

DEVELOPMENT NARRATIVE

TROUTBECK FARM

WILLISTOWN TOWNSHIP, CHESTER COUNTY, PA.

Prepared by

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INTRODUCTION

This report is written to summarize the development potential of Troutbeck Farm, located in Willistown Township, Chester County, PA. This analysis first evaluates the development potential in terms of yield analysis based on net developable area. It then presents a evaluation of the development potential based upon layout and resultant construction costs. The Plan layout was designed according to township requirements for area, bulk and setbacks, as well as percent protected land (no more than 50%). The road geometry was delineated according to the requirements set forth in the Subdivision and Land Development Code (Code). Since Willistown stormwater management regulations are extremely stringent, this was a critical element of this analysis. Finally, a schematic layout and sizing of Erosion and Sediment Controls (E&S) was developed per PADEP requirements. From these detailed design analyses, it is then possible to determine realistic quantities for developing the construction costs.

EXISTING CONDITIONS ANALYSIS

Land Cover and Soils

The site is located in the Piedmont Physiographic Province, and is underlain by Wissahickon Schist. This Pre-Cambrian formation is very deeply eroded, with solum depths exceeding 100 feet in many locations. The solum in this site is dominated by Manor and Glenelg soils. These soils are classified as Hydrologic Soil Group (HSG) B. Small inclusions of Worsham Soils (HSG D) lie along the riparian corridor that defines the western boundary of the project. There are no unusual aspects of the soils and geology in terms of runoff pollutants.

Presently, the site is partly existing meadow, partly cropped areas with several hedgerows planted by the owner to segregate these uses, and to provide screening along the perimeter to prevent visual impact to the neighbors. The central farm complex comprises and farmhouse, barn

and outbuildings. This area is also landscaped with specimen trees. The woodlands comprise a 7 acre woodlot along Forest Lane. Refer to Plan sheet 1 in Appendix A for more details on land cover. Figure 1 displays a geographical information system analysis of land cover, along with drainage areas.

Constraints

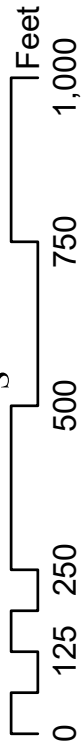
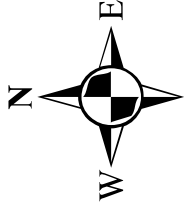
The Riparian Buffer Area (RBA) is defined as any stream, pond, or “area draining 15 acres”, from which a 100 foot setback is required. In addition, wetland and floodplains are to be accorded a 50 foot setback. No activities can take place in this setback, unless for stormwater management beyond Zone 1, which is 25 feet from the resource. Such uses must also be permitted by CU, which would be part of the overall CU review. The development plan anticipates such uses in the “area draining 15 acres” which is really not riparian in character, as it is only wet during runoff events, and has no defined channel. Even though its runoff will be completely diverted as a result of the plan and thus lose its RBA eligibility, the plan is developed to meet these requirements.

In addition to the township RBA requirements, the property is in the Ridley Creek watershed, classified as HQ. Since over an acre of disturbance is involved, an individual NPDES permit will also be required, and PADEP riparian buffer requirements also apply. In this case, the buffer extends an average 150 feet (between 135 and 165 ft.) from open waters only. The Plan has been designed to have minimal impact upon this buffer area, reducing the mitigation required for equivalency.

The precise edge of water that defines the RBA corridor has been surveyed, while any surrounding wetlands have been located, and also surveyed. A Wetlands Report and Bog Turtle Habitat Report have been conducted in support of these delineations. No Bog Turtle habitat exists on the property. The site discharges into an unnamed tributary of Ridley Creek, rated as a High Quality (HQ) stream, so Antidegradation Best Available Combinations of Technology (ABACT) conditions apply for sediment and erosion control measures.

In addition to the RBAs and woodland, there are also sections of steep slopes in the north central portion. None of these resources can comprise more than 50% of the lot area, eliminating most of these resources from developable lots. Plan sheet 1 displays the precise extent of these constraints throughout the property.

PRE-DEVELOPMENT DRAINAGE AREAS
TROUTBECK FARM
 Willistown Township, Chester Co., PA

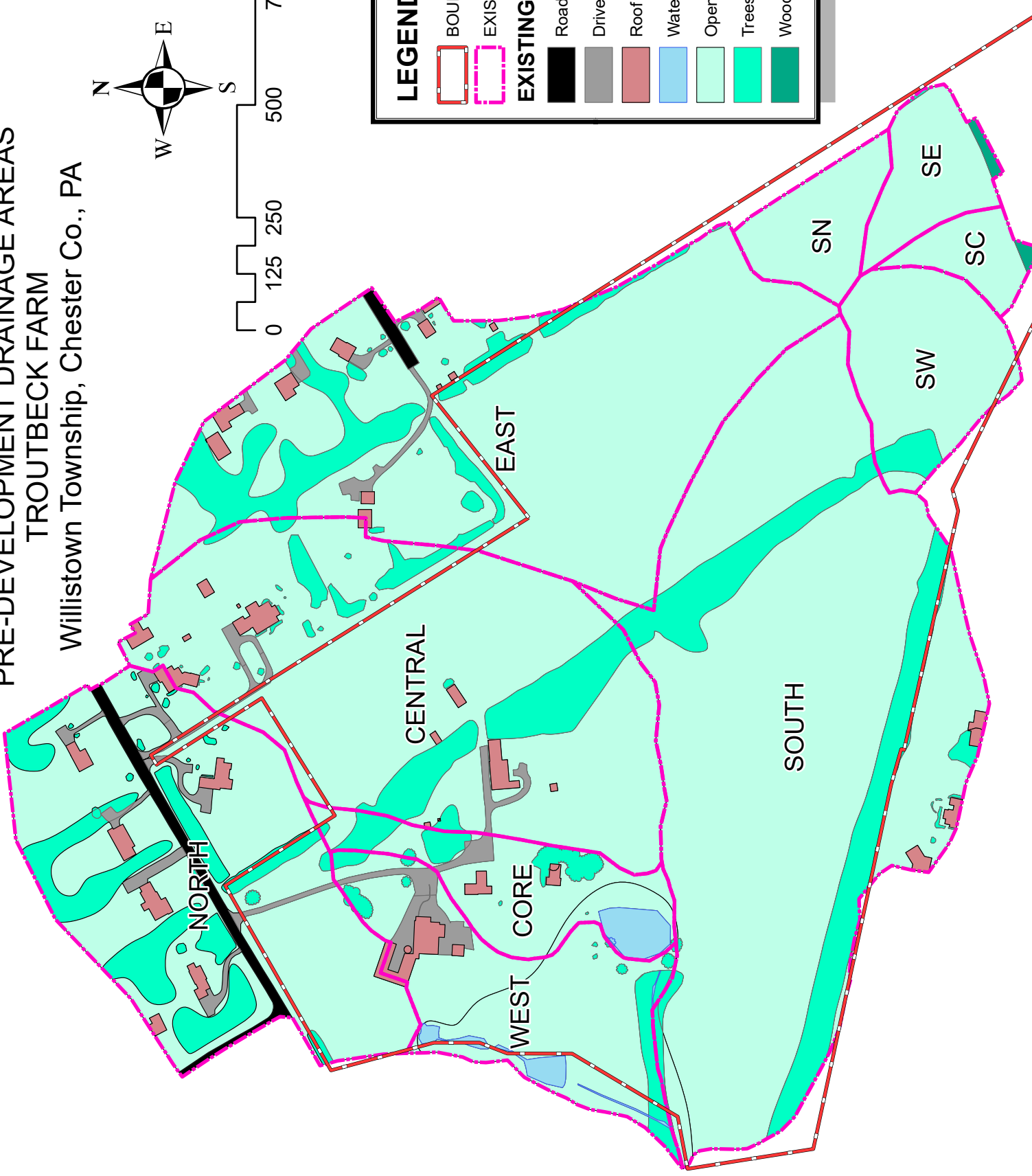


LEGEND

- BOUNDARY
- EXISTING DRAINAGE

EXISTING COVER

- Road
- Drive
- Roof
- Water
- Open
- Trees
- Woods



YIELD ANALYSIS

To obtain the developable acres, the area of these environmental constraints must be subtracted from the total tract area, partially or entirely depending upon resource. These constraints comprise the RBA setbacks, as well as steep slopes and woodlands. A geographical information system (GIS) was used to extract the extent of these constraints within the site. Table 1 presents the extent of these constraints, and how much of their area is to be deducted from the total tract area. In this case, the net lot acreage is 46.53 acres, which is rounded down to 46 lots net. From this area, the proposed right of way (R/W) area must be subtracted, yielding a net developable area of 42.2 acres, or a potential yield of 42 lots.

Table 1: Yield Analysis

YIELD ANALYSIS- TROUTBECK FARM				
TOTAL SITE AREA		acres	sq.ft.	
		62.08	2,704,333	
CONSERVATION ANALYSIS		Constrained Land (SF)		
Resource	Restriction	gross	net	
Riparian Area	100%	405,972	405,972	
Slopes 25%	100%	29,428	29,428	
Slopes 15%	50%	54,533	27,267	
Woodland	75%	286,679	215,010	
Trees	0%	249,189	0	
Total Resource Area		776,613	677,676	
Yield Analysis		acres	sq.ft.	
Net Site Area		46.53	2,026,656	
Net Lots Before R/W		46		
Lot Yield after R/W		42		

The by-right use of the tract is the cluster provision, which requires 75% open space, leaving only 15.52 acres for RW and lots. Assuming 3 acres for R/W, this results in 13,000 sq.ft. lots, which do not meet the minimum lot area of 15,000 sq.ft. Given the physical impossibility of these inherently contradictory zoning requirements, the only reasonable alternative is to develop as the 1 acre lots permitted according the R-1 Zoning District under Conditional Use (CU) Review. As this is such a critical element, it should be emphasized that any development will be subject to CU conditions imposed by the township.

DEVELOPMENT ANALYSIS

Proposed Activities

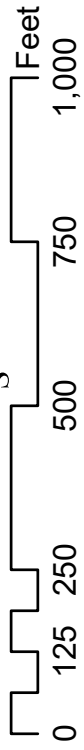
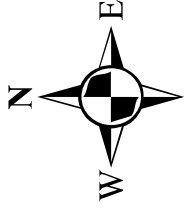
The proposed activities comprise building the roads, houses, stormwater facilities, and appurtenant infrastructure. Plan 4 displays the lot layout, Plan 5 displays the grading and layout of stormwater management, and Plan 6 displays schematic E&S controls. These activities and their extent of disturbance are set forth in detail in the Plans. Figure 2 displays the resultant changes in land cover, and drainage areas treated.

To reduce the impacts as much as possible, the layout of the subdivision and proposed improvements has been intended to minimize the extent and duration of land disturbance. Existing wetlands, waterways and actual drainage features are isolated from any disturbance. The extent of disturbance is purposefully limited to the minimum area needed to install the roads, driveways and buildings. By treating offsite runoff and infiltrating virtually all of the onsite runoff during the 2-year event, the site is essentially non discharging, so there will be no thermal impacts. In fact, the proposed development will actually improve the hydrology and water quality discharged from the site.

As defined by Limits of Disturbance, these measures preserve the integrity of stream channels and maintain and protect the physical, biological and chemical qualities of the receiving stream, prevent an increase in the rate of stormwater runoff, minimize any increase in stormwater runoff volume, minimize impervious areas, maximize the protection of existing drainage features and existing vegetation, minimize land clearing and grading, minimize soil compaction and utilize other structural or nonstructural BMPs that prevent or minimize changes in stormwater runoff.

There are minor unavoidable impacts to the existing PADEP 150 foot buffer, as well as the township RBA. However, these impacts are entirely mitigated by the proposed BMPs in this submission. These BMPs conserve the riparian buffers, minimize the disturbed area, protect sensitive/special value features, and protect/utilize natural drainage features. As a result, this project will preserve the integrity of stream channels and protect the physical, chemical and biological qualities of the receiving stream. It does not increase the rate or volume of runoff, in fact substantially decreasing both.

POST-DEVELOPMENT DRAINAGE AREAS
TROUTBECK FARM
 Willistown Township, Chester Co., PA

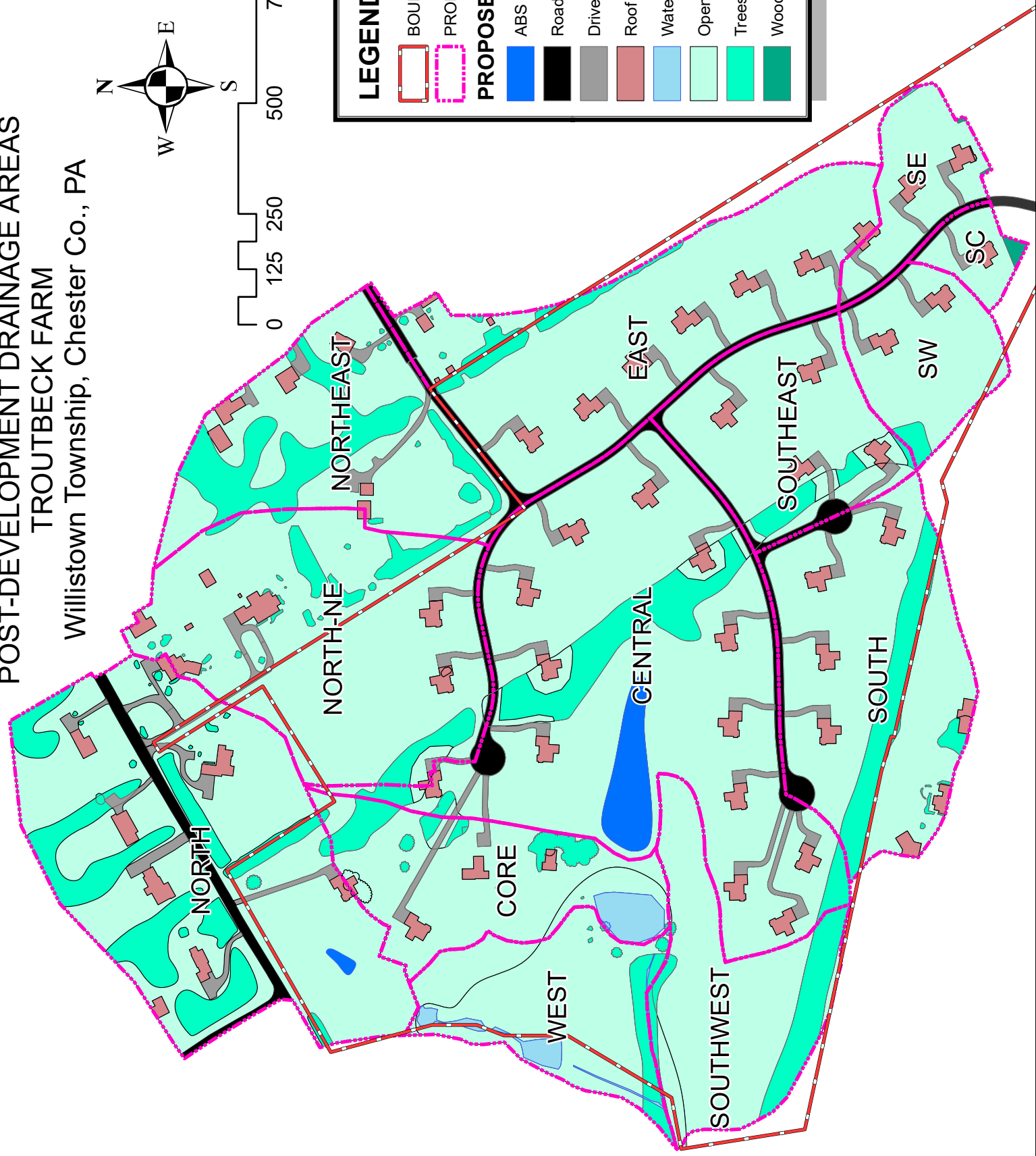


LEGEND

- BOUNDARY
- PROPOSED DRAINAGE

PROPOSED COVER

- ABS
- Road
- Drive
- Roof
- Water
- Open
- Trees
- Woods



Stormwater Runoff Management -Existing

The hydrology of the project included offsite runoff originating from Monument Road and from Friarsheel Lane. Together these offsite areas comprise 22.76 acres, of which 2.59 acres are impervious. This runoff defines much of the “drainage area over 15 acres” which imposes the RBA that runs through the center of the site. Onsite runoff contributes to this flow from the east, most of which bypasses the central pond. To the west, the runoff from the north directly enters another small pond and stream system. Most of the runoff from the core farmhouse complex passes into wetlands west of the central pond. Together, these flows converge as runoff exits the site as Point of Interest (POI) “W”. A small area discharges to the south as well. This is POI “SW”. Figure 1 displays the various subarea land covers and drainage areas. Plan sheet 2 displays the flow path information.

According to the CODE, onsite runoff land cover must be considered either woods or meadow, and 20% of the existing impervious must be considered meadow. Onsite runoff must then be controlled so that the 2- and 5-year event post development peak flows match the 1-year existing peak flow, and that the 10-year flow match the 2-year existing flows. Offsite runoff has no cover adjustment or peak flow reduction required.

Runoff is computed using TR-20 routines using the program HydroCAD®, with the composite curve numbers calculated to one decimal point to avoid rounding errors (the difference in runoff of a change of 1 CN can change results by several percent.) Directly connected impervious surfaces from offsite are routed separately from the offsite pervious surfaces, as they have much faster flow path parameters. This results in two separate subareas for offsite runoff. Sheet flow paths were restricted to a length of 100 feet per NRCS guidance. Pasture condition is used for meadow overland flow. The corresponding land cover, soils, and flow path information were then entered into HydroCAD®, and software using TR-20 routines to determine flow peaks and volumes. Appendix B presents the resultant GIS takeoffs of land covers for each subarea. The corresponding HydroCAD® entries are then shown, along with the resultant peak flows and volumes listed for the 1-, 2-, 5-, 10-, 25-, 50- and 100-year flows. Table 2 presents the resultant flows for the entire site, the flows only originating from offsite, and the required reductions for POI “W” and “SW”.

The relevant discharge criteria according to Section 73-37 G.(1) of the Willistown Code (Code) require that 1-, 2-, and 5-year flow peaks do not exceed the 1-year pre-development meadow peak, and that the 10-year flows do not exceed the 2-year pre-development meadow peak, and that higher flows match pre-development meadow peak flows. Volumes in the 1-year and 2-year events shall not increase. Per Section 37-73(A) (21) of the Code, offsite peak flow rates are not required to be reduced, just that they be safely conveyed through the site. Per Section 73-37 D.(3)(c), neither treatment of these flows nor reductions in their volumes from non-disturbed areas is required. Note that offsite flows and volumes are subtracted from total flows to obtain the onsite flows subject to the reductions listed above. These computations establish the target discharge criteria to be met by the project, as shown in bold italics.

TABLE 2: Existing Flows

POINT OF INTEREST "W"								
PRE-DEVELOPMENT ROUTING RESULTS								
NODE	PARAMETER	Type II 24 hour event						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
POI "W Overall"	Peak	10.29	19.68	45.01	70.88	92.28	118.94	155.31
	Volume	80,788	137,096	257,136	371,239	465,271	582,250	742,339
POI "W Offsite"	Peak	7.31	11.86	22.73	33.27	41.88	52.48	66.84
	Volume	43,605	66,158	111,728	153,668	187,610	229,409	286,016
POI "W Onsite"	Peak	2.98	7.82	22.28	37.61	50.40	66.46	88.47
	Volume	37,183	70,938	145,408	217,571	277,661	352,841	456,323
POA "W" DISCHARGE DESIGN CRITERIA								
POI "W"	Peak	<i>10.29</i>	<i>14.84</i>	<i>25.71</i>	<i>41.09</i>	<i>92.28</i>	<i>118.94</i>	<i>155.31</i>
	Volume	<i>80,788</i>	<i>137,096</i>	<i>257,136</i>	<i>371,239</i>	<i>465,271</i>	<i>582,250</i>	<i>742,339</i>
POINT OF INTEREST "SW"								
PRE-DEVELOPMENT RESULTS								
NODE	PARAMETER	Type II 24 hour event						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
POI "SW"	Peak	<i>0.14</i>	<i>0.67</i>	2.20	3.78	5.13	6.82	9.14
	Volume	1,732	3,768	8,415	13,010	16,861	21,716	28,435
POI "SW Offsite"	Peak	0.01	0.02	0.05	0.08	0.10	0.13	0.17
	Volume	41	81	168	251	319	404	521
POI "SW Onsite"	Peak	0.13	0.65	2.15	3.70	5.03	6.69	8.97
	Volume	1,691	3,687	8,247	12,759	16,542	21,312	27,914
POA "SW" DISCHARGE DESIGN CRITERIA								
POI "SW"	Peak	<i>0.14</i>	<i>0.15</i>	<i>0.18</i>	<i>0.73</i>	<i>5.13</i>	<i>6.82</i>	<i>9.14</i>
	Volume	<i>1,732</i>	<i>3,768</i>	<i>8,415</i>	<i>13,010</i>	<i>16,861</i>	<i>21,716</i>	<i>28,435</i>

Note how the reductions in flows at POI “W” in the 5- and 10-year events compared to virtually pristine conditions are quite extreme, being 87% in the 5-year event, and 79% in the 10-year event. Since there is minimal offsite runoff at POI “SW” to increase criteria, the reductions are 94% and 82%, respectively.

Stormwater Runoff Management -Proposed

The stormwater management approach for this project is to intercept and infiltrate the onsite impervious runoff at its source from roads, drives and houses. To accomplish this, a four foot wide shoulder and swale are proposed next to the road. The shoulder swale comprises 18 inches of bioretention media (25% porosity) overlying 11 inches of stone (40% porosity), for a total void depth of 16 inches. This volume is enough to treat 6.4 inches of runoff (over a 50-year event) for the contributing 10 foot wide roadway section (including flush curbs if desired). Since non-compacted, the infiltration rate is assumed at 0.5 in/hr. The house and driveways are to be porous pavement underlain by an average of 18 inches of stone providing 7.2 inches of storage. Most of the stone is to be placed next to the garage to intercept manifolded roof leaders. Since lightly compacted, the infiltration rate is assumed at 0.33 in/hr. Impermeable drain blocks are used at 4 inch fall intervals to eliminate lateral flow.

These measures essentially eliminate nearly all runoff from impervious surfaces except in the 100-year event, as well as their pollutant load. For these reasons, the swale media is an inexpensive sand/compost mix as recommended in the BMP manual. However, the remaining grass runoff must still be controlled, and reduced from its predevelopment meadow conditions by over an order of magnitude from its pre-development 5-year peak. Since this pervious runoff volume is quite low, its pollutant load is minimal. However, the considerable amount of runoff entering from Friarsheel Lane must also be addressed. To accomplish this, an Advanced Bioretention System (ABS) is used for state of the science treatment of runoff to the maximum extent possible.

The ABS is located within the outer 75 feet of the “area over 15 acres” RBA, as a permitted by CU application. Since the ABS intercepts all of the runoff that defines this “RBA” there is some question as to its relevance. Notwithstanding this, the ABS is designed to not require any special exceptions or variances for its location.

The storage-indication method is used for detention routing, with storage computed by the conic method. For underdrain and outlet pipe hydraulic routing, HydroCAD® calculates the entrance, exit, and friction losses in the outflow pipe as if it were a culvert. This procedure determines the hydraulic gradient inside the structure/stone. Standard orifice and weir flow equations are then applied to determine flows into the structure according to the difference in head across the orifices. HydroCAD® then matches the flows and hydraulic elevations at each time step to arrive at the computed routing through the structure.

Tailwater is accounted for by the use of the dynamic routing method, which carries tailwater from downstream structures through the system for each time step (0.002 hours in this report). As a result, the capacity of the conveyance system can be modeled more accurately than with computations that do not take into account the influence of downstream structures. This is particularly important in routing vertical flows through a bioretention system.

To represent ABS processes most realistically, it is necessary to disaggregate the various components so they can be modeled properly. As shown in the routing diagram in Appendix C, the system is subdivided into three nodes: a surface node (suffix -A), a Media node (suffix -B), a Stone Node (suffix -C), and an Outlet node (suffix -D). These represent the surface pond, the media, stone/underdrain/outlet system and outlet discharge structure, respectively.

For the ABS system, the surface node (-A) is modeled as the surface stage/area of the actual system. It is routed by standard level pool routing. Surface flows exit either by flow into the media, or by overflows conveyed via orifices and weirs directly to the outlet node. Infiltration is simulated by routing flow into the media as a series of orifices, which allows for differential head to increase flow rates in a manner simulating the infiltration dynamics of initially rapid flow, followed by flows controlled by the saturated media. This mimics the rapid infiltration of initially dry media that occurs before the system is saturated.

The media node is treated as detention structure with most of its elevation located below the surface node, albeit with a dummy column so that flows can be routed as if flowing horizontally between these nodes, even though they are actually vertical. Once the media node (-B) is saturated, the flows into and through the media are controlled by Darcy's Law. This is determined by applying the head upon the media to the saturated hydraulic conductivity of the media. This head represents the difference in elevation of the surface pond (which is in

equilibrium with the media as conveyed through the dummy orifice outlets) as opposed to the head within the stone. Divided by media depth, this computes the head loss needed for flows to pass through the media. HydroCAD® then simultaneously solves for the hydraulic grades needed to convey flows through the porous media.

Table 3 displays how flows are computed according to media hydraulic conductivity (Ksat), as applied across the effective depth of the media and multiplied by the effective flow area. Table 3 also computes the head loss for lateral flow through the stone to the underdrain, using the Hazen Equation to estimate stone Ksat. Losses are then allocated for these lateral flows in the same manner as they are computed for the vertical flows through the media. However, the flow paths are much longer, and the effective flow area is much less. The media porosity of 30% is 7% lower than the average porosity for silty sands which ranges from 25% to 49%. This reflects the presence of coir peat providing more available water capacity.

TABLE 3: Advanced Bioretention Design

MAIN ABS COMPUTATIONS	
DESIGN ASSUMPTIONS	
MEDIA POROSITY	0.30
MEDIA DEPTH-BOTTOM (D)(ft)	1.75
HYD. CONDUCTIVITY (in./hr.)	20.0
STONE DEPTH-BOTTOM (ft)	1.25
STONE POROSITY	0.45
AREA OF CELL (L) (sq.ft.)	21,534
LENGTH OF CELL (L) (ft.)	385.0
WIDTH OF CELL (L) (ft.)	55.9
ILM HYDROCAD ENTRIES	
MEDIA PARAMETERS	
UNIT FLOW RATE FULL (cfs)	9.969
DARCY FLOW COEFFICIENT	5.6968
UNDERDRAIN PARAMETERS	
NO. UNDERDRAINS	1
FLOW AREA (sq.ft.)	962.5
UNIT FLOW RATE (cfs)	284.20
DARCY FLOW COEFFICIENT	12.7029
NO.PERFORATIONS	4620
HAZEN LOSSES	
HAZEN COEFFICIENT	1
DIAMETER 10% (mm)	3
STONE KSAT (cm/hr)	32,400

Flows from the media then pass into the outlet node (-C). This comprises the underdrain stone, pipe and its perforations. The latter are evaluated to make sure that they do not control flows. The outlet configuration in the ABS system involves two outlets, in which the lower primary outlet (blue) is used to throttle flows for increased retention time, while the upper outlet (red) is used to convey peak flows through the media, reducing the amount of flows that would otherwise bypass if this outlet were not present. In this manner, retention times in the stone and media are almost 3 hours, greatly improving N retention. These treated flows are directed into the central pond, flushing out accumulated pollutants.

To reduce impacts upon the RBA, and to provide improved flow conditions, a level spreader is proposed to discharge the flows at grade. This comprises a 24-foot trench 3 feet wide, with a concrete lip to ensure level discharge. This is located 2 inches above adjacent ground. The sides are 3 inches higher than the lip, with adjacent grading raised to prevent discharge around the sides. Flows exit upward, and spread along the stone until they are high enough to overtop the lip. The reach below the lip (Middle) was modeled discretely to obtain its flow velocities and depths.

Details of the ABS design parameters are presented in the HydroCAD® summaries on Appendix C, with retention time in the media and stone highlighted. Due to its lowland setting, the infiltration rate was set at only 0.25 in./hr. Still, the composite retention time of system is well over 3 hours, which will reduce nitrogen (N) loading by keeping it in the soil profile where it can be metabolized. The notes for each node explain their parameters in more detail, and how they function. Figure 2 displays the GIS derived land cover and drainage areas.

A small detention basin is proposed for POI “SW”, largely to over-detain the pervious lawn runoff to a fraction of meadow conditions. It is located 15 feet away from the property line per the Code, and discharges through a level spreader. Runoff for the section of roadway running through the woodlands at the south will be treated by an over deep swale with check dams. In this way, no more disturbance is needed for installing the stormwater management facilities. This area was not explicitly routed in this initial feasibility analysis.

STORMWATER RUNOFF MANAGEMENT RESULTS

Table 2 presented the results of the predevelopment analysis. Table 4 compares the criteria at each POI to the resultant flows after this stormwater management approach. Table 4 displays how the design meets the required flow criteria, while substantially exceeding the volume reductions required. All post-development flow events meet the required discharge criteria. Discharges in the 2-year event are also well below the adjusted peak. The discharges in the larger events meet all applicable criteria.

TABLE 4: Post-development Routing Results

POINT OF INTEREST "W"								
NODE	PARAMETER	Type II 24 hour event						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
POA "W" DISCHARGE DESIGN CRITERIA								
POI "W"	Peak	<i>10.29</i>	<i>14.84</i>	<i>25.71</i>	<i>41.09</i>	<i>92.28</i>	<i>118.94</i>	<i>155.31</i>
	Volume	<i>80,788</i>	<i>137,096</i>	<i>257,136</i>	<i>371,239</i>	<i>465,271</i>	<i>582,250</i>	<i>742,339</i>
POST-DEVELOPMENT RESULTS								
NODE	PARAMETER	Type II 24 hour event						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
POI "W Overall"	Peak	7.05	11.91	25.23	40.77	56.62	95.80	151.25
	Volume	73,631	126,725	249,323	365,553	461,559	583,779	754,357
ABS Elevation		496.13	496.30	496.91	497.72	498.17	498.52	498.95
POINT OF INTEREST "SW"								
POA "SW" DISCHARGE DESIGN CRITERIA								
POI "SW"	Peak	<i>0.14</i>	<i>0.15</i>	<i>0.18</i>	<i>0.73</i>	<i>5.13</i>	<i>6.82</i>	<i>9.14</i>
	Volume	<i>1,732</i>	<i>3,768</i>	<i>8,415</i>	<i>13,010</i>	<i>16,861</i>	<i>21,716</i>	<i>28,435</i>
POST-DEVELOPMENT RESULTS								
NODE	PARAMETER	Type II 24 hour event						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
POI "W Overall"	Peak	0.03	0.07	0.18	0.73	2.15	4.57	7.71
	Volume	849	2,548	6,417	10,702	14,423	19,473	26,682
Pond Elevation		518.19	518.51	519.26	519.58	519.72	519.84	519.99

As summarized in Table 4, the permitted discharges at POI "W" and "SW" are met by the proposed design. Section 37-73(A) (18) of the Code requires that the 1-year event runoff volume from onsite be detained for 24 hours or infiltrated. As shown in Appendix C, the total infiltrated volume is 64,559 cu.ft. This is almost twice the runoff volume shown in Table 2, thus exceeding that criterion. Section 37-73(D) (3) (b)[1] of the Code states that the post-development volume in the 2-year event shall not exceed the pre-development volume. This

system exceeds that criterion as well. This means that Section 37-73(D) (3) (b)[2] of the Code requiring extended detention is inapplicable since infiltrated volumes are so high. In fact, the system would be classified as non-discharging since the infiltrated volume is more than the 2-year pre-development runoff volume. It is not until the 5-year event that onsite runoff volumes exceed that infiltrated. As a result, not only is onsite runoff essentially eliminated, a good portion of offsite runoff is reduced as well.

EROSION AND SEDIMENT CONTROLS

The approach used to address E&S controls was to divert as much runoff around the limit of disturbance (LOD) as possible. This involves the use of diversion dike/swales (D/S) above the LOD, and internal collection D/S to keep runoff from entering the RBA. Flows from offsite to the east are collected by part of the proposed stormwater pipe network, with the final pipe rerouted to discharge into the RBA. This resulted in an onsite disturbed drainage area of 25.2 acres. Plan sheet 6 displays the locations of the D/S and the sediment basin. POI “SW” would be treated with a sediment trap.

This drainage area would require a storage of 150,959 cu.ft. at 6,000 cu.ft./acre. As shown in Table 5, this volume would occur at elevation approximately 498.4. This leaves another 3.6 feet to meet the required spillway clearance, flow depth and final freeboard. This initial sizing computation completes this initial analysis of the potential development of Troutbeck Farm.

TABLE 5: Sediment basin Sizing

SEDIMENT BASIN STAGE			
EL.	AREA	STAGE	CUM.
495.00	41496	0	0
496.00	42500	41,997	41,997
497.00	43512	43,005	85,002
498.00	44529	44,020	129,022
499.00	45604	45,065	174,087
500.00	46655	46,129	220,215
501.00	47698	47,176	267,391
502.00	48766	48,231	315,622

COST ANALYSIS

Given that a realistic evaluation of development potential and the supporting infrastructure required, it is now possible to realistically determine site work costs. These costs presume that water will be provided by AquaAmerica, and the sewer treatment will be provided by East Goshen Township. Water mains are located at the end of Friarsheel Lane, and in Monument Avenue close to the site. It is presumed that a single feed from Friarsheel Lane would be adequate. Fire hydrants are spaced at no more than 600 feet intervals, per the NFPA.

Sewer would be managed by low pressure grinder pump systems with a common force main. This main would extend down Monument Road to the Willow Pond Subdivision. Located partly in Willistown and most in East Goshen, its sewage is treated by the East Goshen system. Willistown Township administers the collection of fees for the residents in the township. A similar arrangement would be applicable here. East Goshen Township has been approached, and is willing to provide sewage capacity for this subdivision. The water and sewer lines and force mains are shown on Plan sheet 4.

Given a precise and realistic layout of roads, water, sewer, stormwater management, and E&S controls, it is now possible to evaluate the likely cost of the improvements. Appendix D presents the cost of total site work improvements.

APPENDIX A

DEVELOPMENT PLANS

APPENDIX B

PRE-DEVELOPMENT STORMWATER COMPUTATIONS

Sum of AREA Row Labels	Column Labels			20% IMPERVIOUS ADJUSTMENTS		
	Imperv	Pervious	Grand Total	IMPERVIOUS	PERVIOUS	MEADOW
NORTH						
OFFSITE						
B						
Road	21,654		21,654	21,654	-	
Drive	22,221		22,221	22,221	-	
Roof	15,508		15,508	15,508	-	
Open		228,312	228,312	-	228,312	
Trees		93,417	93,417	-	93,417	
ONSITE						
B						
Drive	2,313		2,313	1,850	463	
Roof	1,689		1,689	1,352	338	
Open		102,771	102,771	-	102,771	103,572
Trees		10,412	10,412	-	10,412	
NORTH Total	63,385	434,913	498,298	62,585	435,713	
CENTRAL						
OFFSITE						
B						
Drive	5,246		5,246	5,246	-	
Roof	9,915		9,915	9,915	-	
Open		154,387	154,387	-	154,387	
Trees		21,449	21,449	-	21,449	
ONSITE						
B						
Drive	5,135		5,135	4,108	1,027	
Roof	6,059		6,059	4,848	1,212	
Open		354,281	354,281	-	354,281	356,520
Trees		60,586	60,586	-	60,586	
CENTRAL Total	26,356	590,702	617,058	24,117	592,941	
EAST						
OFFSITE						
B						
Road	5,488		5,488	5,488	-	
Drive	9,437		9,437	9,437	-	
Roof	11,070		11,070	11,070	-	
Open		186,238	186,238	-	186,238	
Trees		77,702	77,702	-	77,702	
ONSITE						
B						
Drive	1,556		1,556	1,245	311	
Roof	5		5	4	1	
Open		348,055	348,055	-	348,055	348,367
Trees		13,811	13,811	-	13,811	
EAST Total	27,555	625,807	653,362	27,243	626,119	
CORE						
OFFSITE						
B						
Open		1,825	1,825	-	1,825	
Trees		28	28	-	28	
ONSITE						
B						
Drive	4,530		4,530	4,530	-	
Roof	3,240		3,240	3,240	-	
Open		69,758	69,758	-	69,758	
Trees		21,955	21,955	-	21,955	
D						
Water	13,788		13,788	13,788	-	
Open		14,517	14,517	-	14,517	
Trees		273	273	-	273	
CORE Total	21,558	108,356	129,915	21,558	108,356	

WEST						
OFFSITE						
B						
Open		316	316		316	
D						
Water	6,350		6,350	6,350		
Open		23,596	23,596		23,596	
Trees		4,310	4,310		4,310	
ONSITE						
B						
Water	19		19	19		
Drive	16,957		16,957	13,566	3,391	
Roof	8,560		8,560	6,848	1,712	
Open		54,027	54,027		54,027	59,131
Trees		6,280	6,280		6,280	
D						
Water	3,123		3,123	3,123		
Open		87,667	87,667		87,667	
Trees		12,635	12,635		12,635	
WEST Total	35,011	188,833	223,843	29,907	193,936	
SOUTH						
OFFSITE						
B						
Roof	5,877		5,877	5,877		
Open		76,743	76,743		76,743	
Trees		6,119	6,119		6,119	
D						
Water	158		158	158		
Open		1,548	1,548		1,548	
Trees		156	156		156	
ONSITE						
B						
Open		681,576	681,576		681,576	
Trees		126,143	126,143		126,143	
D						
Water	330		330	330		
Open		7,222	7,222		7,222	
Trees		2,673	2,673		2,673	
SOUTH Total	6,365	902,179	908,544	6,365	902,179	
SW						
OFFSITE						
B						
Open		2,196	2,196		2,196	
ONSITE						
B						
Open		122,034	122,034		122,034	
Trees		10,838	10,838		10,838	
SW Total		135,068	135,068		135,068	
SC						
ONSITE						
B						
Open		37,839	37,839		37,839	
Woods		2,014	2,014		2,014	
SC Total		39,853	39,853		39,853	
SE						
ONSITE						
B						
Open		67,086	67,086		67,086	
Trees		396	396		396	
Woods		3,106	3,106		3,106	
SE Total		70,588	70,588		70,588	
SN						
ONSITE						
B						
Open		70,191	70,191		70,191	
SN Total		70,191	70,191		70,191	
Grand Total	180,231	3,166,489	3,346,720			

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN	Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=0.16" Flow Length=100' Slope=0.0200 ' / ' Tc=14.3 min CN=58.0 Runoff=0.09 cfs 924 cf
Subcatchment2: SE	Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=0.16" Flow Length=100' Slope=0.0200 ' / ' Tc=14.3 min CN=57.9 Runoff=0.08 cfs 917 cf
Subcatchment3: SC	Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=0.15" Flow Length=100' Slope=0.0200 ' / ' Tc=14.3 min CN=57.8 Runoff=0.05 cfs 511 cf
Subcatchment4: SW	Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=0.15" Flow Length=400' Tc=17.3 min CN=57.8 Runoff=0.14 cfs 1,732 cf
Subcatchment5i: East I	Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=2.37" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=1.36 cfs 5,381 cf
Subcatchment5p: East P	Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=0.18" Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=0.78 cfs 9,136 cf
Reach 6: East	Avg. Flow Depth=0.15' Max Vel=1.68 fps Inflow=1.96 cfs 14,517 cf n=0.030 L=330.0' S=0.0182 ' / ' Capacity=77.12 cfs Outflow=1.92 cfs 14,517 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=2.37" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.24 cfs 1,257 cf
Subcatchment7p: South P	Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=0.16" Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=0.77 cfs 12,039 cf
Reach 8: Upper	Avg. Flow Depth=0.21' Max Vel=1.66 fps Inflow=2.58 cfs 27,813 cf n=0.030 L=270.0' S=0.0111 ' / ' Capacity=47.52 cfs Outflow=2.55 cfs 27,813 cf
Subcatchment9i: Central I	Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=2.37" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.00 cfs 4,763 cf
Subcatchment9p: Central P	Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=0.17" Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=0.59 cfs 8,331 cf
Reach 10: Middle	Avg. Flow Depth=0.20' Max Vel=2.79 fps Inflow=3.99 cfs 40,907 cf n=0.030 L=295.0' S=0.0339 ' / ' Capacity=83.01 cfs Outflow=3.98 cfs 40,907 cf
Subcatchment11i: Core I	Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=2.37" Flow Length=810' Tc=14.5 min CN=98.0 Runoff=1.39 cfs 4,258 cf
Subcatchment11p: Core P	Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=0.20" Flow Length=810' Tc=14.5 min CN=60.1 Runoff=0.26 cfs 1,847 cf
Pond 12: POND	Peak Elev=494.04' Storage=1,887 cf Inflow=1.59 cfs 6,105 cf Primary=0.52 cfs 6,057 cf Secondary=0.00 cfs 0 cf Outflow=0.52 cfs 6,057 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=2.37" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=1.74 cfs 5,907 cf
Subcatchment13p: West P	Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=0.53" Flow Length=975' Tc=18.0 min CN=70.8 Runoff=2.34 cfs 8,632 cf
Reach 14: West	Avg. Flow Depth=0.65' Max Vel=4.02 fps Inflow=6.89 cfs 61,503 cf n=0.030 L=260.0' S=0.0192 ' / ' Capacity=56.58 cfs Outflow=6.88 cfs 61,502 cf
Subcatchment15i: North I	Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=2.37" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=3.18 cfs 12,361 cf
Subcatchment15p: North P	Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=0.19" Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=0.67 cfs 6,924 cf
Reach 16: NW	Avg. Flow Depth=0.31' Max Vel=2.27 fps Inflow=3.67 cfs 19,286 cf n=0.030 L=800.0' S=0.0130 ' / ' Capacity=127.64 cfs Outflow=3.43 cfs 19,286 cf
Reach 17: OUT	Avg. Flow Depth=0.78' Max Vel=3.48 fps Inflow=10.29 cfs 80,788 cf n=0.030 L=95.0' S=0.0105 ' / ' Capacity=222.57 cfs Outflow=10.29 cfs 80,788 cf
Reach 18: POINT OF INTEREST"W"	Inflow=10.29 cfs 80,788 cf Outflow=10.29 cfs 80,788 cf

Total Runoff Area = 3,346,718 sf Runoff Volume = 84,923 cf Average Runoff Depth = 0.30"
94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN	Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=0.34" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=58.0 Runoff=0.41 cfs 1,996 cf
Subcatchment2: SE	Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=0.34" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.9 Runoff=0.40 cfs 1,988 cf
Subcatchment3: SC	Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=0.33" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.8 Runoff=0.22 cfs 1,112 cf
Subcatchment4: SW	Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=0.33" Flow Length=400' Tc=17.3 min CN=57.8 Runoff=0.67 cfs 3,768 cf
Subcatchment5i: East I	Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=1.69 cfs 6,737 cf
Subcatchment5p: East P	Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=0.37" Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=2.96 cfs 19,170 cf
Reach 6: East	Avg. Flow Depth=0.24' Max Vel=2.18 fps Inflow=4.49 cfs 25,906 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=4.42 cfs 25,906 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.30 cfs 1,574 cf
Subcatchment7p: South P	Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=0.34" Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=2.84 cfs 25,895 cf
Reach 8: Upper	Avg. Flow Depth=0.37' Max Vel=2.28 fps Inflow=6.92 cfs 53,376 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=6.88 cfs 53,376 cf
Subcatchment9i: Central I	Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.24 cfs 5,964 cf
Subcatchment9p: Central P	Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=0.36" Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=2.16 cfs 17,663 cf
Reach 10: Middle	Avg. Flow Depth=0.33' Max Vel=3.77 fps Inflow=10.15 cfs 77,003 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=10.13 cfs 77,003 cf
Subcatchment11i: Core I	Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=810' Tc=14.5 min CN=98.0 Runoff=1.72 cfs 5,331 cf
Subcatchment11p: Core P	Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=0.41" Flow Length=810' Tc=14.5 min CN=60.1 Runoff=0.89 cfs 3,719 cf
Pond 12: POND	Peak Elev=494.09' Storage=2,660 cf Inflow=2.54 cfs 9,050 cf Primary=0.87 cfs 8,997 cf Secondary=0.00 cfs 0 cf Outflow=0.87 cfs 8,997 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=2.16 cfs 7,395 cf
Subcatchment13p: West P	Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=0.87" Flow Length=975' Tc=18.0 min CN=70.8 Runoff=4.18 cfs 14,027 cf
Reach 14: West	Avg. Flow Depth=0.96' Max Vel=4.91 fps Inflow=14.02 cfs 107,423 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=14.01 cfs 107,421 cf
Subcatchment15i: North I	Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=3.94 cfs 15,477 cf
Subcatchment15p: North P	Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=0.39" Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=2.34 cfs 14,198 cf
Reach 16: NW	Avg. Flow Depth=0.41' Max Vel=2.67 fps Inflow=6.10 cfs 29,675 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=5.74 cfs 29,675 cf
Reach 17: OUT	Avg. Flow Depth=1.13' Max Vel=4.21 fps Inflow=19.68 cfs 137,096 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=19.68 cfs 137,096 cf
Reach 18: POINT OF INTEREST"W"	Inflow=19.68 cfs 137,096 cf Outflow=19.68 cfs 137,096 cf

Total Runoff Area = 3,346,718 sf Runoff Volume = 146,015 cf Average Runoff Depth = 0.52"
94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN	Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=0.76" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=58.0 Runoff=1.31 cfs 4,432 cf
Subcatchment2: SE	Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=0.75" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.9 Runoff=1.31 cfs 4,427 cf
Subcatchment3: SC	Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=0.75" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.8 Runoff=0.73 cfs 2,483 cf
Subcatchment4: SW	Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=0.75" Flow Length=400' Tc=17.3 min CN=57.8 Runoff=2.20 cfs 8,415 cf
Subcatchment5i: East I	Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=2.22 cfs 9,001 cf
Subcatchment5p: East P	Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=0.80" Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=8.97 cfs 41,678 cf
Reach 6: East	Avg. Flow Depth=0.39' Max Vel=2.85 fps Inflow=11.12 cfs 50,678 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=10.99 cfs 50,678 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.40 cfs 2,103 cf
Subcatchment7p: South P	Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=0.76" Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=8.86 cfs 57,349 cf
Reach 8: Upper	Avg. Flow Depth=0.63' Max Vel=3.06 fps Inflow=18.81 cfs 110,130 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=18.72 cfs 110,130 cf
Subcatchment9i: Central I	Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.64 cfs 7,968 cf
Subcatchment9p: Central P	Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=0.78" Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=6.60 cfs 38,703 cf
Reach 10: Middle	Avg. Flow Depth=0.57' Max Vel=5.05 fps Inflow=26.87 cfs 156,801 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=26.83 cfs 156,801 cf
Subcatchment11i: Core I	Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=810' Tc=14.5 min CN=98.0 Runoff=2.26 cfs 7,122 cf
Subcatchment11p: Core P	Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=0.87" Flow Length=810' Tc=14.5 min CN=60.1 Runoff=2.43 cfs 7,832 cf
Pond 12: POND	Peak Elev=494.21' Storage=4,267 cf Inflow=4.66 cfs 14,954 cf Primary=1.76 cfs 14,896 cf Secondary=0.00 cfs 0 cf Outflow=1.76 cfs 14,896 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=2.85 cfs 9,881 cf
Subcatchment13p: West P	Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=1.52" Flow Length=975' Tc=18.0 min CN=70.8 Runoff=7.74 cfs 24,549 cf
Reach 14: West	Avg. Flow Depth=1.54' Max Vel=6.21 fps Inflow=33.96 cfs 206,127 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=33.94 cfs 206,125 cf
Subcatchment15i: North I	Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=5.20 cfs 20,677 cf
Subcatchment15p: North P	Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=0.84" Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=6.81 cfs 30,334 cf
Reach 16: NW	Avg. Flow Depth=0.60' Max Vel=3.29 fps Inflow=11.85 cfs 51,011 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=11.33 cfs 51,011 cf
Reach 17: OUT	Avg. Flow Depth=1.78' Max Vel=5.28 fps Inflow=45.02 cfs 257,136 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=45.01 cfs 257,136 cf
Reach 18: POINT OF INTEREST"W"	Inflow=45.01 cfs 257,136 cf Outflow=45.01 cfs 257,136 cf

**Total Runoff Area = 3,346,718 sf Runoff Volume = 276,953 cf Average Runoff Depth = 0.99"
 94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf**

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN	Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=1.17" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=58.0 Runoff=2.23 cfs 6,836 cf
Subcatchment2: SE	Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=1.16" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.9 Runoff=2.23 cfs 6,837 cf
Subcatchment3: SC	Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=1.16" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.8 Runoff=1.25 cfs 3,839 cf
Subcatchment4: SW	Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=1.16" Flow Length=400' Tc=17.3 min CN=57.8 Runoff=3.78 cfs 13,010 cf
Subcatchment5i: East I	Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=4.76" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=2.66 cfs 10,814 cf
Subcatchment5p: East P	Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=1.22" Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=15.29 cfs 63,712 cf
Reach 6: East	Avg. Flow Depth=0.50' Max Vel=3.26 fps Inflow=17.91 cfs 74,526 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=17.70 cfs 74,526 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=4.76" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.48 cfs 2,526 cf
Subcatchment7p: South P	Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=1.18" Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=15.41 cfs 88,359 cf
Reach 8: Upper	Avg. Flow Depth=0.81' Max Vel=3.53 fps Inflow=31.38 cfs 165,411 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=31.25 cfs 165,411 cf
Subcatchment9i: Central I	Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=4.76" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.95 cfs 9,573 cf
Subcatchment9p: Central P	Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=1.20" Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=11.38 cfs 59,362 cf
Reach 10: Middle	Avg. Flow Depth=0.73' Max Vel=5.83 fps Inflow=44.41 cfs 234,346 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=44.36 cfs 234,346 cf
Subcatchment11i: Core I	Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=4.76" Flow Length=810' Tc=14.5 min CN=98.0 Runoff=2.70 cfs 8,557 cf
Subcatchment11p: Core P	Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=1.31" Flow Length=810' Tc=14.5 min CN=60.1 Runoff=3.95 cfs 11,809 cf
Pond 12: POND	Peak Elev=494.32' Storage=5,833 cf Inflow=6.63 cfs 20,366 cf Primary=2.46 cfs 20,304 cf Secondary=0.00 cfs 0 cf Outflow=2.46 cfs 20,304 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=4.76" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=3.40 cfs 11,871 cf
Subcatchment13p: West P	Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=2.10" Flow Length=975' Tc=18.0 min CN=70.8 Runoff=10.90 cfs 33,944 cf
Reach 14: West	Avg. Flow Depth=1.96' Max Vel=7.00 fps Inflow=54.48 cfs 300,466 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=54.45 cfs 300,464 cf
Subcatchment15i: North I	Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=4.76" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=6.20 cfs 24,842 cf
Subcatchment15p: North P	Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=1.27" Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=11.40 cfs 46,023 cf
Reach 16: NW	Avg. Flow Depth=0.74' Max Vel=3.69 fps Inflow=17.42 cfs 70,865 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=16.82 cfs 70,865 cf
Reach 17: OUT	Avg. Flow Depth=2.26' Max Vel=5.95 fps Inflow=70.89 cfs 371,329 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=70.88 cfs 371,329 cf
Reach 18: POINT OF INTEREST"W"	Inflow=70.88 cfs 371,329 cf Outflow=70.88 cfs 371,329 cf

Total Runoff Area = 3,346,718 sf Runoff Volume = 401,914 cf Average Runoff Depth = 1.44"
94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN	Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=1.51" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=58.0 Runoff=3.01 cfs 8,849 cf
Subcatchment2: SE	Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=1.51" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.9 Runoff=3.01 cfs 8,855 cf
Subcatchment3: SC	Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=1.50" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.8 Runoff=1.69 cfs 4,975 cf
Subcatchment4: SW	Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=1.50" Flow Length=400' Tc=17.3 min CN=57.8 Runoff=5.13 cfs 16,861 cf
Subcatchment5i: East I	Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=2.98 cfs 12,174 cf
Subcatchment5p: East P	Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=1.57" Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=20.63 cfs 82,085 cf
Reach 6: East	Avg. Flow Depth=0.57' Max Vel=3.51 fps Inflow=23.57 cfs 94,259 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=23.31 cfs 94,259 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.53 cfs 2,844 cf
Subcatchment7p: South P	Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=1.52" Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=21.06 cfs 114,307 cf
Reach 8: Upper	Avg. Flow Depth=0.94' Max Vel=3.83 fps Inflow=42.00 cfs 211,410 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=41.89 cfs 211,410 cf
Subcatchment9i: Central I	Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=2.19 cfs 10,777 cf
Subcatchment9p: Central P	Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=1.55" Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=15.43 cfs 76,614 cf
Reach 10: Middle	Avg. Flow Depth=0.85' Max Vel=6.31 fps Inflow=59.34 cfs 298,801 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=59.26 cfs 298,801 cf
Subcatchment11i: Core I	Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=810' Tc=14.5 min CN=98.0 Runoff=3.03 cfs 9,633 cf
Subcatchment11p: Core P	Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=1.67" Flow Length=810' Tc=14.5 min CN=60.1 Runoff=5.20 cfs 15,105 cf
Pond 12: POND	Peak Elev=494.43' Storage=7,341 cf Inflow=8.22 cfs 24,738 cf Primary=2.75 cfs 24,674 cf Secondary=0.00 cfs 0 cf Outflow=2.75 cfs 24,674 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=3.81 cfs 13,364 cf
Subcatchment13p: West P	Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=2.56" Flow Length=975' Tc=18.0 min CN=70.8 Runoff=13.41 cfs 41,408 cf
Reach 14: West	Avg. Flow Depth=2.26' Max Vel=7.46 fps Inflow=71.51 cfs 378,247 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=71.45 cfs 378,245 cf
Subcatchment15i: North I	Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=6.96 cfs 27,967 cf
Subcatchment15p: North P	Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=1.63" Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=15.20 cfs 59,060 cf
Reach 16: NW	Avg. Flow Depth=0.83' Max Vel=3.95 fps Inflow=22.01 cfs 87,027 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=21.34 cfs 87,027 cf
Reach 17: OUT	Avg. Flow Depth=2.59' Max Vel=6.37 fps Inflow=92.27 cfs 465,272 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=92.26 cfs 465,271 cf
Reach 18: POINT OF INTEREST"W"	Inflow=92.26 cfs 465,271 cf Outflow=92.26 cfs 465,271 cf

Total Runoff Area = 3,346,718 sf Runoff Volume = 504,878 cf Average Runoff Depth = 1.81"
94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=1.95"
 Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=58.0 Runoff=3.98 cfs 11,386 cf

Subcatchment2: SE Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=1.94"
 Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.9 Runoff=3.98 cfs 11,399 cf

Subcatchment3: SC Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=1.93"
 Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.8 Runoff=2.24 cfs 6,407 cf

Subcatchment4: SW Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=1.93"
 Flow Length=400' Tc=17.3 min CN=57.8 Runoff=6.82 cfs 21,716 cf

Subcatchment5i: East I Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=6.06"
 Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=3.35 cfs 13,761 cf

Subcatchment5p: East P Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=2.02"
 Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=27.30 cfs 105,167 cf

Reach 6: East Avg. Flow Depth=0.65' Max Vel=3.77 fps Inflow=30.61 cfs 118,928 cf
 n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=30.34 cfs 118,928 cf

Subcatchment7i: South I Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=6.06"
 Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.60 cfs 3,215 cf

Subcatchment7p: South P Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=1.96"
 Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=28.19 cfs 146,988 cf

Reach 8: Upper Avg. Flow Depth=1.08' Max Vel=4.11 fps Inflow=55.36 cfs 269,132 cf
 n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=55.27 cfs 269,132 cf

Subcatchment9i: Central I Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=6.06"
 Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=2.47 cfs 12,182 cf

Subcatchment9p: Central P Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=1.99"
 Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=20.51 cfs 98,311 cf

Reach 10: Middle Avg. Flow Depth=0.97' Max Vel=6.80 fps Inflow=78.11 cfs 379,624 cf
 n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=78.01 cfs 379,624 cf

Subcatchment11i: Core I Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=6.06"
 Flow Length=810' Tc=14.5 min CN=98.0 Runoff=3.41 cfs 10,890 cf

Subcatchment11p: Core P Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=2.13"
 Flow Length=810' Tc=14.5 min CN=60.1 Runoff=6.77 cfs 19,226 cf

Pond 12: POND Peak Elev=494.57' Storage=9,318 cf Inflow=10.18 cfs 30,116 cf
 Primary=3.10 cfs 30,050 cf Secondary=0.00 cfs 0 cf Outflow=3.10 cfs 30,050 cf

Subcatchment13i: West I Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=6.06"
 Flow Length=975' Tc=18.0 min CN=98.0 Runoff=4.29 cfs 15,106 cf

Subcatchment13p: West P Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=3.12"
 Flow Length=975' Tc=18.0 min CN=70.8 Runoff=16.42 cfs 50,468 cf

Reach 14: West Avg. Flow Depth=2.64' Max Vel=7.84 fps Inflow=92.78 cfs 475,249 cf
 n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=92.71 cfs 475,247 cf

Subcatchment15i: North I Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=6.06"
 Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=7.84 cfs 31,613 cf

Subcatchment15p: North P Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=2.08"
 Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=19.95 cfs 75,400 cf

Reach 16: NW Avg. Flow Depth=0.94' Max Vel=4.21 fps Inflow=27.69 cfs 107,013 cf
 n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=26.93 cfs 107,013 cf

Reach 17: OUT Avg. Flow Depth=2.94' Max Vel=6.79 fps Inflow=118.92 cfs 582,260 cf
 n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=118.91 cfs 582,260 cf

Reach 18: POINT OF INTEREST"W" Inflow=118.91 cfs 582,260 cf
 Outflow=118.91 cfs 582,260 cf

Total Runoff Area = 3,346,718 sf Runoff Volume = 633,236 cf Average Runoff Depth = 2.27"
94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: SN	Runoff Area=70,191 sf 0.00% Impervious Runoff Depth=2.55" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=58.0 Runoff=5.31 cfs 14,893 cf
Subcatchment2: SE	Runoff Area=70,588 sf 0.00% Impervious Runoff Depth=2.54" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.9 Runoff=5.32 cfs 14,919 cf
Subcatchment3: SC	Runoff Area=39,853 sf 0.00% Impervious Runoff Depth=2.53" Flow Length=100' Slope=0.0200 '/' Tc=14.3 min CN=57.8 Runoff=2.99 cfs 8,390 cf
Subcatchment4: SW	Runoff Area=135,068 sf 0.00% Impervious Runoff Depth=2.53" Flow Length=400' Tc=17.3 min CN=57.8 Runoff=9.14 cfs 28,435 cf
Subcatchment5i: East I	Runoff Area=27,243 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=3.84 cfs 15,803 cf
Subcatchment5p: East P	Runoff Area=626,118 sf 0.00% Impervious Runoff Depth=2.63" Flow Length=1,475' Tc=23.9 min CN=58.8 Runoff=36.46 cfs 137,004 cf
Reach 6: East	Avg. Flow Depth=0.74' Max Vel=4.06 fps Inflow=40.25 cfs 152,806 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=39.97 cfs 152,806 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.69 cfs 3,692 cf
Subcatchment7p: South P	Runoff Area=902,180 sf 0.00% Impervious Runoff Depth=2.56" Flow Length=1,375' Tc=36.7 min CN=58.1 Runoff=38.03 cfs 192,170 cf
Reach 8: Upper	Avg. Flow Depth=1.27' Max Vel=4.38 fps Inflow=73.78 cfs 348,668 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=73.65 cfs 348,668 cf
Subcatchment9i: Central I	Runoff Area=24,117 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=2.82 cfs 13,989 cf
Subcatchment9p: Central P	Runoff Area=592,942 sf 0.00% Impervious Runoff Depth=2.60" Flow Length=1,675' Tc=32.7 min CN=58.5 Runoff=27.49 cfs 128,266 cf
Reach 10: Middle	Avg. Flow Depth=1.12' Max Vel=7.31 fps Inflow=103.87 cfs 490,924 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=103.78 cfs 490,924 cf
Subcatchment11i: Core I	Runoff Area=21,558 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=810' Tc=14.5 min CN=98.0 Runoff=3.90 cfs 12,505 cf
Subcatchment11p: Core P	Runoff Area=108,356 sf 0.00% Impervious Runoff Depth=2.76" Flow Length=810' Tc=14.5 min CN=60.1 Runoff=8.91 cfs 24,887 cf
Pond 12: POND	Peak Elev=494.77' Storage=12,121 cf Inflow=12.81 cfs 37,392 cf Primary=3.53 cfs 37,324 cf Secondary=0.00 cfs 0 cf Outflow=3.53 cfs 37,324 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=4.91 cfs 17,347 cf
Subcatchment13p: West P	Runoff Area=193,935 sf 0.00% Impervious Runoff Depth=3.87" Flow Length=975' Tc=18.0 min CN=70.8 Runoff=20.40 cfs 62,559 cf
Reach 14: West	Avg. Flow Depth=3.15' Max Vel=8.17 fps Inflow=121.78 cfs 608,154 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=121.69 cfs 608,152 cf
Subcatchment15i: North I	Runoff Area=62,585 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=8.97 cfs 36,303 cf
Subcatchment15p: North P	Runoff Area=435,713 sf 0.00% Impervious Runoff Depth=2.70" Flow Length=1,250' Tc=23.3 min CN=59.5 Runoff=26.49 cfs 97,884 cf
Reach 16: NW	Avg. Flow Depth=1.06' Max Vel=4.51 fps Inflow=35.39 cfs 134,188 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=34.53 cfs 134,188 cf
Reach 17: OUT	Avg. Flow Depth=3.36' Max Vel=7.26 fps Inflow=155.20 cfs 742,340 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=155.19 cfs 742,339 cf
Reach 18: POINT OF INTEREST"W"	Inflow=155.19 cfs 742,339 cf Outflow=155.19 cfs 742,339 cf

Total Runoff Area = 3,346,718 sf Runoff Volume = 809,047 cf Average Runoff Depth = 2.90"
94.87% Pervious = 3,174,944 sf 5.13% Impervious = 171,774 sf

Existing Offsite 17-05-01

Prepared by {enter your company name here}

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Type II 24-hr 1-Year Rainfall=2.60"

Printed 5/1/2017

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=0.23"
 Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.01 cfs 41 cf

Subcatchment5i: East I Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=2.37"
 Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=1.30 cfs 5,134 cf

Subcatchment5p: East P Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=0.20"
 Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=0.47 cfs 4,500 cf

Reach 6: East Avg. Flow Depth=0.14' Max Vel=1.59 fps Inflow=1.68 cfs 9,634 cf
 n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=1.63 cfs 9,634 cf

Subcatchment7i: South I Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=2.37"
 Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.24 cfs 1,257 cf

Subcatchment7p: South P Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=0.23"
 Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=0.15 cfs 1,630 cf

Reach 8: Upper Avg. Flow Depth=0.18' Max Vel=1.51 fps Inflow=1.96 cfs 12,521 cf
 n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=1.93 cfs 12,521 cf

Subcatchment9i: Central I Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=2.37"
 Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=0.63 cfs 2,995 cf

Subcatchment9p: Central P Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=0.22"
 Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=0.30 cfs 3,173 cf

Reach 10: Middle Avg. Flow Depth=0.16' Max Vel=2.47 fps Inflow=2.80 cfs 18,688 cf
 n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=2.78 cfs 18,688 cf

Subcatchment11p: Core P Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=0.16"
 Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.00 cfs 25 cf

Pond 12: POND Peak Elev=493.90' Storage=14 cf Inflow=0.00 cfs 25 cf
 Primary=0.00 cfs 18 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 18 cf

Subcatchment13i: West I Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=2.37"
 Flow Length=975' Tc=18.0 min CN=98.0 Runoff=1.74 cfs 5,907 cf

Subcatchment13p: West P Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=0.76"
 Flow Length=975' Tc=18.0 min CN=76.0 Runoff=0.54 cfs 1,778 cf

Reach 14: West Avg. Flow Depth=0.48' Max Vel=3.44 fps Inflow=4.11 cfs 26,390 cf
 n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=4.10 cfs 26,390 cf

Subcatchment15i: North I Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=2.37"
 Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=3.01 cfs 11,729 cf

Subcatchment15p: North P Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=0.20"
 Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=0.58 cfs 5,485 cf

Reach 16: NW Avg. Flow Depth=0.30' Max Vel=2.22 fps Inflow=3.45 cfs 17,214 cf
 n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=3.22 cfs 17,214 cf

Reach 17: OUT Avg. Flow Depth=0.64' Max Vel=3.13 fps Inflow=7.31 cfs 43,605 cf
 n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=7.31 cfs 43,605 cf

Reach 18: POINT OF INTEREST"W" Inflow=7.31 cfs 43,605 cf
 Outflow=7.31 cfs 43,605 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 43,654 cf Average Runoff Depth = 0.52"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW	Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=0.44" Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.02 cfs 81 cf
Subcatchment5i: East I	Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=1.61 cfs 6,428 cf
Subcatchment5p: East P	Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=0.41" Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=1.53 cfs 9,058 cf
Reach 6: East	Avg. Flow Depth=0.19' Max Vel=1.93 fps Inflow=3.05 cfs 15,487 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=2.99 cfs 15,487 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.30 cfs 1,574 cf
Subcatchment7p: South P	Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=0.45" Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=0.42 cfs 3,180 cf
Reach 8: Upper	Avg. Flow Depth=0.26' Max Vel=1.85 fps Inflow=3.60 cfs 20,241 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=3.56 cfs 20,241 cf
Subcatchment9i: Central I	Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=0.78 cfs 3,749 cf
Subcatchment9p: Central P	Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=0.43" Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=0.88 cfs 6,294 cf
Reach 10: Middle	Avg. Flow Depth=0.23' Max Vel=3.04 fps Inflow=5.15 cfs 30,284 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=5.13 cfs 30,284 cf
Subcatchment11p: Core P	Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=0.35" Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.01 cfs 54 cf
Pond 12: POND	Peak Elev=493.90' Storage=26 cf Inflow=0.01 cfs 54 cf Primary=0.00 cfs 43 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 43 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=2.16 cfs 7,395 cf
Subcatchment13p: West P	Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=1.15" Flow Length=975' Tc=18.0 min CN=76.0 Runoff=0.85 cfs 2,709 cf
Reach 14: West	Avg. Flow Depth=0.64' Max Vel=3.99 fps Inflow=6.73 cfs 40,432 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=6.72 cfs 40,432 cf
Subcatchment15i: North I	Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=2.97" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=3.74 cfs 14,685 cf
Subcatchment15p: North P	Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=0.41" Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=1.90 cfs 11,042 cf
Reach 16: NW	Avg. Flow Depth=0.39' Max Vel=2.58 fps Inflow=5.48 cfs 25,726 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=5.15 cfs 25,726 cf
Reach 17: OUT	Avg. Flow Depth=0.85' Max Vel=3.63 fps Inflow=11.86 cfs 66,158 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=11.86 cfs 66,158 cf
Reach 18: POINT OF INTEREST"W"	Inflow=11.86 cfs 66,158 cf Outflow=11.86 cfs 66,158 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 66,251 cf Average Runoff Depth = 0.78"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

Existing Offsite 17-05-01

Prepared by {enter your company name here}

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Type II 24-hr 5-Year Rainfall=4.20"

Printed 5/1/2017

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW	Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=0.92" Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.05 cfs 168 cf
Subcatchment5i: East I	Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=2.12 cfs 8,588 cf
Subcatchment5p: East P	Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=0.87" Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=4.27 cfs 19,078 cf
Reach 6: East	Avg. Flow Depth=0.29' Max Vel=2.42 fps Inflow=6.36 cfs 27,666 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=6.25 cfs 27,666 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.40 cfs 2,103 cf
Subcatchment7p: South P	Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=0.93" Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=1.11 cfs 6,534 cf
Reach 8: Upper	Avg. Flow Depth=0.38' Max Vel=2.34 fps Inflow=7.52 cfs 36,303 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=7.46 cfs 36,303 cf
Subcatchment9i: Central I	Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.03 cfs 5,009 cf
Subcatchment9p: Central P	Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=0.89" Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=2.39 cfs 13,105 cf
Reach 10: Middle	Avg. Flow Depth=0.35' Max Vel=3.85 fps Inflow=10.78 cfs 54,417 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=10.75 cfs 54,417 cf
Subcatchment11p: Core P	Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=0.77" Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.04 cfs 119 cf
Pond 12: POND	Peak Elev=493.90' Storage=53 cf Inflow=0.04 cfs 119 cf Primary=0.00 cfs 104 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 104 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=2.85 cfs 9,881 cf
Subcatchment13p: West P	Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=1.89" Flow Length=975' Tc=18.0 min CN=76.0 Runoff=1.44 cfs 4,452 cf
Reach 14: West	Avg. Flow Depth=0.93' Max Vel=4.82 fps Inflow=13.15 cfs 68,854 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=13.14 cfs 68,854 cf
Subcatchment15i: North I	Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=3.96" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=4.93 cfs 19,619 cf
Subcatchment15p: North P	Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=0.87" Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=5.32 cfs 23,255 cf
Reach 16: NW	Avg. Flow Depth=0.55' Max Vel=3.13 fps Inflow=10.10 cfs 42,874 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=9.64 cfs 42,874 cf
Reach 17: OUT	Avg. Flow Depth=1.23' Max Vel=4.38 fps Inflow=22.73 cfs 111,728 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=22.73 cfs 111,728 cf
Reach 18: POINT OF INTEREST"W"	Inflow=22.73 cfs 111,728 cf Outflow=22.73 cfs 111,728 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 111,911 cf Average Runoff Depth = 1.32"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=1.37"
 Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.08 cfs 251 cf

Subcatchment5i: East I Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=4.76"
 Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=2.53 cfs 10,318 cf

Subcatchment5p: East P Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=1.31"
 Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=7.07 cfs 28,766 cf

Reach 6: East Avg. Flow Depth=0.36' Max Vel=2.73 fps Inflow=9.57 cfs 39,084 cf
 n=0.030 L=330.0' S=0.0182 '/ Capacity=77.12 cfs Outflow=9.43 cfs 39,084 cf

Subcatchment7i: South I Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=4.76"
 Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.48 cfs 2,526 cf

Subcatchment7p: South P Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=1.38"
 Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=1.81 cfs 9,745 cf

Reach 8: Upper Avg. Flow Depth=0.48' Max Vel=2.64 fps Inflow=11.36 cfs 51,355 cf
 n=0.030 L=270.0' S=0.0111 '/ Capacity=47.52 cfs Outflow=11.29 cfs 51,355 cf

Subcatchment9i: Central I Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=4.76"
 Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.23 cfs 6,018 cf

Subcatchment9p: Central P Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=1.34"
 Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=3.92 cfs 19,661 cf

Reach 10: Middle Avg. Flow Depth=0.43' Max Vel=4.36 fps Inflow=16.30 cfs 77,034 cf
 n=0.030 L=295.0' S=0.0339 '/ Capacity=83.01 cfs Outflow=16.26 cfs 77,034 cf

Subcatchment11p: Core P Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=1.19"
 Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.06 cfs 183 cf

Pond 12: POND Peak Elev=493.91' Storage=81 cf Inflow=0.06 cfs 183 cf
 Primary=0.00 cfs 166 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 166 cf

Subcatchment13i: West I Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=4.76"
 Flow Length=975' Tc=18.0 min CN=98.0 Runoff=3.40 cfs 11,871 cf

Subcatchment13p: West P Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=2.54"
 Flow Length=975' Tc=18.0 min CN=76.0 Runoff=1.94 cfs 5,963 cf

Reach 14: West Avg. Flow Depth=1.15' Max Vel=5.36 fps Inflow=19.41 cfs 95,034 cf
 n=0.030 L=260.0' S=0.0192 '/ Capacity=56.58 cfs Outflow=19.39 cfs 95,033 cf

Subcatchment15i: North I Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=4.76"
 Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=5.89 cfs 23,571 cf

Subcatchment15p: North P Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=1.31"
 Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=8.77 cfs 35,064 cf

Reach 16: NW Avg. Flow Depth=0.67' Max Vel=3.49 fps Inflow=14.52 cfs 58,635 cf
 n=0.030 L=800.0' S=0.0130 '/ Capacity=127.64 cfs Outflow=13.97 cfs 58,635 cf

Reach 17: OUT Avg. Flow Depth=1.51' Max Vel=4.87 fps Inflow=33.28 cfs 153,668 cf
 n=0.030 L=95.0' S=0.0105 '/ Capacity=222.57 cfs Outflow=33.27 cfs 153,668 cf

Reach 18: POINT OF INTEREST"W" Inflow=33.27 cfs 153,668 cf
 Outflow=33.27 cfs 153,668 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 153,936 cf Average Runoff Depth = 1.82"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW	Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=1.74" Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.10 cfs 319 cf
Subcatchment5i: East I	Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=2.84 cfs 11,616 cf
Subcatchment5p: East P	Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=1.67" Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=9.40 cfs 36,793 cf
Reach 6: East	Avg. Flow Depth=0.41' Max Vel=2.93 fps Inflow=12.20 cfs 48,409 cf n=0.030 L=330.0' S=0.0182 '/ Capacity=77.12 cfs Outflow=12.05 cfs 48,409 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.53 cfs 2,844 cf
Subcatchment7p: South P	Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=1.76" Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=2.38 cfs 12,392 cf
Reach 8: Upper	Avg. Flow Depth=0.55' Max Vel=2.84 fps Inflow=14.51 cfs 63,645 cf n=0.030 L=270.0' S=0.0111 '/ Capacity=47.52 cfs Outflow=14.44 cfs 63,645 cf
Subcatchment9i: Central I	Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.38 cfs 6,775 cf
Subcatchment9p: Central P	Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=1.71" Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=5.19 cfs 25,080 cf
Reach 10: Middle	Avg. Flow Depth=0.49' Max Vel=4.69 fps Inflow=20.85 cfs 95,500 cf n=0.030 L=295.0' S=0.0339 '/ Capacity=83.01 cfs Outflow=20.80 cfs 95,500 cf
Subcatchment11p: Core P	Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=1.54" Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.08 cfs 237 cf
Pond 12: POND	Peak Elev=493.91' Storage=105 cf Inflow=0.08 cfs 237 cf Primary=0.01 cfs 218 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 218 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=3.81 cfs 13,364 cf
Subcatchment13p: West P	Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=3.04" Flow Length=975' Tc=18.0 min CN=76.0 Runoff=2.33 cfs 7,144 cf
Reach 14: West	Avg. Flow Depth=1.30' Max Vel=5.70 fps Inflow=24.51 cfs 116,226 cf n=0.030 L=260.0' S=0.0192 '/ Capacity=56.58 cfs Outflow=24.49 cfs 116,226 cf
Subcatchment15i: North I	Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=5.36" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=6.60 cfs 26,536 cf
Subcatchment15p: North P	Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=1.67" Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=11.62 cfs 44,848 cf
Reach 16: NW	Avg. Flow Depth=0.75' Max Vel=3.73 fps Inflow=18.11 cfs 71,384 cf n=0.030 L=800.0' S=0.0130 '/ Capacity=127.64 cfs Outflow=17.50 cfs 71,384 cf
Reach 17: OUT	Avg. Flow Depth=1.71' Max Vel=5.18 fps Inflow=41.88 cfs 187,610 cf n=0.030 L=95.0' S=0.0105 '/ Capacity=222.57 cfs Outflow=41.88 cfs 187,610 cf
Reach 18: POINT OF INTEREST"W"	Inflow=41.88 cfs 187,610 cf Outflow=41.88 cfs 187,610 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 187,948 cf Average Runoff Depth = 2.22"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW	Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=2.21" Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.13 cfs 404 cf
Subcatchment5i: East I	Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=6.06" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=3.20 cfs 13,131 cf
Subcatchment5p: East P	Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=2.13" Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=12.30 cfs 46,833 cf
Reach 6: East	Avg. Flow Depth=0.46' Max Vel=3.13 fps Inflow=15.45 cfs 59,963 cf n=0.030 L=330.0' S=0.0182 '/ Capacity=77.12 cfs Outflow=15.29 cfs 59,963 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=6.06" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.60 cfs 3,215 cf
Subcatchment7p: South P	Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=2.23" Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=3.10 cfs 15,692 cf
Reach 8: Upper	Avg. Flow Depth=0.62' Max Vel=3.04 fps Inflow=18.42 cfs 78,870 cf n=0.030 L=270.0' S=0.0111 '/ Capacity=47.52 cfs Outflow=18.34 cfs 78,870 cf
Subcatchment9i: Central I	Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=6.06" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.55 cfs 7,658 cf
Subcatchment9p: Central P	Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=2.17" Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=6.77 cfs 31,846 cf
Reach 10: Middle	Avg. Flow Depth=0.56' Max Vel=5.03 fps Inflow=26.49 cfs 118,375 cf n=0.030 L=295.0' S=0.0339 '/ Capacity=83.01 cfs Outflow=26.42 cfs 118,375 cf
Subcatchment11p: Core P	Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=1.97" Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.11 cfs 305 cf
Pond 12: POND	Peak Elev=493.91' Storage=135 cf Inflow=0.11 cfs 305 cf Primary=0.01 cfs 284 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 284 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=6.06" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=4.29 cfs 15,106 cf
Subcatchment13p: West P	Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=3.64" Flow Length=975' Tc=18.0 min CN=76.0 Runoff=2.79 cfs 8,562 cf
Reach 14: West	Avg. Flow Depth=1.47' Max Vel=6.05 fps Inflow=30.80 cfs 142,327 cf n=0.030 L=260.0' S=0.0192 '/ Capacity=56.58 cfs Outflow=30.77 cfs 142,327 cf
Subcatchment15i: North I	Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=6.06" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=7.44 cfs 29,996 cf
Subcatchment15p: North P	Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=2.13" Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=15.17 cfs 57,086 cf
Reach 16: NW	Avg. Flow Depth=0.84' Max Vel=3.97 fps Inflow=22.54 cfs 87,083 cf n=0.030 L=800.0' S=0.0130 '/ Capacity=127.64 cfs Outflow=21.85 cfs 87,083 cf
Reach 17: OUT	Avg. Flow Depth=1.93' Max Vel=5.50 fps Inflow=52.49 cfs 229,409 cf n=0.030 L=95.0' S=0.0105 '/ Capacity=222.57 cfs Outflow=52.48 cfs 229,409 cf
Reach 18: POINT OF INTEREST"W"	Inflow=52.48 cfs 229,409 cf Outflow=52.48 cfs 229,409 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 229,834 cf Average Runoff Depth = 2.72"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

Time span=0.00-32.00 hrs, dt=0.0010 hrs, 32001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: SW	Runoff Area=2,196 sf 0.00% Impervious Runoff Depth=2.85" Flow Length=400' Tc=17.3 min CN=61.0 Runoff=0.17 cfs 521 cf
Subcatchment5i: East I	Runoff Area=25,995 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,475' Tc=23.9 min CN=98.0 Runoff=3.66 cfs 15,079 cf
Subcatchment5p: East P	Runoff Area=263,940 sf 0.00% Impervious Runoff Depth=2.76" Flow Length=1,475' Tc=23.9 min CN=60.1 Runoff=16.25 cfs 60,622 cf
Reach 6: East	Avg. Flow Depth=0.52' Max Vel=3.35 fps Inflow=19.86 cfs 75,701 cf n=0.030 L=330.0' S=0.0182 '/' Capacity=77.12 cfs Outflow=19.71 cfs 75,701 cf
Subcatchment7i: South I	Runoff Area=6,365 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,375' Tc=36.7 min CN=98.0 Runoff=0.69 cfs 3,692 cf
Subcatchment7p: South P	Runoff Area=84,566 sf 0.00% Impervious Runoff Depth=2.87" Flow Length=1,375' Tc=36.7 min CN=61.2 Runoff=4.08 cfs 20,207 cf
Reach 8: Upper	Avg. Flow Depth=0.71' Max Vel=3.27 fps Inflow=23.74 cfs 99,600 cf n=0.030 L=270.0' S=0.0111 '/' Capacity=47.52 cfs Outflow=23.64 cfs 99,600 cf
Subcatchment9i: Central I	Runoff Area=15,161 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,675' Tc=32.7 min CN=98.0 Runoff=1.77 cfs 8,794 cf
Subcatchment9p: Central P	Runoff Area=175,836 sf 0.00% Impervious Runoff Depth=2.81" Flow Length=1,675' Tc=32.7 min CN=60.6 Runoff=8.95 cfs 41,126 cf
Reach 10: Middle	Avg. Flow Depth=0.64' Max Vel=5.41 fps Inflow=34.15 cfs 149,520 cf n=0.030 L=295.0' S=0.0339 '/' Capacity=83.01 cfs Outflow=34.07 cfs 149,520 cf
Subcatchment11p: Core P	Runoff Area=1,853 sf 0.00% Impervious Runoff Depth=2.58" Flow Length=810' Tc=14.5 min CN=58.3 Runoff=0.14 cfs 398 cf
Pond 12: POND	Peak Elev=493.91' Storage=178 cf Inflow=0.14 cfs 398 cf Primary=0.02 cfs 376 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 376 cf
Subcatchment13i: West I	Runoff Area=29,906 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=975' Tc=18.0 min CN=98.0 Runoff=4.91 cfs 17,347 cf
Subcatchment13p: West P	Runoff Area=28,222 sf 0.00% Impervious Runoff Depth=4.44" Flow Length=975' Tc=18.0 min CN=76.0 Runoff=3.39 cfs 10,432 cf
Reach 14: West	Avg. Flow Depth=1.66' Max Vel=6.45 fps Inflow=39.32 cfs 177,676 cf n=0.030 L=260.0' S=0.0192 '/' Capacity=56.58 cfs Outflow=39.28 cfs 177,676 cf
Subcatchment15i: North I	Runoff Area=59,383 sf 100.00% Impervious Runoff Depth=6.96" Flow Length=1,250' Tc=23.3 min CN=98.0 Runoff=8.51 cfs 34,446 cf
Subcatchment15p: North P	Runoff Area=321,729 sf 0.00% Impervious Runoff Depth=2.76" Flow Length=1,250' Tc=23.3 min CN=60.1 Runoff=20.07 cfs 73,895 cf
Reach 16: NW	Avg. Flow Depth=0.95' Max Vel=4.25 fps Inflow=28.51 cfs 108,341 cf n=0.030 L=800.0' S=0.0130 '/' Capacity=127.64 cfs Outflow=27.75 cfs 108,341 cf
Reach 17: OUT	Avg. Flow Depth=2.20' Max Vel=5.86 fps Inflow=66.85 cfs 286,017 cf n=0.030 L=95.0' S=0.0105 '/' Capacity=222.57 cfs Outflow=66.83 cfs 286,016 cf
Reach 18: POINT OF INTEREST"W"	Inflow=66.83 cfs 286,016 cf Outflow=66.83 cfs 286,016 cf

Total Runoff Area = 1,015,152 sf Runoff Volume = 286,560 cf Average Runoff Depth = 3.39"
86.52% Pervious = 878,342 sf 13.48% Impervious = 136,810 sf

APPENDIX C

POST-DEVELOPMENT STORMWATER COMPUTATIONS

Sum of AREA Row Labels	Column Labels Imperv	Pervious	Grand Total
NORTH			
B			
ABS	1,813		1,813
Road	21,727		21,727
Drive	24,722		24,722
Roof	17,023		17,023
Open		331,299	331,299
Trees		103,601	103,601
NORTH Total	65,284	434,900	500,183
NORTH-NE			
B			
Road	5,624		5,624
Drive	9,894		9,894
Roof	14,695		14,695
Open		313,203	313,203
Trees		32,356	32,356
NORTH-NE Total	30,213	345,559	375,772
NORTHEAST			
B			
Road	8,437		8,437
Drive	9,317		9,317
Roof	9,081		9,081
Open		156,069	156,069
Trees		73,026	73,026
NORTHEAST Total	26,834	229,095	255,929
EAST			
B			
Road	17,052		17,052
Drive	12,466		12,466
Roof	16,340		16,340
Open		280,479	280,479
Trees		17,985	17,985
EAST Total	45,858	298,464	344,322
CENTRAL			
B			
ABS	28,145		28,145
Road	26,615		26,615
Drive	28,238		28,238
Roof	27,584		27,584
Open		443,904	443,904
Trees		64,157	64,157
CENTRAL Total	110,583	508,061	618,644
CORE			
B			
Drive	4,975		4,975
Roof	6,002		6,002
Open		128,456	128,456
Trees		22,767	22,767
D			
Water	13,788		13,788
Open		14,504	14,504
Trees		291	291
CORE Total	24,764	166,017	190,782

SOUTHEAST			
B			
Road	14,207		14,207
Drive	7,809		7,809
Roof	8,631		8,631
Open		138,578	138,578
Trees		12,183	12,183
SOUTHEAST Total	30,646	150,761	181,407
SOUTH			
B			
Road	13,550		13,550
Drive	7,350		7,350
Roof	14,507		14,507
Open		221,058	221,058
Trees		45,730	45,730
SOUTH Total	35,407	266,788	302,195
SOUTHWEST			
B			
Open		145,332	145,332
Trees		30,955	30,955
D			
Water	449		449
Open		8,769	8,769
Trees		2,828	2,828
SOUTHWEST Total	449	187,884	188,333
WEST			
B			
Water	19		19
Open		25,034	25,034
Trees		217	217
D			
Water	9,520		9,520
Open		111,447	111,447
Trees		16,949	16,949
WEST Total	9,539	153,647	163,186
SW			
B			
Road	2,162		2,162
Drive	3,648		3,648
Roof	4,315		4,315
Open		94,721	94,721
Trees		4,812	4,812
SW Total	10,126	99,534	109,659
SC			
B			
Road	2,555		2,555
Drive	1,796		1,796
Roof	2,158		2,158
Open		24,068	24,068
Woods		2,012	2,012
SC Total	6,509	26,081	32,590
SE			
B			
Road	4,681		4,681
Drive	5,340		5,340
Roof	5,072		5,072
Open		66,579	66,579
Trees		396	396
Woods		383	383
SE Total	15,094	67,359	82,453
Grand Total	411,308	2,934,148	3,345,456

Proposed Overall 17-04-29

Prepared by {enter your company name here}
 HydroCAD® 10.00-15 s/n 01371 © 2015 HydroCAD Software Solutions LLC

Type II 24-hr 1-Year Rainfall=2.60"
 Printed 5/2/2017

Summary for Pond 38A: ABS Pond

Inflow Area = 2,078,271 sf, 13.45% Impervious, Inflow Depth = 0.27" for 1-Year event
 Inflow = 6.32 cfs @ 12.15 hrs, Volume= 47,491 cf
 Outflow = 5.71 cfs @ 12.25 hrs, Volume= 47,479 cf, Atten= 10%, Lag= 6.2 min
 Primary = 5.71 cfs @ 12.25 hrs, Volume= 47,479 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.0020 hrs
 Peak Elev= 496.13' @ 12.25 hrs Surf.Area= 22,519 sf Storage= 2,936 cf

Plug-Flow detention time= 20.1 min calculated for 47,479 cf (100% of inflow)
 Center-of-Mass det. time= 20.0 min (922.7 - 902.7)

Volume	Invert	Avail.Storage	Storage Description
#1	496.00'	116,427 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
496.00	22,069	0	0
497.00	25,485	23,777	23,777
498.00	29,000	27,243	51,020
499.00	32,703	30,852	81,871
500.00	36,408	34,556	116,427

Device	Routing	Invert	Outlet Devices
#1	Primary	496.00'	2.0" Vert. Into Media X 250.00 C= 0.600
#2	Secondary	496.30'	56.0" W x 6.0" H Vert. Orifice/Grate C= 0.600
#3	Secondary	497.80'	20.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32
#4	Tertiary	498.75'	Spillway, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.50 Width (feet) 10.00 22.00

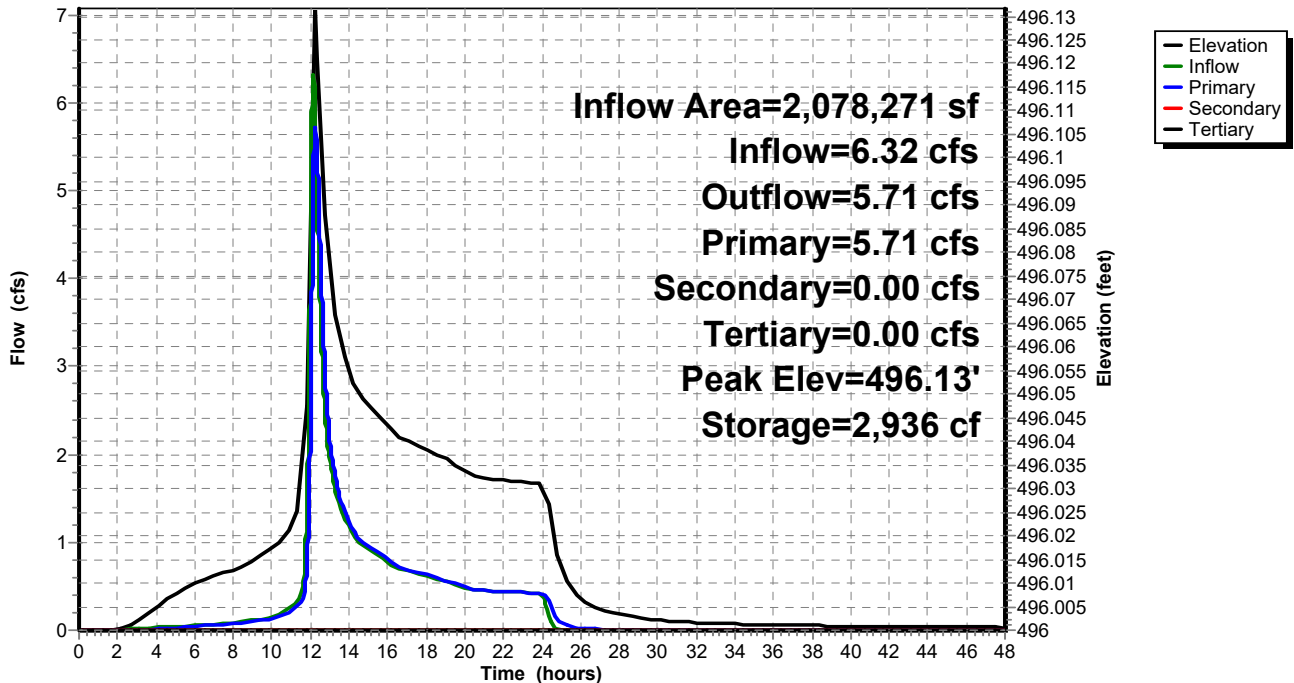
Primary OutFlow Max=5.71 cfs @ 12.25 hrs HW=496.13' TW=494.79' (Dynamic Tailwater)
 ↳1=Into Media (Orifice Controls 5.71 cfs @ 1.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=496.00' TW=491.50' (Dynamic Tailwater)
 ↳2=Orifice/Grate (Controls 0.00 cfs)
 ↳3=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=496.00' TW=495.00' (Dynamic Tailwater)
 ↳4=Spillway (Controls 0.00 cfs)

Pond 38A: ABS Pond

Hydrograph



Summary for Pond 38B: ABS Media

Inflow Area = 2,078,271 sf, 13.45% Impervious, Inflow Depth = 0.27" for 1-Year event
 Inflow = 5.71 cfs @ 12.25 hrs, Volume= 47,479 cf
 Outflow = 4.21 cfs @ 12.53 hrs, Volume= 47,478 cf, Atten= 26%, Lag= 16.4 min
 Primary = 4.21 cfs @ 12.53 hrs, Volume= 47,478 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.0020 hrs
 Peak Elev= 495.11' @ 16.08 hrs Surf.Area= 20,829 sf Storage= 5,302 cf

Plug-Flow detention time= 81.6 min calculated for 47,476 cf (100% of inflow)
 Center-of-Mass det. time= 81.6 min (1,004.3 - 922.7)

Volume	Invert	Avail.Storage	Storage Description
#1	494.25'	14,626 cf	Custom Stage Data (Prismatic) , listed below (Recalc) 48,754 cf Overall x 30.0% Voids

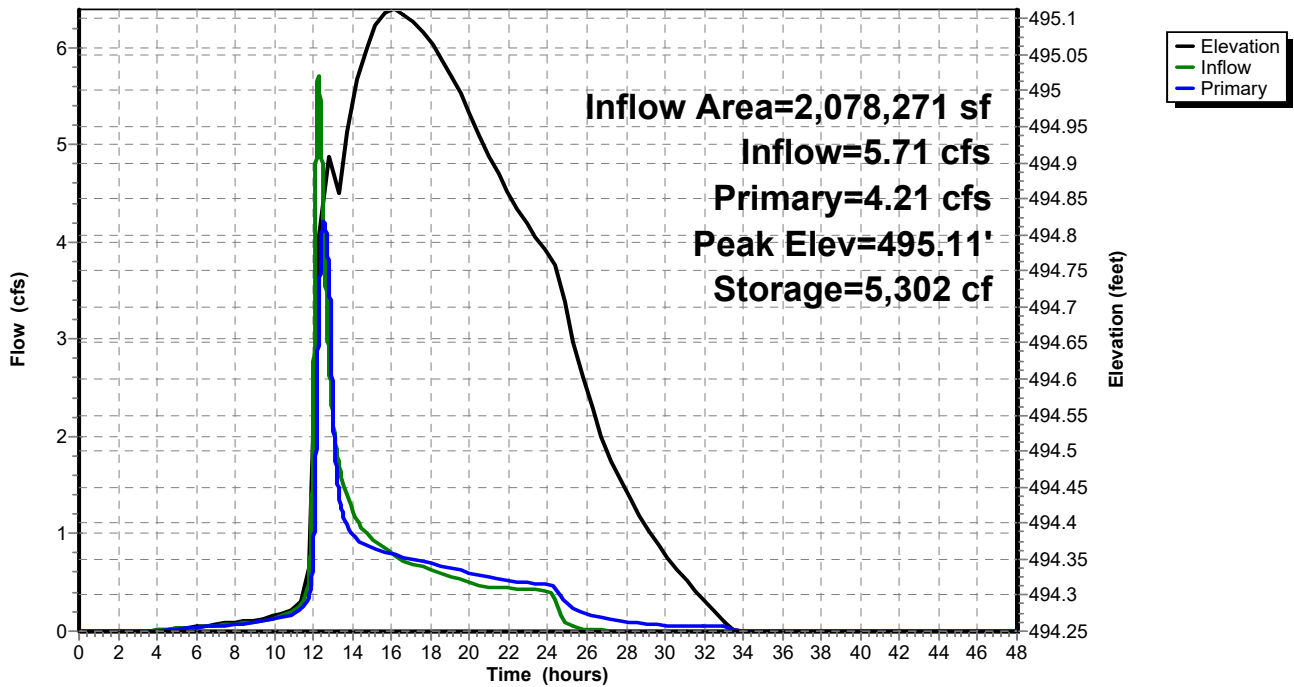
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
494.25	20,135	0	0
496.00	21,543	36,468	36,468
496.50	3,000	6,136	42,604
497.00	3,000	1,500	44,104
500.00	100	4,650	48,754

Device	Routing	Invert	Outlet Devices
#1	Primary	494.25'	Media Flow Loss (feet) 0.00 1.00 Disch. (cfs) 0.000 5.697

Primary OutFlow Max=4.21 cfs @ 12.53 hrs HW=494.99' TW=493.78' (Dynamic Tailwater)
 ←1=Media Flow (Custom Controls 4.21 cfs)

Pond 38B: ABS Media

Hydrograph



Proposed Overall 17-04-29

Prepared by {enter your company name here}
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Type II 24-hr 1-Year Rainfall=2.60"
 Printed 5/2/2017

Summary for Pond 38C: ABS Stone

Inflow Area = 2,078,271 sf, 13.45% Impervious, Inflow Depth = 0.27" for 1-Year event
 Inflow = 4.21 cfs @ 12.53 hrs, Volume= 47,478 cf
 Outflow = 0.78 cfs @ 16.28 hrs, Volume= 42,489 cf, Atten= 81%, Lag= 225.2 min
 Discarded = 0.12 cfs @ 12.83 hrs, Volume= 16,379 cf
 Primary = 0.32 cfs @ 13.20 hrs, Volume= 318 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Tertiary = 0.65 cfs @ 16.35 hrs, Volume= 25,793 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.0020 hrs
 Peak Elev= 494.98' @ 16.35 hrs Surf.Area= 12,835 sf Storage= 16,434 cf

Plug-Flow detention time= 436.0 min calculated for 42,489 cf (89% of inflow)
 Center-of-Mass det. time= 367.3 min (1,371.6 - 1,004.3)

Volume	Invert	Avail.Storage	Storage Description
#1	493.00'	20,152 cf	Custom Stage Data (Prismatic) listed below (Recalc) 44,783 cf Overall x 45.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
493.00	19,150	0	0
494.25	20,135	24,553	24,553
496.25	20	20,155	44,708
500.00	20	75	44,783

Device	Routing	Invert	Outlet Devices
#1	Discarded	493.00'	0.250 in/hr Exfiltration over Horizontal area Phase-In= 0.10'
#2	Tertiary	491.00'	6.0" Round Culvert L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 491.00' / 490.00' S= 0.0091 ' S= 0.0091 ' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#3	Device 2	494.25'	6.0" Vert. Standpipe C= 0.600
#4	Primary	494.25'	4.0" Vert. Low Flow X 2.00 C= 0.600
#5	Secondary	496.00'	3.1' long High Flow 0 End Contraction(s) 1.0' Crest Height
#6	Device 5	493.00'	Stone Flow Loss (feet) 0.00 1.00 Disch. (cfs) 0.000 13.389

Discarded OutFlow Max=0.12 cfs @ 12.83 hrs HW=494.25' (Free Discharge)
 ↳1=Exfiltration (Exfiltration Controls 0.12 cfs)

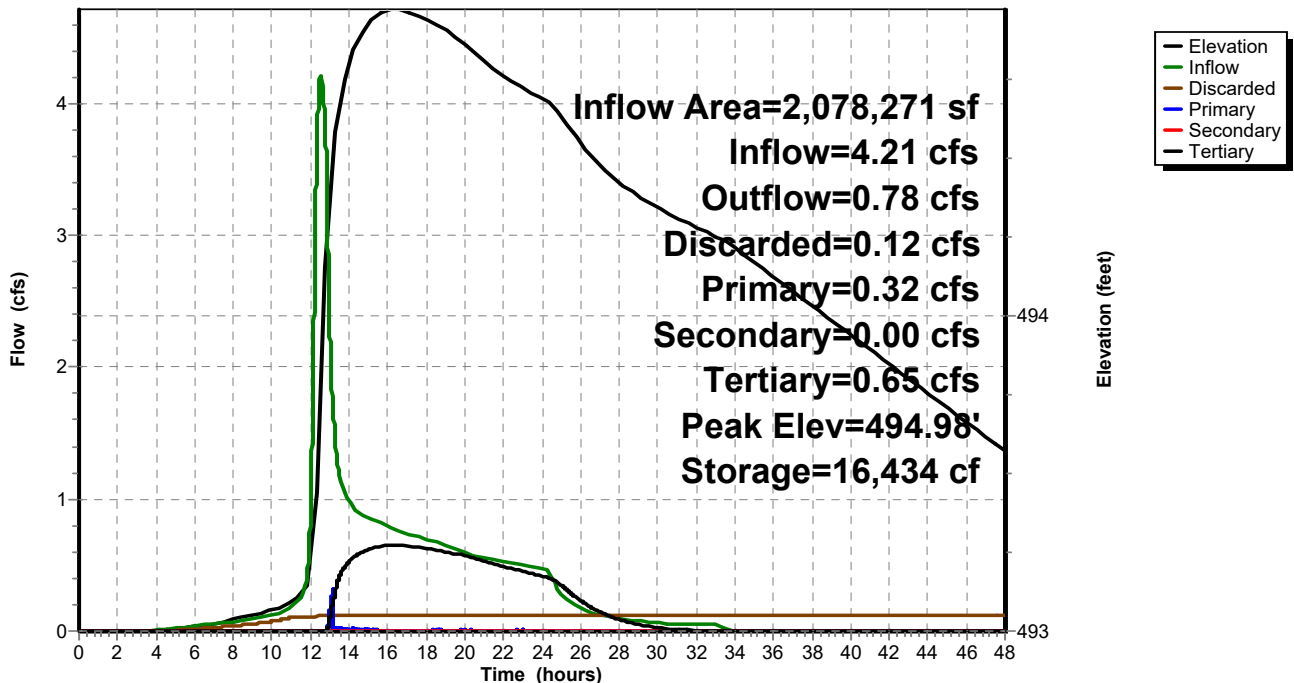
Primary OutFlow Max=0.29 cfs @ 13.20 hrs HW=494.56' TW=494.43' (Dynamic Tailwater)
 ↳4=Low Flow (Orifice Controls 0.29 cfs @ 1.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=493.00' TW=491.50' (Dynamic Tailwater)
 ↳5=High Flow (Controls 0.00 cfs)
 ↳6=Stone Flow (Controls 0.00 cfs)

Tertiary OutFlow Max=0.65 cfs @ 16.35 hrs HW=494.98' TW=491.67' (Dynamic Tailwater)
 ↳2=Culvert (Passes 0.65 cfs of 1.03 cfs potential flow)
 ↳3=Standpipe (Orifice Controls 0.65 cfs @ 3.32 fps)

Pond 38C: ABS Stone

Hydrograph



Summary for Pond 38D: ABS Outlet

Inflow Area = 2,078,271 sf, 13.45% Impervious, Inflow Depth = 0.00" for 1-Year event
 Inflow = 0.32 cfs @ 13.20 hrs, Volume= 318 cf
 Outflow = 0.00 cfs @ 13.01 hrs, Volume= 210 cf, Atten= 99%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 13.01 hrs, Volume= 210 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.0020 hrs
 Peak Elev= 494.98' @ 16.35 hrs Surf.Area= 72 sf Storage= 250 cf

Plug-Flow detention time= 1,043.6 min calculated for 210 cf (66% of inflow)
 Center-of-Mass det. time= 932.5 min (1,828.6 - 896.1)

Volume	Invert	Avail.Storage	Storage Description
#1	491.50'	1,080 cf	4.00'W x 6.00'L x 15.00'H PrismaToid x 3

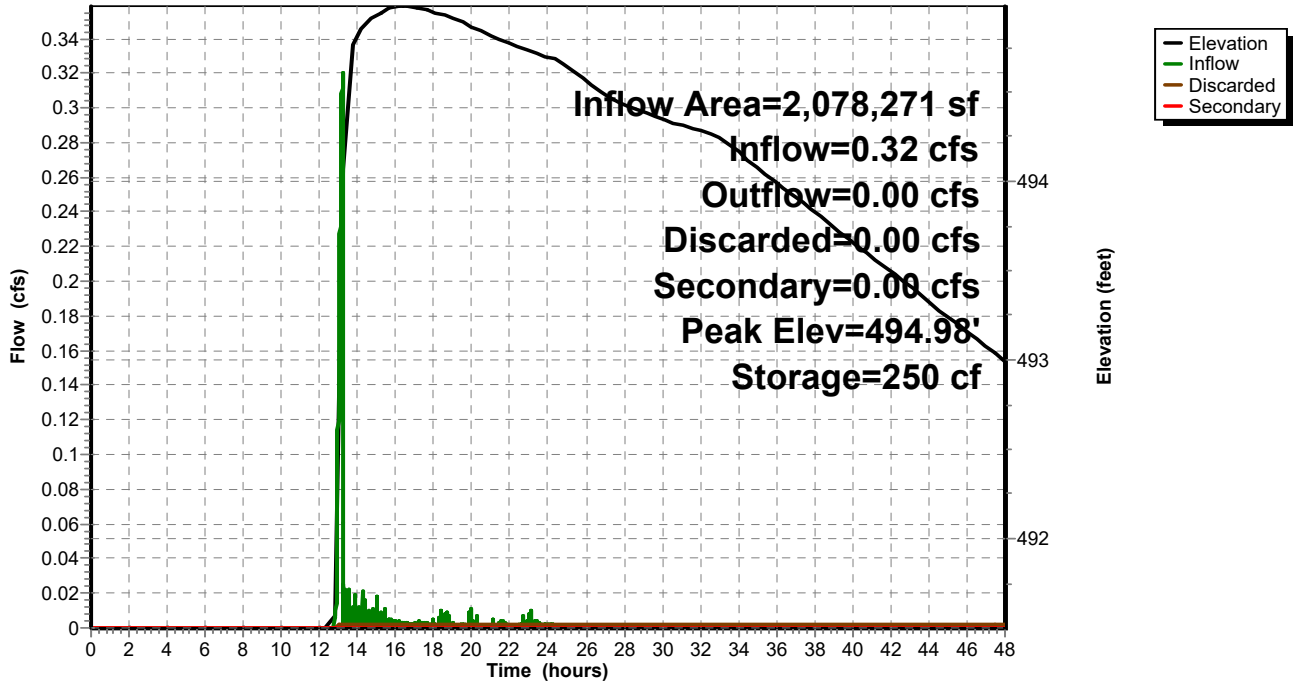
Device	Routing	Invert	Outlet Devices
#1	Discarded	491.50'	1.000 in/hr Exfiltration over Surface area Phase-In= 0.50'
#2	Secondary	496.00'	36.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Device 2	491.50'	30.0" Round Culvert X 2.00 L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 491.50' / 490.00' S= 0.0187 '/' Cc= 0.900 n= 0.011, Flow Area= 4.91 sf

Discarded OutFlow Max=0.00 cfs @ 13.01 hrs HW=492.11' (Free Discharge)
 1=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=491.50' TW=495.00' (Dynamic Tailwater)
 2=Level Spreader (Controls 0.00 cfs)
 3=Culvert (Controls 0.00 cfs)

Pond 38D: ABS Outlet

Hydrograph



Summary for Pond 57: Basin

Inflow Area = 142,247 sf, 11.69% Impervious, Inflow Depth = 0.19" for 1-Year event
 Inflow = 0.32 cfs @ 12.16 hrs, Volume= 2,281 cf
 Outflow = 0.07 cfs @ 13.97 hrs, Volume= 2,281 cf, Atten= 79%, Lag= 108.3 min
 Discarded = 0.03 cfs @ 13.97 hrs, Volume= 1,481 cf
 Primary = 0.03 cfs @ 13.97 hrs, Volume= 800 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.0020 hrs
 Peak Elev= 518.18' @ 13.97 hrs Surf.Area= 3,018 sf Storage= 531 cf

Plug-Flow detention time= 116.4 min calculated for 2,281 cf (100% of inflow)
 Center-of-Mass det. time= 116.4 min (1,077.3 - 960.9)

Volume #1	Invert	Avail.Storage	Storage Description
	518.00'	12,048 cf	Custom Stage Data (Prismatic) , listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
518.00	2,897	0	0
519.00	3,571	3,234	3,234
520.00	4,296	3,934	7,168
521.00	5,465	4,881	12,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	518.00'	0.500 in/hr Exfiltration over Surface area Phase-In= 0.10'
#2	Primary	518.00'	16.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.30 3.32 3.31 3.32
#3	Device 2	518.00'	18.0" Round Culvert L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 518.00' / 518.00' S= 0.0000' /' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#4	Device 3	518.00'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	519.33'	18.0" W x 12.0" H Vert. Orifice/Grate C= 0.600
#6	Device 3	519.60'	8.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 13.97 hrs HW=518.18' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.03 cfs @ 13.97 hrs HW=518.18' TW=0.00' (Dynamic Tailwater)

2=Broad-Crested Rectangular Weir(Passes 0.03 cfs of 3.36 cfs potential flow)

3=Culvert (Passes 0.03 cfs of 0.08 cfs potential flow)

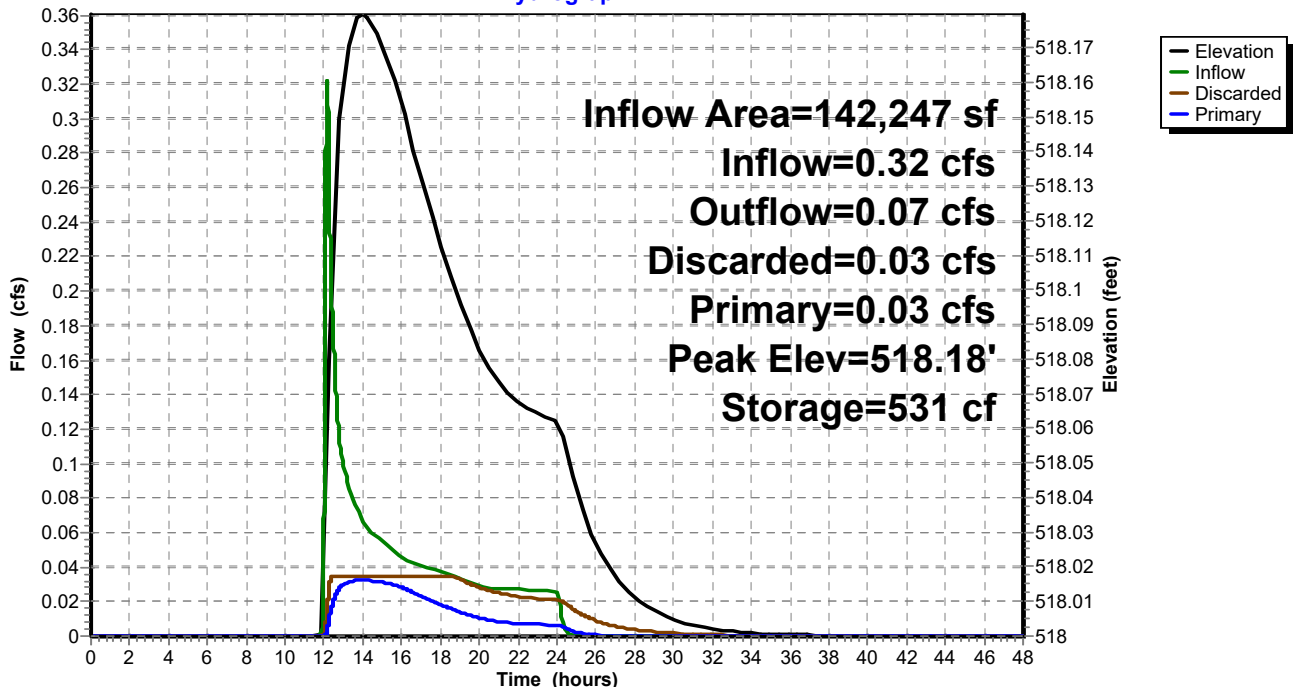
4=Orifice/Grate (Orifice Controls 0.03 cfs @ 1.49 fps)

5=Orifice/Grate (Controls 0.00 cfs)

6=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 57: Basin

Hydrograph



Proposed Overall 17-04-29

Prepared by {enter your company name here}
HydroCAD® 10.00-15 s/n 01371 © 2015 HydroCAD Software Solutions LLC

Type II 24-hr 1-Year Rainfall=2.60"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=496.13' Storage=2,936 cf Inflow=6.32 cfs 47,491 cf
Primary=5.71 cfs 47,479 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=5.71 cfs 47,479 cf

Pond 38B: ABS Media

Peak Elev=495.11' Storage=5,302 cf Inflow=5.71 cfs 47,479 cf
Outflow=4.21 cfs 47,478 cf

Pond 38C: ABS Stone

Peak Elev=494.98' Storage=16,434 cf Inflow=4.21 cfs 47,478 cf
Discarded=0.12 cfs 16,379 cf Primary=0.32 cfs 318 cf Secondary=0.00 cfs 0 cf Tertiary=0.65 cfs 25,793 cf Outflow=0.78 cfs 42,489 cf

Pond 38D: ABS Outlet

Peak Elev=494.98' Storage=250 cf Inflow=0.32 cfs 318 cf
Discarded=0.00 cfs 210 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 210 cf

Reach 46: POI "W"

Inflow=7.05 cfs 68,890 cf
Outflow=7.05 cfs 68,890 cf

Pond 57: Basin

Peak Elev=518.18' Storage=531 cf Inflow=0.32 cfs 2,281 cf
Discarded=0.03 cfs 1,481 cf Primary=0.03 cfs 800 cf Outflow=0.07 cfs 2,281 cf

Reach 58: POI "SW"

Inflow=0.03 cfs 800 cf
Outflow=0.03 cfs 800 cf

Proposed Overall 17-04-29

Prepared by {enter your company name here}

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Type II 24-hr 2-Year Rainfall=3.20"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=496.30' Storage=6,877 cf Inflow=14.60 cfs 83,083 cf
Primary=11.66 cfs 83,061 cf Secondary=0.00 cfs 9 cf Tertiary=0.00 cfs 0 cf Outflow=11.66 cfs 83,070 cf

Pond 38B: ABS Media

Peak Elev=496.30' Storage=12,382 cf Inflow=11.66 cfs 83,061 cf
Outflow=8.59 cfs 83,061 cf

Pond 38C: ABS Stone

Peak Elev=496.04' Storage=20,017 cf Inflow=8.59 cfs 83,061 cf
Discarded=0.12 cfs 16,808 cf Primary=0.57 cfs 1,732 cf Secondary=0.07 cfs 608 cf Tertiary=1.17 cfs 57,690 cf Outflow=1.49 cfs 76,837 cf

Pond 38D: ABS Outlet

Peak Elev=496.02' Storage=325 cf Inflow=0.57 cfs 2,349 cf
Discarded=0.00 cfs 213 cf Secondary=0.20 cfs 1,984 cf Outflow=0.20 cfs 2,197 cf

Reach 46: POI "W"

Inflow=11.91 cfs 126,725 cf
Outflow=11.91 cfs 126,725 cf

Pond 57: Basin

Peak Elev=518.51' Storage=1,579 cf Inflow=1.01 cfs 4,518 cf
Discarded=0.04 cfs 1,970 cf Primary=0.07 cfs 2,548 cf Outflow=0.11 cfs 4,518 cf

Reach 58: POI "SW"

Inflow=0.07 cfs 2,548 cf
Outflow=0.07 cfs 2,548 cf

Proposed Overall 17-04-29

Prepared by {enter your company name here}

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Type II 24-hr 5-Year Rainfall=4.20"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=496.91' Storage=21,434 cf Inflow=35.10 cfs 158,882 cf
Primary=20.77 cfs 112,873 cf Secondary=6.56 cfs 45,996 cf Tertiary=0.00 cfs 0 cf Outflow=24.70 cfs 158,869 cf

Pond 38B: ABS Media

Peak Elev=496.89' Storage=13,135 cf Inflow=20.77 cfs 112,873 cf
Outflow=12.58 cfs 112,873 cf

Pond 38C: ABS Stone

Peak Elev=496.39' Storage=20,120 cf Inflow=12.58 cfs 112,873 cf
Discarded=0.12 cfs 17,353 cf Primary=0.39 cfs 6,198 cf Secondary=2.27 cfs 12,334 cf Tertiary=1.20 cfs 69,904 cf Outflow=3.97 cfs 105,789 cf

Pond 38D: ABS Outlet

Peak Elev=496.21' Storage=339 cf Inflow=8.98 cfs 64,528 cf
Discarded=0.00 cfs 216 cf Secondary=8.64 cfs 64,132 cf Outflow=8.64 cfs 64,348 cf

Reach 46: POI "W"

Inflow=25.23 cfs 249,323 cf
Outflow=25.23 cfs 249,323 cf

Pond 57: Basin

Peak Elev=519.33' Storage=4,458 cf Inflow=2.71 cfs 9,395 cf
Discarded=0.04 cfs 3,083 cf Primary=0.12 cfs 6,312 cf Outflow=0.16 cfs 9,395 cf

Reach 58: POI "SW"

Inflow=0.12 cfs 6,312 cf
Outflow=0.12 cfs 6,312 cf

Proposed Overall 17-04-29

Prepared by {enter your company name here}

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Type II 24-hr 10-Year Rainfall=5.00"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=497.72' Storage=42,915 cf Inflow=55.50 cfs 231,464 cf
Primary=24.46 cfs 135,404 cf Secondary=12.10 cfs 96,047 cf Tertiary=0.00 cfs 0 cf Outflow=31.46 cfs 231,451 cf

Pond 38B: ABS Media

Peak Elev=497.67' Storage=13,766 cf Inflow=24.46 cfs 135,404 cf
Outflow=14.29 cfs 135,404 cf

Pond 38C: ABS Stone

Peak Elev=496.77' Storage=20,123 cf Inflow=14.29 cfs 135,404 cf
Discarded=0.12 cfs 17,676 cf Primary=0.61 cfs 9,152 cf Secondary=6.72 cfs 27,987 cf Tertiary=1.22 cfs 73,256 cf Outflow=8.66 cfs 128,071 cf

Pond 38D: ABS Outlet

Peak Elev=496.33' Storage=348 cf Inflow=18.76 cfs 133,187 cf
Discarded=0.00 cfs 216 cf Secondary=17.54 cfs 132,786 cf Outflow=17.54 cfs 133,002 cf

Reach 46: POI "W"

Inflow=40.76 cfs 365,553 cf
Outflow=40.76 cfs 365,553 cf

Pond 57: Basin

Peak Elev=519.58' Storage=5,431 cf Inflow=4.39 cfs 14,087 cf
Discarded=0.05 cfs 3,384 cf Primary=0.73 cfs 10,702 cf Outflow=0.78 cfs 14,086 cf

Reach 58: POI "SW"

Inflow=0.73 cfs 10,702 cf
Outflow=0.73 cfs 10,702 cf

Proposed Overall 17-04-29

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Type II 24-hr 25-Year Rainfall=5.60"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=498.17' Storage=56,057 cf Inflow=73.52 cfs 292,144 cf
Primary=25.52 cfs 148,802 cf Secondary=26.89 cfs 143,329 cf Tertiary=0.00 cfs 0 cf Outflow=33.87 cfs 292,131 cf

Pond 38B: ABS Media

Peak Elev=498.10' Storage=14,046 cf Inflow=25.52 cfs 148,802 cf
Outflow=14.58 cfs 148,802 cf

Pond 38C: ABS Stone

Peak Elev=497.16' Storage=20,127 cf Inflow=14.58 cfs 148,802 cf
Discarded=0.12 cfs 17,866 cf Primary=0.75 cfs 10,387 cf Secondary=10.49 cfs 38,693 cf Tertiary=1.25 cfs 74,443 cf Outflow=12.60 cfs 141,389 cf

Pond 38D: ABS Outlet

Peak Elev=496.49' Storage=359 cf Inflow=32.55 cfs 192,408 cf
Discarded=0.00 cfs 216 cf Secondary=32.55 cfs 192,006 cf Outflow=32.55 cfs 192,222 cf

Reach 46: POI "W"

Inflow=56.62 cfs 461,659 cf
Outflow=56.62 cfs 461,659 cf

Pond 57: Basin

Peak Elev=519.72' Storage=5,973 cf Inflow=5.76 cfs 17,964 cf
Discarded=0.05 cfs 3,540 cf Primary=2.15 cfs 14,423 cf Outflow=2.19 cfs 17,963 cf

Reach 58: POI "SW"

Inflow=2.15 cfs 14,423 cf
Outflow=2.15 cfs 14,423 cf

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Type II 24-hr 50-Year Rainfall=6.30"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=498.52' Storage=66,678 cf Inflow=94.61 cfs 370,641 cf
Primary=25.37 cfs 160,544 cf Secondary=51.68 cfs 210,084 cf Tertiary=0.00 cfs 0 cf Outflow=58.60 cfs 370,628 cf

Pond 38B: ABS Media

Peak Elev=498.45' Storage=14,233 cf Inflow=25.37 cfs 160,544 cf
Outflow=14.21 cfs 160,544 cf

Pond 38C: ABS Stone

Peak Elev=497.58' Storage=20,131 cf Inflow=14.21 cfs 160,544 cf
Discarded=0.12 cfs 18,050 cf Primary=0.86 cfs 11,417 cf Secondary=14.08 cfs 48,198 cf Tertiary=1.28 cfs 75,403 cf Outflow=16.34 cfs 153,068 cf

Pond 38D: ABS Outlet

Peak Elev=496.86' Storage=386 cf Inflow=57.25 cfs 269,699 cf
Discarded=0.00 cfs 217 cf Secondary=57.25 cfs 269,295 cf Outflow=57.25 cfs 269,512 cf

Reach 46: POI "W"

Inflow=95.80 cfs 583,779 cf
Outflow=95.80 cfs 583,779 cf

Pond 57: Basin

Peak Elev=519.84' Storage=6,503 cf Inflow=7.47 cfs 23,165 cf
Discarded=0.05 cfs 3,691 cf Primary=4.57 cfs 19,473 cf Outflow=4.62 cfs 23,164 cf

Reach 58: POI "SW"

Inflow=4.57 cfs 19,473 cf
Outflow=4.57 cfs 19,473 cf

Proposed Overall 17-04-29

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Type II 24-hr 100-Year Rainfall=7.20"

Printed 5/2/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 38A: ABS Pond

Peak Elev=498.95' Storage=80,117 cf Inflow=128.34 cfs 482,189 cf
Primary=22.54 cfs 171,530 cf Secondary=85.99 cfs 309,155 cf Tertiary=3.02 cfs 1,491 cf Outflow=93.03 cfs 482,175 cf

Pond 38B: ABS Media

Peak Elev=498.92' Storage=14,426 cf Inflow=22.54 cfs 171,530 cf
Outflow=12.17 cfs 171,530 cf

Pond 38C: ABS Stone

Peak Elev=498.22' Storage=20,136 cf Inflow=12.17 cfs 171,530 cf
Discarded=0.12 cfs 18,243 cf Primary=0.79 cfs 12,406 cf Secondary=11.62 cfs 56,590 cf Tertiary=1.32 cfs 76,759 cf Outflow=13.78 cfs 163,997 cf

Pond 38D: ABS Outlet

Peak Elev=498.06' Storage=472 cf Inflow=88.54 cfs 378,150 cf
Discarded=0.00 cfs 217 cf Secondary=88.53 cfs 377,746 cf Outflow=88.54 cfs 377,962 cf

Reach 46: POI "W"

Inflow=151.25 cfs 754,357 cf
Outflow=151.25 cfs 754,357 cf

Pond 57: Basin

Peak Elev=519.99' Storage=7,143 cf Inflow=9.79 cfs 30,496 cf
Discarded=0.05 cfs 3,813 cf Primary=7.71 cfs 26,682 cf Outflow=7.76 cfs 30,495 cf

Reach 58: POI "SW"

Inflow=7.71 cfs 26,682 cf
Outflow=7.71 cfs 26,682 cf

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Type II 24-hr 1-Year Rainfall=2.60"

Printed 5/4/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 5: Swale	Peak Elev=521.20' Storage=2,504 cf Inflow=1.97 cfs 5,257 cf Discarded=0.10 cfs 5,257 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 5,257 cf
Pond 7: Porous	Peak Elev=520.49' Storage=5,566 cf Inflow=4.13 cfs 11,026 cf Discarded=0.22 cfs 11,026 cf Primary=0.00 cfs 0 cf Outflow=0.22 cfs 11,026 cf
Pond 10: Porous	Peak Elev=521.46' Storage=1,016 cf Inflow=0.76 cfs 2,034 cf Discarded=0.04 cfs 2,034 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,034 cf
Pond 12: Swale	Peak Elev=522.01' Storage=512 cf Inflow=0.42 cfs 1,111 cf Discarded=0.02 cfs 1,111 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,111 cf
Pond 16: Swale	Peak Elev=523.59' Storage=243 cf Inflow=0.22 cfs 582 cf Discarded=0.02 cfs 582 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 582 cf
Pond 20: Swale	Peak Elev=516.06' Storage=1,213 cf Inflow=0.98 cfs 2,611 cf Discarded=0.05 cfs 2,611 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 2,611 cf
Pond 22: Porous	Peak Elev=515.57' Storage=2,649 cf Inflow=1.92 cfs 5,125 cf Discarded=0.09 cfs 5,125 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 5,125 cf
Pond 25: Porous	Peak Elev=519.53' Storage=1,659 cf Inflow=1.22 cfs 3,247 cf Discarded=0.06 cfs 3,247 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 3,247 cf
Pond 27: Swale	Peak Elev=520.25' Storage=1,346 cf Inflow=1.05 cfs 2,806 cf Discarded=0.05 cfs 2,806 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 2,806 cf
Pond 33: Swale	Peak Elev=512.56' Storage=1,343 cf Inflow=1.00 cfs 2,676 cf Discarded=0.04 cfs 2,676 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,676 cf
Pond 35: Porous	Peak Elev=511.55' Storage=1,623 cf Inflow=1.18 cfs 3,156 cf Discarded=0.06 cfs 3,156 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 3,156 cf
Pond 38A: ABS Pond	Peak Elev=496.13' Storage=2,936 cf Inflow=6.32 cfs 47,491 cf Primary=5.71 cfs 47,479 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=5.71 cfs 47,479 cf
Pond 38B: ABS Media	Peak Elev=495.11' Storage=5,302 cf Inflow=5.71 cfs 47,479 cf Outflow=4.21 cfs 47,478 cf
Pond 38C: ABS Stone	Peak Elev=494.98' Storage=16,434 cf Inflow=4.21 cfs 47,478 cf Discarded=0.12 cfs 16,379 cf Primary=0.32 cfs 318 cf Secondary=0.00 cfs 0 cf Tertiary=0.65 cfs 25,793 cf Outflow=0.78 cfs 42,489 cf
Pond 38D: ABS Outlet	Peak Elev=494.98' Storage=250 cf Inflow=0.32 cfs 318 cf Discarded=0.00 cfs 210 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 210 cf
Pond 41: POND	Peak Elev=491.67' Storage=2,406 cf Inflow=1.99 cfs 34,130 cf Primary=0.75 cfs 34,113 cf Secondary=0.00 cfs 0 cf Outflow=0.75 cfs 34,113 cf
Pond 48: Porous	Peak Elev=530.55' Storage=809 cf Inflow=0.59 cfs 1,573 cf Discarded=0.03 cfs 1,573 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,573 cf
Pond 50: Swale	Peak Elev=530.92' Storage=193 cf Inflow=0.16 cfs 427 cf Discarded=0.01 cfs 427 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 427 cf
Pond 54: Porous	Peak Elev=530.24' Storage=354 cf Inflow=0.29 cfs 781 cf Discarded=0.03 cfs 781 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 781 cf
Pond 56: Swale	Peak Elev=531.06' Storage=235 cf Inflow=0.19 cfs 505 cf Discarded=0.01 cfs 505 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 505 cf
Pond 57: Basin	Peak Elev=518.18' Storage=531 cf Inflow=0.32 cfs 2,281 cf Discarded=0.03 cfs 1,481 cf Primary=0.03 cfs 800 cf Outflow=0.07 cfs 2,281 cf
Pond 60: Porous	Peak Elev=500.48' Storage=1,036 cf Inflow=0.77 cfs 2,057 cf Discarded=0.04 cfs 2,057 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,057 cf
Pond 62: Swale	Peak Elev=501.01' Storage=426 cf Inflow=0.35 cfs 925 cf Discarded=0.02 cfs 925 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 925 cf

Proposed Overall 17-04-29

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Type II 24-hr 2-Year Rainfall=3.20"

Printed 5/4/2017

Time span=0.00-48.00 hrs, dt=0.0020 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 5: Swale	Peak Elev=521.58' Storage=3,283 cf Inflow=2.44 cfs 6,582 cf Discarded=0.10 cfs 6,582 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 6,582 cf
Pond 7: Porous	Peak Elev=520.64' Storage=7,210 cf Inflow=5.11 cfs 13,804 cf Discarded=0.22 cfs 13,804 cf Primary=0.00 cfs 0 cf Outflow=0.22 cfs 13,804 cf
Pond 10: Porous	Peak Elev=521.60' Storage=1,315 cf Inflow=0.94 cfs 2,547 cf Discarded=0.04 cfs 2,547 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,547 cf
Pond 12: Swale	Peak Elev=522.32' Storage=669 cf Inflow=0.52 cfs 1,391 cf Discarded=0.02 cfs 1,391 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,391 cf
Pond 16: Swale	Peak Elev=523.77' Storage=317 cf Inflow=0.27 cfs 729 cf Discarded=0.02 cfs 729 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 729 cf
Pond 20: Swale	Peak Elev=516.39' Storage=1,587 cf Inflow=1.21 cfs 3,268 cf Discarded=0.05 cfs 3,268 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 3,268 cf
Pond 22: Porous	Peak Elev=515.74' Storage=3,438 cf Inflow=2.38 cfs 6,416 cf Discarded=0.09 cfs 6,416 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 6,416 cf
Pond 25: Porous	Peak Elev=519.69' Storage=2,151 cf Inflow=1.51 cfs 4,065 cf Discarded=0.06 cfs 4,065 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 4,065 cf
Pond 27: Swale	Peak Elev=520.63' Storage=1,765 cf Inflow=1.30 cfs 3,513 cf Discarded=0.05 cfs 3,513 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 3,513 cf
Pond 33: Swale	Peak Elev=513.05' Storage=1,765 cf Inflow=1.24 cfs 3,351 cf Discarded=0.04 cfs 3,351 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 3,351 cf
Pond 35: Porous	Peak Elev=511.72' Storage=2,105 cf Inflow=1.46 cfs 3,952 cf Discarded=0.06 cfs 3,952 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 3,952 cf
Pond 38A: ABS Pond	Peak Elev=496.30' Storage=6,877 cf Inflow=14.60 cfs 83,083 cf Primary=11.66 cfs 83,061 cf Secondary=0.00 cfs 9 cf Tertiary=0.00 cfs 0 cf Outflow=11.66 cfs 83,070 cf
Pond 38B: ABS Media	Peak Elev=496.30' Storage=12,382 cf Inflow=11.66 cfs 83,061 cf Outflow=8.59 cfs 83,061 cf
Pond 38C: ABS Stone	Peak Elev=496.04' Storage=20,017 cf Inflow=8.59 cfs 83,061 cf Discarded=0.12 cfs 16,808 cf Primary=0.57 cfs 1,732 cf Secondary=0.07 cfs 608 cf Tertiary=1.17 cfs 57,690 cf Outflow=1.49 cfs 76,837 cf
Pond 38D: ABS Outlet	Peak Elev=496.02' Storage=325 cf Inflow=0.57 cfs 2,349 cf Discarded=0.00 cfs 213 cf Secondary=0.20 cfs 1,984 cf Outflow=0.20 cfs 2,197 cf
Pond 41: POND	Peak Elev=491.77' Storage=3,687 cf Inflow=3.44 cfs 70,416 cf Primary=1.42 cfs 70,393 cf Secondary=0.00 cfs 0 cf Outflow=1.42 cfs 70,393 cf
Pond 48: Porous	Peak Elev=530.72' Storage=1,050 cf Inflow=0.73 cfs 1,969 cf Discarded=0.03 cfs 1,969 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,969 cf
Pond 50: Swale	Peak Elev=531.20' Storage=252 cf Inflow=0.20 cfs 535 cf Discarded=0.01 cfs 535 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 535 cf
Pond 54: Porous	Peak Elev=530.31' Storage=457 cf Inflow=0.36 cfs 978 cf Discarded=0.03 cfs 978 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 978 cf
Pond 56: Swale	Peak Elev=531.39' Storage=307 cf Inflow=0.23 cfs 632 cf Discarded=0.01 cfs 632 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 632 cf
Pond 57: Basin	Peak Elev=518.51' Storage=1,579 cf Inflow=1.01 cfs 4,518 cf Discarded=0.04 cfs 1,970 cf Primary=0.07 cfs 2,548 cf Outflow=0.11 cfs 4,518 cf
Pond 60: Porous	Peak Elev=500.63' Storage=1,341 cf Inflow=0.95 cfs 2,575 cf Discarded=0.04 cfs 2,575 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,575 cf
Pond 62: Swale	Peak Elev=501.32' Storage=557 cf Inflow=0.43 cfs 1,158 cf Discarded=0.02 cfs 1,158 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,158 cf

APPENDIX D

SITE DEVELOPMENT COST ANALYSIS

TROUTBECK FARM 38 LOT SUBDIVISION				
Description	Quantity	Unit	Unit Price	Item Cost
SEDIMENT & EROSION CONTROL				
Tire Scrub	1	EA.	\$2,000.00	\$ 2,000
Compost Filter Sock	2,700	LF	\$7.65	\$ 20,655
Dvisersion Dike Swale	3,200	LF	\$4.00	\$ 12,800
Sediment Trap #1	1	EA.	\$7,500.00	\$ 7,500
Remove Sed Trap #1	1	LS	\$1,000.00	\$ 1,000
Seed & Straw Mulch (temp)	23,794	SY	\$0.35	\$ 8,328
Clear & Grub Woods	0.5	AC.	\$7,500.00	\$ 3,750
SEDIMENT BASIN				
Strip Topsoil\Basin	1,084	CY	\$0.00	\$ -
Cut\Basin	8,156	CY	\$2.75	\$ 22,429
Fill\Basin	1,500	CY	\$2.75	\$ 4,125
Respread Topsoil (Basin)	5,418	SY	\$2.10	\$ 11,379
Grade\Basin	5,418	SY	\$0.34	\$ 1,842
Hydroseed Basin	5,418	SY	\$0.36	\$ 1,951
Outflow Pipe "30"	260	LF	\$100.00	\$ 26,000
Concrete Collar	2	EA.	\$650.00	\$ 1,300
Outlet Structure	1	LS	\$3,000.00	\$ 3,000
Erosion Control Blanket	5,418	SY	\$1.00	\$ 5,418
Remove Sediment, Convert	1	LS	\$10,000.00	\$ 10,000
SUBTOTAL			\$ 141,478	
EARTHWORK				
Strip Topsoil	5,949	CY	\$2.00	\$ 11,897
Cut	11,897	CY	\$2.75	\$ 32,717
Fill & Compact	11,897	CY	\$2.75	\$ 32,717
Respread Topsoil	11,897	SY	\$2.10	\$ 24,984
Grade Site	23,794	SY	\$1.00	\$ 23,794
Hydroseed	11,897	SY	\$0.36	\$ 4,283
SUBTOTAL			\$ 130,394	
BIORETENTION SWALES-ROAD				
Cut Swales	4,944	CY	\$2.75	\$ 13,596
Separation Fabric for Swales	11,124	SY	\$2.00	\$ 22,247
Place Compost Bioretention Media	4,944	CY	\$50.00	\$ 247,192
Hydroseeding for Swales	8,899	SY	\$1.00	\$ 8,899
Erosion Control Blanket for Swales	8,899	SY	\$1.50	\$ 13,348
SUBTOTAL			\$ 291,934	
BIORETENTION BASIN 1				
Strip Topsoil	9,102	CY	\$2.00	\$ 18,204
Cut	6,559	CY	\$2.75	\$ 18,037
Place Bioretention Stone	909	CY	\$60.00	\$ 54,557
Place Advanced Bioretention Media	1,350	CY	\$100.00	\$ 135,042
Erosion Control Blanket	1,652	SY	\$1.50	\$ 2,478
Hydroseed Meadow mix	4,045	SY	\$3.00	\$ 12,136
SUBTOTAL			\$204,212	

ROADWAYS					
Finegrade & Compact	11,897	SY	\$0.75	\$	8,923
Stone Base No 4A+ Screenings- 8"	10,816	SY	\$11.00	\$	118,972
ID2 Binder 2"	10,816	SY	\$5.00	\$	54,078
Wearing 1.0"	10,816	SY	\$4.50	\$	48,671
Tac Coat	10,816	SY	\$0.25	\$	2,704
Belgian Block Standing Curb	7,901	LF	\$15.00	\$	118,515
Stop signs	4	EA.	\$300.00	\$	1,200
Street signs	4	EA.	\$300.00	\$	1,200
		SUBTOTAL	\$354,263.01		
STORMWATER					
18" HDPE Pipe	1,108	LF	\$35.00	\$	38,780
24" HDPE Pipe	630	LF	\$50.00	\$	31,500
30" HDPE Pipe	296	LF	\$65.00	\$	19,240
HDPE FES	2	EA	\$750.00	\$	1,500
TYPE M INLET	7	EA	\$1,600.00	\$	11,200
MANHOLE	2	EA	\$2,000.00	\$	4,000
SCOUR HOLE	1	EA	\$2,500.00	\$	2,500
		SUBTOTAL	\$108,720.00		
SEWER					
2" PVC Force Main	3,685	LF	\$25.00	\$	92,125
2" PVC Force Main Road Edge	1,680	LF	\$50.00	\$	84,000
2" PVC Force Main Road Paving	294	LF	\$100.00	\$	29,400
		SUBTOTAL	\$205,525.00		
WATER					
8" DIP Main	3,382	LF	\$65.00	\$	219,830
8" DIP Road Paving	299	LF	\$120.00	\$	35,880
Fire Hydrants	5	ea	\$2,500.00	\$	12,500
		SUBTOTAL	\$268,210.00		
LANDSCAPING					
Deciduous Trees	64	EA	\$350.00	\$	22,400
SURVEY					
Construction Stakeout	18	DY	\$750.00	\$	13,500
Monuments	30	EA	\$250.00	\$	7,500
Lot Pins	120	EA	\$150.00	\$	18,000
As-Built Survey	1	LS	\$15,000.00	\$	15,000
INSPECTION/DEDICATION	1	LS	\$25,000.00	\$	25,000
		SUBTOTAL	\$79,000.00		
		TOTAL SITE WORK COSTS	\$	1,857,725	
		CONTINGENCY 15%	\$	278,659	
TOTAL SITE IMPROVEMENTS COST				\$	2,136,384
SITE IMPROVEMENTS COST PER LOT				\$	56,221
ON LOT COSTS					
Porous Pavement Extra Cost	295	SY	\$8.00	\$	2,360
Gravel Reservoir Extra Cost	88.5	CY	\$50.00	\$	4,425
Grinder Pump and Tank	1	EA	\$5,000.00	\$	5,000
Sewer Tap Fee	1	EA	\$2,000.00	\$	2,000
Water Tap Fee	1	EA	\$750.00	\$	750
		ONLOT COST PER LOT	\$	14,535	
TOTAL IMPROVEMENTS COST PER LOT- COMPLETE				\$	70,756