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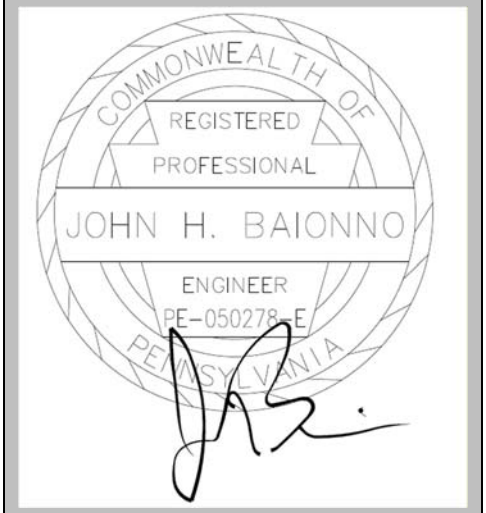
STORMWATER MANAGEMENT REPORT

FOR

100 GREENRIDGE ROAD DEVELOPMENT

LOCATED IN:

UPPER UWCHLAN TOWNSHIP,
CHESTER COUNTY,
PENNSYLVANIA



John H. Baionno
Professional Engineer
PA License No. PE 050278-E

March 2023

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Site Information

Project Location
The project site is known as Tax Parcel Number 32-001-0017.1, 32-001-0011 within Upper Uwchlan Township, Chester County, Pennsylvania. The site is situated along Greenridge Road approximately 1,000 feet south of the Font Road – St. Andrews Lane – Greenridge Road intersection. This site is bound entirely by residential properties and Greenridge Road to the southeast.

Present & Past Land Uses
The site is covered primarily by woods, open space and a small area of wetlands. There is a paved driveway and two dwellings on the site. The driveway and structures are currently used as a residential home. The site has been used for this purpose for the past 40+ years.

Watershed Classification
Most of the site drains to the East (POI 1-A) to an on-site tributary of the Black Horse Creek. The remaining drainage area flows to the West (POI 2) to an off-site tributary to Marsh Creek or across Greenridge Road (POI 1-B) to Black Horse Creek. These streams are in the Brandywine Creek watershed, which has a Chapter 93 designated and existing use of HQ-TSF-MF. A 150-foot wide High-Quality PA DEP buffer is proposed along the on-site tributary on-site.

Geologic Conditions
Available geological sources indicate that most of the site is mapped as being Precambrian, graphitic felsic gneiss. See the "Site Geology Map" prepared by Geo-Technology Associates, Inc., dated June 2021 in Section 8. A review of USGS mapping and NRCS soil mapping does not indicate a potential for these formations to cause pollution during earth disturbance activities.

Project Scope
The applicant proposes to construct sixty-four (64) single family homes on subdivided lots within the parcel. The development includes the construction of homes, support roads, sidewalks, stormwater management facilities, and other improvements typical of residential construction. The site is accessed from Greenridge Road. Stormwater management facilities, storm sewer, and open space areas will be owned and maintained by a Community Association.

Report Scope
This report presents the stormwater management plan for the proposed project, Greenridge Road ("project site"), located in Upper Uwchlan Township, Chester County, Pennsylvania. Included within this report are all the calculations to verify that the stormwater management plan meets the regulations listed in the *Upper Uwchlan Township's Stormwater Management Ordinance*.
The plan has been prepared to follow the general PCSM planning and design requirements as follows:

- The integrity of stream channels has been maintained. The physical, biological and chemical qualities of the receiving stream have been protected: This is accomplished through the proposed BMPs that will treat the runoff.
- The increase in the rate of stormwater runoff has been prevented: The proposed basins have been designed to meet or reduce existing peak flow conditions.
- The increase in stormwater runoff volume has been minimized: The proposed infiltration basin, managed release concept, and underground infiltration bed systems have been designed to meet pre-development volumes for the 2-year storm.
- Impervious cover has been minimized: The cluster design and reduced road width minimize the required road impervious coverage.

- Existing drainage features and existing vegetation have been protected to the maximum extent possible: A large portion of the existing woodlands on-site will be undisturbed.
- Land clearing and grading has been minimized: The sequence of construction and limit of disturbance have been provided.
- Soil compaction has been minimized: The sequence of construction has been provided.
- Other structural BMPs that prevent or minimize changes in stormwater runoff include conduit outlet protection, drywell/seepage pit, level spreader, and an infiltration basin.

Antidegradation Analysis

Listed below are the descriptions of the non-discharge BMPs that will be used after construction and have been incorporated into the PCSM Plan based on the site analysis. An explanation has been provided for the BMPs used and not used.

- Alternative Siting:
  - Alternative Location: an alternative location is not feasible due the limitation of land ownership.
  - Alternative Configuration: the site configuration has been chosen to propose the maximum allowable dwelling units, within the usable areas, without unnecessary encroachment into Natural Resources. The access on Greenridge Road was determined by Upper Uwchlan Township since access to Lauren Lane in the adjacent Stonehedge subdivision was not allowed.
  - Alternative Location of Discharge: Most of the site drains to one point of interest, the existing culvert that conveys runoff under Greenridge Road.

- Low Impact Development: unnecessary encroachment into the Natural Resources has been avoided as much as possible by proposing cluster design. A large portion of the site remain undisturbed throughout construction. A portion of the existing driveway will be utilized as a walking trail.

- Limiting Extent & Duration of Disturbance (Phasing, Sequencing); due to the limited area of disturbance, this project will be done in one phase. Disturbed areas will be stabilized in accordance with the Construction Sequence and the requirements of the Chester County Conservation District.

- PA DEP Stream Buffers (150 ft min); A stream buffer is required for this site because it is an HQ watershed. In the current condition, much of the required buffer area is open space. Any areas of the buffer with woods or other appropriate vegetation will remain undisturbed and be protected. The only area of exception is the designated area for the level spreader and outflow pipe. Those areas of disturbance will be authorized by Chapter 105 and are permitted under Section 102.14(f)(2)(ii) of the Pennsylvania Code. A Township Riparian buffer has also been shown along the stream and is based on the outer most limits of the following: 75’ from top-of-bank of the stream, 25’ from wetlands, or the hydric soil boundary line.

- Infiltration: Two (2) infiltration basins, one above ground and one below, along with a Managed Release Concept basin are all situated within the site. The basins will provide peak rate, volume, and water quality benefits for the entire site.

Stormwater Management Design

Design Criteria

The Stormwater Management Plan described herein has been designed according to the following publications and criterion:

- Upper Uwchlan Township Stormwater Management Ordinance, Ordinance No. 2022-08, adopted on December 12, 2019.
- Pennsylvania Stormwater Best Management Practices Manual, dated December 2006.
- "Urban Hydrology for Small Watersheds" (Technical Release No. 55), published by the United States Department of Agriculture, Soil Conservation Service, dated June 1986.
- Soil Erosion and Sediment Control Measures have been designed per the Erosion and Sediment Control Pollution Control Program Manual: Technical Guidance Number 363-2134-008, dated March 2012.
- The NRCS Soil Cover Complex Method has been used to analyze peak rates/volumes for drainage areas larger than 5 acres per the Upper Uwchlan Township Stormwater Management Ordinance, Ordinance No. 2022-08, adopted on December 12, 2019.

The proposed Stormwater Management Plan has been designed to meet the following requirements and guidelines:

- Peak rate attenuation must be provided to meet the following requirements:

Peak Rate Control Standards	
Proposed Condition Design Storm	Existing Condition Design Storm
2-year	1-year
5-year	2-year
10-year	2-year
25-year	25-year
50-year	50-year
100-year	100-year

- The applicant shall utilize the following ground cover assumptions for all predevelopment water quality and runoff volume, infiltration volume and peak flow rate calculations:
  - For areas that are woods, predevelopment calculations shall assume ground cover of "woods in good condition."
  - For all other areas (including all impervious surfaces), predevelopment calculations shall assume ground cover of "meadow."

- Only the area of the proposed regulated activity shall be subject to peak flow rate control standards. Undisturbed area for which the discharge point has not yet changed are not subject to the peak flow rate control standards.

- Storage facilities have been designed to completely drain the volume and rate control capacities over a period not less than 24 hours and not more than 72 hours from the end of the design storm.

- Basin routings were performed using *HydroCAD* (version First Run by HydroCAD Software

Solutions, LLC.) The program closely follows the S.C.S. TR-55 calculation procedure for calculating and routing hydrographs. The 24-hour (Type II) design rainfalls were taken from the upper limits of the 90% confidence intervals for the 24-hour precipitation events in the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0 per the requirements of Stormwater Management Ordinance. The rainfall depths are as follows:

Storm Frequency (Year)	24 - Hour Rainfall (Inches)
1	2.70
2	3.24
5	4.06
10	4.74
25	5.72
50	6.54
100	7.42

Watershed Summaries

Point of Interest '1-A':

Pre-Developed Study Point 1-A

Drainage Area "POI 1-A" drains to the eastern corner of the developed area. This section consists primarily of woods with areas of open space, the existing asphalt driveway, and an existing building. Runoff enters an existing tributary to Black Horse Creek which crosses the eastern corner of the site and travels under Greenridge Road via an existing culvert. From POI '1-A', the runoff is conveyed within those waters through lands owned by others to the Black Horse Creek.

Post Developed Study Point 1-A

The post-developed drainage area to POI '1-A' is larger than the pre-developed drainage area. This is due to the fact that a majority of the area that drained to POI '1-B' and POI '2' in the pre-developed condition will now drain to POI '1-A' in the proposed condition via the roads and the proposed BMP's. Basin #1 is an underground infiltration system that infiltrates its entire drainage area in the 1 through 100-year storms. Basin #2 drains to the upper portion of Basin #3 to avoid creating a new point source discharge. The upper and lower portions of Basin #3 treat the runoff from Basin #2 and additional runoff from the site. The Basin #3 outflow pipe discharges towards and enters Waters of the U.S. before exiting the property.

Point of Interest '1-B':

Pre-Developed Study Point 1-B

It appears drainage Area "POI 1-B" drains to an existing culvert adjacent to Greenridge Road. The area consists primarily of woods with areas of open space and some impervious cover in the form of an existing pool. POI 1-B is a subarea of POI 1 as both the areas eventually reach Black Horse Creek located on the south side of Greenridge Road.

Post Developed Study Point 1-B

The post-developed drainage area to POI 1-B' is smaller than the pre-developed drainage area. This is due to proposed internal roadway diverting a portion of the pre-developed drainage area. The reduction in area results in a decrease in the peak rate and volume for this point of interest.

Point of Interest '2':

Pre-Developed Study Point 2

Drainage Area "POI #2" drains to the existing Stonehedge residential development located to the West of the proposed development which then reaches a tributary of Marsh Creek. The area consists primarily of woods with areas of open space, a portion of the gravel driveway, and two existing dwellings.

Post Developed Study Point 2

The post-developed drainage area to POI #2 is smaller than the pre-developed drainage area. This is due to proposed site layout and existing buffer area to remain. The design will reduce the post-construction rates to less than 75% of the pre-construction rates, but it will not meet the required reduction rates for the two-year, five-year, and ten-year storm events per Table 308.1 in Section 152-308.A of the Upper Uwchlan Township Stormwater Management Ordinance. Most of the existing ground cover in the drainage area has been maintained and the drainage area to this point of interest has been reduced by 77% from 7.4 acres to 1.7 acres. A waiver has been requested.

Proposed Drainage Conditions

Per Conditional Use Approval, the project site was designed to the maximum allowable impervious cover for each single-family lot. See the "Lot Impervious Area Calculations" table in Section 4. Impervious area was also added for the roads, sidewalk, and sewage pump station. All developed pervious surfaces outside of the individual lots were considered lawn. A portion of the developed pervious surfaces were considered meadow wherever lawn maintenance would be minimal.

Streambank Erosion

Section 307 of the Upper Uwchlan Township Stormwater Ordinance states the peak flow rate of the post construction two-year, twenty-four-hour design storm shall be reduced to the predevelopment peak flow rate of the one-year, twenty-four-hour duration precipitation, using the SCS Type II distribution. This requirement has been met for this project except for POI #2, as described above.

Peak Flow

Peak flows for point of interest '1-A' were generated using the guidelines outlined in *Technical Release 55* (TR-55) issued by the Soil Conservation Service. Unit hydrographs, curve numbers (CNs), and times of concentration (TCs) have been determined in accordance with the TR-55 Handbook. The hydrograph generation and basin routings were performed using *HydroCAD* (version First Run by HydroCAD Software Solutions, LLC.)

A hydrograph summation of post-developed peak runoff rates for the basin and uncontrolled bypass areas were compared to a hydrograph summation of the peak runoff rates generated under pre-developed conditions for each point of interest (POI). The allowable peak flow amounts are based on the ordinance requirements. All peak flow requirements are met for this project except for POI #2, as described above. See the "Peak Flow Summaries" table below.

Times of concentration (Tc) have been calculated in accordance with the TR-55 Handbook.

Volume
Volume reduction is proposed through multiple structural BMPs. A subsurface infiltration basin, a managed release concept basin, aboveground detention/infiltration basins, and one underground drywell on Lot 23 will all be utilized to meet the volume requirement.

BMP Worksheets have been provided for the project to depict compliance with the volume requirements of Control Guideline (CG-1) of the Pennsylvania Stormwater Management BMP Manual.

Furthermore, the township stormwater management recharge volume has been met. The ordinance states that one (1.0) inch of runoff over all proposed impervious surfaces shall be recharged.

Rev = (1/12) x I
where I is the amount of impervious surface in square feet.

There is 487,518 sf of impervious surface; resulting in 40,627 cf per the 1-inch recharge requirement. The total recharge volume for this site, 134,474 cf, was based on the change in runoff volume for the 2-year storm event as shown in BMP worksheet 4. The design proposes to recharge 137,516 cf in the two (2) infiltration basins and the Managed Release Concept basin to meet this requirement. See Sections 4 & 5 of this report for additional calculations.

Testing has been performed throughout the site. In the locations of Basin #1 & #2, positive infiltration was encountered. The testing in the drip field area, adjacent to Basin #3A & #3B generated low infiltration rates; however, due to the depth of cut in this area, the implementation of the Managed Release Concept basin #3B is warranted.

Water Quality
The Upper Uwchlan Township water quality requirements are met because the project meets the requirements of Control Guideline (CG-1) in the PA BMP Manual. Per section 152-305.A of the Upper Uwchlan Township Stormwater Management Ordinance, the water quality and runoff volume to be managed shall consist of any runoff volume generated by the proposed regulated activity over and above the predevelopment total runoff volume. The proposed BMP's on-site have been designed to manage and retain the difference of the pre and post development two-year, twenty-four-hour storm runoff volumes.

Impairment
According to the Pennsylvania eMapPA website, the Black Horse Creek is a non-attaining stream. The stream is listed as "impaired" from Pathogens, source unknown. There is a TMDL for the creek and the source cause listed for the stream is: algae, nutrients, siltation, total suspended solids, turbidity, eutrophication, phosphorous, biochemical oxygen demand, dissolved oxygen, organic enrichment, and chlorophyll-a.

Thermal Impact

To Point of Interest '#1-A'
Runoff from the proposed impervious surfaces will be warmest from the storm's first flush. The runoff will be conveyed through an underground pipe network to one of the following BMP systems:

- an underground infiltration system (Basin #1)
- an aboveground infiltration basin (Basin #2)
- a Managed Release Concept system (Basin #3A)

- a detention basin system (Basin #3B)

Traveling through the underground pipes will give the runoff an opportunity to cool because the ground is cooler than the air. Once the first flush reaches the BMPs, it will be infiltrated into the ground or stored within the detention pond; so, the warmest runoff will not drain directly to the watercourse. These BMPs will minimize the thermal impact associated with the project.

To Points of Interest '#1-B'
Runoff to Point of Interest '#1-B' is from a small bypass area. The area to the point of interest has been decreased due to site layout and grading. The point of interest is within a wooded area that is to be preserved. The shade from the tree canopy will minimize any thermal impacts associated with this project.

To Point of Interest '#2'
Runoff to Point of Interest '#2' is from a small bypass area. The area to the point of interest has been decreased due to site layout and grading. The resulting drainage area includes the existing landscape buffer to remain located behind the proposed lots. By decreasing the drainage area and minimizing the runoff from impervious areas, the thermal impact associated with this site has been minimized.

The following BMPs, which will be owned and maintained by a Community Association, are utilized for the project:

- Infiltration Basin: One (1) subsurface infiltration basin (Basin #1) and one (1) aboveground infiltration basin (Basin #2) are proposed for the project. They will provide peak rate, volume and water quality benefits for the site.

- Managed Release Concept: One (1) Managed Release Concept Basin is proposed (Basin #3A). This BMP will provide peak rate, volume, and water quality benefits for the site.

- Detention Basin: One (1) detention basin is proposed (Basin #3B). This BMP will provide peak rate benefits for the site.

- ABACT BMPs: The project is within a High-Quality Watershed, and the 2-year/24-hour storm event is controlled by the proposed volume reduction BMPs.

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: KLP
By: 6-Mar-23
Chk'd:
Rev'd:

Greenridge Road - PEAK FLOW SUMMARIES

WATERSHED DESCRIPTION		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
POI#1-A	Pre-Developed to POI#1-A	8.21	23.56	40.51	68.67	94.88	125.06
	Post Developed Bypass to POI#1-A	5.72	15.22	24.91	40.89	55.62	72.49
	Post Developed Basin #1 Outflow	0.00	0.00	0.00	0.00	0.00	0.00
	Post Developed Basin #3B Outflow*	0.33	0.44	1.66	6.15	17.06	26.30
	Total Post Developed to POI#1-A	6.74	16.31	26.06	42.09	56.94	96.86
	ALLOWABLE POST DEVELOPED FLOW	6.91	20.60	32.86	72.32	99.57	130.92
POI#1-B	Pre-Developed to POI#1-B	3.59	12.65	22.50	39.21	54.90	73.05
	Post Developed to POI#1-B	1.52	5.90	10.83	19.48	27.60	37.02
	ALLOWABLE POST DEVELOPED FLOW	1.78	7.77	12.42	39.21	54.90	73.06
POI#2	Pre-Developed to POI#2	1.37	4.34	7.65	13.23	18.46	24.50
	Post Developed to POI#2	1.01	2.20	3.36	5.24	6.96	8.91
	ALLOWABLE POST DEVELOPED FLOW	0.45	1.94	2.60	13.23	18.46	24.50

* Basins #2 and #3A flow into basin #3B.

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 3/6/2023
By: KLP
Chk'd:
Rev'd:

STUDY POINT	ALLOWABLE PEAK FLOW RATES FOR POI#1-A																	
	1-Year Peak Flow from Developed Areas	2-Year Peak Flow from Undeveloped Areas	**2-Year Allowable Peak Flow**	2-Year Peak Flow from Developed Areas	5-Year Peak Flow from Undeveloped Areas	**5-Year Allowable Peak Flow**	10-Year Peak Flow from Undeveloped Areas	**10-Year Allowable Peak Flow**	25-Year Peak Flow from Developed Areas	25-Year Peak Flow from Undeveloped Areas	**25-Year Allowable Peak Flow**	50-Year Peak Flow from Developed Areas	50-Year Peak Flow from Undeveloped Areas	**50-Year Allowable Peak Flow**	100-Year Peak Flow from Developed Areas	100-Year Peak Flow from Undeveloped Areas	**100-Year Allowable Peak Flow**
POI#1-A	0.65	6.26	**6.91**	2.57	18.03	**20.60**	30.29	**32.86**	21.64	50.68	**72.32**	29.99	69.58	**99.57**	39.62	91.30	**130.92**

** ALLOWABLE PEAK FLOW RATES ARE DETERMINED BY ADDING THE PRE-CONSTRUCTION CONDITION 2-YEAR PEAK FLOW DEVELOPED AREAS TO THE APPROPRIATE PEAK FLOW FROM UNDEVELOPED AREAS. THAT WAY, THE SITE'S STORMWATER MANAGEMENT DESIGN IS NOT FORCED TO REDUCE PEAK FLOW FOR AREAS THAT WILL NOT BE DEVELOPED. THE 100-YEAR DOES NOT HAVE A REQUIRED REDUCTION; SO, THE ALLOWABLE FLOW EQUALS THE TOTAL PRE-DEVELOPED PEAK FLOW AT THE POINT OF INTEREST.

(EXAMPLE: 2-YR PRE-CONDITION FLOW FROM DEVELOPED AREAS + 10-YEAR PRE-CONDITION FLOW FROM UNDEVELOPED AREAS = 10-YEAR ALLOWABLE PEAK FLOW)

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 3/6/2023
By: KLP
Chk'd:
Rev'd:

STUDY POINT	ALLOWABLE PEAK FLOW RATES FOR POI#1-B																
	1-Year Peak Flow from Developed Areas	2-Year Peak Flow from Undeveloped Areas	**2-Year Allowable Peak Flow**	2-Year Peak Flow from Developed Areas	5-Year Peak Flow from Undeveloped Areas	**5-Year Allowable Peak Flow**	10-Year Peak Flow from Undeveloped Areas	**10-Year Allowable Peak Flow**	25-Year Peak Flow from Developed Areas	25-Year Peak Flow from Undeveloped Areas	**25-Year Allowable Peak Flow**	50-Year Peak Flow from Developed Areas	50-Year Peak Flow from Undeveloped Areas	**50-Year Allowable Peak Flow**	100-Year Peak Flow from Developed Areas	100-Year Peak Flow from Undeveloped Areas	**100-Year Allowable Peak Flow**
POI#1-B	0.44	1.34	**1.78**	2.32	5.45	**7.77**	10.10	**12.42**	21.11	18.10	**39.21**	29.23	25.67	**54.90**	38.59	34.47	**73.06**

** ALLOWABLE PEAK FLOW RATES ARE DETERMINED BY ADDING THE PRE-CONSTRUCTION CONDITION 2-YEAR PEAK FLOW DEVELOPED AREAS TO THE APPROPRIATE PEAK FLOW FROM UNDEVELOPED AREAS. THAT WAY, THE SITE'S STORMWATER MANAGEMENT DESIGN IS NOT FORCED TO REDUCE PEAK FLOW FOR AREAS THAT WILL NOT BE DEVELOPED. THE 100-YEAR DOES NOT HAVE A REQUIRED REDUCTION; SO, THE ALLOWABLE FLOW EQUALS THE TOTAL PRE-DEVELOPED PEAK FLOW AT THE POINT OF INTEREST.

(EXAMPLE: 2-YR PRE-CONDITION FLOW FROM DEVELOPED AREAS + 10-YEAR PRE-CONDITION FLOW FROM UNDEVELOPED AREAS = 10-YEAR ALLOWABLE PEAK FLOW)

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 3/6/2023
By: KLP
Chk'd:
Rev'd:

STUDY POINT	ALLOWABLE PEAK FLOW RATES FOR POI#2																	
	1-Year Peak Flow from Developed Areas	2-Year Peak Flow from Undeveloped Areas	**2-Year Allowable Peak Flow**	2-Year Peak Flow from Developed Areas	5-Year Peak Flow from Undeveloped Areas	**5-Year Allowable Peak Flow**	10-Year Peak Flow from Undeveloped Areas	**10-Year Allowable Peak Flow**	25-Year Peak Flow from Developed Areas	25-Year Peak Flow from Undeveloped Areas	**25-Year Allowable Peak Flow**	50-Year Peak Flow from Developed Areas	50-Year Peak Flow from Undeveloped Areas	**50-Year Allowable Peak Flow**	100-Year Peak Flow from Developed Areas	100-Year Peak Flow from Undeveloped Areas	**100-Year Allowable Peak Flow**
POI#2	0.22	0.23	**0.45**	1.14	0.80	**1.94**	1.46	**2.60**	10.66	2.57	**13.23**	14.84	3.62	**18.46**	19.66	4.84	**24.50**

** ALLOWABLE PEAK FLOW RATES ARE DETERMINED BY ADDING THE PRE-CONSTRUCTION CONDITION 2-YEAR PEAK FLOW DEVELOPED AREAS TO THE APPROPRIATE PEAK FLOW FROM UNDEVELOPED AREAS. THAT WAY, THE SITE'S STORMWATER MANAGEMENT DESIGN IS NOT FORCED TO REDUCE PEAK FLOW FOR AREAS THAT WILL NOT BE DEVELOPED. THE 100-YEAR DOES NOT HAVE A REQUIRED REDUCTION; SO, THE ALLOWABLE FLOW EQUALS THE TOTAL PRE-DEVELOPED PEAK FLOW AT THE POINT OF INTEREST.

(EXAMPLE: 2-YR PRE-CONDITION FLOW FROM DEVELOPED AREAS + 10-YEAR PRE-CONDITION FLOW FROM UNDEVELOPED AREAS = 10-YEAR ALLOWABLE PEAK FLOW)

NOAA Atlas 14, Volume 2, Version 3
Location name: Upper Uwchlan Twp, Pennsylvania, USA*
Latitude: 40.104°, Longitude: -75.7136°
Elevation: 617.26 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.346 (0.316-0.380)	0.412 (0.376-0.453)	0.480 (0.437-0.528)	0.528 (0.481-0.580)	0.583 (0.528-0.640)	0.620 (0.557-0.679)	0.655 (0.586-0.718)	0.685 (0.611-0.751)	0.717 (0.635-0.787)	0.740 (0.651-0.815)
10-min	0.553 (0.504-0.607)	0.658 (0.601-0.724)	0.769 (0.700-0.845)	0.845 (0.769-0.927)	0.930 (0.841-1.02)	0.987 (0.888-1.08)	1.04 (0.932-1.14)	1.09 (0.968-1.19)	1.13 (1.00-1.25)	1.17 (1.03-1.28)
15-min	0.691 (0.630-0.759)	0.827 (0.755-0.910)	0.973 (0.886-1.07)	1.07 (0.973-1.17)	1.18 (1.07-1.29)	1.25 (1.12-1.37)	1.32 (1.18-1.44)	1.37 (1.22-1.50)	1.43 (1.26-1.57)	1.46 (1.29-1.61)
30-min	0.947 (0.864-1.04)	1.14 (1.04-1.26)	1.38 (1.26-1.52)	1.55 (1.41-1.70)	1.75 (1.58-1.91)	1.88 (1.69-2.06)	2.02 (1.80-2.21)	2.13 (1.90-2.34)	2.27 (2.01-2.50)	2.37 (2.09-2.61)
60-min	1.18 (1.08-1.30)	1.43 (1.31-1.58)	1.77 (1.61-1.95)	2.02 (1.84-2.21)	2.32 (2.10-2.55)	2.55 (2.29-2.79)	2.78 (2.48-3.04)	2.99 (2.67-3.28)	3.26 (2.89-3.58)	3.46 (3.04-3.81)
2-hr	1.41 (1.27-1.57)	1.71 (1.54-1.90)	2.12 (1.91-2.36)	2.44 (2.19-2.71)	2.86 (2.55-3.17)	3.19 (2.83-3.53)	3.52 (3.11-3.90)	3.85 (3.37-4.26)	4.29 (3.72-4.76)	4.63 (3.98-5.14)
3-hr	1.53 (1.38-1.71)	1.86 (1.67-2.07)	2.32 (2.08-2.58)	2.66 (2.39-2.96)	3.12 (2.78-3.46)	3.48 (3.08-3.85)	3.84 (3.39-4.25)	4.20 (3.68-4.66)	4.69 (4.06-5.20)	5.05 (4.34-5.62)
6-hr	1.90 (1.72-2.12)	2.30 (2.08-2.56)	2.85 (2.57-3.18)	3.30 (2.96-3.67)	3.92 (3.49-4.34)	4.41 (3.90-4.88)	4.93 (4.33-5.45)	5.47 (4.76-6.05)	6.22 (5.34-6.89)	6.82 (5.77-7.55)
12-hr	2.31 (2.08-2.60)	2.78 (2.51-3.13)	3.47 (3.13-3.89)	4.05 (3.62-4.53)	4.87 (4.32-5.42)	5.55 (4.88-6.17)	6.29 (5.47-6.99)	7.08 (6.09-7.86)	8.22 (6.93-9.13)	9.16 (7.60-10.2)
24-hr	2.70 (2.47-2.96)	3.24 (2.97-3.56)	4.06 (3.71-4.46)	4.74 (4.32-5.20)	5.72 (5.19-6.26)	6.54 (5.91-7.15)	7.42 (6.67-8.10)	8.38 (7.48-9.13)	9.76 (8.62-10.6)	10.9 (9.54-11.9)
2-day	3.13 (2.85-3.46)	3.77 (3.44-4.17)	4.73 (4.30-5.23)	5.51 (5.00-6.08)	6.61 (5.97-7.27)	7.52 (6.76-8.27)	8.48 (7.59-9.32)	9.51 (8.45-10.5)	11.0 (9.66-12.1)	12.2 (10.6-13.4)
3-day	3.30 (3.00-3.65)	3.97 (3.62-4.40)	4.97 (4.52-5.50)	5.78 (5.25-6.39)	6.93 (6.25-7.63)	7.87 (7.07-8.66)	8.86 (7.93-9.75)	9.92 (8.82-10.9)	11.4 (10.1-12.6)	12.7 (11.1-14.0)
4-day	3.47 (3.16-3.84)	4.18 (3.80-4.63)	5.21 (4.74-5.77)	6.05 (5.49-6.69)	7.24 (6.54-7.99)	8.21 (7.39-9.06)	9.24 (8.27-10.2)	10.3 (9.20-11.4)	11.9 (10.5-13.1)	13.2 (11.5-14.5)
7-day	4.06 (3.73-4.45)	4.87 (4.46-5.33)	6.01 (5.50-6.59)	6.95 (6.35-7.61)	8.29 (7.55-9.06)	9.39 (8.51-10.2)	10.6 (9.52-11.5)	11.8 (10.6-12.9)	13.6 (12.1-14.8)	15.0 (13.2-16.4)
10-day	4.64 (4.28-5.04)	5.54 (5.10-6.02)	6.75 (6.21-7.34)	7.71 (7.09-8.38)	9.06 (8.30-9.83)	10.1 (9.26-11.0)	11.3 (10.2-12.2)	12.4 (11.3-13.5)	14.0 (12.6-15.2)	15.3 (13.7-16.7)
20-day	6.26 (5.82-6.75)	7.43 (6.91-8.01)	8.86 (8.23-9.54)	9.98 (9.27-10.7)	11.5 (10.6-12.4)	12.7 (11.7-13.6)	13.9 (12.8-14.9)	15.1 (13.8-16.2)	16.7 (15.2-17.9)	17.9 (16.2-19.3)
30-day	7.79 (7.32-8.30)	9.18 (8.62-9.79)	10.7 (10.0-11.4)	11.9 (11.1-12.6)	13.4 (12.5-14.3)	14.6 (13.6-15.5)	15.7 (14.6-16.7)	16.8 (15.6-18.0)	18.3 (16.9-19.5)	19.4 (17.8-20.7)
45-day	9.88 (9.35-10.5)	11.6 (11.0-12.3)	13.3 (12.6-14.1)	14.6 (13.8-15.5)	16.3 (15.4-17.2)	17.5 (16.5-18.5)	18.6 (17.5-19.7)	19.7 (18.5-20.9)	21.1 (19.7-22.3)	22.0 (20.6-23.4)
60-day	11.8 (11.2-12.5)	13.9 (13.2-14.7)	15.8 (15.0-16.7)	17.3 (16.4-18.3)	19.1 (18.1-20.2)	20.4 (19.3-21.6)	21.6 (20.4-22.9)	22.8 (21.5-24.1)	24.2 (22.8-25.6)	25.1 (23.6-26.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

SECTION 2
Pre-Developed Stormwater Calculations
(Tc, CN, and hydrographs)

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-A (UNDISTURBED) (TOTAL)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	18.94	1041.47
B	On-Site Meadow	58	2.72	157.54
C/D	On-Site Woods	73.5	1.27	93.23
C/D	On-Site Meadow	74.5	0.65	48.35
B	On-Site Impervious	98	0.17	16.20
B	Off-Site Woods	55	1.17	64.29
Totals =			24.90	1421.09

$$\text{Composite Cn} = \frac{1421.09}{24.90} = 57.06$$

USE CN = 57

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-A (DISTURBED) (TOTAL)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	6.14	337.84
B	On-Site Meadow	58	6.92	401.57
C/D	On-Site Woods	73.5	0.00	0.29
B	On-Site Impervious (Meadow)	58	0.84	48.43

Totals =	13.91	788.13

Composite Cn = $\frac{788.13}{13.91}$ = 56.68

USE CN = 57

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

ESE Consultants, Inc.

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-B (UNDISTURBED)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	9.16	503.63
B	On-Site Meadow	58	0.44	25.48
A	On-Site Woods	30	0.69	20.58
A	On-Site Meadow	30	0.03	1.03
B	On-Site Impervious	98	0.09	8.69
Totals =			10.41	559.41

$$\text{Composite Cn} = \frac{559.41}{10.41} = 53.76$$

USE CN = 54

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

ESE Consultants, Inc.

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-B (DISTURBED)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	6.25	343.82
B	On-Site Meadow	58	4.28	248.08
B	On-Site Impervious (Meadow)	58	0.07	4.17

Totals =	10.60	596.07

Composite Cn = $\frac{596.07}{10.60}$ = 56.23

USE CN = 56

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

ESE Consultants, Inc.

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #2 (UNDISTURBED)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	1.47	80.93
B	On-Site Meadow	58	0.04	2.59

Totals =	1.52	83.52

Composite Cn = $\frac{83.52}{1.52}$ = 55.09

USE CN = 55

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #2 (DISTURBED)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	3.88	213.17
B	On-Site Meadow	58	1.56	90.20
B	On-Site Impervious (Meadow)	58	0.45	26.01

Totals =	5.88	329.39

Composite Cn = $\frac{329.39}{5.88}$ = 56.02

USE CN = 56

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-A (DEVELOPED)**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B		
Surface Description (table 3-1)		woods		
Manning's Roughness Coefficient, n (table 3.1)		0.4		
Flow Length, L	ft.	100		
Two Year 24 Hour Rainfall, P2	in.	3.24		
Land Slope, s	ft/ft	0.0635		
Tt = 0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.2241		
Sheet flow Subtotal Tt =	**hr**			**0.2241**

Elev. A = 702.25
Elev. B = 695.90
Chg. Elev. = 6.35

Shallow concentrated flow

	Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)		unpaved	unpaved	unpaved
Flow Length, L	ft	302	608	577
Watercourse Slope, s	ft/ft	0.1189	0.2336	0.0854
Average Velociity, V (figure 3-1)	fps	5.56	7.80	4.72
Tt = L / (3600 x V)	hr	0.0151	0.0217	0.0340
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0707**

Elev. B = 695.90
Elev. C = 660.00
Chg. Elev. = 35.90
Elev. C = 660.00
Elev. D = 518.00
Chg. Elev. = 142.00
Elev. D = 518.00
Elev. E = 468.70
Chg. Elev. = 49.30

Channel flow

	Segment ID	H - POI #1-A		
Cross Sectional Flow Area, a	sq ft			
Wetted Perimeter, Pw	ft			
Hydraulic Radius, r = a/Pw	ft			
Channel Slope, s	ft/ft			
Manning's Roughness Coefficient, n				
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00		
Flow length, L	ft	298		
Tt = L / (3600 x V)	hr	0.0207		
Channel flow Subtotal Tt =	**hr**			**0.0207**

Chg. Elev = 10.14

elev

Total Tt = 0.3155 **18.9**
T lag = 0.6Tt = 0.1893

Total Hydraulic Length = 1885
Total Elevation Change = 243.7
Average Slope = 12.93%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-A (UNDEVELOPED)**

TIME OF CONCENTRATION

(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B			Elev. A = 660.00
Surface Description (table 3-1)		woods			Elev. B = 629.50
Manning's Roughness Coefficient, n (table 3.1)		0.4			Chg. Elev. = 30.50
Flow Length, L	ft.	100			
Two Year 24 Hour Rainfall, P2	in.	3.24			
Land Slope, s	ft/ft	0.3050			
Tt = $\frac{0.007(nL)^{0.8}}{(P2^{0.5})(s^{0.4})}$	hr	0.1196			
Sheet flow Subtotal Tt =	**hr**			**0.1196**	

Shallow concentrated flow

	Segment ID	B - C	C - D		Elev. B = 629.50
Surface Description (paved or unpaved)		unpaved	unpaved		Elev. C = 518.00
Flow Length, L	ft	508	577		Chg. Elev. = 111.50
Watercourse Slope, s	ft/ft	0.2195	0.0854		Elev. C = 518.00
Average Velociity, V (figure 3-1)	fps	7.56	4.72		Elev. D = 468.70
Tt = $\frac{L}{(3600 \times V)}$	hr	0.0187	0.0340		Chg. Elev. = 49.30
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0527**	

Channel flow

	Segment ID	D - POI #1-A			
Cross Sectional Flow Area, a	sq ft				
Wetted Perimeter, Pw	ft				Chg. Elev = 10.14
Hydraulic Radius, r = a/Pw	ft				
Channel Slope, s	ft/ft				**elev**
Manning's Roughness Coefficient, n					
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00			
Flow length, L	ft	298			
Tt = $\frac{L}{(3600 \times V)}$	hr	0.0207			
Channel flow Subtotal Tt =	**hr**			**0.0207**	

Total Tt =	**0.1930**	**11.6**
T lag = 0.6Tt =	**0.1158**	

Total Hydraulic Length =	1483
Total Elevation Change =	201.4
Average Slope =	13.58%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #1-B**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B			Elev. A = 688.00
Surface Description (table 3-1)		grass			Elev. B = 676.50
Manning's Roughness Coefficient, n (table 3.1)		0.24			Chg. Elev. = 11.50
Flow Length, L	ft.	100			
Two Year 24 Hour Rainfall, P2	in.	3.24			
Land Slope, s	ft/ft	0.1150			
$Tt = \frac{0.007(nL)^{0.8}}{(P2^{0.5})(s^{0.4})}$	hr	0.1174			
Sheet flow Subtotal Tt =	**hr**			**0.1174**	

Shallow concentrated flow

	Segment ID	B - C	C - D		Elev. B = 676.50
Surface Description (paved or unpaved)		unpaved	unpaved		Elev. C = 628.00
Flow Length, L	ft	491	795		Chg. Elev. = 48.50
Watercourse Slope, s	ft/ft	0.0988	0.2038		Elev. C = 628.00
Average Velociity, V (figure 3-1)	fps	5.07	7.28		Elev. D = 466.00
$Tt = \frac{L}{(3600 \times V)}$	hr	0.0269	0.0303		Chg. Elev. = 162.00
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0572**	466.00

Channel flow

	Segment ID	-			
Cross Sectional Flow Area, a	sq ft				
Wetted Perimeter, Pw	ft				
Hydraulic Radius, r = a/Pw	ft				
Channel Slope, s	ft/ft				
Manning's Roughness Coefficient, n					
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps				
Flow length, L	ft				
$Tt = \frac{L}{(3600 \times V)}$	hr				
Channel flow Subtotal Tt =	**hr**				

Total Tt = 0.1746 **10.5**
T lag = 0.6Tt = 0.1048

Total Hydraulic Length = 1386
Total Elevation Change = 222.0
Average Slope = 16.02%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Pre Developed to POI #2**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

		Segment ID	A - B		
Surface Description (table 3-1)			grass		
Manning's Roughness Coefficient, n (table 3.1)			0.24		
Flow Length, L		ft.	100		
Two Year 24 Hour Rainfall, P2		in.	3.24		
Land Slope, s		ft/ft	0.0450		
Tt =	0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.1709		
Sheet flow Subtotal Tt =		**hr**			**0.1709**

Elev. A = 703.00
Elev. B = 698.50
Chg. Elev. = 4.50

Shallow concentrated flow

		Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)			unpaved	unpaved	unpaved
Flow Length, L		ft	294	123	255
Watercourse Slope, s		ft/ft	0.0493	0.0813	0.0894
Average Velociity, V (figure 3-1)		fps	3.58	4.60	4.82
Tt =	L / (3600 x V)	hr	0.0228	0.0074	0.0147
Shallow concentrated flow Subtotal Tt =		**hr**			**0.0449**

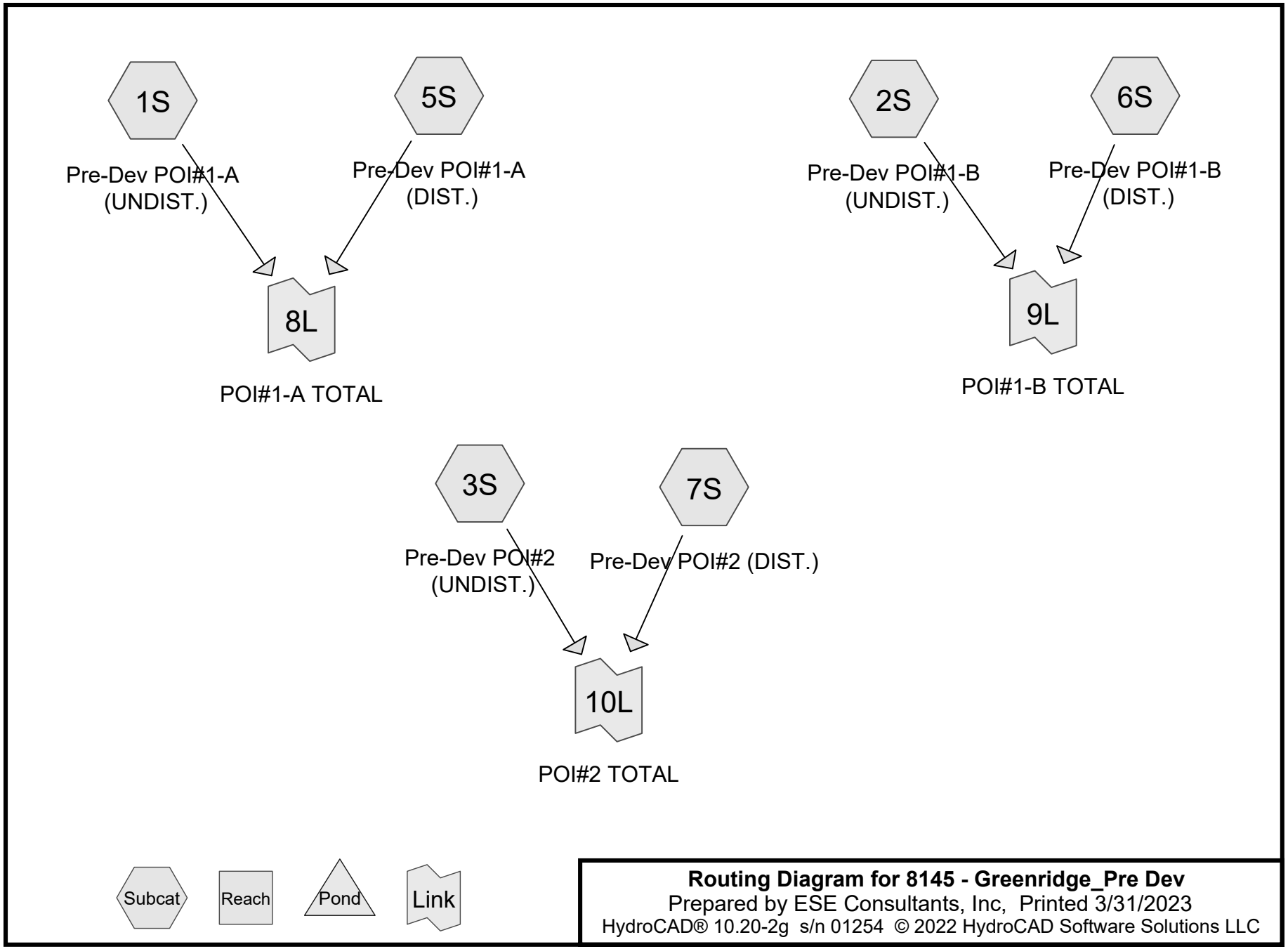
Elev. B = 698.50
Elev. C = 684.00
Chg. Elev. = 14.50
Elev. C = 684.00
Elev. D = 674.00
Chg. Elev. = 10.00
Elev. D = 674.00
Elev. E = 651.20
Chg. Elev. = 22.80

Channel flow

		Segment ID			
Cross Sectional Flow Area, a		sq ft			
Wetted Perimeter, Pw		ft			
Hydraulic Radius, r = a/Pw		ft			
Channel Slope, s		ft/ft			
Manning's Roughness Coefficient, n					
Velocity, V = (1.486)(r^2/3)(s^1/2)/n		fps			
Flow length, L		ft			
Tt =	L / (3600 x V)	hr			
Channel flow Subtotal Tt =		**hr**			

Total Tt = 0.2158 **12.9**
T lag = 0.6Tt = 0.1295

Total Hydraulic Length = 772
Total Elevation Change = 51.8
Average Slope = 6.71%



Routing Diagram for 8145 - Greenridge_Pre Dev
Prepared by ESE Consultants, Inc, Printed 3/31/2023

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 1.52 cfs @ 12.12 hrs, Volume= 0.269 af, Depth> 0.13"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 Year Rainfall=2.70"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 0.18 cfs @ 12.45 hrs, Volume= 0.069 af, Depth> 0.08"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 Year Rainfall=2.70"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 0.04 cfs @ 12.41 hrs, Volume= 0.012 af, Depth> 0.09"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 Year Rainfall=2.70"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 0.65 cfs @ 12.26 hrs, Volume= 0.149 af, Depth> 0.13"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 Year Rainfall=2.70"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 0.44 cfs @ 12.12 hrs, Volume= 0.099 af, Depth> 0.11"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 Year Rainfall=2.70"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 0.22 cfs @ 12.17 hrs, Volume= 0.055 af, Depth> 0.11"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 Year Rainfall=2.70"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 0.13" for 1 Year event
Inflow = 1.97 cfs @ 12.15 hrs, Volume= 0.418 af
Primary = 1.97 cfs @ 12.15 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 0.10" for 1 Year event
Inflow = 0.53 cfs @ 12.15 hrs, Volume= 0.167 af
Primary = 0.53 cfs @ 12.15 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 0.11" for 1 Year event
Inflow = 0.25 cfs @ 12.17 hrs, Volume= 0.067 af
Primary = 0.25 cfs @ 12.17 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 6.26 cfs @ 12.09 hrs, Volume= 0.561 af, Depth> 0.27"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Year Rainfall=3.24"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 1.34 cfs @ 12.09 hrs, Volume= 0.166 af, Depth> 0.19"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Year Rainfall=3.24"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 0.23 cfs @ 12.11 hrs, Volume= 0.027 af, Depth> 0.22"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Year Rainfall=3.24"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 2.57 cfs @ 12.19 hrs, Volume= 0.311 af, Depth> 0.27"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Year Rainfall=3.24"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.214 af, Depth> 0.24"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Year Rainfall=3.24"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 1.14 cfs @ 12.11 hrs, Volume= 0.119 af, Depth> 0.24"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Year Rainfall=3.24"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 0.27" for 2 Year event
Inflow = 8.21 cfs @ 12.10 hrs, Volume= 0.872 af
Primary = 8.21 cfs @ 12.10 hrs, Volume= 0.872 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 0.22" for 2 Year event
Inflow = 3.59 cfs @ 12.08 hrs, Volume= 0.380 af
Primary = 3.59 cfs @ 12.08 hrs, Volume= 0.380 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 0.24" for 2 Year event
Inflow = 1.37 cfs @ 12.11 hrs, Volume= 0.146 af
Primary = 1.37 cfs @ 12.11 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 18.03 cfs @ 12.06 hrs, Volume= 1.157 af, Depth> 0.56"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 Year Rainfall=4.06"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 5.45 cfs @ 12.06 hrs, Volume= 0.377 af, Depth> 0.43"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 Year Rainfall=4.06"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 0.47"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 Year Rainfall=4.06"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 7.44 cfs @ 12.16 hrs, Volume= 0.643 af, Depth> 0.55"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 Year Rainfall=4.06"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 7.21 cfs @ 12.05 hrs, Volume= 0.455 af, Depth> 0.52"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 Year Rainfall=4.06"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 3.53 cfs @ 12.08 hrs, Volume= 0.252 af, Depth> 0.51"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 Year Rainfall=4.06"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 0.56" for 5 Year event
Inflow = 23.56 cfs @ 12.08 hrs, Volume= 1.800 af
Primary = 23.56 cfs @ 12.08 hrs, Volume= 1.800 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 0.48" for 5 Year event
Inflow = 12.65 cfs @ 12.06 hrs, Volume= 0.832 af
Primary = 12.65 cfs @ 12.06 hrs, Volume= 0.832 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 0.51" for 5 Year event
Inflow = 4.34 cfs @ 12.08 hrs, Volume= 0.312 af
Primary = 4.34 cfs @ 12.08 hrs, Volume= 0.312 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 30.29 cfs @ 12.05 hrs, Volume= 1.765 af, Depth> 0.85"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.74"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 10.10 cfs @ 12.05 hrs, Volume= 0.601 af, Depth> 0.69"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.74"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 1.46 cfs @ 12.07 hrs, Volume= 0.094 af, Depth> 0.74"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.74"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 12.71 cfs @ 12.15 hrs, Volume= 0.982 af, Depth> 0.85"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.74"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 12.40 cfs @ 12.04 hrs, Volume= 0.704 af, Depth> 0.80"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.74"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 6.20 cfs @ 12.07 hrs, Volume= 0.390 af, Depth> 0.80"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Year Rainfall=4.74"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 0.85" for 10 Year event
Inflow = 40.51 cfs @ 12.07 hrs, Volume= 2.747 af
Primary = 40.51 cfs @ 12.07 hrs, Volume= 2.747 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 0.75" for 10 Year event
Inflow = 22.50 cfs @ 12.05 hrs, Volume= 1.305 af
Primary = 22.50 cfs @ 12.05 hrs, Volume= 1.305 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 0.79" for 10 Year event
Inflow = 7.65 cfs @ 12.07 hrs, Volume= 0.484 af
Primary = 7.65 cfs @ 12.07 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 50.68 cfs @ 12.05 hrs, Volume= 2.788 af, Depth> 1.34"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Year Rainfall=5.72"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 18.10 cfs @ 12.04 hrs, Volume= 0.986 af, Depth> 1.14"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Year Rainfall=5.72"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 2.57 cfs @ 12.07 hrs, Volume= 0.152 af, Depth> 1.20"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Year Rainfall=5.72"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 21.64 cfs @ 12.14 hrs, Volume= 1.551 af, Depth> 1.34"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Year Rainfall=5.72"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 21.11 cfs @ 12.04 hrs, Volume= 1.125 af, Depth> 1.27"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Year Rainfall=5.72"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 10.66 cfs @ 12.06 hrs, Volume= 0.623 af, Depth> 1.27"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Year Rainfall=5.72"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 1.34" for 25 Year event
Inflow = 68.67 cfs @ 12.06 hrs, Volume= 4.338 af
Primary = 68.67 cfs @ 12.06 hrs, Volume= 4.338 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 1.21" for 25 Year event
Inflow = 39.21 cfs @ 12.04 hrs, Volume= 2.111 af
Primary = 39.21 cfs @ 12.04 hrs, Volume= 2.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 1.26" for 25 Year event
Inflow = 13.23 cfs @ 12.06 hrs, Volume= 0.775 af
Primary = 13.23 cfs @ 12.06 hrs, Volume= 0.775 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 69.58 cfs @ 12.05 hrs, Volume= 3.749 af, Depth> 1.81"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Year Rainfall=6.54"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 25.67 cfs @ 12.04 hrs, Volume= 1.354 af, Depth> 1.56"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Year Rainfall=6.54"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 3.62 cfs @ 12.06 hrs, Volume= 0.207 af, Depth> 1.64"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Year Rainfall=6.54"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 29.99 cfs @ 12.13 hrs, Volume= 2.086 af, Depth> 1.80"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Year Rainfall=6.54"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 29.23 cfs @ 12.03 hrs, Volume= 1.523 af, Depth> 1.72"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Year Rainfall=6.54"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 14.84 cfs @ 12.06 hrs, Volume= 0.844 af, Depth> 1.72"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Year Rainfall=6.54"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 1.80" for 50 Year event
Inflow = 94.88 cfs @ 12.06 hrs, Volume= 5.835 af
Primary = 94.88 cfs @ 12.06 hrs, Volume= 5.835 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 1.64" for 50 Year event
Inflow = 54.90 cfs @ 12.04 hrs, Volume= 2.877 af
Primary = 54.90 cfs @ 12.04 hrs, Volume= 2.877 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 1.71" for 50 Year event
Inflow = 18.46 cfs @ 12.06 hrs, Volume= 1.051 af
Primary = 18.46 cfs @ 12.06 hrs, Volume= 1.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Pre-Dev POI#1-A (UNDIST.)

Runoff = 91.30 cfs @ 12.04 hrs, Volume= 4.868 af, Depth> 2.35"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.42"

	Area (sf)	CN	Description
*	824,846	55	Woods, type B
*	118,321	58	Meadow, type B
*	55,254	74	Woods, type C/D
*	28,270	75	Meadow, type C/D
*	50,919	55	off site woods
*	7,202	98	impervious
	1,084,812	57	Weighted Average
	1,077,610		99.34% Pervious Area
	7,202		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 2S: Pre-Dev POI#1-B (UNDIST.)

Runoff = 34.47 cfs @ 12.03 hrs, Volume= 1.788 af, Depth> 2.06"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.42"

	Area (sf)	CN	Description
*	398,872	55	Woods, type B
*	19,138	58	Meadow, type B
*	29,879	30	Woods, type A
*	1,490	30	Meadow, type A
*	3,864	98	Impervious
	453,243	54	Weighted Average
	449,379		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 3S: Pre-Dev POI#2 (UNDIST.)

Runoff = 4.84 cfs @ 12.06 hrs, Volume= 0.272 af, Depth> 2.15"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.42"

	Area (sf)	CN	Description
*	64,099	55	woods
*	1,943	58	meadow
	66,042	55	Weighted Average
	66,042		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Subcatchment 5S: Pre-Dev POI#1-A (DIST.)

Runoff = 39.62 cfs @ 12.13 hrs, Volume= 2.709 af, Depth> 2.34"
Routed to Link 8L : POI#1-A TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.42"

	Area (sf)	CN	Description
*	267,566	55	Woods, type B
*	301,593	58	Meadow, type B
*	172	74	Woods, type C/D
*	36,375	58	Impervious (Meadow), type B
	605,706	57	Weighted Average
	605,706		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9					**Direct Entry, Pre-Dev POI#1-A**

Summary for Subcatchment 6S: Pre-Dev POI#1-B (DIST.)

Runoff = 38.59 cfs @ 12.03 hrs, Volume= 1.988 af, Depth> 2.25"
Routed to Link 9L : POI#1-B TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.42"

	Area (sf)	CN	Description
*	272,304	55	Woods, type B
*	186,317	58	Meadow, type B
*	3,135	58	Impervious (Meadow), type B
	461,756	56	Weighted Average
	461,756		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5					**Direct Entry, Pre-Dev POI#1-B**

Summary for Subcatchment 7S: Pre-Dev POI#2 (DIST.)

Runoff = 19.66 cfs @ 12.06 hrs, Volume= 1.102 af, Depth> 2.25"
Routed to Link 10L : POI#2 TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Year Rainfall=7.42"

	Area (sf)	CN	Description
*	168,832	55	woods
*	67,746	58	meadow
*	19,538	58	impervious (meadow)
	256,116	56	Weighted Average
	256,116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9					**Direct Entry, Pre-Dev POI#2**

Summary for Link 8L: POI#1-A TOTAL

Inflow Area = 38.809 ac, 0.43% Impervious, Inflow Depth > 2.34" for 100 Year event
Inflow = 125.06 cfs @ 12.06 hrs, Volume= 7.577 af
Primary = 125.06 cfs @ 12.06 hrs, Volume= 7.577 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 9L: POI#1-B TOTAL

Inflow Area = 21.005 ac, 0.42% Impervious, Inflow Depth > 2.16" for 100 Year event
Inflow = 73.05 cfs @ 12.03 hrs, Volume= 3.776 af
Primary = 73.05 cfs @ 12.03 hrs, Volume= 3.776 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 10L: POI#2 TOTAL

Inflow Area = 7.396 ac, 0.00% Impervious, Inflow Depth > 2.23" for 100 Year event
Inflow = 24.50 cfs @ 12.06 hrs, Volume= 1.374 af
Primary = 24.50 cfs @ 12.06 hrs, Volume= 1.374 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

SECTION 3
Post-Developed Stormwater Calculations
(Tc, CN, and hydrographs & routings)

ESE Consultants, Inc.

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #1**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	Open Space	61	1.40	85.48
B	impervious	98	0.47	45.66
B	Open Space (LOTS)	61	0.93	56.88
B	impervious (LOTS)	98	0.90	88.09
B	Off-Site Woods	55	0.29	16.09
B	Open Space (meadow)	58	0.40	23.21

Totals = 4.39 315.42

Composite Cn = $\frac{315.42}{4.39}$ = 71.83

USE CN = 72

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

ESE Consultants, Inc.

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #2**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	Open Space	61	1.79	108.96
B	impervious	98	2.44	239.03
B	Open Space (LOTS)	61	4.24	258.72
B	impervious (LOTS)	98	3.86	378.66
B	On-site woods	55	0.22	12.11

Totals = 12.55 997.49

Composite Cn = $\frac{997.49}{12.55}$ = 79.48

USE CN = 79

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #3A (PERVIOUS)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	Open Space (Meadow)	58	2.57	149.28
B	Open Space	61	2.81	171.40
B	Open Space (LOTS)	61	0.61	37.03
B	On-Site Woods	55	5.67	311.68
B	On-Site Meadow	58	1.58	91.84
Totals =			13.24	761.23

Composite Cn = $\frac{761.23}{13.24}$ = 57.49

USE CN = 57

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #3A (IMPERVIOUS)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	impervious	98	1.57	153.96
B	impervious (LOTS)	98	0.48	47.16

Totals =	2.05	201.12

Composite Cn = $\frac{201.12}{2.05}$ = 98.00

USE CN = 98

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

ESE Consultants, Inc.

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #3B**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	Open Space	61	1.57	95.47
B	impervious	98	0.87	85.47
B	Open Space (LOTS)	61	0.38	23.30
B	impervious (LOTS)	98	0.31	30.63
B	On-Site woods	55	0.45	24.96
B	On-Site meadow	58	0.10	5.98

Totals = 3.69 265.82

Composite Cn = $\frac{265.82}{3.69}$ = 72.06

USE CN = 72

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed BYPASS to POI #1-A (TOTAL)**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	13.05	717.60
B	On-Site Meadow	58	1.20	69.41
C/D	On-Site Woods	73.5	1.27	93.23
C/D	On-Site Meadow	74.5	0.65	48.33
B	Open Space	61	0.58	35.45
B	Off-Site woods	55	0.90	49.48
B	On-Site Meadow (within LOD)	58	1.09	63.19
B	Impervious	98	0.42	41.10

Totals = 19.15 1117.79

Composite Cn = $\frac{1117.79}{19.15}$ = 58.37

USE CN = 58

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed BYPASS to POI #1-B**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	55	8.25	453.69
B	On-Site Meadow	58	0.31	17.72
A	On-Site Woods	30	0.69	20.58
A	On-Site Meadow	30	0.03	1.03
B	Open Space (Good Condition)	61	0.01	0.58
B	Open Space (meadow)	58	1.07	61.86
B	Impervious	98	0.09	8.69

Totals = 10.44 564.14

Composite Cn = $\frac{564.14}{10.44}$ = 54.04

USE CN = 54

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

Greenridge Road
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/17/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to POI #2**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	CN	Area (acres)	Product of CN x Area
B	On-Site Woods	60	1.47	88.38
B	On-Site Meadow	58	0.02	1.02
B	Open Space (Good Condition)	61	0.12	7.21
B	Open Space (meadow)	58	0.10	5.52

Totals =	1.70	102.13

Composite Cn = $\frac{102.13}{1.70}$ = 59.94

USE CN = 60

24 hr RAINFALL for East Bradford Township

(per upper limits of NOAA Atlas 14, Vol. 2, Version 3.0 90% confidence intervals)

1 year	2 year	5 year	10 year	25 year	50 year	100 year
2.70	3.24	4.06	4.74	5.72	6.54	7.42

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed BYPASS to POI #1-A**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

		Segment ID	A - B		
Surface Description (table 3-1)			woods		
Manning's Roughness Coefficient, n (table 3.1)			0.4		
Flow Length, L		ft.	100		
Two Year 24 Hour Rainfall, P2		in.	3.24		
Land Slope, s		ft/ft	0.2840		
Tt =	0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.1231		
Sheet flow Subtotal Tt =		**hr**			**0.1231**

Elev. A = 660.90
Elev. B = 632.50
Chg. Elev. = 28.40

Shallow concentrated flow

		Segment ID	B - C	C - D	
Surface Description (paved or unpaved)			unpaved	unpaved	
Flow Length, L		ft	520	577	
Watercourse Slope, s		ft/ft	0.2202	0.0854	
Average Velociity, V (figure 3-1)		fps	7.57	4.72	
Tt =	L / (3600 x V)	hr	0.0191	0.0340	
Shallow concentrated flow Subtotal Tt =		**hr**			**0.0531**

Elev. B = 632.50
Elev. C = 518.00
Chg. Elev. = 114.50
Elev. C = 518.00
Elev. D = 468.70
Chg. Elev. = 49.30

Channel flow

		Segment ID	D - POI #1-A		
Cross Sectional Flow Area, a		sq ft			
Wetted Perimeter, Pw		ft			
Hydraulic Radius, r = a/Pw		ft			
Channel Slope, s		ft/ft			
Manning's Roughness Coefficient, n					
Velocity, V = (1.486)(r^2/3)(s^1/2)/n		fps	4.00		
Flow length, L		ft	298		
Tt =	L / (3600 x V)	hr	0.0207		
Channel flow Subtotal Tt =		**hr**			**0.0207**

Chg. Elev =
elev

Total Tt =	**0.1968**	**11.9**
T lag = 0.6Tt =	**0.1181**	

Total Hydraulic Length =	1495
Total Elevation Change =	192.2
Average Slope =	12.86%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed BYPASS to POI #1-B**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B	B - C		
Surface Description (table 3-1)		grass	woods		Elev. A = 590.00
Manning's Roughness Coefficient, n (table 3.1)		0.24	0.4		Elev. B = 583.00
Flow Length, L	ft.	25	75		Chg. Elev. = 7.00
Two Year 24 Hour Rainfall, P2	in.	3.24	3.24		Elev. B = 583.00
Land Slope, s	ft/ft	0.2800	0.3200		Elev. C = 559.00
$Tt = \frac{0.007(nL)^{0.8}}{(P2^{0.5})(s^{0.4})}$	hr	0.0271	0.0932		Chg. Elev. = 24.00
Sheet flow Subtotal Tt =	**hr**			**0.1203**	

Shallow concentrated flow

	Segment ID	C - D			
Surface Description (paved or unpaved)		unpaved			Elev. C = 559.00
Flow Length, L	ft	473			Elev. D = 466.00
Watercourse Slope, s	ft/ft	0.1966			Chg. Elev. = 93.00
Average Velociity, V (figure 3-1)	fps	7.15			466.00
$Tt = \frac{L}{(3600 \times V)}$	hr	0.0184			674.00
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0184**	651.50

Channel flow

	Segment ID	D - POI#1-B			
Cross Sectional Flow Area, a	sq ft				Elev. D =
Wetted Perimeter, Pw	ft				Elev. POI# =
Hydraulic Radius, r = a/Pw	ft				Chg. Elev. =
Channel Slope, s	ft/ft				
Manning's Roughness Coefficient, n					
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00			
Flow length, L	ft	112			
$Tt = \frac{L}{(3600 \times V)}$	hr	0.0078			
Channel flow Subtotal Tt =	**hr**			**0.0078**	

Total Tt = 0.1465 **8.8**
T lag = 0.6Tt = 0.0879

Total Hydraulic Length = 685
Total Elevation Change = 124.0
Average Slope = 18.10%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #1**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

Segment ID		A - B		
Surface Description (table 3-1)		grass		
Manning's Roughness Coefficient, n (table 3.1)		0.24		
Flow Length, L	ft.	100		
Two Year 24 Hour Rainfall, P2	in.	3.24		
Land Slope, s	ft/ft	0.0220		
Tt = 0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.2275		
Sheet flow Subtotal Tt =	**hr**			**0.2275**

Elev. A = 703.00
Elev. B = 698.50
Chg. Elev. = 4.50

Shallow concentrated flow

Segment ID		B - C	C - D	D - E
Surface Description (paved or unpaved)		unpaved	paved	unpaved
Flow Length, L	ft	44	9	190
Watercourse Slope, s	ft/ft	0.0220	0.0220	0.0220
Average Velociity, V (figure 3-1)	fps	2.39	3.02	2.39
Tt = L / (3600 x V)	hr	0.0051	0.0008	0.0221
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0280**

Elev. B = 698.50
Elev. C = 684.00
Chg. Elev. = 14.50
Elev. C = 684.00
Elev. D = 674.00
Chg. Elev. = 10.00
Elev. D = 674.00
Elev. E = 651.20
Chg. Elev. = 22.80

Channel flow

Segment ID		E - F		
Cross Sectional Flow Area, a	sq ft			
Wetted Perimeter, Pw	ft			
Hydraulic Radius, r = a/Pw	ft			
Channel Slope, s	ft/ft			
Manning's Roughness Coefficient, n				
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00		
Flow length, L	ft	37		
Tt = L / (3600 x V)	hr	0.0026		
Channel flow Subtotal Tt =	**hr**			**0.0026**

Elev. E =
Elev. F =
Chg. Elev. =

Total Tt = 0.2581 **15.5**
T lag = 0.6Tt = 0.1548

Total Hydraulic Length = 380
Total Elevation Change = 51.8
Average Slope = 13.63%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Basin #3A**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

		Segment ID	A - B		
Surface Description (table 3-1)			grass		
Manning's Roughness Coefficient, n (table 3.1)			0.24		
Flow Length, L		ft.	100		
Two Year 24 Hour Rainfall, P2		in.	3.24		
Land Slope, s		ft/ft	0.2400		
Tt =	0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.0875		
Sheet flow Subtotal Tt =		**hr**			**0.0875**

Elev. A = 692.00
Elev. B = 668.00
Chg. Elev. = 24.00
559.00

Shallow concentrated flow

		Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)			unpaved	paved	unpaved
Flow Length, L		ft	526	88	100
Watercourse Slope, s		ft/ft	0.2205	0.1818	0.3100
Average Velociity, V (figure 3-1)		fps	7.58	8.67	8.98
Tt =	L / (3600 x V)	hr	0.0193	0.0028	0.0031
Shallow concentrated flow Subtotal Tt =		**hr**			**0.0252**

Elev. B = 668.00
Elev. C = 552.00
Chg. Elev. = 116.00
Elev. C = 552.00
Elev. D = 536.00
Chg. Elev. = 16.00
Elev. D = 536.00
Elev. E = 505.00
Chg. Elev. = 31.00

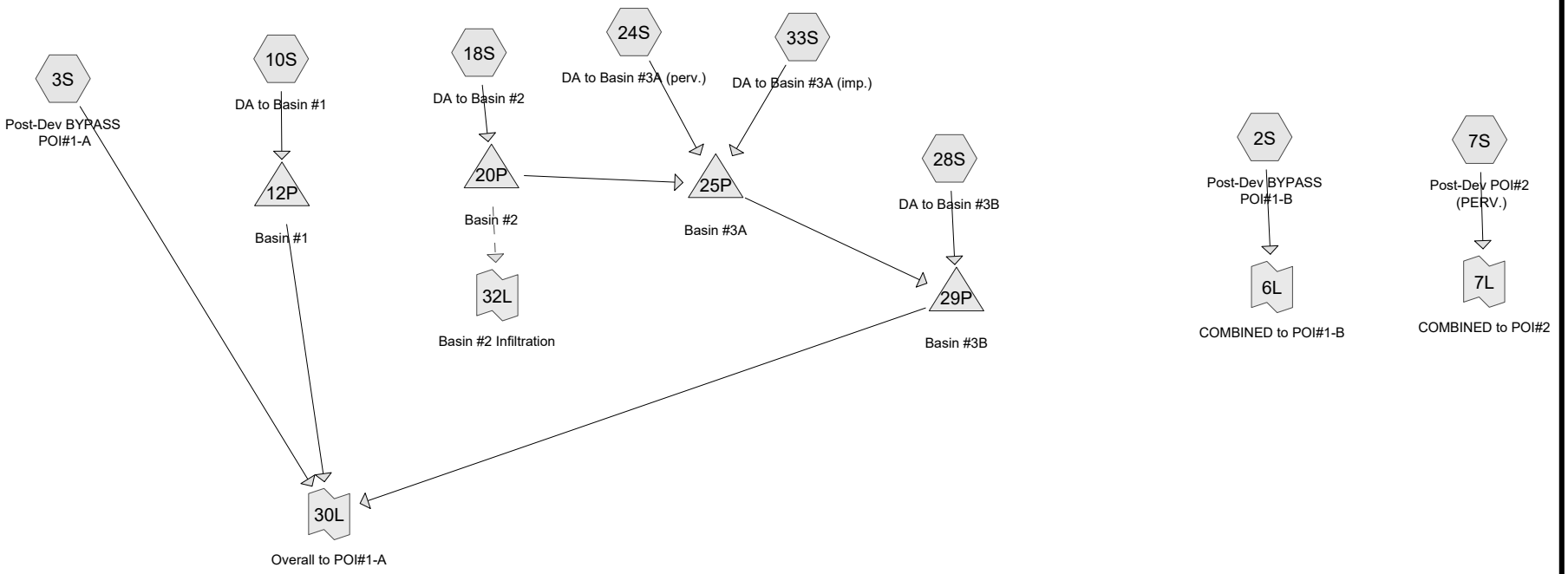
Channel flow

		Segment ID	E - Basin #3A		
Cross Sectional Flow Area, a		sq ft			
Wetted Perimeter, Pw		ft			
Hydraulic Radius, r = a/Pw		ft			
Channel Slope, s		ft/ft			
Manning's Roughness Coefficient, n					
Velocity, V = (1.486)(r^2/3)(s^1/2)/n		fps	4.00		
Flow length, L		ft	98		
Tt =	L / (3600 x V)	hr	0.0068		
Channel flow Subtotal Tt =		**hr**			**0.0068**

Elev. E =
Elev. in =
Chg. Elev. =

Total Tt = 0.1195 **7.2**
T lag = 0.6Tt = 0.0717

Total Hydraulic Length = 912
Total Elevation Change = 187.0
Average Slope = 20.50%



Subcat Reach Pond Link

Routing Diagram for 8145 - Greenridge_Post Dev
Prepared by ESE Consultants, Inc, Printed 3/31/2023

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 0.19 cfs @ 12.42 hrs, Volume= 0.091 af, Depth= 0.10"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 1.66 cfs @ 12.11 hrs, Volume= 0.294 af, Depth= 0.18"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 0.40 cfs @ 12.00 hrs, Volume= 0.033 af, Depth= 0.23"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 3.14 cfs @ 12.10 hrs, Volume= 0.233 af, Depth= 0.64"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 21.92 cfs @ 11.96 hrs, Volume= 1.019 af, Depth= 0.97"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 1.05 cfs @ 12.06 hrs, Volume= 0.179 af, Depth= 0.16"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 3.42 cfs @ 11.97 hrs, Volume= 0.173 af, Depth= 0.55"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 7.38 cfs @ 11.98 hrs, Volume= 0.422 af, Depth= 2.47"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.70"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 0.10" for 1 year event
Inflow = 0.19 cfs @ 12.42 hrs, Volume= 0.091 af
Primary = 0.19 cfs @ 12.42 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 0.23" for 1 year event
Inflow = 0.40 cfs @ 12.00 hrs, Volume= 0.033 af
Primary = 0.40 cfs @ 12.00 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 0.24" for 1 year event
Inflow = 2.62 cfs @ 12.11 hrs, Volume= 1.091 af
Primary = 2.62 cfs @ 12.11 hrs, Volume= 1.091 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 1.52 cfs @ 12.06 hrs, Volume= 0.204 af, Depth= 0.23"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 5.72 cfs @ 12.08 hrs, Volume= 0.567 af, Depth= 0.36"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 1.01 cfs @ 11.99 hrs, Volume= 0.060 af, Depth= 0.42"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 4.99 cfs @ 12.09 hrs, Volume= 0.349 af, Depth= 0.95"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 30.92 cfs @ 11.96 hrs, Volume= 1.430 af, Depth= 1.37"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 4.29 cfs @ 12.02 hrs, Volume= 0.357 af, Depth= 0.32"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 5.53 cfs @ 11.97 hrs, Volume= 0.266 af, Depth= 0.85"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 8.90 cfs @ 11.98 hrs, Volume= 0.514 af, Depth= 3.01"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.24"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 0.23" for 2 year event
Inflow = 1.52 cfs @ 12.06 hrs, Volume= 0.204 af
Primary = 1.52 cfs @ 12.06 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 0.42" for 2 year event
Inflow = 1.01 cfs @ 11.99 hrs, Volume= 0.060 af
Primary = 1.01 cfs @ 11.99 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 0.40" for 2 year event
Inflow = 6.74 cfs @ 12.08 hrs, Volume= 1.821 af
Primary = 6.74 cfs @ 12.08 hrs, Volume= 1.821 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 5.90 cfs @ 12.04 hrs, Volume= 0.444 af, Depth= 0.51"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 15.22 cfs @ 12.06 hrs, Volume= 1.105 af, Depth= 0.69"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 2.20 cfs @ 11.98 hrs, Volume= 0.112 af, Depth= 0.79"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 8.15 cfs @ 12.09 hrs, Volume= 0.550 af, Depth= 1.50"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 45.43 cfs @ 11.96 hrs, Volume= 2.105 af, Depth= 2.01"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 11.88 cfs @ 12.01 hrs, Volume= 0.711 af, Depth= 0.64"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 9.16 cfs @ 11.96 hrs, Volume= 0.428 af, Depth= 1.37"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 11.20 cfs @ 11.98 hrs, Volume= 0.654 af, Depth= 3.82"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 year Rainfall=4.06"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 0.51" for 5 year event
Inflow = 5.90 cfs @ 12.04 hrs, Volume= 0.444 af
Primary = 5.90 cfs @ 12.04 hrs, Volume= 0.444 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 0.79" for 5 year event
Inflow = 2.20 cfs @ 11.98 hrs, Volume= 0.112 af
Primary = 2.20 cfs @ 11.98 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 0.73" for 5 year event
Inflow = 16.31 cfs @ 12.06 hrs, Volume= 3.363 af
Primary = 16.31 cfs @ 12.06 hrs, Volume= 3.363 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 10.83 cfs @ 12.03 hrs, Volume= 0.694 af, Depth= 0.80"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 24.91 cfs @ 12.06 hrs, Volume= 1.642 af, Depth= 1.03"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 3.36 cfs @ 11.97 hrs, Volume= 0.164 af, Depth= 1.15"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 10.99 cfs @ 12.08 hrs, Volume= 0.732 af, Depth= 2.00"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 57.93 cfs @ 11.96 hrs, Volume= 2.698 af, Depth= 2.58"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 19.59 cfs @ 12.00 hrs, Volume= 1.069 af, Depth= 0.97"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 12.44 cfs @ 11.96 hrs, Volume= 0.576 af, Depth= 1.85"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 13.10 cfs @ 11.98 hrs, Volume= 0.770 af, Depth= 4.50"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.74"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 0.80" for 10 year event
Inflow = 10.83 cfs @ 12.03 hrs, Volume= 0.694 af
Primary = 10.83 cfs @ 12.03 hrs, Volume= 0.694 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 1.15" for 10 year event
Inflow = 3.36 cfs @ 11.97 hrs, Volume= 0.164 af
Primary = 3.36 cfs @ 11.97 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 1.08" for 10 year event
Inflow = 26.06 cfs @ 12.06 hrs, Volume= 4.944 af
Primary = 26.06 cfs @ 12.06 hrs, Volume= 4.944 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 19.48 cfs @ 12.02 hrs, Volume= 1.119 af, Depth= 1.29"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 40.89 cfs @ 12.05 hrs, Volume= 2.529 af, Depth= 1.58"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 5.24 cfs @ 11.97 hrs, Volume= 0.247 af, Depth= 1.74"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 15.32 cfs @ 12.08 hrs, Volume= 1.012 af, Depth= 2.77"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 76.35 cfs @ 11.96 hrs, Volume= 3.588 af, Depth= 3.43"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 32.30 cfs @ 12.00 hrs, Volume= 1.665 af, Depth= 1.51"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 17.46 cfs @ 11.96 hrs, Volume= 0.807 af, Depth= 2.58"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 15.84 cfs @ 11.98 hrs, Volume= 0.938 af, Depth= 5.48"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 year Rainfall=5.72"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 1.29" for 25 year event
Inflow = 19.48 cfs @ 12.02 hrs, Volume= 1.119 af
Primary = 19.48 cfs @ 12.02 hrs, Volume= 1.119 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 1.74" for 25 year event
Inflow = 5.24 cfs @ 11.97 hrs, Volume= 0.247 af
Primary = 5.24 cfs @ 11.97 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 1.64" for 25 year event
Inflow = 42.09 cfs @ 12.05 hrs, Volume= 7.531 af
Primary = 42.09 cfs @ 12.05 hrs, Volume= 7.531 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 27.60 cfs @ 12.01 hrs, Volume= 1.524 af, Depth= 1.75"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 55.62 cfs @ 12.05 hrs, Volume= 3.355 af, Depth= 2.10"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 6.96 cfs @ 11.96 hrs, Volume= 0.324 af, Depth= 2.28"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 19.08 cfs @ 12.08 hrs, Volume= 1.259 af, Depth= 3.44"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 91.95 cfs @ 11.95 hrs, Volume= 4.357 af, Depth= 4.17"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 44.02 cfs @ 11.99 hrs, Volume= 2.221 af, Depth= 2.01"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 21.84 cfs @ 11.96 hrs, Volume= 1.012 af, Depth= 3.24"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 18.12 cfs @ 11.98 hrs, Volume= 1.078 af, Depth= 6.30"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 year Rainfall=6.54"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 1.75" for 50 year event
Inflow = 27.60 cfs @ 12.01 hrs, Volume= 1.524 af
Primary = 27.60 cfs @ 12.01 hrs, Volume= 1.524 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 2.28" for 50 year event
Inflow = 6.96 cfs @ 11.96 hrs, Volume= 0.324 af
Primary = 6.96 cfs @ 11.96 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 2.21" for 50 year event
Inflow = 56.94 cfs @ 12.06 hrs, Volume= 10.158 af
Primary = 56.94 cfs @ 12.06 hrs, Volume= 10.158 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 2S: Post-Dev BYPASS POI#1-B

Runoff = 37.02 cfs @ 12.01 hrs, Volume= 1.997 af, Depth= 2.30"
Routed to Link 6L : COMBINED to POI#1-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	359,323	55	woods
*	13,309	58	meadow
*	29,879	30	woods
*	1,490	30	meadow
*	414	61	open space
*	46,456	58	open space (meadow)
*	3,864	98	impervious
	454,735	54	Weighted Average
	450,871		99.15% Pervious Area
	3,864		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8					**Direct Entry, Post-Dev BYPASS POI#1-B (PERV.)**

Summary for Subcatchment 3S: Post-Dev BYPASS POI#1-A

Runoff = 72.49 cfs @ 12.05 hrs, Volume= 4.307 af, Depth= 2.70"
Routed to Link 30L : Overall to POI#1-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	568,336	55	woods
*	52,126	58	meadow
*	55,254	74	woods
*	28,257	75	meadow
*	39,191	55	offsite woods
*	47,461	58	open space (meadow)
*	18,270	98	impervious
*	25,313	61	open space
	834,208	58	Weighted Average
	815,938		97.81% Pervious Area
	18,270		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9					**Direct Entry, Post-Dev BYPASS POI#1-A (IMP.)**

Summary for Subcatchment 7S: Post-Dev POI#2 (PERV.)

Runoff = 8.91 cfs @ 11.96 hrs, Volume= 0.412 af, Depth= 2.90"
Routed to Link 7L : COMBINED to POI#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	64,161	60	woods
*	764	58	meadow
*	5,150	61	open space
*	4,148	58	open space (meadow)
	74,223	60	Weighted Average
	74,223		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Post-Dev POI#2 (PERV.)**

Summary for Subcatchment 10S: DA to Basin #1

Runoff = 23.21 cfs @ 12.08 hrs, Volume= 1.533 af, Depth= 4.19"
Routed to Pond 12P : Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	61,043	61	open space
*	20,297	98	impervious
*	40,618	61	open space (lots)
*	39,156	98	impervious
*	12,743	55	off-site woods
*	17,431	58	open space (meadow)
	191,288	72	Weighted Average
	131,835		68.92% Pervious Area
	59,453		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5					**Direct Entry, DA to Basin #1 (PERV.)**

Summary for Subcatchment 18S: DA to Basin #2

Runoff = 108.79 cfs @ 11.95 hrs, Volume= 5.198 af, Depth= 4.97"
Routed to Pond 20P : Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	77,809	61	open space
*	106,247	98	impervious
*	184,751	61	open space (lots)
*	168,312	98	impervious
*	9,595	55	on-site woods
	546,714	79	Weighted Average
	272,155		49.78% Pervious Area
	274,559		50.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #2 (PERV.)**

Summary for Subcatchment 24S: DA to Basin #3A (perv.)

Runoff = 57.45 cfs @ 11.99 hrs, Volume= 2.866 af, Depth= 2.60"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	112,116	58	open space (meadow)
*	122,399	61	open space
*	26,441	61	open space (lots)
*	246,848	55	on-site woods
*	68,972	58	on-site meadow
	576,776	57	Weighted Average
	576,776		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Subcatchment 28S: DA to Basin #3B

Runoff = 26.66 cfs @ 11.96 hrs, Volume= 1.240 af, Depth= 3.97"
Routed to Pond 29P : Basin #3B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	80,949	61	open space (lots)
*	27,782	98	impervious
*	16,641	61	open space
*	13,615	98	impervious
*	19,770	55	woods
*	4,494	58	meadow
	163,251	70	Weighted Average
	121,854		74.64% Pervious Area
	41,397		25.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DA to Basin #3 (lower)**

Summary for Subcatchment 33S: DA to Basin #3A (imp.)

Runoff = 20.58 cfs @ 11.98 hrs, Volume= 1.228 af, Depth= 7.18"
Routed to Pond 25P : Basin #3A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.42"

	Area (sf)	CN	Description
*	89,395	98	impervious
	89,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2					**Direct Entry, DA to Basin #3 (upper)**

Summary for Link 6L: COMBINED to POI#1-B

Inflow Area = 10.439 ac, 0.85% Impervious, Inflow Depth = 2.30" for 100 year event
Inflow = 37.02 cfs @ 12.01 hrs, Volume= 1.997 af
Primary = 37.02 cfs @ 12.01 hrs, Volume= 1.997 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 7L: COMBINED to POI#2

Inflow Area = 1.704 ac, 0.00% Impervious, Inflow Depth = 2.90" for 100 year event
Inflow = 8.91 cfs @ 11.96 hrs, Volume= 0.412 af
Primary = 8.91 cfs @ 11.96 hrs, Volume= 0.412 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

Summary for Link 30L: Overall to POI#1-A

Inflow Area = 55.134 ac, 20.11% Impervious, Inflow Depth > 2.85" for 100 year event
Inflow = 96.86 cfs @ 12.07 hrs, Volume= 13.107 af
Primary = 96.86 cfs @ 12.07 hrs, Volume= 13.107 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs

SECTION 4
Basin Design/Infiltration Calculations

Summary for Pond 12P: Basin #1

Inflow Area = 4.391 ac, 31.08% Impervious, Inflow Depth = 0.95" for 2 year event
Inflow = 4.99 cfs @ 12.09 hrs, Volume= 0.349 af
Outflow = 0.77 cfs @ 11.95 hrs, Volume= 0.349 af, Atten= 85%, Lag= 0.0 min
Primary = 0.77 cfs @ 11.95 hrs, Volume= 0.349 af
Routed to Link 30L : Overall to POI#1-A

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 672.57' @ 12.67 hrs Surf.Area= 9,200 sf Storage= 4,939 cf

Plug-Flow detention time= 50.2 min calculated for 0.349 af (100% of inflow)
Center-of-Mass det. time= 50.2 min (923.7 - 873.4)

Volume	Invert	Avail.Storage	Storage Description
#1	672.00'	48,070 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 50,600 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
672.00	9,200	0	0
673.00	9,200	9,200	9,200
674.00	9,200	9,200	18,400
675.00	9,200	9,200	27,600
676.00	9,200	9,200	36,800
677.00	9,200	9,200	46,000
677.50	9,200	4,600	50,600

Device	Routing	Invert	Outlet Devices
#1	Primary	672.00'	**3.600 in/hr Exfiltration over Horizontal area**

Primary OutFlow Max=0.77 cfs @ 11.95 hrs HW=672.07' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.77 cfs)

Summary for Pond 20P: Basin #2

Inflow Area = 12.551 ac, 50.22% Impervious, Inflow Depth = 1.37" for 2 year event
Inflow = 30.92 cfs @ 11.96 hrs, Volume= 1.430 af
Outflow = 0.50 cfs @ 11.65 hrs, Volume= 1.430 af, Atten= 98%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 25P : Basin #3A
Secondary = 0.50 cfs @ 11.65 hrs, Volume= 1.430 af
Routed to Link 32L : Basin #2 Infiltration

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 614.39' @ 18.62 hrs Surf.Area= 18,958 sf Storage= 41,142 cf

Plug-Flow detention time= 864.6 min calculated for 1.429 af (100% of inflow)
Center-of-Mass det. time= 864.9 min (1,706.0 - 841.1)

Volume	Invert	Avail.Storage	Storage Description
#1	612.00'	234,576 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) x 0.95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
612.00	16,378	641.0	0	0	16,378
614.00	19,371	678.0	35,707	35,707	20,479
616.00	22,493	712.0	41,825	77,532	24,489
618.00	25,974	760.0	48,425	125,958	30,301
620.00	30,078	854.0	56,002	181,959	42,482
622.00	34,945	974.0	64,962	246,922	60,033

Device	Routing	Invert	Outlet Devices
#1	Primary	612.00'	**18.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 612.00' / 611.50' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.75'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	617.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	612.00'	**0.50 cfs Exfiltration at all elevations**

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=612.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.50 cfs @ 11.65 hrs HW=612.12' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.50 cfs)

Summary for Pond 25P: Basin #3A

Inflow Area = 27.844 ac, 30.01% Impervious, Inflow Depth = 0.38" for 2 year event
Inflow = 12.71 cfs @ 12.00 hrs, Volume= 0.871 af
Outflow = 0.24 cfs @ 23.19 hrs, Volume= 0.645 af, Atten= 98%, Lag= 671.3 min
Primary = 0.24 cfs @ 23.19 hrs, Volume= 0.645 af
Routed to Pond 29P : Basin #3B

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 495.83' @ 23.19 hrs Surf.Area= 17,907 sf Storage= 28,313 cf

Plug-Flow detention time= 1,481.2 min calculated for 0.645 af (74% of inflow)
Center-of-Mass det. time= 1,368.3 min (2,197.5 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	491.00'	167,995 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) x 0.95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
491.00	17,311	584.0	0.0	0	0	17,311
493.00	17,311	584.0	15.0	5,193	5,193	18,479
495.00	17,311	584.0	30.0	10,387	15,580	19,647
496.00	19,176	610.0	95.0	17,324	32,904	22,189
498.00	23,140	662.0	95.0	40,141	73,045	27,604
500.00	27,270	703.0	95.0	47,836	120,881	32,262
502.00	31,686	746.0	95.0	55,956	176,837	37,427

Device	Routing	Invert	Outlet Devices
#1	Device 2	493.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	493.00'	**18.0" Round Culvert** L= 300.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 493.00' / 463.00' S= 0.1000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	495.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	497.20'	**24.0" x 45.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.24 cfs @ 23.19 hrs HW=495.83' (Free Discharge)
└**2=Culvert** (Passes 0.24 cfs of 12.27 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 8.04 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.20 cfs @ 4.04 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 29P: Basin #3B

[79] Warning: Submerged Pond 25P Primary device # 2 OUTLET by 2.09'

Inflow Area = 31.592 ac, 29.46% Impervious, Inflow Depth > 0.35" for 2 year event
Inflow = 5.56 cfs @ 11.97 hrs, Volume= 0.911 af
Outflow = 0.33 cfs @ 20.07 hrs, Volume= 0.904 af, Atten= 94%, Lag= 486.1 min
Primary = 0.33 cfs @ 20.07 hrs, Volume= 0.904 af
Routed to Link 30L : Overall to POI#1-A

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 465.09' @ 20.07 hrs Surf.Area= 4,508 sf Storage= 7,179 cf

Plug-Flow detention time= 273.1 min calculated for 0.904 af (99% of inflow)
Center-of-Mass det. time= 243.5 min (2,053.6 - 1,810.1)

Volume	Invert	Avail.Storage	Storage Description
#1	463.00'	44,985 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) x 0.95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
463.00	2,590	243.0	0	0	2,590
464.00	3,543	290.0	3,054	3,054	4,601
466.00	5,883	386.0	9,328	12,382	9,810
468.00	8,732	476.0	14,522	26,903	16,043
470.00	11,794	523.0	20,449	47,353	19,911

Device	Routing	Invert	Outlet Devices
#1	Primary	463.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 463.00' / 462.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	463.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	467.35'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.33 cfs @ 20.07 hrs HW=465.09' (Free Discharge)
└**1=Culvert** (Passes 0.33 cfs of 15.80 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 6.75 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Basin #1

Inflow Area = 4.391 ac, 31.08% Impervious, Inflow Depth = 4.19" for 100 year event
Inflow = 23.21 cfs @ 12.08 hrs, Volume= 1.533 af
Outflow = 0.77 cfs @ 11.30 hrs, Volume= 1.533 af, Atten= 97%, Lag= 0.0 min
Primary = 0.77 cfs @ 11.30 hrs, Volume= 1.533 af
Routed to Link 30L : Overall to POI#1-A

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 676.40' @ 15.52 hrs Surf.Area= 9,200 sf Storage= 38,444 cf

Plug-Flow detention time= 512.7 min calculated for 1.533 af (100% of inflow)
Center-of-Mass det. time= 512.6 min (1,342.2 - 829.5)

Volume	Invert	Avail.Storage	Storage Description
#1	672.00'	48,070 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 50,600 cf Overall x 95.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
672.00	9,200	0	0
673.00	9,200	9,200	9,200
674.00	9,200	9,200	18,400
675.00	9,200	9,200	27,600
676.00	9,200	9,200	36,800
677.00	9,200	9,200	46,000
677.50	9,200	4,600	50,600

Device	Routing	Invert	Outlet Devices
#1	Primary	672.00'	**3.600 in/hr Exfiltration over Horizontal area**

Primary OutFlow Max=0.77 cfs @ 11.30 hrs HW=672.06' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.77 cfs)

Summary for Pond 20P: Basin #2

Inflow Area = 12.551 ac, 50.22% Impervious, Inflow Depth = 4.97" for 100 year event
Inflow = 108.79 cfs @ 11.95 hrs, Volume= 5.198 af
Outflow = 2.16 cfs @ 15.74 hrs, Volume= 5.198 af, Atten= 98%, Lag= 227.0 min
Primary = 1.66 cfs @ 15.74 hrs, Volume= 2.271 af
Routed to Pond 25P : Basin #3A
Secondary = 0.50 cfs @ 8.85 hrs, Volume= 2.928 af
Routed to Link 32L : Basin #2 Infiltration

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 619.26' @ 15.74 hrs Surf.Area= 27,092 sf Storage= 152,182 cf

Plug-Flow detention time= 1,254.7 min calculated for 5.198 af (100% of inflow)
Center-of-Mass det. time= 1,254.4 min (2,058.5 - 804.1)

Volume	Invert	Avail.Storage	Storage Description
#1	612.00'	234,576 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) x 0.95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
612.00	16,378	641.0	0	0	16,378
614.00	19,371	678.0	35,707	35,707	20,479
616.00	22,493	712.0	41,825	77,532	24,489
618.00	25,974	760.0	48,425	125,958	30,301
620.00	30,078	854.0	56,002	181,959	42,482
622.00	34,945	974.0	64,962	246,922	60,033

Device	Routing	Invert	Outlet Devices
#1	Primary	612.00'	**18.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 612.00' / 611.50' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	614.75'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	617.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	612.00'	**0.50 cfs Exfiltration at all elevations**

Primary OutFlow Max=1.66 cfs @ 15.74 hrs HW=619.26' (Free Discharge)
└**1=Culvert** (Passes 1.66 cfs of 19.44 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.49 cfs @ 10.08 fps)
  └**3=Orifice/Grate** (Orifice Controls 1.16 cfs @ 5.91 fps)

Secondary OutFlow Max=0.50 cfs @ 8.85 hrs HW=612.10' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.50 cfs)

Summary for Pond 25P: Basin #3A

Inflow Area = 27.844 ac, 30.01% Impervious, Inflow Depth = 2.74" for 100 year event
Inflow = 78.18 cfs @ 11.99 hrs, Volume= 6.364 af
Outflow = 18.26 cfs @ 12.18 hrs, Volume= 6.035 af, Atten= 77%, Lag= 11.4 min
Primary = 18.26 cfs @ 12.18 hrs, Volume= 6.035 af
Routed to Pond 29P : Basin #3B

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 498.35' @ 12.18 hrs Surf.Area= 22,654 sf Storage= 76,896 cf

Plug-Flow detention time= 547.1 min calculated for 6.032 af (95% of inflow)
Center-of-Mass det. time= 474.1 min (1,493.2 - 1,019.1)

Volume	Invert	Avail.Storage	Storage Description
#1	491.00'	167,995 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) x 0.95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
491.00	17,311	584.0	0.0	0	0	17,311
493.00	17,311	584.0	15.0	5,193	5,193	18,479
495.00	17,311	584.0	30.0	10,387	15,580	19,647
496.00	19,176	610.0	95.0	17,324	32,904	22,189
498.00	23,140	662.0	95.0	40,141	73,045	27,604
500.00	27,270	703.0	95.0	47,836	120,881	32,262
502.00	31,686	746.0	95.0	55,956	176,837	37,427

Device	Routing	Invert	Outlet Devices
#1	Device 2	493.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	493.00'	**18.0" Round Culvert** L= 300.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 493.00' / 463.00' S= 0.1000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	495.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	497.20'	**24.0" x 45.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.25 cfs @ 12.18 hrs HW=498.35' (Free Discharge)
└**2=Culvert** (Inlet Controls 18.25 cfs @ 10.33 fps)
  ├**1=Orifice/Grate** (Passes < 0.06 cfs potential flow)
  ├**3=Orifice/Grate** (Passes < 0.42 cfs potential flow)
  └**4=Orifice/Grate** (Passes < 39.16 cfs potential flow)

Summary for Pond 29P: Basin #3B

[79] Warning: Submerged Pond 25P Primary device # 2 OUTLET by 4.97'

Inflow Area = 31.592 ac, 29.46% Impervious, Inflow Depth > 2.76" for 100 year event
Inflow = 31.51 cfs @ 12.02 hrs, Volume= 7.275 af
Outflow = 26.30 cfs @ 12.11 hrs, Volume= 7.266 af, Atten= 17%, Lag= 5.5 min
Primary = 26.30 cfs @ 12.11 hrs, Volume= 7.266 af
Routed to Link 30L : Overall to POI#1-A

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 467.97' @ 12.11 hrs Surf.Area= 8,257 sf Storage= 25,342 cf

Plug-Flow detention time= 192.7 min calculated for 7.263 af (100% of inflow)
Center-of-Mass det. time= 187.6 min (1,566.8 - 1,379.2)

Volume	Invert	Avail.Storage	Storage Description
#1	463.00'	44,985 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) x 0.95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
463.00	2,590	243.0	0	0	2,590
464.00	3,543	290.0	3,054	3,054	4,601
466.00	5,883	386.0	9,328	12,382	9,810
468.00	8,732	476.0	14,522	26,903	16,043
470.00	11,794	523.0	20,449	47,353	19,911

Device	Routing	Invert	Outlet Devices
#1	Primary	463.00'	**24.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 463.00' / 462.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	463.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	467.35'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=25.89 cfs @ 12.11 hrs HW=467.97' (Free Discharge)
└**1=Culvert** (Passes 25.89 cfs of 30.13 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.52 cfs @ 10.60 fps)
  └**3=Orifice/Grate** (Weir Controls 25.37 cfs @ 2.57 fps)

MRC Design Standard Summary

Design Standard No. 1
The proposed MRC basin has been designed so that the runoff from the 1.2-inch/2-hour storm from the contributing watershed is captured and managed, without overflow.

Offsetting is not utilized in the design of the MRC basins.

The volume calculations for the MRC basins are based on the square footage of each land cover. In the HydroCAD Stormwater Management Modeling software, the drainage areas contributing to the MRC basins are broken up into pervious and impervious drainage areas. That will prevent the error that can be associated with composite curve numbers.

MRC BMP No.	1.2-inch / 2-year Max. WSEL	Elev. Of 1st Stage Opening on Basin Outlet Structure	All Runoff Contained?
#3A	493.48'	495.00'	Y

Design Standard No. 2
The stormwater release rate for the MRC Basins does not exceed 0.01 cfs from the equivalent impervious area during the 1.2-inch/2-hour storm. To calculate the equivalent impervious area being managed by the MRC BMP, the total contributing volume was divided by 0.0833 feet. Individual land covers have been used to determine the runoff volume rather than a composite CN. The HydroCAD computer software was used to calculate the proposed peak flows.

Calculations for the allowable MRC peak flows are provided on the following sheets.

Design Standard No. 3
The MRC basins have been designed so that there is at least one foot of IWS below the lowest structural outlet (i.e. the outlet for the underdrain). The overall soil media depth is no deeper than 4 feet. A 30% void space is used for the soil media above the IWS. A 15% void space ratio is used for the IWS, which is half of the 30% void space. The elevation-area-storage table for each MRC BMP with applicable void ratios assigned can be found earlier in this section of the report.

All proposed MRC basins are vegetated. Although liners are not recommended for MRC installations, geological conditions at the site necessitate their use. Specifically, the depth to season high water table is a limiting factor.

MRC BMP No.	Bottom of Media Elevation	Top of Media Elevation	Overall Media Depth (ft)	MRC Orifice Elevation	Media Above Orifice (ft)	IWS Depth (ft)	Liner Used?
			(4' Max.)		(1' Min.)	(1' - 2')	
#3A	491.00	495.00	4.00	493.00	2.00	2.00	N

Design Standard No. 4
The peak flow from the post-construction 2-year/24-hour storm should be managed back to the pre-construction 1-year 24-hour storm peak flow. Since the Upper Uwchlan Township Stormwater Management Ordinance requires the reduction of the post-development two-year storm runoff rate to the pre-development runoff one-year runoff condition, the MRC peak rate requirements have been met. Calculations for the allowable 2-year basin outflows are provided on the following sheets.

This basin will assist in the control of peak flows for all storm events up to the 100-year. An increased inspection and maintenance schedule has been included on the PCSM O&M Plan that calls for inspection and repair after all storm events greater than the 10-yr/24-hour storm event.

Design Standard No 5.
These BMPs have been designed by or under the direction of a professional engineer. The MRC basins are incorporated into dry extended detention basins (BMP 6.6.3 in the BMP Manual.)

Design Standard No. 6
The proposed MRC basin will be vegetated. Native vegetation has been selected by the licensed professional engineer in consultation with a registered landscape architect. Vegetation is provided for more than 75% of the surface of the MRC BMP.
The MRC basins have been designed so that there is at least one foot of IWS below the lowest structural outlet (i.e. the outlet for the underdrain). The overall soil media depth is no deeper than 4 feet. A 30% void space is used for the soil media above the IWS. A 15% void space ratio is used for the IWS, which is half of the 30% void space.

Design Standard No. 7
At a minimum one infiltration test for every 40,000 square feet of disturbed acreage should be performed with a minimum of four tests, equally distributed across a site. The disturbed area is about 30.5 acres; so, a minimum of 34 tests should be performed. Geo-Technology Associates, Inc. (GTA) performed 31 test pits. Infiltration tests were not performed at all locations due to limiting factors, such as bedrock or seasonal high water table. The site topography and limiting soil conditions factored into the decision to propose a MRC basin in addition to the infiltration basins (Basin #1-2) where testing supports an infiltration BMP. Additional testing will be required to meet the 34 test minimum.

The soil reports from each company can be found in Section 8 of this report.

Design Standard No. 8
The required separation between the seasonal high-water table and the bottom of the MRC basins has been met. Therefore, liners are not proposed for this MRC system

Design Standard No. 9
Storms larger than the 2-year storm are controlled by the MRC basin, which utilizes an outlet structure with additional openings to manage those peak flows. Maximum ponding depth and drainage time standards have been met for this MRC basin. 2-year storms do not have a water surface elevation more than 2 feet above the top of media, and the maximum depth of the 100-year storm is 4.0 feet or less. The maximum ponding time for the 100-year storm is less than 72

hours as required. The peak water surface elevations can be found on the basin summaries at the beginning of this report section.

MRC BMP No.	Top of Media Elev.	Max. 2-year WSEL	Ponding Depth During 2-year Storm (Shall Not Exceed 2')	Max. 100-Year WSEL	Ponding Depth During 100-Year Storm (Shall Not Exceed 4')	Time When WSEL recedes to the top of media during 100-year storm (Shall Not Exceed 96 Hours)
#3A	495.00	495.83	0.83	498.35	3.35	96.00

Design Standard No. 10

This standard is met. An MRC Basin Underdrain & Media Detail provides a breakdown of 50% sand, 25% compost and 25% native soil for the systems. The minimum depths of media are met per items covered in previous standards.

Design Standard No. 11

The underdrains have been designed with capacities of about 0.35 cfs. Those capacities exceed the MRC release rates for the basins; so, the underdrain will not further constrict the flow. The design flows are also greater than the required 1.34 cubic feet per minute. The underdrain is placed at the bottom of the media because each MRC Basin is proposed to be vegetated. The underdrains, which include cleanouts for maintenance, do not have angles greater than 45 degrees. A stone envelope is proposed around the underdrains as required.

Design Standard No. 12

The MRC Basins discharge from the outlet structure through an RCP pipe to a riprap apron, rather than a level spreader. Downstream analyses have been provided in Section 7 of this report with the appropriate calculations.

Design Standard No. 13

This receiving waters for the MRC basins are all classified as TSF-MF. They do drain to a special protection watershed.

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

MANAGED RELEASE CONCEPT (MRC) DESIGN SUMMARY

Complete One Design Summary Sheet for Each BMP Designed for MRC

GENERAL INFORMATION

Applicant Name:	**Toll Mid-Atlantic LP Co., Inc.**	Project Name:	**Greenridge Road**
Applicant Address:	**1140 Virginia Drive**	Municipality:	**Upper Uwchlan Township**
City, State, Zip:	**Fort Washington, PA 19034**	County:	**Chester**

Permit Type: ☒ NPDES PAG-02 ☐ NPDES IP ☐ ESCGP ☐ ESP

	Pre-Development	Post-Development	Change
Impervious Area (acres):	1.61	11.28	+9.67

MRC BMP INFORMATION

MRC BMP Type: **Dry Extended Detention Basin** Stormwater BMP Manual Section: **6.6.3**

Will the BMP Include Vegetation? ☒ Yes ☐ No

If Yes, Identify Proposed Vegetation: **See PCSM Plans**

For Non-Vegetated BMPs Will There Be Pre- or Post-Treatment? ☐ Yes (Pre-) ☐ Yes (Post-) ☐ No

If Yes, Identify Proposed Pre- or Post-Treatment:

Name of Surface Water to Receive MRC BMP Discharges: **Tributary to Black Horse Creek**

Designated Use of Surface Water: **TSF-MF** Existing Use of Surface Water (if different):

Is the Surface Water Impaired? ☒ Yes ☐ No

If Yes, Identify Cause(s): **Source Unknown - Pathogens**

Will the BMP have an impermeable liner? ☐ Yes ☒ No

If Yes, explain why a liner is proposed:

BMP Media Description: **40% Sand (ASTMC-33 Sharp Sand), 25% Compost (STA Certified) & 25% Native Topsoil**

Are Any Deviations from MRC Design Standards Proposed? ☐ Yes ☒ No

If Yes, Identify Deviations:

MRC BMP DESIGN VALUES AND STANDARDS

Parameter	Design Value	Design Standard
Actual Contributing Impervious Area to BMP (acres)	**2.05**	
Equivalent Contributing Impervious Area to BMP (acres)	**2.02**	
Total Drainage Area to BMP (acres)	**15.29**	
MRC BMP Release Rate (cfs)	**0.02**	*No greater than 0.01 cfs / acre of equivalent contributing impervious*
Underdrain Outflow Rate During 1.2-Inch/2-Hour Storm (cfs)	**0.02**	*<= MRC BMP Release Rate (cfs)*
Maximum Storm Event Routed to MRC BMP	**100-year**	

MRC BMP Design Summary
Revised, August 25, 2020

Parameter	Design Value	Design Standard
BMP Footprint Area (ft^2)	**31,686**	
Bottom BMP Elevation (Native Soils) (ft)	**491.00**	
2-Yr/24-Hr Storm Ponding Depth (ft)	**0.83**	*1 ft (recommended) (2 ft max)*
Maximum Ponding Depth (ft)	**3.35**	*4 ft (max)*
Overflow Bypass Elevation (ft)	**500.00**	
Media Depth (ft)	**4**	*2 ft (min) – 4 ft (max)*
Media Void Space (%)	**30%**	
Internal Water Storage (IWS) Depth (ft)	**2**	*1 ft recommended*
Top of IWS Elevation (ft)	**493.00**	
Underdrain Pipe Diameter (in)	**4**	
Underdrain Orifice Diameter (in)	**1.0**	
Underdrain Outlet Elevation (ft)	**493.00**	
IWS Available for Routing (%)	**50%**	*50% max*
Separation Distance (Groundwater) (ft)	**>2**	*1 ft (min) (2 ft recommended)*
Infiltration Rate (in/hr)	**NA**	
Volume of Overflow During 1.2-Inch/2-Hour Storm (cf)	**0**	*0 (No overflow allowed)*
1-Yr/24-Hr **Pre**-Development Peak Rate (cfs)	**NA**[1]	
2-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**NA**[1]	*1-Yr/24-Hr Pre-Development Peak Rate (or per approved Act 167 Plan)*
10-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**NA**[1]	*10-Yr/24-Hr Pre-Development Peak Rate*
50-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**NA**[1]	*50-Yr/24-Hr Pre-Development Peak Rate*
100-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**NA**[1]	*100-Yr/24-Hr Pre-Development Peak Rate*
Total 2-Yr/24-Hr Runoff Volume Managed by BMP (cf)	**38,868**	
Ponding Time @ 2-Yr/24-Hr Storm (hrs)	**24.25**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 10-Yr/24-Hr Storm (hrs)	**36.85**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 50-Yr/24-Hr Storm (hrs)	**48.70**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 100-Yr/24-Hr Storm (hrs)	**51.30**	*72 hrs (surface), 7 days (underground)*

[1].Design Rates meet Twp. Requirements (See PCSM report)

John H. Baionno, PE
Licensed P.E. Name

Licensed P.E. Signature

PE-050278-E
License No.

3/31/23
Date

Job Number & Name: 8145- Greenridge Road Sheet No. _____ of _____

By: KLP Date: 4/4/2023 Checked By: MRZ Date: _____ Description: _____

- Basin Drainage times:

↳ Basin #1 storage volume (100yr) = 38,444 CF
Infiltration Rate = 3.6 in/hr or 0.30 ft/hr
Basin Area / Infiltration Area = 9,200 SF

Drain time = 38,444 CF · $\frac{1}{9200 SF}$ · $\frac{1}{0.3 ft/hr}$ = **13.9 hours**

↳ Basin #2 storage volume (100yr) = 152,182 CF
Infiltration rate = 3.4 in/hr or 0.28 ft/hr
Basin Area / Infiltration Area = 6,374 SF

Drain time = 152,182 CF · $\frac{1}{6374 SF}$ · $\frac{1}{0.28 ft/hr}$ = **84.4 hours**

↳ Basin #3A see "MRC Design Standard Summary"

↳ Basin #3B Detention Basin, no infiltration.

Hydrograph for Pond 20P: Basin #2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	612.00	0.00	0.00	0.00
2.50	0.00	0	612.00	0.00	0.00	0.00
5.00	0.00	0	612.00	0.00	0.00	0.00
7.50	0.34	613	612.04	0.20	0.00	**0.20**
10.00	**1.48**	4,052	612.26	0.50	0.00	**0.50**
12.50	**8.60**	132,822	618.52	1.78	1.28	0.50
15.00	2.58	**151,606**	**619.24**	**2.15**	**1.65**	0.50
17.50	1.66	**150,366**	**619.19**	**2.13**	**1.63**	0.50
20.00	1.14	144,260	618.96	2.02	1.52	0.50
22.50	1.02	136,421	618.66	1.86	1.36	0.50
25.00	0.00	126,145	618.26	1.61	1.11	0.50
27.50	0.00	113,863	617.76	1.09	0.59	0.50
30.00	0.00	105,432	617.41	0.88	0.38	0.50
32.50	0.00	97,658	617.08	0.85	0.35	0.50
35.00	0.00	90,121	616.75	0.82	0.32	0.50
37.50	0.00	82,840	616.42	0.79	0.29	0.50
40.00	0.00	75,837	616.10	0.76	0.26	0.50
42.50	0.00	69,140	615.79	0.73	0.23	0.50
45.00	0.00	62,791	615.48	0.68	0.18	0.50
47.50	0.00	56,857	615.19	0.63	0.13	0.50
50.00	0.00	51,491	614.92	0.55	0.05	0.50
52.50	0.00	46,866	614.68	0.50	0.00	0.50
55.00	0.00	42,366	614.45	0.50	0.00	0.50
57.50	0.00	37,866	614.21	0.50	0.00	0.50
60.00	0.00	33,366	613.97	0.50	0.00	0.50
62.50	0.00	28,866	613.72	0.50	0.00	0.50
65.00	0.00	24,366	613.47	0.50	0.00	0.50
67.50	0.00	19,866	613.21	0.50	0.00	0.50
70.00	0.00	15,366	612.95	0.50	0.00	0.50
72.50	0.00	10,866	612.68	0.50	0.00	0.50
75.00	0.00	6,366	612.40	0.50	0.00	0.50
77.50	0.00	1,866	612.12	0.50	0.00	0.50
80.00	0.00	107	612.01	0.03	0.00	0.03
82.50	0.00	6	612.00	0.00	0.00	0.00
85.00	0.00	0	612.00	0.00	0.00	0.00
87.50	0.00	0	612.00	0.00	0.00	0.00
90.00	0.00	0	612.00	0.00	0.00	0.00
92.50	0.00	0	612.00	0.00	0.00	0.00
95.00	0.00	0	612.00	0.00	0.00	0.00
97.50	0.00	0	612.00	0.00	0.00	0.00
100.00	0.00	0	612.00	0.00	0.00	0.00

Greenridge Road
Upper Uwchlan Township
Chester County, PA

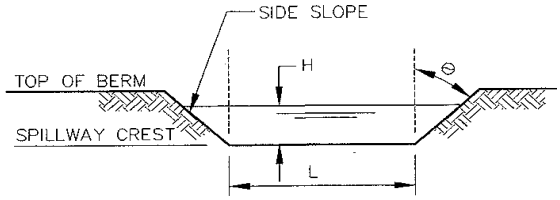
Prepared By: KLP
Date: 03/14/23
Revised By:
Last Revised:

EMERGENCY SPILLWAY CALCULATION

Formula:
$Q = 2.7\ LH^{3/2} + 2.5\ H^{5/2}\ (Tan\theta)$

Inflow Q_{100}: 108.79 c.f.s.

Basin Identification: Basin 2



Water Surface Elevation (Ft.)	Discharge Q (CFS)
620.00	0.0
620.10	5.1
620.20	14.5
620.30	26.5
620.40	40.8
620.50	56.9
620.60	74.7
620.70	94.0
620.80	114.7
620.90	136.7
621.00	159.9
621.10	184.3
621.20	209.7
621.30	236.1
621.40	263.6
621.50	291.9
621.60	321.2
621.70	351.3
621.80	382.2
621.90	414.0
622.00	446.5

Inflow Q_{100}:	108.79
Top of Berm Elevation:	622.00
Spillway Crest Elevation:	620.00
Spillway Bottom Width (L):	60.0
Spillway Side Slope Run:	3.00
Spillway Side Slope Rise:	1.00
Side Angle (θ):	71.57
Velocity (fps):	2.31

100 Year Water Surface Elevation:	**620.77**
Freeboard to Top of Berm (Ft.):	**1.23**

NOTE:
The formula used is a combination of Broad-Crested Weir flow (Q=CLH^3/2) and V-Notch weir flow (Q=CH^5/2tanθ). The 'C' values used in the formula are low and thus conservative.

Greenridge Road
Upper Uwchlan Township
Chester County, PA

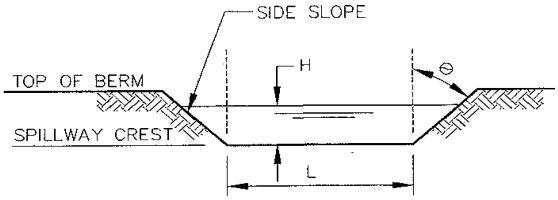
Prepared By: KLP
Date: 03/14/23
Revised By:
Last Revised:

EMERGENCY SPILLWAY CALCULATION

Formula:
$Q = 2.7\ LH^{3/2} + 2.5\ H^{5/2}\ (Tan\theta)$

Inflow Q_{100}: 78.18 c.f.s.

Basin Identification: Basin 3A



Water Surface Elevation (Ft.)	Discharge Q (CFS)
500.00	0.0
500.10	3.1
500.20	8.7
500.30	15.9
500.40	24.4
500.50	34.0
500.60	44.6
500.70	56.1
500.80	68.4
500.90	81.4
501.00	95.1
501.10	109.5
501.20	124.5
501.30	140.1
501.40	156.2
501.50	172.9
501.60	190.0
501.70	207.6
501.80	225.7
501.90	244.3
502.00	263.2

Inflow Q_{100}:	78.18
Top of Berm Elevation:	502.00
Spillway Crest Elevation:	500.00
Spillway Bottom Width (L):	36.0
Spillway Side Slope Run:	3.00
Spillway Side Slope Rise:	1.00
Side Angle (θ):	71.57
Velocity (fps):	2.39

100 Year Water Surface Elevation:	**500.88**
Freeboard to Top of Berm (Ft.):	**1.12**

NOTE:
The formula used is a combination of Broad-Crested Weir flow (Q=CLH^3/2) and V-Notch weir flow (Q=CH^5/2tanθ). The 'C' values used in the formula are low and thus conservative.

Greenridge Road
Upper Uwchlan Township
Chester County, PA

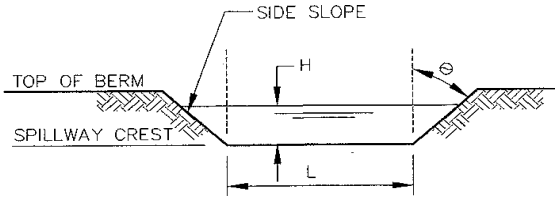
Prepared By: KLP
Date: 03/14/23
Revised By:
Last Revised:

EMERGENCY SPILLWAY CALCULATION

Formula:
$Q = 2.7\ LH^{3/2} + 2.5\ H^{5/2}\ (Tan\theta)$

Inflow Q_{100}: 31.51 c.f.s.

Basin Identification: Basin 3B



Water Surface Elevation (Ft.)	Discharge Q (CFS)
468.30	0.0
468.40	3.0
468.50	8.4
468.60	15.4
468.70	23.7
468.80	33.0
468.90	43.3
469.00	54.5
469.10	66.4
469.20	79.1
469.30	92.4
469.40	106.4
469.50	121.0
469.60	136.1
469.70	151.7
469.80	167.9
469.90	184.6
470.00	201.7

Inflow Q_{100}:	31.51
Top of Berm Elevation:	470.00
Spillway Crest Elevation:	468.30
Spillway Bottom Width (L):	35.0
Spillway Side Slope Run:	3.00
Spillway Side Slope Rise:	1.00
Side Angle (θ):	71.57
Velocity (fps):	1.82

100 Year Water Surface Elevation:	**468.78**
Freeboard to Top of Berm (Ft.):	**1.22**

NOTE:
The formula used is a combination of Broad-Crested Weir flow (Q=CLH^3/2) and V-Notch weir flow (Q=CH^5/2tanθ). The 'C' values used in the formula are low and thus conservative.

Job Number & Name: 8145- Greenridge Road Sheet No. ____ of ____

By: KLP Date: 3/24/2023 Checked By: MRZ Date: ____ Description: Level Spreader Calcs

Level Spreader Design

1) Permissable Velocity Below Level Spreader

Seed mix in stream buffer similar to

Grass Legume Mixture (E&S Manual - Table 6.4)

on 0-5% slopes the Permissable Velocity = 3.5 fps (most conservative)

2) Per Level Spreader Criteria in App. G of

E&S Manual

Design Velocity = $\frac{1}{3}$ Permissable Velocity = $\frac{1}{3} \times 3.5 = 1.1\bar{6}$

'H' over weir => $V = 1.5 \cdot Cw \cdot H^{1/2}$ $Cw = 3.0$

$$H = \left(\frac{1.16}{1.5 \times 3} \right)^2 = 0.066 \text{ ft}$$

3) Length of Level Spreader

$$L = \frac{Q}{Cw \times H^{3/2}}$$

$Q_{10} = 1.66$ cfs

$$L = \frac{1.66}{3 \times 0.066^{3/2}} = 32.63 \Rightarrow \boxed{33 \text{ LF}}$$

8149 - Greenridge Road - Preliminary Plan Submission

Lot Coverage Calculations

Date: 2/16/2023

Overall

Lot Number	Lot Area (SF)	Max Impervious Area (SF)*	Impervious Percentage (%)	Remaining Lawn Area (SF)
1	8,576	3,859	45	4,717
2	11,749	5,287	45	6,462
3	9,931	4,469	45	5,462
4	10,439	4,698	45	5,741
5	8,050	3,623	45	4,428
6	8,050	3,623	45	4,428
7	9,066	4,080	45	4,986
8	8,050	3,623	45	4,428
9	7,605	3,422	45	4,183
10	7,020	3,159	45	3,861
11	7,020	3,159	45	3,861
12	7,020	3,159	45	3,861
13	7,020	3,159	45	3,861
14	7,020	3,159	45	3,861
15	7,020	3,159	45	3,861
16	7,076	3,184	45	3,892
17	9,024	4,061	45	4,963
18	6,900	3,795	55	3,105
19	8,050	3,623	45	4,428
20	10,772	4,847	45	5,925
21	7,474	3,363	45	4,111
22	7,720	3,474	45	4,246
23	14,556	5,095	35	9,461
24	9,468	4,261	45	5,207
25	8,236	3,706	45	4,530
26	7,013	3,156	45	3,857
27	7,475	3,364	45	4,111
28	7,834	3,525	45	4,309
29	10,281	4,626	45	5,655
30	10,076	4,534	45	5,542
31	7,500	3,375	45	4,125
32	8,125	3,656	45	4,469
33	7,500	3,375	45	4,125
34	8,125	3,656	45	4,469
35	7,500	3,375	45	4,125
36	8,125	3,656	45	4,469
37	7,500	3,375	45	4,125
38	8,125	3,656	45	4,469
39	7,500	3,375	45	4,125

40	8,125	3,656	45	4,469
41	7,226	3,252	45	3,974
42	6,900	3,795	55	3,105
43	6,900	3,795	55	3,105
44	6,900	3,795	55	3,105
45	6,900	3,795	55	3,105
46	6,900	3,795	55	3,105
47	6,900	3,795	55	3,105
48	7,015	3,157	45	3,858
49	7,130	3,209	45	3,922
50	7,015	3,157	45	3,858
51	6,900	3,795	55	3,105
52	6,900	3,795	55	3,105
53	6,900	3,795	55	3,105
54	6,900	3,795	55	3,105
55	6,900	3,795	55	3,105
56	6,900	3,795	55	3,105
57	7,226	3,252	45	3,974
58	8,751	3,938	45	4,813
59	8,751	3,938	45	4,813
60	8,751	3,938	45	4,813
61	9,746	4,386	45	5,360
62	10,831	4,874	45	5,957
63	11,198	5,039	45	6,159
64	11,103	4,996	45	6,107

***Maximum impervious coverage**

Lots or parcels less than 7,000 SF in area: 55%

Lots or parcels greater than or equal to 7,000 SF and less than 12,000 SF in area: 45%

Lots or parcels greater than or equal to 12,000 SF and less than 20,000 SF in area: 35%

ESE CONSULTANTS

ENGINEERING · PLANNING · SURVEYING · ENVIRONMENTAL

Job Number & Name: 8145 - Greenridge Road Sheet No. _____ of _____

By: KLP Date: 3/27/2023 Checked By: MRZ Date: _____ Description: _____

- §152-306 Infiltration Requirements
  - ↳ 1" Runoff Calculation | 487,518 SF (Impervious Area)

Runoff volume = 487,518 SF · 1 in · $\frac{1 ft}{12 in}$

= 40,627 CF

SECTION 5
BMP Worksheets

Worksheet 4. Change in Runoff Volume for 2-YR Storm Event

PROJECT: **Greenridge Road**
Drainage Area: POI #1-A
2-Year Rainfall 3.24 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Woodland	B	1,143,241	26.25	55	8.18	1.64	0.26	25,027
	C/D	55,426	1.27	73.5	3.61	0.72	1.04	4,783
Meadow	B	419,914	9.64	58	7.24	1.45	0.36	12,431
	C/D	28,270	0.65	74.5	3.42	0.68	1.09	2,572
Impervious (meadow)	B	36,375	0.84	58	7.24	1.45	0.36	1,077
Impervious	-	7,202	0.17	98	0.20	0.04	3.01	1,804
TOTAL:		1,690,428	38.81		21.72	4.34	5.85	47,695

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Open Space (meadow)	B	305,853	7.02	58	7.24	1.45	0.36	9,054
	C/D	28,257	0.65	74.5	3.42	0.68	1.09	2,571
Woodland	B	895,205	20.55	55	8.18	1.64	0.26	19,597
	C/D	55,254	1.27	73.5	3.61	0.72	1.04	4,768
Open Space , Good	B	627,022	14.39	61	6.39	1.28	0.46	24,048
Impervious	-	487,518	11.19	98	0.20	0.04	3.01	122,129
TOTAL:		2,399,109	55.08		29.05	5.81	6.21	182,169

****** **THE DIFFERENCE IN AREAS IS DUE TO PROPOSED SITE GRADING.**

2-Year Volume Increase (CF):	134,474

Worksheet 4. Change in Runoff Volume for 2-YR Storm Event

PROJECT: **Greenridge Road**
Drainage Area: Basin #1
2-Year Rainfall 3.24 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
TOTAL:		0	0.00		0.00	0.00	0.00	0

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Open Space	B	101,661	2.33	61	6.39	1.28	0.46	3,899
Impervious	B	59,453	1.36	98	0.20	0.04	3.01	14,894
Woodland	B	12,743	0.29	55	8.18	1.64	0.26	279
Meadow	B	17,431	0.40	58	7.24	1.45	0.36	516
TOTAL:		191,288	4.39		22.02	4.40	4.09	19,588

****** **THE DIFFERENCE IN AREAS IS DUE TO PROPOSED SITE GRADING.**

2-Year Volume Increase (CF): 19,588

Worksheet 4. Change in Runoff Volume for 2-YR Storm Event

PROJECT: **Greenridge Road**
Drainage Area: Basin #2
2-Year Rainfall 3.24 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
TOTAL:		0	0.00		0.00	0.00	0.00	0

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Open Space	B	262,560	6.03	61	6.39	1.28	0.46	10,070
Impervious	B	274,559	6.30	98	0.20	0.04	3.01	68,780
Woodland	B	9,595	0.22	55	8.18	1.64	0.26	210
TOTAL:		546,714	12.55		14.78	2.96	3.73	79,060

****** **THE DIFFERENCE IN AREAS IS DUE TO PROPOSED SITE GRADING.**

2-Year Volume Increase (CF):	79,060

Worksheet 4. Change in Runoff Volume for 2-YR Storm Event

PROJECT: **Greenridge Road**
Drainage Area: Basin #3A
2-Year Rainfall 3.24 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
TOTAL:		0	0.00		0.00	0.00	0.00	0

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Open Space	B	148,840	3.42	61	6.39	1.28	0.46	5,709
Impervious	B	89,395	2.05	98	0.20	0.04	3.01	22,394
Woodland	B	246,848	5.67	55	8.18	1.64	0.26	5,404
Meadow	B	181,088	4.16	58	7.24	1.45	0.36	5,361
TOTAL:		666,171	15.29		22.02	4.40	4.09	38,868

****** **THE DIFFERENCE IN AREAS IS DUE TO PROPOSED SITE GRADING.**

2-Year Volume Increase (CF): 38,868

Worksheet 5. Structural BMP Volume Credits

PROJECT: Greenridge Road
SUB-BASIN: POI #1-A

Required Control Volume (ft^3) - *from Worksheet 4*: 134,474

Non-structural Volume Credit (ft^3) - *from Worksheet 3*: - 0
(maximum is 25% of required volume)

Structural Volume Reqmt (ft^3) 134,474
(Required Control Volume minus Non-structural Credit)
Required Control Volume (ft^3) - *from Worksheet 4*:

	Proposed BMP	Area (ft^2)	Volume Reduction Permanently Removed (ft^3)
6.4.1	Porous Pavement		
6.4.2	Infiltration Basin	555,604	79,060
6.4.3	Infiltration Bed	203,425	19,588
6.4.4	Infiltration Trench		
6.4.5	Rain Garden/Bioretention		
6.4.6	Dry Well / Seepage Pit		
6.4.7	Constructed Filter		
6.4.8	Vegetated Swale		
6.4.9	Vegetated Filter Strip		
6.4.10	Berm		
6.5.1	Vegetated Roof		
6.5.2	Capture and Re-use		
6.6.1	Constructed Wetlands		
6.6.2	Wet Pond / Retention Basin		
6.7.1	Riparian Buffer/Riparian Forest Buffer Restoration		
6.7.2	Landscape Restoration / Reforestation		
6.7.3	Soil Amendment		
6.8.1	Level Spreader		
6.8.2	Special Storage Areas		
Other	Managed Release Concept	700,032	38,868

Total Structural Volume (ft^3): 137,516
Structural Volume Requirement (ft^3): 134,474
DIFFERENCE 3,042

Worksheet 4. Change in Runoff Volume for 2-YR Storm Event

PROJECT: **Greenridge Road**
Drainage Area: POI #1-B
2-Year Rainfall 3.24 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Woodland	A	29,879	0.69	30	23.33	4.67	0.09	231
	B	671,176	15.41	55	8.18	1.64	0.26	14,693
Meadow	A	1,490	0.03	30	23.33	4.67	0.09	12
	B	205,455	4.72	58	7.24	1.45	0.36	6,082
Impervious (meadow)	B	3,135	0.07	58	7.24	1.45	0.36	93
Impervious	B	3,864	0.09	98	0.20	0.04	3.01	968
TOTAL:		914,999	21.01		46.20	9.24	4.07	22,079

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Open Space (meadow)	A	1,490	0.03	30	23.33	4.67	0.09	12
	B	59,765	1.37	58	7.24	1.45	0.36	1,769
Woodland	A	29,879	0.69	30	23.33	4.67	0.09	231
	B	359,323	8.25	55	8.18	1.64	0.26	7,866
Open Space , Good	B	414	0.01	61	6.39	1.28	0.46	16
Impervious	-	3,864	0.09	98	0.20	0.04	3.01	968
TOTAL:		454,735	10.44		68.69	13.74	4.27	10,862

****** **THE DIFFERENCE IN AREAS IS DUE TO PROPOSED SITE GRADING.**

2-Year Volume Increase (CF): -11,217

Worksheet 4. Change in Runoff Volume for 2-YR Storm Event

PROJECT: **Greenridge Road**
Drainage Area: POI #2
2-Year Rainfall 3.24 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Woodland	B	168,832	3.88	55	8.18	1.64	0.26	3,696
Meadow	B	67,746	1.56	58	7.24	1.45	0.36	2,006
Impervious (Meadow)	B	19,538	0.45	58	7.24	1.45	0.36	578
TOTAL:		256,116	5.88		22.66	4.53	0.97	6,280

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia	Q (in)	Runoff Volume (cf)
Woodland	B	64,161	1.47	60	6.67	1.33	0.42	2,266
Meadow	B	764	0.02	58	7.24	1.45	0.36	23
Open Space, Good	B	5,150	0.12	61	6.39	1.28	0.46	198
Open Space (meadow)	B	4,148	0.10	62	6.13	1.23	0.50	172
TOTAL:		74,223	1.70		26.43	5.29	1.74	2,659

****** **THE DIFFERENCE IN AREAS IS DUE TO PROPOSED SITE GRADING.**

2-Year Volume Increase (CF): -3,621

SECTION 6
Storm Sewer Calculations

Storm Pipe System

The storm pipe system for the project site has been designed using *Hydraflow Storm Sewers* (version 6.066 by Autodesk, Inc.). The storm pipes have been analyzed for the 100-year storm event due to the fact that overland flow relief does not exist for all intended BMPs. All storm pipes have been designed with a minimum pipe size of 15 inches, a minimum cover of 1.5 feet, and a minimum slope of 0.5%. The 100-year HGL was analyzed to show that all runoff will reach the intended stormwater BMPs

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
4	End	31.227	1.62	1.62	0.43	0.70	0.70	5.0	5.0	7.9	5.47	7.44	3.10	18	0.50	672.00	672.16	675.02	675.11	679.00	677.50	114-112
3	2	60.764	1.29	1.29	0.39	0.50	0.50	5.0	5.0	7.9	3.95	4.61	4.22	15	0.51	676.35	676.66	677.24	677.55	680.63	679.60	106-104
2	1	94.088	0.40	1.69	0.70	0.28	0.78	5.0	5.0	7.9	6.15	8.14	6.56	15	1.59	674.65	676.15	675.47	677.15	677.59	680.63	104-102
1	End	20.966	0.77	2.46	0.71	0.55	1.33	5.0	5.0	7.9	10.45	16.38	3.33	24	0.52	672.00	672.11	675.02	675.06	679.00	677.59	102-100

Project File: Basin 1.stm

Number of lines: 4

Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
29	28	118.877	1.03	1.03	0.45	0.46	0.46	5.0	5.0	7.9	3.64	4.58	4.07	15	0.50	623.06	623.66	623.95	624.48	634.69	626.60	254-252
28	23	28.010	0.20	1.23	0.70	0.14	0.60	5.0	5.0	7.9	4.74	7.42	3.46	18	0.50	622.67	622.81	623.81	623.85	634.69	634.69	252-250
27	26	111.574	0.69	0.69	0.57	0.39	0.39	5.0	5.0	7.9	3.09	4.58	3.90	15	0.50	638.50	639.06	639.32	639.78	644.30	642.00	262-260
26	25	28.081	0.36	1.05	0.71	0.26	0.65	5.0	5.0	7.9	5.10	7.40	4.51	18	0.50	638.11	638.25	639.03	639.17	644.30	644.30	260-258
25	24	70.766	0.37	1.42	0.73	0.27	0.92	5.0	5.0	7.9	7.22	16.80	6.16	18	2.56	636.10	637.91	636.97	638.95	639.50	644.30	258-256
24	23	70.860	0.08	1.50	0.68	0.05	0.97	5.0	5.0	7.9	7.65	26.78	9.37	18	6.51	631.29	635.90	631.84	636.97	634.69	639.50	256-250
23	22	40.920	0.05	2.78	0.76	0.04	1.61	5.0	5.0	7.9	12.69	31.49	12.23	18	8.99	618.79	622.47	619.45	623.81	622.00	634.69	250-MH249
22	End	34.160	0.00	2.78	0.00	0.00	1.61	0.0	5.0	7.9	12.69	15.95	4.04	24	0.50	612.00	612.17	617.14	617.25	0.00	622.00	MH249-EW248
21	20	125.876	0.54	0.54	0.57	0.31	0.31	5.0	5.0	7.9	2.42	4.57	3.08	15	0.50	654.73	655.36	655.72	656.00	669.22	658.30	234-232
20	7	28.083	0.25	0.79	0.71	0.18	0.49	5.0	5.0	7.9	3.81	7.41	2.43	18	0.50	654.34	654.48	655.65	655.67	669.22	669.22	232-230
19	18	125.876	0.62	0.62	0.57	0.35	0.35	5.0	5.0	7.9	2.78	4.57	2.36	15	0.50	651.73	652.36	653.23	653.44	660.10	655.30	228-226
18	6	30.230	0.20	0.82	0.71	0.14	0.50	5.0	5.0	7.9	3.89	7.40	2.20	18	0.50	651.33	651.48	653.14	653.18	660.40	660.10	226-224
17	5	109.985	0.78	0.78	0.64	0.50	0.50	5.0	5.0	7.9	3.92	13.35	7.09	15	4.27	652.36	657.06	652.82	657.86	655.30	660.00	222-220
16	12	28.081	0.19	0.19	0.71	0.13	0.13	5.0	5.0	7.9	1.06	6.46	2.04	15	1.00	658.59	658.87	659.59	659.27	661.81	661.81	210-208
15	13	28.083	0.67	0.67	0.66	0.44	0.44	5.0	5.0	7.9	3.48	4.57	4.10	15	0.50	667.50	667.64	668.32	668.46	670.58	670.58	214-212
14	13	116.095	0.82	0.82	0.52	0.43	0.43	5.0	5.0	7.9	3.35	4.57	3.81	15	0.50	664.48	665.06	665.42	665.83	670.58	668.00	216-212
13	12	180.014	0.33	1.82	0.70	0.23	1.10	5.0	5.0	7.9	8.64	11.19	8.71	15	3.00	658.87	664.28	659.69	665.42	661.81	670.58	212-208
12	11	156.586	0.19	2.20	0.74	0.14	1.38	5.0	5.0	7.9	10.81	11.69	9.45	15	3.28	653.26	658.39	654.29	659.59	656.20	661.81	208-206
11	3	41.705	0.16	2.36	0.74	0.12	1.49	5.0	5.0	7.9	11.74	11.84	7.42	18	1.27	652.46	652.99	653.68	654.29	655.71	656.20	206-204
10	9	125.876	0.71	0.71	0.57	0.40	0.40	5.0	5.0	7.9	3.18	4.57	3.95	15	0.50	671.63	672.26	672.45	673.00	683.35	675.20	240-238
9	8	28.083	0.36	1.07	0.68	0.24	0.65	5.0	5.0	7.9	5.10	7.44	4.53	18	0.50	671.24	671.38	672.15	672.29	683.35	683.35	238-236
8	7	249.992	0.29	1.36	0.72	0.21	0.86	5.0	5.0	7.9	6.75	14.90	6.79	18	2.01	666.01	671.04	666.72	672.04	669.22	683.35	236-230

Project File: Basin 2.stm

Number of lines: 29

Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
7	6	173.464	0.25	2.40	0.73	0.18	1.53	5.0	5.0	7.9	11.99	15.92	5.57	24	0.50	652.77	653.63	654.07	654.93	660.40	669.22	230-224
6	5	126.125	0.19	3.41	0.74	0.14	2.16	5.0	5.0	7.9	16.99	28.99	3.49	30	0.50	649.70	650.33	652.52	652.71	655.30	660.40	224-220
5	4	75.002	0.63	4.82	0.62	0.39	3.05	5.0	5.0	7.9	23.99	29.21	4.90	30	0.51	649.12	649.50	651.72	651.96	656.76	655.30	220-218
4	3	104.129	0.11	4.93	0.69	0.08	3.13	5.0	5.0	7.9	24.58	28.99	6.48	30	0.50	648.40	648.92	650.26	650.67	655.71	656.76	218-204
3	2	45.450	0.16	7.45	0.69	0.11	4.73	5.0	5.0	7.9	37.19	37.50	8.65	30	0.84	647.82	648.20	649.85	650.26	654.88	655.71	204-202
2	1	79.530	0.41	7.86	0.75	0.31	5.04	5.0	5.0	7.9	39.61	251.9	23.15	30	37.72	617.62	647.62	618.29	649.74	622.00	654.88	202-MH201
1	End	25.280	0.00	7.86	0.00	0.00	5.04	0.0	5.0	7.9	39.61	47.85	5.60	36	0.51	612.00	612.13	617.14	617.23	0.00	622.00	MH201-EW200

Project File: Basin 2.stm | Number of lines: 29 | Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
2	1	69.010	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	18.26	31.50	14.45	18	9.00	486.79	493.00	487.61	494.45	490.00	498.40	OS 3.1-MH 332
1	End	38.520	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	18.26	19.03	6.81	24	0.71	463.00	463.27	464.62	464.84	0.00	490.00	MH 332- EW 330

Project File: Basin 3A Outlet.stm | Number of lines: 2 | Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
14	13	31.840	6.65	6.65	0.29	1.93	1.93	7.0	7.0	7.2	13.96	16.05	5.29	24	0.50	496.59	496.75	498.19	498.29	500.99	500.50	326A-324A
13	12	27.990	0.18	6.83	0.76	0.14	2.07	5.0	7.0	7.2	14.95	15.96	5.77	24	0.50	496.25	496.39	497.79	497.93	500.99	500.99	324A-322A
12	End	44.340	0.16	6.99	0.77	0.12	2.19	5.0	7.0	7.2	15.85	16.28	5.04	24	0.52	495.00	495.23	497.14	497.36	0.00	500.99	322A-EW320
11	5	28.045	0.29	0.29	0.76	0.22	0.22	5.0	5.0	7.9	3.09	4.56	4.00	15	0.50	602.43	602.57	603.18	603.32	605.51	605.51	316A-314A
10	4	17.395	1.74	1.74	0.39	0.68	0.68	12.5	12.5	6.0	4.08	4.65	4.28	15	0.52	567.73	567.82	568.64	568.73	570.67	599.50	312A-308A
9	4	28.023	0.20	0.20	0.77	0.15	0.15	5.0	5.0	7.9	1.21	6.46	2.10	15	1.00	567.45	567.73	568.63	568.16	570.67	570.67	310A-308A
8	3	17.388	2.80	2.80	0.30	0.84	0.84	12.2	12.2	6.1	5.09	5.32	4.14	15	0.68	525.06	525.18	527.14	527.24	528.00	551.00	306A-304A
7	6	57.808	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.16	9.77	3.91	18	0.86	611.50	612.00	612.00	612.55	616.39	617.50	OS2.1-318A
6	5	179.013	0.18	0.18	0.74	0.13	0.13	5.0	5.0	7.9	3.39	23.55	3.73	18	5.03	602.30	611.30	603.15	612.00	605.51	616.39	318A-314A
5	4	363.949	0.22	0.69	0.50	0.11	0.46	5.0	5.0	7.9	7.34	32.40	5.26	18	9.52	567.46	602.10	568.63	603.15	570.67	605.51	314A-308A
4	3	385.364	1.15	3.78	0.38	0.44	1.73	5.0	12.5	6.0	14.12	34.86	8.14	18	11.02	524.79	567.25	527.14	568.63	528.00	570.67	308A-304A
3	2	28.110	0.23	6.81	0.75	0.17	2.75	5.0	12.5	6.0	20.20	20.46	7.43	24	0.82	524.02	524.25	525.64	525.87	528.00	528.00	304A-302A
2	1	72.010	0.23	7.04	0.76	0.17	2.92	5.0	12.5	6.0	21.25	134.8	19.48	24	35.51	498.25	523.82	498.79	525.47	502.00	528.00	302A-301A
1	End	16.230	0.00	7.04	0.00	0.00	2.92	0.0	12.5	6.0	21.25	30.54	5.66	30	0.55	495.00	495.09	497.14	496.66	0.00	502.00	301A-EW300

Project File: Basin 3A.stm

Number of lines: 14

Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
2	1	30.258	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	26.30	26.65	9.27	24	1.39	463.18	463.60	464.80	465.39	470.00	467.35	OS3.2-MH 352B
1	End	136.340	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	26.30	28.97	6.25	24 x 38 e	0.50	462.00	462.68	463.75	464.36	0.00	470.00	MH352B-EW350

Project File: Basin 3B Outlet.stm | Number of lines: 2 | Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
5	1	27.870	0.17	0.17	0.68	0.12	0.12	5.0	5.0	7.9	0.91	6.48	2.11	15	1.01	466.78	467.06	467.49	467.43	470.00	470.00	344B-342B
4	3	27.572	1.86	1.86	0.41	0.76	0.76	7.3	7.3	7.2	5.46	7.48	3.24	18	0.51	476.65	476.79	478.06	478.11	480.92	481.00	HW350-348B
3	2	27.870	0.39	2.25	0.73	0.28	1.05	5.0	7.3	7.2	8.66	8.90	5.74	18	0.72	476.25	476.45	477.45	477.64	480.92	480.92	348B-346B
2	1	152.009	0.21	2.46	0.59	0.12	1.17	5.0	7.3	7.2	11.08	25.92	10.38	18	6.09	466.79	476.05	467.49	477.32	470.00	480.92	346B-342B
1	End	47.299	0.09	2.72	0.76	0.07	1.36	5.0	7.3	7.2	12.39	16.11	3.95	24	0.51	463.00	463.24	466.98	467.12	0.00	470.00	342B-EW340

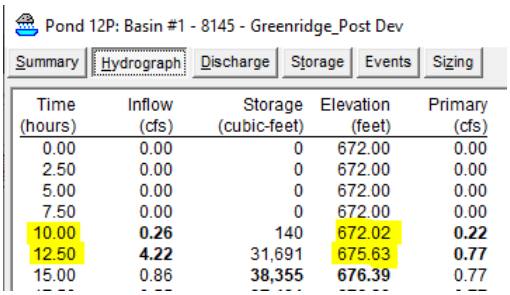
Project File: Basin 3B.stm | Number of lines: 5 | Run Date: 4/5/2023

NOTES:Intensity = 52.64 / (Inlet time + 10.70) ^ 0.69; Return period =Yrs. 100 ; Pipe travel time suppressed. ; c = cir e = ellip b = box

Starting HGL Elevations

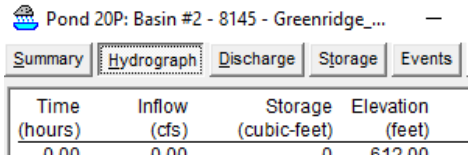
Job: 8145, TRK, 4/4/2023

The starting HGL for the pipe calculations is based on the water surface elevation at the time of peak inflow during the 100-year storm. The peak inflow times Basin 1 thru 3B are 12.08 hours, 11.95 hours, 11.99 hours, and 12.02 hours, respectively.



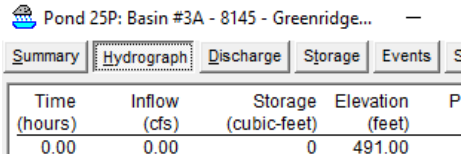
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	672.00	0.00
2.50	0.00	0	672.00	0.00
5.00	0.00	0	672.00	0.00
7.50	0.00	0	672.00	0.00
10.00	**0.26**	140	672.02	**0.22**
12.50	**4.22**	31,691	675.63	**0.77**
15.00	0.86	**38,355**	**676.39**	0.77

Basin 1 Elev @ 12.08 hrs = 675.02 (100 Pipe Series)



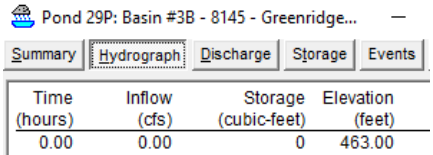
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)
0.00	0.00	0	612.00
2.50	0.00	0	612.00
5.00	0.00	0	612.00
7.50	0.34	613	612.04
10.00	**1.48**	4,052	612.26
12.50	**8.60**	132,822	618.52
15.00	2.58	**151,606**	**619.24**

Basin 2 Elev @ 11.95 hrs = 617.14 (200 Pipe Series)



Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)
0.00	0.00	0	491.00
2.50	0.13	512	491.21
5.00	0.22	2,063	491.84
7.50	0.30	4,411	492.79
10.00	**0.58**	**8,065**	**493.63**
12.50	**9.26**	**70,152**	**498.04**
15.00	4.03	57,392	497.41

Basin 3A Elev @ 11.99 hrs = 497.14 (300A Pipe Series)



Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)
0.00	0.00	0	463.00
2.50	0.00	0	463.00
5.00	0.00	0	463.00
7.50	0.00	0	463.00
10.00	**0.22**	**561**	**463.22**
12.50	**19.86**	**24,492**	**467.87**
15.00	4.81	21,897	467.54

Basin 3B Elev @ 12.02 hrs = 466.98 (300B Pipe Series)

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 04/03/23
By: TRK
Chk'd:
Revised:

STORM SEWER INLET RUNOFF COEFFICIENT CALCULATIONS

Inlet No.	Road	Station	Left or Right	TG / RIM ELEV.	Inlet Drainage Area 'C' Value						overland travel time to inlet (min.)
					Imp. (ac.)	'C'	Lawn (ac.)	'C'	Total Area (ac.)	Overall 'C'	
Basin 1											
100	---	---	---		---	---	---	---	---	---	---
102					0.50	0.95	0.27	0.26	0.77	0.71	5.00
104					0.26	0.95	0.14	0.26	0.40	0.70	5.00
106					0.24	0.95	1.05	0.26	1.29	0.39	5.00
108											
110					0.08	0.95	0.19	0.26	0.27	0.46	5.00
112											
114					0.41	0.95	1.21	0.26	1.62	0.43	5.00

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 04/03/23
By: TRK
Chk'd:
Revised:

STORM SEWER INLET RUNOFF COEFFICIENT CALCULATIONS

Inlet No.	Road	Station	Left or Right	TG / RIM ELEV.	Inlet Drainage Area 'C' Value						overland travel time to inlet (min.)
					Imp. (ac.)	'C'	Lawn (ac.)	'C'	Total Area (ac.)	Overall 'C'	
Basin 2											
EW 200	---	---	---		---	---	---	---	---	---	---
MH 201	---	---	---		---	---	---	---	---	---	---
202					0.29	0.95	0.12	0.26	0.41	0.75	5.00
204					0.10	0.95	0.06	0.26	0.16	0.69	5.00
206					0.12	0.95	0.05	0.26	0.16	0.74	5.00
208					0.13	0.95	0.06	0.26	0.19	0.74	5.00
210					0.12	0.95	0.06	0.26	0.19	0.71	5.00
212					0.21	0.95	0.12	0.26	0.33	0.70	5.00
214					0.38	0.95	0.28	0.26	0.67	0.66	5.00
216					0.31	0.95	0.50	0.26	0.82	0.52	5.00
218					0.07	0.95	0.04	0.26	0.11	0.69	5.00
220					0.33	0.95	0.30	0.26	0.63	0.62	5.00
222					0.43	0.95	0.35	0.26	0.78	0.64	5.00
224					0.14	0.95	0.06	0.26	0.19	0.74	5.00
226					0.13	0.95	0.07	0.26	0.20	0.71	5.00
228					0.28	0.95	0.34	0.26	0.62	0.57	5.00
230					0.17	0.95	0.08	0.26	0.25	0.73	5.00
232					0.16	0.95	0.09	0.26	0.25	0.71	5.00
234					0.24	0.95	0.29	0.26	0.54	0.57	5.00

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 04/03/23
By: TRK
Chk'd:
Revised:

STORM SEWER INLET RUNOFF COEFFICIENT CALCULATIONS

Inlet No.	Road	Station	Left or Right	TG / RIM ELEV.	Inlet Drainage Area 'C' Value						overland travel time to inlet (min.)
					Imp. (ac.)	'C'	Lawn (ac.)	'C'	Total Area (ac.)	Overall 'C'	
236					0.20	0.95	0.10	0.26	0.29	0.72	5.00
238					0.22	0.95	0.14	0.26	0.36	0.68	5.00
240					0.32	0.95	0.39	0.26	0.71	0.57	5.00
EW 248	---	---	---		---	---	---	---	---	---	---
MH 249	---	---	---		---	---	---	---	---	---	---
250					0.03	0.95	0.01	0.26	0.05	0.76	5.00
252					0.12	0.95	0.07	0.26	0.20	0.70	5.00
254					0.28	0.95	0.74	0.26	1.03	0.45	5.00
256					0.05	0.95	0.03	0.26	0.08	0.68	5.00
258					0.26	0.95	0.12	0.26	0.37	0.73	5.00
260					0.24	0.95	0.12	0.26	0.36	0.71	5.00
262					0.31	0.95	0.38	0.26	0.69	0.57	5.00

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 04/03/23
By: TRK
Chk'd:
Revised:

STORM SEWER INLET RUNOFF COEFFICIENT CALCULATIONS

Inlet No.	Road	Station	Left or Right	TG / RIM ELEV.	Inlet Drainage Area 'C' Value						overland travel time to inlet (min.)
					Imp. (ac.)	'C'	Lawn (ac.)	'C'	Total Area (ac.)	Overall 'C'	
Basin 3A											
EW 300	---	---	---		---	---	---	---	---	---	---
302A					0.17	0.95	0.06	0.26	0.23	0.76	5.00
304A					0.16	0.95	0.06	0.26	0.23	0.75	5.00
306A					0.16	0.95	2.64	0.26	2.80	0.30	12.21
308A					0.20	0.95	0.95	0.26	1.15	0.38	5.00
310A					0.15	0.95	0.05	0.26	0.20	0.77	5.00
312A					0.33	0.95	1.41	0.26	1.74	0.39	12.45
314A					0.08	0.95	0.14	0.26	0.22	0.50	5.00
316A					0.21	0.95	0.08	0.26	0.29	0.76	5.00
318A					0.12	0.95	0.05	0.26	0.18	0.74	5.00
EW 320											
322A					0.12	0.95	0.04	0.26	0.16	0.77	5.00
324A					0.13	0.95	0.05	0.26	0.18	0.76	5.00
326A					0.34	0.95	6.32	0.26	6.65	0.29	6.98

Greenridge Road
Upper Uwchlan Township
Chester County, PA

Date: 04/03/23
By: TRK
Chk'd:
Revised:

STORM SEWER INLET RUNOFF COEFFICIENT CALCULATIONS

Inlet No.	Road	Station	Left or Right	TG / RIM ELEV.	Inlet Drainage Area 'C' Value						overland travel time to inlet (min.)
					Imp. (ac.)	'C'	Lawn (ac.)	'C'	Total Area (ac.)	Overall 'C'	
Basin 3B											
EW 340	---	---	---		---	---	---	---	---	---	---
342 B					0.07	0.95	0.03	0.26	0.09	0.76	5.00
344 B					0.11	0.95	0.07	0.26	0.17	0.68	5.00
346 B					0.10	0.95	0.11	0.26	0.21	0.59	5.00
348 B					0.26	0.95	0.12	0.26	0.39	0.73	5.00
HW 350					0.39	0.95	1.47	0.26	1.86	0.41	7.27

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Inlet 326A**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B		
Surface Description (table 3-1)		grass		
Manning's Roughness Coefficient, n (table 3.1)		0.24		
Flow Length, L	ft.	100		
Two Year 24 Hour Rainfall, P2	in.	3.24		
Land Slope, s	ft/ft	0.2600		
Tt = 0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.0847		
Sheet flow Subtotal Tt =	**hr**			**0.0847**

Elev. A = 693.50
Elev. B = 667.50
Chg. Elev. = 26.00

Shallow concentrated flow

	Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)		unpaved	paved	unpaved
Flow Length, L	ft	526	88	100
Watercourse Slope, s	ft/ft	0.2215	0.1466	0.3310
Average Velociity, V (figure 3-1)	fps	7.59	7.78	9.28
Tt = L / (3600 x V)	hr	0.0192	0.0031	0.0030
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0254**

Elev. B = 667.50
Elev. C = 551.00
Chg. Elev. = 116.50
Elev. C = 551.00
Elev. D = 538.10
Chg. Elev. = 12.90
Elev. D = 538.10
Elev. E = 505.00
Chg. Elev. = 33.10

Channel flow

	Segment ID	E - F		
Cross Sectional Flow Area, a	sq ft			
Wetted Perimeter, Pw	ft			
Hydraulic Radius, r = a/Pw	ft			
Channel Slope, s	ft/ft			
Manning's Roughness Coefficient, n				
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00		
Flow length, L	ft	89		
Tt = L / (3600 x V)	hr	0.0062		
Channel flow Subtotal Tt =	**hr**			**0.0062**

Elev. E =
Elev. F =
Chg. Elev. =

Total Tt = 0.1163 **7.0**
T lag = 0.6Tt = 0.0698

Total Hydraulic Length = 903
Total Elevation Change = 188.5
Average Slope = 20.87%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Inlet 306A**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B		
Surface Description (table 3-1)		grass		
Manning's Roughness Coefficient, n (table 3.1)		0.24		
Flow Length, L	ft.	100		
Two Year 24 Hour Rainfall, P2	in.	3.24		
Land Slope, s	ft/ft	0.0480		
Tt = 0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.1665		
Sheet flow Subtotal Tt =	**hr**			**0.1665**

Elev. A = 674.30
Elev. B = 669.50
Chg. Elev. = 4.80

Shallow concentrated flow

	Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)		unpaved	paved	unpaved
Flow Length, L	ft	255	37	434
Watercourse Slope, s	ft/ft	0.1471	0.1892	0.1705
Average Velociity, V (figure 3-1)	fps	6.19	8.84	6.66
Tt = L / (3600 x V)	hr	0.0114	0.0012	0.0181
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0307**

Elev. B = 669.50
Elev. C = 632.00
Chg. Elev. = 37.50
Elev. C = 632.00
Elev. D = 625.00
Chg. Elev. = 7.00
Elev. D = 625.00
Elev. E = 551.00
Chg. Elev. = 74.00

Channel flow

	Segment ID	E - F		
Cross Sectional Flow Area, a	sq ft			
Wetted Perimeter, Pw	ft			
Hydraulic Radius, r = a/Pw	ft			
Channel Slope, s	ft/ft			
Manning's Roughness Coefficient, n				
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00		
Flow length, L	ft	89		
Tt = L / (3600 x V)	hr	0.0062		
Channel flow Subtotal Tt =	**hr**			**0.0062**

Elev. E =
Elev. F =
Chg. Elev. =

Total Tt = 0.2034 **12.2**
T lag = 0.6Tt = 0.1221

Total Hydraulic Length = 915
Total Elevation Change = 123.3
Average Slope = 13.48%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to Inlet 312A**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B		
Surface Description (table 3-1)		grass		
Manning's Roughness Coefficient, n (table 3.1)		0.24		
Flow Length, L	ft.	100		
Two Year 24 Hour Rainfall, P2	in.	3.24		
Land Slope, s	ft/ft	0.0640		
Tt = 0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.1484		
Sheet flow Subtotal Tt =	**hr**			**0.1484**

Elev. A = 671.40
Elev. B = 665.00
Chg. Elev. = 6.40

Shallow concentrated flow

	Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)		unpaved	paved	unpaved
Flow Length, L	ft	255	37	434
Watercourse Slope, s	ft/ft	0.1929	0.0216	0.0357
Average Velociity, V (figure 3-1)	fps	7.09	2.99	3.05
Tt = L / (3600 x V)	hr	0.0100	0.0034	0.0395
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0530**

Elev. B = 665.00
Elev. C = 615.80
Chg. Elev. = 49.20
Elev. C = 615.80
Elev. D = 615.00
Chg. Elev. = 0.80
Elev. D = 615.00
Elev. E = 599.50
Chg. Elev. = 15.50

Channel flow

	Segment ID	E - F		
Cross Sectional Flow Area, a	sq ft			
Wetted Perimeter, Pw	ft			
Hydraulic Radius, r = a/Pw	ft			
Channel Slope, s	ft/ft			
Manning's Roughness Coefficient, n				
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00		
Flow length, L	ft	89		
Tt = L / (3600 x V)	hr	0.0062		
Channel flow Subtotal Tt =	**hr**			**0.0062**

Elev. E =
Elev. F =
Chg. Elev. =

Total Tt = 0.2076 **12.5**
T lag = 0.6Tt = 0.1245

Total Hydraulic Length = 915
Total Elevation Change = 71.9
Average Slope = 7.86%

100 Greenridge Road Development
Upper Uwchlan Township
Chester County, Pennsylvania

By: KLP
Date: 2/22/2023
Chk'd: MRZ
Rev'd:

Watershed: **Post Developed to HW 350**

TIME OF CONCENTRATION
(S.C.S. TR-55 method)

Sheet Flow

	Segment ID	A - B		
Surface Description (table 3-1)		grass		
Manning's Roughness Coefficient, n (table 3.1)		0.24		
Flow Length, L	ft.	100		
Two Year 24 Hour Rainfall, P2	in.	3.24		
Land Slope, s	ft/ft	0.2560		
Tt = 0.007(nL)^0.8 / (P2^0.5)(s^0.4)	hr	0.0853		
Sheet flow Subtotal Tt =	**hr**			**0.0853**

Elev. A = 584.00
Elev. B = 558.40
Chg. Elev. = 25.60

Shallow concentrated flow

	Segment ID	B - C	C - D	D - E
Surface Description (paved or unpaved)		unpaved	paved	unpaved
Flow Length, L	ft	114	16	512
Watercourse Slope, s	ft/ft	0.2670	0.1690	0.0924
Average Velociity, V (figure 3-1)	fps	8.34	8.36	4.90
Tt = L / (3600 x V)	hr	0.0038	0.0005	0.0290
Shallow concentrated flow Subtotal Tt =	**hr**			**0.0333**

Elev. B = 558.40
Elev. C = 528.00
Chg. Elev. = 30.40
Elev. C = 528.00
Elev. D = 525.30
Chg. Elev. = 2.70
Elev. D = 525.30
Elev. E = 478.00
Chg. Elev. = 47.30

Channel flow

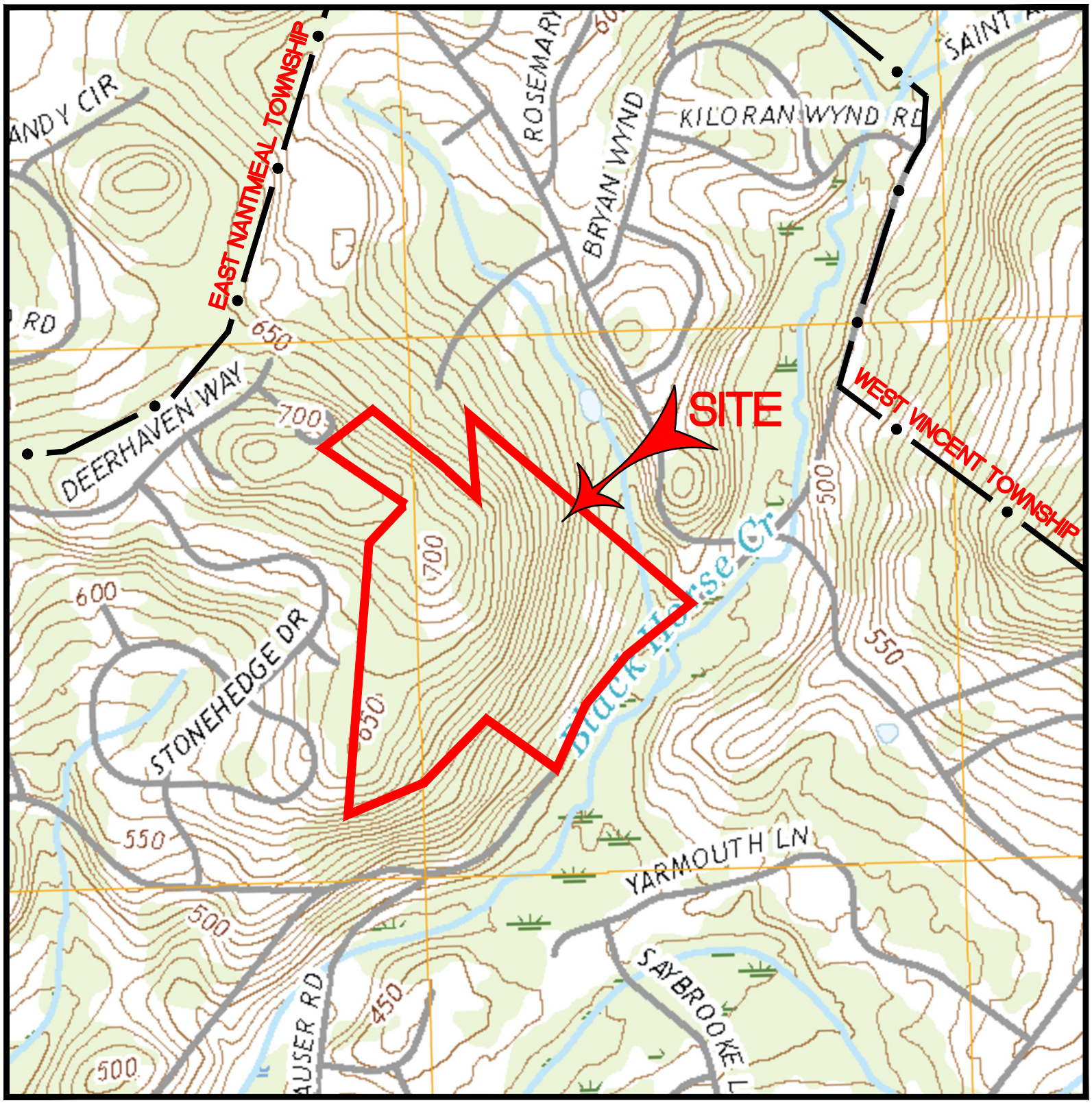
	Segment ID	E - F		
Cross Sectional Flow Area, a	sq ft			
Wetted Perimeter, Pw	ft			
Hydraulic Radius, r = a/Pw	ft			
Channel Slope, s	ft/ft			
Manning's Roughness Coefficient, n				
Velocity, V = (1.486)(r^2/3)(s^1/2)/n	fps	4.00		
Flow length, L	ft	37		
Tt = L / (3600 x V)	hr	0.0026		
Channel flow Subtotal Tt =	**hr**			**0.0026**

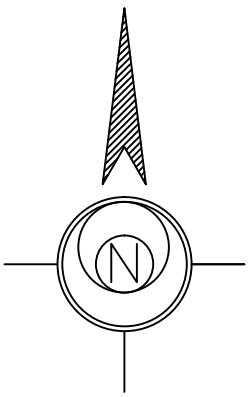
Elev. E =
Elev. F =
Chg. Elev. =

Total Tt = 0.1211 **7.3**
T lag = 0.6Tt = 0.0727

Total Hydraulic Length = 779
Total Elevation Change = 106.0
Average Slope = 13.61%

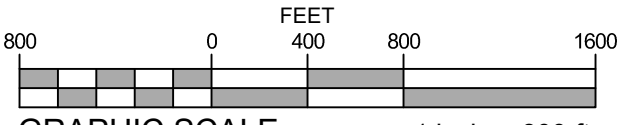
SECTION 7
U.S.G.S. Location Map





LOCATION MAP

SCALE: 1"=800'



SECTION 8
Soil Data & Geotechnical Testing

Soil Narrative

The soils shown on the plans have been generated from the USDA-NRCS certified data. They are based on the Chester County, Pennsylvania Soil Survey, Version 9, dated November 16, 2015. The hydrologic soil groups used for this analysis were obtained from this data.

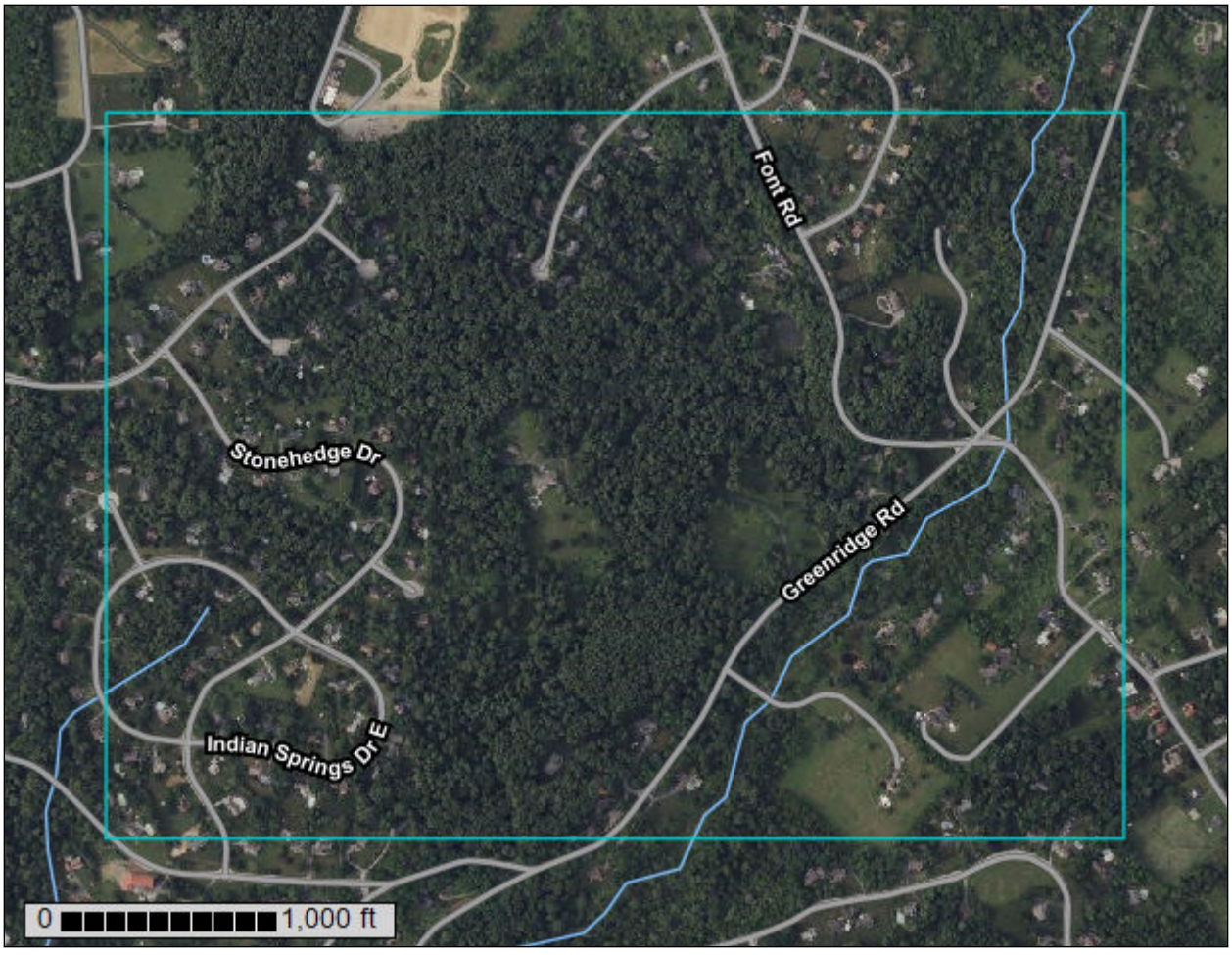
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Chester County, Pennsylvania



February 16, 2023

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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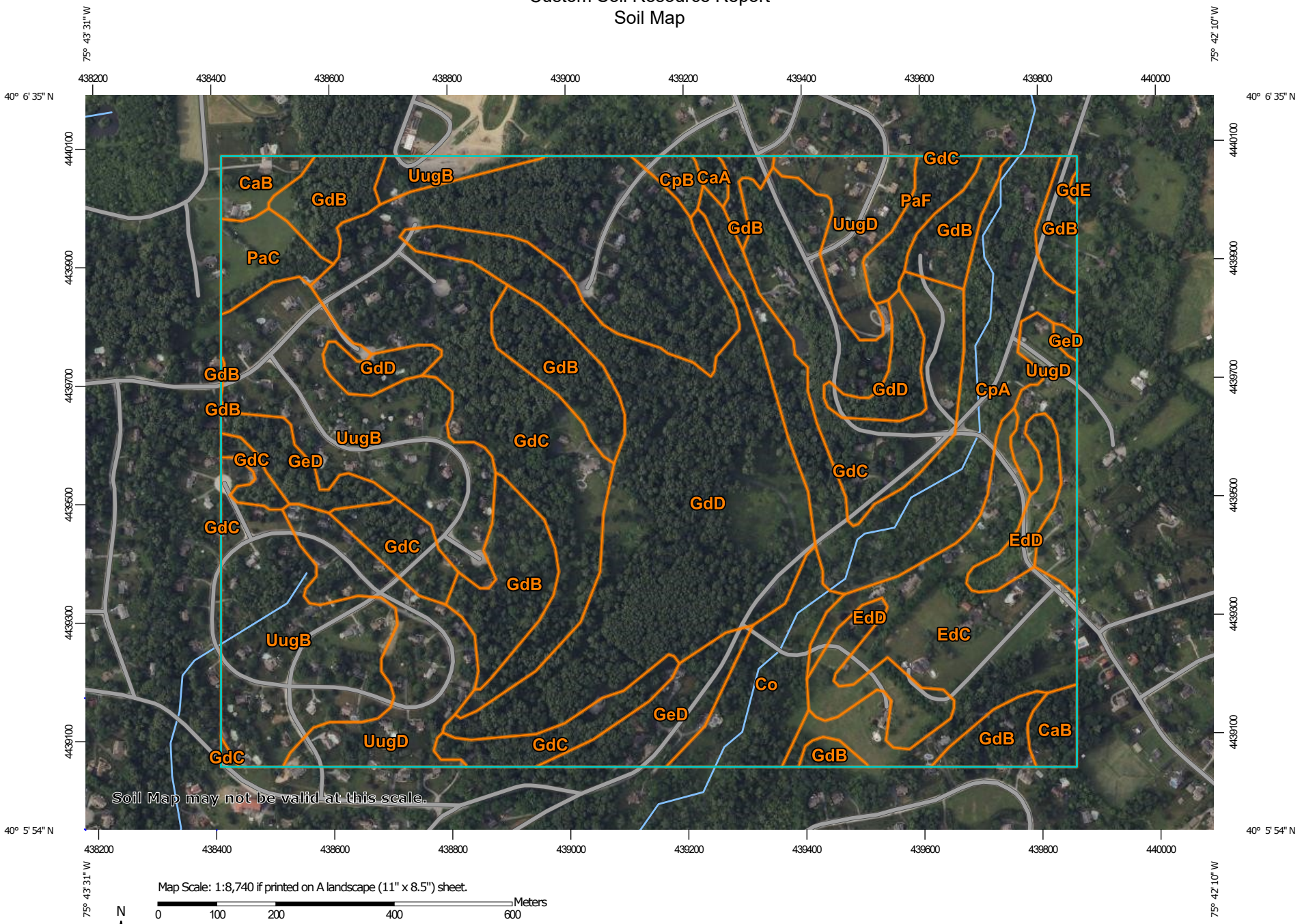
Contents

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:8,740 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

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

MAP LEGEND

Area of Interest (AOI)
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MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Chester County, Pennsylvania
Survey Area Data: Version 15, Sep 6, 2022

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

Date(s) aerial images were photographed: Jun 3, 2022—Jul 20, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaA	Califon loam, 0 to 3 percent slopes	0.8	0.2%
CaB	Califon loam, 3 to 8 percent slopes	5.3	1.4%
Co	Codorus silt loam	10.8	2.9%
CpA	Cokesbury silt loam, 0 to 3 percent slopes	30.5	8.2%
CpB	Cokesbury silt loam, 3 to 8 percent slopes	1.5	0.4%
EdC	Edgemont channery loam, 8 to 15 percent slopes	26.8	7.2%
EdD	Edgemont channery loam, 15 to 25 percent slopes	9.6	2.6%
GdB	Gladstone gravelly loam, 3 to 8 percent slopes	32.7	8.8%
GdC	Gladstone gravelly loam, 8 to 15 percent slopes	89.7	24.2%
GdD	Gladstone gravelly loam, 15 to 25 percent slopes	59.8	16.1%
GdE	Gladstone gravelly loam, 25 to 35 percent slopes	0.1	0.0%
GeD	Gladstone-Parker gravelly loams, 15 to 25 percent slopes	12.0	3.2%
PaC	Parker gravelly loam, 8 to 15 percent slopes	4.7	1.3%
PaF	Parker gravelly loam, 35 to 60 percent slopes	4.1	1.1%
UugB	Urban land-Udorthents, schist and gneiss complex, 0 to 8 percent slopes	50.7	13.7%
UugD	Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes	31.9	8.6%
Totals for Area of Interest		**371.1**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps.

The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

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

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

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

Chester County, Pennsylvania

CaA—Califon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: yrhm
Elevation: 10 to 2,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Califon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Califon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Colluvium derived from granite and gneiss

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 23 inches: clay loam
Bx - 23 to 38 inches: sandy loam
Cx - 38 to 57 inches: sandy loam
2C - 57 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 30 inches to fragipan; 72 to 99 inches to lithic bedrock
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Holly

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Fluvaquents

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Baile

Percent of map unit: 3 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

CaB—Califon loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: yrhl
Elevation: 200 to 2,000 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Califon and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Califon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope

Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Colluvium derived from granite and gneiss

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 23 inches: clay loam
Bx - 23 to 38 inches: sandy loam
Cx - 38 to 57 inches: sandy loam
C - 57 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 30 inches to fragipan; 72 to 99 inches to lithic bedrock
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Gladstone

Percent of map unit: 10 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Hatboro

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Baile

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope

Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Co—Codorus silt loam

Map Unit Setting

National map unit symbol: pjfx
Elevation: 200 to 2,000 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Codorus

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from gneiss and/or alluvium derived from mica schist

Typical profile

Ap - 0 to 12 inches: silt loam
Bw - 12 to 48 inches: silt loam
C - 48 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 72 to 99 inches to lithic bedrock
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C

Ecological site: F148XY027PA - Moist, Piedmont - felsic, Riparian Zone, Ecotonal Meadow-Shrub-Forest
Hydric soil rating: No

Minor Components

Hatboro
Percent of map unit: 8 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Glenville
Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Baile
Percent of map unit: 3 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

CpA—Cokesbury silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: yrhj
Elevation: 200 to 840 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 133 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition
Cokesbury and similar soils: 85 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cokesbury

Setting

Landform: Depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Colluvium derived from granite and gneiss

Typical profile

Ag - 0 to 9 inches: silt loam
BAg - 9 to 17 inches: gravelly sandy clay loam
Btg - 17 to 26 inches: clay loam
Btgx - 26 to 38 inches: gravelly clay loam
C - 38 to 60 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 30 inches to fragipan; 72 to 99 inches to lithic bedrock
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F148XY030PA - Hydric, Piedmont - felsic, Riparian Zone, Swamp Meadow-Shrub-Forest
Hydric soil rating: Yes

Minor Components

Holly

Percent of map unit: 3 percent
Landform: Valley floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: Yes

CpB—Cokesbury silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: yrhh
Elevation: 200 to 840 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 133 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Cokesbury and similar soils: 90 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cokesbury

Setting

Landform: Depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Colluvium derived from granite and gneiss

Typical profile

Ag - 0 to 5 inches: silt loam
BAg - 5 to 8 inches: gravelly sandy clay loam
Btg - 8 to 20 inches: clay loam
Btgx - 20 to 37 inches: gravelly clay loam
C - 37 to 60 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 30 inches to fragipan; 72 to 99 inches to lithic bedrock
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D

Ecological site: F148XY030PA - Hydric, Piedmont - felsic, Riparian Zone, Swamp Meadow-Shrub-Forest
Hydric soil rating: Yes

Minor Components

Holly
Percent of map unit: 3 percent
Landform: Valley floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: Yes

EdC—Edgemont channery loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: pjcr
Elevation: 500 to 1,800 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 46 to 59 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Edgemont and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edgemont

Setting
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Upper third of mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from quartzite and/or residuum weathered from orthoquartzite

Typical profile
Ap - 0 to 8 inches: channery loam
Bt - 8 to 36 inches: channery fine sandy loam
C - 36 to 60 inches: channery sandy loam

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: 42 to 84 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Buchanan

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Andover

Percent of map unit: 3 percent
Landform: Drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

EdD—Edgemont channery loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: pjcs
Elevation: 500 to 1,800 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 46 to 59 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Edgemont and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edgemont

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Upper third of mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from quartzite and/or residuum weathered from orthoquartzite

Typical profile

Ap - 0 to 8 inches: channery loam
Bt - 8 to 36 inches: channery fine sandy loam
C - 36 to 60 inches: channery sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 42 to 84 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Buchanan

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Andover

Percent of map unit: 3 percent
Landform: Drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

GdB—Gladstone gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v7gk
Elevation: 250 to 1,200 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Gladstone

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy colluvium derived from granite and gneiss and/or loamy residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 10 inches: gravelly loam
Bt1 - 10 to 22 inches: sandy clay loam
Bt2 - 22 to 37 inches: loam
C - 37 to 66 inches: sandy loam
R - 66 to 76 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 60 to 80 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest

Hydric soil rating: No

Minor Components

Parker

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Annandale

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Califon

Percent of map unit: 5 percent
Landform: Flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

GdC—Gladstone gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2v7gl
Elevation: 250 to 1,200 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 170 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Gladstone

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy colluvium derived from granite and gneiss and/or loamy residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 10 inches: gravelly loam
Bt1 - 10 to 22 inches: gravelly sandy clay loam
Bt2 - 22 to 37 inches: gravelly loam
C - 37 to 66 inches: gravelly sandy loam
R - 66 to 76 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 65 to 67 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Califon

Percent of map unit: 5 percent
Landform: Flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Parker

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Annandale

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

GdD—Gladstone gravelly loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2v7hd
Elevation: 250 to 1,200 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Gladstone

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy colluvium derived from granite and gneiss over loamy residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 10 inches: gravelly loam
Bt1 - 10 to 22 inches: gravelly sandy clay loam
Bt2 - 22 to 37 inches: gravelly loam
C - 37 to 66 inches: gravelly sandy loam
R - 66 to 80 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 65 to 67 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Califon
Percent of map unit: 5 percent
Landform: Flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Parker
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Annandale
Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

GdE—Gladstone gravelly loam, 25 to 35 percent slopes

Map Unit Setting
National map unit symbol: 135g9
Elevation: 200 to 1,200 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition
Gladstone and similar soils: 90 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gladstone

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Local colluvium and residuum weathered from granite and gneiss

Typical profile

Oa - 0 to 2 inches: highly decomposed plant material
Ap - 2 to 5 inches: gravelly loam
Bt - 5 to 35 inches: gravelly clay loam
C - 35 to 68 inches: cobbly loam
R - 68 to 78 inches: bedrock

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: 60 to 100 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Califon

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Cokesbury

Percent of map unit: 3 percent
Landform: Depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

GeD—Gladstone-Parker gravelly loams, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 1qpvm
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Gladstone and similar soils: 58 percent
Parker and similar soils: 42 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gladstone

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Local colluvium and residuum weathered from granite and gneiss

Typical profile

A - 0 to 6 inches: gravelly loam
BA - 6 to 10 inches: gravelly loam
Bt1 - 10 to 25 inches: gravelly loam
Bt2 - 25 to 35 inches: very gravelly loam
C - 35 to 68 inches: extremely gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 60 to 100 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F148XY024PA - Moist, Piedmont - felsic, Upland, Mixed Oak - Hardwood - Conifer Forest

Hydric soil rating: No

Description of Parker

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 7 inches: gravelly loam
Bw1 - 7 to 18 inches: very gravelly loam
Bw2 - 18 to 27 inches: very gravelly sandy loam
C - 27 to 41 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 60 to 118 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F148XY021PA - Dry, Piedmont - felsic, Upland, Mixed Oak Heath / Oak-Pine Woodland
Hydric soil rating: No

PaC—Parker gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: y4wc
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Parker and similar soils: 97 percent
Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Parker

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 7 inches: gravelly loam
Bw - 7 to 20 inches: very gravelly sandy loam
C - 20 to 72 inches: very gravelly sandy loam
R - 72 to 157 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 60 to 118 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F148XY021PA - Dry, Piedmont - felsic, Upland, Mixed Oak Heath / Oak-Pine Woodland
Hydric soil rating: No

Minor Components

Gladstone

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

PaF—Parker gravelly loam, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: y53r
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Parker and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Parker

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

Ap - 0 to 9 inches: gravelly loam
Bw - 9 to 22 inches: very gravelly sandy loam
C - 22 to 72 inches: very gravelly sandy loam
R - 72 to 157 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: 60 to 118 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F148XY021PA - Dry, Piedmont - felsic, Upland, Mixed Oak Heath / Oak-Pine Woodland
Hydric soil rating: No

UugB—Urban land-Udorthents, schist and gneiss complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: pjny
Elevation: 200 to 2,000 feet
Mean annual precipitation: 35 to 55 inches
Mean annual air temperature: 45 to 61 degrees F
Frost-free period: 110 to 235 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 80 percent
Udorthents, schist and gneiss, and similar soils: 15 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Pavement, buildings and other artifically covered areas

Typical profile

C - 0 to 6 inches: variable

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 10 to 99 inches to lithic bedrock
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Description of Udorthents, Schist And Gneiss

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Graded areas of schist and/or gneiss

Typical profile

Ap - 0 to 6 inches: loam

C - 6 to 40 inches: silty clay loam
R - 40 to 60 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 20 to 70 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

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

Minor Components

Glenelg

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Edgemont

Percent of map unit: 1 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Glenville

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Baile

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Hydric soil rating: Yes

Gladstone

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

UugD—Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: pjnz
Elevation: 200 to 2,000 feet
Mean annual precipitation: 35 to 55 inches
Mean annual air temperature: 45 to 61 degrees F
Frost-free period: 110 to 235 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 80 percent
Udorthents, schist and gneiss, and similar soils: 15 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Pavement, buildings and other artifically covered areas

Typical profile

C - 0 to 6 inches: variable

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 10 to 99 inches to lithic bedrock
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Description of Udorthents, Schist And Gneiss

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Graded areas of schist and/or gneiss

Typical profile

Ap - 0 to 6 inches: loam
C - 6 to 40 inches: silty clay loam
R - 40 to 60 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 20 to 70 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 60 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

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

Minor Components

Edgemont

Percent of map unit: 1 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Glenville

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Baile

Percent of map unit: 1 percent
Landform: Depressions
Landform position (two-dimensional): Footslope

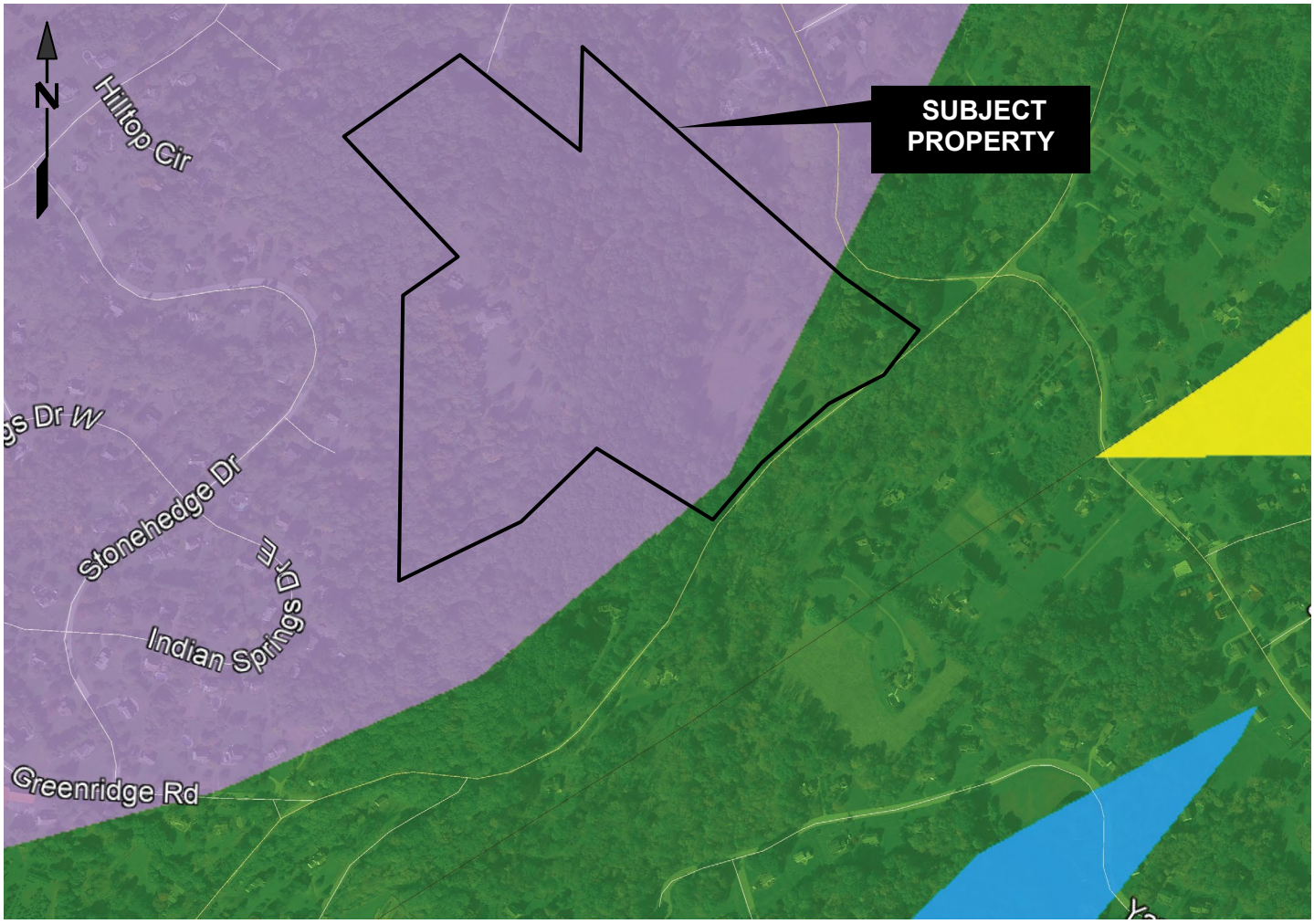
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Gladstone

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Glenelg

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No



Notes:

1) **Green Shading** (eastern corner of subject property)**:** Precambrian graphitic felsic gneiss, includes Pickering Gneiss and small areas of marble; dominantly quartz and feldspar with varying amounts of graphite and various metamorphic minerals; medium grained, light to dark gray and greenish gray.
2) **Purple Shading:** Precambrian, graphitic felsic gneiss, medium grained, medium to dark gray; locally gneissic, predominantly feldspar and quartz.
3) **Blue Shading:** Precambrian banded mafic gneiss, dark, fine to medium grained; includes arocks of probable sedimentary origin.
4) **Yellow Shading:** Chickies Formation, light-gray, hard, massive, scolithus-bearing quartzite and quartz schist; thin, interbedded dark slate at top; conglomerate.
5) Base map obtained from Google Earth 2021.
    i. Horton, J.D., C.A. San Juan, and D.B. Stoeser, 207, The State Geologic Map Compilation (SGMC) geodatabase of the continuous United States: U.S. Geological Survey Data Series 1052.

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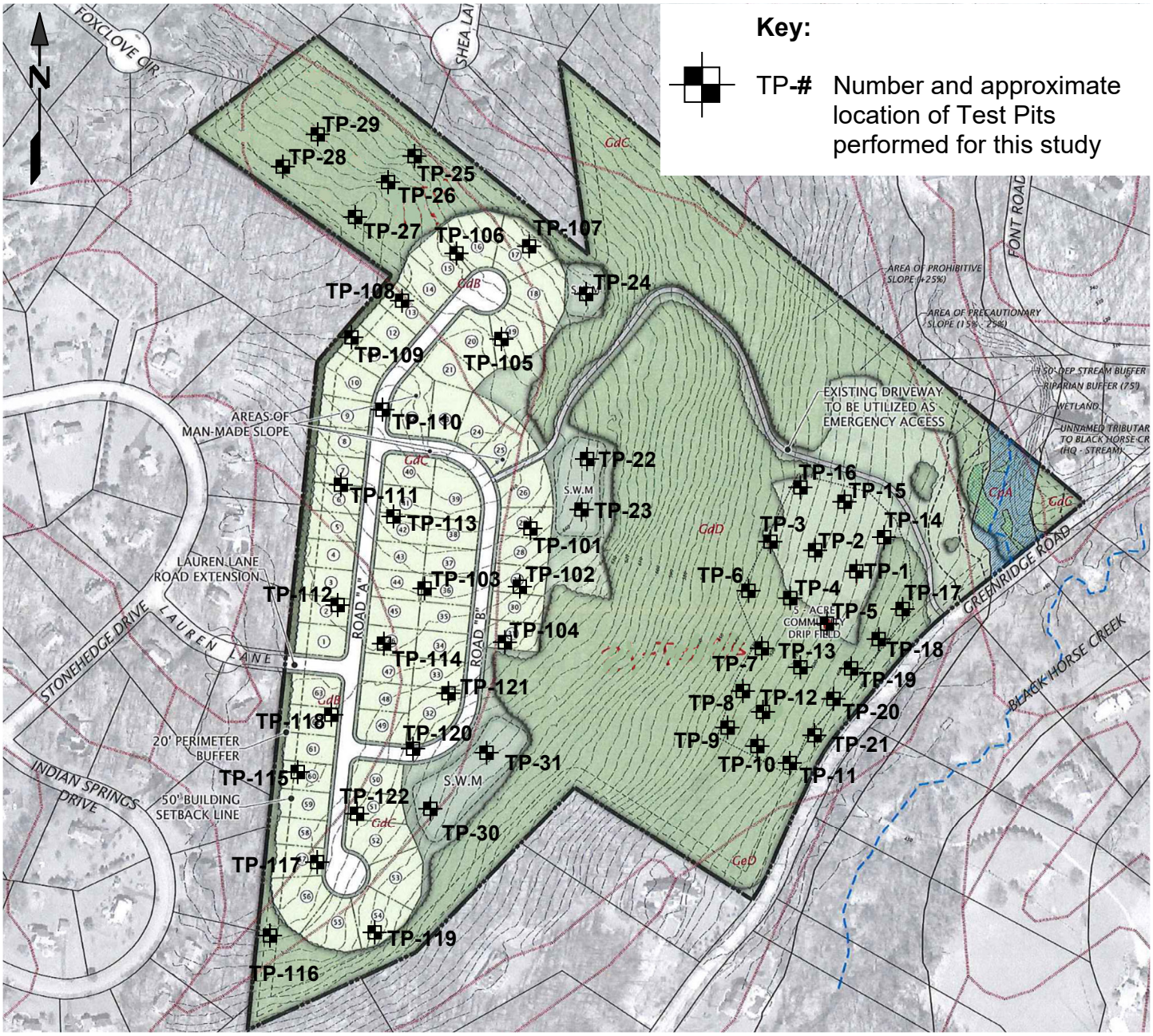
SITE GEOLOGY MAP

GREENRIDGE ROAD

CHESTER COUNTY, PA

SCALE	DATE	DRAWN BY	REVIEW BY	JOB NO.	FIGURE NO.
NTS	JUN 2021	MDF	MWD	31210993	2



Notes: (1) Layout was obtained from a drawing titled "Green Ridge Road Property" prepared by ESE Planning, dated June 4, 2021
(2) Exploration Location Plan should be read together with GTA Report, Job No. 31210993 for complete evaluation.

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EXPLORATION LOCATION MAP

GREENRIDGE ROAD

CHESTER COUNTY, PA

SCALE	DATE	DRAWN BY	REVIEW BY	JOB NO.	FIGURE:
NTS	JUN 2021	MDF	MWD	31210993	1

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SUMMARY OF INFILTRATION TEST RESULTS

Greenridge Road Property
100 Greenridge Road, Uwachlan Township, Pennsylvania
GTA Project Number: 31210993

(09/25&26/2019)

Infiltration Test Number	Ground Surface Elevation (ft)	Infiltration Test Elevation (ft)	Infiltration Test Depth (ft)	Final Recorded Rate (in/hr)	Subgrade Soils Description
TP-22	664	664	0.0	4.0	Gladstone
TP-23	656	654	2.0	1.75	Annandale
TP-24	665	664	1.0	7.25	Gladstone
TP-30	617	614	3.0	11.63	Gladstone
TP-31	627	622	5.0	2.0	Gladstone

NOTES:

- Infiltration testing performed using double ring infiltrometers per the Pennsylvania *Stormwater BMP Manual*, dated 2006.
- A one-hour presoak was performed prior to starting the infiltration testing.
- The infiltration test locations were field-located by GTA on the day of the exploration.
- The infiltration elevations are based on the topographical contours on the *Sketch Plan* provided by ESE Planning dated June 6, 2021.
- A minimum safety factor of 2.0 is recommended for design purposes.

GTA Representative: C. Limbert

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TEST PIT LOG: TP-1

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 4 to 6 %
LANDSCAPE POSITION: Backslope/footslope
COVER: Grass
DATUM: Topo
ELEVATION: 502

SOIL TYPE: Califon Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: X Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-8	10YR 3/4	Loam	Granular	Friable			Topsoil
B t	8-24	7.5YR 5/6	Loam	Subangular Blocky	Friable			Colluvium
B t	24-36	7.5YR 4/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B C	36-55	10YR 4/4	Clay Loam	Angular Blocky	Friable			Residual
C	55-72	10YR 5/6	Stoney Loam	Massive	Firm			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth: 12 & 36 inches
Final Raw Infiltration Rate (in/hr): 1.0 & 0.5 inches

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TEST PIT LOG: TP-2

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Grass
DATUM: Topo
ELEVATION: 520

SOIL TYPE: Califon Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: X Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-8	10YR 3/4	Loam	Granular	Friable			Topsoil
B w	8-20	10YR 5/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t	20-30	10YR 5/6	Gravelly Loam	Prismatic	Friable			Colluvium
B tx	30-38	10YR 6/3	Stoney Silt Loam	Platy	Firm			Colluvium
B C	38-57	10YR 5/6	Stoney Silt Loam	Prismatic	Very Firm	FD	Redox Depletions	Residual
C	57-72	10YR 5/8	Silty Clay	Massive	Firm			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-3

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 8 to 10%
LANDSCAPE POSITION: Backslope
COVER: Grass
DATUM: Topo
ELEVATION: 538

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: X Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-6	7.5YR 4/3	Loam	Granular	Very Friable			Topsoil
A w	6-16	10YR 5/4	Cobbly Loam	Granular	Friable			Colluvium
B t1	16-24	7.5YR 5/6	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t2	24-36	7.5YR 5/4	Gravelly Fine Sandy Loam	Subangular Blocky	Friable			Colluvium
B C	36-56	7.5YR 6/8	Stoney Sandy Loam	Platy	Firm			Residual
C	56-72	10YR 5/6	Gravelly Coarse Sandy Loam	Massive	Firm			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-4

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 522

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-6	7.5YR 4/3	Loam	Granular	Very Friable			Topsoil
A B	6-8	7.5YR 5/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t1	8-16	10YR 5/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t2	16-24	10YR 5/6	Gravelly Clay Loam	Subangular Blocky	Firm			Colluvium
B tx	24-44	10YR 6/8	Clay Loam	Platy	Firm			Colluvium
B Cx	44-58	7.5YR 5/6	Cobbly Silty Clay Loam	Platy	Very Firm	CD	Redox Depletions	Colluvium
C	58-78	5YR 5/6	Fine Sandy Clay Loam	Massive	Friable	FF	Redox Depletions	Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 78 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-5

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Grass
DATUM: Topo
ELEVATION: 502

SOIL TYPE: Califon Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained:
Mod. Well-Drained: X
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-6	10YR 4/3	Loam	Granular	Very Friable			Topsoil
B A	6-12	10YR 5/6	Cobbly Loam	Subangular Blocky	Friable			Colluvium
B t	12-24	7.5YR 5/6	Gravelly Loam	Angular Blocky	Friable			Colluvium
B tx	24-38	7.5YR 6/8	Cobbly Clay Loam	Platy	Firm			Colluvium
B C	38-60	7.5YR 5/8	Gravelly Sandy Clay Loam	Angular Blocky	Friable			Residual
C	60-78	10YR 7/3	Gravelly Sandy Loam	Massive	Friable			Residual
C r	78							Weathered Rock

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated on weathered bedrock at a depth of about 78 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-6

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 8 to 10%
LANDSCAPE POSITION: Shoulder/backslope
COVER: Forested
DATUM: Topo
ELEVATION: 542

SOIL TYPE: Califon Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: X Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES	COMMENTS
O e	0-4	10YR 2/1					Organic Matter
A	4-6	7.5YR 3/2	Loam	Granular	Friable		Topsoil
B w1	6-12	7.5YR 5/4	Gravelly Loam	Subangular Blocky	Friable		Colluvium
B w2	12-24	7.5YR 4/4	Fine Sandy Loam	Subangular Blocky	Friable		Colluvium
B t	24-41	7.5YR 5/6	Cobbly Sandy Loam	Prismatic	Firm		Colluvium
B C	41-55	10YR 7/3	Coarse Sandy Loam	Platy	Firm		Residual
C r	55-72	10YR 7/4	Channery Sandy Loam	Massive	Friable		Weathered Rock
R	72						Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 72 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-7

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 526

SOIL TYPE: Califon Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained:
Mod. Well-Drained: X
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-4	10YR 4/3	Loam	Granular	Very Friable			Topsoil
B A	4-12	7.5YR 5/4	Cobbly Loam	Granular	Friable			Colluvium
B t	12-24	10YR 5/6	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B tx	24-44	10YR 5/4	Clay Loam	Platy	Firm			Colluvium
C	44-56	10YR 4/3	Channery Sandy Loam	Massive	Friable			Residual
C r	56-72	10YR 7/3	Stoney Sandy Loam	Massive	Friable			Weathered Rock
R	72							Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 72 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-8

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 524

SOIL TYPE: Califon Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained:
Mod. Well-Drained: X
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-6	10YR 4/3	Loam	Granular	Very Friable			Topsoil
A B	6-12	10YR 4/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t1	12-24	7.5YR 5/4	Cobbly Loam	Subangular Blocky	Friable			Colluvium
B t2	24-36	7.5YR 5/6	Loam	Subangular Blocky	Friable			Colluvium
B tx	36-51	7.5YR 5/8	Cobbly Clay Loam	Platy	Firm			Residual
C	51-72	10YR 5/4	Cobbly Sandy Loam	Massive	Friable			Residual
R	72							Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 72 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-9

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 8 to 10%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 520

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-3	10YR 2/1						Organic Matter
B E	3-8	10YR 5/2	Loam	Granular	Friable			Colluvium
B t1	8-22	7.5YR 4/4	Loam	Subangular Blocky	Friable			Colluvium
B t2	22-36	7.5YR 5/6	Gravelly Clay Loam	Subangular Blocky	Friable			Colluvium
C 1	36-56	10YR 5/4	Fine Sandy Loam	Massive	Friable	FD	Redox Concentrations	Residual
C 2	56-72	10YR 7/3	Fine Sandy Loam	Massive	Firm			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-10

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 504

SOIL TYPE: Califon Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: X Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A p	0-6	10YR 4/3	Loam	Granular	Very Friable			Topsoil
A B	6-12	10YR 5/4	Cobbly Loam	Granular	Friable			Colluvium
B t1	12-24	7.5YR 5/4	Loam	Subangular Blocky	Friable			Colluvium
B t2	24-34	10YR 5/4	Clay Loam	Subangular Blocky	Firm			Colluvium
B tx	34-56	5YR 5/6	Stoney Loam	Platy	Firm	FD	Redox Concentrations	Residual
C	56-72	5YR 5/1	Stoney Sandy Loam	Massive	Firm			Residual
C r	72							Weathered Rock

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated on weathered bedrock at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-11

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 6 to 8%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 490

SOIL TYPE: Califon Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: X Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES	COMMENTS
O e	0-4	10YR 2/1					Organic Matter
A B	4-10	10YR 4/3	Loam	Granular	Friable		Colluvium
B t1	10-20	10YR 5/6	Gravelly Loam	Subangular Blocky	Friable		Colluvium
B t2	20-40	10YR 6/3	Gravelly Clay Loam	Subangular Blocky	Friable		Colluvium
B C	40-55	10YR 5/4	Loam	Platy	Firm		Colluvium
C	55-72	10YR 5/6	Cobbly Sandy Clay Loam	Massive	Firm		Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-12

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 4 to 6%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 506

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-2	10YR 2/1						Organic Matter
A B	2-6	10YR 4/3	Gravelly Loam	Granular	Friable			Colluvium
B w	6-20	7.5YR 5/6	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t1	20-36	7.5YR 5/8	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t2	36-53	7.5YR 5/4	Cobbly Clay Loam	Angular Blocky	Firm			Colluvium
C	53-66	10YR 5/8	Cobbly Sandy Loam	Massive	Friable			Residual
R	66							Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 66 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 66 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-13

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/07/2021
DATE COMPLETED: 06/07/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 4 to 6%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 504

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-2	10YR 2/1						Organic Matter
A B	2-10	10YR 4/3	Loam	Granular	Friable			Colluvium
B t1	10-24	7.5YR 5/6	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t2	24-36	7.5YR 4/4	Gravelly Clay Loam	Angular Blocky	Firm			Colluvium
C 1	36-55	10YR 5/4	Gravelly Sandy Loam	Massive	Friable			Residual
C 2	55-66	10YR 5/8	Cobbly Loam	Massive	Firm			Residual
R	66							Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 66 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 66 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-14

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 5-8%
LANDSCAPE POSITION: Backslope
COVER: Open Field
DATUM: Topo
ELEVATION: 494

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep: X
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-6	10YR 3/6	Bouldery Loam	Subangular Blocky	Very Friable			Topsoil
A B	6-14	10YR 4/4	Stoney Loam	Subangular Blocky	Friable			Colluvium
B t1	14-26	10YR 4/6	Cobbly Loam	Angular Blocky	Friable			Colluvium
B t2	26-49	7.5YR 4/6	Cobbly Loam	Subangular Blocky	Friable			Colluvium
B t3	49-74	7.5YR Loam	Cobbly Silty Clay Loam	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 74 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-15

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 8-12%
LANDSCAPE POSITION: Backslope
COVER: Open Field
DATUM: Topo
ELEVATION: 512

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep: X
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-6	10YR 3/6	Gravelly Loam	Granular	Very Friable			Topsoil
B h	6-15	7.5YR 4/6	Gravelly Loam	Angular Blocky	Friable			Colluvium
B t1	15-46	7.5YR 5/6	Channery Loam	Subangular Blocky	Friable			Colluvium
B t2	46-60	10YR 5/6	Cobbly Clay Loam	Subangular Blocky	Friable	FD	Iron Depletions	Colluvium
B t3	60-69	10YR 5/6	Cobbly Silty Clay Loam	Subangular Blocky	Friable	FD	Iron Depletions	Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 69 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-16

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 8-12%
LANDSCAPE POSITION: Backslope
COVER: Open Field
DATUM: Topo
ELEVATION: 530

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: X Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: X Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-6	7.5YR 3/4	Loam	Subangular Blocky	Friable			Topsoil
B w	6-18	7.5YR 5/6	Sandy Loam	Angular Blocky	Friable			Colluvium
C	18-56	7.5YR 5/8	Gravelly Loamy Sand	Single Grain	Loose			Colluvium

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 56 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-17

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 3-5%
LANDSCAPE POSITION: Backslope/Footslope
COVER: Forested
DATUM: Topo
ELEVATION: 476

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep: X
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-6	7.5YR 3/4	Gravelly Loam	Granular	Very Friable			Topsoil
A B	6-13	7.5YR 4/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t	13-33	7.5YR 4/6	Cobbly Loam	Subangular Blocky	Friable			Colluvium
B t2	33-55	5YR 4/6	Cobbly Sandy Clay Loam	Subangular Blocky	Friable			Colluvium
C	55-71	7.5YR 4/6	Cobbly Sandy Clay Loam	Subangular Blocky	Very Friable			Colluvium

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 71 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-18

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 3-5%
LANDSCAPE POSITION: Backslope/Footslope
COVER: Forested
DATUM: Topo
ELEVATION: 484

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep: X
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained:
Mod. Well-Drained: X
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-4	7.5YR 2.5/2	Gravelly Loam	Granular	Very Friable			Topsoil
A B	4-10	7.5YR 4/4	Gravelly Loam	Angular Blocky	Friable			Colluvium
B t1	10-33	7.5YR 4/6	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t2	33-54	7.5YR 5/6	Gravelly Clay Loam	Subangular Blocky	Friable			Colluvium
C	54-72	7.5YR 5/8	Channery Loam	Subangular Blocky	Very Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-19

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 3-5%
LANDSCAPE POSITION: Backslope/Footslope
COVER: Forested
DATUM: Topo
ELEVATION: 486

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep: X
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-4	7.5YR 3/4	Gravelly Silt Loam	Granular	Very Friable			Topsoil
A B	4-10	7.5YR 4/4	Gravelly Loam	Angular Blocky	Friable			Colluvium
B t1	10-32	7.5YR 4/6	Gravelly Silt Loam	Subangular Blocky	Friable			Colluvium
B t2	32-61	7.5YR 5/6	Cobbly Silt Loam	Subangular Blocky	Friable			Colluvium
B t3	61-74	7.5YR 4/6	Cobbly Sandy Clay Loam	Subangular Blocky	Friable			Colluvium

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 74 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-20

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 4 to 6%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 490

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-4	10YR 2/1						Organic Matter
A B	4-12	10YR 3/4	Gravelly Loam	Granular	Friable			Colluvium
B t1	12-28	7.5YR 5/6	Loam	Subangular Blocky	Friable			Colluvium
B t2	28-42	7.5YR 5/4	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B C	42-66	7.5YR 4/4	Gravelly Clay Loam	Subangular Blocky	Firm			Residual
C	66-84	7.5YR 5/3	Sandy Loam	Massive	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 84 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-21

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #1
SLOPE: 4 to 6%
LANDSCAPE POSITION: Backslope
COVER: Forested
DATUM: Topo
ELEVATION: 490

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-2	10YR 2/1						Organic Matter
B E	2-8	10YR 4/3	Gravelly Loam	Granular	Friable			Colluvium
B w	8-20	7.5YR 5/4	Loam	Subangular Blocky	Friable			Colluvium
B t1	20-32	7.5YR 5/6	Gravelly Loam	Subangular Blocky	Friable			Colluvium
B t2	32-45	7.5YR 4/4	Clay Loam	Angular Blocky	Firm			Colluvium
C 1	45-58	7.5YR 5/6	Cobbly Clay Loam	Massive	Friable			Residual
C 2	58-72	10YR 7/3	Gravelly Loam	Massive	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-22

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Maxwell Coniglio
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Open Stormwater Basin
SLOPE: 8 to 10%
LANDSCAPE POSITION: Hill summit/shoulder
COVER: Forested
DATUM: Topo
ELEVATION: 664

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: X Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-2	10YR 2/1						Organic Matter
A B	2-16	7.5YR 4/3	Bouldery Sandy Loam	Granular	Very Friable			Residual
B w	16-32	10YR 5/4	Cobbly Loam	Massive	Friable			Residual
C r	32-48	10YR 5/6	Channery Loam	Massive	Friable			Weathered Rock
R	48							Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 48 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 48 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth: N/A
Performed Infiltration Depth: At the existing ground surface
Final Raw Infiltration Rate (in/hr): 4.0

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TEST PIT LOG: TP-23

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Maxwell Coniglio
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Open Stormwater Basin
SLOPE: 6 to 8%
LANDSCAPE POSITION: Hill summit/shoulder
COVER: Forested
DATUM: Topo
ELEVATION: 656

SOIL TYPE: Annandale Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained: X
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-2	10YR 2/1						Organic Matter
A B	2-6	7.5YR 3/2	Gravelly Sandy Loam	Granular	Friable			Colluvium
B t1	6-18	7.5YR 5/6	Loam	Subangular Blocky	Friable			Colluvium
B t2	18-36	7.5YR 4/4	Gravelly Sandy Clay Loam	Subangular Blocky	Firm			Residual
B C	36-55	7.5YR 5/4	Channery Sandy Loam	Massive	Friable			Residual
C	55-84	7.5YR 4/3	Channery Sandy Loam	Massive	Firm			Residual
R	84							Bedrock

NOTES: The ground surface elevation should be considered approximate. Bucket refusal on bedrock was encountered at a depth of about 84 inches below the existing ground surface.

Soil Features:
Bedrock Depth: 84 inches
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth: N/A
Performed Infiltration Depth: 24 inches
Final Raw Infiltration Rate (in/hr): 1.75

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TEST PIT LOG: TP-24

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Open Stormwater Basin
SLOPE: 3-5%
LANDSCAPE POSITION:
COVER: Forest
DATUM: Topo
ELEVATION: 665

SOIL TYPE: Gladstone Series

SOIL DEPTH CLASS:
Very Deep:
Deep:
Moderately Deep:
Shallow:

SOIL DRAINAGE CLASS:
Well-Drained:
Mod. Well-Drained:
Somewhat Poorly-Drained:
Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O a	0-2	7.5YR 2.5/1		Granular	Very Friable			Organic Matter
B h	2-7	7.5YR 3/4	Channery Loam	Angular Blocky	Friable			Residual
B t1	7-19	7.5YR 4/6	Cobbly Loam	Subangular Blocky	Very Friable			Residual
B t2	19-38	7.5YR 5/6	Stoney Silt Loam	Subangular Blocky	Friable			Residual
B t3	38-72	7.5YR 5/8	Stoney Sandy Clay Loam	Subangular Blocky	Very Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth: N/A
Performed Infiltration Depth: 1
Final Raw Infiltration Rate (in/hr): 7.25

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TEST PIT LOG: TP-25

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #2
SLOPE: 5-8%
LANDSCAPE POSITION:
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 665

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O a	0-3	7.5YR 3/4			Very Friable			Organic Matter
B h	3-12	7.5YR 4/4	Stoney Loam	Angular Blocky	Friable			Residual
B t1	12-32	7.5YR 5/6	Stoney Silt Loam	Subangular Blocky	Very Friable			Residual
B t2	32-72	7.5YR 5/8	Bouldery Sandy Clay Loam	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 72 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-26

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #2
SLOPE: 5-8%
LANDSCAPE POSITION:
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 695

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O a	0-3	7.5YR 2.5/2			Very Friable			Organic Matter
B h	3-16	7.5YR 4/3	Stoney Loam	Angular Blocky	Friable			Residual
B t1	16-32	7.5YR 5/8	Stoney Silty Clay Loam	Subangular Blocky	Very Friable			Residual
B t2	32-42	7.5YR 5/6	Bouldery Sandy Loam	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 42 inches below the existing ground surface, machine refusal on a boulder.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-27

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #2
SLOPE: 5-8%
LANDSCAPE POSITION:
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 705

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O e	0-2	7.5YR 2.5/1		Granular	Very Friable			Organic Matter
B A	2-6	7.5YR 4/4	Stoney Loam	Angular Blocky	Friable			Residual
B t1	6-28	7.5YR 5/6	Stoney Sandy Loam	Subangular Blocky	Friable			Residual
B t2	28-43	7.5YR 5/6	Bouldery Sandy Clay Loam	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 43 inches below the existing ground surface, machine refusal on a boulder.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-28

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #2
SLOPE: 5-8%
LANDSCAPE POSITION:
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 705

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O a	0-5	7.5YR 2.5/1		Granular	Very Friable			Organic Matter
B h	5-14	7.5YR 4/4	Stoney Sandy Loam	Angular Blocky	Friable			Residual
B t1	14-22	7.5YR 5/6	Stoney Sandy Loam	Subangular Blocky	Friable			Residual
B t2	22-62	7.5YR 5/8	Bouldery Loamy Sand	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 62 inches below the existing ground surface.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-29

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Drip irrigation field #2
SLOPE: 5-8%
LANDSCAPE POSITION:
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 687

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
O a	0-3	7.5YR 2.5/1	Stoney	Granular	Very Friable			Organic Matter
A B	3-6	7.5YR 4/3	Stoney Sandy Loam	Granular	Friable			Residual
B h	6-16	7.5YR 5/8	Stoney Loamy Sand	Subangular Blocky	Friable			Residual
B t	16-49	7.5YR 5/6	Bouldery Sandy Clay Loam	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 49 inches below the existing ground surface, machine refusal on a boulder.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth:
Performed Infiltration Depth:
Final Raw Infiltration Rate (in/hr):

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TEST PIT LOG: TP-30

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Open Stormwater Basin
SLOPE: 1-3%
LANDSCAPE POSITION: Backslope
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 617

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: X Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: X Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:

PARENT MATERIAL: Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-5	7.5YR 2.5/1	Stoney Silt Loam	Granular	Very Friable			Topsoil
B t	5-24	7.5YR 5/8	Stoney Sandy Clay Loam	Subangular Blocky	Friable			Colluvium
C	24-60	7.5YR 4/4	Stoney Loamy Sand	Subangular Blocky	Friable			Colluvium
C r	60-84	7.5YR 5/6	Bouldery Loamy Sand	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 84 inches below the existing ground surface, machine refusal on a boulder.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth: N/A
Performed Infiltration Depth: 36 inches
Final Raw Infiltration Rate (in/hr): 11.63

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TEST PIT LOG: TP-31

PROJECT NAME: 100 Greenridge Road
PROJECT NUMBER: 31210993
PROJECT LOCATION: Upper Uwchlan Township, Chester County, Pennsylvania
CLIENT: Toll Bros. Inc.
LOGGED BY: Colleen Limbert
CHECKED BY: Michael Derr

CONTRACTOR: Broad Excavating
EQUIPMENT: Komatsu PC120
DATE STARTED: 06/08/2021
DATE COMPLETED: 06/08/2021

TEST LOCATION: Open Stormwater Basin
SLOPE: 3-5%
LANDSCAPE POSITION: Backslope
COVER: Heavily Forested
DATUM: Topo
ELEVATION: 627

SOIL TYPE: Gladstone Series	**SOIL DEPTH CLASS:** Very Deep: Deep: Moderately Deep: Shallow:	**SOIL DRAINAGE CLASS:** Well-Drained: Mod. Well-Drained: Somewhat Poorly-Drained: Poorly-Drained:	**PARENT MATERIAL:** Granitic Gneiss

HORIZON	DEPTH (in.)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE	REDOX FEATURES		COMMENTS
A	0-4	7.5YR 2.5/1	Stoney	Granular	Very Friable			Topsoil
B t	4-36	7.5YR 5/6	Stoney Sandy Loam	Subangular Blocky	Friable			Colluvium
C r	36-96	7.5YR 5/8	Stoney Loamy Sand	Subangular Blocky	Friable			Residual

NOTES: The ground surface elevation should be considered approximate. The test pit was terminated at a depth of about 49 inches below the existing ground surface, machine refusal on a boulder.

Soil Features:
Bedrock Depth: N/E
Groundwater Seeps: Dry

Infiltration Results:
Proposed Infiltration Depth: N/A
Performed Infiltration Depth: 60 inches
Final Raw Infiltration Rate (in/hr): 2.0

SECTION 9
Drainage Plans