 20,323 CF (152,036 gallons)

'BARE' ROOF RUNOFF IS .... **3.27** INCHES BASED ON TR-55 EQUATION 2-2
D WHICH IS 8,158 CF (61,028 gallons)

THE TOTAL RUNOFF IS .... 28,481 CF (213,064 gallons) (C + D)
WHICH IS 1.14 INCHES

WHAT RUNOFF CURVE NUMBER YIELDS 1.14 INCHES OF RUNOFF FROM A 3.50 INCH STORM?

RUNOFF CURVE NUMBER = 72.3 **(COMPOSITE GARDEN ROOF® AND 'BARE' AREAS)**

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9/22/2009

TR-55 Worksheet 4: Graphical Peak Discharge Method

Project Belleayre Resort - Hotel

Location Catskill Park

Condition: **DEVELOPED 1-yr** (for Garden Roof® LEED calculation)

1. Data

Drainage area	299,693	sf	A_m =	0.010750 mi^2
Runoff Curve Number	72.3			
Time of Concentration	6	min	T_c =	0.10 hr
Rainfall distribution	II	(I, IA, II, III)		

	STORM INFO	
2. Frequency, yr	1	
3. Rainfall, P (24 hr)	3.50	
Potential maximum ret., S, in	3.82	From equation 2-4
4. Initial abstraction, I_a, in	0.765	From equation 2-2
5. Compute I_a/P	0.219	
6. Unit peak discharge, q_u, csm/in	966	Use T_c and I_a/P with Exhibit 4-II
7. Runoff, Q, in	1.14	From equation 2-3
8. Pond & Swamp adjustment factor	1	Per table 4-2; F_p = 1 for 0% percent pond & swamp area
9. **Peak discharge, Q_p, cfs**	**11.84**	Where $Q_p = q_u A_m Q F_p$

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9/22/2009

GARDEN ROOF® ASSEMBLY RUNOFF CURVE NUMBER

THE BELLEAYRE RESORT - LODGE ROOF CONSISTS OF:

GARDEN ROOF® -	**47,044**	SF
'BARE' ROOF -	**5,228**	SF
TOTAL	52,272	SF

A THE GARDEN ROOF CAN HOLD .... **2.60** INCHES OF MOISTURE (SYSTEM TOTAL STORAGE - ANTECEDENT RAINFALL)
THE TOTAL MOISTURE STORAGE IS 10,177 CUBIC FEET (76,131 GALLONS).

B THE DESIGN 24-HR STORM IS .... **3.50** INCHES OF RAINFALL 2-YR
WHICH IS 15,246 CF (114,055 gallons)

THE GARDEN ROOF RUNOFF IS .... **0.90** INCHES (B - A)
C WHICH IS 3,545 CF (26,517 gallons)

'BARE' ROOF RUNOFF IS .... **3.27** INCHES BASED ON TR-55 EQUATION 2-2
D WHICH IS 1,423 CF (10,646 gallons)

THE TOTAL RUNOFF IS .... 4,968 CF (37,164 gallons) (C + D)
WHICH IS 1.14 INCHES

WHAT RUNOFF CURVE NUMBER YIELDS 1.14 INCHES OF RUNOFF FROM A 3.50 INCH STORM?

RUNOFF CURVE NUMBER = 72.3 **(COMPOSITE GARDEN ROOF® AND 'BARE' AREAS)**

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TR-55 Worksheet 4: Graphical Peak Discharge Method

Project Belleayre Resort - Lodge

Location Catskill Park

Condition: **DEVELOPED 1-yr** (for Garden Roof® LEED calculation)

1. Data

Drainage area	52,272	sf	A_m =	0.001875 mi^2
Runoff Curve Number	72.3			
Time of Concentration	6	min	T_c =	0.10 hr
Rainfall distribution	II	(I, IA, II, III)		

	STORM INFO	
2. Frequency, yr	1	
3. Rainfall, P (24 hr)	3.50	
Potential maximum ret., S, in	3.82	From equation 2-4
4. Initial abstraction, I_a, in	0.765	From equation 2-2
5. Compute I_a/P	0.219	
6. Unit peak discharge, q_u, csm/in	966	Use T_c and I_a/P with Exhibit 4-II
7. Runoff, Q, in	1.14	From equation 2-3
8. Pond & Swamp adjustment factor	1	Per table 4-2; F_p = 1 for 0% percent pond & swamp area
9. **Peak discharge, Q_p, cfs**	**2.07**	Where $Q_p = q_u A_m Q F_p$

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TABLE 5

The Belleayre Resort at Catskill Park

CPv Summary

Design Point	SMP	Req'd (cf)	Provided (cf)
1a	Bioret.-B9	3,305	5,232
4	AB - Gr. Roof		In Pond AC
	AD - Gr. Roof		In Pond AC
	Z - Dry Swale		In Pond AC
	AC - Pond	26,100	33,022
7	S - Dry Swale	2,573	4,200
	T - Dry Swale	2,478	3,000
	U - Dry Swale	2,182	8,800
8	B4 - Bioret.		In Pond L
	M - Dry Swale	4,549	9,663
	N - Dry Swale	1,459	2,621
	O - Dry Swale	7,362	9,800
	Q - Dry Swale	3,375	7,963
	W - Dry Swale	4,077	7,117
	K - Pond	14,220	14,780
	L - Pond	46,150	46,272
9	SP1 - Planter		In Pond H
	J - Dry Swale	5,056	5,628
	X - Dry Swale	2,962	4,328
	H - Pond	25,990	26,069
11	B3 - Bioret.		In Pond IP
	A1-A5 - Dry Sw.	5,181	10,031
	B. - Dry Swale	4,738	6,834
	F1. - Dry Swale	2,893	4,350
	G. - Dry Swale	3,477	8,399
	IP - Pond	165,000	166,713
16	B1-Bioret & 6p	11,909	13,575

TABLE 6

The Belleayre Resort at Catskill Park
Channel Protection Volume Calculations

Dry Swale S - DP7 - Wildacres
Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	2.21	acres
CN =	68	
Ia =	0.941	
Ia/P =	0.34	
Tc =	0.115	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu =	740	csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.03

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.641

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.5 in

Step 5: Determine Cpv

Area = 2.21 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.059	ac-ft
Cpv =	2573	ft^3

Dry Swale T - DP7 - Wildacres
Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	1.81	acres
CN =	70	
Ia =	0.857	
Ia/P =	0.31	
Tc =	0.03	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu =	950	csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.04

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.627

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.6 in

Step 5: Determine Cpv

Area = 1.81 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.057	ac-ft
Cpv =	2478	ft^3

Dry Swale U - DP7 - Wildacres

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	4.79	acres
CN =	66	
Ia =	1.030	
Ia/P =	0.37	
Tc =	0.1	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 850 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.04

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.627

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.2 in

Step 5: Determine Cpv

Area = 4.79 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.050	ac-ft
Cpv =	2182	ft^3

Dry Swale M - DP8 - Wildacres

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	4.79	acres
CN =	66	
Ia =	1.030	
Ia/P =	0.37	
Tc =	0.1	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 850 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.02

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.654

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.4 in

Step 5: Determine Cpv

Area = 4.79 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.104	ac-ft
Cpv =	4549	ft^3

Channel Protection Volume Calculations

Dry Swale N - DP8 - Wildacres

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	1.57	acres
CN =	64	
Ia =	1.125	
Ia/P =	0.40	
Tc =	0.08	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 800 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.03

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.641

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.4 in

Step 5: Determine Cpv

Area = 1.57 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.033	ac-ft
Cpv =	1459	ft^3

Dry Swale O - DP8 - Wildacres

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	4.43	acres
CN =	73	
Ia =	0.740	
Ia/P =	0.26	
Tc =	0.07	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 975 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.02

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.654

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.7 in

Step 5: Determine Cpv

Area = 4.43 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.169	ac-ft
Cpv =	7362	ft^3

Channel Protection Volume Calculations

Dry Swale Q - DP8 - Wildacres

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	3.63	acres
CN =	66	
Ia =	1.030	
Ia/P =	0.37	
Tc =	0.11	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 810 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.03

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.641

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.4 in

Step 5: Determine Cpv

Area = 3.63 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.077	ac-ft
Cpv =	3375	ft^3

Dry Swale W - DP8 - Wildacres

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	4.29	acres
CN =	66	
Ia =	1.030	
Ia/P =	0.37	
Tc =	0.09	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 850 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.02

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.654

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.4 in

Step 5: Determine Cpv

Area = 4.29 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.094	ac-ft
Cpv =	4077	ft^3

The Belleayre Resort at Catskill Park

Channel Protection Volume Calculations

Detention Pond K - DP8 - Wildacres West

Step 1: Determine Qu

P = 2.8 in. (1-yr. storm)
Area = 7.33 acres
CN = 71
Ia = 0.817
Ia/P = 0.29
Tc = 0.23 Hrs.
Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)
Qu = 610 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi
Qo/Qi = 0.03

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3
Vs/Vr = 0.641

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)
Qd = 0.6 in

Step 5: Determine Cpv

Area = 7.33 acres
Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv = 0.235 ac-ft
Cpv = 10224 ft^3

Dry Swale J - DP9 - Wildacres

Step 1: Determine Qu

P = 2.8 in. (1-yr. storm)
Area = 1.77 acres
CN = 83
Ia = 0.410
Ia/P = 0.15
Tc = 0.04 Hrs.
Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)
Qu = 975 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi
Qo/Qi = 0.02

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3
Vs/Vr = 0.654

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)
Qd = 1.2 in

Step 5: Determine Cpv

Area = 1.77 acres
Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv = 0.116 ac-ft
Cpv = 5056 ft^3

Channel Protection Volume Calculations

Dry Swale X - DP9 - Wildacres

Step 1: Determine Qu

P = 2.8 in. (1-yr. storm)
Area = 2.50 acres
CN = 67
Ia = 0.985
Ia/P = 0.35
Tc = 0.1 Hrs.
Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)
Qu = 900 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi
Qo/Qi = 0.02

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3
Vs/Vr = 0.654

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)
Qd = 0.5 in

Step 5: Determine Cpv

Area = 2.50 acres
Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv = 0.068 ac-ft
Cpv = 2962 ft^3

Dry Swales A1-A5 - DP11 - Wildacres East

Step 1: Determine Qu

P = 2.8 in. (1-yr. storm)
Area = 4.41 acres
CN = 68
Ia = 0.941
Ia/P = 0.34
Tc = 0.175 Hrs.
Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)
Qu = 700 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi
Qo/Qi = 0.025

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3
Vs/Vr = 0.647

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)
Qd = 0.5 in

Step 5: Determine Cpv

Area = 4.41 acres
Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv = 0.119 ac-ft
Cpv = 5181 ft^3

Channel Protection Volume Calculations

Dry Swale B - DP11 - Wildacres East

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	3.36	acres
CN =	69	
Ia =	0.899	
Ia/P =	0.32	
Tc =	0.21	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 700 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.025

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.647

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.6 in

Step 5: Determine Cpv

Area = 3.36 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.109	ac-ft
Cpv =	4738	ft^3

Dry Swale F1 - DP11 - Wildacres East

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	2.05	acres
CN =	69	
Ia =	0.899	
Ia/P =	0.32	
Tc =	0.13	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 850 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.025

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.647

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.6 in

Step 5: Determine Cpv

Area = 2.05 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.066	ac-ft
Cpv =	2893	ft^3

Channel Protection Volume Calculations

Dry Swale G - DP11 - Wildacres East

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	3.70	acres
CN =	66	
Ia =	1.030	
Ia/P =	0.37	
Tc =	0.15	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 700 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.025

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.647

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.4 in

Step 5: Determine Cpv

Area = 3.70 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.080	ac-ft
Cpv =	3477	ft^3

Detention Pond 6p - DP16 - Wildacres East

Step 1: Determine Qu

P =	2.8	in. (1-yr. storm)
Area =	10.46	acres
CN =	67	
Ia =	0.985	
Ia/P =	0.35	
Tc =	0.4	Hrs.

Using Figure 4-II, TR-55 and Tc, determine Qu (csm/in)

Qu = 450 csm/in

Step 2: Determine Qo/Qi

Using Figure B-1, DEC Manual Appendix B for T = 24 hrs. and Qu, determine Qo/Qi

Qo/Qi = 0.04

Step 3: Determine Vs/Vr

Vs/Vr = 0.682 - 1.43(Qo/Qi) + 1.64 (Qo/Qi)^2 - 0.804 (Qo/Qi)^3

Vs/Vr = 0.627

Step 4: Determine Qd

Using Figure 2.1, TR-55 or SCS TR-16 and P, determine Qd (in of runoff)

Qd = 0.5 in

Step 5: Determine Cpv

Area = 10.46 acres

Cpv = Vs = (Vs/Vr) * Qd * A/12

Cpv =	0.273	ac-ft
Cpv =	11909	ft^3

Reference: NYSDEC Stormwater Management Design Manual, August 2010

TABLE 7

Rate and Volume Summary

The Belleayre Resort at Catskill Park

			WATERSHED AREA 748.48 ACRES					
DESIGN POINT #	Areas (Ac.)		*DESIGN STORM*					
			10 YEAR, 6.0"		*25 YEAR, 6.5"*		*100 YEAR, 8.0"*	
			VOLUME	*PEAK*	*VOLUME*	*PEAK*	*VOLUME*	*PEAK*
			af	*cfs*	*af*	*cfs*	*af*	*cfs*
1a	4.64	*PRE*	1.15	18.01	1.31	20.51	1.82	28.20
	4.64	*POST*	1.13	17.84	1.29	20.24	1.79	27.31
2	39.11	*PRE*	9.44	106.49	10.77	121.88	14.92	169.46
	31.94	*POST*	7.73	60.02	8.82	68.69	12.21	95.64
3	2.2	*PRE*	0.54	8.12	0.62	9.26	0.86	12.73
	0.71	*POST*	0.23	5.19	0.26	5.76	0.34	7.48
4	10.00	*PRE*	2.41	33.83	2.75	38.66	3.81	53.58
	22.18	*POST*	6.22	22.94	7.00	26.41	9.47	37.87
5	14.63	*PRE*	3.42	55.50	3.90	63.53	5.44	88.34
	9.41	*POST*	2.27	42.79	2.59	48.77	3.59	67.16
5a	12.2	*PRE*	2.85	40.90	3.26	46.88	4.53	65.36
	13.04	*POST*	3.04	26.09	3.49	29.99	4.85	42.11
6	58.77	*PRE*	14.19	169.07	16.19	193.45	22.42	268.75
	58.47	*POST*	13.67	118.71	15.63	136.44	21.75	191.48
6a	41.78	*PRE*	10.09	104.54	11.51	119.71	15.94	166.63
	41.78	*POST*	10.09	104.54	11.51	119.71	15.94	166.63
7	*148.77*	*PRE*	34.95	366.47	39.95	424.74	55.58	607.19
	130.68	*POST*	30.97	298.77	35.38	343.50	49.14	483.32
8	95.97	*PRE*	23.05	283.49	26.30	325.64	36.46	456.92
	110.69	*POST*	26.99	188.59	30.74	241.25	42.45	416.82
9	56.37	*PRE*	13.83	131.61	15.76	153.94	21.77	224.36
	45.92	*POST*	11.67	116.13	13.26	136.19	18.20	193.69
10	162.26	*PRE*	38.58	212.16	44.05	245.18	61.16	349.19
	157.34	*POST*	37.65	211.67	42.98	243.46	59.60	343.05
11	66.27	*PRE*	15.90	141.89	18.15	163.12	25.16	228.95
	89.65	*POST*	19.68	72.97	22.82	89.12	32.57	146.19
12	7.26	*PRE*	1.92	28.72	2.18	32.54	2.98	44.22
	5.40	*POST*	1.52	28.05	1.71	31.56	2.30	42.25
16	*18.79*	*PRE*	4.57	60.58	5.21	69.14	7.21	95.48
	18.37	*POST*	4.09	31.46	4.70	38.99	6.61	61.92

Pre-development Acreage	**739.02**
Post-development Acreage	**740.23**
**Difference*	1.21

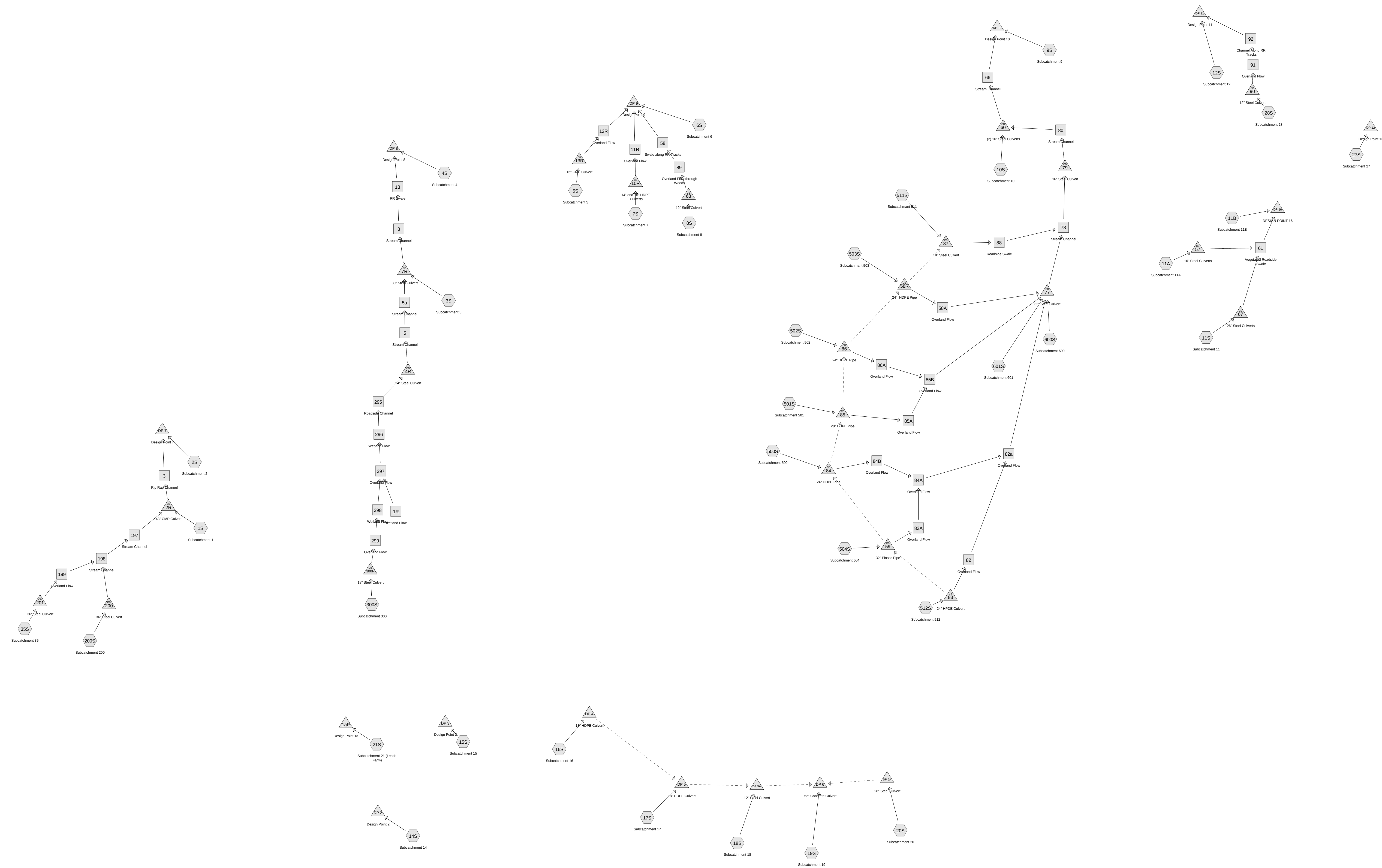
**Area not included in pre-development model at top of highmount*

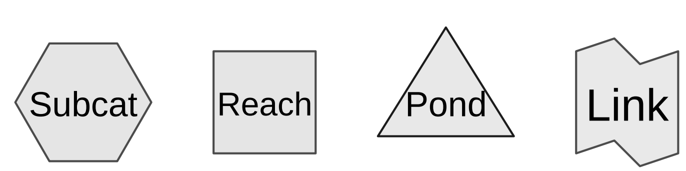
APPENDIX D

HydroCAD Data – Existing Model – Entire Site

1. **Existing Model Diagram, Area/Soil Listings and Subcatchment Summaries**
2. **Existing Reach and Culvert Summaries – 1 & 10-yr Storm Events**
3. **Existing Design Point Summaries - 1-yr Event**
4. **Existing Design Point Totals – 10, 25 and 100-yr Storm Events**

Model Diagram, Area and Soil Listings and Subcatchment Summaries





Drainage Diagram for 07074_existing

Prepared by The LA Group P.C., Printed 3/16/2011

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.442	65	Brush, Good, HSG C (18S, 19S)
674.218	70	Woods, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11A, 11B, 11S, 12S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 27S, 28S, 35S, 200S, 300S, 500S, 501S, 502S, 503S, 504S, 511S, 512S, 600S, 601S)
40.588	71	Meadow, non-grazed, HSG C (1S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 14S, 15S, 16S, 17S, 20S, 28S, 35S, 200S, 300S, 500S, 501S, 502S)
7.927	74	>75% Grass cover, Good, HSG C (3S, 6S, 12S, 21S, 27S, 504S)
0.586	87	Dirt roads, HSG C (14S)
3.908	89	Dirt Road (1S, 3S, 8S, 19S, 20S)
0.571	98	Dirt Road (6S)
0.110	98	Paved Drive (21S)
1.109	98	Paved Road (3S, 35S, 200S, 300S)
0.807	98	Paved parking & roofs (11A, 11B, 11S)
0.301	98	Paved parking, HSG C (9S)
0.739	98	Paved roads (12S, 14S)
2.001	98	Pavement (1S, 7S, 15S, 16S, 18S, 27S)
0.188	98	Pavment (8S)
0.783	98	Road (504S, 600S, 601S)
0.363	98	Road/Drive (10S)
2.041	98	Roadway (2S, 4S, 17S, 19S, 20S, 500S, 501S, 502S)
0.618	98	Roof (21S, 27S, 35S)
1.546	98	Roof Area (1S, 3S, 4S, 5S, 6S, 9S, 10S, 14S, 19S, 20S)
0.410	98	Roofs (12S)
739.256		**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
724.062	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11A, 11B, 11S, 12S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 27S, 28S, 35S, 200S, 300S, 500S, 501S, 502S, 503S, 504S, 511S, 512S, 600S, 601S
0.000	HSG D	
15.194	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11A, 11B, 11S, 12S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 27S, 35S, 200S, 300S, 500S, 501S, 502S, 504S, 600S, 601S
739.256		**TOTAL AREA**

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcatchment 1 Runoff Area=2,611,846 sf 0.88% Impervious Runoff Depth=0.61"
Flow Length=2,860' Tc=17.6 min CN=70 Runoff=36.91 cfs 3.028 af

Subcatchment 2S: Subcatchment 2 Runoff Area=18,469 sf 23.82% Impervious Runoff Depth=0.93"
Flow Length=375' Tc=7.5 min CN=77 Runoff=0.66 cfs 0.033 af

Subcatchment 3S: Subcatchment 3 Runoff Area=2,671,441 sf 1.35% Impervious Runoff Depth=0.65"
Flow Length=2,885' Tc=17.0 min CN=71 Runoff=42.27 cfs 3.312 af

Subcatchment 4S: Subcatchment 4 Runoff Area=796,495 sf 2.51% Impervious Runoff Depth=0.65"
Flow Length=2,020' Tc=15.5 min CN=71 Runoff=13.33 cfs 0.988 af

Subcatchment 5S: Subcatchment 5 Runoff Area=91,345 sf 8.77% Impervious Runoff Depth=0.74"
Flow Length=715' Tc=13.9 min CN=73 Runoff=1.92 cfs 0.129 af

Subcatchment 6S: Subcatchment 6 Runoff Area=1,024,096 sf 3.41% Impervious Runoff Depth=0.69"
Flow Length=2,176' Tc=20.1 min CN=72 Runoff=15.90 cfs 1.355 af

Subcatchment 7S: Subcatchment 7 Runoff Area=876,427 sf 2.73% Impervious Runoff Depth=0.65"
Flow Length=1,860' Tc=23.6 min CN=71 Runoff=11.18 cfs 1.087 af

Subcatchment 8S: Subcatchment 8 Runoff Area=463,566 sf 1.77% Impervious Runoff Depth=0.65"
Flow Length=1,835' Tc=18.8 min CN=71 Runoff=6.89 cfs 0.575 af

Subcatchment 9S: Subcatchment 9 Runoff Area=1,465,881 sf 1.47% Impervious Runoff Depth=0.61"
Flow Length=1,923' Slope=0.1100 '/' Tc=2.3 min CN=70 Runoff=39.51 cfs 1.700 af

Subcatchment 10S: Subcatchment 10 Runoff Area=1,643,388 sf 1.43% Impervious Runoff Depth=0.65"
Flow Length=2,845' Tc=25.8 min CN=71 Runoff=19.76 cfs 2.038 af

Subcatchment 11A: Subcatchment 11A Runoff Area=57,739 sf 4.72% Impervious Runoff Depth=0.65"
Flow Length=480' Tc=15.3 min CN=71 Runoff=0.97 cfs 0.072 af

Subcatchment 11B: Subcatchment 11B Runoff Area=577,903 sf 3.29% Impervious Runoff Depth=0.65"
Flow Length=1,270' Tc=22.3 min CN=71 Runoff=7.68 cfs 0.717 af

Subcatchment 11S: Subcatchment 11 Runoff Area=182,734 sf 7.35% Impervious Runoff Depth=0.69"
Flow Length=984' Tc=11.5 min CN=72 Runoff=3.90 cfs 0.242 af

Subcatchment 12S: Subcatchment 12 Runoff Area=2,326,061 sf 1.82% Impervious Runoff Depth=0.65"
Flow Length=2,390' Tc=34.4 min CN=71 Runoff=22.78 cfs 2.884 af

Subcatchment 14S: Subcatchment 14 Runoff Area=1,703,544 sf 0.76% Impervious Runoff Depth=0.65"
Flow Length=2,585' Tc=26.2 min CN=71 Runoff=20.26 cfs 2.112 af

Subcatchment 15S: Subcatchment 15 Runoff Area=95,640 sf 4.19% Impervious Runoff Depth=0.69"
Flow Length=945' Tc=16.4 min CN=72 Runoff=1.69 cfs 0.127 af

Subcatchment 16S: Subcatchment 16 Runoff Area=435,730 sf 2.13% Impervious Runoff Depth=0.65"
Flow Length=1,844' Tc=18.2 min CN=71 Runoff=6.61 cfs 0.540 af

Subcatchment 17S: Subcatchment 17 Runoff Area=637,108 sf 1.24% Impervious Runoff Depth=0.61"
Flow Length=1,167' Tc=13.6 min CN=70 Runoff=10.49 cfs 0.739 af

Subcatchment 18S: Subcatchment 18 Runoff Area=531,432 sf 1.42% Impervious Runoff Depth=0.61"
Flow Length=2,315' Tc=17.4 min CN=70 Runoff=7.57 cfs 0.616 af

Subcatchment 19S: Subcatchment 19 Runoff Area=2,560,021 sf 0.86% Impervious Runoff Depth=0.65"
Flow Length=2,625' Tc=24.0 min CN=71 Runoff=32.30 cfs 3.174 af

Subcatchment 20S: Subcatchment 20 Runoff Area=1,819,937 sf 0.64% Impervious Runoff Depth=0.65"
Flow Length=3,465' Tc=29.8 min CN=71 Runoff=19.76 cfs 2.257 af

Subcatchment 21S: Subcatchment 21 Runoff Area=202,100 sf 4.97% Impervious Runoff Depth=0.69"
Flow Length=890' Tc=14.9 min CN=72 Runoff=3.77 cfs 0.267 af

Subcatchment 27S: Subcatchment 27 Runoff Area=316,441 sf 12.46% Impervious Runoff Depth=0.78"
Flow Length=943' Tc=16.3 min CN=74 Runoff=6.57 cfs 0.475 af

Subcatchment 28S: Subcatchment 28 Runoff Area=560,792 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=1,455' Tc=36.1 min CN=70 Runoff=4.82 cfs 0.650 af

Subcatchment 35S: Subcatchment 35 Runoff Area=532,041 sf 2.97% Impervious Runoff Depth=0.65"
Flow Length=3,110' Tc=22.0 min CN=71 Runoff=7.13 cfs 0.660 af

Subcatchment 200S: Subcatchment 200 Runoff Area=3,328,419 sf 0.43% Impervious Runoff Depth=0.61"
Flow Length=3,545' Tc=23.5 min CN=70 Runoff=38.77 cfs 3.859 af

Subcatchment 300S: Subcatchment 300 Runoff Area=712,598 sf 0.46% Impervious Runoff Depth=0.61"
Flow Length=2,040' Tc=21.0 min CN=70 Runoff=8.97 cfs 0.826 af

Subcatchment 500S: Subcatchment 500 Runoff Area=1,350,926 sf 2.16% Impervious Runoff Depth=0.65"
Flow Length=3,875' Tc=32.0 min CN=71 Runoff=13.91 cfs 1.675 af

Subcatchment 501S: Subcatchment 501 Runoff Area=186,481 sf 0.54% Impervious Runoff Depth=0.61"
Flow Length=2,030' Tc=19.3 min CN=70 Runoff=2.48 cfs 0.216 af

Subcatchment 502S: Subcatchment 502 Runoff Area=189,050 sf 0.76% Impervious Runoff Depth=0.61"
Flow Length=1,300' Tc=13.0 min CN=70 Runoff=3.20 cfs 0.219 af

Subcatchment 503S: Subcatchmant 503 Runoff Area=130,680 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=1,010' Tc=16.6 min CN=70 Runoff=1.92 cfs 0.152 af

Subcatchment 504S: Subcatchment 504 Runoff Area=1,320,521 sf 1.06% Impervious Runoff Depth=0.61"
Flow Length=3,280' Tc=25.0 min CN=70 Runoff=14.76 cfs 1.531 af

Subcatchment 511S: Subcatchmant 511 Runoff Area=87,120 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=680' Tc=15.6 min CN=70 Runoff=1.33 cfs 0.101 af

Subcatchment 512S: Subcatchment 512 Runoff Area=56,628 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=600' Tc=14.0 min CN=70 Runoff=0.92 cfs 0.066 af

Subcatchment 600S: Subcatchment 600 Runoff Area=369,868 sf 2.61% Impervious Runoff Depth=0.65"
Flow Length=1,610' Tc=19.3 min CN=71 Runoff=5.40 cfs 0.459 af

Subcatchment 601S: Subcatchment 601 Runoff Area=267,502 sf 3.92% Impervious Runoff Depth=0.65"
Flow Length=1,070' Tc=15.0 min CN=71 Runoff=4.56 cfs 0.332 af

Total Runoff Area = 739.256 ac Runoff Volume = 39.210 af Average Runoff Depth = 0.64"
98.43% Pervious = 727.669 ac 1.57% Impervious = 11.587 ac

Summary for Subcatchment 1S: Subcatchment 1

Runoff = 36.91 cfs @ 12.13 hrs, Volume= 3.028 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	7,405	98	Roof Area
*	15,551	98	Pavement
*	9,714	89	Dirt Road
	75,794	71	Meadow, non-grazed, HSG C
	2,503,382	70	Woods, Good, HSG C
	2,611,846	70	Weighted Average
	2,588,890		99.12% Pervious Area
	22,956		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	55	0.0720	2.28		**Sheet Flow, Sheet Flow over Pavement** Smooth surfaces n= 0.011 P2= 4.00"
4.4	45	0.1600	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
10.6	1,315	0.1720	2.07		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
2.2	1,445	0.1868	11.00	70.92	**Trap/Vee/Rect Channel Flow, Mountain Stream w/ Medium Boul** Bot.W=4.00' D=1.50' Z= 0.2 '/' Top.W=4.60' n= 0.055
17.6	2,860	Total			

Summary for Subcatchment 2S: Subcatchment 2

Runoff = 0.66 cfs @ 12.00 hrs, Volume= 0.033 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	4,400	98	Roadway
	5,009	71	Meadow, non-grazed, HSG C
	9,060	70	Woods, Good, HSG C
	18,469	77	Weighted Average
	14,069		76.18% Pervious Area
	4,400		23.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	90	0.2290	0.23		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
0.5	70	0.2550	2.52		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	215	0.0547	13.12	137.80	**Trap/Vee/Rect Channel Flow, Vegetated Swale along RR Tracks** Bot.W=2.00' D=3.00' Z= 0.5 '/' Top.W=5.00' n= 0.030
7.5	375	Total			

Summary for Subcatchment 3S: Subcatchment 3

Runoff = 42.27 cfs @ 12.12 hrs, Volume= 3.312 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	18,818	89	Dirt Road
*	24,002	98	Paved Road
*	11,979	98	Roof Area
	73,006	74	>75% Grass cover, Good, HSG C
	2,543,636	70	Woods, Good, HSG C
	2,671,441	71	Weighted Average
	2,635,460		98.65% Pervious Area
	35,981		1.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.2270	0.23		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
4.0	307	0.0650	1.27		**Shallow Concentrated Flow, SC Flow overland** Woodland Kv= 5.0 fps
4.1	592	0.2300	2.40		**Shallow Concentrated Flow, overland** Woodland Kv= 5.0 fps
0.4	655	0.1959	28.46	3,073.23	**Trap/Vee/Rect Channel Flow, Stream Channel** Bot.W=25.00' D=4.00' Z= 0.5 '/' Top.W=29.00' n= 0.050 Mountain streams w/large boulders
0.1	50	0.0400	6.18	10.92	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.025 Corrugated metal
1.1	1,181	0.1950	18.29	493.73	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=3.00' Z= 2.0 '/' Top.W=15.00' n= 0.050 Mountain streams w/large boulders
17.0	2,885	Total			

Summary for Subcatchment 4S: Subcatchment 4

Runoff = 13.33 cfs @ 12.10 hrs, Volume= 0.988 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	5,009	98	Roof Area
	64,992	71	Meadow, non-grazed, HSG C
*	14,985	98	Roadway
	711,509	70	Woods, Good, HSG C
	796,495	71	Weighted Average
	776,501		97.49% Pervious Area
	19,994		2.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.3000	0.26		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
6.0	770	0.1860	2.16		**Shallow Concentrated Flow, Sheet Flow through Woods** Woodland Kv= 5.0 fps
0.4	200	0.0750	9.49	56.96	**Trap/Vee/Rect Channel Flow, RR Swale w/Gravel and Leaves** Bot.W=1.00' D=2.00' Z= 1.0 '/' Top.W=5.00' n= 0.040
0.8	250	0.0800	5.03	7.55	**Trap/Vee/Rect Channel Flow, RR Swale w/ Gravel and Leaves** Bot.W=1.00' D=1.00' Z= 0.5 '/' Top.W=2.00' n= 0.050
0.6	300	0.0650	8.00	48.03	**Trap/Vee/Rect Channel Flow, RR Swale w/ Cobbles and Leaves** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.045
1.2	400	0.0600	5.69	14.23	**Trap/Vee/Rect Channel Flow, RR Swale w/ Cobbles and Leaves** Bot.W=2.00' D=1.00' Z= 0.5 '/' Top.W=3.00' n= 0.045
15.5	2,020	Total			

Summary for Subcatchment 5S: Subcatchment 5

Runoff = 1.92 cfs @ 12.07 hrs, Volume= 0.129 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	40,511	71	Meadow, non-grazed, HSG C
*	8,015	98	Roof Area
	42,819	70	Woods, Good, HSG C
	91,345	73	Weighted Average
	83,330		91.23% Pervious Area
	8,015		8.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.1300	0.18		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
4.3	390	0.0920	1.52		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.5	225	0.0346	7.48	29.91	**Trap/Vee/Rect Channel Flow, Flow in Vegated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
13.9	715	Total			

Summary for Subcatchment 6S: Subcatchment 6

Runoff = 15.90 cfs @ 12.15 hrs, Volume= 1.355 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	24,873	98	Dirt Road
*	10,062	98	Roof Area
	70,635	71	Meadow, non-grazed, HSG C
	777,256	70	Woods, Good, HSG C
	141,270	74	>75% Grass cover, Good, HSG C
	1,024,096	72	Weighted Average
	989,161		96.59% Pervious Area
	34,935		3.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1100	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
8.7	1,016	0.1500	1.94		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
1.7	1,060	0.0750	10.48	83.81	**Trap/Vee/Rect Channel Flow, RR Swale w/ Gravel and Leaves** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.040
20.1	2,176	Total			

Summary for Subcatchment 7S: Subcatchment 7

Runoff = 11.18 cfs @ 12.20 hrs, Volume= 1.087 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	23,914	98	Pavement
	18,513	71	Meadow, non-grazed, HSG C
	834,000	70	Woods, Good, HSG C
	876,427	71	Weighted Average
	852,513		97.27% Pervious Area
	23,914		2.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.1570	0.20		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
15.2	1,760	0.1490	1.93		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
23.6	1,860	Total			

Summary for Subcatchment 8S: Subcatchment 8

Runoff = 6.89 cfs @ 12.14 hrs, Volume= 0.575 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	27,225	71	Meadow, non-grazed, HSG C
*	3,006	89	Dirt Road
*	8,189	98	Pavment
	425,146	70	Woods, Good, HSG C
	463,566	71	Weighted Average
	455,377		98.23% Pervious Area
	8,189		1.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.1570	0.20		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
6.0	850	0.2200	2.35		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
1.1	135	0.0850	2.04		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
2.6	310	0.1540	1.96		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.7	440	0.0360	10.52	63.14	**Trap/Vee/Rect Channel Flow, Flow through Vegetated Swale** Bot.W=1.00' D=2.00' Z= 1.0 '/' Top.W=5.00' n= 0.025
18.8	1,835	Total			

Summary for Subcatchment 9S: Subcatchment 9

Runoff = 39.51 cfs @ 11.94 hrs, Volume= 1.700 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	8,494	98	Roof Area
	57,978	71	Meadow, non-grazed, HSG C
	1,386,297	70	Woods, Good, HSG C
	13,112	98	Paved parking, HSG C
	1,465,881	70	Weighted Average
	1,444,275		98.53% Pervious Area
	21,606		1.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	1,923	0.1100	13.81	662.89	**Trap/Vee/Rect Channel Flow, Flow through Rock Channel** Bot.W=20.00' D=2.00' Z= 2.0 '/' Top.W=28.00' n= 0.050 Mountain streams w/large boulders

Summary for Subcatchment 10S: Subcatchment 10

Runoff = 19.76 cfs @ 12.23 hrs, Volume= 2.038 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	1,134,433	70	Woods, Good, HSG C
	485,520	71	Meadow, non-grazed, HSG C
*	7,623	98	Roof Area
*	15,812	98	Road/Drive
	1,643,388	71	Weighted Average
	1,619,953		98.57% Pervious Area
	23,435		1.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
7.2	600	0.0780	1.40		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
2.7	455	0.1600	2.80		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
2.8	330	0.1570	1.98		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
1.6	685	0.0945	7.35	33.08	**Trap/Vee/Rect Channel Flow, Stream Channel** Bot.W=4.00' D=1.00' Z= 0.5 '/' Top.W=5.00' n= 0.050
0.0	30	0.0500	13.31	18.59	**Pipe Channel, 16" Steel Culvert** 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Steel, smooth
1.4	645	0.0483	7.65	91.77	**Trap/Vee/Rect Channel Flow, Stream Channel** Bot.W=5.00' D=2.00' Z= 0.5 '/' Top.W=7.00' n= 0.050
25.8	2,845	Total			

Summary for Subcatchment 11A: Subcatchment 11A

Runoff = 0.97 cfs @ 12.09 hrs, Volume= 0.072 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
55,013	70	Woods, Good, HSG C
2,726	98	Paved parking & roofs
57,739	71	Weighted Average
55,013		95.28% Pervious Area
2,726		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0800	0.15		**Sheet Flow, Sheet Flow through woods** Woods: Light underbrush n= 0.400 P2= 4.00"
4.3	380	0.0875	1.48		**Shallow Concentrated Flow, SC flow through Woods** Woodland Kv= 5.0 fps
15.3	480	Total			

Summary for Subcatchment 11B: Subcatchment 11B

Runoff = 7.68 cfs @ 12.18 hrs, Volume= 0.717 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
558,889	70	Woods, Good, HSG C
19,014	98	Paved parking & roofs
577,903	71	Weighted Average
558,889		96.71% Pervious Area
19,014		3.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0800	0.15		**Sheet Flow, Sheet Flow through woods** Woods: Light underbrush n= 0.400 P2= 4.00"
4.0	460	0.0750	1.92		**Shallow Concentrated Flow, Sheet Flow through Meadow** Short Grass Pasture Kv= 7.0 fps
0.8	80	0.0625	1.75		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
6.3	560	0.0875	1.48		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	70	0.0500	7.39	16.25	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=2.00' D=1.00' Z= 0.2 '/' Top.W=2.40' n= 0.030 Earth, grassed & winding
22.3	1,270	Total			

Summary for Subcatchment 11S: Subcatchment 11

Runoff = 3.90 cfs @ 12.05 hrs, Volume= 0.242 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
169,300	70	Woods, Good, HSG C
13,434	98	Paved parking & roofs
182,734	72	Weighted Average
169,300		92.65% Pervious Area
13,434		7.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	25	0.0800	2.03		**Sheet Flow, Sheet Flow off Roof** Smooth surfaces n= 0.011 P2= 4.00"
4.4	75	0.0625	0.28		**Sheet Flow, Sheet flow over meadow** Grass: Short n= 0.150 P2= 4.00"
2.9	330	0.0750	1.92		**Shallow Concentrated Flow, Sheet Flow through Meadow** Short Grass Pasture Kv= 7.0 fps
3.4	300	0.0875	1.48		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.6	254	0.0500	7.39	16.25	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=2.00' D=1.00' Z= 0.2 '/' Top.W=2.40' n= 0.030
11.5	984	Total			

Summary for Subcatchment 12S: Subcatchment 12

Runoff = 22.78 cfs @ 12.34 hrs, Volume= 2.884 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	18,687	74	>75% Grass cover, Good, HSG C
	2,265,120	70	Woods, Good, HSG C
*	17,860	98	Roofs
*	24,394	98	Paved roads
	2,326,061	71	Weighted Average
	2,283,807		98.18% Pervious Area
	42,254		1.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	100	0.0850	0.15		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
23.6	2,290	0.1050	1.62		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
34.4	2,390	Total			

Summary for Subcatchment 14S: Subcatchment 14

Runoff = 20.26 cfs @ 12.23 hrs, Volume= 2.112 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	133,250	71	Meadow, non-grazed, HSG C
	25,526	87	Dirt roads, HSG C
*	5,184	98	Roof Area
	1,531,787	70	Woods, Good, HSG C
	7,797	98	Paved roads
	1,703,544	71	Weighted Average
	1,690,563		99.24% Pervious Area
	12,981		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1100	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
0.6	80	0.1000	2.21		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
15.2	2,165	0.2260	2.38		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.4	90	0.2350	3.39		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
0.3	150	0.0450	8.53	34.11	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
26.2	2,585	Total			

Summary for Subcatchment 15S: Subcatchment 15

Runoff = 1.69 cfs @ 12.11 hrs, Volume= 0.127 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	35,962	71	Meadow, non-grazed, HSG C
	55,670	70	Woods, Good, HSG C
*	4,008	98	Pavement
	95,640	72	Weighted Average
	91,632		95.81% Pervious Area
	4,008		4.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
5.3	640	0.1600	2.00		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.8	125	0.1500	2.71		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
0.2	80	0.0400	5.93	8.90	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=1.00' D=1.00' Z= 0.5 '/' Top.W=2.00' n= 0.030
16.4	945	Total			

Summary for Subcatchment 16S: Subcatchment 16

Runoff = 6.61 cfs @ 12.13 hrs, Volume= 0.540 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	141,134	71	Meadow, non-grazed, HSG C
*	9,278	98	Pavement
	285,318	70	Woods, Good, HSG C
	435,730	71	Weighted Average
	426,452		97.87% Pervious Area
	9,278		2.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
5.7	644	0.1406	1.87		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
1.4	200	0.1200	2.42		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
1.0	900	0.1029	15.11	90.64	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.030
18.2	1,844	Total			

Summary for Subcatchment 17S: Subcatchment 17

Runoff = 10.49 cfs @ 12.08 hrs, Volume= 0.739 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	7,884	98	Roadway
	8,494	71	Meadow, non-grazed, HSG C
	620,730	70	Woods, Good, HSG C
	637,108	70	Weighted Average
	629,224		98.76% Pervious Area
	7,884		1.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.2000	0.22		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
5.8	922	0.2800	2.65		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	145	0.1160	16.04	96.24	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.030
13.6	1,167	Total			

Summary for Subcatchment 18S: Subcatchment 18

Runoff = 7.57 cfs @ 12.12 hrs, Volume= 0.616 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	7,536	98	Pavement
	3,615	65	Brush, Good, HSG C
	520,281	70	Woods, Good, HSG C
	531,432	70	Weighted Average
	523,896		98.58% Pervious Area
	7,536		1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.3280	0.27		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
10.5	1,895	0.3630	3.01		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.6	320	0.0500	8.99	35.95	**Trap/Vee/Rect Channel Flow, Flow in Roadside Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
17.4	2,315	Total			

Summary for Subcatchment 19S: Subcatchment 19

Runoff = 32.30 cfs @ 12.20 hrs, Volume= 3.174 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	69,870	89	Dirt Road
*	1,176	98	Roof Area
*	20,735	98	Roadway
	2,452,602	70	Woods, Good, HSG C
	15,638	65	Brush, Good, HSG C
	2,560,021	71	Weighted Average
	2,538,110		99.14% Pervious Area
	21,911		0.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0910	0.16		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
12.6	2,055	0.2960	2.72		**Shallow Concentrated Flow, SC Flow through woods** Woodland Kv= 5.0 fps
0.9	470	0.0500	8.99	35.95	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
24.0	2,625	Total			

Summary for Subcatchment 20S: Subcatchment 20

Runoff = 19.76 cfs @ 12.28 hrs, Volume= 2.257 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	68,825	89	Dirt Road
*	2,396	98	Roof Area
*	9,278	98	Roadway
	1,637,943	70	Woods, Good, HSG C
	101,495	71	Meadow, non-grazed, HSG C
	1,819,937	71	Weighted Average
	1,808,263		99.36% Pervious Area
	11,674		0.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0910	0.16		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
18.7	3,055	0.2960	2.72		**Shallow Concentrated Flow, SC Flow through woods** Woodland Kv= 5.0 fps
0.6	310	0.0466	8.68	34.71	**Trap/Vee/Rect Channel Flow, Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
29.8	3,465	Total			

Summary for Subcatchment 21S: Subcatchment 21 (Leach Farm)

Runoff = 3.77 cfs @ 12.09 hrs, Volume= 0.267 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	147,807	70	Woods, Good, HSG C
*	5,253	98	Roof
*	4,790	98	Paved Drive
	44,250	74	>75% Grass cover, Good, HSG C
	202,100	72	Weighted Average
	192,057		95.03% Pervious Area
	10,043		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	100	0.0840	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
3.7	460	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	330	0.2300	14.23	21.34	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 0.5 '/' Top.W=2.00' n= 0.030 Earth, clean & winding
14.9	890	Total			

Summary for Subcatchment 27S: Subcatchment 27

Runoff = 6.57 cfs @ 12.10 hrs, Volume= 0.475 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	12,543	98	Roof
*	26,873	98	Pavement
	54,050	74	>75% Grass cover, Good, HSG C
	222,975	70	Woods, Good, HSG C
	316,441	74	Weighted Average
	277,025		87.54% Pervious Area
	39,416		12.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	100	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
2.5	165	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	50	0.0560	5.58	4.38	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
0.4	250	0.0500	10.53	63.18	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.030 Earth, grassed & winding
0.1	40	0.0560	5.58	4.38	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
0.1	70	0.0450	9.99	59.94	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.030 Earth, grassed & winding
0.3	80	0.0500	5.27	4.14	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
0.2	128	0.0560	11.14	66.87	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.030 Earth, grassed & winding
0.2	60	0.0560	5.58	4.38	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
16.3	943	Total			

Summary for Subcatchment 28S: Subcatchment 28

Runoff = 4.82 cfs @ 12.38 hrs, Volume= 0.650 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
33,932	71	Meadow, non-grazed, HSG C
526,860	70	Woods, Good, HSG C
560,792	70	Weighted Average
560,792		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0500	0.13		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
15.4	1,205	0.0680	1.30		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
7.4	150	0.0130	0.34	0.51	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=1.00' D=1.00' Z= 0.5 '/' Top.W=2.00' n= 0.300

36.1	1,455	Total

Summary for Subcatchment 35S: Subcatchment 35

Runoff = 7.13 cfs @ 12.18 hrs, Volume= 0.660 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	122,752	71	Meadow, non-grazed, HSG C
*	6,708	98	Paved Road
	393,477	70	Woods, Good, HSG C
*	9,104	98	Roof
	532,041	71	Weighted Average
	516,229		97.03% Pervious Area
	15,812		2.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	120	0.1667	0.52		**Sheet Flow, Sheet Flow through Ski Trail** Range n= 0.130 P2= 4.00"
3.7	630	0.3170	2.82		**Shallow Concentrated Flow, Sheet Flow through Woods** Woodland Kv= 5.0 fps
1.3	270	0.2590	3.56		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.6	225	0.2220	2.36		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.5	115	0.3478	4.13		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.5	230	0.2790	2.64		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	50	0.3150	3.93		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
9.3	1,470	0.2799	2.65		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
22.0	3,110	Total			

Summary for Subcatchment 200S: Subcatchment 200

Runoff = 38.77 cfs @ 12.20 hrs, Volume= 3.859 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	14,331	98	Paved Road
	311,323	71	Meadow, non-grazed, HSG C
	3,002,765	70	Woods, Good, HSG C
	3,328,419	70	Weighted Average
	3,314,088		99.57% Pervious Area
	14,331		0.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	100	0.1667	0.50		**Sheet Flow, Sheet Flow through Ski Trail** Range n= 0.130 P2= 4.00"
3.7	630	0.3170	2.82		**Shallow Concentrated Flow, Sheet Flow through Woods** Woodland Kv= 5.0 fps
1.3	270	0.2590	3.56		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.6	225	0.2220	2.36		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.5	115	0.3478	4.13		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.4	215	0.2790	2.64		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	70	0.3150	3.93		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
11.1	1,760	0.2799	2.65		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	160	0.0500	8.99	35.95	**Trap/Vee/Rect Channel Flow, Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
23.5	3,545	Total			

Summary for Subcatchment 300S: Subcatchment 300

Runoff = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	3,267	98	Paved Road
	6,447	71	Meadow, non-grazed, HSG C
	702,884	70	Woods, Good, HSG C
	712,598	70	Weighted Average
	709,331		99.54% Pervious Area
	3,267		0.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	120	0.2500	0.25		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
12.7	1,810	0.2257	2.38		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	110	0.0910	12.13	48.50	**Trap/Vee/Rect Channel Flow, Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
21.0	2,040	Total			

Summary for Subcatchment 500S: Subcatchment 500

Runoff = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	9,017	71	Meadow, non-grazed, HSG C
*	29,185	98	Roadway
	1,312,724	70	Woods, Good, HSG C
	1,350,926	71	Weighted Average
	1,321,741		97.84% Pervious Area
	29,185		2.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.3330	0.27		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
25.7	3,665	0.2266	2.38		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.1	110	0.1066	16.65	133.22	**Trap/Vee/Rect Channel Flow, Roadside Swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.030
32.0	3,875	Total			

Summary for Subcatchment 501S: Subcatchment 501

Runoff = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	9,017	71	Meadow, non-grazed, HSG C
*	1,002	98	Roadway
	176,462	70	Woods, Good, HSG C
	186,481	70	Weighted Average
	185,479		99.46% Pervious Area
	1,002		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.3330	0.27		**Sheet Flow, Sheet Flow through Woods**
					Woods: Light underbrush n= 0.400 P2= 4.00"
13.1	1,930	0.2410	2.45		**Shallow Concentrated Flow, SC Flow through Woods**
					Woodland Kv= 5.0 fps
19.3	2,030	Total			

Summary for Subcatchment 502S: Subcatchment 502

Runoff = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	9,017	71	Meadow, non-grazed, HSG C
*	1,437	98	Roadway
	178,596	70	Woods, Good, HSG C
	189,050	70	Weighted Average
	187,613		99.24% Pervious Area
	1,437		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.3330	0.27		**Sheet Flow, Sheet Flow through Woods**
					Woods: Light underbrush n= 0.400 P2= 4.00"
6.5	935	0.2266	2.38		**Shallow Concentrated Flow, SC Flow through Woods**
					Woodland Kv= 5.0 fps
0.3	265	0.1066	16.65	133.22	**Trap/Vee/Rect Channel Flow, Roadside Swale**
					Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00'
					n= 0.030
13.0	1,300	Total			

Summary for Subcatchment 503S: Subcatchmant 503

Runoff = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
130,680	70	Woods, Good, HSG C
130,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
6.2	655	0.1250	1.77		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	255	0.1066	16.65	133.22	**Trap/Vee/Rect Channel Flow, Roadside swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.030
16.6	1,010	Total			

Summary for Subcatchment 504S: Subcatchment 504

Runoff = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	1,292,556	70	Woods, Good, HSG C
*	13,939	98	Road
	14,026	74	>75% Grass cover, Good, HSG C
	1,320,521	70	Weighted Average
	1,306,582		98.94% Pervious Area
	13,939		1.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.4375	0.30		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
19.1	2,860	0.2500	2.50		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	320	0.1910	15.31	321.48	**Trap/Vee/Rect Channel Flow, Mountain Stream** Bot.W=4.00' D=3.00' Z= 1.0 '/' Top.W=10.00' n= 0.060
25.0	3,280	Total			

Summary for Subcatchment 511S: Subcatchmant 511

Runoff = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
87,120	70	Woods, Good, HSG C
87,120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
5.5	580	0.1250	1.77		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
15.6	680	Total			

Summary for Subcatchment 512S: Subcatchment 512

Runoff = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
56,628	70	Woods, Good, HSG C
56,628		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.3125	0.15		**Sheet Flow, Sheet Flow through Woods** Woods: Dense underbrush n= 0.800 P2= 4.00"
2.6	345	0.1900	2.18		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	155	0.1000	8.43	10.12	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=1.00' D=1.00' Z= 0.2 '/' Top.W=1.40' n= 0.030 Earth, grassed & winding
14.0	600	Total			

Summary for Subcatchment 600S: Subcatchment 600

Runoff = 5.40 cfs @ 12.14 hrs, Volume= 0.459 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	9,670	98	Road
	360,198	70	Woods, Good, HSG C
	369,868	71	Weighted Average
	360,198		97.39% Pervious Area
	9,670		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.0500	1.40		**Sheet Flow, Sheet Flow off Road** Smooth surfaces n= 0.011 P2= 4.00"
7.2	90	0.1875	0.21		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
12.0	1,510	0.1764	2.10		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
19.3	1,610	Total			

Summary for Subcatchment 601S: Subcatchment 601

Runoff = 4.56 cfs @ 12.09 hrs, Volume= 0.332 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	10,498	98	Road
	257,004	70	Woods, Good, HSG C
	267,502	71	Weighted Average
	257,004		96.08% Pervious Area
	10,498		3.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.0500	1.40		**Sheet Flow, Sheet Flow off Road** Smooth surfaces n= 0.011 P2= 4.00"
7.2	90	0.1875	0.21		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
7.7	970	0.1764	2.10		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
15.0	1,070	Total			

Reach and Culvert Summaries
1 & 10-yr Storm Events

Summary for Reach 1R: Wetland Flow

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 802.14 cfs

100.00' x 1.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 50.0 '/' Top Width= 200.00'
Length= 408.0' Slope= 0.0931 '/'
Inlet Invert= 2,208.00', Outlet Invert= 2,170.00'

‡

Summary for Reach 3: Rip Rap Channel

Inflow Area = 148.584 ac, 0.82% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 57.49 cfs @ 12.37 hrs, Volume= 7.547 af
Outflow = 57.47 cfs @ 12.37 hrs, Volume= 7.547 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 14.92 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 5.49 fps, Avg. Travel Time= 0.2 min

Peak Storage= 196 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 257.29 cfs

5.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 0.2 '/' Top Width= 5.80'
Length= 51.0' Slope= 0.5098 '/'
Inlet Invert= 1,740.00', Outlet Invert= 1,714.00'

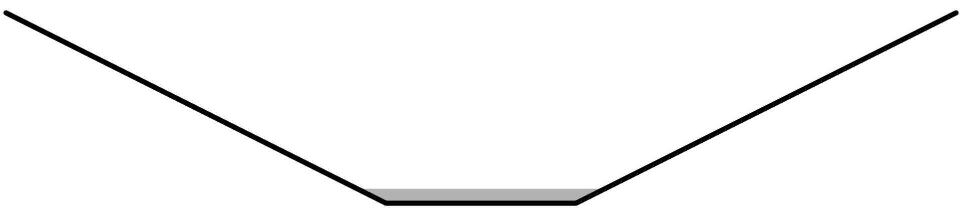
Summary for Reach 5: Stream Channel

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 7.73 cfs @ 12.51 hrs, Volume= 0.826 af
Outflow = 7.53 cfs @ 12.60 hrs, Volume= 0.826 af, Atten= 2%, Lag= 4.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.39 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 2.00 fps, Avg. Travel Time= 7.2 min

Peak Storage= 1,223 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 1,064.40 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 870.0' Slope= 0.1954 '/'
Inlet Invert= 2,060.00', Outlet Invert= 1,890.00'



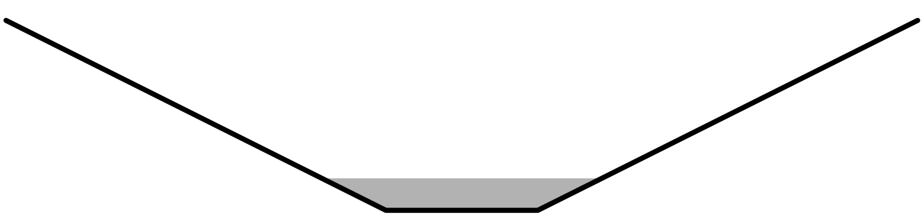
Summary for Reach 5a: Stream Channel

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 7.53 cfs @ 12.60 hrs, Volume= 0.826 af
Outflow = 7.49 cfs @ 12.62 hrs, Volume= 0.826 af, Atten= 1%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.28 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 2.5 min

Peak Storage= 425 cf @ 12.61 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 290.71 cfs

2.00' x 2.50' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 355.0' Slope= 0.2141 '/'
Inlet Invert= 1,890.00', Outlet Invert= 1,814.00'



Summary for Reach 8: Stream Channel

Inflow Area = 77.687 ac, 1.16% Impervious, Inflow Depth = 0.64" for 1-YEAR event
Inflow = 42.27 cfs @ 12.12 hrs, Volume= 4.139 af
Outflow = 42.04 cfs @ 12.13 hrs, Volume= 4.139 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.36 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 3.71 fps, Avg. Travel Time= 1.1 min

Peak Storage= 999 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 578.22 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 5.0 '/' Top Width= 24.00'
Length= 245.0' Slope= 0.2571 '/'
Inlet Invert= 1,813.00', Outlet Invert= 1,750.00'

‡

Summary for Reach 11R: Overland Flow

Inflow Area = 20.120 ac, 2.73% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 11.18 cfs @ 12.20 hrs, Volume= 1.087 af
Outflow = 8.14 cfs @ 12.59 hrs, Volume= 1.087 af, Atten= 27%, Lag= 23.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.38 fps, Min. Travel Time= 14.3 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 41.5 min

Peak Storage= 6,971 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 620.77 cfs

75.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 105.00'
Length= 1,180.0' Slope= 0.1695 '/'
Inlet Invert= 1,973.00', Outlet Invert= 1,773.00'

‡

Summary for Reach 12R: Overland Flow

Inflow Area = 2.097 ac, 8.77% Impervious, Inflow Depth = 0.74" for 1-YEAR event
Inflow = 1.92 cfs @ 12.07 hrs, Volume= 0.129 af
Outflow = 1.08 cfs @ 12.49 hrs, Volume= 0.129 af, Atten= 43%, Lag= 25.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.93 fps, Min. Travel Time= 17.0 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 38.7 min

Peak Storage= 1,112 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 305.91 cfs

30.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 60.00'
Length= 950.0' Slope= 0.1968 '/'
Inlet Invert= 1,960.00', Outlet Invert= 1,773.00'

‡

Summary for Reach 13: RR Swale

Inflow Area = 77.687 ac, 1.16% Impervious, Inflow Depth = 0.64" for 1-YEAR event
Inflow = 42.04 cfs @ 12.13 hrs, Volume= 4.139 af
Outflow = 41.52 cfs @ 12.16 hrs, Volume= 4.139 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.70 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 2.9 min

Peak Storage= 2,635 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 529.21 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 360.0' Slope= 0.0444 '/'
Inlet Invert= 1,750.00', Outlet Invert= 1,734.00'

‡

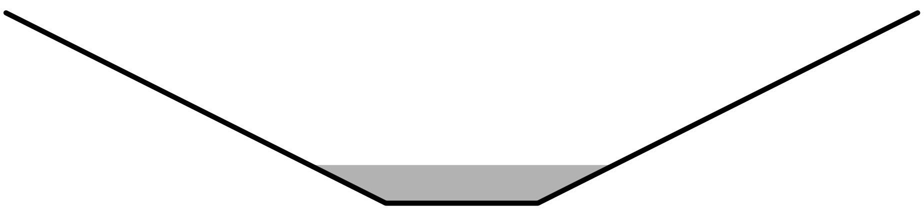
Summary for Reach 58: Swale along RR Tracks

Inflow Area = 10.642 ac, 1.77% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 4.98 cfs @ 12.46 hrs, Volume= 0.575 af
Outflow = 4.57 cfs @ 12.64 hrs, Volume= 0.575 af, Atten= 8%, Lag= 10.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.03 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 15.0 min

Peak Storage= 1,539 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 127.78 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 1,020.0' Slope= 0.0265 '/'
Inlet Invert= 1,800.00', Outlet Invert= 1,773.00'



Summary for Reach 58A: Overland Flow

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af
Outflow = 0.46 cfs @ 13.75 hrs, Volume= 0.152 af, Atten= 76%, Lag= 98.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.11 fps, Min. Travel Time= 71.2 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 151.8 min

Peak Storage= 1,948 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 151.22 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 478.0' Slope= 0.0711 '/'
Inlet Invert= 2,212.00', Outlet Invert= 2,178.00'

‡

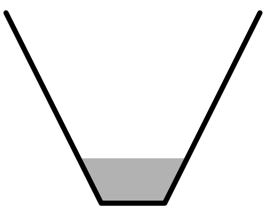
Summary for Reach 61: Vegetated Roadside Swale

Inflow Area = 5.521 ac, 6.72% Impervious, Inflow Depth = 0.68" for 1-YEAR event
Inflow = 4.80 cfs @ 12.06 hrs, Volume= 0.313 af
Outflow = 4.51 cfs @ 12.13 hrs, Volume= 0.313 af, Atten= 6%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.75 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 7.2 min

Peak Storage= 720 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 67.71 cfs

1.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 751.0' Slope= 0.0613 '/'
Inlet Invert= 2,000.00', Outlet Invert= 1,954.00'



Summary for Reach 66: Stream Channel

Inflow Area = 128.608 ac, 1.59% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 29.07 cfs @ 12.26 hrs, Volume= 6.788 af
Outflow = 27.03 cfs @ 12.42 hrs, Volume= 6.788 af, Atten= 7%, Lag= 9.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.95 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 22.0 min

Peak Storage= 8,566 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 297.74 cfs

5.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 21.00'
Length= 1,884.0' Slope= 0.1152 '/'
Inlet Invert= 2,017.00', Outlet Invert= 1,800.00'

‡

Summary for Reach 78: Stream Channel

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 17.10 cfs @ 13.58 hrs, Volume= 4.750 af
Outflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af, Atten= 0%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 8.2 min

Peak Storage= 2,060 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 213.41 cfs

6.00' x 1.50' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 18.00'
Length= 685.0' Slope= 0.1635 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,058.00'

‡

Summary for Reach 80: Stream Channel

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af
Outflow = 16.98 cfs @ 13.74 hrs, Volume= 4.750 af, Atten= 1%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 13.7 min

Peak Storage= 3,397 cf @ 13.68 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 209.43 cfs

6.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 740.0' Slope= 0.0473 '/'
Inlet Invert= 2,055.00', Outlet Invert= 2,020.00'

‡

Summary for Reach 82: Overland Flow

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af
Outflow = 0.09 cfs @ 16.94 hrs, Volume= 0.066 af, Atten= 90%, Lag= 291.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.07 fps, Min. Travel Time= 215.5 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 361.8 min

Peak Storage= 1,136 cf @ 13.35 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 53.31 cfs

100.00' x 0.50' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 938.0' Slope= 0.1354 '/'
Inlet Invert= 2,347.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 82a: Overland Flow

Inflow Area = 62.628 ac, 1.58% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 19.39 cfs @ 12.98 hrs, Volume= 3.272 af
Outflow = 14.95 cfs @ 13.58 hrs, Volume= 3.272 af, Atten= 23%, Lag= 36.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.41 fps, Min. Travel Time= 19.3 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 96.5 min

Peak Storage= 17,297 cf @ 13.26 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 164.89 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 473.0' Slope= 0.0846 '/'
Inlet Invert= 2,220.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 83A: Overland Flow

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af
Outflow = 10.29 cfs @ 12.67 hrs, Volume= 1.531 af, Atten= 30%, Lag= 26.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.46 fps, Min. Travel Time= 16.1 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 57.9 min

Peak Storage= 9,967 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 232.26 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 441.0' Slope= 0.1678 '/'
Inlet Invert= 2,326.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 84A: Overland Flow

Inflow Area = 61.328 ac, 1.61% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 21.55 cfs @ 12.68 hrs, Volume= 3.206 af
Outflow = 19.39 cfs @ 12.98 hrs, Volume= 3.206 af, Atten= 10%, Lag= 17.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.49 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 35.6 min

Peak Storage= 10,876 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 192.72 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 277.0' Slope= 0.1155 '/'
Inlet Invert= 2,252.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 84B: Overland Flow

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af
Outflow = 11.30 cfs @ 12.70 hrs, Volume= 1.675 af, Atten= 19%, Lag= 22.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.46 fps, Min. Travel Time= 13.3 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 46.4 min

Peak Storage= 9,002 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 228.33 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 370.0' Slope= 0.1622 '/'
Inlet Invert= 2,312.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 85A: Overland Flow

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af
Outflow = 0.86 cfs @ 13.27 hrs, Volume= 0.216 af, Atten= 65%, Lag= 67.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.18 fps, Min. Travel Time= 46.5 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 107.2 min

Peak Storage= 2,406 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 221.40 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 505.0' Slope= 0.1525 '/'
Inlet Invert= 2,292.00', Outlet Invert= 2,215.00'

‡

Summary for Reach 85B: Overland Flow

Inflow Area = 8.621 ac, 0.65% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.84 cfs @ 12.44 hrs, Volume= 0.435 af
Outflow = 1.09 cfs @ 14.39 hrs, Volume= 0.435 af, Atten= 41%, Lag= 116.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 47.3 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 116.5 min

Peak Storage= 3,091 cf @ 13.60 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 157.60 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 453.0' Slope= 0.0773 '/'
Inlet Invert= 2,215.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 86A: Overland Flow

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af
Outflow = 1.84 cfs @ 12.44 hrs, Volume= 0.219 af, Atten= 42%, Lag= 22.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 14.9 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 43.4 min

Peak Storage= 1,652 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 190.45 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 195.0' Slope= 0.1128 '/'
Inlet Invert= 2,237.00', Outlet Invert= 2,215.00'

‡

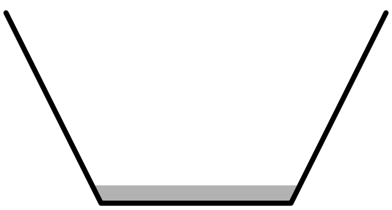
Summary for Reach 88: Roadside Swale

Inflow Area = 2.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af
Outflow = 1.28 cfs @ 12.17 hrs, Volume= 0.101 af, Atten= 4%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 7.2 min

Peak Storage= 185 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 63.06 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 472.0' Slope= 0.0678 '/'
Inlet Invert= 2,207.00', Outlet Invert= 2,175.00'



Summary for Reach 89: Overland Flow through Woods

Inflow Area = 10.642 ac, 1.77% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 6.89 cfs @ 12.14 hrs, Volume= 0.575 af
Outflow = 4.98 cfs @ 12.46 hrs, Volume= 0.575 af, Atten= 28%, Lag= 19.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.46 fps, Min. Travel Time= 12.0 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 29.6 min

Peak Storage= 3,592 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 1,000.42 cfs

150.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 250.00'
Length= 1,051.0' Slope= 0.1884 '/'
Inlet Invert= 1,998.00', Outlet Invert= 1,800.00'

‡

Summary for Reach 91: Overland Flow

Inflow Area = 12.874 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 4.82 cfs @ 12.38 hrs, Volume= 0.650 af
Outflow = 4.77 cfs @ 12.46 hrs, Volume= 0.650 af, Atten= 1%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.06 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 8.7 min

Peak Storage= 893 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 79.94 cfs

20.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 198.0' Slope= 0.0303 '/'
Inlet Invert= 1,893.00', Outlet Invert= 1,887.00'

‡

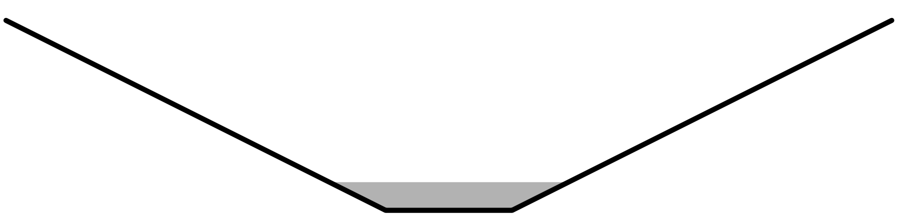
Summary for Reach 92: Channel Along RR Tracks

Inflow Area = 12.874 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 4.77 cfs @ 12.46 hrs, Volume= 0.650 af
Outflow = 4.56 cfs @ 12.64 hrs, Volume= 0.650 af, Atten= 4%, Lag= 10.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.55 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 14.0 min

Peak Storage= 1,563 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 243.54 cfs

2.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,216.0' Slope= 0.0317 '/'
Inlet Invert= 1,887.00', Outlet Invert= 1,848.50'



Summary for Reach 197: Stream Channel

Inflow Area = 88.624 ac, 0.78% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 44.68 cfs @ 12.28 hrs, Volume= 4.519 af
Outflow = 42.70 cfs @ 12.40 hrs, Volume= 4.519 af, Atten= 4%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.15 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 10.6 min

Peak Storage= 10,437 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 9,816.53 cfs

15.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 7.0 '/' Top Width= 99.00'
Length= 1,500.0' Slope= 0.1807 '/'
Inlet Invert= 2,015.00', Outlet Invert= 1,744.00'

‡

Summary for Reach 198: Stream Channel

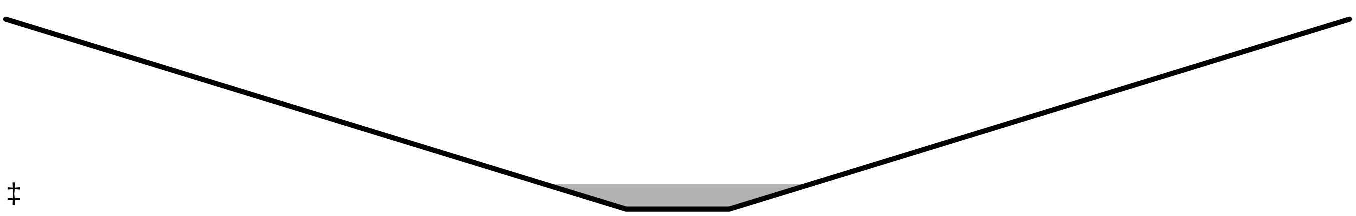
Inflow Area = 88.624 ac, 0.78% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 45.77 cfs @ 12.21 hrs, Volume= 4.519 af
Outflow = 44.68 cfs @ 12.28 hrs, Volume= 4.519 af, Atten= 2%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.04 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 3.32 fps, Avg. Travel Time= 6.3 min

Peak Storage= 7,044 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 4,399.92 cfs

4.00' x 6.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 1,262.0' Slope= 0.1688 '/'
Inlet Invert= 2,228.00', Outlet Invert= 2,015.00'

‡



Summary for Reach 199: Overland Flow

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 7.13 cfs @ 12.18 hrs, Volume= 0.660 af
Outflow = 7.08 cfs @ 12.22 hrs, Volume= 0.660 af, Atten= 1%, Lag= 2.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.49 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 4.8 min

Peak Storage= 710 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 458.82 cfs

50.00' x 0.50' deep channel, n= 0.040 Earth, dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 150.00'
Length= 250.0' Slope= 0.2640 '/'
Inlet Invert= 2,234.00', Outlet Invert= 2,168.00'

‡

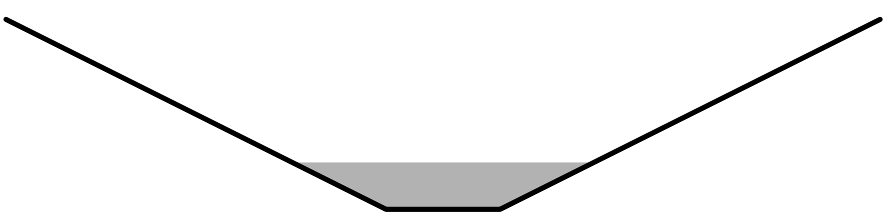
Summary for Reach 295: Roadside Channel

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 7.79 cfs @ 12.47 hrs, Volume= 0.826 af
Outflow = 7.73 cfs @ 12.51 hrs, Volume= 0.826 af, Atten= 1%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.60 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 3.5 min

Peak Storage= 639 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 163.61 cfs

1.50' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 11.50'
Length= 379.0' Slope= 0.0528 '/'
Inlet Invert= 2,085.00', Outlet Invert= 2,065.00'



Summary for Reach 296: Wetland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 7.86 cfs @ 12.43 hrs, Volume= 0.826 af
Outflow = 7.79 cfs @ 12.47 hrs, Volume= 0.826 af, Atten= 1%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.74 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 3.7 min

Peak Storage= 668 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 122.08 cfs

2.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 320.0' Slope= 0.0375 '/'
Inlet Invert= 2,096.00', Outlet Invert= 2,084.00'

Summary for Reach 297: Overland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 7.98 cfs @ 12.37 hrs, Volume= 0.826 af
Outflow = 7.86 cfs @ 12.43 hrs, Volume= 0.826 af, Atten= 1%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 6.3 min

Peak Storage= 1,000 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 225.40 cfs

30.00' x 0.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 50.0 '/' Top Width= 80.00'
Length= 366.0' Slope= 0.2022 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,096.00'

‡

Summary for Reach 298: Wetland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 8.93 cfs @ 12.19 hrs, Volume= 0.826 af
Outflow = 7.98 cfs @ 12.37 hrs, Volume= 0.826 af, Atten= 11%, Lag= 10.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.09 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 18.0 min

Peak Storage= 3,003 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 802.14 cfs

100.00' x 1.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 50.0 '/' Top Width= 200.00'
Length= 408.0' Slope= 0.0931 '/'
Inlet Invert= 2,208.00', Outlet Invert= 2,170.00'

‡

Summary for Reach 299: Overland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af
Outflow = 8.93 cfs @ 12.19 hrs, Volume= 0.826 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 1.5 min

Peak Storage= 322 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 134.95 cfs

10.00' x 0.50' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 50.0 '/' Top Width= 60.00'
Length= 135.0' Slope= 0.3481 '/'
Inlet Invert= 2,255.00', Outlet Invert= 2,208.00'

‡

Summary for Reach 1R: Wetland Flow

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 802.14 cfs

100.00' x 1.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 50.0 '/' Top Width= 200.00'
Length= 408.0' Slope= 0.0931 '/'
Inlet Invert= 2,208.00', Outlet Invert= 2,170.00'

‡

Summary for Reach 3: Rip Rap Channel

Inflow Area = 148.584 ac, 0.82% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 366.11 cfs @ 12.21 hrs, Volume= 34.829 af
Outflow = 366.04 cfs @ 12.21 hrs, Volume= 34.829 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 25.97 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 8.20 fps, Avg. Travel Time= 0.1 min

Peak Storage= 719 cf @ 12.21 hrs
Average Depth at Peak Storage= 2.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 257.29 cfs

5.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 0.2 '/' Top Width= 5.80'
Length= 51.0' Slope= 0.5098 '/'
Inlet Invert= 1,740.00', Outlet Invert= 1,714.00'

Summary for Reach 5: Stream Channel

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 46.62 cfs @ 12.33 hrs, Volume= 3.824 af
Outflow = 46.19 cfs @ 12.38 hrs, Volume= 3.824 af, Atten= 1%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 9.56 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 2.88 fps, Avg. Travel Time= 5.0 min

Peak Storage= 4,213 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 1,064.40 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 870.0' Slope= 0.1954 '/'
Inlet Invert= 2,060.00', Outlet Invert= 1,890.00'

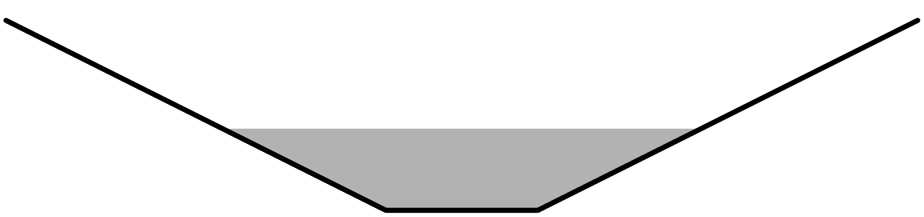
Summary for Reach 5a: Stream Channel

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 46.19 cfs @ 12.38 hrs, Volume= 3.824 af
Outflow = 46.00 cfs @ 12.39 hrs, Volume= 3.824 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.37 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.36 fps, Avg. Travel Time= 1.8 min

Peak Storage= 1,581 cf @ 12.38 hrs
Average Depth at Peak Storage= 1.07'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 290.71 cfs

2.00' x 2.50' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 355.0' Slope= 0.2141 '/'
Inlet Invert= 1,890.00', Outlet Invert= 1,814.00'



Summary for Reach 8: Stream Channel

Inflow Area =	77.687 ac,	1.16% Impervious,	Inflow Depth = 2.88"	for 10-YEAR event	
Inflow =	222.80 cfs @	12.10 hrs,	Volume=	18.639 af	
Outflow =	221.91 cfs @	12.11 hrs,	Volume=	18.639 af,	Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 16.14 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.23 fps, Avg. Travel Time= 0.8 min

Peak Storage= 3,376 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.31'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 578.22 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 5.0 '/' Top Width= 24.00'
Length= 245.0' Slope= 0.2571 '/'
Inlet Invert= 1,813.00', Outlet Invert= 1,750.00'

‡

Summary for Reach 11R: Overland Flow

Inflow Area =	20.120 ac,	2.73% Impervious,	Inflow Depth = 2.90"	for 10-YEAR event	
Inflow =	58.43 cfs @	12.17 hrs,	Volume=	4.860 af	
Outflow =	53.37 cfs @	12.36 hrs,	Volume=	4.860 af,	Atten= 9%, Lag= 11.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.85 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 29.6 min

Peak Storage= 22,106 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 620.77 cfs

75.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 105.00'
Length= 1,180.0' Slope= 0.1695 '/'
Inlet Invert= 1,973.00', Outlet Invert= 1,773.00'

‡

Summary for Reach 12R: Overland Flow

Inflow Area = 2.097 ac, 8.77% Impervious, Inflow Depth = 3.09" for 10-YEAR event
Inflow = 8.69 cfs @ 12.06 hrs, Volume= 0.540 af
Outflow = 7.10 cfs @ 12.27 hrs, Volume= 0.540 af, Atten= 18%, Lag= 12.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 31.7 min

Peak Storage= 3,552 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 305.91 cfs

30.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 60.00'
Length= 950.0' Slope= 0.1968 '/'
Inlet Invert= 1,960.00', Outlet Invert= 1,773.00'

‡

Summary for Reach 13: RR Swale

Inflow Area = 77.687 ac, 1.16% Impervious, Inflow Depth = 2.88" for 10-YEAR event
Inflow = 221.91 cfs @ 12.11 hrs, Volume= 18.639 af
Outflow = 220.40 cfs @ 12.13 hrs, Volume= 18.639 af, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.84 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 2.1 min

Peak Storage= 9,029 cf @ 12.12 hrs
Average Depth at Peak Storage= 2.05'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 529.21 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 360.0' Slope= 0.0444 '/'
Inlet Invert= 1,750.00', Outlet Invert= 1,734.00'

‡

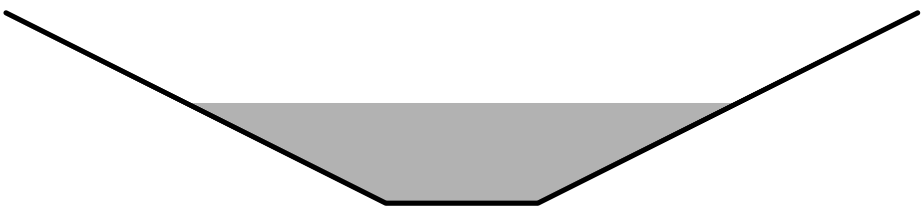
Summary for Reach 58: Swale along RR Tracks

Inflow Area = 10.642 ac, 1.77% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 32.28 cfs @ 12.27 hrs, Volume= 2.571 af
Outflow = 31.00 cfs @ 12.37 hrs, Volume= 2.571 af, Atten= 4%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.09 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 10.9 min

Peak Storage= 6,219 cf @ 12.32 hrs
Average Depth at Peak Storage= 1.32'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 127.78 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 1,020.0' Slope= 0.0265 '/'
Inlet Invert= 1,800.00', Outlet Invert= 1,773.00'



Summary for Reach 58A: Overland Flow

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af
Outflow = 4.96 cfs @ 12.78 hrs, Volume= 0.701 af, Atten= 52%, Lag= 41.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.27 fps, Min. Travel Time= 29.8 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 121.9 min

Peak Storage= 8,863 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 151.22 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 478.0' Slope= 0.0711 '/'
Inlet Invert= 2,212.00', Outlet Invert= 2,178.00'

‡

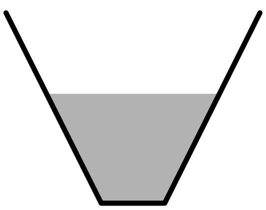
Summary for Reach 61: Vegetated Roadside Swale

Inflow Area = 5.521 ac, 6.72% Impervious, Inflow Depth = 2.97" for 10-YEAR event
Inflow = 22.93 cfs @ 12.04 hrs, Volume= 1.367 af
Outflow = 22.39 cfs @ 12.09 hrs, Volume= 1.367 af, Atten= 2%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.98 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 5.2 min

Peak Storage= 2,410 cf @ 12.06 hrs
Average Depth at Peak Storage= 1.72'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 67.71 cfs

1.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 751.0' Slope= 0.0613 '/'
Inlet Invert= 2,000.00', Outlet Invert= 1,954.00'



Summary for Reach 66: Stream Channel

Inflow Area = 128.608 ac, 1.59% Impervious, Inflow Depth = 2.87" for 10-YEAR event
Inflow = 161.62 cfs @ 12.20 hrs, Volume= 30.714 af
Outflow = 156.56 cfs @ 12.29 hrs, Volume= 30.714 af, Atten= 3%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 9.68 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 16.9 min

Peak Storage= 30,535 cf @ 12.24 hrs
Average Depth at Peak Storage= 1.48'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 297.74 cfs

5.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 21.00'
Length= 1,884.0' Slope= 0.1152 '/'
Inlet Invert= 2,017.00', Outlet Invert= 1,800.00'

‡

Summary for Reach 78: Stream Channel

Inflow Area =	90.881 ac,	1.66% Impervious, Inflow Depth = 2.85"	for 10-YEAR event	
Inflow =	130.68 cfs @	12.97 hrs, Volume=	21.601 af	
Outflow =	130.41 cfs @	13.01 hrs, Volume=	21.601 af,	Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.37 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 6.2 min

Peak Storage= 8,622 cf @ 12.99 hrs
Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 213.41 cfs

6.00' x 1.50' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 18.00'
Length= 685.0' Slope= 0.1635 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,058.00'

‡

Summary for Reach 80: Stream Channel

Inflow Area =	90.881 ac,	1.66% Impervious, Inflow Depth = 2.85"	for 10-YEAR event	
Inflow =	130.41 cfs @	13.01 hrs, Volume=	21.601 af	
Outflow =	130.05 cfs @	13.06 hrs, Volume=	21.601 af,	Atten= 0%, Lag= 3.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.59 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 10.6 min

Peak Storage= 14,598 cf @ 13.03 hrs
Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 209.43 cfs

6.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 740.0' Slope= 0.0473 '/'
Inlet Invert= 2,055.00', Outlet Invert= 2,020.00'

‡

Summary for Reach 82: Overland Flow

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 4.87 cfs @ 12.06 hrs, Volume= 0.304 af
Outflow = 1.08 cfs @ 13.77 hrs, Volume= 0.304 af, Atten= 78%, Lag= 102.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 82.5 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 306.3 min

Peak Storage= 5,366 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 53.31 cfs

100.00' x 0.50' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 938.0' Slope= 0.1354 '/'
Inlet Invert= 2,347.00', Outlet Invert= 2,220.00'

‡


Summary for Reach 82a: Overland Flow

Inflow Area = 62.628 ac, 1.58% Impervious, Inflow Depth = 2.68" for 10-YEAR event
Inflow = 101.52 cfs @ 12.67 hrs, Volume= 13.991 af
Outflow = 92.40 cfs @ 13.01 hrs, Volume= 13.991 af, Atten= 9%, Lag= 20.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.70 fps, Min. Travel Time= 11.2 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 75.6 min

Peak Storage= 62,178 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 164.89 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 473.0' Slope= 0.0846 '/'
Inlet Invert= 2,220.00', Outlet Invert= 2,180.00'

‡


Summary for Reach 83A: Overland Flow

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 2.48" for 10-YEAR event
Inflow = 46.42 cfs @ 12.19 hrs, Volume= 6.253 af
Outflow = 42.96 cfs @ 12.51 hrs, Volume= 6.253 af, Atten= 7%, Lag= 19.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.72 fps, Min. Travel Time= 10.2 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 41.7 min

Peak Storage= 26,373 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 232.26 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 441.0' Slope= 0.1678 '/'
Inlet Invert= 2,326.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 84A: Overland Flow

Inflow Area = 61.328 ac, 1.61% Impervious, Inflow Depth = 2.68" for 10-YEAR event
Inflow = 104.13 cfs @ 12.49 hrs, Volume= 13.687 af
Outflow = 101.51 cfs @ 12.67 hrs, Volume= 13.687 af, Atten= 3%, Lag= 10.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.81 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 25.6 min

Peak Storage= 34,815 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 192.72 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 277.0' Slope= 0.1155 '/'
Inlet Invert= 2,252.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 84B: Overland Flow

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 2.88" for 10-YEAR event
Inflow = 64.69 cfs @ 12.23 hrs, Volume= 7.434 af
Outflow = 61.22 cfs @ 12.48 hrs, Volume= 7.434 af, Atten= 5%, Lag= 15.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.79 fps, Min. Travel Time= 7.8 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 33.0 min

Peak Storage= 28,726 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 228.33 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 370.0' Slope= 0.1622 '/'
Inlet Invert= 2,312.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 85A: Overland Flow

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 4.95" for 10-YEAR event
Inflow = 40.92 cfs @ 12.21 hrs, Volume= 1.765 af
Outflow = 30.67 cfs @ 12.58 hrs, Volume= 1.765 af, Atten= 25%, Lag= 21.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.63 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 80.5 min

Peak Storage= 24,784 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 221.40 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 505.0' Slope= 0.1525 '/'
Inlet Invert= 2,292.00', Outlet Invert= 2,215.00'

‡

Summary for Reach 85B: Overland Flow

Inflow Area = 8.621 ac, 0.65% Impervious, Inflow Depth = 4.05" for 10-YEAR event
Inflow = 36.47 cfs @ 12.55 hrs, Volume= 2.906 af
Outflow = 29.55 cfs @ 12.93 hrs, Volume= 2.906 af, Atten= 19%, Lag= 22.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.49 fps, Min. Travel Time= 15.4 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 87.5 min

Peak Storage= 27,375 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 157.60 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 453.0' Slope= 0.0773 '/'
Inlet Invert= 2,215.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 86A: Overland Flow

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 3.16" for 10-YEAR event
Inflow = 19.66 cfs @ 12.19 hrs, Volume= 1.142 af
Outflow = 17.29 cfs @ 12.35 hrs, Volume= 1.142 af, Atten= 12%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.47 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 31.1 min

Peak Storage= 7,157 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 190.45 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 195.0' Slope= 0.1128 '/'
Inlet Invert= 2,237.00', Outlet Invert= 2,215.00'

‡

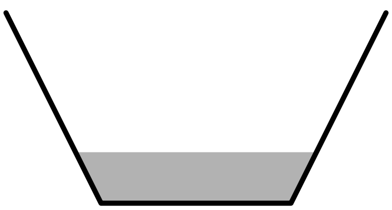
Summary for Reach 88: Roadside Swale

Inflow Area =	2.000 ac,	0.00% Impervious,	Inflow Depth = 2.81"	for 10-YEAR event	
Inflow =	7.10 cfs @	12.08 hrs,	Volume=	0.468 af	
Outflow =	7.00 cfs @	12.12 hrs,	Volume=	0.468 af,	Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.79 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 4.8 min

Peak Storage= 573 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 63.06 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 472.0' Slope= 0.0678 '/'
Inlet Invert= 2,207.00', Outlet Invert= 2,175.00'



Summary for Reach 89: Overland Flow through Woods

Inflow Area =	10.642 ac,	1.77% Impervious,	Inflow Depth = 2.90"	for 10-YEAR event	
Inflow =	35.36 cfs @	12.12 hrs,	Volume=	2.571 af	
Outflow =	32.28 cfs @	12.27 hrs,	Volume=	2.571 af,	Atten= 9%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.01 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 22.3 min

Peak Storage= 11,327 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 1,000.42 cfs

150.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 250.00'
Length= 1,051.0' Slope= 0.1884 '/'
Inlet Invert= 1,998.00', Outlet Invert= 1,800.00'

‡

Summary for Reach 91: Overland Flow

Inflow Area = 12.874 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 27.27 cfs @ 12.32 hrs, Volume= 3.010 af
Outflow = 27.18 cfs @ 12.37 hrs, Volume= 3.010 af, Atten= 0%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.91 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 5.8 min

Peak Storage= 2,811 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 79.94 cfs

20.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 198.0' Slope= 0.0303 '/'
Inlet Invert= 1,893.00', Outlet Invert= 1,887.00'

‡

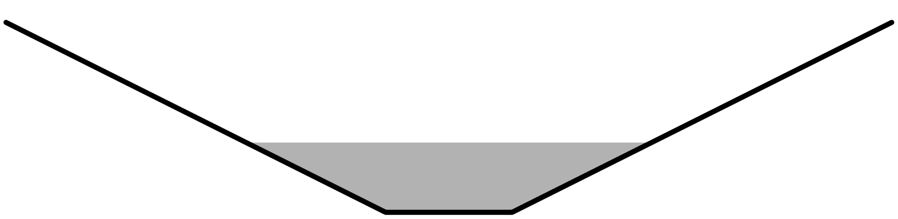
Summary for Reach 92: Channel Along RR Tracks

Inflow Area = 12.874 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 27.18 cfs @ 12.37 hrs, Volume= 3.010 af
Outflow = 26.72 cfs @ 12.48 hrs, Volume= 3.010 af, Atten= 2%, Lag= 6.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.78 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 9.9 min

Peak Storage= 5,627 cf @ 12.42 hrs
Average Depth at Peak Storage= 1.10'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 243.54 cfs

2.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,216.0' Slope= 0.0317 '/'
Inlet Invert= 1,887.00', Outlet Invert= 1,848.50'



Summary for Reach 197: Stream Channel

Inflow Area =	88.624 ac,	0.78% Impervious,	Inflow Depth =	2.82"	for 10-YEAR event	
Inflow =	249.32 cfs @	12.22 hrs,	Volume=	20.813 af		
Outflow =	244.79 cfs @	12.29 hrs,	Volume=	20.813 af,	Atten= 2%,	Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.67 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 3.39 fps, Avg. Travel Time= 7.4 min

Peak Storage= 34,527 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 9,816.53 cfs

15.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 7.0 '/' Top Width= 99.00'
Length= 1,500.0' Slope= 0.1807 '/'
Inlet Invert= 2,015.00', Outlet Invert= 1,744.00'

‡

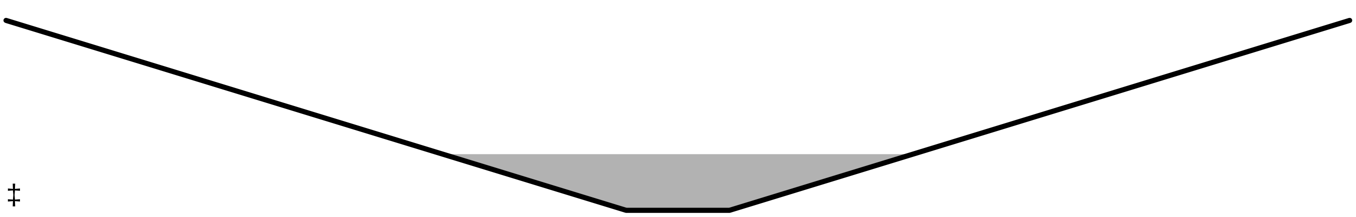
Summary for Reach 198: Stream Channel

Inflow Area =	88.624 ac,	0.78% Impervious,	Inflow Depth =	2.82"	for 10-YEAR event	
Inflow =	251.53 cfs @	12.17 hrs,	Volume=	20.813 af		
Outflow =	249.32 cfs @	12.22 hrs,	Volume=	20.813 af,	Atten= 1%,	Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.66 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 4.63 fps, Avg. Travel Time= 4.5 min

Peak Storage= 24,858 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.77'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 4,399.92 cfs

4.00' x 6.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 1,262.0' Slope= 0.1688 '/'
Inlet Invert= 2,228.00', Outlet Invert= 2,015.00'



‡

Summary for Reach 199: Overland Flow

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 37.07 cfs @ 12.15 hrs, Volume= 2.950 af
Outflow = 36.79 cfs @ 12.18 hrs, Volume= 2.950 af, Atten= 1%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 3.2 min

Peak Storage= 2,108 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 458.82 cfs

50.00' x 0.50' deep channel, n= 0.040 Earth, dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 150.00'
Length= 250.0' Slope= 0.2640 '/'
Inlet Invert= 2,234.00', Outlet Invert= 2,168.00'

‡

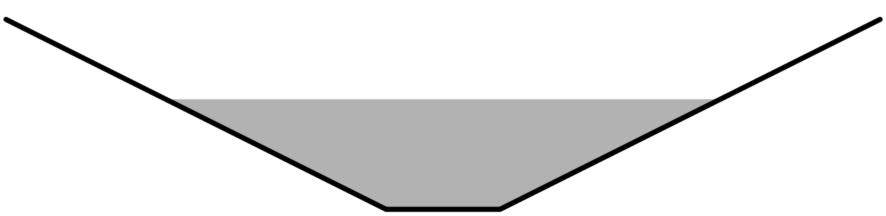
Summary for Reach 295: Roadside Channel

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 46.94 cfs @ 12.31 hrs, Volume= 3.824 af
Outflow = 46.62 cfs @ 12.33 hrs, Volume= 3.824 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.34 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 2.5 min

Peak Storage= 2,415 cf @ 12.32 hrs
Average Depth at Peak Storage= 1.45'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 163.61 cfs

1.50' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 11.50'
Length= 379.0' Slope= 0.0528 '/'
Inlet Invert= 2,085.00', Outlet Invert= 2,065.00'



Summary for Reach 296: Wetland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 47.28 cfs @ 12.28 hrs, Volume= 3.824 af
Outflow = 46.94 cfs @ 12.31 hrs, Volume= 3.824 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.99 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 2.6 min

Peak Storage= 2,517 cf @ 12.29 hrs
Average Depth at Peak Storage= 1.32'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 122.08 cfs

2.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 320.0' Slope= 0.0375 '/'
Inlet Invert= 2,096.00', Outlet Invert= 2,084.00'

Summary for Reach 297: Overland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 47.66 cfs @ 12.24 hrs, Volume= 3.824 af
Outflow = 47.28 cfs @ 12.28 hrs, Volume= 3.824 af, Atten= 1%, Lag= 2.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.21 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 4.3 min

Peak Storage= 3,330 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 225.40 cfs

30.00' x 0.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 50.0 '/' Top Width= 80.00'
Length= 366.0' Slope= 0.2022 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,096.00'

‡

Summary for Reach 298: Wetland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 49.11 cfs @ 12.15 hrs, Volume= 3.824 af
Outflow = 47.66 cfs @ 12.24 hrs, Volume= 3.824 af, Atten= 3%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.12 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 12.3 min

Peak Storage= 9,199 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 802.14 cfs

100.00' x 1.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 50.0 '/' Top Width= 200.00'
Length= 408.0' Slope= 0.0931 '/'
Inlet Invert= 2,208.00', Outlet Invert= 2,170.00'

‡

Summary for Reach 299: Overland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 49.29 cfs @ 12.14 hrs, Volume= 3.824 af
Outflow = 49.11 cfs @ 12.15 hrs, Volume= 3.824 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.95 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 1.0 min

Peak Storage= 1,118 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 134.95 cfs

10.00' x 0.50' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 50.0 '/' Top Width= 60.00'
Length= 135.0' Slope= 0.3481 '/'
Inlet Invert= 2,255.00', Outlet Invert= 2,208.00'

‡

Summary for Pond 2R: 48" CMP Culvert

Inflow Area =	148.584 ac,	0.82% Impervious,	Inflow Depth = 0.61"	for 1-YEAR event
Inflow =	57.49 cfs @	12.37 hrs, Volume=	7.547 af	
Outflow =	57.49 cfs @	12.37 hrs, Volume=	7.547 af,	Atten= 0%, Lag= 0.0 min
Primary =	57.49 cfs @	12.37 hrs, Volume=	7.547 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,744.93' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,742.00'	**48.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 1,742.00' / 1,740.00' S= 0.0667 '/' Cc= 0.900 n= 0.025
#2	Secondary	1,746.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=57.33 cfs @ 12.37 hrs HW=1,744.92' (Free Discharge)
1=Culvert (Inlet Controls 57.33 cfs @ 5.82 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,742.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4R: 24" Steel Culvert

Inflow Area =	16.359 ac,	0.46% Impervious,	Inflow Depth = 0.61"	for 1-YEAR event
Inflow =	7.73 cfs @	12.51 hrs, Volume=	0.826 af	
Outflow =	7.73 cfs @	12.51 hrs, Volume=	0.826 af,	Atten= 0%, Lag= 0.0 min
Primary =	7.73 cfs @	12.51 hrs, Volume=	0.826 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,066.24' @ 12.51 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 2,065.00' / 2,060.00' S= 0.1000 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,067.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=7.71 cfs @ 12.51 hrs HW=2,066.24' (Free Discharge)
1=Culvert (Inlet Controls 7.71 cfs @ 3.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,065.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 7R: 30" Steel Culvert

Inflow Area = 77.687 ac, 1.16% Impervious, Inflow Depth = 0.64" for 1-YEAR event
Inflow = 42.27 cfs @ 12.12 hrs, Volume= 4.139 af
Outflow = 42.27 cfs @ 12.12 hrs, Volume= 4.139 af, Atten= 0%, Lag= 0.0 min
Primary = 42.27 cfs @ 12.12 hrs, Volume= 4.139 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,816.17' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,812.50'	**30.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 1,812.50' / 1,812.00' S= 0.0167 '/' Cc= 0.900 n= 0.012
#2	Primary	1,816.00'	**30.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=42.09 cfs @ 12.12 hrs HW=1,816.16' (Free Discharge)
1=Culvert (Inlet Controls 36.73 cfs @ 7.48 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 5.37 cfs @ 1.09 fps)

Summary for Pond 10R: 14" and 16" HDPE Culverts

Inflow Area = 20.120 ac, 2.73% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 11.18 cfs @ 12.20 hrs, Volume= 1.087 af
Outflow = 11.18 cfs @ 12.20 hrs, Volume= 1.087 af, Atten= 0%, Lag= 0.0 min
Primary = 11.01 cfs @ 12.20 hrs, Volume= 1.086 af
Secondary = 0.17 cfs @ 12.20 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,977.01' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,975.00'	**14.0" Round 14" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#2	Primary	1,975.00'	**16.0" Round 16" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#3	Secondary	1,977.00'	**50.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.00 cfs @ 12.20 hrs HW=1,977.01' (Free Discharge)
1=14" Culvert (Inlet Controls 4.85 cfs @ 4.54 fps)
2=16" Culvert (Inlet Controls 6.15 cfs @ 4.40 fps)

Secondary OutFlow Max=0.09 cfs @ 12.20 hrs HW=1,977.01' (Free Discharge)
3=Broad-Crested Rectangular Weir (Weir Controls 0.09 cfs @ 0.24 fps)

Summary for Pond 13R: 16" CMP Culvert

Inflow Area = 2.097 ac, 8.77% Impervious, Inflow Depth = 0.74" for 1-YEAR event
Inflow = 1.92 cfs @ 12.07 hrs, Volume= 0.129 af
Outflow = 1.92 cfs @ 12.07 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.0 min
Primary = 1.92 cfs @ 12.07 hrs, Volume= 0.129 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,968.66' @ 12.07 hrs
Flood Elev= 1,969.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,968.00'	**16.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 1,968.00' / 1,965.00' S= 0.0750 '/' Cc= 0.900 n= 0.025

Primary OutFlow Max=1.90 cfs @ 12.07 hrs HW=1,968.66' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.90 cfs @ 2.76 fps)

Summary for Pond 57: 16" Steel Culverts

Inflow Area = 1.326 ac, 4.72% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 0.97 cfs @ 12.09 hrs, Volume= 0.072 af
Outflow = 0.97 cfs @ 12.09 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.09 hrs, Volume= 0.072 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,004.52' @ 12.09 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,004.00'	**16.0" Round 16" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,004.00' / 2,000.00' S= 0.0667 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.97 cfs @ 12.09 hrs HW=2,004.52' (Free Discharge)
└─**1=16" Smooth Steel Culvert (old)** (Inlet Controls 0.97 cfs @ 1.93 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,004.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 58R: 24" HDPE Pipe

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af
Outflow = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,215.65' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,215.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,215.00' / 2,212.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,218.50'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.90 cfs @ 12.11 hrs HW=2,215.65' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.90 cfs @ 2.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,215.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 59: 32" Plastic Pipe

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af
Outflow = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af, Atten= 0%, Lag= 0.0 min
Primary = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,328.82' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,327.00'	**32.0" Round 32" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,327.00' / 2,324.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,331.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.71 cfs @ 12.22 hrs HW=2,328.82' (Free Discharge)
└─**1=32" Plastic Culvert** (Inlet Controls 14.71 cfs @ 3.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,327.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 60: (2) 16" Steel Culverts

Inflow Area =	128.608 ac,	1.59% Impervious, Inflow Depth = 0.63"	for 1-YEAR event
Inflow =	29.07 cfs @	12.26 hrs, Volume=	6.788 af
Outflow =	29.07 cfs @	12.26 hrs, Volume=	6.788 af, Atten= 0%, Lag= 0.0 min
Primary =	26.98 cfs @	12.26 hrs, Volume=	6.771 af
Secondary =	2.09 cfs @	12.26 hrs, Volume=	0.017 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,022.69' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,018.00'	**16.0" Round Culvert X 2.00** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,018.00' / 2,017.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,022.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=26.96 cfs @ 12.26 hrs HW=2,022.69' (Free Discharge)
└─**1=Culvert** (Inlet Controls 26.96 cfs @ 9.65 fps)

Secondary OutFlow Max=2.01 cfs @ 12.26 hrs HW=2,022.69' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.01 cfs @ 1.08 fps)

Summary for Pond 67: 26" Steel Culverts

Inflow Area =	4.195 ac,	7.35% Impervious, Inflow Depth = 0.69"	for 1-YEAR event
Inflow =	3.90 cfs @	12.05 hrs, Volume=	0.242 af
Outflow =	3.90 cfs @	12.05 hrs, Volume=	0.242 af, Atten= 0%, Lag= 0.0 min
Primary =	3.90 cfs @	12.05 hrs, Volume=	0.242 af
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,003.93' @ 12.05 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,003.00'	**26.0" Round 26" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,003.00' / 2,000.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.85 cfs @ 12.05 hrs HW=2,003.92' (Free Discharge)
└─**1=26" Smooth Steel Culvert (old)** (Inlet Controls 3.85 cfs @ 2.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,003.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 68: 12" Steel Culvert

Inflow Area = 10.642 ac, 1.77% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 6.89 cfs @ 12.14 hrs, Volume= 0.575 af
Outflow = 6.89 cfs @ 12.14 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.0 min
Primary = 3.26 cfs @ 12.14 hrs, Volume= 0.480 af
Secondary = 3.62 cfs @ 12.14 hrs, Volume= 0.095 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,001.24' @ 12.14 hrs
Flood Elev= 2,001.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,000.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,000.00' / 1,999.00' S= 0.0250 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,000.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.25 cfs @ 12.14 hrs HW=2,001.24' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.25 cfs @ 4.14 fps)

Secondary OutFlow Max=3.59 cfs @ 12.14 hrs HW=2,001.24' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 3.59 cfs @ 2.43 fps)

Summary for Pond 77: 32" Steel Culvert

Inflow Area = 88.881 ac, 1.70% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 16.97 cfs @ 13.58 hrs, Volume= 4.649 af
Outflow = 16.97 cfs @ 13.58 hrs, Volume= 4.649 af, Atten= 0%, Lag= 0.0 min
Primary = 16.97 cfs @ 13.58 hrs, Volume= 4.649 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,181.72' @ 13.58 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,180.00'	**32.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,180.00' / 2,179.00' S= 0.0250 '/' Cc= 0.900 n= 0.012

#2	Secondary	2,183.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.96 cfs @ 13.58 hrs HW=2,181.72' (Free Discharge)
└─**1=Culvert** (Inlet Controls 16.96 cfs @ 4.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,180.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 79: 16" Steel Culvert

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af
Outflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af, Atten= 0%, Lag= 0.0 min
Primary = 9.67 cfs @ 13.64 hrs, Volume= 4.197 af
Secondary = 7.39 cfs @ 13.64 hrs, Volume= 0.553 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,058.74' @ 13.64 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,056.00'	**16.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,056.00' / 2,055.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,057.50'	**2.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.67 cfs @ 13.64 hrs HW=2,058.74' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.67 cfs @ 6.93 fps)

Secondary OutFlow Max=7.39 cfs @ 13.64 hrs HW=2,058.74' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 7.39 cfs @ 2.99 fps)

Summary for Pond 83: 24" HPDE Culvert

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af
Outflow = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
Primary = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,360.44' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,360.00'	**24.0" Round 24" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,360.00' / 2,357.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,364.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.91 cfs @ 12.08 hrs HW=2,360.44' (Free Discharge)
└─**1=24" Plastic Culvert** (Inlet Controls 0.91 cfs @ 1.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,360.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84: 24" HDPE Pipe

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af
Outflow = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af, Atten= 0%, Lag= 0.0 min
Primary = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,316.66' @ 12.31 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,315.00'	**36.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,315.00' / 2,312.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,320.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=13.89 cfs @ 12.31 hrs HW=2,316.66' (Free Discharge)
└─**1=Culvert** (Inlet Controls 13.89 cfs @ 3.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,315.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85: 28" HDPE Pipe

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af
Outflow = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min
Primary = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,295.69' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,295.00'	**30.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,295.00' / 2,292.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,300.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.48 cfs @ 12.15 hrs HW=2,295.69' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.48 cfs @ 2.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,295.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86: 24" HDPE Pipe

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af
Outflow = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,240.86' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,240.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,240.00' / 2,237.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,245.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.17 cfs @ 12.07 hrs HW=2,240.85' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.17 cfs @ 2.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,240.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 87: 18" Steel Culvert

Inflow Area = 2.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af
Outflow = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Primary = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,208.59' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,208.00'	**18.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,208.00' / 2,207.00' S= 0.0167 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=1.32 cfs @ 12.10 hrs HW=2,208.59' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.32 cfs @ 2.06 fps)

Summary for Pond 90: 12" Steel Culvert

Inflow Area =	12.874 ac,	0.00% Impervious, Inflow Depth =	0.61"	for 1-YEAR event	
Inflow =	4.82 cfs @	12.38 hrs, Volume=	0.650 af		
Outflow =	4.82 cfs @	12.38 hrs, Volume=	0.650 af,	Atten= 0%,	Lag= 0.0 min
Primary =	4.82 cfs @	12.38 hrs, Volume=	0.650 af		
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,892.12' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,890.00'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,890.00' / 1,889.50' S= 0.0250 '/' Cc= 0.900 n= 0.012
#2	Secondary	1,895.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.81 cfs @ 12.38 hrs HW=1,892.12' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.81 cfs @ 6.12 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,890.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 200: 36" Steel Culvert

Inflow Area =	76.410 ac,	0.43% Impervious, Inflow Depth =	0.61"	for 1-YEAR event	
Inflow =	38.77 cfs @	12.20 hrs, Volume=	3.859 af		
Outflow =	38.77 cfs @	12.20 hrs, Volume=	3.859 af,	Atten= 0%,	Lag= 0.0 min
Primary =	33.94 cfs @	12.20 hrs, Volume=	3.783 af		
Secondary =	4.83 cfs @	12.20 hrs, Volume=	0.076 af		

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,236.50' @ 12.20 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,228.00' S= 0.1200 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.87 cfs @ 12.20 hrs HW=2,236.50' (Free Discharge)
└─**1=Culvert** (Inlet Controls 33.87 cfs @ 5.38 fps)

Secondary OutFlow Max=4.76 cfs @ 12.20 hrs HW=2,236.50' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 4.76 cfs @ 1.91 fps)

Summary for Pond 201: 36" Steel Culvert

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 7.13 cfs @ 12.18 hrs, Volume= 0.660 af
Outflow = 7.13 cfs @ 12.18 hrs, Volume= 0.660 af, Atten= 0%, Lag= 0.0 min
Primary = 7.13 cfs @ 12.18 hrs, Volume= 0.660 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,235.01' @ 12.18 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 30.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,233.00' S= 0.0333 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.11 cfs @ 12.18 hrs HW=2,235.01' (Free Discharge)
└─**1=Culvert** (Barrel Controls 7.11 cfs @ 5.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,234.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 300R: 18" Steel Culvert

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af
Outflow = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af, Atten= 0%, Lag= 0.0 min
Primary = 8.40 cfs @ 12.17 hrs, Volume= 0.821 af
Secondary = 0.57 cfs @ 12.17 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,260.72' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,259.00'	**18.0" Round 18" Steel Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,259.00' / 2,256.00' S= 0.0750 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,260.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=8.38 cfs @ 12.17 hrs HW=2,260.72' (Free Discharge)
1=18" Steel Culvert (Inlet Controls 8.38 cfs @ 4.74 fps)

Secondary OutFlow Max=0.55 cfs @ 12.17 hrs HW=2,260.72' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.55 cfs @ 1.26 fps)

Summary for Pond 2R: 48" CMP Culvert

Inflow Area = 148.584 ac, 0.82% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 366.11 cfs @ 12.21 hrs, Volume= 34.829 af
Outflow = 366.11 cfs @ 12.21 hrs, Volume= 34.829 af, Atten= 0%, Lag= 0.0 min
Primary = 149.11 cfs @ 12.21 hrs, Volume= 27.203 af
Secondary = 217.00 cfs @ 12.21 hrs, Volume= 7.626 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,750.07' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,742.00'	**48.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 1,742.00' / 1,740.00' S= 0.0667 '/' Cc= 0.900 n= 0.025
#2	Secondary	1,746.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=149.08 cfs @ 12.21 hrs HW=1,750.07' (Free Discharge)
└─**1=Culvert** (Inlet Controls 149.08 cfs @ 11.86 fps)

Secondary OutFlow Max=216.81 cfs @ 12.21 hrs HW=1,750.07' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 216.81 cfs @ 5.33 fps)

Summary for Pond 4R: 24" Steel Culvert

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 46.62 cfs @ 12.33 hrs, Volume= 3.824 af
Outflow = 46.62 cfs @ 12.33 hrs, Volume= 3.824 af, Atten= 0%, Lag= 0.0 min
Primary = 28.22 cfs @ 12.33 hrs, Volume= 3.424 af
Secondary = 18.40 cfs @ 12.33 hrs, Volume= 0.401 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,069.48' @ 12.33 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 2,065.00' / 2,060.00' S= 0.1000 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,067.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=28.21 cfs @ 12.33 hrs HW=2,069.48' (Free Discharge)
└─**1=Culvert** (Inlet Controls 28.21 cfs @ 8.98 fps)

Secondary OutFlow Max=18.37 cfs @ 12.33 hrs HW=2,069.48' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 18.37 cfs @ 4.64 fps)

Summary for Pond 7R: 30" Steel Culvert

Inflow Area = 77.687 ac, 1.16% Impervious, Inflow Depth = 2.88" for 10-YEAR event
Inflow = 222.80 cfs @ 12.10 hrs, Volume= 18.639 af
Outflow = 222.80 cfs @ 12.10 hrs, Volume= 18.639 af, Atten= 0%, Lag= 0.0 min
Primary = 222.80 cfs @ 12.10 hrs, Volume= 18.639 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,817.71' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,812.50'	**30.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 1,812.50' / 1,812.00' S= 0.0167 '/' Cc= 0.900 n= 0.012
#2	Primary	1,816.00'	**30.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=221.46 cfs @ 12.10 hrs HW=1,817.70' (Free Discharge)
1=Culvert (Inlet Controls 46.96 cfs @ 9.57 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 174.50 cfs @ 3.43 fps)

Summary for Pond 10R: 14" and 16" HDPE Culverts

Inflow Area = 20.120 ac, 2.73% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 58.43 cfs @ 12.17 hrs, Volume= 4.860 af
Outflow = 58.43 cfs @ 12.17 hrs, Volume= 4.860 af, Atten= 0%, Lag= 0.0 min
Primary = 12.76 cfs @ 12.17 hrs, Volume= 3.359 af
Secondary = 45.67 cfs @ 12.17 hrs, Volume= 1.501 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,977.49' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,975.00'	**14.0" Round 14" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#2	Primary	1,975.00'	**16.0" Round 16" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#3	Secondary	1,977.00'	**50.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=12.76 cfs @ 12.17 hrs HW=1,977.48' (Free Discharge)
1=14" Culvert (Inlet Controls 5.60 cfs @ 5.24 fps)
2=16" Culvert (Inlet Controls 7.16 cfs @ 5.12 fps)

Secondary OutFlow Max=45.49 cfs @ 12.17 hrs HW=1,977.48' (Free Discharge)
3=Broad-Crested Rectangular Weir (Weir Controls 45.49 cfs @ 1.88 fps)

Summary for Pond 13R: 16" CMP Culvert

Inflow Area = 2.097 ac, 8.77% Impervious, Inflow Depth = 3.09" for 10-YEAR event
Inflow = 8.69 cfs @ 12.06 hrs, Volume= 0.540 af
Outflow = 8.69 cfs @ 12.06 hrs, Volume= 0.540 af, Atten= 0%, Lag= 0.0 min
Primary = 8.69 cfs @ 12.06 hrs, Volume= 0.540 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,970.34' @ 12.06 hrs
Flood Elev= 1,969.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,968.00'	**16.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 1,968.00' / 1,965.00' S= 0.0750 '/' Cc= 0.900 n= 0.025

Primary OutFlow Max=8.68 cfs @ 12.06 hrs HW=1,970.33' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.68 cfs @ 6.22 fps)

Summary for Pond 57: 16" Steel Culverts

Inflow Area = 1.326 ac, 4.72% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 4.91 cfs @ 12.08 hrs, Volume= 0.320 af
Outflow = 4.91 cfs @ 12.08 hrs, Volume= 0.320 af, Atten= 0%, Lag= 0.0 min
Primary = 4.91 cfs @ 12.08 hrs, Volume= 0.320 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,005.52' @ 12.08 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,004.00'	**16.0" Round 16" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,004.00' / 2,000.00' S= 0.0667 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.87 cfs @ 12.08 hrs HW=2,005.51' (Free Discharge)
└**1=16" Smooth Steel Culvert (old)** (Inlet Controls 4.87 cfs @ 3.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,004.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 58R: 24" HDPE Pipe

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af
Outflow = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af, Atten= 0%, Lag= 0.0 min
Primary = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,216.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,215.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,215.00' / 2,212.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,218.50'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=10.29 cfs @ 12.09 hrs HW=2,216.74' (Free Discharge)
└─**1=Culvert** (Inlet Controls 10.29 cfs @ 3.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,215.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 59: 32" Plastic Pipe

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 82.05 cfs @ 12.19 hrs, Volume= 7.087 af
Outflow = 82.05 cfs @ 12.19 hrs, Volume= 7.087 af, Atten= 0%, Lag= 0.0 min
Primary = 46.42 cfs @ 12.19 hrs, Volume= 6.253 af
Secondary = 35.63 cfs @ 12.19 hrs, Volume= 0.834 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,333.11' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,327.00'	**32.0" Round 32" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,327.00' / 2,324.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,331.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=46.38 cfs @ 12.19 hrs HW=2,333.11' (Free Discharge)
└─**1=32" Plastic Culvert** (Inlet Controls 46.38 cfs @ 8.30 fps)

Secondary OutFlow Max=35.39 cfs @ 12.19 hrs HW=2,333.11' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 35.39 cfs @ 4.20 fps)

Summary for Pond 60: (2) 16" Steel Culverts

Inflow Area =	128.608 ac,	1.59% Impervious,	Inflow Depth = 2.87"	for 10-YEAR event	
Inflow =	161.62 cfs @	12.20 hrs,	Volume=	30.714 af	
Outflow =	161.62 cfs @	12.20 hrs,	Volume=	30.714 af,	Atten= 0%, Lag= 0.0 min
Primary =	34.75 cfs @	12.20 hrs,	Volume=	18.423 af	
Secondary =	126.86 cfs @	12.20 hrs,	Volume=	12.292 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,025.35' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,018.00'	**16.0" Round Culvert X 2.00** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,018.00' / 2,017.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,022.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=34.73 cfs @ 12.20 hrs HW=2,025.34' (Free Discharge)
└─**1=Culvert** (Inlet Controls 34.73 cfs @ 12.44 fps)

Secondary OutFlow Max=126.31 cfs @ 12.20 hrs HW=2,025.34' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 126.31 cfs @ 4.45 fps)

Summary for Pond 67: 26" Steel Culverts

Inflow Area =	4.195 ac,	7.35% Impervious,	Inflow Depth = 2.99"	for 10-YEAR event	
Inflow =	18.29 cfs @	12.03 hrs,	Volume=	1.046 af	
Outflow =	18.29 cfs @	12.03 hrs,	Volume=	1.046 af,	Atten= 0%, Lag= 0.0 min
Primary =	18.29 cfs @	12.03 hrs,	Volume=	1.046 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,005.79' @ 12.03 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,003.00'	**26.0" Round 26" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,003.00' / 2,000.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=18.18 cfs @ 12.03 hrs HW=2,005.77' (Free Discharge)
└─**1=26" Smooth Steel Culvert (old)** (Inlet Controls 18.18 cfs @ 4.93 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,003.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 68: 12" Steel Culvert

Inflow Area = 10.642 ac, 1.77% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 35.36 cfs @ 12.12 hrs, Volume= 2.571 af
Outflow = 35.36 cfs @ 12.12 hrs, Volume= 2.571 af, Atten= 0%, Lag= 0.0 min
Primary = 6.20 cfs @ 12.12 hrs, Volume= 1.449 af
Secondary = 29.17 cfs @ 12.12 hrs, Volume= 1.121 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,003.19' @ 12.12 hrs
Flood Elev= 2,001.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,000.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,000.00' / 1,999.00' S= 0.0250 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,000.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=6.19 cfs @ 12.12 hrs HW=2,003.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 6.19 cfs @ 7.88 fps)

Secondary OutFlow Max=29.09 cfs @ 12.12 hrs HW=2,003.18' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 29.09 cfs @ 5.43 fps)

Summary for Pond 77: 32" Steel Culvert

Inflow Area = 88.881 ac, 1.70% Impervious, Inflow Depth = 2.85" for 10-YEAR event
Inflow = 130.01 cfs @ 12.97 hrs, Volume= 21.133 af
Outflow = 130.01 cfs @ 12.97 hrs, Volume= 21.133 af, Atten= 0%, Lag= 0.0 min
Primary = 51.92 cfs @ 12.97 hrs, Volume= 16.640 af
Secondary = 78.09 cfs @ 12.97 hrs, Volume= 4.493 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,185.06' @ 12.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,180.00'	**32.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,180.00' / 2,179.00' S= 0.0250 '/' Cc= 0.900 n= 0.012

#2	Secondary	2,183.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=51.90 cfs @ 12.97 hrs HW=2,185.06' (Free Discharge)
└─**1=Culvert** (Inlet Controls 51.90 cfs @ 9.29 fps)

Secondary OutFlow Max=77.95 cfs @ 12.97 hrs HW=2,185.06' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 77.95 cfs @ 3.79 fps)

Summary for Pond 79: 16" Steel Culvert

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 2.85" for 10-YEAR event
Inflow = 130.41 cfs @ 13.01 hrs, Volume= 21.601 af
Outflow = 130.41 cfs @ 13.01 hrs, Volume= 21.601 af, Atten= 0%, Lag= 0.0 min
Primary = 19.54 cfs @ 13.01 hrs, Volume= 9.968 af
Secondary = 110.87 cfs @ 13.01 hrs, Volume= 11.633 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,065.11' @ 13.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,056.00'	**16.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,056.00' / 2,055.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,057.50'	**2.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=19.53 cfs @ 13.01 hrs HW=2,065.11' (Free Discharge)
└─**1=Culvert** (Inlet Controls 19.53 cfs @ 13.99 fps)

Secondary OutFlow Max=110.74 cfs @ 13.01 hrs HW=2,065.11' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 110.74 cfs @ 7.28 fps)

Summary for Pond 83: 24" HPDE Culvert

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 4.87 cfs @ 12.06 hrs, Volume= 0.304 af
Outflow = 4.87 cfs @ 12.06 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
Primary = 4.87 cfs @ 12.06 hrs, Volume= 0.304 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,361.08' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,360.00'	**24.0" Round 24" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,360.00' / 2,357.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,364.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=4.85 cfs @ 12.06 hrs HW=2,361.08' (Free Discharge)
└─**1=24" Plastic Culvert** (Inlet Controls 4.85 cfs @ 2.80 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,360.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84: 24" HDPE Pipe

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 3.22" for 10-YEAR event
Inflow = 106.20 cfs @ 12.23 hrs, Volume= 8.325 af
Outflow = 106.20 cfs @ 12.23 hrs, Volume= 8.325 af, Atten= 0%, Lag= 0.0 min
Primary = 64.69 cfs @ 12.23 hrs, Volume= 7.434 af
Secondary = 41.51 cfs @ 12.23 hrs, Volume= 0.891 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,322.30' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,315.00'	**36.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,315.00' / 2,312.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,320.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=64.65 cfs @ 12.23 hrs HW=2,322.29' (Free Discharge)
└─**1=Culvert** (Inlet Controls 64.65 cfs @ 9.15 fps)

Secondary OutFlow Max=41.22 cfs @ 12.23 hrs HW=2,322.29' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 41.22 cfs @ 4.50 fps)

Summary for Pond 85: 28" HDPE Pipe

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 5.30" for 10-YEAR event
Inflow = 52.58 cfs @ 12.21 hrs, Volume= 1.892 af
Outflow = 52.58 cfs @ 12.21 hrs, Volume= 1.892 af, Atten= 0%, Lag= 0.0 min
Primary = 40.92 cfs @ 12.21 hrs, Volume= 1.765 af
Secondary = 11.65 cfs @ 12.21 hrs, Volume= 0.127 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,301.06' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,295.00'	**30.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,295.00' / 2,292.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,300.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=40.89 cfs @ 12.21 hrs HW=2,301.05' (Free Discharge)
└─**1=Culvert** (Inlet Controls 40.89 cfs @ 8.33 fps)

Secondary OutFlow Max=11.52 cfs @ 12.21 hrs HW=2,301.05' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 11.52 cfs @ 2.74 fps)

Summary for Pond 86: 24" HDPE Pipe

Inflow Area =	4.340 ac,	0.76% Impervious, Inflow Depth = 3.16"	for 10-YEAR event
Inflow =	19.66 cfs @	12.19 hrs, Volume=	1.142 af
Outflow =	19.66 cfs @	12.19 hrs, Volume=	1.142 af, Atten= 0%, Lag= 0.0 min
Primary =	19.66 cfs @	12.19 hrs, Volume=	1.142 af
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,243.71' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,240.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,240.00' / 2,237.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,245.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=19.41 cfs @ 12.19 hrs HW=2,243.64' (Free Discharge)
└─**1=Culvert** (Inlet Controls 19.41 cfs @ 6.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,240.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 87: 18" Steel Culvert

Inflow Area =	2.000 ac,	0.00% Impervious, Inflow Depth = 2.81"	for 10-YEAR event
Inflow =	7.10 cfs @	12.08 hrs, Volume=	0.468 af
Outflow =	7.10 cfs @	12.08 hrs, Volume=	0.468 af, Atten= 0%, Lag= 0.0 min
Primary =	7.10 cfs @	12.08 hrs, Volume=	0.468 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,209.87' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,208.00'	**18.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,208.00' / 2,207.00' S= 0.0167 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=7.05 cfs @ 12.08 hrs HW=2,209.85' (Free Discharge)
└─**1=Culvert** (Inlet Controls 7.05 cfs @ 3.99 fps)

Summary for Pond 90: 12" Steel Culvert

Inflow Area =	12.874 ac,	0.00% Impervious, Inflow Depth = 2.81"	for 10-YEAR event
Inflow =	27.27 cfs @	12.32 hrs, Volume=	3.010 af
Outflow =	27.27 cfs @	12.32 hrs, Volume=	3.010 af, Atten= 0%, Lag= 0.0 min
Primary =	8.69 cfs @	12.32 hrs, Volume=	2.252 af
Secondary =	18.58 cfs @	12.32 hrs, Volume=	0.758 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,895.78' @ 12.32 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,890.00'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,890.00' / 1,889.50' S= 0.0250 '/' Cc= 0.900 n= 0.012
#2	Secondary	1,895.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.69 cfs @ 12.32 hrs HW=1,895.78' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.69 cfs @ 11.06 fps)

Secondary OutFlow Max=18.54 cfs @ 12.32 hrs HW=1,895.78' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 18.54 cfs @ 2.38 fps)

Summary for Pond 200: 36" Steel Culvert

Inflow Area =	76.410 ac,	0.43% Impervious, Inflow Depth = 2.81"	for 10-YEAR event
Inflow =	214.79 cfs @	12.17 hrs, Volume=	17.862 af
Outflow =	214.79 cfs @	12.17 hrs, Volume=	17.862 af, Atten= 0%, Lag= 0.0 min
Primary =	78.08 cfs @	12.17 hrs, Volume=	13.324 af
Secondary =	136.71 cfs @	12.17 hrs, Volume=	4.538 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,240.76' @ 12.17 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,228.00' S= 0.1200 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=77.98 cfs @ 12.17 hrs HW=2,240.75' (Free Discharge)
└─**1=Culvert** (Inlet Controls 77.98 cfs @ 11.03 fps)

Secondary OutFlow Max=136.11 cfs @ 12.17 hrs HW=2,240.75' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 136.11 cfs @ 5.73 fps)

Summary for Pond 201: 36" Steel Culvert

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 37.07 cfs @ 12.15 hrs, Volume= 2.950 af
Outflow = 37.07 cfs @ 12.15 hrs, Volume= 2.950 af, Atten= 0%, Lag= 0.0 min
Primary = 32.24 cfs @ 12.15 hrs, Volume= 2.877 af
Secondary = 4.83 cfs @ 12.15 hrs, Volume= 0.074 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,236.50' @ 12.15 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 30.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,233.00' S= 0.0333 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=32.20 cfs @ 12.15 hrs HW=2,236.50' (Free Discharge)
└─**1=Culvert** (Barrel Controls 32.20 cfs @ 6.93 fps)

Secondary OutFlow Max=4.78 cfs @ 12.15 hrs HW=2,236.50' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 4.78 cfs @ 1.91 fps)

Summary for Pond 300R: 18" Steel Culvert

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 49.29 cfs @ 12.14 hrs, Volume= 3.824 af
Outflow = 49.29 cfs @ 12.14 hrs, Volume= 3.824 af, Atten= 0%, Lag= 0.0 min
Primary = 16.29 cfs @ 12.14 hrs, Volume= 2.851 af
Secondary = 33.01 cfs @ 12.14 hrs, Volume= 0.973 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,263.41' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,259.00'	**18.0" Round 18" Steel Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,259.00' / 2,256.00' S= 0.0750 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,260.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=16.26 cfs @ 12.14 hrs HW=2,263.40' (Free Discharge)
└─**1=18" Steel Culvert** (Inlet Controls 16.26 cfs @ 9.20 fps)

Secondary OutFlow Max=32.84 cfs @ 12.14 hrs HW=2,263.40' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 32.84 cfs @ 5.65 fps)

Design Point Summary
1-yr Storm Event

Design Point Totals
10, 25 & 100-yr Storm Events

Summary for Pond 1aP: Design Point 1a

Inflow Area = 4.640 ac, 4.97% Impervious, Inflow Depth = 0.69" for 1-YEAR event
Inflow = 3.77 cfs @ 12.09 hrs, Volume= 0.267 af
Primary = 3.77 cfs @ 12.09 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 10: Design Point 10

Inflow Area = 162.260 ac, 1.57% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 39.56 cfs @ 11.94 hrs, Volume= 8.487 af
Primary = 39.56 cfs @ 11.94 hrs, Volume= 8.487 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 11: Design Point 11

Inflow Area = 66.273 ac, 1.46% Impervious, Inflow Depth = 0.64" for 1-YEAR event
Inflow = 24.41 cfs @ 12.40 hrs, Volume= 3.534 af
Primary = 24.41 cfs @ 12.40 hrs, Volume= 3.534 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 12: Design Point 12

Inflow Area = 7.264 ac, 12.46% Impervious, Inflow Depth = 0.78" for 1-YEAR event
Inflow = 6.57 cfs @ 12.10 hrs, Volume= 0.475 af
Primary = 6.57 cfs @ 12.10 hrs, Volume= 0.475 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 16: DESIGN POINT 16

Inflow Area = 18.787 ac, 4.30% Impervious, Inflow Depth = 0.66" for 1-YEAR event
Inflow = 11.97 cfs @ 12.16 hrs, Volume= 1.030 af
Primary = 11.97 cfs @ 12.16 hrs, Volume= 1.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 2: Design Point 2

Inflow Area = 39.108 ac, 0.76% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 20.26 cfs @ 12.23 hrs, Volume= 2.112 af
Primary = 20.26 cfs @ 12.23 hrs, Volume= 2.112 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 3: Design Point 3

Inflow Area = 2.196 ac, 4.19% Impervious, Inflow Depth = 0.69" for 1-YEAR event
Inflow = 1.69 cfs @ 12.11 hrs, Volume= 0.127 af
Primary = 1.69 cfs @ 12.11 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 4: 18" HDPE Culvert

Inflow Area = 10.003 ac, 2.13% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 6.61 cfs @ 12.13 hrs, Volume= 0.540 af
Primary = 6.61 cfs @ 12.13 hrs, Volume= 0.540 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 5: 18" HDPE Culvert

Inflow Area = 14.626 ac, 1.24% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 10.49 cfs @ 12.08 hrs, Volume= 0.739 af
Primary = 10.49 cfs @ 12.08 hrs, Volume= 0.739 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 5A: 12" Steel Culvert

Inflow Area = 12.200 ac, 1.42% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 7.57 cfs @ 12.12 hrs, Volume= 0.616 af
Primary = 7.57 cfs @ 12.12 hrs, Volume= 0.616 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 6: 52" Concrete Culvert

Inflow Area = 58.770 ac, 0.86% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 32.30 cfs @ 12.20 hrs, Volume= 3.174 af
Primary = 32.30 cfs @ 12.20 hrs, Volume= 3.174 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 6A: 28" Steel Culvert

Inflow Area = 41.780 ac, 0.64% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 19.76 cfs @ 12.28 hrs, Volume= 2.257 af
Primary = 19.76 cfs @ 12.28 hrs, Volume= 2.257 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 7: Design Point 7

Inflow Area = 149.008 ac, 0.89% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 57.56 cfs @ 12.37 hrs, Volume= 7.580 af
Primary = 57.56 cfs @ 12.37 hrs, Volume= 7.580 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 8: Design Point 8

Inflow Area = 95.972 ac, 1.42% Impervious, Inflow Depth = 0.64" for 1-YEAR event
Inflow = 53.51 cfs @ 12.14 hrs, Volume= 5.126 af
Primary = 53.51 cfs @ 12.14 hrs, Volume= 5.126 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 9: Design Point 9

Inflow Area = 56.369 ac, 3.06% Impervious, Inflow Depth = 0.67" for 1-YEAR event
Inflow = 18.01 cfs @ 12.58 hrs, Volume= 3.146 af
Primary = 18.01 cfs @ 12.58 hrs, Volume= 3.146 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1aP: Design Point 1a Inflow=18.01 cfs 1.157 af
Primary=18.01 cfs 1.157 af

Pond DP 10: Design Point 10 Inflow=212.16 cfs 38.581 af
Primary=212.16 cfs 38.581 af

Pond DP 11: Design Point 11 Inflow=141.89 cfs 15.909 af
Primary=141.89 cfs 15.909 af

Pond DP 12: Design Point 12 Inflow=28.72 cfs 1.928 af
Primary=28.72 cfs 1.928 af

Pond DP 16: DESIGN POINT 16 Inflow=60.58 cfs 4.571 af
Primary=60.58 cfs 4.571 af

Pond DP 2: Design Point 2 Inflow=106.49 cfs 9.447 af
Primary=106.49 cfs 9.447 af

Pond DP 3: Design Point 3 Inflow=8.12 cfs 0.548 af
Primary=8.12 cfs 0.548 af

Pond DP 4: 18" HDPE Culvert Inflow=33.83 cfs 2.416 af
Primary=33.83 cfs 2.416 af

Pond DP 5: 18" HDPE Culvert Inflow=55.50 cfs 3.419 af
Primary=55.50 cfs 3.419 af

Pond DP 5A: 12" Steel Culvert Inflow=40.90 cfs 2.852 af
Primary=40.90 cfs 2.852 af

Pond DP 6: 52" Concrete Culvert Inflow=169.07 cfs 14.197 af
Primary=169.07 cfs 14.197 af

Pond DP 6A: 28" Steel Culvert Inflow=104.54 cfs 10.092 af
Primary=104.54 cfs 10.092 af

Pond DP 7: Design Point 7 Inflow=366.47 cfs 34.952 af
Primary=366.47 cfs 34.952 af

Pond DP 8: Design Point 8 Inflow=283.49 cfs 23.056 af
Primary=283.49 cfs 23.056 af

Pond DP 9: Design Point 9 Inflow=131.61 cfs 13.835 af
Primary=131.61 cfs 13.835 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1aP: Design Point 1a	Inflow=20.51 cfs 1.317 af Primary=20.51 cfs 1.317 af
Pond DP 10: Design Point 10	Inflow=245.18 cfs 44.057 af Primary=245.18 cfs 44.057 af
Pond DP 11: Design Point 11	Inflow=163.12 cfs 18.155 af Primary=163.12 cfs 18.155 af
Pond DP 12: Design Point 12	Inflow=32.54 cfs 2.185 af Primary=32.54 cfs 2.185 af
Pond DP 16: DESIGN POINT 16	Inflow=69.14 cfs 5.212 af Primary=69.14 cfs 5.212 af
Pond DP 2: Design Point 2	Inflow=121.88 cfs 10.776 af Primary=121.88 cfs 10.776 af
Pond DP 3: Design Point 3	Inflow=9.26 cfs 0.623 af Primary=9.26 cfs 0.623 af
Pond DP 4: 18" HDPE Culvert	Inflow=38.66 cfs 2.756 af Primary=38.66 cfs 2.756 af
Pond DP 5: 18" HDPE Culvert	Inflow=63.53 cfs 3.909 af Primary=63.53 cfs 3.909 af
Pond DP 5A: 12" Steel Culvert	Inflow=46.88 cfs 3.261 af Primary=46.88 cfs 3.261 af
Pond DP 6: 52" Concrete Culvert	Inflow=193.45 cfs 16.194 af Primary=193.45 cfs 16.194 af
Pond DP 6A: 28" Steel Culvert	Inflow=119.71 cfs 11.512 af Primary=119.71 cfs 11.512 af
Pond DP 7: Design Point 7	Inflow=424.74 cfs 39.950 af Primary=424.74 cfs 39.950 af
Pond DP 8: Design Point 8	Inflow=325.64 cfs 26.309 af Primary=325.64 cfs 26.309 af
Pond DP 9: Design Point 9	Inflow=153.94 cfs 15.764 af Primary=153.94 cfs 15.764 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

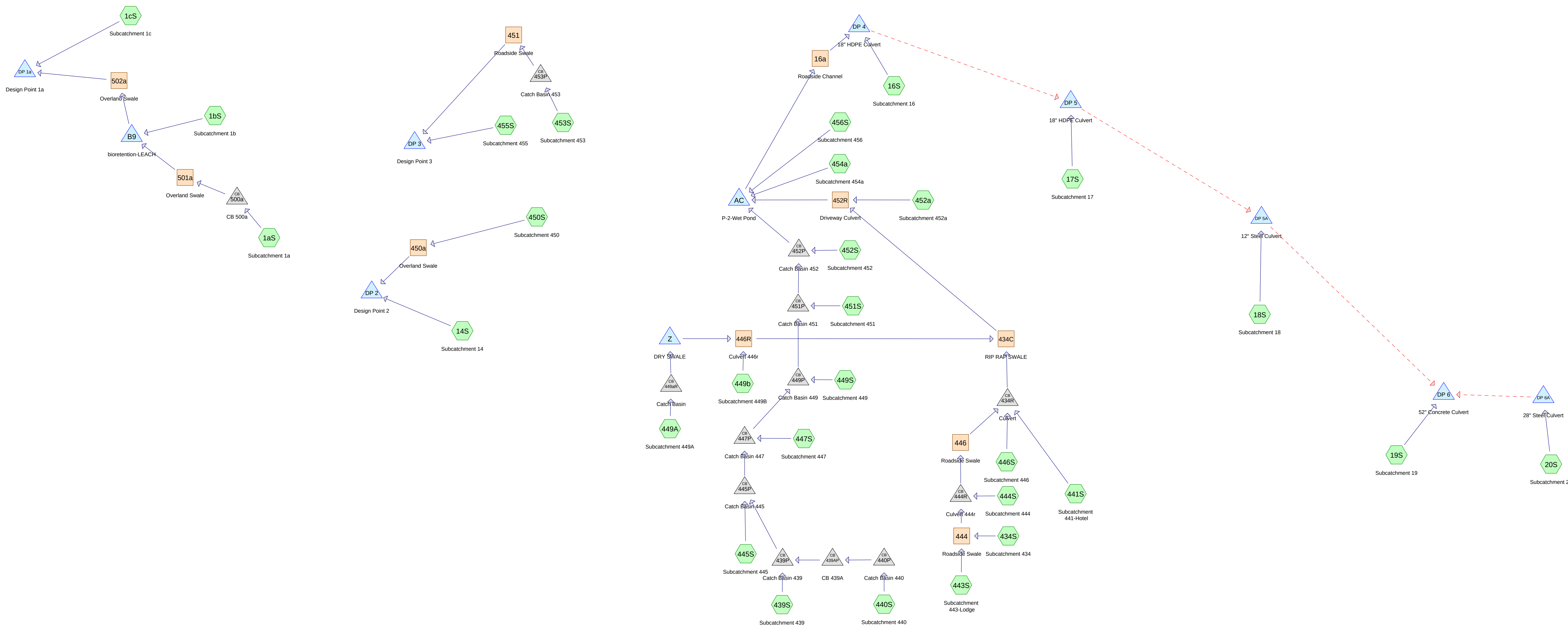
Pond 1aP: Design Point 1a	Inflow=28.20 cfs 1.815 af Primary=28.20 cfs 1.815 af
Pond DP 10: Design Point 10	Inflow=349.19 cfs 61.163 af Primary=349.19 cfs 61.163 af
Pond DP 11: Design Point 11	Inflow=228.95 cfs 25.167 af Primary=228.95 cfs 25.167 af
Pond DP 12: Design Point 12	Inflow=44.22 cfs 2.982 af Primary=44.22 cfs 2.982 af
Pond DP 16: DESIGN POINT 16	Inflow=95.48 cfs 7.210 af Primary=95.48 cfs 7.210 af
Pond DP 2: Design Point 2	Inflow=169.46 cfs 14.924 af Primary=169.46 cfs 14.924 af
Pond DP 3: Design Point 3	Inflow=12.73 cfs 0.859 af Primary=12.73 cfs 0.859 af
Pond DP 4: 18" HDPE Culvert	Inflow=53.58 cfs 3.817 af Primary=53.58 cfs 3.817 af
Pond DP 5: 18" HDPE Culvert	Inflow=88.34 cfs 5.441 af Primary=88.34 cfs 5.441 af
Pond DP 5A: 12" Steel Culvert	Inflow=65.36 cfs 4.539 af Primary=65.36 cfs 4.539 af
Pond DP 6: 52" Concrete Culvert	Inflow=268.75 cfs 22.427 af Primary=268.75 cfs 22.427 af
Pond DP 6A: 28" Steel Culvert	Inflow=166.63 cfs 15.943 af Primary=166.63 cfs 15.943 af
Pond DP 7: Design Point 7	Inflow=607.19 cfs 55.580 af Primary=607.19 cfs 55.580 af
Pond DP 8: Design Point 8	Inflow=456.92 cfs 36.466 af Primary=456.92 cfs 36.466 af
Pond DP 9: Design Point 9	Inflow=224.36 cfs 21.777 af Primary=224.36 cfs 21.777 af

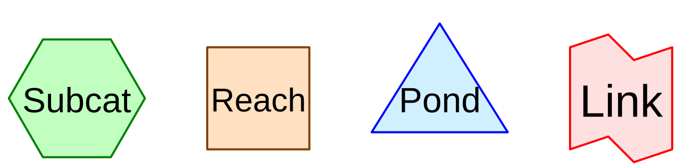
APPENDIX E

HydroCAD Data – Proposed Model – Highmount

1. **Proposed Model Diagram, Area/Soil Listings and Subcatchment Summaries**
2. **Proposed Reach and Culvert Summaries – 1 & 10-yr Storm Events**
3. **Proposed Pond Summaries – 1, 10 & 100-yr Storm Events**
4. **Proposed Design Point Summaries - 1-yr Event**
5. **Proposed Design Point Totals – 10, 25 and 100-yr Storm Events**

Model Diagram, Area and Soil Listings and Subcatchment Summaries





Drainage Diagram for 07074_Pro-Highmount

Prepared by The LA group, Printed 2/27/2012

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
115.837	70	Woods, Good, HSG C (1cS, 14S, 16S, 17S, 18S, 19S, 20S, 450S)
41.436	71	Meadow, non-grazed, HSG C (14S, 16S, 17S, 18S, 19S, 20S)
1.200	72	Green Roof (443S)
7.256	72	green roof (441S)
9.936	74	>75% Grass cover, Good, HSG C (1aS, 1bS, 1cS, 434S, 439S, 440S, 444S, 445S, 446S, 447S, 449A, 449b, 450S, 452a, 452S, 453S, 455S, 456S)
1.580	89	Dirt Road (20S)
0.230	98	Paved (1aS)
0.036	98	Paved parking (1bS)
1.050	98	Paved parking & roofs (439S, 447S, 449A, 449S)
0.080	98	Paved parking, HSG C (19S)
0.668	98	Paved roads (14S)
0.598	98	Paved roads w/curbs & sewers (445S, 451S, 453S, 455S)
0.284	98	Paved roads w/curbs & sewers, HSG C (452S)
0.255	98	Pavement (16S, 18S)
0.373	98	Roadway (17S, 20S)
0.463	98	Roof (1bS, 454a)
0.213	98	Roof Area (14S, 19S, 20S)
0.294	98	Roofs (449A)
0.040	98	Roofs, HSG C (440S)
0.071	98	Water Surface (1bS)
0.247	98	Water Surface, 0% imp, HSG C (456S)
0.025	98	Water Surface, HSG C (14S)

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
167.886	HSG C	1aS, 1bS, 1cS, 14S, 16S, 17S, 18S, 19S, 20S, 434S, 439S, 440S, 444S, 445S, 446S, 447S, 449A, 449b, 450S, 452a, 452S, 453S, 455S, 456S
0.000	HSG D	
14.286	Other	1aS, 1bS, 14S, 16S, 17S, 18S, 19S, 20S, 439S, 441S, 443S, 445S, 447S, 449A, 449S, 451S, 453S, 454a, 455S

Summary for Subcatchment 1aS: Subcatchment 1a

Runoff = 1.33 cfs @ 11.91 hrs, Volume= 0.054 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	0	70	Woods, Good, HSG C
*	0	98	Roof
*	10,000	98	Paved
	7,305	74	>75% Grass cover, Good, HSG C
	17,305	88	Weighted Average
	7,305		42.21% Pervious Area
	10,000		57.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.3	76	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	176	Total			

Summary for Subcatchment 1bS: Subcatchment 1b

Runoff = 1.74 cfs @ 11.96 hrs, Volume= 0.078 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	1,580	98	Paved parking
	21,744	74	>75% Grass cover, Good, HSG C
	3,090	98	Water Surface
*	7,080	98	Roof
	0	70	Woods, Good, HSG C
	33,494	82	Weighted Average
	21,744		64.92% Pervious Area
	11,750		35.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 1cS: Subcatchment 1c

Runoff = 2.37 cfs @ 12.09 hrs, Volume= 0.175 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
135,640	70	Woods, Good, HSG C
15,700	74	>75% Grass cover, Good, HSG C
151,340	70	Weighted Average
151,340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	100	0.0840	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
3.7	460	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	330	0.2300	14.23	21.34	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=1.00' Z= 0.5 '/' Top.W=2.00' n= 0.030 Earth, clean & winding
14.9	890	Total			

Summary for Subcatchment 14S: Subcatchment 14

Runoff = 10.91 cfs @ 12.45 hrs, Volume= 1.606 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	405,108	71	Meadow, non-grazed, HSG C
*	2,091	98	Roof Area
	858,175	70	Woods, Good, HSG C
	29,098	98	Paved roads
	1,089	98	Water Surface, HSG C
	1,295,561	71	Weighted Average
	1,263,283		97.51% Pervious Area
	32,278		2.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1100	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
0.6	80	0.1000	2.21		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
30.4	2,165	0.2260	1.19		**Shallow Concentrated Flow, SC Flow through Woods** Forest w/Heavy Litter Kv= 2.5 fps
1.2	90	0.2350	1.21		**Shallow Concentrated Flow, SC Flow through Grass** Forest w/Heavy Litter Kv= 2.5 fps
0.3	150	0.0450	8.53	34.11	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
42.2	2,585	Total			

Summary for Subcatchment 16S: Subcatchment 16

Runoff = 4.88 cfs @ 11.94 hrs, Volume= 0.209 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	8,620	98	Pavement
	100,893	70	Woods, Good, HSG C
	48,662	71	Meadow, non-grazed, HSG C
	158,175	72	Weighted Average
	149,555		94.55% Pervious Area
	8,620		5.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	421	0.0230	4.64	37.13	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.050 Earth, cobble bottom, clean sides
1.3	740	0.1000	9.68	77.42	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.050 Earth, cobble bottom, clean sides
2.8	1,161	Total			

Summary for Subcatchment 17S: Subcatchment 17

Runoff = 8.83 cfs @ 12.03 hrs, Volume= 0.508 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	6,950	98	Roadway
	81,862	71	Meadow, non-grazed, HSG C
	321,183	70	Woods, Good, HSG C
	409,995	71	Weighted Average
	403,045		98.30% Pervious Area
	6,950		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow, Sheet Flow through Woods** Grass: Short n= 0.150 P2= 4.00"
5.2	440	0.3200	1.41		**Shallow Concentrated Flow, SC Flow through Woods** Forest w/Heavy Litter Kv= 2.5 fps
0.7	540	0.1160	13.69	54.76	**Trap/Vee/Rect Channel Flow, Roadside Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
9.4	1,080	Total			

Summary for Subcatchment 18S: Subcatchment 18

Runoff = 4.58 cfs @ 12.43 hrs, Volume= 0.659 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	2,494	98	Pavement
	183,388	71	Meadow, non-grazed, HSG C
	382,141	70	Woods, Good, HSG C
	568,023	70	Weighted Average
	565,529		99.56% Pervious Area
	2,494		0.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0900	0.16		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
11.7	651	0.1380	0.93		**Shallow Concentrated Flow, SCF** Forest w/Heavy Litter Kv= 2.5 fps
2.8	102	0.0600	0.61		**Shallow Concentrated Flow, SCF2** Forest w/Heavy Litter Kv= 2.5 fps
14.2	997	0.2190	1.17		**Shallow Concentrated Flow, SCF3** Forest w/Heavy Litter Kv= 2.5 fps
0.1	51	0.0590	9.76	39.05	**Trap/Vee/Rect Channel Flow, Flow in Roadside Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
39.3	1,901	Total			

Summary for Subcatchment 19S: Subcatchment 19

Runoff = 20.84 cfs @ 12.41 hrs, Volume= 2.953 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	4,792	98	Roof Area
	3,485	98	Paved parking, HSG C
	1,554,221	70	Woods, Good, HSG C
	984,456	71	Meadow, non-grazed, HSG C
	2,546,954	70	Weighted Average
	2,538,677		99.68% Pervious Area
	8,277		0.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0910	0.16		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
26.9	2,633	0.2960	1.63		**Shallow Concentrated Flow, SC Flow through woods** Kv= 3.0 fps
1.1	300	0.0130	4.58	18.33	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
38.5	3,033	Total			

Summary for Subcatchment 20S: Subcatchment 20

Runoff = 19.76 cfs @ 12.28 hrs, Volume= 2.257 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	68,825	89	Dirt Road
*	2,396	98	Roof Area
*	9,278	98	Roadway
	1,637,943	70	Woods, Good, HSG C
	101,495	71	Meadow, non-grazed, HSG C
	1,819,937	71	Weighted Average
	1,808,263		99.36% Pervious Area
	11,674		0.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0910	0.16		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
18.7	3,055	0.2960	2.72		**Shallow Concentrated Flow, SC Flow through woods** Woodland Kv= 5.0 fps
0.6	310	0.0466	8.68	34.71	**Trap/Vee/Rect Channel Flow, Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
29.8	3,465	Total			

Summary for Subcatchment 434S: Subcatchment 434

Runoff = 0.59 cfs @ 11.98 hrs, Volume= 0.029 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
19,166	74	>75% Grass cover, Good, HSG C
19,166		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0600	0.30		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 4.00"
0.1	27	0.2240	7.10		**Shallow Concentrated Flow, shallow concentrated flow** Grassed Waterway Kv= 15.0 fps
0.5	287	0.0450	9.08	54.49	**Trap/Vee/Rect Channel Flow, roadside ditch** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.033
6.2	414	Total			

Summary for Subcatchment 439S: Subcatchment 439

Runoff = 3.04 cfs @ 11.98 hrs, Volume= 0.144 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
13,896	98	Paved parking & roofs
58,414	74	>75% Grass cover, Good, HSG C
72,310	79	Weighted Average
58,414		80.78% Pervious Area
13,896		19.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 4.00"
0.6	84	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	322	0.0340	3.74		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.3	506	Total			

Summary for Subcatchment 440S: Subcatchment 440

Runoff = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
1,742	98	Roofs, HSG C
32,234	74	>75% Grass cover, Good, HSG C
33,976	75	Weighted Average
32,234		94.87% Pervious Area
1,742		5.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
3.0	235	0.0340	1.29		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.6	335	Total			

Summary for Subcatchment 441S: Subcatchment 441-Hotel

Runoff = 7.50 cfs @ 12.02 hrs, Volume= 0.418 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	316,069	72	green roof
	316,069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0					**Direct Entry,**

Summary for Subcatchment 443S: Subcatchment 443-Lodge

Runoff = 1.24 cfs @ 12.02 hrs, Volume= 0.069 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	52,272	72	Green Roof
	52,272		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0					**Direct Entry, Highmount Lodge**

Summary for Subcatchment 444S: Subcatchment 444

Runoff = 1.01 cfs @ 11.94 hrs, Volume= 0.042 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
28,241	74	>75% Grass cover, Good, HSG C
28,241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	66	0.3030	0.52		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.5	300	0.0600	10.49	62.92	**Trap/Vee/Rect Channel Flow, TRM SWALE** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.033 Earth, grassed & winding
2.6	366	Total			

Summary for Subcatchment 445S: Subcatchment 445

Runoff = 0.90 cfs @ 11.96 hrs, Volume= 0.041 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
7,680	98	Paved roads w/curbs & sewers
4,825	74	>75% Grass cover, Good, HSG C
12,505	89	Weighted Average
4,825		38.58% Pervious Area
7,680		61.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.1800	0.46		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.0	350	0.0800	5.74		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.6	450	Total			

Summary for Subcatchment 446S: Subcatchment 446

Runoff = 1.73 cfs @ 11.98 hrs, Volume= 0.084 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
55,919	74	>75% Grass cover, Good, HSG C
55,919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	88	0.0680	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.4	730	0.0400	8.56	51.38	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.033 Earth, grassed & winding
6.2	818	Total			

Summary for Subcatchment 447S: Subcatchment 447

Runoff = 1.10 cfs @ 11.92 hrs, Volume= 0.050 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
10,130	98	Paved parking & roofs
1,562	74	>75% Grass cover, Good, HSG C
11,692	95	Weighted Average
1,562		13.36% Pervious Area
10,130		86.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.81		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
1.1	244	0.0328	3.68		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	344	Total			

Summary for Subcatchment 449A: Subcatchment 449A

Runoff = 3.18 cfs @ 11.95 hrs, Volume= 0.143 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	13,350	98	Paved parking & roofs
	19,520	74	>75% Grass cover, Good, HSG C
*	12,800	98	Roofs
	45,670	88	Weighted Average
	19,520		42.74% Pervious Area
	26,150		57.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	30	0.5000	0.54		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 4.00"
1.3	300	0.0350	3.80		**Shallow Concentrated Flow, ROAD** Paved Kv= 20.3 fps
0.8	250	0.0050	5.09	16.00	**Pipe Channel, culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
1.1	213	0.0050	3.28	26.23	**Trap/Vee/Rect Channel Flow, trm swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.033 Earth, grassed & winding
0.2	50	0.0050	5.09	16.00	**Pipe Channel, into cb** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
4.3	843	Total			

Summary for Subcatchment 449b: Subcatchment 449B

Runoff = 0.82 cfs @ 11.92 hrs, Volume= 0.033 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
22,066	74	>75% Grass cover, Good, HSG C
22,066		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	455	0.0200	7.01	14.01	**Channel Flow,** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.030 Earth, grassed & winding

Summary for Subcatchment 449S: Subcatchment 449

Runoff = 0.83 cfs @ 11.92 hrs, Volume= 0.041 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
8,350	98	Paved parking & roofs
8,350		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0400	2.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
1.3	245	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	345	Total			

Summary for Subcatchment 450S: Subcatchment 450

Runoff = 3.04 cfs @ 11.93 hrs, Volume= 0.127 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
40,190	74	>75% Grass cover, Good, HSG C
55,675	70	Woods, Good, HSG C
95,865	72	Weighted Average
95,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	740	0.0600	7.50	59.97	**Trap/Vee/Rect Channel Flow, conveyance swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.050 swale with checkdams

Summary for Subcatchment 451S: Subcatchment 451

Runoff = 0.81 cfs @ 11.91 hrs, Volume= 0.040 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
8,072	98	Paved roads w/curbs & sewers
8,072		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.81		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.8	234	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	334	Total			

Summary for Subcatchment 452a: Subcatchment 452a

Runoff = 0.08 cfs @ 11.91 hrs, Volume= 0.003 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
2,110	74	>75% Grass cover, Good, HSG C
2,110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	188	0.0600	9.10	18.20	**Channel Flow,** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.040 Earth, cobble bottom, clean sides

Summary for Subcatchment 452S: Subcatchment 452

Runoff = 1.43 cfs @ 11.91 hrs, Volume= 0.062 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
12,360	98	Paved roads w/curbs & sewers, HSG C
3,381	74	>75% Grass cover, Good, HSG C
15,741	93	Weighted Average
3,381		21.48% Pervious Area
12,360		78.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0700	2.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	234	0.0726	5.47		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	334	Total			

Summary for Subcatchment 453S: Subcatchment 453

Runoff = 0.94 cfs @ 11.94 hrs, Volume= 0.041 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
8,020	98	Paved roads w/curbs & sewers
4,462	74	>75% Grass cover, Good, HSG C
12,482	89	Weighted Average
4,462		35.75% Pervious Area
8,020		64.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	43	0.1160	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.4	57	0.0700	2.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.8	217	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	317	Total			

Summary for Subcatchment 454a: Subcatchment 454a

Runoff = 1.21 cfs @ 11.96 hrs, Volume= 0.064 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	13,080	98	Roof
	13,080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 455S: Subcatchment 455

Runoff = 0.84 cfs @ 11.91 hrs, Volume= 0.033 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
2,272	98	Paved roads w/curbs & sewers
16,118	74	>75% Grass cover, Good, HSG C
18,390	77	Weighted Average
16,118		87.65% Pervious Area
2,272		12.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	346	0.0400	8.74	69.95	**Trap/Vee/Rect Channel Flow, roadside swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.035 Earth, dense weeds

Summary for Subcatchment 456S: Subcatchment 456

Runoff = 3.82 cfs @ 11.94 hrs, Volume= 0.162 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
79,875	74	>75% Grass cover, Good, HSG C
10,775	98	Water Surface, 0% imp, HSG C
90,650	77	Weighted Average
90,650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	100	0.2500	0.52		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"

Reach and Culvert Summaries
1 & 10-yr Storm Events

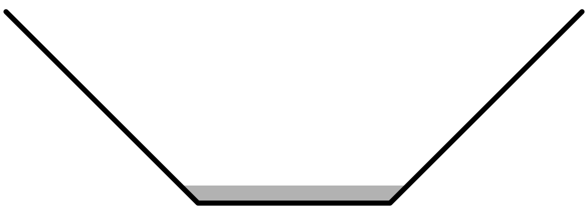
Summary for Reach 16a: Roadside Channel

Inflow Area = 18.547 ac, 12.56% Impervious, Inflow Depth > 0.95" for 1-YEAR event
Inflow = 1.09 cfs @ 14.75 hrs, Volume= 1.470 af
Outflow = 1.09 cfs @ 14.88 hrs, Volume= 1.470 af, Atten= 0%, Lag= 7.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 11.5 min

Peak Storage= 310 cf @ 14.80 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 75.38 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 770.0' Slope= 0.0948 '/'
Inlet Invert= 2,443.00', Outlet Invert= 2,370.00'



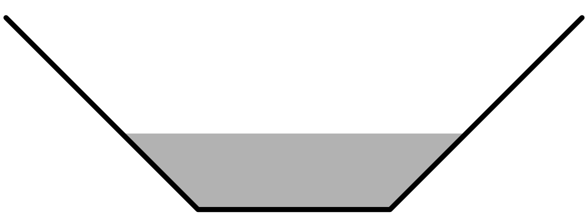
Summary for Reach 434C: RIP RAP SWALE

Inflow Area = 12.383 ac, 4.85% Impervious, Inflow Depth = 0.79" for 1-YEAR event
Inflow = 10.80 cfs @ 12.02 hrs, Volume= 0.819 af
Outflow = 10.65 cfs @ 12.04 hrs, Volume= 0.819 af, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.87 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 2.6 min

Peak Storage= 416 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 61.85 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 188.0' Slope= 0.0638 '/'
Inlet Invert= 2,500.00', Outlet Invert= 2,488.00'



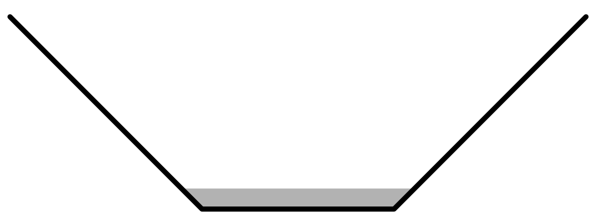
Summary for Reach 444: Roadside Swale

Inflow Area = 1.640 ac, 0.00% Impervious, Inflow Depth = 0.72" for 1-YEAR event
Inflow = 1.79 cfs @ 12.01 hrs, Volume= 0.098 af
Outflow = 1.74 cfs @ 12.05 hrs, Volume= 0.098 af, Atten= 3%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.71 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 4.8 min

Peak Storage= 150 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 95.47 cfs

2.00' x 2.00' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 317.0' Slope= 0.0662 '/'
Inlet Invert= 2,548.00', Outlet Invert= 2,527.00'



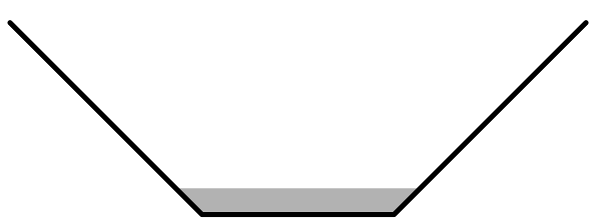
Summary for Reach 446: Roadside Swale

Inflow Area = 2.288 ac, 0.00% Impervious, Inflow Depth = 0.74" for 1-YEAR event
Inflow = 2.09 cfs @ 12.00 hrs, Volume= 0.140 af
Outflow = 1.96 cfs @ 12.11 hrs, Volume= 0.140 af, Atten= 7%, Lag= 6.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.15 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 12.2 min

Peak Storage= 447 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 70.49 cfs

2.00' x 2.00' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 720.0' Slope= 0.0361 '/'
Inlet Invert= 2,526.00', Outlet Invert= 2,500.00'



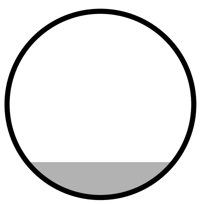
Summary for Reach 446R: Culvert 446r

Inflow Area = 1.555 ac, 38.61% Impervious, Inflow Depth = 1.36" for 1-YEAR event
Inflow = 0.92 cfs @ 11.92 hrs, Volume= 0.176 af
Outflow = 0.92 cfs @ 11.93 hrs, Volume= 0.176 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.93 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 11.92 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 11.74 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 40.0' Slope= 0.0125 '/'
Inlet Invert= 2,498.50', Outlet Invert= 2,498.00'



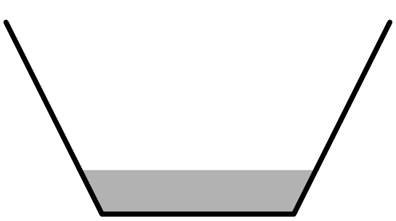
Summary for Reach 450a: Overland Swale

Inflow Area = 2.201 ac, 0.00% Impervious, Inflow Depth = 0.69" for 1-YEAR event
Inflow = 3.04 cfs @ 11.93 hrs, Volume= 0.127 af
Outflow = 2.29 cfs @ 12.06 hrs, Volume= 0.127 af, Atten= 25%, Lag= 8.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.25 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 20.3 min

Peak Storage= 756 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 26.44 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 740.0' Slope= 0.0243 '/'
Inlet Invert= 2,452.00', Outlet Invert= 2,434.00'



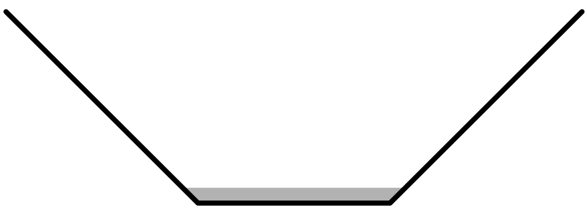
Summary for Reach 451: Roadside Swale

Inflow Area = 0.287 ac, 64.25% Impervious, Inflow Depth = 1.72" for 1-YEAR event
Inflow = 0.94 cfs @ 11.94 hrs, Volume= 0.041 af
Outflow = 0.92 cfs @ 11.95 hrs, Volume= 0.041 af, Atten= 2%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 1.1 min

Peak Storage= 17 cf @ 11.94 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 81.60 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 2,450.00', Outlet Invert= 2,448.00'



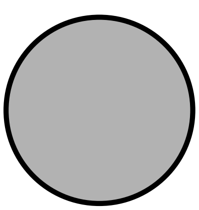
Summary for Reach 452R: Driveway Culvert

Inflow Area = 12.431 ac, 4.83% Impervious, Inflow Depth = 0.79" for 1-YEAR event
Inflow = 10.66 cfs @ 12.04 hrs, Volume= 0.822 af
Outflow = 8.73 cfs @ 12.03 hrs, Volume= 0.822 af, Atten= 18%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.62 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.05 fps, Avg. Travel Time= 1.2 min

Peak Storage= 236 cf @ 12.00 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 8.73 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 300.0' Slope= 0.0600 '/'
Inlet Invert= 2,488.00', Outlet Invert= 2,470.00'



Summary for Reach 501a: Overland Swale

Inflow Area = 0.397 ac, 57.79% Impervious, Inflow Depth = 1.64" for 1-YEAR event
Inflow = 1.33 cfs @ 11.91 hrs, Volume= 0.054 af
Outflow = 1.28 cfs @ 11.92 hrs, Volume= 0.054 af, Atten= 4%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.98 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 1.7 min

Peak Storage= 30 cf @ 11.91 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 25.98 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 90.0' Slope= 0.0889 '/'
Inlet Invert= 2,436.00', Outlet Invert= 2,428.00'

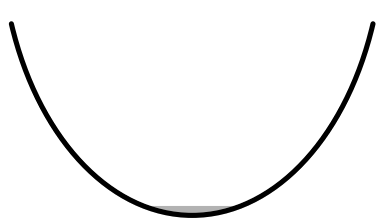
Summary for Reach 502a: Overland Swale

Inflow Area = 1.166 ac, 42.82% Impervious, Inflow Depth > 0.43" for 1-YEAR event
Inflow = 0.03 cfs @ 21.53 hrs, Volume= 0.041 af
Outflow = 0.03 cfs @ 21.66 hrs, Volume= 0.041 af, Atten= 0%, Lag= 7.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 7.3 min

Peak Storage= 8 cf @ 21.59 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 18.45 cfs

2.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, clean & winding
Length= 600.0' Slope= 0.2258 '/'
Inlet Invert= 2,418.00', Outlet Invert= 2,282.50'



Summary for Pond 434R: Culvert

Inflow Area = 10.828 ac, 0.00% Impervious, Inflow Depth = 0.71" for 1-YEAR event
Inflow = 10.45 cfs @ 12.02 hrs, Volume= 0.642 af
Outflow = 10.45 cfs @ 12.02 hrs, Volume= 0.642 af, Atten= 0%, Lag= 0.0 min
Primary = 10.45 cfs @ 12.02 hrs, Volume= 0.642 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,496.32' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,495.00'	**36.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,495.00' / 2,494.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,498.00'	**20.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.32 cfs @ 12.02 hrs HW=2,496.31' (Free Discharge)
1=Culvert (Barrel Controls 10.32 cfs @ 5.11 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 439AP: CB 439A

Inflow Area = 0.780 ac, 5.13% Impervious, Inflow Depth = 0.83" for 1-YEAR event
Inflow = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af
Outflow = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,576.42' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,576.00'	**24.0" Round Culvert** L= 265.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,576.00' / 2,559.00' S= 0.0642 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.06 cfs @ 12.00 hrs HW=2,576.42' (Free Discharge)
1=Culvert (Inlet Controls 1.06 cfs @ 2.21 fps)

Summary for Pond 439P: Catch Basin 439

Inflow Area = 2.440 ac, 14.71% Impervious, Inflow Depth = 0.98" for 1-YEAR event
Inflow = 4.08 cfs @ 11.99 hrs, Volume= 0.199 af
Outflow = 4.08 cfs @ 11.99 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min
Primary = 4.08 cfs @ 11.99 hrs, Volume= 0.199 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,559.75' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,559.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,559.00' / 2,527.00' S= 0.0914 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,564.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.01 cfs @ 11.99 hrs HW=2,559.74' (Free Discharge)
1=Culvert (Inlet Controls 4.01 cfs @ 2.94 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 440P: Catch Basin 440

Inflow Area = 0.780 ac, 5.13% Impervious, Inflow Depth = 0.83" for 1-YEAR event
Inflow = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af
Outflow = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.00 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,585.42' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,585.00'	**24.0" Round Culvert** L= 180.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,585.00' / 2,576.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,589.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.06 cfs @ 12.00 hrs HW=2,585.42' (Free Discharge)
1=Culvert (Inlet Controls 1.06 cfs @ 2.21 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 444R: Culvert 444r

Inflow Area = 2.288 ac, 0.00% Impervious, Inflow Depth = 0.74" for 1-YEAR event
Inflow = 2.09 cfs @ 12.00 hrs, Volume= 0.140 af
Outflow = 2.09 cfs @ 12.00 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.00 hrs, Volume= 0.140 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,527.66' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,527.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 2,527.00' / 2,526.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.09 cfs @ 12.00 hrs HW=2,527.66' (Free Discharge)
1=Culvert (Inlet Controls 2.09 cfs @ 2.77 fps)

Summary for Pond 445P: Catch Basin 445

Inflow Area = 2.727 ac, 19.63% Impervious, Inflow Depth = 1.05" for 1-YEAR event
Inflow = 4.91 cfs @ 11.98 hrs, Volume= 0.240 af
Outflow = 4.91 cfs @ 11.98 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min
Primary = 4.91 cfs @ 11.98 hrs, Volume= 0.240 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,527.83' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,527.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,527.00' / 2,520.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,534.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.84 cfs @ 11.98 hrs HW=2,527.82' (Free Discharge)
1=Culvert (Inlet Controls 4.84 cfs @ 3.08 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 447P: Catch Basin 447

Inflow Area = 2.995 ac, 25.63% Impervious, Inflow Depth = 1.16" for 1-YEAR event
Inflow = 5.68 cfs @ 11.97 hrs, Volume= 0.290 af
Outflow = 5.68 cfs @ 11.97 hrs, Volume= 0.290 af, Atten= 0%, Lag= 0.0 min
Primary = 5.68 cfs @ 11.97 hrs, Volume= 0.290 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,516.89' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,516.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,516.00' / 2,509.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,523.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.63 cfs @ 11.97 hrs HW=2,516.89' (Free Discharge)
1=Culvert (Inlet Controls 5.63 cfs @ 3.21 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 449P: Catch Basin 449

Inflow Area = 3.187 ac, 30.11% Impervious, Inflow Depth = 1.25" for 1-YEAR event
Inflow = 6.33 cfs @ 11.96 hrs, Volume= 0.331 af
Outflow = 6.33 cfs @ 11.96 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
Primary = 6.33 cfs @ 11.96 hrs, Volume= 0.331 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,507.95' @ 11.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,507.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,507.00' / 2,492.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,513.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.24 cfs @ 11.96 hrs HW=2,507.94' (Free Discharge)
1=Culvert (Inlet Controls 6.24 cfs @ 3.30 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 451P: Catch Basin 451

Inflow Area = 3.372 ac, 33.95% Impervious, Inflow Depth = 1.32" for 1-YEAR event
Inflow = 6.99 cfs @ 11.95 hrs, Volume= 0.371 af
Outflow = 6.99 cfs @ 11.95 hrs, Volume= 0.371 af, Atten= 0%, Lag= 0.0 min
Primary = 6.99 cfs @ 11.95 hrs, Volume= 0.371 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,489.00' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,488.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,488.00' / 2,468.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,496.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.89 cfs @ 11.95 hrs HW=2,488.99' (Free Discharge)
1=Culvert (Inlet Controls 6.89 cfs @ 3.39 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 452P: Catch Basin 452

Inflow Area = 3.734 ac, 38.26% Impervious, Inflow Depth = 1.39" for 1-YEAR event
Inflow = 8.22 cfs @ 11.94 hrs, Volume= 0.433 af
Outflow = 8.22 cfs @ 11.94 hrs, Volume= 0.433 af, Atten= 0%, Lag= 0.0 min
Primary = 8.22 cfs @ 11.94 hrs, Volume= 0.433 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,467.03' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,466.00'	**42.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,466.00' / 2,462.00' S= 0.0364 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,472.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.20 cfs @ 11.94 hrs HW=2,467.03' (Free Discharge)
├─**1=Culvert** (Inlet Controls 8.20 cfs @ 3.46 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 453P: Catch Basin 453

Inflow Area =	0.287 ac,	64.25% Impervious,	Inflow Depth = 1.72"	for 1-YEAR event
Inflow =	0.94 cfs @	11.94 hrs, Volume=	0.041 af	
Outflow =	0.94 cfs @	11.94 hrs, Volume=	0.041 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.94 cfs @	11.94 hrs, Volume=	0.041 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,452.43' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,456.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	2,452.00'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,452.00' / 2,450.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.94 cfs @ 11.94 hrs HW=2,452.43' (Free Discharge)
├─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Culvert** (Inlet Controls 0.94 cfs @ 2.23 fps)

Summary for Pond 500a: CB 500a

Inflow Area =	0.397 ac,	57.79% Impervious,	Inflow Depth = 1.64"	for 1-YEAR event
Inflow =	1.33 cfs @	11.91 hrs, Volume=	0.054 af	
Outflow =	1.33 cfs @	11.91 hrs, Volume=	0.054 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.33 cfs @	11.91 hrs, Volume=	0.054 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,441.36' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,440.75'	**12.0" Round Culvert** L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,440.75' / 2,436.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,446.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.33 cfs @ 11.91 hrs HW=2,441.36' (Free Discharge)
├─**1=Culvert** (Inlet Controls 1.33 cfs @ 2.66 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

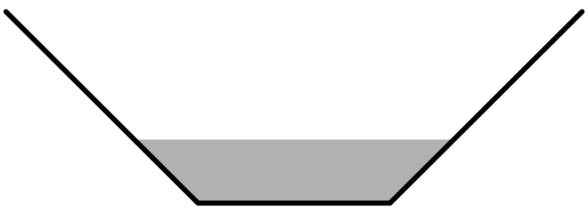
Summary for Reach 16a: Roadside Channel

Inflow Area = 18.547 ac, 12.56% Impervious, Inflow Depth > 3.44" for 10-YEAR event
Inflow = 9.60 cfs @ 14.49 hrs, Volume= 5.318 af
Outflow = 9.59 cfs @ 14.52 hrs, Volume= 5.318 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.42 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 8.9 min

Peak Storage= 1,362 cf @ 14.48 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 75.38 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 770.0' Slope= 0.0948 '/'
Inlet Invert= 2,443.00', Outlet Invert= 2,370.00'



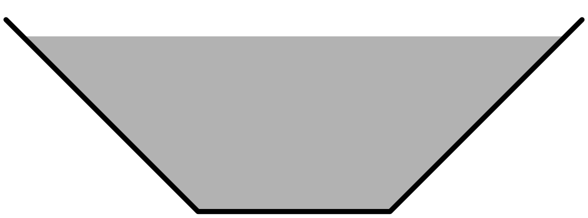
Summary for Reach 434C: RIP RAP SWALE

Inflow Area = 12.383 ac, 4.85% Impervious, Inflow Depth = 3.18" for 10-YEAR event
Inflow = 51.72 cfs @ 12.00 hrs, Volume= 3.277 af
Outflow = 51.12 cfs @ 12.01 hrs, Volume= 3.277 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.38 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 2.0 min

Peak Storage= 1,314 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.83'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 61.85 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 188.0' Slope= 0.0638 '/'
Inlet Invert= 2,500.00', Outlet Invert= 2,488.00'



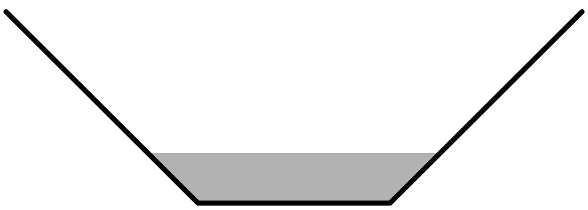
Summary for Reach 444: Roadside Swale

Inflow Area = 1.640 ac, 0.00% Impervious, Inflow Depth = 3.04" for 10-YEAR event
Inflow = 8.05 cfs @ 12.00 hrs, Volume= 0.416 af
Outflow = 7.86 cfs @ 12.02 hrs, Volume= 0.416 af, Atten= 2%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.06 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 3.3 min

Peak Storage= 417 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 95.47 cfs

2.00' x 2.00' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 317.0' Slope= 0.0662 '/'
Inlet Invert= 2,548.00', Outlet Invert= 2,527.00'



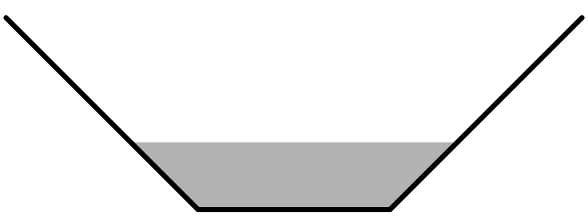
Summary for Reach 446: Roadside Swale

Inflow Area = 2.288 ac, 0.00% Impervious, Inflow Depth = 3.08" for 10-YEAR event
Inflow = 10.15 cfs @ 11.98 hrs, Volume= 0.588 af
Outflow = 9.77 cfs @ 12.04 hrs, Volume= 0.588 af, Atten= 4%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.21 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 8.6 min

Peak Storage= 1,361 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 70.49 cfs

2.00' x 2.00' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 720.0' Slope= 0.0361 '/'
Inlet Invert= 2,526.00', Outlet Invert= 2,500.00'



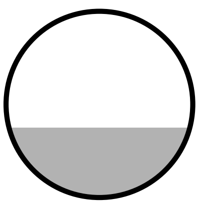
Summary for Reach 446R: Culvert 446r

Inflow Area = 1.555 ac, 38.61% Impervious, Inflow Depth = 4.16" for 10-YEAR event
Inflow = 3.51 cfs @ 11.91 hrs, Volume= 0.539 af
Outflow = 3.47 cfs @ 11.91 hrs, Volume= 0.539 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.80 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 0.3 min

Peak Storage= 24 cf @ 11.91 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 11.74 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 40.0' Slope= 0.0125 '/'
Inlet Invert= 2,498.50', Outlet Invert= 2,498.00'



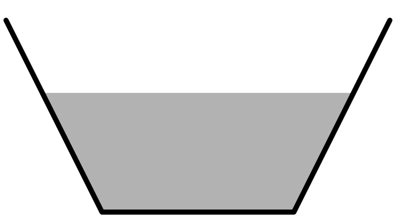
Summary for Reach 450a: Overland Swale

Inflow Area = 2.201 ac, 0.00% Impervious, Inflow Depth = 2.99" for 10-YEAR event
Inflow = 13.37 cfs @ 11.92 hrs, Volume= 0.549 af
Outflow = 11.62 cfs @ 12.01 hrs, Volume= 0.549 af, Atten= 13%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.58 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 14.1 min

Peak Storage= 2,411 cf @ 11.95 hrs
Average Depth at Peak Storage= 1.24'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 26.44 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 740.0' Slope= 0.0243 '/'
Inlet Invert= 2,452.00', Outlet Invert= 2,434.00'



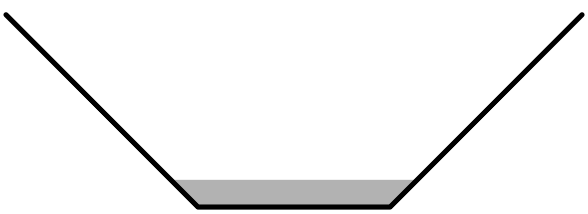
Summary for Reach 451: Roadside Swale

Inflow Area = 0.287 ac, 64.25% Impervious, Inflow Depth = 4.74" for 10-YEAR event
Inflow = 2.42 cfs @ 11.94 hrs, Volume= 0.113 af
Outflow = 2.39 cfs @ 11.94 hrs, Volume= 0.113 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 0.9 min

Peak Storage= 32 cf @ 11.94 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 81.60 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 2,450.00', Outlet Invert= 2,448.00'



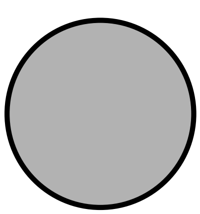
Summary for Reach 452R: Driveway Culvert

Inflow Area = 12.431 ac, 4.83% Impervious, Inflow Depth = 3.18" for 10-YEAR event
Inflow = 51.16 cfs @ 12.01 hrs, Volume= 3.290 af
Outflow = 8.73 cfs @ 11.79 hrs, Volume= 3.290 af, Atten= 83%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.67 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.97 fps, Avg. Travel Time= 1.0 min

Peak Storage= 236 cf @ 11.76 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 8.73 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 300.0' Slope= 0.0600 '/'
Inlet Invert= 2,488.00', Outlet Invert= 2,470.00'



Summary for Reach 501a: Overland Swale

Inflow Area = 0.397 ac, 57.79% Impervious, Inflow Depth = 4.63" for 10-YEAR event
Inflow = 3.52 cfs @ 11.91 hrs, Volume= 0.153 af
Outflow = 3.42 cfs @ 11.91 hrs, Volume= 0.153 af, Atten= 3%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.61 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 1.3 min

Peak Storage= 56 cf @ 11.91 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 25.98 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 90.0' Slope= 0.0889 '/'
Inlet Invert= 2,436.00', Outlet Invert= 2,428.00'

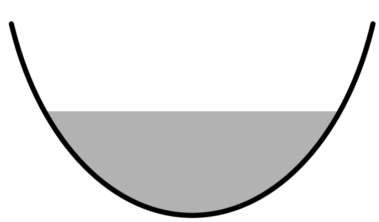
Summary for Reach 502a: Overland Swale

Inflow Area = 1.166 ac, 42.82% Impervious, Inflow Depth > 3.27" for 10-YEAR event
Inflow = 5.41 cfs @ 12.01 hrs, Volume= 0.318 af
Outflow = 5.35 cfs @ 12.04 hrs, Volume= 0.318 af, Atten= 1%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.08 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 5.9 min

Peak Storage= 320 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 18.45 cfs

2.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, clean & winding
Length= 600.0' Slope= 0.2258 '/'
Inlet Invert= 2,418.00', Outlet Invert= 2,282.50'



Summary for Pond 434R: Culvert

Inflow Area = 10.828 ac, 0.00% Impervious, Inflow Depth = 3.04" for 10-YEAR event
Inflow = 50.46 cfs @ 12.01 hrs, Volume= 2.739 af
Outflow = 50.46 cfs @ 12.01 hrs, Volume= 2.739 af, Atten= 0%, Lag= 0.0 min
Primary = 50.46 cfs @ 12.01 hrs, Volume= 2.739 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,498.27' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,495.00'	**36.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,495.00' / 2,494.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,498.00'	**20.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=50.04 cfs @ 12.01 hrs HW=2,498.27' (Free Discharge)
1=Culvert (Barrel Controls 42.66 cfs @ 6.90 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 7.38 cfs @ 1.39 fps)

Summary for Pond 439AP: CB 439A

Inflow Area = 0.780 ac, 5.13% Impervious, Inflow Depth = 3.28" for 10-YEAR event
Inflow = 4.27 cfs @ 11.99 hrs, Volume= 0.213 af
Outflow = 4.27 cfs @ 11.99 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
Primary = 4.27 cfs @ 11.99 hrs, Volume= 0.213 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,576.88' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,576.00'	**24.0" Round Culvert** L= 265.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,576.00' / 2,559.00' S= 0.0642 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=4.21 cfs @ 11.99 hrs HW=2,576.88' (Free Discharge)
1=Culvert (Inlet Controls 4.21 cfs @ 3.19 fps)

Summary for Pond 439P: Catch Basin 439

Inflow Area = 2.440 ac, 14.71% Impervious, Inflow Depth = 3.55" for 10-YEAR event
Inflow = 14.72 cfs @ 11.98 hrs, Volume= 0.722 af
Outflow = 14.72 cfs @ 11.98 hrs, Volume= 0.722 af, Atten= 0%, Lag= 0.0 min
Primary = 14.72 cfs @ 11.98 hrs, Volume= 0.722 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,560.50' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,559.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,559.00' / 2,527.00' S= 0.0914 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,564.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=14.54 cfs @ 11.98 hrs HW=2,560.49' (Free Discharge)
1=Culvert (Inlet Controls 14.54 cfs @ 4.15 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 440P: Catch Basin 440

Inflow Area = 0.780 ac, 5.13% Impervious, Inflow Depth = 3.28" for 10-YEAR event
Inflow = 4.27 cfs @ 11.99 hrs, Volume= 0.213 af
Outflow = 4.27 cfs @ 11.99 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
Primary = 4.27 cfs @ 11.99 hrs, Volume= 0.213 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,585.88' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,585.00'	**24.0" Round Culvert** L= 180.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,585.00' / 2,576.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,589.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.21 cfs @ 11.99 hrs HW=2,585.88' (Free Discharge)
1=Culvert (Inlet Controls 4.21 cfs @ 3.19 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 444R: Culvert 444r

Inflow Area = 2.288 ac, 0.00% Impervious, Inflow Depth = 3.08" for 10-YEAR event
Inflow = 10.15 cfs @ 11.98 hrs, Volume= 0.588 af
Outflow = 10.15 cfs @ 11.98 hrs, Volume= 0.588 af, Atten= 0%, Lag= 0.0 min
Primary = 10.15 cfs @ 11.98 hrs, Volume= 0.588 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,529.17' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,527.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 2,527.00' / 2,526.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=10.10 cfs @ 11.98 hrs HW=2,529.16' (Free Discharge)
1=Culvert (Inlet Controls 10.10 cfs @ 5.72 fps)

Summary for Pond 445P: Catch Basin 445

Inflow Area = 2.727 ac, 19.63% Impervious, Inflow Depth = 3.68" for 10-YEAR event
Inflow = 16.94 cfs @ 11.97 hrs, Volume= 0.836 af
Outflow = 16.94 cfs @ 11.97 hrs, Volume= 0.836 af, Atten= 0%, Lag= 0.0 min
Primary = 16.94 cfs @ 11.97 hrs, Volume= 0.836 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,528.62' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,527.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,527.00' / 2,520.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,534.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=16.81 cfs @ 11.97 hrs HW=2,528.62' (Free Discharge)
↑**1=Culvert** (Inlet Controls 16.81 cfs @ 4.33 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 447P: Catch Basin 447

Inflow Area = 2.995 ac, 25.63% Impervious, Inflow Depth = 3.83" for 10-YEAR event
Inflow = 18.72 cfs @ 11.97 hrs, Volume= 0.957 af
Outflow = 18.72 cfs @ 11.97 hrs, Volume= 0.957 af, Atten= 0%, Lag= 0.0 min
Primary = 18.72 cfs @ 11.97 hrs, Volume= 0.957 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,517.72' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,516.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,516.00' / 2,509.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,523.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.56 cfs @ 11.97 hrs HW=2,517.71' (Free Discharge)
↑**1=Culvert** (Inlet Controls 18.56 cfs @ 4.45 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 449P: Catch Basin 449

Inflow Area = 3.187 ac, 30.11% Impervious, Inflow Depth = 3.95" for 10-YEAR event
Inflow = 20.14 cfs @ 11.96 hrs, Volume= 1.049 af
Outflow = 20.14 cfs @ 11.96 hrs, Volume= 1.049 af, Atten= 0%, Lag= 0.0 min
Primary = 20.14 cfs @ 11.96 hrs, Volume= 1.049 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,508.80' @ 11.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,507.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,507.00' / 2,492.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,513.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=19.87 cfs @ 11.96 hrs HW=2,508.78' (Free Discharge)
1=Culvert (Inlet Controls 19.87 cfs @ 4.54 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 451P: Catch Basin 451

Inflow Area = 3.372 ac, 33.95% Impervious, Inflow Depth = 4.05" for 10-YEAR event
Inflow = 21.50 cfs @ 11.95 hrs, Volume= 1.138 af
Outflow = 21.50 cfs @ 11.95 hrs, Volume= 1.138 af, Atten= 0%, Lag= 0.0 min
Primary = 21.50 cfs @ 11.95 hrs, Volume= 1.138 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,489.87' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,488.00'	**36.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,488.00' / 2,468.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,496.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=21.21 cfs @ 11.95 hrs HW=2,489.85' (Free Discharge)
1=Culvert (Inlet Controls 21.21 cfs @ 4.63 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 452P: Catch Basin 452

Inflow Area = 3.734 ac, 38.26% Impervious, Inflow Depth = 4.16" for 10-YEAR event
Inflow = 24.26 cfs @ 11.94 hrs, Volume= 1.294 af
Outflow = 24.26 cfs @ 11.94 hrs, Volume= 1.294 af, Atten= 0%, Lag= 0.0 min
Primary = 24.26 cfs @ 11.94 hrs, Volume= 1.294 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,467.87' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,466.00'	**42.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,466.00' / 2,462.00' S= 0.0364 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,472.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=24.09 cfs @ 11.94 hrs HW=2,467.86' (Free Discharge)
1=Culvert (Inlet Controls 24.09 cfs @ 4.64 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 453P: Catch Basin 453

Inflow Area =	0.287 ac,	64.25% Impervious,	Inflow Depth = 4.74"	for 10-YEAR event
Inflow =	2.42 cfs @	11.94 hrs, Volume=	0.113 af	
Outflow =	2.42 cfs @	11.94 hrs, Volume=	0.113 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.42 cfs @	11.94 hrs, Volume=	0.113 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,452.72' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,456.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	2,452.00'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,452.00' / 2,450.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.40 cfs @ 11.94 hrs HW=2,452.72' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Inlet Controls 2.40 cfs @ 2.88 fps)

Summary for Pond 500a: CB 500a

Inflow Area =	0.397 ac,	57.79% Impervious,	Inflow Depth = 4.63"	for 10-YEAR event
Inflow =	3.52 cfs @	11.91 hrs, Volume=	0.153 af	
Outflow =	3.52 cfs @	11.91 hrs, Volume=	0.153 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.52 cfs @	11.91 hrs, Volume=	0.153 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,442.11' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,440.75'	**12.0" Round Culvert** L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,440.75' / 2,436.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,446.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.48 cfs @ 11.91 hrs HW=2,442.10' (Free Discharge)
1=Culvert (Inlet Controls 3.48 cfs @ 4.43 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Pond Summaries
1, 10 & 100-yr Storm Events

Summary for Pond AC: P-2-Wet Pond

Inflow Area = 18.547 ac, 12.56% Impervious, Inflow Depth = 0.96" for 1-YEAR event
Inflow = 20.11 cfs @ 11.97 hrs, Volume= 1.482 af
Outflow = 1.09 cfs @ 14.75 hrs, Volume= 1.470 af, Atten= 95%, Lag= 166.8 min
Primary = 1.09 cfs @ 14.75 hrs, Volume= 1.470 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 2,455.00' Surf.Area= 21,032 sf Storage= 57,564 cf
Peak Elev= 2,456.12' @ 14.75 hrs Surf.Area= 37,459 sf Storage= 90,585 cf (33,022 cf above start)

Plug-Flow detention time= 2,033.0 min calculated for 0.148 af (10% of inflow)
Center-of-Mass det. time= 527.9 min (1,397.8 - 870.0)

Volume	Invert	Avail.Storage	Storage Description
#1	2,448.00'	190,566 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
2,448.00	2,220	247.0	0	0	2,220
2,450.00	2,450	550.0	4,668	4,668	21,454
2,452.00	9,960	590.0	11,567	16,235	25,257
2,454.00	14,058	650.0	23,901	40,135	31,306
2,455.00	21,032	724.0	17,428	57,564	39,427
2,456.00	37,023	950.0	28,653	86,217	69,544
2,458.00	44,800	1,000.0	81,700	167,916	77,544
2,458.50	45,800	1,004.0	22,650	190,566	78,356

Device	Routing	Invert	Outlet Devices
#1	Primary	2,453.00'	**24.0" Round Culvert** L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,453.00' / 2,450.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	2,455.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	2,456.00'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	2,457.50'	**40.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.07 cfs @ 14.75 hrs HW=2,456.12' (Free Discharge)
1=**Culvert** (Passes 1.07 cfs of 22.01 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 0.88 cfs @ 4.48 fps)
3=**Orifice/Grate** (Orifice Controls 0.19 cfs @ 1.10 fps)
4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B9: bioretention-LEACH

Inflow Area = 1.166 ac, 42.82% Impervious, Inflow Depth = 1.37" for 1-YEAR event
Inflow = 2.86 cfs @ 11.94 hrs, Volume= 0.133 af
Outflow = 0.03 cfs @ 21.53 hrs, Volume= 0.041 af, Atten= 99%, Lag= 575.5 min
Primary = 0.03 cfs @ 21.53 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,423.51' @ 21.53 hrs Surf.Area= 10,590 sf Storage= 5,232 cf

Plug-Flow detention time= 1,898.3 min calculated for 0.041 af (31% of inflow)
Center-of-Mass det. time= 1,767.8 min (2,596.6 - 828.8)

Volume	Invert	Avail.Storage	Storage Description
#1	2,418.00'	1,366 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 3,414 cf Overall x 40.0% Voids
#2	2,419.00'	2,048 cf	**filter media (Prismatic)** Listed below (Recalc) 13,656 cf Overall x 15.0% Voids
#3	2,423.00'	8,215 cf	**surface storage (Prismatic)** Listed below (Recalc)
		11,629 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,418.00	3,414	0	0
2,419.00	3,414	3,414	3,414

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,419.00	3,414	0	0
2,423.00	3,414	13,656	13,656

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,423.00	3,414	0	0
2,424.00	4,100	3,757	3,757
2,425.00	4,815	4,458	8,215

Device	Routing	Invert	Outlet Devices
#1	Primary	2,418.50'	**24.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,418.50' / 2,418.00' S= 0.0076 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,423.00'	**1.000 in/hr Exfiltration over Surface area above 2,423.00'** Excluded Surface area = 10,242 sf
#3	Device 1	2,423.50'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 21.53 hrs HW=2,423.51' (Free Discharge)
└─**1=Culvert** (Passes 0.02 cfs of 30.28 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.01 cfs)
  └─**3=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.27 fps)

Summary for Pond Z: DRY SWALE

Inflow Area = 1.048 ac, 57.26% Impervious, Inflow Depth = 1.64" for 1-YEAR event
Inflow = 3.18 cfs @ 11.95 hrs, Volume= 0.143 af
Outflow = 0.16 cfs @ 12.97 hrs, Volume= 0.143 af, Atten= 95%, Lag= 61.4 min
Primary = 0.16 cfs @ 12.97 hrs, Volume= 0.143 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,504.66' @ 12.97 hrs Surf.Area= 6,920 sf Storage= 3,166 cf

Plug-Flow detention time= 237.4 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 237.0 min (1,053.0 - 816.0)

Volume	Invert	Avail.Storage	Storage Description
#1	2,500.50'	800 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 2,000 cf Overall x 40.0% Voids
#2	2,501.50'	750 cf	**filter media (Prismatic)** Listed below (Recalc) 5,000 cf Overall x 15.0% Voids
#3	2,504.00'	11,950 cf	**surface storage (Prismatic)** Listed below (Recalc)
		13,500 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,500.50	2,000	0	0
2,501.50	2,000	2,000	2,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,501.50	2,000	0	0
2,504.00	2,000	5,000	5,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,504.00	2,000	0	0
2,506.00	4,800	6,800	6,800
2,507.00	5,500	5,150	11,950

Device	Routing	Invert	Outlet Devices
#1	Device 2	2,500.50'	**1.000 in/hr Exfiltration over Surface area above 1,863.00'** Excluded Surface area = 0 sf
#2	Primary	2,500.50'	**8.0" Round Culvert** L= 235.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,500.50' / 2,495.00' S= 0.0234 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Primary	2,506.00'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.16 cfs @ 12.97 hrs HW=2,504.66' (Free Discharge)
2=Culvert (Passes 0.16 cfs of 2.80 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.16 cfs)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AC: P-2-Wet Pond

Inflow Area = 18.547 ac, 12.56% Impervious, Inflow Depth = 3.45" for 10-YEAR event
Inflow = 49.53 cfs @ 11.94 hrs, Volume= 5.331 af
Outflow = 9.60 cfs @ 14.49 hrs, Volume= 5.318 af, Atten= 81%, Lag= 152.9 min
Primary = 9.60 cfs @ 14.49 hrs, Volume= 5.318 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 2,455.00' Surf.Area= 21,032 sf Storage= 57,564 cf
Peak Elev= 2,457.54' @ 14.49 hrs Surf.Area= 42,928 sf Storage= 147,541 cf (89,977 cf above start)

Plug-Flow detention time= 511.1 min calculated for 3.997 af (75% of inflow)
Center-of-Mass det. time= 277.9 min (1,140.7 - 862.8)

Volume	Invert	Avail.Storage	Storage Description
#1	2,448.00'	190,566 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
2,448.00	2,220	247.0	0	0	2,220
2,450.00	2,450	550.0	4,668	4,668	21,454
2,452.00	9,960	590.0	11,567	16,235	25,257
2,454.00	14,058	650.0	23,901	40,135	31,306
2,455.00	21,032	724.0	17,428	57,564	39,427
2,456.00	37,023	950.0	28,653	86,217	69,544
2,458.00	44,800	1,000.0	81,700	167,916	77,544
2,458.50	45,800	1,004.0	22,650	190,566	78,356

Device	Routing	Invert	Outlet Devices
#1	Primary	2,453.00'	**24.0" Round Culvert** L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,453.00' / 2,450.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	2,455.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	2,456.00'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	2,457.50'	**40.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=9.42 cfs @ 14.49 hrs HW=2,457.54' (Free Discharge)
—**1=Culvert** (Passes 8.70 cfs of 28.44 cfs potential flow)
—**2=Orifice/Grate** (Orifice Controls 1.43 cfs @ 7.28 fps)
—**3=Orifice/Grate** (Orifice Controls 7.27 cfs @ 4.85 fps)
—**4=Broad-Crested Rectangular Weir** (Weir Controls 0.72 cfs @ 0.51 fps)

Summary for Pond B9: bioretention-LEACH

Inflow Area = 1.166 ac, 42.82% Impervious, Inflow Depth = 4.20" for 10-YEAR event
Inflow = 8.43 cfs @ 11.94 hrs, Volume= 0.409 af
Outflow = 5.41 cfs @ 12.01 hrs, Volume= 0.318 af, Atten= 36%, Lag= 4.3 min
Primary = 5.41 cfs @ 12.01 hrs, Volume= 0.318 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,424.01' @ 12.01 hrs Surf.Area= 10,934 sf Storage= 7,206 cf

Plug-Flow detention time= 361.1 min calculated for 0.318 af (78% of inflow)
Center-of-Mass det. time= 276.6 min (1,074.0 - 797.4)

Volume	Invert	Avail.Storage	Storage Description
#1	2,418.00'	1,366 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 3,414 cf Overall x 40.0% Voids
#2	2,419.00'	2,048 cf	**filter media (Prismatic)** Listed below (Recalc) 13,656 cf Overall x 15.0% Voids
#3	2,423.00'	8,215 cf	**surface storage (Prismatic)** Listed below (Recalc)
		11,629 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,418.00	3,414	0	0
2,419.00	3,414	3,414	3,414

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,419.00	3,414	0	0
2,423.00	3,414	13,656	13,656

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,423.00	3,414	0	0
2,424.00	4,100	3,757	3,757
2,425.00	4,815	4,458	8,215

Device	Routing	Invert	Outlet Devices
#1	Primary	2,418.50'	**24.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,418.50' / 2,418.00' S= 0.0076 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,423.00'	**1.000 in/hr Exfiltration over Surface area above 2,423.00'** Excluded Surface area = 10,242 sf
#3	Device 1	2,423.50'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.38 cfs @ 12.01 hrs HW=2,424.00' (Free Discharge)
└─**1=Culvert** (Passes 5.38 cfs of 32.10 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.02 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 5.37 cfs @ 3.42 fps)

Summary for Pond Z: DRY SWALE

Inflow Area = 1.048 ac, 57.26% Impervious, Inflow Depth = 4.63" for 10-YEAR event
Inflow = 8.45 cfs @ 11.95 hrs, Volume= 0.404 af
Outflow = 1.20 cfs @ 12.14 hrs, Volume= 0.404 af, Atten= 86%, Lag= 11.3 min
Primary = 1.20 cfs @ 12.14 hrs, Volume= 0.404 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,506.11' @ 12.14 hrs Surf.Area= 8,876 sf Storage= 8,877 cf

Plug-Flow detention time= 404.6 min calculated for 0.404 af (100% of inflow)
Center-of-Mass det. time= 404.7 min (1,191.4 - 786.7)

Volume	Invert	Avail.Storage	Storage Description
#1	2,500.50'	800 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 2,000 cf Overall x 40.0% Voids
#2	2,501.50'	750 cf	**filter media (Prismatic)** Listed below (Recalc) 5,000 cf Overall x 15.0% Voids
#3	2,504.00'	11,950 cf	**surface storage (Prismatic)** Listed below (Recalc)
		13,500 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,500.50	2,000	0	0
2,501.50	2,000	2,000	2,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,501.50	2,000	0	0
2,504.00	2,000	5,000	5,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,504.00	2,000	0	0
2,506.00	4,800	6,800	6,800
2,507.00	5,500	5,150	11,950

Device	Routing	Invert	Outlet Devices
#1	Device 2	2,500.50'	**1.000 in/hr Exfiltration over Surface area above 1,863.00'** Excluded Surface area = 0 sf
#2	Primary	2,500.50'	**8.0" Round Culvert** L= 235.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,500.50' / 2,495.00' S= 0.0234 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Primary	2,506.00'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.17 cfs @ 12.14 hrs HW=2,506.11' (Free Discharge)
2=Culvert (Passes 0.21 cfs of 3.02 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.21 cfs)
3=Broad-Crested Rectangular Weir (Weir Controls 0.96 cfs @ 0.89 fps)

Summary for Pond AC: P-2-Wet Pond

Inflow Area = 18.547 ac, 12.56% Impervious, Inflow Depth = 5.22" for 100-YEAR event
Inflow = 67.59 cfs @ 11.94 hrs, Volume= 8.067 af
Outflow = 15.65 cfs @ 12.27 hrs, Volume= 8.054 af, Atten= 77%, Lag= 19.9 min
Primary = 15.65 cfs @ 12.27 hrs, Volume= 8.054 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 2,455.00' Surf.Area= 21,032 sf Storage= 57,564 cf
Peak Elev= 2,457.65' @ 12.27 hrs Surf.Area= 43,396 sf Storage= 152,597 cf (95,034 cf above start)

Plug-Flow detention time= 370.8 min calculated for 6.732 af (83% of inflow)
Center-of-Mass det. time= 220.4 min (1,088.9 - 868.5)

Volume	Invert	Avail.Storage	Storage Description
#1	2,448.00'	190,566 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
2,448.00	2,220	247.0	0	0	2,220
2,450.00	2,450	550.0	4,668	4,668	21,454
2,452.00	9,960	590.0	11,567	16,235	25,257
2,454.00	14,058	650.0	23,901	40,135	31,306
2,455.00	21,032	724.0	17,428	57,564	39,427
2,456.00	37,023	950.0	28,653	86,217	69,544
2,458.00	44,800	1,000.0	81,700	167,916	77,544
2,458.50	45,800	1,004.0	22,650	190,566	78,356

Device	Routing	Invert	Outlet Devices
#1	Primary	2,453.00'	**24.0" Round Culvert** L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,453.00' / 2,450.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	2,455.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	2,456.00'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	2,457.50'	**40.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=15.57 cfs @ 12.27 hrs HW=2,457.65' (Free Discharge)
1=**Culvert** (Passes 9.16 cfs of 28.91 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 1.47 cfs @ 7.46 fps)
3=**Orifice/Grate** (Orifice Controls 7.69 cfs @ 5.13 fps)
4=**Broad-Crested Rectangular Weir** (Weir Controls 6.41 cfs @ 1.05 fps)

Summary for Pond B9: bioretention-LEACH

Inflow Area = 1.166 ac, 42.82% Impervious, Inflow Depth = 6.10" for 100-YEAR event
Inflow = 11.95 cfs @ 11.94 hrs, Volume= 0.593 af
Outflow = 7.36 cfs @ 12.01 hrs, Volume= 0.502 af, Atten= 38%, Lag= 4.5 min
Primary = 7.36 cfs @ 12.01 hrs, Volume= 0.502 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,424.44' @ 12.01 hrs Surf.Area= 11,243 sf Storage= 9,046 cf

Plug-Flow detention time= 256.4 min calculated for 0.502 af (85% of inflow)
Center-of-Mass det. time= 187.3 min (974.4 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	2,418.00'	1,366 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 3,414 cf Overall x 40.0% Voids
#2	2,419.00'	2,048 cf	**filter media (Prismatic)** Listed below (Recalc) 13,656 cf Overall x 15.0% Voids
#3	2,423.00'	8,215 cf	**surface storage (Prismatic)** Listed below (Recalc)
		11,629 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,418.00	3,414	0	0
2,419.00	3,414	3,414	3,414

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,419.00	3,414	0	0
2,423.00	3,414	13,656	13,656

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,423.00	3,414	0	0
2,424.00	4,100	3,757	3,757
2,425.00	4,815	4,458	8,215

Device	Routing	Invert	Outlet Devices
#1	Primary	2,418.50'	**24.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,418.50' / 2,418.00' S= 0.0076 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,423.00'	**1.000 in/hr Exfiltration over Surface area above 2,423.00'** Excluded Surface area = 10,242 sf
#3	Device 1	2,423.50'	**12.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.33 cfs @ 12.01 hrs HW=2,424.43' (Free Discharge)
└─**1=Culvert** (Passes 7.33 cfs of 33.60 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.02 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 7.30 cfs @ 4.65 fps)

Summary for Pond Z: DRY SWALE

Inflow Area = 1.048 ac, 57.26% Impervious, Inflow Depth = 6.57" for 100-YEAR event
Inflow = 11.72 cfs @ 11.95 hrs, Volume= 0.574 af
Outflow = 7.66 cfs @ 12.01 hrs, Volume= 0.574 af, Atten= 35%, Lag= 4.0 min
Primary = 7.66 cfs @ 12.01 hrs, Volume= 0.574 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,506.42' @ 12.01 hrs Surf.Area= 9,095 sf Storage= 10,436 cf

Plug-Flow detention time= 326.2 min calculated for 0.574 af (100% of inflow)
Center-of-Mass det. time= 326.5 min (1,103.6 - 777.2)

Volume	Invert	Avail.Storage	Storage Description
#1	2,500.50'	800 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 2,000 cf Overall x 40.0% Voids
#2	2,501.50'	750 cf	**filter media (Prismatic)** Listed below (Recalc) 5,000 cf Overall x 15.0% Voids
#3	2,504.00'	11,950 cf	**surface storage (Prismatic)** Listed below (Recalc)
		13,500 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,500.50	2,000	0	0
2,501.50	2,000	2,000	2,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,501.50	2,000	0	0
2,504.00	2,000	5,000	5,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,504.00	2,000	0	0
2,506.00	4,800	6,800	6,800
2,507.00	5,500	5,150	11,950

Device	Routing	Invert	Outlet Devices
#1	Device 2	2,500.50'	**1.000 in/hr Exfiltration over Surface area above 1,863.00'** Excluded Surface area = 0 sf
#2	Primary	2,500.50'	**8.0" Round Culvert** L= 235.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,500.50' / 2,495.00' S= 0.0234 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#3	Primary	2,506.00'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=7.42 cfs @ 12.01 hrs HW=2,506.41' (Free Discharge)
└─**2=Culvert** (Passes 0.21 cfs of 3.06 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.21 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 7.21 cfs @ 1.75 fps)

Design Point Summary
1-yr Storm Event

Design Point Totals
10, 25 & 100-yr Storm Events

Summary for Pond DP 1a: Design Point 1a

Inflow Area = 4.640 ac, 10.76% Impervious, Inflow Depth > 0.56" for 1-YEAR event
Inflow = 2.37 cfs @ 12.09 hrs, Volume= 0.217 af
Primary = 2.37 cfs @ 12.09 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 2: Design Point 2

Inflow Area = 31.943 ac, 2.32% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 11.32 cfs @ 12.44 hrs, Volume= 1.733 af
Primary = 11.32 cfs @ 12.44 hrs, Volume= 1.733 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 3: Design Point 3

Inflow Area = 0.709 ac, 33.34% Impervious, Inflow Depth = 1.25" for 1-YEAR event
Inflow = 1.67 cfs @ 11.92 hrs, Volume= 0.074 af
Primary = 1.67 cfs @ 11.92 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 4: 18" HDPE Culvert

Inflow Area = 22.178 ac, 11.39% Impervious, Inflow Depth > 0.91" for 1-YEAR event
Inflow = 5.01 cfs @ 11.94 hrs, Volume= 1.679 af
Primary = 5.01 cfs @ 11.94 hrs, Volume= 1.679 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 5: 18" HDPE Culvert

Inflow Area = 9.412 ac, 1.70% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 8.83 cfs @ 12.03 hrs, Volume= 0.508 af
Primary = 8.83 cfs @ 12.03 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 5A: 12" Steel Culvert

Inflow Area = 13.040 ac, 0.44% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 4.58 cfs @ 12.43 hrs, Volume= 0.659 af
Primary = 4.58 cfs @ 12.43 hrs, Volume= 0.659 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 6: 52" Concrete Culvert

Inflow Area =	58.470 ac,	0.32% Impervious, Inflow Depth =	0.61"	for 1-YEAR event
Inflow =	20.84 cfs @	12.41 hrs, Volume=	2.953 af	
Primary =	20.84 cfs @	12.41 hrs, Volume=	2.953 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 6A: 28" Steel Culvert

Inflow Area =	41.780 ac,	0.64% Impervious, Inflow Depth =	0.65"	for 1-YEAR event
Inflow =	19.76 cfs @	12.28 hrs, Volume=	2.257 af	
Primary =	19.76 cfs @	12.28 hrs, Volume=	2.257 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 1a: Design Point 1a Inflow=17.84 cfs 1.130 af
Primary=17.84 cfs 1.130 af

Pond DP 2: Design Point 2 Inflow=60.02 cfs 7.734 af
Primary=60.02 cfs 7.734 af

Pond DP 3: Design Point 3 Inflow=5.19 cfs 0.235 af
Primary=5.19 cfs 0.235 af

Pond DP 4: 18" HDPE Culvert Inflow=22.94 cfs 6.224 af
Primary=22.94 cfs 6.224 af

Pond DP 5: 18" HDPE Culvert Inflow=42.79 cfs 2.274 af
Primary=42.79 cfs 2.274 af

Pond DP 5A: 12" Steel Culvert Inflow=26.09 cfs 3.048 af
Primary=26.09 cfs 3.048 af

Pond DP 6: 52" Concrete Culvert Inflow=118.71 cfs 13.668 af
Primary=118.71 cfs 13.668 af

Pond DP 6A: 28" Steel Culvert Inflow=104.54 cfs 10.092 af
Primary=104.54 cfs 10.092 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 1a: Design Point 1a	Inflow=20.24 cfs 1.292 af Primary=20.24 cfs 1.292 af
Pond DP 2: Design Point 2	Inflow=68.69 cfs 8.820 af Primary=68.69 cfs 8.820 af
Pond DP 3: Design Point 3	Inflow=5.76 cfs 0.263 af Primary=5.76 cfs 0.263 af
Pond DP 4: 18" HDPE Culvert	Inflow=26.41 cfs 7.019 af Primary=26.41 cfs 7.019 af
Pond DP 5: 18" HDPE Culvert	Inflow=48.77 cfs 2.594 af Primary=48.77 cfs 2.594 af
Pond DP 5A: 12" Steel Culvert	Inflow=29.99 cfs 3.485 af Primary=29.99 cfs 3.485 af
Pond DP 6: 52" Concrete Culvert	Inflow=136.44 cfs 15.627 af Primary=136.44 cfs 15.627 af
Pond DP 6A: 28" Steel Culvert	Inflow=119.71 cfs 11.512 af Primary=119.71 cfs 11.512 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

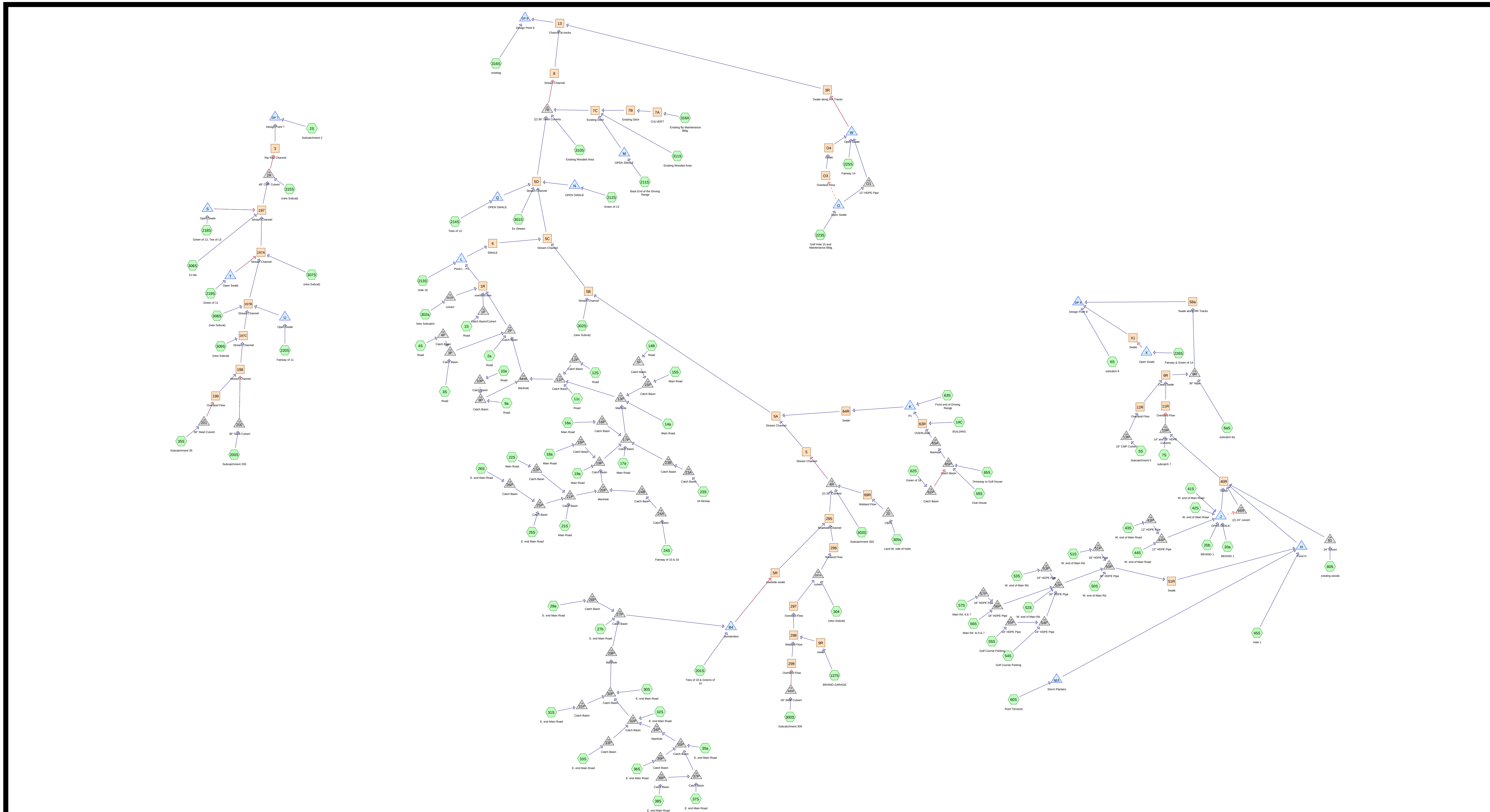
Pond DP 1a: Design Point 1a	Inflow=27.31 cfs 1.794 af Primary=27.31 cfs 1.794 af
Pond DP 2: Design Point 2	Inflow=95.64 cfs 12.211 af Primary=95.64 cfs 12.211 af
Pond DP 3: Design Point 3	Inflow=7.48 cfs 0.345 af Primary=7.48 cfs 0.345 af
Pond DP 4: 18" HDPE Culvert	Inflow=37.87 cfs 9.474 af Primary=37.87 cfs 9.474 af
Pond DP 5: 18" HDPE Culvert	Inflow=67.16 cfs 3.592 af Primary=67.16 cfs 3.592 af
Pond DP 5A: 12" Steel Culvert	Inflow=42.11 cfs 4.851 af Primary=42.11 cfs 4.851 af
Pond DP 6: 52" Concrete Culvert	Inflow=191.48 cfs 21.752 af Primary=191.48 cfs 21.752 af
Pond DP 6A: 28" Steel Culvert	Inflow=166.63 cfs 15.943 af Primary=166.63 cfs 15.943 af

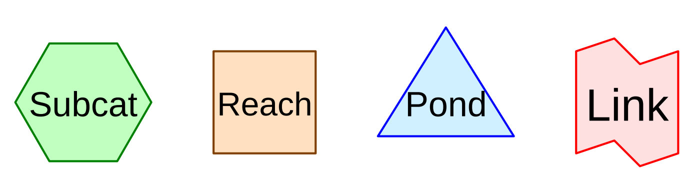
APPENDIX F

HydroCAD Data – Proposed Model – Wildacres West

1. **Proposed Model Diagram, Area/Soil Listings and Subcatchment Summaries**
2. **Proposed Reach and Culvert Summaries – 1 & 10-yr Storm Events**
3. **Proposed Pond Summaries – 1, 10 & 100-yr Storm Events**
4. **Proposed Design Point Summaries - 1-yr Event**
5. **Proposed Design Point Totals – 10, 25 and 100-yr Storm Events**

Model Diagram, Area and Soil Listings and Subcatchment Summaries





Drainage Diagram for 07074_Pro-WildacresWest

Prepared by The LA group, Printed 2/27/2012

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
38.893	61	>75% Grass cover, Good, HSG B (6aS, 23S, 24S, 45S, 51S, 53S, 60S, 62S, 63S, 80S, 201S, 211S, 212S, 213S, 214S, 218S, 219S, 220S, 223S, 225S, 226S, 303S, 305s, 307S, 309S, 316S)
0.462	68	Porous Pavement (52S, 53S, 80S, 301S, 310S, 311S, 316S)
163.770	70	Woods, Good, HSG C (2S, 5S, 6aS, 6S, 7S, 20b, 24S, 35S, 45S, 63S, 80S, 137S, 200S, 201S, 220S, 223S, 300S, 301S, 302a, 302S, 304, 306S, 307S, 308S, 309S, 310S, 311S, 315S, 316A, 316S)
15.346	71	Meadow, non-grazed, HSG C (2S, 5S, 6aS, 35S, 200S, 300S, 302S, 316A)
48.567	74	>75% Grass cover, Good, HSG C (1S, 2a, 3S, 6aS, 6S, 7S, 9a, 10a, 11c, 12S, 14a, 14B, 14C, 15S, 16a, 17a, 18a, 19a, 20a, 20b, 21S, 22S, 23S, 24S, 25S, 26S, 27b, 28a, 30S, 31S, 32S, 33S, 35a, 36S, 37S, 38S, 43S, 44S, 45S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 62S, 63S, 65S, 80S, 137S, 201S, 211S, 212S, 213S, 214S, 218S, 219S, 220S, 223S, 225S, 226S, 301S, 303S, 304, 305s, 306S, 307S, 308S, 309S, 310S, 311S, 315S, 316S)
4.641	74	Pasture/grassland/range, Good, HSG C (302a)
5.969	98	Paved (2a, 3S, 4S, 6aS, 6S, 9a, 10a, 11c, 12S, 14a, 15S, 16a, 17a, 18a, 19a, 21S, 22S, 25S, 26S, 27b, 28a, 30S, 31S, 32S, 33S, 35a, 36S, 37S, 38S, 41S, 42S, 43S, 44S, 50S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 65S, 309S, 310S, 311S, 316S)
0.249	98	Paved (Porous) (307S)
0.027	98	Paved (porous) (302S)
0.558	98	Paved Road (35S, 200S, 300S)
0.067	98	Paved parking (316A)
0.223	98	Paved parking & roofs (7S)
1.166	98	Paved parking, HSG C (5S, 14B, 14C, 20a, 63S, 223S)
3.309	98	Porous Pavement (23S, 24S, 45S, 54S, 55S, 56S, 62S, 65S, 201S, 211S, 212S, 213S, 214S, 218S, 219S, 223S, 225S, 226S, 303S, 304, 305s, 306S, 309S)
0.164	98	Porous Paving (6aS)
0.101	98	Roadway (2S)
2.655	98	Roof (1S, 6aS, 6S, 18a, 35S, 59S, 60S, 223S)
0.031	98	Roof Area (5S)
0.100	98	Roofs (11c)
0.007	98	Roofs, HSG C (63S)
0.667	98	Water Surface, 0% imp, HSG C (63S, 213S)
0.179	98	Water Surface, HSG C (220S)
0.389	98	porous paving (220S)

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
38.893	HSG B	6aS, 23S, 24S, 45S, 51S, 53S, 60S, 62S, 63S, 80S, 201S, 211S, 212S, 213S, 214S, 218S, 219S, 220S, 223S, 225S, 226S, 303S, 305s, 307S, 309S, 316S
234.343	HSG C	1S, 2a, 2S, 3S, 5S, 6aS, 6S, 7S, 9a, 10a, 11c, 12S, 14a, 14B, 14C, 15S, 16a, 17a, 18a, 19a, 20a, 20b, 21S, 22S, 23S, 24S, 25S, 26S, 27b, 28a, 30S, 31S, 32S, 33S, 35a, 35S, 36S, 37S, 38S, 43S, 44S, 45S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 62S, 63S, 65S, 80S, 137S, 200S, 201S, 211S, 212S, 213S, 214S, 218S, 219S, 220S, 223S, 225S, 226S, 300S, 301S, 302a, 302S, 303S, 304, 305s, 306S, 307S, 308S, 309S, 310S, 311S, 315S, 316A, 316S
0.000	HSG D	
14.302	Other	1S, 2a, 2S, 3S, 4S, 5S, 6aS, 6S, 7S, 9a, 10a, 11c, 12S, 14a, 15S, 16a, 17a, 18a, 19a, 21S, 22S, 23S, 24S, 25S, 26S, 27b, 28a, 30S, 31S, 32S, 33S, 35a, 35S, 36S, 37S, 38S, 41S, 42S, 43S, 44S, 45S, 50S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 59S, 60S, 62S, 65S, 80S, 200S, 201S, 211S, 212S, 213S, 214S, 218S, 219S, 220S, 223S, 225S, 226S, 300S, 301S, 302S, 303S, 304, 305s, 306S, 307S, 309S, 310S, 311S, 316A, 316S

Summary for Subcatchment 1S: Road

Runoff = 3.14 cfs @ 12.01 hrs, Volume= 0.170 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	30,818	98	Roof
	23,162	74	>75% Grass cover, Good, HSG C
	53,980	88	Weighted Average
	23,162		42.91% Pervious Area
	30,818		57.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0200	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.8	130	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	230	Total			

Summary for Subcatchment 2a: Road

Runoff = 1.25 cfs @ 11.92 hrs, Volume= 0.056 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	10,932	98	Paved
	3,222	74	>75% Grass cover, Good, HSG C
	14,154	93	Weighted Average
	3,222		22.76% Pervious Area
	10,932		77.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.9	219	0.0380	3.96		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	319	Total			

Summary for Subcatchment 2S: Subcatchment 2

Runoff = 0.65 cfs @ 12.00 hrs, Volume= 0.033 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	4,400	98	Roadway
	5,009	71	Meadow, non-grazed, HSG C
	9,060	70	Woods, Good, HSG C
	18,469	77	Weighted Average
	14,069		76.18% Pervious Area
	4,400		23.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	90	0.2290	0.23		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
0.8	70	0.2550	1.51		**Shallow Concentrated Flow, SC Flow through Woods** Kv= 3.0 fps
0.3	215	0.0547	13.12	137.80	**Trap/Vee/Rect Channel Flow, Vegetated Swale along RR Tracks** Bot.W=2.00' D=3.00' Z= 0.5 '/' Top.W=5.00' n= 0.030
7.8	375	Total			

Summary for Subcatchment 3S: Road

Runoff = 0.58 cfs @ 11.91 hrs, Volume= 0.024 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	4,120	98	Paved
	3,743	74	>75% Grass cover, Good, HSG C
	7,863	87	Weighted Average
	3,743		47.60% Pervious Area
	4,120		52.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1100	3.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	172	0.1100	6.73		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	272	Total			

Summary for Subcatchment 4S: Road

Runoff = 0.46 cfs @ 11.91 hrs, Volume= 0.022 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	4,505	98	Paved
	4,505		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	2.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	174	0.0460	4.35		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	274	Total			

Summary for Subcatchment 5S: Subcatchment 5

Runoff = 1.93 cfs @ 12.07 hrs, Volume= 0.130 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	39,399	71	Meadow, non-grazed, HSG C
*	1,338	98	Roof Area
	45,785	70	Woods, Good, HSG C
	5,498	98	Paved parking, HSG C
	92,020	73	Weighted Average
	85,184		92.57% Pervious Area
	6,836		7.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.1300	0.18		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
4.3	390	0.0920	1.52		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.5	225	0.0346	7.48	29.91	**Trap/Vee/Rect Channel Flow, Flow in Vegated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
13.9	715	Total			

Summary for Subcatchment 6aS: subcatch 6a

Runoff = 8.62 cfs @ 12.13 hrs, Volume= 0.703 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	7,130	98	Porous Paving
*	2,840	98	Roof
	334,295	70	Woods, Good, HSG C
	27,046	74	>75% Grass cover, Good, HSG C
*	18,735	98	Paved
	9,300	61	>75% Grass cover, Good, HSG B
	131,702	71	Meadow, non-grazed, HSG C
	531,048	72	Weighted Average
	502,343		94.59% Pervious Area
	28,705		5.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.1200	0.18		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
9.2	915	0.1100	1.66		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	240	0.0950	18.86	150.91	**Trap/Vee/Rect Channel Flow, swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.025 Earth, clean & winding
18.8	1,255	Total			

Summary for Subcatchment 6S: subcatch 6

Runoff = 6.25 cfs @ 12.14 hrs, Volume= 0.516 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	7,240	98	Roof
	293,063	70	Woods, Good, HSG C
	78,387	74	>75% Grass cover, Good, HSG C
*	10,890	98	Paved
	389,580	72	Weighted Average
	371,450		95.35% Pervious Area
	18,130		4.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.1100	0.17		**Sheet Flow, Sheet Flow through Woods**
					Woods: Light underbrush n= 0.400 P2= 4.00"
7.7	1,015	0.1950	2.21		**Shallow Concentrated Flow, SC Flow through Woods**
					Woodland Kv= 5.0 fps
1.7	1,060	0.0750	10.48	83.81	**Trap/Vee/Rect Channel Flow, RR Swale w/ Gravel and Leaves**
					Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00'
					n= 0.040 Earth, cobble bottom, clean sides
19.1	2,175	Total			

Summary for Subcatchment 7S: subcatch 7

Runoff = 1.54 cfs @ 11.94 hrs, Volume= 0.065 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	9,700	98	Paved parking & roofs
	5,730	70	Woods, Good, HSG C
	12,143	74	>75% Grass cover, Good, HSG C
	27,573	82	Weighted Average
	17,873		64.82% Pervious Area
	9,700		35.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	20	0.3000	0.41		**Sheet Flow,**
					Grass: Short n= 0.150 P2= 4.00"
2.1	225	0.1250	1.77		**Shallow Concentrated Flow,**
					Woodland Kv= 5.0 fps
2.9	245	Total			

Summary for Subcatchment 9a: Road

Runoff = 0.30 cfs @ 11.91 hrs, Volume= 0.012 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,405	98	Paved
	1,022	74	>75% Grass cover, Good, HSG C
	3,427	91	Weighted Average
	1,022		29.82% Pervious Area
	2,405		70.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0790	2.66		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	138	0.0790	5.71		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	238	Total			

Summary for Subcatchment 10a: Road

Runoff = 0.39 cfs @ 11.91 hrs, Volume= 0.018 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,650	98	Paved
	200	74	>75% Grass cover, Good, HSG C
	3,850	97	Weighted Average
	200		5.19% Pervious Area
	3,650		94.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0940	2.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.5	171	0.0940	6.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	271	Total			

Summary for Subcatchment 11c: Road

Runoff = 1.40 cfs @ 11.90 hrs, Volume= 0.058 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	7,010	98	Paved
	4,732	74	>75% Grass cover, Good, HSG C
*	4,335	98	Roofs
	16,077	91	Weighted Average
	4,732		29.43% Pervious Area
	11,345		70.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0920	2.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.1	31	0.0920	6.16		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	131	Total			

Summary for Subcatchment 12S: Road

Runoff = 0.29 cfs @ 11.90 hrs, Volume= 0.013 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,610	98	Paved
	330	74	>75% Grass cover, Good, HSG C
	2,940	95	Weighted Average
	330		11.22% Pervious Area
	2,610		88.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0810	2.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.1	49	0.0810	5.78		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	149	Total			

Summary for Subcatchment 14a: Main Road

Runoff = 0.54 cfs @ 11.94 hrs, Volume= 0.023 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	4,265	98	Paved
	3,075	74	>75% Grass cover, Good, HSG C
	7,340	88	Weighted Average
	3,075		41.89% Pervious Area
	4,265		58.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0280	1.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
2.0	411	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.9	511	Total			

Summary for Subcatchment 14B: Road

Runoff = 0.92 cfs @ 11.94 hrs, Volume= 0.041 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
8,075	98	Paved parking, HSG C
3,326	74	>75% Grass cover, Good, HSG C
11,401	91	Weighted Average
3,326		29.17% Pervious Area
8,075		70.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
2.3	426	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	526	Total			

Summary for Subcatchment 14C: BUILDING

Runoff = 1.89 cfs @ 11.98 hrs, Volume= 0.095 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
19,361	98	Paved parking, HSG C
5,890	74	>75% Grass cover, Good, HSG C
25,251	92	Weighted Average
5,890		23.33% Pervious Area
19,361		76.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0400	0.25		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 4.00"
0.2	27	0.0375	2.90		**Shallow Concentrated Flow, shallow concentrated flow** Grassed Waterway Kv= 15.0 fps
6.8	127	Total			

Summary for Subcatchment 15S: Main Road

Runoff = 1.16 cfs @ 11.93 hrs, Volume= 0.050 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	9,480	98	Paved
	5,664	74	>75% Grass cover, Good, HSG C
	15,144	89	Weighted Average
	5,664		37.40% Pervious Area
	9,480		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0290	1.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
1.9	394	0.0290	3.46		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.8	494	Total			

Summary for Subcatchment 16a: Main Road

Runoff = 0.74 cfs @ 11.91 hrs, Volume= 0.034 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	6,864	98	Paved
	453	74	>75% Grass cover, Good, HSG C
	7,317	97	Weighted Average
	453		6.19% Pervious Area
	6,864		93.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0750	2.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.6	206	0.0750	5.56		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	306	Total			

Summary for Subcatchment 17a: Main Road

Runoff = 0.37 cfs @ 11.91 hrs, Volume= 0.016 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,040	98	Paved
	1,330	74	>75% Grass cover, Good, HSG C
	4,370	91	Weighted Average
	1,330		30.43% Pervious Area
	3,040		69.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0790	2.66		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.6	192	0.0790	5.71		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	292	Total			

Summary for Subcatchment 18a: Main Road

Runoff = 2.99 cfs @ 11.91 hrs, Volume= 0.137 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	13,586	98	Paved
	2,952	74	>75% Grass cover, Good, HSG C
*	13,800	98	Roof
	30,338	96	Weighted Average
	2,952		9.73% Pervious Area
	27,386		90.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	56	0.0360	1.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.9	220	0.0450	4.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	276	Total			

Summary for Subcatchment 19a: Main Road

Runoff = 0.35 cfs @ 11.91 hrs, Volume= 0.015 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,920	98	Paved
	1,054	74	>75% Grass cover, Good, HSG C
	3,974	92	Weighted Average
	1,054		26.52% Pervious Area
	2,920		73.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0400	2.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.6	139	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	239	Total			

Summary for Subcatchment 20a: BEHIND 1

Runoff = 1.10 cfs @ 11.91 hrs, Volume= 0.044 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
26,663	74	>75% Grass cover, Good, HSG C
910	98	Paved parking, HSG C
27,573	75	Weighted Average
26,663		96.70% Pervious Area
910		3.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	395	0.0380	6.65	79.79	**Channel Flow,** Area= 12.0 sf Perim= 21.0' r= 0.57' n= 0.030 Earth, grassed & winding

Summary for Subcatchment 20b: BEHIND 1

Runoff = 0.83 cfs @ 11.97 hrs, Volume= 0.039 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	23,963	74	>75% Grass cover, Good, HSG C
	3,610	70	Woods, Good, HSG C
	27,573	73	Weighted Average
	27,573		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.4	136	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.2	236	Total			

Summary for Subcatchment 21S: Main Road

Runoff = 0.39 cfs @ 11.91 hrs, Volume= 0.016 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,330	98	Paved
	1,244	74	>75% Grass cover, Good, HSG C
	4,574	91	Weighted Average
	1,244		27.20% Pervious Area
	3,330		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0610	2.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.6	169	0.0610	5.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	269	Total			

Summary for Subcatchment 22S: Main Road

Runoff = 1.58 cfs @ 11.91 hrs, Volume= 0.067 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	13,274	98	Paved
	5,332	74	>75% Grass cover, Good, HSG C
	18,606	91	Weighted Average
	5,332		28.66% Pervious Area
	13,274		71.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0630	2.43		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	161	0.0311	3.58		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	261	Total			

Summary for Subcatchment 23S: 18 fairway

Runoff = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	1,549	74	>75% Grass cover, Good, HSG C
*	3,090	98	Porous Pavement
	27,280	61	>75% Grass cover, Good, HSG B
	31,919	65	Weighted Average
	28,829		90.32% Pervious Area
	3,090		9.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	100	0.0640	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.7	73	0.0640	1.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	114	0.0100	3.17	7.92	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 0.5 '/' Top.W=3.00' n= 0.033 Earth, grassed & winding
6.8	287	Total			

Summary for Subcatchment 24S: Fairway of 10 & 18

Runoff = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	23,070	74	>75% Grass cover, Good, HSG C
	6,012	70	Woods, Good, HSG C
*	8,530	98	Porous Pavement
	138,653	61	>75% Grass cover, Good, HSG B
	176,265	65	Weighted Average
	167,735		95.16% Pervious Area
	8,530		4.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.9	152	0.0054	2.69	13.44	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.00' Z= 1.0 '/' Top.W=6.00' n= 0.033 Earth, grassed & winding
5.9	252	Total			

Summary for Subcatchment 25S: E. end Main Road

Runoff = 0.33 cfs @ 11.91 hrs, Volume= 0.014 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,740	98	Paved
	1,011	74	>75% Grass cover, Good, HSG C
	3,751	92	Weighted Average
	1,011		26.95% Pervious Area
	2,740		73.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0700	2.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	127	0.0700	5.37		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	227	Total			

Summary for Subcatchment 26S: E. end Main Road

Runoff = 0.32 cfs @ 11.91 hrs, Volume= 0.014 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,740	98	Paved
	905	74	>75% Grass cover, Good, HSG C
	3,645	92	Weighted Average
	905		24.83% Pervious Area
	2,740		75.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0700	2.54		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	126	0.0700	5.37		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	226	Total			

Summary for Subcatchment 27b: E. end Main Road

Runoff = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,930	98	Paved
	1,046	74	>75% Grass cover, Good, HSG C
	3,976	92	Weighted Average
	1,046		26.31% Pervious Area
	2,930		73.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1250	3.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.3	140	0.1250	7.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	240	Total			

Summary for Subcatchment 28a: E. end Main Road

Runoff = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,090	98	Paved
	970	74	>75% Grass cover, Good, HSG C
	4,060	92	Weighted Average
	970		23.89% Pervious Area
	3,090		76.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1170	3.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	156	0.1170	6.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	256	Total			

Summary for Subcatchment 30S: E. end Main Road

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 0.010 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,010	98	Paved
	709	74	>75% Grass cover, Good, HSG C
	2,719	92	Weighted Average
	709		26.08% Pervious Area
	2,010		73.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1290	3.24		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.1	63	0.1290	7.29		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	163	Total			

Summary for Subcatchment 31S: E. end Main Road

Runoff = 0.26 cfs @ 11.90 hrs, Volume= 0.011 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,160	98	Paved
	749	74	>75% Grass cover, Good, HSG C
	2,909	92	Weighted Average
	749		25.75% Pervious Area
	2,160		74.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1190	3.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.2	77	0.1190	7.00		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	177	Total			

Summary for Subcatchment 32S: E. end Main Road

Runoff = 0.32 cfs @ 11.91 hrs, Volume= 0.014 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,640	98	Paved
	941	74	>75% Grass cover, Good, HSG C
	3,581	92	Weighted Average
	941		26.28% Pervious Area
	2,640		73.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1270	3.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.3	112	0.1270	7.23		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	212	Total			

Summary for Subcatchment 33S: E. end Main Road

Runoff = 0.34 cfs @ 11.91 hrs, Volume= 0.014 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,780	98	Paved
	956	74	>75% Grass cover, Good, HSG C
	3,736	92	Weighted Average
	956		25.59% Pervious Area
	2,780		74.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1170	3.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.3	130	0.1170	6.94		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	230	Total			

Summary for Subcatchment 35a: E. end Main Road

Runoff = 0.29 cfs @ 11.90 hrs, Volume= 0.012 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,400	98	Paved
	908	74	>75% Grass cover, Good, HSG C
	3,308	91	Weighted Average
	908		27.45% Pervious Area
	2,400		72.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1220	3.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.2	96	0.1220	7.09		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	196	Total			

Summary for Subcatchment 35S: Subcatchment 35

Runoff = 7.26 cfs @ 12.17 hrs, Volume= 0.660 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	6,708	98	Paved Road
	393,477	70	Woods, Good, HSG C
	122,752	71	Meadow, non-grazed, HSG C
*	9,104	98	Roof
	532,041	71	Weighted Average
	516,229		97.03% Pervious Area
	15,812		2.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	100	0.1667	0.50		**Sheet Flow, Sheet Flow through Ski Trail** Range n= 0.130 P2= 4.00"
3.7	630	0.3170	2.82		**Shallow Concentrated Flow, Sheet Flow through Woods** Woodland Kv= 5.0 fps
1.3	270	0.2590	3.56		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.6	225	0.2220	2.36		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.5	115	0.3478	4.13		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.5	230	0.2790	2.64		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	50	0.3150	3.93		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
9.3	1,470	0.2799	2.65		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
21.4	3,090	Total			

Summary for Subcatchment 36S: E. end Main Road

Runoff = 0.29 cfs @ 11.90 hrs, Volume= 0.012 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,400	98	Paved
	804	74	>75% Grass cover, Good, HSG C
	3,204	92	Weighted Average
	804		25.09% Pervious Area
	2,400		74.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1210	3.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.2	98	0.1210	7.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	198	Total			

Summary for Subcatchment 37S: E. end Main Road

Runoff = 0.38 cfs @ 11.91 hrs, Volume= 0.016 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,200	98	Paved
	1,247	74	>75% Grass cover, Good, HSG C
	4,447	91	Weighted Average
	1,247		28.04% Pervious Area
	3,200		71.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0620	2.42		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.5	143	0.0620	5.05		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	243	Total			

Summary for Subcatchment 38S: E. end Main Road

Runoff = 0.32 cfs @ 11.91 hrs, Volume= 0.013 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	2,730	98	Paved
	839	74	>75% Grass cover, Good, HSG C
	3,569	92	Weighted Average
	839		23.51% Pervious Area
	2,730		76.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0720	2.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.3	107	0.0720	5.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	207	Total			

Summary for Subcatchment 41S: W. end of Main Road

Runoff = 0.77 cfs @ 11.91 hrs, Volume= 0.038 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	7,632	98	Paved
	7,632		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0467	2.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.9	190	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	290	Total			

Summary for Subcatchment 42S: W. end of Main Road

Runoff = 0.71 cfs @ 11.91 hrs, Volume= 0.034 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	7,012	98	Paved
	7,012		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0467	2.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.9	183	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	283	Total			

Summary for Subcatchment 43S: W. end of Main Road

Runoff = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,000	98	Paved
	858	74	>75% Grass cover, Good, HSG C
	3,858	93	Weighted Average
	858		22.24% Pervious Area
	3,000		77.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1200	3.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	144	0.1110	6.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	244	Total			

Summary for Subcatchment 44S: W. end of Main Road

Runoff = 0.35 cfs @ 11.90 hrs, Volume= 0.015 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,000	98	Paved
	652	74	>75% Grass cover, Good, HSG C
	3,652	94	Weighted Average
	652		17.85% Pervious Area
	3,000		82.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1200	3.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.3	139	0.1150	6.88		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	239	Total			

Summary for Subcatchment 45S: Hole 1

Runoff = 7.17 cfs @ 12.02 hrs, Volume= 0.426 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	29,365	70	Woods, Good, HSG C
	168,858	74	>75% Grass cover, Good, HSG C
*	16,666	98	Porous Pavement
	208,438	61	>75% Grass cover, Good, HSG B
	423,327	68	Weighted Average
	406,661		96.06% Pervious Area
	16,666		3.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0500	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.2	208	0.1830	2.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	888	0.0690	10.54	55.33	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
8.7	1,196	Total			

Summary for Subcatchment 50S: W. end of Main Rd.

Runoff = 0.41 cfs @ 11.91 hrs, Volume= 0.019 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,930	98	Paved
	3,930		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	100	0.1140	3.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.5	193	0.1140	6.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	293	Total			

Summary for Subcatchment 51S: W. end of Main Rd.

Runoff = 0.63 cfs @ 11.96 hrs, Volume= 0.028 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,600	98	Paved
	8,603	74	>75% Grass cover, Good, HSG C
	5,464	61	>75% Grass cover, Good, HSG B
	17,667	75	Weighted Average
	14,067		79.62% Pervious Area
	3,600		20.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	86	0.1400	0.40		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.1	14	0.1140	2.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.6	261	0.1150	6.88		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.3	361	Total			

Summary for Subcatchment 52S: W. end of Main Rd.

Runoff = 0.41 cfs @ 11.93 hrs, Volume= 0.017 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	7,193	74	>75% Grass cover, Good, HSG C
*	1,536	98	Paved
*	816	68	Porous Pavement
	9,545	77	Weighted Average
	8,009		83.91% Pervious Area
	1,536		16.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	40	0.4000	0.52		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.5	60	0.0500	2.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.6	220	0.0820	5.81		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	320	Total			

Summary for Subcatchment 53S: W. end of Main Rd.

Runoff = 0.66 cfs @ 11.95 hrs, Volume= 0.029 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	6,647	74	>75% Grass cover, Good, HSG C
*	3,490	98	Paved
*	4,753	68	Porous Pavement
	4,360	61	>75% Grass cover, Good, HSG B
	19,250	74	Weighted Average
	15,760		81.87% Pervious Area
	3,490		18.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.0750	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.4	60	0.0670	2.25		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.8	236	0.0660	5.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	336	Total			

Summary for Subcatchment 54S: Golf Course Parking

Runoff = 4.19 cfs @ 12.00 hrs, Volume= 0.213 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	17,600	98	Paved
	67,503	74	>75% Grass cover, Good, HSG C
*	10,730	98	Porous Pavement
	95,833	81	Weighted Average
	67,503		70.44% Pervious Area
	28,330		29.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	27	0.0760	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.3	33	0.0450	1.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
2.7	40	0.0625	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
2.7	434	0.1470	2.68		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	188	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.2	722	Total			

Summary for Subcatchment 55S: Golf Course Parking

Runoff = 1.38 cfs @ 11.91 hrs, Volume= 0.060 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	3,030	74	>75% Grass cover, Good, HSG C
*	11,425	98	Paved
*	815	98	Porous Pavement
	15,270	93	Weighted Average
	3,030		19.84% Pervious Area
	12,240		80.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0330	1.88		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	159	0.0390	4.01		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	259	Total			

Summary for Subcatchment 56S: Main Rd. to 6 & 7

Runoff = 0.93 cfs @ 11.92 hrs, Volume= 0.038 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	13,240	74	>75% Grass cover, Good, HSG C
*	3,160	98	Paved
*	1,620	98	Porous Pavement
	18,020	80	Weighted Average
	13,240		73.47% Pervious Area
	4,780		26.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0170	1.44		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.5	145	0.0480	4.45		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	245	Total			

Summary for Subcatchment 57S: Main Rd. 6 & 7

Runoff = 0.45 cfs @ 11.92 hrs, Volume= 0.020 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	4,049	98	Paved
	831	74	>75% Grass cover, Good, HSG C
	4,880	94	Weighted Average
	831		17.03% Pervious Area
	4,049		82.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0160	1.41		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	137	0.0292	3.47		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.9	237	Total			

Summary for Subcatchment 59S: Club House

Runoff = 0.67 cfs @ 11.96 hrs, Volume= 0.035 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	7,222	98	Roof
	7,222		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 60S: Roof Terraces

Runoff = 3.53 cfs @ 11.96 hrs, Volume= 0.170 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	36,970	98	Roof
	5,980	61	>75% Grass cover, Good, HSG B
	42,950	93	Weighted Average
	5,980		13.92% Pervious Area
	36,970		86.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 62S: Green of 18

Runoff = 0.62 cfs @ 12.03 hrs, Volume= 0.043 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	2,744	74	>75% Grass cover, Good, HSG C
*	2,600	98	Porous Pavement
	59,100	61	>75% Grass cover, Good, HSG B
	64,444	63	Weighted Average
	61,844		95.97% Pervious Area
	2,600		4.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0350	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.6	78	0.1030	2.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	255	0.0512	9.08	47.66	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
8.1	433	Total			

Summary for Subcatchment 63S: Front end of Driving Range

Runoff = 3.34 cfs @ 12.09 hrs, Volume= 0.249 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
75,560	74	>75% Grass cover, Good, HSG C
16,416	70	Woods, Good, HSG C
15,620	98	Water Surface, 0% imp, HSG C
121,724	61	>75% Grass cover, Good, HSG B
642	98	Paved parking, HSG C
319	98	Roofs, HSG C
230,281	69	Weighted Average
229,320		99.58% Pervious Area
961		0.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0250	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
5.7	496	0.0430	1.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	297	0.0330	7.29	38.26	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
14.4	893	Total			

Summary for Subcatchment 65S: Driveway to Golf House

Runoff = 1.40 cfs @ 11.92 hrs, Volume= 0.059 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	5,721	74	>75% Grass cover, Good, HSG C
*	8,740	98	Paved
*	2,800	98	Porous Pavement
	17,261	90	Weighted Average
	5,721		33.14% Pervious Area
	11,540		66.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0350	1.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	199	0.0830	4.64		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.6	299	Total			

Summary for Subcatchment 80S: existing woods

Runoff = 3.20 cfs @ 11.97 hrs, Volume= 0.153 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	62,404	74	>75% Grass cover, Good, HSG C
	46,340	70	Woods, Good, HSG C
*	3,190	68	Porous Pavement
	11,666	61	>75% Grass cover, Good, HSG B
	123,600	71	Weighted Average
	123,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow, sheet** Grass: Short n= 0.150 P2= 4.00"
0.3	90	0.1300	5.41		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.1	410	0.0350	6.38	76.58	**Channel Flow,** Area= 12.0 sf Perim= 21.0' r= 0.57' n= 0.030 Earth, grassed & winding
5.2	600	Total			

Summary for Subcatchment 137S: BEHIND GARAGE

Runoff = 0.73 cfs @ 12.01 hrs, Volume= 0.039 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
10,210	74	>75% Grass cover, Good, HSG C
21,275	70	Woods, Good, HSG C
31,485	71	Weighted Average
31,485		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	97	0.2500	0.24		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
1.0	280	0.0180	4.68	11.69	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
7.8	377	Total			

Summary for Subcatchment 200S: Subcatchment 200

Runoff = 38.77 cfs @ 12.20 hrs, Volume= 3.859 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	311,323	71	Meadow, non-grazed, HSG C
*	14,331	98	Paved Road
	3,002,765	70	Woods, Good, HSG C
	3,328,419	70	Weighted Average
	3,314,088		99.57% Pervious Area
	14,331		0.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	100	0.1667	0.50		**Sheet Flow, Sheet Flow through Ski Trail** Range n= 0.130 P2= 4.00"
3.7	630	0.3170	2.82		**Shallow Concentrated Flow, Sheet Flow through Woods** Woodland Kv= 5.0 fps
1.3	270	0.2590	3.56		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.6	225	0.2220	2.36		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.5	115	0.3478	4.13		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
1.4	215	0.2790	2.64		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	70	0.3150	3.93		**Shallow Concentrated Flow, SC Flow through Ski Trail** Short Grass Pasture Kv= 7.0 fps
11.1	1,760	0.2799	2.65		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	160	0.0500	8.99	35.95	**Trap/Vee/Rect Channel Flow, Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
23.5	3,545	Total			

Summary for Subcatchment 201S: Tees of 18 & Greens of 10

Runoff = 4.03 cfs @ 11.97 hrs, Volume= 0.193 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	64,007	74	>75% Grass cover, Good, HSG C
*	12,310	98	Porous Pavement
	86,820	61	>75% Grass cover, Good, HSG B
	15,640	70	Woods, Good, HSG C
	178,777	69	Weighted Average
	166,467		93.11% Pervious Area
	12,310		6.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1658	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.5	93	0.1658	2.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	232	0.0948	13.87	114.45	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 1.0 '/' Top.W=7.00' n= 0.033 Earth, grassed & winding
4.6	425	Total			

Summary for Subcatchment 211S: Back End of the Driving Range

Runoff = 3.31 cfs @ 11.99 hrs, Volume= 0.181 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	61,458	74	>75% Grass cover, Good, HSG C
*	5,760	98	Porous Pavement
	141,430	61	>75% Grass cover, Good, HSG B
	208,648	66	Weighted Average
	202,888		97.24% Pervious Area
	5,760		2.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.3	40	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	765	0.1390	14.96	78.53	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
5.8	905	Total			

Summary for Subcatchment 212S: Green of 13

Runoff = 0.89 cfs @ 11.98 hrs, Volume= 0.050 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	9,320	74	>75% Grass cover, Good, HSG C
*	1,810	98	Porous Pavement
	57,180	61	>75% Grass cover, Good, HSG B
	68,310	64	Weighted Average
	66,500		97.35% Pervious Area
	1,810		2.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.3	119	0.0336	7.35	38.61	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
4.9	219	Total			

Summary for Subcatchment 213S: Hole 16

Runoff = 2.87 cfs @ 12.06 hrs, Volume= 0.196 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	45,442	74	>75% Grass cover, Good, HSG C
*	8,230	98	Porous Pavement
	127,890	61	>75% Grass cover, Good, HSG B
	13,418	98	Water Surface, 0% imp, HSG C
	194,980	68	Weighted Average
	186,750		95.78% Pervious Area
	8,230		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	100	0.0118	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.9	590	0.0576	10.81	89.21	**Trap/Vee/Rect Channel Flow, Turf Reinforcement Mat** Bot.W=4.00' D=1.50' Z= 1.0 '/' Top.W=7.00' n= 0.033 Earth, grassed & winding
11.7	690	Total			

Summary for Subcatchment 214S: Tees of 13

Runoff = 2.43 cfs @ 12.00 hrs, Volume= 0.137 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	36,885	74	>75% Grass cover, Good, HSG C
*	9,000	98	Porous Pavement
	112,185	61	>75% Grass cover, Good, HSG B
	158,070	66	Weighted Average
	149,070		94.31% Pervious Area
	9,000		5.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0600	0.30		**Sheet Flow,**
					Grass: Short n= 0.150 P2= 4.00"
0.7	527	0.0700	11.92	98.35	**Trap/Vee/Rect Channel Flow, TRM Swale**
					Bot.W=4.00' D=1.50' Z= 1.0 '/' Top.W=7.00'
					n= 0.033 Earth, grassed & winding
0.0	20	0.0200	13.34	94.33	**Pipe Channel,**
					36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75'
					n= 0.013 Corrugated PE, smooth interior
0.1	110	0.1500	17.45	143.97	**Trap/Vee/Rect Channel Flow, TRM Swale**
					Bot.W=4.00' D=1.50' Z= 1.0 '/' Top.W=7.00'
					n= 0.033 Earth, grassed & winding
6.4	757	Total			

Summary for Subcatchment 218S: Green of 12, Tee of 13

Runoff = 1.78 cfs @ 12.00 hrs, Volume= 0.097 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	40,598	74	>75% Grass cover, Good, HSG C
*	4,120	98	Porous Pavement
	51,700	61	>75% Grass cover, Good, HSG B
	96,418	68	Weighted Average
	92,298		95.73% Pervious Area
	4,120		4.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0800	0.33		**Sheet Flow,**
					Grass: Short n= 0.150 P2= 4.00"
1.7	200	0.0800	1.98		**Shallow Concentrated Flow,**
					Short Grass Pasture Kv= 7.0 fps
0.2	167	0.1205	17.20	141.94	**Trap/Vee/Rect Channel Flow, TRM Swale**
					Bot.W=4.00' D=1.50' Z= 1.0 '/' Top.W=7.00'
					n= 0.030 Earth, grassed & winding
6.9	467	Total			

Summary for Subcatchment 219S: Green of 11

Runoff = 2.14 cfs @ 11.94 hrs, Volume= 0.092 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	37,165	74	>75% Grass cover, Good, HSG C
*	6,050	98	Porous Pavement
	35,770	61	>75% Grass cover, Good, HSG B
	78,985	70	Weighted Average
	72,935		92.34% Pervious Area
	6,050		7.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0130	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.4	108	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	198	0.0550	10.57	87.18	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 1.0 '/' Top.W=7.00' n= 0.033 Earth, grassed & winding
2.0	406	Total			

Summary for Subcatchment 220S: Fairway of 11

Runoff = 4.49 cfs @ 12.06 hrs, Volume= 0.305 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	76,630	74	>75% Grass cover, Good, HSG C
	34,383	70	Woods, Good, HSG C
*	16,925	98	porous paving
	146,470	61	>75% Grass cover, Good, HSG B
	7,780	98	Water Surface, HSG C
	282,188	69	Weighted Average
	257,483		91.25% Pervious Area
	24,705		8.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	100	0.1200	0.39		**Sheet Flow, sheet flow** Grass: Short n= 0.150 P2= 4.00"
7.7	627	0.0730	1.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	142	0.1270	15.73	82.57	**Trap/Vee/Rect Channel Flow, TRM Swale** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.030 Earth, grassed & winding
12.2	869	Total			

Summary for Subcatchment 223S: Golf Hole 15 and Maintenance Bldg.

Runoff = 6.06 cfs @ 11.96 hrs, Volume= 0.272 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	16,393	70	Woods, Good, HSG C
	84,076	74	>75% Grass cover, Good, HSG C
*	7,663	98	Roof
	62,572	61	>75% Grass cover, Good, HSG B
*	5,950	98	Porous Pavement
	16,303	98	Paved parking, HSG C
	192,957	73	Weighted Average
	163,041		84.50% Pervious Area
	29,916		15.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1000	2.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
2.2	70	0.3000	0.52		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.5	233	0.1460	2.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	68	0.0200	5.67	29.79	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
4.1	401	Total			

Summary for Subcatchment 225S: Fairway 14

Runoff = 3.05 cfs @ 11.98 hrs, Volume= 0.162 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	55,496	74	>75% Grass cover, Good, HSG C
*	7,480	98	Porous Pavement
	124,042	61	>75% Grass cover, Good, HSG B
	187,018	66	Weighted Average
	179,538		96.00% Pervious Area
	7,480		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.1800	0.46		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.1	147	0.0950	2.16		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	284	0.0560	9.49	49.84	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
5.2	531	Total			

Summary for Subcatchment 226S: Fairway & Green of 14

Runoff = 1.91 cfs @ 11.99 hrs, Volume= 0.102 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	28,724	74	>75% Grass cover, Good, HSG C
*	7,290	98	Porous Pavement
	72,670	61	>75% Grass cover, Good, HSG B
	108,684	67	Weighted Average
	101,394		93.29% Pervious Area
	7,290		6.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	100	0.3100	0.57		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.8	225	0.0840	2.03		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	100	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	43	0.0470	1.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	468	Total			

Summary for Subcatchment 300S: Subcatchment 300

Runoff = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,267	98	Paved Road
	6,447	71	Meadow, non-grazed, HSG C
	702,884	70	Woods, Good, HSG C
	712,598	70	Weighted Average
	709,331		99.54% Pervious Area
	3,267		0.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	120	0.2500	0.25		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
12.7	1,810	0.2257	2.38		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.2	110	0.0910	12.13	48.50	**Trap/Vee/Rect Channel Flow, Vegetated Swale** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030
21.0	2,040	Total			

Summary for Subcatchment 301S: Ex Stream

Runoff = 3.10 cfs @ 11.97 hrs, Volume= 0.147 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	65,722	70	Woods, Good, HSG C
	43,672	74	>75% Grass cover, Good, HSG C
*	1,350	68	Porous Pavement
	110,744	72	Weighted Average
	110,744		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	100	0.2100	0.49		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.4	51	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	118	0.1610	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	228	0.1140	10.19	50.95	**Trap/Vee/Rect Channel Flow, Ex Stream** Bot.W=4.00' D=1.00' Z= 1.0 '/' Top.W=6.00' n= 0.040 Mountain streams
5.2	497	Total			

Summary for Subcatchment 302a: New Subcatch

Runoff = 5.83 cfs @ 12.11 hrs, Volume= 0.441 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	202,172	74	Pasture/grassland/range, Good, HSG C
	110,552	70	Woods, Good, HSG C
	312,724	73	Weighted Average
	312,724		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	92	0.1530	0.11		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 4.00"
1.4	130	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.8	1,608	0.1100	14.64	76.84	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.030 Earth, grassed & winding
17.1	1,830	Total			

Summary for Subcatchment 302S: (new Subcat)

Runoff = 4.85 cfs @ 11.98 hrs, Volume= 0.239 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	46,647	71	Meadow, non-grazed, HSG C
	158,360	70	Woods, Good, HSG C
*	1,180	98	Paved (porous)
	206,187	70	Weighted Average
	205,007		99.43% Pervious Area
	1,180		0.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.1600	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.2	43	0.1860	3.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	871	0.0600	9.83	51.59	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
5.5	1,014	Total			

Summary for Subcatchment 303S: Subcatchment 303

Runoff = 3.02 cfs @ 11.99 hrs, Volume= 0.149 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	9,520	98	Porous Pavement
	72,299	74	>75% Grass cover, Good, HSG C
	23,715	61	>75% Grass cover, Good, HSG B
	105,534	73	Weighted Average
	96,014		90.98% Pervious Area
	9,520		9.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	670	0.0850	12.87	67.55	**Trap/Vee/Rect Channel Flow, TRM Swale** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.030 Earth, grassed & winding
4.9	358	0.0170	1.22	21.30	**Trap/Vee/Rect Channel Flow, ex wetland flow** Bot.W=10.00' D=0.50' Z= 50.0 '/' Top.W=60.00' n= 0.070 Sluggish weedy reaches w/pools
0.6	316	0.0450	9.45	132.34	**Trap/Vee/Rect Channel Flow, ex wetland ditch** Bot.W=5.00' D=2.00' Z= 1.0 '/' Top.W=9.00' n= 0.040 Earth, cobble bottom, clean sides
6.4	1,344	Total			

Summary for Subcatchment 304: (new Subcat)

Runoff = 6.49 cfs @ 11.97 hrs, Volume= 0.307 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	1,900	98	Porous Pavement
	136,810	70	Woods, Good, HSG C
	93,272	74	>75% Grass cover, Good, HSG C
	231,982	72	Weighted Average
	230,082		99.18% Pervious Area
	1,900		0.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	52	0.3300	0.51		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.9	527	0.0500	9.57	57.44	**Trap/Vee/Rect Channel Flow, swale** Bot.W=2.00' D=2.00' Z= 0.5 '/' Top.W=4.00' n= 0.033 Earth, grassed & winding
1.7	280	0.0750	2.69	39.72	**Trap/Vee/Rect Channel Flow, overland, wetland** Bot.W=40.00' D=0.34' Z= 10.0 '/' Top.W=46.80' n= 0.070 Sluggish weedy reaches w/pools
0.9	190	0.2500	3.41	258.90	**Trap/Vee/Rect Channel Flow, overland** Bot.W=50.00' D=0.83' Z= 50.0 '/' Top.W=133.00' n= 0.150 Sheet flow over Short Grass
5.2	1,049	Total			

Summary for Subcatchment 305s: Land W. side of hotel

Runoff = 4.89 cfs @ 12.00 hrs, Volume= 0.254 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	145,260	74	>75% Grass cover, Good, HSG C
*	7,690	98	Porous Pavement
	16,700	61	>75% Grass cover, Good, HSG B
	169,650	74	Weighted Average
	161,960		95.47% Pervious Area
	7,690		4.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	100	0.3000	0.56		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
4.0	650	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	215	0.0100	4.01	21.06	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
7.9	965	Total			

Summary for Subcatchment 306S: 12 tee

Runoff = 5.64 cfs @ 12.00 hrs, Volume= 0.292 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	75,600	70	Woods, Good, HSG C
*	2,810	98	Porous Pavement
	128,794	74	>75% Grass cover, Good, HSG C
	207,204	73	Weighted Average
	204,394		98.64% Pervious Area
	2,810		1.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0700	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.9	182	0.2200	3.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	550	0.0650	9.20	27.59	**Trap/Vee/Rect Channel Flow, TRM Swale** Bot.W=2.00' D=1.00' Z= 1.0 '/' Top.W=4.00' n= 0.030 Earth, grassed & winding
0.4	240	0.1600	11.19	72.20	**Trap/Vee/Rect Channel Flow, Ex Wetlnd channel** Bot.W=4.00' D=1.50' Z= 0.2 '/' Top.W=4.60' n= 0.050 Mountain streams w/large boulders
7.6	1,072	Total			

Summary for Subcatchment 307S: (new Subcat)

Runoff = 3.06 cfs @ 12.00 hrs, Volume= 0.162 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	13,050	61	>75% Grass cover, Good, HSG B
*	10,840	98	Paved (Porous)
	24,084	74	>75% Grass cover, Good, HSG C
	74,350	70	Woods, Good, HSG C
	122,324	72	Weighted Average
	111,484		91.14% Pervious Area
	10,840		8.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	66	0.2000	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
1.1	130	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	72	0.0350	4.77	14.31	**Trap/Vee/Rect Channel Flow, Grassed Swale** Bot.W=4.00' D=0.50' Z= 4.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
0.9	830	0.1100	14.87	111.53	**Trap/Vee/Rect Channel Flow, TRM Swale** Bot.W=2.00' D=1.50' Z= 2.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
7.8	1,098	Total			

Summary for Subcatchment 308S: (new Subcat)

Runoff = 6.49 cfs @ 12.04 hrs, Volume= 0.401 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
36,866	74	>75% Grass cover, Good, HSG C
309,380	70	Woods, Good, HSG C
346,246	70	Weighted Average
346,246		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	65	0.0920	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
3.4	35	0.1860	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
3.8	634	0.3120	2.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.6	734	Total			

Summary for Subcatchment 309S: (new Subcat)

Runoff = 6.81 cfs @ 12.07 hrs, Volume= 0.447 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	180,807	70	Woods, Good, HSG C
	103,518	74	>75% Grass cover, Good, HSG C
*	13,610	98	Paved
*	7,390	98	Porous Pavement
	11,400	61	>75% Grass cover, Good, HSG B
	316,725	73	Weighted Average
	295,725		93.37% Pervious Area
	21,000		6.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	72	0.0278	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
4.2	28	0.0714	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
3.2	549	0.3320	2.88		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	649	Total			

Summary for Subcatchment 310S: Existing Wooded Area

Runoff = 4.59 cfs @ 11.96 hrs, Volume= 0.208 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	107,476	70	Woods, Good, HSG C
*	7,355	98	Paved
	39,560	74	>75% Grass cover, Good, HSG C
*	2,820	68	Porous Pavement
	157,211	72	Weighted Average
	149,856		95.32% Pervious Area
	7,355		4.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.2500	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
0.7	434	0.1240	10.89	32.66	**Trap/Vee/Rect Channel Flow, ex. vegetated ditch** Bot.W=2.00' D=1.00' Z= 1.0 '/' Top.W=4.00' n= 0.035 Earth, dense weeds
4.1	474	Total			

Summary for Subcatchment 311S: Existing Wooded Area

Runoff = 5.73 cfs @ 12.09 hrs, Volume= 0.411 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	103,137	74	>75% Grass cover, Good, HSG C
*	2,085	98	Paved
	224,527	70	Woods, Good, HSG C
*	2,000	68	Porous Pavement
	331,749	71	Weighted Average
	329,664		99.37% Pervious Area
	2,085		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0500	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.1	12	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	737	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	930	0.1180	9.10	47.75	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.050 Earth, cobble bottom, clean sides
14.7	1,779	Total			

Summary for Subcatchment 315S: (new Subcat)

Runoff = 7.52 cfs @ 12.04 hrs, Volume= 0.451 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

Area (sf)	CN	Description
315,930	70	Woods, Good, HSG C
47,510	74	>75% Grass cover, Good, HSG C
363,440	71	Weighted Average
363,440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.2200	0.23		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
2.9	482	0.3150	2.81		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.3	582	Total			

Summary for Subcatchment 316A: Existing By Maintenance Bldg.

Runoff = 0.72 cfs @ 11.99 hrs, Volume= 0.035 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
	17,043	70	Woods, Good, HSG C
*	2,900	98	Paved parking
	5,182	71	Meadow, non-grazed, HSG C
	25,125	73	Weighted Average
	22,225		88.46% Pervious Area
	2,900		11.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.4000	0.29		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
0.4	270	0.0800	11.83	29.57	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.00' Z= 0.5 '/' Top.W=3.00' n= 0.025 Earth, clean & winding
6.2	370	Total			

Summary for Subcatchment 316S: existing

Runoff = 9.59 cfs @ 12.00 hrs, Volume= 0.514 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1 Year Rainfall=2.80"

	Area (sf)	CN	Description
*	5,340	98	Paved
	380,785	70	Woods, Good, HSG C
	33,106	74	>75% Grass cover, Good, HSG C
*	5,210	68	Porous Pavement
	18,632	61	>75% Grass cover, Good, HSG B
	443,073	70	Weighted Average
	437,733		98.79% Pervious Area
	5,340		1.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	77	0.3120	0.25		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
2.2	867	0.0280	6.71	35.25	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
7.4	944	Total			

Reach and Culvert Summaries
1 & 10-yr Storm Events

Summary for Reach 1R: overland flow

Inflow Area = 16.946 ac, 22.50% Impervious, Inflow Depth = 1.00" for 1 Year event
Inflow = 19.48 cfs @ 11.93 hrs, Volume= 1.407 af
Outflow = 19.44 cfs @ 11.94 hrs, Volume= 1.407 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.05 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 0.6 min

Peak Storage= 182 cf @ 11.93 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 103.60 cfs

3.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 0.5 '/' Top Width= 5.00'
Length= 75.0' Slope= 0.1733 '/'
Inlet Invert= 1,963.00', Outlet Invert= 1,950.00'

Summary for Reach 3: Rip Rap Channel

Inflow Area = 130.257 ac, 1.76% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 50.83 cfs @ 12.39 hrs, Volume= 6.765 af
Outflow = 50.80 cfs @ 12.39 hrs, Volume= 6.765 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 14.31 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.77 fps, Avg. Travel Time= 0.3 min

Peak Storage= 181 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 257.29 cfs

5.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 0.2 '/' Top Width= 5.80'
Length= 51.0' Slope= 0.5098 '/'
Inlet Invert= 1,740.00', Outlet Invert= 1,714.00'

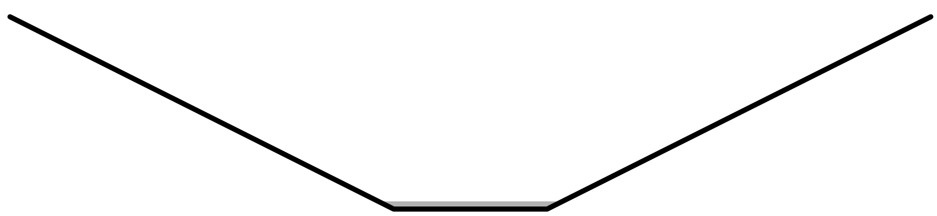
Summary for Reach 3R: Swale along RR Tracks

Inflow Area = 8.723 ac, 9.84% Impervious, Inflow Depth = 0.60" for 1 Year event
Inflow = 0.22 cfs @ 24.05 hrs, Volume= 0.434 af
Outflow = 0.22 cfs @ 24.43 hrs, Volume= 0.434 af, Atten= 0%, Lag= 22.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.98 fps, Min. Travel Time= 17.7 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 22.2 min

Peak Storage= 231 cf @ 24.13 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 103.07 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 1,045.0' Slope= 0.0172 '/'
Inlet Invert= 1,750.00', Outlet Invert= 1,732.00'



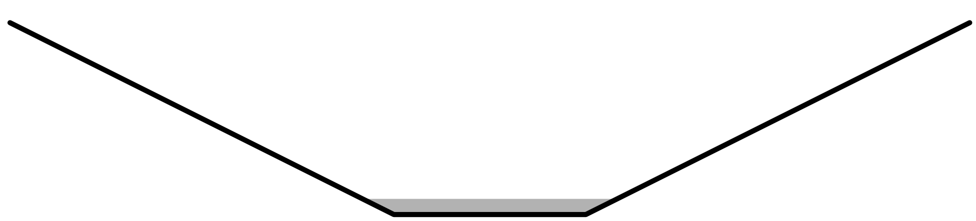
Summary for Reach 5: Stream Channel

Inflow Area = 33.644 ac, 4.16% Impervious, Inflow Depth = 0.66" for 1 Year event
Inflow = 10.59 cfs @ 12.52 hrs, Volume= 1.843 af
Outflow = 10.56 cfs @ 12.53 hrs, Volume= 1.843 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.95 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 1.0 min

Peak Storage= 244 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 1,318.86 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 160.0' Slope= 0.3000 '/'
Inlet Invert= 2,060.00', Outlet Invert= 2,012.00'



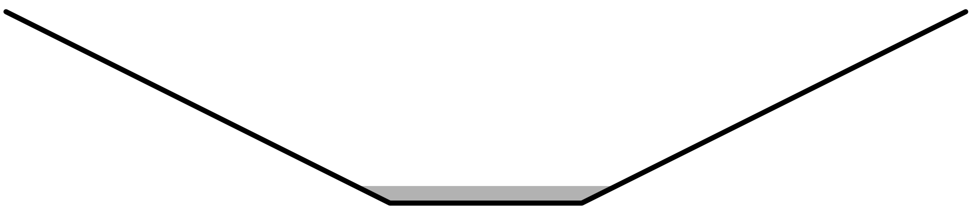
Summary for Reach 5A: Stream Channel

Inflow Area = 41.552 ac, 5.67% Impervious, Inflow Depth = 0.67" for 1 Year event
Inflow = 10.67 cfs @ 12.53 hrs, Volume= 2.326 af
Outflow = 10.63 cfs @ 12.55 hrs, Volume= 2.326 af, Atten= 0%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.32 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 3.1 min

Peak Storage= 574 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 1,138.43 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 340.0' Slope= 0.2235 '/'
Inlet Invert= 2,012.00', Outlet Invert= 1,936.00'



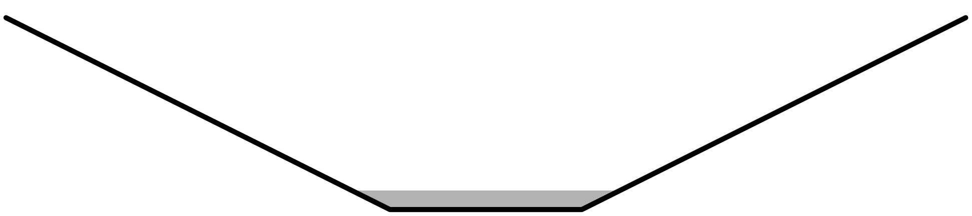
Summary for Reach 5B: Stream Channel

Inflow Area = 46.285 ac, 5.15% Impervious, Inflow Depth = 0.66" for 1 Year event
Inflow = 11.12 cfs @ 12.55 hrs, Volume= 2.565 af
Outflow = 11.08 cfs @ 12.56 hrs, Volume= 2.565 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 5.80 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 1.2 min

Peak Storage= 229 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 983.02 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 120.0' Slope= 0.1667 '/'
Inlet Invert= 1,936.00', Outlet Invert= 1,916.00'



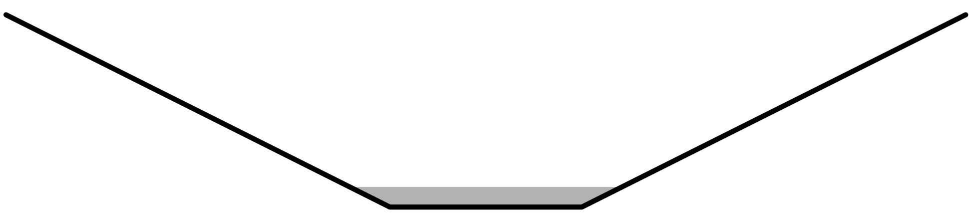
Summary for Reach 5C: Stream Channel

Inflow Area = 67.707 ac, 9.43% Impervious, Inflow Depth > 0.74" for 1 Year event
Inflow = 11.42 cfs @ 12.56 hrs, Volume= 4.165 af
Outflow = 11.38 cfs @ 12.59 hrs, Volume= 4.165 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.68 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.76 fps, Avg. Travel Time= 2.6 min

Peak Storage= 557 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 937.61 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 277.0' Slope= 0.1516 '/'
Inlet Invert= 1,916.00', Outlet Invert= 1,874.00'



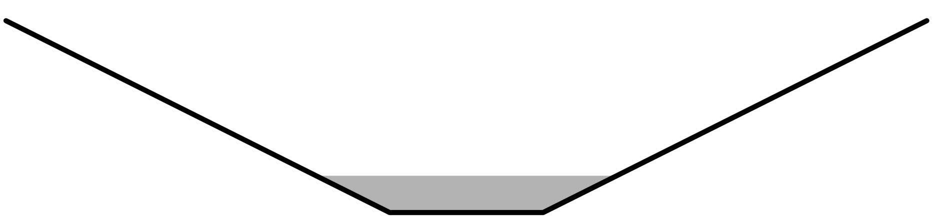
Summary for Reach 5D: Stream Channel

Inflow Area = 75.446 ac, 8.80% Impervious, Inflow Depth > 0.72" for 1 Year event
Inflow = 11.78 cfs @ 12.58 hrs, Volume= 4.499 af
Outflow = 11.75 cfs @ 12.60 hrs, Volume= 4.499 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.27 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.53 fps, Avg. Travel Time= 2.0 min

Peak Storage= 427 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 357.03 cfs

2.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 300.0' Slope= 0.2067 '/'
Inlet Invert= 1,874.00', Outlet Invert= 1,812.00'



Summary for Reach 5R: roadside swale

Inflow Area = 4.919 ac, 18.04% Impervious, Inflow Depth = 0.65" for 1 Year event
Inflow = 0.23 cfs @ 14.81 hrs, Volume= 0.267 af
Outflow = 0.23 cfs @ 15.01 hrs, Volume= 0.267 af, Atten= 0%, Lag= 12.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 10.1 min

Peak Storage= 103 cf @ 14.88 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 61.25 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 607.0' Slope= 0.0626 '/'
Inlet Invert= 2,122.00', Outlet Invert= 2,084.00'

Summary for Reach 6: SWALE

Inflow Area = 21.422 ac, 18.68% Impervious, Inflow Depth > 0.90" for 1 Year event
Inflow = 0.83 cfs @ 15.93 hrs, Volume= 1.601 af
Outflow = 0.83 cfs @ 16.03 hrs, Volume= 1.601 af, Atten= 0%, Lag= 6.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.37 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 6.6 min

Peak Storage= 182 cf @ 15.97 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 108.04 cfs

4.00' x 2.50' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 9.00'
Length= 300.0' Slope= 0.0300 '/'
Inlet Invert= 1,939.00', Outlet Invert= 1,930.00'

Summary for Reach 6R: Clean Swale

Inflow Area = 22.295 ac, 15.82% Impervious, Inflow Depth > 0.80" for 1 Year event
Inflow = 4.81 cfs @ 12.29 hrs, Volume= 1.494 af
Outflow = 4.76 cfs @ 12.32 hrs, Volume= 1.494 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.68 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 3.0 min

Peak Storage= 251 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 139.88 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 245.0' Slope= 0.0490 '/'
Inlet Invert= 1,842.00', Outlet Invert= 1,830.00'

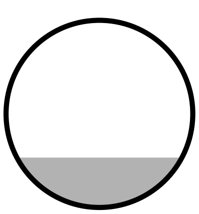
Summary for Reach 7A: CULVERT

Inflow Area = 0.577 ac, 11.54% Impervious, Inflow Depth = 0.74" for 1 Year event
Inflow = 0.72 cfs @ 11.99 hrs, Volume= 0.035 af
Outflow = 0.71 cfs @ 12.00 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 1.3 min

Peak Storage= 19 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.70 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 115.0' Slope= 0.0174 '/'
Inlet Invert= 1,900.00', Outlet Invert= 1,898.00'



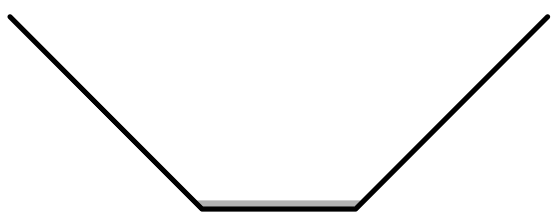
Summary for Reach 7B: Existing Ditch

Inflow Area = 0.577 ac, 11.54% Impervious, Inflow Depth = 0.74" for 1 Year event
Inflow = 0.71 cfs @ 12.00 hrs, Volume= 0.035 af
Outflow = 0.69 cfs @ 12.02 hrs, Volume= 0.035 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.94 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 1.8 min

Peak Storage= 30 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 172.60 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 125.0' Slope= 0.1280 '/'
Inlet Invert= 1,896.00', Outlet Invert= 1,880.00'



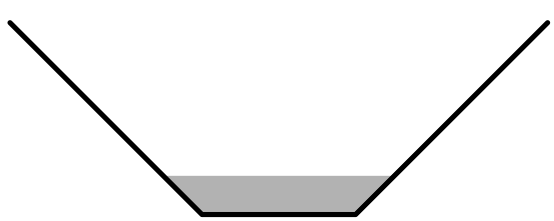
Summary for Reach 7C: Existing Ditch

Inflow Area = 12.983 ac, 1.90% Impervious, Inflow Depth = 0.57" for 1 Year event
Inflow = 6.28 cfs @ 12.08 hrs, Volume= 0.614 af
Outflow = 6.17 cfs @ 12.13 hrs, Volume= 0.614 af, Atten= 2%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.88 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 7.3 min

Peak Storage= 670 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 123.26 cfs

2.00' x 2.50' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 530.0' Slope= 0.1020 '/'
Inlet Invert= 1,880.00', Outlet Invert= 1,825.94'



Summary for Reach 8: Stream Channel

Inflow Area = 92.038 ac, 7.66% Impervious, Inflow Depth > 0.69" for 1 Year event
Inflow = 16.80 cfs @ 12.04 hrs, Volume= 5.321 af
Outflow = 16.66 cfs @ 12.07 hrs, Volume= 5.321 af, Atten= 1%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 6.89 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 2.1 min

Peak Storage= 593 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 473.46 cfs

4.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 5.0 '/' Top Width= 24.00'
Length= 245.0' Slope= 0.2694 '/'
Inlet Invert= 1,816.00', Outlet Invert= 1,750.00'

‡

Summary for Reach 9R: swale

Inflow Area = 0.723 ac, 0.00% Impervious, Inflow Depth = 0.65" for 1 Year event
Inflow = 0.73 cfs @ 12.01 hrs, Volume= 0.039 af
Outflow = 0.68 cfs @ 12.07 hrs, Volume= 0.039 af, Atten= 7%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 8.8 min

Peak Storage= 102 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 11.64 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 280.0' Slope= 0.0179 '/'
Inlet Invert= 2,225.00', Outlet Invert= 2,220.00'

Summary for Reach 11R: Overland Flow

Inflow Area = 20.182 ac, 16.70% Impervious, Inflow Depth > 0.81" for 1 Year event
Inflow = 5.61 cfs @ 11.97 hrs, Volume= 1.365 af
Outflow = 3.33 cfs @ 12.29 hrs, Volume= 1.365 af, Atten= 41%, Lag= 18.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.98 fps, Min. Travel Time= 12.9 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 33.4 min

Peak Storage= 2,604 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 626.02 cfs

75.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 105.00'
Length= 760.0' Slope= 0.1724 '/'
Inlet Invert= 1,973.00', Outlet Invert= 1,842.00'

Summary for Reach 12R: Overland Flow

Inflow Area = 2.112 ac, 7.43% Impervious, Inflow Depth = 0.74" for 1 Year event
Inflow = 1.93 cfs @ 12.07 hrs, Volume= 0.130 af
Outflow = 1.48 cfs @ 12.31 hrs, Volume= 0.130 af, Atten= 23%, Lag= 13.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.07 fps, Min. Travel Time= 8.7 min
Avg. Velocity = 0.42 fps, Avg. Travel Time= 22.1 min

Peak Storage= 780 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 315.94 cfs

30.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 60.00'
Length= 562.0' Slope= 0.2100 '/'
Inlet Invert= 1,960.00', Outlet Invert= 1,842.00'

Summary for Reach 13: Channel at tracks

Inflow Area = 100.761 ac, 7.85% Impervious, Inflow Depth > 0.69" for 1 Year event
Inflow = 16.66 cfs @ 12.07 hrs, Volume= 5.755 af
Outflow = 16.52 cfs @ 12.12 hrs, Volume= 5.755 af, Atten= 1%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 5.4 min

Peak Storage= 1,583 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 423.37 cfs

4.00' x 3.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 360.0' Slope= 0.0444 '/'
Inlet Invert= 1,750.00', Outlet Invert= 1,734.00'

‡

Summary for Reach 40R: Swale

Inflow Area = 19.549 ac, 16.10% Impervious, Inflow Depth > 0.80" for 1 Year event
Inflow = 4.52 cfs @ 11.98 hrs, Volume= 1.301 af
Outflow = 4.40 cfs @ 11.99 hrs, Volume= 1.300 af, Atten= 3%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 3.40 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 1.6 min

Peak Storage= 124 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 106.53 cfs

2.50' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.50'
Length= 95.0' Slope= 0.0411 '/'
Inlet Invert= 1,983.90', Outlet Invert= 1,980.00'

Summary for Reach 51R: Swale

Inflow Area = 4.233 ac, 33.60% Impervious, Inflow Depth = 1.20" for 1 Year event
Inflow = 7.90 cfs @ 11.95 hrs, Volume= 0.425 af
Outflow = 7.58 cfs @ 12.00 hrs, Volume= 0.425 af, Atten= 4%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.57 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 7.7 min

Peak Storage= 891 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 162.52 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 535.0' Slope= 0.0374 '/'
Inlet Invert= 2,020.00', Outlet Invert= 2,000.00'

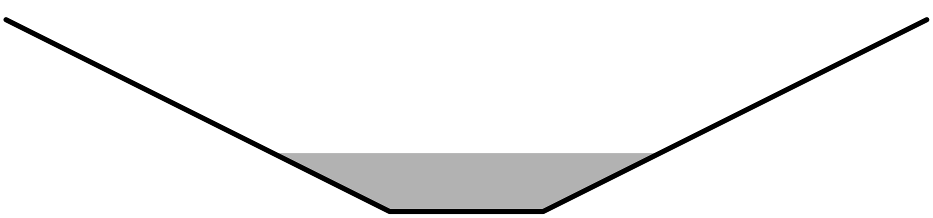
Summary for Reach 58a: Swale along RR Tracks

Inflow Area = 34.486 ac, 12.14% Impervious, Inflow Depth > 0.76" for 1 Year event
Inflow = 10.48 cfs @ 12.23 hrs, Volume= 2.197 af
Outflow = 10.37 cfs @ 12.30 hrs, Volume= 2.197 af, Atten= 1%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.87 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 9.2 min

Peak Storage= 1,458 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 130.53 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 543.0' Slope= 0.0276 '/'
Inlet Invert= 1,788.00', Outlet Invert= 1,773.00'



Summary for Reach 63R: OVERLAND

Inflow Area = 2.621 ac, 35.67% Impervious, Inflow Depth = 1.07" for 1 Year event
Inflow = 3.97 cfs @ 11.95 hrs, Volume= 0.234 af
Outflow = 3.91 cfs @ 11.97 hrs, Volume= 0.234 af, Atten= 1%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.49 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 2.3 min

Peak Storage= 143 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 290.92 cfs

20.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 70.00'
Length= 126.0' Slope= 0.3095 '/'
Inlet Invert= 2,079.00', Outlet Invert= 2,040.00'

‡

Summary for Reach 64R: Swale

Inflow Area = 7.908 ac, 12.10% Impervious, Inflow Depth > 0.73" for 1 Year event
Inflow = 0.14 cfs @ 23.39 hrs, Volume= 0.483 af
Outflow = 0.14 cfs @ 23.58 hrs, Volume= 0.483 af, Atten= 0%, Lag= 11.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 6.8 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 10.2 min

Peak Storage= 56 cf @ 23.46 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 31.81 cfs

2.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 222.0' Slope= 0.0045 '/'
Inlet Invert= 2,016.50', Outlet Invert= 2,015.50'

Summary for Reach 69R: Wetland Flow

Inflow Area = 3.895 ac, 4.53% Impervious, Inflow Depth = 0.78" for 1 Year event
Inflow = 4.89 cfs @ 12.00 hrs, Volume= 0.254 af
Outflow = 3.08 cfs @ 12.27 hrs, Volume= 0.254 af, Atten= 37%, Lag= 16.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.73 fps, Min. Travel Time= 11.1 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 38.3 min

Peak Storage= 2,067 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 172.83 cfs

76.00' x 0.50' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 100.0 '/' Top Width= 176.00'
Length= 487.0' Slope= 0.0657 '/'
Inlet Invert= 2,098.00', Outlet Invert= 2,066.00'

‡

Summary for Reach 197: Stream Channel

Inflow Area = 121.913 ac, 1.88% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 49.67 cfs @ 12.36 hrs, Volume= 6.315 af
Outflow = 49.40 cfs @ 12.39 hrs, Volume= 6.315 af, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.44 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.56 fps, Avg. Travel Time= 3.9 min

Peak Storage= 3,984 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 12,157.92 cfs

15.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 7.0 '/' Top Width= 99.00'
Length= 599.0' Slope= 0.2771 '/'
Inlet Invert= 1,910.00', Outlet Invert= 1,744.00'

‡

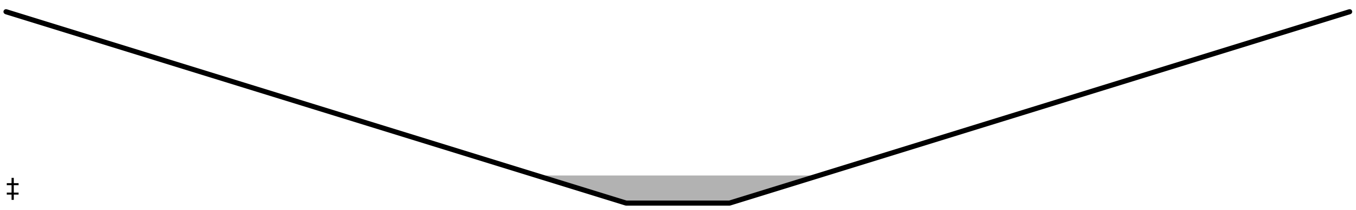
Summary for Reach 197A: Stream Channel

Inflow Area = 114.943 ac, 1.85% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 49.07 cfs @ 12.32 hrs, Volume= 5.925 af
Outflow = 48.75 cfs @ 12.36 hrs, Volume= 5.925 af, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.55 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.12 fps, Avg. Travel Time= 4.7 min

Peak Storage= 3,891 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 3,907.44 cfs

4.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 601.0' Slope= 0.1331 '/'
Inlet Invert= 1,990.00', Outlet Invert= 1,910.00'



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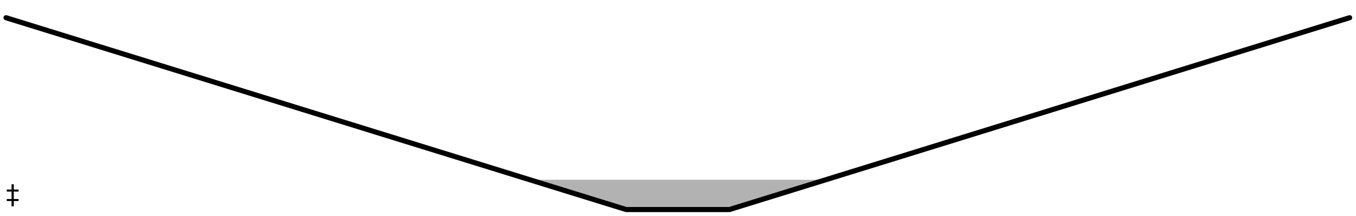
Summary for Reach 197B: Stream Channel

Inflow Area = 110.322 ac, 1.58% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 48.72 cfs @ 12.30 hrs, Volume= 5.672 af
Outflow = 48.51 cfs @ 12.32 hrs, Volume= 5.672 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.78 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 2.3 min

Peak Storage= 1,810 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 3,373.30 cfs

4.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 252.0' Slope= 0.0992 '/'
Inlet Invert= 2,015.00', Outlet Invert= 1,990.00'



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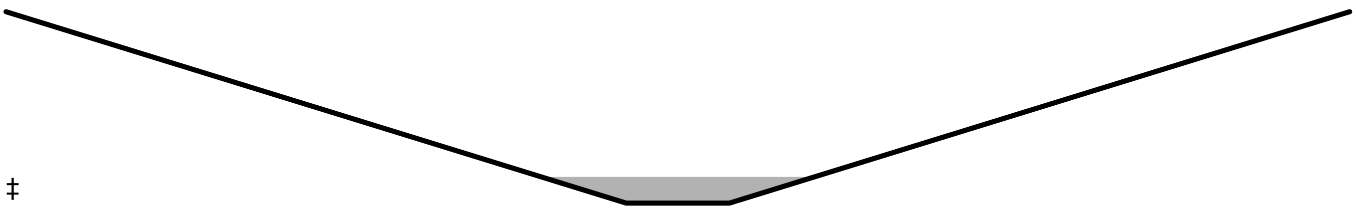
Summary for Reach 197C: Stream Channel

Inflow Area = 95.895 ac, 1.22% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 47.27 cfs @ 12.28 hrs, Volume= 4.965 af
Outflow = 46.99 cfs @ 12.30 hrs, Volume= 4.965 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.85 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.27 fps, Avg. Travel Time= 2.2 min

Peak Storage= 2,557 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 4,183.47 cfs

4.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 426.0' Slope= 0.1526 '/'
Inlet Invert= 2,080.00', Outlet Invert= 2,015.00'



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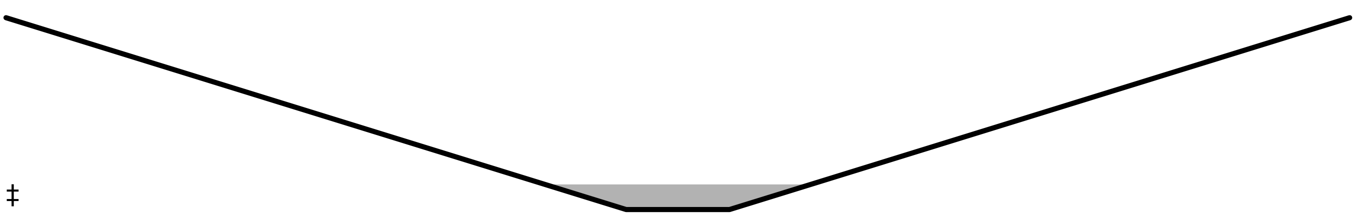
Summary for Reach 198: Stream Channel

Inflow Area = 88.624 ac, 0.78% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 45.94 cfs @ 12.20 hrs, Volume= 4.519 af
Outflow = 44.84 cfs @ 12.28 hrs, Volume= 4.519 af, Atten= 2%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.04 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 3.32 fps, Avg. Travel Time= 6.3 min

Peak Storage= 7,062 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 4,399.92 cfs

4.00' x 6.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 1,262.0' Slope= 0.1688 '/'
Inlet Invert= 2,228.00', Outlet Invert= 2,015.00'



‡

Summary for Reach 199: Overland Flow

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 0.65" for 1 Year event
Inflow = 7.26 cfs @ 12.17 hrs, Volume= 0.660 af
Outflow = 7.21 cfs @ 12.22 hrs, Volume= 0.660 af, Atten= 1%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.51 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 4.8 min

Peak Storage= 719 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 458.82 cfs

50.00' x 0.50' deep channel, n= 0.040 Earth, dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 150.00'
Length= 250.0' Slope= 0.2640 '/'
Inlet Invert= 2,234.00', Outlet Invert= 2,168.00'

‡

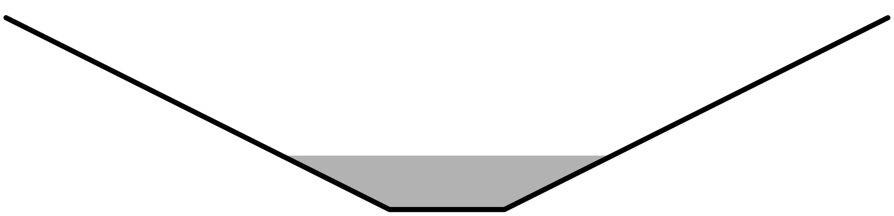
Summary for Reach 295: Roadside Channel

Inflow Area = 27.327 ac, 3.68% Impervious, Inflow Depth = 0.63" for 1 Year event
Inflow = 8.91 cfs @ 12.50 hrs, Volume= 1.440 af
Outflow = 8.86 cfs @ 12.53 hrs, Volume= 1.440 af, Atten= 1%, Lag= 2.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.36 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 2.9 min

Peak Storage= 571 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 144.47 cfs

1.50' x 2.50' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 11.50'
Length= 280.0' Slope= 0.0643 '/'
Inlet Invert= 2,084.00', Outlet Invert= 2,066.00'



Summary for Reach 296: Wetland Flow

Inflow Area = 22.407 ac, 0.53% Impervious, Inflow Depth = 0.63" for 1 Year event
Inflow = 9.14 cfs @ 12.38 hrs, Volume= 1.172 af
Outflow = 8.72 cfs @ 12.50 hrs, Volume= 1.172 af, Atten= 5%, Lag= 7.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.69 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 11.6 min

Peak Storage= 2,204 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 251.85 cfs

12.00' x 2.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 8.0 '/' Top Width= 44.00'
Length= 427.0' Slope= 0.0328 '/'
Inlet Invert= 2,098.00', Outlet Invert= 2,084.00'

‡

Summary for Reach 297: Overland Flow

Inflow Area = 17.082 ac, 0.44% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 8.35 cfs @ 12.36 hrs, Volume= 0.865 af
Outflow = 8.30 cfs @ 12.38 hrs, Volume= 0.865 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 2.4 min

Peak Storage= 410 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 358.18 cfs

30.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 80.00'
Length= 195.0' Slope= 0.2872 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,114.00'

‡

Summary for Reach 298: Wetland Flow

Inflow Area = 17.082 ac, 0.44% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 9.29 cfs @ 12.18 hrs, Volume= 0.865 af
Outflow = 8.35 cfs @ 12.36 hrs, Volume= 0.865 af, Atten= 10%, Lag= 10.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.11 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 17.8 min

Peak Storage= 3,090 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 802.14 cfs

100.00' x 1.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 50.0 '/' Top Width= 200.00'
Length= 408.0' Slope= 0.0931 '/'
Inlet Invert= 2,208.00', Outlet Invert= 2,170.00'

‡

Summary for Reach 299: Overland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af
Outflow = 8.93 cfs @ 12.19 hrs, Volume= 0.826 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 1.5 min

Peak Storage= 322 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 134.95 cfs

10.00' x 0.50' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 50.0 '/' Top Width= 60.00'
Length= 135.0' Slope= 0.3481 '/'
Inlet Invert= 2,255.00', Outlet Invert= 2,208.00'

‡

Summary for Reach O3: Overland Flow

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 78.90 cfs

30.00' x 0.25' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 100.0 '/' Top Width= 80.00'
Length= 178.0' Slope= 0.1404 '/'
Inlet Invert= 1,838.00', Outlet Invert= 1,813.00'

‡

Summary for Reach O4: Swale

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 59.96 cfs

2.00' x 1.50' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 286.0' Slope= 0.0385 '/'
Inlet Invert= 1,810.00', Outlet Invert= 1,799.00'

Summary for Reach X1: Swale

Inflow Area = 2.495 ac, 6.71% Impervious, Inflow Depth = 0.49" for 1 Year event
Inflow = 0.11 cfs @ 13.92 hrs, Volume= 0.102 af
Outflow = 0.11 cfs @ 13.99 hrs, Volume= 0.102 af, Atten= 0%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.34 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 3.0 min

Peak Storage= 16 cf @ 13.95 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 153.60 cfs

2.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 200.0' Slope= 0.1050 '/'
Inlet Invert= 1,794.00', Outlet Invert= 1,773.00'

Summary for Pond 1P: Catch Basin/Culvert

Inflow Area = 1.239 ac, 57.09% Impervious, Inflow Depth = 1.64" for 1 Year event
Inflow = 3.14 cfs @ 12.01 hrs, Volume= 0.170 af
Outflow = 3.14 cfs @ 12.01 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min
Primary = 3.14 cfs @ 12.01 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,980.65' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,980.00'	**36.0" Round Culvert** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,980.00' / 1,964.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.09 cfs @ 12.01 hrs HW=1,980.65' (Free Discharge)
1=Culvert (Inlet Controls 3.09 cfs @ 2.74 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 2P: Catch Basin

Inflow Area = 8.528 ac, 36.42% Impervious, Inflow Depth = 1.12" for 1 Year event
Inflow = 15.55 cfs @ 11.92 hrs, Volume= 0.797 af
Outflow = 15.55 cfs @ 11.92 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.0 min
Primary = 15.55 cfs @ 11.92 hrs, Volume= 0.797 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,997.68' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,996.00'	**36.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,996.00' / 1,995.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=15.23 cfs @ 11.92 hrs HW=1,997.66' (Free Discharge)
1=Culvert (Barrel Controls 15.23 cfs @ 5.49 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 2R: 48" CMP Culvert

Inflow Area = 130.257 ac, 1.76% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 50.83 cfs @ 12.39 hrs, Volume= 6.765 af
Outflow = 50.83 cfs @ 12.39 hrs, Volume= 6.765 af, Atten= 0%, Lag= 0.0 min
Primary = 50.83 cfs @ 12.39 hrs, Volume= 6.765 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 1,744.71' @ 12.39 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,742.00'	**48.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 1,742.00' / 1,740.00' S= 0.0667 '/' Cc= 0.900 n= 0.025
#2	Secondary	1,746.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=50.79 cfs @ 12.39 hrs HW=1,744.71' (Free Discharge)
└─**1=Culvert** (Inlet Controls 50.79 cfs @ 5.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,742.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Catch Basin

Inflow Area = 0.284 ac, 69.74% Impervious, Inflow Depth = 1.93" for 1 Year event
Inflow = 1.04 cfs @ 11.91 hrs, Volume= 0.046 af
Outflow = 1.04 cfs @ 11.91 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 11.91 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,009.65' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,009.19'	**18.0" Round Culvert** L= 304.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,009.19' / 1,997.21' S= 0.0394 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,014.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.04 cfs @ 11.91 hrs HW=2,009.64' (Free Discharge)
├─**1=Culvert** (Inlet Controls 1.04 cfs @ 2.29 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 4P: Catch Basin

Inflow Area = 0.103 ac,100.00% Impervious, Inflow Depth = 2.57" for 1 Year event
Inflow = 0.46 cfs @ 11.91 hrs, Volume= 0.022 af
Outflow = 0.46 cfs @ 11.91 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.46 cfs @ 11.91 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,010.03' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,009.71'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,009.71' / 2,009.53' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

#2	Primary	2,014.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.46 cfs @ 11.91 hrs HW=2,010.03' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.46 cfs @ 2.51 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 4R: (2) 36" Culverts

Inflow Area = 33.644 ac, 4.16% Impervious, Inflow Depth = 0.66" for 1 Year event
Inflow = 10.59 cfs @ 12.52 hrs, Volume= 1.843 af
Outflow = 10.59 cfs @ 12.52 hrs, Volume= 1.843 af, Atten= 0%, Lag= 0.0 min
Primary = 10.59 cfs @ 12.52 hrs, Volume= 1.843 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,064.86' @ 12.52 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,064.00'	**36.0" Round Culvert X 2.00** L= 70.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,064.00' / 2,063.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	2,070.00'	**50.0' long x 35.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.55 cfs @ 12.52 hrs HW=2,064.86' (Free Discharge)
└─**1=Culvert** (Inlet Controls 10.55 cfs @ 3.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,064.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Catch Basin

Inflow Area = 0.262 ac, 70.83% Impervious, Inflow Depth = 1.89" for 1 Year event
Inflow = 0.92 cfs @ 11.94 hrs, Volume= 0.041 af
Outflow = 0.92 cfs @ 11.94 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min
Primary = 0.92 cfs @ 11.94 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,065.95' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.43'	**12.0" Round Culvert** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,065.43' / 2,065.25' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,070.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.92 cfs @ 11.94 hrs HW=2,065.95' (Free Discharge)
—**1=Culvert** (Barrel Controls 0.92 cfs @ 3.22 fps)
—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 7R: (2) 36" Steel Culverts

Inflow Area =	92.038 ac,	7.66% Impervious, Inflow Depth > 0.69"	for 1 Year event
Inflow =	16.80 cfs @	12.04 hrs, Volume=	5.321 af
Outflow =	16.80 cfs @	12.04 hrs, Volume=	5.321 af, Atten= 0%, Lag= 0.0 min
Primary =	16.80 cfs @	12.04 hrs, Volume=	5.321 af
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,813.10' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,812.00'	**36.0" Round Culvert X 2.00** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,812.00' / 1,811.00' S= 0.0333 '/' Cc= 0.900 n= 0.012
#2	Secondary	1,816.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=16.70 cfs @ 12.04 hrs HW=1,813.10' (Free Discharge)
—**1=Culvert** (Inlet Controls 16.70 cfs @ 3.57 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,812.00' (Free Discharge)
—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8R: 36" hdpe

Inflow Area =	34.486 ac,	12.14% Impervious, Inflow Depth > 0.76"	for 1 Year event
Inflow =	10.48 cfs @	12.23 hrs, Volume=	2.197 af
Outflow =	10.48 cfs @	12.23 hrs, Volume=	2.197 af, Atten= 0%, Lag= 0.0 min
Primary =	10.48 cfs @	12.23 hrs, Volume=	2.197 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,831.24' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,830.00'	**36.0" Round Culvert** L= 245.0' Ke= 0.500 Inlet / Outlet Invert= 1,830.00' / 1,788.00' S= 0.1714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=10.46 cfs @ 12.23 hrs HW=1,831.24' (Free Discharge)
—**1=Culvert** (Inlet Controls 10.46 cfs @ 3.79 fps)

Summary for Pond 9P: Catch Basin

Inflow Area = 0.167 ac, 83.21% Impervious, Inflow Depth = 2.19" for 1 Year event
Inflow = 0.69 cfs @ 11.91 hrs, Volume= 0.030 af
Outflow = 0.69 cfs @ 11.91 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 11.91 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,034.83' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,034.40'	**24.0" Round Culvert** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,034.40' / 2,034.00' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,039.40'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.68 cfs @ 11.91 hrs HW=2,034.82' (Free Discharge)
1=Culvert (Barrel Controls 0.68 cfs @ 2.10 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 10P: Catch Basin

Inflow Area = 0.088 ac, 94.81% Impervious, Inflow Depth = 2.46" for 1 Year event
Inflow = 0.39 cfs @ 11.91 hrs, Volume= 0.018 af
Outflow = 0.39 cfs @ 11.91 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 11.91 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,035.62' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,035.29'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,035.29' / 2,035.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,039.40'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.39 cfs @ 11.91 hrs HW=2,035.62' (Free Discharge)
1=Culvert (Barrel Controls 0.39 cfs @ 2.53 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 10R: 14" and 16" HDPE Culverts

Inflow Area = 20.182 ac, 16.70% Impervious, Inflow Depth > 0.81" for 1 Year event
Inflow = 5.61 cfs @ 11.97 hrs, Volume= 1.365 af
Outflow = 5.61 cfs @ 11.97 hrs, Volume= 1.365 af, Atten= 0%, Lag= 0.0 min
Primary = 5.61 cfs @ 11.97 hrs, Volume= 1.365 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,976.00' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,975.00'	**14.0" Round 14" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#2	Primary	1,975.00'	**16.0" Round 16" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#3	Secondary	1,977.00'	**50.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.58 cfs @ 11.97 hrs HW=1,975.99' (Free Discharge)
1=14" Culvert (Inlet Controls 2.59 cfs @ 2.68 fps)
2=16" Culvert (Inlet Controls 2.98 cfs @ 2.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,975.00' (Free Discharge)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 11P: Catch Basin

Inflow Area =	7.752 ac, 32.48% Impervious,	Inflow Depth = 1.03"	for 1 Year event
Inflow =	12.60 cfs @ 11.92 hrs, Volume=	0.664 af	
Outflow =	12.60 cfs @ 11.92 hrs, Volume=	0.664 af, Atten= 0%, Lag= 0.0 min	
Primary =	12.60 cfs @ 11.92 hrs, Volume=	0.664 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,056.37' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,055.00'	**36.0" Round Culvert** L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,055.00' / 2,040.74' S= 0.1584 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,060.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=12.33 cfs @ 11.92 hrs HW=2,056.36' (Free Discharge)
1=Culvert (Inlet Controls 12.33 cfs @ 3.97 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 12P: Catch Basin

Inflow Area =	0.067 ac, 88.78% Impervious,	Inflow Depth = 2.25"	for 1 Year event
Inflow =	0.29 cfs @ 11.90 hrs, Volume=	0.013 af	
Outflow =	0.29 cfs @ 11.90 hrs, Volume=	0.013 af, Atten= 0%, Lag= 0.0 min	
Primary =	0.29 cfs @ 11.90 hrs, Volume=	0.013 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,055.26' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,055.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,055.00' / 2,054.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,060.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.28 cfs @ 11.90 hrs HW=2,055.26' (Free Discharge)
1=Culvert (Inlet Controls 0.28 cfs @ 1.73 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 13P: Manhole

Inflow Area = 7.315 ac, 30.04% Impervious, Inflow Depth = 0.97" for 1 Year event
Inflow = 11.03 cfs @ 11.93 hrs, Volume= 0.594 af
Outflow = 11.03 cfs @ 11.93 hrs, Volume= 0.594 af, Atten= 0%, Lag= 0.0 min
Primary = 11.03 cfs @ 11.93 hrs, Volume= 0.594 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,065.16' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,063.88'	**36.0" Round Culvert** L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,063.88' / 2,055.10' S= 0.0641 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,072.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=10.81 cfs @ 11.93 hrs HW=2,065.14' (Free Discharge)
1=Culvert (Inlet Controls 10.81 cfs @ 3.83 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 13R: 16" CMP Culvert

Inflow Area = 2.112 ac, 7.43% Impervious, Inflow Depth = 0.74" for 1 Year event
Inflow = 1.93 cfs @ 12.07 hrs, Volume= 0.130 af
Outflow = 1.93 cfs @ 12.07 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 12.07 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,968.66' @ 12.07 hrs
Flood Elev= 1,969.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,968.00'	**16.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 1,968.00' / 1,965.00' S= 0.0750 '/' Cc= 0.900 n= 0.025

Primary OutFlow Max=1.91 cfs @ 12.07 hrs HW=1,968.66' (Free Discharge)
1=Culvert (Inlet Controls 1.91 cfs @ 2.77 fps)

Summary for Pond 15P: Catch Basin

Inflow Area = 0.609 ac, 66.13% Impervious, Inflow Depth = 1.79" for 1 Year event
Inflow = 2.08 cfs @ 11.94 hrs, Volume= 0.091 af
Outflow = 2.08 cfs @ 11.94 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min
Primary = 2.08 cfs @ 11.94 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,066.34' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.43'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,065.43' / 2,065.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,070.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.05 cfs @ 11.94 hrs HW=2,066.33' (Free Discharge)
—**1=Culvert** (Barrel Controls 2.05 cfs @ 3.65 fps)
—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 16P: Catch Basin

Inflow Area = 0.168 ac, 93.81% Impervious, Inflow Depth = 2.46" for 1 Year event
Inflow = 0.74 cfs @ 11.91 hrs, Volume= 0.034 af
Outflow = 0.74 cfs @ 11.91 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 11.91 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,081.07' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,080.59'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,080.59' / 2,080.41' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,084.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.73 cfs @ 11.91 hrs HW=2,081.07' (Free Discharge)
—**1=Culvert** (Barrel Controls 0.73 cfs @ 2.91 fps)
—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 17P: Catch Basin

Inflow Area = 6.537 ac, 25.96% Impervious, Inflow Depth = 0.88" for 1 Year event
Inflow = 8.49 cfs @ 11.92 hrs, Volume= 0.480 af
Outflow = 8.49 cfs @ 11.92 hrs, Volume= 0.480 af, Atten= 0%, Lag= 0.0 min
Primary = 8.49 cfs @ 11.92 hrs, Volume= 0.480 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,080.61' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,079.50'	**36.0" Round Culvert** L= 213.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,079.50' / 2,067.47' S= 0.0565 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,084.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.30 cfs @ 11.92 hrs HW=2,080.59' (Free Discharge)
1=Culvert (Inlet Controls 8.30 cfs @ 3.56 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 18P: Catch Basin

Inflow Area = 0.696 ac, 90.27% Impervious, Inflow Depth = 2.36" for 1 Year event
Inflow = 2.99 cfs @ 11.91 hrs, Volume= 0.137 af
Outflow = 2.99 cfs @ 11.91 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 2.99 cfs @ 11.91 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,093.42' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,092.21'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,092.21' / 2,092.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.99 cfs @ 11.91 hrs HW=2,093.42' (Free Discharge)
1=Culvert (Barrel Controls 2.99 cfs @ 3.99 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 19P: Catch Basin

Inflow Area = 5.536 ac, 25.26% Impervious, Inflow Depth = 0.88" for 1 Year event
Inflow = 7.20 cfs @ 11.92 hrs, Volume= 0.404 af
Outflow = 7.20 cfs @ 11.92 hrs, Volume= 0.404 af, Atten= 0%, Lag= 0.0 min
Primary = 7.20 cfs @ 11.92 hrs, Volume= 0.404 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,092.01' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,091.00'	**36.0" Round Culvert** L= 250.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,091.00' / 2,077.47' S= 0.0541 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=7.04 cfs @ 11.92 hrs HW=2,092.00' (Free Discharge)
├─**1=Culvert** (Inlet Controls 7.04 cfs @ 3.41 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 20: CB20

Inflow Area =	3.895 ac,	4.53% Impervious,	Inflow Depth = 0.78"	for 1 Year event
Inflow =	4.89 cfs @	12.00 hrs, Volume=	0.254 af	
Outflow =	4.89 cfs @	12.00 hrs, Volume=	0.254 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.89 cfs @	12.00 hrs, Volume=	0.254 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,105.09' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,104.00'	**18.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,104.00' / 2,094.00' S= 0.1538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,112.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.86 cfs @ 12.00 hrs HW=2,105.09' (Free Discharge)
├─**1=Culvert** (Inlet Controls 4.86 cfs @ 3.55 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 20P: Manhole

Inflow Area =	4.748 ac,	14.80% Impervious,	Inflow Depth = 0.64"	for 1 Year event
Inflow =	4.09 cfs @	11.95 hrs, Volume=	0.252 af	
Outflow =	4.09 cfs @	11.95 hrs, Volume=	0.252 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.09 cfs @	11.95 hrs, Volume=	0.252 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,095.20' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,094.40'	**30.0" Round Culvert** L= 107.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,094.40' / 2,091.00' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=4.05 cfs @ 11.95 hrs HW=2,095.19' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.05 cfs @ 3.03 fps)

Summary for Pond 21P: Catch Basin

Inflow Area = 0.702 ac, 72.23% Impervious, Inflow Depth = 1.91" for 1 Year event
Inflow = 2.63 cfs @ 11.91 hrs, Volume= 0.112 af
Outflow = 2.63 cfs @ 11.91 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min
Primary = 2.63 cfs @ 11.91 hrs, Volume= 0.112 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,113.84' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,113.21'	**30.0" Round Culvert** L= 138.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,113.21' / 2,098.84' S= 0.1041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,118.50'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.62 cfs @ 11.91 hrs HW=2,113.84' (Free Discharge)
1=Culvert (Inlet Controls 2.62 cfs @ 2.70 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 22P: Catch Basin

Inflow Area = 0.427 ac, 71.34% Impervious, Inflow Depth = 1.89" for 1 Year event
Inflow = 1.58 cfs @ 11.91 hrs, Volume= 0.067 af
Outflow = 1.58 cfs @ 11.91 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Primary = 1.58 cfs @ 11.91 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,115.27' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,114.64'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,114.64' / 2,114.46' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,118.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.57 cfs @ 11.91 hrs HW=2,115.27' (Free Discharge)
1=Culvert (Barrel Controls 1.57 cfs @ 3.28 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 23A: Catch Basin

Inflow Area = 0.733 ac, 9.68% Impervious, Inflow Depth = 0.42" for 1 Year event
Inflow = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af
Outflow = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,092.88' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,092.59'	**18.0" Round Culvert** L= 198.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,092.59' / 2,083.20' S= 0.0474 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,097.50'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.42 cfs @ 12.00 hrs HW=2,092.87' (Free Discharge)
1=Culvert (Inlet Controls 0.42 cfs @ 1.81 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 23B: Catch Basin

Inflow Area = 0.733 ac, 9.68% Impervious, Inflow Depth = 0.42" for 1 Year event
Inflow = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af
Outflow = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.00 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,083.35' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,083.07'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,083.07' / 2,079.50' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.50'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.41 cfs @ 12.00 hrs HW=2,083.35' (Free Discharge)
1=Culvert (Inlet Controls 0.41 cfs @ 1.80 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 24A: Catch Basin

Inflow Area = 4.046 ac, 4.84% Impervious, Inflow Depth = 0.42" for 1 Year event
Inflow = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af
Outflow = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Primary = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,098.61' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,098.00'	**30.0" Round Culvert** L= 149.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,098.00' / 2,096.51' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,102.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.44 cfs @ 11.99 hrs HW=2,098.61' (Free Discharge)
1=Culvert (Inlet Controls 2.44 cfs @ 2.65 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 24B: Catch Basin

Inflow Area = 4.046 ac, 4.84% Impervious, Inflow Depth = 0.42" for 1 Year event
Inflow = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af
Outflow = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Primary = 2.48 cfs @ 11.99 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,095.63' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,095.00'	**30.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,095.00' / 2,094.51' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,100.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.44 cfs @ 11.99 hrs HW=2,095.62' (Free Discharge)
1=Culvert (Barrel Controls 2.44 cfs @ 3.85 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 25P: Catch Basin

Inflow Area = 0.170 ac, 74.09% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.66 cfs @ 11.91 hrs, Volume= 0.028 af
Outflow = 0.66 cfs @ 11.91 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.66 cfs @ 11.91 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,123.20' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,122.88'	**24.0" Round Culvert** L= 270.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,122.88' / 2,113.50' S= 0.0347 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,135.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.64 cfs @ 11.91 hrs HW=2,123.20' (Free Discharge)
1=Culvert (Inlet Controls 0.64 cfs @ 1.93 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 26P: Catch Basin

Inflow Area = 0.084 ac, 75.17% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.32 cfs @ 11.91 hrs, Volume= 0.014 af
Outflow = 0.32 cfs @ 11.91 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 11.91 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,131.35' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,131.05'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,131.05' / 2,130.87' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,135.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.32 cfs @ 11.91 hrs HW=2,131.35' (Free Discharge)
1=Culvert (Barrel Controls 0.32 cfs @ 2.42 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 27P: Catch Basin

Inflow Area = 0.815 ac, 74.18% Impervious, Inflow Depth = 1.95" for 1 Year event
Inflow = 3.16 cfs @ 11.91 hrs, Volume= 0.133 af
Outflow = 3.16 cfs @ 11.91 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min
Primary = 3.16 cfs @ 11.91 hrs, Volume= 0.133 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,148.54' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,147.75'	**21.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,147.75' / 2,145.50' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,152.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.10 cfs @ 11.91 hrs HW=2,148.53' (Free Discharge)
1=Culvert (Inlet Controls 3.10 cfs @ 3.00 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 28P: Catch Basin

Inflow Area = 0.093 ac, 76.11% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af
Outflow = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,148.30' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,148.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,148.00' / 2,147.75' S= 0.0139 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,152.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.36 cfs @ 11.91 hrs HW=2,148.30' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.36 cfs @ 2.73 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 29P: Manhole

Inflow Area = 0.631 ac, 73.96% Impervious, Inflow Depth = 1.95" for 1 Year event
Inflow = 2.44 cfs @ 11.91 hrs, Volume= 0.102 af
Outflow = 2.44 cfs @ 11.91 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 2.44 cfs @ 11.91 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,162.68' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,162.00'	**21.0" Round Culvert** L= 125.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,162.00' / 2,147.75' S= 0.1140 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.39 cfs @ 11.91 hrs HW=2,162.68' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.39 cfs @ 2.80 fps)

Summary for Pond 30P: Catch Basin

Inflow Area = 0.631 ac, 73.96% Impervious, Inflow Depth = 1.95" for 1 Year event
Inflow = 2.44 cfs @ 11.91 hrs, Volume= 0.102 af
Outflow = 2.44 cfs @ 11.91 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 2.44 cfs @ 11.91 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,174.84' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,174.16'	**21.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,174.16' / 2,162.64' S= 0.1239 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,181.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.39 cfs @ 11.91 hrs HW=2,174.83' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.39 cfs @ 2.80 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 31P: Catch Basin

Inflow Area = 0.067 ac, 74.25% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.26 cfs @ 11.90 hrs, Volume= 0.011 af
Outflow = 0.26 cfs @ 11.90 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 11.90 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,177.45' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,177.18'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,177.18' / 2,177.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,181.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.25 cfs @ 11.90 hrs HW=2,177.45' (Free Discharge)
1=Culvert (Barrel Controls 0.25 cfs @ 2.30 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 32P: Catch Basin

Inflow Area = 0.501 ac, 73.93% Impervious, Inflow Depth = 1.94" for 1 Year event
Inflow = 1.93 cfs @ 11.91 hrs, Volume= 0.081 af
Outflow = 1.93 cfs @ 11.91 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 11.91 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,196.04' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,195.44'	**21.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,195.44' / 2,174.62' S= 0.1190 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,202.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.90 cfs @ 11.91 hrs HW=2,196.04' (Free Discharge)
1=Culvert (Inlet Controls 1.90 cfs @ 2.63 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 33P: Catch Basin

Inflow Area = 0.086 ac, 74.41% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.34 cfs @ 11.91 hrs, Volume= 0.014 af
Outflow = 0.34 cfs @ 11.91 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 11.91 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,198.28' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,198.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,198.00' / 2,197.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,202.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.33 cfs @ 11.91 hrs HW=2,198.28' (Free Discharge)
1=Culvert (Inlet Controls 0.33 cfs @ 1.81 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 34P: Manhole

Inflow Area = 0.334 ac, 73.86% Impervious, Inflow Depth = 1.93" for 1 Year event
Inflow = 1.28 cfs @ 11.91 hrs, Volume= 0.054 af
Outflow = 1.28 cfs @ 11.91 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.28 cfs @ 11.91 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,209.51' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,209.00'	**18.0" Round Culvert** L= 90.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,209.00' / 2,195.92' S= 0.1449 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.26 cfs @ 11.91 hrs HW=2,209.50' (Free Discharge)
1=Culvert (Inlet Controls 1.26 cfs @ 2.42 fps)

Summary for Pond 35P: Catch Basin

Inflow Area = 0.334 ac, 73.86% Impervious, Inflow Depth = 1.93" for 1 Year event
Inflow = 1.28 cfs @ 11.91 hrs, Volume= 0.054 af
Outflow = 1.28 cfs @ 11.91 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.28 cfs @ 11.91 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,225.51' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,225.00'	**18.0" Round Culvert** L= 121.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,225.00' / 2,209.50' S= 0.1277 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,229.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.26 cfs @ 11.91 hrs HW=2,225.50' (Free Discharge)
1=Culvert (Inlet Controls 1.26 cfs @ 2.41 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 36P: Catch Basin

Inflow Area = 0.074 ac, 74.91% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.29 cfs @ 11.90 hrs, Volume= 0.012 af
Outflow = 0.29 cfs @ 11.90 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 11.90 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,225.76' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,225.50'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,225.50' / 2,225.14' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,229.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 11.90 hrs HW=2,225.76' (Free Discharge)
1=Culvert (Inlet Controls 0.28 cfs @ 1.73 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 37P: Catch Basin

Inflow Area = 0.184 ac, 73.98% Impervious, Inflow Depth = 1.92" for 1 Year event
Inflow = 0.70 cfs @ 11.91 hrs, Volume= 0.030 af
Outflow = 0.70 cfs @ 11.91 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 11.91 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,248.87' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,248.50'	**18.0" Round Culvert** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,248.50' / 2,225.10' S= 0.1170 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,253.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 11.91 hrs HW=2,248.87' (Free Discharge)
1=Culvert (Inlet Controls 0.69 cfs @ 2.06 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 38P: Catch Basin

Inflow Area = 0.082 ac, 76.49% Impervious, Inflow Depth = 1.97" for 1 Year event
Inflow = 0.32 cfs @ 11.91 hrs, Volume= 0.013 af
Outflow = 0.32 cfs @ 11.91 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 11.91 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,249.28' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,249.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,249.00' / 2,248.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,253.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.31 cfs @ 11.91 hrs HW=2,249.28' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.31 cfs @ 1.79 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 43P: 12" HDPE Pipe

Inflow Area = 0.089 ac, 77.76% Impervious, Inflow Depth = 2.06" for 1 Year event
Inflow = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af
Outflow = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 11.91 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,997.85' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,997.50'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,997.50' / 1,997.40' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.35 cfs @ 11.91 hrs HW=1,997.85' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.35 cfs @ 2.12 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 44P: 12" HDPE Pipe

Inflow Area = 0.172 ac, 79.89% Impervious, Inflow Depth = 2.11" for 1 Year event
Inflow = 0.71 cfs @ 11.91 hrs, Volume= 0.030 af
Outflow = 0.71 cfs @ 11.91 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 11.91 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,997.82' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,997.40'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,997.40' / 1,997.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 11.91 hrs HW=1,997.82' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.69 cfs @ 2.21 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 50P: 30" HDPE Pipe

Inflow Area = 4.233 ac, 33.60% Impervious, Inflow Depth = 1.20" for 1 Year event
Inflow = 7.90 cfs @ 11.95 hrs, Volume= 0.425 af
Outflow = 7.90 cfs @ 11.95 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.0 min
Primary = 7.90 cfs @ 11.95 hrs, Volume= 0.425 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,025.14' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,024.00'	**30.0" Round Culvert** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,024.00' / 2,020.00' S= 0.0769 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,030.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.81 cfs @ 11.95 hrs HW=2,025.13' (Free Discharge)
1=Culvert (Inlet Controls 7.81 cfs @ 3.62 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 51P: 18" HDPE Pipe

Inflow Area = 0.406 ac, 20.38% Impervious, Inflow Depth = 0.83" for 1 Year event
Inflow = 0.63 cfs @ 11.96 hrs, Volume= 0.028 af
Outflow = 0.63 cfs @ 11.96 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 11.96 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,026.35' @ 11.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,026.00'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,026.00' / 2,025.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,030.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.62 cfs @ 11.96 hrs HW=2,026.35' (Free Discharge)
1=Culvert (Inlet Controls 0.62 cfs @ 2.00 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 52P: 30" HDPE Pipe

Inflow Area = 3.737 ac, 33.43% Impervious, Inflow Depth = 1.21" for 1 Year event
Inflow = 6.98 cfs @ 11.95 hrs, Volume= 0.377 af
Outflow = 6.98 cfs @ 11.95 hrs, Volume= 0.377 af, Atten= 0%, Lag= 0.0 min
Primary = 6.98 cfs @ 11.95 hrs, Volume= 0.377 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,059.56' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,058.50'	**30.0" Round Culvert** L= 301.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,058.50' / 2,026.00' S= 0.1080 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,064.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.88 cfs @ 11.95 hrs HW=2,059.55' (Free Discharge)
1=Culvert (Inlet Controls 6.88 cfs @ 3.50 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 53P: 18" HDPE Pipe

Inflow Area =	0.442 ac, 18.13% Impervious, Inflow Depth = 0.78"	for 1 Year event	
Inflow =	0.66 cfs @ 11.95 hrs, Volume=	0.029 af	
Outflow =	0.66 cfs @ 11.95 hrs, Volume=	0.029 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.66 cfs @ 11.95 hrs, Volume=	0.029 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,060.86' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,060.50'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,060.50' / 2,060.14' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,064.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.64 cfs @ 11.95 hrs HW=2,060.85' (Free Discharge)
1=Culvert (Inlet Controls 0.64 cfs @ 2.02 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 54P: 24" HDPE Pipe

Inflow Area =	2.551 ac, 36.52% Impervious, Inflow Depth = 1.29"	for 1 Year event	
Inflow =	4.82 cfs @ 11.98 hrs, Volume=	0.273 af	
Outflow =	4.82 cfs @ 11.98 hrs, Volume=	0.273 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.82 cfs @ 11.98 hrs, Volume=	0.273 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,101.94' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,101.00'	**24.0" Round Culvert** L= 201.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,101.00' / 2,059.50' S= 0.2065 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,106.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.79 cfs @ 11.98 hrs HW=2,101.94' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.79 cfs @ 3.30 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 55P: 18" HDPE Pipe

Inflow Area = 0.351 ac, 80.16% Impervious, Inflow Depth = 2.06" for 1 Year event
Inflow = 1.38 cfs @ 11.91 hrs, Volume= 0.060 af
Outflow = 1.38 cfs @ 11.91 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 11.91 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,102.53' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,102.00'	**18.0" Round Culvert** L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,102.00' / 2,101.00' S= 0.0208 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,106.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.36 cfs @ 11.91 hrs HW=2,102.52' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.36 cfs @ 2.47 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 56P: 18" HDPE Pipe

Inflow Area = 0.526 ac, 38.55% Impervious, Inflow Depth = 1.33" for 1 Year event
Inflow = 1.38 cfs @ 11.92 hrs, Volume= 0.058 af
Outflow = 1.38 cfs @ 11.92 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 11.92 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,082.03' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,081.50'	**18.0" Round Culvert** L= 299.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,081.50' / 2,060.00' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,086.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.34 cfs @ 11.92 hrs HW=2,082.02' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.34 cfs @ 2.46 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 57P: 18" HDPE Pipe

Inflow Area = 0.112 ac, 82.97% Impervious, Inflow Depth = 2.16" for 1 Year event
Inflow = 0.45 cfs @ 11.92 hrs, Volume= 0.020 af
Outflow = 0.45 cfs @ 11.92 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 11.92 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,082.29' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,082.00'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,082.00' / 2,081.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,086.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.44 cfs @ 11.92 hrs HW=2,082.29' (Free Discharge)
1=Culvert (Inlet Controls 0.44 cfs @ 1.83 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 62P: Catch Basin

Inflow Area = 1.479 ac, 4.03% Impervious, Inflow Depth = 0.35" for 1 Year event
Inflow = 0.62 cfs @ 12.03 hrs, Volume= 0.043 af
Outflow = 0.62 cfs @ 12.03 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Primary = 0.62 cfs @ 12.03 hrs, Volume= 0.043 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,083.34' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	2,087.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	2,083.00'	**18.0" Round Culvert** L= 207.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,083.00' / 2,080.00' S= 0.0145 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.61 cfs @ 12.03 hrs HW=2,083.34' (Free Discharge)
2=Culvert (Inlet Controls 0.61 cfs @ 1.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,083.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 65A: Manhole

Inflow Area = 2.041 ac, 24.02% Impervious, Inflow Depth = 0.81" for 1 Year event
Inflow = 2.22 cfs @ 11.94 hrs, Volume= 0.138 af
Outflow = 2.22 cfs @ 11.94 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Primary = 2.22 cfs @ 11.94 hrs, Volume= 0.138 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,080.16' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,079.40'	**24.0" Round Culvert** L= 125.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,079.40' / 2,079.00' S= 0.0032 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.20 cfs @ 11.94 hrs HW=2,080.16' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.20 cfs @ 2.99 fps)

Summary for Pond 65P: Catch Basin

Inflow Area = 2.041 ac, 24.02% Impervious, Inflow Depth = 0.81" for 1 Year event
Inflow = 2.22 cfs @ 11.94 hrs, Volume= 0.138 af
Outflow = 2.22 cfs @ 11.94 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Primary = 2.22 cfs @ 11.94 hrs, Volume= 0.138 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,080.66' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,080.00'	**24.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,080.00' / 2,079.50' S= 0.0077 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.20 cfs @ 11.94 hrs HW=2,080.66' (Free Discharge)
├─**1=Culvert** (Barrel Controls 2.20 cfs @ 3.66 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 66R: (2) 24" culvert

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,990.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,990.00'	**24.0" Round Culvert X 2.00** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500

			Inlet / Outlet Invert= 1,990.00' / 1,984.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,992.50'	**40.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,990.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 81: 24" culvert

Inflow Area = 2.837 ac, 0.00% Impervious, Inflow Depth = 0.65" for 1 Year event
Inflow = 3.20 cfs @ 11.97 hrs, Volume= 0.153 af
Outflow = 3.20 cfs @ 11.97 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min
Primary = 3.20 cfs @ 11.97 hrs, Volume= 0.153 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,013.75' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,013.00'	**24.0" Round Culvert** L= 350.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,013.00' / 1,983.90' S= 0.0831 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,016.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.16 cfs @ 11.97 hrs HW=2,013.75' (Free Discharge)
1=Culvert (Inlet Controls 3.16 cfs @ 2.95 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 200: 36" Steel Culvert

Inflow Area = 76.410 ac, 0.43% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 38.77 cfs @ 12.20 hrs, Volume= 3.859 af
Outflow = 38.77 cfs @ 12.20 hrs, Volume= 3.859 af, Atten= 0%, Lag= 0.0 min
Primary = 33.94 cfs @ 12.20 hrs, Volume= 3.783 af
Secondary = 4.83 cfs @ 12.20 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,236.50' @ 12.20 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,228.00' S= 0.1200 '/' Cc= 0.900

			n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.87 cfs @ 12.20 hrs HW=2,236.50' (Free Discharge)
└─**1=Culvert** (Inlet Controls 33.87 cfs @ 5.38 fps)

Secondary OutFlow Max=4.76 cfs @ 12.20 hrs HW=2,236.50' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 4.76 cfs @ 1.91 fps)

Summary for Pond 201: 36" Steel Culvert

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 0.65" for 1 Year event
Inflow = 7.26 cfs @ 12.17 hrs, Volume= 0.660 af
Outflow = 7.26 cfs @ 12.17 hrs, Volume= 0.660 af, Atten= 0%, Lag= 0.0 min
Primary = 7.26 cfs @ 12.17 hrs, Volume= 0.660 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,235.02' @ 12.17 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 30.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,233.00' S= 0.0333 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.22 cfs @ 12.17 hrs HW=2,235.02' (Free Discharge)
└─**1=Culvert** (Barrel Controls 7.22 cfs @ 5.10 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,234.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 297A: culvert

Inflow Area = 22.407 ac, 0.53% Impervious, Inflow Depth = 0.63" for 1 Year event
Inflow = 9.14 cfs @ 12.38 hrs, Volume= 1.172 af
Outflow = 9.14 cfs @ 12.38 hrs, Volume= 1.172 af, Atten= 0%, Lag= 0.0 min
Primary = 9.14 cfs @ 12.38 hrs, Volume= 1.172 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,113.23' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,112.00'	**36.0" Round Culvert** L= 93.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 2,112.00' / 2,099.00' S= 0.1398 '/' Cc= 0.900

			n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,116.00'	**85.0' long x 70.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.11 cfs @ 12.38 hrs HW=2,113.23' (Free Discharge)
└**1=Culvert** (Inlet Controls 9.11 cfs @ 3.33 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 300R: 18" Steel Culvert

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af
Outflow = 8.97 cfs @ 12.17 hrs, Volume= 0.826 af, Atten= 0%, Lag= 0.0 min
Primary = 8.40 cfs @ 12.17 hrs, Volume= 0.821 af
Secondary = 0.57 cfs @ 12.17 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,260.72' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,259.00'	**18.0" Round 18" Steel Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,259.00' / 2,256.00' S= 0.0750 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,260.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=8.38 cfs @ 12.17 hrs HW=2,260.72' (Free Discharge)
└**1=18" Steel Culvert** (Inlet Controls 8.38 cfs @ 4.74 fps)

Secondary OutFlow Max=0.55 cfs @ 12.17 hrs HW=2,260.72' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.55 cfs @ 1.26 fps)

Summary for Pond 302R: culvert

Inflow Area = 7.179 ac, 0.00% Impervious, Inflow Depth = 0.74" for 1 Year event
Inflow = 5.83 cfs @ 12.11 hrs, Volume= 0.441 af
Outflow = 5.83 cfs @ 12.11 hrs, Volume= 0.441 af, Atten= 0%, Lag= 0.0 min
Primary = 5.83 cfs @ 12.11 hrs, Volume= 0.441 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,860.88' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,954.00'	**18.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,954.00' / 1,952.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,858.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.81 cfs @ 12.11 hrs HW=1,860.86' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)
└—**2=Orifice/Grate** (Orifice Controls 5.81 cfs @ 7.40 fps)

Summary for Pond MH8: Manhole

Inflow Area =	7.919 ac,	33.56% Impervious,	Inflow Depth = 1.05"	for 1 Year event
Inflow =	13.27 cfs @	11.92 hrs, Volume=	0.695 af	
Outflow =	13.27 cfs @	11.92 hrs, Volume=	0.695 af,	Atten= 0%, Lag= 0.0 min
Primary =	13.27 cfs @	11.92 hrs, Volume=	0.695 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,035.31' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,033.90'	**36.0" Round Culvert** L= 158.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,033.90' / 1,997.00' S= 0.2335 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=12.99 cfs @ 11.92 hrs HW=2,035.30' (Free Discharge)
└—**1=Culvert** (Inlet Controls 12.99 cfs @ 4.03 fps)

Summary for Pond O1: 12" HDPE Pipe

Inflow Area =	4.430 ac,	15.50% Impervious,	Inflow Depth = 0.74"	for 1 Year event
Inflow =	0.22 cfs @	14.46 hrs, Volume=	0.272 af	
Outflow =	0.22 cfs @	14.46 hrs, Volume=	0.272 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.22 cfs @	14.46 hrs, Volume=	0.272 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,834.73' @ 14.46 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,834.50'	**12.0" Round Culvert** L= 334.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 1,834.50' / 1,780.00' S= 0.1632 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.22 cfs @ 14.46 hrs HW=1,834.73' (Free Discharge)
└—**1=Culvert** (Inlet Controls 0.22 cfs @ 1.63 fps)

Summary for Reach 1R: overland flow

Inflow Area = 16.946 ac, 22.50% Impervious, Inflow Depth = 3.44" for 10 Year event
Inflow = 68.85 cfs @ 11.94 hrs, Volume= 4.858 af
Outflow = 68.78 cfs @ 11.95 hrs, Volume= 4.858 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 11.63 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.90 fps, Avg. Travel Time= 0.4 min

Peak Storage= 445 cf @ 11.95 hrs
Average Depth at Peak Storage= 1.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 103.60 cfs

3.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 0.5 '/' Top Width= 5.00'
Length= 75.0' Slope= 0.1733 '/'
Inlet Invert= 1,963.00', Outlet Invert= 1,950.00'

Summary for Reach 3: Rip Rap Channel

Inflow Area = 130.257 ac, 1.76% Impervious, Inflow Depth = 2.84" for 10 Year event
Inflow = 298.44 cfs @ 12.26 hrs, Volume= 30.853 af
Outflow = 298.39 cfs @ 12.26 hrs, Volume= 30.853 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 24.76 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.75 fps, Avg. Travel Time= 0.2 min

Peak Storage= 614 cf @ 12.26 hrs
Average Depth at Peak Storage= 2.22'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 257.29 cfs

5.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 0.2 '/' Top Width= 5.80'
Length= 51.0' Slope= 0.5098 '/'
Inlet Invert= 1,740.00', Outlet Invert= 1,714.00'

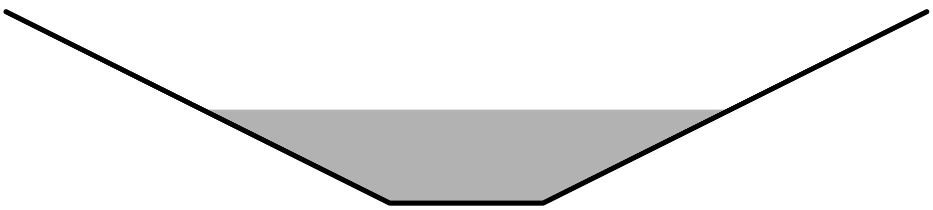
Summary for Reach 3R: Swale along RR Tracks

Inflow Area = 8.723 ac, 9.84% Impervious, Inflow Depth = 2.77" for 10 Year event
Inflow = 26.28 cfs @ 12.07 hrs, Volume= 2.013 af
Outflow = 21.15 cfs @ 12.21 hrs, Volume= 2.013 af, Atten= 20%, Lag= 8.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.93 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 17.6 min

Peak Storage= 5,678 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.22'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 103.07 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 1,045.0' Slope= 0.0172 '/'
Inlet Invert= 1,750.00', Outlet Invert= 1,732.00'



Summary for Reach 5: Stream Channel

Inflow Area = 33.644 ac, 4.16% Impervious, Inflow Depth = 2.92" for 10 Year event
Inflow = 73.70 cfs @ 12.09 hrs, Volume= 8.196 af
Outflow = 73.54 cfs @ 12.10 hrs, Volume= 8.196 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.20 fps, Avg. Travel Time= 0.8 min

Peak Storage= 926 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.97'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 1,318.86 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 160.0' Slope= 0.3000 '/'
Inlet Invert= 2,060.00', Outlet Invert= 2,012.00'

Summary for Reach 5A: Stream Channel

Inflow Area = 41.552 ac, 5.67% Impervious, Inflow Depth = 2.93" for 10 Year event
Inflow = 73.86 cfs @ 12.10 hrs, Volume= 10.142 af
Outflow = 73.20 cfs @ 12.11 hrs, Volume= 10.142 af, Atten= 1%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 11.47 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.19 fps, Avg. Travel Time= 2.6 min

Peak Storage= 2,188 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.05'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 1,138.43 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 340.0' Slope= 0.2235 '/'
Inlet Invert= 2,012.00', Outlet Invert= 1,936.00'

Summary for Reach 5B: Stream Channel

Inflow Area = 46.285 ac, 5.15% Impervious, Inflow Depth = 2.92" for 10 Year event
Inflow = 79.56 cfs @ 12.09 hrs, Volume= 11.249 af
Outflow = 79.26 cfs @ 12.10 hrs, Volume= 11.249 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 10.55 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 1.0 min

Peak Storage= 903 cf @ 12.09 hrs
Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 983.02 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 120.0' Slope= 0.1667 '/'
Inlet Invert= 1,936.00', Outlet Invert= 1,916.00'

Summary for Reach 5C: Stream Channel

Inflow Area = 67.707 ac, 9.43% Impervious, Inflow Depth = 3.03" for 10 Year event
Inflow = 111.92 cfs @ 12.14 hrs, Volume= 17.083 af
Outflow = 111.78 cfs @ 12.16 hrs, Volume= 17.083 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 11.21 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 2.2 min

Peak Storage= 2,766 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.45'
Bank-Full Depth= 4.00', Capacity at Bank-Full= 937.61 cfs

4.00' x 4.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 20.00'
Length= 277.0' Slope= 0.1516 '/'
Inlet Invert= 1,916.00', Outlet Invert= 1,874.00'

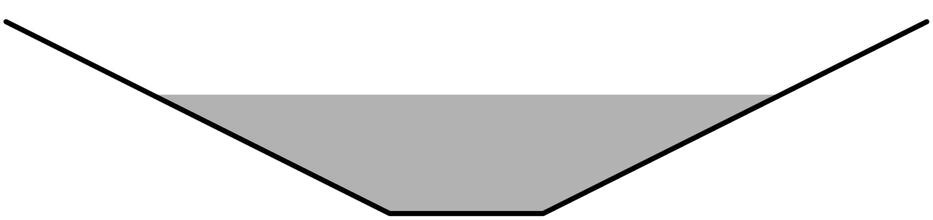
Summary for Reach 5D: Stream Channel

Inflow Area = 75.446 ac, 8.80% Impervious, Inflow Depth = 2.98" for 10 Year event
Inflow = 122.90 cfs @ 12.10 hrs, Volume= 18.750 af
Outflow = 122.86 cfs @ 12.11 hrs, Volume= 18.750 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 15.56 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.17 fps, Avg. Travel Time= 1.6 min

Peak Storage= 2,369 cf @ 12.11 hrs
Average Depth at Peak Storage= 1.55'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 357.03 cfs

2.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 300.0' Slope= 0.2067 '/'
Inlet Invert= 1,874.00', Outlet Invert= 1,812.00'



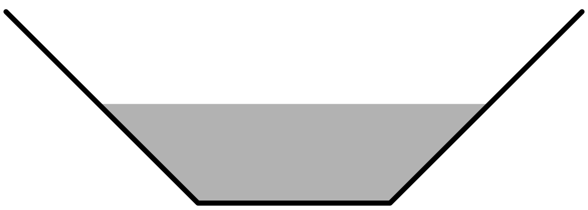
Summary for Reach 5R: roadside swale

Inflow Area = 4.919 ac, 18.04% Impervious, Inflow Depth = 2.96" for 10 Year event
Inflow = 18.56 cfs @ 12.01 hrs, Volume= 1.211 af
Outflow = 17.29 cfs @ 12.06 hrs, Volume= 1.211 af, Atten= 7%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.51 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 7.6 min

Peak Storage= 1,908 cf @ 12.03 hrs
Average Depth at Peak Storage= 1.04'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 61.25 cfs

2.00' x 2.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 6.00'
Length= 607.0' Slope= 0.0626 '/'
Inlet Invert= 2,122.00', Outlet Invert= 2,084.00'



Summary for Reach 6: SWALE

Inflow Area = 21.422 ac, 18.68% Impervious, Inflow Depth = 3.27" for 10 Year event
Inflow = 39.33 cfs @ 12.19 hrs, Volume= 5.834 af
Outflow = 39.13 cfs @ 12.22 hrs, Volume= 5.834 af, Atten= 1%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.03 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 5.5 min

Peak Storage= 2,337 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.43'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 108.04 cfs

4.00' x 2.50' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 9.00'
Length= 300.0' Slope= 0.0300 '/'
Inlet Invert= 1,939.00', Outlet Invert= 1,930.00'

Summary for Reach 6R: Clean Swale

Inflow Area = 22.295 ac, 15.82% Impervious, Inflow Depth > 3.16" for 10 Year event
Inflow = 46.82 cfs @ 12.16 hrs, Volume= 5.879 af
Outflow = 46.53 cfs @ 12.18 hrs, Volume= 5.879 af, Atten= 1%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.79 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 2.5 min

Peak Storage= 1,303 cf @ 12.16 hrs
Average Depth at Peak Storage= 1.21'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 139.88 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 245.0' Slope= 0.0490 '/'
Inlet Invert= 1,842.00', Outlet Invert= 1,830.00'

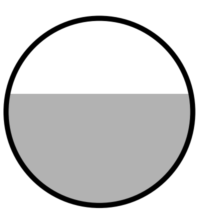
Summary for Reach 7A: CULVERT

Inflow Area = 0.577 ac, 11.54% Impervious, Inflow Depth = 3.09" for 10 Year event
Inflow = 3.13 cfs @ 11.98 hrs, Volume= 0.148 af
Outflow = 3.09 cfs @ 11.98 hrs, Volume= 0.148 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.39 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 0.9 min

Peak Storage= 56 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.70 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 115.0' Slope= 0.0174 '/'
Inlet Invert= 1,900.00', Outlet Invert= 1,898.00'



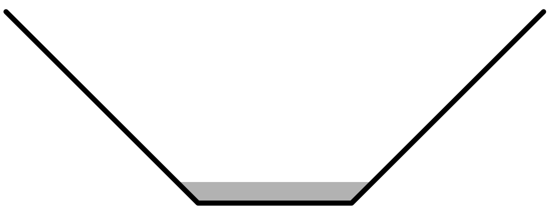
Summary for Reach 7B: Existing Ditch

Inflow Area = 0.577 ac, 11.54% Impervious, Inflow Depth = 3.09" for 10 Year event
Inflow = 3.09 cfs @ 11.98 hrs, Volume= 0.148 af
Outflow = 3.05 cfs @ 12.00 hrs, Volume= 0.148 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.91 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 1.6 min

Peak Storage= 78 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 172.60 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 125.0' Slope= 0.1280 '/'
Inlet Invert= 1,896.00', Outlet Invert= 1,880.00'



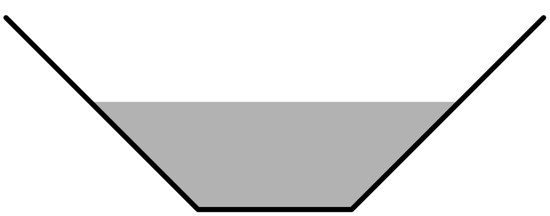
Summary for Reach 7C: Existing Ditch

Inflow Area = 12.983 ac, 1.90% Impervious, Inflow Depth = 2.73" for 10 Year event
Inflow = 39.44 cfs @ 12.07 hrs, Volume= 2.948 af
Outflow = 38.80 cfs @ 12.10 hrs, Volume= 2.948 af, Atten= 2%, Lag= 2.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.17 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 5.9 min

Peak Storage= 2,532 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 123.26 cfs

2.00' x 2.50' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 530.0' Slope= 0.1020 '/'
Inlet Invert= 1,880.00', Outlet Invert= 1,825.94'



Summary for Reach 8: Stream Channel

Inflow Area = 92.038 ac, 7.66% Impervious, Inflow Depth = 2.95" for 10 Year event
Inflow = 165.27 cfs @ 12.09 hrs, Volume= 22.599 af
Outflow = 164.87 cfs @ 12.10 hrs, Volume= 22.599 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 12.90 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.44 fps, Avg. Travel Time= 1.7 min

Peak Storage= 3,135 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 473.46 cfs

4.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 5.0 '/' Top Width= 24.00'
Length= 245.0' Slope= 0.2694 '/'
Inlet Invert= 1,816.00', Outlet Invert= 1,750.00'

‡

Summary for Reach 9R: swale

Inflow Area = 0.723 ac, 0.00% Impervious, Inflow Depth = 2.90" for 10 Year event
Inflow = 3.49 cfs @ 11.99 hrs, Volume= 0.175 af
Outflow = 3.38 cfs @ 12.03 hrs, Volume= 0.175 af, Atten= 3%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.24 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 5.9 min

Peak Storage= 294 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 11.64 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 280.0' Slope= 0.0179 '/'
Inlet Invert= 2,225.00', Outlet Invert= 2,220.00'

Summary for Reach 11R: Overland Flow

Inflow Area = 20.182 ac, 16.70% Impervious, Inflow Depth > 3.17" for 10 Year event
Inflow = 44.73 cfs @ 12.00 hrs, Volume= 5.335 af
Outflow = 38.99 cfs @ 12.15 hrs, Volume= 5.335 af, Atten= 13%, Lag= 9.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 28.8 min

Peak Storage= 11,678 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 626.02 cfs

75.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 105.00'
Length= 760.0' Slope= 0.1724 '/'
Inlet Invert= 1,973.00', Outlet Invert= 1,842.00'

‡

Summary for Reach 12R: Overland Flow

Inflow Area = 2.112 ac, 7.43% Impervious, Inflow Depth = 3.09" for 10 Year event
Inflow = 8.75 cfs @ 12.06 hrs, Volume= 0.544 af
Outflow = 8.02 cfs @ 12.18 hrs, Volume= 0.544 af, Atten= 8%, Lag= 7.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.04 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 17.8 min

Peak Storage= 2,224 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 315.94 cfs

30.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 15.0 '/' Top Width= 60.00'
Length= 562.0' Slope= 0.2100 '/'
Inlet Invert= 1,960.00', Outlet Invert= 1,842.00'

‡

Summary for Reach 13: Channel at tracks

Inflow Area = 100.761 ac, 7.85% Impervious, Inflow Depth = 2.93" for 10 Year event
Inflow = 178.33 cfs @ 12.15 hrs, Volume= 24.612 af
Outflow = 177.51 cfs @ 12.18 hrs, Volume= 24.612 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.07 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 4.3 min

Peak Storage= 9,056 cf @ 12.16 hrs
Average Depth at Peak Storage= 2.06'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 423.37 cfs

4.00' x 3.00' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 4.0 '/' Top Width= 28.00'
Length= 360.0' Slope= 0.0444 '/'
Inlet Invert= 1,750.00', Outlet Invert= 1,734.00'

‡

Summary for Reach 40R: Swale

Inflow Area = 19.549 ac, 16.10% Impervious, Inflow Depth > 3.15" for 10 Year event
Inflow = 42.54 cfs @ 12.00 hrs, Volume= 5.125 af
Outflow = 42.08 cfs @ 12.01 hrs, Volume= 5.125 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 6.45 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.4 min

Peak Storage= 623 cf @ 12.00 hrs
Average Depth at Peak Storage= 1.29'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 106.53 cfs

2.50' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.50'
Length= 95.0' Slope= 0.0411 '/'
Inlet Invert= 1,983.90', Outlet Invert= 1,980.00'

Summary for Reach 51R: Swale

Inflow Area = 4.233 ac, 33.60% Impervious, Inflow Depth = 3.91" for 10 Year event
Inflow = 25.69 cfs @ 11.95 hrs, Volume= 1.378 af
Outflow = 24.91 cfs @ 11.99 hrs, Volume= 1.378 af, Atten= 3%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.30 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 5.5 min

Peak Storage= 2,137 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 162.52 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 535.0' Slope= 0.0374 '/'
Inlet Invert= 2,020.00', Outlet Invert= 2,000.00'

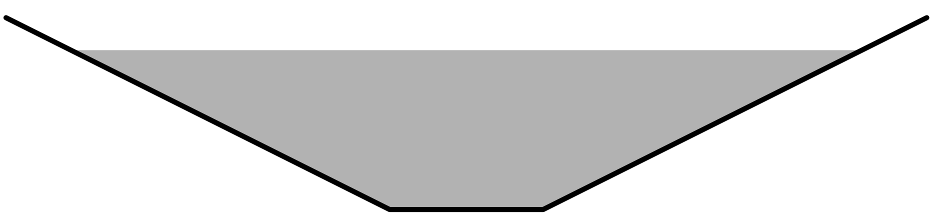
Summary for Reach 58a: Swale along RR Tracks

Inflow Area = 34.486 ac, 12.14% Impervious, Inflow Depth = 3.10" for 10 Year event
Inflow = 86.57 cfs @ 12.15 hrs, Volume= 8.920 af
Outflow = 85.58 cfs @ 12.19 hrs, Volume= 8.919 af, Atten= 1%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.70 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 7.7 min

Peak Storage= 6,944 cf @ 12.17 hrs
Average Depth at Peak Storage= 2.08'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 130.53 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 543.0' Slope= 0.0276 '/'
Inlet Invert= 1,788.00', Outlet Invert= 1,773.00'



Summary for Reach 63R: OVERLAND

Inflow Area = 2.621 ac, 35.67% Impervious, Inflow Depth = 3.45" for 10 Year event
Inflow = 13.23 cfs @ 11.96 hrs, Volume= 0.753 af
Outflow = 13.10 cfs @ 11.97 hrs, Volume= 0.753 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.26 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 1.7 min

Peak Storage= 316 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 290.92 cfs

20.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 70.00'
Length= 126.0' Slope= 0.3095 '/'
Inlet Invert= 2,079.00', Outlet Invert= 2,040.00'

‡

Summary for Reach 64R: Swale

Inflow Area = 7.908 ac, 12.10% Impervious, Inflow Depth > 2.95" for 10 Year event
Inflow = 5.49 cfs @ 12.43 hrs, Volume= 1.947 af
Outflow = 5.45 cfs @ 12.50 hrs, Volume= 1.946 af, Atten= 1%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.68 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 6.9 min

Peak Storage= 722 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 31.81 cfs

2.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 222.0' Slope= 0.0045 '/'
Inlet Invert= 2,016.50', Outlet Invert= 2,015.50'

Summary for Reach 69R: Wetland Flow

Inflow Area = 3.895 ac, 4.53% Impervious, Inflow Depth = 3.18" for 10 Year event
Inflow = 20.51 cfs @ 11.99 hrs, Volume= 1.034 af
Outflow = 16.96 cfs @ 12.15 hrs, Volume= 1.034 af, Atten= 17%, Lag= 9.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.34 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 28.1 min

Peak Storage= 6,222 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 172.83 cfs

76.00' x 0.50' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 100.0 '/' Top Width= 176.00'
Length= 487.0' Slope= 0.0657 '/'
Inlet Invert= 2,098.00', Outlet Invert= 2,066.00'

‡

Summary for Reach 197: Stream Channel

Inflow Area = 121.913 ac, 1.88% Impervious, Inflow Depth = 2.84" for 10 Year event
Inflow = 291.10 cfs @ 12.24 hrs, Volume= 28.838 af
Outflow = 290.13 cfs @ 12.26 hrs, Volume= 28.838 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 13.04 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 3.03 fps, Avg. Travel Time= 3.3 min

Peak Storage= 13,352 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 12,157.92 cfs

15.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 7.0 '/' Top Width= 99.00'
Length= 599.0' Slope= 0.2771 '/'
Inlet Invert= 1,910.00', Outlet Invert= 1,744.00'

‡

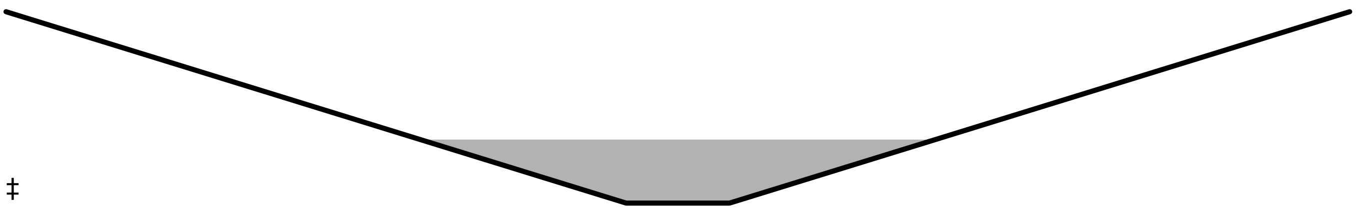
Summary for Reach 197A: Stream Channel

Inflow Area = 114.943 ac, 1.85% Impervious, Inflow Depth = 2.83" for 10 Year event
Inflow = 286.56 cfs @ 12.22 hrs, Volume= 27.130 af
Outflow = 285.42 cfs @ 12.24 hrs, Volume= 27.130 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.01 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.57 fps, Avg. Travel Time= 3.9 min

Peak Storage= 14,314 cf @ 12.23 hrs
Average Depth at Peak Storage= 1.99'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 3,907.44 cfs

4.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 601.0' Slope= 0.1331 '/'
Inlet Invert= 1,990.00', Outlet Invert= 1,910.00'



‡

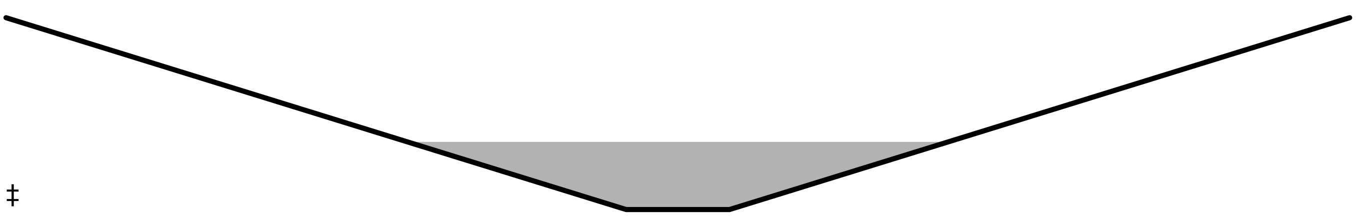
Summary for Reach 197B: Stream Channel

Inflow Area = 110.322 ac, 1.58% Impervious, Inflow Depth = 2.83" for 10 Year event
Inflow = 283.45 cfs @ 12.21 hrs, Volume= 26.006 af
Outflow = 282.80 cfs @ 12.22 hrs, Volume= 26.006 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.74 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 1.9 min

Peak Storage= 6,646 cf @ 12.22 hrs
Average Depth at Peak Storage= 2.12'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 3,373.30 cfs

4.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 252.0' Slope= 0.0992 '/'
Inlet Invert= 2,015.00', Outlet Invert= 1,990.00'



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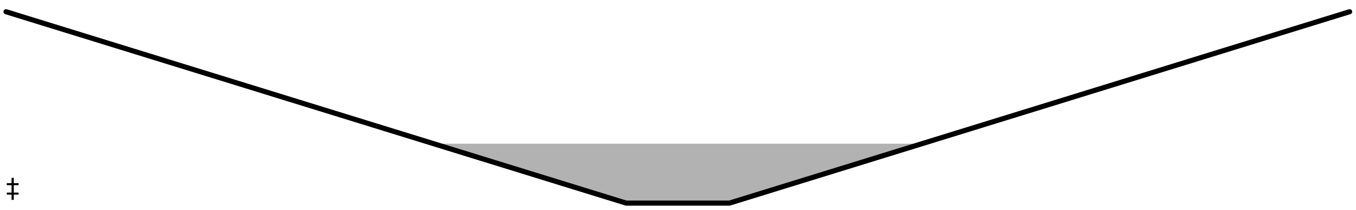
Summary for Reach 197C: Stream Channel

Inflow Area = 95.895 ac, 1.22% Impervious, Inflow Depth = 2.84" for 10 Year event
Inflow = 263.71 cfs @ 12.21 hrs, Volume= 22.684 af
Outflow = 262.56 cfs @ 12.23 hrs, Volume= 22.684 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.37 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 4.47 fps, Avg. Travel Time= 1.6 min

Peak Storage= 9,070 cf @ 12.22 hrs
Average Depth at Peak Storage= 1.86'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 4,183.47 cfs

4.00' x 6.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 426.0' Slope= 0.1526 '/'
Inlet Invert= 2,080.00', Outlet Invert= 2,015.00'



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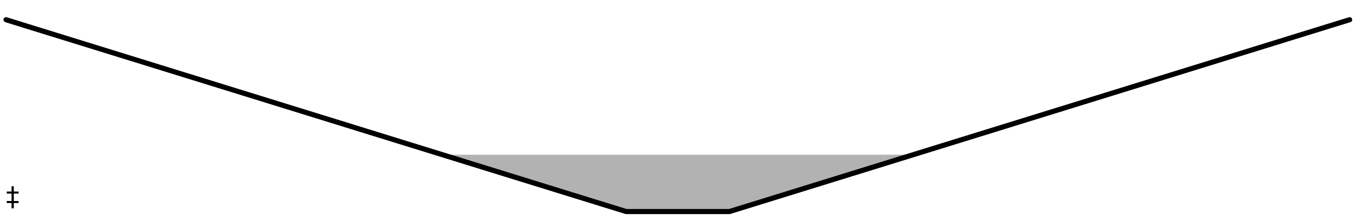
Summary for Reach 198: Stream Channel

Inflow Area = 88.624 ac, 0.78% Impervious, Inflow Depth = 2.82" for 10 Year event
Inflow = 252.17 cfs @ 12.17 hrs, Volume= 20.813 af
Outflow = 249.95 cfs @ 12.22 hrs, Volume= 20.813 af, Atten= 1%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 12.67 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 4.63 fps, Avg. Travel Time= 4.5 min

Peak Storage= 24,905 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.78'
Bank-Full Depth= 6.00', Capacity at Bank-Full= 4,399.92 cfs

4.00' x 6.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 4.0 '/' Top Width= 52.00'
Length= 1,262.0' Slope= 0.1688 '/'
Inlet Invert= 2,228.00', Outlet Invert= 2,015.00'



‡

Summary for Reach 199: Overland Flow

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 2.90" for 10 Year event
Inflow = 37.69 cfs @ 12.15 hrs, Volume= 2.950 af
Outflow = 37.39 cfs @ 12.17 hrs, Volume= 2.950 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.41 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 3.2 min

Peak Storage= 2,132 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 458.82 cfs

50.00' x 0.50' deep channel, n= 0.040 Earth, dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 150.00'
Length= 250.0' Slope= 0.2640 '/'
Inlet Invert= 2,234.00', Outlet Invert= 2,168.00'

‡

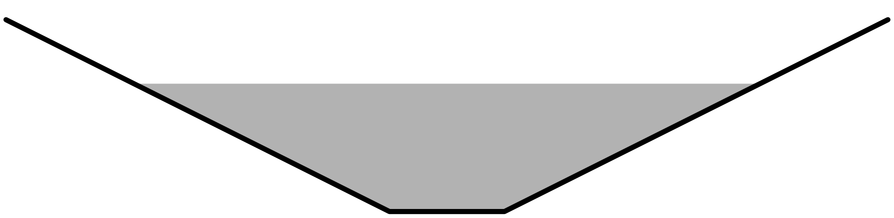
Summary for Reach 295: Roadside Channel

Inflow Area = 27.327 ac, 3.68% Impervious, Inflow Depth = 2.87" for 10 Year event
Inflow = 56.52 cfs @ 12.31 hrs, Volume= 6.539 af
Outflow = 56.29 cfs @ 12.33 hrs, Volume= 6.539 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.01 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 2.4 min

Peak Storage= 2,252 cf @ 12.32 hrs
Average Depth at Peak Storage= 1.67'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 144.47 cfs

1.50' x 2.50' deep channel, n= 0.050 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 11.50'
Length= 280.0' Slope= 0.0643 '/'
Inlet Invert= 2,084.00', Outlet Invert= 2,066.00'



Summary for Reach 296: Wetland Flow

Inflow Area = 22.407 ac, 0.53% Impervious, Inflow Depth = 2.85" for 10 Year event
Inflow = 52.89 cfs @ 12.25 hrs, Volume= 5.327 af
Outflow = 51.91 cfs @ 12.32 hrs, Volume= 5.327 af, Atten= 2%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.92 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 8.1 min

Peak Storage= 7,607 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 251.85 cfs

12.00' x 2.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 8.0 '/' Top Width= 44.00'
Length= 427.0' Slope= 0.0328 '/'
Inlet Invert= 2,098.00', Outlet Invert= 2,084.00'

‡

Summary for Reach 297: Overland Flow

Inflow Area = 17.082 ac, 0.44% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 49.30 cfs @ 12.24 hrs, Volume= 3.999 af
Outflow = 49.13 cfs @ 12.25 hrs, Volume= 3.999 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.26 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 1.6 min

Peak Storage= 1,324 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 358.18 cfs

30.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 80.00'
Length= 195.0' Slope= 0.2872 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,114.00'

‡

Summary for Reach 298: Wetland Flow

Inflow Area = 17.082 ac, 0.44% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 50.68 cfs @ 12.15 hrs, Volume= 3.999 af
Outflow = 49.30 cfs @ 12.24 hrs, Volume= 3.999 af, Atten= 3%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 12.1 min

Peak Storage= 9,402 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 802.14 cfs

100.00' x 1.00' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 50.0 '/' Top Width= 200.00'
Length= 408.0' Slope= 0.0931 '/'
Inlet Invert= 2,208.00', Outlet Invert= 2,170.00'

‡

Summary for Reach 299: Overland Flow

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 49.29 cfs @ 12.14 hrs, Volume= 3.824 af
Outflow = 49.11 cfs @ 12.15 hrs, Volume= 3.824 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.95 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 1.0 min

Peak Storage= 1,118 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 134.95 cfs

10.00' x 0.50' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 50.0 '/' Top Width= 60.00'
Length= 135.0' Slope= 0.3481 '/'
Inlet Invert= 2,255.00', Outlet Invert= 2,208.00'

‡

Summary for Reach O3: Overland Flow

Inflow	=	22.52 cfs @	11.99 hrs, Volume=	0.640 af	
Outflow	=	21.94 cfs @	12.01 hrs, Volume=	0.640 af,	Atten= 3%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 3.6 min

Peak Storage= 997 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 78.90 cfs

30.00' x 0.25' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 100.0 '/' Top Width= 80.00'
Length= 178.0' Slope= 0.1404 '/'
Inlet Invert= 1,838.00', Outlet Invert= 1,813.00'

‡

Summary for Reach O4: Swale

Inflow	=	21.94 cfs @	12.01 hrs, Volume=	0.640 af	
Outflow	=	21.25 cfs @	12.03 hrs, Volume=	0.640 af,	Atten= 3%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.10 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 3.3 min

Peak Storage= 1,010 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 59.96 cfs

2.00' x 1.50' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 286.0' Slope= 0.0385 '/'
Inlet Invert= 1,810.00', Outlet Invert= 1,799.00'

Summary for Reach X1: Swale

Inflow Area = 2.495 ac, 6.71% Impervious, Inflow Depth = 2.53" for 10 Year event
Inflow = 10.37 cfs @ 12.01 hrs, Volume= 0.526 af
Outflow = 10.00 cfs @ 12.03 hrs, Volume= 0.526 af, Atten= 4%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.24 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 2.4 min

Peak Storage= 335 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 153.60 cfs

2.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 200.0' Slope= 0.1050 '/'
Inlet Invert= 1,794.00', Outlet Invert= 1,773.00'

Summary for Pond 1P: Catch Basin/Culvert

Inflow Area = 1.239 ac, 57.09% Impervious, Inflow Depth = 4.63" for 10 Year event
Inflow = 8.44 cfs @ 12.01 hrs, Volume= 0.478 af
Outflow = 8.44 cfs @ 12.01 hrs, Volume= 0.478 af, Atten= 0%, Lag= 0.0 min
Primary = 8.44 cfs @ 12.01 hrs, Volume= 0.478 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,981.10' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,980.00'	**36.0" Round Culvert** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,980.00' / 1,964.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.37 cfs @ 12.01 hrs HW=1,981.10' (Free Discharge)
1=Culvert (Inlet Controls 8.37 cfs @ 3.57 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 2P: Catch Basin

Inflow Area = 8.528 ac, 36.42% Impervious, Inflow Depth = 3.56" for 10 Year event
Inflow = 49.00 cfs @ 11.93 hrs, Volume= 2.533 af
Outflow = 49.00 cfs @ 11.93 hrs, Volume= 2.533 af, Atten= 0%, Lag= 0.0 min
Primary = 49.00 cfs @ 11.93 hrs, Volume= 2.533 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,999.69' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,996.00'	**36.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,996.00' / 1,995.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=48.20 cfs @ 11.93 hrs HW=1,999.64' (Free Discharge)
1=Culvert (Barrel Controls 48.20 cfs @ 7.14 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 2R: 48" CMP Culvert

Inflow Area = 130.257 ac, 1.76% Impervious, Inflow Depth = 2.84" for 10 Year event
Inflow = 298.44 cfs @ 12.26 hrs, Volume= 30.853 af
Outflow = 298.44 cfs @ 12.26 hrs, Volume= 30.853 af, Atten= 0%, Lag= 0.0 min
Primary = 139.43 cfs @ 12.26 hrs, Volume= 25.036 af
Secondary = 159.00 cfs @ 12.26 hrs, Volume= 5.817 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 1,749.31' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,742.00'	**48.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 1,742.00' / 1,740.00' S= 0.0667 '/' Cc= 0.900 n= 0.025
#2	Secondary	1,746.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=139.33 cfs @ 12.26 hrs HW=1,749.30' (Free Discharge)
└─**1=Culvert** (Inlet Controls 139.33 cfs @ 11.09 fps)

Secondary OutFlow Max=158.44 cfs @ 12.26 hrs HW=1,749.30' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 158.44 cfs @ 4.80 fps)

Summary for Pond 3P: Catch Basin

Inflow Area = 0.284 ac, 69.74% Impervious, Inflow Depth = 4.97" for 10 Year event
Inflow = 2.57 cfs @ 11.91 hrs, Volume= 0.118 af
Outflow = 2.57 cfs @ 11.91 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
Primary = 2.57 cfs @ 11.91 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,009.93' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,009.19'	**18.0" Round Culvert** L= 304.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,009.19' / 1,997.21' S= 0.0394 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,014.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.54 cfs @ 11.91 hrs HW=2,009.93' (Free Discharge)
├─**1=Culvert** (Inlet Controls 2.54 cfs @ 2.93 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 4P: Catch Basin

Inflow Area = 0.103 ac,100.00% Impervious, Inflow Depth = 5.76" for 10 Year event
Inflow = 0.99 cfs @ 11.91 hrs, Volume= 0.050 af
Outflow = 0.99 cfs @ 11.91 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 11.91 hrs, Volume= 0.050 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,010.20' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,009.71'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,009.71' / 2,009.53' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

#2	Primary	2,014.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.99 cfs @ 11.91 hrs HW=2,010.20' (Free Discharge)
1=Culvert (Barrel Controls 0.99 cfs @ 2.98 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 4R: (2) 36" Culverts

Inflow Area = 33.644 ac, 4.16% Impervious, Inflow Depth = 2.92" for 10 Year event
Inflow = 73.70 cfs @ 12.09 hrs, Volume= 8.196 af
Outflow = 73.70 cfs @ 12.09 hrs, Volume= 8.196 af, Atten= 0%, Lag= 0.0 min
Primary = 73.70 cfs @ 12.09 hrs, Volume= 8.196 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,066.66' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,064.00'	**36.0" Round Culvert X 2.00** L= 70.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,064.00' / 2,063.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Secondary	2,070.00'	**50.0' long x 35.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=73.65 cfs @ 12.09 hrs HW=2,066.66' (Free Discharge)
1=Culvert (Inlet Controls 73.65 cfs @ 5.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,064.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 7P: Catch Basin

Inflow Area = 0.262 ac, 70.83% Impervious, Inflow Depth = 4.96" for 10 Year event
Inflow = 2.27 cfs @ 11.94 hrs, Volume= 0.108 af
Outflow = 2.27 cfs @ 11.94 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min
Primary = 2.27 cfs @ 11.94 hrs, Volume= 0.108 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,066.36' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.43'	**12.0" Round Culvert** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,065.43' / 2,065.25' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,070.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.25 cfs @ 11.94 hrs HW=2,066.36' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.25 cfs @ 3.86 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 7R: (2) 36" Steel Culverts

Inflow Area = 92.038 ac, 7.66% Impervious, Inflow Depth = 2.95" for 10 Year event
Inflow = 165.27 cfs @ 12.09 hrs, Volume= 22.599 af
Outflow = 165.27 cfs @ 12.09 hrs, Volume= 22.599 af, Atten= 0%, Lag= 0.0 min
Primary = 124.45 cfs @ 12.09 hrs, Volume= 21.662 af
Secondary = 40.82 cfs @ 12.09 hrs, Volume= 0.937 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,816.84' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,812.00'	**36.0" Round Culvert X 2.00** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,812.00' / 1,811.00' S= 0.0333 '/' Cc= 0.900 n= 0.012
#2	Secondary	1,816.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=124.42 cfs @ 12.09 hrs HW=1,816.84' (Free Discharge)
└─**1=Culvert** (Inlet Controls 124.42 cfs @ 8.80 fps)

Secondary OutFlow Max=40.69 cfs @ 12.09 hrs HW=1,816.84' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 40.69 cfs @ 2.42 fps)

Summary for Pond 8R: 36" hdpe

Inflow Area = 34.486 ac, 12.14% Impervious, Inflow Depth = 3.10" for 10 Year event
Inflow = 86.57 cfs @ 12.15 hrs, Volume= 8.920 af
Outflow = 86.57 cfs @ 12.15 hrs, Volume= 8.920 af, Atten= 0%, Lag= 0.0 min
Primary = 86.57 cfs @ 12.15 hrs, Volume= 8.920 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,837.97' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,830.00'	**36.0" Round Culvert** L= 245.0' Ke= 0.500 Inlet / Outlet Invert= 1,830.00' / 1,788.00' S= 0.1714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=86.52 cfs @ 12.15 hrs HW=1,837.96' (Free Discharge)
└─**1=Culvert** (Inlet Controls 86.52 cfs @ 12.24 fps)

Summary for Pond 9P: Catch Basin

Inflow Area = 0.167 ac, 83.21% Impervious, Inflow Depth = 5.32" for 10 Year event
Inflow = 1.59 cfs @ 11.91 hrs, Volume= 0.074 af
Outflow = 1.59 cfs @ 11.91 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 11.91 hrs, Volume= 0.074 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,035.05' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,034.40'	**24.0" Round Culvert** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,034.40' / 2,034.00' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,039.40'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.56 cfs @ 11.91 hrs HW=2,035.04' (Free Discharge)
1=Culvert (Barrel Controls 1.56 cfs @ 2.66 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 10P: Catch Basin

Inflow Area = 0.088 ac, 94.81% Impervious, Inflow Depth = 5.64" for 10 Year event
Inflow = 0.86 cfs @ 11.91 hrs, Volume= 0.042 af
Outflow = 0.86 cfs @ 11.91 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 11.91 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,035.81' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,035.29'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,035.29' / 2,035.11' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,039.40'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.85 cfs @ 11.91 hrs HW=2,035.81' (Free Discharge)
1=Culvert (Barrel Controls 0.85 cfs @ 3.00 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 10R: 14" and 16" HDPE Culverts

Inflow Area = 20.182 ac, 16.70% Impervious, Inflow Depth > 3.17" for 10 Year event
Inflow = 44.73 cfs @ 12.00 hrs, Volume= 5.335 af
Outflow = 44.73 cfs @ 12.00 hrs, Volume= 5.335 af, Atten= 0%, Lag= 0.0 min
Primary = 12.41 cfs @ 12.00 hrs, Volume= 4.176 af
Secondary = 32.31 cfs @ 12.00 hrs, Volume= 1.160 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,977.39' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,975.00'	**14.0" Round 14" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#2	Primary	1,975.00'	**16.0" Round 16" Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,975.00' / 1,974.50' S= 0.0100 '/' Cc= 0.900 n= 0.011
#3	Secondary	1,977.00'	**50.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=12.41 cfs @ 12.00 hrs HW=1,977.38' (Free Discharge)
1=14" Culvert (Inlet Controls 5.45 cfs @ 5.10 fps)
2=16" Culvert (Inlet Controls 6.96 cfs @ 4.98 fps)

Secondary OutFlow Max=32.21 cfs @ 12.00 hrs HW=1,977.38' (Free Discharge)
3=Broad-Crested Rectangular Weir (Weir Controls 32.21 cfs @ 1.67 fps)

Summary for Pond 11P: Catch Basin

Inflow Area = 7.752 ac, 32.48% Impervious, Inflow Depth = 3.41" for 10 Year event
Inflow = 42.22 cfs @ 11.93 hrs, Volume= 2.201 af
Outflow = 42.22 cfs @ 11.93 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.0 min
Primary = 42.22 cfs @ 11.93 hrs, Volume= 2.201 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,058.04' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,055.00'	**36.0" Round Culvert** L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,055.00' / 2,040.74' S= 0.1584 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,060.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=41.61 cfs @ 11.93 hrs HW=2,057.99' (Free Discharge)
1=Culvert (Inlet Controls 41.61 cfs @ 5.89 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 12P: Catch Basin

Inflow Area = 0.067 ac, 88.78% Impervious, Inflow Depth = 5.41" for 10 Year event
Inflow = 0.65 cfs @ 11.90 hrs, Volume= 0.030 af
Outflow = 0.65 cfs @ 11.90 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 11.90 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,055.41' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,055.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,055.00' / 2,054.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,060.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.63 cfs @ 11.90 hrs HW=2,055.40' (Free Discharge)
1=Culvert (Inlet Controls 0.63 cfs @ 2.15 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 13P: Manhole

Inflow Area = 7.315 ac, 30.04% Impervious, Inflow Depth = 3.31" for 10 Year event
Inflow = 38.80 cfs @ 11.94 hrs, Volume= 2.018 af
Outflow = 38.80 cfs @ 11.94 hrs, Volume= 2.018 af, Atten= 0%, Lag= 0.0 min
Primary = 38.80 cfs @ 11.94 hrs, Volume= 2.018 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,066.66' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,063.88'	**36.0" Round Culvert** L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,063.88' / 2,055.10' S= 0.0641 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,072.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=38.49 cfs @ 11.94 hrs HW=2,066.64' (Free Discharge)
1=Culvert (Inlet Controls 38.49 cfs @ 5.66 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 13R: 16" CMP Culvert

Inflow Area = 2.112 ac, 7.43% Impervious, Inflow Depth = 3.09" for 10 Year event
Inflow = 8.75 cfs @ 12.06 hrs, Volume= 0.544 af
Outflow = 8.75 cfs @ 12.06 hrs, Volume= 0.544 af, Atten= 0%, Lag= 0.0 min
Primary = 8.75 cfs @ 12.06 hrs, Volume= 0.544 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,970.36' @ 12.06 hrs
Flood Elev= 1,969.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,968.00'	**16.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 1,968.00' / 1,965.00' S= 0.0750 '/' Cc= 0.900 n= 0.025

Primary OutFlow Max=8.75 cfs @ 12.06 hrs HW=1,970.36' (Free Discharge)
1=Culvert (Inlet Controls 8.75 cfs @ 6.26 fps)

Summary for Pond 15P: Catch Basin

Inflow Area = 0.609 ac, 66.13% Impervious, Inflow Depth = 4.83" for 10 Year event
Inflow = 5.26 cfs @ 11.93 hrs, Volume= 0.245 af
Outflow = 5.26 cfs @ 11.93 hrs, Volume= 0.245 af, Atten= 0%, Lag= 0.0 min
Primary = 5.26 cfs @ 11.93 hrs, Volume= 0.245 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,067.86' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,065.43'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,065.43' / 2,065.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,070.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.17 cfs @ 11.93 hrs HW=2,067.80' (Free Discharge)
└1=**Culvert** (Inlet Controls 5.17 cfs @ 6.58 fps)
└2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 16P: Catch Basin

Inflow Area = 0.168 ac, 93.81% Impervious, Inflow Depth = 5.64" for 10 Year event
Inflow = 1.63 cfs @ 11.91 hrs, Volume= 0.079 af
Outflow = 1.63 cfs @ 11.91 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min
Primary = 1.63 cfs @ 11.91 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,081.36' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,080.59'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,080.59' / 2,080.41' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,084.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.61 cfs @ 11.91 hrs HW=2,081.36' (Free Discharge)
└1=**Culvert** (Barrel Controls 1.61 cfs @ 3.45 fps)
└2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 17P: Catch Basin

Inflow Area = 6.537 ac, 25.96% Impervious, Inflow Depth = 3.13" for 10 Year event
Inflow = 32.12 cfs @ 11.94 hrs, Volume= 1.708 af
Outflow = 32.12 cfs @ 11.94 hrs, Volume= 1.708 af, Atten= 0%, Lag= 0.0 min
Primary = 32.12 cfs @ 11.94 hrs, Volume= 1.708 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,081.91' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,079.50'	**36.0" Round Culvert** L= 213.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,079.50' / 2,067.47' S= 0.0565 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,084.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=31.92 cfs @ 11.94 hrs HW=2,081.90' (Free Discharge)
└1=**Culvert** (Inlet Controls 31.92 cfs @ 5.27 fps)
└2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 18P: Catch Basin

Inflow Area = 0.696 ac, 90.27% Impervious, Inflow Depth = 5.53" for 10 Year event
Inflow = 6.65 cfs @ 11.91 hrs, Volume= 0.321 af
Outflow = 6.65 cfs @ 11.91 hrs, Volume= 0.321 af, Atten= 0%, Lag= 0.0 min
Primary = 6.65 cfs @ 11.91 hrs, Volume= 0.321 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,095.81' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,092.21'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,092.21' / 2,092.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.64 cfs @ 11.91 hrs HW=2,095.79' (Free Discharge)
└1=**Culvert** (Inlet Controls 6.64 cfs @ 8.46 fps)
└2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 19P: Catch Basin

Inflow Area = 5.536 ac, 25.26% Impervious, Inflow Depth = 3.13" for 10 Year event
Inflow = 27.43 cfs @ 11.94 hrs, Volume= 1.444 af
Outflow = 27.43 cfs @ 11.94 hrs, Volume= 1.444 af, Atten= 0%, Lag= 0.0 min
Primary = 27.43 cfs @ 11.94 hrs, Volume= 1.444 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,093.17' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,091.00'	**36.0" Round Culvert** L= 250.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,091.00' / 2,077.47' S= 0.0541 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=27.25 cfs @ 11.94 hrs HW=2,093.16' (Free Discharge)
├─**1=Culvert** (Inlet Controls 27.25 cfs @ 5.00 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 20: CB20

Inflow Area =	3.895 ac,	4.53% Impervious,	Inflow Depth = 3.18"	for 10 Year event
Inflow =	20.51 cfs @	11.99 hrs, Volume=	1.034 af	
Outflow =	20.51 cfs @	11.99 hrs, Volume=	1.034 af,	Atten= 0%, Lag= 0.0 min
Primary =	20.51 cfs @	11.99 hrs, Volume=	1.034 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,110.56' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,104.00'	**18.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,104.00' / 2,094.00' S= 0.1538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,112.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=20.32 cfs @ 11.99 hrs HW=2,110.45' (Free Discharge)
├─**1=Culvert** (Inlet Controls 20.32 cfs @ 11.50 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 20P: Manhole

Inflow Area =	4.748 ac,	14.80% Impervious,	Inflow Depth = 2.74"	for 10 Year event
Inflow =	21.14 cfs @	11.96 hrs, Volume=	1.084 af	
Outflow =	21.14 cfs @	11.96 hrs, Volume=	1.084 af,	Atten= 0%, Lag= 0.0 min
Primary =	21.14 cfs @	11.96 hrs, Volume=	1.084 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,096.46' @ 11.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,094.40'	**30.0" Round Culvert** L= 107.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,094.40' / 2,091.00' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=20.80 cfs @ 11.96 hrs HW=2,096.44' (Free Discharge)
└─**1=Culvert** (Inlet Controls 20.80 cfs @ 4.86 fps)

Summary for Pond 21P: Catch Basin

Inflow Area = 0.702 ac, 72.23% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 6.43 cfs @ 11.91 hrs, Volume= 0.292 af
Outflow = 6.43 cfs @ 11.91 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min
Primary = 6.43 cfs @ 11.91 hrs, Volume= 0.292 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,114.23' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,113.21'	**30.0" Round Culvert** L= 138.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,113.21' / 2,098.84' S= 0.1041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,118.50'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.41 cfs @ 11.91 hrs HW=2,114.22' (Free Discharge)
1=Culvert (Inlet Controls 6.41 cfs @ 3.43 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 22P: Catch Basin

Inflow Area = 0.427 ac, 71.34% Impervious, Inflow Depth = 4.96" for 10 Year event
Inflow = 3.89 cfs @ 11.91 hrs, Volume= 0.176 af
Outflow = 3.89 cfs @ 11.91 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min
Primary = 3.89 cfs @ 11.91 hrs, Volume= 0.176 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,115.72' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,114.64'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,114.64' / 2,114.46' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,118.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.89 cfs @ 11.91 hrs HW=2,115.72' (Free Discharge)
1=Culvert (Barrel Controls 3.89 cfs @ 4.00 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 23A: Catch Basin

Inflow Area = 0.733 ac, 9.68% Impervious, Inflow Depth = 2.35" for 10 Year event
Inflow = 2.97 cfs @ 11.99 hrs, Volume= 0.144 af
Outflow = 2.97 cfs @ 11.99 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min
Primary = 2.97 cfs @ 11.99 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,093.40' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,092.59'	**18.0" Round Culvert** L= 198.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,092.59' / 2,083.20' S= 0.0474 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,097.50'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.92 cfs @ 11.99 hrs HW=2,093.39' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.92 cfs @ 3.04 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 23B: Catch Basin

Inflow Area = 0.733 ac, 9.68% Impervious, Inflow Depth = 2.35" for 10 Year event
Inflow = 2.97 cfs @ 11.99 hrs, Volume= 0.144 af
Outflow = 2.97 cfs @ 11.99 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min
Primary = 2.97 cfs @ 11.99 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,083.88' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,083.07'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,083.07' / 2,079.50' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.50'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.91 cfs @ 11.99 hrs HW=2,083.87' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.91 cfs @ 3.04 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 24A: Catch Basin

Inflow Area = 4.046 ac, 4.84% Impervious, Inflow Depth = 2.35" for 10 Year event
Inflow = 16.98 cfs @ 11.98 hrs, Volume= 0.793 af
Outflow = 16.98 cfs @ 11.98 hrs, Volume= 0.793 af, Atten= 0%, Lag= 0.0 min
Primary = 16.98 cfs @ 11.98 hrs, Volume= 0.793 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,099.78' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,098.00'	**30.0" Round Culvert** L= 149.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,098.00' / 2,096.51' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,102.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=16.79 cfs @ 11.98 hrs HW=2,099.77' (Free Discharge)
└─**1=Culvert** (Inlet Controls 16.79 cfs @ 4.53 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 24B: Catch Basin

Inflow Area = 4.046 ac, 4.84% Impervious, Inflow Depth = 2.35" for 10 Year event
Inflow = 16.98 cfs @ 11.98 hrs, Volume= 0.793 af
Outflow = 16.98 cfs @ 11.98 hrs, Volume= 0.793 af, Atten= 0%, Lag= 0.0 min
Primary = 16.98 cfs @ 11.98 hrs, Volume= 0.793 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,096.94' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,095.00'	**30.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,095.00' / 2,094.51' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,100.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=16.79 cfs @ 11.98 hrs HW=2,096.92' (Free Discharge)
1=Culvert (Barrel Controls 16.79 cfs @ 5.73 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 25P: Catch Basin

Inflow Area = 0.170 ac, 74.09% Impervious, Inflow Depth = 5.07" for 10 Year event
Inflow = 1.58 cfs @ 11.91 hrs, Volume= 0.072 af
Outflow = 1.58 cfs @ 11.91 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 1.58 cfs @ 11.91 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,123.40' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,122.88'	**24.0" Round Culvert** L= 270.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,122.88' / 2,113.50' S= 0.0347 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,135.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.55 cfs @ 11.91 hrs HW=2,123.39' (Free Discharge)
1=Culvert (Inlet Controls 1.55 cfs @ 2.44 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 26P: Catch Basin

Inflow Area = 0.084 ac, 75.17% Impervious, Inflow Depth = 5.07" for 10 Year event
Inflow = 0.78 cfs @ 11.91 hrs, Volume= 0.035 af
Outflow = 0.78 cfs @ 11.91 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
Primary = 0.78 cfs @ 11.91 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,131.54' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,131.05'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,131.05' / 2,130.87' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,135.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.77 cfs @ 11.91 hrs HW=2,131.54' (Free Discharge)
1=Culvert (Barrel Controls 0.77 cfs @ 2.94 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 27P: Catch Basin

Inflow Area = 0.815 ac, 74.18% Impervious, Inflow Depth = 5.04" for 10 Year event
Inflow = 7.63 cfs @ 11.90 hrs, Volume= 0.343 af
Outflow = 7.63 cfs @ 11.90 hrs, Volume= 0.343 af, Atten= 0%, Lag= 0.0 min
Primary = 7.63 cfs @ 11.90 hrs, Volume= 0.343 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,149.07' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,147.75'	**21.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,147.75' / 2,145.50' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,152.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.46 cfs @ 11.90 hrs HW=2,149.05' (Free Discharge)
1=Culvert (Inlet Controls 7.46 cfs @ 3.89 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 28P: Catch Basin

Inflow Area = 0.093 ac, 76.11% Impervious, Inflow Depth = 5.07" for 10 Year event
Inflow = 0.87 cfs @ 11.91 hrs, Volume= 0.039 af
Outflow = 0.87 cfs @ 11.91 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 11.91 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,148.50' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,148.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,148.00' / 2,147.75' S= 0.0139 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,152.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.86 cfs @ 11.91 hrs HW=2,148.49' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.86 cfs @ 3.26 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 29P: Manhole

Inflow Area =	0.631 ac, 73.96% Impervious, Inflow Depth = 5.04"	for 10 Year event	
Inflow =	5.89 cfs @ 11.90 hrs, Volume=	0.265 af	
Outflow =	5.89 cfs @ 11.90 hrs, Volume=	0.265 af, Atten= 0%, Lag= 0.0 min	
Primary =	5.89 cfs @ 11.90 hrs, Volume=	0.265 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,163.12' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,162.00'	**21.0" Round Culvert** L= 125.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,162.00' / 2,147.75' S= 0.1140 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=5.76 cfs @ 11.90 hrs HW=2,163.11' (Free Discharge)
└—**1=Culvert** (Inlet Controls 5.76 cfs @ 3.59 fps)

Summary for Pond 30P: Catch Basin

Inflow Area =	0.631 ac, 73.96% Impervious, Inflow Depth = 5.04"	for 10 Year event	
Inflow =	5.89 cfs @ 11.90 hrs, Volume=	0.265 af	
Outflow =	5.89 cfs @ 11.90 hrs, Volume=	0.265 af, Atten= 0%, Lag= 0.0 min	
Primary =	5.89 cfs @ 11.90 hrs, Volume=	0.265 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,175.28' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,174.16'	**21.0" Round Culvert** L= 93.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,174.16' / 2,162.64' S= 0.1239 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,181.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.76 cfs @ 11.90 hrs HW=2,175.27' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 5.76 cfs @ 3.59 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 31P: Catch Basin

Inflow Area =	0.067 ac, 74.25% Impervious, Inflow Depth = 5.07"	for 10 Year event	
Inflow =	0.63 cfs @ 11.90 hrs, Volume=	0.028 af	
Outflow =	0.63 cfs @ 11.90 hrs, Volume=	0.028 af, Atten= 0%, Lag= 0.0 min	
Primary =	0.63 cfs @ 11.90 hrs, Volume=	0.028 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,177.62' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,177.18'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,177.18' / 2,177.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,181.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.61 cfs @ 11.90 hrs HW=2,177.61' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.61 cfs @ 2.80 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 32P: Catch Basin

Inflow Area = 0.501 ac, 73.93% Impervious, Inflow Depth = 5.03" for 10 Year event
Inflow = 4.68 cfs @ 11.90 hrs, Volume= 0.210 af
Outflow = 4.68 cfs @ 11.90 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min
Primary = 4.68 cfs @ 11.90 hrs, Volume= 0.210 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,196.42' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,195.44'	**21.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,195.44' / 2,174.62' S= 0.1190 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,202.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.58 cfs @ 11.90 hrs HW=2,196.41' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.58 cfs @ 3.35 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 33P: Catch Basin

Inflow Area = 0.086 ac, 74.41% Impervious, Inflow Depth = 5.07" for 10 Year event
Inflow = 0.81 cfs @ 11.90 hrs, Volume= 0.036 af
Outflow = 0.81 cfs @ 11.90 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 11.90 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,198.46' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,198.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,198.00' / 2,197.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,202.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.79 cfs @ 11.90 hrs HW=2,198.45' (Free Discharge)
1=**Culvert** (Inlet Controls 0.79 cfs @ 2.29 fps)
2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 34P: Manhole

Inflow Area = 0.334 ac, 73.86% Impervious, Inflow Depth = 5.01" for 10 Year event
Inflow = 3.10 cfs @ 11.91 hrs, Volume= 0.139 af
Outflow = 3.10 cfs @ 11.91 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min
Primary = 3.10 cfs @ 11.91 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,209.83' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,209.00'	**18.0" Round Culvert** L= 90.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,209.00' / 2,195.92' S= 0.1449 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.04 cfs @ 11.91 hrs HW=2,209.82' (Free Discharge)
1=**Culvert** (Inlet Controls 3.04 cfs @ 3.08 fps)

Summary for Pond 35P: Catch Basin

Inflow Area = 0.334 ac, 73.86% Impervious, Inflow Depth = 5.01" for 10 Year event
Inflow = 3.10 cfs @ 11.91 hrs, Volume= 0.139 af
Outflow = 3.10 cfs @ 11.91 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min
Primary = 3.10 cfs @ 11.91 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,225.83' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,225.00'	**18.0" Round Culvert** L= 121.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,225.00' / 2,209.50' S= 0.1277 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,229.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.04 cfs @ 11.91 hrs HW=2,225.82' (Free Discharge)
1=**Culvert** (Inlet Controls 3.04 cfs @ 3.08 fps)
2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 36P: Catch Basin

Inflow Area = 0.074 ac, 74.91% Impervious, Inflow Depth = 5.07" for 10 Year event
Inflow = 0.69 cfs @ 11.90 hrs, Volume= 0.031 af
Outflow = 0.69 cfs @ 11.90 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 11.90 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,225.92' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,225.50'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,225.50' / 2,225.14' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,229.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.67 cfs @ 11.90 hrs HW=2,225.91' (Free Discharge)
1=Culvert (Inlet Controls 0.67 cfs @ 2.19 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 37P: Catch Basin

Inflow Area = 0.184 ac, 73.98% Impervious, Inflow Depth = 5.01" for 10 Year event
Inflow = 1.71 cfs @ 11.91 hrs, Volume= 0.077 af
Outflow = 1.71 cfs @ 11.91 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min
Primary = 1.71 cfs @ 11.91 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,249.09' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,248.50'	**18.0" Round Culvert** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,248.50' / 2,225.10' S= 0.1170 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,253.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.68 cfs @ 11.91 hrs HW=2,249.09' (Free Discharge)
1=Culvert (Inlet Controls 1.68 cfs @ 2.61 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 38P: Catch Basin

Inflow Area = 0.082 ac, 76.49% Impervious, Inflow Depth = 5.07" for 10 Year event
Inflow = 0.77 cfs @ 11.91 hrs, Volume= 0.035 af
Outflow = 0.77 cfs @ 11.91 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
Primary = 0.77 cfs @ 11.91 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,249.45' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,249.00'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,249.00' / 2,248.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,253.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.75 cfs @ 11.91 hrs HW=2,249.44' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.75 cfs @ 2.26 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 43P: 12" HDPE Pipe

Inflow Area = 0.089 ac, 77.76% Impervious, Inflow Depth = 5.18" for 10 Year event
Inflow = 0.84 cfs @ 11.90 hrs, Volume= 0.038 af
Outflow = 0.84 cfs @ 11.90 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 11.90 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,998.07' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,997.50'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,997.50' / 1,997.40' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.82 cfs @ 11.90 hrs HW=1,998.06' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.82 cfs @ 2.63 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 44P: 12" HDPE Pipe

Inflow Area = 0.172 ac, 79.89% Impervious, Inflow Depth = 5.24" for 10 Year event
Inflow = 1.64 cfs @ 11.90 hrs, Volume= 0.075 af
Outflow = 1.64 cfs @ 11.90 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
Primary = 1.64 cfs @ 11.90 hrs, Volume= 0.075 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,998.10' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,997.40'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,997.40' / 1,997.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,002.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.61 cfs @ 11.90 hrs HW=1,998.09' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.61 cfs @ 3.91 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 50P: 30" HDPE Pipe

Inflow Area = 4.233 ac, 33.60% Impervious, Inflow Depth = 3.91" for 10 Year event
Inflow = 25.69 cfs @ 11.95 hrs, Volume= 1.378 af
Outflow = 25.69 cfs @ 11.95 hrs, Volume= 1.378 af, Atten= 0%, Lag= 0.0 min
Primary = 25.69 cfs @ 11.95 hrs, Volume= 1.378 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,026.41' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,024.00'	**30.0" Round Culvert** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,024.00' / 2,020.00' S= 0.0769 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,030.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=25.49 cfs @ 11.95 hrs HW=2,026.39' (Free Discharge)
—**1=Culvert** (Inlet Controls 25.49 cfs @ 5.27 fps)
—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 51P: 18" HDPE Pipe

Inflow Area = 0.406 ac, 20.38% Impervious, Inflow Depth = 3.28" for 10 Year event
Inflow = 2.48 cfs @ 11.95 hrs, Volume= 0.111 af
Outflow = 2.48 cfs @ 11.95 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min
Primary = 2.48 cfs @ 11.95 hrs, Volume= 0.111 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,026.73' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,026.00'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,026.00' / 2,025.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,030.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.43 cfs @ 11.95 hrs HW=2,026.72' (Free Discharge)
—**1=Culvert** (Barrel Controls 2.43 cfs @ 4.23 fps)
—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 52P: 30" HDPE Pipe

Inflow Area = 3.737 ac, 33.43% Impervious, Inflow Depth = 3.93" for 10 Year event
Inflow = 22.54 cfs @ 11.95 hrs, Volume= 1.224 af
Outflow = 22.54 cfs @ 11.95 hrs, Volume= 1.224 af, Atten= 0%, Lag= 0.0 min
Primary = 22.54 cfs @ 11.95 hrs, Volume= 1.224 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,060.66' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,058.50'	**30.0" Round Culvert** L= 301.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,058.50' / 2,026.00' S= 0.1080 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,064.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=22.32 cfs @ 11.95 hrs HW=2,060.64' (Free Discharge)
1=Culvert (Inlet Controls 22.32 cfs @ 4.98 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 53P: 18" HDPE Pipe

Inflow Area = 0.442 ac, 18.13% Impervious, Inflow Depth = 3.18" for 10 Year event
Inflow = 2.69 cfs @ 11.94 hrs, Volume= 0.117 af
Outflow = 2.69 cfs @ 11.94 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min
Primary = 2.69 cfs @ 11.94 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,061.27' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,060.50'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,060.50' / 2,060.14' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,064.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.66 cfs @ 11.94 hrs HW=2,061.26' (Free Discharge)
1=Culvert (Barrel Controls 2.66 cfs @ 4.29 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 54P: 24" HDPE Pipe

Inflow Area = 2.551 ac, 36.52% Impervious, Inflow Depth = 4.06" for 10 Year event
Inflow = 15.27 cfs @ 11.98 hrs, Volume= 0.863 af
Outflow = 15.27 cfs @ 11.98 hrs, Volume= 0.863 af, Atten= 0%, Lag= 0.0 min
Primary = 15.27 cfs @ 11.98 hrs, Volume= 0.863 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,103.02' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,101.00'	**24.0" Round Culvert** L= 201.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,101.00' / 2,059.50' S= 0.2065 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,106.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=15.17 cfs @ 11.98 hrs HW=2,103.01' (Free Discharge)
└**1=Culvert** (Inlet Controls 15.17 cfs @ 4.83 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 55P: 18" HDPE Pipe

Inflow Area = 0.351 ac, 80.16% Impervious, Inflow Depth = 5.18" for 10 Year event
Inflow = 3.24 cfs @ 11.91 hrs, Volume= 0.151 af
Outflow = 3.24 cfs @ 11.91 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 11.91 hrs, Volume= 0.151 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,102.85' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,102.00'	**18.0" Round Culvert** L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,102.00' / 2,101.00' S= 0.0208 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,106.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.21 cfs @ 11.91 hrs HW=2,102.85' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.21 cfs @ 3.13 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 56P: 18" HDPE Pipe

Inflow Area = 0.526 ac, 38.55% Impervious, Inflow Depth = 4.10" for 10 Year event
Inflow = 4.10 cfs @ 11.92 hrs, Volume= 0.180 af
Outflow = 4.10 cfs @ 11.92 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min
Primary = 4.10 cfs @ 11.92 hrs, Volume= 0.180 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,082.48' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,081.50'	**18.0" Round Culvert** L= 299.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,081.50' / 2,060.00' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,086.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.03 cfs @ 11.92 hrs HW=2,082.47' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.03 cfs @ 3.35 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 57P: 18" HDPE Pipe

Inflow Area = 0.112 ac, 82.97% Impervious, Inflow Depth = 5.30" for 10 Year event
Inflow = 1.03 cfs @ 11.92 hrs, Volume= 0.049 af
Outflow = 1.03 cfs @ 11.92 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 11.92 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,082.45' @ 11.92 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,082.00'	**18.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,082.00' / 2,081.64' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,086.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.02 cfs @ 11.92 hrs HW=2,082.45' (Free Discharge)
1=Culvert (Inlet Controls 1.02 cfs @ 2.28 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 62P: Catch Basin

Inflow Area = 1.479 ac, 4.03% Impervious, Inflow Depth = 2.18" for 10 Year event
Inflow = 5.26 cfs @ 12.00 hrs, Volume= 0.268 af
Outflow = 5.26 cfs @ 12.00 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min
Primary = 5.26 cfs @ 12.00 hrs, Volume= 0.268 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,084.14' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	2,087.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	2,083.00'	**18.0" Round Culvert** L= 207.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,083.00' / 2,080.00' S= 0.0145 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=5.24 cfs @ 12.00 hrs HW=2,084.14' (Free Discharge)
2=Culvert (Inlet Controls 5.24 cfs @ 3.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,083.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 65A: Manhole

Inflow Area = 2.041 ac, 24.02% Impervious, Inflow Depth = 2.99" for 10 Year event
Inflow = 8.77 cfs @ 11.95 hrs, Volume= 0.508 af
Outflow = 8.77 cfs @ 11.95 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min
Primary = 8.77 cfs @ 11.95 hrs, Volume= 0.508 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,081.05' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,079.40'	**24.0" Round Culvert** L= 125.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,079.40' / 2,079.00' S= 0.0032 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=8.67 cfs @ 11.95 hrs HW=2,081.04' (Free Discharge)
└─**1=Culvert** (Barrel Controls 8.67 cfs @ 4.29 fps)

Summary for Pond 65P: Catch Basin

Inflow Area = 2.041 ac, 24.02% Impervious, Inflow Depth = 2.99" for 10 Year event
Inflow = 8.77 cfs @ 11.95 hrs, Volume= 0.508 af
Outflow = 8.77 cfs @ 11.95 hrs, Volume= 0.508 af, Atten= 0%, Lag= 0.0 min
Primary = 8.77 cfs @ 11.95 hrs, Volume= 0.508 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,081.46' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,080.00'	**24.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,080.00' / 2,079.50' S= 0.0077 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,096.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.67 cfs @ 11.95 hrs HW=2,081.45' (Free Discharge)
├─**1=Culvert** (Barrel Controls 8.67 cfs @ 4.96 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 66R: (2) 24" culvert

Inflow = 4.92 cfs @ 11.99 hrs, Volume= 0.069 af
Outflow = 4.92 cfs @ 11.99 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min
Primary = 4.92 cfs @ 11.99 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,990.65' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,990.00'	**24.0" Round Culvert X 2.00** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500

Device	Routing	Invert	Outlet Devices
			Inlet / Outlet Invert= 1,990.00' / 1,984.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,992.50'	**40.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.83 cfs @ 11.99 hrs HW=1,990.65' (Free Discharge)
1=Culvert (Inlet Controls 4.83 cfs @ 2.74 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 81: 24" culvert

Inflow Area = 2.837 ac, 0.00% Impervious, Inflow Depth = 2.90" for 10 Year event
Inflow = 15.06 cfs @ 11.96 hrs, Volume= 0.685 af
Outflow = 15.06 cfs @ 11.96 hrs, Volume= 0.685 af, Atten= 0%, Lag= 0.0 min
Primary = 15.06 cfs @ 11.96 hrs, Volume= 0.685 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,014.98' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,013.00'	**24.0" Round Culvert** L= 350.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,013.00' / 1,983.90' S= 0.0831 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,016.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.90 cfs @ 11.96 hrs HW=2,014.96' (Free Discharge)
1=Culvert (Inlet Controls 14.90 cfs @ 4.77 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 200: 36" Steel Culvert

Inflow Area = 76.410 ac, 0.43% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 214.79 cfs @ 12.17 hrs, Volume= 17.862 af
Outflow = 214.79 cfs @ 12.17 hrs, Volume= 17.862 af, Atten= 0%, Lag= 0.0 min
Primary = 78.08 cfs @ 12.17 hrs, Volume= 13.324 af
Secondary = 136.71 cfs @ 12.17 hrs, Volume= 4.538 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,240.76' @ 12.17 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,228.00' S= 0.1200 '/' Cc= 0.900

			n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=77.98 cfs @ 12.17 hrs HW=2,240.75' (Free Discharge)
└─**1=Culvert** (Inlet Controls 77.98 cfs @ 11.03 fps)

Secondary OutFlow Max=136.11 cfs @ 12.17 hrs HW=2,240.75' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 136.11 cfs @ 5.73 fps)

Summary for Pond 201: 36" Steel Culvert

Inflow Area = 12.214 ac, 2.97% Impervious, Inflow Depth = 2.90" for 10 Year event
Inflow = 37.69 cfs @ 12.15 hrs, Volume= 2.950 af
Outflow = 37.69 cfs @ 12.15 hrs, Volume= 2.950 af, Atten= 0%, Lag= 0.0 min
Primary = 32.60 cfs @ 12.15 hrs, Volume= 2.873 af
Secondary = 5.09 cfs @ 12.15 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,236.52' @ 12.15 hrs
Flood Elev= 2,248.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,234.00'	**36.0" Round Culvert** L= 30.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 2,234.00' / 2,233.00' S= 0.0333 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	2,236.00'	**5.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=32.55 cfs @ 12.15 hrs HW=2,236.52' (Free Discharge)
└─**1=Culvert** (Barrel Controls 32.55 cfs @ 6.94 fps)

Secondary OutFlow Max=5.06 cfs @ 12.15 hrs HW=2,236.52' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 5.06 cfs @ 1.95 fps)

Summary for Pond 297A: culvert

Inflow Area = 22.407 ac, 0.53% Impervious, Inflow Depth = 2.85" for 10 Year event
Inflow = 52.89 cfs @ 12.25 hrs, Volume= 5.327 af
Outflow = 52.89 cfs @ 12.25 hrs, Volume= 5.327 af, Atten= 0%, Lag= 0.0 min
Primary = 52.89 cfs @ 12.25 hrs, Volume= 5.327 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,116.07' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,112.00'	**36.0" Round Culvert** L= 93.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 2,112.00' / 2,099.00' S= 0.1398 '/' Cc= 0.900

			n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,116.00'	**85.0' long x 70.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=52.70 cfs @ 12.25 hrs HW=2,116.07' (Free Discharge)
└1=**Culvert** (Inlet Controls 48.17 cfs @ 6.82 fps)
└2=**Broad-Crested Rectangular Weir** (Weir Controls 4.52 cfs @ 0.73 fps)

Summary for Pond 300R: 18" Steel Culvert

Inflow Area = 16.359 ac, 0.46% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 49.29 cfs @ 12.14 hrs, Volume= 3.824 af
Outflow = 49.29 cfs @ 12.14 hrs, Volume= 3.824 af, Atten= 0%, Lag= 0.0 min
Primary = 16.29 cfs @ 12.14 hrs, Volume= 2.851 af
Secondary = 33.01 cfs @ 12.14 hrs, Volume= 0.973 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,263.41' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,259.00'	**18.0" Round 18" Steel Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,259.00' / 2,256.00' S= 0.0750 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,260.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=16.26 cfs @ 12.14 hrs HW=2,263.40' (Free Discharge)
└1=**18" Steel Culvert** (Inlet Controls 16.26 cfs @ 9.20 fps)

Secondary OutFlow Max=32.84 cfs @ 12.14 hrs HW=2,263.40' (Free Discharge)
└2=**Broad-Crested Rectangular Weir** (Weir Controls 32.84 cfs @ 5.65 fps)

Summary for Pond 302R: culvert

Inflow Area = 7.179 ac, 0.00% Impervious, Inflow Depth = 3.09" for 10 Year event
Inflow = 26.82 cfs @ 12.10 hrs, Volume= 1.848 af
Outflow = 26.82 cfs @ 12.10 hrs, Volume= 1.848 af, Atten= 0%, Lag= 0.0 min
Primary = 26.82 cfs @ 12.10 hrs, Volume= 1.848 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,908.80' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,954.00'	**18.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,954.00' / 1,952.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,858.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=26.71 cfs @ 12.10 hrs HW=1,908.38' (Free Discharge)
1=Culvert (Controls 0.00 cfs)
2=Orifice/Grate (Orifice Controls 26.71 cfs @ 34.01 fps)

Summary for Pond MH8: Manhole

Inflow Area = 7.919 ac, 33.56% Impervious, Inflow Depth = 3.45" for 10 Year event
Inflow = 43.66 cfs @ 11.93 hrs, Volume= 2.275 af
Outflow = 43.66 cfs @ 11.93 hrs, Volume= 2.275 af, Atten= 0%, Lag= 0.0 min
Primary = 43.66 cfs @ 11.93 hrs, Volume= 2.275 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,037.05' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,033.90'	**36.0" Round Culvert** L= 158.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,033.90' / 1,997.00' S= 0.2335 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=43.01 cfs @ 11.93 hrs HW=2,037.00' (Free Discharge)
1=Culvert (Inlet Controls 43.01 cfs @ 6.08 fps)

Summary for Pond O1: 12" HDPE Pipe

Inflow Area = 4.430 ac, 15.50% Impervious, Inflow Depth = 1.35" for 10 Year event
Inflow = 0.29 cfs @ 11.99 hrs, Volume= 0.500 af
Outflow = 0.29 cfs @ 11.99 hrs, Volume= 0.500 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 11.99 hrs, Volume= 0.500 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,834.76' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,834.50'	**12.0" Round Culvert** L= 334.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 1,834.50' / 1,780.00' S= 0.1632 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.29 cfs @ 11.99 hrs HW=1,834.76' (Free Discharge)
1=Culvert (Inlet Controls 0.29 cfs @ 1.74 fps)

Pond Summaries
1, 10 & 100-yr Storm Events

Summary for Pond B4: bioretention

Inflow Area = 4.919 ac, 18.04% Impervious, Inflow Depth = 0.80" for 1 Year event
Inflow = 6.17 cfs @ 11.94 hrs, Volume= 0.326 af
Outflow = 0.23 cfs @ 14.81 hrs, Volume= 0.267 af, Atten= 96%, Lag= 172.2 min
Primary = 0.23 cfs @ 14.81 hrs, Volume= 0.267 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,143.21' @ 14.81 hrs Surf.Area= 19,493 sf Storage= 7,742 cf

Plug-Flow detention time= 431.7 min calculated for 0.267 af (82% of inflow)
Center-of-Mass det. time= 349.3 min (1,199.1 - 849.8)

Volume	Invert	Avail.Storage	Storage Description
#1	2,138.00'	2,551 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 6,377 cf Overall x 40.0% Voids
#2	2,139.00'	3,826 cf	**filter media (Prismatic)** Listed below (Recalc) 25,508 cf Overall x 15.0% Voids
#3	2,143.00'	16,265 cf	**surface storage (Prismatic)** Listed below (Recalc)
		22,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,138.00	6,377	0	0
2,139.00	6,377	6,377	6,377

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,139.00	6,377	0	0
2,143.00	6,377	25,508	25,508

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,143.00	6,377	0	0
2,144.00	8,116	7,247	7,247
2,145.00	9,920	9,018	16,265

Device	Routing	Invert	Outlet Devices
#1	Primary	2,139.00'	**8.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,139.00' / 2,137.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,138.00'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	2,143.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	2,144.25'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.23 cfs @ 14.81 hrs HW=2,143.21' (Free Discharge)
└─**1=Culvert** (Passes 0.23 cfs of 3.05 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.23 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,138.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond H: Pond H

Inflow Area = 14.937 ac, 17.76% Impervious, Inflow Depth = 0.78" for 1 Year event
Inflow = 14.87 cfs @ 12.02 hrs, Volume= 0.966 af
Outflow = 0.66 cfs @ 15.71 hrs, Volume= 0.962 af, Atten= 96%, Lag= 221.9 min
Primary = 0.66 cfs @ 15.71 hrs, Volume= 0.962 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 1,996.00' Surf.Area= 4,665 sf Storage= 6,646 cf
Peak Elev= 1,999.16' @ 15.71 hrs Surf.Area= 11,812 sf Storage= 32,715 cf (26,069 cf above start)

Plug-Flow detention time= 1,611.1 min calculated for 0.809 af (84% of inflow)
Center-of-Mass det. time= 1,298.8 min (2,174.9 - 876.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,993.00'	95,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,993.00	385	0	0
1,994.00	1,192	789	789
1,996.00	4,665	5,857	6,646
1,997.00	6,868	5,767	12,412
1,998.00	9,300	8,084	20,496
2,000.00	13,640	22,940	43,436
2,002.00	18,315	31,955	75,391
2,003.00	21,000	19,658	95,049

Device	Routing	Invert	Outlet Devices
#1	Primary	1,995.00'	**24.0" Round Culvert** L= 335.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,995.00' / 1,983.90' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,996.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,999.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	2,002.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.55 cfs @ 15.71 hrs HW=1,999.16' (Free Discharge)
└─1=**Culvert** (Passes 0.55 cfs of 26.88 cfs potential flow)
  ├─2=**Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.44 fps)
  └─3=**Orifice/Grate** (Weir Controls 0.36 cfs @ 0.78 fps)
└─4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond J: OPEN SWALE

Inflow Area =	1.775 ac, 27.88% Impervious, Inflow Depth = 1.25" for 1 Year event			
Inflow =	3.87 cfs @	11.92 hrs, Volume=	0.185 af	
Outflow =	1.26 cfs @	12.03 hrs, Volume=	0.185 af,	Atten= 68%, Lag= 6.6 min
Primary =	1.26 cfs @	12.03 hrs, Volume=	0.185 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,990.54' @ 12.03 hrs Surf.Area= 6,153 sf Storage= 2,566 cf

Plug-Flow detention time= 116.4 min calculated for 0.185 af (100% of inflow)
Center-of-Mass det. time= 116.5 min (924.4 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,986.50'	720 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 1,800 cf Overall x 40.0% Voids
#2	1,987.50'	675 cf	**Filter Media (Prismatic)** Listed below (Recalc) 4,500 cf Overall x 15.0% Voids
#3	1,990.00'	8,500 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		9,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,986.50	1,800	0	0
1,987.50	1,800	1,800	1,800

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,987.50	1,800	0	0
1,990.00	1,800	4,500	4,500

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,990.00	1,800	0	0
1,991.00	3,200	2,500	2,500
1,992.50	4,800	6,000	8,500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,986.50'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,989.50'	**8.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,989.50' / 1,984.00' S= 0.0786 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	1,991.50'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#4	Primary	1,992.00'	**10.0' long x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.26 cfs @ 12.03 hrs HW=1,990.54' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.14 cfs)
2=Culvert (Inlet Controls 1.11 cfs @ 3.19 fps)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,986.50' (Free Discharge)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond K: P1

Inflow Area = 7.908 ac, 12.10% Impervious, Inflow Depth = 0.73" for 1 Year event
Inflow = 6.05 cfs @ 12.02 hrs, Volume= 0.483 af
Outflow = 0.14 cfs @ 23.39 hrs, Volume= 0.483 af, Atten= 98%, Lag= 682.3 min
Primary = 0.14 cfs @ 23.39 hrs, Volume= 0.483 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 2,018.00' Surf.Area= 2,252 sf Storage= 4,088 cf
Peak Elev= 2,021.38' @ 23.39 hrs Surf.Area= 7,553 sf Storage= 18,868 cf (14,780 cf above start)

Plug-Flow detention time= 1,613.2 min calculated for 0.389 af (81% of inflow)
Center-of-Mass det. time= 1,242.2 min (2,101.1 - 858.9)

Volume	Invert	Avail.Storage	Storage Description
#1	2,014.00'	56,425 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,014.00	117	0	0
2,016.00	896	1,013	1,013
2,016.50	1,162	515	1,528
2,018.00	2,252	2,561	4,088
2,020.00	4,326	6,578	10,666
2,022.00	9,000	13,326	23,992
2,024.00	15,031	24,031	48,023
2,024.50	18,575	8,402	56,425

Device	Routing	Invert	Outlet Devices
#1	Primary	2,017.50'	**24.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,017.50' / 2,016.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	2,018.00'	**1.7" Vert. Orifice/Grate** C= 0.600
#3	Device 1	2,021.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	2,023.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600

			Limited to weir flow at low heads
#5	Primary	2,024.00'	**51.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.14 cfs @ 23.39 hrs HW=2,021.38' (Free Discharge)
1=**Culvert** (Passes 0.14 cfs of 25.67 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 0.14 cfs @ 8.76 fps)
3=**Orifice/Grate** (Controls 0.00 cfs)
4=**Orifice/Grate** (Controls 0.00 cfs)
5=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond L: Pond L - P1

Inflow Area = 21.422 ac, 18.68% Impervious, Inflow Depth = 0.90" for 1 Year event
Inflow = 20.64 cfs @ 11.94 hrs, Volume= 1.603 af
Outflow = 0.83 cfs @ 15.93 hrs, Volume= 1.601 af, Atten= 96%, Lag= 239.3 min
Primary = 0.83 cfs @ 15.93 hrs, Volume= 1.601 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 1,944.00' Surf.Area= 5,350 sf Storage= 8,885 cf
Peak Elev= 1,948.06' @ 15.93 hrs Surf.Area= 18,179 sf Storage= 55,157 cf (46,272 cf above start)

Plug-Flow detention time= 1,512.8 min calculated for 1.397 af (87% of inflow)
Center-of-Mass det. time= 1,263.9 min (2,108.0 - 844.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,941.50'	133,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,941.50	1,964	0	0
1,942.00	2,435	1,100	1,100
1,944.00	5,350	7,785	8,885
1,946.00	11,083	16,433	25,318
1,948.00	17,735	28,818	54,136
1,949.00	25,553	21,644	75,780
1,949.75	27,569	19,921	95,701
1,950.00	29,207	7,097	102,798
1,951.00	31,547	30,377	133,175

Device	Routing	Invert	Outlet Devices
#1	Primary	1,943.00'	**21.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,943.00' / 1,942.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,944.00'	**2.7" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,948.00'	**30.0" x 30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	1,949.50'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50
3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72
2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.82 cfs @ 15.93 hrs HW=1,948.06' (Free Discharge)
1=**Culvert** (Passes 0.82 cfs of 23.68 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 0.38 cfs @ 9.56 fps)
3=**Orifice/Grate** (Weir Controls 0.44 cfs @ 0.78 fps)
4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond M: OPEN SWALE

Inflow Area = 4.790 ac, 2.76% Impervious, Inflow Depth = 0.45" for 1 Year event
Inflow = 3.31 cfs @ 11.99 hrs, Volume= 0.181 af
Outflow = 0.12 cfs @ 16.36 hrs, Volume= 0.167 af, Atten= 96%, Lag= 262.5 min
Primary = 0.12 cfs @ 16.36 hrs, Volume= 0.167 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,887.90' @ 16.36 hrs Surf.Area= 10,200 sf Storage= 3,776 cf

Plug-Flow detention time= 415.1 min calculated for 0.167 af (92% of inflow)
Center-of-Mass det. time= 376.9 min (1,279.5 - 902.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,884.00'	1,198 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,995 cf Overall x 40.0% Voids
#2	1,885.00'	1,123 cf	**Filter Media (Prismatic)** Listed below (Recalc) 7,488 cf Overall x 15.0% Voids
#3	1,887.50'	19,290 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		21,611 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,884.00	2,995	0	0
1,885.00	2,995	2,995	2,995

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,885.00	2,995	0	0
1,887.50	2,995	7,488	7,488

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,887.50	2,995	0	0
1,888.00	4,500	1,874	1,874
1,889.00	6,437	5,469	7,342
1,890.00	8,574	7,506	14,848
1,890.50	9,195	4,442	19,290

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,884.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,884.50'	**6.0" Vert. Culvert** C= 0.600
#3	Primary	1,889.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.12 cfs @ 16.36 hrs HW=1,887.90' (Free Discharge)
2=Culvert (Passes 0.12 cfs of 1.68 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.12 cfs)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond N: OPEN SWALE

Inflow Area = 1.568 ac, 2.65% Impervious, Inflow Depth = 0.38" for 1 Year event
Inflow = 0.89 cfs @ 11.98 hrs, Volume= 0.050 af
Outflow = 0.03 cfs @ 17.85 hrs, Volume= 0.050 af, Atten= 97%, Lag= 351.9 min
Primary = 0.03 cfs @ 17.85 hrs, Volume= 0.050 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,874.07' @ 17.85 hrs Surf.Area= 2,603 sf Storage= 1,068 cf

Plug-Flow detention time= 488.7 min calculated for 0.050 af (100% of inflow)
Center-of-Mass det. time= 489.0 min (1,402.0 - 913.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,870.00'	258 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 644 cf Overall x 40.0% Voids
#2	1,871.00'	242 cf	**Filter Media (Prismatic)** Listed below (Recalc) 1,610 cf Overall x 15.0% Voids
#3	1,873.50'	4,639 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		5,138 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,870.00	644	0	0
1,871.00	644	644	644

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,871.00	644	0	0
1,873.50	644	1,610	1,610

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,873.50	644	0	0
1,874.00	1,260	476	476
1,875.00	2,031	1,646	2,122
1,876.00	3,003	2,517	4,639

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,870.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,870.00'	**6.0" Vert. culvert** C= 0.600
#3	Primary	1,875.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.03 cfs @ 17.85 hrs HW=1,874.07' (Free Discharge)
2=culvert (Passes 0.03 cfs of 1.85 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.03 cfs)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond O: Open Swale

Inflow Area = 4.430 ac, 15.50% Impervious, Inflow Depth = 0.74" for 1 Year event
Inflow = 6.06 cfs @ 11.96 hrs, Volume= 0.272 af
Outflow = 0.22 cfs @ 14.46 hrs, Volume= 0.272 af, Atten= 96%, Lag= 150.2 min
Primary = 0.22 cfs @ 14.46 hrs, Volume= 0.272 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,838.66' @ 14.46 hrs Surf.Area= 9,462 sf Storage= 5,749 cf

Plug-Flow detention time= 340.8 min calculated for 0.272 af (100% of inflow)
Center-of-Mass det. time= 340.6 min (1,210.4 - 869.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,834.00'	814 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,035 cf Overall x 40.0% Voids
#2	1,835.00'	763 cf	**Filter Bed (Prismatic)** Listed below (Recalc) 5,088 cf Overall x 15.0% Voids
#3	1,837.50'	13,965 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		15,542 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,834.00	2,035	0	0
1,835.00	2,035	2,035	2,035

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,835.00	2,035	0	0
1,837.50	2,035	5,088	5,088

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,837.50	2,035	0	0
1,838.00	3,275	1,328	1,328
1,839.00	6,500	4,888	6,215
1,840.00	9,000	7,750	13,965

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,834.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,834.00'	**6.0" Vert. culvert** C= 0.600
#3	Secondary	1,839.25'	**25.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.22 cfs @ 14.46 hrs HW=1,838.66' (Free Discharge)
└─**2=culvert** (Passes 0.22 cfs of 1.98 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,834.00' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Q: OPEN SWALE

Inflow Area = 3.629 ac, 5.69% Impervious, Inflow Depth = 0.45" for 1 Year event
Inflow = 2.43 cfs @ 12.00 hrs, Volume= 0.137 af
Outflow = 0.10 cfs @ 15.94 hrs, Volume= 0.137 af, Atten= 96%, Lag= 236.4 min
Primary = 0.10 cfs @ 15.94 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,877.78' @ 15.94 hrs Surf.Area= 8,244 sf Storage= 2,750 cf

Plug-Flow detention time= 406.4 min calculated for 0.137 af (100% of inflow)
Center-of-Mass det. time= 406.7 min (1,309.9 - 903.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,874.00'	928 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,319 cf Overall x 40.0% Voids
#2	1,875.00'	870 cf	**Filter Media (Prismatic)** Listed below (Recalc) 5,798 cf Overall x 15.0% Voids
#3	1,877.50'	11,728 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		13,525 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,874.00	2,319	0	0
1,875.00	2,319	2,319	2,319

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,875.00	2,319	0	0
1,877.50	2,319	5,798	5,798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,877.50	3,319	0	0
1,878.00	3,840	1,790	1,790
1,879.00	4,913	4,377	6,166
1,880.00	6,211	5,562	11,728

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,874.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,874.00'	**6.0" Vert. Culvert** C= 0.600
#3	Primary	1,879.00'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.10 cfs @ 15.94 hrs HW=1,877.78' (Free Discharge)
└─2=**Culvert** (Passes 0.10 cfs of 1.78 cfs potential flow)
  └─1=**Exfiltration** (Exfiltration Controls 0.10 cfs)
└─3=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond S: Open Swale

Inflow Area = 2.213 ac, 4.27% Impervious, Inflow Depth = 0.53" for 1 Year event
Inflow = 1.78 cfs @ 12.00 hrs, Volume= 0.097 af
Outflow = 0.06 cfs @ 16.83 hrs, Volume= 0.097 af, Atten= 97%, Lag= 289.8 min
Primary = 0.06 cfs @ 16.83 hrs, Volume= 0.097 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,918.14' @ 16.83 hrs Surf.Area= 5,004 sf Storage= 2,153 cf

Plug-Flow detention time= 492.0 min calculated for 0.097 af (100% of inflow)
Center-of-Mass det. time= 492.3 min (1,385.9 - 893.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,914.50'	549 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 1,372 cf Overall x 40.0% Voids
#2	1,915.50'	412 cf	**Filter Media (Prismatic)** Listed below (Recalc) 2,744 cf Overall x 15.0% Voids
#3	1,917.50'	6,299 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		7,259 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,914.50	1,372	0	0
1,915.50	1,372	1,372	1,372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,915.50	1,372	0	0
1,917.50	1,372	2,744	2,744

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,917.50	1,372	0	0
1,918.00	2,190	891	891
1,920.00	3,218	5,408	6,299

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,914.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,914.50'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,919.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.06 cfs @ 16.83 hrs HW=1,918.14' (Free Discharge)
└─**2=Culvert** (Passes 0.06 cfs of 1.74 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,914.50' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond sp1: Storm Planters

Inflow Area = 0.986 ac, 86.08% Impervious, Inflow Depth = 2.06" for 1 Year event
Inflow = 3.53 cfs @ 11.96 hrs, Volume= 0.170 af
Outflow = 0.28 cfs @ 12.03 hrs, Volume= 0.115 af, Atten= 92%, Lag= 4.3 min
Primary = 0.28 cfs @ 12.03 hrs, Volume= 0.115 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,150.09' @ 12.48 hrs Surf.Area= 11,960 sf Storage= 4,280 cf

Plug-Flow detention time= 246.9 min calculated for 0.115 af (68% of inflow)
Center-of-Mass det. time= 148.1 min (941.4 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	2,147.50'	2,392 cf	**stone underdrain (Prismatic)** Listed below (Recalc) -Impervious 5,980 cf Overall x 40.0% Voids
#2	2,148.50'	1,346 cf	**filter media (Prismatic)** Listed below (Recalc) 8,970 cf Overall x 15.0% Voids
#3	2,150.00'	11,960 cf	**surface storage (Prismatic)** Listed below (Recalc)
		15,698 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,147.50	5,980	0	0
2,148.50	5,980	5,980	5,980

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,148.50	5,980	0	0
2,150.00	5,980	8,970	8,970

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,150.00	5,980	0	0
2,151.00	5,980	5,980	5,980
2,152.00	5,980	5,980	11,960

Device	Routing	Invert	Outlet Devices
#1	Primary	2,147.50'	**24.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,147.50' / 2,080.00' S= 0.1929 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,147.50'	**1.000 in/hr Exfiltration over Surface area**
#3	Device 1	2,151.00'	**6.0" Horiz. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 12.03 hrs HW=2,150.02' (Free Discharge)
└─**1=Culvert** (Passes 0.28 cfs of 18.63 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.28 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond T: Open Swale

Inflow Area = 1.813 ac, 7.66% Impervious, Inflow Depth = 0.61" for 1 Year event
Inflow = 2.14 cfs @ 11.94 hrs, Volume= 0.092 af
Outflow = 0.04 cfs @ 18.28 hrs, Volume= 0.092 af, Atten= 98%, Lag= 380.9 min
Primary = 0.04 cfs @ 18.28 hrs, Volume= 0.092 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,990.65' @ 18.28 hrs Surf.Area= 3,788 sf Storage= 2,302 cf

Plug-Flow detention time= 660.0 min calculated for 0.092 af (100% of inflow)
Center-of-Mass det. time= 660.2 min (1,540.3 - 880.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,986.50'	374 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 935 cf Overall x 40.0% Voids
#2	1,987.50'	281 cf	**Filter Media (Prismatic)** Listed below (Recalc) 1,870 cf Overall x 15.0% Voids
#3	1,989.50'	5,089 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		5,744 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,986.50	935	0	0
1,987.50	935	935	935

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,987.50	935	0	0
1,989.50	935	1,870	1,870

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,989.50	935	0	0
1,990.00	1,375	578	578
1,991.00	2,211	1,793	2,371
1,992.00	3,226	2,719	5,089

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,986.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,985.50'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,991.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.04 cfs @ 18.28 hrs HW=1,990.65' (Free Discharge)
└─**2=Culvert** (Passes 0.04 cfs of 2.09 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,986.50' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond U: Open Swale

Inflow Area = 6.478 ac, 8.75% Impervious, Inflow Depth = 0.57" for 1 Year event
Inflow = 4.49 cfs @ 12.06 hrs, Volume= 0.305 af
Outflow = 0.13 cfs @ 19.47 hrs, Volume= 0.305 af, Atten= 97%, Lag= 444.7 min
Primary = 0.13 cfs @ 19.47 hrs, Volume= 0.305 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 2,014.83' @ 19.47 hrs Surf.Area= 11,222 sf Storage= 8,012 cf

Plug-Flow detention time= 747.4 min calculated for 0.305 af (100% of inflow)
Center-of-Mass det. time= 747.8 min (1,641.8 - 893.9)

Volume	Invert	Avail.Storage	Storage Description
#1	2,010.50'	1,034 cf	**Stone Layer (Prismatic)** Listed below (Recalc) 2,584 cf Overall x 40.0% Voids
#2	2,011.50'	775 cf	**Filter Media (Prismatic)** Listed below (Recalc) 5,168 cf Overall x 15.0% Voids
#3	2,013.50'	18,070 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		19,878 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,010.50	2,584	0	0
2,011.50	2,584	2,584	2,584

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,011.50	2,584	0	0
2,013.50	2,584	5,168	5,168

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,013.50	2,584	0	0
2,014.00	4,540	1,781	1,781
2,015.00	6,354	5,447	7,228
2,016.00	7,336	6,845	14,073
2,016.50	8,650	3,997	18,070

Device	Routing	Invert	Outlet Devices
#1	Device 2	2,010.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	2,010.50'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,010.50' / 2,010.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Primary	2,015.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.13 cfs @ 19.47 hrs HW=2,014.83' (Free Discharge)
└─**2=Culvert** (Passes 0.13 cfs of 1.51 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.13 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W: Open Swale

Inflow Area = 8.723 ac, 9.84% Impervious, Inflow Depth = 0.60" for 1 Year event
Inflow = 3.22 cfs @ 11.98 hrs, Volume= 0.434 af
Outflow = 0.22 cfs @ 24.05 hrs, Volume= 0.434 af, Atten= 93%, Lag= 723.9 min
Primary = 0.22 cfs @ 24.05 hrs, Volume= 0.434 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,788.98' @ 24.05 hrs Surf.Area= 9,380 sf Storage= 7,025 cf

Plug-Flow detention time= 407.8 min calculated for 0.434 af (100% of inflow)
Center-of-Mass det. time= 407.7 min (1,503.1 - 1,095.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,784.00'	960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,399 cf Overall x 40.0% Voids
#2	1,785.00'	900 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 5,998 cf Overall x 15.0% Voids
#3	1,787.50'	25,064 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		26,923 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,784.00	2,399	0	0
1,785.00	2,399	2,399	2,399

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,785.00	2,399	0	0
1,787.50	2,399	5,998	5,998

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,787.50	2,399	0	0
1,788.00	3,136	1,384	1,384
1,789.00	4,612	3,874	5,258
1,790.00	8,000	6,306	11,564
1,791.50	10,000	13,500	25,064

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,784.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,784.00'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,789.50'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.22 cfs @ 24.05 hrs HW=1,788.98' (Free Discharge)
└─**2=Culvert** (Passes 0.22 cfs of 2.06 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,784.00' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond X: Open Swale

Inflow Area = 2.495 ac, 6.71% Impervious, Inflow Depth = 0.49" for 1 Year event
Inflow = 1.91 cfs @ 11.99 hrs, Volume= 0.102 af
Outflow = 0.11 cfs @ 13.92 hrs, Volume= 0.102 af, Atten= 94%, Lag= 115.7 min
Primary = 0.11 cfs @ 13.92 hrs, Volume= 0.102 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,797.89' @ 13.92 hrs Surf.Area= 4,585 sf Storage= 1,704 cf

Plug-Flow detention time= 221.6 min calculated for 0.102 af (100% of inflow)
Center-of-Mass det. time= 221.7 min (1,119.2 - 897.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,794.00'	556 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,391 cf Overall x 40.0% Voids
#2	1,795.00'	522 cf	**Filter Media (Prismatic)** Listed below (Recalc) 3,478 cf Overall x 15.0% Voids
#3	1,797.50'	9,040 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		10,118 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,794.00	1,391	0	0
1,795.00	1,391	1,391	1,391

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,795.00	1,391	0	0
1,797.50	1,391	3,478	3,478

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,797.50	1,391	0	0
1,798.00	1,916	827	827
1,799.00	2,930	2,423	3,250
1,800.00	4,105	3,518	6,767
1,800.50	4,984	2,272	9,040

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,794.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,794.00'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,799.00'	**15.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.11 cfs @ 13.92 hrs HW=1,797.89' (Free Discharge)
↑—**2=Culvert** (Passes 0.11 cfs of 1.80 cfs potential flow)
↑—**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,794.00' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B4: bioretention

Inflow Area = 4.919 ac, 18.04% Impervious, Inflow Depth = 3.10" for 10 Year event
Inflow = 26.19 cfs @ 11.94 hrs, Volume= 1.270 af
Outflow = 18.56 cfs @ 12.01 hrs, Volume= 1.211 af, Atten= 29%, Lag= 3.9 min
Primary = 2.11 cfs @ 12.01 hrs, Volume= 0.931 af
Secondary = 16.45 cfs @ 12.01 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,144.72' @ 12.01 hrs Surf.Area= 22,161 sf Storage= 19,891 cf

Plug-Flow detention time= 212.0 min calculated for 1.211 af (95% of inflow)
Center-of-Mass det. time= 185.1 min (1,003.2 - 818.2)

Volume	Invert	Avail.Storage	Storage Description
#1	2,138.00'	2,551 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 6,377 cf Overall x 40.0% Voids
#2	2,139.00'	3,826 cf	**filter media (Prismatic)** Listed below (Recalc) 25,508 cf Overall x 15.0% Voids
#3	2,143.00'	16,265 cf	**surface storage (Prismatic)** Listed below (Recalc)
		22,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,138.00	6,377	0	0
2,139.00	6,377	6,377	6,377

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,139.00	6,377	0	0
2,143.00	6,377	25,508	25,508

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,143.00	6,377	0	0
2,144.00	8,116	7,247	7,247
2,145.00	9,920	9,018	16,265

Device	Routing	Invert	Outlet Devices
#1	Primary	2,139.00'	**8.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,139.00' / 2,137.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,138.00'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	2,143.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	2,144.25'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.10 cfs @ 12.01 hrs HW=2,144.71' (Free Discharge)
└─1=**Culvert** (Passes 2.10 cfs of 3.43 cfs potential flow)
  ├─2=**Exfiltration** (Exfiltration Controls 0.26 cfs)
  └─3=**Orifice/Grate** (Orifice Controls 1.85 cfs @ 5.29 fps)

Secondary OutFlow Max=16.08 cfs @ 12.01 hrs HW=2,144.71' (Free Discharge)
└─4=**Broad-Crested Rectangular Weir** (Weir Controls 16.08 cfs @ 1.75 fps)

Summary for Pond H: Pond H

Inflow Area = 14.937 ac, 17.76% Impervious, Inflow Depth = 3.11" for 10 Year event
Inflow = 65.89 cfs @ 12.00 hrs, Volume= 3.872 af
Outflow = 27.64 cfs @ 12.14 hrs, Volume= 3.867 af, Atten= 58%, Lag= 8.2 min
Primary = 27.64 cfs @ 12.14 hrs, Volume= 3.867 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 1,996.00' Surf.Area= 4,665 sf Storage= 6,646 cf
Peak Elev= 2,001.12' @ 12.14 hrs Surf.Area= 16,268 sf Storage= 60,250 cf (53,604 cf above start)

Plug-Flow detention time= 407.2 min calculated for 3.714 af (96% of inflow)
Center-of-Mass det. time= 361.6 min (1,211.8 - 850.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,993.00'	95,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,993.00	385	0	0
1,994.00	1,192	789	789
1,996.00	4,665	5,857	6,646
1,997.00	6,868	5,767	12,412
1,998.00	9,300	8,084	20,496
2,000.00	13,640	22,940	43,436
2,002.00	18,315	31,955	75,391
2,003.00	21,000	19,658	95,049

Device	Routing	Invert	Outlet Devices
#1	Primary	1,995.00'	**24.0" Round Culvert** L= 335.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,995.00' / 1,983.90' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,996.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,999.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	2,002.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=27.61 cfs @ 12.14 hrs HW=2,001.12' (Free Discharge)
└─**1=Culvert** (Passes 27.61 cfs of 34.23 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.24 cfs @ 10.81 fps)
  └─**3=Orifice/Grate** (Orifice Controls 27.37 cfs @ 6.84 fps)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond J: OPEN SWALE

Inflow Area = 1.775 ac, 27.88% Impervious, Inflow Depth = 3.87" for 10 Year event
Inflow = 12.01 cfs @ 11.92 hrs, Volume= 0.573 af
Outflow = 7.03 cfs @ 11.99 hrs, Volume= 0.573 af, Atten= 41%, Lag= 4.6 min
Primary = 2.12 cfs @ 11.99 hrs, Volume= 0.504 af
Secondary = 4.92 cfs @ 11.99 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,991.96' @ 11.99 hrs Surf.Area= 7,826 sf Storage= 7,467 cf

Plug-Flow detention time= 67.3 min calculated for 0.573 af (100% of inflow)
Center-of-Mass det. time= 67.4 min (858.1 - 790.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,986.50'	720 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 1,800 cf Overall x 40.0% Voids
#2	1,987.50'	675 cf	**Filter Media (Prismatic)** Listed below (Recalc) 4,500 cf Overall x 15.0% Voids
#3	1,990.00'	8,500 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		9,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,986.50	1,800	0	0
1,987.50	1,800	1,800	1,800

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,987.50	1,800	0	0
1,990.00	1,800	4,500	4,500

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,990.00	1,800	0	0
1,991.00	3,200	2,500	2,500
1,992.50	4,800	6,000	8,500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,986.50'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,989.50'	**8.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,989.50' / 1,984.00' S= 0.0786 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	1,991.50'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#4	Primary	1,992.00'	**10.0' long x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.11 cfs @ 11.99 hrs HW=1,991.96' (Free Discharge)
├─**1=Exfiltration** (Exfiltration Controls 0.18 cfs)
├─**2=Culvert** (Inlet Controls 1.93 cfs @ 5.54 fps)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=4.83 cfs @ 11.99 hrs HW=1,991.96' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.83 cfs @ 1.76 fps)

Summary for Pond K: P1

Inflow Area = 7.908 ac, 12.10% Impervious, Inflow Depth = 2.96" for 10 Year event
Inflow = 28.69 cfs @ 12.02 hrs, Volume= 1.948 af
Outflow = 5.49 cfs @ 12.43 hrs, Volume= 1.947 af, Atten= 81%, Lag= 24.3 min
Primary = 5.49 cfs @ 12.43 hrs, Volume= 1.947 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 2,018.00' Surf.Area= 2,252 sf Storage= 4,088 cf
Peak Elev= 2,023.83' @ 12.43 hrs Surf.Area= 14,512 sf Storage= 45,481 cf (41,393 cf above start)

Plug-Flow detention time= 898.5 min calculated for 1.853 af (95% of inflow)
Center-of-Mass det. time= 821.9 min (1,650.0 - 828.1)

Volume	Invert	Avail.Storage	Storage Description
#1	2,014.00'	56,425 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,014.00	117	0	0
2,016.00	896	1,013	1,013
2,016.50	1,162	515	1,528
2,018.00	2,252	2,561	4,088
2,020.00	4,326	6,578	10,666
2,022.00	9,000	13,326	23,992
2,024.00	15,031	24,031	48,023
2,024.50	18,575	8,402	56,425

Device	Routing	Invert	Outlet Devices
#1	Primary	2,017.50'	**24.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 2,017.50' / 2,016.50' S= 0.0200 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior
#2	Device 1	2,018.00'	**1.7" Vert. Orifice/Grate** C= 0.600
#3	Device 1	2,021.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	2,023.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600

			Limited to weir flow at low heads
#5	Primary	2,024.00'	**51.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=5.44 cfs @ 12.43 hrs HW=2,023.83' (Free Discharge)
1=**Culvert** (Passes 5.44 cfs of 34.91 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 0.18 cfs @ 11.55 fps)
3=**Orifice/Grate** (Orifice Controls 0.35 cfs @ 7.15 fps)
4=**Orifice/Grate** (Weir Controls 4.90 cfs @ 1.87 fps)
5=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond L: Pond L - P1

Inflow Area = 21.422 ac, 18.68% Impervious, Inflow Depth = 3.27" for 10 Year event
Inflow = 80.52 cfs @ 11.96 hrs, Volume= 5.836 af
Outflow = 39.33 cfs @ 12.19 hrs, Volume= 5.834 af, Atten= 51%, Lag= 13.5 min
Primary = 39.33 cfs @ 12.19 hrs, Volume= 5.834 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 1,944.00' Surf.Area= 5,350 sf Storage= 8,885 cf
Peak Elev= 1,949.86' @ 12.19 hrs Surf.Area= 28,310 sf Storage= 98,860 cf (89,975 cf above start)

Plug-Flow detention time= 420.2 min calculated for 5.630 af (96% of inflow)
Center-of-Mass det. time= 379.6 min (1,197.0 - 817.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,941.50'	133,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,941.50	1,964	0	0
1,942.00	2,435	1,100	1,100
1,944.00	5,350	7,785	8,885
1,946.00	11,083	16,433	25,318
1,948.00	17,735	28,818	54,136
1,949.00	25,553	21,644	75,780
1,949.75	27,569	19,921	95,701
1,950.00	29,207	7,097	102,798
1,951.00	31,547	30,377	133,175

Device	Routing	Invert	Outlet Devices
#1	Primary	1,943.00'	**21.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,943.00' / 1,942.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,944.00'	**2.7" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,948.00'	**30.0" x 30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	1,949.50'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=39.24 cfs @ 12.19 hrs HW=1,949.86' (Free Discharge)
1=**Culvert** (Inlet Controls 28.34 cfs @ 11.78 fps)
2=**Orifice/Grate** (Passes < 0.46 cfs potential flow)
3=**Orifice/Grate** (Passes < 41.06 cfs potential flow)
4=**Broad-Crested Rectangular Weir** (Weir Controls 10.90 cfs @ 1.51 fps)

Summary for Pond M: OPEN SWALE

Inflow Area = 4.790 ac, 2.76% Impervious, Inflow Depth = 2.44" for 10 Year event
Inflow = 20.96 cfs @ 11.97 hrs, Volume= 0.974 af
Outflow = 8.59 cfs @ 12.08 hrs, Volume= 0.960 af, Atten= 59%, Lag= 6.3 min
Primary = 8.59 cfs @ 12.08 hrs, Volume= 0.960 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,889.75' @ 12.08 hrs Surf.Area= 14,026 sf Storage= 15,079 cf

Plug-Flow detention time= 316.0 min calculated for 0.960 af (99% of inflow)
Center-of-Mass det. time= 308.3 min (1,152.6 - 844.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,884.00'	1,198 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc)
			2,995 cf Overall x 40.0% Voids
#2	1,885.00'	1,123 cf	**Filter Media (Prismatic)** Listed below (Recalc)
			7,488 cf Overall x 15.0% Voids
#3	1,887.50'	19,290 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		21,611 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,884.00	2,995	0	0
1,885.00	2,995	2,995	2,995

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,885.00	2,995	0	0
1,887.50	2,995	7,488	7,488

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,887.50	2,995	0	0
1,888.00	4,500	1,874	1,874
1,889.00	6,437	5,469	7,342
1,890.00	8,574	7,506	14,848
1,890.50	9,195	4,442	19,290

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,884.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,884.50'	**6.0" Vert. Culvert** C= 0.600
#3	Primary	1,889.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=8.52 cfs @ 12.08 hrs HW=1,889.74' (Free Discharge)
└2=**Culvert** (Passes 0.16 cfs of 2.11 cfs potential flow)
 └1=**Exfiltration** (Exfiltration Controls 0.16 cfs)
└3=**Broad-Crested Rectangular Weir** (Weir Controls 8.35 cfs @ 2.25 fps)

Summary for Pond N: OPEN SWALE

Inflow Area = 1.568 ac, 2.65% Impervious, Inflow Depth = 2.26" for 10 Year event
Inflow = 6.58 cfs @ 11.96 hrs, Volume= 0.296 af
Outflow = 4.55 cfs @ 12.03 hrs, Volume= 0.296 af, Atten= 31%, Lag= 3.8 min
Primary = 4.55 cfs @ 12.03 hrs, Volume= 0.296 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,875.49' @ 12.03 hrs Surf.Area= 3,797 sf Storage= 3,736 cf

Plug-Flow detention time= 297.8 min calculated for 0.296 af (100% of inflow)
Center-of-Mass det. time= 298.3 min (1,146.6 - 848.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,870.00'	258 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 644 cf Overall x 40.0% Voids
#2	1,871.00'	242 cf	**Filter Media (Prismatic)** Listed below (Recalc) 1,610 cf Overall x 15.0% Voids
#3	1,873.50'	4,639 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		5,138 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,870.00	644	0	0
1,871.00	644	644	644

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,871.00	644	0	0
1,873.50	644	1,610	1,610

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,873.50	644	0	0
1,874.00	1,260	476	476
1,875.00	2,031	1,646	2,122
1,876.00	3,003	2,517	4,639

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,870.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,870.00'	**6.0" Vert. culvert** C= 0.600
#3	Primary	1,875.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=4.50 cfs @ 12.03 hrs HW=1,875.49' (Free Discharge)
└─**2=culvert** (Passes 0.04 cfs of 2.16 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.04 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.46 cfs @ 1.82 fps)

Summary for Pond O: Open Swale

Inflow Area = 4.430 ac, 15.50% Impervious, Inflow Depth = 3.09" for 10 Year event
Inflow = 25.79 cfs @ 11.95 hrs, Volume= 1.140 af
Outflow = 22.81 cfs @ 11.99 hrs, Volume= 1.140 af, Atten= 12%, Lag= 2.1 min
Primary = 0.29 cfs @ 11.99 hrs, Volume= 0.500 af
Secondary = 22.52 cfs @ 11.99 hrs, Volume= 0.640 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,839.74' @ 11.99 hrs Surf.Area= 12,425 sf Storage= 13,302 cf

Plug-Flow detention time= 218.5 min calculated for 1.140 af (100% of inflow)
Center-of-Mass det. time= 218.8 min (1,045.0 - 826.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,834.00'	814 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,035 cf Overall x 40.0% Voids
#2	1,835.00'	763 cf	**Filter Bed (Prismatic)** Listed below (Recalc) 5,088 cf Overall x 15.0% Voids
#3	1,837.50'	13,965 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		15,542 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,834.00	2,035	0	0
1,835.00	2,035	2,035	2,035

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,835.00	2,035	0	0
1,837.50	2,035	5,088	5,088

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,837.50	2,035	0	0
1,838.00	3,275	1,328	1,328
1,839.00	6,500	4,888	6,215
1,840.00	9,000	7,750	13,965

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,834.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,834.00'	**6.0" Vert. culvert** C= 0.600
#3	Secondary	1,839.25'	**25.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.29 cfs @ 11.99 hrs HW=1,839.73' (Free Discharge)
└─**2=culvert** (Passes 0.29 cfs of 2.21 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Secondary OutFlow Max=22.04 cfs @ 11.99 hrs HW=1,839.73' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 22.04 cfs @ 1.82 fps)

Summary for Pond Q: OPEN SWALE

Inflow Area = 3.629 ac, 5.69% Impervious, Inflow Depth = 2.44" for 10 Year event
Inflow = 15.50 cfs @ 11.98 hrs, Volume= 0.738 af
Outflow = 9.42 cfs @ 12.06 hrs, Volume= 0.738 af, Atten= 39%, Lag= 4.9 min
Primary = 9.42 cfs @ 12.06 hrs, Volume= 0.738 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,879.49' @ 12.06 hrs Surf.Area= 10,183 sf Storage= 10,510 cf

Plug-Flow detention time= 360.4 min calculated for 0.738 af (100% of inflow)
Center-of-Mass det. time= 360.9 min (1,205.7 - 844.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,874.00'	928 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,319 cf Overall x 40.0% Voids
#2	1,875.00'	870 cf	**Filter Media (Prismatic)** Listed below (Recalc) 5,798 cf Overall x 15.0% Voids
#3	1,877.50'	11,728 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		13,525 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,874.00	2,319	0	0
1,875.00	2,319	2,319	2,319

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,875.00	2,319	0	0
1,877.50	2,319	5,798	5,798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,877.50	3,319	0	0
1,878.00	3,840	1,790	1,790
1,879.00	4,913	4,377	6,166
1,880.00	6,211	5,562	11,728

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,874.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,874.00'	**6.0" Vert. Culvert** C= 0.600
#3	Primary	1,879.00'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=9.35 cfs @ 12.06 hrs HW=1,879.49' (Free Discharge)
2=Culvert (Passes 0.12 cfs of 2.16 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.12 cfs)
3=Broad-Crested Rectangular Weir (Weir Controls 9.23 cfs @ 1.90 fps)

Summary for Pond S: Open Swale

Inflow Area = 2.213 ac, 4.27% Impervious, Inflow Depth = 2.62" for 10 Year event
Inflow = 9.99 cfs @ 11.99 hrs, Volume= 0.483 af
Outflow = 11.00 cfs @ 11.98 hrs, Volume= 0.483 af, Atten= 0%, Lag= 0.0 min
Primary = 0.06 cfs @ 11.97 hrs, Volume= 0.166 af
Secondary = 10.94 cfs @ 11.98 hrs, Volume= 0.317 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,919.18' @ 11.97 hrs Surf.Area= 5,538 sf Storage= 4,779 cf

Plug-Flow detention time= 285.4 min calculated for 0.483 af (100% of inflow)
Center-of-Mass det. time= 285.8 min (1,126.4 - 840.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,914.50'	549 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 1,372 cf Overall x 40.0% Voids
#2	1,915.50'	412 cf	**Filter Media (Prismatic)** Listed below (Recalc) 2,744 cf Overall x 15.0% Voids
#3	1,917.50'	6,299 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		7,259 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,914.50	1,372	0	0
1,915.50	1,372	1,372	1,372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,915.50	1,372	0	0
1,917.50	1,372	2,744	2,744

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,917.50	1,372	0	0
1,918.00	2,190	891	891
1,920.00	3,218	5,408	6,299

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,914.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,914.50'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,919.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.06 cfs @ 11.97 hrs HW=1,919.18' (Free Discharge)
└─**2=Culvert** (Passes 0.06 cfs of 1.99 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Secondary OutFlow Max=9.78 cfs @ 11.98 hrs HW=1,919.17' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 9.78 cfs @ 1.12 fps)

Summary for Pond sp1: Storm Planters

Inflow Area = 0.986 ac, 86.08% Impervious, Inflow Depth = 5.18" for 10 Year event
Inflow = 8.33 cfs @ 11.96 hrs, Volume= 0.426 af
Outflow = 1.06 cfs @ 12.19 hrs, Volume= 0.371 af, Atten= 87%, Lag= 14.0 min
Primary = 1.06 cfs @ 12.19 hrs, Volume= 0.371 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,151.14' @ 12.19 hrs Surf.Area= 11,960 sf Storage= 10,537 cf

Plug-Flow detention time= 346.4 min calculated for 0.371 af (87% of inflow)
Center-of-Mass det. time= 284.8 min (1,053.4 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1	2,147.50'	2,392 cf	**stone underdrain (Prismatic)** Listed below (Recalc) -Impervious 5,980 cf Overall x 40.0% Voids
#2	2,148.50'	1,346 cf	**filter media (Prismatic)** Listed below (Recalc) 8,970 cf Overall x 15.0% Voids
#3	2,150.00'	11,960 cf	**surface storage (Prismatic)** Listed below (Recalc)
		15,698 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,147.50	5,980	0	0
2,148.50	5,980	5,980	5,980

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,148.50	5,980	0	0
2,150.00	5,980	8,970	8,970

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,150.00	5,980	0	0
2,151.00	5,980	5,980	5,980
2,152.00	5,980	5,980	11,960

Device	Routing	Invert	Outlet Devices
#1	Primary	2,147.50'	**24.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,147.50' / 2,080.00' S= 0.1929 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,147.50'	**1.000 in/hr Exfiltration over Surface area**
#3	Device 1	2,151.00'	**6.0" Horiz. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.06 cfs @ 12.19 hrs HW=2,151.14' (Free Discharge)
└─**1=Culvert** (Passes 1.06 cfs of 24.56 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.28 cfs)
  └─**3=Orifice/Grate** (Weir Controls 0.78 cfs @ 1.21 fps)

Summary for Pond T: Open Swale

Inflow Area = 1.813 ac, 7.66% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 10.30 cfs @ 11.93 hrs, Volume= 0.424 af
Outflow = 10.09 cfs @ 11.93 hrs, Volume= 0.424 af, Atten= 2%, Lag= 0.4 min
Primary = 0.05 cfs @ 11.93 hrs, Volume= 0.121 af
Secondary = 10.04 cfs @ 11.93 hrs, Volume= 0.303 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,991.18' @ 11.93 hrs Surf.Area= 4,261 sf Storage= 3,433 cf

Plug-Flow detention time= 229.8 min calculated for 0.424 af (100% of inflow)
Center-of-Mass det. time= 229.7 min (1,061.0 - 831.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,986.50'	374 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 935 cf Overall x 40.0% Voids
#2	1,987.50'	281 cf	**Filter Media (Prismatic)** Listed below (Recalc) 1,870 cf Overall x 15.0% Voids
#3	1,989.50'	5,089 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		5,744 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,986.50	935	0	0
1,987.50	935	935	935

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,987.50	935	0	0
1,989.50	935	1,870	1,870

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,989.50	935	0	0
1,990.00	1,375	578	578
1,991.00	2,211	1,793	2,371
1,992.00	3,226	2,719	5,089

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,986.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,985.50'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,991.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.05 cfs @ 11.93 hrs HW=1,991.17' (Free Discharge)
└─**2=Culvert** (Passes 0.05 cfs of 2.20 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=9.82 cfs @ 11.93 hrs HW=1,991.17' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 9.82 cfs @ 1.12 fps)

Summary for Pond U: Open Swale

Inflow Area = 6.478 ac, 8.75% Impervious, Inflow Depth = 2.71" for 10 Year event
Inflow = 24.91 cfs @ 12.04 hrs, Volume= 1.464 af
Outflow = 24.48 cfs @ 12.06 hrs, Volume= 1.464 af, Atten= 2%, Lag= 1.0 min
Primary = 24.48 cfs @ 12.06 hrs, Volume= 1.464 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 2,015.32' @ 12.06 hrs Surf.Area= 11,834 sf Storage= 11,107 cf

Plug-Flow detention time= 203.0 min calculated for 1.463 af (100% of inflow)
Center-of-Mass det. time= 203.3 min (1,046.4 - 843.1)

Volume	Invert	Avail.Storage	Storage Description
#1	2,010.50'	1,034 cf	**Stone Layer (Prismatic)** Listed below (Recalc) 2,584 cf Overall x 40.0% Voids
#2	2,011.50'	775 cf	**Filter Media (Prismatic)** Listed below (Recalc) 5,168 cf Overall x 15.0% Voids
#3	2,013.50'	18,070 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		19,878 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,010.50	2,584	0	0
2,011.50	2,584	2,584	2,584

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,011.50	2,584	0	0
2,013.50	2,584	5,168	5,168

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,013.50	2,584	0	0
2,014.00	4,540	1,781	1,781
2,015.00	6,354	5,447	7,228
2,016.00	7,336	6,845	14,073
2,016.50	8,650	3,997	18,070

Device	Routing	Invert	Outlet Devices
#1	Device 2	2,010.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	2,010.50'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,010.50' / 2,010.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Primary	2,015.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=24.37 cfs @ 12.06 hrs HW=2,015.32' (Free Discharge)
└2=**Culvert** (Passes 0.14 cfs of 1.60 cfs potential flow)
  └1=**Exfiltration** (Exfiltration Controls 0.14 cfs)
└3=**Broad-Crested Rectangular Weir** (Weir Controls 24.24 cfs @ 1.53 fps)

Summary for Pond W: Open Swale

Inflow Area =	8.723 ac,	9.84% Impervious,	Inflow Depth = 2.77"	for 10 Year event	
Inflow =	36.51 cfs @	12.01 hrs,	Volume=	2.013 af	
Outflow =	26.28 cfs @	12.07 hrs,	Volume=	2.013 af,	Atten= 28%, Lag= 3.9 min
Primary =	0.31 cfs @	12.07 hrs,	Volume=	0.724 af	
Secondary =	25.97 cfs @	12.07 hrs,	Volume=	1.289 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,790.49' @ 12.07 hrs Surf.Area= 13,445 sf Storage= 17,462 cf

Plug-Flow detention time= 199.4 min calculated for 2.013 af (100% of inflow)
Center-of-Mass det. time= 199.1 min (1,158.4 - 959.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,784.00'	960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,399 cf Overall x 40.0% Voids
#2	1,785.00'	900 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 5,998 cf Overall x 15.0% Voids
#3	1,787.50'	25,064 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		26,923 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,784.00	2,399	0	0
1,785.00	2,399	2,399	2,399

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,785.00	2,399	0	0
1,787.50	2,399	5,998	5,998

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,787.50	2,399	0	0
1,788.00	3,136	1,384	1,384
1,789.00	4,612	3,874	5,258
1,790.00	8,000	6,306	11,564
1,791.50	10,000	13,500	25,064

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,784.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,784.00'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,789.50'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.31 cfs @ 12.07 hrs HW=1,790.47' (Free Discharge)
└─**2=Culvert** (Passes 0.31 cfs of 2.36 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.31 cfs)

Secondary OutFlow Max=25.49 cfs @ 12.07 hrs HW=1,790.47' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 25.49 cfs @ 2.62 fps)

Summary for Pond X: Open Swale

Inflow Area = 2.495 ac, 6.71% Impervious, Inflow Depth = 2.53" for 10 Year event
Inflow = 11.33 cfs @ 11.97 hrs, Volume= 0.526 af
Outflow = 10.37 cfs @ 12.01 hrs, Volume= 0.526 af, Atten= 8%, Lag= 2.1 min
Primary = 0.14 cfs @ 12.01 hrs, Volume= 0.239 af
Secondary = 10.23 cfs @ 12.01 hrs, Volume= 0.287 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,799.41' @ 12.01 hrs Surf.Area= 6,192 sf Storage= 5,623 cf

Plug-Flow detention time= 204.0 min calculated for 0.526 af (100% of inflow)
Center-of-Mass det. time= 203.8 min (1,045.7 - 841.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,794.00'	556 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,391 cf Overall x 40.0% Voids
#2	1,795.00'	522 cf	**Filter Media (Prismatic)** Listed below (Recalc) 3,478 cf Overall x 15.0% Voids
#3	1,797.50'	9,040 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		10,118 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,794.00	1,391	0	0
1,795.00	1,391	1,391	1,391

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,795.00	1,391	0	0
1,797.50	1,391	3,478	3,478

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,797.50	1,391	0	0
1,798.00	1,916	827	827
1,799.00	2,930	2,423	3,250
1,800.00	4,105	3,518	6,767
1,800.50	4,984	2,272	9,040

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,794.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,794.00'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,799.00'	**15.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.14 cfs @ 12.01 hrs HW=1,799.40' (Free Discharge)
└─**2=Culvert** (Passes 0.14 cfs of 2.15 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Secondary OutFlow Max=9.96 cfs @ 12.01 hrs HW=1,799.40' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 9.96 cfs @ 1.65 fps)

Summary for Pond B4: bioretention

Inflow Area = 4.919 ac, 18.04% Impervious, Inflow Depth = 4.79" for 100 Year event
Inflow = 40.42 cfs @ 11.94 hrs, Volume= 1.964 af
Outflow = 36.57 cfs @ 11.97 hrs, Volume= 1.906 af, Atten= 10%, Lag= 2.0 min
Primary = 2.31 cfs @ 11.97 hrs, Volume= 1.171 af
Secondary = 34.25 cfs @ 11.97 hrs, Volume= 0.735 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,144.99' @ 11.97 hrs Surf.Area= 22,658 sf Storage= 22,554 cf

Plug-Flow detention time= 148.3 min calculated for 1.905 af (97% of inflow)
Center-of-Mass det. time= 130.8 min (938.5 - 807.7)

Volume	Invert	Avail.Storage	Storage Description
#1	2,138.00'	2,551 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 6,377 cf Overall x 40.0% Voids
#2	2,139.00'	3,826 cf	**filter media (Prismatic)** Listed below (Recalc) 25,508 cf Overall x 15.0% Voids
#3	2,143.00'	16,265 cf	**surface storage (Prismatic)** Listed below (Recalc)
		22,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,138.00	6,377	0	0
2,139.00	6,377	6,377	6,377

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,139.00	6,377	0	0
2,143.00	6,377	25,508	25,508

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,143.00	6,377	0	0
2,144.00	8,116	7,247	7,247
2,145.00	9,920	9,018	16,265

Device	Routing	Invert	Outlet Devices
#1	Primary	2,139.00'	**8.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,139.00' / 2,137.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,138.00'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	2,143.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	2,144.25'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.31 cfs @ 11.97 hrs HW=2,144.99' (Free Discharge)
└─1=**Culvert** (Passes 2.31 cfs of 3.50 cfs potential flow)
  ├─2=**Exfiltration** (Exfiltration Controls 0.26 cfs)
  └─3=**Orifice/Grate** (Orifice Controls 2.05 cfs @ 5.87 fps)

Secondary OutFlow Max=33.98 cfs @ 11.97 hrs HW=2,144.99' (Free Discharge)
└─4=**Broad-Crested Rectangular Weir** (Weir Controls 33.98 cfs @ 2.30 fps)

Summary for Pond H: Pond H

Inflow Area = 14.937 ac, 17.76% Impervious, Inflow Depth = 4.82" for 100 Year event
Inflow = 103.90 cfs @ 12.00 hrs, Volume= 5.994 af
Outflow = 50.50 cfs @ 12.12 hrs, Volume= 5.989 af, Atten= 51%, Lag= 7.3 min
Primary = 50.50 cfs @ 12.12 hrs, Volume= 5.989 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 1,996.00' Surf.Area= 4,665 sf Storage= 6,646 cf
Peak Elev= 2,002.66' @ 12.12 hrs Surf.Area= 20,079 sf Storage= 88,004 cf (81,358 cf above start)

Plug-Flow detention time= 276.5 min calculated for 5.835 af (97% of inflow)
Center-of-Mass det. time= 250.0 min (1,083.4 - 833.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,993.00'	95,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,993.00	385	0	0
1,994.00	1,192	789	789
1,996.00	4,665	5,857	6,646
1,997.00	6,868	5,767	12,412
1,998.00	9,300	8,084	20,496
2,000.00	13,640	22,940	43,436
2,002.00	18,315	31,955	75,391
2,003.00	21,000	19,658	95,049

Device	Routing	Invert	Outlet Devices
#1	Primary	1,995.00'	**24.0" Round Culvert** L= 335.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,995.00' / 1,983.90' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,996.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,999.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	2,002.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=50.41 cfs @ 12.12 hrs HW=2,002.66' (Free Discharge)
—**1=Culvert** (Passes 36.58 cfs of 39.02 cfs potential flow)
—**2=Orifice/Grate** (Orifice Controls 0.27 cfs @ 12.34 fps)
—**3=Orifice/Grate** (Orifice Controls 36.31 cfs @ 9.08 fps)
—**4=Broad-Crested Rectangular Weir** (Weir Controls 13.83 cfs @ 2.11 fps)

Summary for Pond J: OPEN SWALE

Inflow Area = 1.775 ac, 27.88% Impervious, Inflow Depth = 5.69" for 100 Year event
Inflow = 17.44 cfs @ 11.92 hrs, Volume= 0.841 af
Outflow = 14.83 cfs @ 11.96 hrs, Volume= 0.841 af, Atten= 15%, Lag= 2.5 min
Primary = 5.14 cfs @ 11.96 hrs, Volume= 0.675 af
Secondary = 9.68 cfs @ 11.96 hrs, Volume= 0.166 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,992.23' @ 11.96 hrs Surf.Area= 8,109 sf Storage= 8,624 cf

Plug-Flow detention time= 52.3 min calculated for 0.841 af (100% of inflow)
Center-of-Mass det. time= 52.4 min (836.0 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,986.50'	720 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 1,800 cf Overall x 40.0% Voids
#2	1,987.50'	675 cf	**Filter Media (Prismatic)** Listed below (Recalc) 4,500 cf Overall x 15.0% Voids
#3	1,990.00'	8,500 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		9,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,986.50	1,800	0	0
1,987.50	1,800	1,800	1,800

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,987.50	1,800	0	0
1,990.00	1,800	4,500	4,500

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,990.00	1,800	0	0
1,991.00	3,200	2,500	2,500
1,992.50	4,800	6,000	8,500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,986.50'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,989.50'	**8.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,989.50' / 1,984.00' S= 0.0786 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Secondary	1,991.50'	**6.0' long x 2.0' breadth Broad-Crested Rectangular Weir**

			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#4	Primary	1,992.00'	**10.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.98 cfs @ 11.96 hrs HW=1,992.22' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.19 cfs)
2=Culvert (Inlet Controls 2.05 cfs @ 5.87 fps)
4=Broad-Crested Rectangular Weir (Weir Controls 2.74 cfs @ 1.25 fps)

Secondary OutFlow Max=9.52 cfs @ 11.96 hrs HW=1,992.22' (Free Discharge)
3=Broad-Crested Rectangular Weir (Weir Controls 9.52 cfs @ 2.21 fps)

Summary for Pond K: P1

Inflow Area = 7.908 ac, 12.10% Impervious, Inflow Depth = 4.61" for 100 Year event
Inflow = 45.30 cfs @ 12.02 hrs, Volume= 3.041 af
Outflow = 33.99 cfs @ 12.13 hrs, Volume= 3.040 af, Atten= 25%, Lag= 6.2 min
Primary = 33.99 cfs @ 12.13 hrs, Volume= 3.040 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 2,018.00' Surf.Area= 2,252 sf Storage= 4,088 cf
Peak Elev= 2,024.25' @ 12.13 hrs Surf.Area= 16,785 sf Storage= 51,959 cf (47,871 cf above start)

Plug-Flow detention time= 585.6 min calculated for 2.946 af (97% of inflow)
Center-of-Mass det. time= 544.4 min (1,362.1 - 817.7)

Volume	Invert	Avail.Storage	Storage Description
#1	2,014.00'	56,425 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,014.00	117	0	0
2,016.00	896	1,013	1,013
2,016.50	1,162	515	1,528
2,018.00	2,252	2,561	4,088
2,020.00	4,326	6,578	10,666
2,022.00	9,000	13,326	23,992
2,024.00	15,031	24,031	48,023
2,024.50	18,575	8,402	56,425

Device	Routing	Invert	Outlet Devices
#1	Primary	2,017.50'	**24.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,017.50' / 2,016.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	2,018.00'	**1.7" Vert. Orifice/Grate** C= 0.600
#3	Device 1	2,021.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	2,023.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600

			Limited to weir flow at low heads
#5	Primary	2,024.00'	**51.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=33.84 cfs @ 12.13 hrs HW=2,024.24' (Free Discharge)
1=**Culvert** (Passes 17.19 cfs of 36.26 cfs potential flow)
2=**Orifice/Grate** (Orifice Controls 0.19 cfs @ 11.96 fps)
3=**Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.79 fps)
4=**Orifice/Grate** (Orifice Controls 16.62 cfs @ 4.16 fps)
5=**Broad-Crested Rectangular Weir** (Weir Controls 16.65 cfs @ 1.33 fps)

Summary for Pond L: Pond L - P1

Inflow Area = 21.422 ac, 18.68% Impervious, Inflow Depth = 4.99" for 100 Year event
Inflow = 123.83 cfs @ 11.96 hrs, Volume= 8.899 af
Outflow = 90.24 cfs @ 12.09 hrs, Volume= 8.897 af, Atten= 27%, Lag= 7.8 min
Primary = 90.24 cfs @ 12.09 hrs, Volume= 8.897 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Starting Elev= 1,944.00' Surf.Area= 5,350 sf Storage= 8,885 cf
Peak Elev= 1,950.58' @ 12.09 hrs Surf.Area= 30,572 sf Storage= 120,230 cf (111,345 cf above start)

Plug-Flow detention time= 283.5 min calculated for 8.690 af (98% of inflow)
Center-of-Mass det. time= 259.8 min (1,067.7 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,941.50'	133,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,941.50	1,964	0	0
1,942.00	2,435	1,100	1,100
1,944.00	5,350	7,785	8,885
1,946.00	11,083	16,433	25,318
1,948.00	17,735	28,818	54,136
1,949.00	25,553	21,644	75,780
1,949.75	27,569	19,921	95,701
1,950.00	29,207	7,097	102,798
1,951.00	31,547	30,377	133,175

Device	Routing	Invert	Outlet Devices
#1	Primary	1,943.00'	**21.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,943.00' / 1,942.50' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	1,944.00'	**2.7" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,948.00'	**30.0" x 30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	1,949.50'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=90.02 cfs @ 12.09 hrs HW=1,950.58' (Free Discharge)
1=**Culvert** (Inlet Controls 29.99 cfs @ 12.47 fps)
2=**Orifice/Grate** (Passes < 0.49 cfs potential flow)
3=**Orifice/Grate** (Passes < 48.35 cfs potential flow)
4=**Broad-Crested Rectangular Weir** (Weir Controls 60.03 cfs @ 2.78 fps)

Summary for Pond M: OPEN SWALE

Inflow Area = 4.790 ac, 2.76% Impervious, Inflow Depth = 4.01" for 100 Year event
Inflow = 34.32 cfs @ 11.97 hrs, Volume= 1.600 af
Outflow = 23.30 cfs @ 12.04 hrs, Volume= 1.586 af, Atten= 32%, Lag= 4.0 min
Primary = 23.30 cfs @ 12.04 hrs, Volume= 1.586 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,890.41' @ 12.04 hrs Surf.Area= 15,067 sf Storage= 20,746 cf

Plug-Flow detention time= 201.2 min calculated for 1.586 af (99% of inflow)
Center-of-Mass det. time= 195.7 min (1,025.6 - 829.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,884.00'	1,198 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,995 cf Overall x 40.0% Voids
#2	1,885.00'	1,123 cf	**Filter Media (Prismatic)** Listed below (Recalc) 7,488 cf Overall x 15.0% Voids
#3	1,887.50'	19,290 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		21,611 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,884.00	2,995	0	0
1,885.00	2,995	2,995	2,995

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,885.00	2,995	0	0
1,887.50	2,995	7,488	7,488

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,887.50	2,995	0	0
1,888.00	4,500	1,874	1,874
1,889.00	6,437	5,469	7,342
1,890.00	8,574	7,506	14,848
1,890.50	9,195	4,442	19,290

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,884.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,884.50'	**6.0" Vert. Culvert** C= 0.600
#3	Primary	1,889.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=23.00 cfs @ 12.04 hrs HW=1,890.40' (Free Discharge)
└─**2=Culvert** (Passes 0.17 cfs of 2.25 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.17 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 22.83 cfs @ 3.27 fps)

Summary for Pond N: OPEN SWALE

Inflow Area = 1.568 ac, 2.65% Impervious, Inflow Depth = 3.78" for 100 Year event
Inflow = 10.98 cfs @ 11.96 hrs, Volume= 0.494 af
Outflow = 9.64 cfs @ 12.00 hrs, Volume= 0.494 af, Atten= 12%, Lag= 2.1 min
Primary = 9.64 cfs @ 12.00 hrs, Volume= 0.494 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,875.82' @ 12.00 hrs Surf.Area= 4,111 sf Storage= 4,599 cf

Plug-Flow detention time= 183.2 min calculated for 0.494 af (100% of inflow)
Center-of-Mass det. time= 183.7 min (1,016.9 - 833.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,870.00'	258 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 644 cf Overall x 40.0% Voids
#2	1,871.00'	242 cf	**Filter Media (Prismatic)** Listed below (Recalc) 1,610 cf Overall x 15.0% Voids
#3	1,873.50'	4,639 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		5,138 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,870.00	644	0	0
1,871.00	644	644	644

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,871.00	644	0	0
1,873.50	644	1,610	1,610

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,873.50	644	0	0
1,874.00	1,260	476	476
1,875.00	2,031	1,646	2,122
1,876.00	3,003	2,517	4,639

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,870.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,870.00'	**6.0" Vert. culvert** C= 0.600
#3	Primary	1,875.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=9.58 cfs @ 12.00 hrs HW=1,875.81' (Free Discharge)
└2=**culvert** (Passes 0.05 cfs of 2.23 cfs potential flow)
  └1=**Exfiltration** (Exfiltration Controls 0.05 cfs)
└3=**Broad-Crested Rectangular Weir** (Weir Controls 9.53 cfs @ 2.35 fps)

Summary for Pond O: Open Swale

Inflow Area = 4.430 ac, 15.50% Impervious, Inflow Depth = 4.81" for 100 Year event
Inflow = 39.54 cfs @ 11.95 hrs, Volume= 1.776 af
Outflow = 36.92 cfs @ 11.97 hrs, Volume= 1.776 af, Atten= 7%, Lag= 1.5 min
Primary = 0.30 cfs @ 11.97 hrs, Volume= 0.522 af
Secondary = 36.62 cfs @ 11.97 hrs, Volume= 1.254 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,839.93' @ 11.97 hrs Surf.Area= 12,897 sf Storage= 14,927 cf

Plug-Flow detention time= 146.1 min calculated for 1.775 af (100% of inflow)
Center-of-Mass det. time= 146.4 min (960.0 - 813.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,834.00'	814 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,035 cf Overall x 40.0% Voids
#2	1,835.00'	763 cf	**Filter Bed (Prismatic)** Listed below (Recalc) 5,088 cf Overall x 15.0% Voids
#3	1,837.50'	13,965 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		15,542 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,834.00	2,035	0	0
1,835.00	2,035	2,035	2,035

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,835.00	2,035	0	0
1,837.50	2,035	5,088	5,088

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,837.50	2,035	0	0
1,838.00	3,275	1,328	1,328
1,839.00	6,500	4,888	6,215
1,840.00	9,000	7,750	13,965

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,834.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,834.00'	**6.0" Vert. culvert** C= 0.600
#3	Secondary	1,839.25'	**25.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.30 cfs @ 11.97 hrs HW=1,839.93' (Free Discharge)
└─**2=culvert** (Passes 0.30 cfs of 2.25 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Secondary OutFlow Max=36.32 cfs @ 11.97 hrs HW=1,839.93' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 36.32 cfs @ 2.14 fps)

Summary for Pond Q: OPEN SWALE

Inflow Area = 3.629 ac, 5.69% Impervious, Inflow Depth = 4.01" for 100 Year event
Inflow = 25.41 cfs @ 11.98 hrs, Volume= 1.212 af
Outflow = 22.67 cfs @ 12.02 hrs, Volume= 1.212 af, Atten= 11%, Lag= 2.2 min
Primary = 22.67 cfs @ 12.02 hrs, Volume= 1.212 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,879.85' @ 12.02 hrs Surf.Area= 10,653 sf Storage= 12,602 cf

Plug-Flow detention time= 225.2 min calculated for 1.212 af (100% of inflow)
Center-of-Mass det. time= 225.7 min (1,056.1 - 830.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,874.00'	928 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 2,319 cf Overall x 40.0% Voids
#2	1,875.00'	870 cf	**Filter Media (Prismatic)** Listed below (Recalc) 5,798 cf Overall x 15.0% Voids
#3	1,877.50'	11,728 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		13,525 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,874.00	2,319	0	0
1,875.00	2,319	2,319	2,319

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,875.00	2,319	0	0
1,877.50	2,319	5,798	5,798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,877.50	3,319	0	0
1,878.00	3,840	1,790	1,790
1,879.00	4,913	4,377	6,166
1,880.00	6,211	5,562	11,728

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,874.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,874.00'	**6.0" Vert. Culvert** C= 0.600
#3	Primary	1,879.00'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=22.30 cfs @ 12.02 hrs HW=1,879.84' (Free Discharge)
└─**2=Culvert** (Passes 0.12 cfs of 2.24 cfs potential flow)
　└─**1=Exfiltration** (Exfiltration Controls 0.12 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 22.18 cfs @ 2.64 fps)

Summary for Pond S: Open Swale

Inflow Area = 2.213 ac, 4.27% Impervious, Inflow Depth = 4.24" for 100 Year event
Inflow = 16.02 cfs @ 11.98 hrs, Volume= 0.781 af
Outflow = 15.98 cfs @ 11.99 hrs, Volume= 0.781 af, Atten= 0%, Lag= 0.5 min
Primary = 0.06 cfs @ 11.99 hrs, Volume= 0.171 af
Secondary = 15.92 cfs @ 11.99 hrs, Volume= 0.611 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,919.24' @ 11.99 hrs Surf.Area= 5,572 sf Storage= 4,963 cf

Plug-Flow detention time= 180.0 min calculated for 0.781 af (100% of inflow)
Center-of-Mass det. time= 180.6 min (1,007.3 - 826.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,914.50'	549 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 1,372 cf Overall x 40.0% Voids
#2	1,915.50'	412 cf	**Filter Media (Prismatic)** Listed below (Recalc) 2,744 cf Overall x 15.0% Voids
#3	1,917.50'	6,299 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		7,259 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,914.50	1,372	0	0
1,915.50	1,372	1,372	1,372

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,915.50	1,372	0	0
1,917.50	1,372	2,744	2,744

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,917.50	1,372	0	0
1,918.00	2,190	891	891
1,920.00	3,218	5,408	6,299

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,914.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,914.50'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,919.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.06 cfs @ 11.99 hrs HW=1,919.24' (Free Discharge)
└─**2=Culvert** (Passes 0.06 cfs of 2.00 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Secondary OutFlow Max=15.66 cfs @ 11.99 hrs HW=1,919.24' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 15.66 cfs @ 1.32 fps)

Summary for Pond sp1: Storm Planters

Inflow Area = 0.986 ac, 86.08% Impervious, Inflow Depth = 7.16" for 100 Year event
Inflow = 11.29 cfs @ 11.96 hrs, Volume= 0.589 af
Outflow = 2.47 cfs @ 12.10 hrs, Volume= 0.534 af, Atten= 78%, Lag= 8.6 min
Primary = 2.47 cfs @ 12.10 hrs, Volume= 0.534 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 2,151.60' @ 12.10 hrs Surf.Area= 11,960 sf Storage= 13,292 cf

Plug-Flow detention time= 290.9 min calculated for 0.534 af (91% of inflow)
Center-of-Mass det. time= 242.0 min (1,002.7 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1	2,147.50'	2,392 cf	**stone underdrain (Prismatic)** Listed below (Recalc) -Impervious 5,980 cf Overall x 40.0% Voids
#2	2,148.50'	1,346 cf	**filter media (Prismatic)** Listed below (Recalc) 8,970 cf Overall x 15.0% Voids
#3	2,150.00'	11,960 cf	**surface storage (Prismatic)** Listed below (Recalc)
		15,698 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,147.50	5,980	0	0
2,148.50	5,980	5,980	5,980

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,148.50	5,980	0	0
2,150.00	5,980	8,970	8,970

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,150.00	5,980	0	0
2,151.00	5,980	5,980	5,980
2,152.00	5,980	5,980	11,960

Device	Routing	Invert	Outlet Devices
#1	Primary	2,147.50'	**24.0" Round Culvert** L= 350.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,147.50' / 2,080.00' S= 0.1929 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	2,147.50'	**1.000 in/hr Exfiltration over Surface area**
#3	Device 1	2,151.00'	**6.0" Horiz. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.47 cfs @ 12.10 hrs HW=2,151.60' (Free Discharge)
└1=**Culvert** (Passes 2.47 cfs of 26.61 cfs potential flow)
  ├2=**Exfiltration** (Exfiltration Controls 0.28 cfs)
  └3=**Orifice/Grate** (Orifice Controls 2.19 cfs @ 3.72 fps)

Summary for Pond T: Open Swale

Inflow Area = 1.813 ac, 7.66% Impervious, Inflow Depth = 4.46" for 100 Year event
Inflow = 15.99 cfs @ 11.92 hrs, Volume= 0.675 af
Outflow = 15.84 cfs @ 11.93 hrs, Volume= 0.674 af, Atten= 1%, Lag= 0.3 min
Primary = 0.05 cfs @ 11.93 hrs, Volume= 0.124 af
Secondary = 15.79 cfs @ 11.93 hrs, Volume= 0.550 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,991.24' @ 11.93 hrs Surf.Area= 4,324 sf Storage= 3,583 cf

Plug-Flow detention time= 147.9 min calculated for 0.674 af (100% of inflow)
Center-of-Mass det. time= 148.2 min (966.2 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,986.50'	374 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 935 cf Overall x 40.0% Voids
#2	1,987.50'	281 cf	**Filter Media (Prismatic)** Listed below (Recalc) 1,870 cf Overall x 15.0% Voids
#3	1,989.50'	5,089 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		5,744 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,986.50	935	0	0
1,987.50	935	935	935

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,987.50	935	0	0
1,989.50	935	1,870	1,870

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,989.50	935	0	0
1,990.00	1,375	578	578
1,991.00	2,211	1,793	2,371
1,992.00	3,226	2,719	5,089

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,986.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	1,985.50'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,991.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.05 cfs @ 11.93 hrs HW=1,991.24' (Free Discharge)
└─**2=Culvert** (Passes 0.05 cfs of 2.21 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=15.39 cfs @ 11.93 hrs HW=1,991.24' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 15.39 cfs @ 1.31 fps)

Summary for Pond U: Open Swale

Inflow Area = 6.478 ac, 8.75% Impervious, Inflow Depth = 4.35" for 100 Year event
Inflow = 39.97 cfs @ 12.04 hrs, Volume= 2.348 af
Outflow = 39.43 cfs @ 12.05 hrs, Volume= 2.349 af, Atten= 1%, Lag= 0.8 min
Primary = 39.43 cfs @ 12.05 hrs, Volume= 2.349 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 2,015.44' @ 12.05 hrs Surf.Area= 11,950 sf Storage= 11,901 cf

Plug-Flow detention time= 129.8 min calculated for 2.348 af (100% of inflow)
Center-of-Mass det. time= 130.5 min (960.0 - 829.5)

Volume	Invert	Avail.Storage	Storage Description
#1	2,010.50'	1,034 cf	**Stone Layer (Prismatic)** Listed below (Recalc) 2,584 cf Overall x 40.0% Voids
#2	2,011.50'	775 cf	**Filter Media (Prismatic)** Listed below (Recalc) 5,168 cf Overall x 15.0% Voids
#3	2,013.50'	18,070 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		19,878 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,010.50	2,584	0	0
2,011.50	2,584	2,584	2,584

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,011.50	2,584	0	0
2,013.50	2,584	5,168	5,168

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,013.50	2,584	0	0
2,014.00	4,540	1,781	1,781
2,015.00	6,354	5,447	7,228
2,016.00	7,336	6,845	14,073
2,016.50	8,650	3,997	18,070

Device	Routing	Invert	Outlet Devices
#1	Device 2	2,010.50'	**0.500 in/hr Exfiltration over Surface area**
#2	Primary	2,010.50'	**6.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,010.50' / 2,010.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#3	Primary	2,015.00'	**50.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=39.14 cfs @ 12.05 hrs HW=2,015.43' (Free Discharge)
└─**2=Culvert** (Passes 0.14 cfs of 1.62 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.14 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 39.00 cfs @ 1.80 fps)

Summary for Pond W: Open Swale

Inflow Area = 8.723 ac, 9.84% Impervious, Inflow Depth = 4.42" for 100 Year event
Inflow = 63.70 cfs @ 11.98 hrs, Volume= 3.209 af
Outflow = 56.77 cfs @ 12.02 hrs, Volume= 3.209 af, Atten= 11%, Lag= 2.4 min
Primary = 0.33 cfs @ 12.02 hrs, Volume= 0.746 af
Secondary = 56.44 cfs @ 12.02 hrs, Volume= 2.463 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,791.07' @ 12.02 hrs Surf.Area= 14,225 sf Storage= 22,748 cf

Plug-Flow detention time= 129.1 min calculated for 3.208 af (100% of inflow)
Center-of-Mass det. time= 129.1 min (1,032.3 - 903.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,784.00'	960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,399 cf Overall x 40.0% Voids
#2	1,785.00'	900 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 5,998 cf Overall x 15.0% Voids
#3	1,787.50'	25,064 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		26,923 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,784.00	2,399	0	0
1,785.00	2,399	2,399	2,399

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,785.00	2,399	0	0
1,787.50	2,399	5,998	5,998

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,787.50	2,399	0	0
1,788.00	3,136	1,384	1,384
1,789.00	4,612	3,874	5,258
1,790.00	8,000	6,306	11,564
1,791.50	10,000	13,500	25,064

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,784.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,784.00'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,789.50'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.33 cfs @ 12.02 hrs HW=1,791.06' (Free Discharge)
└─**2=Culvert** (Passes 0.33 cfs of 2.47 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Secondary OutFlow Max=56.03 cfs @ 12.02 hrs HW=1,791.06' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 56.03 cfs @ 3.59 fps)

Summary for Pond X: Open Swale

Inflow Area = 2.495 ac, 6.71% Impervious, Inflow Depth = 4.12" for 100 Year event
Inflow = 18.36 cfs @ 11.97 hrs, Volume= 0.857 af
Outflow = 17.64 cfs @ 11.99 hrs, Volume= 0.857 af, Atten= 4%, Lag= 1.3 min
Primary = 0.15 cfs @ 11.99 hrs, Volume= 0.248 af
Secondary = 17.49 cfs @ 11.99 hrs, Volume= 0.609 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,799.58' @ 11.99 hrs Surf.Area= 6,398 sf Storage= 6,240 cf

Plug-Flow detention time= 129.1 min calculated for 0.857 af (100% of inflow)
Center-of-Mass det. time= 129.4 min (957.2 - 827.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,794.00'	556 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,391 cf Overall x 40.0% Voids
#2	1,795.00'	522 cf	**Filter Media (Prismatic)** Listed below (Recalc) 3,478 cf Overall x 15.0% Voids
#3	1,797.50'	9,040 cf	**Surface Storage (Prismatic)** Listed below (Recalc)
		10,118 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,794.00	1,391	0	0
1,795.00	1,391	1,391	1,391

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,795.00	1,391	0	0
1,797.50	1,391	3,478	3,478

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,797.50	1,391	0	0
1,798.00	1,916	827	827
1,799.00	2,930	2,423	3,250
1,800.00	4,105	3,518	6,767
1,800.50	4,984	2,272	9,040

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,794.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,794.00'	**6.0" Vert. Culvert** C= 0.600
#3	Secondary	1,799.00'	**15.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.15 cfs @ 11.99 hrs HW=1,799.58' (Free Discharge)
└─**2=Culvert** (Passes 0.15 cfs of 2.18 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Secondary OutFlow Max=17.23 cfs @ 11.99 hrs HW=1,799.58' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 17.23 cfs @ 1.99 fps)

Design Point Summary
1-yr Storm Event

Design Point Totals
10, 25 & 100-yr Storm Events

Summary for Pond DP 7: Design Point 7

Inflow Area = 130.681 ac, 1.83% Impervious, Inflow Depth = 0.62" for 1 Year event
Inflow = 50.89 cfs @ 12.39 hrs, Volume= 6.798 af
Primary = 50.89 cfs @ 12.39 hrs, Volume= 6.798 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 8: Design Point 8

Inflow Area = 110.933 ac, 7.24% Impervious, Inflow Depth > 0.68" for 1 Year event
Inflow = 22.63 cfs @ 12.05 hrs, Volume= 6.268 af
Primary = 22.63 cfs @ 12.05 hrs, Volume= 6.268 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 9: Design Point 9

Inflow Area = 45.925 ac, 10.39% Impervious, Inflow Depth > 0.74" for 1 Year event
Inflow = 15.26 cfs @ 12.21 hrs, Volume= 2.814 af
Primary = 15.26 cfs @ 12.21 hrs, Volume= 2.814 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 7: Design Point 7	Inflow=298.77 cfs 30.976 af
	Primary=298.77 cfs 30.976 af
Pond DP 8: Design Point 8	Inflow=188.59 cfs 26.990 af
	Primary=188.59 cfs 26.990 af
Pond DP 9: Design Point 9	Inflow=116.13 cfs 11.676 af
	Primary=116.13 cfs 11.676 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 7: Design Point 7 Inflow=343.50 cfs 35.378 af
Primary=343.50 cfs 35.378 af

Pond DP 8: Design Point 8 Inflow=241.25 cfs 30.741 af
Primary=241.25 cfs 30.741 af

Pond DP 9: Design Point 9 Inflow=136.19 cfs 13.262 af
Primary=136.19 cfs 13.262 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 7: Design Point 7 Inflow=483.32 cfs 49.138 af
Primary=483.32 cfs 49.138 af

Pond DP 8: Design Point 8 Inflow=416.82 cfs 42.447 af
Primary=416.82 cfs 42.447 af

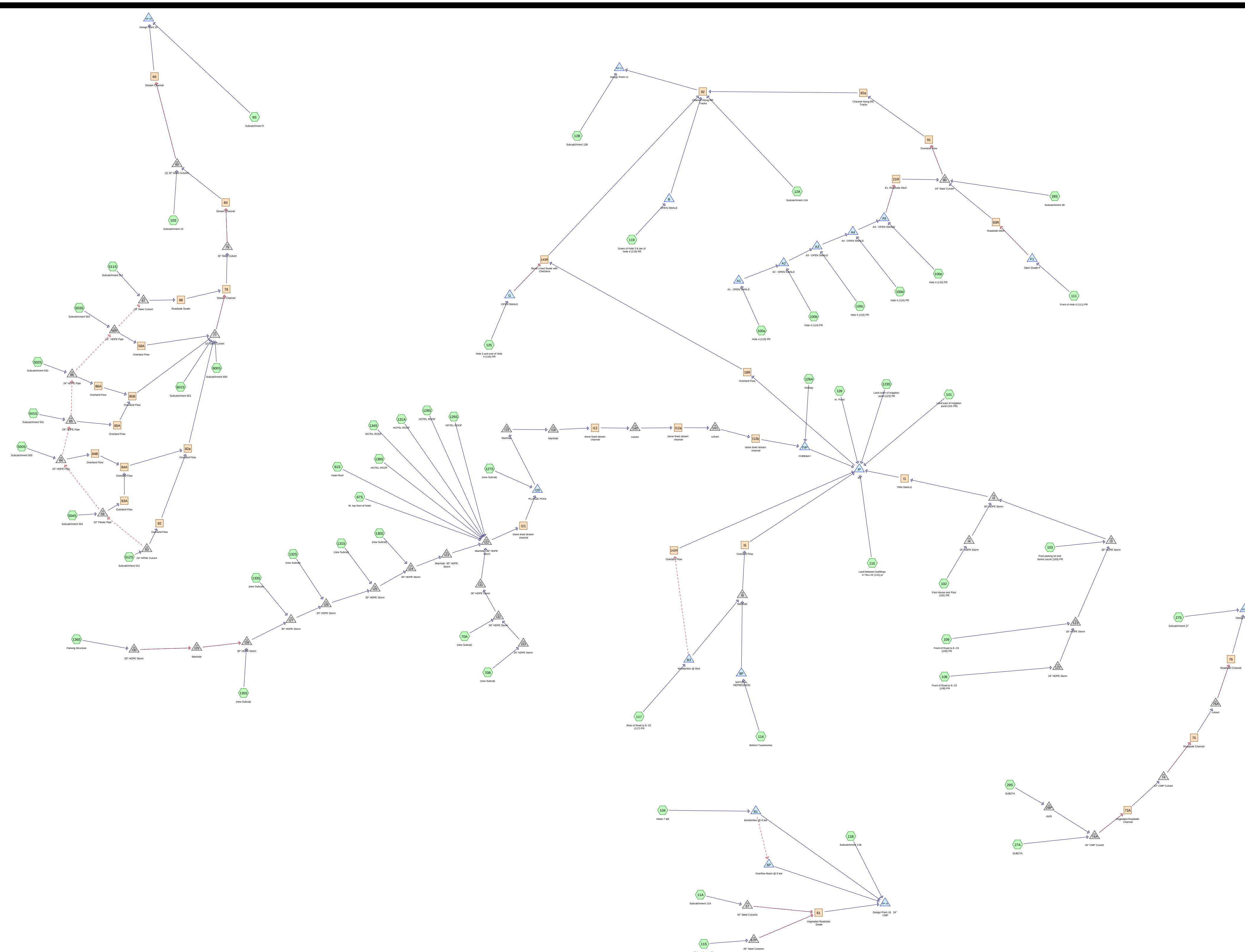
Pond DP 9: Design Point 9 Inflow=193.69 cfs 18.193 af
Primary=193.69 cfs 18.193 af

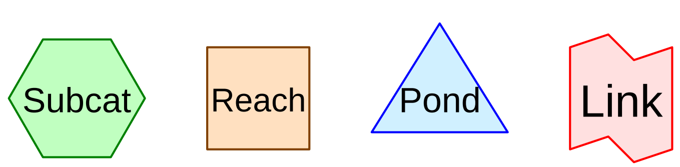
APPENDIX G

HydroCAD Data – Proposed Model – Wildacres East

1. **Proposed Model Diagram, Area/Soil Listings and Subcatchment Summaries**
2. **Proposed Reach and Culvert Summaries – 1 & 10-yr Storm Events**
3. **Proposed Pond Summaries – 1, 10 & 100-yr Storm Events**
4. **Proposed Design Point Summaries - 1-yr Event**
5. **Proposed Design Point Totals – 10, 25 and 100-yr Storm Events**

Model Diagram, Area and Soil Listings and Subcatchment Summaries





Drainage Diagram for 07074_Pro-WildacresEast

Prepared by The LA group, Printed 2/27/2012

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
23.643	61	>75% Grass cover, Good, HSG B (9S, 11B, 12A, 27A, 100a, 100b, 100c, 100d, 100e, 104, 111, 114, 115, 119, 123S, 125, 127S)
0.635	68	Porous Pavement (127S)
175.556	70	Woods, Good, HSG C (9S, 10S, 11A, 11B, 11S, 12A, 12B, 27A, 27S, 28S, 100a, 100b, 104, 114, 119, 125, 127S, 135S, 500S, 501S, 502S, 503S, 504S, 511S, 512S, 600S, 601S)
16.030	71	Meadow, non-grazed, HSG C (9S, 10S, 27A, 28S, 500S, 501S, 502S)
0.674	73	Woods, Fair, HSG C (115, 117)
33.488	74	>75% Grass cover, Good, HSG C (11B, 12A, 12B, 27S, 29S, 70A, 70B, 100a, 100b, 100c, 100d, 100e, 101, 103, 104, 108, 109, 111, 114, 115, 117, 119, 125, 126, 127S, 130S, 131S, 132S, 133S, 135S, 504S)
1.107	98	Paved (27A, 29S, 61S, 108)
9.384	98	Paved parking & roofs (11A, 11B, 11S, 12A, 70A, 70B, 102, 103, 109, 115, 117, 130S, 131A, 131S, 132S, 134S, 136S)
0.393	98	Paved parking, HSG C (9S, 135S)
0.432	98	Pavement (27S)
1.292	98	Pond (126)
1.700	98	Porous Pavement (11B, 12A, 70A, 70B, 100a, 100b, 100c, 100d, 100e, 104, 111, 119, 125)
0.268	98	Porus Pavement (115)
0.783	98	Road (504S, 600S, 601S)
0.363	98	Road/Drive (10S)
0.726	98	Roadway (500S, 501S, 502S)
1.424	98	Roof (27A, 27S, 67S, 128S, 129S, 138S)
0.195	98	Roof Area (9S)
1.862	98	Roofs (10S, 12A, 101, 102, 115)
0.184	98	Water Surface, 0% imp, HSG C (126A)
0.269	98	Water Surface, HSG C (117)
0.217	98	porous paving (9S)

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
23.643	HSG B	9S, 11B, 12A, 27A, 100a, 100b, 100c, 100d, 100e, 104, 111, 114, 115, 119, 123S, 125, 127S
226.593	HSG C	9S, 10S, 11A, 11B, 11S, 12A, 12B, 27A, 27S, 28S, 29S, 70A, 70B, 100a, 100b, 100c, 100d, 100e, 101, 103, 104, 108, 109, 111, 114, 115, 117, 119, 125, 126, 126A, 127S, 130S, 131S, 132S, 133S, 135S, 500S, 501S, 502S, 503S, 504S, 511S, 512S, 600S, 601S
0.000	HSG D	
20.389	Other	9S, 10S, 11A, 11B, 11S, 12A, 27A, 27S, 29S, 61S, 67S, 70A, 70B, 100a, 100b, 100c, 100d, 100e, 101, 102, 103, 104, 108, 109, 111, 115, 117, 119, 125, 126, 127S, 128S, 129S, 130S, 131A, 131S, 132S, 134S, 136S, 138S, 500S, 501S, 502S, 504S, 600S, 601S

Summary for Subcatchment 9S: Subcatchment 9

Runoff = 42.73 cfs @ 11.94 hrs, Volume= 1.818 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	8,494	98	Roof Area
	57,978	71	Meadow, non-grazed, HSG C
	1,355,532	70	Woods, Good, HSG C
	13,112	98	Paved parking, HSG C
*	9,470	98	porous paving
	21,295	61	>75% Grass cover, Good, HSG B
	1,465,881	71	Weighted Average
	1,434,805		97.88% Pervious Area
	31,076		2.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	1,923	0.1100	13.81	662.89	**Trap/Vee/Rect Channel Flow, Flow through Rock Channel** Bot.W=20.00' D=2.00' Z= 2.0 '/' Top.W=28.00' n= 0.050 Mountain streams w/large boulders

Summary for Subcatchment 10S: Subcatchment 10

Runoff = 14.65 cfs @ 12.31 hrs, Volume= 1.772 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	890,947	70	Woods, Good, HSG C
	514,750	71	Meadow, non-grazed, HSG C
*	15,812	98	Road/Drive
*	7,623	98	Roofs
	1,429,132	71	Weighted Average
	1,405,697		98.36% Pervious Area
	23,435		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
11.9	600	0.0780	0.84		**Shallow Concentrated Flow, SC Flow through Woods** Kv= 3.0 fps
2.7	455	0.1600	2.80		**Shallow Concentrated Flow, SC Flow through Grass** Short Grass Pasture Kv= 7.0 fps
4.6	330	0.1570	1.19		**Shallow Concentrated Flow, SC Flow through Woods** Kv= 3.0 fps
1.6	685	0.0945	7.35	33.08	**Trap/Vee/Rect Channel Flow, Stream Channel** Bot.W=4.00' D=1.00' Z= 0.5 '/' Top.W=5.00' n= 0.050
0.0	30	0.0500	13.31	18.59	**Pipe Channel, 16" Steel Culvert** 16.0" Round Area= 1.4 sf Perim= 4.2' r= 0.33' n= 0.012 Steel, smooth
1.4	645	0.0483	7.65	91.77	**Trap/Vee/Rect Channel Flow, Stream Channel** Bot.W=5.00' D=2.00' Z= 0.5 '/' Top.W=7.00' n= 0.050
32.3	2,845	Total			

Summary for Subcatchment 11A: Subcatchment 11A

Runoff = 0.83 cfs @ 12.15 hrs, Volume= 0.072 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
55,013	70	Woods, Good, HSG C
2,726	98	Paved parking & roofs
57,739	71	Weighted Average
55,013		95.28% Pervious Area
2,726		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0800	0.15		**Sheet Flow, Sheet Flow through woods** Woods: Light underbrush n= 0.400 P2= 4.00"
8.6	380	0.0875	0.74		**Shallow Concentrated Flow, SC flow through Woods** Forest w/Heavy Litter Kv= 2.5 fps
19.6	480	Total			

Summary for Subcatchment 11B: Subcatchment 11B

Runoff = 1.61 cfs @ 12.29 hrs, Volume= 0.176 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	50,820	70	Woods, Good, HSG C
	19,475	98	Paved parking & roofs
	27,337	74	>75% Grass cover, Good, HSG C
*	2,120	98	Porous Pavement
	4,400	61	>75% Grass cover, Good, HSG B
	104,152	76	Weighted Average
	82,557		79.27% Pervious Area
	21,595		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.3	100	0.0100	0.07		**Sheet Flow, Sheet Flow through woods** Woods: Light underbrush n= 0.400 P2= 4.00"
6.9	436	0.0440	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
32.2	536	Total			

Summary for Subcatchment 11S: Subcatchment 11

Runoff = 3.47 cfs @ 12.08 hrs, Volume= 0.242 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
169,300	70	Woods, Good, HSG C
13,434	98	Paved parking & roofs
182,734	72	Weighted Average
169,300		92.65% Pervious Area
13,434		7.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	25	0.0800	2.03		**Sheet Flow, Sheet Flow off Roof** Smooth surfaces n= 0.011 P2= 4.00"
3.9	75	0.0625	0.32		**Sheet Flow, Sheet flow over meadow** Range n= 0.130 P2= 4.00"
2.9	330	0.0750	1.92		**Shallow Concentrated Flow, Sheet Flow through Meadow** Short Grass Pasture Kv= 7.0 fps
6.8	300	0.0875	0.74		**Shallow Concentrated Flow, SC Flow through Woods** Forest w/Heavy Litter Kv= 2.5 fps
0.6	254	0.0500	7.39	16.25	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=2.00' D=1.00' Z= 0.2 '/' Top.W=2.40' n= 0.030
14.4	984	Total			

Summary for Subcatchment 12A: Subcatchment 12A

Runoff = 16.89 cfs @ 11.99 hrs, Volume= 0.826 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	172,175	74	>75% Grass cover, Good, HSG C
	265,310	70	Woods, Good, HSG C
	43,737	98	Paved parking & roofs
*	4,020	98	Porous Pavement
*	19,225	98	Roofs
	45,983	61	>75% Grass cover, Good, HSG B
	550,450	74	Weighted Average
	483,468		87.83% Pervious Area
	66,982		12.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	33	0.0300	1.45		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
1.6	264	0.0300	2.79		**Shallow Concentrated Flow, SC Flow through Developed area** Unpaved Kv= 16.1 fps
4.4	1,813	0.0200	6.80	71.42	**Trap/Vee/Rect Channel Flow, roadside ditch** Bot.W=2.00' D=3.00' Z= 0.5 '/' Top.W=5.00' n= 0.035 Earth, dense weeds
6.4	2,110	Total			

Summary for Subcatchment 12B: Subcatchment 12B

Runoff = 3.97 cfs @ 12.71 hrs, Volume= 0.760 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
630,510	70	Woods, Good, HSG C
25,422	74	>75% Grass cover, Good, HSG C
655,932	70	Weighted Average
655,932		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, sheet through woods** Woods: Dense underbrush n= 0.800 P2= 4.00"
39.5	1,600	0.0730	0.68		**Shallow Concentrated Flow, SC Flow through Woods** Forest w/Heavy Litter Kv= 2.5 fps
58.7	1,700	Total			

Summary for Subcatchment 27A: SUB27A

Runoff = 4.20 cfs @ 11.98 hrs, Volume= 0.204 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	51,722	70	Woods, Good, HSG C
*	11,934	98	Paved
*	5,722	98	Roof
	64,538	71	Meadow, non-grazed, HSG C
	2,062	61	>75% Grass cover, Good, HSG B
	135,978	74	Weighted Average
	118,322		87.02% Pervious Area
	17,656		12.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.0900	0.35		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
1.1	264	0.0700	3.97		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	254	0.0600	13.66	20.49	**Channel Flow, roadside ditch** Area= 1.5 sf Perim= 2.0' r= 0.75' n= 0.022 Earth, clean & straight
6.2	618	Total			

Summary for Subcatchment 27S: Subcatchment 27

Runoff = 4.04 cfs @ 11.91 hrs, Volume= 0.159 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	6,900	98	Roof
*	18,822	98	Pavement
	29,912	74	>75% Grass cover, Good, HSG C
	12,420	70	Woods, Good, HSG C
	68,054	82	Weighted Average
	42,332		62.20% Pervious Area
	25,722		37.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	40	0.0560	5.58	4.38	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
0.1	70	0.0560	9.51	38.05	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
0.2	80	0.0560	5.58	4.38	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
0.2	128	0.0560	9.51	38.05	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=2.00' Z= 0.5 '/' Top.W=3.00' n= 0.030 Earth, grassed & winding
0.2	60	0.0560	5.58	4.38	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
0.8	378	Total			

Summary for Subcatchment 28S: Subcatchment 28

Runoff = 1.20 cfs @ 12.39 hrs, Volume= 0.164 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
33,932	71	Meadow, non-grazed, HSG C
107,420	70	Woods, Good, HSG C
141,352	70	Weighted Average
141,352		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0500	0.13		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
4.2	326	0.0680	1.30		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
19.3	392	0.0130	0.34	0.51	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=1.00' D=1.00' Z= 0.5 '/' Top.W=2.00' n= 0.300
36.8	818	Total			

Summary for Subcatchment 29S: SUB27A

Runoff = 1.21 cfs @ 11.91 hrs, Volume= 0.048 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	4,025	98	Paved
	21,330	74	>75% Grass cover, Good, HSG C
	25,355	78	Weighted Average
	21,330		84.13% Pervious Area
	4,025		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0300	1.42		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.7	218	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	248	Total			

Summary for Subcatchment 61S: Hotel Roof

Runoff = 1.39 cfs @ 11.96 hrs, Volume= 0.074 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	15,005	98	Paved
	15,005		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 67S: W. top front of hotel

Runoff = 1.39 cfs @ 11.96 hrs, Volume= 0.074 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	15,005	98	Roof
	15,005		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 70A: (new Subcat)

Runoff = 1.21 cfs @ 11.95 hrs, Volume= 0.052 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	12,012	74	>75% Grass cover, Good, HSG C
	7,200	98	Paved parking & roofs
*	1,000	98	Porous Pavement
	20,212	84	Weighted Average
	12,012		59.43% Pervious Area
	8,200		40.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	34	0.0588	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.6	66	0.0450	1.96		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
0.2	21	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.0	8	0.1110	6.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	11	0.1110	2.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	67	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	207	Total			

Summary for Subcatchment 70B: (new Subcat)

Runoff = 1.44 cfs @ 11.97 hrs, Volume= 0.066 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	7,200	98	Paved parking & roofs
	20,394	74	>75% Grass cover, Good, HSG C
*	1,880	98	Porous Pavement
	29,474	81	Weighted Average
	20,394		69.19% Pervious Area
	9,080		30.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1000	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.2	37	0.2160	3.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	61	0.0660	5.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	37	0.1176	2.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	235	Total			

Summary for Subcatchment 100a: Hole 4 (110) PR

Runoff = 1.12 cfs @ 12.04 hrs, Volume= 0.067 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	25,572	74	>75% Grass cover, Good, HSG C
	9,715	70	Woods, Good, HSG C
*	3,940	98	Porous Pavement
	11,267	61	>75% Grass cover, Good, HSG B
	50,494	72	Weighted Average
	46,554		92.20% Pervious Area
	3,940		7.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Dense n= 0.240 P2= 4.00"
2.3	319	0.1070	2.29		**Shallow Concentrated Flow, SC Flow on golf course** Short Grass Pasture Kv= 7.0 fps
10.5	419	Total			

Summary for Subcatchment 100b: Hole 4 (110) PR

Runoff = 0.28 cfs @ 12.05 hrs, Volume= 0.019 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	5,558	74	>75% Grass cover, Good, HSG C
	2,890	70	Woods, Good, HSG C
	11,040	61	>75% Grass cover, Good, HSG B
*	650	98	Porous Pavement
	20,138	67	Weighted Average
	19,488		96.77% Pervious Area
	650		3.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow Along Golf Course**
					Grass: Dense n= 0.240 P2= 4.00"
2.3	319	0.1070	2.29		**Shallow Concentrated Flow, SC Flow on golf course**
					Short Grass Pasture Kv= 7.0 fps
10.5	419	Total			

Summary for Subcatchment 100c: Hole 4 (110) PR

Runoff = 0.41 cfs @ 12.05 hrs, Volume= 0.029 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	6,495	74	>75% Grass cover, Good, HSG C
*	2,610	98	Porous Pavement
	23,895	61	>75% Grass cover, Good, HSG B
	33,000	66	Weighted Average
	30,390		92.09% Pervious Area
	2,610		7.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow Along Golf Course**
					Grass: Dense n= 0.240 P2= 4.00"
2.3	319	0.1070	2.29		**Shallow Concentrated Flow, SC Flow on golf course**
					Short Grass Pasture Kv= 7.0 fps
10.5	419	Total			

Summary for Subcatchment 100d: Hole 4 (110) PR

Runoff = 0.26 cfs @ 12.05 hrs, Volume= 0.019 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	2,916	74	>75% Grass cover, Good, HSG C
*	1,300	98	Porous Pavement
	19,488	61	>75% Grass cover, Good, HSG B
	23,704	65	Weighted Average
	22,404		94.52% Pervious Area
	1,300		5.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Dense n= 0.240 P2= 4.00"
2.3	319	0.1070	2.29		**Shallow Concentrated Flow, SC Flow on golf course** Short Grass Pasture Kv= 7.0 fps
10.5	419	Total			

Summary for Subcatchment 100e: Hole 4 (110) PR

Runoff = 1.11 cfs @ 12.04 hrs, Volume= 0.070 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	27,442	74	>75% Grass cover, Good, HSG C
*	3,930	98	Porous Pavement
	33,414	61	>75% Grass cover, Good, HSG B
	64,786	69	Weighted Average
	60,856		93.93% Pervious Area
	3,930		6.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Dense n= 0.240 P2= 4.00"
2.3	319	0.1070	2.29		**Shallow Concentrated Flow, SC Flow on golf course** Short Grass Pasture Kv= 7.0 fps
10.5	419	Total			

Summary for Subcatchment 101: Land east of irrigation pond (101 PR)

Runoff = 1.88 cfs @ 11.93 hrs, Volume= 0.077 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	31,112	74	>75% Grass cover, Good, HSG C
*	7,596	98	Roofs
	38,708	79	Weighted Average
	31,112		80.38% Pervious Area
	7,596		19.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	68	0.0144	1.25		**Sheet Flow, Sheet Flow Across Roof**
					Smooth surfaces n= 0.011 P2= 4.00"
1.4	191	0.0990	2.20		**Shallow Concentrated Flow, SC Flow**
					Short Grass Pasture Kv= 7.0 fps
0.1	35	0.0570	8.39	12.58	**Channel Flow, Roadside Ditch**
					Area= 1.5 sf Perim= 4.0' r= 0.38'
					n= 0.022 Earth, clean & straight
2.4	294	Total			

Summary for Subcatchment 102: Pool House and Pool (102) PR

Runoff = 1.67 cfs @ 11.90 hrs, Volume= 0.079 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	11,423	98	Paved parking & roofs
*	4,650	98	Roofs
	16,073	98	Weighted Average
	16,073		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.0570	1.48		**Sheet Flow, Sheet Flow Along Roof or into Pool**
					Smooth surfaces n= 0.011 P2= 4.00"
0.3	70	0.0500	4.54		**Shallow Concentrated Flow, Shallow Flow on Pavement**
					Paved Kv= 20.3 fps
0.4	80	Total			

Summary for Subcatchment 103: Pool parking lot and tennis courts (103) PR

Runoff = 6.05 cfs @ 12.00 hrs, Volume= 0.315 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
62,227	74	>75% Grass cover, Good, HSG C
53,467	98	Paved parking & roofs
115,694	85	Weighted Average
62,227		53.79% Pervious Area
53,467		46.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.0900	0.35		**Sheet Flow, Sheet Flow Along Steep Hill** Grass: Short n= 0.150 P2= 4.00"
2.1	150	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.9	352	0.0227	3.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.8	602	Total			

Summary for Subcatchment 104: Holes 7 &8

Runoff = 3.84 cfs @ 12.22 hrs, Volume= 0.426 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	25,420	98	Porous Pavement
	104,543	74	>75% Grass cover, Good, HSG C
	45,415	70	Woods, Good, HSG C
	280,195	61	>75% Grass cover, Good, HSG B
	455,573	67	Weighted Average
	430,153		94.42% Pervious Area
	25,420		5.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	39	0.0510	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
12.0	61	0.0240	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 4.00"
1.8	133	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	167	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	300	0.0570	1.19		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	122	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	209	0.0670	10.38	54.52	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=1.50' Z= 1.0 '/' Top.W=5.00' n= 0.033 Earth, grassed & winding
23.7	1,031	Total			

Summary for Subcatchment 108: Front of Road to 8 -23 (108) PR

Runoff = 1.89 cfs @ 11.93 hrs, Volume= 0.086 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
3,491	74	>75% Grass cover, Good, HSG C
17,269	98	Paved
20,760	94	Weighted Average
3,491		16.82% Pervious Area
17,269		83.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.54		**Sheet Flow, Sheet Flow Roof** Smooth surfaces n= 0.011 P2= 4.00"
0.2	13	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	369	0.0600	4.97		**Shallow Concentrated Flow, Flow in Concrete Curb** Paved Kv= 20.3 fps
2.5	482	Total			

Summary for Subcatchment 109: Front of Road to 8 -23 (109) PR

Runoff = 0.72 cfs @ 11.92 hrs, Volume= 0.031 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
2,105	74	>75% Grass cover, Good, HSG C
6,175	98	Paved parking & roofs
8,280	92	Weighted Average
2,105		25.42% Pervious Area
6,175		74.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0310	1.83		**Sheet Flow, Sheet Flow on Pavement** Smooth surfaces n= 0.011 P2= 4.00"
0.8	258	0.0700	5.37		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	358	Total			

Summary for Subcatchment 111: Front of Hole 4 (111) PR

Runoff = 1.75 cfs @ 12.01 hrs, Volume= 0.097 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	33,460	74	>75% Grass cover, Good, HSG C
*	6,880	98	Porous Pavement
	49,040	61	>75% Grass cover, Good, HSG B
	89,380	69	Weighted Average
	82,500		92.30% Pervious Area
	6,880		7.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.1400	0.28		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Dense n= 0.240 P2= 4.00"
1.8	293	0.1500	2.71		**Shallow Concentrated Flow, SC Flow on golf course** Short Grass Pasture Kv= 7.0 fps
7.7	393	Total			

Summary for Subcatchment 114: Behind Townhomes

Runoff = 2.28 cfs @ 12.10 hrs, Volume= 0.174 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
88,388	74	>75% Grass cover, Good, HSG C
21,938	70	Woods, Good, HSG C
39,975	61	>75% Grass cover, Good, HSG B
150,301	70	Weighted Average
150,301		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0750	0.22		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Dense n= 0.240 P2= 4.00"
8.2	830	0.0580	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.7	930	Total			

Summary for Subcatchment 115: Land between buildings 17 thru 22 (115) pr

Runoff = 11.65 cfs @ 12.06 hrs, Volume= 0.734 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	1,000	98	Paved parking & roofs
*	42,019	98	Roofs
	304,107	74	>75% Grass cover, Good, HSG C
	78,570	61	>75% Grass cover, Good, HSG B
	23,492	73	Woods, Fair, HSG C
*	11,655	98	Porus Pavement
	460,843	75	Weighted Average
	406,169		88.14% Pervious Area
	54,674		11.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0800	0.23		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 4.00"
5.6	709	0.0900	2.10		**Shallow Concentrated Flow, SC Flow in Swale** Short Grass Pasture Kv= 7.0 fps
12.9	809	Total			

Summary for Subcatchment 117: Rest of Road to 8 -23 (117) PR

Runoff = 10.09 cfs @ 12.09 hrs, Volume= 0.677 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
108,508	74	>75% Grass cover, Good, HSG C
111,127	98	Paved parking & roofs
5,863	73	Woods, Fair, HSG C
11,700	98	Water Surface, HSG C
237,198	86	Weighted Average
114,371		48.22% Pervious Area
122,827		51.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow in Side Yard** Grass: Dense n= 0.240 P2= 4.00"
8.1	830	0.0600	1.71		**Shallow Concentrated Flow, SC Flow in Swale** Short Grass Pasture Kv= 7.0 fps
16.3	930	Total			

Summary for Subcatchment 119: Green of Hole 3 & tee of Hole 4 (119) PR

Runoff = 2.31 cfs @ 12.06 hrs, Volume= 0.158 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	49,282	74	>75% Grass cover, Good, HSG C
	18,600	70	Woods, Good, HSG C
	70,125	61	>75% Grass cover, Good, HSG B
*	8,380	98	Porous Pavement
	146,387	69	Weighted Average
	138,007		94.28% Pervious Area
	8,380		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0700	0.22		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Dense n= 0.240 P2= 4.00"
0.5	54	0.0740	1.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.8	176	0.1110	1.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.4	397	0.0910	2.71		**Shallow Concentrated Flow, SC Flow on golf course** Cultivated Straight Rows Kv= 9.0 fps
12.4	727	Total			

Summary for Subcatchment 123S: Land north of irrigation pond (123) PR

Runoff = 0.29 cfs @ 12.04 hrs, Volume= 0.025 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
43,890	61	>75% Grass cover, Good, HSG B
43,890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0600	0.20		**Sheet Flow, Sheet Flow Through Golf Course** Grass: Dense n= 0.240 P2= 4.00"
0.4	46	0.0430	1.87		**Shallow Concentrated Flow, SC Flow in Swale** Cultivated Straight Rows Kv= 9.0 fps
8.6	146	Total			

Summary for Subcatchment 125: Hole 3 and end of Hole 4 (119) PR

Runoff = 2.15 cfs @ 12.03 hrs, Volume= 0.140 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	17,968	74	>75% Grass cover, Good, HSG C
	8,956	70	Woods, Good, HSG C
*	11,910	98	Porous Pavement
	122,325	61	>75% Grass cover, Good, HSG B
	161,159	66	Weighted Average
	149,249		92.61% Pervious Area
	11,910		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0600	0.30		**Sheet Flow, Sheet Flow Along Golf Course** Grass: Short n= 0.150 P2= 4.00"
3.6	1,031	0.1040	4.84		**Shallow Concentrated Flow, SC Flow on golf course** Grassed Waterway Kv= 15.0 fps
9.2	1,131	Total			

Summary for Subcatchment 126: Irr. Pond

Runoff = 5.96 cfs @ 11.96 hrs, Volume= 0.283 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	56,286	98	Pond
	18,705	74	>75% Grass cover, Good, HSG C
	74,991	92	Weighted Average
	18,705		24.94% Pervious Area
	56,286		75.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 126A: forebay

Runoff = 0.74 cfs @ 11.96 hrs, Volume= 0.039 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	8,000	98	Water Surface, 0% imp, HSG C
	8,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 127S: (new Subcat)

Runoff = 10.76 cfs @ 11.91 hrs, Volume= 0.452 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	27,670	68	Porous Pavement
	151,709	74	>75% Grass cover, Good, HSG C
	96,570	70	Woods, Good, HSG C
	172,945	61	>75% Grass cover, Good, HSG B
	448,894	68	Weighted Average
	448,894		100.00% Pervious Area

Summary for Subcatchment 128S: HOTEL ROOF

Runoff = 0.64 cfs @ 11.96 hrs, Volume= 0.034 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	6,878	98	Roof
	6,878		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 129S: HOTEL ROOF

Runoff = 1.28 cfs @ 11.96 hrs, Volume= 0.068 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	13,760	98	Roof
	13,760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 130S: (new Subcat)

Runoff = 1.81 cfs @ 11.97 hrs, Volume= 0.083 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
9,220	98	Paved parking & roofs
29,927	74	>75% Grass cover, Good, HSG C
39,147	80	Weighted Average
29,927		76.45% Pervious Area
9,220		23.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
0.3	21	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
5.3	21	Total			

Summary for Subcatchment 131A: HOTEL ROOF

Runoff = 4.76 cfs @ 11.96 hrs, Volume= 0.252 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
51,300	98	Paved parking & roofs
51,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 131S: (new Subcat)

Runoff = 1.69 cfs @ 12.02 hrs, Volume= 0.093 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
10,863	74	>75% Grass cover, Good, HSG C
17,500	98	Paved parking & roofs
28,363	89	Weighted Average
10,863		38.30% Pervious Area
17,500		61.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**
5.1	64	0.0310	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
10.1	64	Total			

Summary for Subcatchment 132S: (new Subcat)

Runoff = 0.52 cfs @ 11.94 hrs, Volume= 0.022 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
1,650	98	Paved parking & roofs
10,495	74	>75% Grass cover, Good, HSG C
12,145	77	Weighted Average
10,495		86.41% Pervious Area
1,650		13.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	92	0.2600	0.52		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.1	11	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.0	103	Total			

Summary for Subcatchment 133S: (new Subcat)

Runoff = 1.05 cfs @ 11.94 hrs, Volume= 0.044 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
29,164	74	>75% Grass cover, Good, HSG C
29,164		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0100	0.84		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.00"
2.1	30	0.0670	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
2.5	50	Total			

Summary for Subcatchment 134S: HOTEL ROOF

Runoff = 0.64 cfs @ 11.96 hrs, Volume= 0.034 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
6,878	98	Paved parking & roofs
6,878		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 135S: (new Subcat)

Runoff = 0.83 cfs @ 11.95 hrs, Volume= 0.037 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
4,000	98	Paved parking, HSG C
12,105	74	>75% Grass cover, Good, HSG C
2,192	70	Woods, Good, HSG C
18,297	79	Weighted Average
14,297		78.14% Pervious Area
4,000		21.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.2000	0.48		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.00"
0.2	71	0.4790	4.84		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	75	0.0267	3.32		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	246	Total			

Summary for Subcatchment 136S: Parking Structure

Runoff = 4.45 cfs @ 11.93 hrs, Volume= 0.222 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
45,262	98	Paved parking & roofs
45,262		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.17		**Sheet Flow, Pavement of parking structure** Smooth surfaces n= 0.011 P2= 4.00"
1.7	206	0.0100	2.03		**Shallow Concentrated Flow, Pavement of parking structure** Paved Kv= 20.3 fps
3.1	306	Total			

Summary for Subcatchment 138S: HOTEL ROOF

Runoff = 1.28 cfs @ 11.96 hrs, Volume= 0.068 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	13,760	98	Roof
	13,760		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 500S: Subcatchment 500

Runoff = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	9,017	71	Meadow, non-grazed, HSG C
*	29,185	98	Roadway
	1,312,724	70	Woods, Good, HSG C
	1,350,926	71	Weighted Average
	1,321,741		97.84% Pervious Area
	29,185		2.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.3330	0.27		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
25.7	3,665	0.2266	2.38		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.1	110	0.1066	16.65	133.22	**Trap/Vee/Rect Channel Flow, Roadside Swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.030
32.0	3,875	Total			

Summary for Subcatchment 501S: Subcatchment 501

Runoff = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	9,017	71	Meadow, non-grazed, HSG C
*	1,002	98	Roadway
	176,462	70	Woods, Good, HSG C
	186,481	70	Weighted Average
	185,479		99.46% Pervious Area
	1,002		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.3330	0.27		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
13.1	1,930	0.2410	2.45		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
19.3	2,030	Total			

Summary for Subcatchment 502S: Subcatchment 502

Runoff = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	9,017	71	Meadow, non-grazed, HSG C
*	1,437	98	Roadway
	178,596	70	Woods, Good, HSG C
	189,050	70	Weighted Average
	187,613		99.24% Pervious Area
	1,437		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.3330	0.27		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
6.5	935	0.2266	2.38		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	265	0.1066	16.65	133.22	**Trap/Vee/Rect Channel Flow, Roadside Swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.030
13.0	1,300	Total			

Summary for Subcatchment 503S: Subcatchmant 503

Runoff = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
130,680	70	Woods, Good, HSG C
130,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
6.2	655	0.1250	1.77		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	255	0.1066	16.65	133.22	**Trap/Vee/Rect Channel Flow, Roadside swale** Bot.W=2.00' D=2.00' Z= 1.0 '/' Top.W=6.00' n= 0.030
16.6	1,010	Total			

Summary for Subcatchment 504S: Subcatchment 504

Runoff = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
	1,292,556	70	Woods, Good, HSG C
*	13,939	98	Road
	14,026	74	>75% Grass cover, Good, HSG C
	1,320,521	70	Weighted Average
	1,306,582		98.94% Pervious Area
	13,939		1.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.4375	0.30		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
19.1	2,860	0.2500	2.50		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	320	0.1910	15.31	321.48	**Trap/Vee/Rect Channel Flow, Mountain Stream** Bot.W=4.00' D=3.00' Z= 1.0 '/' Top.W=10.00' n= 0.060
25.0	3,280	Total			

Summary for Subcatchment 511S: Subcatchmant 511

Runoff = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
87,120	70	Woods, Good, HSG C
87,120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1000	0.17		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
5.5	580	0.1250	1.77		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
15.6	680	Total			

Summary for Subcatchment 512S: Subcatchment 512

Runoff = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
56,628	70	Woods, Good, HSG C
56,628		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.3125	0.15		**Sheet Flow, Sheet Flow through Woods** Woods: Dense underbrush n= 0.800 P2= 4.00"
2.6	345	0.1900	2.18		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
0.3	155	0.1000	8.43	10.12	**Trap/Vee/Rect Channel Flow, Roadside Vegated Swale** Bot.W=1.00' D=1.00' Z= 0.2 '/' Top.W=1.40' n= 0.030 Earth, grassed & winding
14.0	600	Total			

Summary for Subcatchment 600S: Subcatchment 600

Runoff = 5.40 cfs @ 12.14 hrs, Volume= 0.459 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	9,670	98	Road
	360,198	70	Woods, Good, HSG C
	369,868	71	Weighted Average
	360,198		97.39% Pervious Area
	9,670		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.0500	1.40		**Sheet Flow, Sheet Flow off Road** Smooth surfaces n= 0.011 P2= 4.00"
7.2	90	0.1875	0.21		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
12.0	1,510	0.1764	2.10		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
19.3	1,610	Total			

Summary for Subcatchment 601S: Subcatchment 601

Runoff = 4.56 cfs @ 12.09 hrs, Volume= 0.332 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type II 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	10,498	98	Road
	257,004	70	Woods, Good, HSG C
	267,502	71	Weighted Average
	257,004		96.08% Pervious Area
	10,498		3.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.0500	1.40		**Sheet Flow, Sheet Flow off Road** Smooth surfaces n= 0.011 P2= 4.00"
7.2	90	0.1875	0.21		**Sheet Flow, Sheet Flow through Woods** Woods: Light underbrush n= 0.400 P2= 4.00"
7.7	970	0.1764	2.10		**Shallow Concentrated Flow, SC Flow through Woods** Woodland Kv= 5.0 fps
15.0	1,070	Total			

Reach and Culvert Summaries
1 & 10-yr Storm Events

Summary for Reach 18R: Overland Flow

Inflow Area = 45.186 ac, 28.04% Impervious, Inflow Depth = 0.00" for 1-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 214.48 cfs

30.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 75.0 '/' Top Width= 105.00'
Length= 535.0' Slope= 0.0748 '/'
Inlet Invert= 1,937.00', Outlet Invert= 1,897.00'

‡

Summary for Reach 21R: Ex. Roadside Ditch

Inflow Area = 4.411 ac, 6.47% Impervious, Inflow Depth = 0.50" for 1-YEAR event
Inflow = 0.04 cfs @ 24.12 hrs, Volume= 0.186 af
Outflow = 0.04 cfs @ 24.19 hrs, Volume= 0.186 af, Atten= 0%, Lag= 4.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.73 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 3.0 min

Peak Storage= 7 cf @ 24.14 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 36.63 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 5.00'
Length= 120.0' Slope= 0.0250 '/'
Inlet Invert= 1,897.00', Outlet Invert= 1,894.00'

Summary for Reach 58A: Overland Flow

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af
Outflow = 0.46 cfs @ 13.75 hrs, Volume= 0.152 af, Atten= 76%, Lag= 98.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.11 fps, Min. Travel Time= 71.2 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 151.8 min

Peak Storage= 1,948 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 151.22 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 478.0' Slope= 0.0711 '/'
Inlet Invert= 2,212.00', Outlet Invert= 2,178.00'

‡

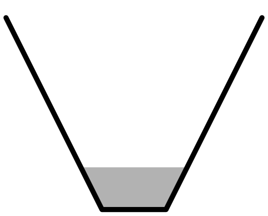
Summary for Reach 61: Vegetated Roadside Swale

Inflow Area = 5.521 ac, 6.72% Impervious, Inflow Depth = 0.68" for 1-YEAR event
Inflow = 4.22 cfs @ 12.09 hrs, Volume= 0.313 af
Outflow = 4.01 cfs @ 12.17 hrs, Volume= 0.313 af, Atten= 5%, Lag= 4.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.60 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 7.2 min

Peak Storage= 659 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 67.71 cfs

1.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 751.0' Slope= 0.0613 '/'
Inlet Invert= 2,000.00', Outlet Invert= 1,954.00'



Summary for Reach 66: Stream Channel

Inflow Area = 123.689 ac, 1.65% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 24.56 cfs @ 12.30 hrs, Volume= 6.522 af
Outflow = 22.77 cfs @ 12.47 hrs, Volume= 6.522 af, Atten= 7%, Lag= 10.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.65 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 22.2 min

Peak Storage= 7,591 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 297.74 cfs

5.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 21.00'
Length= 1,884.0' Slope= 0.1152 '/'
Inlet Invert= 2,017.00', Outlet Invert= 1,800.00'

‡

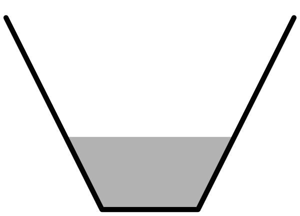
Summary for Reach 73A: Vegetated Roadside Channel

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 0.82" for 1-YEAR event
Inflow = 4.89 cfs @ 11.97 hrs, Volume= 0.252 af
Outflow = 4.84 cfs @ 11.97 hrs, Volume= 0.252 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.67 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.7 min

Peak Storage= 63 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 28.54 cfs

1.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 60.0' Slope= 0.0560 '/'
Inlet Invert= 1,920.00', Outlet Invert= 1,916.64'



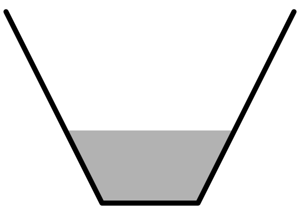
Summary for Reach 75: Roadside Channel

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 0.82" for 1-YEAR event
Inflow = 4.84 cfs @ 11.97 hrs, Volume= 0.252 af
Outflow = 4.76 cfs @ 11.99 hrs, Volume= 0.252 af, Atten= 2%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.59 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 1.8 min

Peak Storage= 174 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 28.08 cfs

1.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 166.0' Slope= 0.0542 '/'
Inlet Invert= 1,911.00', Outlet Invert= 1,902.00'



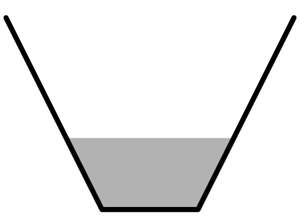
Summary for Reach 76: Roadside Channel

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 0.82" for 1-YEAR event
Inflow = 4.76 cfs @ 11.99 hrs, Volume= 0.252 af
Outflow = 4.72 cfs @ 12.00 hrs, Volume= 0.252 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.64 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 0.7 min

Peak Storage= 63 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 28.53 cfs

1.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 62.0' Slope= 0.0560 '/'
Inlet Invert= 1,902.00', Outlet Invert= 1,898.53'



Summary for Reach 78: Stream Channel

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 17.10 cfs @ 13.58 hrs, Volume= 4.750 af
Outflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af, Atten= 0%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 8.2 min

Peak Storage= 2,060 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 213.41 cfs

6.00' x 1.50' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 18.00'
Length= 685.0' Slope= 0.1635 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,058.00'

‡

Summary for Reach 80: Stream Channel

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af
Outflow = 16.98 cfs @ 13.74 hrs, Volume= 4.750 af, Atten= 1%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 13.7 min

Peak Storage= 3,397 cf @ 13.68 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 209.43 cfs

6.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 740.0' Slope= 0.0473 '/'
Inlet Invert= 2,055.00', Outlet Invert= 2,020.00'

‡

Summary for Reach 82: Overland Flow

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af
Outflow = 0.09 cfs @ 16.94 hrs, Volume= 0.066 af, Atten= 90%, Lag= 291.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.07 fps, Min. Travel Time= 215.5 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 361.8 min

Peak Storage= 1,136 cf @ 13.35 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 53.31 cfs

100.00' x 0.50' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 938.0' Slope= 0.1354 '/'
Inlet Invert= 2,347.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 82a: Overland Flow

Inflow Area = 62.628 ac, 1.58% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 19.39 cfs @ 12.98 hrs, Volume= 3.272 af
Outflow = 14.95 cfs @ 13.58 hrs, Volume= 3.272 af, Atten= 23%, Lag= 36.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.41 fps, Min. Travel Time= 19.3 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 96.5 min

Peak Storage= 17,297 cf @ 13.26 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 164.89 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 473.0' Slope= 0.0846 '/'
Inlet Invert= 2,220.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 83A: Overland Flow

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af
Outflow = 10.29 cfs @ 12.67 hrs, Volume= 1.531 af, Atten= 30%, Lag= 26.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.46 fps, Min. Travel Time= 16.1 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 57.9 min

Peak Storage= 9,967 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 232.26 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 441.0' Slope= 0.1678 '/'
Inlet Invert= 2,326.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 84A: Overland Flow

Inflow Area = 61.328 ac, 1.61% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 21.55 cfs @ 12.68 hrs, Volume= 3.206 af
Outflow = 19.39 cfs @ 12.98 hrs, Volume= 3.206 af, Atten= 10%, Lag= 17.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.49 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 35.6 min

Peak Storage= 10,876 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 192.72 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 277.0' Slope= 0.1155 '/'
Inlet Invert= 2,252.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 84B: Overland Flow

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af
Outflow = 11.30 cfs @ 12.70 hrs, Volume= 1.675 af, Atten= 19%, Lag= 22.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.46 fps, Min. Travel Time= 13.3 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 46.4 min

Peak Storage= 9,002 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 228.33 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 370.0' Slope= 0.1622 '/'
Inlet Invert= 2,312.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 85A: Overland Flow

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af
Outflow = 0.86 cfs @ 13.27 hrs, Volume= 0.216 af, Atten= 65%, Lag= 67.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.18 fps, Min. Travel Time= 46.5 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 107.2 min

Peak Storage= 2,406 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 221.40 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 505.0' Slope= 0.1525 '/'
Inlet Invert= 2,292.00', Outlet Invert= 2,215.00'

‡

Summary for Reach 85B: Overland Flow

Inflow Area = 8.621 ac, 0.65% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.84 cfs @ 12.44 hrs, Volume= 0.435 af
Outflow = 1.09 cfs @ 14.39 hrs, Volume= 0.435 af, Atten= 41%, Lag= 116.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 47.3 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 116.5 min

Peak Storage= 3,091 cf @ 13.60 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 157.60 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 453.0' Slope= 0.0773 '/'
Inlet Invert= 2,215.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 86A: Overland Flow

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af
Outflow = 1.84 cfs @ 12.44 hrs, Volume= 0.219 af, Atten= 42%, Lag= 22.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 14.9 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 43.4 min

Peak Storage= 1,652 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 190.45 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 195.0' Slope= 0.1128 '/'
Inlet Invert= 2,237.00', Outlet Invert= 2,215.00'

‡

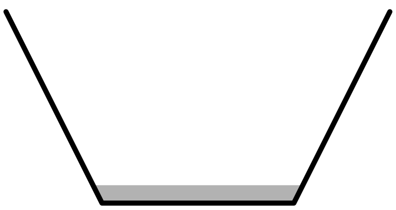
Summary for Reach 88: Roadside Swale

Inflow Area = 2.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af
Outflow = 1.28 cfs @ 12.17 hrs, Volume= 0.101 af, Atten= 4%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 7.2 min

Peak Storage= 185 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 63.06 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 472.0' Slope= 0.0678 '/'
Inlet Invert= 2,207.00', Outlet Invert= 2,175.00'



Summary for Reach 91: Overland Flow

Inflow Area = 9.707 ac, 4.57% Impervious, Inflow Depth = 0.54" for 1-YEAR event
Inflow = 1.27 cfs @ 12.39 hrs, Volume= 0.439 af
Outflow = 1.15 cfs @ 12.69 hrs, Volume= 0.439 af, Atten= 10%, Lag= 17.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.33 fps, Min. Travel Time= 10.0 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 29.7 min

Peak Storage= 690 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 126.11 cfs

100.00' x 0.50' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 198.0' Slope= 0.0303 '/'
Inlet Invert= 1,893.00', Outlet Invert= 1,887.00'

‡

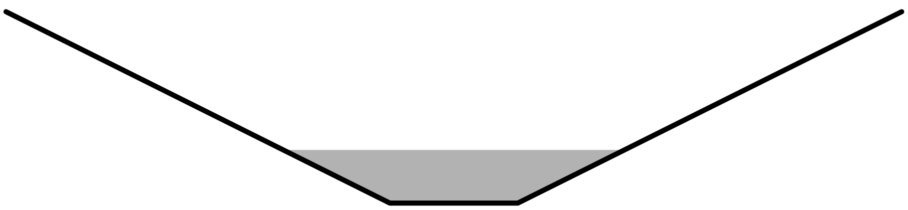
Summary for Reach 92: Channel Along RR Tracks

Inflow Area = 74.590 ac, 20.27% Impervious, Inflow Depth = 0.25" for 1-YEAR event
Inflow = 16.89 cfs @ 11.99 hrs, Volume= 1.549 af
Outflow = 15.76 cfs @ 12.05 hrs, Volume= 1.549 af, Atten= 7%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.20 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 10.6 min

Peak Storage= 2,066 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 255.39 cfs

2.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 675.0' Slope= 0.0348 '/'
Inlet Invert= 1,848.50', Outlet Invert= 1,825.00'



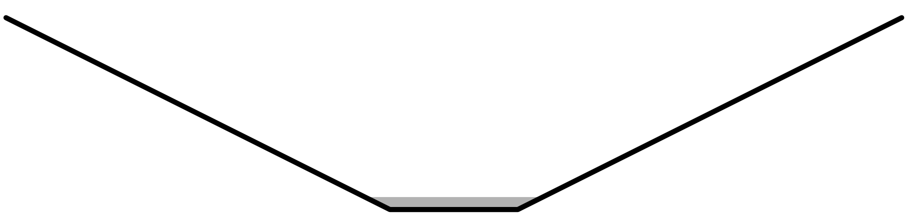
Summary for Reach 92a: Channel Along RR Tracks

Inflow Area = 9.707 ac, 4.57% Impervious, Inflow Depth = 0.54" for 1-YEAR event
Inflow = 1.15 cfs @ 12.69 hrs, Volume= 0.439 af
Outflow = 1.06 cfs @ 12.96 hrs, Volume= 0.439 af, Atten= 8%, Lag= 16.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.26 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 24.1 min

Peak Storage= 570 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 243.54 cfs

2.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,216.0' Slope= 0.0317 '/'
Inlet Invert= 1,887.00', Outlet Invert= 1,848.50'



Summary for Reach 93R: Roadside Ditch

Inflow Area = 2.052 ac, 7.70% Impervious, Inflow Depth = 0.52" for 1-YEAR event
Inflow = 0.06 cfs @ 15.87 hrs, Volume= 0.090 af
Outflow = 0.06 cfs @ 16.10 hrs, Volume= 0.090 af, Atten= 0%, Lag= 14.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 0.46 fps, Min. Travel Time= 8.6 min
Avg. Velocity = 0.39 fps, Avg. Travel Time= 10.2 min

Peak Storage= 33 cf @ 15.96 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 19.90 cfs

2.00' x 1.50' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 236.0' Slope= 0.0042 '/'
Inlet Invert= 1,895.00', Outlet Invert= 1,894.00'

Summary for Reach 142R: Overland Flow

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 209.00 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 60.0 '/' Top Width= 100.00'
Length= 280.0' Slope= 0.0589 '/'
Inlet Invert= 1,960.00', Outlet Invert= 1,943.50'

‡

Summary for Reach 143R: Stone Lined Swale with ChkDams

Inflow Area = 48.885 ac, 26.48% Impervious, Inflow Depth = 0.03" for 1-YEAR event
Inflow = 0.20 cfs @ 13.26 hrs, Volume= 0.139 af
Outflow = 0.20 cfs @ 13.36 hrs, Volume= 0.139 af, Atten= 0%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.61 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 5.1 min

Peak Storage= 42 cf @ 13.30 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 142.04 cfs

2.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 335.0' Slope= 0.1403 '/'
Inlet Invert= 1,897.00', Outlet Invert= 1,850.00'

Summary for Reach I1: TRM SWALE

Inflow Area = 3.692 ac, 57.82% Impervious, Inflow Depth = 1.66" for 1-YEAR event
Inflow = 8.53 cfs @ 11.95 hrs, Volume= 0.511 af
Outflow = 8.42 cfs @ 11.97 hrs, Volume= 0.511 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.13 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 3.1 min

Peak Storage= 392 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 33.85 cfs

2.00' x 1.50' deep channel, n= 0.035 TRM
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 145.0' Slope= 0.0138 '/'
Inlet Invert= 1,943.00', Outlet Invert= 1,941.00'

Summary for Reach I12: stone lined stream channel

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af
Outflow = 22.69 cfs @ 12.06 hrs, Volume= 1.673 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.95 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 1.7 min

Peak Storage= 546 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 2.25', Capacity at Bank-Full= 142.16 cfs

4.00' x 2.25' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 8.50'
Length= 142.0' Slope= 0.0493 '/'
Inlet Invert= 2,000.00', Outlet Invert= 1,993.00'

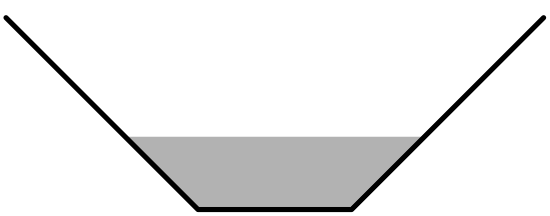
Summary for Reach I12a: stone lined stream channel

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.69 cfs @ 12.06 hrs, Volume= 1.673 af
Outflow = 22.47 cfs @ 12.06 hrs, Volume= 1.673 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.07 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 1.3 min

Peak Storage= 448 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 147.72 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 160.0' Slope= 0.0938 '/'
Inlet Invert= 1,991.00', Outlet Invert= 1,976.00'



Summary for Reach I12b: stone lined stream channel

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.47 cfs @ 12.06 hrs, Volume= 1.673 af
Outflow = 22.16 cfs @ 12.09 hrs, Volume= 1.673 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.99 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 3.9 min

Peak Storage= 1,405 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 133.69 cfs

2.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 440.0' Slope= 0.0795 '/'
Inlet Invert= 1,975.00', Outlet Invert= 1,940.00'

Summary for Reach I21: stone lined stream channel

Inflow Area = 7.912 ac, 63.11% Impervious, Inflow Depth = 1.85" for 1-YEAR event
Inflow = 23.65 cfs @ 11.95 hrs, Volume= 1.221 af
Outflow = 21.33 cfs @ 12.04 hrs, Volume= 1.221 af, Atten= 10%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.49 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 14.7 min

Peak Storage= 4,512 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 1.75', Capacity at Bank-Full= 88.29 cfs

2.00' x 1.75' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.5 '/' Top Width= 7.25'
Length= 1,585.0' Slope= 0.0893 '/'
Inlet Invert= 2,170.05', Outlet Invert= 2,028.50'

Summary for Reach I5: Overland Flow

Inflow Area = 8.896 ac, 31.70% Impervious, Inflow Depth = 0.91" for 1-YEAR event
Inflow = 0.82 cfs @ 13.10 hrs, Volume= 0.677 af
Outflow = 0.82 cfs @ 13.15 hrs, Volume= 0.677 af, Atten= 0%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.40 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 3.4 min

Peak Storage= 92 cf @ 13.12 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 215.99 cfs

100.00' x 0.50' deep channel, n= 0.120 Sheet flow over Short Grass
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 45.0' Slope= 0.2000 '/'
Inlet Invert= 1,952.50', Outlet Invert= 1,943.50'

Summary for Pond 29P: cb29

Inflow Area = 0.582 ac, 15.87% Impervious, Inflow Depth = 0.99" for 1-YEAR event
Inflow = 1.21 cfs @ 11.91 hrs, Volume= 0.048 af
Outflow = 1.21 cfs @ 11.91 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 1.21 cfs @ 11.91 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,924.54' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,924.00'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,924.00' / 1,923.75' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,928.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.18 cfs @ 11.91 hrs HW=1,924.53' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.18 cfs @ 3.12 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 57: 16" Steel Culverts

Inflow Area = 1.326 ac, 4.72% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 0.83 cfs @ 12.15 hrs, Volume= 0.072 af
Outflow = 0.83 cfs @ 12.15 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.15 hrs, Volume= 0.072 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,004.48' @ 12.15 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,004.00'	**16.0" Round 16" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,004.00' / 2,000.00' S= 0.0667 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.83 cfs @ 12.15 hrs HW=2,004.48' (Free Discharge)
└─**1=16" Smooth Steel Culvert (old)** (Inlet Controls 0.83 cfs @ 1.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,004.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 58R: 24" HDPE Pipe

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af
Outflow = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 1.92 cfs @ 12.11 hrs, Volume= 0.152 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,215.65' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,215.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,215.00' / 2,212.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,218.50'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.90 cfs @ 12.11 hrs HW=2,215.65' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.90 cfs @ 2.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,215.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 59: 32" Plastic Pipe

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af
Outflow = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af, Atten= 0%, Lag= 0.0 min
Primary = 14.76 cfs @ 12.22 hrs, Volume= 1.531 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,328.82' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,327.00'	**32.0" Round 32" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,327.00' / 2,324.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,331.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.71 cfs @ 12.22 hrs HW=2,328.82' (Free Discharge)
└─**1=32" Plastic Culvert** (Inlet Controls 14.71 cfs @ 3.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,327.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 60: (2) 16" Steel Culverts

Inflow Area = 123.689 ac, 1.65% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 24.56 cfs @ 12.30 hrs, Volume= 6.522 af
Outflow = 24.56 cfs @ 12.30 hrs, Volume= 6.522 af, Atten= 0%, Lag= 0.0 min
Primary = 24.56 cfs @ 12.30 hrs, Volume= 6.522 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,022.00' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,018.00'	**16.0" Round Culvert X 2.00** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,018.00' / 2,017.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,022.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=24.55 cfs @ 12.30 hrs HW=2,022.00' (Free Discharge)
└─**1=Culvert** (Inlet Controls 24.55 cfs @ 8.79 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,018.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 67P: 26" Steel Culverts

Inflow Area = 4.195 ac, 7.35% Impervious, Inflow Depth = 0.69" for 1-YEAR event
Inflow = 3.47 cfs @ 12.08 hrs, Volume= 0.242 af
Outflow = 3.47 cfs @ 12.08 hrs, Volume= 0.242 af, Atten= 0%, Lag= 0.0 min
Primary = 3.47 cfs @ 12.08 hrs, Volume= 0.242 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,003.87' @ 12.08 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,003.00'	**26.0" Round 26" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,003.00' / 2,000.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.44 cfs @ 12.08 hrs HW=2,003.87' (Free Discharge)
↑**1=26" Smooth Steel Culvert (old)** (Inlet Controls 3.44 cfs @ 2.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,003.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 74: 12" CMP Culvert

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 0.82" for 1-YEAR event
Inflow = 4.84 cfs @ 11.97 hrs, Volume= 0.252 af
Outflow = 4.84 cfs @ 11.97 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min
Primary = 4.84 cfs @ 11.97 hrs, Volume= 0.252 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,916.39' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,914.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 1,914.00' / 1,911.76' S= 0.0560 '/' Cc= 0.900 n= 0.025
#2	Secondary	1,917.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.81 cfs @ 11.97 hrs HW=1,916.34' (Free Discharge)
↑**1=Culvert** (Barrel Controls 4.81 cfs @ 6.13 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,914.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 74A: 16" CMP Culvert

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 0.82" for 1-YEAR event
Inflow = 4.89 cfs @ 11.97 hrs, Volume= 0.252 af
Outflow = 4.89 cfs @ 11.97 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min
Primary = 4.89 cfs @ 11.97 hrs, Volume= 0.252 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,922.69' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,921.50'	**16.0" Round Culvert** L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 1,921.50' / 1,920.00' S= 0.0429 '/' Cc= 0.900

			n= 0.025
#2	Secondary	1,924.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.87 cfs @ 11.97 hrs HW=1,922.69' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.87 cfs @ 3.71 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,921.50' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 76A: culvert

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 0.82" for 1-YEAR event
Inflow = 4.76 cfs @ 11.99 hrs, Volume= 0.252 af
Outflow = 4.76 cfs @ 11.99 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min
Primary = 4.72 cfs @ 11.99 hrs, Volume= 0.252 af
Secondary = 0.04 cfs @ 12.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,904.06' @ 11.99 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,902.00'	**12.0" Round Culvert** L= 60.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,902.00' / 1,898.00' S= 0.0667 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,904.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.66 cfs @ 11.99 hrs HW=1,904.02' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.66 cfs @ 5.94 fps)

Secondary OutFlow Max=0.04 cfs @ 12.00 hrs HW=1,904.04' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.52 fps)

Summary for Pond 77: 32" Steel Culvert

Inflow Area = 88.881 ac, 1.70% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 16.97 cfs @ 13.58 hrs, Volume= 4.649 af
Outflow = 16.97 cfs @ 13.58 hrs, Volume= 4.649 af, Atten= 0%, Lag= 0.0 min
Primary = 16.97 cfs @ 13.58 hrs, Volume= 4.649 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,181.72' @ 13.58 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,180.00'	**32.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,180.00' / 2,179.00' S= 0.0250 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,183.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.96 cfs @ 13.58 hrs HW=2,181.72' (Free Discharge)
└─**1=Culvert** (Inlet Controls 16.96 cfs @ 4.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,180.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 79: 16" Steel Culvert

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af
Outflow = 17.07 cfs @ 13.64 hrs, Volume= 4.750 af, Atten= 0%, Lag= 0.0 min
Primary = 9.67 cfs @ 13.64 hrs, Volume= 4.197 af
Secondary = 7.39 cfs @ 13.64 hrs, Volume= 0.553 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,058.74' @ 13.64 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,056.00'	**16.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,056.00' / 2,055.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,057.50'	**2.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.67 cfs @ 13.64 hrs HW=2,058.74' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.67 cfs @ 6.93 fps)

Secondary OutFlow Max=7.39 cfs @ 13.64 hrs HW=2,058.74' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 7.39 cfs @ 2.99 fps)

Summary for Pond 83: 24" HPDE Culvert

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af
Outflow = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
Primary = 0.92 cfs @ 12.08 hrs, Volume= 0.066 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,360.44' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,360.00'	**24.0" Round 24" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,360.00' / 2,357.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,364.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.91 cfs @ 12.08 hrs HW=2,360.44' (Free Discharge)
↑**1=24" Plastic Culvert** (Inlet Controls 0.91 cfs @ 1.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,360.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84: 24" HDPE Pipe

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 0.65" for 1-YEAR event
Inflow = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af
Outflow = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af, Atten= 0%, Lag= 0.0 min
Primary = 13.91 cfs @ 12.31 hrs, Volume= 1.675 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,316.66' @ 12.31 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,315.00'	**36.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,315.00' / 2,312.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,320.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=13.89 cfs @ 12.31 hrs HW=2,316.66' (Free Discharge)
↑**1=Culvert** (Inlet Controls 13.89 cfs @ 3.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,315.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85: 28" HDPE Pipe

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af
Outflow = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min
Primary = 2.48 cfs @ 12.15 hrs, Volume= 0.216 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,295.69' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,295.00'	**30.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,295.00' / 2,292.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,300.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.48 cfs @ 12.15 hrs HW=2,295.69' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.48 cfs @ 2.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,295.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86: 24" HDPE Pipe

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af
Outflow = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 3.20 cfs @ 12.07 hrs, Volume= 0.219 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,240.86' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,240.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,240.00' / 2,237.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,245.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.17 cfs @ 12.07 hrs HW=2,240.85' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.17 cfs @ 2.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,240.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 87: 18" Steel Culvert

Inflow Area = 2.000 ac, 0.00% Impervious, Inflow Depth = 0.61" for 1-YEAR event
Inflow = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af
Outflow = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Primary = 1.33 cfs @ 12.10 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,208.59' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,208.00'	**18.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,208.00' / 2,207.00' S= 0.0167 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=1.32 cfs @ 12.10 hrs HW=2,208.59' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.32 cfs @ 2.06 fps)

Summary for Pond 90: 24" Steel Culvert

Inflow Area = 9.707 ac, 4.57% Impervious, Inflow Depth = 0.54" for 1-YEAR event
Inflow = 1.27 cfs @ 12.39 hrs, Volume= 0.439 af
Outflow = 1.27 cfs @ 12.39 hrs, Volume= 0.439 af, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.39 hrs, Volume= 0.439 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,890.46' @ 12.39 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,890.00'	**24.0" Round Culvert** L= 25.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,890.00' / 1,889.50' S= 0.0200 '/' Cc= 0.900 n= 0.012
#2	Secondary	1,895.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.27 cfs @ 12.39 hrs HW=1,890.46' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.27 cfs @ 2.31 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,890.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 122: 18" HDPE Storm

Inflow Area = 0.477 ac, 83.18% Impervious, Inflow Depth = 2.16" for 1-YEAR event
Inflow = 1.89 cfs @ 11.93 hrs, Volume= 0.086 af
Outflow = 1.89 cfs @ 11.93 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Primary = 1.89 cfs @ 11.93 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,946.76' @ 11.93 hrs
Flood Elev= 1,961.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,946.00'	**18.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 1,946.00' / 1,945.89' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,949.33'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.84 cfs @ 11.93 hrs HW=1,946.74' (Free Discharge)
1=Culvert (Barrel Controls 1.84 cfs @ 3.06 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 123: 18" HDPE Storm

Inflow Area = 0.667 ac, 80.73% Impervious, Inflow Depth = 2.10" for 1-YEAR event
Inflow = 2.60 cfs @ 11.93 hrs, Volume= 0.117 af
Outflow = 2.60 cfs @ 11.93 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min
Primary = 2.60 cfs @ 11.93 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,946.74' @ 11.93 hrs
Flood Elev= 1,961.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,945.89'	**18.0" Round Culvert** L= 124.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,945.89' / 1,945.27' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,949.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.53 cfs @ 11.93 hrs HW=1,946.73' (Free Discharge)
1=Culvert (Barrel Controls 2.53 cfs @ 3.59 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 140: culvert

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.69 cfs @ 12.06 hrs, Volume= 1.673 af
Outflow = 22.69 cfs @ 12.06 hrs, Volume= 1.673 af, Atten= 0%, Lag= 0.0 min
Primary = 22.69 cfs @ 12.06 hrs, Volume= 1.673 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,993.53' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,991.50'	**36.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,991.50' / 1,991.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,995.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=22.58 cfs @ 12.06 hrs HW=1,993.53' (Free Discharge)
1=Culvert (Barrel Controls 22.58 cfs @ 6.28 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 141: culvert

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.47 cfs @ 12.06 hrs, Volume= 1.673 af
Outflow = 22.47 cfs @ 12.06 hrs, Volume= 1.673 af, Atten= 0%, Lag= 0.0 min
Primary = 22.47 cfs @ 12.06 hrs, Volume= 1.673 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,977.92' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,976.00'	**36.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,976.00' / 1,975.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,980.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=22.42 cfs @ 12.06 hrs HW=1,977.91' (Free Discharge)
1=Culvert (Inlet Controls 22.42 cfs @ 4.71 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond I18: Manhole

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af
Outflow = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af, Atten= 0%, Lag= 0.0 min
Primary = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,007.71' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,006.00'	**48.0" Round Culvert** L= 304.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,006.00' / 2,000.00' S= 0.0197 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=22.61 cfs @ 12.05 hrs HW=2,007.70' (Free Discharge)
↑**1=Culvert** (Inlet Controls 22.61 cfs @ 4.44 fps)

Summary for Pond I19: Manhole

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af
Outflow = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af, Atten= 0%, Lag= 0.0 min
Primary = 22.88 cfs @ 12.05 hrs, Volume= 1.673 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,018.71' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,017.00'	**48.0" Round Culvert** L= 348.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,017.00' / 2,006.00' S= 0.0316 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=22.61 cfs @ 12.05 hrs HW=2,018.70' (Free Discharge)
↑**1=Culvert** (Inlet Controls 22.61 cfs @ 4.44 fps)

Summary for Pond I2: 30" HDPE Storm

Inflow Area = 3.692 ac, 57.82% Impervious, Inflow Depth = 1.66" for 1-YEAR event
Inflow = 8.53 cfs @ 11.95 hrs, Volume= 0.511 af
Outflow = 8.53 cfs @ 11.95 hrs, Volume= 0.511 af, Atten= 0%, Lag= 0.0 min
Primary = 8.53 cfs @ 11.95 hrs, Volume= 0.511 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,945.21' @ 11.95 hrs
Flood Elev= 1,955.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,943.90'	**30.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,943.90' / 1,943.00' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=8.46 cfs @ 11.95 hrs HW=1,945.20' (Free Discharge)
↑**1=Culvert** (Barrel Controls 8.46 cfs @ 4.76 fps)

Summary for Pond I22: Manhole- 48" HDPE Storm

Inflow Area = 7.912 ac, 63.11% Impervious, Inflow Depth = 1.85" for 1-YEAR event
Inflow = 23.65 cfs @ 11.95 hrs, Volume= 1.221 af
Outflow = 23.65 cfs @ 11.95 hrs, Volume= 1.221 af, Atten= 0%, Lag= 0.0 min
Primary = 23.65 cfs @ 11.95 hrs, Volume= 1.221 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,172.35' @ 11.95 hrs
Flood Elev= 2,182.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,170.15'	**48.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,170.15' / 2,170.05' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,182.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=23.26 cfs @ 11.95 hrs HW=2,172.33' (Free Discharge)
1=Culvert (Barrel Controls 23.26 cfs @ 4.82 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I23: Manhole -30" HDPE Storm

Inflow Area = 3.957 ac, 45.04% Impervious, Inflow Depth = 1.52" for 1-YEAR event
Inflow = 9.79 cfs @ 11.95 hrs, Volume= 0.500 af
Outflow = 9.79 cfs @ 11.95 hrs, Volume= 0.500 af, Atten= 0%, Lag= 0.0 min
Primary = 9.79 cfs @ 11.95 hrs, Volume= 0.500 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,185.00' @ 11.95 hrs
Flood Elev= 2,189.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,183.72'	**30.0" Round Culvert** L= 171.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,183.72' / 2,176.64' S= 0.0414 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,189.19'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=9.66 cfs @ 11.95 hrs HW=2,184.99' (Free Discharge)
1=Culvert (Inlet Controls 9.66 cfs @ 3.84 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I24: 30" HDPE Storm

Inflow Area = 3.957 ac, 45.04% Impervious, Inflow Depth = 1.52" for 1-YEAR event
Inflow = 9.79 cfs @ 11.95 hrs, Volume= 0.500 af
Outflow = 9.79 cfs @ 11.95 hrs, Volume= 0.500 af, Atten= 0%, Lag= 0.0 min
Primary = 9.79 cfs @ 11.95 hrs, Volume= 0.500 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,190.31' @ 11.95 hrs
Flood Elev= 2,194.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,189.03'	**30.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,189.03' / 2,183.82' S= 0.0827 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,194.48'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.66 cfs @ 11.95 hrs HW=2,190.30' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.66 cfs @ 3.84 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I25: 30" HDPE Storm

Inflow Area =	3.059 ac, 51.35% Impervious, Inflow Depth = 1.64" for 1-YEAR event		
Inflow =	8.09 cfs @ 11.94 hrs, Volume=	0.418 af	
Outflow =	8.09 cfs @ 11.94 hrs, Volume=	0.418 af,	Atten= 0%, Lag= 0.0 min
Primary =	8.09 cfs @ 11.94 hrs, Volume=	0.418 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,192.65' @ 11.94 hrs
Flood Elev= 2,205.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,191.50'	**30.0" Round Culvert** L= 253.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,191.50' / 2,189.13' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,205.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.05 cfs @ 11.94 hrs HW=2,192.65' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.05 cfs @ 3.65 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I26: 30" HDPE Storm

Inflow Area =	2.407 ac, 48.55% Impervious, Inflow Depth = 1.62" for 1-YEAR event		
Inflow =	6.82 cfs @ 11.94 hrs, Volume=	0.324 af	
Outflow =	6.82 cfs @ 11.94 hrs, Volume=	0.324 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.82 cfs @ 11.94 hrs, Volume=	0.324 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,193.29' @ 11.94 hrs
Flood Elev= 2,208.54'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,191.80'	**30.0" Round Culvert** L= 201.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,191.80' / 2,191.60' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,195.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.74 cfs @ 11.94 hrs HW=2,193.28' (Free Discharge)
└─**1=Culvert** (Barrel Controls 6.74 cfs @ 3.21 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I27: 30" HDPE Storm

Inflow Area = 2.129 ac, 53.13% Impervious, Inflow Depth = 1.71" for 1-YEAR event
Inflow = 6.30 cfs @ 11.94 hrs, Volume= 0.303 af
Outflow = 6.30 cfs @ 11.94 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min
Primary = 6.30 cfs @ 11.94 hrs, Volume= 0.303 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,193.37' @ 11.94 hrs
Flood Elev= 2,208.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,192.00'	**30.0" Round Culvert** L= 98.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,192.00' / 2,191.90' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,208.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.22 cfs @ 11.94 hrs HW=2,193.36' (Free Discharge)
1=Culvert (Barrel Controls 6.22 cfs @ 3.30 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I28: 30" HDPE Storm

Inflow Area = 1.459 ac, 77.51% Impervious, Inflow Depth = 2.13" for 1-YEAR event
Inflow = 5.25 cfs @ 11.94 hrs, Volume= 0.259 af
Outflow = 5.25 cfs @ 11.94 hrs, Volume= 0.259 af, Atten= 0%, Lag= 0.0 min
Primary = 5.25 cfs @ 11.94 hrs, Volume= 0.259 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,193.61' @ 11.94 hrs
Flood Elev= 2,195.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,192.30'	**30.0" Round Culvert** L= 236.0' Ke= 0.500 Inlet / Outlet Invert= 2,192.30' / 2,192.07' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,197.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.19 cfs @ 11.94 hrs HW=2,193.61' (Free Discharge)
1=Culvert (Barrel Controls 5.19 cfs @ 2.91 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I29: Manhole

Inflow Area = 1.039 ac,100.00% Impervious, Inflow Depth = 2.57" for 1-YEAR event
Inflow = 4.45 cfs @ 11.93 hrs, Volume= 0.222 af
Outflow = 4.45 cfs @ 11.93 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min
Primary = 4.45 cfs @ 11.93 hrs, Volume= 0.222 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,193.64' @ 11.93 hrs
Flood Elev= 2,208.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,192.50'	**30.0" Round Culvert** L= 98.0' Ke= 0.500 Inlet / Outlet Invert= 2,192.50' / 2,192.40' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=4.36 cfs @ 11.93 hrs HW=2,193.63' (Free Discharge)
└─**1=Culvert** (Barrel Controls 4.36 cfs @ 2.96 fps)

Summary for Pond I3: 30" HDPE Storm

Inflow Area =	3.323 ac, 53.14% Impervious, Inflow Depth = 1.56" for 1-YEAR event		
Inflow =	7.57 cfs @	11.97 hrs, Volume=	0.432 af
Outflow =	7.57 cfs @	11.97 hrs, Volume=	0.432 af, Atten= 0%, Lag= 0.0 min
Primary =	7.57 cfs @	11.97 hrs, Volume=	0.432 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,946.39' @ 11.97 hrs
Flood Elev= 1,949.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,945.17'	**30.0" Round Culvert** L= 231.0' Ke= 0.500 Inlet / Outlet Invert= 1,945.17' / 1,944.02' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,949.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.57 cfs @ 11.97 hrs HW=1,946.39' (Free Discharge)
├─**1=Culvert** (Barrel Controls 7.57 cfs @ 4.63 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I30: 30" HDPE Storm

Inflow Area =	1.039 ac,100.00% Impervious, Inflow Depth = 2.57" for 1-YEAR event		
Inflow =	4.45 cfs @	11.93 hrs, Volume=	0.222 af
Outflow =	4.45 cfs @	11.93 hrs, Volume=	0.222 af, Atten= 0%, Lag= 0.0 min
Primary =	4.45 cfs @	11.93 hrs, Volume=	0.222 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,195.21' @ 11.93 hrs
Flood Elev= 2,204.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,194.08'	**30.0" Round Culvert** L= 79.0' Ke= 0.500 Inlet / Outlet Invert= 2,194.08' / 2,194.00' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,199.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.37 cfs @ 11.93 hrs HW=2,195.20' (Free Discharge)
↑1=**Culvert** (Barrel Controls 4.37 cfs @ 3.01 fps)
└2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I31: 30" HDPE Storm

Inflow Area = 1.141 ac, 34.78% Impervious, Inflow Depth = 1.24" for 1-YEAR event
Inflow = 2.61 cfs @ 11.96 hrs, Volume= 0.118 af
Outflow = 2.61 cfs @ 11.96 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
Primary = 2.61 cfs @ 11.96 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,171.29' @ 11.96 hrs
Flood Elev= 2,180.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,170.50'	**30.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,170.50' / 2,170.35' S= 0.0027 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.55 cfs @ 11.96 hrs HW=2,171.28' (Free Discharge)
↑1=**Culvert** (Barrel Controls 2.55 cfs @ 2.91 fps)

Summary for Pond I32: 30" HDPE Storm

Inflow Area = 1.141 ac, 34.78% Impervious, Inflow Depth = 1.24" for 1-YEAR event
Inflow = 2.61 cfs @ 11.96 hrs, Volume= 0.118 af
Outflow = 2.61 cfs @ 11.96 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
Primary = 2.61 cfs @ 11.96 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,171.67' @ 11.96 hrs
Flood Elev= 2,180.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,170.85'	**30.0" Round Culvert** L= 119.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,170.85' / 2,170.60' S= 0.0021 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,180.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.55 cfs @ 11.96 hrs HW=2,171.66' (Free Discharge)
↑1=**Culvert** (Barrel Controls 2.55 cfs @ 2.76 fps)
└2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I33: 24" HDPE Storm

Inflow Area = 0.677 ac, 30.81% Impervious, Inflow Depth = 1.16" for 1-YEAR event
Inflow = 1.44 cfs @ 11.97 hrs, Volume= 0.066 af
Outflow = 1.44 cfs @ 11.97 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
Primary = 1.44 cfs @ 11.97 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,171.96' @ 11.97 hrs
Flood Elev= 2,175.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,171.30'	**24.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,171.30' / 2,170.95' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,175.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.43 cfs @ 11.97 hrs HW=2,171.96' (Free Discharge)
1=Culvert (Barrel Controls 1.43 cfs @ 2.35 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I4: 15" HDPE Storm

Inflow Area = 0.369 ac,100.00% Impervious, Inflow Depth = 2.57" for 1-YEAR event
Inflow = 1.67 cfs @ 11.90 hrs, Volume= 0.079 af
Outflow = 1.67 cfs @ 11.90 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 11.90 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,952.13' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,951.50'	**15.0" Round Culvert** L= 140.0' Ke= 0.500 Inlet / Outlet Invert= 1,951.50' / 1,950.00' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.62 cfs @ 11.90 hrs HW=1,952.12' (Free Discharge)
1=Culvert (Inlet Controls 1.62 cfs @ 2.68 fps)

Summary for Pond I6: Manhole

Inflow Area = 8.896 ac, 31.70% Impervious, Inflow Depth = 0.91" for 1-YEAR event
Inflow = 0.82 cfs @ 13.10 hrs, Volume= 0.677 af
Outflow = 0.82 cfs @ 13.10 hrs, Volume= 0.677 af, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 13.10 hrs, Volume= 0.677 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,952.92' @ 13.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,952.50'	**36.0" Round Culvert** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,952.50' / 1,952.00' S= 0.0027 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.82 cfs @ 13.10 hrs HW=1,952.92' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.82 cfs @ 2.05 fps)

Summary for Reach 18R: Overland Flow

Inflow Area = 45.186 ac, 28.04% Impervious, Inflow Depth > 2.42" for 10-YEAR event
Inflow = 9.18 cfs @ 13.90 hrs, Volume= 9.123 af
Outflow = 9.18 cfs @ 14.00 hrs, Volume= 9.122 af, Atten= 0%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 10.3 min

Peak Storage= 1,934 cf @ 13.94 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 214.48 cfs

30.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 75.0 '/' Top Width= 105.00'
Length= 535.0' Slope= 0.0748 '/'
Inlet Invert= 1,937.00', Outlet Invert= 1,897.00'

‡

Summary for Reach 21R: Ex. Roadside Ditch

Inflow Area = 4.411 ac, 6.47% Impervious, Inflow Depth = 2.63" for 10-YEAR event
Inflow = 16.31 cfs @ 12.07 hrs, Volume= 0.966 af
Outflow = 15.61 cfs @ 12.09 hrs, Volume= 0.966 af, Atten= 4%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.57 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 2.4 min

Peak Storage= 341 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.96'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 36.63 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 1.0 '/' Top Width= 5.00'
Length= 120.0' Slope= 0.0250 '/'
Inlet Invert= 1,897.00', Outlet Invert= 1,894.00'

Summary for Reach 58A: Overland Flow

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af
Outflow = 4.96 cfs @ 12.78 hrs, Volume= 0.701 af, Atten= 52%, Lag= 41.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.27 fps, Min. Travel Time= 29.8 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 121.9 min

Peak Storage= 8,863 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 151.22 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 478.0' Slope= 0.0711 '/'
Inlet Invert= 2,212.00', Outlet Invert= 2,178.00'

‡

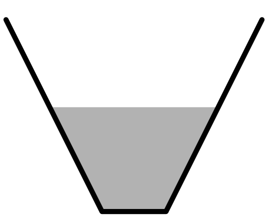
Summary for Reach 61: Vegetated Roadside Swale

Inflow Area = 5.521 ac, 6.72% Impervious, Inflow Depth = 2.97" for 10-YEAR event
Inflow = 20.53 cfs @ 12.07 hrs, Volume= 1.367 af
Outflow = 20.13 cfs @ 12.13 hrs, Volume= 1.367 af, Atten= 2%, Lag= 3.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.80 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 5.2 min

Peak Storage= 2,222 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 67.71 cfs

1.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 751.0' Slope= 0.0613 '/'
Inlet Invert= 2,000.00', Outlet Invert= 1,954.00'



Summary for Reach 66: Stream Channel

Inflow Area = 123.689 ac, 1.65% Impervious, Inflow Depth = 2.86" for 10-YEAR event
Inflow = 145.90 cfs @ 13.04 hrs, Volume= 29.526 af
Outflow = 144.73 cfs @ 13.14 hrs, Volume= 29.526 af, Atten= 1%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 9.48 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 17.0 min

Peak Storage= 28,778 cf @ 13.08 hrs
Average Depth at Peak Storage= 1.43'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 297.74 cfs

5.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 21.00'
Length= 1,884.0' Slope= 0.1152 '/'
Inlet Invert= 2,017.00', Outlet Invert= 1,800.00'

‡

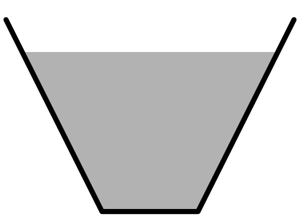
Summary for Reach 73A: Vegetated Roadside Channel

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 3.25" for 10-YEAR event
Inflow = 20.04 cfs @ 11.96 hrs, Volume= 1.002 af
Outflow = 19.92 cfs @ 11.96 hrs, Volume= 1.002 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.56 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 0.5 min

Peak Storage= 183 cf @ 11.96 hrs
Average Depth at Peak Storage= 1.66'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 28.54 cfs

1.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 60.0' Slope= 0.0560 '/'
Inlet Invert= 1,920.00', Outlet Invert= 1,916.64'



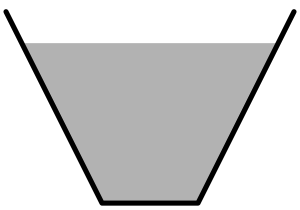
Summary for Reach 75: Roadside Channel

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 3.25" for 10-YEAR event
Inflow = 19.92 cfs @ 11.96 hrs, Volume= 1.002 af
Outflow = 19.64 cfs @ 11.98 hrs, Volume= 1.002 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.47 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 1.3 min

Peak Storage= 509 cf @ 11.97 hrs
Average Depth at Peak Storage= 1.67'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 28.08 cfs

1.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 166.0' Slope= 0.0542 '/'
Inlet Invert= 1,911.00', Outlet Invert= 1,902.00'



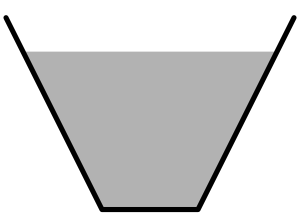
Summary for Reach 76: Roadside Channel

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 3.25" for 10-YEAR event
Inflow = 19.64 cfs @ 11.98 hrs, Volume= 1.002 af
Outflow = 19.54 cfs @ 11.98 hrs, Volume= 1.002 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.53 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 0.5 min

Peak Storage= 186 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.65'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 28.53 cfs

1.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 0.5 '/' Top Width= 3.00'
Length= 62.0' Slope= 0.0560 '/'
Inlet Invert= 1,902.00', Outlet Invert= 1,898.53'



Summary for Reach 78: Stream Channel

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 2.85" for 10-YEAR event
Inflow = 130.68 cfs @ 12.97 hrs, Volume= 21.601 af
Outflow = 130.41 cfs @ 13.01 hrs, Volume= 21.601 af, Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.37 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 6.2 min

Peak Storage= 8,622 cf @ 12.99 hrs
Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 213.41 cfs

6.00' x 1.50' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 18.00'
Length= 685.0' Slope= 0.1635 '/'
Inlet Invert= 2,170.00', Outlet Invert= 2,058.00'

‡

Summary for Reach 80: Stream Channel

Inflow Area = 90.881 ac, 1.66% Impervious, Inflow Depth = 2.85" for 10-YEAR event
Inflow = 130.41 cfs @ 13.01 hrs, Volume= 21.601 af
Outflow = 130.05 cfs @ 13.06 hrs, Volume= 21.601 af, Atten= 0%, Lag= 3.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.59 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 10.6 min

Peak Storage= 14,598 cf @ 13.03 hrs
Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 209.43 cfs

6.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 22.00'
Length= 740.0' Slope= 0.0473 '/'
Inlet Invert= 2,055.00', Outlet Invert= 2,020.00'

‡

Summary for Reach 82: Overland Flow

Inflow Area = 1.300 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 4.87 cfs @ 12.06 hrs, Volume= 0.304 af
Outflow = 1.08 cfs @ 13.77 hrs, Volume= 0.304 af, Atten= 78%, Lag= 102.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 82.5 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 306.3 min

Peak Storage= 5,366 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 53.31 cfs

100.00' x 0.50' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 938.0' Slope= 0.1354 '/'
Inlet Invert= 2,347.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 82a: Overland Flow

Inflow Area = 62.628 ac, 1.58% Impervious, Inflow Depth = 2.68" for 10-YEAR event
Inflow = 101.52 cfs @ 12.67 hrs, Volume= 13.991 af
Outflow = 92.40 cfs @ 13.01 hrs, Volume= 13.991 af, Atten= 9%, Lag= 20.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.70 fps, Min. Travel Time= 11.2 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 75.6 min

Peak Storage= 62,178 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 164.89 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 473.0' Slope= 0.0846 '/'
Inlet Invert= 2,220.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 83A: Overland Flow

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 2.48" for 10-YEAR event
Inflow = 46.42 cfs @ 12.19 hrs, Volume= 6.253 af
Outflow = 42.96 cfs @ 12.51 hrs, Volume= 6.253 af, Atten= 7%, Lag= 19.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.72 fps, Min. Travel Time= 10.2 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 41.7 min

Peak Storage= 26,373 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 232.26 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 441.0' Slope= 0.1678 '/'
Inlet Invert= 2,326.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 84A: Overland Flow

Inflow Area = 61.328 ac, 1.61% Impervious, Inflow Depth = 2.68" for 10-YEAR event
Inflow = 104.13 cfs @ 12.49 hrs, Volume= 13.687 af
Outflow = 101.51 cfs @ 12.67 hrs, Volume= 13.687 af, Atten= 3%, Lag= 10.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.81 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 25.6 min

Peak Storage= 34,815 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 192.72 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 277.0' Slope= 0.1155 '/'
Inlet Invert= 2,252.00', Outlet Invert= 2,220.00'

‡

Summary for Reach 84B: Overland Flow

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 2.88" for 10-YEAR event
Inflow = 64.69 cfs @ 12.23 hrs, Volume= 7.434 af
Outflow = 61.22 cfs @ 12.48 hrs, Volume= 7.434 af, Atten= 5%, Lag= 15.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.79 fps, Min. Travel Time= 7.8 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 33.0 min

Peak Storage= 28,726 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 228.33 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 370.0' Slope= 0.1622 '/'
Inlet Invert= 2,312.00', Outlet Invert= 2,252.00'

‡

Summary for Reach 85A: Overland Flow

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 4.95" for 10-YEAR event
Inflow = 40.92 cfs @ 12.21 hrs, Volume= 1.765 af
Outflow = 30.67 cfs @ 12.58 hrs, Volume= 1.765 af, Atten= 25%, Lag= 21.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.63 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 80.5 min

Peak Storage= 24,784 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 221.40 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 505.0' Slope= 0.1525 '/'
Inlet Invert= 2,292.00', Outlet Invert= 2,215.00'

‡

Summary for Reach 85B: Overland Flow

Inflow Area = 8.621 ac, 0.65% Impervious, Inflow Depth = 4.05" for 10-YEAR event
Inflow = 36.47 cfs @ 12.55 hrs, Volume= 2.906 af
Outflow = 29.55 cfs @ 12.93 hrs, Volume= 2.906 af, Atten= 19%, Lag= 22.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.49 fps, Min. Travel Time= 15.4 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 87.5 min

Peak Storage= 27,375 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 157.60 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 453.0' Slope= 0.0773 '/'
Inlet Invert= 2,215.00', Outlet Invert= 2,180.00'

‡

Summary for Reach 86A: Overland Flow

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 3.16" for 10-YEAR event
Inflow = 19.66 cfs @ 12.19 hrs, Volume= 1.142 af
Outflow = 17.29 cfs @ 12.35 hrs, Volume= 1.142 af, Atten= 12%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.47 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 31.1 min

Peak Storage= 7,157 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 190.45 cfs

100.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 195.0' Slope= 0.1128 '/'
Inlet Invert= 2,237.00', Outlet Invert= 2,215.00'

‡

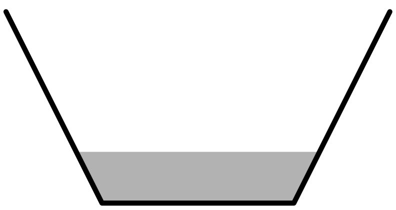
Summary for Reach 88: Roadside Swale

Inflow Area = 2.000 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 7.10 cfs @ 12.08 hrs, Volume= 0.468 af
Outflow = 7.00 cfs @ 12.12 hrs, Volume= 0.468 af, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.79 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 4.8 min

Peak Storage= 573 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 63.06 cfs

2.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 0.5 '/' Top Width= 4.00'
Length= 472.0' Slope= 0.0678 '/'
Inlet Invert= 2,207.00', Outlet Invert= 2,175.00'



Summary for Reach 91: Overland Flow

Inflow Area = 9.707 ac, 4.57% Impervious, Inflow Depth = 2.70" for 10-YEAR event
Inflow = 27.22 cfs @ 12.09 hrs, Volume= 2.183 af
Outflow = 23.78 cfs @ 12.19 hrs, Volume= 2.183 af, Atten= 13%, Lag= 6.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.99 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 23.8 min

Peak Storage= 4,753 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 126.11 cfs

100.00' x 0.50' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 198.0' Slope= 0.0303 '/'
Inlet Invert= 1,893.00', Outlet Invert= 1,887.00'

‡

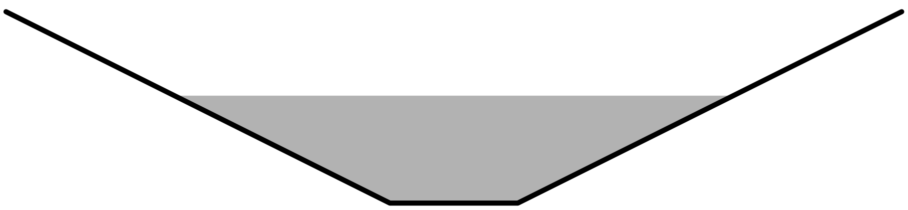
Summary for Reach 92: Channel Along RR Tracks

Inflow Area = 74.590 ac, 20.27% Impervious, Inflow Depth > 2.60" for 10-YEAR event
Inflow = 70.90 cfs @ 11.98 hrs, Volume= 16.158 af
Outflow = 68.58 cfs @ 12.03 hrs, Volume= 16.157 af, Atten= 3%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.64 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 6.0 min

Peak Storage= 6,096 cf @ 12.00 hrs
Average Depth at Peak Storage= 1.68'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 255.39 cfs

2.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 675.0' Slope= 0.0348 '/'
Inlet Invert= 1,848.50', Outlet Invert= 1,825.00'



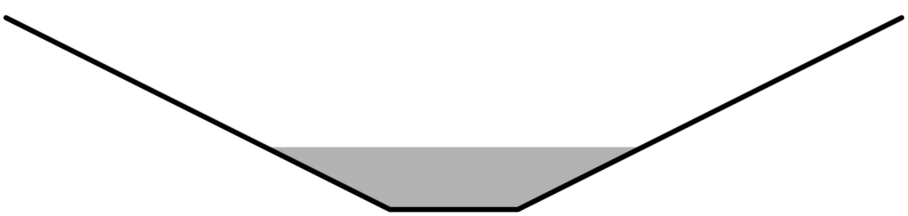
Summary for Reach 92a: Channel Along RR Tracks

Inflow Area = 9.707 ac, 4.57% Impervious, Inflow Depth = 2.70" for 10-YEAR event
Inflow = 23.78 cfs @ 12.19 hrs, Volume= 2.183 af
Outflow = 20.78 cfs @ 12.31 hrs, Volume= 2.183 af, Atten= 13%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 5.41 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 19.9 min

Peak Storage= 4,685 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 243.54 cfs

2.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,216.0' Slope= 0.0317 '/'
Inlet Invert= 1,887.00', Outlet Invert= 1,848.50'



Summary for Reach 93R: Roadside Ditch

Inflow Area = 2.052 ac, 7.70% Impervious, Inflow Depth = 2.68" for 10-YEAR event
Inflow = 9.23 cfs @ 12.01 hrs, Volume= 0.459 af
Outflow = 8.37 cfs @ 12.07 hrs, Volume= 0.459 af, Atten= 9%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Max. Velocity= 2.11 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 7.8 min

Peak Storage= 936 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.99'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 19.90 cfs

2.00' x 1.50' deep channel, n= 0.033 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 236.0' Slope= 0.0042 '/'
Inlet Invert= 1,895.00', Outlet Invert= 1,894.00'

Summary for Reach 142R: Overland Flow

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 209.00 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 60.0 '/' Top Width= 100.00'
Length= 280.0' Slope= 0.0589 '/'
Inlet Invert= 1,960.00', Outlet Invert= 1,943.50'

‡

Summary for Reach 143R: Stone Lined Swale with ChkDams

Inflow Area = 48.885 ac, 26.48% Impervious, Inflow Depth > 2.42" for 10-YEAR event
Inflow = 11.87 cfs @ 12.07 hrs, Volume= 9.876 af
Outflow = 10.59 cfs @ 12.11 hrs, Volume= 9.875 af, Atten= 11%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 6.08 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 2.7 min

Peak Storage= 629 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 142.04 cfs

2.00' x 2.00' deep channel, n= 0.050 Mountain streams w/large boulders
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 335.0' Slope= 0.1403 '/'
Inlet Invert= 1,897.00', Outlet Invert= 1,850.00'

Summary for Reach I1: TRM SWALE

Inflow Area = 3.692 ac, 57.82% Impervious, Inflow Depth = 4.62" for 10-YEAR event
Inflow = 23.21 cfs @ 11.95 hrs, Volume= 1.420 af
Outflow = 22.98 cfs @ 11.97 hrs, Volume= 1.420 af, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.09 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 2.2 min

Peak Storage= 820 cf @ 11.96 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 33.85 cfs

2.00' x 1.50' deep channel, n= 0.035 TRM
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 145.0' Slope= 0.0138 '/'
Inlet Invert= 1,943.00', Outlet Invert= 1,941.00'

Summary for Reach I12: stone lined stream channel

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af
Outflow = 84.46 cfs @ 11.94 hrs, Volume= 5.410 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 8.77 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1,374 cf @ 11.93 hrs
Average Depth at Peak Storage= 1.70'
Bank-Full Depth= 2.25', Capacity at Bank-Full= 142.16 cfs

4.00' x 2.25' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 8.50'
Length= 142.0' Slope= 0.0493 '/'
Inlet Invert= 2,000.00', Outlet Invert= 1,993.00'

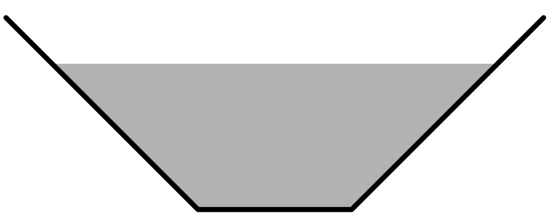
Summary for Reach I12a: stone lined stream channel

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.46 cfs @ 11.94 hrs, Volume= 5.410 af
Outflow = 84.00 cfs @ 11.94 hrs, Volume= 5.410 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 11.41 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.96 fps, Avg. Travel Time= 0.9 min

Peak Storage= 1,185 cf @ 11.94 hrs
Average Depth at Peak Storage= 1.90'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 147.72 cfs

2.00' x 2.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 160.0' Slope= 0.0938 '/'
Inlet Invert= 1,991.00', Outlet Invert= 1,976.00'



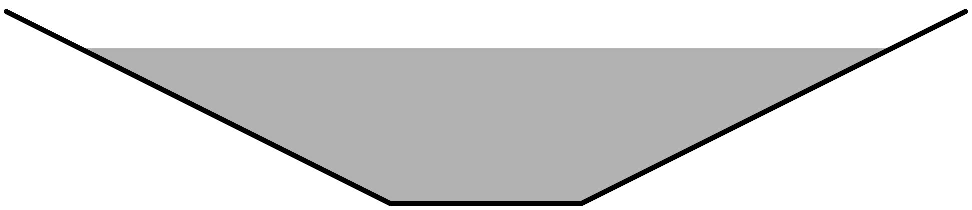
Summary for Reach I12b: stone lined stream channel

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.00 cfs @ 11.94 hrs, Volume= 5.410 af
Outflow = 82.54 cfs @ 11.97 hrs, Volume= 5.410 af, Atten= 2%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 9.87 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.64 fps, Avg. Travel Time= 2.8 min

Peak Storage= 3,721 cf @ 11.95 hrs
Average Depth at Peak Storage= 1.62'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 133.69 cfs

2.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 440.0' Slope= 0.0795 '/'
Inlet Invert= 1,975.00', Outlet Invert= 1,940.00'



Summary for Reach I21: stone lined stream channel

Inflow Area = 7.912 ac, 63.11% Impervious, Inflow Depth = 4.79" for 10-YEAR event
Inflow = 60.29 cfs @ 11.95 hrs, Volume= 3.159 af
Outflow = 55.44 cfs @ 12.02 hrs, Volume= 3.159 af, Atten= 8%, Lag= 4.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 9.71 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 2.44 fps, Avg. Travel Time= 10.8 min

Peak Storage= 9,183 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 1.75', Capacity at Bank-Full= 88.29 cfs

2.00' x 1.75' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 1.5 '/' Top Width= 7.25'
Length= 1,585.0' Slope= 0.0893 '/'
Inlet Invert= 2,170.05', Outlet Invert= 2,028.50'

Summary for Reach I5: Overland Flow

Inflow Area = 8.896 ac, 31.70% Impervious, Inflow Depth = 3.10" for 10-YEAR event
Inflow = 19.76 cfs @ 12.20 hrs, Volume= 2.300 af
Outflow = 19.72 cfs @ 12.22 hrs, Volume= 2.300 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.22 fps, Avg. Travel Time= 3.4 min

Peak Storage= 669 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 215.99 cfs

100.00' x 0.50' deep channel, n= 0.120 Sheet flow over Short Grass
Side Slope Z-value= 100.0 '/' Top Width= 200.00'
Length= 45.0' Slope= 0.2000 '/'
Inlet Invert= 1,952.50', Outlet Invert= 1,943.50'

Summary for Pond 29P: cb29

Inflow Area = 0.582 ac, 15.87% Impervious, Inflow Depth = 3.58" for 10-YEAR event
Inflow = 4.24 cfs @ 11.91 hrs, Volume= 0.174 af
Outflow = 4.24 cfs @ 11.91 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min
Primary = 4.24 cfs @ 11.91 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,925.13' @ 11.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,924.00'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,924.00' / 1,923.75' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,928.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.23 cfs @ 11.91 hrs HW=1,925.12' (Free Discharge)
1=Culvert (Barrel Controls 4.23 cfs @ 4.14 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 57: 16" Steel Culverts

Inflow Area = 1.326 ac, 4.72% Impervious, Inflow Depth = 2.90" for 10-YEAR event
Inflow = 4.30 cfs @ 12.13 hrs, Volume= 0.320 af
Outflow = 4.30 cfs @ 12.13 hrs, Volume= 0.320 af, Atten= 0%, Lag= 0.0 min
Primary = 4.30 cfs @ 12.13 hrs, Volume= 0.320 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,005.32' @ 12.12 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,004.00'	**16.0" Round 16" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,004.00' / 2,000.00' S= 0.0667 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.29 cfs @ 12.13 hrs HW=2,005.32' (Free Discharge)
1=16" Smooth Steel Culvert (old) (Inlet Controls 4.29 cfs @ 3.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,004.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 58R: 24" HDPE Pipe

Inflow Area = 3.000 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af
Outflow = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af, Atten= 0%, Lag= 0.0 min
Primary = 10.31 cfs @ 12.09 hrs, Volume= 0.701 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,216.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,215.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,215.00' / 2,212.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,218.50'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=10.29 cfs @ 12.09 hrs HW=2,216.74' (Free Discharge)
└─**1=Culvert** (Inlet Controls 10.29 cfs @ 3.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,215.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 59: 32" Plastic Pipe

Inflow Area = 30.315 ac, 1.06% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 82.05 cfs @ 12.19 hrs, Volume= 7.087 af
Outflow = 82.05 cfs @ 12.19 hrs, Volume= 7.087 af, Atten= 0%, Lag= 0.0 min
Primary = 46.42 cfs @ 12.19 hrs, Volume= 6.253 af
Secondary = 35.63 cfs @ 12.19 hrs, Volume= 0.834 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,333.11' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,327.00'	**32.0" Round 32" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,327.00' / 2,324.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,331.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=46.38 cfs @ 12.19 hrs HW=2,333.11' (Free Discharge)
↑—**1=32" Plastic Culvert** (Inlet Controls 46.38 cfs @ 8.30 fps)

Secondary OutFlow Max=35.39 cfs @ 12.19 hrs HW=2,333.11' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 35.39 cfs @ 4.20 fps)

Summary for Pond 60: (2) 16" Steel Culverts

Inflow Area = 123.689 ac, 1.65% Impervious, Inflow Depth = 2.86" for 10-YEAR event
Inflow = 145.90 cfs @ 13.04 hrs, Volume= 29.526 af
Outflow = 145.90 cfs @ 13.04 hrs, Volume= 29.526 af, Atten= 0%, Lag= 0.0 min
Primary = 34.15 cfs @ 13.04 hrs, Volume= 17.944 af
Secondary = 111.75 cfs @ 13.04 hrs, Volume= 11.582 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,025.12' @ 13.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,018.00'	**16.0" Round Culvert X 2.00** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,018.00' / 2,017.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,022.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=34.14 cfs @ 13.04 hrs HW=2,025.12' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 34.14 cfs @ 12.23 fps)

Secondary OutFlow Max=111.64 cfs @ 13.04 hrs HW=2,025.12' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 111.64 cfs @ 4.27 fps)

Summary for Pond 67P: 26" Steel Culverts

Inflow Area = 4.195 ac, 7.35% Impervious, Inflow Depth = 2.99" for 10-YEAR event
Inflow = 16.56 cfs @ 12.07 hrs, Volume= 1.046 af
Outflow = 16.56 cfs @ 12.07 hrs, Volume= 1.046 af, Atten= 0%, Lag= 0.0 min
Primary = 16.56 cfs @ 12.07 hrs, Volume= 1.046 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,005.48' @ 12.07 hrs
Flood Elev= 2,008.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,003.00'	**26.0" Round 26" Smooth Steel Culvert (old)** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,003.00' / 2,000.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,006.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31
3.32

Primary OutFlow Max=16.46 cfs @ 12.07 hrs HW=2,005.46' (Free Discharge)
└─**1=26" Smooth Steel Culvert (old)** (Inlet Controls 16.46 cfs @ 4.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,003.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 74: 12" CMP Culvert

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 3.25" for 10-YEAR event
Inflow = 19.92 cfs @ 11.96 hrs, Volume= 1.002 af
Outflow = 19.92 cfs @ 11.96 hrs, Volume= 1.002 af, Atten= 0%, Lag= 0.0 min
Primary = 6.16 cfs @ 11.96 hrs, Volume= 0.795 af
Secondary = 13.76 cfs @ 11.96 hrs, Volume= 0.207 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,918.64' @ 11.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,914.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 1,914.00' / 1,911.76' S= 0.0560 '/' Cc= 0.900 n= 0.025
#2	Secondary	1,917.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=6.16 cfs @ 11.96 hrs HW=1,918.62' (Free Discharge)
└─**1=Culvert** (Barrel Controls 6.16 cfs @ 7.84 fps)

Secondary OutFlow Max=13.58 cfs @ 11.96 hrs HW=1,918.62' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 13.58 cfs @ 4.18 fps)

Summary for Pond 74A: 16" CMP Culvert

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 3.25" for 10-YEAR event
Inflow = 20.04 cfs @ 11.96 hrs, Volume= 1.002 af
Outflow = 20.04 cfs @ 11.96 hrs, Volume= 1.002 af, Atten= 0%, Lag= 0.0 min
Primary = 11.39 cfs @ 11.96 hrs, Volume= 0.908 af
Secondary = 8.65 cfs @ 11.96 hrs, Volume= 0.094 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,925.75' @ 11.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,921.50'	**16.0" Round Culvert** L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 1,921.50' / 1,920.00' S= 0.0429 '/' Cc= 0.900

			n= 0.025
#2	Secondary	1,924.50'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=11.36 cfs @ 11.96 hrs HW=1,925.73' (Free Discharge)
└─**1=Culvert** (Barrel Controls 11.36 cfs @ 8.14 fps)

Secondary OutFlow Max=8.40 cfs @ 11.96 hrs HW=1,925.73' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 8.40 cfs @ 3.43 fps)

Summary for Pond 76A: culvert

Inflow Area = 3.704 ac, 13.44% Impervious, Inflow Depth = 3.25" for 10-YEAR event
Inflow = 19.64 cfs @ 11.98 hrs, Volume= 1.002 af
Outflow = 19.64 cfs @ 11.98 hrs, Volume= 1.002 af, Atten= 0%, Lag= 0.0 min
Primary = 5.59 cfs @ 11.98 hrs, Volume= 0.780 af
Secondary = 14.05 cfs @ 11.98 hrs, Volume= 0.222 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,905.66' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,902.00'	**12.0" Round Culvert** L= 60.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,902.00' / 1,898.00' S= 0.0667 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,904.00'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=5.58 cfs @ 11.98 hrs HW=1,905.65' (Free Discharge)
└─**1=Culvert** (Barrel Controls 5.58 cfs @ 7.11 fps)

Secondary OutFlow Max=13.90 cfs @ 11.98 hrs HW=1,905.65' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 13.90 cfs @ 4.22 fps)

Summary for Pond 77: 32" Steel Culvert

Inflow Area = 88.881 ac, 1.70% Impervious, Inflow Depth = 2.85" for 10-YEAR event
Inflow = 130.01 cfs @ 12.97 hrs, Volume= 21.133 af
Outflow = 130.01 cfs @ 12.97 hrs, Volume= 21.133 af, Atten= 0%, Lag= 0.0 min
Primary = 51.92 cfs @ 12.97 hrs, Volume= 16.640 af
Secondary = 78.09 cfs @ 12.97 hrs, Volume= 4.493 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,185.06' @ 12.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,180.00'	**32.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 2,180.00' / 2,179.00' S= 0.0250 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,183.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=51.90 cfs @ 12.97 hrs HW=2,185.06' (Free Discharge)
└─**1=Culvert** (Inlet Controls 51.90 cfs @ 9.29 fps)

Secondary OutFlow Max=77.95 cfs @ 12.97 hrs HW=2,185.06' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 77.95 cfs @ 3.79 fps)

Summary for Pond 79: 16" Steel Culvert

Inflow Area =	90.881 ac,	1.66% Impervious, Inflow Depth = 2.85"	for 10-YEAR event
Inflow =	130.41 cfs @	13.01 hrs, Volume=	21.601 af
Outflow =	130.41 cfs @	13.01 hrs, Volume=	21.601 af, Atten= 0%, Lag= 0.0 min
Primary =	19.54 cfs @	13.01 hrs, Volume=	9.968 af
Secondary =	110.87 cfs @	13.01 hrs, Volume=	11.633 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,065.11' @ 13.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,056.00'	**16.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 2,056.00' / 2,055.00' S= 0.0500 '/' Cc= 0.900 n= 0.012
#2	Secondary	2,057.50'	**2.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=19.53 cfs @ 13.01 hrs HW=2,065.11' (Free Discharge)
└─**1=Culvert** (Inlet Controls 19.53 cfs @ 13.99 fps)

Secondary OutFlow Max=110.74 cfs @ 13.01 hrs HW=2,065.11' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 110.74 cfs @ 7.28 fps)

Summary for Pond 83: 24" HPDE Culvert

Inflow Area =	1.300 ac,	0.00% Impervious, Inflow Depth = 2.81"	for 10-YEAR event
Inflow =	4.87 cfs @	12.06 hrs, Volume=	0.304 af
Outflow =	4.87 cfs @	12.06 hrs, Volume=	0.304 af, Atten= 0%, Lag= 0.0 min
Primary =	4.87 cfs @	12.06 hrs, Volume=	0.304 af
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,361.08' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,360.00'	**24.0" Round 24" Plastic Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,360.00' / 2,357.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,364.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=4.85 cfs @ 12.06 hrs HW=2,361.08' (Free Discharge)
└─**1=24" Plastic Culvert** (Inlet Controls 4.85 cfs @ 2.80 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,360.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84: 24" HDPE Pipe

Inflow Area = 31.013 ac, 2.16% Impervious, Inflow Depth = 3.22" for 10-YEAR event
Inflow = 106.20 cfs @ 12.23 hrs, Volume= 8.325 af
Outflow = 106.20 cfs @ 12.23 hrs, Volume= 8.325 af, Atten= 0%, Lag= 0.0 min
Primary = 64.69 cfs @ 12.23 hrs, Volume= 7.434 af
Secondary = 41.51 cfs @ 12.23 hrs, Volume= 0.891 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,322.30' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,315.00'	**36.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,315.00' / 2,312.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,320.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=64.65 cfs @ 12.23 hrs HW=2,322.29' (Free Discharge)
└─**1=Culvert** (Inlet Controls 64.65 cfs @ 9.15 fps)

Secondary OutFlow Max=41.22 cfs @ 12.23 hrs HW=2,322.29' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 41.22 cfs @ 4.50 fps)

Summary for Pond 85: 28" HDPE Pipe

Inflow Area = 4.281 ac, 0.54% Impervious, Inflow Depth = 5.30" for 10-YEAR event
Inflow = 52.58 cfs @ 12.21 hrs, Volume= 1.892 af
Outflow = 52.58 cfs @ 12.21 hrs, Volume= 1.892 af, Atten= 0%, Lag= 0.0 min
Primary = 40.92 cfs @ 12.21 hrs, Volume= 1.765 af
Secondary = 11.65 cfs @ 12.21 hrs, Volume= 0.127 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,301.06' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,295.00'	**30.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,295.00' / 2,292.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,300.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=40.89 cfs @ 12.21 hrs HW=2,301.05' (Free Discharge)
└─**1=Culvert** (Inlet Controls 40.89 cfs @ 8.33 fps)

Secondary OutFlow Max=11.52 cfs @ 12.21 hrs HW=2,301.05' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 11.52 cfs @ 2.74 fps)

Summary for Pond 86: 24" HDPE Pipe

Inflow Area = 4.340 ac, 0.76% Impervious, Inflow Depth = 3.16" for 10-YEAR event
Inflow = 19.66 cfs @ 12.19 hrs, Volume= 1.142 af
Outflow = 19.66 cfs @ 12.19 hrs, Volume= 1.142 af, Atten= 0%, Lag= 0.0 min
Primary = 19.66 cfs @ 12.19 hrs, Volume= 1.142 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,243.71' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,240.00'	**24.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,240.00' / 2,237.00' S= 0.0500 '/' Cc= 0.900 n= 0.011
#2	Secondary	2,245.00'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=19.41 cfs @ 12.19 hrs HW=2,243.64' (Free Discharge)
└─**1=Culvert** (Inlet Controls 19.41 cfs @ 6.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2,240.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 87: 18" Steel Culvert

Inflow Area = 2.000 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 7.10 cfs @ 12.08 hrs, Volume= 0.468 af
Outflow = 7.10 cfs @ 12.08 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min
Primary = 7.10 cfs @ 12.08 hrs, Volume= 0.468 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,209.87' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,208.00'	**18.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 2,208.00' / 2,207.00' S= 0.0167 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=7.05 cfs @ 12.08 hrs HW=2,209.85' (Free Discharge)
└─**1=Culvert** (Inlet Controls 7.05 cfs @ 3.99 fps)

Summary for Pond 90: 24" Steel Culvert

Inflow Area = 9.707 ac, 4.57% Impervious, Inflow Depth = 2.70" for 10-YEAR event
Inflow = 27.22 cfs @ 12.09 hrs, Volume= 2.183 af
Outflow = 27.22 cfs @ 12.09 hrs, Volume= 2.183 af, Atten= 0%, Lag= 0.0 min
Primary = 27.22 cfs @ 12.09 hrs, Volume= 2.183 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,894.24' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,890.00'	**24.0" Round Culvert** L= 25.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,890.00' / 1,889.50' S= 0.0200 '/' Cc= 0.900 n= 0.012
#2	Secondary	1,895.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=27.07 cfs @ 12.09 hrs HW=1,894.20' (Free Discharge)
└─**1=Culvert** (Inlet Controls 27.07 cfs @ 8.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,890.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 122: 18" HDPE Storm

Inflow Area = 0.477 ac, 83.18% Impervious, Inflow Depth = 5.30" for 10-YEAR event
Inflow = 4.37 cfs @ 11.93 hrs, Volume= 0.210 af
Outflow = 4.37 cfs @ 11.93 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min
Primary = 4.37 cfs @ 11.93 hrs, Volume= 0.210 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,947.23' @ 11.93 hrs
Flood Elev= 1,961.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,946.00'	**18.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 1,946.00' / 1,945.89' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,949.33'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.25 cfs @ 11.93 hrs HW=1,947.21' (Free Discharge)
1=Culvert (Barrel Controls 4.25 cfs @ 3.79 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 123: 18" HDPE Storm

Inflow Area = 0.667 ac, 80.73% Impervious, Inflow Depth = 5.23" for 10-YEAR event
Inflow = 6.02 cfs @ 11.92 hrs, Volume= 0.291 af
Outflow = 6.02 cfs @ 11.92 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min
Primary = 6.02 cfs @ 11.92 hrs, Volume= 0.291 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,947.34' @ 11.92 hrs
Flood Elev= 1,961.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,945.89'	**18.0" Round Culvert** L= 124.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,945.89' / 1,945.27' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,949.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.92 cfs @ 11.92 hrs HW=1,947.32' (Free Discharge)
1=Culvert (Barrel Controls 5.92 cfs @ 4.37 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 140: culvert

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.46 cfs @ 11.94 hrs, Volume= 5.410 af
Outflow = 84.46 cfs @ 11.94 hrs, Volume= 5.410 af, Atten= 0%, Lag= 0.0 min
Primary = 84.46 cfs @ 11.94 hrs, Volume= 5.410 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,995.58' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,991.50'	**36.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,991.50' / 1,991.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,995.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=83.93 cfs @ 11.94 hrs HW=1,995.57' (Free Discharge)
1=Culvert (Inlet Controls 54.60 cfs @ 7.72 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 29.33 cfs @ 2.05 fps)

Summary for Pond 141: culvert

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.00 cfs @ 11.94 hrs, Volume= 5.410 af
Outflow = 84.00 cfs @ 11.94 hrs, Volume= 5.410 af, Atten= 0%, Lag= 0.0 min
Primary = 84.00 cfs @ 11.94 hrs, Volume= 5.410 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,980.51' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,976.00'	**36.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,976.00' / 1,975.00' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,980.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=83.71 cfs @ 11.94 hrs HW=1,980.51' (Free Discharge)
1=Culvert (Inlet Controls 59.06 cfs @ 8.36 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 24.65 cfs @ 1.93 fps)

Summary for Pond I18: Manhole

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af
Outflow = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af, Atten= 0%, Lag= 0.0 min
Primary = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,009.95' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,006.00'	**48.0" Round Culvert** L= 304.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,006.00' / 2,000.00' S= 0.0197 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=84.03 cfs @ 11.93 hrs HW=2,009.91' (Free Discharge)
└─**1=Culvert** (Inlet Controls 84.03 cfs @ 6.73 fps)

Summary for Pond I19: Manhole

Inflow Area = 18.217 ac, 27.41% Impervious, Inflow Depth = 3.56" for 10-YEAR event
Inflow = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af
Outflow = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af, Atten= 0%, Lag= 0.0 min
Primary = 84.95 cfs @ 11.93 hrs, Volume= 5.410 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,020.95' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	2,017.00'	**48.0" Round Culvert** L= 348.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,017.00' / 2,006.00' S= 0.0316 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=84.03 cfs @ 11.93 hrs HW=2,020.91' (Free Discharge)
└─**1=Culvert** (Inlet Controls 84.03 cfs @ 6.73 fps)

Summary for Pond I2: 30" HDPE Storm

Inflow Area = 3.692 ac, 57.82% Impervious, Inflow Depth = 4.62" for 10-YEAR event
Inflow = 23.21 cfs @ 11.95 hrs, Volume= 1.420 af
Outflow = 23.21 cfs @ 11.95 hrs, Volume= 1.420 af, Atten= 0%, Lag= 0.0 min
Primary = 23.21 cfs @ 11.95 hrs, Volume= 1.420 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,946.36' @ 11.95 hrs
Flood Elev= 1,955.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,943.90'	**30.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,943.90' / 1,943.00' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=23.02 cfs @ 11.95 hrs HW=1,946.34' (Free Discharge)
└─**1=Culvert** (Barrel Controls 23.02 cfs @ 5.97 fps)

Summary for Pond I22: Manhole- 48" HDPE Storm

Inflow Area = 7.912 ac, 63.11% Impervious, Inflow Depth = 4.79" for 10-YEAR event
Inflow = 60.29 cfs @ 11.95 hrs, Volume= 3.159 af
Outflow = 60.29 cfs @ 11.95 hrs, Volume= 3.159 af, Atten= 0%, Lag= 0.0 min
Primary = 60.29 cfs @ 11.95 hrs, Volume= 3.159 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Peak Elev= 2,173.94' @ 11.95 hrs
Flood Elev= 2,182.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,170.15'	**48.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,170.15' / 2,170.05' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,182.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=59.45 cfs @ 11.95 hrs HW=2,173.91' (Free Discharge)
1=**Culvert** (Barrel Controls 59.45 cfs @ 6.29 fps)
2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I23: Manhole -30" HDPE Storm

Inflow Area =	3.957 ac,	45.04% Impervious, Inflow Depth =	4.33"	for 10-YEAR event
Inflow =	27.81 cfs @	11.94 hrs, Volume=	1.426 af	
Outflow =	27.81 cfs @	11.94 hrs, Volume=	1.426 af,	Atten= 0%, Lag= 0.0 min
Primary =	27.81 cfs @	11.94 hrs, Volume=	1.426 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,186.35' @ 11.94 hrs
Flood Elev= 2,189.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,183.72'	**30.0" Round Culvert** L= 171.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,183.72' / 2,176.64' S= 0.0414 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,189.19'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=27.60 cfs @ 11.94 hrs HW=2,186.33' (Free Discharge)
1=**Culvert** (Inlet Controls 27.60 cfs @ 5.62 fps)
2=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I24: 30" HDPE Storm

Inflow Area =	3.957 ac,	45.04% Impervious, Inflow Depth =	4.33"	for 10-YEAR event
Inflow =	27.81 cfs @	11.94 hrs, Volume=	1.426 af	
Outflow =	27.81 cfs @	11.94 hrs, Volume=	1.426 af,	Atten= 0%, Lag= 0.0 min
Primary =	27.81 cfs @	11.94 hrs, Volume=	1.426 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,191.66' @ 11.94 hrs
Flood Elev= 2,194.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,189.03'	**30.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,189.03' / 2,183.82' S= 0.0827 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,194.48'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=27.60 cfs @ 11.94 hrs HW=2,191.64' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 27.60 cfs @ 5.62 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I25: 30" HDPE Storm

Inflow Area = 3.059 ac, 51.35% Impervious, Inflow Depth = 4.49" for 10-YEAR event
Inflow = 22.03 cfs @ 11.94 hrs, Volume= 1.143 af
Outflow = 22.03 cfs @ 11.94 hrs, Volume= 1.143 af, Atten= 0%, Lag= 0.0 min
Primary = 22.03 cfs @ 11.94 hrs, Volume= 1.143 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,193.62' @ 11.94 hrs
Flood Elev= 2,205.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,191.50'	**30.0" Round Culvert** L= 253.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,191.50' / 2,189.13' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,205.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=21.99 cfs @ 11.94 hrs HW=2,193.62' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 21.99 cfs @ 4.96 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I26: 30" HDPE Storm

Inflow Area = 2.407 ac, 48.55% Impervious, Inflow Depth = 4.42" for 10-YEAR event
Inflow = 18.58 cfs @ 11.93 hrs, Volume= 0.886 af
Outflow = 18.58 cfs @ 11.93 hrs, Volume= 0.886 af, Atten= 0%, Lag= 0.0 min
Primary = 18.58 cfs @ 11.93 hrs, Volume= 0.886 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,194.49' @ 11.93 hrs
Flood Elev= 2,208.54'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,191.80'	**30.0" Round Culvert** L= 201.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,191.80' / 2,191.60' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,195.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.32 cfs @ 11.93 hrs HW=2,194.46' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 18.32 cfs @ 4.36 fps)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I27: 30" HDPE Storm

Inflow Area = 2.129 ac, 53.13% Impervious, Inflow Depth = 4.54" for 10-YEAR event
Inflow = 16.70 cfs @ 11.93 hrs, Volume= 0.805 af
Outflow = 16.70 cfs @ 11.93 hrs, Volume= 0.805 af, Atten= 0%, Lag= 0.0 min
Primary = 16.70 cfs @ 11.93 hrs, Volume= 0.805 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,194.37' @ 11.93 hrs
Flood Elev= 2,208.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,192.00'	**30.0" Round Culvert** L= 98.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,192.00' / 2,191.90' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,208.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=16.45 cfs @ 11.93 hrs HW=2,194.34' (Free Discharge)
1=Culvert (Barrel Controls 16.45 cfs @ 4.46 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I28: 30" HDPE Storm

Inflow Area = 1.459 ac, 77.51% Impervious, Inflow Depth = 5.16" for 10-YEAR event
Inflow = 12.46 cfs @ 11.94 hrs, Volume= 0.628 af
Outflow = 12.46 cfs @ 11.94 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min
Primary = 12.46 cfs @ 11.94 hrs, Volume= 0.628 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,194.40' @ 11.94 hrs
Flood Elev= 2,195.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,192.30'	**30.0" Round Culvert** L= 236.0' Ke= 0.500 Inlet / Outlet Invert= 2,192.30' / 2,192.07' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,197.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=12.32 cfs @ 11.94 hrs HW=2,194.39' (Free Discharge)
1=Culvert (Barrel Controls 12.32 cfs @ 3.80 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I29: Manhole

Inflow Area = 1.039 ac,100.00% Impervious, Inflow Depth = 5.76" for 10-YEAR event
Inflow = 9.65 cfs @ 11.93 hrs, Volume= 0.499 af
Outflow = 9.65 cfs @ 11.93 hrs, Volume= 0.499 af, Atten= 0%, Lag= 0.0 min
Primary = 9.65 cfs @ 11.93 hrs, Volume= 0.499 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,194.22' @ 11.93 hrs
Flood Elev= 2,208.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,192.50'	**30.0" Round Culvert** L= 98.0' Ke= 0.500 Inlet / Outlet Invert= 2,192.50' / 2,192.40' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=9.47 cfs @ 11.93 hrs HW=2,194.20' (Free Discharge)
└─**1=Culvert** (Barrel Controls 9.47 cfs @ 3.76 fps)

Summary for Pond I3: 30" HDPE Storm

Inflow Area = 3.323 ac, 53.14% Impervious, Inflow Depth = 4.49" for 10-YEAR event
Inflow = 21.25 cfs @ 11.97 hrs, Volume= 1.243 af
Outflow = 21.25 cfs @ 11.97 hrs, Volume= 1.243 af, Atten= 0%, Lag= 0.0 min
Primary = 21.25 cfs @ 11.97 hrs, Volume= 1.243 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,947.47' @ 11.97 hrs
Flood Elev= 1,949.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,945.17'	**30.0" Round Culvert** L= 231.0' Ke= 0.500 Inlet / Outlet Invert= 1,945.17' / 1,944.02' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,949.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=21.24 cfs @ 11.97 hrs HW=1,947.47' (Free Discharge)
├─**1=Culvert** (Barrel Controls 21.24 cfs @ 5.88 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I30: 30" HDPE Storm

Inflow Area = 1.039 ac,100.00% Impervious, Inflow Depth = 5.76" for 10-YEAR event
Inflow = 9.65 cfs @ 11.93 hrs, Volume= 0.499 af
Outflow = 9.65 cfs @ 11.93 hrs, Volume= 0.499 af, Atten= 0%, Lag= 0.0 min
Primary = 9.65 cfs @ 11.93 hrs, Volume= 0.499 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,195.78' @ 11.93 hrs
Flood Elev= 2,204.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,194.08'	**30.0" Round Culvert** L= 79.0' Ke= 0.500 Inlet / Outlet Invert= 2,194.08' / 2,194.00' S= 0.0010 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,199.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.47 cfs @ 11.93 hrs HW=2,195.76' (Free Discharge)
├─**1=Culvert** (Barrel Controls 9.47 cfs @ 3.81 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I31: 30" HDPE Storm

Inflow Area = 1.141 ac, 34.78% Impervious, Inflow Depth = 4.01" for 10-YEAR event
Inflow = 8.10 cfs @ 11.95 hrs, Volume= 0.381 af
Outflow = 8.10 cfs @ 11.95 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.0 min
Primary = 8.10 cfs @ 11.95 hrs, Volume= 0.381 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,171.94' @ 11.95 hrs
Flood Elev= 2,180.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,170.50'	**30.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,170.50' / 2,170.35' S= 0.0027 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=7.97 cfs @ 11.95 hrs HW=2,171.93' (Free Discharge)
└─**1=Culvert** (Barrel Controls 7.97 cfs @ 3.96 fps)

Summary for Pond I32: 30" HDPE Storm

Inflow Area = 1.141 ac, 34.78% Impervious, Inflow Depth = 4.01" for 10-YEAR event
Inflow = 8.10 cfs @ 11.95 hrs, Volume= 0.381 af
Outflow = 8.10 cfs @ 11.95 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.0 min
Primary = 8.10 cfs @ 11.95 hrs, Volume= 0.381 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,172.33' @ 11.95 hrs
Flood Elev= 2,180.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,170.85'	**30.0" Round Culvert** L= 119.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,170.85' / 2,170.60' S= 0.0021 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,180.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=7.97 cfs @ 11.95 hrs HW=2,172.32' (Free Discharge)
├─**1=Culvert** (Barrel Controls 7.97 cfs @ 3.82 fps)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond I33: 24" HDPE Storm

Inflow Area = 0.677 ac, 30.81% Impervious, Inflow Depth = 3.88" for 10-YEAR event
Inflow = 4.65 cfs @ 11.96 hrs, Volume= 0.219 af
Outflow = 4.65 cfs @ 11.96 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 4.65 cfs @ 11.96 hrs, Volume= 0.219 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 2,172.52' @ 11.96 hrs
Flood Elev= 2,175.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	2,171.30'	**24.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,171.30' / 2,170.95' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	2,175.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.58 cfs @ 11.96 hrs HW=2,172.51' (Free Discharge)
1=Culvert (Barrel Controls 4.58 cfs @ 3.30 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond I4: 15" HDPE Storm

Inflow Area = 0.369 ac,100.00% Impervious, Inflow Depth = 5.76" for 10-YEAR event
Inflow = 3.62 cfs @ 11.90 hrs, Volume= 0.177 af
Outflow = 3.62 cfs @ 11.90 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Primary = 3.62 cfs @ 11.90 hrs, Volume= 0.177 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,952.51' @ 11.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,951.50'	**15.0" Round Culvert** L= 140.0' Ke= 0.500 Inlet / Outlet Invert= 1,951.50' / 1,950.00' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.50 cfs @ 11.90 hrs HW=1,952.48' (Free Discharge)
1=Culvert (Inlet Controls 3.50 cfs @ 3.38 fps)

Summary for Pond I6: Manhole

Inflow Area = 8.896 ac, 31.70% Impervious, Inflow Depth = 3.10" for 10-YEAR event
Inflow = 19.76 cfs @ 12.20 hrs, Volume= 2.300 af
Outflow = 19.76 cfs @ 12.20 hrs, Volume= 2.300 af, Atten= 0%, Lag= 0.0 min
Primary = 19.76 cfs @ 12.20 hrs, Volume= 2.300 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,954.70' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,952.50'	**36.0" Round Culvert** L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,952.50' / 1,952.00' S= 0.0027 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=19.73 cfs @ 12.20 hrs HW=1,954.70' (Free Discharge)
└─**1=Culvert** (Barrel Controls 19.73 cfs @ 4.96 fps)

Pond Summaries
1, 10 & 100-yr Storm Events

Summary for Pond 6P: Overflow Basin @ 8 tee

Inflow	=	0.28 cfs @ 13.50 hrs, Volume=	0.029 af
Outflow	=	0.00 cfs @ 0.00 hrs, Volume=	0.000 af, Atten= 100%, Lag= 0.0 min
Primary	=	0.00 cfs @ 0.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,961.36' @ 16.05 hrs Surf.Area= 3,823 sf Storage= 1,251 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	1,961.00'	25,500 cf	**surface storage (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,961.00	3,100	0	0
1,962.00	5,100	4,100	4,100
1,963.00	6,100	5,600	9,700
1,964.00	8,250	7,175	16,875
1,965.00	9,000	8,625	25,500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,962.50'	**36.0" Round Culvert** L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,962.50' / 1,958.00' S= 0.0310 '/' Cc= 0.900 n= 0.010 PVC, smooth interior

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,961.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond A1: A1 - OPEN SWALE

Inflow Area	=	1.159 ac, 7.80% Impervious, Inflow Depth = 0.69"	for 1-YEAR event
Inflow	=	1.12 cfs @ 12.04 hrs, Volume=	0.067 af
Outflow	=	0.03 cfs @ 17.21 hrs, Volume=	0.063 af, Atten= 97%, Lag= 310.4 min
Primary	=	0.03 cfs @ 17.21 hrs, Volume=	0.063 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,909.33' @ 17.21 hrs Surf.Area= 1,975 sf Storage= 1,653 cf

Plug-Flow detention time= 573.1 min calculated for 0.063 af (94% of inflow)
Center-of-Mass det. time= 540.6 min (1,420.3 - 879.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,904.50'	186 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc)
			464 cf Overall x 40.0% Voids
#2	1,905.50'	139 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc)
			928 cf Overall x 15.0% Voids
#3	1,907.50'	2,803 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,128 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,904.50	464	0	0
1,905.50	464	464	464

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,905.50	464	0	0
1,907.50	464	928	928

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,907.50	464	0	0
1,908.00	567	258	258
1,910.00	1,291	1,858	2,116
1,910.50	1,457	687	2,803

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,904.50'	**1.000 in/hr Exfiltration over Surface area above 1,904.50'**
			Excluded Surface area = 464 sf
#2	Primary	1,904.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,910.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.03 cfs @ 17.21 hrs HW=1,909.33' (Free Discharge)
↑—**2=Orifice/Grate** (Passes 0.03 cfs of 2.02 cfs potential flow)
  ↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond A2: A2 - OPEN SWALE

Inflow Area = 1.621 ac, 6.50% Impervious, Inflow Depth = 0.60" for 1-YEAR event
Inflow = 0.31 cfs @ 12.05 hrs, Volume= 0.082 af
Outflow = 0.04 cfs @ 19.27 hrs, Volume= 0.079 af, Atten= 86%, Lag= 433.6 min
Primary = 0.04 cfs @ 19.27 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,907.00' @ 19.27 hrs Surf.Area= 1,427 sf Storage= 1,019 cf

Plug-Flow detention time= 491.8 min calculated for 0.079 af (96% of inflow)

Center-of-Mass det. time= 455.6 min (1,756.2 - 1,300.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,902.50'	134 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 336 cf Overall x 40.0% Voids
#2	1,903.50'	101 cf	**FILTER BED (Prismatic)** Listed below (Recalc) 672 cf Overall x 15.0% Voids
#3	1,905.50'	2,316 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		2,551 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,902.50	336	0	0
1,903.50	336	336	336

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,903.50	336	0	0
1,905.50	336	672	672

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,905.50	336	0	0
1,906.00	428	191	191
1,908.00	1,080	1,508	1,699
1,908.50	1,386	617	2,316

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,902.50'	**1.000 in/hr Exfiltration over Surface area above 1,902.50'** Excluded Surface area = 336 sf
#2	Primary	1,902.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,907.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.03 cfs @ 19.27 hrs HW=1,907.00' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.03 cfs of 1.95 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.12 fps)

Summary for Pond A3: A3 - OPEN SWALE

Inflow Area = 2.379 ac, 6.95% Impervious, Inflow Depth = 0.54" for 1-YEAR event
Inflow = 0.41 cfs @ 12.05 hrs, Volume= 0.107 af
Outflow = 0.03 cfs @ 24.50 hrs, Volume= 0.103 af, Atten= 92%, Lag= 747.2 min
Primary = 0.03 cfs @ 24.50 hrs, Volume= 0.103 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,904.86' @ 24.50 hrs Surf.Area= 1,930 sf Storage= 1,296 cf

Plug-Flow detention time= 511.9 min calculated for 0.103 af (96% of inflow)
Center-of-Mass det. time= 451.8 min (1,981.7 - 1,529.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,900.50'	206 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 514 cf Overall x 40.0% Voids
#2	1,901.50'	154 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc) 1,028 cf Overall x 15.0% Voids
#3	1,903.50'	2,895 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,255 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,900.50	514	0	0
1,901.50	514	514	514

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,901.50	514	0	0
1,903.50	514	1,028	1,028

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,903.50	514	0	0
1,904.00	613	282	282
1,906.00	1,283	1,896	2,178
1,906.50	1,585	717	2,895

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,900.50'	**1.000 in/hr Exfiltration over Surface area above 1,900.50'** Excluded Surface area = 514 sf
#2	Primary	1,900.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,905.50'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.03 cfs @ 24.50 hrs HW=1,904.86' (Free Discharge)
2=Orifice/Grate (Passes 0.03 cfs of 1.92 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.03 cfs)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond A4: A4 - OPEN SWALE

Inflow Area = 2.923 ac, 6.68% Impervious, Inflow Depth = 0.50" for 1-YEAR event
Inflow = 0.26 cfs @ 12.05 hrs, Volume= 0.122 af
Outflow = 0.03 cfs @ 34.55 hrs, Volume= 0.119 af, Atten= 88%, Lag= 1,349.9 min
Primary = 0.03 cfs @ 34.55 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,903.50' @ 34.55 hrs Surf.Area= 1,504 sf Storage= 1,365 cf

Plug-Flow detention time= 678.2 min calculated for 0.119 af (98% of inflow)
Center-of-Mass det. time= 640.4 min (2,455.5 - 1,815.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,898.50'	137 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc)
			343 cf Overall x 40.0% Voids
#2	1,899.50'	103 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc)
			686 cf Overall x 15.0% Voids
#3	1,901.50'	2,105 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		2,345 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,898.50	343	0	0
1,899.50	343	343	343

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.50	343	0	0
1,901.50	343	686	686

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,901.50	343	0	0
1,902.00	425	192	192
1,904.00	949	1,374	1,566
1,904.50	1,207	539	2,105

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,898.50'	**1.000 in/hr Exfiltration over Surface area above 1,898.50'**
			Excluded Surface area = 343 sf
#2	Primary	1,898.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,903.50'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.03 cfs @ 34.55 hrs HW=1,903.50' (Free Discharge)
2=**Orifice/Grate** (Passes 0.03 cfs of 2.06 cfs potential flow)
1=**Exfiltration** (Exfiltration Controls 0.03 cfs)
3=**Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.05 fps)

Summary for Pond A5: A5 - OPEN SWALE

Inflow Area = 4.411 ac, 6.47% Impervious, Inflow Depth = 0.51" for 1-YEAR event
Inflow = 1.11 cfs @ 12.04 hrs, Volume= 0.189 af
Outflow = 0.04 cfs @ 24.12 hrs, Volume= 0.186 af, Atten= 96%, Lag= 724.5 min
Primary = 0.04 cfs @ 24.12 hrs, Volume= 0.186 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,901.83' @ 24.12 hrs Surf.Area= 2,138 sf Storage= 2,295 cf

Plug-Flow detention time= 715.4 min calculated for 0.186 af (98% of inflow)
Center-of-Mass det. time= 676.7 min (2,551.5 - 1,874.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,896.50'	138 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 346 cf Overall x 40.0% Voids
#2	1,897.50'	104 cf	**FILTER BED (Prismatic)** Listed below (Recalc) 692 cf Overall x 15.0% Voids
#3	1,899.50'	3,125 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,367 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,896.50	346	0	0
1,897.50	346	346	346

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,897.50	346	0	0
1,899.50	346	692	692

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.50	346	0	0
1,900.00	550	224	224
1,902.00	1,528	2,078	2,302
1,902.50	1,764	823	3,125

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,896.50'	**1.000 in/hr Exfiltration over Surface area above 1,896.50'** Excluded Surface area = 346 sf
#2	Primary	1,896.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,902.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07
3.20 3.32

Primary OutFlow Max=0.04 cfs @ 24.12 hrs HW=1,901.83' (Free Discharge)
↑—**2=Orifice/Grate** (Passes 0.04 cfs of 2.13 cfs potential flow)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,896.50' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B: OPEN SWALE

Inflow Area = 3.361 ac, 5.72% Impervious, Inflow Depth = 0.57" for 1-YEAR event
Inflow = 2.31 cfs @ 12.06 hrs, Volume= 0.158 af
Outflow = 0.10 cfs @ 16.01 hrs, Volume= 0.145 af, Atten= 96%, Lag= 236.9 min
Primary = 0.10 cfs @ 16.01 hrs, Volume= 0.145 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,867.10' @ 16.01 hrs Surf.Area= 5,940 sf Storage= 3,465 cf

Plug-Flow detention time= 419.0 min calculated for 0.145 af (91% of inflow)
Center-of-Mass det. time= 375.2 min (1,269.3 - 894.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,863.00'	595 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 1,488 cf Overall x 40.0% Voids
#2	1,864.00'	446 cf	**filter media (Prismatic)** Listed below (Recalc) 2,976 cf Overall x 15.0% Voids
#3	1,866.00'	8,167 cf	**surface storage (Prismatic)** Listed below (Recalc)
		9,209 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,863.00	1,488	0	0
1,864.00	1,488	1,488	1,488

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,864.00	1,488	0	0
1,866.00	1,488	2,976	2,976

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,866.00	1,488	0	0
1,867.00	2,798	2,143	2,143
1,868.00	4,500	3,649	5,792
1,868.50	5,000	2,375	8,167

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,863.00'	**1.000 in/hr Exfiltration over Surface area above 1,863.00'** Excluded Surface area = 1,488 sf
#2	Primary	1,863.00'	**6.0" Vert. culvert** C= 0.600
#3	Primary	1,868.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.10 cfs @ 16.01 hrs HW=1,867.10' (Free Discharge)
2=**culvert** (Passes 0.10 cfs of 1.85 cfs potential flow)
1=**Exfiltration** (Exfiltration Controls 0.10 cfs)
3=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B1: bioretention @ 8 tee

Inflow Area =	10.459 ac,	5.58% Impervious, Inflow Depth =	0.49"	for 1-YEAR event
Inflow =	3.84 cfs @	12.22 hrs, Volume=	0.426 af	
Outflow =	0.60 cfs @	13.50 hrs, Volume=	0.426 af,	Atten= 84%, Lag= 77.2 min
Primary =	0.33 cfs @	13.50 hrs, Volume=	0.397 af	
Secondary =	0.28 cfs @	13.50 hrs, Volume=	0.029 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,965.55' @ 13.50 hrs Surf.Area= 14,102 sf Storage= 7,126 cf

Plug-Flow detention time= 274.7 min calculated for 0.426 af (100% of inflow)
Center-of-Mass det. time= 274.8 min (1,188.9 - 914.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,960.00'	1,800 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 4,500 cf Overall x 40.0% Voids
#2	1,961.00'	2,700 cf	**filter media (Prismatic)** Listed below (Recalc) 18,000 cf Overall x 15.0% Voids
#3	1,965.00'	12,150 cf	**surface storage (Prismatic)** Listed below (Recalc)
		16,650 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,960.00	4,500	0	0
1,961.00	4,500	4,500	4,500

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,961.00	4,500	0	0
1,965.00	4,500	18,000	18,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,965.00	4,500	0	0
1,966.00	5,600	5,050	5,050
1,967.00	8,600	7,100	12,150

Device	Routing	Invert	Outlet Devices
#1	Primary	1,960.00'	**12.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,960.00' / 1,958.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	1,960.00'	**1.000 in/hr Exfiltration over Surface area**
#3	Secondary	1,965.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.33 cfs @ 13.50 hrs HW=1,965.55' (Free Discharge)
└─**1=Culvert** (Passes 0.33 cfs of 8.50 cfs potential flow)
  └─**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Secondary OutFlow Max=0.24 cfs @ 13.50 hrs HW=1,965.55' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.24 cfs @ 0.52 fps)

Summary for Pond B3: bioretention @ blvd

Inflow Area = 5.445 ac, 51.78% Impervious, Inflow Depth = 1.49" for 1-YEAR event
Inflow = 10.09 cfs @ 12.09 hrs, Volume= 0.677 af
Outflow = 0.82 cfs @ 13.10 hrs, Volume= 0.677 af, Atten= 92%, Lag= 61.0 min
Primary = 0.82 cfs @ 13.10 hrs, Volume= 0.677 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,959.25' @ 13.10 hrs Surf.Area= 35,540 sf Storage= 14,769 cf

Plug-Flow detention time= 245.2 min calculated for 0.677 af (100% of inflow)
Center-of-Mass det. time= 245.6 min (1,080.4 - 834.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,954.00'	4,700 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 11,750 cf Overall x 40.0% Voids
#2	1,955.00'	7,050 cf	**filter media (Prismatic)** Listed below (Recalc) 47,000 cf Overall x 15.0% Voids
#3	1,959.00'	26,092 cf	**surface storage (Prismatic)** Listed below (Recalc)
		37,842 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,954.00	11,750	0	0
1,955.00	11,750	11,750	11,750

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,955.00	11,750	0	0
1,959.00	11,750	47,000	47,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,959.00	11,750	0	0
1,960.00	12,892	12,321	12,321
1,961.00	14,650	13,771	26,092

Device	Routing	Invert	Outlet Devices
#1	Primary	1,954.00'	**21.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,954.00' / 1,953.00' S= 0.0118 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	1,954.00'	**1.000 in/hr Exfiltration over Surface area**
#3	Device 1	1,959.50'	**12.0" Horiz. Orifice/Grate X 6.00** C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,960.50'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.82 cfs @ 13.10 hrs HW=1,959.25' (Free Discharge)
└─**1=Culvert** (Passes 0.82 cfs of 24.23 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.82 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,954.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond F1: Open Swale-F

Inflow Area = 2.052 ac, 7.70% Impervious, Inflow Depth = 0.57" for 1-YEAR event
Inflow = 1.75 cfs @ 12.01 hrs, Volume= 0.097 af
Outflow = 0.06 cfs @ 15.87 hrs, Volume= 0.090 af, Atten= 96%, Lag= 231.6 min
Primary = 0.06 cfs @ 15.87 hrs, Volume= 0.090 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,894.55' @ 15.87 hrs Surf.Area= 3,561 sf Storage= 2,092 cf

Plug-Flow detention time= 406.9 min calculated for 0.090 af (93% of inflow)
Center-of-Mass det. time= 369.4 min (1,259.2 - 889.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,890.50'	317 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 792 cf Overall x 40.0% Voids
#2	1,891.50'	238 cf	**Filter Bed (Prismatic)** Listed below 1,584 cf Overall x 15.0% Voids
#3	1,893.50'	6,962 cf	**surface storage (Prismatic)** Listed below (Recalc)
		7,516 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,890.50	792	0	0
1,891.50	792	792	792

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,891.50	792	0	0
1,893.50	792	1,584	1,584

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,893.50	792	0	0
1,894.00	1,526	580	580
1,896.00	3,175	4,701	5,281
1,896.50	3,550	1,681	6,962

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,890.50'	**1.000 in/hr Exfiltration over Surface area above 1,890.50'** Excluded Surface area = 792 sf
#2	Primary	1,890.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,895.50'	**75.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.06 cfs @ 15.87 hrs HW=1,894.55' (Free Discharge)
2=Orifice/Grate (Passes 0.06 cfs of 1.84 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.06 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,890.50' (Free Discharge)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond FIP: FOREBAY

Inflow Area = 18.401 ac, 27.13% Impervious, Inflow Depth = 1.12" for 1-YEAR event
Inflow = 22.35 cfs @ 12.08 hrs, Volume= 1.712 af
Outflow = 22.24 cfs @ 12.09 hrs, Volume= 1.483 af, Atten= 0%, Lag= 0.2 min
Primary = 22.24 cfs @ 12.09 hrs, Volume= 1.483 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,940.73' @ 12.09 hrs Surf.Area= 5,006 sf Storage= 11,077 cf

Plug-Flow detention time= 106.4 min calculated for 1.483 af (87% of inflow)
Center-of-Mass det. time= 39.0 min (863.0 - 824.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,937.50'	15,249 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,937.50	1,937	0	0
1,938.00	2,369	1,077	1,077
1,940.00	4,256	6,625	7,702
1,940.50	4,764	2,255	9,957
1,941.50	5,821	5,293	15,249

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.50'	**75.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=22.16 cfs @ 12.09 hrs HW=1,940.73' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 22.16 cfs @ 1.29 fps)

Summary for Pond G: OPEN SWALE

Inflow Area = 3.700 ac, 7.39% Impervious, Inflow Depth = 0.45" for 1-YEAR event
Inflow = 2.15 cfs @ 12.03 hrs, Volume= 0.140 af
Outflow = 0.20 cfs @ 13.26 hrs, Volume= 0.139 af, Atten= 91%, Lag= 73.8 min
Primary = 0.20 cfs @ 13.26 hrs, Volume= 0.139 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,902.03' @ 13.26 hrs Surf.Area= 8,644 sf Storage= 2,080 cf

Plug-Flow detention time= 202.0 min calculated for 0.139 af (100% of inflow)
Center-of-Mass det. time= 201.5 min (1,107.3 - 905.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,899.00'	1,146 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 2,865 cf Overall x 40.0% Voids
#2	1,900.00'	860 cf	**filter media (Prismatic)** Listed below (Recalc) 5,730 cf Overall x 15.0% Voids
#3	1,902.00'	12,721 cf	**surface storage (Prismatic)** Listed below (Recalc)
		14,726 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.00	2,865	0	0
1,900.00	2,865	2,865	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,900.00	2,865	0	0
1,902.00	2,865	5,730	5,730

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,902.00	2,865	0	0
1,903.00	4,783	3,824	3,824
1,904.00	6,154	5,469	9,293
1,904.50	7,558	3,428	12,721

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,899.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,899.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,903.50'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.20 cfs @ 13.26 hrs HW=1,902.03' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.20 cfs of 1.58 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,899.00' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IP: P2

Inflow Area = 45.186 ac, 28.04% Impervious, Inflow Depth = 1.01" for 1-YEAR event
Inflow = 45.93 cfs @ 12.01 hrs, Volume= 3.790 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,940.38' @ 95.82 hrs Surf.Area= 78,250 sf Storage= 165,092 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	1,938.00'	463,648 cf	**Storage above Perm Pool (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,938.00	56,286	1,229.0	0	0	56,286
1,939.00	70,553	1,304.0	63,285	63,285	71,457
1,940.00	74,969	1,432.0	72,750	136,035	99,359
1,942.00	93,060	2,050.0	167,703	303,739	270,635
1,942.25	97,168	2,034.0	23,777	327,515	275,860
1,943.00	111,843	1,898.0	78,315	405,830	318,440
1,943.50	119,472	1,918.0	57,818	463,648	324,588

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.40'	**18.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,940.40' / 1,937.00' S= 0.0262 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,943.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,938.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: Overflow Basin @ 8 tee

Inflow = 24.51 cfs @ 12.23 hrs, Volume= 1.689 af
Outflow = 16.95 cfs @ 12.40 hrs, Volume= 1.534 af, Atten= 31%, Lag= 10.5 min
Primary = 16.95 cfs @ 12.40 hrs, Volume= 1.534 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,964.12' @ 12.40 hrs Surf.Area= 8,343 sf Storage= 17,905 cf

Plug-Flow detention time= 78.6 min calculated for 1.533 af (91% of inflow)
Center-of-Mass det. time= 37.4 min (871.4 - 834.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,961.00'	25,500 cf	**surface storage (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,961.00	3,100	0	0
1,962.00	5,100	4,100	4,100
1,963.00	6,100	5,600	9,700
1,964.00	8,250	7,175	16,875
1,965.00	9,000	8,625	25,500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,962.50'	**36.0" Round Culvert** L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,962.50' / 1,958.00' S= 0.0310 '/' Cc= 0.900 n= 0.010 PVC, smooth interior

Primary OutFlow Max=16.89 cfs @ 12.40 hrs HW=1,964.12' (Free Discharge)
└─**1=Culvert** (Inlet Controls 16.89 cfs @ 4.33 fps)

Summary for Pond A1: A1 - OPEN SWALE

Inflow Area = 1.159 ac, 7.80% Impervious, Inflow Depth = 2.99" for 10-YEAR event
Inflow = 5.24 cfs @ 12.02 hrs, Volume= 0.289 af
Outflow = 5.16 cfs @ 12.04 hrs, Volume= 0.286 af, Atten= 1%, Lag= 0.9 min
Primary = 5.16 cfs @ 12.04 hrs, Volume= 0.286 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,910.25' @ 12.04 hrs Surf.Area= 2,302 sf Storage= 2,776 cf

Plug-Flow detention time= 249.2 min calculated for 0.285 af (99% of inflow)
Center-of-Mass det. time= 242.1 min (1,076.6 - 834.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,904.50'	186 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 464 cf Overall x 40.0% Voids
#2	1,905.50'	139 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc) 928 cf Overall x 15.0% Voids
#3	1,907.50'	2,803 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,128 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,904.50	464	0	0
1,905.50	464	464	464

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,905.50	464	0	0
1,907.50	464	928	928

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,907.50	464	0	0
1,908.00	567	258	258
1,910.00	1,291	1,858	2,116
1,910.50	1,457	687	2,803

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,904.50'	**1.000 in/hr Exfiltration over Surface area above 1,904.50'** Excluded Surface area = 464 sf
#2	Primary	1,904.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,910.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=5.08 cfs @ 12.04 hrs HW=1,910.25' (Free Discharge)
├─**2=Orifice/Grate** (Passes 0.04 cfs of 2.22 cfs potential flow)
│ └─**1=Exfiltration** (Exfiltration Controls 0.04 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.04 cfs @ 1.35 fps)

Summary for Pond A2: A2 - OPEN SWALE

Inflow Area = 1.621 ac, 6.50% Impervious, Inflow Depth = 2.83" for 10-YEAR event
Inflow = 6.91 cfs @ 12.04 hrs, Volume= 0.383 af
Outflow = 6.88 cfs @ 12.04 hrs, Volume= 0.379 af, Atten= 0%, Lag= 0.5 min
Primary = 6.88 cfs @ 12.04 hrs, Volume= 0.379 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,907.31' @ 12.04 hrs Surf.Area= 1,526 sf Storage= 1,263 cf

Plug-Flow detention time= 144.4 min calculated for 0.379 af (99% of inflow)

Center-of-Mass det. time= 127.8 min (1,145.8 - 1,018.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,902.50'	134 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 336 cf Overall x 40.0% Voids
#2	1,903.50'	101 cf	**FILTER BED (Prismatic)** Listed below (Recalc) 672 cf Overall x 15.0% Voids
#3	1,905.50'	2,316 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		2,551 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,902.50	336	0	0
1,903.50	336	336	336

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,903.50	336	0	0
1,905.50	336	672	672

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,905.50	336	0	0
1,906.00	428	191	191
1,908.00	1,080	1,508	1,699
1,908.50	1,386	617	2,316

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,902.50'	**1.000 in/hr Exfiltration over Surface area above 1,902.50'** Excluded Surface area = 336 sf
#2	Primary	1,902.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,907.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=6.73 cfs @ 12.04 hrs HW=1,907.30' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.03 cfs of 2.02 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 6.71 cfs @ 1.48 fps)

Summary for Pond A3: A3 - OPEN SWALE

Inflow Area = 2.379 ac, 6.95% Impervious, Inflow Depth = 2.69" for 10-YEAR event
Inflow = 9.62 cfs @ 12.04 hrs, Volume= 0.533 af
Outflow = 9.39 cfs @ 12.05 hrs, Volume= 0.529 af, Atten= 2%, Lag= 0.9 min
Primary = 9.39 cfs @ 12.05 hrs, Volume= 0.529 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,905.81' @ 12.05 hrs Surf.Area= 2,247 sf Storage= 2,299 cf

Plug-Flow detention time= 204.9 min calculated for 0.529 af (99% of inflow)
Center-of-Mass det. time= 186.1 min (1,246.0 - 1,059.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,900.50'	206 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 514 cf Overall x 40.0% Voids
#2	1,901.50'	154 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc) 1,028 cf Overall x 15.0% Voids
#3	1,903.50'	2,895 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,255 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,900.50	514	0	0
1,901.50	514	514	514

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,901.50	514	0	0
1,903.50	514	1,028	1,028

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,903.50	514	0	0
1,904.00	613	282	282
1,906.00	1,283	1,896	2,178
1,906.50	1,585	717	2,895

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,900.50'	**1.000 in/hr Exfiltration over Surface area above 1,900.50'** Excluded Surface area = 514 sf
#2	Primary	1,900.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,905.50'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=9.26 cfs @ 12.05 hrs HW=1,905.81' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.04 cfs of 2.13 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.04 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 9.22 cfs @ 1.50 fps)

Summary for Pond A4: A4 - OPEN SWALE

Inflow Area = 2.923 ac, 6.68% Impervious, Inflow Depth = 2.61" for 10-YEAR event
Inflow = 11.23 cfs @ 12.05 hrs, Volume= 0.636 af
Outflow = 11.46 cfs @ 12.07 hrs, Volume= 0.631 af, Atten= 0%, Lag= 1.2 min
Primary = 11.46 cfs @ 12.07 hrs, Volume= 0.631 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,903.86' @ 12.07 hrs Surf.Area= 1,597 sf Storage= 1,672 cf

Plug-Flow detention time= 184.7 min calculated for 0.631 af (99% of inflow)
Center-of-Mass det. time= 165.8 min (1,345.6 - 1,179.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,898.50'	137 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 343 cf Overall x 40.0% Voids
#2	1,899.50'	103 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc) 686 cf Overall x 15.0% Voids
#3	1,901.50'	2,105 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		2,345 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,898.50	343	0	0
1,899.50	343	343	343

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.50	343	0	0
1,901.50	343	686	686

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,901.50	343	0	0
1,902.00	425	192	192
1,904.00	949	1,374	1,566
1,904.50	1,207	539	2,105

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,898.50'	**1.000 in/hr Exfiltration over Surface area above 1,898.50'** Excluded Surface area = 343 sf
#2	Primary	1,898.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,903.50'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=10.68 cfs @ 12.07 hrs HW=1,903.84' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.03 cfs of 2.13 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 10.65 cfs @ 1.58 fps)

Summary for Pond A5: A5 - OPEN SWALE

Inflow Area =	4.411 ac,	6.47% Impervious,	Inflow Depth = 2.63"	for 10-YEAR event	
Inflow =	16.91 cfs @	12.07 hrs,	Volume=	0.967 af	
Outflow =	16.31 cfs @	12.07 hrs,	Volume=	0.966 af,	Atten= 4%, Lag= 0.3 min
Primary =	0.05 cfs @	12.07 hrs,	Volume=	0.242 af	
Secondary =	16.27 cfs @	12.07 hrs,	Volume=	0.723 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,902.25' @ 12.07 hrs Surf.Area= 2,339 sf Storage= 2,945 cf

Plug-Flow detention time= 199.1 min calculated for 0.965 af (100% of inflow)
Center-of-Mass det. time= 192.6 min (1,363.0 - 1,170.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,896.50'	138 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 346 cf Overall x 40.0% Voids
#2	1,897.50'	104 cf	**FILTER BED (Prismatic)** Listed below (Recalc) 692 cf Overall x 15.0% Voids
#3	1,899.50'	3,125 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,367 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,896.50	346	0	0
1,897.50	346	346	346

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,897.50	346	0	0
1,899.50	346	692	692

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.50	346	0	0
1,900.00	550	224	224
1,902.00	1,528	2,078	2,302
1,902.50	1,764	823	3,125

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,896.50'	**1.000 in/hr Exfiltration over Surface area above 1,896.50'** Excluded Surface area = 346 sf
#2	Primary	1,896.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,902.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07
3.20 3.32

Primary OutFlow Max=0.05 cfs @ 12.07 hrs HW=1,902.24' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.05 cfs of 2.22 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=15.47 cfs @ 12.07 hrs HW=1,902.24' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 15.47 cfs @ 1.26 fps)

Summary for Pond B: OPEN SWALE

Inflow Area = 3.361 ac, 5.72% Impervious, Inflow Depth = 2.71" for 10-YEAR event
Inflow = 12.83 cfs @ 12.05 hrs, Volume= 0.760 af
Outflow = 11.91 cfs @ 12.09 hrs, Volume= 0.746 af, Atten= 7%, Lag= 2.6 min
Primary = 11.91 cfs @ 12.09 hrs, Volume= 0.746 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,868.29' @ 12.09 hrs Surf.Area= 7,761 sf Storage= 8,158 cf

Plug-Flow detention time= 248.1 min calculated for 0.746 af (98% of inflow)
Center-of-Mass det. time= 237.3 min (1,080.6 - 843.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,863.00'	595 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 1,488 cf Overall x 40.0% Voids
#2	1,864.00'	446 cf	**filter media (Prismatic)** Listed below (Recalc) 2,976 cf Overall x 15.0% Voids
#3	1,866.00'	8,167 cf	**surface storage (Prismatic)** Listed below (Recalc)
		9,209 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,863.00	1,488	0	0
1,864.00	1,488	1,488	1,488

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,864.00	1,488	0	0
1,866.00	1,488	2,976	2,976

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,866.00	1,488	0	0
1,867.00	2,798	2,143	2,143
1,868.00	4,500	3,649	5,792
1,868.50	5,000	2,375	8,167

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,863.00'	**1.000 in/hr Exfiltration over Surface area above 1,863.00'** Excluded Surface area = 1,488 sf
#2	Primary	1,863.00'	**6.0" Vert. culvert** C= 0.600
#3	Primary	1,868.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=11.87 cfs @ 12.09 hrs HW=1,868.28' (Free Discharge)
└**2=culvert** (Passes 0.15 cfs of 2.12 cfs potential flow)
  └**1=Exfiltration** (Exfiltration Controls 0.15 cfs)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 11.73 cfs @ 1.37 fps)

Summary for Pond B1: bioretention @ 8 tee

Inflow Area = 10.459 ac, 5.58% Impervious, Inflow Depth = 2.53" for 10-YEAR event
Inflow = 26.12 cfs @ 12.18 hrs, Volume= 2.205 af
Outflow = 24.88 cfs @ 12.23 hrs, Volume= 2.205 af, Atten= 5%, Lag= 3.2 min
Primary = 0.37 cfs @ 12.23 hrs, Volume= 0.516 af
Secondary = 24.51 cfs @ 12.23 hrs, Volume= 1.689 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,966.44' @ 12.23 hrs Surf.Area= 15,932 sf Storage= 12,332 cf

Plug-Flow detention time= 77.4 min calculated for 2.205 af (100% of inflow)
Center-of-Mass det. time= 77.7 min (936.2 - 858.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,960.00'	1,800 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 4,500 cf Overall x 40.0% Voids
#2	1,961.00'	2,700 cf	**filter media (Prismatic)** Listed below (Recalc) 18,000 cf Overall x 15.0% Voids
#3	1,965.00'	12,150 cf	**surface storage (Prismatic)** Listed below (Recalc)
		16,650 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,960.00	4,500	0	0
1,961.00	4,500	4,500	4,500

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,961.00	4,500	0	0
1,965.00	4,500	18,000	18,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,965.00	4,500	0	0
1,966.00	5,600	5,050	5,050
1,967.00	8,600	7,100	12,150

Device	Routing	Invert	Outlet Devices
#1	Primary	1,960.00'	**12.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,960.00' / 1,958.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	1,960.00'	**1.000 in/hr Exfiltration over Surface area**
#3	Secondary	1,965.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.37 cfs @ 12.23 hrs HW=1,966.44' (Free Discharge)
└─1=**Culvert** (Passes 0.37 cfs of 9.22 cfs potential flow)
  └─2=**Exfiltration** (Exfiltration Controls 0.37 cfs)

Secondary OutFlow Max=24.43 cfs @ 12.23 hrs HW=1,966.44' (Free Discharge)
└─3=**Broad-Crested Rectangular Weir** (Weir Controls 24.43 cfs @ 2.59 fps)

Summary for Pond B3: bioretention @ blvd

Inflow Area = 5.445 ac, 51.78% Impervious, Inflow Depth = 4.41" for 10-YEAR event
Inflow = 29.02 cfs @ 12.08 hrs, Volume= 2.001 af
Outflow = 19.76 cfs @ 12.20 hrs, Volume= 2.002 af, Atten= 32%, Lag= 7.2 min
Primary = 19.76 cfs @ 12.20 hrs, Volume= 2.002 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,960.20' @ 12.20 hrs Surf.Area= 36,735 sf Storage= 26,622 cf

Plug-Flow detention time= 162.9 min calculated for 2.000 af (100% of inflow)
Center-of-Mass det. time= 163.7 min (967.8 - 804.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,954.00'	4,700 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 11,750 cf Overall x 40.0% Voids
#2	1,955.00'	7,050 cf	**filter media (Prismatic)** Listed below (Recalc) 47,000 cf Overall x 15.0% Voids
#3	1,959.00'	26,092 cf	**surface storage (Prismatic)** Listed below (Recalc)
		37,842 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,954.00	11,750	0	0
1,955.00	11,750	11,750	11,750

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,955.00	11,750	0	0
1,959.00	11,750	47,000	47,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,959.00	11,750	0	0
1,960.00	12,892	12,321	12,321
1,961.00	14,650	13,771	26,092

Device	Routing	Invert	Outlet Devices
#1	Primary	1,954.00'	**21.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,954.00' / 1,953.00' S= 0.0118 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	1,954.00'	**1.000 in/hr Exfiltration over Surface area**
#3	Device 1	1,959.50'	**12.0" Horiz. Orifice/Grate X 6.00** C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,960.50'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=19.73 cfs @ 12.20 hrs HW=1,960.19' (Free Discharge)
└─**1=Culvert** (Passes 19.73 cfs of 26.71 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.85 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 18.88 cfs @ 4.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,954.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond F1: Open Swale-F

Inflow Area = 2.052 ac, 7.70% Impervious, Inflow Depth = 2.71" for 10-YEAR event
Inflow = 9.31 cfs @ 11.99 hrs, Volume= 0.464 af
Outflow = 9.23 cfs @ 12.01 hrs, Volume= 0.459 af, Atten= 1%, Lag= 0.7 min
Primary = 0.08 cfs @ 12.01 hrs, Volume= 0.179 af
Secondary = 9.15 cfs @ 12.01 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,895.63' @ 12.01 hrs Surf.Area= 4,450 sf Storage= 4,704 cf

Plug-Flow detention time= 258.2 min calculated for 0.458 af (99% of inflow)
Center-of-Mass det. time= 251.8 min (1,090.7 - 838.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,890.50'	317 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 792 cf Overall x 40.0% Voids
#2	1,891.50'	238 cf	**Filter Bed (Prismatic)** Listed below 1,584 cf Overall x 15.0% Voids
#3	1,893.50'	6,962 cf	**surface storage (Prismatic)** Listed below (Recalc)
		7,516 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,890.50	792	0	0
1,891.50	792	792	792

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,891.50	792	0	0
1,893.50	792	1,584	1,584

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,893.50	792	0	0
1,894.00	1,526	580	580
1,896.00	3,175	4,701	5,281
1,896.50	3,550	1,681	6,962

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,890.50'	**1.000 in/hr Exfiltration over Surface area above 1,890.50'** Excluded Surface area = 792 sf
#2	Primary	1,890.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,895.50'	**75.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.08 cfs @ 12.01 hrs HW=1,895.62' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.08 cfs of 2.09 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=8.82 cfs @ 12.01 hrs HW=1,895.62' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 8.82 cfs @ 0.95 fps)

Summary for Pond FIP: FOREBAY

Inflow Area = 18.401 ac, 27.13% Impervious, Inflow Depth = 3.59" for 10-YEAR event
Inflow = 84.13 cfs @ 11.96 hrs, Volume= 5.498 af
Outflow = 83.52 cfs @ 11.97 hrs, Volume= 5.269 af, Atten= 1%, Lag= 0.4 min
Primary = 83.52 cfs @ 11.97 hrs, Volume= 5.269 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,941.05' @ 11.97 hrs Surf.Area= 5,343 sf Storage= 12,727 cf

Plug-Flow detention time= 44.4 min calculated for 5.269 af (96% of inflow)
Center-of-Mass det. time= 19.4 min (823.2 - 803.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,937.50'	15,249 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,937.50	1,937	0	0
1,938.00	2,369	1,077	1,077
1,940.00	4,256	6,625	7,702
1,940.50	4,764	2,255	9,957
1,941.50	5,821	5,293	15,249

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.50'	**75.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=83.33 cfs @ 11.97 hrs HW=1,941.05' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 83.33 cfs @ 2.03 fps)

Summary for Pond G: OPEN SWALE

Inflow Area = 3.700 ac, 7.39% Impervious, Inflow Depth = 2.44" for 10-YEAR event
Inflow = 14.22 cfs @ 12.01 hrs, Volume= 0.752 af
Outflow = 11.86 cfs @ 12.07 hrs, Volume= 0.753 af, Atten= 17%, Lag= 3.7 min
Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.440 af
Secondary = 11.60 cfs @ 12.07 hrs, Volume= 0.313 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,903.70' @ 12.07 hrs Surf.Area= 11,477 sf Storage= 9,531 cf

Plug-Flow detention time= 250.0 min calculated for 0.752 af (100% of inflow)
Center-of-Mass det. time= 252.0 min (1,099.4 - 847.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,899.00'	1,146 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 2,865 cf Overall x 40.0% Voids
#2	1,900.00'	860 cf	**filter media (Prismatic)** Listed below (Recalc) 5,730 cf Overall x 15.0% Voids
#3	1,902.00'	12,721 cf	**surface storage (Prismatic)** Listed below (Recalc)
		14,726 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.00	2,865	0	0
1,900.00	2,865	2,865	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,900.00	2,865	0	0
1,902.00	2,865	5,730	5,730

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,902.00	2,865	0	0
1,903.00	4,783	3,824	3,824
1,904.00	6,154	5,469	9,293
1,904.50	7,558	3,428	12,721

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,899.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,899.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,903.50'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.27 cfs @ 12.07 hrs HW=1,903.69' (Free Discharge)
2=Orifice/Grate (Passes 0.27 cfs of 1.99 cfs potential flow)
1=Exfiltration (Exfiltration Controls 0.27 cfs)

Secondary OutFlow Max=10.68 cfs @ 12.07 hrs HW=1,903.69' (Free Discharge)
3=Broad-Crested Rectangular Weir (Weir Controls 10.68 cfs @ 1.11 fps)

Summary for Pond IP: P2

Inflow Area = 45.186 ac, 28.04% Impervious, Inflow Depth = 3.47" for 10-YEAR event
Inflow = 167.75 cfs @ 11.98 hrs, Volume= 13.051 af
Outflow = 9.18 cfs @ 13.90 hrs, Volume= 9.123 af, Atten= 95%, Lag= 115.0 min
Primary = 9.18 cfs @ 13.90 hrs, Volume= 9.123 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,942.32' @ 13.90 hrs Surf.Area= 98,399 sf Storage= 333,873 cf

Plug-Flow detention time= 544.1 min calculated for 9.123 af (70% of inflow)
Center-of-Mass det. time= 414.5 min (1,268.3 - 853.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,938.00'	463,648 cf	**Storage above Perm Pool (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,938.00	56,286	1,229.0	0	0	56,286
1,939.00	70,553	1,304.0	63,285	63,285	71,457
1,940.00	74,969	1,432.0	72,750	136,035	99,359
1,942.00	93,060	2,050.0	167,703	303,739	270,635
1,942.25	97,168	2,034.0	23,777	327,515	275,860
1,943.00	111,843	1,898.0	78,315	405,830	318,440
1,943.50	119,472	1,918.0	57,818	463,648	324,588

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.40'	**18.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,940.40' / 1,937.00' S= 0.0262 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,943.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.18 cfs @ 13.90 hrs HW=1,942.32' (Free Discharge)
├─**1=Culvert** (Inlet Controls 9.18 cfs @ 5.20 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Overflow Basin @ 8 tee

Inflow	=	41.05 cfs @	12.22 hrs, Volume=	3.047 af	
Outflow	=	33.80 cfs @	12.34 hrs, Volume=	2.892 af,	Atten= 18%, Lag= 7.3 min
Primary	=	33.80 cfs @	12.34 hrs, Volume=	2.892 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,965.00' @ 12.34 hrs Surf.Area= 8,997 sf Storage= 25,460 cf

Plug-Flow detention time= 53.4 min calculated for 2.891 af (95% of inflow)
Center-of-Mass det. time= 26.2 min (859.9 - 833.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,961.00'	25,500 cf	**surface storage (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,961.00	3,100	0	0
1,962.00	5,100	4,100	4,100
1,963.00	6,100	5,600	9,700
1,964.00	8,250	7,175	16,875
1,965.00	9,000	8,625	25,500

Device	Routing	Invert	Outlet Devices
#1	Primary	1,962.50'	**36.0" Round Culvert** L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,962.50' / 1,958.00' S= 0.0310 '/' Cc= 0.900 n= 0.010 PVC, smooth interior

Primary OutFlow Max=33.72 cfs @ 12.34 hrs HW=1,964.99' (Free Discharge)
└─**1=Culvert** (Inlet Controls 33.72 cfs @ 5.37 fps)

Summary for Pond A1: A1 - OPEN SWALE

Inflow Area	=	1.159 ac,	7.80% Impervious, Inflow Depth =	4.69"	for 100-YEAR event
Inflow	=	8.15 cfs @	12.02 hrs, Volume=	0.453 af	
Outflow	=	8.05 cfs @	12.03 hrs, Volume=	0.449 af,	Atten= 1%, Lag= 0.6 min
Primary	=	8.05 cfs @	12.03 hrs, Volume=	0.449 af	

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,910.34' @ 12.03 hrs Surf.Area= 2,331 sf Storage= 2,896 cf

Plug-Flow detention time= 164.6 min calculated for 0.449 af (99% of inflow)
Center-of-Mass det. time= 158.8 min (980.4 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,904.50'	186 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc)
			464 cf Overall x 40.0% Voids
#2	1,905.50'	139 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc)
			928 cf Overall x 15.0% Voids
#3	1,907.50'	2,803 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,128 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,904.50	464	0	0
1,905.50	464	464	464

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,905.50	464	0	0
1,907.50	464	928	928

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,907.50	464	0	0
1,908.00	567	258	258
1,910.00	1,291	1,858	2,116
1,910.50	1,457	687	2,803

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,904.50'	**1.000 in/hr Exfiltration over Surface area above 1,904.50'**
			Excluded Surface area = 464 sf
#2	Primary	1,904.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,910.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=8.01 cfs @ 12.03 hrs HW=1,910.34' (Free Discharge)
- **2=Orifice/Grate** (Passes 0.04 cfs of 2.23 cfs potential flow)
  - **1=Exfiltration** (Exfiltration Controls 0.04 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 7.97 cfs @ 1.57 fps)

Summary for Pond A2: A2 - OPEN SWALE

Inflow Area = 1.621 ac, 6.50% Impervious, Inflow Depth = 4.50" for 100-YEAR event
Inflow = 10.92 cfs @ 12.03 hrs, Volume= 0.608 af
Outflow = 10.83 cfs @ 12.04 hrs, Volume= 0.605 af, Atten= 1%, Lag= 0.3 min
Primary = 10.83 cfs @ 12.04 hrs, Volume= 0.605 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,907.41' @ 12.04 hrs Surf.Area= 1,560 sf Storage= 1,355 cf

Plug-Flow detention time= 88.1 min calculated for 0.605 af (100% of inflow)

Center-of-Mass det. time= 80.6 min (1,022.3 - 941.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,902.50'	134 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 336 cf Overall x 40.0% Voids
#2	1,903.50'	101 cf	**FILTER BED (Prismatic)** Listed below (Recalc) 672 cf Overall x 15.0% Voids
#3	1,905.50'	2,316 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		2,551 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,902.50	336	0	0
1,903.50	336	336	336

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,903.50	336	0	0
1,905.50	336	672	672

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,905.50	336	0	0
1,906.00	428	191	191
1,908.00	1,080	1,508	1,699
1,908.50	1,386	617	2,316

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,902.50'	**1.000 in/hr Exfiltration over Surface area above 1,902.50'** Excluded Surface area = 336 sf
#2	Primary	1,902.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,907.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=10.75 cfs @ 12.04 hrs HW=1,907.41' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.03 cfs of 2.04 cfs potential flow)
 └─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 10.72 cfs @ 1.74 fps)

Summary for Pond A3: A3 - OPEN SWALE

Inflow Area = 2.379 ac, 6.95% Impervious, Inflow Depth = 4.33" for 100-YEAR event
Inflow = 15.39 cfs @ 12.03 hrs, Volume= 0.858 af
Outflow = 15.26 cfs @ 12.04 hrs, Volume= 0.852 af, Atten= 1%, Lag= 0.4 min
Primary = 15.26 cfs @ 12.04 hrs, Volume= 0.852 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,905.93' @ 12.04 hrs Surf.Area= 2,286 sf Storage= 2,444 cf

Plug-Flow detention time= 134.8 min calculated for 0.852 af (99% of inflow)
Center-of-Mass det. time= 117.1 min (1,084.0 - 966.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,900.50'	206 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc)
			514 cf Overall x 40.0% Voids
#2	1,901.50'	154 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc)
			1,028 cf Overall x 15.0% Voids
#3	1,903.50'	2,895 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,255 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,900.50	514	0	0
1,901.50	514	514	514

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,901.50	514	0	0
1,903.50	514	1,028	1,028

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,903.50	514	0	0
1,904.00	613	282	282
1,906.00	1,283	1,896	2,178
1,906.50	1,585	717	2,895

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,900.50'	**1.000 in/hr Exfiltration over Surface area above 1,900.50'**
			Excluded Surface area = 514 sf
#2	Primary	1,900.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,905.50'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=15.10 cfs @ 12.04 hrs HW=1,905.92' (Free Discharge)
↑**2=Orifice/Grate** (Passes 0.04 cfs of 2.15 cfs potential flow)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)
3=Broad-Crested Rectangular Weir (Weir Controls 15.06 cfs @ 1.77 fps)

Summary for Pond A4: A4 - OPEN SWALE

Inflow Area = 2.923 ac, 6.68% Impervious, Inflow Depth = 4.22" for 100-YEAR event
Inflow = 18.43 cfs @ 12.04 hrs, Volume= 1.029 af
Outflow = 18.30 cfs @ 12.04 hrs, Volume= 1.025 af, Atten= 1%, Lag= 0.3 min
Primary = 18.30 cfs @ 12.04 hrs, Volume= 1.025 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,903.98' @ 12.04 hrs Surf.Area= 1,630 sf Storage= 1,789 cf

Plug-Flow detention time= 111.6 min calculated for 1.025 af (100% of inflow)
Center-of-Mass det. time= 102.1 min (1,143.6 - 1,041.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,898.50'	137 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 343 cf Overall x 40.0% Voids
#2	1,899.50'	103 cf	**FILTER MEDIA (Prismatic)** Listed below (Recalc) 686 cf Overall x 15.0% Voids
#3	1,901.50'	2,105 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		2,345 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,898.50	343	0	0
1,899.50	343	343	343

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.50	343	0	0
1,901.50	343	686	686

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,901.50	343	0	0
1,902.00	425	192	192
1,904.00	949	1,374	1,566
1,904.50	1,207	539	2,105

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,898.50'	**1.000 in/hr Exfiltration over Surface area above 1,898.50'** Excluded Surface area = 343 sf
#2	Primary	1,898.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	1,903.50'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=18.12 cfs @ 12.04 hrs HW=1,903.98' (Free Discharge)
└**2=Orifice/Grate** (Passes 0.03 cfs of 2.16 cfs potential flow)
 └**1=Exfiltration** (Exfiltration Controls 0.03 cfs)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 18.09 cfs @ 1.89 fps)

Summary for Pond A5: A5 - OPEN SWALE

Inflow Area = 4.411 ac, 6.47% Impervious, Inflow Depth = 4.26" for 100-YEAR event
Inflow = 27.95 cfs @ 12.03 hrs, Volume= 1.564 af
Outflow = 27.77 cfs @ 12.04 hrs, Volume= 1.562 af, Atten= 1%, Lag= 0.2 min
Primary = 0.05 cfs @ 12.04 hrs, Volume= 0.245 af
Secondary = 27.72 cfs @ 12.04 hrs, Volume= 1.317 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,902.36' @ 12.04 hrs Surf.Area= 2,388 sf Storage= 3,119 cf

Plug-Flow detention time= 124.9 min calculated for 1.562 af (100% of inflow)
Center-of-Mass det. time= 120.3 min (1,155.2 - 1,034.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,896.50'	138 cf	**STONE UNDERDRAIN (Prismatic)** Listed below (Recalc) 346 cf Overall x 40.0% Voids
#2	1,897.50'	104 cf	**FILTER BED (Prismatic)** Listed below (Recalc) 692 cf Overall x 15.0% Voids
#3	1,899.50'	3,125 cf	**SURFACE STORAGE (Prismatic)** Listed below (Recalc)
		3,367 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,896.50	346	0	0
1,897.50	346	346	346

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,897.50	346	0	0
1,899.50	346	692	692

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.50	346	0	0
1,900.00	550	224	224
1,902.00	1,528	2,078	2,302
1,902.50	1,764	823	3,125

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,896.50'	**1.000 in/hr Exfiltration over Surface area above 1,896.50'** Excluded Surface area = 346 sf
#2	Primary	1,896.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,902.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50

3.00 3.50
Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07
3.20 3.32

Primary OutFlow Max=0.05 cfs @ 12.04 hrs HW=1,902.35' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.05 cfs of 2.24 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Secondary OutFlow Max=27.42 cfs @ 12.04 hrs HW=1,902.35' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 27.42 cfs @ 1.55 fps)

Summary for Pond B: OPEN SWALE

Inflow Area = 3.361 ac, 5.72% Impervious, Inflow Depth = 4.35" for 100-YEAR event
Inflow = 20.59 cfs @ 12.04 hrs, Volume= 1.218 af
Outflow = 20.21 cfs @ 12.06 hrs, Volume= 1.204 af, Atten= 2%, Lag= 1.1 min
Primary = 20.21 cfs @ 12.06 hrs, Volume= 1.204 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,868.40' @ 12.06 hrs Surf.Area= 7,879 sf Storage= 8,730 cf

Plug-Flow detention time= 158.3 min calculated for 1.204 af (99% of inflow)
Center-of-Mass det. time= 151.4 min (981.1 - 829.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,863.00'	595 cf	**stone underdrain (Prismatic)** Listed below (Recalc)
			1,488 cf Overall x 40.0% Voids
#2	1,864.00'	446 cf	**filter media (Prismatic)** Listed below (Recalc)
			2,976 cf Overall x 15.0% Voids
#3	1,866.00'	8,167 cf	**surface storage (Prismatic)** Listed below (Recalc)
		9,209 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,863.00	1,488	0	0
1,864.00	1,488	1,488	1,488

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,864.00	1,488	0	0
1,866.00	1,488	2,976	2,976

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,866.00	1,488	0	0
1,867.00	2,798	2,143	2,143
1,868.00	4,500	3,649	5,792
1,868.50	5,000	2,375	8,167

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,863.00'	**1.000 in/hr Exfiltration over Surface area above 1,863.00'** Excluded Surface area = 1,488 sf
#2	Primary	1,863.00'	**6.0" Vert. culvert** C= 0.600
#3	Primary	1,868.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=20.18 cfs @ 12.06 hrs HW=1,868.40' (Free Discharge)
—**2=culvert** (Passes 0.15 cfs of 2.15 cfs potential flow)
—**1=Exfiltration** (Exfiltration Controls 0.15 cfs)
—**3=Broad-Crested Rectangular Weir** (Weir Controls 20.04 cfs @ 1.66 fps)

Summary for Pond B1: bioretention @ 8 tee

Inflow Area = 10.459 ac, 5.58% Impervious, Inflow Depth = 4.12" for 100-YEAR event
Inflow = 43.23 cfs @ 12.17 hrs, Volume= 3.592 af
Outflow = 41.45 cfs @ 12.22 hrs, Volume= 3.592 af, Atten= 4%, Lag= 3.0 min
Primary = 0.40 cfs @ 12.22 hrs, Volume= 0.545 af
Secondary = 41.05 cfs @ 12.22 hrs, Volume= 3.047 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,966.84' @ 12.22 hrs Surf.Area= 17,110 sf Storage= 15,284 cf

Plug-Flow detention time= 51.3 min calculated for 3.591 af (100% of inflow)
Center-of-Mass det. time= 51.6 min (895.9 - 844.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,960.00'	1,800 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 4,500 cf Overall x 40.0% Voids
#2	1,961.00'	2,700 cf	**filter media (Prismatic)** Listed below (Recalc) 18,000 cf Overall x 15.0% Voids
#3	1,965.00'	12,150 cf	**surface storage (Prismatic)** Listed below (Recalc)
		16,650 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,960.00	4,500	0	0
1,961.00	4,500	4,500	4,500

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,961.00	4,500	0	0
1,965.00	4,500	18,000	18,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,965.00	4,500	0	0
1,966.00	5,600	5,050	5,050
1,967.00	8,600	7,100	12,150

Device	Routing	Invert	Outlet Devices
#1	Primary	1,960.00'	**12.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,960.00' / 1,958.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	1,960.00'	**1.000 in/hr Exfiltration over Surface area**
#3	Secondary	1,965.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.40 cfs @ 12.22 hrs HW=1,966.83' (Free Discharge)
└─**1=Culvert** (Passes 0.40 cfs of 9.52 cfs potential flow)
  └─**2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Secondary OutFlow Max=40.91 cfs @ 12.22 hrs HW=1,966.83' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 40.91 cfs @ 3.07 fps)

Summary for Pond B3: bioretention @ blvd

Inflow Area = 5.445 ac, 51.78% Impervious, Inflow Depth = 6.33" for 100-YEAR event
Inflow = 40.93 cfs @ 12.08 hrs, Volume= 2.873 af
Outflow = 31.27 cfs @ 12.18 hrs, Volume= 2.873 af, Atten= 24%, Lag= 6.0 min
Primary = 25.63 cfs @ 12.18 hrs, Volume= 2.816 af
Secondary = 5.65 cfs @ 12.18 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,960.69' @ 12.18 hrs Surf.Area= 37,606 sf Storage= 33,393 cf

Plug-Flow detention time= 135.5 min calculated for 2.873 af (100% of inflow)
Center-of-Mass det. time= 135.0 min (929.1 - 794.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,954.00'	4,700 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 11,750 cf Overall x 40.0% Voids
#2	1,955.00'	7,050 cf	**filter media (Prismatic)** Listed below (Recalc) 47,000 cf Overall x 15.0% Voids
#3	1,959.00'	26,092 cf	**surface storage (Prismatic)** Listed below (Recalc)
		37,842 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,954.00	11,750	0	0
1,955.00	11,750	11,750	11,750

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,955.00	11,750	0	0
1,959.00	11,750	47,000	47,000

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,959.00	11,750	0	0
1,960.00	12,892	12,321	12,321
1,961.00	14,650	13,771	26,092

Device	Routing	Invert	Outlet Devices
#1	Primary	1,954.00'	**21.0" Round Culvert** L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,954.00' / 1,953.00' S= 0.0118 '/' Cc= 0.900 n= 0.010 PVC, smooth interior
#2	Device 1	1,954.00'	**1.000 in/hr Exfiltration over Surface area**
#3	Device 1	1,959.50'	**12.0" Horiz. Orifice/Grate X 6.00** C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,960.50'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.62 cfs @ 12.18 hrs HW=1,960.69' (Free Discharge)
└─**1=Culvert** (Passes 25.62 cfs of 27.93 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.87 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 24.75 cfs @ 5.25 fps)

Secondary OutFlow Max=5.53 cfs @ 12.18 hrs HW=1,960.69' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Weir Controls 5.53 cfs @ 1.17 fps)

Summary for Pond F1: Open Swale-F

Inflow Area = 2.052 ac, 7.70% Impervious, Inflow Depth = 4.35" for 100-YEAR event
Inflow = 14.84 cfs @ 11.99 hrs, Volume= 0.744 af
Outflow = 14.69 cfs @ 12.00 hrs, Volume= 0.738 af, Atten= 1%, Lag= 0.3 min
Primary = 0.09 cfs @ 12.00 hrs, Volume= 0.184 af
Secondary = 14.60 cfs @ 12.00 hrs, Volume= 0.553 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,895.67' @ 12.00 hrs Surf.Area= 4,489 sf Storage= 4,840 cf

Plug-Flow detention time= 165.4 min calculated for 0.738 af (99% of inflow)
Center-of-Mass det. time= 160.5 min (985.8 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,890.50'	317 cf	**Stone Underdrain (Prismatic)** Listed below (Recalc) 792 cf Overall x 40.0% Voids
#2	1,891.50'	238 cf	**Filter Bed (Prismatic)** Listed below 1,584 cf Overall x 15.0% Voids
#3	1,893.50'	6,962 cf	**surface storage (Prismatic)** Listed below (Recalc)
		7,516 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,890.50	792	0	0
1,891.50	792	792	792

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,891.50	792	0	0
1,893.50	792	1,584	1,584

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,893.50	792	0	0
1,894.00	1,526	580	580
1,896.00	3,175	4,701	5,281
1,896.50	3,550	1,681	6,962

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,890.50'	**1.000 in/hr Exfiltration over Surface area above 1,890.50'** Excluded Surface area = 792 sf
#2	Primary	1,890.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,895.50'	**75.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.09 cfs @ 12.00 hrs HW=1,895.67' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.09 cfs of 2.10 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Secondary OutFlow Max=14.42 cfs @ 12.00 hrs HW=1,895.67' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 14.42 cfs @ 1.12 fps)

Summary for Pond FIP: FOREBAY

Inflow Area = 18.401 ac, 27.13% Impervious, Inflow Depth = 5.34" for 100-YEAR event
Inflow = 124.88 cfs @ 11.97 hrs, Volume= 8.181 af
Outflow = 124.17 cfs @ 11.98 hrs, Volume= 7.953 af, Atten= 1%, Lag= 0.3 min
Primary = 124.17 cfs @ 11.98 hrs, Volume= 7.953 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,941.20' @ 11.98 hrs Surf.Area= 5,508 sf Storage= 13,572 cf

Plug-Flow detention time= 32.3 min calculated for 7.953 af (97% of inflow)
Center-of-Mass det. time= 14.9 min (810.8 - 795.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,937.50'	15,249 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,937.50	1,937	0	0
1,938.00	2,369	1,077	1,077
1,940.00	4,256	6,625	7,702
1,940.50	4,764	2,255	9,957
1,941.50	5,821	5,293	15,249

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.50'	**75.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=123.44 cfs @ 11.98 hrs HW=1,941.20' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 123.44 cfs @ 2.35 fps)

Summary for Pond G: OPEN SWALE

Inflow Area = 3.700 ac, 7.39% Impervious, Inflow Depth = 4.01" for 100-YEAR event
Inflow = 23.42 cfs @ 12.01 hrs, Volume= 1.236 af
Outflow = 22.96 cfs @ 12.02 hrs, Volume= 1.235 af, Atten= 2%, Lag= 0.9 min
Primary = 0.27 cfs @ 12.02 hrs, Volume= 0.476 af
Secondary = 22.69 cfs @ 12.02 hrs, Volume= 0.758 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs / 2
Peak Elev= 1,903.81' @ 12.02 hrs Surf.Area= 11,628 sf Storage= 10,173 cf

Plug-Flow detention time= 169.1 min calculated for 1.234 af (100% of inflow)
Center-of-Mass det. time= 168.9 min (1,001.9 - 833.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,899.00'	1,146 cf	**stone underdrain (Prismatic)** Listed below (Recalc) 2,865 cf Overall x 40.0% Voids
#2	1,900.00'	860 cf	**filter media (Prismatic)** Listed below (Recalc) 5,730 cf Overall x 15.0% Voids
#3	1,902.00'	12,721 cf	**surface storage (Prismatic)** Listed below (Recalc)
		14,726 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,899.00	2,865	0	0
1,900.00	2,865	2,865	2,865

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,900.00	2,865	0	0
1,902.00	2,865	5,730	5,730

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,902.00	2,865	0	0
1,903.00	4,783	3,824	3,824
1,904.00	6,154	5,469	9,293
1,904.50	7,558	3,428	12,721

Device	Routing	Invert	Outlet Devices
#1	Device 2	1,899.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	1,899.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,903.50'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.27 cfs @ 12.02 hrs HW=1,903.81' (Free Discharge)
└─**2=Orifice/Grate** (Passes 0.27 cfs of 2.02 cfs potential flow)
  └─**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Secondary OutFlow Max=22.42 cfs @ 12.02 hrs HW=1,903.81' (Free Discharge)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 22.42 cfs @ 1.44 fps)

Summary for Pond IP: P2

Inflow Area = 45.186 ac, 28.04% Impervious, Inflow Depth = 5.25" for 100-YEAR event
Inflow = 263.71 cfs @ 11.99 hrs, Volume= 19.768 af
Outflow = 35.97 cfs @ 12.62 hrs, Volume= 15.838 af, Atten= 86%, Lag= 37.9 min
Primary = 35.97 cfs @ 12.62 hrs, Volume= 15.838 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1,943.49' @ 12.62 hrs Surf.Area= 119,270 sf Storage= 462,096 cf

Plug-Flow detention time= 440.9 min calculated for 15.838 af (80% of inflow)
Center-of-Mass det. time= 341.6 min (1,178.4 - 836.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,938.00'	463,648 cf	**Storage above Perm Pool (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,938.00	56,286	1,229.0	0	0	56,286
1,939.00	70,553	1,304.0	63,285	63,285	71,457
1,940.00	74,969	1,432.0	72,750	136,035	99,359
1,942.00	93,060	2,050.0	167,703	303,739	270,635
1,942.25	97,168	2,034.0	23,777	327,515	275,860
1,943.00	111,843	1,898.0	78,315	405,830	318,440
1,943.50	119,472	1,918.0	57,818	463,648	324,588

Device	Routing	Invert	Outlet Devices
#1	Primary	1,940.40'	**18.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,940.40' / 1,937.00' S= 0.0262 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Primary	1,943.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=35.93 cfs @ 12.62 hrs HW=1,943.49' (Free Discharge)
├─**1=Culvert** (Inlet Controls 13.01 cfs @ 7.36 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 22.92 cfs @ 1.88 fps)

Design Point Summary
1-yr Storm Event

Design Point Totals
10, 25 & 100-yr Storm Events

Summary for Pond DP 10: Design Point 10

Inflow Area = 157.341 ac, 1.75% Impervious, Inflow Depth = 0.64" for 1-YEAR event
Inflow = 42.75 cfs @ 11.94 hrs, Volume= 8.340 af
Primary = 42.75 cfs @ 11.94 hrs, Volume= 8.340 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 11: Design Point 11

Inflow Area = 89.648 ac, 16.86% Impervious, Inflow Depth = 0.31" for 1-YEAR event
Inflow = 16.06 cfs @ 12.05 hrs, Volume= 2.309 af
Primary = 16.06 cfs @ 12.05 hrs, Volume= 2.309 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 12: Design Point 12

Inflow Area = 5.266 ac, 20.67% Impervious, Inflow Depth = 0.94" for 1-YEAR event
Inflow = 7.22 cfs @ 11.93 hrs, Volume= 0.411 af
Primary = 7.22 cfs @ 11.93 hrs, Volume= 0.411 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Summary for Pond DP 16: Design Point 16 24" CMP

Inflow Area = 18.370 ac, 7.89% Impervious, Inflow Depth = 0.58" for 1-YEAR event
Inflow = 5.55 cfs @ 12.20 hrs, Volume= 0.886 af
Primary = 5.55 cfs @ 12.20 hrs, Volume= 0.886 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 10: Design Point 10 Inflow=211.67 cfs 37.655 af
Primary=211.67 cfs 37.655 af

Pond DP 11: Design Point 11 Inflow=72.97 cfs 19.678 af
Primary=72.97 cfs 19.678 af

Pond DP 12: Design Point 12 Inflow=28.05 cfs 1.521 af
Primary=28.05 cfs 1.521 af

Pond DP 16: Design Point 16 24" CMP Inflow=31.46 cfs 4.090 af
Primary=31.46 cfs 4.090 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 10: Design Point 10 Inflow=243.46 cfs 42.980 af
Primary=243.46 cfs 42.980 af

Pond DP 11: Design Point 11 Inflow=89.12 cfs 22.823 af
Primary=89.12 cfs 22.823 af

Pond DP 12: Design Point 12 Inflow=31.56 cfs 1.713 af
Primary=31.56 cfs 1.713 af

Pond DP 16: Design Point 16 24" CMP Inflow=38.99 cfs 4.700 af
Primary=38.99 cfs 4.700 af

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond DP 10: Design Point 10 Inflow=343.05 cfs 59.609 af
Primary=343.05 cfs 59.609 af

Pond DP 11: Design Point 11 Inflow=146.19 cfs 32.571 af
Primary=146.19 cfs 32.571 af

Pond DP 12: Design Point 12 Inflow=42.25 cfs 2.306 af
Primary=42.25 cfs 2.306 af

Pond DP 16: Design Point 16 24" CMP Inflow=61.92 cfs 6.611 af
Primary=61.92 cfs 6.611 af

APPENDIX H

Soil Test Pit Logs

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Soil Test Pit Summary

Deep hole test pits and percolation tests were performed on the site in the Fall of 2000, by certified soil scientist, Roger J. Case of the LA Group. Subsequent deep hole test pits and percolation tests were conducted by Roger in September 2002 at Wildacres, and November, 2007 on the Highmount parcel. The summary below includes only the test pits located on the properties that make up the 'Modified Project', specifically Wildacres and Highmount.

November, 2000

These deep soil test pits observations were made November 2000. Present at the time were Roger Case, soil scientist, cpss, cpsc, LA Group and representatives from the New York City DEP.

Test pit WA119:

Oe horizon: 0 to 2 inches, black (10YR2/1) mucky silt loam duff layer
E horizon: 2 to 3 inches, light gray (10YR7/2) gravelly silt loam
Bw1 horizon: 3 to 10 inches, (5YR4/6) yellowish red channery* silt loam with common small flagstones.
Bw2 horizon: 10 to 16 inches, brown (7.5YR 4/4) very channery silt loam with common flagstones of varying sizes.
Bw3 horizon: 16 to 38 inches, firm, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones.
Bx horizon**: 38 to 72 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones.
R horizon: 72+ fractured sandstone and silt stone over hard bedrock.

*channers are elongated thin gravel fragments derived from shale and silt and sandstone, as opposed to typical gravel which is rounded or at least irregularly shaped.
**The Bx horizon designates the beginning of the fragipan.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious. A deep "perc" test exceeded one hour.
Percolation rate @ 26 inches is: 5 minutes 35 seconds (5:35)
Soil Series: Lewbeach

Test pit WA120:

Oe horizon: 0 to 1 inches, black (10YR2/1) mucky silt loam duff layer
E horizon: 1 to 2 inches, light gray (10YR7/2) gravelly silt loam (discontinuous)
Bw1 horizon: 2 to 12 inches, (7.5YR6/8) reddish yellow channery silt loam with common small flagstones.
Bw2 horizon: 12 to 24 inches, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones of varying sizes.
Bx horizon: 24 to 54 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones.
R horizon: 54+ fractured sandstone and silt stone over hard bedrock.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious.
Percolation rate @ 22 inches is: 7 minutes 45 seconds (7:45)
Soil Series: Lewbeach

Test pit WA122:

Ap horizon: 0 to 5 inches, dark brown (10YR3/3) very channery silt loam, with common flagstones and boulders.
Bw1 horizon: 5 to 19 inches, brown (7.5YR4/4) very channery silt loam with common flagstones.
Bw2 horizon: 19 to 34 inches, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones of varying sizes.
Bx horizon: 34 to 58 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones and boulders.
Cd horizon: 58 to 84 inches, very firm layers of sand and gravel.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious.
Percolation rate @ 18 inches is: 9 minutes 30 seconds (9:30)
Soil Series: Lewbeach

Test pit WA Pond 3:

Oe horizon: 0 to 4 inches, black (10YR2/1) mucky silt loam duff layer
E horizon: 4 to 6 inches, light gray (10YR7/2) gravelly silt loam
Bw1 horizon: 6 to 16 inches, (7.5YR 6/8) reddish yellowish very channery fine sandy loam with common small boulders.
Bw2 horizon: 16 to 26 inches, yellowish brown (10YR 5/4) very channery fine sandy loam with some small boulders.
Bx horizon: 26 to 42 inches, very firm, grayish brown (2.5Y 5/2) very bouldery loam
Cd horizon: 42 to 86+ inches, very firm, brown (2.5Y 5/2) very channery loam.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious. This location was investigated as a future location for pond construction, no percolation test was run. These impervious hardpan soils should make successful ponds.
Soil Series: Lewbeach

Test pit WA117001:

Oe horizon: 0 to 2 inches, black (10YR2/1) mucky silt loam duff layer
Bw1 horizon: 2 to 10 inches, (10YR 6/8) brownish yellowish channery loam.
Bw2 horizon: 10 to 24 inches, brown (7.5YR 6/4) very channery loam.
Bx horizon: 24 to 48 inches, very firm, brown (7.5YR 4/4) very channery silt loam with a few small boulders.
C horizon: 48 to 84 inches, firm, brown (7.5YR 6/4) very gravelly sandy loam.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious. This test pit was excavated to confirm soil mapping. The test pit confirms the map unit for Lewbeach soils which are deep, well drained soils formed in coarse textured glacial till soils. This particular area of Lewbeach is not quite a red as typical Lewbeach soils.

Test pit WA117:

Ap horizon: 0 to 7 inches, dark brown (10YR3/3) silt loam, very stony
Bw1 horizon: 7 to 16 inches, yellowish brown (10YR3/6) very gravelly silt loam.
Bw2 horizon: 16 to 28 inches, brown (7.5YR 5/4) very gravelly silt loam
Bx horizon: 28 to 52 inches, very firm, reddish brown (5YR 5/3) very channery silt loam with many mixed flagstones.
C horizon: 52 to 84 inches, very firm, very flaggy silt loam.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious. No percolation test was run, this area was investigated as a proposed pond site and should be successful.
Soil Series: Lewbeach

Test pit WA117002:

Oe horizon: 0 to 1 inches, black (10YR2/1) mucky silt loam duff layer
E horizon: 1 to 2 inches, light gray (10YR7/2) gravelly silt loam (discontinuous)
Bw1 horizon: 2 to 12 inches, (7.5YR6/8) reddish yellow channery silt loam with common small flag stones.
Bw2 horizon: 12 to 24 inches, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones of varying sizes.
BC horizon: 24 to 38 inches, firm, brown (7.5YR 4/4) very channery silt loam, many flagstones.
R horizon: 38+ fractured sandstone and silt stone over hard bedrock.

The depth to bedrock varied in the pit from 38 inches at one end to 72 inches at the other end. There are no seeps and no mottles, however there is a very firm Bx horizon at the deeper end of the pit and it is essentially impervious.
Soil Series: Vly (slightly brown phase)

Test pit #WA116:

This test pit was excavated in the lawn, west of the existing motel on the property. The soil consists of old stable fill excavated from the hillside behind the motel.

Ap horizon: 0 to 6 inches, dark reddish brown (5YR 3/2) silt loam.
C horizon: 6 to 84 inches, reddish brown (5YR 5/4) very gravelly/channery silt loam.

This area is intended for construction. No percolation tests were run. There were no seeps or mottles.
Udorthents, smoothed

Test pit WA117003:

Oe horizon: 0 to 25 inches, black (10YR2/1) fibrous organic duff layer mixed in a near pavement of large flagstones and boulders.
Bw1 horizon: 25 to 41 inches, reddish brown (5YR 4/4) very channery silt loam with common mixed flagstones.
Bw2 horizon: 41 to 60 inches, reddish brown (5YR 5/4) very channery loam, slightly firm, with many flagstones of varying sizes.
C horizon: 60 to 72 inches, slightly firm, reddish brown (7.5YR 4/4) very channery silt loam, many flagstones and boulders.

There are no seeps and no mottles. No perc test was run.
Soil Series: Elka

Test pit WA117004:

Ap horizon: 0 to 9 inches, dark brown (10YR3/3) channery silt loam.
Bw1 horizon: 9 to 19 inches, reddish brown(5YR 4/6) channery loam.
Bw2 horizon: 19 to 35 inches, reddish brown (7.5YR 4/3) very channery silt loam.
Bx horizon: 35 to 84 inches, very firm, light reddish brown (5YR 6/3) very channery silt loam with thick beds of flag stone in the lower part.

There are no seeps and no mottles, however the Bx horizon is very firm and essentially impervious. This test pit was excavated to confirm soil mapping. The test pit confirms the map unit for Lewbeach soils which are deep, well drained soils formed in coarse textured glacial till soils.

Test pit WA115:

Oe horizon: 0 to 1 inches, black (10YR2/1) fibrous organic duff layer
A horizon: 1 to 6 inches, dark grayish brown (10YR3/2) gravelly silt loam
Bw1 horizon: 6 to 9 inches, dark brown (10YR 3/3) channery silt loam
Bw2 horizon: 9 to 16 inches, yellowish brown (10YR 5/6) very channery silt loam with many flagstones of varying sizes.
R horizon: 16+ fractured sandstone and silt stone over hard bedrock.

There are no seeps and no mottles. This is an area confirmed as Halcott soils, however there is not the extensive areas of Halcott first predicted.

<u>September, 2002</u>

These deep soil test pits observations were made September 3, 4 & 5, 2002

Test pit DP102: (Wildacres 9-04-02)
Oe horizon: 0 to 1 inches, black (10YR2/1) organic and silt loam duff layer

E horizon: (discontinuous)	1 to 2 inches, light gray (10YR7/2) gravelly silt loam
Bw1 horizon:	2 to 12 inches, (7.5YR6/8) reddish yellow channery silt loam with common small flagstones.
Bw2 horizon:	12 to 30 inches, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones of varying sizes.
Bx horizon:	30 to 72 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones. There are no seeps and no mottles, the Bx horizon is very firm and essentially impervious.
Soil Series:	Lewbeach

Test pit DP103: (Wildacres 9-04-02)

Oe horizon:	0 to 2 inches, black (10YR2/1) fibrous organic duff layer mixed in a near pavement of large flagstones and boulders.
Bw1 horizon:	2 to 44 inches, reddish brown (5YR 4/4) very channery silt loam with common mixed flagstones.
Bw2 horizon:	44 to 58 inches, reddish brown (5YR 5/4) very channery loam, slightly firm, with many flagstones of varying sizes.
2C horizon:	58 to 60+ inches, flagstones with cobbles and gravel in stratified layers.

There are no seeps and no mottles. Percolation rate @ 60 inches: <2:00 minutes

Soil Series: Elka o/ Tunnkanock

Test pit DP104: (Wildacres 9-4-02)

Oe horizon:	0 to 1 inches, black (10YR2/1) mucky silt loam duff layer
Bw1 horizon:	1 to 6 inches, (7.5YR6/8) reddish yellow channery silt loam with common small flagstones.
Bw2 horizon:	6 to 29 inches, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones of varying sizes.
Bx horizon:	29 to 72 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones.

There are no seeps and no mottles, the Bx horizon is very firm and essentially impervious.

Soil Series: Lewbeach

Test pit DP105: (Wildacres 9-4-02)

Oe horizon:	0 to 2 inches, black (10YR2/1) mucky silt loam duff layer
E horizon:	2 to 3 inches, light gray (10YR7/2) gravelly silt loam
Bw1 horizon:	3 to 10 inches, (5YR4/6) yellowish red channery silt loam with common small flagstones.
Bw2 horizon:	10 to 33 inches, firm, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones, common fine faint mottles in the lower part.

Bx horizon: 33 to 72 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones..

There are mottles @ 24 to 33 inches. The Bx horizon is very firm and essentially impervious

Percolation rate @ 20 inches is: 5 minutes (5:00)

Soil Series: Willowemoc

Test pit DP107: (Wildacres 9-05-02)

Oe horizon: 0 to 10 inches, black (10YR2/1) fibrous organic duff layer mixed in a near pavement of large flagstones and boulders.
Bw1 horizon: 10 to 30 inches, reddish brown (5YR 4/4) very channery silt loam with common mixed flagstones.
Bw2 horizon: 30 to 49 inches, reddish brown (5YR 5/4) very channery loam, slightly firm, with many flagstones of varying sizes.
C horizon: 49 to 60+ inches, slightly firm, reddish brown (7.5YR 4/4) very channery silt loam, many flagstones and boulders.

There are no seeps and no mottles. Percolation rate @ 60 inches: 9:00 minutes

Soil Series: Elka

Test pit DP108: (Wildacres 9-05-02)

Oe horizon: 0 to 10 inches, black (10YR2/1) fibrous organic duff layer mixed in a near pavement of large flagstones and boulders.
Bw1 horizon: 10 to 34 inches, reddish brown (5YR 4/4) very channery silt loam with common mixed flagstones.
Bw2 horizon: 34 to 55 inches, reddish brown (5YR 5/4) very channery loam, slightly firm, with many flagstones of varying sizes.
C horizon: 55 to 60+ inches, reddish brown (7.5YR 4/4) very channery silt loam, many flagstones and mixed gravel.

There are no seeps and no mottles. Percolation rate @ 60 inches: 4:00 minutes

Soil Series: Elka

Test pit DP109: (Wildacres 9-04-02)

Oe horizon: 0 to 5 inches, black (10YR2/1) fibrous organic duff layer mixed in a near pavement of large flagstones and boulders.
Bw1 horizon: 5 to 33 inches, reddish brown (5YR 4/4) very channery silt loam with common mixed flagstones.
Bw2 horizon: 33 to 49 inches, reddish brown (5YR 5/4) very channery loam, few, fine, faint mottles in the lower part, firm, with many flagstones of varying sizes.

C horizon: 49 to 60+ inches, friable, reddish brown (7.5YR 4/4) very channery silt loam, many flagstones and boulders.

There are no seeps and few fine mottles. Percolation rate @ 60 inches: 4:40 minutes

Soil Series: Lewbeach o/ Elka

Test pit DP110: (Wildacres 9-4-02)

Oe horizon: 0 to 2 inches, black (10YR2/1) mucky silt loam duff layer
E horizon: 2 to 3 inches, light gray (10YR7/2) gravelly silt loam
Bw1 horizon: 3 to 10 inches, (5YR4/6) yellowish red channery silt loam with common small flagstones.
Bw2 horizon: 10 to 30 inches, firm, dark yellowish brown (10YR 4/4) very channery silt loam with many flagstones, common fine faint mottles in the lower part.
Bx horizon: 30 to 72 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones.

There are mottles @ 24 to 30 inches. The Bx horizon is very firm and essentially impervious

Soil Series: Willowemoc

Test pit DP113: (Wildacres 9-4-02)

Oe horizon: 0 to 1 inches, black (10YR2/1) organic duff layer
Ap horizon: 1 to 5 inches, dark brown (7.5YR3/3) gravelly silt loam.
Bw1 horizon: 5 to 26 inches, (7.5YR6/8) reddish yellow channery silt loam with common small flagstones.
Bx horizon: 26 to 72 inches, very firm, brown (7.5YR 4/4) very channery silt loam, many flagstones. There is a discontinuous seam of gravel at 48 to 62 inches. The seam probably had reasonable permeability but was discontinuous within the pit and could be a reliable outlet for infiltration within the matrix of very firm hardpan.

There are no seeps and no mottles, the Bx horizon is very firm and essentially impervious.

Soil Series: Lewbeach

Test pit DP116: (Wildacres 9-03-02)

Oe horizon: 0 to 10 inches, black (10YR2/1) fibrous organic duff layer mixed in a near pavement of large flagstones and boulders.
Bw1 horizon: 10 to 30 inches, reddish brown (5YR 4/4) very channery silt loam with common mixed flagstones.
Bw2 horizon: 30 to 45 inches, reddish brown (5YR 5/4) very channery loam, slightly firm, with many flagstones of varying sizes.

C horizon: 45 to 60+ inches, slightly firm, reddish brown (7.5YR 4/4) very channery silt loam, many flagstones and boulders.

There are no seeps and no mottles. Percolation rate @ 60 inches: 8:00 minutes

Soil Series: Elka

November, 2007

On November 28, 29 & 30, 2007 the following deep soil test pits were observed.

Test pit #11280701: Soil Type: Willowemoc
Strong seeps @ 29 inches
Fractured bedrock @ 42 inches
Hard bedrock @ 60 inches

Test pit #11280702: Soil Type: Lewbeach
Fractured bedrock @ 60 inches
Hard bedrock @ 85 inches

Test pit #11280703: Soil Type: Lewbeach
Fractured bedrock @ 61 inches
Hard bedrock @ 81 inches

Test pit #11280704: Soil Type: Halcott
Hard bedrock @ 17 inches

Test pit #11280705: Soil Type: Vly
Fractured bedrock @ 17 inches
Hard bedrock @ 28 inches

Test pit #11280706: Soil Type: Vly
Seeps @ 12 inches
Fractured bedrock @ 20 inches
Hard bedrock @ 40 inches

Test pit #11280707: Soil Type: Lairdsville
Fractured soft red shale @ 52 inches
Hard red shale bedrock @ 60 inches

Test pit #11280708: Soil Type: Lairdsville
Reddsih brown clay 0 to 81 inches
Hard red shale bedrock @ 81 inches

Test pit #11280709: Soil Type: Lewbeach
Very firm @ 33 inches
Hard bedrock @ 108 inches

Test pit #11280710: Soil Type: Lewbeach
Stong seeps @ 66 inches
Soft reddish brown shale bedrock @ 66 inches

Test pit #11280711: Soil Type: Lewbeach
Very firm @ 35 inches
Fractured bedrock with seeps @ 88 inches
Hard bedrock @ 102 inches

Test pit #11280712: Soil Type: Elka
Fractured bedrock @ 52 inches
Hard bedrock @ 83 inches

Test pit #11280713: Soil Type: Vly
Fractured bedrock @ 25 inches
Hard bedrock @ 35 inches

Test pit #11280714: Soil Type: Halcott
Fractured bedrock @ 2 inches
Hard bedrock @ 15 inches

Test pit #11280715: Soil Type: Vly
Fractured bedrock @ 6 inches
Hard bedrock @ 23 inches

Test pit #11280716: Soil Type: Rubble
Fractured bedrock, flagstones and boulders

Test pit #11280717: Soil Type: Lewbeach
Fractured soft red shale bedrock @ 45 inches
Hard (rippable) red shale bedrock @ 68 inches

Test pit #11280718: Soil Type: Rubble
Fractured bedrock, flagstones and boulders

Test pit #11280719: Soil Type: Lewbeach
Fractured bedrock @ 52 inches
Hard bedrock @ 68 inches

Test pit #11280720: Soil Type: Elka
Fractured bedrock @ 45 inches
Hard bedrock @ 60 inches

Test pit #11280721: Soil Type: Vly
Hard bedrock @ 30 inches

Test pit #11280722: Soil Type: Halcott
Hard bedrock @ 10 inches

Test pit #11280723: Soil Type: Elka
Fractured bedrock @ 40 inches
Hard bedrock @ 61 inches

Test pit #11280724: Soil Type: Vly
Hard bedrock @ 35 inches

Test pit #11290725: Soil Type: Vly
Fractured shale and slate bedrock @ 35 inches
Hard bedrock @ 52 inches

Test pit #11290726: Soil Type: Vly
Fractured bedrock @ 26 inches
Hard bedrock @ 30 inches

Test pit #11290727: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 40 inches

Test pit #11290728: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 56 inches

Test pit #11290729: Soil Type: Vly
Hard bedrock @ 31 inches

Test pit #11290730: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 34 inches

Test pit #11290731: Soil Type: Vly
Fractured bedrock @ 32 inches
Hard bedrock @ 42 inches

Test pit #11290732: Soil Type: Vly
Fractured bedrock @ 26 inches
Hard bedrock @ 32 inches

Test pit #11290733: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 34 inches

Test pit #11290734: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 38 inches

Test pit #11290735: Soil Type: Vly
Fractured bedrock @ 16 inches
Hard bedrock @ 31 inches

Test pit #11290736: Soil Type: Willowemoc
Strong seeps @ 24 inches
Fractured bedrock @ 47 inches
Hard bedrock @ 62 inches

Test pit #11290737: Soil Type: Lairdsville
Strong seeps @ 24 inches
Soft red shale bedrock

Test pit #11290738: Soil Type: Rubble
Fractured bedrock, flagstones and boulders
Refusal @ 60 inches

Test pit #11290739: Soil Type: Vly
Fractured bedrock @ 32 inches
Hard bedrock @ 41 inches

Test pit #11290740: Soil Type: Halcott
Fractured bedrock @ 18 inches
Soft red shale bedrock @ 18 inches

Test pit #11290741: Soil Type: Vly
Fractured bedrock @ 27 inches
Soft shale and slate bedrock @ 56 inches
Hard bedrock @ 56 inches

Test pit #11290742: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 40 inches

Test pit #11290743: Soil Type: Rock outcrop
0 inches, bedrock

Test pit #11290744: Soil Type: Vly
Fractured bedrock @ 25 inches
Hard bedrock @ 48 inches

Test pit #11290745: Soil Type: Vly
Fractured bedrock @ 30 inches

Hard bedrock @ 40 inches

Test pit #11290746: Soil Type: Vly
Fractured bedrock @ 19 inches
Hard bedrock @ 31 inches

Test pit #11290747: Soil Type: Halcott
Fractured bedrock @ 10 inches
Hard bedrock @ 19 inches

Test pit #11290748: Soil Type: Vly
Fractured bedrock @ 28 inches
Hard bedrock @ 31 inches

Test pit #11290749: Soil Type: Halcott
Fractured bedrock @ 0 inches
Hard bedrock @ 10 inches

Test pit #11290750: Soil Type: Vly
Fractured bedrock @ 33 inches
Hard bedrock @ 51 inches

Test pit #11290751: Soil Type: Vly
Fractured bedrock @ 18 inches
Hard bedrock @ 23 inches

Test pit #11290752: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 38 inches

Test pit #11300768: Soil Type: Vly
Fractured bedrock @ 15 inches
Hard bedrock @ 22 inches

Test pit #11300769: Soil Type: Halcott
Fractured bedrock @ 15 inches
Hard bedrock @ 19 inches

The stabilized soil percolation rate is 0:15:00 (fifteen minutes)

Test pit #11300770: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 35 inches

Test pit #11300771: Soil Type: Vly
Fractured bedrock @ 19 inches
Hard bedrock @ 25 inches

Test pit #11300772: Soil Type: Halcott

Fractured bedrock @ 10 inches
Hard bedrock @ 15 inches

Test pit #11300773: Soil Type: Vly
Fractured bedrock @ 30 inches
Hard bedrock @ 35 inches

Test pit #11300774: Soil Type: Halcott
Fractured bedrock @ 15 inches
Hard bedrock @ 20 inches

Test pit #11300775: Soil Type: Halcott
Fractured bedrock @ 10 inches
Hard bedrock @ 20 inches

Test pit #11300776: Soil Type: Vly
Gravelly and bouldery native glacial till with some mixed disturbance from the adjacent road just north of the test pit
Fractured bedrock @ 30 inches
Hard bedrock @ 40 inches

Test pit #11300777: Soil Type: Paxton
Very gravelly sandy loam
Very firm, very gravelly sandy loam @ 35 inches

The stabilized soil percolation rate is 0:17:00 (seventeen minutes)

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APPENDIX D

LIQUI-FLOC CHITOSAN INFORMATION

natural site solutions

This US Department of Labor Material Safety Data Sheet shows the Storm-Klear Gel-Floc to be composed of chitosan, which is safe for human health and the environment.

Simply clean water

Material Safety Data Sheet
for Storm-Klear Gel-Floc™

Material Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved - OMB No. 1218-0072

IDENTITY *(As Used on Label and List)*	***Storm-Klear Gel-Floc™***

Section I

Manufacturer's Name Vanson	Emergency Telephone Number (888) 282-6766
8840 152nd Avenue NE	Telephone Number for Information (206) 881-6464
Redmond, WA 98052	Date Prepared 9/10/01

Section II: Hazard Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	*% (optional)*
No Hazardous Components – contains chitosan from recycled crab and shrimp shells and lactic acid				
Chitosan CAS# 9012-76-4, Lactic acid CAS# 598-82-3				

Section III: Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H_2O = 1)	>1
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water - Completely soluble in water			
Appearance and Odor - Off white gel/mild odor			

Section IV: Fire and Explosion Hazard Data

Flash Point (Method Used) - Will not burn	Flammable Limits - N/A	LEL - N/A	UEL - N/A
Extinguishing Media - CO_2, Dry Chemical, Water			
Special Fire Fighting Procedures – N/A			
Unusual Fire and Explosion Hazards - None currently known			

Section V: Reactivity Data

Stability	Unstable		Conditions to Avoid - Avoid elevated temperatures
	Stable	X	
Incompatibility *(Materials to Avoid)* - Avoid strong oxidizers			
Hazardous Decomposition or Byproducts - Carbon Monoxide, Carbon Dioxide			
Hazardous Polymerization	May Occur		Conditions to Avoid – N/A
	Will Not Occur	X	

Section VI: Health Hazard Data

Route(s) of Entry:	Inhalation? - N/A	Skin? - N/A	Ingestion? - N/A
Health Hazards *(Acute and Chronic)* - None known			
Carcinogenicity: N/A	NTP? N/A	IARC Monographs? N/A	OSHA Regulated? No
Signs and Symptoms of Exposure - N/A			
Medical Conditions Generally Aggravated by Exposure - None known			
Emergency and First Aid Procedures - N/A			

Section VII: Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled - Sweep up or absorb liquid spills with spill cleanup absorbent and dispose as a solid waste in accordance with local, state, and federal regulations. Flush residue with water.

Waste Disposal Method - Comply with all federal, state, and local regulations

Precautions to Be taken in Handling and Storing - Store in dry area away from elevated temperatures

Other Precautions - N/A

Section VIII: Control Measures

Respiratory Protection *(Specify Type)* - Not required for normal use		
Ventilation - N/A	Local Exhaust - N/A	Special - N/A
	Mechanical *(General)* - N/A	Other - N/A

Protective Gloves None required when used as directed	Eye Protection None required when used as directed
Other Protective Clothing or Equipment - None required when used as directed	
Work/Hygienic Practices - Wash hands after handling and before smoking or eating	

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About Natural Site Solutions

Natural Site Solutions (NSS) is the exclusive distributor of Storm-Klear natural and biodegradable chitosan products by Vanson, Inc. NSS provides technical support and training for all Storm-Klear products.

natural site solutions

Effective storm water management on construction projects involves purifying sediment-contaminated water before discharging it into natural waterways.

The Storm-Klear Gel-Floc Water Management System provides a concise means of achieving this.

Simply clean water

Storm Water Biofiltration

with the Storm-Klear Gel-Floc™

Storm Water Collection System

During all phases of grading and construction, provide storm water collection and conveyance systems as needed to collect and direct sediment-contaminated water to temporary sediment traps, preventing offsite discharge of sediment-laden storm water.

As much as practicable, do construction in phases to avoid unnecessary exposure of the site. Whenever necessary, collect and convey clean storm water generated from stabilized and undisturbed portions of the site to stabilized discharge areas to avoid contact with disturbed portions of the site. Construct all conveyance and collection systems in consistency with Best Managerment Practices (BMPs) required under local and state regulations and guidelines.

Temporary Sediment Traps

During construction, convey sediment-contaminated storm water to temporary sediment traps, as designed by the project engineer and shown on the temporary erosion and sediment control (TESC) plan. The sediment traps should gravity settle large-sized particles. Considering subsurface soil types, it is unlikely that gravity settling alone will remove all suspended particles. If settled storm water does not meet surface water quality standards, manage the storm water by pumping it from the surface of sediment traps through the Gel-Floc, then disperse it in vegetated areas for biofiltration and infiltration.

Water Management System

The Storm-Klear Gel-Floc Water Management System utilizes a combination of sediment traps, pumps, a Gel-Floc, interconnecting pipe and vegetated areas for biofiltration and infiltration. The purpose of the Gel-Floc Water Management System is the transportation of sediment-contaminated water from sedimentation or detention basins onsite to vegetated areas, thus avoiding offsite discharge of turbid water. The system releases micro quantities of chitosan –a natural biopolymer– from the Gel-Floc into the storm water, making biofiltration highly effective.

The typical water management components for a 5- to10-acre project include a two-horse power pump, 3-inch solid wall conveyance pipe, 6-inch Gel-Floc housing unit, and 50 to 100 feet of 4-inch dispersal pipe. (See our CAD Drawings for a typical Gel-Floc water management system layout.)

The two-horse power submersible pump is electric-powered and operates on float level controls as needed, depending on predetermined high- and low-sediment trap levels. The pump transfers storm water through the Gel-Floc housing unit, over the Gel-Floc, then delivers it to vegetated areas for biofiltration and infiltration.

The daily capacity of the water management system depends upon head losses related to discharge piping and on elevation differences between the pump and the water dispersal and biofiltration area. Modulate the total daily capacity by a flow control valve as necessary to assure maximum system performance.

Follow five steps for use and monitoring of the Storm-Klear Gel-Floc Water Management System.

Disperse treated water evenly throughout available vegetated areas to the maximum extent practicable. Allow a minimum of 50 feet of biofiltration between the dispersal pipe and surface water. Select dispersal areas using, but not limited to, the following criteria:

- type of vegetation
- area of vegetation
- gradient of dispersal areas
- proximity of dispersal area to sensitive receptors
- soil types

Monitoring the Gel-Floc System

As with all effective BMPs, the Gel-Floc Water Management System requires regular monitoring to assure the overall effectiveness of storm water management.

1) **Monitor the sediment trap.** Visually monitor all sediment traps at least once a day during the wet season or as needed to monitor the level and quality of water within the sediment traps. Designate site personal to routinely monitor the level of the sediment trap so the water level never reaches levels approaching discharge. Also monitor weekly or as needed the sediment traps for sediment accumulation, functionality, and other required maintenance. Immediately in the event of abnormal conditions, site personal must report the information to the site superintendent for resolution.

2) **Monitor the pump and mechanical system.** The pump or pumps that operate the storm water management system require routine monitoring to ensure proper system performance. The contractor should follow all recommended inspection and maintenance procedures throughout the life of the project. During the wet season, have site personal monitor pump systems for correct operation, adequate power supply, and correct float level control operation. Severe storm events may require more frequent inspections, especially if pumps rely on utility-supplied power. Onsite or within reasonable distance to the site, have backup equipment available 24 hours a day. This should include, but is not limited to a pump and generator. In the event of mechanical equipment failure, the site operator immediately must take all necessary actions to replace any malfunctioning components in order to restore the original capacity of the water management system.

3) **Inspect the Gel-Floc.** The Storm-Klear Gel-Floc provides effective water management for up to 500,000 gallons, depending on site-specific conditions. Inspect the Gel-Floc each day during the wet season to ensure optimum performance. Install, maintain and inspect all Gel-Flocs as indicated in our Operation and Maintenance of the Storm-Klear Gel-Floc data sheet.

4) **Monitor the vegetative dispersal system and the biofiltration area.** During operation of the Storm-Klear Gel-Floc Water Management System, conduct a daily inspection for functionality and effectiveness of the vegetated dispersal and biofiltration area. A dispersal area of 50 liner feet is necessary for effective biofiltration, depending on the quality of vegetation.

5) **Monitor the water quality.** Perform water quality monitoring to demonstrate that the Storm-Klear Gel-Floc Water Management process is working properly, to document surface water quality of water discharged to the environment, and to document the background water quality of the stream. Monitor the effectiveness of the water management system daily, record it on the Water Management Log form, and report it to regulatory authorities as required.

[1] Typical dose is < 500 ug/L

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About Natural Site Solutions

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Each Gel-Floc treats up to 500,000 gallons of turbid water. Longevity is a function of water temperature, flow rate, degree of turbulence and water pH.

For maximum performance, have the proper number of units for your site and inspect regularly.

Simply clean water

Operation and Maintenance

of the Storm-Klear Gel-Floc™

Number of Gel-Floc Units Needed

If pumping water past the Gel-Floc:

Size of pump	Flow rate (gpm)	Number of Gel-Floc units needed	Longevity (hours of pumping)
2-inch	50-200	1	40
3 inch gas	200-300	1	30-40
4-inch diesel	500-700	2	24-33
6-inch diesel	700-1000	3	25-36

If using the Gel-Floc with gravity water flow[1]:

Flow rate (gpm)	Number of Gel-Floc units needed	Effective volume treated before Gel-Floc replacement
≤ 450	1	0.5 million gallons
450-900	2	1 million gallons
>900	3	1.5 million gallons

Using Gel-Floc with Biofiltration

Pump turbid water through a pipe containing a fixed Gel-Floc, then disperse water into vegetated area for biofiltration.

Using Gel-Floc with Gravity Settling[1]

Anchor the Gel-Floc upstream of a settling basin or sediment pond

- in catch basins discharging to settling basin
- in dikes, swales or ditches discharging to settling basins
- downstream of checkdams discharging to settling basins
- in conveyances discharging to sediment traps

Maintenance and Inspection

Frequency of inspection depends upon the application and flow rate.

- For pumping applications, check the Gel-Floc weekly or after every 250,000 gallons of water are processed.
- For ditch applications, check the Gel-Floc minimally once a week and prior to significant storm events.

Inspection Procedures

- Regularly inspect the water quality downstream of the Gel-Floc to ensure the system is working. Turbidity reductions depend upon the length of time the water is given to gravity settle or, when using biofiltration, upon the effectiveness of the biofiltration area.
- Squeeze the Gel-Floc unit and note the amount of solid material left in the fabric sock. Over time, a spent Gel-Floc may appear plump due to water displacement of the chitosan inside the sock. If squeezing yields only water, replace the unit.

Replacement

Keep an adequate supply of Gel-Flocs on hand in order to replace units as they are depleted. Each Gel-Floc treats up to 500,000 gallons of turbid water. Longevity is a function of water temperature, flow rate, degree of turbulence and water pH.

NOTE: Do not leave the Gel-Floc submerged in water when not in use as the unit will continue to dissolve.

[1] Assumes Gel-Floc will be deployed in a conveyance channel discharging to a settling basin for subsequent gravity settling of sediment. Do not deploy Gel-Floc in streams, rivers, lakes or bays.

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The Fox Creek Salmon Habitat Enhancement Project employed the Storm-Klear Gel-Floc Water Management System and was conducted by the Washington State Department of Fish and Wildlife (WDFW), the City of Lacey, and the Washington State Department of Ecology's (DOE) Washington Conservation Corp (WCC).

Simply clean water

Case Study:

Storm-Klear Gel-Floc™ and the Fox Creek Project

Project Description

Located in the Pacific Northwest, Fox Creek is a pristine head-water stream whose salmon populations are protected by the Endangered Species Act (ESA). Because monetary fines were levied for an illegal wetland fill near the stream, funding became available for a salmon habitat enhancement project near the 26th Street crossing in Lacey, Washington.

Although Fox Creek has extensive riparian vegetation and class AA water quality designation, the stream lacks ideal substrate characteristics for optimum salmon habitat. The purpose of this project was to create additional spawning pools constructed out of wooden weirs and gravel beds to promote increased spawning activity within a key reach of the stream.

Project Background

The WDFW, DOE, and WCC perform dozens of salmon habitat enhancement projects each year to revitalize salmon runs in the Pacific Northwest. Virtually all projects involve in-stream work which requires stream diversions, excavation, dewatering, and storm water management.

Sediment contaminated water has always been difficult to manage because of the close proximity of the work area to sensitive and protected receiving waters. Since each project requires a water quality certification from the DOE mandating water quality preservation, construction activity is not allowed to impair downstream water quality.

Traditional methods of construction water management include silt fence, filter fabric, filter bags, settling tanks, rock berms, and straw bale barriers. Although all methods are recognized Best Management Practices (BMPs) by the DOE, none has been successful in producing water that meets DOE water quality standards. As a result of these circumstances, the WDFW and DOE have been exploring new, more effective methods of managing construction water associated with stream restoration/improvement projects.

In June 2001, Steve Jenks, Biologist for the WDFW, contacted Natural Site Solutions to assist in construction water management for his upcoming Fox Creek Salmon Habitat Enhancement Project. Natural Site Solutions demonstrated the controlled dosing technology of the Storm-Klear Gel-Floc to Mr. Jenks at the WDFW facility in Redmond, Washington. Following the demonstration and review of all water quality and aquatic toxicity test data, the WDFW, DOE, and Army Corp of Engineers approved the Gel-Floc for storm water management on the Fox Creek Project.

The Gel-Floc Water Management System was constructed by a two-person crew in less than three hours.

Project Approach

The Natural Site Solutions method of creating cost-effective and efficient storm water management solutions for site-specific needs resulted in an integrated approach for the Fox Creek Project which included:

- an effective tight-lined stream bypass around the construction area
- efficient collection of all sediment-contaminated water
- pumping of contaminated water through the Storm-Klear Gel-Floc system and dispersal of treated water in vegetated areas adjacent to the creek
- monitoring of water quality and documentation of compliance throughout the project

Gel-Floc Water Management System

The construction water management system for the Fox Creek Project was designed to manage a maximum of 300 gallons per minute (gpm) with high turbidity loads. Since the system would discharge water adjacent to a protected stream, DOE water quality standards had to be met at the Fox Creek downstream monitoring location.

The Natural Site Solutions water management system was designed using inexpensive, readily available components including:

- one gasoline powered 3-inch centrifugal pump
- 50 feet of 3-inch fire hose
- 60 feet of 4-inch schedule 40 polyvinyl chloride (PVC) pipe
- one 6-inch diameter PVC Gel-Floc contactor unit
- 100 feet of 4-inch ABS perforated drain pipe
- one Storm-Klear Gel-Floc unit

This system was constructed by a two-person crew in less than three hours.

Operations and Maintenance

During construction, water collected from excavations, bank flows, storm water run-on, and base flow was intermittently pumped to the treatment system, and then dispersed at a rate of 250 gpm. Pumping duration and flow rates fluctuated depending upon construction activity, streambed work location, and precipitation. Water was collected at a point located at the furthest downstream point of construction, but immediately upstream of the point of reintroduction of the stream bypass.

System monitoring/maintenance requirements included:

- water quality compliance monitoring at five locations during construction
- routine plumbing inspections
- flow rate monitoring
- routine Gel-Floc inspection (once per week)

The project was completed on schedule and without impairment of surface water quality standards.

The success of the project proved that effective alternatives to traditional BMPs are available for construction water management.

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Water Quality Monitoring Results

The table below presents water quality compliance monitoring that documents the effectiveness of the Gel-Floc controlled dosing system.

Date and Parameter	Fox Creek Up-Stream	Fox Creek Down-Stream	Construction Water Collection Sump	Dispersal Pipe Outlet	10 Feet Below Dispersal Pipe
07/16/01					
Turbidity (NTU)	2.34	3.13	2,400	102	50
pH	7.1	7.2	7.1	7.1	7.1
Conductivity (Us/cm)	110	110	100	110	100
7/17/01					
Turbidity (NTU)	3.45	3.85	2,600	68	13.9
pH	7.2	7.2	7.1	7.2	7.2
Conductivity (Us/cm)	100	110	120	110	110
07/18/01					
Turbidity (NTU)	4.36	7.18	2,000	150	60
pH	7.0	7.1	7.1	7.1	7.1
Conductivity (Us/cm)	120	110	110	110	110

Project Discussion

Natural Site Solutions teamed with the WDFW, the DOE and the City of Lacey to provide cost-effective construction water management for the Fox Creek Project. As a result of this teamwork, the Fox Creek Project was completed on schedule and without impairment of surface water quality standards. The success of the project proved that effective alternatives to traditional BMPs are available for construction water management.

Under extreme conditions, the Storm-Klear Gel-Floc reduced turbidities by up to 97% prior to biofiltration and 99.5% following 10 feet of biofiltration. After a full week of use, the Gel-Floc was depleted by approximately 50%. The remaining portion of the Gel-Floc was used on another project, one week later.

About Natural Site Solutions

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"...your system reduced turbidity by up to 99.5% which far exceeds our traditional Best Management Practices."

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

August 28, 2001

Mr. Karl Bruegeman
Natural Site Solutions
6213 East Lake Sammamish Parkway NE
Redmond, Washington 98052

Dear Mr. Bruegeman

Thank you for providing Storm-Klear™ (Chitosan) stromwater treatment services for the Fox Creek salmon spawning enhancement project in Lacey, Washington. I was very impressed with the simplicity and efficiency of the chitosan stormwater management system which was used to treat sediment contaminated water from our construction site. As you know, when working in or around sensitive aquatic habitats, the preservation of water quality is a prime concern of the Washington Department of Fish and Wildlife. Without the Storm-Klear™ system we may have had a difficult time managing water quality and have been required to spend a significant portion of the project funding on construction water management. As it was, we were able to complete the project on time and well under budget.

The water quality monitoring data collected during the project clearly shows that your system reduced turbidity by up to 99.5%, which far exceeds the reductions of our traditional Best Management Practices (BMPs). Throughout the project we were able to maintain compliance with state water quality standards with no impacts to Endangered Species Act (ESA) listed species in the receiving waters. Water quality monitoring also indicated that neither pH, nor specific conductance were altered by the Storm-Klear™ treatment process.

The Storm-Klear Passive™ Contactor technology proved to be extremely effective method of treating sediment laden waters and promises to be a valuable stormwater management tool for future Washington Department of Fish and Wildlife projects.

Thank you for your participation in the Fox Creek salmon spawning habitat enhancement project.

Sincerely,

Steve Jenks

Steve Jenks
Environmental Specialist 4
Habitat Program
Washington Department of Fish and Wildlife

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Because the Gel-Floc is used in the constantly changing environment of construction sites, a number of factors (some inconstant) may affect its performance.

For best results from the Gel-Floc, please consider the following:

- water quality
- water quantity
- number of units needed

Simply clean water

Best Uses

for the Storm-Klear Gel-Floc™

Storm Water Quality

The Gel-Floc passively treats storm water runoff from construction sites. Although it has effectively treated a wide range of runoff from different types of soil and water qualities, the quality of the storm water being treated does influence the ability of the Gel-Floc to treat the water. The most critical factors are pH and turbidity.

pH. The Gel-Floc most effectively treats runoff containing a pH between 6.5 and 8.5 which is similar to most state and local surface water quality discharge standards . If the pH of the runoff or the retention basin is outside this range, first neutralize the storm water to a pH between 7 and 8 before using the Gel-Floc.

Turbidity. Water's clarity is measured by its turbidity –the amount of sediment or foreign particles stirred up or suspended in it. Silt, sediment, microorganisms, plant fibers and chemicals in the water all affect turbidity. The unit of measure used for turbidity is the Nuephelometric Turbidity Unit (NTU). The lower the NTU, the clearer the water. Normal functioning fresh water bodies have low turbidity of less than 50 NTU. Normal construction site runoff, however, can have turbidities ranging from 50 NTU up to 2000 NTU.

The Gel-Floc works best on construction sites that use reasonable Best Management Practices (BMPs) to control influent turbidities, that is, 100 to 1000 NTU. Higher turbidities may require additional Gel-Flocs.

The best use of the Gel-Floc is in conjunction with gravity settling and biofiltration. To do this, allow storm water to settle in a basin prior to pumping it past the Gel-Floc. Water that is treated by the Gel-Floc should be directed to vegetated areas for dispersal, biofiltration and infiltration.

Storm Water Quantity

Because the Gel-Floc treats specific flow rates and quantities of storm water, fluctuations in these areas will change the dose rate of the unit. It is essential, then, to evaluate these rates and quantities in order to fit the site with the correct number of units. Typically on construction sites, storm water quantity fluctuates and is directly related to precipitation and snowmelt runoff. Each Gel-Floc can treat up to 500,000 gallons of water with a maximum flow rate of one cubic foot per second (CFS), or about 450 gallons per minute (GPM).

The Gel-Floc and Biofiltration

The table below provides a means of estimating the quantity of water treated when storm water is pumped from a retention basin past the Gel-Floc and then dispersed in vegetated areas for biofiltration. Designate a responsible person to track the length of service of each Gel-Floc. If water treatment does not appear to be successful following biofiltration, inspect the Gel-Floc and replace as needed. Keep a reasonable quantity of Gel-Flocs onsite for storm situations.

Number of Gel-Floc units needed per site

Size of construction site (acres)	Rainfall in 24-hour period (inches)	Maximum rainfall runoff (gallons)	Number of Gel-Floc units needed
	1	136,000	.5
5	2	272,000	1
	3	407,000	1
	1	272,000	1
10	2	543,000	1.5
	3	815,000	2
	1	543,000	1.5
20	2	1,086,000	2.520
	3	1,629,000	3.5
	1	1,358,000	3
50	2	2,715,000	6
	3	4,073,000	9

Gravity Flows

If the Gel-Floc is used with gravity flows, it can be difficult to determine the number of units needed because storm water flow rates vary by storm intensity and frequency. The site operator and project engineer should work closely to estimate storm water flows related to precipitation events. Monitor rainfall to determine when enough runoff is generated to warrant the use of additional Gel-Flocs.

[1] Please check with your local regulatory authority for exact pH discharge standards for your area.
[2] Depends on size of site and climate.

Natural Site Solutions
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Redmond, WA 98052

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(425) 861-8848 fax

www.naturalsitesolutions.com

About Natural Site Solutions

Natural Site Solutions is the exclusive distributor of Storm-Klear natural and biodegradable chitosan products for storm water treatment by Vanson, Incorporated. In addition to technical support and training for all Storm-Klear products, Natural Site Solutions also provides project-specific consulting services.

natural site solutions

Storm-Klear chitosan is so environmentally safe, commercial aquariums such as SeaWorld use it to keep their exhibits crystal clear.

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Simply clean water

Aquatic Safety
of Storm-Klear™ Chitosan

Chitosan coagulates suspended materials in aquariums just as it does in storm water. SeaWorld, for example, injects chitosan into the water of their exhibits, then filters the water to remove the suspended material. Chitosan is used in both fresh and saltwater with coldwater and tropical fish, as well as with crustaceans, sea anemones, coral, and marine mammals.

SeaWorld uses as much as 30 gallons of chitosan per day. Commercial aquariums (hosting some of the most exotic and sensitive fish species in the world) have been using chitosan for years with no indication of aquatic toxicity.

Test #[1]	Turbidity Before	Turbidity After	pH Before	pH After	Aquatic Toxicity Tests[2]	
					Trout	Daphnia
1	79	2.7	7.0	7.0	0% mortality	0% mortality
2	150	1	6.9	6.9	0% mortality	0% mortality
3	365	2	7.1	7.1	0% mortality	2% mortality
4	643	3.1	7.1	7.1	0% mortality	0% mortality

The table above shows the results of four separate chitosan treatment tests in which the water tested was treated with chitosan. Turbidity, pH and acute aquatic toxicity (for Rainbow Trout and Daphnia Magna) were reported. Under most guidelines, up to 20 percent mortality of test populations is acceptable. As shown in the table, mortality rates were insignificant.

Test Species	Chitosan Lc_{50} Values[3]
Fathead Minnow	1,108 mg/L
Rainbow Trout	155 mg/L
Daphnia Pulex	417 mg/L

LC50 is the amount of a material demonstrated to cause death in 50 percent of the population being tested. The table at left shows the LC50 values for three aquatic species.

[1] Test#1 performed on January 1, 2001 – 550 gpm flow rate
Test#2 performed on October 31, 2000 – 550 gpm flow rate
Test#3 performed on January 17, 2001 – 550 gpm flow rate
Test#4 performed on March 19, 1999 – 350 gallon batch.

[2] The 96-hour Rainbow Trout acute toxicity test and the 48-hour Daphnia Magna acute toxicity test both followed Method EPA/600/4-90/027 and SQ R-05 80
Mortality exceeding 20% for any one test indicates a failure of the test.

[3] Aquatic toxicity testing performed by Parametrix Laboratories, Bellevue, Washington

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Suggested applications:

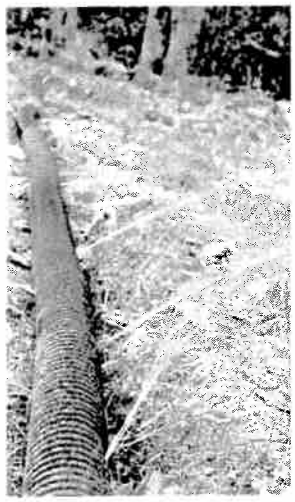
- biofiltration
- pond recirculation
- settling tank
- sand filtration

Simply clean water

Suggested Applications
for the Storm-Klear Gel-Floc™

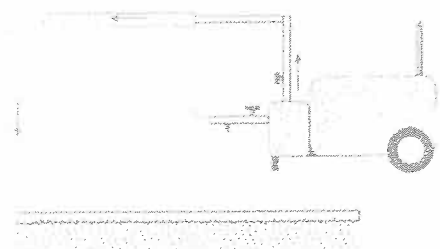
Biofiltration. If there is adequate vegetation on or near the site, the Storm-Klear Gel-Floc in conjunction with biofiltration is an excellent solution. Specifications and instructions for building the Gel-Floc housing are available in our CAD Drawings.

In biofiltration, turbid water is pumped past the Gel-Floc directly into a pipe dispersal system in a vegetated area. Exposure to the minute amounts of chitosan from the Gel-Floc dissolve and bind suspended sediment particles together which then "stick" to vegetation in the biofilter.



A biofiltration system 150 feet long can disperse up to 200 gallons per minute — nearly 300,000 gallons per day.

We recommend a minimum biofiltration path length of 50 feet and a dispersal rate of 0.5 to 2 gallons per linear foot of dispersal pipe. Of course, this depends upon the turbidity of the water and the effectiveness of the biofilter.

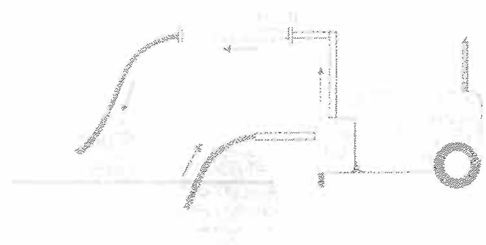


Biofiltration

Pond Recirculation. Between storm events, treat smaller detention basins and sediment ponds by recirculating turbid water with the Gel-Floc in line. A pond containing up to 50,000 gallons of water can be recirculated using a 3- or 4-inch trash pump. Ponds up to 200,000 gallons require a 6-inch, high-output pump. Specifications and instructions for building the Gel-Floc housing are available in our CAD Drawings.

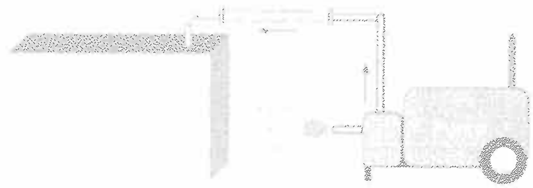
The front pond recirculating with the Gel-Floc in line is appreciably cleaner than the untreated pond behind it.

Note: Ponds larger than 200,000 gallons are difficult to treat by recirculation due to insufficient mixing.



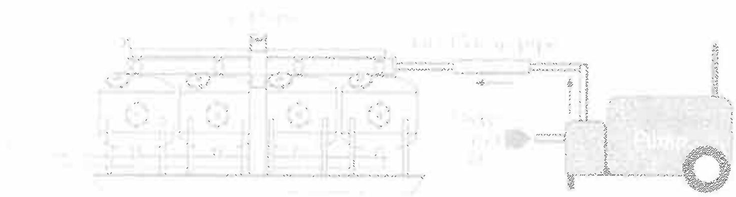
Pond Recirculation

Settling Tank. Smaller sites that need to manage only limited amounts of water on a periodic basis should use the Gel-Floc in conjunction with a settling tank. Pump turbid water past the Gel-Floc, then direct it into a settling tank. Allow the water to settle for several hours or overnight, then discharge the water.



Settling Tank

Sand Filter. Large sites with no biofiltration capacity that need to manage large amounts of water with subsequent direct discharge to surface water should use the Gel-Floc in conjunction with sand filtration. Pump turbid water past the Gel-Floc, then direct it into a sand filter for removal of contaminants.



Sand Filtration

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natural site solutions

Storm-Klear Gel-Floc™

Clean construction site storm water fast

The Storm-Klear Gel-Floc Blue reduces turbidity, phosphorus, oil, and metals in storm water on construction, industrial, and residential sites.

For use in:

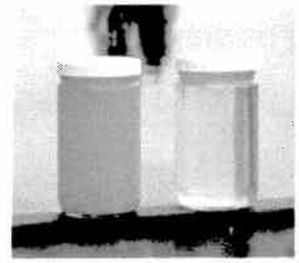
- **drain pipes**
- **pump discharges**
- **catch basins**

in conjunction with:

- **biofiltration**
- **pond recirculation**
- **infiltration**
- **sand filtration**

Simply clean water

Effective storm water management on construction projects involves purifying sediment-contaminated water before discharging it into natural waterways. The Gel-Floc reduces turbidity, phosphorous, and metals in storm water. Easy to use, 100% PAM-free, it is biodegradable, fish safe and cost effective.



These two samples were identical until sample right was treated with Storm-Klear Gel-Floc.

Controlled Dosing System

The Gel-Floc is a controlled dosing system. Basically, this means there are no heavy barrels of liquid chemicals to handle, and no electricity or metering pumps required. Here's how it works:

Chitosan is a natural biopolymer derived from crab and shrimp shells. In turbid water, it causes coagulation of sediment particles which then allows for gravity settling, biofiltration, sand filtration, or cartridge filtration.

The Gel-Floc is a fabric sock containing a gel form of chitosan which dissolves slowly in moving —essentially, the storm water passes over the unit, dosing the water continuously 24/7. One Gel-Floc Blue unit can treat up to 500,000 gallons of storm water.

Best Uses of the Gel-Floc

Biofiltration. If there is adequate vegetation on or near the construction site, biofiltration in conjunction with the Gel-Floc is an excellent solution.

Pond Recirculation. Between storm events, smaller detention basins and sediment ponds can be treated by simply recirculating turbid water with the Gel-Floc unit in line.

Settling Tank. Smaller sites that manage only limited amounts of water on a periodic basis can use the Gel-Floc in conjunction with a settling tank.

Sand Filter. When biofiltration is not possible, large sites that need to manage large amounts of water with subsequent direct discharge to surface water can use the Gel-Floc in conjunction with sand filtration.

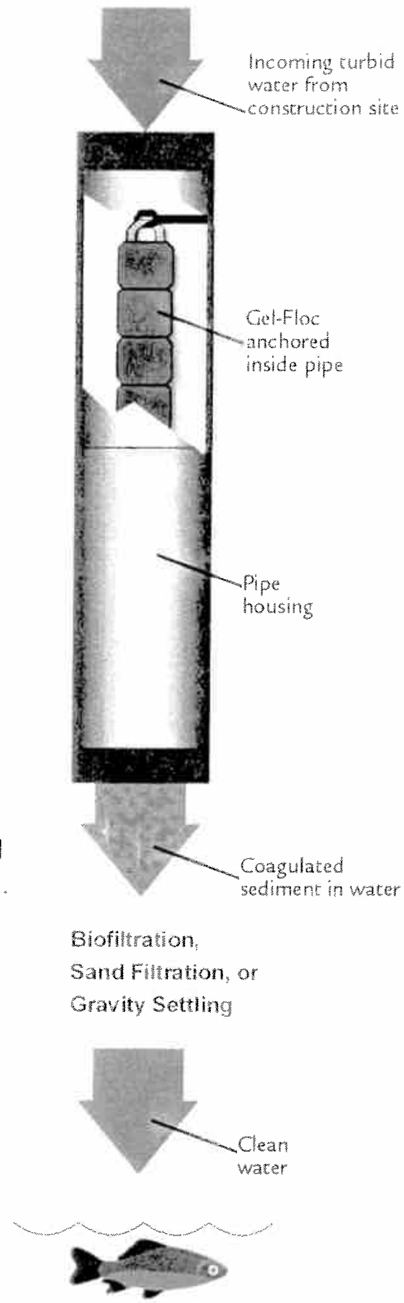
Gel-Floc Blue treats up to 500,000 gallons of storm water

The Storm Water Treatment Process

1. Storm water is pumped past the Gel-Floc to coagulate sediment.

2. The coagulated particles are removed (by various methods).

3. Clean water is discharged.



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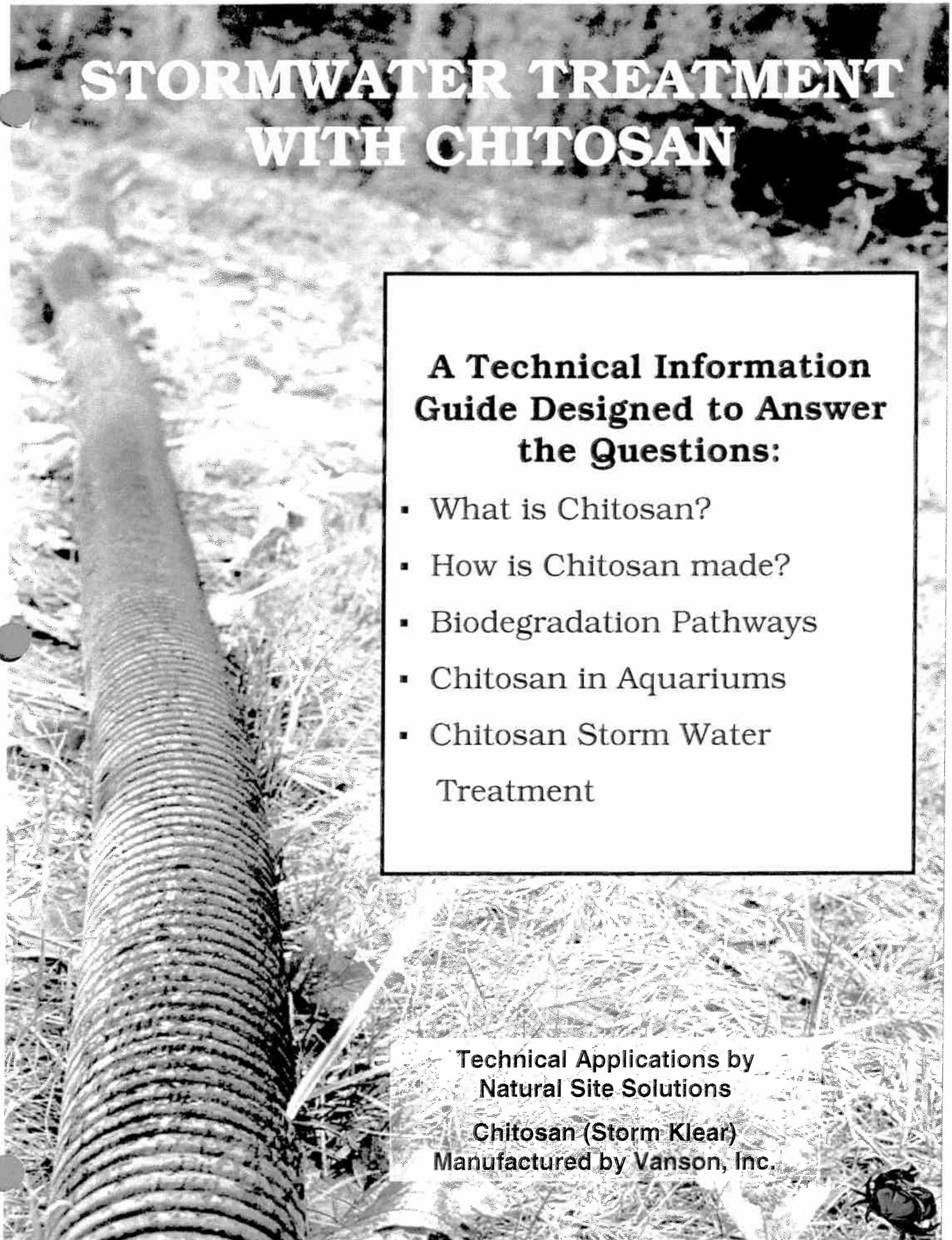


STORMWATER TREATMENT WITH CHITOSAN

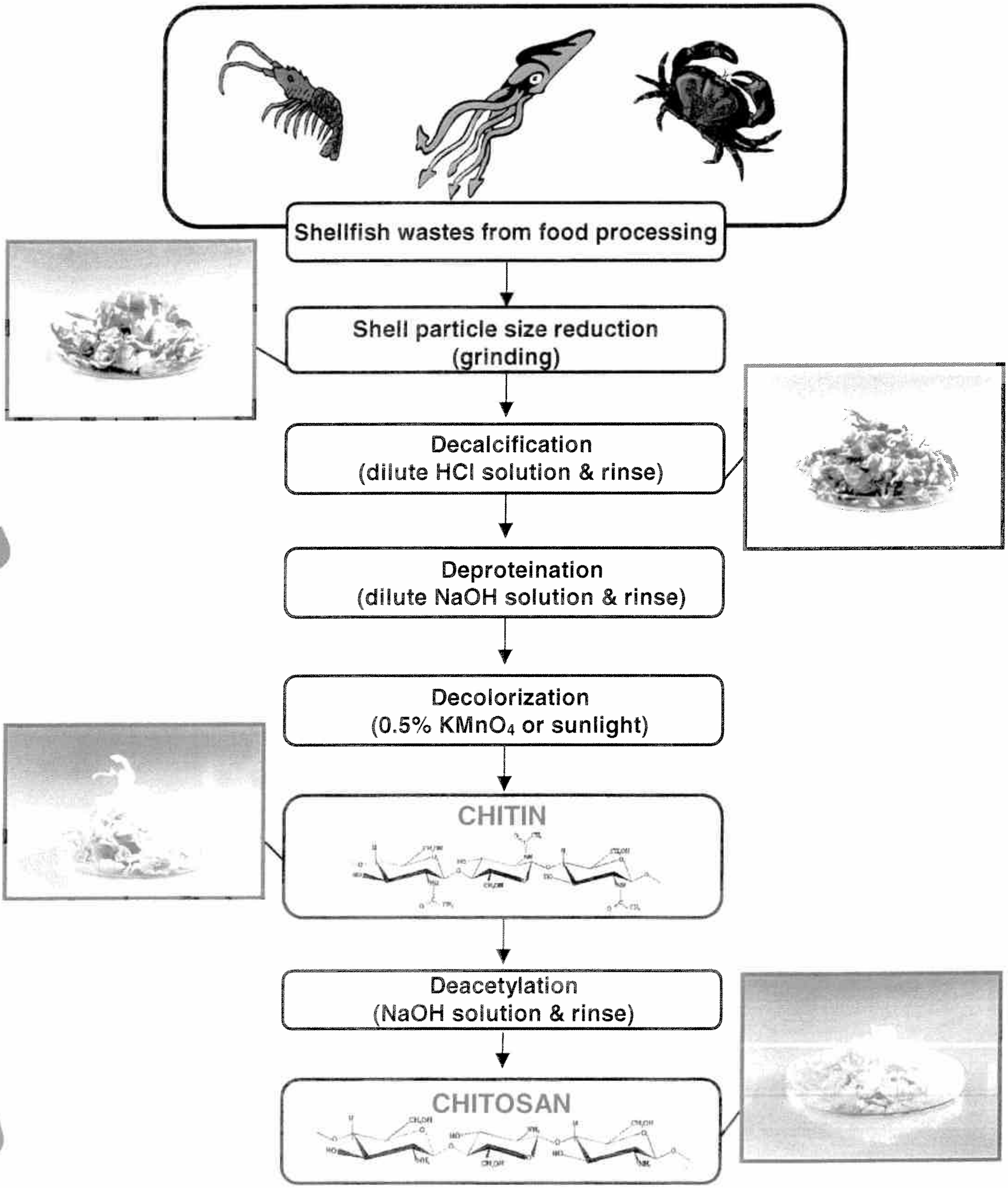
A Technical Information Guide Designed to Answer the Questions:

- What is Chitosan?
- How is Chitosan made?
- Biodegradation Pathways
- Chitosan in Aquariums
- Chitosan Storm Water Treatment

Technical Applications by
Natural Site Solutions

Chitosan (Storm Klear)
Manufactured by Vanson, Inc.

How is Chitosan Made?



BIOCHEMICAL DEGREDATION OF CHITIN AND CHITOSAN

CHITIN

↓ ← **CHITINASE** (natural enzyme)

CHITOSAN

↓ ← **CHITOSANASE** (natural enzyme)

GLUCOSAMINYL-GLUCOSAMINIDE

↓ ← **GLUCOSAMINIDASE** (natural enzyme)

GLUCOSAMINE

↓ ← **BACTERIOLOGIC DEGREDATION** (aerobic)

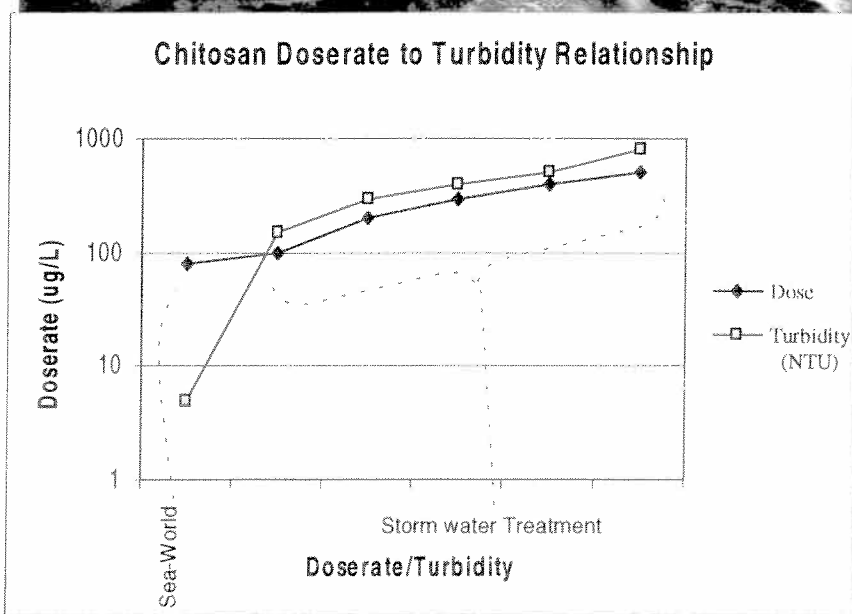
GLUCOSE → **CO2 + Water**

Chitosan use in Commercial Aquariums[1]

Chitosan is so environmentally safe it is actually used by commercial aquariums to keep the exhibits crystal clear for viewing. Chitosan coagulates the suspended materials in aquariums just as it does in stormwater. Sea-World, for example, injects chitosan directly into their fish tanks at dose rates similar to those used in stormwater treatment (see chart below). Chitosan is used in fresh and saltwater with coldwater and tropical fishes, crustaceans, sea anemones, corals, and marine mammals. The exact form of chitosan used in stormwater treatment is continuously injected into the aquariums with metering pumps for a prescribed period each day. Sea-World alone may use over 30 gallons of chitosan daily.

Because Sea-World and other commercial aquariums (hosting some of the most exotic and sensitive fish species in the world) have been using chitosan for years, the issue of acute and chronic aquatic toxicity is effectively mute. Absolutely no toxicity has been associated with chitosan use in these applications.

Recent aquatic toxicity testing on chitosan and stormwater treated with chitosan confirms what professional aquarium operators already know - chitosan keeps water clean and is fish-safe.



Dose and Turbidity

Chitosan aquatic toxicity is mitigated as turbidity increases, therefore, the doserate/turbidity ratio is a better indicator of potential toxicity than doserate alone. This chart shows that higher doserates are used when treating stormwater but the stormwater turbidity is significantly higher than aquarium water. The conclusion is that stormwater treated with chitosan would be expected to exhibit even less potential toxicity than the water treated at Sea-World.

---

[1] Information provided by Vanson Corporation - Redmond, Washington

How is Chitosan used to Treat Storm water

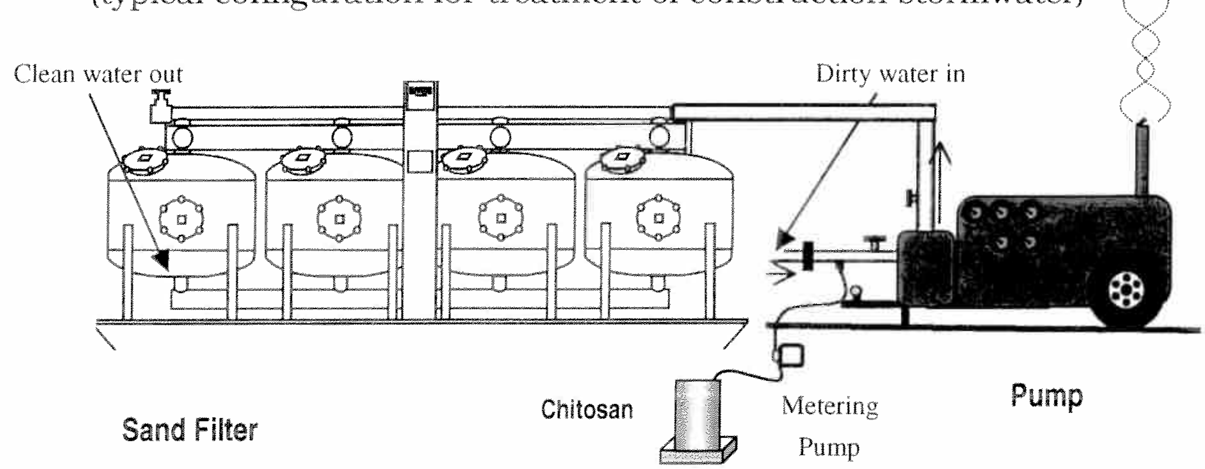
Chitosan is made into a 1 percent liquid solution (chitosan acetate) that is used for a variety of water treatment applications throughout the world. Chitosan has recently been proven highly effective for the treatment of stormwater on construction sites. The stormwater is typically pumped from a detention basin into a modified sand filter as shown below. Just before the stormwater enters the sand filter a minute dose of chitosan is injected into the dirty water (dose rates are usually less than 0.5 mg/l or about one gallon of chitosan per 20,000 gallons of dirty water). The chitosan causes the fine sediment particles to bind together and are subsequently removed during filtration. Chitosan also removes phosphorus, heavy metals and oils from the water.

Periodically the filter will back-wash the sediment out of the individual filter pods and this high sediment-containing water is simply discharged back into the detention basin. Experience has shown that the back-wash water actually pretreats the water in the basin reducing the suspended sediment load prior to filtration.

This process is relatively simple as treatment systems go and has demonstrated good reliability considering the challenging environment of construction sites.

Chitosan-Enhanced Sand Filtration

(typical configuration for treatment of construction stormwater)



Chitosan-Enhanced Sand Filtration Results in Construction Water Treatment

A full-scale (1,000 gpm) sand filtration system was installed on a construction site in Redmond, Washington in late 2000 and operated through the 2001 wet season. The treated water was tested and the results summarized below. The chitosan treatment system exceeded all expectations consistently producing water which met all state water quality standards.

Table 1

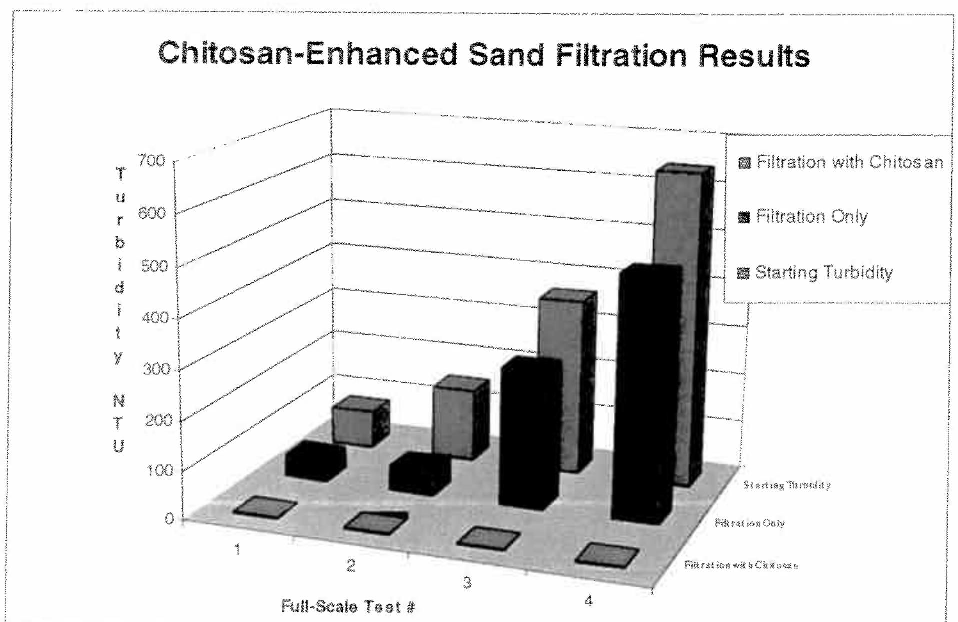
Chitosan-Enhanced Sand Filtration Test Data Summary

Test #[1]	Turbidity Before	Turbidity After	pH Before	pH After	Aquatic Toxicity Tests[2]	
					Trout	Daphnia
1	79	2.7	7.0	7.0	0% mortality	0% mortality
2	150	1	6.9	6.9	0% mortality	0% mortality
3	365	2	7.1	7.1	0% mortality	2% mortality
4	643	3.1	7.1	7.1	0% mortality	0% mortality

[1] Test # 1 performed on January 1st, 2001 – 550 gpm flow rate
Test #2 performed on October 31st, 2000 – 500 gpm flow rate
Test # 3 performed January 17th, 2001 – 500 gpm flow rate
Test # 4 performed on March 19th, 1999 – 350 gal. batch

[2] The 96-hour Rainbow Trout acute toxicity test followed Method EPA/600/4-90/027 and WQ-R-95-80
The 48-hour Daphnia magna acute toxicity test followed Method EPA/600/4-90/027 and WQ-R-95-80
Mortality exceeding 20% for any one test indicates a failure of the test.

The chart to the right illustrates the tremendous advantage in sand filtration effectiveness when chitosan is added to dirty construction water at approximately 0.5 mg/l.



EAST COAST ENVIRONMENTAL, INC.
95 Goshen Turnpike Bloomingburg, NY 12721

MATERIAL SAFETY DATA SHEET

SECTION I - IDENTIFICATION

PRODUCT: ECE-1048
SYNONYMS: None
CHEMICAL NAME/FAMILY: Flocculant
MOLECULAR FORMULA: Mixture
MOLECULAR WEIGHT: Mixture
DESCRIPTION: Concentrated, liquid mixture.

ISSUE/REC DATE: 12/11/97
PREPARED BY: TZ
TELEPHONE NUMBER: (845) 733-7759

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS No.	Hazard	TLV*	PEL*

No permissable exposure limits (PEL/TLV) have been establihed by OSHA or ACGIH.

SECTION IIA - NON-HAZARDOUS INGREDIENTS

Ingredients not precisely identified are proprietary or non-hazardous

SECTION III - PHYSICAL PROPERTIES

BOILING POINT (degrees F): similar to water
SPECIFIC GRAVITY (H2O =1): 1.0-1.05
VAPOR PRESSURE (mmHg): similar to water
VAPOR DENSITY: similar to water
pH: 5-7

VOLATILES (% by weight): about 75
EVAPORATION RATE (ether=1): similar to water
MELTING POINT: 27 degrees F
SOLUBILITY IN WATER: Completely soluble
ODOR: No specific odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.
FLAMMABILITY LIMITS IN AIR % BY VOLUME: N/A
FLASH POINT AND METHOD USED: >200 F; Closed cup
SPECIAL FIRE FIGHTING PROCEDURES: None except wetted product present a slip hazard.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Dust in sufficient concentration can result in an explosive mixture in air.
LEL: N/A
UEL: N/A

SECTION V - REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY: Strong oxidants like chlorine.
HAZARD POLYMERIZATION: None
CONDITIONS TO AVOID: None known
HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce oxides of carbon and nitrogen, various hydrocarbons, ammonia and/or hydrogen chloride vapor.

SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: inhalation, skin, ingestion, eyes
CARCINOGEN LISTED IN: not listed as carcinogen by IARC, NTP, OSHA or ACGIH

HEALTH HAZARDS:
ACUTE: Redness or irritation to exposed areas. Inhaled dust may cause some respiratory irritation.
CHRONIC: None known.

SIGNS AND SYMPTOMS OF EXPOSURE: Contact with eyes may produce irritation and redness. Inhaled dust may cause some respiratory irritation.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: May aggravate pre-existing skin irritations.

EMERGENCY FIRST AID PROCEDURES: Seek medical assistance for further treatment, observation, and support, if necessary.

EYE CONTACT: Immediately flush eye(s) with large amounts of water for at least 15 minutes. If irritation persists, keep flushing with water. Seek medical aid.

INGESTION: Do not induce vomiting. If victim is conscious, have victim rinse mouth with water and drink large quantity of water. Seek medical aid.

SKIN CONTACT: Wash with water. If irritation persists, keep rinsing with cold water.

INHALATION: Remove to fresh air. Get medical attention.

SECTION VII - PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Use a NIOSH approved dust respirator.
EYE PROTECTION: Chemical goggles/face shield
PROTECTIVE GLOVES: Rubber (Neoprene)
VENTILATION TO BE USED: Local Exhaust
OTHER PROTECTIVE CLOTHING AND EQUIPMENT: Long sleeved shirt, long pants, boots, and rubber gloves.
HYGIENIC WORK PRACTICES: Wash hands frequently, wear goggles or face shield and protective clothing.

SECTION VIII - PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

STEPS TO BE TAKES IF MATERIAL IS SPILLED OR RELEASED: For large spills, dike to prevent spilled materials from entering streams or sewer systems. Small spills may be picked up and reused or recycled. Observe all local, state and federal regulations

WASTE DISPOSAL METHOD: As recommended by local, state and federal authorities.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Spills should be scooped/wiped up immediately and the spill area flushed with water.

OTHER PRECAUTIONS AND/OR SPECIAL HANDLING: Store in cool, dry place. **SPILLS OF THIS PRODUCT ARE VERY SLIPPERY.**

NFPA RATING: Health__1__ Flammability__0__ Reactivity__0__ Special____

D.O.T. Shipping information: Not applicable / Not rated

ECOLOGICAL INFORMATION

LC50 determinations without added suspended solids overestimate the true toxicity of cationic polymers. Suspened solids and other dissolved organic materials like humic acid are present in natural waters and reduce the effedtive concentration of the polymer and thereby its toxicity.

LC50
Bluegill, 96 hour: 0.90 mg/L
Trout, 96 hour: 0.60 mg/L
Octanol/H2O Partition Coef.: Not available

While we heloive that the data contained herein is factual and the opinions expressed are those of qualified experts, the data are not to be taken as a warranty or representation for which the company assumes legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of these data and information must be deteremined by the user to be in accordance with applicable Federal, State, and Local Laws and regulations.

EAST COAST ENVIRONMENTAL, INC.
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www.ecoastusa.com

TECH BULLETIN

ECE-1048

CATIONIC POLYMER

DESCRIPTION
ECE-1048 is a liquid cationic polyelectrolyte, which works effectively as a primary flocculent and charge neutralization agent in liquid-solid separation processes.

PRINCIPAL USES
Water clarification—improves influent, process and effluent water quality by reducing suspended solids, color and turbidity.

TYPICAL PROPERTIES
Appearance.............................amber liquid
Charge.................................cationic
Relative molecular weight.............high
Apparent viscosity @25C, CPS.......3200
Freeze point.............................-5C
pH......................................5.0-8.0
Shelf life................................2 years

ADVANTAGES
- Economical to use-effective at low dosage levels
- Unaffected by pH of system
- Effective over a wide pH range
- Resistant to chlorine
- Replaces inorganic salt use
- Capable of direct feed—simplifies dilution, feed and handling equipment
- Immediately soluble in water at all concentrations

APPLICATION
ECE-1048 should be metered to the system by use of a positive displacement pump. For maximum effectiveness, add dilution water at a ratio of at least 10:1. Best results are obtained by dispersing feed stream and promoting high turbulence for rapid mixing beyond the application point. Maximum residence time before the separation process yields improved efficiency.

HEALTH & SAFETY
This product can irritate the eyes and skin. Rubber gloves, goggles and protective clothing are recommended for use while handling. See MSDS.

HANDLING & STORAGE
Recommended materials of construction include stainless steel, fiberglass, plastic and glass or epoxy-lined vessels. Do not use iron, copper, or aluminum. If material freezes, thaw and mix before use. Spilled polymer is slippery and should be flushed with water.

APPENDIX E

Deep Ripping and Decompaction Specifications NYSDEC 2008

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

Deep-Ripping and Decompaction

April 2008

New York State
Department of Environmental Conservation

Document Prepared by:

John E. Lacey,
Land Resource Consultant and Environmental Compliance Monitor
(Formerly with the Division of Agricultural Protection and Development Services,
NYS Dept. of Agriculture & Markets)

Alternative Stormwater Management
Deep-Ripping and Decompaction

Description

The two-phase practice of 1) "Deep Ripping;" and 2) "Decompaction" (deep subsoiling), of the soil material as a step in the cleanup and restoration/landscaping of a construction site, helps mitigate the physically induced impacts of soil compression; i.e.: soil compaction or the substantial increase in the bulk density of the soil material.

Deep Ripping and Decompaction are key factors which help in restoring soil pore space and permeability for water infiltration. Conversely, the physical actions of cut-and-fill work, land grading, the ongoing movement of construction equipment and the transport of building materials throughout a site alter the architecture and structure of the soil, resulting in: the mixing of layers (horizons) of soil materials, compression of those materials and diminished soil porosity which, if left unchecked, severely impairs the soil's water holding capacity and vertical drainage (rainfall infiltration), from the surface downward.

In a humid climate region, compaction damage on a site is virtually guaranteed over the duration of a project. Soil in very moist to wet condition when compacted, will have severely reduced permeability. Figure 1 displays the early stage of the deep-ripping phase (Note that all topsoil was stripped prior to construction access, and it remains stockpiled until the next phase – decompaction – is complete). A heavy-duty tractor is pulling a three-shank ripper on the first of several series of incrementally deepening passes through the construction access corridor's densely compressed subsoil material. Figure 2 illustrates the approximate volumetric composition of a loam surface soil when conditions are good for plant growth, with adequate natural pore space for fluctuating moisture conditions.

Fig. 1. A typical deep ripping phase of this practice, during the first in a series of progressively deeper "rips" through severely compressed subsoil.

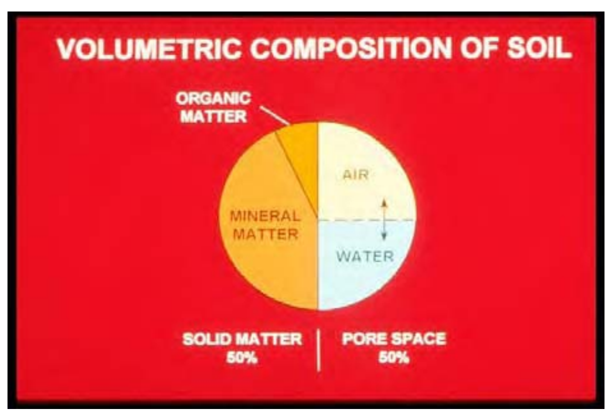

Fig. 2. About 50% of the volume of undisturbed loam surface soil is pore space, when soil is in good condition for plant growth. Brady, 2002.

Recommended Application of Practice

The objective of Deep Ripping and Decompaction is to effectively fracture (vertically and laterallly) through the thickness of the physically compressed subsoil material (see Figure 3), restoring soil porosity and permeability and aiding infiltration to help reduce runoff. Together with topsoil stripping, the "two-phase" practice of Deep Ripping and Decompaction first became established as a "best management practice" through ongoing success on commercial farmlands affected by heavy utility construction right-of-way projects (transmission pipelines and large power lines).

Fig. 3. Construction site with significant compaction of the deep basal till subsoil extends 24 inches below this exposed cut-and-fill work surface.

Soil permeability, soil drainage and cropland productivity were restored. For broader construction application, the two-phase practice of Deep Ripping and Decompaction is best adapted to areas impacted with significant soil compaction, on contiguous open portions of large construction sites and inside long, open construction corridors used as temporary access over the duration of construction. Each mitigation area should have minimal above-and-below-ground obstructions for the easy avoidance and maneuvering of a large tractor and ripping/decompacting implements. Conversely, the complete two-phase practice is not recommended in congested or obstructed areas due to the limitations on tractor and implement movement.

Benefits

Aggressive "deep ripping" through the compressed thickness of exposed subsoil before the replacement/respreading of the topsoil layer, followed by "decompaction," i.e.: "sub-soiling," through the restored topsoil layer down into the subsoil, offers the following benefits:

- Increases the project (larger size) area's direct surface infiltration of rainfall by providing the open site's mitigated soil condition and lowers the demand on concentrated runoff control structures

- Enhances direct groundwater recharge through greater dispersion across and through a broader surface than afforded by some runoff-control structural measures

- Decreases runoff volume generated and provides hydrologic source control

- May be planned for application in feasible open locations either alone or in conjunction with plans for structural practices (e.g., subsurface drain line or infiltration basin) serving the same or contiguous areas

- Promotes successful long-term revegetation by restoring soil permeability, drainage and water holding capacity for healthy (rather than restricted) root-system development of trees, shrubs and deep rooted ground cover, minimizing plant drowning during wet periods and burnout during dry periods.

Feasibility/Limitations

The effectiveness of Deep Ripping and Decompaction is governed mostly by site factors such as: the original (undisturbed) soil's hydrologic characteristics; the general slope; local weather/timing (soil moisture) for implementation; the space-related freedom of equipment/implement maneuverability (noted above in **Recommended Application of Practice**), and by the proper selection and operation of tractor and implements (explained below in **Design Guidance**). The more notable site-related factors include:

Soil
In the undisturbed condition, each identified soil type comprising a site is grouped into one of four categories of soil hydrology, Hydrologic Soil Group A, B, C or D, determined primarily by a range of characteristics including soil texture, drainage capability when thoroughly wet, and depth to water table. The natural rates of infiltration and transmission of soil-water through the undisturbed soil layers for Group A is "high" with a low runoff potential while soils in Group B are moderate in infiltration and the transmission of soil-water with a moderate runoff potential, depending somewhat on slope. Soils in Group C have slow rates of infiltration and transmission of soil-water and a moderately high runoff potential influenced by soil texture and slope; while soils in Group D have exceptionally slow rates of infiltration and transmission of soil-water, and high runoff potential.

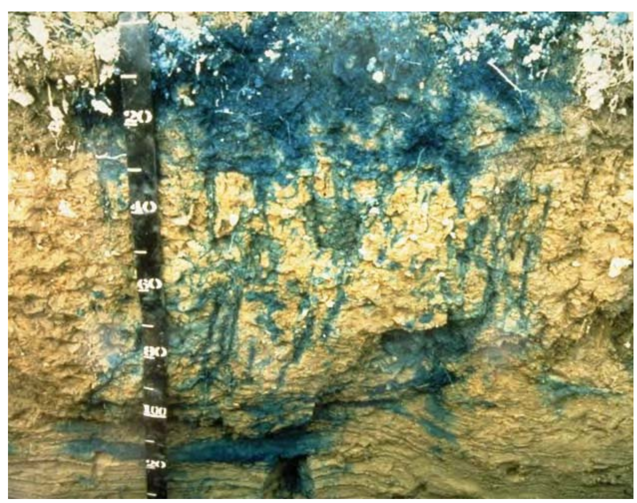

Fig. 4. Profile (in centimeters) displaying the infiltration test result of the natural undisturbed horizons of a soil in Hydrologic Soil Group C.

In Figure 4, the profile displays the undisturbed horizons of a soil in Hydrologic Soil Group C and the naturally slow rate of infiltration through the subsoil. The slow rate of infiltration begins immediately below the topsoil horizon (30 cm), due to the limited amount of macro pores, e.g.: natural subsoil fractures, worm holes and root channels. Infiltration after the construction-induced mixing and compression of such subsoil material is virtually absent; but can be restored back to this natural level with the two-phase practice of deep ripping and decompaction, followed by the permanent establishment of an appropriate, deep taproot lawn/ground cover to help maintain the restored subsoil structure. Infiltration after construction-induced mixing and compression of such subsoil material can be notably rehabilitated with the Deep Ripping and Decompaction practice, which prepares the site for the appropriate long-term lawn/ground cover mix including deep taproot plants such as clover, fescue or trefoil, etc. needed for all rehabilitated soils.

Generally, soils in Hydrologic Soil Groups A and B, which respectively may include deep, well-drained, sandy-gravelly materials or deep, moderately well-drained basal till materials, are among the easier ones to restore permeability and infiltration, by deep ripping and decompaction. Among the many different soils in Hydrologic Soil Group C are those unique glacial tills having a natural fragipan zone, beginning about 12 to 18 inches (30 – 45cm), below surface. Although soils in Hydrologic Soil Group C do require a somewhat more carefully applied level of the Deep Ripping and Decompaction practice, it can greatly benefit such affected areas by reducing the runoff and fostering infiltration to a level equal to that of pre-disturbance.

Soils in Hydrologic Soil Group D typically have a permanent high water table close to the surface, influenced by a clay or other highly impervious layer of material. In many locations with clay subsoil material, the bulk density is so naturally high that heavy trafficking has little or no added impact on infiltration; and structural runoff control practices rather than Deep Ripping and Decompaction should be considered.

The information about Hydrologic Soil Groups is merely a general guideline. Site-specific data such as limited depths of cut-and-fill grading with minimal removal or translocation of the inherent subsoil materials (as analyzed in the county soil survey) or, conversely, the excavation and translocation of deeper, unconsolidated substratum or consolidated bedrock materials (unlike the analyzed subsoil horizons' materials referred to in the county soil survey) should always be taken into account.

Sites made up with significant quantities of large rocks, or having a very shallow depth to bedrock, are not conducive to deep ripping and decompation (subsoiling); and other measures may be more practical.

Slope

The two-phase application of 1) deep ripping and 2) decompaction (deep subsoiling), is most practical on flat, gentle and moderate slopes. In some situations, such as but not limited to temporary construction access corridors, inclusion areas that are moderately steep along a project's otherwise gentle or moderate slope may also be deep ripped and decompacted. For limited instances of moderate steepness on other projects, however, the post-construction land use and the relative alignment of the potential ripping and decompaction work in relation to the lay of the slope should be reviewed for safety and practicality. In broad construction areas predominated by moderately steep or steep slopes, the practice is generally not used.

Local Weather/Timing/Soil Moisture

Effective fracturing of compressed subsoil material from the exposed work surface, laterally and vertically down through the affected zone is achieved only when the soil material is moderately dry to moderately moist. Neither one of the two-phases, deep ripping nor decompaction (deep subsoiling), can be effectively conducted when the soil material (subsoil or replaced topsoil) is in either a "plastic" or "liquid" state of soil consistency. Pulling the respective implements legs through the soil when it is overly moist only results in the "slicing and smearing" of the material or added "squeezing and compression" instead of the necessary fracturing. Ample drying time is needed for a "rippable" soil condition not merely in the material close to the surface, but throughout the material located down to the bottom of the physically compressed zone of the subsoil.


Fig. 5. Augered from a depth of 19 inches below the surface of the replaced topsoil, this subsoil sample was hand rolled to a 1/8-inch diameter. The test shows the soil at this site stretches out too far without crumbling; it indicates the material is in a plastic state of consistence, too wet for final decompaction (deep subsoiling) at this time.

The "poor man's Atterberg field test" for soil plasticity is a simple "hand-roll" method used for quick, on-site determination of whether or not the moisture level of the affected soil material is low enough for: effective deep ripping of subsoil; respreading of topsoil in a friable state; and final decompaction (deep subsoiling). Using a sample of soil material obtained from the planned bottom depth of ripping, e.g.: 20 - 24 inches below exposed subsoil surface, the sample is hand rolled between the palms down to a 1/8-inch diameter thread. (Use the same test for stored topsoil material before respreading on the site.) If the respective soil sample crumbles apart in segments no greater than 3/8 of an inch long, by the time it is rolled down to 1/8 inch diameter, it is low enough in moisture for deep ripping (or topsoil replacement), and decompaction. Conversely, as shown in Figure 5, if the rolled sample stretches out in increments greater than 3/8 of an inch long before crumbling, it is in a "plastic" state of soil consistency and is too wet for subsoil ripping (as well as topsoil replacement) and final decompaction.

Design Guidance

Beyond the above-noted site factors, a vital requirement for the effective Deep Ripping and Decompaction (deep subsoiling), is implementing the practice in its distinct, two-phase process:

1) Deep rip the affected thickness of exposed subsoil material (see Figure 10 and 11), aggressively fracturing it before the protected topsoil is reapplied on the site (see Figure 12); and

2) Decompact (deep subsoil), simultaneously through the restored topsoil layer and the upper half of the affected subsoil (Figure 13). The second phase, "decompaction," mitigates the partial recompaction which occurs during the heavy process of topsoil spreading/grading. Prior to deep ripping and decompacting the site, all construction activity, including construction equipment and material storage, site cleanup and trafficking (Figure 14), should be finished; and the site closed off to further disturbance. Likewise, once the practice is underway and the area's soil permeability and

rainfall infiltration are being restored, a policy limiting all further traffic to permanent travel lanes is maintained.

The other critical elements, outlined below, are: using the proper implements (deep, heavy-duty rippers and subsoilers), and ample pulling-power equipment (tractors); and conducting the practice at the appropriate speed, depth and pattern(s) of movement.

Note that an appropriate plan for the separate practice of establishing a healthy perennial ground cover, with deep rooting to help maintain the restored soil structure, should be developed in advance. This may require the assistance of an agronomist or landscape horticulturist.

Implements

Avoid the use of all undersize implements. The small-to-medium, light-duty tool will, at best, only “scarify” the uppermost surface portion of the mass of compacted subsoil material. The term “chisel plow” is commonly but incorrectly applied to a broad range of implements. While a few may be adapted for the moderate subsoiling of non-impacted soils, the majority are less durable and used for only lighter land-fitting (see Figure 6).

Fig. 6. A light duty chisel implement, not adequate for either the deep ripping or decompaction (deep subsoiling) phase.

Fig. 7. One of several variations of an agricultural ripper. This unit has long, rugged shanks mounted on a steel V-frame for deep, aggressive fracturing through Phase 1.

Use a “heavy duty” agricultural-grade, deep ripper (see Figures 7,9,10 and 11) for the first phase: the lateral and vertical fracturing of the mass of exposed and compressed subsoil, down and through, to the bottom of impact, prior to the replacement of the topsoil layer. (Any oversize rocks which are uplifted to the subsoil surface during the deep ripping phase are picked and removed.) Like the heavy-duty class of implement for the first phase, the decompaction (deep subsoiling) of Phase 2 is conducted with the heavy-duty version of the deep subsoiler. More preferable is the angled-leg variety of deep subsoiler (shown in Figures 8 and 13). It minimizes the inversion of the subsoil and topsoil layers while laterally and vertically fracturing the upper half of the previously ripped subsoil layer and all of the topsoil layer by delivering a momentary, wave-like “lifting and shattering” action up through the soil layers as it is pulled.

Pulling-Power of Equipment
Use the following rule of thumb for tractor horsepower (hp) whenever deep ripping and decompacting a significantly impacted site: For both types of implement, have at least 40 hp of tractor pull available for each mounted shank/ leg.

Using the examples of a 3-shank and a 5-shank implement, the respective tractors should have 120 and 200 hp available for fracturing down to the final depth of 20-to-24 inches per phase. Final depth for the deep ripping in Phase 1 is achieved incrementally by a progressive series of passes (see Depth and Patterns of Movement, below); while for Phase 2, the full operating depth of the deep subsoiler is applied from the beginning.

The operating speed for pulling both types of implement should not exceed 2 to 3 mph. At this slow and managed rate of operating speed, maximum functional performance is sustained by the tractor and the implement performing the soil fracturing. Referring to Figure 8, the implement is the 6-leg version of the deep angled-leg subsoiler. Its two outside legs are “chained up” so that only four legs will be engaged (at the maximum depth), requiring no less than 160 hp, (rather than 240 hp) of pull. The 4-wheel drive, articulated-frame tractor in Figure 8 is 174 hp. It will be decompacting this unobstructed, former construction access area simultaneously through 11 inches of replaced topsoil and the upper 12 inches of the previously deep-ripped subsoil. In constricted areas of Phase 1) Deep Ripping, a medium-size tractor with adequate hp, such as the one in Figure 9 pulling a 3-shank deep ripper, may be more maneuverable.

Fig. 8. A deep, angled-leg subsoiler, ideal for Phase 2 decompaction of after the topsoil layer is graded on top of the ripped subsoil.

Fig. 9. This medium tractor is pulling a 3-shank deep ripper. The severely compacted construction access corridor is narrow, and the 120 hp tractor is more maneuverable for Phase 1 deep ripping (subsoil fracturing), here.

Some industrial-grade variations of ripping implements are attached to power graders and bulldozers. Although highly durable, they are generally not recommended. Typically, the shanks or “teeth” of these rippers are too short and stout; and they are mounted too far apart to achieve the well-distributed type of lateral and vertical fracturing of the soil materials necessary to restore soil permeability and infiltration. In addition, the power graders and bulldozers, as pullers, are far less maneuverable for turns and patterns than the tractor.

Depth and Patterns of Movement
As previously noted both Phase 1 Deep Ripping through significantly compressed, exposed subsoil and Phase 2 Decompaction (deep subsoiling) through the replaced topsoil and upper subsoil need to be performed at maximum capable depth of each implement. With an implement's guide wheels attached, some have a "normal" maximum operating depth of 18 inches, while others may go deeper. In many situations, however, the tractor/implement operator must first remove the guide wheels and other non essential elements from the implement. This adapts the ripper or the deep subsoiler for skillful pulling with its frame only a few inches above surface, while the shanks or legs, fracture the soil material 20-to-24 inches deep.

There may be construction sites where the depth of the exposed subsoil's compression is moderate, e.g.: 12 inches, rather than deep. This can be verified by using a ¾ inch cone penetrometer and a shovel to test the subsoil for its level of compaction, incrementally, every three inches of increasing depth. Once the full thickness of the subsoil's compacted zone is finally "pieced" and there is a significant drop in the psi measurements of the soil penetrometer, the depth/thickness of compaction is determined. This is repeated at several representative locations of the construction site. If the thickness of the site's subsoil compaction is verified as, for example, ten inches, then the Phase 1 Deep Ripping can be correspondingly reduced to the implement's minimum operable depth of 12 inches. However, the Phase 2 simultaneous Decompation (subsoiling) of an 11 inch thick layer of replaced topsoil and the upper subsoil should run at the subsoiling implements full operating depth.

Fig. 10. An early pass with a 3-shank deep ripper penetrating only 8 inches into this worksite's severely compressed subsoil.

Fig. 11. A repeat run of the 3-shank ripper along the same patterned pass area as Fig. 9; here, incrementally reaching 18 of the needed 22 inches of subsoil fracture.

Typically, three separate series (patterns) are used for both the Phase 1 Deep Ripping and the Phase 2 Decompaction on significantly compacted sites. For Phase 1, each series begins with a moderate depth of rip and, by repeat-pass, continues until full depth is reached. Phase 2 applies the full depth of Decompation (subsoiling), from the beginning.

Every separate series (pattern) consists of parallel, forward-and-return runs, with each progressive pass of the implement's legs or shanks evenly staggered between those from the previous pass. This compensates for the shank or leg-spacing on the implement, e.g., with 24-to-30 inches between each shank or leg. The staggered return pass ensures lateral and vertical fracturing actuated every 12 to 15 inches across the densely compressed soil mass.

Large, Unobstructed Areas
For larger easy areas, use the standard patterns of movement:

- The first series (pattern) of passes is applied lengthwise, parallel with the longest spread of the site; gradually progressing across the site's width, with each successive pass.

- The second series runs obliquely, crossing the first series at an angle of about 45 degrees.

- The third series runs at right angle (or 90 degrees), to the first series to complete the fracturing and shattering on severely compacted sites, and avoid leaving large unbroken blocks of compressed soil material. (In certain instances, the third series may be optional, depending on how thoroughly the first two series loosen the material and eliminate large chunks/blocks of material as verified by tests with a ¾-inch cone penetrometer.)

Fig. 12. Moderately dry topsoil is being replaced on the affected site now that Phase 1 deep ripping of the compressed subsoil is complete.


Fig. 13. The same deep, angled-leg subsoiler shown in Fig. 7 is engaged at maximum depth for Phase 2, decompaction (deep soiling), of the replaced topsoil and the upper subsoil materials.

Corridors
In long corridors of limited width and less maneuverability than larger sites, e.g.: along compacted areas used as temporary construction access, a modified series of pattern passes are used.

- First, apply the same initial lengthwise, parallel series of passes described above.

● A second series of passes makes a broad “S” shaped pattern of rips, continually and gradually alternating the “S” curves between opposite edges inside the compacted corridor.

● The third and final series again uses the broad, alternating S pattern, but it is “flip-flopped” to continually cross the previous S pattern along the corridor’s centerline. This final series of the S pattern curves back along the edge areas skipped by the second series.

Maintenance and Cost

Once the two-phase practice of Deep Ripping and Decompation is completed, two items are essential for maintaining a site’s soil porosity and permeability for infiltration. They are: planting and maintaining the appropriate ground cover with deep roots to maintain the soil structure (see Figure 15); and keeping the site free of traffic or other weight loads.

Note that site-specific choice of an appropriate vegetative ground-cover seed mix, including the proper seeding ratio of one or more perennial species with a deep taproot system and the proper amount of lime and soil nutrients (fertilizer mix) adapted to the soil-needs, are basic to the final practice of landscaping, i.e: surface tillage, seeding/planting/fertilizing and culti-packing or mulching is applied. The "maintenance" of an effectively deep-ripped and decompacted area is generally limited to the successful perennial (long-term) landscape ground cover; as long as no weight-bearing force of soil compaction is applied.

Fig. 14. The severely compacted soil of a temporary construction yard used daily by heavy equipment for four months; shown before deep ripping, topsoil replacement, and decompaction.

Fig. 15. The same site as Fig. 14 after deep ripping of the exposed subsoil, topsoil replacement, decompaction through the topsoil and upper subsoil and final surface tillage and revegetation to maintain soil permeability and infiltration.

The Deep Ripping and Decompaction practice is, by necessity, more extensive than periodic subsoiling of farmland.The cost of deep ripping and decompacting (deep subsoiling), will vary according to the depth and severity of soil-material compression and the relative amount of tractor and implement time that is required. In some instances, depending on open maneuverability, two-to-three acres of compacted project area may be deep-ripped in one day. In other situations of more severe compaction and - or less maneuverability, as little as one acre may be fully ripped in a day. Generally, if the Phase 1) Deep Ripping is fully effective, the Phase 2) Decompaction should be completed in 2/3 to 3/4 of the time required for Phase 1.

Using the example of two acres of Phase 1) Deep Ripping in one day, at $1800 per day, the net cost is $900 per acre. If the Phase 2) Decompacting or deep subsoiling takes 3/4 the time as Phase 1, it costs $675 per acre for a combined total of $1575 per acre to complete the practice (these figures do not include the cost of the separate practice of topsoil stripping and replacement). Due to the many variables, it must be recognized that cost will be determined by the specific conditions or constraints of the site and the availability of proper equipment.

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- Soil penetrometer information. Access by internet searches of: *Diagnosing Soil Compaction using a Penetrometer (soil compaction tester), PSU Extension;* as well as *Dickey-john Soil Compaction Tester*. http://www.dickey-johnproducts.com/pdf/SoilCompactionTest.pdf and http://cropsoil.psu.edu/Extension/Facts/uc178pdf Last visited Sept. 07

APPENDIX F

Erosion Control Inspection Form and Maintenance Logs for Post Construction Stormwater Management Practices

Stormwater Pond/Wetland Operation, Maintenance and Management Inspection Checklist

Project
Location: ______________________
Site Status: ______________________

Date: ______________________
Time: ______________________

Inspector: ______________________

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe		
downstream		
upstream		
d. Emergency spillway		
6.Pond, toe & chimney drains clear and functioning		
7.Seeps/leaks on downstream face		
8.Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam "As-Built"		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
10. Emergency spillway clear of obstructions and debris		
11. Other (specify)		
2. Riser and principal spillway (Annual)		
Type: Reinforced concrete ______ Corrugated pipe ______ Masonry ______ 1. Low flow orifice obstructed		
2. Low flow trash rack. a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (rebars exposed)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		
10. Other (specify)		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
3. Permanent Pool (Wet Ponds) (monthly)		
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
5. Other (specify)		
4. Sediment Forebays		
1.Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
5. Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
7. Other (specify)		
6. Condition of Outfalls (Annual , After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4.Endwalls / Headwalls		
5. Other (specify)		
7. Other (Monthly)		
1. Encroachment on pond, wetland or easement area		

Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
2. Complaints from residents		
3.Aesthetics a. Grass growing required		
b. Graffiti removal needed		
c. Other (specify)		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
8. Wetland Vegetation (Annual)		
1. Vegetation healthy and growing Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants: Survival of desired wetland plant species Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants "choked" with sediment		
7. Eutrophication level of the wetland.		
8. Other (specify)		

Comments:

Actions to be Taken:

Bioretention Operation, Maintenance and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Bioretention and contributing areas clean of debris		
No dumping of yard wastes into practice		
Litter (branches, etc.) have been removed		
2. Vegetation (Monthly)		
Plant height not less than design water depth		
Fertilized per specifications		
Plant composition according to approved plans		
No placement of inappropriate plants		
Grass height not greater than 6 inches		
No evidence of erosion		
3. Check Dams/Energy Dissipaters/Sumps (Annual, After Major Storms)		
No evidence of sediment buildup		

Maintenance Item	Satisfactory / Unsatisfactory	Comments
Sumps should not be more than 50% full of sediment		
No evidence of erosion at downstream toe of drop structure		
4. Dewatering (Monthly)		
Dewaters between storms		
No evidence of standing water		
5. Sediment Deposition (Annual)		
Swale clean of sediments		
Sediments should not be > 20% of swale design depth		
6. Outlet/Overflow Spillway (Annual, After Major Storms)		
Good condition, no need for repair		
No evidence of erosion		
No evidence of any blockages		
7. Integrity of Filter Bed (Annual)		
Filter bed has not been blocked or filled inappropriately		

Comments:

Actions to be Taken:

Open Channel Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

Stormwater Planter Maintenance and Management Inspection Checklist

Project____

Location____

Site Status____

Date____

Time____

Inspector____

Maintenance Item	Satisfactory/Unsatisfactory	Comments
1. Trash and Debris Removal		
2. Vegetation condition		
3. Condition of soil surface in planter		
4. Condition of piping feeding planter		

Comments:____

Actions to be Taken:

Green Roof Maintenance and Management Inspection Checklist

Project____

Location____

Site Status____

Date____

Time____

Inspector____

Maintenance Item	Satisfactory/Unsatisfactory	Comments
1. Condition of vegetation		
1. Watering, fertilization, pruning		
2. Replacement of dead vegetation		
3. Status of weeds in roof		
2. Condition of substrate		
1. Is substrate stable		
2. Gutters cleaned of sediment regularly		
3. Condition of membrane roof		
4. Winter inspection of roof		

Comments:____

____

____

____

Actions to be Taken:

____

____

____

____

Porus Pavement Maintenance and Management Inspection Checklist

Project____

Location____

Site Status____

Date____

Time____

Inspector____

Maintenance Item	Satisfactory/Unsatisfactory	Comments
1.Use of sand and salt during winter snow removal		
2. Condition of pavement surface (repairs needed)		
3. Trash and debris removal from pavement area		
4. Rainfall infiltration during rain storm		
5. Condition of upland areas (stabilized)		
6. Sediment accumulation on surface (sweeping or vacuuming needed)		

Comments:____

____

____

____

Actions to be Taken:

____

____

____

____

Phase 1(A) of the Modified Belleayre Resort at Catskill Park
INDIVIDUAL SWPPP INSPECTION REPORT

Inspector Name:	Date:
Signature:	Inspection #:
Weather:	

REPORT CHECKLIST

Complete the following report checklist and key issue items to attached site plan.

Inspection of Control Devices

	YES	NO	N/A	
1.	☐	☐	☐	Temporary Sediment Detention Basins:
2.	☐	☐	☐	Silt accumulation? Amount (%):
3.	☐	☐	☐	Check Dams:
4.	☐	☐	☐	Silt accumulation? Amount (%):

Additional Comments:

Stabilization

	YES	NO	N/A	
1.	☐	☐	☐	Are all existing disturbed areas contained by control devices? Type of devices:
2.	☐	☐	☐	Are there areas that require stabilization within the next 7 days? Specify Area:
3.	☐	☐	☐	Have stabilization measures been initiated in inactive areas?
4.	☐	☐	☐	Is there current snow cover or frozen ground conditions?
5.	☐	☐	☐	Rills or gullies?
6.	☐	☐	☐	Slumping/deposition?
7.	☐	☐	☐	Loss of vegetation?
8.	☐	☐	☐	Lack of germination?
9.	☐	☐	☐	Loss of mulching?

Additional Comments:

Receiving Structures/Water Bodies (Indicate locations where runoff leaves the project site on the site plan)

	YES	NO	N/A	
1.	☐	☐	☐	Is there stormwater leaving the site untreated?
2.	☐	☐	☐	Surface water swale or stream?
3.	☐	☐	☐	Municipal or community system?

Inspect locations where runoff from project site enters the receiving waters and indicate if there is evidence of:

4.	☐	☐	☐	Rills or gullies?
5.	☐	☐	☐	Slumping/deposition?
6.	☐	☐	☐	Loss of vegetation?
7.	☐	☐	☐	Undermining of structures?
8.	☐	☐	☐	Was there a discharge into the receiving water on the day of inspection?
9.	☐	☐	☐	Is there evidence of turbidity, sedimentation, or oil in the receiving waters?

Additional Comments:

General Site Condition

	YES	NO	N/A	
1.	☐	☐	☐	Have action items from previous reports been addressed?
2.	☐	☐	☐	Does routine maintenance of protection components occur on a regular basis?
3.	☐	☐	☐	Does cleaning and/or sweeping affected roadways occur, at minimum, daily?
4.	☐	☐	☐	Is debris and litter removed on a monthly basis, or as necessary?
5.	☐	☐	☐	Is the site maintained in an orderly manner?

Additional Comments:

Visual Observations

	YES	NO	N/A	
1.	☐	☐	☐	All erosion and sediment control measures have been installed/constructed?
2.	☐	☐	☐	All erosion and sediment control measures are being maintained properly?

Additional Comments:

Scope of Compliance Evaluation

1.	☐	☐	☐	Hazardous materials, residue or trash on the ground that could contaminate or be washed away in stormwater;
2.	☐	☐	☐	Leaks or spills from industrial equipment, drums, barrels, tanks of similar containers;
3.	☐	☐	☐	Unauthorized non-stormwater discharges or allowable non-stormwater discharges that are not certified in accordance with Part III.E.1;
4.	☐	☐	☐	Off-Site tracking of material or sediment where vehicles enter or exit the site;
5.	☐	☐	☐	Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas; and
6.	☐	☐	☐	Evidence of, or the potential for, pollutants entering the drainage system.

Results of both visual and any analytical monitoring done during the year must be taken into consideration during the evaluation. Stormwater BMPs identified in the SWPPP must be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they must be inspected to see whether BMPs are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations must be inspected if possible

Additional Comments:

SUMMARY OF ACTION ITEMS

Action Reported To: ______________________________

Company: ______________________________

Received By: (Signature) ______________________________

APPENDIX G

Sample Restrictive Deed Covenant

SAMPLE DEED COVENANT

DECLARATION OF RESTRICTIVE COVENANT
REGARDING STORMWATER MAINTENANCE

This Declaration of Restrictive Covenant regarding Stormwater Maintenance is entered into effective the _____ day of __________, _____ by ____________________________________ (the "Owner"), as owner of the real property located at ____________________________________ and more particularly described in Exhibit A attached hereto and made a part hereof (the "Property"). The Owner hereby acknowledges and agrees that the Property shall be operated and maintained in accordance with the operation and maintenance plan set forth in Schedule A and Schedule B attached hereto and made a part hereof.

This restrictive covenant shall run with the land and be binding on the successors and assigns of the owner.

DATED EFFECTIVE the day and year written above.

____

<u>Exhibit A</u>

<u>LEGAL DESCRIPTION</u>

(Insert Legal Description of property (e.g., All that certain plot, piece or parcel of land situate, lying…)

Schedule B

STORMWATER CONTROL FACILITY MAINTENANCE AGREEMENT

The facility owner desires that the stormwater control measures be built in accordance with the approved project plans and thereafter be maintained, cleaned, repaired, and replaced and continued in perpetuity in order to ensure optimum performance of the components. Therefore, facility owner agrees as follows:

1. This document binds the facility owner, its successors and assigns, to the maintenance provisions depicted in the approved project plan which is attached as Schedule A of this agreement.

2. The facility owner shall maintain, clean, repair, replace and continue the stormwater control measures depicted in Schedule A as necessary to ensure optimum performance of the measures to design specifications. The stormwater control measures shall include, but shall not be limited to, the following: drainage ditches, swales, infiltrators, drain inlets, pipes, and culverts.

3. The facility owner shall be responsible for all expenses related to the maintenance of the stormwater control measures and shall establish a means for the collection and distribution of expenses among parties for any commonly owned facilities.

4. The facility owner shall provide for the periodic inspection of the stormwater control measures, not less than once every five-year period, to determine the condition and integrity of the measures. Such inspection shall be performed by a Professional Engineer licensed by the State of New York. The inspecting engineer shall prepare and submit to the facility owner within 30 days of the inspection, a written report of the findings including recommendations for those actions necessary for the continuation of the stormwater control measures.

5. The facility owner shall not authorize, undertake or permit alteration, abandonment, modification or discontinuation of the stormwater control measures except in accordance with written approval of the agencies having jurisdiction.

6. The facility owner shall undertake necessary repairs and replacement of the stormwater control measures in accordance with the recommendations of the inspecting engineer.

7. This agreement shall be recorded in the Office of the County Clerk, County of ________________, together with the deed for the common property.

8. This agreement is effective ____.

Appendix H

Certification of No Non-Stormwater Discharges Onsite

Certification of No Non-Stormwater Discharges on the Belleayre Resort at Catskill Park Project Site

By signing this document, I certify that there currently are no non-stormwater discharges present on the property proposed for the Belleayre Resort at Catskill Park Project. Nearly all of this property is currently undeveloped. The previously developed parts of the property that include the Marlowe Mansion, the Wildacres Motel, the Ski Area support buildings at the base of the old Highmount Ski Area, and the Leach Farm buildings are all unoccupied, and to my knowledge, have no non-stormwater discharges. During the design process for this Project, numerous evaluations have been done on the property such as wetland delineations, wildlife and vegetation inventories and visual simulations, and none of this work on the property has revealed any sources of non-stormwater discharges existing on the property.

______________________________________ ________________

Dean Gitter, President of Crossroads Ventures, LLC. Date

Appendix I

Correspondences

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

January 6, 2003

Terresa Bakner
Whiteman, Osterman & Hanna
1 Commerce Plaza
Albany, NY 12260

Re: **CORPS,/DEC/SEQRA**
Belleayre Resort at Catskill Park
Shandaken/Middletown, Ulster &
Delaware Counties
99PR4498

Dear Ms. Bakner:

Thank you for requesting the comment of the State Historic Preservation Office (SHPO). We have had an opportunity to review the project in accordance with Section 106 of the National Historic Preservation Act of 1966 and relevant implementing regulations

Based upon our review of the submitted archeological information, the SHPO has no further concerns regarding archeology: additional survey for the project is **not** warranted.

Based upon our review of the submitted plans, drawings and Draft Environmental Impact Statement, it is the SHPO's opinion that the project will have **No Adverse Effect** upon properties in or eligible for inclusion in the State and National Registers of Historic Places. This 'No Adverse Effect' is based upon the provision that the following condition is met:

CONDITION

- All work (interior and exterior) that is proposed for the historic structures on the project site shall be reviewed by the SHPO prior to the initiation of any construction activities.

If you have any questions regarding this letter or any aspect of your project, please feel free to contact me at your convenience. Ext. 3273.

Sincerely,

Kenneth Markunas

Kenneth Markunas
Historic Sites
Restoration Coordinator

Cc: Alexander F. Ciesluk, Jr., DEC Region #3
~~K~~ Kenneth Graham, Crossroads Ventures LLC

FAXED: 1/6/03

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

April 11, 2002

Kenneth Graham
Project Manager
Crossroads Ventures LLC
P.O. Box 267, Andrew Lane Road
Mount Tremper, NY 12457

Re: **SEQRA**
Belleayre Resort at Catskill Park
Shandaken/Middletown, Ulster &
Delaware Counties
99PR4498

Dear Mr. Graham:

You have provided our office with information that requests comment on this project. As the state agency responsible for the coordination of the state's historic preservation program, including the encouragement and assistance of local preservation efforts, the Office of Parks, Recreation and Historic Preservation offers the following comment:

Based upon our review of the submitted archeological information, the OPRHP has no further concerns regarding archeology: additional survey for the project is **not** warranted.

Based upon our review of the submitted plans, drawings and Draft Environmental Impact Statement, the OPRHP does not have substantial concerns regarding potential impacts to the existing historic resources. Considering the size and complexity of the project, it is noteworthy that the mansions and the outbuildings would not suffer substantial losses to the integrity of their settings. it was noted that the design has utilized available space and plant materials to help screen the project from the new development. However, considering the intensity of the development, it would be impossible to completely avoid some impact to the historic resources. Although a substantial project is planned for the mountainside, the use of local materials, low building heights and judicious site selection have minimized negative impact upon the historic properties to a great extent.

The OPRHP recommends that any work performed on the historic properties (both interior and exterior) utilize the Secretary of Interior's <u>Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings</u>. Our office is willing to provide a courtesy review of the proposed work when the contract documents become available.

SEQRA
Belleayre Resort at Catskill Park
Shandaken/Middletown, Ulster &
Delaware Counties
99PR4498

Please inform our office if state or federal funding or permitting, licensing , etc. becomes involved with the project. A separate review from our office under state Section 14.09 or federal Section 106 will be required.

If you have any questions regarding this letter or any aspect of your project, please feel free to contact me at your convenience. Ext. 3273.

Sincerely,

Kenneth Markunas
Historic Sites
Restoration Coordinator

Cc: Alexander F. Ciesluk, Jr., DEC Region #3

NEW YORK STATE
OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

November 21, 2001

Terresa M. Bakner
Whiteman, Osterman & Hanna LLP
One Commerce Plaza
Albany, NY 12260

RECEIVED
WHITEMAN OSTERMAN & HANNA LLP

Re: **Info. Request**
Belleayre Ski Center
Shandaken/ Middletown,
Ulster/Delaware Co.
99PR4498

Dear Ms. Bakner:

The Office of Parks, Recreation and Historic Preservation (OPRHP) has received the documentation that you provided on this project. As the state agency responsible for the coordination of the State's historic preservation programs, including the encouragement and assistance of local preservation efforts, we offer the following comments.

OPRHP has no further issues regarding project ground disturbance and archeology: additional archeological survey is not warranted.

Before we can offer our opinion of the construction portion of the work, we will have to review the project plans that depict the rehabilitation of existing structures, the construction of new buildings, and, landscape and topographic changes that attend the project. Please provide the requested information as soon as it becomes available so that we can complete our review of the project

If you have any questions, please feel free to contact me at your convenience. Ext. 3273.

Sincerely,

Kenneth Markunas
Historic Sites
Restoration Coordinator

OFFICE OF PARKS, RECREATION, HISTORIC PRESERVATION
NEW YORK STATE

Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643

RECEIVED
JUN 15 2000
the LA GROUP

June 12, 2000

Kevin J. Franke
The LA Group, P.C.
40 Long Alley
Saratoga Springs, New York 12866

Re: **INFO REQUEST**
Crossroads Ventures/Belleayre Ski
Shandaken/Middletown, Ulster Co.
99PR4498

Dear Mr. Franke:

The State Historic Preservation Office (SHPO) has reviewed the submitted information in accordance with Section 106 of the National Historic Preservation Act of 1966 and relevant implementing regulations.

Enclosed, please find Archeology Comments that concur with the findings of the Phase 1A survey including the proposed 1B testing. Also included is a Resource Evaluation that identifies eligible and ineligible properties that were based upon the submitted Inventory Forms.

Before our office can offer an opinion on possible effects related to the project, we will need to review the additional archeological study along with the site improvement plans. Please forward this information if you want our continued involvement with the review of the project.

If you have any questions, please feel free to contact me at your convenience. Ext. 3273.

Sincerely,

Kenneth Markunas

Kenneth Markunas
Historic Sites
Restoration Coordinator

Attachments: Archeology Comments & Resource Evaluation

ARCHAEOLOGY COMMENTS

99PR4498

OPRHP staff have reviewed the Phase 1A Review and Assessment Report prepared by Hartgen Archeological Associates, Inc. OPRHP concurs with the findings of the Phase 1A that portions of the project are sensitive to both prehistoric and historic archaeological deposits. OPRHP further concurs with the Sections 1 and 2 of the proposed Phase 1B testing plan. Section 3 discusses field testing. This testing should be conducted at a maximum of 50 foot intervals in all area considered sensitive for archeological deposits. A smaller interval may be utilized if indicated by conditions in the field. All parcels obtained after the date of the Phase 1A report, will need to be fully examined as part of the Phase 1B research.

Please contact Douglas Mackey at (518) 237-8643, ext 3291 for any questions regarding archaeological concerns.

Appendix J

NYSDEC Notification for Construction
(as specified by the Individual Permit)

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section I - Permittee and Facility Information

Please type or print the requested information.

1. Current Permit Information (leave blank if for new discharge)

SPDES Number:	DEC Number:
NY-027 0679	0-9999-00096/00005

2. Permit Action Requested: (Check applicable box)

- [✓] A **NEW** proposed discharge
- [ ] An **EBPS INFORMATION REQUEST** response
- [ ] A **RENEWAL** of an existing SPDES permit
- [ ] A **MODIFICATION** of the existing permit
- [ ] An **EXISTING** discharge currently without permit

Does this request include an increase in the quantity of water discharged from your facility to the waters of the State?

- [ ] **YES** - Describe the increase:
- [ ] **NO** - Go to Item 3. below.

3. Permittee Name and Address

Name	Attention
Crossroads Ventures, LLC	Mr. Dean Gitter, President

Street Address
72 Andrews Lane Road, PO Box 267

City or Village	State	ZIP Code
Mt. Tremper	NY	12457

4. Facility Name, Address and Location

Name
Belleayre Resort At Catskill

Street Address	P.O. Box
NYS Route 28	

City or Village	State	ZIP Code
	NY	12441

Town	County
Shandaken	Ulster and Deleware

Telephone	FAX	NYTM - E	NYTM - N
845-688-7740	845-688-6887	539842	4666255

Tax Map Info (New York City, Nassau County and Suffolk County only)

Section	Block	Subblock	Lot

5. Facility Contact Person

Name	Title
Dean Gitter, Crossroads Ventures, LLC	President

Street Address	P.O. Box
72 Andrews Lane Road	267

City or Village	State	ZIP Code
Mt. Tremper	NY	12457

Telephone	FAX	E-Mail or Internet
845-688-7740	845-688-6887	

6. Discharge Monitoring Report (DMR) Mailing Address

Mailing Name
Crossroads Ventures, LLC

Street Address	P.O. Box
72 Andrews Lane Road, PO Box 267	267

City or Village	State	ZIP Code
Mt. Tremper	NY	12457

Telephone	FAX	E-Mail or Internet
845-688-7740	845-688-6887	

Name and Title of person responsible for signing DMRs	Signature
Dean Gitter , Managing Member	Dean L. Gitter

INDUSTRIAL APPLICATION FORM NY-2C
Section I - Permittee and Facility Information

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

7. Summarize the outfalls present at the facility:

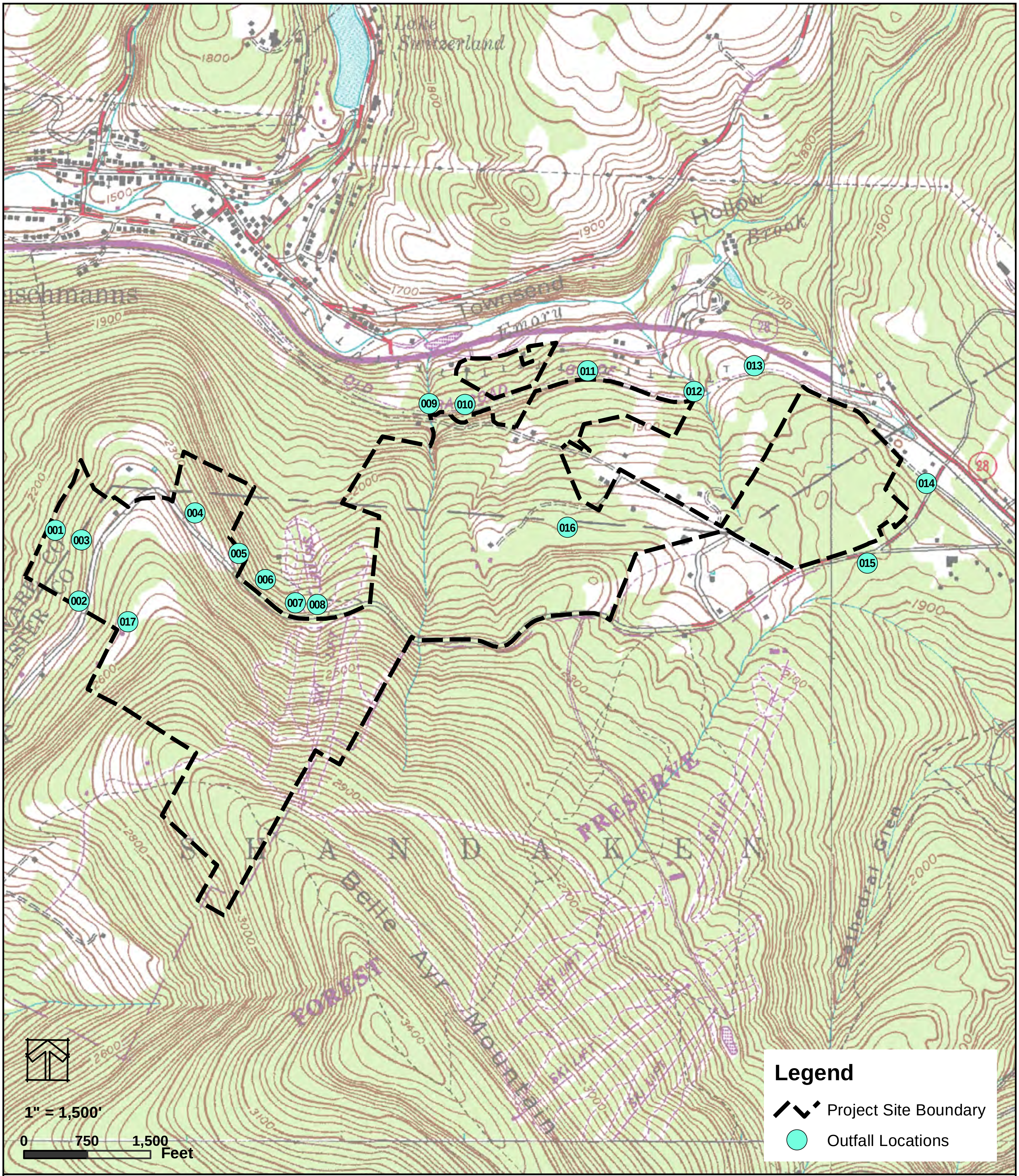
Outfall Number	Receiving Water	Type of discharge
001-003	Todd Mountain Brook	Stormwater
004-008 and 011	Emory Brook	Stormwater
009-010, 012-014	Unnamed Tributary to Emory Brook	Stormwater
015	Crystal Spring Brook	Stormwater
016	Unnamed Tributary to Emory Brook	Stormwater from concrete plant and rock crushing Wildacres
017	Todd Mountain Brook	Stormwater from rock crushing Highmount

8. Map of Facility and Discharge Locations:

Provide a detailed map showing the location of the facility, all buildings or structures present, wastewater discharge systems, outfall locations into receiving waters, nearby surface water bodies, water supply wells, and groundwater monitoring wells, and attach it to this application. Also submit proof, either by indication on the map or other documentation, that a right of way for the discharges exists from the facility property to a public right of way.

9. Water Flow Diagram:

See Provided Diagram (four pages)



The Modified Belleayre Resort at Catskill Park

Wildacres Resort & The Highmount Spa Resort
Towns of Shandaken & Town of Middletown, New York

Title

Outfall Locations Map

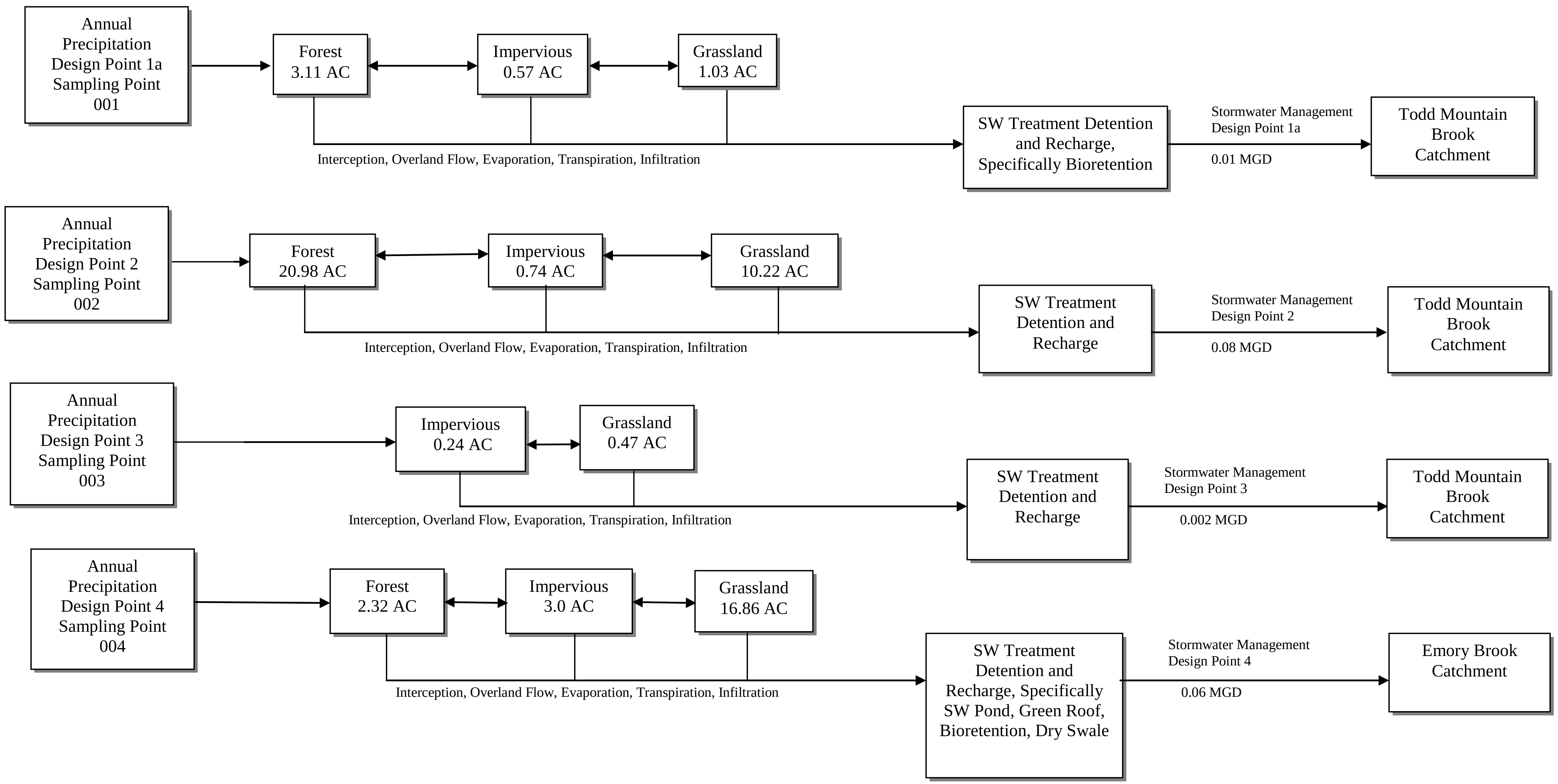
PREPARED FOR:

Crossroads Ventures, L.L.C.
P.O. Box 267
Mt. Tremper, NY 12457

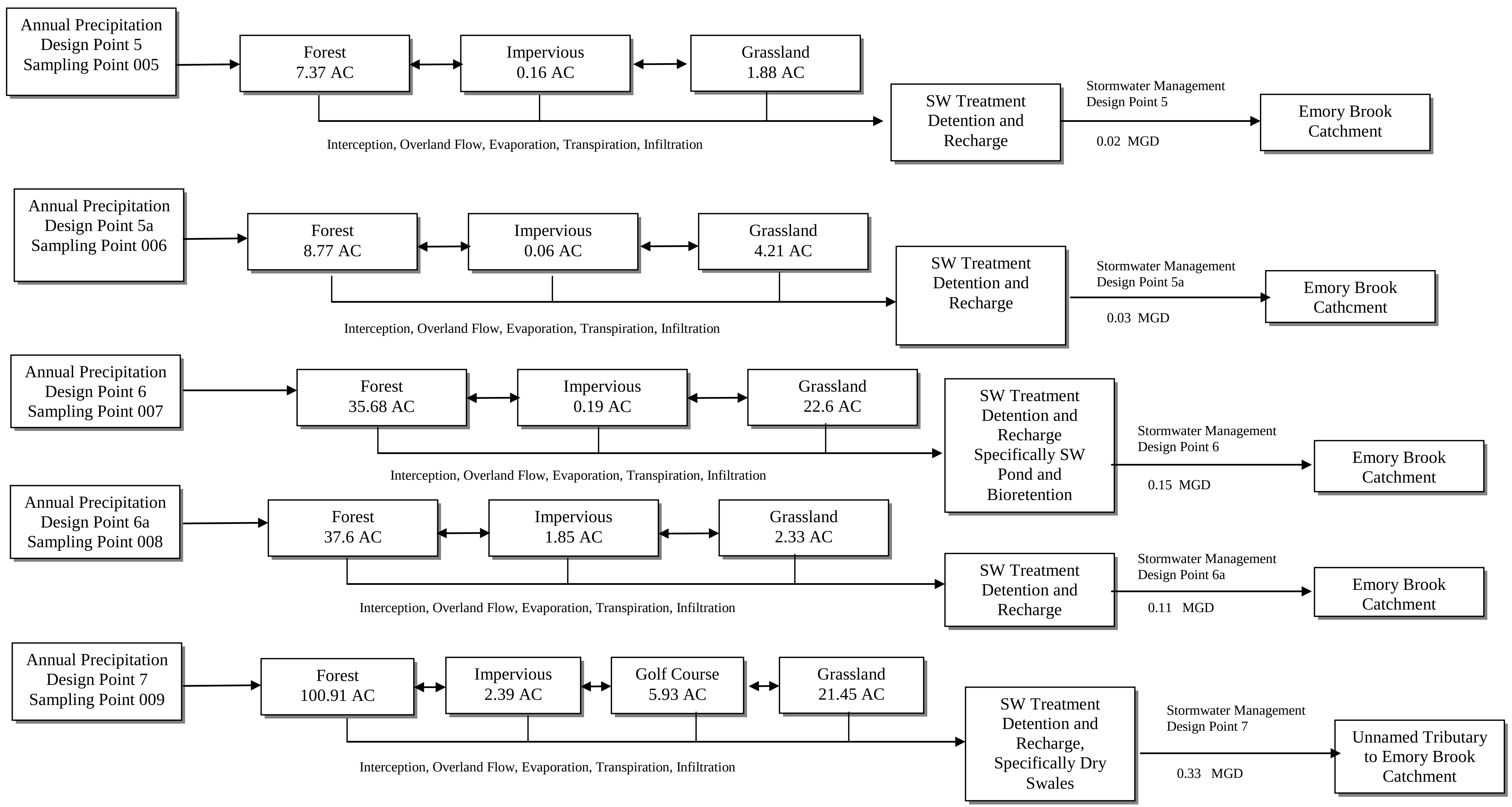
the LA group
Landscape Architecture and Engineering, P.C.

Project 07074
Date 03/29/2011

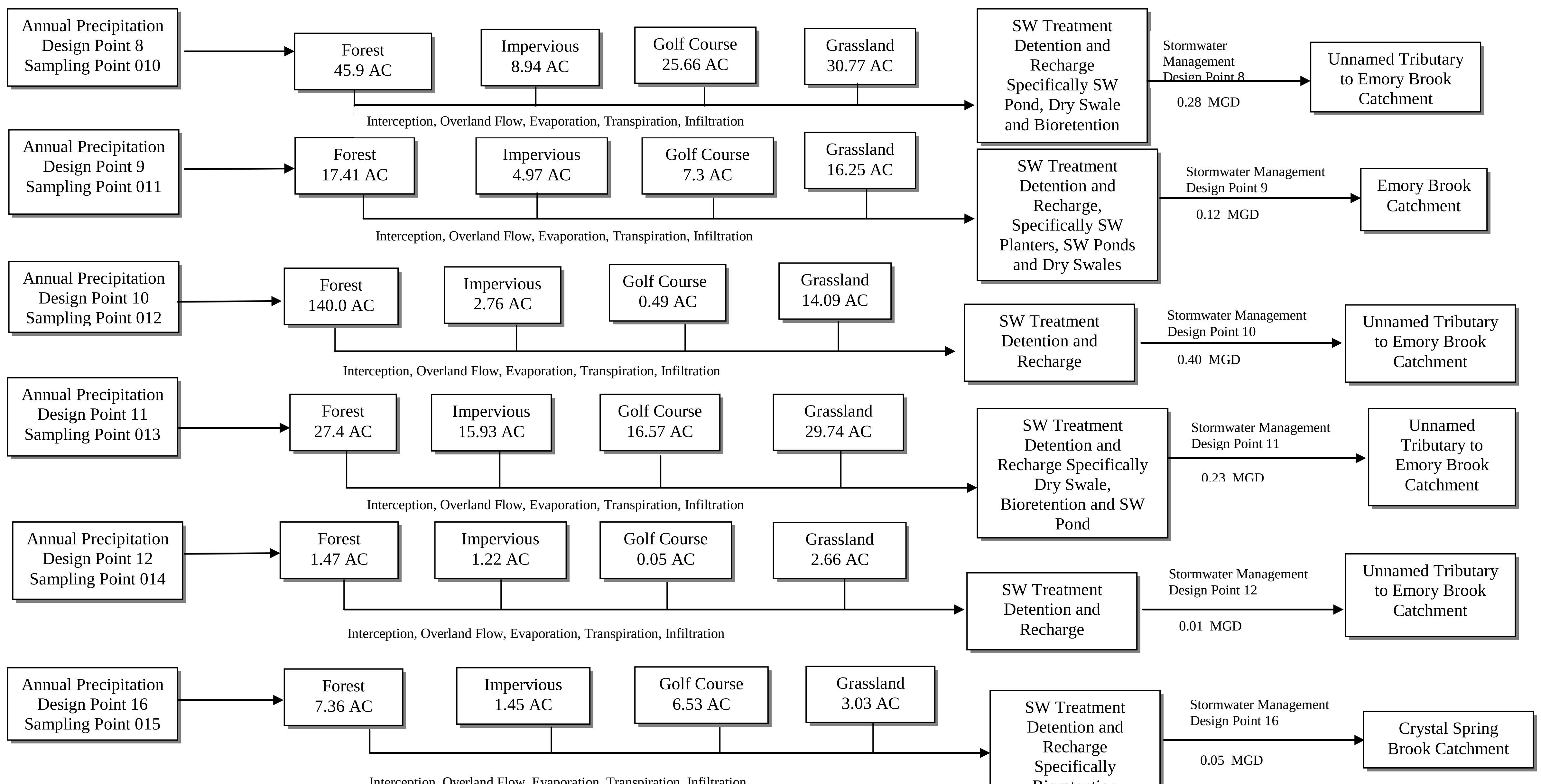
Belleayre Resort at Catskill Park Discharges
Page 1 of 4



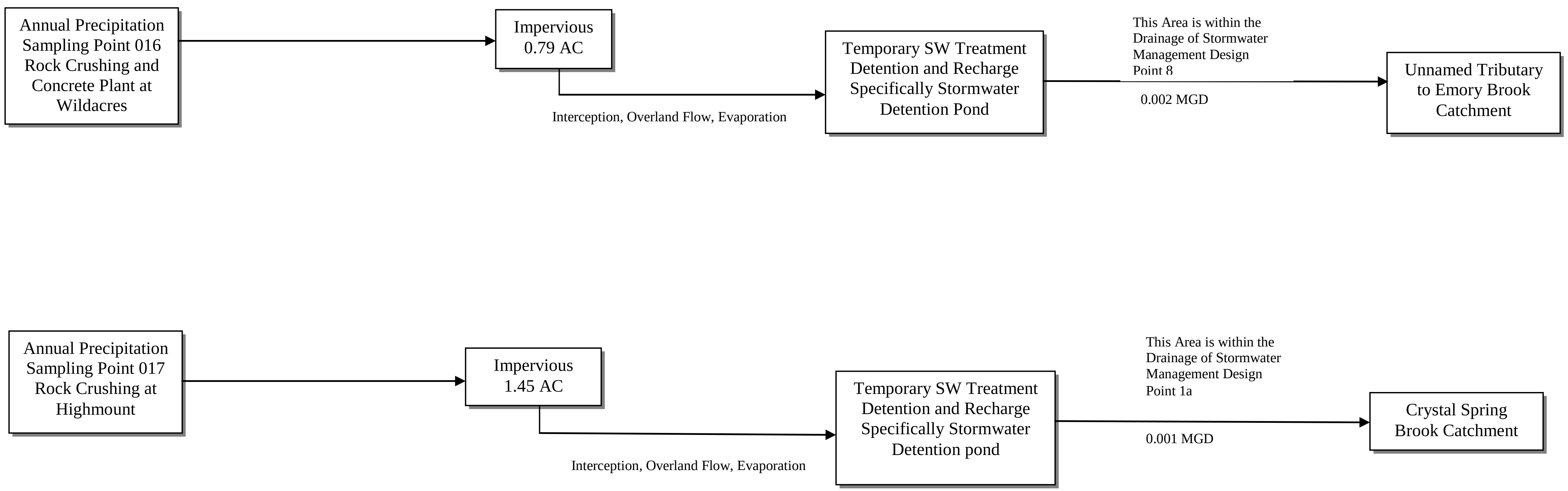
Belleayre Resort at Catskill Park Discharges
Page 2 of 4



Belleayre Resort at Catskill Park Discharges



Belleayre Resort at Catskill Park Discharges
Page 4 of 4



Calculated Estimated Average Flow for Discharge Points

SPDES Discharge Point	Design Point	Acreage (Ac)	Acreage (ft2)	Estimated Aggregate Curve Number	Estimated Average Rainfall Annual (ft)	Average Annual Runoff (cf)	Average Daily Runoff (cf)	Average Runoff (MGD)
001	1a	4.71	205,168	0.68	4.17	581,308.20	1,592.63	**0.01**
002	2	31.94	1,391,306	0.68	4.17	3,942,034.80	10,800.10	**0.08**
003	3	0.71	30,928	0.68	4.17	87,628.20	240.08	**0.002**
004	4	22.18	966,161	0.68	4.17	2,737,455.60	7,499.88	**0.06**
005	5	9.41	409,900	0.68	4.17	1,161,382.20	3,181.87	**0.02**
006	5a	13.04	568,022	0.68	4.17	1,609,396.80	4,409.31	**0.03**
007	6	58.47	2,546,953	0.68	4.17	7,216,367.40	19,770.87	**0.15**
008	6a	41.78	1,819,937	0.68	4.17	5,156,487.60	14,127.36	**0.11**
009	7	130.68	5,692,421	0.68	4.17	16,128,525.60	44,187.74	**0.33**
010	8	111.27	4,846,921	0.68	4.17	13,732,943.40	37,624.50	**0.28**
011	9	45.92	2,000,275	0.68	4.17	5,667,446.40	15,527.25	**0.12**
012	10	157.34	6,853,730	0.68	4.17	19,418,902.80	53,202.47	**0.40**
013	11	89.65	3,905,154	0.68	4.17	11,064,603.00	30,313.98	**0.23**
014	12	5.4	235,224	0.68	4.17	666,468.00	1,825.94	**0.01**
015	16	18.37	800,197	0.68	4.17	2,267,225.40	6,211.58	**0.05**
Concrete plant and rock crushing								
016		0.79	34,412	0.68	4.17	97,501.80	267.13	**0.0020**
017		0.42	18,295	0.68	4.17	51,836.40	142.02	**0.0011**

Estimated Runoff Values were calculated by multiplying the acreage * aggregate curve number * average annual rainfall amount to get annual runoff in cubic feet

Units were changed to million gallons per day (MGD)

Estimated Aggregate Curve Number was assumed from the aggregate curve number for the Ashokan reservoir watershed.

Estimated Average Annual Rainfall was taken from NYSDEP 1997 "Guidance for Phosphorus Offset Pilot Program, Bureau of Water Supply Quality and Protection," report.

INDUSTRIAL APPLICATION FORM NY-2C
Section I - Permittee and Facility Information

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

10. Nature of business: (Describe the activities at the facility and the date(s) that operation(s) at the facility commenced)

The Belleayre Resort at Catskill Park Development which consist of the Wildacres Resort and Highmount Spa Resort. Overall there will be two hotels, with ancillary hotel buildings, multiple types of lodging buildings, an 18 hole golf course and 15 discharge points that discharge to the Ashokan and Pepacton Watersheds.

11. List the 4-digit SIC codes which describe your facility in order of priority:

Priority 1	Description:	Priority 3	Description:
1 5 2 2	General Contractors,Residential Buildings	7 2 1 1	Hotel
Priority 2	Description:	Priority 4	Description:
1 6 2 9	Heavy Construction-Not Elsewhere Class	7 1 3 91	Golf

12. Is your facility a primary industry as listed in Table 1 of the instructions?

☐ **YES -** Complete the following table.

☑ **NO** - Go to Item 13. below.

Industrial Category	40 CFR		Industrial Category	40 CFR	
	Part	Subpart		Part	Subpart

13. Does this facility manufacture, handle, or discharge recombinant-DNA, pathogens, or other potentially infectious or dangerous organisms?

☐ **YES** - Attach a detailed explanation to this application.

☑ **NO** - Go to Item 14 below.

14. Is storm runoff or leachate from a material storage area discharged by your facility?

☐ **YES -** Complete the following table, and show the location of the stockpile(s) and discharge point(s) on the diagram in Item 9.

☑ **NO** - Go to Item 15 on the following page.

Size of area	Type(s) of material stored	Quantity of material stored	Runoff control devices

INDUSTRIAL APPLICATION FORM NY-2C
Section I - Permittee and Facility Information

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027 0679

15. Facility Ownership: (Place an "X" in the appropriate box)

Corporate ✓ Sole Proprietorship ☐ Partnership ☐ Municipal ☐ State ☐ Federal ☐ Other ☐

Are any of the discharges applied for in this application on Indian lands? Yes ☐ No ✓

16. List information on any other environmental permits for this facility:

Issuing Agency	Permit Type	Permit Number	Permit Status		
			Active	Applied for	Inactive
NYDEC	Part 608				
NYSDEC SPDES	Part 608				
NYSDEC Water Supply	Part 601				
NYSDEC WQC	Part 608				
NYSDOH Water Supply	Part 5				
Town of Middletown	Site Plan				
Town of Shadaken	Site Plan				

17. Laboratory Certification:

Were any of the analyses reported in Section III of this application performed by a contract laboratory or a consulting firm?

✓ **YES** - Complete the following table.

☐ **NO** - Go to Item 18 below.

Name of laboratory or consulting firm	Address	Telephone (area code and number)	Pollutants analyzed
Information in Section 3 prepared by The LA Group, PC	40 Long Alley, Saratoga Springs, NY 12866	(518) 587-8100	See Spreadsheets

18. Certification

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 gather and evaluate the information submitted. Based on my inquiry of the person or persons 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and official title (type or print)		Date signed
Dean Gitter Managing Member		03/31/2011
Signature	Telephone number	FAX number
Dean L. Gitter	845-688-7740	845-688-6887

INDUSTRIAL APPLICATION FORM NY-2C
Section I - Permittee and Facility Information

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

19. Industrial Chemical Survey (ICS)

Complete all information for those substances your facility has used, produced, stored, distributed, or otherwise disposed of in the past five (5) years at or above the threshold values listed in the instructions. Include substances manufactured at your facility, as well as any substances that you have reason to know or believe present in materials used or manufactured at your facility. Do not include chemicals used only in analytical laboratory work, or small quantities of routine household cleaning chemicals. Enter the name and CAS number for each of the chemicals listed in Tables 6-10 of the instructions, and the table number which lists the chemical. You may use ranges (e.g. 10-100 lbs., 100-1000 lbs., 1000-10000 lbs., etc.) to describe the quantities used on an annual basis as well as for the amount presently on hand. For those chemicals listed in Tables 6, 7, or 8 which are indicated as being potentially present in the discharge from one or more outfalls at the facility, indicate which outfalls may be affected in the appropriate column below, and include sampling results in Section III of this application for each of the potentially affected outfalls. Make additional copies of this sheet if necessary.

Name of Substance	Table	CAS Number	Average Annual Usage	Amount Now On Hand	Units (gallons, lbs, etc)	Purpose of Use (see codes in Table 2 of instructions)	Present in Discharge? (Outfall(s)?)

This completes Section I of the SPDES Industrial Application Form NY-2C. Section II, which requires specific information for each of the outfalls at your facility, and Section III, which requires sampling information for each of the outfalls at your facility, must also be completed and submitted with this application.

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
001 Design Point 1a		
Latitude 42 ° 8 ' 42.1 "	Longitude 74 ° 32 ' 0.2 "	Receiving Water Todd Mountain Brook (NYSDEC # 815-762)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units				Volume/Flow	Units		
		MGD	GPM	Other (specify)			MGD	GPM	Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.01 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 002 Design Point 2

Latitude	Longitude	Receiving Water
42 ° 8 ' 34.0 "	74 ° 31 ' 55.6 "	Todd Mountain Brook (NYSDEC # 815-762)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.08 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 003 Design Point 3

Latitude	Longitude	Receiving Water
42 ° 8 ' 39.7"	74 ° 31 ' 54.3"	Todd Mountain Brook (NYSDEC # 815-762)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	GPM	Other (specify)		Volume/Flow	Units MGD	GPM	Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.002 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 004 Design Point 4

Latitude	Longitude	Receiving Water
42 ° 8 ' 43.2 "	74 ° 31 ' 39.9 "	Emory Brook (NYSDEC # 815-763)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units: MGD	Units: GPM	Units: Other (specify)		Volume/Flow	Units: MGD	Units: GPM	Units: Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.06 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 005 Design Point 5

Latitude	Longitude	Receiving Water
42 ° 8 ' 38.1 "	74 ° 31 ' 33.7 "	Emory Brook (NYSDEC # 815-763)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units				Volume/Flow	Units		
		MGD	GPM	Other (specify)			MGD	GPM	Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.02 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
006 Design Point 5a		
Latitude 42 ° 8 ' 35.7 "	Longitude 74 ° 31 ' 30.3 "	Receiving Water Emory Brook (NYSDEC # 815-763)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Other (specify)		Volume/Flow	Units MGD	Units GPM	Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.03 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
007 Design Point 6		
Latitude 42 ° 8 ' 32.6 "	Longitude 74 ° 31 ' 25.3 "	Receiving Water Emory Brook (NYSDEC # 815-763)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.15 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
008 Design point 6a		
Latitude 42 ° 8 ' 31.7 "	Longitude 74 ° 31 ' 21.5 "	Receiving Water Emory Brook (NYSDEC # 815-763)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units: MGD	GPM	Other (specify)		Volume/Flow	Units: MGD	GPM	Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.11 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
009 Design Point 7		
Latitude 42 ° 8 ' 56.2 "	Longitude 74 ° 31 ' 2.1 "	Receiving Water Unnamed Tributary to Emory Brook (NYSDEC # 815-765)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units: MGD	Units: GPM	Units: Other (specify)		Volume/Flow	Units: MGD	Units: GPM	Units: Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.33 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 010 Design Point 8

Latitude	Longitude	Receiving Water
42 ° 8 ‘55.9 “	74 °30 ‘ 55.9“	Unnamed Tributary to Emory Brook (NYSDEC # 815-765)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.28 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
011 Design Point 9		
Latitude: 42 ° 9 ' 0.0 "	Longitude: 74 ° 30 ' 36.8 "	Receiving Water: Emory Brook (NYSDEC # 815-763)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units: MGD	GPM	Other (specify)		Volume/Flow	Units: MGD	GPM	Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.12 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 012 Design Point 10

Latitude	Longitude	Receiving Water
42 ° 8 ' 57.6 "	74 ° 30 ' 19.5 "	Unnamed Tributary to Emory Brook (NYSDEC # 815-765)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units: MGD	Units: GPM	Units: Other (specify)		Volume/Flow	Units: MGD	Units: GPM	Units: Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.40 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
013 Design Point 11		
Latitude 42 °9 ‘0.8 “	Longitude 74 ° 30 ‘ 10.6“	Receiving Water Unnamed Tributary to Emory Brook (NYSDEC # 815-765)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.23 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
014 Design Point 12		
Latitude 42 ° 8 ' 47.3"	Longitude 74 ° 29 ' 43.5"	Receiving Water Unnamed Tributary to Emory Brook (NYSDEC # 815-765)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.01 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.: 015 Design Point 16		
Latitude 42 ° 8 ' 39.1 "	Longitude 74 ° 29 ' 54.3"	Receiving Water Crystal Spring Brook (NYSDEC # 862-649)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.05 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
016		
Latitude 42 ° 8 ' 42.2 "	Longitude 74 ° 40 ' 40.0 "	Receiving Water Unnamed Tributary to Emory Brook (NYSDEC # 815-765)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.002 MGD	MGD	MGD

State Pollutant Discharge Elimination System (SPDES)

INDUSTRIAL APPLICATION FORM NY-2C

For New Permits and Permit Modifications to Discharge Industrial Wastewater and Storm Water

Section II - Outfall Information

Please type or print the requested information.

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

1. Outfall Number and Location

Outfall No.:		
017		
Latitude 42 ° 8 ' 31.1 "	Longitude 74 ° 31 ' 49.1 "	Receiving Water Todd Mountain Brook (NYSDEC# 815-762)

2. Type of Discharge and Discharge Rate (List all information applicable to this outfall)

	Volume/Flow	Units MGD	Units GPM	Units Other (specify)		Volume/Flow	Units MGD	Units GPM	Units Other (specify)
a. Process Wastewater					f. Noncontact Cooling Water				
b. Process Wastewater					g. Remediation System Discharge				
c. Process Wastewater					h. Boiler Blowdown				
d. Process Wastewater					i. Storm Water ✓				
e. Contact Cooling Water					j. Sanitary Wastewater				
k. Other discharge (specify):									
l. Other discharge (specify):									

3. List process information for the Process Wastewater streams identified in 2.a-d above:

a. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
b. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
c. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure
d. Name of the process contributing to the discharge			Process SIC code:
Describe the contributing process	Category / Subcategory	Quantity per day	Units of measure

4. Expected or Proposed Discharge Flow Rates for this outfall:

a. Total Annual Discharge	b. Daily Minimum Flow	c. Daily Average Flow	d. Daily Maximum Flow	e. Maximum Design flow rate
MG	MGD	0.001 MGD	MGD	MGD

INDUSTRIAL APPLICATION FORM NY-2C
Section II - Outfall Information

	Outfall No.: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
Facility Name: Belleayre Resort At Catskill	SPDES Number: NY-027-0679

5. Is this a seasonal discharge?

☐ **YES -** Complete the following table.

☑ **NO** - Go to Item 6 below.

Operations contributing flow (list)	Discharge frequency		Flow				
	Batches per year	Duration per batch	Flow rate per day		Total volume per discharge	Units	Duration (Days)
			LTA	Daily Max			

6. Water Supply Source (indicate all that apply)

	Name or owner of water supply source	Volume or flow rate	Units (check one)		
Municipal Supply			MGD	GPD	GPM
Private Surface Water Source			MGD	GPD	GPM
Private Supply Well	K Well Field, Q Well Field, and Irrigation Wells	K-157, Q-45 Irrig-36	MGD	☑ GPD	GPM
Other (specify)			MGD	GPD	GPM

7. Outfall configuration: (Surface water discharges only)

A. Where is the discharge point located with respect to the receiving water?

- In the streambank: ☑
- In the stream: ☐
- Within a lake or ponded water: ☐
- Within an estuary: ☐ Attach Supplement C, MIXING ZONE REQUIREMENTS FOR DISCHARGES TO ESTUARIES.
- Discharge is equipped with diffuser: ☐ Attach description, including configuration and plan drawing of diffuser, if used.

B. If located in a stream, approximately what percentage of stream width from shore is the discharge point located?

10% ☐ **25%** ☐ **50%** ☐ **Other:** ☐

C. If located in a stream, describe the stream geometry in the general vicinity of the discharge point, under low flow conditions:

Stream width	Stream depth	Stream velocity
Feet	**Feet**	**Feet/Sec**

Are the results of a mixing/diffusion study attached? ☐ **YES** ☑ **NO**

Section II - Outfall Information

	Outfall No.:
Facility Name: Beleayre Resort At Catskill	SPDES Number: NY-027-0679

8. Thermal Discharge Criteria

Is your facility one of the applicable types of facilities listed in the instructions, and does the temperature of this discharge exceed the receiving water temperature by greater than three (3) degrees Fahrenheit?

☐ **YES -** Complete the following table.

☑ **NO** - Go to Item 9. below.

☐ **Information on the intake and discharge configuration of this outfall is attached**.

Discharge Temperature, deg. F			Duration of maximum discharge temperature		Dates of maximum discharge temperature		Maximum flow rate	Discharge configuration (e.g. subsurface, surface, effluent diffuser, diffusion well, etc.)
Average change in temperature (delta T)	Maximum change in temperature (delta T)	Maximum temperature	hours per day	days per year	From	To	MGD	

9. Are any water treament chemicals or additives that are used by your facility subsequently discharged through this outfall?

☐ **YES -** Complete the following table and complete pages 1 of 3 and 2 of 3 of Form WTCFX for each water treatment chemical listed.

☑ **NO** - Go to Item 10. below.

Manufacturer	WTC trade name	Manufacturer	WTC trade name

10. Has any biological test for acute or chronic toxicity been performed on this outfall or on the receiving water in relation to this outfall in the past three (3) years?

☐ **YES -** Complete the following table.

☑ **NO** - Go to Item 11. on the following page.

Water tested	Purpose of test	Type of test	Chronic or Acute?	Subject species	Testing date(s)		Submitted? (Date)
					Start	Finish	

INDUSTRIAL APPLICATION FORM NY-2C
Section II - Outfall Information

Outfall No.:

Facility Name:	SPDES Number:
Belleayre Resort At Catskill	NY-027-0679

11. Is the discharge from this outfall treated to remove process wastes, water treatment additives, or other pollutants?

☐ **YES -** Complete the following table. Treatment codes are listed in Table 4.

☑ **NO** - Go to Item 12 below.

Treatment process	Treatment Code(s)	Treatment used for the removal of:	Design Flow Rate (include units)

12. Does this facility have either a compliance agreement with a regulating agency, or have planned changes in production, which will materially alter the quantity and/or quality of the discharge from this outfall?

☐ **YES -** Complete the following table.

☑ **NO** - Go to Section III on the following page.

Description of project	Subject to Condition or Agreement in existing permit or consent order? (List)	Change due to production increase?	Completion Date(s)	
			Required	Projected

This completes Section II of the SPDES Industrial Application Form NY-2C. Section I, which requires general information regarding your facility, and Section III, which requires sampling information for each of the outfalls at your facility, must also be completed and submitted with this application.

INDUSTRIAL APPLICATION FORM NY-2C
Section III - Sampling Information

Facility Name:	SPDES No.:	Outfall No.:
Belleayre Resort At Catskill	NY-027-0679	016 and 017

1. Sampling Information - Conventional Parameters

Provide the analytical results of at least one analysis for every pollutant in this table. If this outfall is subject to a waiver as listed in Table 5 of the instructions for one or more of the parameters listed below, provide the results for those parameters which are required for this type of outfall.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (using the same format) instead of completing this page.

Pollutant	Effluent data							Units		Intake data (optional)		
	a. Maximum daily value		b. Maximum 30 day value		c. Long term average		d. Number of analyses	a. Concentration	b. Mass	a. Long term average value		b. Number of analyses
	1. Concentration	2. Mass	1. Concentration	2. Mass	1. Concentration	2. Mass				1. Concentration	2. Mass	
a. Biochemical Oxygen Demand, 5 day (BOD)	N/A											
b. Chemical Oxygen Demand (COD)	N/A											
c. Total Suspended Solids (TSS)	10.0											
d. Total Dissolved Solids (TDS)	7.0											
e. Oil & Grease	N/A											
f. Chlorine, Total Residual (TRC)	N/A											
g. Total Organic Nitrogen (TON)	N/A											
h. Ammonia (as N)	N/A											
i. Flow	Value Monitor		Value		Value					Value		
j. Temperature, winter	Value N/A		Value		Value					Value		
k. Temperature, summer	Value N/A		Value		Value					Value		
l. pH	Minimum 6.5	Maximum 8.5	Minimum	Maximum						Minimum	Maximum	

2. Sampling Information - Priority Pollutants, Toxic Pollutants, and Hazardous Substances

a. Primary Industries:

i. Does the discharge from this outfall contain process wastewater?

- ☐ **Yes** - Go to Item **ii.** below.
- ☑ **No** - Go to Item **b.** below.

ii. Indicate which GC/MS fractions have been tested for: Volatiles: ☐ Acid: ☐ Base/Neutral: ☐ Pesticide: ☐

b. All applicants:

i. Do you know or have reason to believe that any of the pollutants listed in Tables 6, 7, or 8 of the instructions are present in the discharge from this outfall?

- ☐ **Yes** - Concentration and mass data attached.
- ☑ **No** - Go to Item **ii.** below.

ii. Do you know or have reason to believe that any of the pollutants listed in Table 9 or Table 10 of the instructions, or any other toxic, harmful, or injurious chemical substances not listed in Tables 6-10, are present in the discharge from this outfall?

- ☐ **Yes** - Source or reason for presence in discharge attached
- ☐ **Yes** - Quantitative or qualitative data attached
- ☑ **No**

INDUSTRIAL APPLICATION FORM NY-2C
Section III - Sampling Information

Facility Name:	SPDES No.:	**Outfall No.:**
Belleayre Resort At Catskill	NY-027-0679	

3. Projected Effluent Quality - Priority Pollutants, Toxic Pollutants, and Hazardous Substances

Provide analytical results of at least one analysis for each pollutant that you know or have reason to believe is present in this discharge, as well as for any GC/MS fractions and metals required to be sampled from Section III Forms, Item 2.a on the preceding page.

List the name and CAS number for each pollutant that you know or have reason to believe is present in the discharge from this outfall. For each pollutant listed from Tables 6, 7, or 8, provide the results of at least one analysis for that pollutant, and determine the mass discharge based on the flow rate reported in Item 1.i. For each pollutant listed from Table 9, or any other toxic pollutant not listed in Tables 6-10, you must provide concentration and mass data (if available) and/or an explanation for their presence in the discharge. Make as many copies of this table as necessary for each outfall.

Page of

Pollutant and CAS Number	Effluent data							Units		Intake data (optional)			Believed present, no sampling results available
	a. Maximum daily value		b. Maximum 30 day value *(if available)*		c. Long term average value *(if available)*		d. Number of analyses	a. Concen- tration	b. Mass	a. Long term average value		d. Number of analyses	
	(1)Concen- tration	(2) Mass	(1)Concen- tration	(2) Mass	(1)Concen- tration	(2) Mass				(1)Concen- tration	(2) Mass		
CAS Number:													
CAS Number:													
CAS Number:													
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INDUSTRIAL APPLICATION FORM NY-2C
Section III - Sampling Information

Facility Name:	SPDES No.:	Outfall No.:
Belleayre Resort At Catskill	NY-027-0679	

4. Existing Effluent Quality - Priority Pollutants, Toxic Pollutants, and Hazardous Substances

Provide analytical results for the last three (3) years for each pollutant that you know or have reason to believe present in this discharge from this outfall, as well as for any GC/MS fractions and metals required to be sampled from Section III Forms, Item 2.a for this discharge.

Make as many copies of this table as necessary for each outfall. You can list the results from 24 sampling dates on each copy of this page.		Parameter name:	Parameter name:	Parameter name:	Parameter name:	Parameter name:	Parameter name:	Parameter name:
Page Of		CAS Number:	CAS Number:	CAS Number:	CAS Number:	CAS Number:	CAS Number:	CAS Number:
Date	Flow rate	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
	Units:	Units:	Units:	Units:	Units:	Units:	Units:	Units:

Appendix K

Copy of Individual SPDES Permit