APPENDIX 4.1-11

Land Exchange Alternative
Hydromodification Management Plan

HMP Flow Control Facility Design for

OTAY RANCH VILLAGE 14 AND PLANNING AREA 16/19- LAND EXCHANGE ALTERNATIVE

County of San Diego, California

Preparation/Revision Date:
January 29, 2018

Prepared for:

Jackson- Pendo Development Company
2245 San Diego Avenue, Suite 223
San Diego, CA 92110

Declaration of Responsible Charge

I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as engineer of work, of my responsibilities for project design.

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Alisa S. Vialpando 1/29/18

Alisa S. Vialpando, R.C.E. 47945 Date
Vice President

HMP Flow Control Facility Design

This report has been prepared in place of Attachment 2a of the *Priority Development Project (PDP) SWQMP for Otay Ranch Village 14 and Planning Area 16/19- Land Exchange Alternative* (January 2018) and has been prepared to be submitted concurrently with the SWQMP.

Project Summary:

This technical report provides a project level analysis of the Land Exchange Alternative (defined below) for inclusion in the Otay Ranch Village 14 and Planning Areas 16/19 Environmental Impact Report (EIR). The regional location is shown in Figure 1.

The Land Exchange Alternative is located within Otay Ranch Village 14 and Planning Areas 16 and 19 in the Proctor Valley Parcel of Otay Ranch as shown on Figure 2. Village 14 and Planning Areas 16 and 19 are part of the larger Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas.

The Land Exchange Alternative proposes 1,530 homes within a development footprint that is limited to Proctor Valley Village 14. The majority of Planning Areas 16 and 19 would be converted to MSCP and Otay Ranch RMP Preserve and would not be developed.

DEFINITIONS

"Land Exchange Area" Defined

As indicated above, the "Land Exchange Area" is located within Otay Ranch Village 14 and Planning Areas 16 and 19. The total Land Exchange Area covers approximately 2,387 acres, of which the Applicant owns 1,294 acres, the State owns approximately 1,053 acres and 39.9 acres are Offsites. Within the Land Exchange Area, there are 1,003 acres in Village 14 and 1,345 acres in Planning Areas 16 and 19. Offsites include Proctor Valley Road and related utilities in the south and central portions of Village 14. The State's ownership is included in order to process a General Plan Amendment to remove existing approved Otay Ranch GDP/SRP and County General Plan development land uses and convert these acres to MSCP/Otay Ranch RMP Preserve.

"Land Exchange Alternative" Defined

The Land Exchange Alternative limits development to Otay Ranch Village 14 and converts the majority of development approved by the Otay Ranch GDP/SRP in Planning Areas 16 and 19 to MSCP and Otay Ranch RMP Preserve. The Land Exchange Alternative assumes the completion of a land exchange agreement with the State of California and a simultaneous boundary adjustment to the MSCP and Otay Ranch RMP Preserve systems.

Specifically, the "Land Exchange Alternative" proposes to:

- Exchange 278 acres owned by the State in Village 14 for 278 acres owned by the Applicant in Planning Area 16.

- Amend MSCP and Otay Ranch RMP Preserve boundaries via a boundary adjustment where approximately 169.8 acres in Planning Areas 16/19 are converted to Otay Ranch RMP Preserve and 142.3 acres in Village 14 are converted to Otay Ranch RMP Preserve and 43.6 acres in Village 14 are converted to development footprint for an overall net increase in Otay Ranch RMP Preserve of 268.5 acres.

After implementation, the Land Exchange Alternative land plan is depicted in Figure 3. The Land Exchange Alternative contemplates a Specific Plan, General Plan Amendments, EIR, Rezone, Tentative Map, the Otay Ranch RMP Amendment, and County MSCP Subarea Plan South County Segment Boundary Adjustment.

"Village 14" Defined

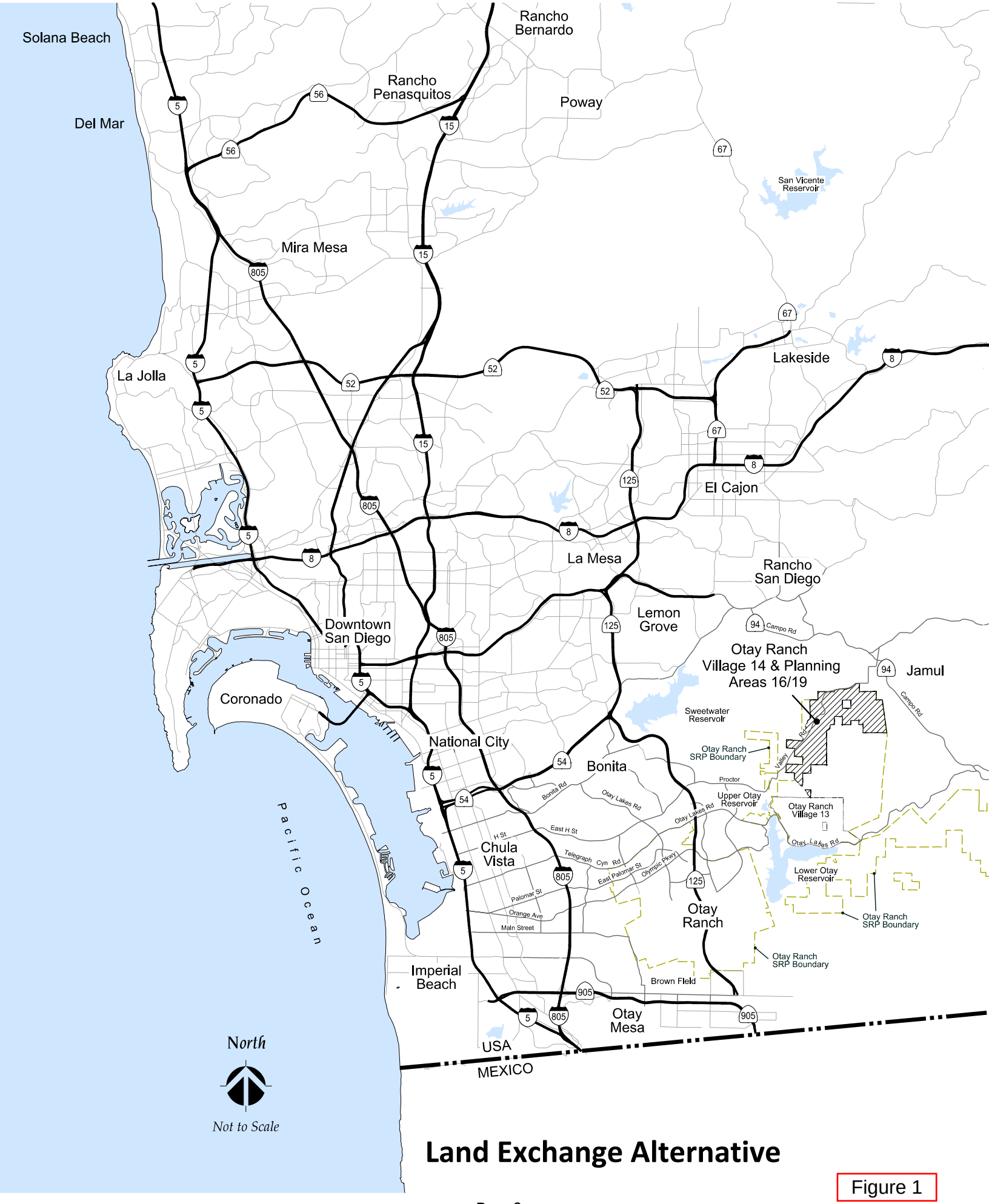
"Village 14" as referred to herein is a discrete subset of the Land Exchange Alternative and reflects that portion located exclusively within Village 14 as depicted in Figure 4. The majority of the technical reports focus on Village 14 as this is where the development is planned.

Proposed Specific Plan

The adopted Otay Ranch GDP/SRP requires the preparation of a Site Utilization Plan that describes proposed land uses. Figures 3 and 4 depict the proposed Site Utilization Plan for the Land Exchange Alternative. Additionally, Table 1 quantifies the land uses.

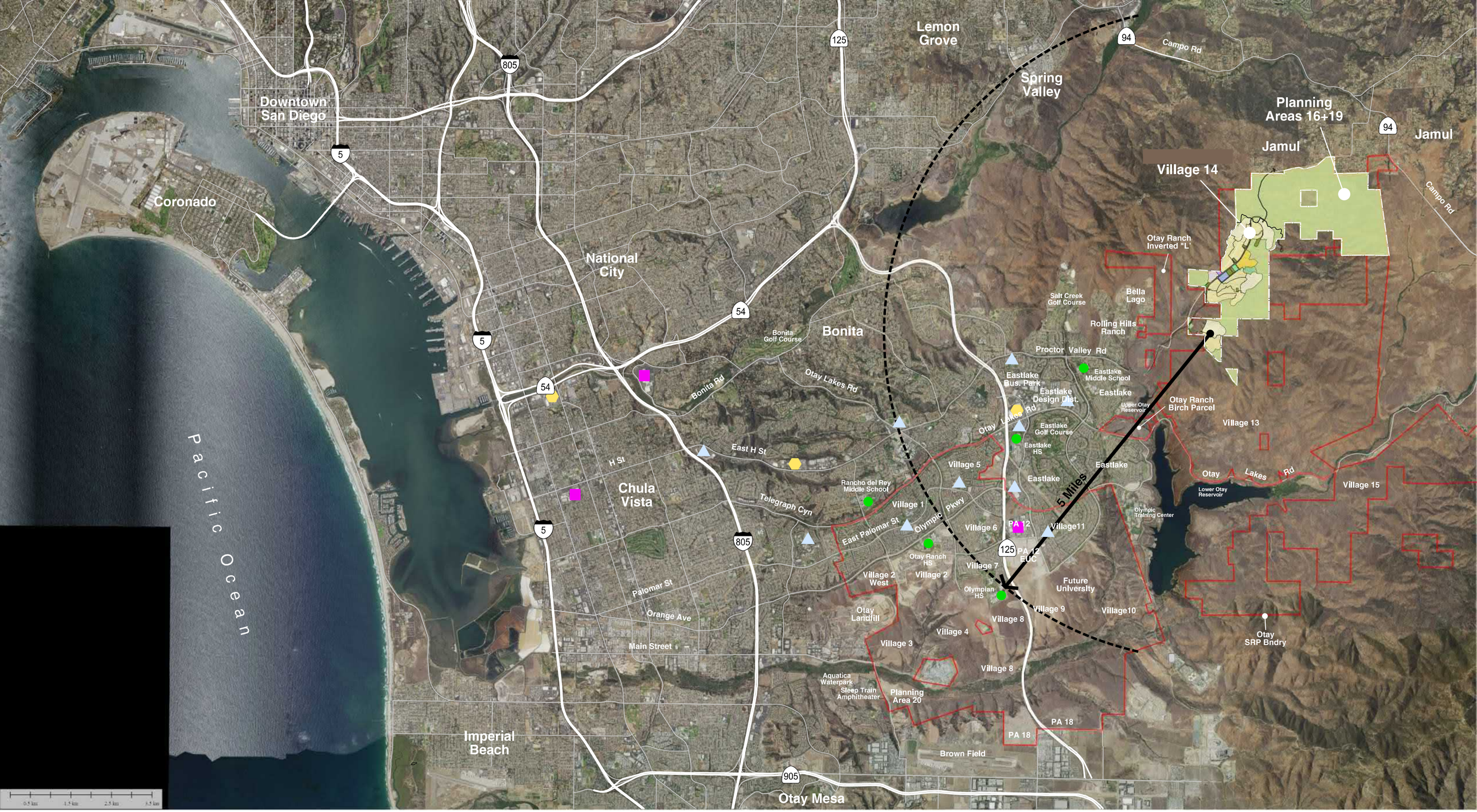
The Land Exchange Alternative includes approximately 511 acres designated for 1,530 homes, 1,124 of which would be traditional single-family homes, 283 would be single family age-restricted and 123 would be multifamily homes as indicated on Table 1 below. 18 neighborhoods are planned with approximate densities ranging from 1.5 to 15.0 dwelling units per acre. The age-restricted neighborhoods would be gated, as would four of the single-family neighborhoods situated on the largest lots.

Village 14 in the Land Exchange Alternative is planned around a Village Core, centrally located in the heart of the village. Higher density residential uses will be adjacent to the Village Core with single family residential radiating out in decreasing densities. The Village Core is comprised of the Neighborhood Center which includes an 8-acre elementary school; a 4-acre Village Green (public park); a 3-acre Mixed Use Site with up to 15,000 square feet of commercial/retail uses and 54 multi-family homes; and a 2-acre Village Square Community Facility. The Village Core also includes a 2-acre public safety site for a fire station and sheriff's storefront facility and 69 multi-family townhomes located adjacent to the public safety site.



Land Exchange Alternative

Figure 1



North

0 1 2 MILES

Scale in miles

LEGEND

Retail
- Regional
- Big Box
- Local

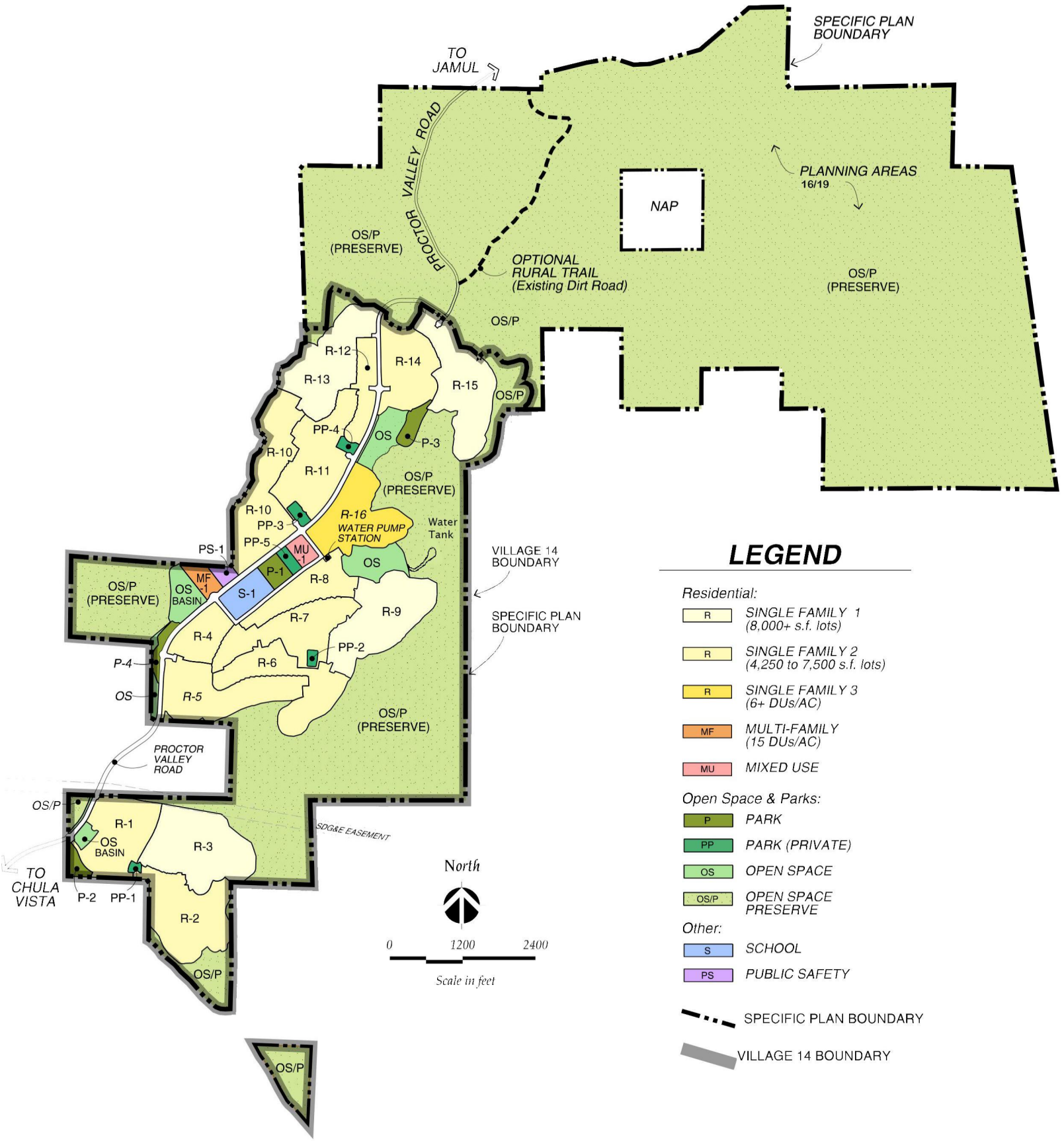
Secondary School (7-12)

Otay SPA Boundary

Source: NAIP Color Imagery for US (1m Resolution)
Aerial Flown: May 2014

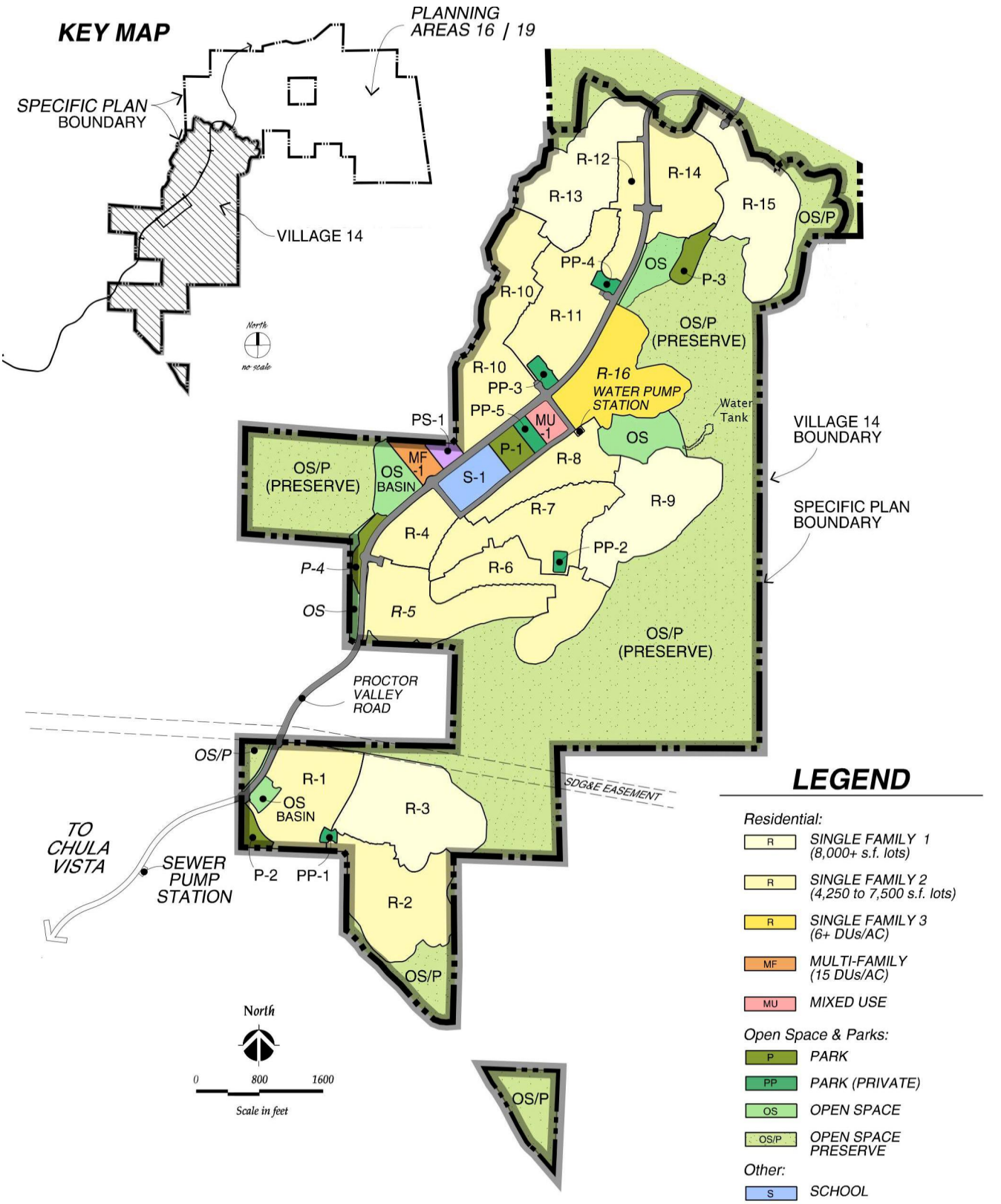
Land Exchange Alternative

Figure 2



Land Exchange Alternative

Figure 3



Land Exchange Alternative

Figure 4

Table 1

Otay Ranch Land Exchange Alternative

Site Utilization Plan - Land Use Summary

January 25, 2018

Proctor Valley Village 14		**Acres**	**Units**	**Density**
Residential Uses				
Single Family Residential				
R-1	SF-2	28.9	112	3.9
R-2	SF-2	37.1	72	1.9
R-3	SF-1	41.7	67	1.6
R-4	SF-2	14.3	57	4.0
R-5	SF-2	33.9	109	3.2
R-6	SF-2	30.6	75	2.4
R-7	SF-2	32.1	91	2.8
R-8	SF-2	20.1	47	2.3
R-9	SF-1	41.5	74	1.8
R-10	Age Restricted SF-1	42.5	127	3.0
R-11	Age Restricted SF-1	34.4	156	4.5
R-12	SF-2	12.3	44	3.6
R-13	SF-1	36.4	66	1.8
R-14	SF-2	26.9	60	2.2
R-15	SF-1	38.5	59	1.5
R-16	SF-3	31.7	191	6.0
Single Family Subtotal		503.1	1,407	2.8
Multi-Family & Mixed Use				
MF-1		4.6	69	15.2
MU-1 *(2)*		3.5	54	15.5
MF & Mixed Use Subtotal		8.0	123	15.3
Residential Subtotal *(3)*		**511.2**	**1,530**	**3.0**
Non-Residential Uses				
Public Parks				
P-1	Village Green	3.9		
P-2	Overlook Park	4.2		
P-3	South Park	2.9		
P-4	Scenic Park	2.5		
Public Parks Subtotal		**13.5**		
Private Parks				
PP-1	South	0.8		
PP-2	Central	1.0		
PP-3	Senior Activity Center	1.8		
PP-4	North	1.4		
PP-5	Village Core	1.9		
Private Parks/Recreation Subtotal		6.9		
Public Uses				
Public Safety		2.3		
Elementary School		8.3		
Public Uses Subtotal		10.6		
Open Space & Preserve				
Internal Open Space *(4)*		33.4		
Preserve		403.9		
Open Space & Preserve Subtotal		437.3		
Circulation Subtotal *(5)*		23.1		
Non-Residential Uses Subtotal		**491.4**		
Proctor Valley Village 14 Subtotal		**1,002.6**	**1,530**	**1.5**
Planning Area 16/19 Preserve				
Circulation in Preserve *(6)*		16.4		
Preserve		276.3		
Exchange to State for preserve		278.0		
Existing State Ownership (portion)		774.1		
Planning Area 16/19 Preserve Subtotal		**1,344.9**		
Proctor Valley Village and Preserve Grand Total		**2,347.3**	**1,530**	**0.7**

NOTES

(1) Additional offsites excluded from the acreage above include:

Proctor Valley Road Offsite Central & South	40.2
Offsite Sewer to Salt Creek Interceptor	

(2) Mixed Use acreage includes 15,000 sf of commerical use

(3) Residential acreage includes 153.2 acres of fuel mod and internal open space slopes and 2.6 acres of private pocket parks.

(4) Open Space included 11.3 acres of basins and HOA open space lots not included in the residential acreage.

(5) Proctor Valley Road Onsite in Village 14 only

(6) Proctor Valley Road north in Planning Area 16 is in Preserve.

The Land Exchange Alternative is designed around an active lifestyle and wellness recreation theme and includes an extensive park and recreation system including four public parks totaling 13 acres as depicted on Figure 4. The remaining private recreation facilities include three private swim clubs, a senior activity center, the Village Square community facility and numerous pocket parks totaling approximately 9 acres. Approximately 4.6 miles of community pathway are proposed on the Proctor Valley Road. Approximately three miles of Park-to-Park Loop connect to the regional pathway.

After implementing the proposed land exchange agreement, MSCP and RMP Preserve boundary adjustments, and General Plan Amendments, the Land Exchange Alternative Area will include 1,749 acres of land designated MSCP and Otay Ranch RMP Preserve, consisting of 404 acres in Proctor Valley Village 14, and 1,345 acres in Planning Areas 16 and 19.

Circulation and Access

Under the Land Exchange Alternative, regional access to Village 14 would be provided by State Route 125 (SR-125), located approximately three miles to the west. Interstate 805 (I-805), approximately eight miles to the west, provides secondary north/south access. SR 54, located approximately six miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access.

Proctor Valley Road would provide the main access to Village 14. Five roundabouts would identify the entrance into each residential area as well as provide traffic calming at key internal intersections. The internal circulation plan also includes a series of residential collectors and residential streets to provide access to the residential neighborhoods.

Proctor Valley Road is planned as a two-lane road and is designated as a scenic corridor. The Land Exchange Alternative includes an Otay Ranch GDP/SRP amendment to the classification of Proctor Valley Road from a 4 Lane Major to a 2 Lane Light Collector. The northern connection of Proctor Valley Village 14 to Jamul will be in the alignment of the existing partially-improved Proctor Valley Road and will be paved provide both public access and secondary emergency access to both communities.

The Lane Exchange Alternative Circulation Plan incorporates vehicular and non-vehicular modes of transportation to create an integrated system of roads, bike lanes, trails, pathways, and sidewalks.

Options

The Land Exchange Alternative includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option and (3) the Perimeter Trail Option. The Draft EIR Land Exchange Alternative assesses each of these options and their respective impacts. Each of the options summarized below. For detailed descriptions with exhibits, see the Specific Plan Section VIII. Internal Circulation Options.

Proctor Valley Road North Option: The Proctor Valley Road North Option applies to Proctor Valley Road Street Section 10 at the northerly edge of Village 14. Street Section 10 would be replaced with Street Section 10B to provide for two dedicated bike lanes (one on each side of the road) instead of the "sharrows" [1] proposed in the Land Exchange Alternative. Note that Street Section 10A provides a transition section at the northerly property boundary and does not change in the Option scenario. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 48 feet.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments "A" & "B" as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52& 49 in the County of San Diego's Community Trails Master Plan (CTMP). Segment "A"/"52" is 4,450 lineal feet, generally located at the northern terminus of Village 14 and extending northeast through the onsite Otay Ranch RMP Preserve to the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment "B"/"49" is approximately 3,100 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within onsite Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are contemplated.

Perimeter Trail Option: The Perimeter Trail Option is an approximately 4.5-mile perimeter trail located within the Development Footprint of Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2-6 feet. Due to topography, trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 5,200 lineal feet (1.0 mile) of 5 to-7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County of San Diego.

Hunsaker & Associates has evaluated these options and they are not material to the information presented in this technical report.

HMP INTRODUCTION

This HMP report summarizes the approach used to model the proposed Land Exchange Alternative project site within San Diego County, CA using the Environmental Protection Agency (EPA) Storm Water Management Model 5.0 (SWMM). SWMM models were prepared for the pre and post developed conditions at the site's designated Point of Compliances (POC) in order to determine if the proposed biofiltration basin facilities have sufficient footprints to meet the current Hydromodification Management Plan (HMP) requirements from the Regional Water Quality Control Board (RWQCB).

The Land Exchange Alternative project was subdivided into eight (8) areas with each draining to their respective Point of Compliance (POC). See Section 9 of this Report for HMP-related maps. Following are brief descriptions of each Point of Compliance.

POC1:
POC1 is the largest POC and encompasses 591.62 acres of native undeveloped area in existing condition. The western boundary of this project subwatershed is generally the existing Proctor Valley Road. In proposed condition, the drainage area to this POC is about 385.85 acres of developed area and 306.58 acres of undisturbed or pervious area which will not need to be treated and routed through the proposed water quality basin for this POC. The developed portions of this POC include single- family, multi-family, multi-use, parks, a school site, a firehouse, open space, and community facilities. The proposed water quality basin will be situated within an open space lot located at the downstream end of the POC subwatershed directly adjacent to the Proctor Valley drainageway. This POC includes a dual pipe storm drain system to convey the untreated-developed area flows and to convey the offsite flows through the site. The peak developed flows will be routed through Basin #1(BF-1-1) for water quality treatment and flow control. The designed riser outlet structure will include flow control discharge orifices. Both onsite and offsite storm drain systems will confluence immediately downstream of Basin#1 prior to discharging at the POC1 location (west of the P-4 park).

POC2:
POC2 is located south of POC1 and is related to the location of Basin #2 (BF-1-2). The existing condition tributary area to POC2 consists of about 432.14 acres of undisturbed native pervious land east of the existing Proctor Valley Road. Similar to POC1, the area to POC2 in developed condition will include both developed areas as well as undeveloped/unimproved areas. About 314.16 acres will remain completely pervious and about 140.98 acres will be developed. The POC2 developed portions of Village 14 will consist of single- family residential, parks, and open space areas. The developed area runoff will be conveyed towards Basin #2 for treatment then confluence with the offsite flows downstream of Basin #2 prior to discharging into Proctor Valley drainageway located immediately west of Proctor Valley Road. The peak developed flows which were directed into Basin #2 for water quality treatment and flow control will outlet the basin via the designed riser outlet structure which will include flow control discharge orifices and be sized to accommodate peak flows.

POC3:
The POC3 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #3 (BF-1-3). The HMP analysis for POC3 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside basin will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. The proposed sewer pump station is also included within this developed subwatershed to POC3.

POC4:
The POC4 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #4 (BF-1-4). The HMP analysis for POC4 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside basin (Basin #4) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. This POC also includes some pervious natural areas which will bypass the basin since it does not require any WQ treatment.

POC5:
POC5 is the southernmost POC and final HMP analysis required for the Proctor Valley Village Project. The POC5 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed Basin #5 (BF-1-5). The HMP analysis for POC5 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside basin (Basin #5) will treat storm water runoff collected by inlets along a portion of Proctor Valley Road. The analysis at this POC also includes some existing undeveloped areas located north of Proctor Valley Road and developed areas including portions of Rolling Hills Ranch which is located upstream of POC5. The County allowed for Inclusion of the upstream offsite developed areas since buildout is complete and no other development is expected to occur in the future which would impact the results from this study.

POC6:
POC6 is located along the northern branch of Proctor Valley Road. The POC6 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the proposed storm drain which will discharge from the proposed Basin #6 (BF-1-6) as well as two inlets which will be equipped with a proprietary biofiltration facility for pollution control. The HMP analysis for POC6 was prepared to address HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. Since the two proposed modular treatment units are located downstream of the basin, additional storage detention is necessary to supplement the basin volume. The analysis at this POC also includes some existing undeveloped areas located on the upstream side east of PVR. This offsite area will cross PVR. However, prior to crossing PVR, it will be routed through a riser structure which will aid in attenuating hydromodification flows. In essence, the east side of PVR at this location will act as necessary storage to allow flow control compliance at POC6.

POC7:
The POC7 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the storm drain outletting the proposed Basin #7 (BF-1-7). The HMP analysis for POC7 was prepared to address water quality and HMP compliance due to widening and associated improvements proposed for Proctor Valley Road. The roadside basin (Basin #7) will treat storm water runoff collected by two inlets along a portion of Proctor Valley Road. Two additional units will receive treatment via proprietary biofiltration units. Similar to POC6, this POC also includes some pervious natural areas east of PVR which will cross PVR and bypass the basin since it does not require any WQ treatment. However, this crossing cannot be utilized as a flow control structure similar to POC6 since it is a proposed wildlife crossing. Therefore, a vault structure within PVR is proposed to aid in storage for flow control volumes necessary to comply with hydromodification.

POC8:
The POC8 existing and proposed condition subwatershed was delineated for areas tributary to the point of discharge from the northern portion of Proctor Valley Road. The HMP analysis for POC8 was prepared to address water quality and HMP compliance due to the associated improvements proposed for Proctor Valley Road. Two roadside swales are proposed on either side of PVR which will include a bio-media and gravel layer sized for both pollution control and HMP detention storage.

SWMM MODEL DEVELOPMENT

Since each Point of Compliance is similar in terms of model development, the following will outline the typical model development. Two (2) SWMM models area prepared for each Point of Compliance; one to represent existing condition and another for proposed condition.

The existing condition analysis was prepared by defining the area to the respective POC. Similarly, the proposed condition analysis was prepared by defining the areas to the respective POC. However, since not all of the tributary areas are routed through the respective water quality basin, further subdivision of the overall tributary area is required. Areas are subdivided as follows:

1. Areas not requiring water quality treatment and bypassing basin
2. Newly developed areas whose runoff is directed to WQ basin but excluding basin area.
3. Basin area.
4. For POC6 and POC7, additional area breakdowns were completed due to the supplemental storage created from the area east of PVR (POC6) and the vault (POC7).

For all SWMM models, flow duration curves were prepared to demonstrate that the proposed biofiltration basin footprints will be sufficient to meet the current HMP requirements.

The inputs required to develop SWMM models include rainfall, watershed characteristics, and BMP configurations. The Lower Otay Reservoir Rain Gage from the Project Clean Water

website was used for this study since it is the most representative of the project site precipitation.

Evaporation for the site was modeled using average monthly values from the San Diego County hourly dataset. The site was modeled with hydrologic soil group D soils as determined from both the San Diego County Hydrology Manual soil map and the USGS Survey web-based Soil Survey Map. Other SWMM inputs for the subareas are discussed in the following sections to this document where the selection of the parameters is explained in detail.

BIOFILTRATION MODELING

For each respective POC, developed area storm water runoff is routed through a biofiltration basin located at the downstream end of the respective drainage area as shown on the Proposed Condition HMP map in Section 9. The analysis was modeled using the biofiltration LID module within SWMM. The biofiltration module can model the underground gravel storage layer, underdrain with an orifice plate, amended soil layer, and a surface storage pond up to the elevation of the invert of the bottom orifice. Separate diversion and detention basin calculations were prepared to model the portion of the storage pond between the base orifice invert elevations and the spillway elevation from the biofiltration basin, according to the assumptions to be explained in the Section 4 of this report. Once runoff has been routed through the respective basin outlet structure, it is conveyed via a storm drain pipe to the respective POC.

Basin Discussion:

Flow control at each basin is achieved using multiple orifices on a concrete riser structure which may be square or circular. The size, number and location of the orifices along its height are presented in the Basin Summary Table which follows.

BASIN SUMMARY TABLE

	Basin 1 BF-1-1	Basin 2 BF-1-2	Basin 3 POC3	Basin 4 POC4	Basin 5 POC5	Basin 6 POC6	POC7 Basin	POC7 Vault	Basins 8 POC8	Basins 9 POC8
Bottom Basin Area (sf)	160,200	49,200	4,231	3,379	5,192	2,700	2,300	450	160	160
Total Basin Depth (ft)	13	10	5	5.5	6.5	8	6	10.5	6	6
WQ Ponding Depth (in)	12	12	6	6	6	6	6	N/A	6	6
Amended Soil Depth (in)	36	18	18	18	18	18	18	N/A	18	18
Class 2 Perm. Depth (in)	12	36	12	12	12	12	24	N/A	24	24
Underdrain Orifice (in)	5.1	3.5	0.8	0.7	0.8	0.6	0.5	N/A	0.15	0.15
Riser Cross-section Dimensions	7' x 7'	3' x 3'	1' x 1'	1' x 1'	2' x 2'	1' x 1.5'	1' x 1.5'	1' x 0.5'	1' x 1'	1' x 1'
Riser Height (ft)*	11	8.5	3.75	4	4.25	4	4.5	9	1	1
Top Riser Orifce										
No. of Orifices	1	1	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Diameter (in)	3"	3"	N/A	0.75	N/A	N/A	N/A	N/A	N/A	N/A
Invert Hieght (ft)*	8	3.5	N/A	3.5	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Riser Orifce										
No. of Orifices	3	2	1	N/A	1	N/A	1	1	N/A	N/A
Diamter (in)	3"	2.25"	1"	N/A	4	N/A	2	1.25"	N/A	N/A
Invert Hieght (ft)*	1'	1'	0.5'	N/A	0.5'	N/A	0.5'	0	N/A	N/A

*-relative to basin bottom

FLOW DURATION CURVE COMPARISON

The Flow Duration Curves (FDC) for the site were compared at each POC by exporting the hourly runoff time series results from SWMM to a spreadsheet. The FDC for each POC were compared between 10% of the existing condition Q_2 (based on accepting an assumption of high susceptibility for downstream channel erosion as required if no soils tests are completed) up to the existing condition Q_{10}. The Q_2 and Q_{10} were determined using a partial duration statistical analysis of the runoff time series in an Excel spreadsheet using the Cunnane plotting position method, which is the preferred plotting methodology in the HMP Permit. As the SWMM Model is a statistical analysis based on the Weibull Plotting Position Method, the Weibull Method was also used within the spreadsheet to ensure that the results were similar to those obtained by the SWMM Model.

The range between 10% of Q_2 and Q_{10} was divided into 100 equal time intervals; the number of hours that each flow rate was exceeded was counted from the hourly series. Additionally, the intermediate peaks with a return period "i" were obtained (Q_i with i=3 to 9). For the purpose of the plot, the values were presented as percentage of time exceeded for each flow rate.

As an example, the FDC comparison for POC1 is illustrated in Figure 1 in both normal and logarithmic scale. Section 9 of this HMP Study provides detailed drainage exhibit for the post-developed condition. As can be seen in Figures 1a-1j the FDC for the proposed condition with the basin is within 110% of the curve for the existing condition. The additional runoff volume generated from developing the site will be released to the downstream storm drain at a flow rate below the 10% Q_2 lower threshold. Additionally, the project will not increase peak flow rates between the Q_2 and the Q_{10}, as shown in the graphic and also in the attached table. Similar FDC comparison curves were generated at each POC and are included in the following Section 2.

SUMMARY & CONCLUSION

A summary of existing and proposed areas draining to each POC is shown in the table below. The proposed biofiltration basins are proposed to mitigate increased flow frequencies as a result of development.

POC1 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 1	591.62	306.58
Via Basin	N/A	385.85
TOTAL	591.62	692.43

POC2 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 2	432.14	314.16
Via Basin	N/A	140.98
TOTAL	432.14	455.14

POC3 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 3	10.62	6.45
Via Basin	N/A	4.63
TOTAL	10.62	11.08

POC4 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 4	18.32	16.03
Via Basin	N/A	3.40
TOTAL	18.32	19.43

POC5 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 5	1,094.73	1,090.75
via Basin	N/A	6.64
TOTAL	1,094.73	1,097.39

POC6 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 6	146.19	145.64
via Basin	N/A	1.29
TOTAL	146.19	146.93

POC7 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 7	148.33	147.61
via Basin	N/A	2.06
TOTAL	148.33	149.67

POC8 Area Summary

	Existing (AC)	Proposed (AC)
Direct POC 8	0.29	0
Via Basin 8	N/A	0.145
Via Basin 9	N/A	0.145
TOTAL	0.29	.29

This study has demonstrated that the proposed biofiltration basin footprints for the Land Exchange Alternative project site is sufficient to meet the current HMP criteria if the biofiltration cross-section area and volume recommended within this attachment are incorporated within the proposed project site.

KEY ASSUMPTIONS

1. D Soils are representative of the existing conditions for the site.

SECTIONS

1. Q_2 to Q_{10} Summary Table
2. Flow Duration Curve Analysis, Plots (log and natural "x" scale) and Tables.
3. List of the "n" largest Peaks: Pre-Development and Post-Development Conditions
4. Elevation vs. Area Curves and Elevations vs. Discharge Curves to be used in SWMM
5. Biofiltration Details
6. SWMM Input Data (Existing and Proposed Models)
7. SWMM Screenshots and Explanation of Significant Variables
8. NRCS Soil Map of Project Site
9. Hydromodification Watershed Maps

SECTION 1 – Q_2 to Q_{10} Summary Tables

POC 1

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	110.098	77.462	32.635
9	108.967	68.513	40.454
8	102.481	64.349	38.132
7	97.051	62.433	34.618
6	96.330	61.325	35.005
5	80.156	56.659	23.498
4	73.817	54.332	19.485
3	67.384	44.321	23.063
2	58.230	38.310	19.920

POC 2

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	96.109	89.861	6.248
9	90.597	83.425	7.172
8	88.234	79.894	8.339
7	84.757	77.382	7.374
6	79.833	73.494	6.339
5	75.101	68.808	6.293
4	69.806	65.407	4.399
3	60.689	54.392	6.297
2	54.380	49.020	5.360

POC 3

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	3.106	2.166	0.940
9	3.086	1.914	1.172
8	3.004	1.818	1.186
7	2.944	1.792	1.152
6	2.912	1.742	1.169
5	2.793	1.644	1.149
4	2.523	1.546	0.977
3	2.251	1.300	0.951
2	1.900	1.180	0.720

POC 4

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	8.272	7.280	0.991
9	8.233	7.235	0.998
8	8.086	6.700	1.386
7	7.503	6.264	1.239
6	6.879	6.051	0.828
5	6.616	5.836	0.780
4	6.161	5.567	0.594
3	5.860	5.150	0.710
2	4.650	4.150	0.500

POC 5

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	36.957	36.240	0.717
9	34.469	34.185	0.284
8	33.237	32.763	0.473
7	32.926	32.102	0.824
6	31.115	30.704	0.411
5	27.622	26.714	0.908
4	25.541	24.048	1.493
3	22.687	22.032	0.655
2	20.500	19.370	1.130

POC 6

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	20.757	20.666	0.091
9	20.744	20.557	0.188
8	20.711	20.386	0.325
7	19.800	19.604	0.196
6	18.458	18.426	0.032
5	16.128	16.047	0.081
4	14.614	14.547	0.067
3	13.425	13.384	0.041
2	11.730	11.450	0.280

POC 7

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	36.289	36.202	0.086
9	35.442	35.421	0.022
8	34.511	34.511	0.000
7	33.244	33.232	0.012
6	30.473	30.359	0.114
5	29.645	29.623	0.022
4	29.047	29.053	-0.006
3	24.522	23.985	0.536
2	21.450	21.310	0.140

POC 8

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	0.149	0.149	0.000
9	0.142	0.142	0.000
8	0.140	0.134	0.006
7	0.134	0.124	0.010
6	0.121	0.120	0.001
5	0.111	0.110	0.001
4	0.110	0.090	0.020
3	0.100	0.045	0.055
2	0.090	0.030	0.060

SECTION 2 - Flow Duration Curve Analysis, Plot & Table

Flow duration curve shall not exceed the existing conditions by more than 10% neither in peak flow nor duration.

The figures on the following pages illustrate that the flow duration curves in post-development conditions after the proposed BMPs is below the existing flow duration curve. The flow duration curve table following the curve shows that if the interval 0.10Q 2 – Q 10 is divided in 100 sub-intervals, then a) the post development divided by pre-development durations are never larger than 110% (the permit allows up to 110%); and b) there are no more than 10 intervals in the range 101%-110% which would imply an excess over 10% of the length of the curve (the permit allows less than 10% of excesses measured as 101-110%).

Consequently, the design passes the hydromodification test.

It is important to note that the flow duration curves can be expressed in the "x" axis as percentage of time, hours per year, total number of hours, or any other similar time variable. As those variables only differ by a multiplying constant, their plot in logarithmic scale is going to look exactly the same and compliance can be observed regardless of the variable selected. The selection of a logarithmic scale in lieu of the normal scale is preferred, as differences between the pre-development and post-development curves can be seen more clearly in the entire range of analysis. Both graphics are presented for reference.

In terms of the "y" axis, the peak flow value is the variable of choice. As an additional analysis performed by H&A, not only the range of analysis is clearly depicted (10% of Q 2 to Q 10) but also all intermediate flows are shown (30% of Q 2 , 50% of Q 2 , Q 2 , Q 3 , Q 4 , Q 5 , Q 6 , Q 7 , Q 8 and Q 9) in order to demonstrate compliance at any range Q x – Q x+1 . It must be pointed out that one of the limitations of both the SWMM and SDHM models is that the intermediate analysis is not performed (to obtain Q i from i = 2 to 10). H&A performed the analysis using the Cunnane Plotting position Method (the preferred method in the HMP permit) from the "n" largest independent peak flows obtained from the continuous time series.

The largest "n" peak flows are attached in this appendix, as well as the values of Q_i with a return period "i", from i=2 to 10. The Q i values are also added into the flow-duration plot.

Flow Duration Curve Data for Village 14 , POC 1

Q2 = 58.23 cfs
Q10 = 110.10 cfs
Step = 1.0533 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

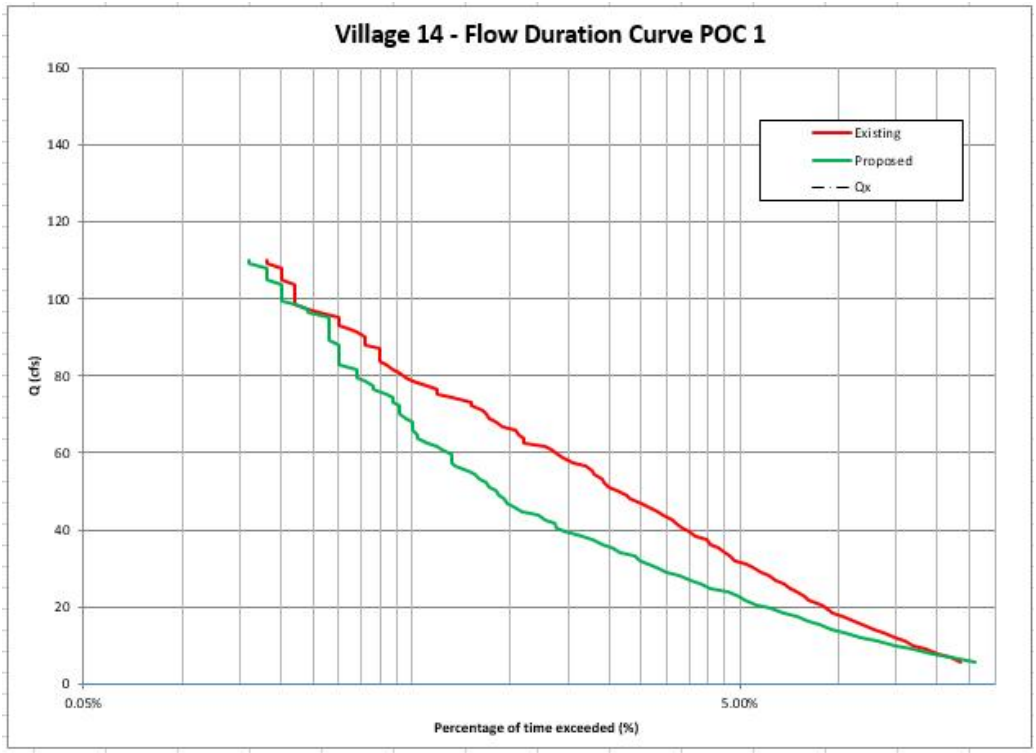
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	5.823	1180	2.36E-01	1298	2.60E-01	110%	Pass
2	6.876	1091	2.18E-01	1099	2.20E-01	101%	Pass
3	7.930	1001	2.00E-01	961	1.92E-01	96%	Pass
4	8.983	924	1.85E-01	838	1.68E-01	91%	Pass
5	10.036	846	1.69E-01	744	1.49E-01	88%	Pass
6	11.089	792	1.59E-01	655	1.31E-01	83%	Pass
7	12.143	739	1.48E-01	581	1.16E-01	79%	Pass
8	13.196	687	1.37E-01	519	1.04E-01	76%	Pass
9	14.249	639	1.28E-01	477	9.55E-02	75%	Pass
10	15.303	592	1.18E-01	439	8.79E-02	74%	Pass
11	16.356	557	1.11E-01	404	8.09E-02	73%	Pass
12	17.409	515	1.03E-01	374	7.48E-02	73%	Pass
13	18.462	481	9.63E-02	339	6.78E-02	70%	Pass
14	19.516	459	9.19E-02	309	6.18E-02	67%	Pass
15	20.569	442	8.85E-02	281	5.62E-02	64%	Pass
16	21.622	406	8.13E-02	257	5.14E-02	63%	Pass
17	22.675	393	7.87E-02	248	4.96E-02	63%	Pass
18	23.729	372	7.44E-02	229	4.58E-02	62%	Pass
19	24.782	354	7.08E-02	204	4.08E-02	58%	Pass
20	25.835	341	6.82E-02	190	3.80E-02	56%	Pass
21	26.889	322	6.44E-02	177	3.54E-02	55%	Pass
22	27.942	307	6.14E-02	164	3.28E-02	53%	Pass
23	28.995	289	5.78E-02	149	2.98E-02	52%	Pass
24	30.048	274	5.48E-02	139	2.78E-02	51%	Pass
25	31.102	260	5.20E-02	131	2.62E-02	50%	Pass
26	32.155	242	4.84E-02	124	2.48E-02	51%	Pass
27	33.208	232	4.64E-02	119	2.38E-02	51%	Pass
28	34.262	225	4.50E-02	108	2.16E-02	48%	Pass
29	35.315	214	4.28E-02	102	2.04E-02	48%	Pass
30	36.368	204	4.08E-02	95	1.90E-02	47%	Pass
31	37.421	198	3.96E-02	89	1.78E-02	45%	Pass
32	38.475	184	3.68E-02	83	1.66E-02	45%	Pass
33	39.528	174	3.48E-02	73	1.46E-02	42%	Pass
34	40.581	167	3.34E-02	69	1.38E-02	41%	Pass
35	41.635	160	3.20E-02	68	1.36E-02	43%	Pass
36	42.688	155	3.10E-02	64	1.28E-02	41%	Pass

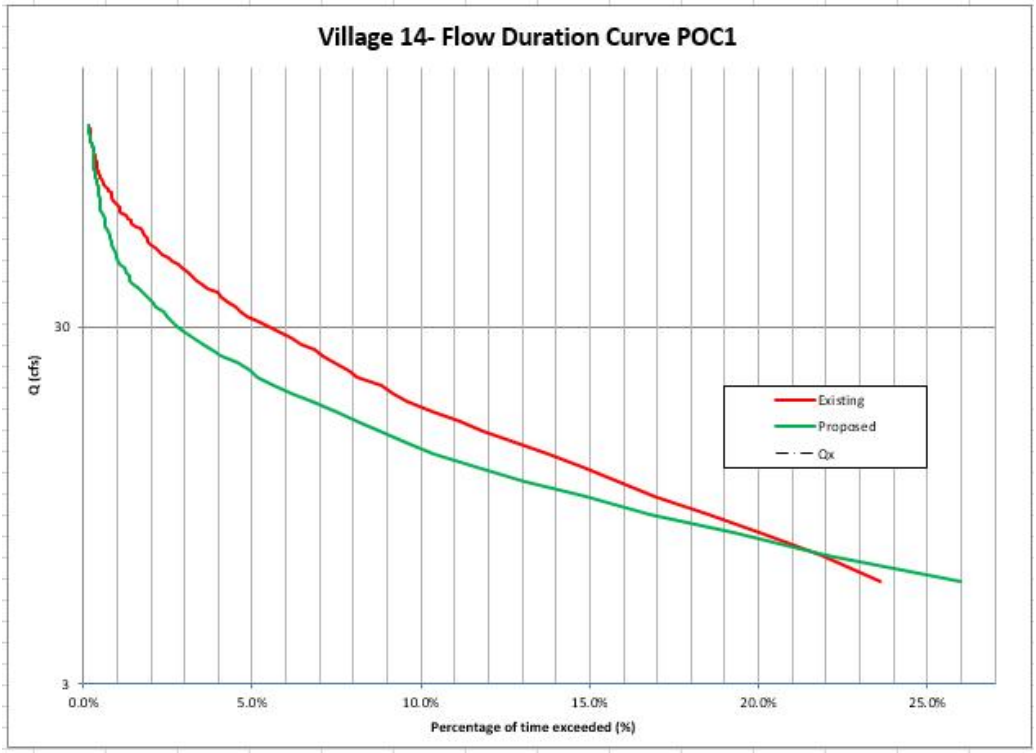
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	43.741	145	2.90E-02	61	1.22E-02	42%	Pass
38	44.794	140	2.80E-02	54	1.08E-02	39%	Pass
39	45.848	131	2.62E-02	51	1.02E-02	39%	Pass
40	46.901	126	2.52E-02	49	9.81E-03	39%	Pass
41	47.954	116	2.32E-02	48	9.61E-03	41%	Pass
42	49.007	113	2.26E-02	46	9.21E-03	41%	Pass
43	50.061	106	2.12E-02	45	9.01E-03	42%	Pass
44	51.114	100	2.00E-02	43	8.61E-03	43%	Pass
45	52.167	96	1.92E-02	42	8.41E-03	44%	Pass
46	53.221	95	1.90E-02	40	8.01E-03	42%	Pass
47	54.274	90	1.80E-02	39	7.81E-03	43%	Pass
48	55.327	89	1.78E-02	37	7.40E-03	42%	Pass
49	56.380	85	1.70E-02	34	6.80E-03	40%	Pass
50	57.434	77	1.54E-02	33	6.60E-03	43%	Pass
51	58.487	72	1.44E-02	33	6.60E-03	46%	Pass
52	59.540	70	1.40E-02	33	6.60E-03	47%	Pass
53	60.594	67	1.34E-02	31	6.20E-03	46%	Pass
54	61.647	64	1.28E-02	30	6.00E-03	47%	Pass
55	62.700	55	1.10E-02	28	5.60E-03	51%	Pass
56	63.753	55	1.10E-02	26	5.20E-03	47%	Pass
57	64.807	53	1.06E-02	26	5.20E-03	49%	Pass
58	65.860	52	1.04E-02	25	5.00E-03	48%	Pass
59	66.913	47	9.41E-03	25	5.00E-03	53%	Pass
60	67.967	45	9.01E-03	25	5.00E-03	56%	Pass
61	69.020	43	8.61E-03	24	4.80E-03	56%	Pass
62	70.073	42	8.41E-03	23	4.60E-03	55%	Pass
63	71.126	41	8.21E-03	23	4.60E-03	56%	Pass
64	72.180	38	7.60E-03	23	4.60E-03	61%	Pass
65	73.233	38	7.60E-03	22	4.40E-03	58%	Pass
66	74.286	33	6.60E-03	22	4.40E-03	67%	Pass
67	75.339	30	6.00E-03	21	4.20E-03	70%	Pass
68	76.393	30	6.00E-03	19	3.80E-03	63%	Pass
69	77.446	28	5.60E-03	19	3.80E-03	68%	Pass
70	78.499	25	5.00E-03	18	3.60E-03	72%	Pass
71	79.553	24	4.80E-03	17	3.40E-03	71%	Pass
72	80.606	23	4.60E-03	17	3.40E-03	74%	Pass
73	81.659	22	4.40E-03	17	3.40E-03	77%	Pass
74	82.712	21	4.20E-03	15	3.00E-03	71%	Pass
75	83.766	20	4.00E-03	15	3.00E-03	75%	Pass
76	84.819	20	4.00E-03	15	3.00E-03	75%	Pass
77	85.872	20	4.00E-03	15	3.00E-03	75%	Pass
78	86.926	20	4.00E-03	15	3.00E-03	75%	Pass
79	87.979	18	3.60E-03	15	3.00E-03	83%	Pass
80	89.032	18	3.60E-03	14	2.80E-03	78%	Pass
81	90.085	18	3.60E-03	14	2.80E-03	78%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	91.139	17	3.40E-03	14	2.80E-03	82%	Pass
83	92.192	16	3.20E-03	14	2.80E-03	88%	Pass
84	93.245	15	3.00E-03	14	2.80E-03	93%	Pass
85	94.298	15	3.00E-03	14	2.80E-03	93%	Pass
86	95.352	15	3.00E-03	14	2.80E-03	93%	Pass
87	96.405	13	2.60E-03	12	2.40E-03	92%	Pass
88	97.458	12	2.40E-03	12	2.40E-03	100%	Pass
89	98.512	11	2.20E-03	11	2.20E-03	100%	Pass
90	99.565	11	2.20E-03	10	2.00E-03	91%	Pass
91	100.618	11	2.20E-03	10	2.00E-03	91%	Pass
92	101.671	11	2.20E-03	10	2.00E-03	91%	Pass
93	102.725	11	2.20E-03	10	2.00E-03	91%	Pass
94	103.778	11	2.20E-03	10	2.00E-03	91%	Pass
95	104.831	10	2.00E-03	9	1.80E-03	90%	Pass
96	105.885	10	2.00E-03	9	1.80E-03	90%	Pass
97	106.938	10	2.00E-03	9	1.80E-03	90%	Pass
98	107.991	10	2.00E-03	9	1.80E-03	90%	Pass
99	109.044	9	1.80E-03	8	1.60E-03	89%	Pass
100	110.098	9	1.80E-03	8	1.60E-03	89%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	110.098	77.462	32.635
9	108.967	68.513	40.454
8	102.481	64.349	38.132
7	97.051	62.433	34.618
6	96.330	61.325	35.005
5	80.156	56.659	23.498
4	73.817	54.332	19.485
3	67.384	44.321	23.063
2	58.230	38.310	19.920





Figures 1a and 1b. – POC 1 Flow Duration Curve Comparison (logarithmic and normal “x” scale)

Flow Duration Curve Data for Village 14 , POC 2

Q2 = 54.38 cfs
Q10 = 96.11 cfs
Step = 0.9159 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

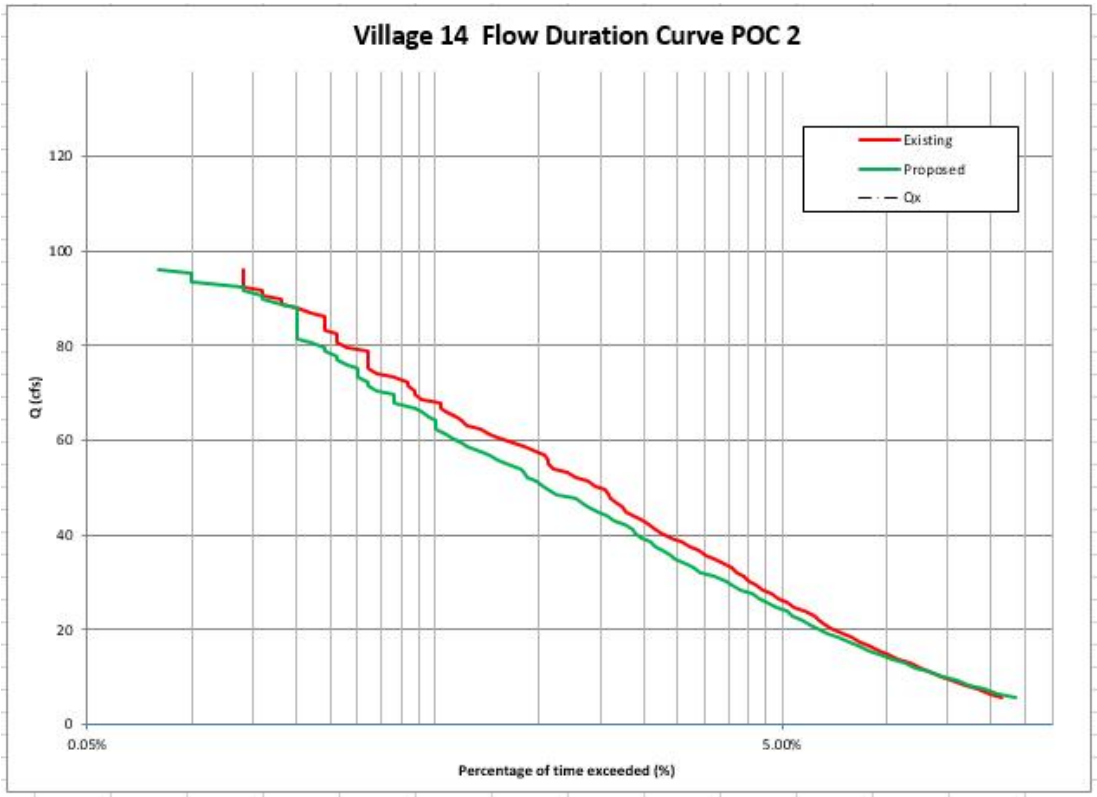
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	5.438	1069	2.14E-01	1176	2.35E-01	110.0%	Pass
2	6.354	991	1.98E-01	1047	2.10E-01	106%	Pass
3	7.270	912	1.83E-01	951	1.90E-01	104%	Pass
4	8.186	839	1.68E-01	864	1.73E-01	103%	Pass
5	9.101	771	1.54E-01	796	1.59E-01	103%	Pass
6	10.017	713	1.43E-01	727	1.45E-01	102%	Pass
7	10.933	659	1.32E-01	663	1.33E-01	101%	Pass
8	11.849	623	1.25E-01	605	1.21E-01	97%	Pass
9	12.765	585	1.17E-01	561	1.12E-01	96%	Pass
10	13.681	539	1.08E-01	517	1.03E-01	96%	Pass
11	14.597	501	1.00E-01	476	9.53E-02	95%	Pass
12	15.513	475	9.51E-02	442	8.85E-02	93%	Pass
13	16.428	442	8.85E-02	412	8.25E-02	93%	Pass
14	17.344	419	8.39E-02	389	7.79E-02	93%	Pass
15	18.260	394	7.89E-02	360	7.20E-02	91%	Pass
16	19.176	374	7.48E-02	337	6.74E-02	90%	Pass
17	20.092	344	6.88E-02	314	6.28E-02	91%	Pass
18	21.008	333	6.66E-02	298	5.96E-02	89%	Pass
19	21.924	316	6.32E-02	282	5.64E-02	89%	Pass
20	22.839	310	6.20E-02	267	5.34E-02	86%	Pass
21	23.755	289	5.78E-02	257	5.14E-02	89%	Pass
22	24.671	271	5.42E-02	241	4.82E-02	89%	Pass
23	25.587	258	5.16E-02	224	4.48E-02	87%	Pass
24	26.503	245	4.90E-02	215	4.30E-02	88%	Pass
25	27.419	233	4.66E-02	205	4.10E-02	88%	Pass
26	28.335	220	4.40E-02	190	3.80E-02	86%	Pass
27	29.251	211	4.22E-02	179	3.58E-02	85%	Pass
28	30.166	200	4.00E-02	173	3.46E-02	87%	Pass
29	31.082	194	3.88E-02	159	3.18E-02	82%	Pass
30	31.998	186	3.72E-02	145	2.90E-02	78%	Pass
31	32.914	178	3.56E-02	139	2.78E-02	78%	Pass
32	33.830	170	3.40E-02	132	2.64E-02	78%	Pass
33	34.746	159	3.18E-02	123	2.46E-02	77%	Pass
34	35.662	151	3.02E-02	119	2.38E-02	79%	Pass
35	36.578	143	2.86E-02	113	2.26E-02	79%	Pass
36	37.493	135	2.70E-02	108	2.16E-02	80%	Pass

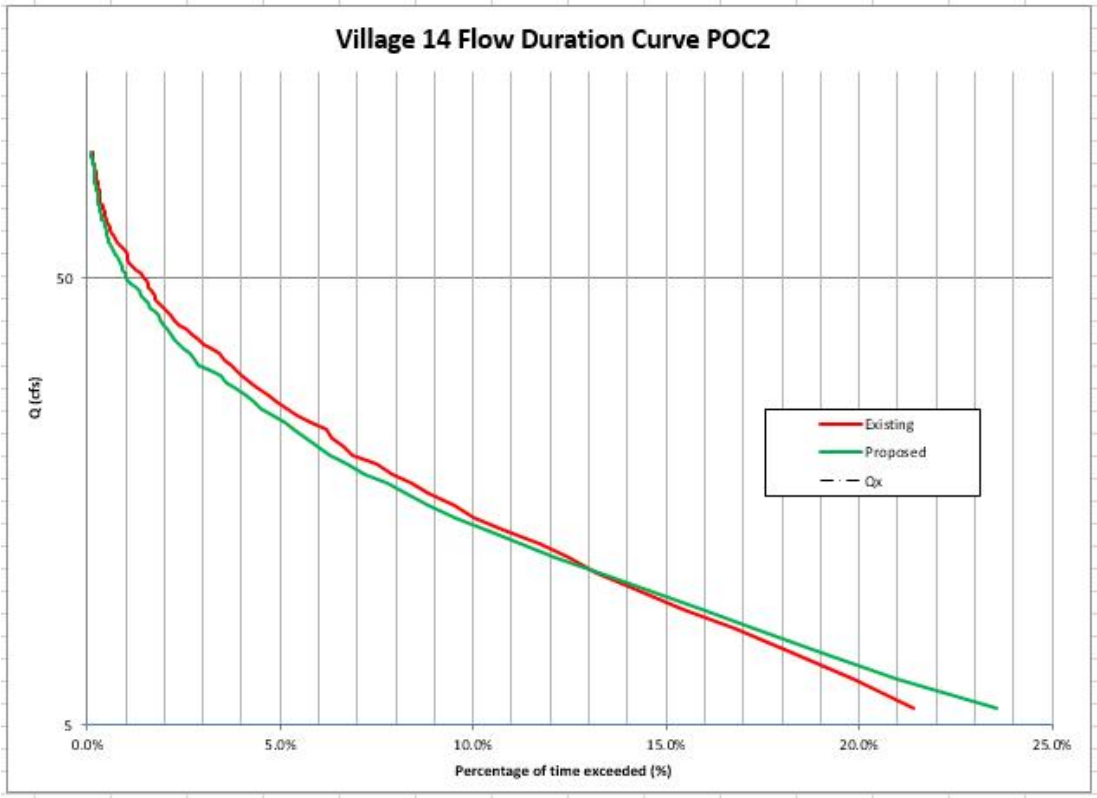
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	38.409	128	2.56E-02	104	2.08E-02	81%	Pass
38	39.325	120	2.40E-02	99	1.98E-02	83%	Pass
39	40.241	112	2.24E-02	94	1.88E-02	84%	Pass
40	41.157	108	2.16E-02	93	1.86E-02	86%	Pass
41	42.073	103	2.06E-02	88	1.76E-02	85%	Pass
42	42.989	100	2.00E-02	82	1.64E-02	82%	Pass
43	43.904	93	1.86E-02	78	1.56E-02	84%	Pass
44	44.820	89	1.78E-02	74	1.48E-02	83%	Pass
45	45.736	87	1.74E-02	69	1.38E-02	79%	Pass
46	46.652	84	1.68E-02	67	1.34E-02	80%	Pass
47	47.568	80	1.60E-02	64	1.28E-02	80%	Pass
48	48.484	79	1.58E-02	56	1.12E-02	71%	Pass
49	49.400	77	1.54E-02	53	1.06E-02	69%	Pass
50	50.316	72	1.44E-02	51	1.02E-02	71%	Pass
51	51.231	69	1.38E-02	49	9.81E-03	71%	Pass
52	52.147	64	1.28E-02	46	9.21E-03	72%	Pass
53	53.063	60	1.20E-02	45	9.01E-03	75%	Pass
54	53.979	55	1.10E-02	44	8.81E-03	80%	Pass
55	54.895	53	1.06E-02	40	8.01E-03	75%	Pass
56	55.811	53	1.06E-02	38	7.60E-03	72%	Pass
57	56.727	52	1.04E-02	36	7.20E-03	69%	Pass
58	57.642	49	9.81E-03	34	6.80E-03	69%	Pass
59	58.558	45	9.01E-03	31	6.20E-03	69%	Pass
60	59.474	42	8.41E-03	30	6.00E-03	71%	Pass
61	60.390	38	7.60E-03	28	5.60E-03	74%	Pass
62	61.306	36	7.20E-03	27	5.40E-03	75%	Pass
63	62.222	34	6.80E-03	25	5.00E-03	74%	Pass
64	63.138	31	6.20E-03	25	5.00E-03	81%	Pass
65	64.054	30	6.00E-03	25	5.00E-03	83%	Pass
66	64.969	29	5.80E-03	24	4.80E-03	83%	Pass
67	65.885	27	5.40E-03	23	4.60E-03	85%	Pass
68	66.801	26	5.20E-03	22	4.40E-03	85%	Pass
69	67.717	26	5.20E-03	19	3.80E-03	73%	Pass
70	68.633	23	4.60E-03	19	3.80E-03	83%	Pass
71	69.549	22	4.40E-03	19	3.80E-03	86%	Pass
72	70.465	22	4.40E-03	17	3.40E-03	77%	Pass
73	71.380	21	4.20E-03	16	3.20E-03	76%	Pass
74	72.296	21	4.20E-03	16	3.20E-03	76%	Pass
75	73.212	19	3.80E-03	15	3.00E-03	79%	Pass
76	74.128	17	3.40E-03	15	3.00E-03	88%	Pass
77	75.044	16	3.20E-03	15	3.00E-03	94%	Pass
78	75.960	16	3.20E-03	14	2.80E-03	88%	Pass
79	76.876	16	3.20E-03	13	2.60E-03	81%	Pass
80	77.792	16	3.20E-03	13	2.60E-03	81%	Pass
81	78.707	16	3.20E-03	12	2.40E-03	75%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	79.623	14	2.80E-03	12	2.40E-03	86%	Pass
83	80.539	13	2.60E-03	11	2.20E-03	85%	Pass
84	81.455	13	2.60E-03	10	2.00E-03	77%	Pass
85	82.371	13	2.60E-03	10	2.00E-03	77%	Pass
86	83.287	12	2.40E-03	10	2.00E-03	83%	Pass
87	84.203	12	2.40E-03	10	2.00E-03	83%	Pass
88	85.119	12	2.40E-03	10	2.00E-03	83%	Pass
89	86.034	12	2.40E-03	10	2.00E-03	83%	Pass
90	86.950	11	2.20E-03	10	2.00E-03	91%	Pass
91	87.866	10	2.00E-03	10	2.00E-03	100%	Pass
92	88.782	9	1.80E-03	9	1.80E-03	100%	Pass
93	89.698	9	1.80E-03	8	1.60E-03	89%	Pass
94	90.614	8	1.60E-03	8	1.60E-03	100%	Pass
95	91.530	8	1.60E-03	7	1.40E-03	88%	Pass
96	92.445	7	1.40E-03	7	1.40E-03	100%	Pass
97	93.361	7	1.40E-03	5	1.00E-03	71%	Pass
98	94.277	7	1.40E-03	5	1.00E-03	71%	Pass
99	95.193	7	1.40E-03	5	1.00E-03	71%	Pass
100	96.109	7	1.40E-03	4	8.01E-04	57%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	96.109	89.861	6.248
9	90.597	83.425	7.172
8	88.234	79.894	8.339
7	84.757	77.382	7.374
6	79.833	73.494	6.339
5	75.101	68.808	6.293
4	69.806	65.407	4.399
3	60.689	54.392	6.297
2	54.380	49.020	5.360





Figures 1c and 1d. – POC 2 Flow Duration Curve Comparison (logarithmic and normal "x" scale)

Flow Duration Curve Data for Village 14 , POC 3

Q2 = 1.90 cfs
Q10 = 3.11 cfs
Step = 0.0295 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

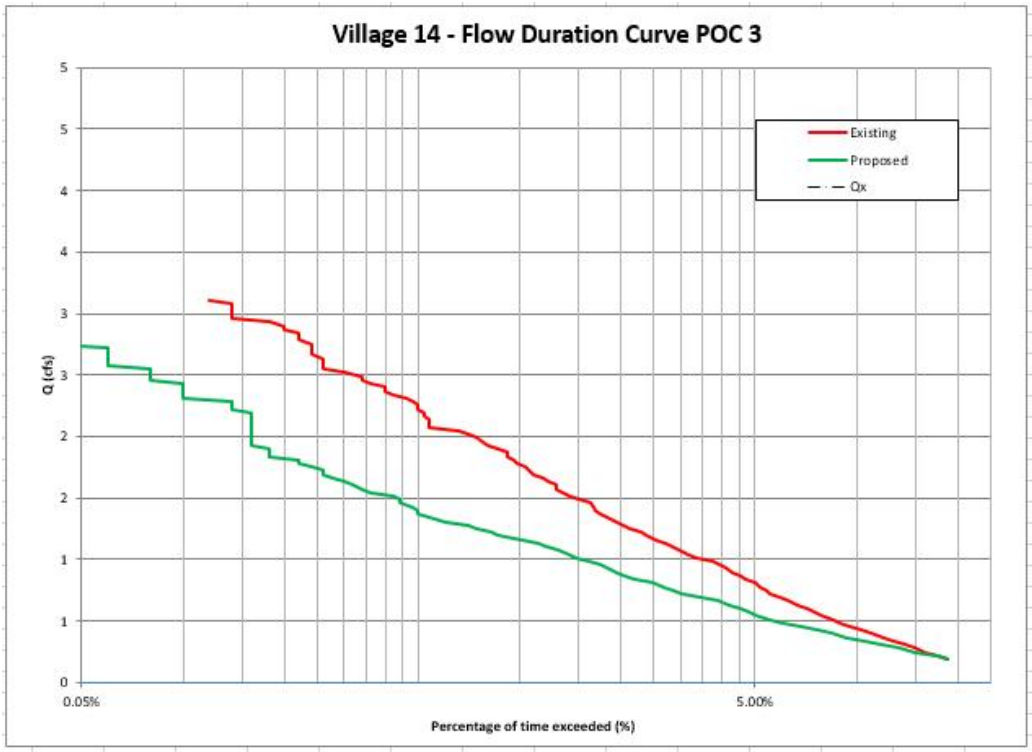
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	0.190	933	1.87E-01	935	1.87E-01	100%	Pass
2	0.219	869	1.74E-01	873	1.75E-01	100%	Pass
3	0.249	801	1.60E-01	748	1.50E-01	93%	Pass
4	0.278	747	1.49E-01	665	1.33E-01	89%	Pass
5	0.308	695	1.39E-01	592	1.18E-01	85%	Pass
6	0.337	644	1.29E-01	526	1.05E-01	82%	Pass
7	0.367	603	1.21E-01	465	9.31E-02	77%	Pass
8	0.396	552	1.10E-01	421	8.43E-02	76%	Pass
9	0.426	516	1.03E-01	381	7.62E-02	74%	Pass
10	0.455	476	9.53E-02	343	6.86E-02	72%	Pass
11	0.485	447	8.95E-02	303	6.06E-02	68%	Pass
12	0.514	425	8.51E-02	276	5.52E-02	65%	Pass
13	0.543	392	7.85E-02	249	4.98E-02	64%	Pass
14	0.573	375	7.50E-02	238	4.76E-02	63%	Pass
15	0.602	356	7.12E-02	225	4.50E-02	63%	Pass
16	0.632	336	6.72E-02	210	4.20E-02	63%	Pass
17	0.661	314	6.28E-02	194	3.88E-02	62%	Pass
18	0.691	295	5.90E-02	172	3.44E-02	58%	Pass
19	0.720	278	5.56E-02	152	3.04E-02	55%	Pass
20	0.750	271	5.42E-02	144	2.88E-02	53%	Pass
21	0.779	258	5.16E-02	134	2.68E-02	52%	Pass
22	0.809	250	5.00E-02	124	2.48E-02	50%	Pass
23	0.838	235	4.70E-02	110	2.20E-02	47%	Pass
24	0.867	227	4.54E-02	103	2.06E-02	45%	Pass
25	0.897	215	4.30E-02	97	1.94E-02	45%	Pass
26	0.926	204	4.08E-02	91	1.82E-02	45%	Pass
27	0.956	195	3.90E-02	87	1.74E-02	45%	Pass
28	0.985	187	3.74E-02	80	1.60E-02	43%	Pass
29	1.015	168	3.36E-02	73	1.46E-02	43%	Pass
30	1.044	158	3.16E-02	70	1.40E-02	44%	Pass
31	1.074	148	2.96E-02	65	1.30E-02	44%	Pass
32	1.103	141	2.82E-02	60	1.20E-02	43%	Pass
33	1.132	135	2.70E-02	57	1.14E-02	42%	Pass
34	1.162	126	2.52E-02	51	1.02E-02	40%	Pass
35	1.191	119	2.38E-02	43	8.61E-03	36%	Pass
36	1.221	114	2.28E-02	41	8.21E-03	36%	Pass

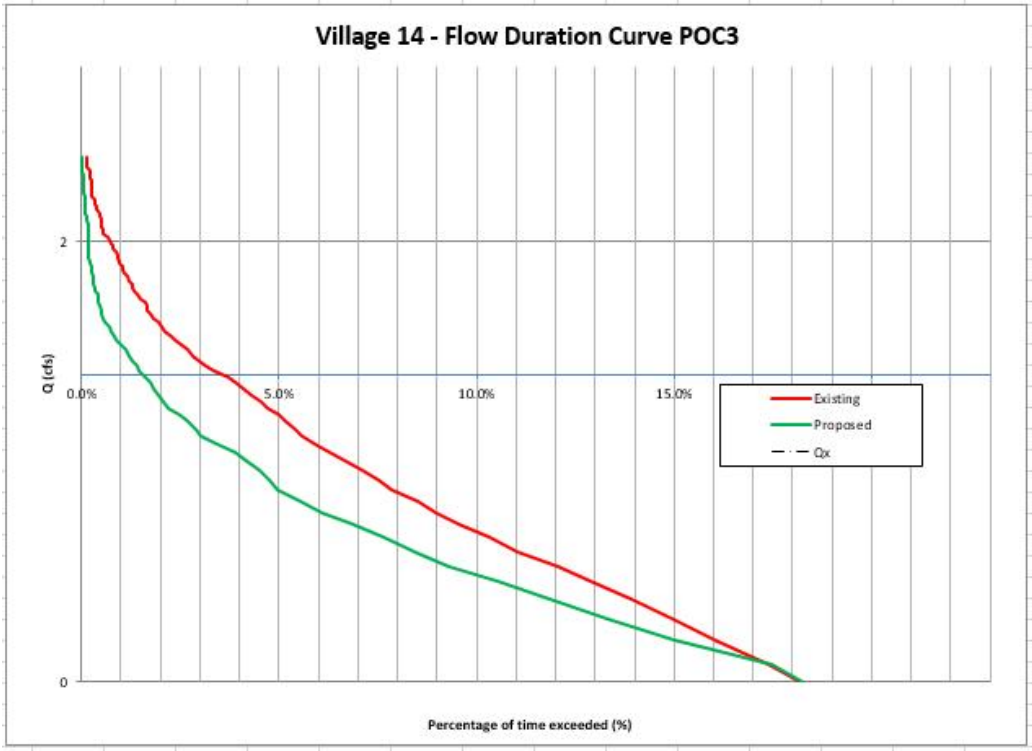
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	1.250	106	2.12E-02	37	7.40E-03	35%	Pass
38	1.280	101	2.02E-02	35	7.00E-03	35%	Pass
39	1.309	97	1.94E-02	30	6.00E-03	31%	Pass
40	1.339	91	1.82E-02	27	5.40E-03	30%	Pass
41	1.368	87	1.74E-02	25	5.00E-03	29%	Pass
42	1.398	84	1.68E-02	25	5.00E-03	30%	Pass
43	1.427	83	1.66E-02	24	4.80E-03	29%	Pass
44	1.456	81	1.62E-02	22	4.40E-03	27%	Pass
45	1.486	75	1.50E-02	22	4.40E-03	29%	Pass
46	1.515	70	1.40E-02	21	4.20E-03	30%	Pass
47	1.545	67	1.34E-02	18	3.60E-03	27%	Pass
48	1.574	64	1.28E-02	17	3.40E-03	27%	Pass
49	1.604	64	1.28E-02	16	3.20E-03	25%	Pass
50	1.633	61	1.22E-02	15	3.00E-03	25%	Pass
51	1.663	59	1.18E-02	14	2.80E-03	24%	Pass
52	1.692	55	1.10E-02	13	2.60E-03	24%	Pass
53	1.722	53	1.06E-02	13	2.60E-03	25%	Pass
54	1.751	52	1.04E-02	12	2.40E-03	23%	Pass
55	1.780	49	9.81E-03	11	2.20E-03	22%	Pass
56	1.810	48	9.61E-03	11	2.20E-03	23%	Pass
57	1.839	46	9.21E-03	9	1.80E-03	20%	Pass
58	1.869	46	9.21E-03	9	1.80E-03	20%	Pass
59	1.898	43	8.61E-03	9	1.80E-03	21%	Pass
60	1.928	40	8.01E-03	8	1.60E-03	20%	Pass
61	1.957	39	7.81E-03	8	1.60E-03	21%	Pass
62	1.987	37	7.40E-03	8	1.60E-03	22%	Pass
63	2.016	35	7.00E-03	8	1.60E-03	23%	Pass
64	2.046	33	6.60E-03	8	1.60E-03	24%	Pass
65	2.075	27	5.40E-03	8	1.60E-03	30%	Pass
66	2.104	27	5.40E-03	8	1.60E-03	30%	Pass
67	2.134	27	5.40E-03	8	1.60E-03	30%	Pass
68	2.163	26	5.20E-03	8	1.60E-03	31%	Pass
69	2.193	26	5.20E-03	8	1.60E-03	31%	Pass
70	2.222	25	5.00E-03	7	1.40E-03	28%	Pass
71	2.252	25	5.00E-03	7	1.40E-03	28%	Pass
72	2.281	24	4.80E-03	7	1.40E-03	29%	Pass
73	2.311	23	4.60E-03	5	1.00E-03	22%	Pass
74	2.340	21	4.20E-03	5	1.00E-03	24%	Pass
75	2.370	20	4.00E-03	5	1.00E-03	25%	Pass
76	2.399	20	4.00E-03	5	1.00E-03	25%	Pass
77	2.428	18	3.60E-03	5	1.00E-03	28%	Pass
78	2.458	17	3.40E-03	4	8.01E-04	24%	Pass
79	2.487	17	3.40E-03	4	8.01E-04	24%	Pass
80	2.517	15	3.00E-03	4	8.01E-04	27%	Pass
81	2.546	13	2.60E-03	4	8.01E-04	31%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	2.576	13	2.60E-03	3	6.00E-04	23%	Pass
83	2.605	13	2.60E-03	3	6.00E-04	23%	Pass
84	2.635	13	2.60E-03	3	6.00E-04	23%	Pass
85	2.664	12	2.40E-03	3	6.00E-04	25%	Pass
86	2.694	12	2.40E-03	3	6.00E-04	25%	Pass
87	2.723	12	2.40E-03	3	6.00E-04	25%	Pass
88	2.752	12	2.40E-03	2	4.00E-04	17%	Pass
89	2.782	11	2.20E-03	2	4.00E-04	18%	Pass
90	2.811	11	2.20E-03	2	4.00E-04	18%	Pass
91	2.841	11	2.20E-03	2	4.00E-04	18%	Pass
92	2.870	10	2.00E-03	1	2.00E-04	10%	Pass
93	2.900	10	2.00E-03	1	2.00E-04	10%	Pass
94	2.929	9	1.80E-03	1	2.00E-04	11%	Pass
95	2.959	7	1.40E-03	1	2.00E-04	14%	Pass
96	2.988	7	1.40E-03	1	2.00E-04	14%	Pass
97	3.017	7	1.40E-03	1	2.00E-04	14%	Pass
98	3.047	7	1.40E-03	1	2.00E-04	14%	Pass
99	3.076	7	1.40E-03	1	2.00E-04	14%	Pass
100	3.106	6	1.20E-03	1	2.00E-04	17%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	3.106	2.166	0.940
9	3.086	1.914	1.172
8	3.004	1.818	1.186
7	2.944	1.792	1.152
6	2.912	1.742	1.169
5	2.793	1.644	1.149
4	2.523	1.546	0.977
3	2.251	1.300	0.951
2	1.900	1.180	0.720





Figures 1e and 1f. – POC 3 Flow Duration Curve Comparison (logarithmic and normal “x” scale)

Flow Duration Curve Data for Village 14 , POC 4

Q2 = 4.65 cfs
Q10 = 8.27 cfs
Step = 0.0789 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

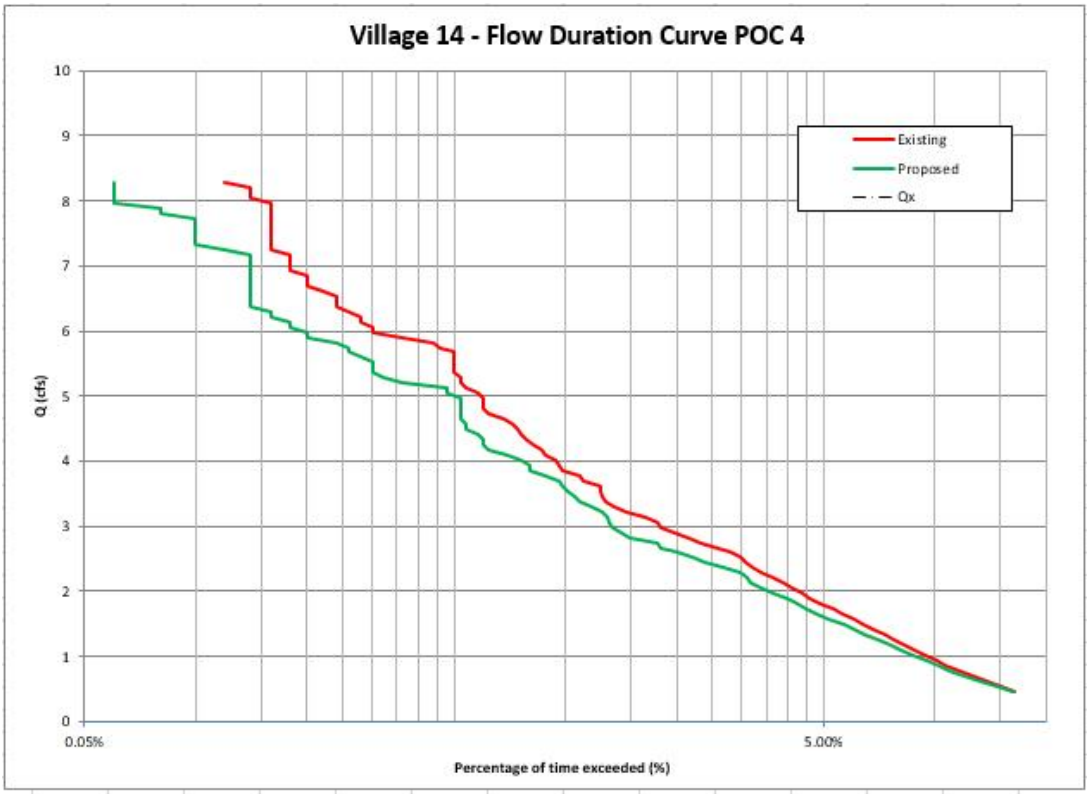
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	0.465	824	1.65E-01	812	1.63E-01	99%	Pass
2	0.544	757	1.51E-01	736	1.47E-01	97%	Pass
3	0.623	692	1.38E-01	660	1.32E-01	95%	Pass
4	0.702	633	1.27E-01	601	1.20E-01	95%	Pass
5	0.780	580	1.16E-01	546	1.09E-01	94%	Pass
6	0.859	534	1.07E-01	513	1.03E-01	96%	Pass
7	0.938	504	1.01E-01	474	9.49E-02	94%	Pass
8	1.017	472	9.45E-02	437	8.75E-02	93%	Pass
9	1.096	440	8.81E-02	405	8.11E-02	92%	Pass
10	1.175	412	8.25E-02	377	7.54E-02	92%	Pass
11	1.254	385	7.70E-02	352	7.04E-02	91%	Pass
12	1.332	366	7.32E-02	323	6.46E-02	88%	Pass
13	1.411	340	6.80E-02	301	6.02E-02	89%	Pass
14	1.490	319	6.38E-02	282	5.64E-02	88%	Pass
15	1.569	301	6.02E-02	258	5.16E-02	86%	Pass
16	1.648	281	5.62E-02	239	4.78E-02	85%	Pass
17	1.727	267	5.34E-02	223	4.46E-02	84%	Pass
18	1.806	245	4.90E-02	211	4.22E-02	86%	Pass
19	1.884	229	4.58E-02	198	3.96E-02	86%	Pass
20	1.963	219	4.38E-02	182	3.64E-02	83%	Pass
21	2.042	206	4.12E-02	169	3.38E-02	82%	Pass
22	2.121	194	3.88E-02	159	3.18E-02	82%	Pass
23	2.200	182	3.64E-02	155	3.10E-02	85%	Pass
24	2.279	169	3.38E-02	148	2.96E-02	88%	Pass
25	2.358	161	3.22E-02	134	2.68E-02	83%	Pass
26	2.436	153	3.06E-02	119	2.38E-02	78%	Pass
27	2.515	148	2.96E-02	110	2.20E-02	74%	Pass
28	2.594	139	2.78E-02	100	2.00E-02	72%	Pass
29	2.673	129	2.58E-02	91	1.82E-02	71%	Pass
30	2.752	116	2.32E-02	89	1.78E-02	77%	Pass
31	2.831	108	2.16E-02	75	1.50E-02	69%	Pass
32	2.910	99	1.98E-02	71	1.42E-02	72%	Pass
33	2.988	91	1.82E-02	67	1.34E-02	74%	Pass
34	3.067	89	1.78E-02	66	1.32E-02	74%	Pass
35	3.146	82	1.64E-02	65	1.30E-02	79%	Pass
36	3.225	73	1.46E-02	63	1.26E-02	86%	Pass

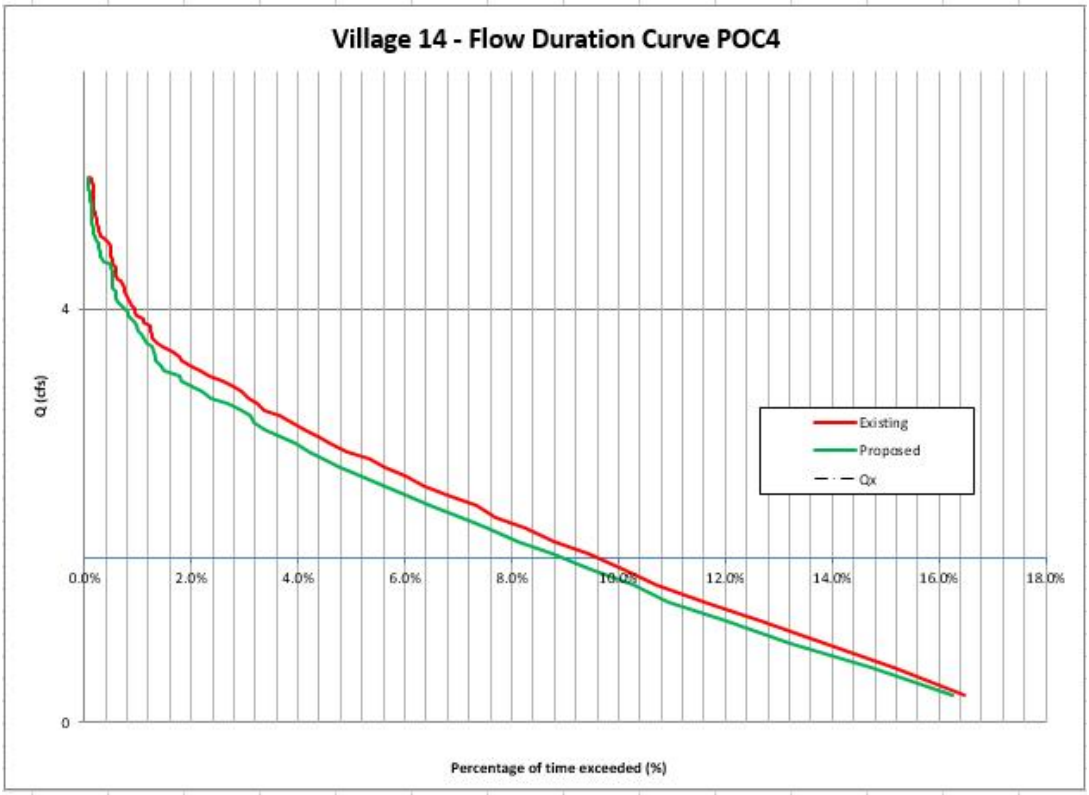
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	3.304	68	1.36E-02	59	1.18E-02	87%	Pass
38	3.383	64	1.28E-02	55	1.10E-02	86%	Pass
39	3.462	63	1.26E-02	53	1.06E-02	84%	Pass
40	3.540	62	1.24E-02	51	1.02E-02	82%	Pass
41	3.619	62	1.24E-02	49	9.81E-03	79%	Pass
42	3.698	56	1.12E-02	48	9.61E-03	86%	Pass
43	3.777	55	1.10E-02	44	8.81E-03	80%	Pass
44	3.856	49	9.81E-03	40	8.01E-03	82%	Pass
45	3.935	48	9.61E-03	40	8.01E-03	83%	Pass
46	4.013	47	9.41E-03	38	7.60E-03	81%	Pass
47	4.092	44	8.81E-03	35	7.00E-03	80%	Pass
48	4.171	43	8.61E-03	31	6.20E-03	72%	Pass
49	4.250	41	8.21E-03	30	6.00E-03	73%	Pass
50	4.329	39	7.81E-03	30	6.00E-03	77%	Pass
51	4.408	38	7.60E-03	29	5.80E-03	76%	Pass
52	4.487	37	7.40E-03	27	5.40E-03	73%	Pass
53	4.565	36	7.20E-03	27	5.40E-03	75%	Pass
54	4.644	34	6.80E-03	26	5.20E-03	76%	Pass
55	4.723	31	6.20E-03	26	5.20E-03	84%	Pass
56	4.802	30	6.00E-03	26	5.20E-03	87%	Pass
57	4.881	30	6.00E-03	26	5.20E-03	87%	Pass
58	4.960	30	6.00E-03	26	5.20E-03	87%	Pass
59	5.039	29	5.80E-03	24	4.80E-03	83%	Pass
60	5.117	27	5.40E-03	24	4.80E-03	89%	Pass
61	5.196	26	5.20E-03	18	3.60E-03	69%	Pass
62	5.275	26	5.20E-03	16	3.20E-03	62%	Pass
63	5.354	25	5.00E-03	15	3.00E-03	60%	Pass
64	5.433	25	5.00E-03	15	3.00E-03	60%	Pass
65	5.512	25	5.00E-03	15	3.00E-03	60%	Pass
66	5.591	25	5.00E-03	14	2.80E-03	56%	Pass
67	5.669	25	5.00E-03	13	2.60E-03	52%	Pass
68	5.748	23	4.60E-03	13	2.60E-03	57%	Pass
69	5.827	22	4.40E-03	12	2.40E-03	55%	Pass
70	5.906	18	3.60E-03	10	2.00E-03	56%	Pass
71	5.985	15	3.00E-03	10	2.00E-03	67%	Pass
72	6.064	15	3.00E-03	9	1.80E-03	60%	Pass
73	6.143	14	2.80E-03	9	1.80E-03	64%	Pass
74	6.221	14	2.80E-03	8	1.60E-03	57%	Pass
75	6.300	13	2.60E-03	8	1.60E-03	62%	Pass
76	6.379	12	2.40E-03	7	1.40E-03	58%	Pass
77	6.458	12	2.40E-03	7	1.40E-03	58%	Pass
78	6.537	12	2.40E-03	7	1.40E-03	58%	Pass
79	6.616	11	2.20E-03	7	1.40E-03	64%	Pass
80	6.695	10	2.00E-03	7	1.40E-03	70%	Pass
81	6.773	10	2.00E-03	7	1.40E-03	70%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	6.852	10	2.00E-03	7	1.40E-03	70%	Pass
83	6.931	9	1.80E-03	7	1.40E-03	78%	Pass
84	7.010	9	1.80E-03	7	1.40E-03	78%	Pass
85	7.089	9	1.80E-03	7	1.40E-03	78%	Pass
86	7.168	9	1.80E-03	7	1.40E-03	78%	Pass
87	7.247	8	1.60E-03	6	1.20E-03	75%	Pass
88	7.325	8	1.60E-03	5	1.00E-03	63%	Pass
89	7.404	8	1.60E-03	5	1.00E-03	63%	Pass
90	7.483	8	1.60E-03	5	1.00E-03	63%	Pass
91	7.562	8	1.60E-03	5	1.00E-03	63%	Pass
92	7.641	8	1.60E-03	5	1.00E-03	63%	Pass
93	7.720	8	1.60E-03	5	1.00E-03	63%	Pass
94	7.799	8	1.60E-03	4	8.01E-04	50%	Pass
95	7.877	8	1.60E-03	4	8.01E-04	50%	Pass
96	7.956	8	1.60E-03	3	6.00E-04	38%	Pass
97	8.035	7	1.40E-03	3	6.00E-04	43%	Pass
98	8.114	7	1.40E-03	3	6.00E-04	43%	Pass
99	8.193	7	1.40E-03	3	6.00E-04	43%	Pass
100	8.272	6	1.20E-03	3	6.00E-04	50%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	8.272	7.280	0.991
9	8.233	7.235	0.998
8	8.086	6.700	1.386
7	7.503	6.264	1.239
6	6.879	6.051	0.828
5	6.616	5.836	0.780
4	6.161	5.567	0.594
3	5.860	5.150	0.710
2	4.650	4.150	0.500





Figures 1g and 1h. – POC 4 Flow Duration Curve Comparison (logarithmic and normal “x” scale)

Flow Duration Curve Data for Village 14 , POC 5

Q2 = 123.08 cfs
Q10 = 215.58 cfs
Step = 2.0532 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

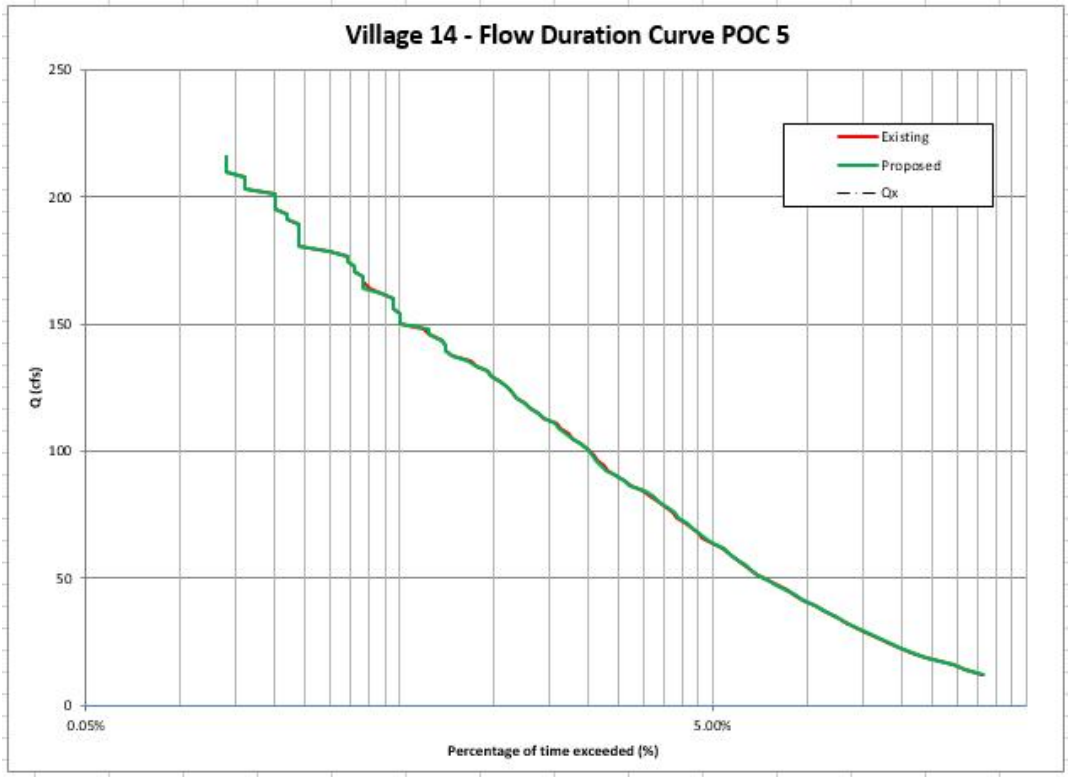
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	12.308	1811	3.62E-01	1816	3.63E-01	100%	Pass
2	14.361	1585	3.17E-01	1590	3.18E-01	100%	Pass
3	16.414	1467	2.94E-01	1463	2.93E-01	100%	Pass
4	18.468	1194	2.39E-01	1196	2.39E-01	100%	Pass
5	20.521	1077	2.16E-01	1080	2.16E-01	100%	Pass
6	22.574	977	1.96E-01	986	1.97E-01	101%	Pass
7	24.627	904	1.81E-01	907	1.82E-01	100%	Pass
8	26.681	833	1.67E-01	835	1.67E-01	100%	Pass
9	28.734	765	1.53E-01	773	1.55E-01	101%	Pass
10	30.787	711	1.42E-01	713	1.43E-01	100%	Pass
11	32.840	661	1.32E-01	664	1.33E-01	100%	Pass
12	34.894	621	1.24E-01	618	1.24E-01	100%	Pass
13	36.947	576	1.15E-01	577	1.15E-01	100%	Pass
14	39.000	526	1.05E-01	530	1.06E-01	101%	Pass
15	41.053	485	9.71E-02	486	9.73E-02	100%	Pass
16	43.106	458	9.17E-02	461	9.23E-02	101%	Pass
17	45.160	432	8.65E-02	431	8.63E-02	100%	Pass
18	47.213	402	8.05E-02	400	8.01E-02	100%	Pass
19	49.266	376	7.52E-02	374	7.48E-02	99%	Pass
20	51.319	348	6.96E-02	347	6.94E-02	100%	Pass
21	53.373	331	6.62E-02	330	6.60E-02	100%	Pass
22	55.426	316	6.32E-02	317	6.34E-02	100%	Pass
23	57.479	300	6.00E-02	300	6.00E-02	100%	Pass
24	59.532	284	5.68E-02	285	5.70E-02	100%	Pass
25	61.585	267	5.34E-02	270	5.40E-02	101%	Pass
26	63.639	248	4.96E-02	249	4.98E-02	100%	Pass
27	65.692	232	4.64E-02	235	4.70E-02	101%	Pass
28	67.745	224	4.48E-02	225	4.50E-02	100%	Pass
29	69.798	214	4.28E-02	215	4.30E-02	100%	Pass
30	71.852	204	4.08E-02	205	4.10E-02	100%	Pass
31	73.905	192	3.84E-02	195	3.90E-02	102%	Pass
32	75.958	187	3.74E-02	188	3.76E-02	101%	Pass
33	78.011	177	3.54E-02	179	3.58E-02	101%	Pass
34	80.065	169	3.38E-02	170	3.40E-02	101%	Pass
35	82.118	157	3.14E-02	160	3.20E-02	102%	Pass
36	84.171	150	3.00E-02	151	3.02E-02	101%	Pass

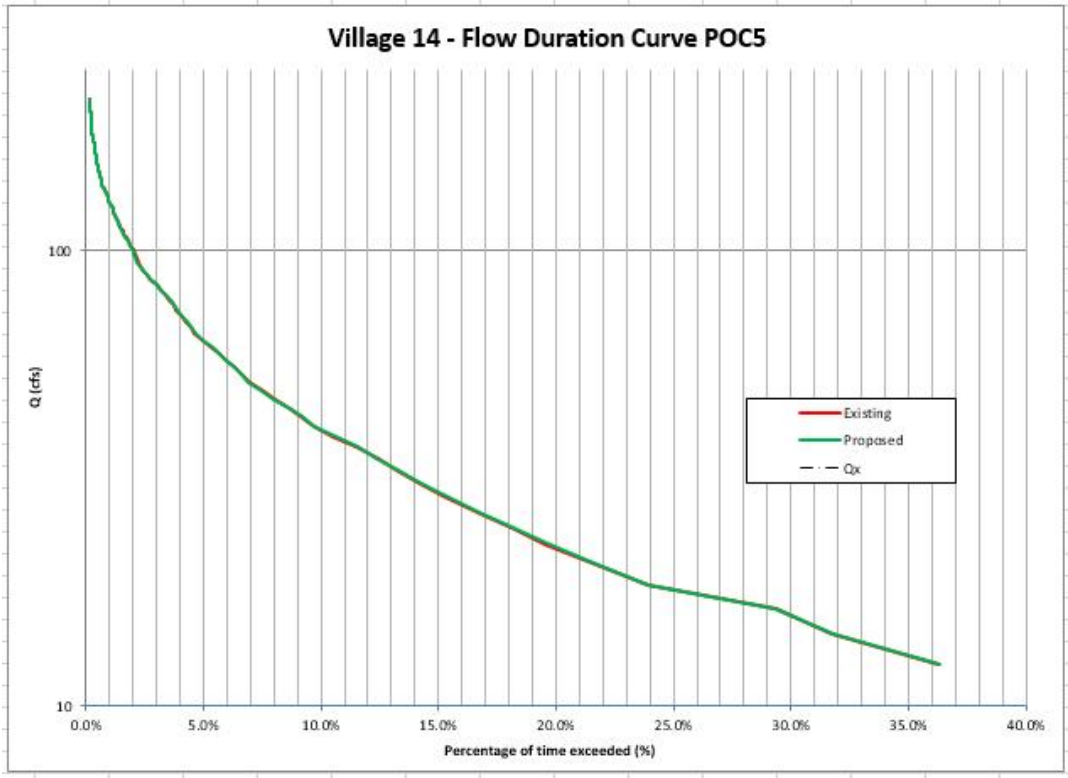
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	86.224	137	2.74E-02	136	2.72E-02	99%	Pass
38	88.277	130	2.60E-02	130	2.60E-02	100%	Pass
39	90.331	123	2.46E-02	122	2.44E-02	99%	Pass
40	92.384	115	2.30E-02	114	2.28E-02	99%	Pass
41	94.437	112	2.24E-02	110	2.20E-02	98%	Pass
42	96.490	107	2.14E-02	105	2.10E-02	98%	Pass
43	98.544	104	2.08E-02	103	2.06E-02	99%	Pass
44	100.597	101	2.02E-02	100	2.00E-02	99%	Pass
45	102.650	94	1.88E-02	94	1.88E-02	100%	Pass
46	104.703	89	1.78E-02	89	1.78E-02	100%	Pass
47	106.756	87	1.74E-02	84	1.68E-02	97%	Pass
48	108.810	81	1.62E-02	80	1.60E-02	99%	Pass
49	110.863	79	1.58E-02	78	1.56E-02	99%	Pass
50	112.916	72	1.44E-02	72	1.44E-02	100%	Pass
51	114.969	69	1.38E-02	69	1.38E-02	100%	Pass
52	117.023	65	1.30E-02	65	1.30E-02	100%	Pass
53	119.076	63	1.26E-02	63	1.26E-02	100%	Pass
54	121.129	59	1.18E-02	59	1.18E-02	100%	Pass
55	123.182	57	1.14E-02	57	1.14E-02	100%	Pass
56	125.236	55	1.10E-02	55	1.10E-02	100%	Pass
57	127.289	52	1.04E-02	52	1.04E-02	100%	Pass
58	129.342	49	9.81E-03	49	9.81E-03	100%	Pass
59	131.395	48	9.61E-03	48	9.61E-03	100%	Pass
60	133.448	44	8.81E-03	44	8.81E-03	100%	Pass
61	135.502	42	8.41E-03	41	8.21E-03	98%	Pass
62	137.555	37	7.40E-03	37	7.40E-03	100%	Pass
63	139.608	35	7.00E-03	35	7.00E-03	100%	Pass
64	141.661	35	7.00E-03	35	7.00E-03	100%	Pass
65	143.715	34	6.80E-03	34	6.80E-03	100%	Pass
66	145.768	31	6.20E-03	31	6.20E-03	100%	Pass
67	147.821	30	6.00E-03	31	6.20E-03	103%	Pass
68	149.874	25	5.00E-03	25	5.00E-03	100%	Pass
69	151.927	25	5.00E-03	25	5.00E-03	100%	Pass
70	153.981	25	5.00E-03	25	5.00E-03	100%	Pass
71	156.034	24	4.80E-03	24	4.80E-03	100%	Pass
72	158.087	24	4.80E-03	24	4.80E-03	100%	Pass
73	160.140	24	4.80E-03	24	4.80E-03	100%	Pass
74	162.194	22	4.40E-03	22	4.40E-03	100%	Pass
75	164.247	20	4.00E-03	19	3.80E-03	95%	Pass
76	166.300	19	3.80E-03	19	3.80E-03	100%	Pass
77	168.353	19	3.80E-03	19	3.80E-03	100%	Pass
78	170.407	18	3.60E-03	18	3.60E-03	100%	Pass
79	172.460	18	3.60E-03	18	3.60E-03	100%	Pass
80	174.513	17	3.40E-03	17	3.40E-03	100%	Pass
81	176.566	17	3.40E-03	17	3.40E-03	100%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	178.619	15	3.00E-03	15	3.00E-03	100%	Pass
83	180.673	12	2.40E-03	12	2.40E-03	100%	Pass
84	182.726	12	2.40E-03	12	2.40E-03	100%	Pass
85	184.779	12	2.40E-03	12	2.40E-03	100%	Pass
86	186.832	12	2.40E-03	12	2.40E-03	100%	Pass
87	188.886	12	2.40E-03	12	2.40E-03	100%	Pass
88	190.939	11	2.20E-03	11	2.20E-03	100%	Pass
89	192.992	11	2.20E-03	11	2.20E-03	100%	Pass
90	195.045	10	2.00E-03	10	2.00E-03	100%	Pass
91	197.098	10	2.00E-03	10	2.00E-03	100%	Pass
92	199.152	10	2.00E-03	10	2.00E-03	100%	Pass
93	201.205	10	2.00E-03	10	2.00E-03	100%	Pass
94	203.258	8	1.60E-03	8	1.60E-03	100%	Pass
95	205.311	8	1.60E-03	8	1.60E-03	100%	Pass
96	207.365	8	1.60E-03	8	1.60E-03	100%	Pass
97	209.418	7	1.40E-03	7	1.40E-03	100%	Pass
98	211.471	7	1.40E-03	7	1.40E-03	100%	Pass
99	213.524	7	1.40E-03	7	1.40E-03	100%	Pass
100	215.578	7	1.40E-03	7	1.40E-03	100%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	215.578	215.523	0.055
9	206.279	206.296	-0.016
8	197.708	197.690	0.018
7	191.114	191.090	0.024
6	181.153	181.134	0.019
5	178.062	177.839	0.223
4	162.755	162.668	0.087
3	140.443	140.502	-0.059
2	123.080	123.140	-0.060





Figures 1i and 1j. – POC 5 Flow Duration Curve Comparison (logarithmic and normal “x” scale)

Flow Duration Curve Data for Village 14 , POC 6

Q2 = 11.73 cfs
Q10 = 20.76 cfs
Step = 0.1978 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

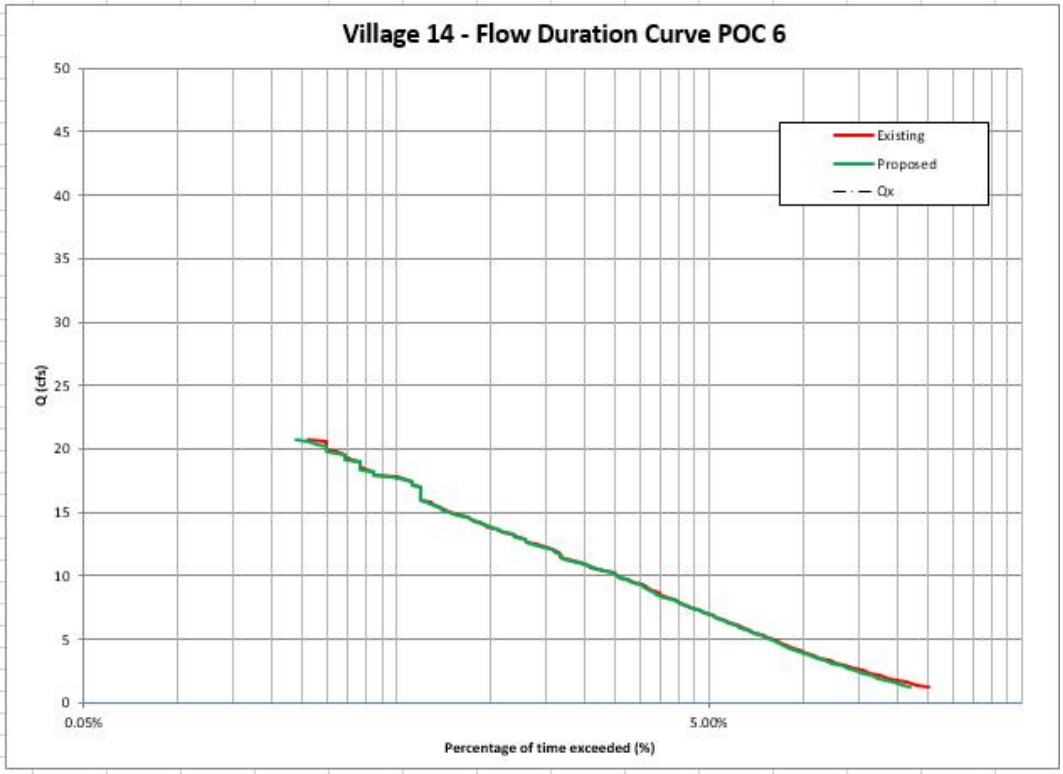
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	1.173	1256	2.51E-01	1101	2.20E-01	88%	Pass
2	1.371	1160	2.32E-01	1041	2.08E-01	90%	Pass
3	1.569	1071	2.14E-01	973	1.95E-01	91%	Pass
4	1.766	994	1.99E-01	911	1.82E-01	92%	Pass
5	1.964	936	1.87E-01	870	1.74E-01	93%	Pass
6	2.162	880	1.76E-01	827	1.66E-01	94%	Pass
7	2.360	821	1.64E-01	778	1.56E-01	95%	Pass
8	2.558	772	1.54E-01	729	1.46E-01	94%	Pass
9	2.756	733	1.47E-01	698	1.40E-01	95%	Pass
10	2.953	678	1.36E-01	658	1.32E-01	97%	Pass
11	3.151	634	1.27E-01	612	1.22E-01	97%	Pass
12	3.349	605	1.21E-01	585	1.17E-01	97%	Pass
13	3.547	563	1.13E-01	557	1.11E-01	99%	Pass
14	3.745	535	1.07E-01	520	1.04E-01	97%	Pass
15	3.942	510	1.02E-01	501	1.00E-01	98%	Pass
16	4.140	483	9.67E-02	469	9.39E-02	97%	Pass
17	4.338	460	9.21E-02	449	8.99E-02	98%	Pass
18	4.536	441	8.83E-02	431	8.63E-02	98%	Pass
19	4.734	421	8.43E-02	416	8.33E-02	99%	Pass
20	4.932	408	8.17E-02	399	7.99E-02	98%	Pass
21	5.129	386	7.72E-02	382	7.64E-02	99%	Pass
22	5.327	368	7.36E-02	363	7.26E-02	99%	Pass
23	5.525	348	6.96E-02	348	6.96E-02	100%	Pass
24	5.723	336	6.72E-02	330	6.60E-02	98%	Pass
25	5.921	322	6.44E-02	315	6.30E-02	98%	Pass
26	6.119	307	6.14E-02	304	6.08E-02	99%	Pass
27	6.316	292	5.84E-02	288	5.76E-02	99%	Pass
28	6.514	278	5.56E-02	273	5.46E-02	98%	Pass
29	6.712	265	5.30E-02	264	5.28E-02	100%	Pass
30	6.910	255	5.10E-02	256	5.12E-02	100%	Pass
31	7.108	242	4.84E-02	243	4.86E-02	100%	Pass
32	7.305	232	4.64E-02	230	4.60E-02	99%	Pass
33	7.503	220	4.40E-02	220	4.40E-02	100%	Pass
34	7.701	207	4.14E-02	208	4.16E-02	100%	Pass
35	7.899	201	4.02E-02	201	4.02E-02	100%	Pass
36	8.097	193	3.86E-02	191	3.82E-02	99%	Pass

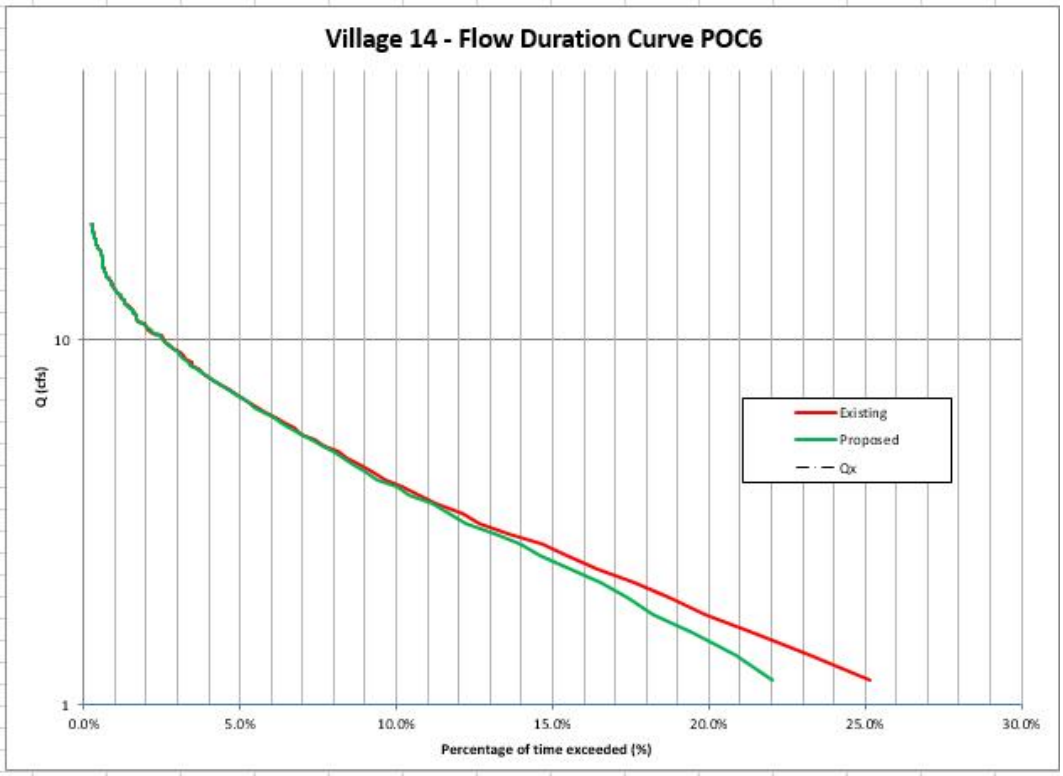
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	8.295	184	3.68E-02	181	3.62E-02	98%	Pass
38	8.492	174	3.48E-02	170	3.40E-02	98%	Pass
39	8.690	173	3.46E-02	167	3.34E-02	97%	Pass
40	8.888	161	3.22E-02	159	3.18E-02	99%	Pass
41	9.086	159	3.18E-02	155	3.10E-02	97%	Pass
42	9.284	153	3.06E-02	151	3.02E-02	99%	Pass
43	9.481	144	2.88E-02	143	2.86E-02	99%	Pass
44	9.679	137	2.74E-02	136	2.72E-02	99%	Pass
45	9.877	129	2.58E-02	129	2.58E-02	100%	Pass
46	10.075	126	2.52E-02	125	2.50E-02	99%	Pass
47	10.273	124	2.48E-02	122	2.44E-02	98%	Pass
48	10.471	110	2.20E-02	110	2.20E-02	100%	Pass
49	10.668	104	2.08E-02	107	2.14E-02	103%	Pass
50	10.866	101	2.02E-02	101	2.02E-02	100%	Pass
51	11.064	97	1.94E-02	94	1.88E-02	97%	Pass
52	11.262	88	1.76E-02	86	1.72E-02	98%	Pass
53	11.460	83	1.66E-02	84	1.68E-02	101%	Pass
54	11.657	83	1.66E-02	83	1.66E-02	100%	Pass
55	11.855	82	1.64E-02	80	1.60E-02	98%	Pass
56	12.053	78	1.56E-02	78	1.56E-02	100%	Pass
57	12.251	76	1.52E-02	74	1.48E-02	97%	Pass
58	12.449	70	1.40E-02	68	1.36E-02	97%	Pass
59	12.647	65	1.30E-02	65	1.30E-02	100%	Pass
60	12.844	64	1.28E-02	64	1.28E-02	100%	Pass
61	13.042	61	1.22E-02	60	1.20E-02	98%	Pass
62	13.240	58	1.16E-02	59	1.18E-02	102%	Pass
63	13.438	55	1.10E-02	55	1.10E-02	100%	Pass
64	13.636	52	1.04E-02	52	1.04E-02	100%	Pass
65	13.834	49	9.81E-03	50	1.00E-02	102%	Pass
66	14.031	47	9.41E-03	47	9.41E-03	100%	Pass
67	14.229	46	9.21E-03	45	9.01E-03	98%	Pass
68	14.427	44	8.81E-03	44	8.81E-03	100%	Pass
69	14.625	42	8.41E-03	42	8.41E-03	100%	Pass
70	14.823	40	8.01E-03	39	7.81E-03	98%	Pass
71	15.020	37	7.40E-03	37	7.40E-03	100%	Pass
72	15.218	36	7.20E-03	35	7.00E-03	97%	Pass
73	15.416	34	6.80E-03	34	6.80E-03	100%	Pass
74	15.614	33	6.60E-03	33	6.60E-03	100%	Pass
75	15.812	32	6.40E-03	31	6.20E-03	97%	Pass
76	16.010	30	6.00E-03	30	6.00E-03	100%	Pass
77	16.207	30	6.00E-03	30	6.00E-03	100%	Pass
78	16.405	30	6.00E-03	30	6.00E-03	100%	Pass
79	16.603	30	6.00E-03	30	6.00E-03	100%	Pass
80	16.801	30	6.00E-03	30	6.00E-03	100%	Pass
81	16.999	30	6.00E-03	30	6.00E-03	100%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	17.196	28	5.60E-03	28	5.60E-03	100%	Pass
83	17.394	28	5.60E-03	28	5.60E-03	100%	Pass
84	17.592	27	5.40E-03	27	5.40E-03	100%	Pass
85	17.790	25	5.00E-03	24	4.80E-03	96%	Pass
86	17.988	21	4.20E-03	21	4.20E-03	100%	Pass
87	18.186	21	4.20E-03	21	4.20E-03	100%	Pass
88	18.383	20	4.00E-03	19	3.80E-03	95%	Pass
89	18.581	19	3.80E-03	19	3.80E-03	100%	Pass
90	18.779	19	3.80E-03	19	3.80E-03	100%	Pass
91	18.977	19	3.80E-03	19	3.80E-03	100%	Pass
92	19.175	18	3.60E-03	17	3.40E-03	94%	Pass
93	19.372	17	3.40E-03	17	3.40E-03	100%	Pass
94	19.570	17	3.40E-03	17	3.40E-03	100%	Pass
95	19.768	16	3.20E-03	15	3.00E-03	94%	Pass
96	19.966	15	3.00E-03	15	3.00E-03	100%	Pass
97	20.164	15	3.00E-03	15	3.00E-03	100%	Pass
98	20.362	15	3.00E-03	14	2.80E-03	93%	Pass
99	20.559	15	3.00E-03	13	2.60E-03	87%	Pass
100	20.757	13	2.60E-03	12	2.40E-03	92%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	20.757	20.666	0.091
9	20.744	20.557	0.188
8	20.711	20.386	0.325
7	19.800	19.604	0.196
6	18.458	18.426	0.032
5	16.128	16.047	0.081
4	14.614	14.547	0.067
3	13.425	13.384	0.041
2	11.730	11.450	0.280





Figures 1k and 1l. – POC 6 Flow Duration Curve Comparison (logarithmic and normal "x" scale)

Flow Duration Curve Data for Village 14 , POC 7

Q2 = 21.45 cfs
Q10 = 36.29 cfs
Step = 0.3449 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

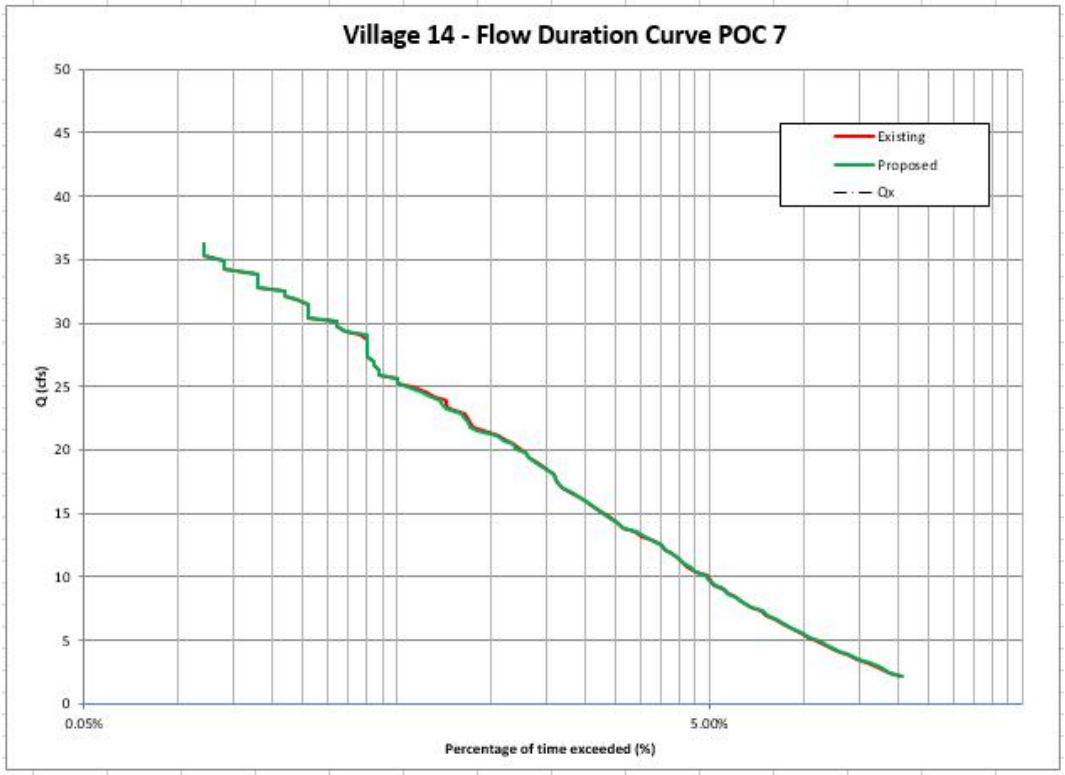
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	2.145	1015	2.03E-01	1033	2.07E-01	102%	Pass
2	2.490	935	1.87E-01	940	1.88E-01	101%	Pass
3	2.835	872	1.75E-01	888	1.78E-01	102%	Pass
4	3.180	800	1.60E-01	815	1.63E-01	102%	Pass
5	3.525	738	1.48E-01	752	1.50E-01	102%	Pass
6	3.869	682	1.36E-01	699	1.40E-01	102%	Pass
7	4.214	634	1.27E-01	644	1.29E-01	102%	Pass
8	4.559	591	1.18E-01	601	1.20E-01	102%	Pass
9	4.904	551	1.10E-01	560	1.12E-01	102%	Pass
10	5.249	518	1.04E-01	524	1.05E-01	101%	Pass
11	5.594	488	9.77E-02	490	9.81E-02	100%	Pass
12	5.939	459	9.19E-02	462	9.25E-02	101%	Pass
13	6.284	427	8.55E-02	432	8.65E-02	101%	Pass
14	6.629	402	8.05E-02	407	8.15E-02	101%	Pass
15	6.973	380	7.60E-02	383	7.66E-02	101%	Pass
16	7.318	364	7.28E-02	368	7.36E-02	101%	Pass
17	7.663	338	6.76E-02	338	6.76E-02	100%	Pass
18	8.008	319	6.38E-02	317	6.34E-02	99%	Pass
19	8.353	303	6.06E-02	301	6.02E-02	99%	Pass
20	8.698	288	5.76E-02	286	5.72E-02	99%	Pass
21	9.043	275	5.50E-02	276	5.52E-02	100%	Pass
22	9.388	258	5.16E-02	260	5.20E-02	101%	Pass
23	9.732	252	5.04E-02	249	4.98E-02	99%	Pass
24	10.077	244	4.88E-02	241	4.82E-02	99%	Pass
25	10.422	226	4.52E-02	224	4.48E-02	99%	Pass
26	10.767	212	4.24E-02	216	4.32E-02	102%	Pass
27	11.112	207	4.14E-02	207	4.14E-02	100%	Pass
28	11.457	199	3.98E-02	199	3.98E-02	100%	Pass
29	11.802	190	3.80E-02	190	3.80E-02	100%	Pass
30	12.147	179	3.58E-02	180	3.60E-02	101%	Pass
31	12.492	175	3.50E-02	176	3.52E-02	101%	Pass
32	12.836	162	3.24E-02	164	3.28E-02	101%	Pass
33	13.181	152	3.04E-02	155	3.10E-02	102%	Pass
34	13.526	144	2.88E-02	145	2.90E-02	101%	Pass
35	13.871	132	2.64E-02	132	2.64E-02	100%	Pass
36	14.216	128	2.56E-02	128	2.56E-02	100%	Pass

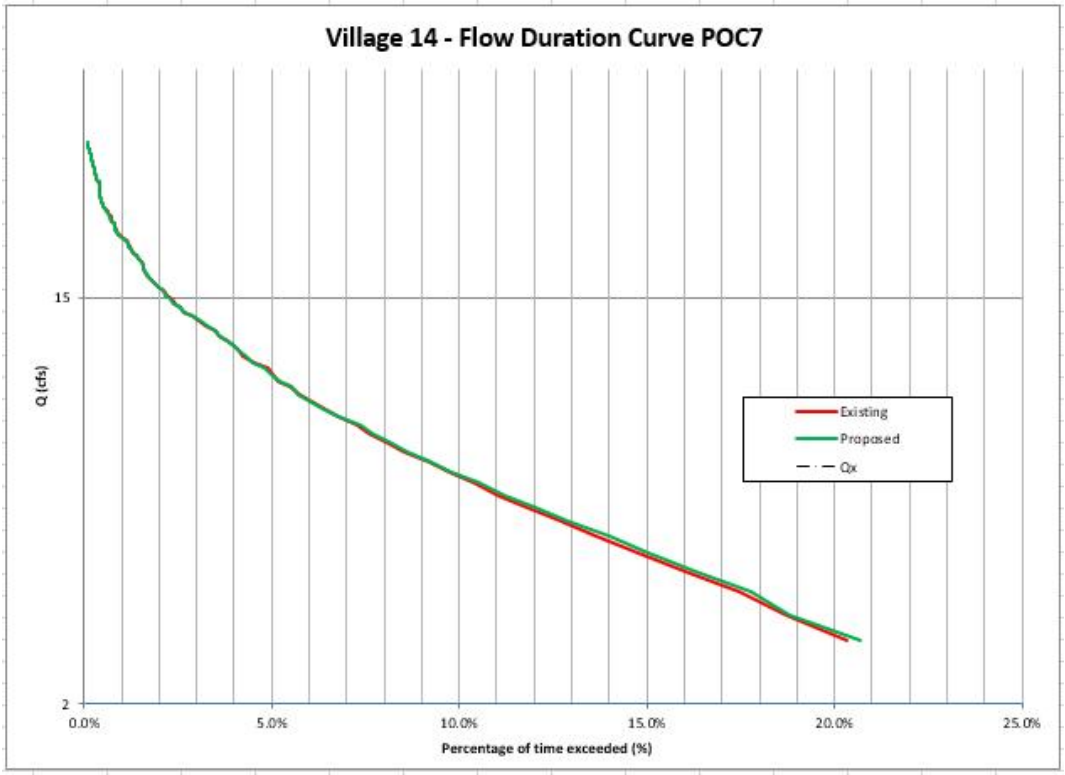
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	14.561	121	2.42E-02	120	2.40E-02	99%	Pass
38	14.906	117	2.34E-02	115	2.30E-02	98%	Pass
39	15.251	110	2.20E-02	109	2.18E-02	99%	Pass
40	15.596	105	2.10E-02	105	2.10E-02	100%	Pass
41	15.940	100	2.00E-02	100	2.00E-02	100%	Pass
42	16.285	94	1.88E-02	94	1.88E-02	100%	Pass
43	16.630	90	1.80E-02	91	1.82E-02	101%	Pass
44	16.975	85	1.70E-02	85	1.70E-02	100%	Pass
45	17.320	82	1.64E-02	82	1.64E-02	100%	Pass
46	17.665	80	1.60E-02	80	1.60E-02	100%	Pass
47	18.010	79	1.58E-02	79	1.58E-02	100%	Pass
48	18.355	77	1.54E-02	77	1.54E-02	100%	Pass
49	18.699	73	1.46E-02	72	1.44E-02	99%	Pass
50	19.044	70	1.40E-02	69	1.38E-02	99%	Pass
51	19.389	66	1.32E-02	66	1.32E-02	100%	Pass
52	19.734	64	1.28E-02	64	1.28E-02	100%	Pass
53	20.079	62	1.24E-02	60	1.20E-02	97%	Pass
54	20.424	59	1.18E-02	59	1.18E-02	100%	Pass
55	20.769	56	1.12E-02	55	1.10E-02	98%	Pass
56	21.114	53	1.06E-02	52	1.04E-02	98%	Pass
57	21.459	47	9.41E-03	45	9.01E-03	96%	Pass
58	21.803	44	8.81E-03	43	8.61E-03	98%	Pass
59	22.148	43	8.61E-03	42	8.41E-03	98%	Pass
60	22.493	42	8.41E-03	41	8.21E-03	98%	Pass
61	22.838	41	8.21E-03	40	8.01E-03	98%	Pass
62	23.183	37	7.40E-03	36	7.20E-03	97%	Pass
63	23.528	36	7.20E-03	35	7.00E-03	97%	Pass
64	23.873	36	7.20E-03	34	6.80E-03	94%	Pass
65	24.218	33	6.60E-03	32	6.40E-03	97%	Pass
66	24.563	31	6.20E-03	30	6.00E-03	97%	Pass
67	24.907	28	5.60E-03	27	5.40E-03	96%	Pass
68	25.252	25	5.00E-03	25	5.00E-03	100%	Pass
69	25.597	25	5.00E-03	25	5.00E-03	100%	Pass
70	25.942	22	4.40E-03	22	4.40E-03	100%	Pass
71	26.287	22	4.40E-03	22	4.40E-03	100%	Pass
72	26.632	21	4.20E-03	21	4.20E-03	100%	Pass
73	26.977	21	4.20E-03	21	4.20E-03	100%	Pass
74	27.322	20	4.00E-03	20	4.00E-03	100%	Pass
75	27.666	20	4.00E-03	20	4.00E-03	100%	Pass
76	28.011	20	4.00E-03	20	4.00E-03	100%	Pass
77	28.356	20	4.00E-03	20	4.00E-03	100%	Pass
78	28.701	20	4.00E-03	20	4.00E-03	100%	Pass
79	29.046	19	3.80E-03	20	4.00E-03	105%	Pass
80	29.391	17	3.40E-03	17	3.40E-03	100%	Pass
81	29.736	16	3.20E-03	16	3.20E-03	100%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	30.081	16	3.20E-03	16	3.20E-03	100%	Pass
83	30.426	13	2.60E-03	13	2.60E-03	100%	Pass
84	30.770	13	2.60E-03	13	2.60E-03	100%	Pass
85	31.115	13	2.60E-03	13	2.60E-03	100%	Pass
86	31.460	13	2.60E-03	13	2.60E-03	100%	Pass
87	31.805	12	2.40E-03	12	2.40E-03	100%	Pass
88	32.150	11	2.20E-03	11	2.20E-03	100%	Pass
89	32.495	11	2.20E-03	11	2.20E-03	100%	Pass
90	32.840	9	1.80E-03	9	1.80E-03	100%	Pass
91	33.185	9	1.80E-03	9	1.80E-03	100%	Pass
92	33.530	9	1.80E-03	9	1.80E-03	100%	Pass
93	33.874	9	1.80E-03	9	1.80E-03	100%	Pass
94	34.219	7	1.40E-03	7	1.40E-03	100%	Pass
95	34.564	7	1.40E-03	7	1.40E-03	100%	Pass
96	34.909	7	1.40E-03	7	1.40E-03	100%	Pass
97	35.254	6	1.20E-03	6	1.20E-03	100%	Pass
98	35.599	6	1.20E-03	6	1.20E-03	100%	Pass
99	35.944	6	1.20E-03	6	1.20E-03	100%	Pass
100	36.289	6	1.20E-03	6	1.20E-03	100%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	36.289	36.202	0.086
9	35.442	35.421	0.022
8	34.511	34.511	0.000
7	33.244	33.232	0.012
6	30.473	30.359	0.114
5	29.645	29.623	0.022
4	29.047	29.053	-0.006
3	24.522	23.985	0.536
2	21.450	21.310	0.140





Figures 1m and 1n. – POC 7 Flow Duration Curve Comparison (logarithmic and normal “x” scale)

Flow Duration Curve Data for Village 14 , POC 8

Q2 = 0.09 cfs
Q10 = 0.15 cfs
Step = 0.0014 cfs
Count = 499678 hours
57.00 years

Fraction Q2= 10 %

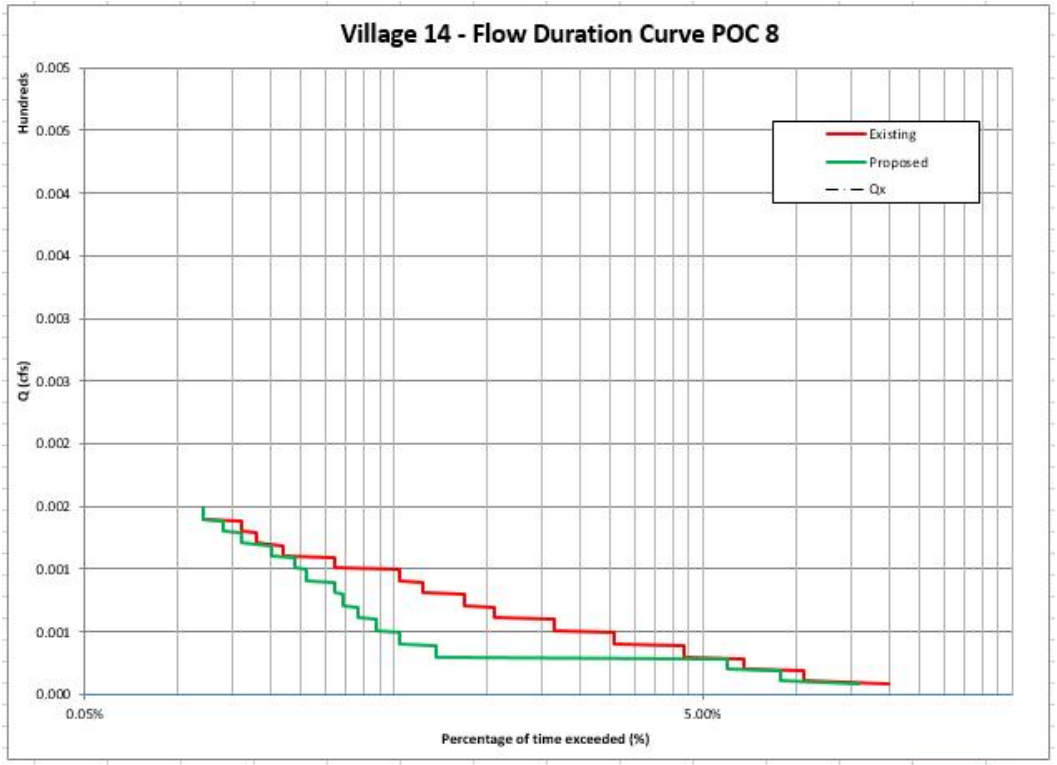
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
1	0.009	997	2.00E-01	795	1.59E-01	80%	Pass
2	0.010	526	1.05E-01	446	8.93E-02	85%	Pass
3	0.012	526	1.05E-01	446	8.93E-02	85%	Pass
4	0.013	526	1.05E-01	446	8.93E-02	85%	Pass
5	0.015	526	1.05E-01	446	8.93E-02	85%	Pass
6	0.016	526	1.05E-01	446	8.93E-02	85%	Pass
7	0.017	526	1.05E-01	446	8.93E-02	85%	Pass
8	0.019	526	1.05E-01	446	8.93E-02	85%	Pass
9	0.020	339	6.78E-02	300	6.00E-02	88%	Pass
10	0.022	339	6.78E-02	300	6.00E-02	88%	Pass
11	0.023	339	6.78E-02	300	6.00E-02	88%	Pass
12	0.025	339	6.78E-02	300	6.00E-02	88%	Pass
13	0.026	339	6.78E-02	300	6.00E-02	88%	Pass
14	0.027	339	6.78E-02	300	6.00E-02	88%	Pass
15	0.029	339	6.78E-02	300	6.00E-02	88%	Pass
16	0.030	218	4.36E-02	34	6.80E-03	16%	Pass
17	0.032	218	4.36E-02	34	6.80E-03	16%	Pass
18	0.033	218	4.36E-02	34	6.80E-03	16%	Pass
19	0.034	218	4.36E-02	34	6.80E-03	16%	Pass
20	0.036	218	4.36E-02	34	6.80E-03	16%	Pass
21	0.037	218	4.36E-02	34	6.80E-03	16%	Pass
22	0.039	218	4.36E-02	34	6.80E-03	16%	Pass
23	0.040	129	2.58E-02	26	5.20E-03	20%	Pass
24	0.041	129	2.58E-02	26	5.20E-03	20%	Pass
25	0.043	129	2.58E-02	26	5.20E-03	20%	Pass
26	0.044	129	2.58E-02	26	5.20E-03	20%	Pass
27	0.046	129	2.58E-02	26	5.20E-03	20%	Pass
28	0.047	129	2.58E-02	26	5.20E-03	20%	Pass
29	0.048	129	2.58E-02	26	5.20E-03	20%	Pass
30	0.050	129	2.58E-02	26	5.20E-03	20%	Pass
31	0.051	82	1.64E-02	22	4.40E-03	27%	Pass
32	0.053	82	1.64E-02	22	4.40E-03	27%	Pass
33	0.054	82	1.64E-02	22	4.40E-03	27%	Pass
34	0.056	82	1.64E-02	22	4.40E-03	27%	Pass
35	0.057	82	1.64E-02	22	4.40E-03	27%	Pass
36	0.058	82	1.64E-02	22	4.40E-03	27%	Pass

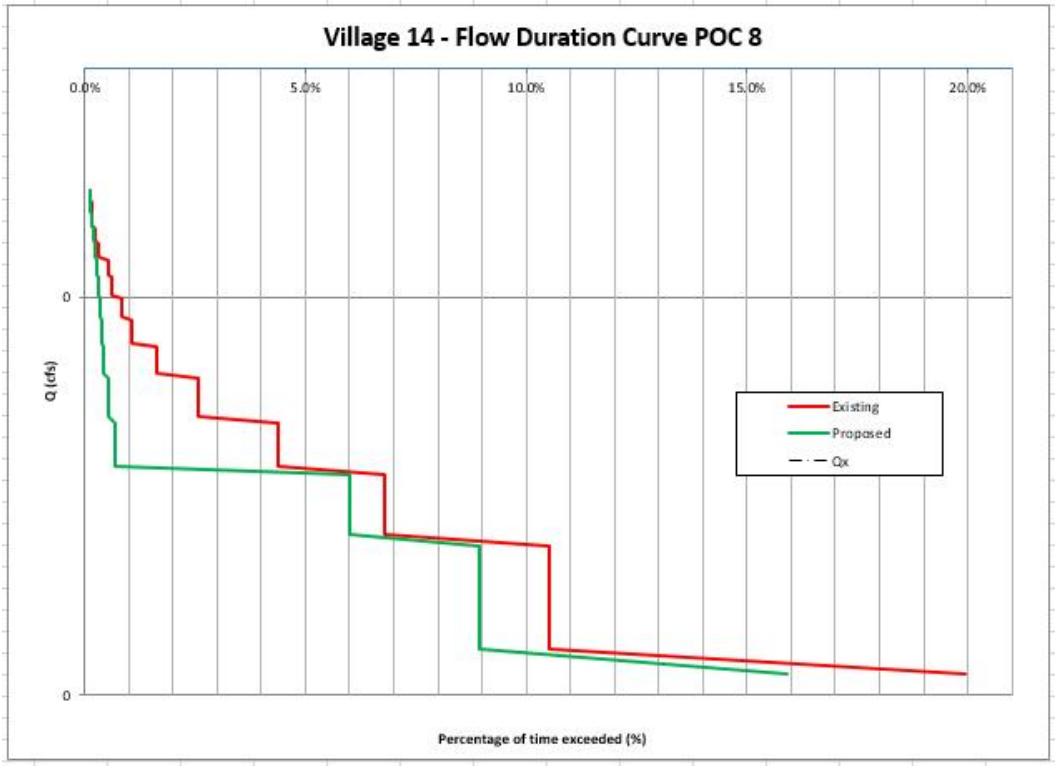
Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
37	0.060	82	1.64E-02	22	4.40E-03	27%	Pass
38	0.061	53	1.06E-02	19	3.80E-03	36%	Pass
39	0.063	53	1.06E-02	19	3.80E-03	36%	Pass
40	0.064	53	1.06E-02	19	3.80E-03	36%	Pass
41	0.065	53	1.06E-02	19	3.80E-03	36%	Pass
42	0.067	53	1.06E-02	19	3.80E-03	36%	Pass
43	0.068	53	1.06E-02	19	3.80E-03	36%	Pass
44	0.070	53	1.06E-02	19	3.80E-03	36%	Pass
45	0.071	42	8.41E-03	17	3.40E-03	40%	Pass
46	0.072	42	8.41E-03	17	3.40E-03	40%	Pass
47	0.074	42	8.41E-03	17	3.40E-03	40%	Pass
48	0.075	42	8.41E-03	17	3.40E-03	40%	Pass
49	0.077	42	8.41E-03	17	3.40E-03	40%	Pass
50	0.078	42	8.41E-03	17	3.40E-03	40%	Pass
51	0.080	42	8.41E-03	17	3.40E-03	40%	Pass
52	0.081	31	6.20E-03	16	3.20E-03	52%	Pass
53	0.082	31	6.20E-03	16	3.20E-03	52%	Pass
54	0.084	31	6.20E-03	16	3.20E-03	52%	Pass
55	0.085	31	6.20E-03	16	3.20E-03	52%	Pass
56	0.087	31	6.20E-03	16	3.20E-03	52%	Pass
57	0.088	31	6.20E-03	16	3.20E-03	52%	Pass
58	0.089	31	6.20E-03	16	3.20E-03	52%	Pass
59	0.091	26	5.20E-03	13	2.60E-03	50%	Pass
60	0.092	26	5.20E-03	13	2.60E-03	50%	Pass
61	0.094	26	5.20E-03	13	2.60E-03	50%	Pass
62	0.095	26	5.20E-03	13	2.60E-03	50%	Pass
63	0.096	26	5.20E-03	13	2.60E-03	50%	Pass
64	0.098	26	5.20E-03	13	2.60E-03	50%	Pass
65	0.099	26	5.20E-03	13	2.60E-03	50%	Pass
66	0.101	16	3.20E-03	12	2.40E-03	75%	Pass
67	0.102	16	3.20E-03	12	2.40E-03	75%	Pass
68	0.103	16	3.20E-03	12	2.40E-03	75%	Pass
69	0.105	16	3.20E-03	12	2.40E-03	75%	Pass
70	0.106	16	3.20E-03	12	2.40E-03	75%	Pass
71	0.108	16	3.20E-03	12	2.40E-03	75%	Pass
72	0.109	16	3.20E-03	12	2.40E-03	75%	Pass
73	0.111	11	2.20E-03	10	2.00E-03	91%	Pass
74	0.112	11	2.20E-03	10	2.00E-03	91%	Pass
75	0.113	11	2.20E-03	10	2.00E-03	91%	Pass
76	0.115	11	2.20E-03	10	2.00E-03	91%	Pass
77	0.116	11	2.20E-03	10	2.00E-03	91%	Pass
78	0.118	11	2.20E-03	10	2.00E-03	91%	Pass
79	0.119	11	2.20E-03	10	2.00E-03	91%	Pass
80	0.120	9	1.80E-03	8	1.60E-03	89%	Pass
81	0.122	9	1.80E-03	8	1.60E-03	89%	Pass

Interval	Existing Condition			Detention Basin Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
82	0.123	9	1.80E-03	8	1.60E-03	89%	Pass
83	0.125	9	1.80E-03	8	1.60E-03	89%	Pass
84	0.126	9	1.80E-03	8	1.60E-03	89%	Pass
85	0.127	9	1.80E-03	8	1.60E-03	89%	Pass
86	0.129	9	1.80E-03	8	1.60E-03	89%	Pass
87	0.130	8	1.60E-03	7	1.40E-03	88%	Pass
88	0.132	8	1.60E-03	7	1.40E-03	88%	Pass
89	0.133	8	1.60E-03	7	1.40E-03	88%	Pass
90	0.135	8	1.60E-03	7	1.40E-03	88%	Pass
91	0.136	8	1.60E-03	7	1.40E-03	88%	Pass
92	0.137	8	1.60E-03	7	1.40E-03	88%	Pass
93	0.139	8	1.60E-03	7	1.40E-03	88%	Pass
94	0.140	6	1.20E-03	6	1.20E-03	100%	Pass
95	0.142	6	1.20E-03	6	1.20E-03	100%	Pass
96	0.143	6	1.20E-03	6	1.20E-03	100%	Pass
97	0.144	6	1.20E-03	6	1.20E-03	100%	Pass
98	0.146	6	1.20E-03	6	1.20E-03	100%	Pass
99	0.147	6	1.20E-03	6	1.20E-03	100%	Pass
100	0.149	6	1.20E-03	6	1.20E-03	100%	Pass

Peak Flows calculated with Cunnane Plotting Position

Return Period	Pre-dev. Q	Post-Dev. Q	Reduction
10	0.149	0.149	0.000
9	0.142	0.142	0.000
8	0.140	0.134	0.006
7	0.134	0.124	0.010
6	0.121	0.120	0.001
5	0.111	0.110	0.001
4	0.110	0.090	0.020
3	0.100	0.045	0.055
2	0.090	0.030	0.060





Figures 1o and 1p. – POC 8 Flow Duration Curve Comparison (logarithmic and normal “x” scale)

SECTION 3 - List of Peak Events and Determination of Q2 & Q10

POC1 EXIST

List of Peak events and Determination of P2 and P10 (Pre-Development)

T	Cunnane	Weibull				Period of Return	
10	110.10	110.54	Peaks	Date	Position	Weibull	Cunnane
9	108.97	109.50	34.94	3/16/1954	57	1.02	1.01
8	102.48	105.71	37.82	2/11/1959	56	1.04	1.03
7	97.05	97.58	39.09	12/2/1961	55	1.05	1.05
6	96.33	96.33	39.34	1/21/1964	54	1.07	1.07
5	80.16	82.94	41.34	11/16/1965	53	1.09	1.09
4	73.82	73.93	42.13	11/17/1972	52	1.12	1.11
3	67.38	67.48	42.99	3/20/1973	51	1.14	1.13
2	58.23	58.23	43.03	1/6/1977	50	1.16	1.15
			43.08	1/14/1978	49	1.18	1.18
			43.71	3/11/1978	48	1.21	1.20
			44.39	11/25/1985	47	1.23	1.23
			45.62	1/18/1952	46	1.26	1.25
			46.03	12/18/1967	45	1.29	1.28
			46.91	1/14/1969	44	1.32	1.31
			47.81	2/6/1969	43	1.35	1.34
			48.21	2/17/1971	42	1.38	1.38
			50.41	2/8/1976	41	1.41	1.41
			50.65	12/31/1976	40	1.45	1.44
			51.65	5/8/1977	39	1.49	1.48
			52.12	1/6/1979	38	1.53	1.52
			54.79	3/1/1981	37	1.57	1.56
			55.93	3/17/1982	36	1.61	1.61
			56.01	3/24/1983	35	1.66	1.65
			56.37	11/25/1983	34	1.71	1.70
			57.01	1/18/1993	33	1.76	1.75
			57.42	3/11/1995	32	1.81	1.81
			57.62	12/28/2004	31	1.87	1.87
			57.67	2/21/2005	30	1.93	1.93
			58.23	2/21/2005	29	2.00	2.00
			59.25	2/3/1958	28	2.07	2.07
			60.88	3/6/1975	27	2.15	2.15
			61.13	2/25/1981	26	2.23	2.23
			62.69	3/1/1983	25	2.32	2.33
			62.7	11/17/1986	24	2.42	2.42
			65.87	12/4/1987	23	2.52	2.53
			66.47	4/21/1988	22	2.64	2.65
			66.67	1/31/1993	21	2.76	2.78
			67.03	2/14/1995	20	2.90	2.92
			67.71	12/23/1995	19	3.05	3.08
			68.36	1/12/1960	18	3.22	3.25
			69.2	3/8/1968	17	3.41	3.45
			71.52	12/4/1974	16	3.63	3.67
			73.66	3/16/1986	15	3.87	3.92
			74.21	11/5/1987	14	4.14	4.21
			77.82	1/10/1955	13	4.46	4.54
			78.37	1/10/1978	12	4.83	4.93
			90.42	1/25/1995	11	5.27	5.40
			96.33	10/27/2004	10	5.80	5.96
			96.33	11/21/1967	9	6.44	6.65
			98.14	2/28/1970	8	7.25	7.53
			108.59	11/16/1972	7	8.29	8.67
			110.34	1/31/1979	6	9.67	10.21
			111.51	2/24/1998	5	11.60	12.43
			114.4	12/29/2004	4	14.50	15.89
			121.06	2/20/1980	3	19.33	22.00
			137.23	3/7/1952	2	29.00	35.75
			163	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC1 PROPOSED

List of Peak events and Determination of P2 and P10 (Post-Development)

T	Cunnane	Weibull				Period of Return	
10	77.46	82.21	Peaks	Date	Position	Weibull	Cunnane
9	68.51	72.69	24.64	1/13/1952	57	1.02	1.01
8	64.35	64.97	25.4	1/18/1952	56	1.04	1.03
7	62.43	62.95	25.57	1/18/1952	55	1.05	1.05
6	61.33	61.43	25.58	12/20/1952	54	1.07	1.07
5	56.66	57.53	25.66	1/10/1955	53	1.09	1.09
4	54.33	54.56	25.69	1/7/1957	52	1.12	1.11
3	44.32	44.39	26.11	1/20/1962	51	1.14	1.13
2	38.31	38.31	26.68	4/8/1965	50	1.16	1.15
			27.31	3/22/1954	49	1.18	1.18
			27.56	12/5/1957	48	1.21	1.20
			27.72	1/12/1960	47	1.23	1.23
			28.16	12/2/1961	46	1.26	1.25
			28.29	11/20/1963	45	1.29	1.28
			28.62	12/5/1966	44	1.32	1.31
			30.14	1/14/1969	43	1.35	1.34
			30.4	12/21/2002	42	1.38	1.38
			30.44	2/14/2003	41	1.41	1.41
			30.91	2/22/2004	40	1.45	1.44
			32.34	3/7/1952	39	1.49	1.48
			32.38	3/16/1958	38	1.53	1.52
			33.17	3/1/1981	37	1.57	1.56
			33.47	3/17/1982	36	1.61	1.61
			33.85	2/2/1983	35	1.66	1.65
			33.87	3/1/1983	34	1.71	1.70
			34.86	11/25/1985	33	1.76	1.75
			35.68	3/1/1991	32	1.81	1.81
			35.73	2/19/1993	31	1.87	1.87
			36.37	3/11/1995	30	1.93	1.93
			38.31	3/11/1995	29	2.00	2.00
			38.33	2/3/1998	28	2.07	2.07
			38.49	2/8/1998	27	2.15	2.15
			39.04	2/12/2003	26	2.23	2.23
			39.23	3/5/2005	25	2.32	2.33
			39.31	12/30/1951	24	2.42	2.42
			39.39	3/16/1952	23	2.52	2.53
			41.38	3/16/1986	22	2.64	2.65
			42.31	1/14/1990	21	2.76	2.78
			44.05	1/15/1993	20	2.90	2.92
			44.57	1/25/1995	19	3.05	3.08
			46.4	1/25/1995	18	3.22	3.25
			50.82	11/22/1996	17	3.41	3.45
			52.57	10/27/2004	16	3.63	3.67
			54.01	12/29/2004	15	3.87	3.92
			55.14	1/3/2005	14	4.14	4.21
			56.06	3/6/1975	13	4.46	4.54
			56.1	1/10/1978	12	4.83	4.93
			59.87	1/14/1978	11	5.27	5.40
			61.3	1/11/2001	10	5.80	5.96
			61.72	3/2/1983	9	6.44	6.65
			63.51	11/5/1987	8	7.25	7.53
			65.53	11/21/1967	7	8.29	8.67
			79.38	2/28/1970	6	9.67	10.21
			95.82	11/16/1972	5	11.60	12.43
			96.31	1/31/1979	4	14.50	15.89
			135.04	1/4/1995	3	19.33	22.00
			158.33	2/21/2005	2	29.00	35.75
			184.65	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Pre-Development)

POC2 EXIST

T	Cunnane	Weibull				Period of Return	
10	96.11	98.37	Peaks	Date	Position	Weibull	Cunnane
9	90.60	93.17	32.84	3/16/1954	57	1.02	1.01
8	88.23	88.51	33.13	2/11/1959	56	1.04	1.03
7	84.76	86.26	34.6	12/2/1961	55	1.05	1.05
6	79.83	80.60	35.73	1/21/1964	54	1.07	1.07
5	75.10	76.32	36.17	11/16/1965	53	1.09	1.09
4	69.81	70.52	36.69	11/17/1972	52	1.12	1.11
3	60.69	60.95	37.76	3/20/1973	51	1.14	1.13
2	54.38	54.38	38.38	1/6/1977	50	1.16	1.15
			38.42	1/14/1978	49	1.18	1.18
			38.87	3/11/1978	48	1.21	1.20
			38.94	11/25/1985	47	1.23	1.23
			39.14	1/18/1952	46	1.26	1.25
			39.17	12/18/1967	45	1.29	1.28
			40.73	1/14/1969	44	1.32	1.31
			40.91	2/6/1969	43	1.35	1.34
			41.95	2/17/1971	42	1.38	1.38
			43.5	2/8/1976	41	1.41	1.41
			44.12	12/31/1976	40	1.45	1.44
			44.64	5/8/1977	39	1.49	1.48
			45.75	1/6/1979	38	1.53	1.52
			46.86	3/1/1981	37	1.57	1.56
			46.94	3/17/1982	36	1.61	1.61
			48.42	3/24/1983	35	1.66	1.65
			49.38	11/25/1983	34	1.71	1.70
			51.76	1/18/1993	33	1.76	1.75
			51.88	3/11/1995	32	1.81	1.81
			53.01	12/28/2004	31	1.87	1.87
			53.57	2/21/2005	30	1.93	1.93
			54.38	2/21/2005	29	2.00	2.00
			56.63	2/3/1958	28	2.07	2.07
			57.1	3/6/1975	27	2.15	2.15
			57.13	2/25/1981	26	2.23	2.23
			57.76	3/1/1983	25	2.32	2.33
			58.27	11/17/1986	24	2.42	2.42
			58.65	12/4/1987	23	2.52	2.53
			58.79	4/21/1988	22	2.64	2.65
			59.55	1/31/1993	21	2.76	2.78
			59.68	2/14/1995	20	2.90	2.92
			61.62	12/23/1995	19	3.05	3.08
			62.09	1/12/1960	18	3.22	3.25
			62.96	3/8/1968	17	3.41	3.45
			64.19	12/4/1974	16	3.63	3.67
			68.77	3/16/1986	15	3.87	3.92
			72.4	11/5/1987	14	4.14	4.21
			72.67	1/10/1955	13	4.46	4.54
			74.32	1/10/1978	12	4.83	4.93
			79.59	1/25/1995	11	5.27	5.40
			79.65	10/27/2004	10	5.80	5.96
			82.7	11/21/1967	9	6.44	6.65
			87.86	2/28/1970	8	7.25	7.53
			88.76	11/16/1972	7	8.29	8.67
			97.29	1/31/1979	6	9.67	10.21
			103.53	2/24/1998	5	11.60	12.43
			104.15	12/29/2004	4	14.50	15.89
			106.44	2/20/1980	3	19.33	22.00
			129.27	3/7/1952	2	29.00	35.75
			145.39	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Post-Development)

POC2 PROPOSED

T	Cunnane	Weibull				Period of Return	
10	89.86	91.71	Peaks	Date	Position	Weibull	Cunnane
9	83.43	86.43	32.06	1/13/1952	57	1.02	1.01
8	79.89	80.63	32.23	1/18/1952	56	1.04	1.03
7	77.38	78.12	32.49	1/18/1952	55	1.05	1.05
6	73.49	74.26	32.5	12/20/1952	54	1.07	1.07
5	68.81	70.00	32.6	1/10/1955	53	1.09	1.09
4	65.41	65.49	33.19	1/7/1957	52	1.12	1.11
3	54.39	54.57	33.57	1/20/1962	51	1.14	1.13
2	49.02	49.02	33.95	4/8/1965	50	1.16	1.15
			34.38	3/22/1954	49	1.18	1.18
			35.06	12/5/1957	48	1.21	1.20
			35.62	1/12/1960	47	1.23	1.23
			36.34	12/2/1961	46	1.26	1.25
			36.82	11/20/1963	45	1.29	1.28
			38.36	12/5/1966	44	1.32	1.31
			38.44	1/14/1969	43	1.35	1.34
			39.01	12/21/2002	42	1.38	1.38
			39.69	2/14/2003	41	1.41	1.41
			40.22	2/22/2004	40	1.45	1.44
			40.75	3/7/1952	39	1.49	1.48
			42.22	3/16/1958	38	1.53	1.52
			42.57	3/1/1981	37	1.57	1.56
			42.78	3/17/1982	36	1.61	1.61
			43.53	2/2/1983	35	1.66	1.65
			45.54	3/1/1983	34	1.71	1.70
			47.23	11/25/1985	33	1.76	1.75
			47.49	3/1/1991	32	1.81	1.81
			48.48	2/19/1993	31	1.87	1.87
			48.66	3/11/1995	30	1.93	1.93
			49.02	3/11/1995	29	2.00	2.00
			49.21	2/3/1998	28	2.07	2.07
			49.4	2/8/1998	27	2.15	2.15
			50.4	2/12/2003	26	2.23	2.23
			51.37	3/5/2005	25	2.32	2.33
			51.69	12/30/1951	24	2.42	2.42
			52.34	3/16/1952	23	2.52	2.53
			52.41	3/16/1986	22	2.64	2.65
			52.96	1/14/1990	21	2.76	2.78
			53.69	1/15/1993	20	2.90	2.92
			55.04	1/25/1995	19	3.05	3.08
			56.68	1/25/1995	18	3.22	3.25
			58.35	11/22/1996	17	3.41	3.45
			59.74	10/27/2004	16	3.63	3.67
			65.29	12/29/2004	15	3.87	3.92
			65.7	1/3/2005	14	4.14	4.21
			67.72	3/6/1975	13	4.46	4.54
			68.04	1/10/1978	12	4.83	4.93
			73.22	1/14/1978	11	5.27	5.40
			73.31	1/11/2001	10	5.80	5.96
			76.37	3/2/1983	9	6.44	6.65
			78.91	11/5/1987	8	7.25	7.53
			81.28	11/21/1967	7	8.29	8.67
			91.24	2/28/1970	6	9.67	10.21
			93.96	11/16/1972	5	11.60	12.43
			96.29	1/31/1979	4	14.50	15.89
			115.24	1/4/1995	3	19.33	22.00
			115.7	2/21/2005	2	29.00	35.75
			124.82	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC3 EXIST

List of Peak events and Determination of P2 and P10 (Pre-Development)

T	Cunnane	Weibull				Period of Return	
10	3.11	3.11	Peaks	Date	Position	Weibull	Cunnane
9	3.09	3.10	1.14	3/16/1954	57	1.02	1.01
8	3.00	3.04	1.15	2/11/1959	56	1.04	1.03
7	2.94	2.95	1.18	12/2/1961	55	1.05	1.05
6	2.91	2.92	1.18	1/21/1964	54	1.07	1.07
5	2.79	2.81	1.2	11/16/1965	53	1.09	1.09
4	2.52	2.52	1.23	11/17/1972	52	1.12	1.11
3	2.25	2.26	1.25	3/20/1973	51	1.14	1.13
2	1.90	1.90	1.25	1/6/1977	50	1.16	1.15
			1.32	1/14/1978	49	1.18	1.18
			1.32	3/11/1978	48	1.21	1.20
			1.33	11/25/1985	47	1.23	1.23
			1.33	1/18/1952	46	1.26	1.25
			1.34	12/18/1967	45	1.29	1.28
			1.35	1/14/1969	44	1.32	1.31
			1.37	2/6/1969	43	1.35	1.34
			1.38	2/17/1971	42	1.38	1.38
			1.48	2/8/1976	41	1.41	1.41
			1.54	12/31/1976	40	1.45	1.44
			1.55	5/8/1977	39	1.49	1.48
			1.55	1/6/1979	38	1.53	1.52
			1.64	3/1/1981	37	1.57	1.56
			1.67	3/17/1982	36	1.61	1.61
			1.7	3/24/1983	35	1.66	1.65
			1.74	11/25/1983	34	1.71	1.70
			1.77	1/18/1993	33	1.76	1.75
			1.82	3/11/1995	32	1.81	1.81
			1.87	12/28/2004	31	1.87	1.87
			1.87	2/21/2005	30	1.93	1.93
			1.9	2/21/2005	29	2.00	2.00
			1.91	2/3/1958	28	2.07	2.07
			1.96	3/6/1975	27	2.15	2.15
			1.97	2/25/1981	26	2.23	2.23
			2.01	3/1/1983	25	2.32	2.33
			2.03	11/17/1986	24	2.42	2.42
			2.05	12/4/1987	23	2.52	2.53
			2.07	4/21/1988	22	2.64	2.65
			2.14	1/31/1993	21	2.76	2.78
			2.22	2/14/1995	20	2.90	2.92
			2.28	12/23/1995	19	3.05	3.08
			2.29	1/12/1960	18	3.22	3.25
			2.36	3/8/1968	17	3.41	3.45
			2.49	12/4/1974	16	3.63	3.67
			2.52	3/16/1986	15	3.87	3.92
			2.53	11/5/1987	14	4.14	4.21
			2.65	1/10/1955	13	4.46	4.54
			2.78	1/10/1978	12	4.83	4.93
			2.87	1/25/1995	11	5.27	5.40
			2.91	10/27/2004	10	5.80	5.96
			2.94	11/21/1967	9	6.44	6.65
			2.95	2/28/1970	8	7.25	7.53
			3.08	11/16/1972	7	8.29	8.67
			3.11	1/31/1979	6	9.67	10.21
			3.12	2/24/1998	5	11.60	12.43
			3.83	12/29/2004	4	14.50	15.89
			4.04	2/20/1980	3	19.33	22.00
			4.76	3/7/1952	2	29.00	35.75
			4.89	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC3 PROPOSED

List of Peak events and Determination of P2 and P10 (Post-Development)

T	Cunnane	Weibull				Period of Return	
10	2.17	2.23	Peaks	Date	Position	Weibull	Cunnane
9	1.91	2.03	0.75	1/13/1952	57	1.02	1.01
8	1.82	1.82	0.76	1/18/1952	56	1.04	1.03
7	1.79	1.80	0.76	1/18/1952	55	1.05	1.05
6	1.74	1.75	0.76	12/20/1952	54	1.07	1.07
5	1.64	1.65	0.79	1/10/1955	53	1.09	1.09
4	1.55	1.55	0.79	1/7/1957	52	1.12	1.11
3	1.30	1.30	0.82	1/20/1962	51	1.14	1.13
2	1.18	1.18	0.82	4/8/1965	50	1.16	1.15
			0.83	3/22/1954	49	1.18	1.18
			0.83	12/5/1957	48	1.21	1.20
			0.84	1/12/1960	47	1.23	1.23
			0.87	12/2/1961	46	1.26	1.25
			0.88	11/20/1963	45	1.29	1.28
			0.9	12/5/1966	44	1.32	1.31
			0.94	1/14/1969	43	1.35	1.34
			0.95	12/21/2002	42	1.38	1.38
			0.98	2/14/2003	41	1.41	1.41
			1	2/22/2004	40	1.45	1.44
			1	3/7/1952	39	1.49	1.48
			1.03	3/16/1958	38	1.53	1.52
			1.08	3/1/1981	37	1.57	1.56
			1.08	3/17/1982	36	1.61	1.61
			1.08	2/2/1983	35	1.66	1.65
			1.11	3/1/1983	34	1.71	1.70
			1.13	11/25/1985	33	1.76	1.75
			1.16	3/1/1991	32	1.81	1.81
			1.16	2/19/1993	31	1.87	1.87
			1.17	3/11/1995	30	1.93	1.93
			1.18	3/11/1995	29	2.00	2.00
			1.19	2/3/1998	28	2.07	2.07
			1.19	2/8/1998	27	2.15	2.15
			1.19	2/12/2003	26	2.23	2.23
			1.21	3/5/2005	25	2.32	2.33
			1.23	12/30/1951	24	2.42	2.42
			1.23	3/16/1952	23	2.52	2.53
			1.25	3/16/1986	22	2.64	2.65
			1.26	1/14/1990	21	2.76	2.78
			1.29	1/15/1993	20	2.90	2.92
			1.31	1/25/1995	19	3.05	3.08
			1.36	1/25/1995	18	3.22	3.25
			1.44	11/22/1996	17	3.41	3.45
			1.45	10/27/2004	16	3.63	3.67
			1.54	12/29/2004	15	3.87	3.92
			1.56	1/3/2005	14	4.14	4.21
			1.62	3/6/1975	13	4.46	4.54
			1.64	1/10/1978	12	4.83	4.93
			1.67	1/14/1978	11	5.27	5.40
			1.74	1/11/2001	10	5.80	5.96
			1.78	3/2/1983	9	6.44	6.65
			1.81	11/5/1987	8	7.25	7.53
			1.83	11/21/1967	7	8.29	8.67
			2.22	2/28/1970	6	9.67	10.21
			2.3	11/16/1972	5	11.60	12.43
			2.31	1/31/1979	4	14.50	15.89
			2.73	1/4/1995	3	19.33	22.00
			2.86	2/21/2005	2	29.00	35.75
			3.13	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC4 EXIST

List of Peak events and Determination of P2 and P10 (Pre-Development)

T	Cunnane	Weibull				Period of Return	
10	8.27	8.38	Peaks	Date	Position	Weibull	Cunnane
9	8.23	8.25	3.02	3/16/1954	57	1.02	1.01
8	8.09	8.16	3.12	2/11/1959	56	1.04	1.03
7	7.50	7.74	3.14	12/2/1961	55	1.05	1.05
6	6.88	6.96	3.14	1/21/1964	54	1.07	1.07
5	6.62	6.63	3.18	11/16/1965	53	1.09	1.09
4	6.16	6.20	3.23	11/17/1972	52	1.12	1.11
3	5.86	5.86	3.33	3/20/1973	51	1.14	1.13
2	4.65	4.65	3.33	1/6/1977	50	1.16	1.15
			3.34	1/14/1978	49	1.18	1.18
			3.67	3/11/1978	48	1.21	1.20
			3.75	11/25/1985	47	1.23	1.23
			3.78	1/18/1952	46	1.26	1.25
			3.78	12/18/1967	45	1.29	1.28
			3.81	1/14/1969	44	1.32	1.31
			3.81	2/6/1969	43	1.35	1.34
			3.84	2/17/1971	42	1.38	1.38
			3.84	2/8/1976	41	1.41	1.41
			3.9	12/31/1976	40	1.45	1.44
			3.95	5/8/1977	39	1.49	1.48
			4.06	1/6/1979	38	1.53	1.52
			4.07	3/1/1981	37	1.57	1.56
			4.09	3/17/1982	36	1.61	1.61
			4.17	3/24/1983	35	1.66	1.65
			4.24	11/25/1983	34	1.71	1.70
			4.29	1/18/1993	33	1.76	1.75
			4.35	3/11/1995	32	1.81	1.81
			4.54	12/28/2004	31	1.87	1.87
			4.6	2/21/2005	30	1.93	1.93
			4.65	2/21/2005	29	2.00	2.00
			4.79	2/3/1958	28	2.07	2.07
			4.96	3/6/1975	27	2.15	2.15
			5.04	2/25/1981	26	2.23	2.23
			5.07	3/1/1983	25	2.32	2.33
			5.29	11/17/1986	24	2.42	2.42
			5.69	12/4/1987	23	2.52	2.53
			5.72	4/21/1988	22	2.64	2.65
			5.8	1/31/1993	21	2.76	2.78
			5.85	2/14/1995	20	2.90	2.92
			5.87	12/23/1995	19	3.05	3.08
			5.87	1/12/1960	18	3.22	3.25
			5.89	3/8/1968	17	3.41	3.45
			5.93	12/4/1974	16	3.63	3.67
			6.11	3/16/1986	15	3.87	3.92
			6.29	11/5/1987	14	4.14	4.21
			6.36	1/10/1955	13	4.46	4.54
			6.61	1/10/1978	12	4.83	4.93
			6.65	1/25/1995	11	5.27	5.40
			6.86	10/27/2004	10	5.80	5.96
			7.18	11/21/1967	9	6.44	6.65
			7.99	2/28/1970	8	7.25	7.53
			8.22	11/16/1972	7	8.29	8.67
			8.28	1/31/1979	6	9.67	10.21
			8.84	2/24/1998	5	11.60	12.43
			9.03	12/29/2004	4	14.50	15.89
			10.15	2/20/1980	3	19.33	22.00
			11.1	3/7/1952	2	29.00	35.75
			11.49	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC4 PROPOSED

List of Peak events and Determination of P2 and P10 (Post-Development)

T	Cunnane	Weibull				Period of Return	
10	7.28	7.37	Peaks	Date	Position	Weibull	Cunnane
9	7.24	7.26	2.75	1/13/1952	57	1.02	1.01
8	6.70	6.97	2.76	1/18/1952	56	1.04	1.03
7	6.26	6.30	2.79	1/18/1952	55	1.05	1.05
6	6.05	6.10	2.79	12/20/1952	54	1.07	1.07
5	5.84	5.85	2.81	1/10/1955	53	1.09	1.09
4	5.57	5.58	2.81	1/7/1957	52	1.12	1.11
3	5.15	5.15	2.84	1/20/1962	51	1.14	1.13
2	4.15	4.15	2.96	4/8/1965	50	1.16	1.15
			2.97	3/22/1954	49	1.18	1.18
			3.26	12/5/1957	48	1.21	1.20
			3.33	1/12/1960	47	1.23	1.23
			3.33	12/2/1961	46	1.26	1.25
			3.35	11/20/1963	45	1.29	1.28
			3.38	12/5/1966	44	1.32	1.31
			3.4	1/14/1969	43	1.35	1.34
			3.41	12/21/2002	42	1.38	1.38
			3.49	2/14/2003	41	1.41	1.41
			3.58	2/22/2004	40	1.45	1.44
			3.6	3/7/1952	39	1.49	1.48
			3.62	3/16/1958	38	1.53	1.52
			3.7	3/1/1981	37	1.57	1.56
			3.75	3/17/1982	36	1.61	1.61
			3.76	2/2/1983	35	1.66	1.65
			3.8	3/1/1983	34	1.71	1.70
			3.84	11/25/1985	33	1.76	1.75
			3.98	3/1/1991	32	1.81	1.81
			4.04	2/19/1993	31	1.87	1.87
			4.12	3/11/1995	30	1.93	1.93
			4.15	3/11/1995	29	2.00	2.00
			4.24	2/3/1998	28	2.07	2.07
			4.39	2/8/1998	27	2.15	2.15
			4.45	2/12/2003	26	2.23	2.23
			4.46	3/5/2005	25	2.32	2.33
			4.62	12/30/1951	24	2.42	2.42
			5.02	3/16/1952	23	2.52	2.53
			5.03	3/16/1986	22	2.64	2.65
			5.12	1/14/1990	21	2.76	2.78
			5.15	1/15/1993	20	2.90	2.92
			5.15	1/25/1995	19	3.05	3.08
			5.18	1/25/1995	18	3.22	3.25
			5.19	11/22/1996	17	3.41	3.45
			5.2	10/27/2004	16	3.63	3.67
			5.55	12/29/2004	15	3.87	3.92
			5.61	1/3/2005	14	4.14	4.21
			5.76	3/6/1975	13	4.46	4.54
			5.83	1/10/1978	12	4.83	4.93
			5.87	1/14/1978	11	5.27	5.40
			6.04	1/11/2001	10	5.80	5.96
			6.22	3/2/1983	9	6.44	6.65
			6.33	11/5/1987	8	7.25	7.53
			7.22	11/21/1967	7	8.29	8.67
			7.29	2/28/1970	6	9.67	10.21
			7.78	11/16/1972	5	11.60	12.43
			7.95	1/31/1979	4	14.50	15.89
			8.92	1/4/1995	3	19.33	22.00
			9.76	2/21/2005	2	29.00	35.75
			10.1	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC5 EXIST

List of Peak events and Determination of P2 and P10 (Pre-Development)

T	Cunnane	Weibull				Period of Return	
10	215.58	219.61	Peaks	Date	Position	Weibull	Cunnane
9	206.28	210.62	81.86	3/16/1954	57	1.02	1.01
8	197.71	200.60	83.02	2/11/1959	56	1.04	1.03
7	191.11	192.42	83.25	12/2/1961	55	1.05	1.05
6	181.15	183.33	83.62	1/21/1964	54	1.07	1.07
5	178.06	178.33	84.58	11/16/1965	53	1.09	1.09
4	162.75	163.17	84.58	11/17/1972	52	1.12	1.11
3	140.44	141.46	85.15	3/20/1973	51	1.14	1.13
2	123.08	123.08	85.24	1/6/1977	50	1.16	1.15
			85.27	1/14/1978	49	1.18	1.18
			89.95	3/11/1978	48	1.21	1.20
			90.18	11/25/1985	47	1.23	1.23
			91.09	1/18/1952	46	1.26	1.25
			91.34	12/18/1967	45	1.29	1.28
			96.79	1/14/1969	44	1.32	1.31
			97.22	2/6/1969	43	1.35	1.34
			98.95	2/17/1971	42	1.38	1.38
			100.4	2/8/1976	41	1.41	1.41
			102.51	12/31/1976	40	1.45	1.44
			104.65	5/8/1977	39	1.49	1.48
			105.22	1/6/1979	38	1.53	1.52
			107.99	3/1/1981	37	1.57	1.56
			109.62	3/17/1982	36	1.61	1.61
			111.11	3/24/1983	35	1.66	1.65
			111.99	11/25/1983	34	1.71	1.70
			113.51	1/18/1993	33	1.76	1.75
			117.42	3/11/1995	32	1.81	1.81
			118.29	12/28/2004	31	1.87	1.87
			121.73	2/21/2005	30	1.93	1.93
			123.08	2/21/2005	29	2.00	2.00
			123.79	2/3/1958	28	2.07	2.07
			124.4	3/6/1975	27	2.15	2.15
			128.49	2/25/1981	26	2.23	2.23
			131.02	3/1/1983	25	2.32	2.33
			133.03	11/17/1986	24	2.42	2.42
			133.16	12/4/1987	23	2.52	2.53
			134.25	4/21/1988	22	2.64	2.65
			136.2	1/31/1993	21	2.76	2.78
			136.52	2/14/1995	20	2.90	2.92
			144.06	12/23/1995	19	3.05	3.08
			144.66	1/12/1960	18	3.22	3.25
			144.95	3/8/1968	17	3.41	3.45
			148.03	12/4/1974	16	3.63	3.67
			162.15	3/16/1986	15	3.87	3.92
			164.27	11/5/1987	14	4.14	4.21
			172.6	1/10/1955	13	4.46	4.54
			177.89	1/10/1978	12	4.83	4.93
			179.05	1/25/1995	11	5.27	5.40
			180.63	10/27/2004	10	5.80	5.96
			189.32	11/21/1967	9	6.44	6.65
			193.82	2/28/1970	8	7.25	7.53
			203.18	11/16/1972	7	8.29	8.67
			217.57	1/31/1979	6	9.67	10.21
			229.43	2/24/1998	5	11.60	12.43
			230.14	12/29/2004	4	14.50	15.89
			233.05	2/20/1980	3	19.33	22.00
			279.04	3/7/1952	2	29.00	35.75
			319.35	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Post-Development)

POC5 PROPOSED

T	Cunnane	Weibull				Period of Return	
10	215.52	219.51	Peaks	Date	Position	Weibull	Cunnane
9	206.30	210.61	82.02	1/13/1952	57	1.02	1.01
8	197.69	200.61	82.81	1/18/1952	56	1.04	1.03
7	191.09	192.38	83.27	1/18/1952	55	1.05	1.05
6	181.13	183.31	83.64	12/20/1952	54	1.07	1.07
5	177.84	178.10	84.73	1/10/1955	53	1.09	1.09
4	162.67	163.10	84.77	1/7/1957	52	1.12	1.11
3	140.50	141.51	85.24	1/20/1962	51	1.14	1.13
2	123.14	123.14	85.4	4/8/1965	50	1.16	1.15
			85.44	3/22/1954	49	1.18	1.18
			89.03	12/5/1957	48	1.21	1.20
			90.09	1/12/1960	47	1.23	1.23
			90.2	12/2/1961	46	1.26	1.25
			91.26	11/20/1963	45	1.29	1.28
			91.37	12/5/1966	44	1.32	1.31
			91.66	1/14/1969	43	1.35	1.34
			96.97	12/21/2002	42	1.38	1.38
			99.01	2/14/2003	41	1.41	1.41
			100.57	2/22/2004	40	1.45	1.44
			102.63	3/7/1952	39	1.49	1.48
			104.85	3/16/1958	38	1.53	1.52
			104.93	3/1/1981	37	1.57	1.56
			107.34	3/17/1982	36	1.61	1.61
			109.85	2/2/1983	35	1.66	1.65
			111.71	3/1/1983	34	1.71	1.70
			113.59	11/25/1985	33	1.76	1.75
			117.54	3/1/1991	32	1.81	1.81
			118.1	2/19/1993	31	1.87	1.87
			121.83	3/11/1995	30	1.93	1.93
			123.14	3/11/1995	29	2.00	2.00
			123.65	2/3/1998	28	2.07	2.07
			124.57	2/8/1998	27	2.15	2.15
			128.11	2/12/2003	26	2.23	2.23
			128.51	3/5/2005	25	2.32	2.33
			133.16	12/30/1951	24	2.42	2.42
			133.17	3/16/1952	23	2.52	2.53
			133.99	3/16/1986	22	2.64	2.65
			135.38	1/14/1990	21	2.76	2.78
			136.61	1/15/1993	20	2.90	2.92
			144.09	1/25/1995	19	3.05	3.08
			144.68	1/25/1995	18	3.22	3.25
			144.76	11/22/1996	17	3.41	3.45
			148.05	10/27/2004	16	3.63	3.67
			162.04	12/29/2004	15	3.87	3.92
			164.24	1/3/2005	14	4.14	4.21
			172.46	3/6/1975	13	4.46	4.54
			177.67	1/10/1978	12	4.83	4.93
			178.81	1/14/1978	11	5.27	5.40
			180.61	1/11/2001	10	5.80	5.96
			189.32	3/2/1983	9	6.44	6.65
			193.76	11/5/1987	8	7.25	7.53
			203.22	11/21/1967	7	8.29	8.67
			217.5	2/28/1970	6	9.67	10.21
			229.16	11/16/1972	5	11.60	12.43
			229.91	1/31/1979	4	14.50	15.89
			231.44	1/4/1995	3	19.33	22.00
			278.65	2/21/2005	2	29.00	35.75
			318.83	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Pre-Development)

POC6 EXIST

T	Cunnane	Weibull				Period of Return	
10	20.76	21.24	Peaks	Date	Position	Weibull	Cunnane
9	20.74	20.75	7.52	3/16/1954	57	1.02	1.01
8	20.71	20.73	7.53	2/11/1959	56	1.04	1.03
7	19.80	20.23	7.59	12/2/1961	55	1.05	1.05
6	18.46	18.66	8.3	1/21/1964	54	1.07	1.07
5	16.13	16.61	8.32	11/16/1965	53	1.09	1.09
4	14.61	14.62	8.72	11/17/1972	52	1.12	1.11
3	13.42	13.52	8.79	3/20/1973	51	1.14	1.13
2	11.73	11.73	8.88	1/6/1977	50	1.16	1.15
			9.17	1/14/1978	49	1.18	1.18
			9.27	3/11/1978	48	1.21	1.20
			9.31	11/25/1985	47	1.23	1.23
			9.37	1/18/1952	46	1.26	1.25
			9.43	12/18/1967	45	1.29	1.28
			9.58	1/14/1969	44	1.32	1.31
			9.62	2/6/1969	43	1.35	1.34
			9.78	2/17/1971	42	1.38	1.38
			10.36	2/8/1976	41	1.41	1.41
			10.38	12/31/1976	40	1.45	1.44
			10.45	5/8/1977	39	1.49	1.48
			10.45	1/6/1979	38	1.53	1.52
			10.82	3/1/1981	37	1.57	1.56
			11.09	3/17/1982	36	1.61	1.61
			11.12	3/24/1983	35	1.66	1.65
			11.17	11/25/1983	34	1.71	1.70
			11.2	1/18/1993	33	1.76	1.75
			11.34	3/11/1995	32	1.81	1.81
			11.4	12/28/2004	31	1.87	1.87
			11.42	2/21/2005	30	1.93	1.93
			11.73	2/21/2005	29	2.00	2.00
			11.99	2/3/1958	28	2.07	2.07
			12.02	3/6/1975	27	2.15	2.15
			12.18	2/25/1981	26	2.23	2.23
			12.31	3/1/1983	25	2.32	2.33
			12.31	11/17/1986	24	2.42	2.42
			12.39	12/4/1987	23	2.52	2.53
			12.48	4/21/1988	22	2.64	2.65
			12.92	1/31/1993	21	2.76	2.78
			13.05	2/14/1995	20	2.90	2.92
			13.77	12/23/1995	19	3.05	3.08
			13.78	1/12/1960	18	3.22	3.25
			14.01	3/8/1968	17	3.41	3.45
			14.28	12/4/1974	16	3.63	3.67
			14.6	3/16/1986	15	3.87	3.92
			14.65	11/5/1987	14	4.14	4.21
			14.85	1/10/1955	13	4.46	4.54
			15.82	1/10/1978	12	4.83	4.93
			17.9	1/25/1995	11	5.27	5.40
			18.41	10/27/2004	10	5.80	5.96
			19.21	11/21/1967	9	6.44	6.65
			20.69	2/28/1970	8	7.25	7.53
			20.74	11/16/1972	7	8.29	8.67
			20.76	1/31/1979	6	9.67	10.21
			23.55	2/24/1998	5	11.60	12.43
			25.3	12/29/2004	4	14.50	15.89
			25.79	2/20/1980	3	19.33	22.00
			26.7	3/7/1952	2	29.00	35.75
			32.27	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Post-Development)

POC6 PROPOSED

T	Cunnane	Weibull				Period of Return	
10	20.67	21.15	Peaks	Date	Position	Weibull	Cunnane
9	20.56	20.61	6.93	1/13/1952	57	1.02	1.01
8	20.39	20.46	7.15	1/18/1952	56	1.04	1.03
7	19.60	19.94	7.55	1/18/1952	55	1.05	1.05
6	18.43	18.62	8.13	12/20/1952	54	1.07	1.07
5	16.05	16.54	8.17	1/10/1955	53	1.09	1.09
4	14.55	14.56	8.27	1/7/1957	52	1.12	1.11
3	13.38	13.48	8.3	1/20/1962	51	1.14	1.13
2	11.45	11.45	8.59	4/8/1965	50	1.16	1.15
			8.69	3/22/1954	49	1.18	1.18
			8.91	12/5/1957	48	1.21	1.20
			9.05	1/12/1960	47	1.23	1.23
			9.18	12/2/1961	46	1.26	1.25
			9.32	11/20/1963	45	1.29	1.28
			9.38	12/5/1966	44	1.32	1.31
			9.44	1/14/1969	43	1.35	1.34
			9.52	12/21/2002	42	1.38	1.38
			9.53	2/14/2003	41	1.41	1.41
			9.78	2/22/2004	40	1.45	1.44
			10.31	3/7/1952	39	1.49	1.48
			10.32	3/16/1958	38	1.53	1.52
			10.34	3/1/1981	37	1.57	1.56
			10.72	3/17/1982	36	1.61	1.61
			10.94	2/2/1983	35	1.66	1.65
			11.07	3/1/1983	34	1.71	1.70
			11.13	11/25/1985	33	1.76	1.75
			11.22	3/1/1991	32	1.81	1.81
			11.26	2/19/1993	31	1.87	1.87
			11.27	3/11/1995	30	1.93	1.93
			11.45	3/11/1995	29	2.00	2.00
			11.71	2/3/1998	28	2.07	2.07
			11.77	2/8/1998	27	2.15	2.15
			11.92	2/12/2003	26	2.23	2.23
			12.19	3/5/2005	25	2.32	2.33
			12.19	12/30/1951	24	2.42	2.42
			12.39	3/16/1952	23	2.52	2.53
			12.4	3/16/1986	22	2.64	2.65
			12.87	1/14/1990	21	2.76	2.78
			13.03	1/15/1993	20	2.90	2.92
			13.71	1/25/1995	19	3.05	3.08
			13.71	1/25/1995	18	3.22	3.25
			13.98	11/22/1996	17	3.41	3.45
			14.2	10/27/2004	16	3.63	3.67
			14.53	12/29/2004	15	3.87	3.92
			14.59	1/3/2005	14	4.14	4.21
			14.74	3/6/1975	13	4.46	4.54
			15.73	1/10/1978	12	4.83	4.93
			17.87	1/14/1978	11	5.27	5.40
			18.38	1/11/2001	10	5.80	5.96
			19.15	3/2/1983	9	6.44	6.65
			20.29	11/5/1987	8	7.25	7.53
			20.52	11/21/1967	7	8.29	8.67
			20.69	2/28/1970	6	9.67	10.21
			23.37	11/16/1972	5	11.60	12.43
			25.24	1/31/1979	4	14.50	15.89
			25.38	1/4/1995	3	19.33	22.00
			26.51	2/21/2005	2	29.00	35.75
			31.82	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Pre-Development)

POC7 EXIST

T	Cunnane	Weibull				Period of Return	
10	36.29	36.88	Peaks	Date	Position	Weibull	Cunnane
9	35.44	35.84	12.6	3/16/1954	57	1.02	1.01
8	34.51	34.85	13.44	2/11/1959	56	1.04	1.03
7	33.24	33.63	13.66	12/2/1961	55	1.05	1.05
6	30.47	31.07	13.78	1/21/1964	54	1.07	1.07
5	29.64	29.79	13.8	11/16/1965	53	1.09	1.09
4	29.05	29.06	13.93	11/17/1972	52	1.12	1.11
3	24.52	24.60	14.25	3/20/1973	51	1.14	1.13
2	21.45	21.45	14.5	1/6/1977	50	1.16	1.15
			14.75	1/14/1978	49	1.18	1.18
			15.14	3/11/1978	48	1.21	1.20
			15.34	11/25/1985	47	1.23	1.23
			15.36	1/18/1952	46	1.26	1.25
			15.5	12/18/1967	45	1.29	1.28
			15.88	1/14/1969	44	1.32	1.31
			16.53	2/6/1969	43	1.35	1.34
			16.72	2/17/1971	42	1.38	1.38
			16.84	2/8/1976	41	1.41	1.41
			16.98	12/31/1976	40	1.45	1.44
			17.12	5/8/1977	39	1.49	1.48
			17.74	1/6/1979	38	1.53	1.52
			18.57	3/1/1981	37	1.57	1.56
			18.66	3/17/1982	36	1.61	1.61
			18.73	3/24/1983	35	1.66	1.65
			18.86	11/25/1983	34	1.71	1.70
			20.09	1/18/1993	33	1.76	1.75
			20.7	3/11/1995	32	1.81	1.81
			21.17	12/28/2004	31	1.87	1.87
			21.38	2/21/2005	30	1.93	1.93
			21.45	2/21/2005	29	2.00	2.00
			21.47	2/3/1958	28	2.07	2.07
			21.59	3/6/1975	27	2.15	2.15
			22.08	2/25/1981	26	2.23	2.23
			22.72	3/1/1983	25	2.32	2.33
			23.08	11/17/1986	24	2.42	2.42
			23.14	12/4/1987	23	2.52	2.53
			23.5	4/21/1988	22	2.64	2.65
			24.14	1/31/1993	21	2.76	2.78
			24.22	2/14/1995	20	2.90	2.92
			24.8	12/23/1995	19	3.05	3.08
			25.03	1/12/1960	18	3.22	3.25
			25.8	3/8/1968	17	3.41	3.45
			26.4	12/4/1974	16	3.63	3.67
			29.03	3/16/1986	15	3.87	3.92
			29.09	11/5/1987	14	4.14	4.21
			29.09	1/10/1955	13	4.46	4.54
			29.55	1/10/1978	12	4.83	4.93
			30.19	1/25/1995	11	5.27	5.40
			30.33	10/27/2004	10	5.80	5.96
			32.71	11/21/1967	9	6.44	6.65
			34.05	2/28/1970	8	7.25	7.53
			35.16	11/16/1972	7	8.29	8.67
			36.47	1/31/1979	6	9.67	10.21
			38.83	2/24/1998	5	11.60	12.43
			42.11	12/29/2004	4	14.50	15.89
			43.47	2/20/1980	3	19.33	22.00
			52.23	3/7/1952	2	29.00	35.75
			56.61	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of P2 and P10 (Post-Development)

POC7 PROPOSED

T	Cunnane	Weibull				Period of Return	
10	36.20	36.78	Peaks	Date	Position	Weibull	Cunnane
9	35.42	35.79	13.49	1/13/1952	57	1.02	1.01
8	34.51	34.85	13.7	1/18/1952	56	1.04	1.03
7	33.23	33.63	13.79	1/18/1952	55	1.05	1.05
6	30.36	30.98	13.85	12/20/1952	54	1.07	1.07
5	29.62	29.75	13.99	1/10/1955	53	1.09	1.09
4	29.05	29.05	14.04	1/7/1957	52	1.12	1.11
3	23.99	24.05	14.3	1/20/1962	51	1.14	1.13
2	21.31	21.31	14.54	4/8/1965	50	1.16	1.15
			14.67	3/22/1954	49	1.18	1.18
			14.87	12/5/1957	48	1.21	1.20
			15.18	1/12/1960	47	1.23	1.23
			15.41	12/2/1961	46	1.26	1.25
			15.51	11/20/1963	45	1.29	1.28
			15.78	12/5/1966	44	1.32	1.31
			16.5	1/14/1969	43	1.35	1.34
			16.76	12/21/2002	42	1.38	1.38
			16.91	2/14/2003	41	1.41	1.41
			17.01	2/22/2004	40	1.45	1.44
			17.15	3/7/1952	39	1.49	1.48
			17.56	3/16/1958	38	1.53	1.52
			18.46	3/1/1981	37	1.57	1.56
			18.58	3/17/1982	36	1.61	1.61
			18.69	2/2/1983	35	1.66	1.65
			18.7	3/1/1983	34	1.71	1.70
			19.99	11/25/1985	33	1.76	1.75
			20.72	3/1/1991	32	1.81	1.81
			20.74	2/19/1993	31	1.87	1.87
			21.14	3/11/1995	30	1.93	1.93
			21.31	3/11/1995	29	2.00	2.00
			21.39	2/3/1998	28	2.07	2.07
			21.45	2/8/1998	27	2.15	2.15
			21.54	2/12/2003	26	2.23	2.23
			22.12	3/5/2005	25	2.32	2.33
			22.7	12/30/1951	24	2.42	2.42
			23	3/16/1952	23	2.52	2.53
			23.1	3/16/1986	22	2.64	2.65
			23.31	1/14/1990	21	2.76	2.78
			23.72	1/15/1993	20	2.90	2.92
			24.23	1/25/1995	19	3.05	3.08
			24.9	1/25/1995	18	3.22	3.25
			25.81	11/22/1996	17	3.41	3.45
			26.42	10/27/2004	16	3.63	3.67
			29.05	12/29/2004	15	3.87	3.92
			29.06	1/3/2005	14	4.14	4.21
			29.1	3/6/1975	13	4.46	4.54
			29.54	1/10/1978	12	4.83	4.93
			30.1	1/14/1978	11	5.27	5.40
			30.21	1/11/2001	10	5.80	5.96
			32.69	3/2/1983	9	6.44	6.65
			34.05	11/5/1987	8	7.25	7.53
			35.16	11/21/1967	7	8.29	8.67
			36.37	2/28/1970	6	9.67	10.21
			38.75	11/16/1972	5	11.60	12.43
			42.07	1/31/1979	4	14.50	15.89
			43.25	1/4/1995	3	19.33	22.00
			52.13	2/21/2005	2	29.00	35.75
			56.48	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC8 EXIST

List of Peak events and Determination of P2 and P10 (Pre-Development)

T	Cunnane	Weibull				Period of Return	
10	0.15	0.15	Peaks	Date	Position	Weibull	Cunnane
9	0.14	0.15	0.06	3/16/1954	57	1.02	1.01
8	0.14	0.14	0.06	2/11/1959	56	1.04	1.03
7	0.13	0.14	0.06	12/2/1961	55	1.05	1.05
6	0.12	0.12	0.06	1/21/1964	54	1.07	1.07
5	0.11	0.11	0.06	11/16/1965	53	1.09	1.09
4	0.11	0.11	0.06	11/17/1972	52	1.12	1.11
3	0.10	0.10	0.06	3/20/1973	51	1.14	1.13
2	0.09	0.09	0.06	1/6/1977	50	1.16	1.15
			0.06	1/14/1978	49	1.18	1.18
			0.06	3/11/1978	48	1.21	1.20
			0.07	11/25/1985	47	1.23	1.23
			0.07	1/18/1952	46	1.26	1.25
			0.07	12/18/1967	45	1.29	1.28
			0.07	1/14/1969	44	1.32	1.31
			0.07	2/6/1969	43	1.35	1.34
			0.07	2/17/1971	42	1.38	1.38
			0.07	2/8/1976	41	1.41	1.41
			0.07	12/31/1976	40	1.45	1.44
			0.07	5/8/1977	39	1.49	1.48
			0.08	1/6/1979	38	1.53	1.52
			0.08	3/1/1981	37	1.57	1.56
			0.08	3/17/1982	36	1.61	1.61
			0.08	3/24/1983	35	1.66	1.65
			0.08	11/25/1983	34	1.71	1.70
			0.08	1/18/1993	33	1.76	1.75
			0.08	3/11/1995	32	1.81	1.81
			0.08	12/28/2004	31	1.87	1.87
			0.08	2/21/2005	30	1.93	1.93
			0.09	2/21/2005	29	2.00	2.00
			0.09	2/3/1958	28	2.07	2.07
			0.09	3/6/1975	27	2.15	2.15
			0.1	2/25/1981	26	2.23	2.23
			0.1	3/1/1983	25	2.32	2.33
			0.1	11/17/1986	24	2.42	2.42
			0.1	12/4/1987	23	2.52	2.53
			0.1	4/21/1988	22	2.64	2.65
			0.1	1/31/1993	21	2.76	2.78
			0.1	2/14/1995	20	2.90	2.92
			0.1	12/23/1995	19	3.05	3.08
			0.1	1/12/1960	18	3.22	3.25
			0.1	3/8/1968	17	3.41	3.45
			0.11	12/4/1974	16	3.63	3.67
			0.11	3/16/1986	15	3.87	3.92
			0.11	11/5/1987	14	4.14	4.21
			0.11	1/10/1955	13	4.46	4.54
			0.11	1/10/1978	12	4.83	4.93
			0.12	1/25/1995	11	5.27	5.40
			0.12	10/27/2004	10	5.80	5.96
			0.13	11/21/1967	9	6.44	6.65
			0.14	2/28/1970	8	7.25	7.53
			0.14	11/16/1972	7	8.29	8.67
			0.15	1/31/1979	6	9.67	10.21
			0.15	2/24/1998	5	11.60	12.43
			0.16	12/29/2004	4	14.50	15.89
			0.17	2/20/1980	3	19.33	22.00
			0.19	3/7/1952	2	29.00	35.75
			0.19	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

POC8 PROPOSED

List of Peak events and Determination of P2 and P10 (Post-Development)

T	Cunnane	Weibull				Period of Return	
10	0.15	0.15	Peaks	Date	Position	Weibull	Cunnane
9	0.14	0.15	0.03	1/13/1952	57	1.02	1.01
8	0.13	0.14	0.03	1/18/1952	56	1.04	1.03
7	0.12	0.13	0.03	1/18/1952	55	1.05	1.05
6	0.12	0.12	0.03	12/20/1952	54	1.07	1.07
5	0.11	0.11	0.03	1/10/1955	53	1.09	1.09
4	0.09	0.09	0.03	1/7/1957	52	1.12	1.11
3	0.05	0.05	0.03	1/20/1962	51	1.14	1.13
2	0.03	0.03	0.03	4/8/1965	50	1.16	1.15
			0.03	3/22/1954	49	1.18	1.18
			0.03	12/5/1957	48	1.21	1.20
			0.03	1/12/1960	47	1.23	1.23
			0.03	12/2/1961	46	1.26	1.25
			0.03	11/20/1963	45	1.29	1.28
			0.03	12/5/1966	44	1.32	1.31
			0.03	1/14/1969	43	1.35	1.34
			0.03	12/21/2002	42	1.38	1.38
			0.03	2/14/2003	41	1.41	1.41
			0.03	2/22/2004	40	1.45	1.44
			0.03	3/7/1952	39	1.49	1.48
			0.03	3/16/1958	38	1.53	1.52
			0.03	3/1/1981	37	1.57	1.56
			0.03	3/17/1982	36	1.61	1.61
			0.03	2/2/1983	35	1.66	1.65
			0.03	3/1/1983	34	1.71	1.70
			0.03	11/25/1985	33	1.76	1.75
			0.03	3/1/1991	32	1.81	1.81
			0.03	2/19/1993	31	1.87	1.87
			0.03	3/11/1995	30	1.93	1.93
			0.03	3/11/1995	29	2.00	2.00
			0.03	2/3/1998	28	2.07	2.07
			0.03	2/8/1998	27	2.15	2.15
			0.03	2/12/2003	26	2.23	2.23
			0.03	3/5/2005	25	2.32	2.33
			0.04	12/30/1951	24	2.42	2.42
			0.04	3/16/1952	23	2.52	2.53
			0.04	3/16/1986	22	2.64	2.65
			0.04	1/14/1990	21	2.76	2.78
			0.04	1/15/1993	20	2.90	2.92
			0.05	1/25/1995	19	3.05	3.08
			0.06	1/25/1995	18	3.22	3.25
			0.06	11/22/1996	17	3.41	3.45
			0.06	10/27/2004	16	3.63	3.67
			0.09	12/29/2004	15	3.87	3.92
			0.09	1/3/2005	14	4.14	4.21
			0.09	3/6/1975	13	4.46	4.54
			0.11	1/10/1978	12	4.83	4.93
			0.11	1/14/1978	11	5.27	5.40
			0.12	1/11/2001	10	5.80	5.96
			0.12	3/2/1983	9	6.44	6.65
			0.13	11/5/1987	8	7.25	7.53
			0.14	11/21/1967	7	8.29	8.67
			0.15	2/28/1970	6	9.67	10.21
			0.16	11/16/1972	5	11.60	12.43
			0.16	1/31/1979	4	14.50	15.89
			0.17	1/4/1995	3	19.33	22.00
			0.18	2/21/2005	2	29.00	35.75
			0.18	12/10/1965	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

SECTION 4 - Elevation vs. Area Curves vs. Discharge Curves to be used in SWMM

Elevation vs. Area

For the flow diverted to the respective receiving detention basin, a pond is used to route the hydrographs. The elevation vs area curve in the model is calculated in Excel and imported into the model.

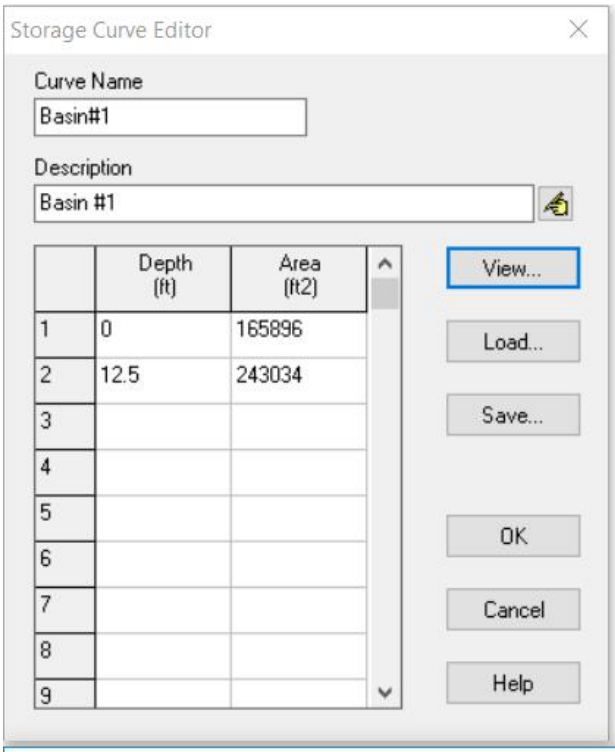
Elevation vs Discharge

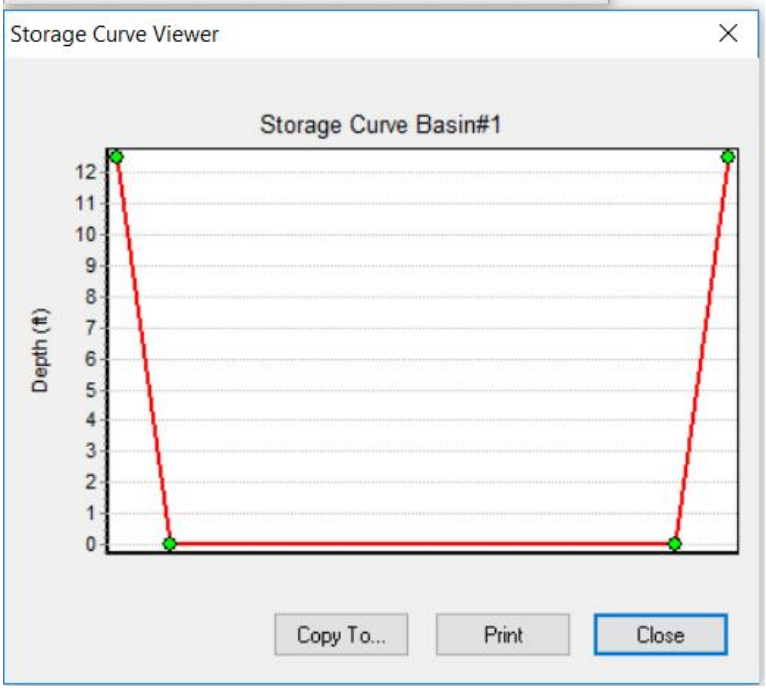
The total discharge peak flow is imported from an Excel spreadsheet that calculated the elevation vs discharge of the multiple outlet system for each basin.

The orifices have been selected to maximize their size while still restricting flows to conform to the required 10% of the Q2 event flow as mandated in the Final Hydromodification Management Plan by Brown & Caldwell, dated March 2011. While we acknowledge that these orifices may be small, to increase the size of these outlets would impact the basins' ability to restrict flows beneath the HMP thresholds, thus preventing the BMP from conformance with HMP requirements.

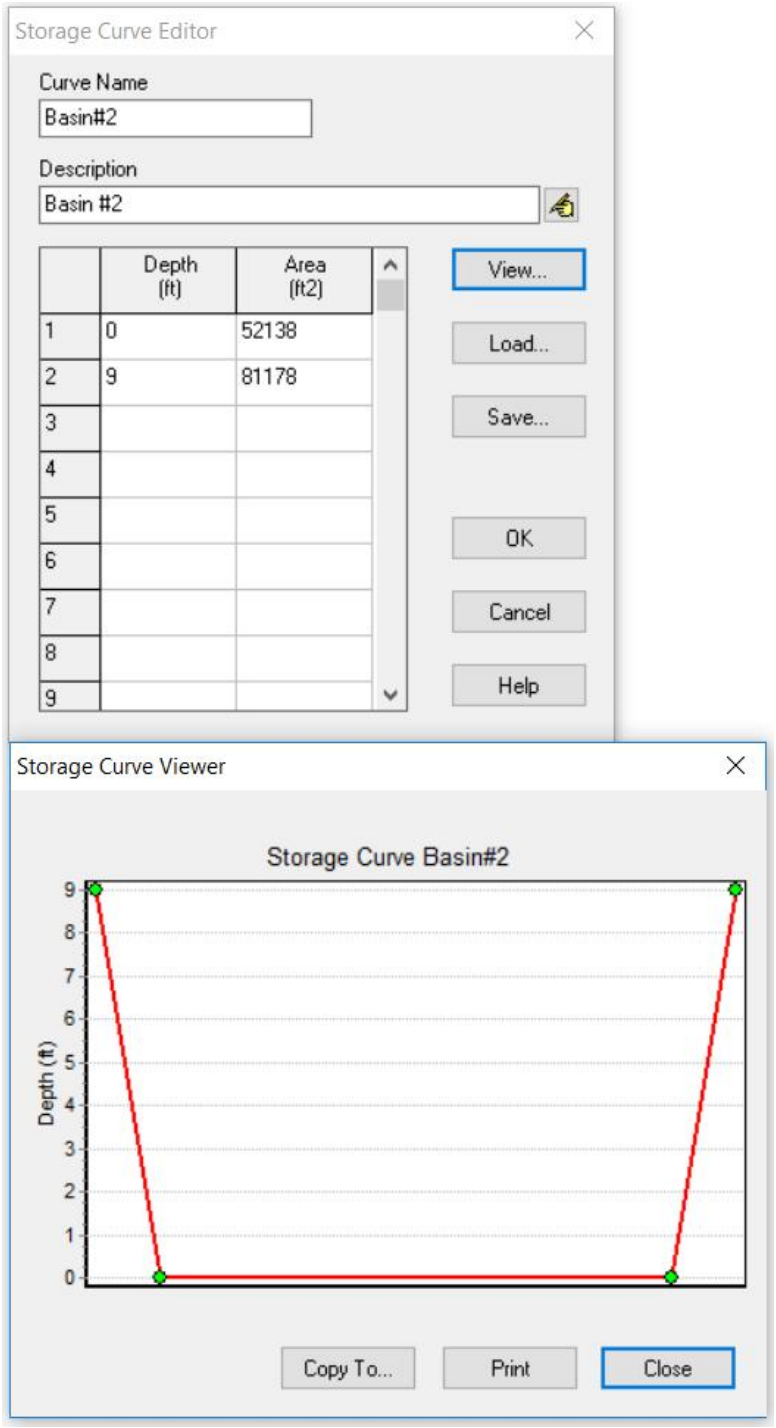
In order to prevent blockage of the orifices, a debris screen will be fitted to the base invert of the lower orifices located within each basin. Regular maintenance of the riser and orifices will be performed to ensure potential blockages are minimized. A detail of the orifice and riser structure is provided in Section 5 of this attachment. The stage-storage and stage-discharge calculations have been provided on the following pages.

POC1PRBasin Stage-Storage

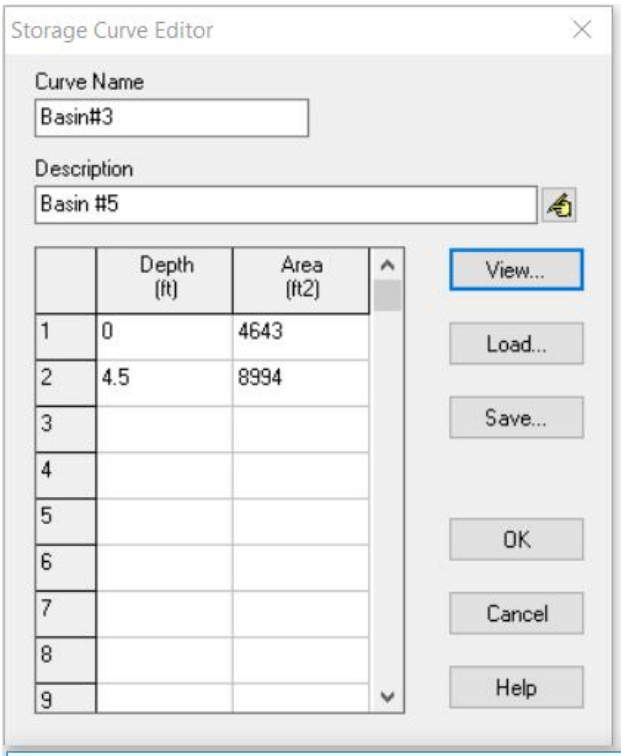


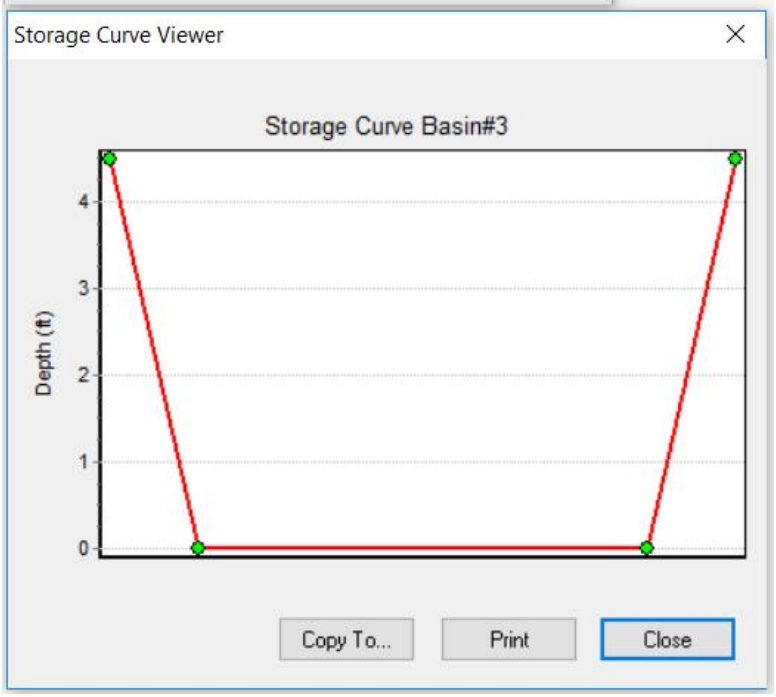


POC2PRBasin Stage-Storage

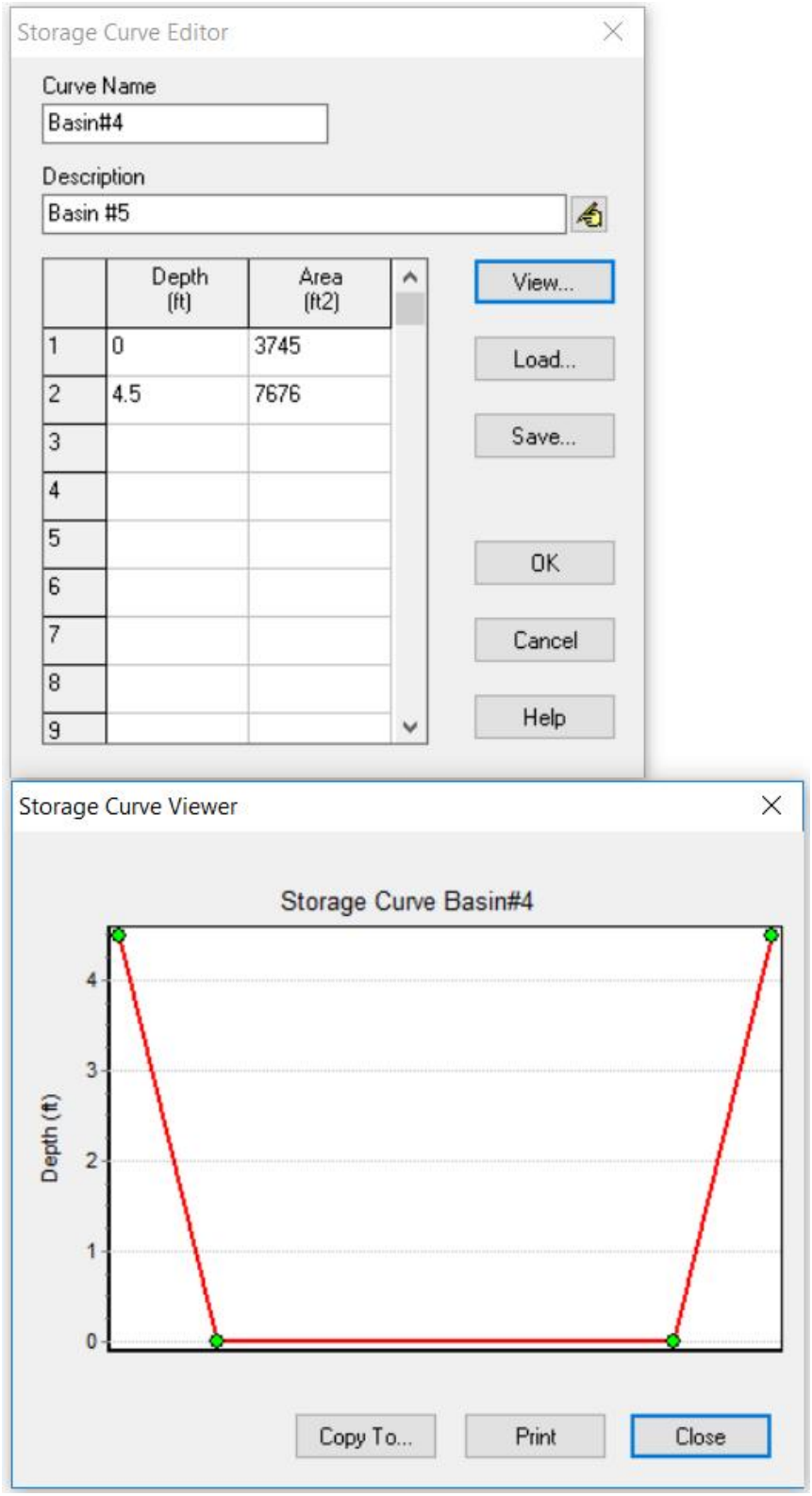


POC3PRBasin Stage-Storage

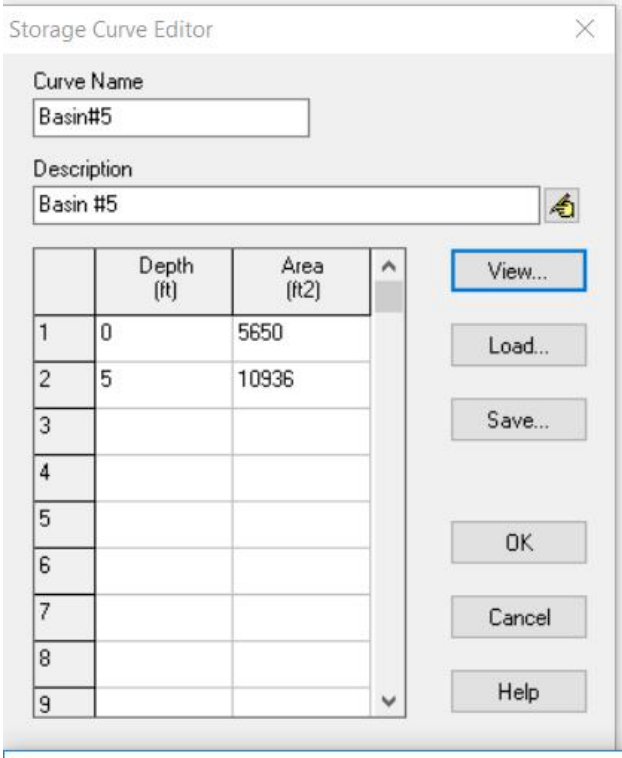


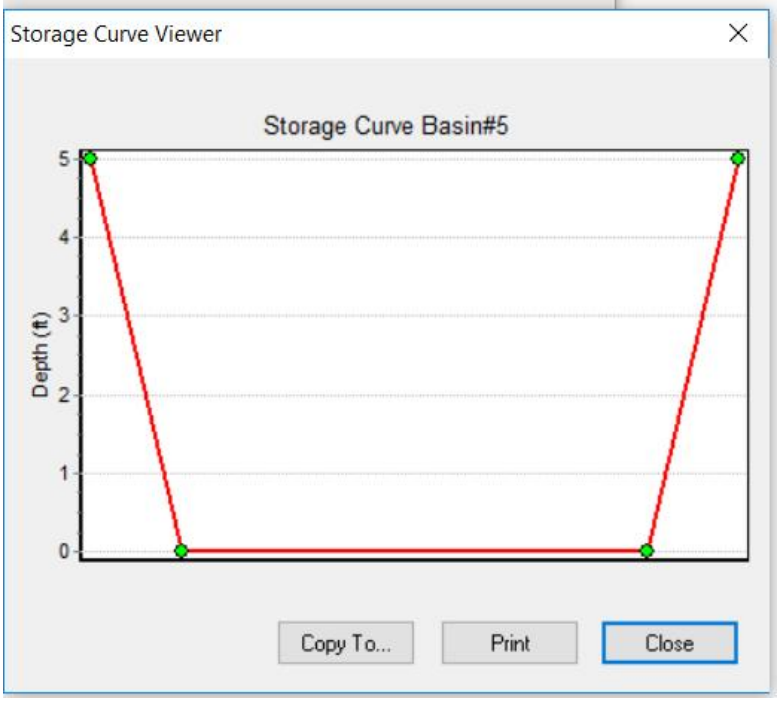


POC4PRBasin Stage-Storage

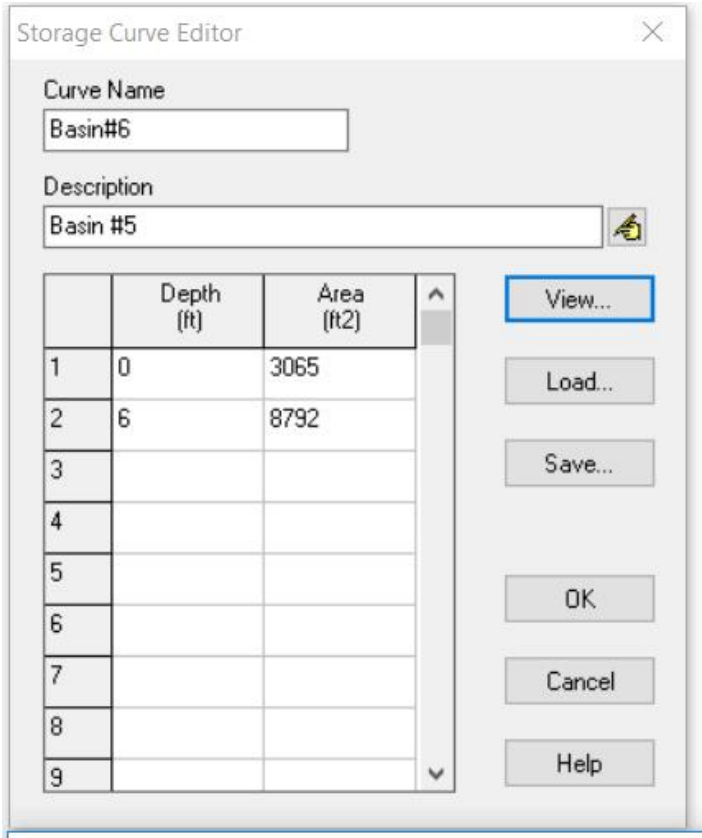


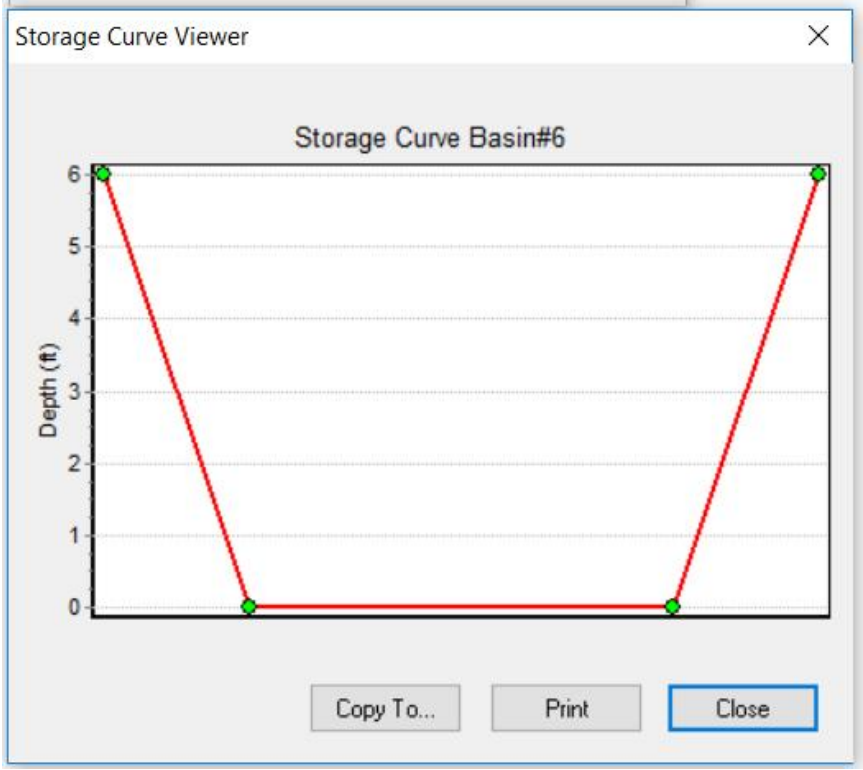
POC5PRBasin Stage-Storage





POC6PRBasin Stage-Storage





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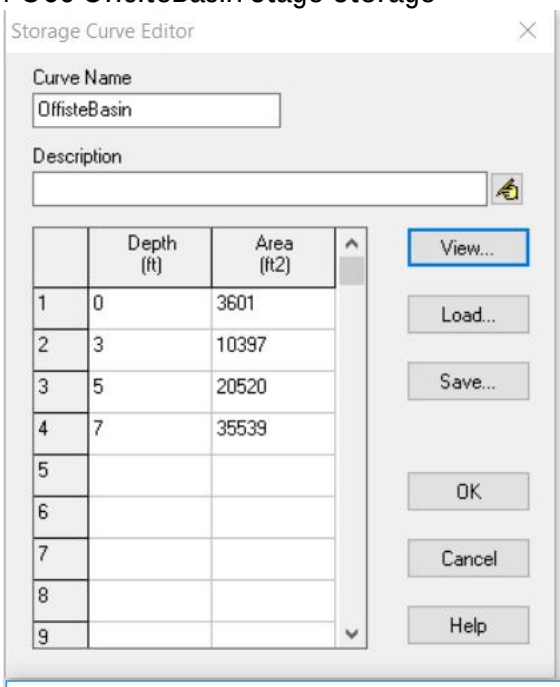
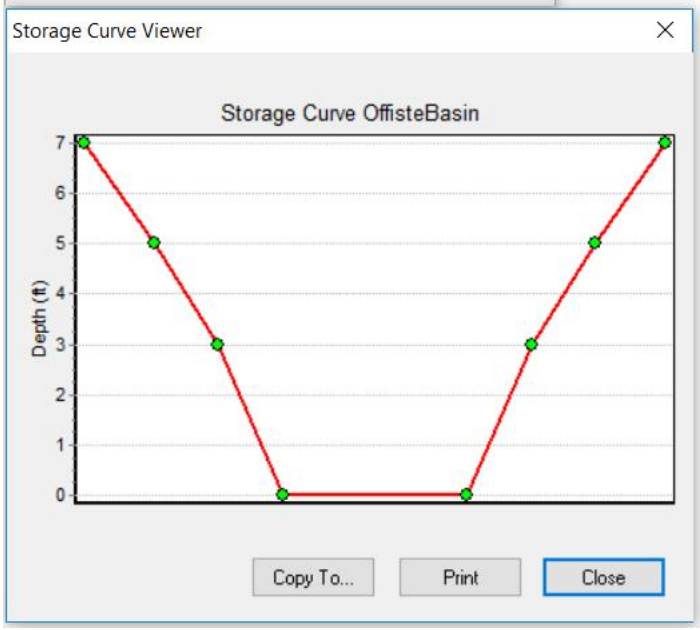
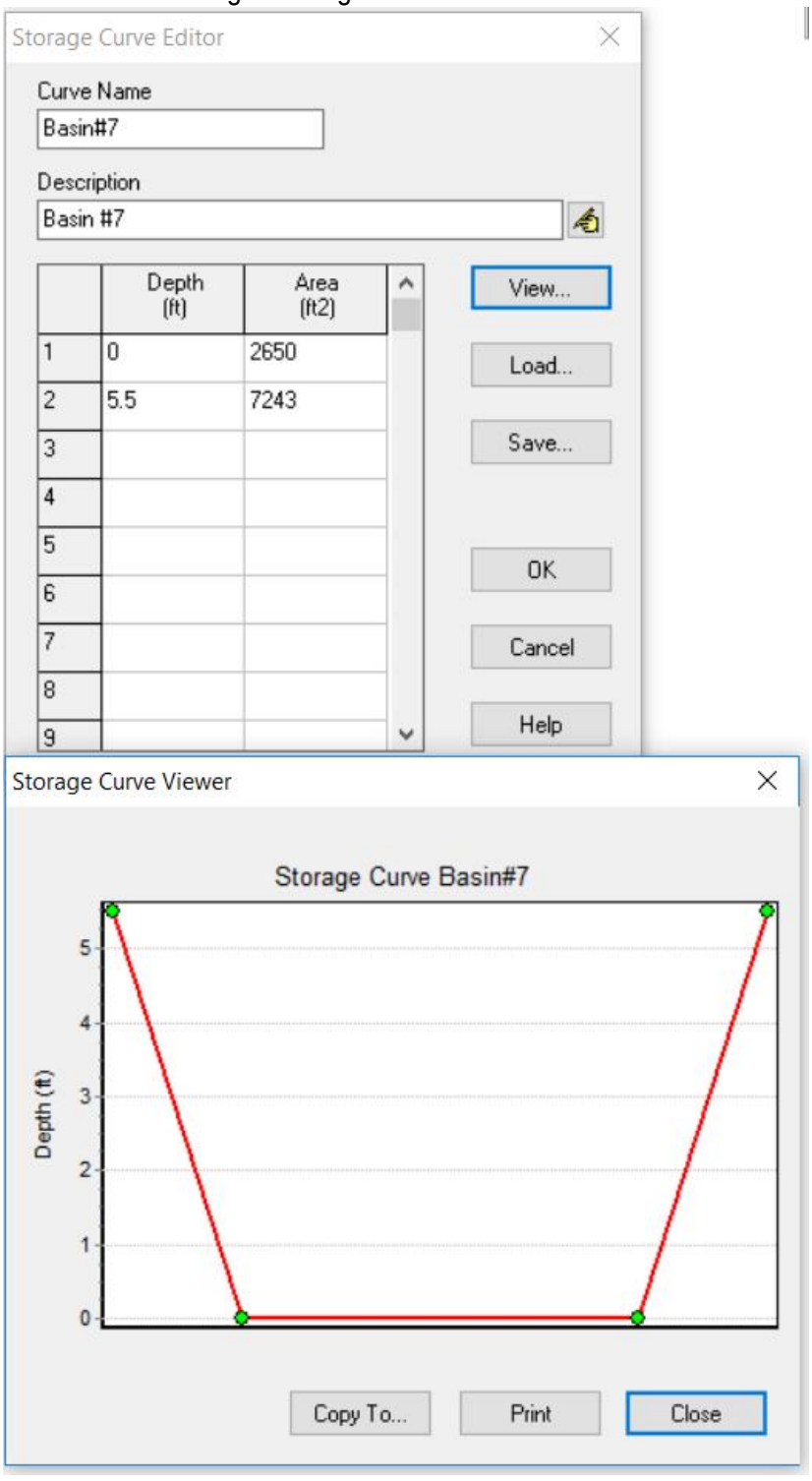
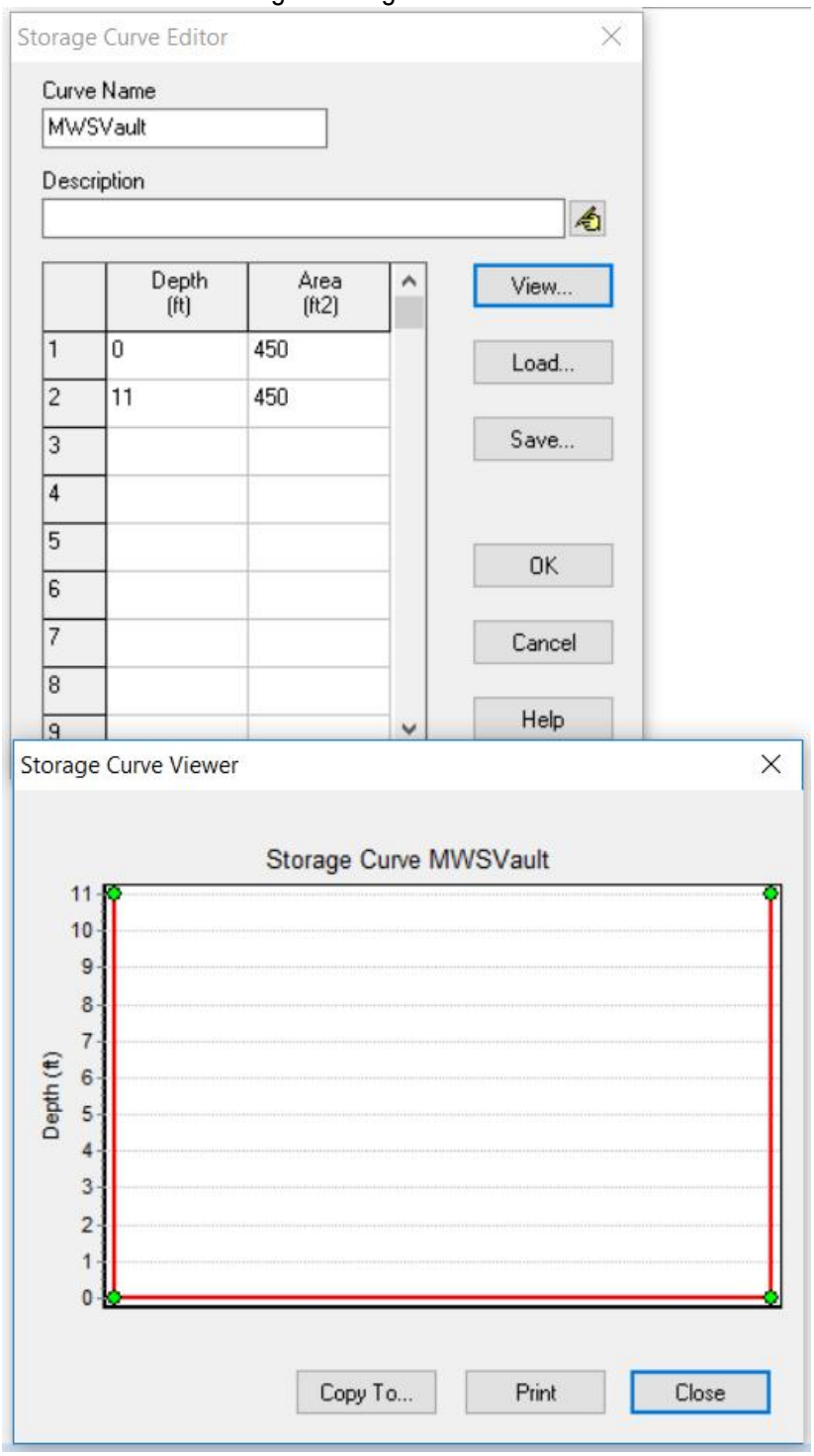




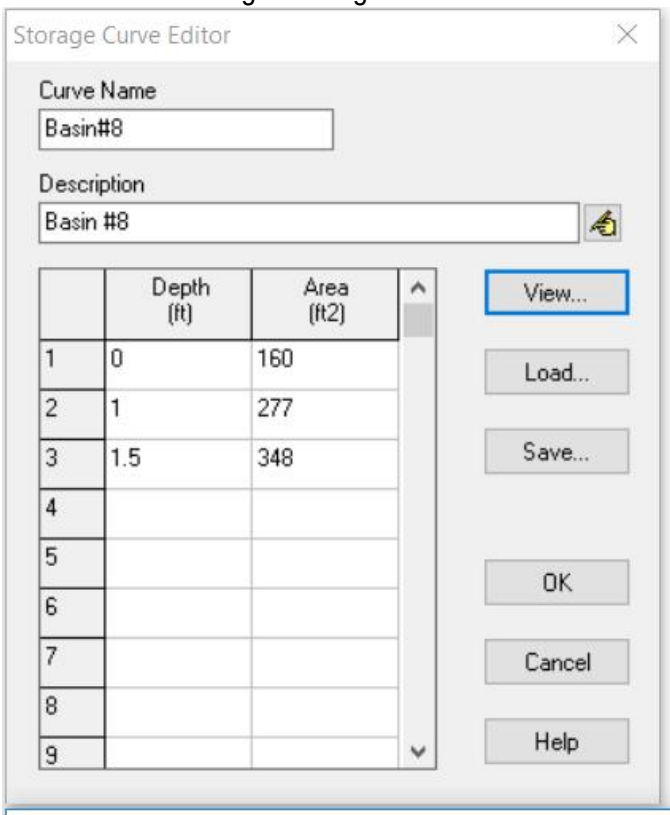
POC7PRBasin Stage-Storage

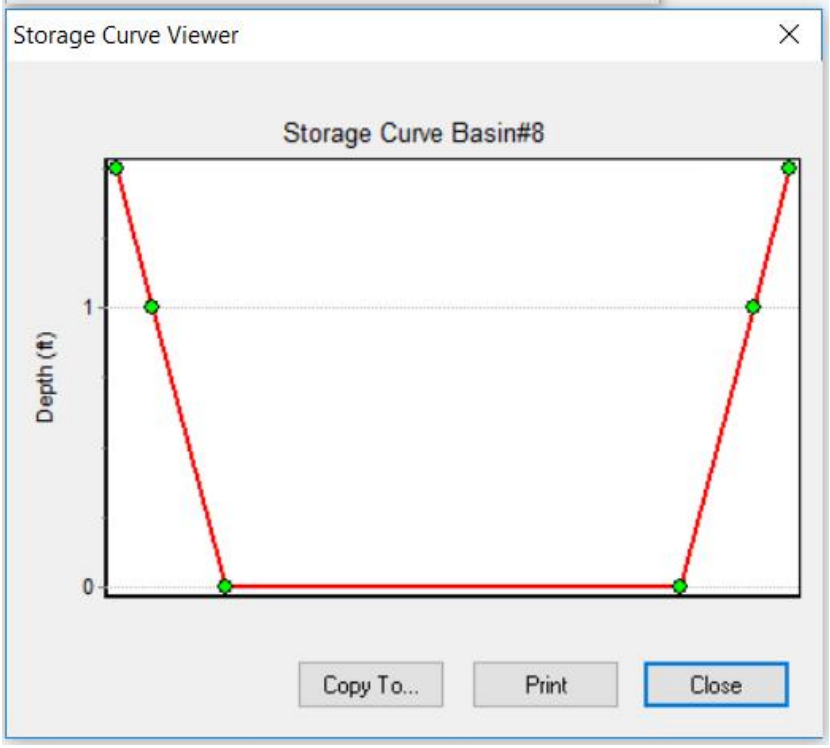


POC7 MWSVault Stage-Storage

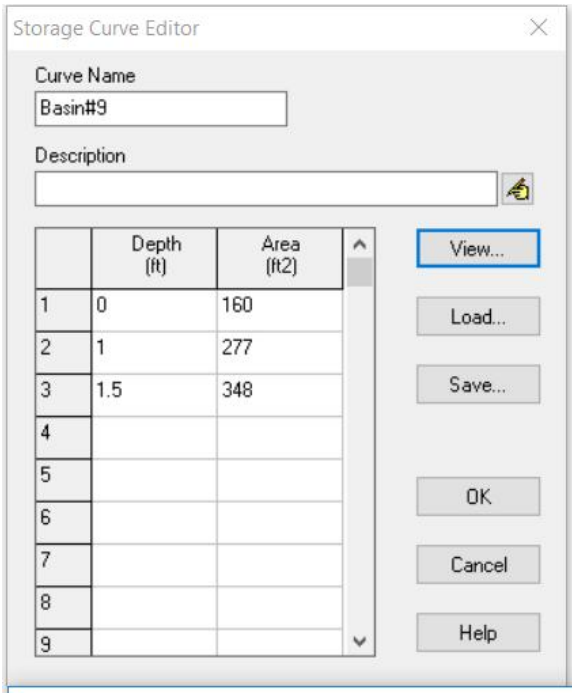


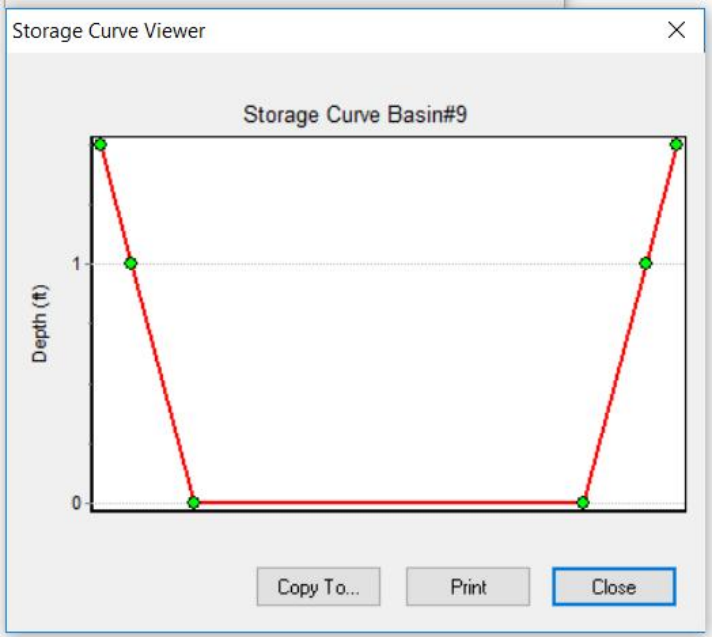
POC8 Basin #8 Stage-Storage





POC8 Basin #9 Stage-Storage





Basin #1 Discharge

Discharge vs Elevation Table

Low orifice:	3 "	Top orifice:	14 "
Number:	3	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.00 ft	invert elev:	6.50 ft
Middle orifice:	3 "	Emergency inlet:	
number of orif:	1	Rim height:	10.00 ft
Cg-middle:	0.61	Area	49.00 sq ft
invert elev:	7.00 ft	Circumference	28.00 ft

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.40	0.00	0.00	0.000	0.047	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
0.2	0.80	0.00	0.00	0.197	0.168	0.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.168
0.3	1.20	0.00	0.00	0.302	0.323	0.302	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.302
0.4	1.60	0.00	0.00	0.378	0.474	0.378	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.378
0.5	2.00	0.00	0.00	0.441	0.586	0.441	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.441
0.6	2.40	0.00	0.00	0.497	0.645	0.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.497
0.7	2.80	0.00	0.00	0.547	0.659	0.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.547
0.8	3.20	0.00	0.00	0.592	0.673	0.592	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.592
0.9	3.60	0.00	0.00	0.635	0.775	0.635	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.635
1.0	4.00	0.00	0.00	0.674	1.107	0.674	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.674
1.1	4.40	0.00	0.00	0.712	1.873	0.712	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.712
1.2	4.80	0.00	0.00	0.747	3.350	0.747	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.747
1.3	5.20	0.00	0.00	0.781	5.894	0.781	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.781
1.4	5.60	0.00	0.00	0.814	9.954	0.814	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.814
1.5	6.00	0.00	0.00	0.845	16.076	0.845	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.845
1.6	6.40	0.00	0.00	0.876	24.916	0.876	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.876
1.7	6.80	0.00	0.00	0.905	37.247	0.905	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.905
1.8	7.20	0.00	0.00	0.933	53.971	0.933	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.933
1.9	7.60	0.00	0.00	0.960	76.124	0.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.960
2.0	8.00	0.00	0.00	0.987	104.889	0.987	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.987
2.1	8.40	0.00	0.00	1.013	141.603	1.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.013
2.2	8.80	0.00	0.00	1.038	187.769	1.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.038
2.3	9.20	0.00	0.00	1.063	245.061	1.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.063
2.4	9.60	0.00	0.00	1.087	315.337	1.087	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.087
2.5	10.00	0.00	0.00	1.111	400.645	1.111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.111
2.6	10.40	0.00	0.00	1.134	503.236	1.134	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.134
2.7	10.80	0.00	0.00	1.157	625.569	1.157	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.157
2.8	11.20	0.00	0.00	1.179	770.325	1.179	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.179
2.9	11.60	0.00	0.00	1.201	940.411	1.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.201
3.0	12.00	0.00	0.00	1.222	1138.974	1.222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.222
3.1	12.40	0.00	0.00	1.243	1369.407	1.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.243
3.2	12.80	0.00	0.00	1.264	1635.358	1.264	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.264
3.3	13.20	0.00	0.00	1.285	1940.744	1.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.285
3.4	13.60	0.00	0.00	1.305	2289.753	1.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.305
3.5	14.00	0.00	0.00	1.324	2686.859	1.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.324
3.6	14.40	0.00	0.00	1.344	3136.829	1.344	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.344
3.7	14.80	0.00	0.00	1.363	3644.732	1.363	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.363
3.8	15.20	0.00	0.00	1.382	4215.948	1.382	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.382
3.9	15.60	0.00	0.00	1.401	4856.180	1.401	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.401
4.0	16.00	0.00	0.00	1.419	5571.459	1.419	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.419
4.1	16.40	0.00	0.00	1.437	6368.157	1.437	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.437
4.2	16.80	0.00	0.00	1.455	7252.991	1.455	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.455
4.3	17.20	0.00	0.00	1.473	8233.041	1.473	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.473
4.4	17.60	0.00	0.00	1.491	9315.750	1.491	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.491
4.5	18.00	0.00	0.00	1.508	10508.938	1.508	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.508
4.6	18.40	0.00	0.00	1.525	11820.812	1.525	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.525
4.7	18.80	0.00	0.00	1.542	13259.971	1.542	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.542
4.8	19.20	0.00	0.00	1.559	14835.421	1.559	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.559
4.9	19.60	0.00	0.00	1.575	16556.578	1.575	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.575
5.0	20.00	0.00	0.00	1.592	18433.283	1.592	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.592
5.1	20.40	0.00	0.00	1.608	20475.806	1.608	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.608
5.2	20.80	0.00	0.00	1.624	22694.861	1.624	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.624
5.3	21.20	0.00	0.00	1.640	25101.607	1.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.640
5.4	21.60	0.00	0.00	1.656	27707.668	1.656	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.656
5.5	22.00	0.00	0.00	1.671	30525.133	1.671	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.671
5.6	22.40	0.00	0.00	1.687	33566.568	1.687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.687
5.7	22.80	0.00	0.00	1.702	36845.029	1.702	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.702
5.8	23.20	0.00	0.00	1.717	40374.065	1.717	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.717
5.9	23.60	0.00	0.00	1.732	44167.732	1.732	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.732
6.0	24.00	0.00	0.00	1.747	48240.600	1.747	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.747
6.1	24.40	0.00	0.00	1.762	52607.764	1.762	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.762
6.2	24.80	0.00	0.00	1.777	57284.850	1.777	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.777
6.3	25.20	0.00	0.00	1.791	62288.027	1.791	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.791
6.4	25.60	0.00	0.00	1.806	67634.015	1.806	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.806
6.5	26.00	0.00	0.00	1.820	73340.097	1.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.820

6.6	26.40	0.00	0.09	1.834	79424.124	1.834	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.834
6.7	26.80	0.00	0.17	1.848	85904.525	1.848	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.848
6.8	27.20	0.00	0.26	1.862	92800.319	1.862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.862
6.9	27.60	0.00	0.34	1.876	100131.123	1.876	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.876
7.0	28.00	0.00	0.43	1.890	107917.159	1.890	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.890
7.1	28.40	0.40	0.51	1.904	116179.266	1.904	0.000	0.016	0.016	0.000	0.000	0.000	0.000	1.920
7.2	28.80	0.80	0.60	1.917	124938.909	1.917	0.066	0.056	0.056	0.000	0.000	0.000	0.000	1.973
7.3	29.20	1.20	0.69	1.931	134218.186	1.931	0.101	0.108	0.101	0.000	0.000	0.000	0.000	2.031
7.4	29.60	1.60	0.77	1.944	144039.840	1.944	0.126	0.158	0.126	0.000	0.000	0.000	0.000	2.070
7.5	30.00	2.00	0.86	1.958	154427.266	1.958	0.147	0.195	0.147	0.000	0.000	0.000	0.000	2.105
7.6	30.40	2.40	0.94	1.971	165404.521	1.971	0.166	0.215	0.166	0.000	0.000	0.000	0.000	2.137
7.7	30.80	2.80	1.03	1.984	176996.334	1.984	0.182	0.220	0.182	0.000	0.000	0.000	0.000	2.166
7.8	31.20	3.20	1.11	1.997	189228.114	1.997	0.197	0.224	0.197	0.000	0.000	0.000	0.000	2.195
7.9	31.60	3.60	1.20	2.010	202125.961	2.010	0.212	0.258	0.212	0.000	0.000	0.000	0.000	2.222
8.0	32.00	4.00	1.29	2.023	215716.672	2.023	0.225	0.369	0.225	0.000	0.000	0.000	0.000	2.248
8.1	32.40	4.40	1.37	2.036	230027.754	2.036	0.237	0.624	0.237	0.000	0.000	0.000	0.000	2.273
8.2	32.80	4.80	1.46	2.048	245087.431	2.048	0.249	1.117	0.249	0.000	0.000	0.000	0.000	2.298
8.3	33.20	5.20	1.54	2.061	260924.654	2.061	0.260	1.965	0.260	0.000	0.000	0.000	0.000	2.322
8.4	33.60	5.60	1.63	2.074	277569.108	2.074	0.271	3.318	0.271	0.000	0.000	0.000	0.000	2.345
8.5	34.00	6.00	1.71	2.086	295051.226	2.086	0.282	5.359	0.282	0.000	0.000	0.000	0.000	2.368
8.6	34.40	6.40	1.80	2.099	313402.193	2.099	0.292	8.305	0.292	0.000	0.000	0.000	0.000	2.390
8.7	34.80	6.80	1.89	2.111	332653.959	2.111	0.302	12.416	0.302	0.000	0.000	0.000	0.000	2.413
8.8	35.20	7.20	1.97	2.123	352839.247	2.123	0.311	17.990	0.311	0.000	0.000	0.000	0.000	2.434
8.9	35.60	7.60	2.06	2.135	373991.560	2.135	0.320	25.375	0.320	0.000	0.000	0.000	0.000	2.456
9.0	36.00	8.00	2.14	2.148	396145.195	2.148	0.329	34.963	0.329	0.000	0.000	0.000	0.000	2.477
9.1	36.40	8.40	2.23	2.160	419335.248	2.160	0.338	47.201	0.338	0.000	0.000	0.000	0.000	2.497
9.2	36.80	8.80	2.31	2.172	443597.625	2.172	0.346	62.590	0.346	0.000	0.000	0.000	0.000	2.518
9.3	37.20	9.20	2.40	2.184	468969.049	2.184	0.354	81.687	0.354	0.000	0.000	0.000	0.000	2.538
9.4	37.60	9.60	2.49	2.195	495487.076	2.195	0.362	105.112	0.362	0.000	0.000	0.000	0.000	2.558
9.5	38.00	10.00	2.57	2.207	523192.924	2.207	0.370	133.551	0.370	0.000	0.000	0.000	0.000	2.578
9.6	38.40	10.40	2.66	2.219	552120.295	2.219	0.378	167.749	0.378	0.000	0.000	0.000	0.000	2.597
9.7	38.80	10.80	2.74	2.231	582311.992	2.231	0.386	208.527	0.386	0.000	0.000	0.000	0.000	2.616
9.8	39.20	11.20	2.83	2.242	613808.972	2.242	0.393	256.780	0.393	0.000	0.000	0.000	0.000	2.635
9.9	39.60	11.60	2.91	2.254	646653.068	2.254	0.400	313.477	0.400	0.000	0.000	0.000	0.000	2.654
10.0	40.00	12.00	3.00	2.265	680921.939	2.265	0.407	379.736	0.407	0.000	0.000	0.000	0.000	2.673
10.1	40.40	12.40	3.09	2.277	716590.761	2.277	0.414	456.560	0.414	0.000	0.000	0.000	2.749	5.441
10.2	40.80	12.80	3.17	2.288	753737.579	2.288	0.421	545.224	0.421	0.000	0.000	0.000	7.770	10.480
10.3	41.20	13.20	3.26	2.300	792407.814	2.300	0.428	647.034	0.428	0.000	0.000	0.000	14.271	16.998
10.4	41.60	13.60	3.34	2.311	832647.810	2.311	0.435	763.387	0.435	0.000	0.000	0.000	21.968	24.714
10.5	42.00	14.00	3.43	2.322	874504.839	2.322	0.441	895.775	0.441	0.000	0.000	0.000	30.699	33.462
10.6	42.40	14.40	3.51	2.333	918027.111	2.333	0.448	1045.785	0.448	0.000	0.000	0.000	40.352	43.133
10.7	42.80	14.80	3.60	2.344	963263.788	2.344	0.454	1215.108	0.454	0.000	0.000	0.000	50.847	53.646
10.8	43.20	15.20	3.69	2.355	1010264.985	2.355	0.461	1405.538	0.461	0.000	0.000	0.000	62.122	64.938
10.9	43.60	15.60	3.77	2.366	1059081.786	2.366	0.467	1618.975	0.467	0.000	0.000	0.000	74.125	76.958
11.0	44.00	16.00	3.86	2.377	1109766.249	2.377	0.473	1857.430	0.473	0.000	0.000	0.000	86.814	89.665
11.1	44.40	16.40	3.94	2.388	1162371.419	2.388	0.479	2123.027	0.479	0.000	0.000	0.000	100.155	103.023
11.2	44.80	16.80	4.03	2.399	1216951.333	2.399	0.485	2418.005	0.485	0.000	0.000	0.000	114.117	117.001
11.3	45.20	17.20	4.11	2.410	1273561.034	2.410	0.491	2744.725	0.491	0.000	0.000	0.000	128.674	131.575
11.4	45.60	17.60	4.20	2.421	1332256.576	2.421	0.497	3105.667	0.497	0.000	0.000	0.000	143.801	146.719
11.5	46.00	18.00	4.29	2.431	1393095.034	2.431	0.503	3503.438	0.503	0.000	0.000	0.000	159.479	162.413
11.6	46.40	18.40	4.37	2.442	1456134.516	2.442	0.508	3940.774	0.508	0.000	0.000	0.000	175.689	178.639
11.7	46.80	18.80	4.46	2.453	1521434.169	2.453	0.514	4420.543	0.514	0.000	0.000	0.000	192.413	195.380
11.8	47.20	19.20	4.54	2.463	1589054.191	2.463	0.520	4945.744	0.520	0.000	0.000	0.000	209.637	212.620
11.9	47.60	19.60	4.63	2.474	1659055.836	2.474	0.525	5519.518	0.525	0.000	0.000	0.000	227.346	230.345
12.0	48.00	20.00	4.71	2.484	1731501.429	2.484	0.531	6145.146	0.531	0.000	0.000	0.000	245.528	248.542
12.1	48.40	20.40	4.80	2.495	1806454.371	2.495	0.536	6826.049	0.536	0.000	0.000	0.000	264.170	267.200
12.2	48.80	20.80	4.89	2.505	1883979.150	2.505	0.541	7565.801	0.541	0.000	0.000	0.000	283.261	286.307
12.3	49.20	21.20	4.97	2.515	1964141.347	2.515	0.547	8368.121	0.547	0.000	0.000	0.000	302.791	305.853
12.4	49.60	21.60	5.06	2.526	2047007.652	2.526	0.552	9236.883	0.552	0.000	0.000	0.000	322.750	325.828
12.5	50.00	22.00	5.14	2.536	2132645.866	2.536	0.557	10176.118	0.557	0.000	0.000	0.000	343.130	346.223
12.6	50.40	22.40	5.23	2.546	2221124.914	2.546	0.562	11190.014	0.562	0.000	0.000	0.000	363.921	367.030
12.7	50.80	22.80	5.31	2.556	2312514.855	2.556	0.567	12282.924	0.567	0.000	0.000	0.000	385.116	388.240
12.8	51.20	23.20	5.40	2.566	2406886.888	2.566	0.572	13459.363	0.572	0.000	0.000	0.000	401.381	404.520
12.9	51.60	23.60	5.49	2.577	2504313.364	2.577	0.577	14724.019	0.577	0.000	0.000	0.000	408.485	411.639
13.0	52.00	24.00	5.57	2.587	2604867.794	2.587	0.582	16081.747	0.582	0.000	0.000	0.000	415.468	418.637

LID Outlet #1			
ABMP=	160200	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	4.15	in	(diameter in inches of the bottom orifice)
Aorifice=	0.09393	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0358		C coefficient to be inserted into SWMM
H-gravel=	5.75	ft	Depth of the gravel layer where water is ponding
	69	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	64.85	in	
H-design=	5.404	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	1.06896	cfs	
$Q_{orif\text{-}SWMM}$=	1.06896	cfs	
$Q_{diversion}$=	1.07965	cfs	1% additional to the Qorifice.

Basin #2 Discharge

Discharge vs Elevation Table

Low orifice:	2.25 "	Top orifice:	8 "	
Number:	2	Number:	0	
Cg-low:	0.61	Cg-low:	0.61	
invert elev:	0.00 ft	invert elev:	0.00 ft	
Middle orifice:	3 "	Emergency inlet:		
number of orif:	1	Rim height:	7.50 ft	
Cg-middle:	0.61	Xsect. Area	9.00 sq ft	<--- 3' x 3'
invert elev:	2.50 ft	Circumference	12.00 ft	

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.53	0.00	0.15	0.021	0.026	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026
0.2	1.07	0.00	0.30	0.088	0.088	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.088
0.3	1.60	0.00	0.45	0.123	0.154	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.123
0.4	2.13	0.00	0.60	0.150	0.199	0.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150
0.5	2.67	0.00	0.75	0.172	0.214	0.172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.172
0.6	3.20	0.00	0.90	0.192	0.219	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.192
0.7	3.73	0.00	1.05	0.210	0.276	0.210	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.210
0.8	4.27	0.00	1.20	0.227	0.505	0.227	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.227
0.9	4.80	0.00	1.35	0.243	1.088	0.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.243
1.0	5.33	0.00	1.50	0.257	2.291	0.257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.257
1.1	5.87	0.00	1.65	0.271	4.471	0.271	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.271
1.2	6.40	0.00	1.80	0.284	8.092	0.284	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.284
1.3	6.93	0.00	1.95	0.297	13.733	0.297	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.297
1.4	7.47	0.00	2.10	0.309	22.105	0.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.309
1.5	8.00	0.00	2.25	0.321	34.064	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.321
1.6	8.53	0.00	2.40	0.332	50.618	0.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.332
1.7	9.07	0.00	2.55	0.343	72.946	0.343	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.343
1.8	9.60	0.00	2.70	0.353	102.409	0.353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.353
1.9	10.13	0.00	2.85	0.363	140.557	0.363	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.363
2.0	10.67	0.00	3.00	0.373	189.152	0.373	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.373
2.1	11.20	0.00	3.15	0.383	250.170	0.383	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.383
2.2	11.73	0.00	3.30	0.392	325.822	0.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392
2.3	12.27	0.00	3.45	0.402	418.561	0.402	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.402
2.4	12.80	0.00	3.60	0.411	531.098	0.411	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.411
2.5	13.33	0.00	3.75	0.419	666.412	0.419	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.419
2.6	13.87	0.40	3.90	0.428	827.766	0.428	0.000	0.016	0.016	0.000	0.000	0.000	0.000	0.444
2.7	14.40	0.80	4.05	0.436	1018.715	0.436	0.066	0.056	0.056	0.000	0.000	0.000	0.000	0.492
2.8	14.93	1.20	4.20	0.445	1243.123	0.445	0.101	0.108	0.101	0.000	0.000	0.000	0.000	0.545
2.9	15.47	1.60	4.35	0.453	1505.175	0.453	0.126	0.158	0.126	0.000	0.000	0.000	0.000	0.579
3.0	16.00	2.00	4.50	0.461	1809.385	0.461	0.147	0.195	0.147	0.000	0.000	0.000	0.000	0.608
3.1	16.53	2.40	4.65	0.469	2160.614	0.469	0.166	0.215	0.166	0.000	0.000	0.000	0.000	0.634
3.2	17.07	2.80	4.80	0.476	2564.083	0.476	0.182	0.220	0.182	0.000	0.000	0.000	0.000	0.659
3.3	17.60	3.20	4.95	0.484	3025.379	0.484	0.197	0.224	0.197	0.000	0.000	0.000	0.000	0.681
3.4	18.13	3.60	5.10	0.492	3550.474	0.492	0.212	0.258	0.212	0.000	0.000	0.000	0.000	0.703
3.5	18.67	4.00	5.25	0.499	4145.738	0.499	0.225	0.369	0.225	0.000	0.000	0.000	0.000	0.724
3.6	19.20	4.40	5.40	0.506	4817.944	0.506	0.237	0.624	0.237	0.000	0.000	0.000	0.000	0.743
3.7	19.73	4.80	5.55	0.513	5574.291	0.513	0.249	1.117	0.249	0.000	0.000	0.000	0.000	0.763
3.8	20.27	5.20	5.70	0.520	6422.408	0.520	0.260	1.965	0.260	0.000	0.000	0.000	0.000	0.781
3.9	20.80	5.60	5.85	0.527	7370.372	0.527	0.271	3.318	0.271	0.000	0.000	0.000	0.000	0.799
4.0	21.33	6.00	6.00	0.534	8426.718	0.534	0.282	5.359	0.282	0.000	0.000	0.000	0.000	0.816
4.1	21.87	6.40	6.15	0.541	9600.451	0.541	0.292	8.305	0.292	0.000	0.000	0.000	0.000	0.833
4.2	22.40	6.80	6.30	0.548	10901.063	0.548	0.302	12.416	0.302	0.000	0.000	0.000	0.000	0.849
4.3	22.93	7.20	6.45	0.554	12338.540	0.554	0.311	17.990	0.311	0.000	0.000	0.000	0.000	0.865
4.4	23.47	7.60	6.60	0.561	13923.378	0.561	0.320	25.375	0.320	0.000	0.000	0.000	0.000	0.881
4.5	24.00	8.00	6.75	0.567	15666.595	0.567	0.329	34.963	0.329	0.000	0.000	0.000	0.000	0.896
4.6	24.53	8.40	6.90	0.574	17579.743	0.574	0.338	47.201	0.338	0.000	0.000	0.000	0.000	0.912
4.7	25.07	8.80	7.05	0.580	19674.922	0.580	0.346	62.590	0.346	0.000	0.000	0.000	0.000	0.926
4.8	25.60	9.20	7.20	0.586	21964.791	0.586	0.354	81.687	0.354	0.000	0.000	0.000	0.000	0.941
4.9	26.13	9.60	7.35	0.593	24462.581	0.593	0.362	105.112	0.362	0.000	0.000	0.000	0.000	0.955
5.0	26.67	10.00	7.50	0.599	27182.109	0.599	0.370	133.548	0.370	0.000	0.000	0.000	0.000	0.969
5.1	27.20	10.40	7.65	0.605	30137.788	0.605	0.378	167.745	0.378	0.000	0.000	0.000	0.000	0.983
5.2	27.73	10.80	7.80	0.611	33344.642	0.611	0.386	208.523	0.386	0.000	0.000	0.000	0.000	0.996
5.3	28.27	11.20	7.95	0.617	36818.319	0.617	0.393	256.775	0.393	0.000	0.000	0.000	0.000	1.010
5.4	28.80	11.60	8.10	0.623	40575.101	0.623	0.400	313.470	0.400	0.000	0.000	0.000	0.000	1.023
5.5	29.33	12.00	8.25	0.629	44631.918	0.629	0.407	379.658	0.407	0.000	0.000	0.000	0.000	1.036
5.6	29.87	12.40	8.40	0.634	49006.361	0.634	0.414	456.469	0.414	0.000	0.000	0.000	0.000	1.049
5.7	30.40	12.80	8.55	0.640	53716.694	0.640	0.421	545.119	0.421	0.000	0.000	0.000	0.000	1.061
5.8	30.93	13.20	8.70	0.646	58781.868	0.646	0.428	646.915	0.428	0.000	0.000	0.000	0.000	1.074
5.9	31.47	13.60	8.85	0.651	64221.531	0.651	0.435	763.251	0.435	0.000	0.000	0.000	0.000	1.086
6.0	32.00	14.00	9.00	0.657	70056.044	0.657	0.441	895.620	0.441	0.000	0.000	0.000	0.000	1.098
6.1	32.53	14.40	9.15	0.663	76306.490	0.663	0.448	1045.610	0.448	0.000	0.000	0.000	0.000	1.110
6.2	33.07	14.80	9.30	0.668	82994.690	0.668	0.454	1214.911	0.454	0.000	0.000	0.000	0.000	1.122
6.3	33.60	15.20	9.45	0.673	90143.212	0.673	0.461	1405.316	0.461	0.000	0.000	0.000	0.000	1.134
6.4	34.13	15.60	9.60	0.679	97775.388	0.679	0.467	1618.727	0.467	0.000	0.000	0.000	0.000	1.146
6.5	34.67	16.00	9.75	0.684	105915.322	0.684	0.473	1857.153	0.473	0.000	0.000	0.000	0.000	1.157

6.6	35.20	16.40	9.90	0.690	114587.907	0.690	0.479	2122.719	0.479	0.000	0.000	0.000	0.000	1.169
6.7	35.73	16.80	10.05	0.695	123818.834	0.695	0.485	2417.664	0.485	0.000	0.000	0.000	0.000	1.180
6.8	36.27	17.20	10.20	0.700	133634.607	0.700	0.491	2744.347	0.491	0.000	0.000	0.000	0.000	1.191
6.9	36.80	17.60	10.35	0.705	144062.554	0.705	0.497	3105.250	0.497	0.000	0.000	0.000	0.000	1.202
7.0	37.33	18.00	10.50	0.710	155130.842	0.710	0.503	3502.979	0.503	0.000	0.000	0.000	0.000	1.213
7.1	37.87	18.40	10.65	0.716	166868.487	0.716	0.508	3940.271	0.508	0.000	0.000	0.000	0.000	1.224
7.2	38.40	18.80	10.80	0.721	179305.366	0.721	0.514	4419.990	0.514	0.000	0.000	0.000	0.000	1.235
7.3	38.93	19.20	10.95	0.726	192472.234	0.726	0.520	4945.140	0.520	0.000	0.000	0.000	0.000	1.245
7.4	39.47	19.60	11.10	0.731	206400.732	0.731	0.525	5518.859	0.525	0.000	0.000	0.000	0.000	1.256
7.5	40.00	20.00	11.25	0.736	221123.403	0.736	0.531	6144.428	0.531	0.000	0.000	0.000	0.000	1.266
7.6	40.53	20.40	11.40	0.741	236673.702	0.741	0.536	6825.269	0.536	0.000	0.000	0.000	1.176	2.453
7.7	41.07	20.80	11.55	0.746	253086.011	0.746	0.541	7564.954	0.541	0.000	0.000	0.000	3.327	4.614
7.8	41.60	21.20	11.70	0.750	270395.648	0.750	0.547	8367.202	0.547	0.000	0.000	0.000	6.113	7.410
7.9	42.13	21.60	11.85	0.755	288638.884	0.755	0.552	9235.889	0.552	0.000	0.000	0.000	9.411	10.718
8.0	42.67	22.00	12.00	0.760	307852.953	0.760	0.557	10175.044	0.557	0.000	0.000	0.000	13.152	14.469
8.1	43.20	22.40	12.15	0.765	328076.067	0.765	0.562	11188.856	0.562	0.000	0.000	0.000	17.289	18.616
8.2	43.73	22.80	12.30	0.770	349347.423	0.770	0.567	12281.676	0.567	0.000	0.000	0.000	21.787	23.124
8.3	44.27	23.20	12.45	0.774	371707.223	0.774	0.572	13458.022	0.572	0.000	0.000	0.000	26.618	27.965
8.4	44.80	23.60	12.60	0.779	395196.682	0.779	0.577	14722.577	0.577	0.000	0.000	0.000	31.762	33.118
8.5	45.33	24.00	12.75	0.784	419858.041	0.784	0.582	16080.200	0.582	0.000	0.000	0.000	37.200	38.566
8.6	45.87	24.40	12.90	0.788	445734.581	0.788	0.587	17535.921	0.587	0.000	0.000	0.000	42.917	44.293
8.7	46.40	24.80	13.05	0.793	472870.636	0.793	0.592	19094.950	0.592	0.000	0.000	0.000	48.262	49.647
8.8	46.93	25.20	13.20	0.798	501311.603	0.798	0.597	20762.676	0.597	0.000	0.000	0.000	50.233	51.628
8.9	47.47	25.60	13.35	0.802	531103.956	0.802	0.602	22544.672	0.602	0.000	0.000	0.000	52.129	53.533
9.0	48.00	26.00	13.50	0.807	562295.260	0.807	0.607	24446.699	0.607	0.000	0.000	0.000	53.959	55.372
9.1	48.53	26.40	13.65	0.811	594934.184	0.811	0.611	26474.708	0.611	0.000	0.000	0.000	55.728	57.151
9.2	49.07	26.80	13.80	0.816	629070.508	0.816	0.616	28634.842	0.616	0.000	0.000	0.000	57.443	58.875
9.3	49.60	27.20	13.95	0.820	664755.142	0.820	0.621	30933.440	0.621	0.000	0.000	0.000	59.109	60.550
9.4	50.13	27.60	14.10	0.825	702040.138	0.825	0.625	33377.041	0.625	0.000	0.000	0.000	60.728	62.179
9.5	50.67	28.00	14.25	0.829	740978.699	0.829	0.630	35972.386	0.630	0.000	0.000	0.000	62.306	63.765
9.6	51.20	28.40	14.40	0.833	781625.192	0.833	0.635	38726.422	0.635	0.000	0.000	0.000	63.845	65.313
9.7	51.73	28.80	14.55	0.838	824035.166	0.838	0.639	41646.303	0.639	0.000	0.000	0.000	65.347	66.824
9.8	52.27	29.20	14.70	0.842	868265.359	0.842	0.644	44739.395	0.644	0.000	0.000	0.000	66.816	68.302
9.9	52.80	29.60	14.85	0.847	914373.712	0.847	0.648	48013.280	0.648	0.000	0.000	0.000	68.253	69.748
10.0	53.33	30.00	15.00	0.851	962419.382	0.851	0.653	51475.755	0.653	0.000	0.000	0.000	69.660	71.164

LID Outlet #2			
ABMP=	49200	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	3.5	in	(diameter in inches of the bottom orifice)
Aorifice=	0.06681	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0829		C coefficient to be inserted into SWMM
H-gravel=	5.75	ft	Depth of the gravel layer where water is ponding
	69	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	65.5	in	
H-design=	5.458	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.76413	cfs	
$Q_{orif\text{-}SWMM}$=	0.76413	cfs	
$Q_{diversion}$=	0.77177	cfs	1% additional to the Qorifice.

Basin #3 Discharge

Discharge vs Elevation Table

Low orifice:	1 "	Top orifice:	8 "		
Number:	1	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	3.25 ft		
Cg-middle:	0.61	Area (SF=2)	1.00 sq ft	<---	1.0 x 1.0
invert elev:	3.50 ft	Circumference	4.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	1.20	0.00	0.15	0.006	0.007	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
0.2	2.40	0.00	0.30	0.011	0.014	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
0.3	3.60	0.00	0.45	0.014	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
0.4	4.80	0.00	0.60	0.016	0.072	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
0.5	6.00	0.00	0.75	0.018	0.344	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018
0.6	7.20	0.00	0.90	0.020	1.154	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
0.7	8.40	0.00	1.05	0.022	3.028	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022
0.8	9.60	0.00	1.20	0.023	6.743	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
0.9	10.80	0.00	1.35	0.025	13.377	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025
1.0	12.00	0.00	1.50	0.026	24.355	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026
1.1	13.20	0.00	1.65	0.027	41.500	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027
1.2	14.40	0.00	1.80	0.029	67.076	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
1.3	15.60	0.00	1.95	0.030	103.841	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030
1.4	16.80	0.00	2.10	0.031	155.093	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
1.5	18.00	0.00	2.25	0.032	224.716	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
1.6	19.20	0.00	2.40	0.033	317.231	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033
1.7	20.40	0.00	2.55	0.034	437.841	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034
1.8	21.60	0.00	2.70	0.035	592.483	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035
1.9	22.80	0.00	2.85	0.036	787.870	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
2.0	24.00	0.00	3.00	0.037	1031.545	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037
2.1	25.20	0.00	3.15	0.038	1331.926	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038
2.2	26.40	0.00	3.30	0.039	1698.353	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
2.3	27.60	0.00	3.45	0.040	2141.138	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
2.4	28.80	0.00	3.60	0.041	2671.612	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
2.5	30.00	0.00	3.75	0.042	3302.171	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042
2.6	31.20	0.00	3.90	0.043	4046.330	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043
2.7	32.40	0.00	4.05	0.044	4918.762	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
2.8	33.60	0.00	4.20	0.044	5935.356	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
2.9	34.80	0.00	4.35	0.045	7113.254	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
3.0	36.00	0.00	4.50	0.046	8470.909	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046
3.1	37.20	0.00	4.65	0.047	10028.126	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
3.2	38.40	0.00	4.80	0.047	11806.115	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
3.3	39.60	0.00	4.95	0.048	13827.533	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.139	0.187
3.4	40.80	0.00	5.10	0.049	16116.538	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.720	0.769
3.5	42.00	0.00	5.25	0.050	18698.833	0.050	0.000	0.000	0.000	0.000	0.000	0.000	1.550	1.600
3.6	43.20	0.40	5.40	0.050	21601.716	0.050	0.000	0.000	0.000	0.000	0.000	0.000	2.568	2.618
3.7	44.40	0.80	5.55	0.051	24854.127	0.051	0.000	0.000	0.000	0.000	0.000	0.000	3.284	3.335
3.8	45.60	1.20	5.70	0.052	28486.694	0.052	0.000	0.000	0.000	0.000	0.000	0.000	3.630	3.682
3.9	46.80	1.60	5.85	0.052	32531.786	0.052	0.000	0.000	0.000	0.000	0.000	0.000	3.947	3.999
4.0	48.00	2.00	6.00	0.053	37023.556	0.053	0.000	0.000	0.000	0.000	0.000	0.000	4.239	4.293
4.1	49.20	2.40	6.15	0.054	41997.992	0.054	0.000	0.000	0.000	0.000	0.000	0.000	4.513	4.567
4.2	50.40	2.80	6.30	0.054	47492.961	0.054	0.000	0.000	0.000	0.000	0.000	0.000	4.771	4.826
4.3	51.60	3.20	6.45	0.055	53548.264	0.055	0.000	0.000	0.000	0.000	0.000	0.000	5.016	5.071
4.4	52.80	3.60	6.60	0.056	60205.676	0.056	0.000	0.000	0.000	0.000	0.000	0.000	5.250	5.305
4.5	54.00	4.00	6.75	0.056	67509.000	0.056	0.000	0.000	0.000	0.000	0.000	0.000	5.473	5.529
4.6	55.20	4.40	6.90	0.057	75504.110	0.057	0.000	0.000	0.000	0.000	0.000	0.000	5.688	5.745
4.7	56.40	4.80	7.05	0.058	84239.002	0.058	0.000	0.000	0.000	0.000	0.000	0.000	5.895	5.952
4.8	57.60	5.20	7.20	0.058	93763.844	0.058	0.000	0.000	0.000	0.000	0.000	0.000	6.095	6.153
4.9	58.80	5.60	7.35	0.059	104131.018	0.059	0.000	0.000	0.000	0.000	0.000	0.000	6.288	6.347
5.0	60.00	6.00	7.50	0.059	115395.172	0.059	0.000	0.000	0.000	0.000	0.000	0.000	6.476	6.535

LID Outlet #3			
ABMP=	4231	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	0.8	in	(diameter in inches of the bottom orifice)
Aorifice=	0.00349	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0504		C coefficient to be inserted into SWMM
H-gravel=	3.25	ft	Depth of the gravel layer where water is ponding
	39	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	38.2	in	
H-design=	3.183	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.03049	cfs	
$Q_{orif\text{-}SWMM}$=	0.03049	cfs	
$Q_{diversion}$=	0.03079	cfs	1% additional to the Qorifice.

Basin #4 Discharge

Discharge vs Elevation Table

Low orifice:	0.75 "	Top orifice:	8 "		
Number:	0	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	3.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	3.50 ft		
Cg-middle:	0.61	Area (SF=2)	1.00 sq ft	<---	1 x 1
invert elev:	3.50 ft	Circumference	4.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.00	0.00	0.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.2	0.00	0.00	0.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.3	0.00	0.00	0.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.4	0.00	0.00	0.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.5	0.00	0.00	0.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.6	0.00	0.00	0.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.7	0.00	0.00	1.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.8	0.00	0.00	1.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.9	0.00	0.00	1.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	0.00	0.00	1.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.1	0.00	0.00	1.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.2	0.00	0.00	1.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.3	0.00	0.00	1.95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.4	0.00	0.00	2.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.5	0.00	0.00	2.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.6	0.00	0.00	2.40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.7	0.00	0.00	2.55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.8	0.00	0.00	2.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.9	0.00	0.00	2.85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.0	0.00	0.00	3.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.1	0.00	0.00	3.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.2	0.00	0.00	3.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.3	0.00	0.00	3.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.4	0.00	0.00	3.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.5	0.00	0.00	3.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.6	0.00	0.00	3.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.7	0.00	0.00	4.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.8	0.00	0.00	4.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.9	0.00	0.00	4.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.0	0.00	0.00	4.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.1	1.60	0.00	4.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.2	3.20	0.00	4.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.3	4.80	0.00	4.95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.4	6.40	0.00	5.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.5	8.00	0.00	5.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.6	9.60	0.40	5.40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392	0.392
3.7	11.20	0.80	5.55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.109	1.109
3.8	12.80	1.20	5.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.038	2.038
3.9	14.40	1.60	5.85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.096	3.096
4.0	16.00	2.00	6.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.461	3.461
4.1	17.60	2.40	6.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.792	3.792
4.2	19.20	2.80	6.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.096	4.096
4.3	20.80	3.20	6.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.378	4.378
4.4	22.40	3.60	6.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.644	4.644
4.5	24.00	4.00	6.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.895	4.895
4.6	25.60	4.40	6.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.134	5.134
4.7	27.20	4.80	7.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.362	5.362
4.8	28.80	5.20	7.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.581	5.581
4.9	30.40	5.60	7.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.792	5.792
5.0	32.00	6.00	7.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.995	5.995

LID Outlet #4			
ABMP=	3379	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	0.7	in	(diameter in inches of the bottom orifice)
Aorifice=	0.00267	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0483		C coefficient to be inserted into SWMM
H-gravel=	3.25	ft	Depth of the gravel layer where water is ponding
	39	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	38.3	in	
H-design=	3.192	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.02337	cfs	
$Q_{orif\text{-}SWMM}$=	0.02337	cfs	
$Q_{diversion}$=	0.02361	cfs	1% additional to the Qorifice.

Basin #5 Discharge

Discharge vs Elevation Table

Low orifice:	4 "	Top orifice:	8 "		
Number:	1	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	2 "	Emergency inlet:			
number of orif:	0	Rim height:	3.75 ft		
Cg-middle:	0.61	Area (SF=2)	4.00 sq ft	<---	2 x 2
invert elev:	3.00 ft	Circumference	8.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.30	0.00	0.15	0.000	0.019	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019
0.2	0.60	0.00	0.30	0.078	0.069	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069
0.3	0.90	0.00	0.45	0.156	0.140	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140
0.4	1.20	0.00	0.60	0.206	0.221	0.206	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.206
0.5	1.50	0.00	0.75	0.247	0.300	0.247	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.247
0.6	1.80	0.00	0.90	0.281	0.367	0.281	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.281
0.7	2.10	0.00	1.05	0.312	0.415	0.312	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.312
0.8	2.40	0.00	1.20	0.340	0.441	0.340	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.340
0.9	2.70	0.00	1.35	0.366	0.450	0.366	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.366
1.0	3.00	0.00	1.50	0.390	0.453	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.390
1.1	3.30	0.00	1.65	0.413	0.469	0.413	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.413
1.2	3.60	0.00	1.80	0.434	0.530	0.434	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.434
1.3	3.90	0.00	1.95	0.455	0.679	0.455	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.455
1.4	4.20	0.00	2.10	0.474	0.972	0.474	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.474
1.5	4.50	0.00	2.25	0.493	1.480	0.493	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.493
1.6	4.80	0.00	2.40	0.511	2.292	0.511	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.511
1.7	5.10	0.00	2.55	0.529	3.514	0.529	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.529
1.8	5.40	0.00	2.70	0.546	5.271	0.546	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.546
1.9	5.70	0.00	2.85	0.562	7.710	0.562	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.562
2.0	6.00	0.00	3.00	0.578	11.000	0.578	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.578
2.1	6.30	0.00	3.15	0.594	15.335	0.594	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.594
2.2	6.60	0.00	3.30	0.609	20.933	0.609	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.609
2.3	6.90	0.00	3.45	0.624	28.040	0.624	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.624
2.4	7.20	0.00	3.60	0.638	36.930	0.638	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.638
2.5	7.50	0.00	3.75	0.653	47.908	0.653	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.653
2.6	7.80	0.00	3.90	0.666	61.310	0.666	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.666
2.7	8.10	0.00	4.05	0.680	77.504	0.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.680
2.8	8.40	0.00	4.20	0.693	96.895	0.693	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.693
2.9	8.70	0.00	4.35	0.706	119.920	0.706	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.706
3.0	9.00	0.00	4.50	0.719	147.058	0.719	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.719
3.1	9.30	0.60	4.65	0.732	178.824	0.732	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.732
3.2	9.60	1.20	4.80	0.744	215.775	0.744	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.744
3.3	9.90	1.80	4.95	0.756	258.509	0.756	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.756
3.4	10.20	2.40	5.10	0.768	307.668	0.768	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768
3.5	10.50	3.00	5.25	0.780	363.939	0.780	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.780
3.6	10.80	3.60	5.40	0.792	428.056	0.792	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.792
3.7	11.10	4.20	5.55	0.803	500.801	0.803	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.803
3.8	11.40	4.80	5.70	0.814	583.003	0.814	0.000	0.000	0.000	0.000	0.000	0.000	0.277	1.092
3.9	11.70	5.40	5.85	0.825	675.545	0.825	0.000	0.000	0.000	0.000	0.000	0.000	1.441	2.266
4.0	12.00	6.00	6.00	0.836	779.362	0.836	0.000	0.000	0.000	0.000	0.000	0.000	3.100	3.936
4.1	12.30	6.60	6.15	0.847	895.443	0.847	0.000	0.000	0.000	0.000	0.000	0.000	5.135	5.982
4.2	12.60	7.20	6.30	0.858	1024.830	0.858	0.000	0.000	0.000	0.000	0.000	0.000	7.486	8.344
4.3	12.90	7.80	6.45	0.869	1168.625	0.869	0.000	0.000	0.000	0.000	0.000	0.000	10.116	10.984
4.4	13.20	8.40	6.60	0.879	1327.987	0.879	0.000	0.000	0.000	0.000	0.000	0.000	12.996	13.875
4.5	13.50	9.00	6.75	0.889	1504.136	0.889	0.000	0.000	0.000	0.000	0.000	0.000	16.108	16.997
4.6	13.80	9.60	6.90	0.899	1698.353	0.899	0.000	0.000	0.000	0.000	0.000	0.000	18.053	18.952
4.7	14.10	10.20	7.05	0.910	1911.981	0.910	0.000	0.000	0.000	0.000	0.000	0.000	19.085	19.995
4.8	14.40	10.80	7.20	0.920	2146.428	0.920	0.000	0.000	0.000	0.000	0.000	0.000	20.064	20.984
4.9	14.70	11.40	7.35	0.929	2403.170	0.929	0.000	0.000	0.000	0.000	0.000	0.000	20.998	21.928
5.0	15.00	12.00	7.50	0.939	2683.748	0.939	0.000	0.000	0.000	0.000	0.000	0.000	21.892	22.831

LID Outlet #5			
ABMP=	5192	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	0.8	in	(diameter in inches of the bottom orifice)
Aorifice=	0.00349	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0410		C coefficient to be inserted into SWMM
H-gravel=	3.25	ft	Depth of the gravel layer where water is ponding
	39	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	38.2	in	
H-design=	3.183	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.03049	cfs	
$Q_{orif\text{-}SWMM}$=	0.03049	cfs	
$Q_{diversion}$=	0.03079	cfs	1% additional to the Qorifice.

Basin #6 Discharge

Discharge vs Elevation Table

Low orifice:	1 "	Top orifice:	8 "		
Number:	0	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	3.50 ft		
Cg-middle:	0.61	Area (SF=2)	1.50 sq ft	<---	1.5 x 1.0
invert elev:	3.50 ft	Circumference	5.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	1.20	0.00	0.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.2	2.40	0.00	0.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.3	3.60	0.00	0.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.4	4.80	0.00	0.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.5	6.00	0.00	0.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.6	7.20	0.00	0.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.7	8.40	0.00	1.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.8	9.60	0.00	1.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.9	10.80	0.00	1.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	12.00	0.00	1.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.1	13.20	0.00	1.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.2	14.40	0.00	1.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.3	15.60	0.00	1.95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.4	16.80	0.00	2.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.5	18.00	0.00	2.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.6	19.20	0.00	2.40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.7	20.40	0.00	2.55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.8	21.60	0.00	2.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.9	22.80	0.00	2.85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.0	24.00	0.00	3.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.1	25.20	0.00	3.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.2	26.40	0.00	3.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.3	27.60	0.00	3.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.4	28.80	0.00	3.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.5	30.00	0.00	3.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.6	31.20	0.00	3.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.7	32.40	0.00	4.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.8	33.60	0.00	4.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.9	34.80	0.00	4.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.0	36.00	0.00	4.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.1	37.20	0.00	4.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.2	38.40	0.00	4.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.3	39.60	0.00	4.95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.4	40.80	0.00	5.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.5	42.00	0.00	5.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.6	43.20	0.40	5.40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.490	0.490
3.7	44.40	0.80	5.55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.386	1.386
3.8	45.60	1.20	5.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.547	2.547
3.9	46.80	1.60	5.85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.921	3.921
4.0	48.00	2.00	6.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.192	5.192
4.1	49.20	2.40	6.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.688	5.688
4.2	50.40	2.80	6.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.143	6.143
4.3	51.60	3.20	6.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.568	6.568
4.4	52.80	3.60	6.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.966	6.966
4.5	54.00	4.00	6.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.343	7.343
4.6	55.20	4.40	6.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.701	7.701
4.7	56.40	4.80	7.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.044	8.044
4.8	57.60	5.20	7.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.372	8.372
4.9	58.80	5.60	7.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.688	8.688
5.0	60.00	6.00	7.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.993	8.993
5.1	61.20	6.40	7.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.288	9.288
5.2	62.40	6.80	7.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.574	9.574
5.3	63.60	7.20	7.95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.851	9.851
5.4	64.80	7.60	8.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.121	10.121
5.5	66.00	8.00	8.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.384	10.384
5.6	67.20	8.40	8.40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.641	10.641
5.7	68.40	8.80	8.55	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.891	10.891
5.8	69.60	9.20	8.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.136	11.136
5.9	70.80	9.60	8.85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.375	11.375
6.0	72.00	10.00	9.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.610	11.610

LID Outlet #6			
ABMP=	2700	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	0.6	in	(diameter in inches of the bottom orifice)
Aorifice=	0.00196	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0444		C coefficient to be inserted into SWMM
H-gravel=	3.25	ft	Depth of the gravel layer where water is ponding
	39	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	38.4	in	
H-design=	3.200	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.01719	cfs	
$Q_{orif\text{-}SWMM}$=	0.01719	cfs	
$Q_{diversion}$=	0.01737	cfs	1% additional to the Qorifice.

Offiste Basin Discharge

Discharge vs Elevation Table

Low orifice:	2 "	Top orifice:	8 "		
Number:	1	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	1.50 ft		
Cg-middle:	0.61	Area (SF=2)	16.00 sq ft	<---	4 x 4
invert elev:	3.50 ft	Circumference	16.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.60	0.00	0.15	0.014	0.012	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
0.2	1.20	0.00	0.30	0.036	0.039	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
0.3	1.80	0.00	0.45	0.050	0.065	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050
0.4	2.40	0.00	0.60	0.060	0.078	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
0.5	3.00	0.00	0.75	0.069	0.080	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069
0.6	3.60	0.00	0.90	0.077	0.094	0.077	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.077
0.7	4.20	0.00	1.05	0.084	0.172	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084
0.8	4.80	0.00	1.20	0.090	0.405	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090
0.9	5.40	0.00	1.35	0.097	0.932	0.097	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.097
1.0	6.00	0.00	1.50	0.102	1.945	0.102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.102
1.1	6.60	0.00	1.65	0.108	3.700	0.108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.108
1.2	7.20	0.00	1.80	0.113	6.528	0.113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.113
1.3	7.80	0.00	1.95	0.118	10.838	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.118
1.4	8.40	0.00	2.10	0.123	17.129	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.123
1.5	9.00	0.00	2.25	0.127	25.996	0.127	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.127
1.6	9.60	0.00	2.40	0.132	38.144	0.132	0.000	0.000	0.000	0.000	0.000	0.000	1.568	1.700
1.7	10.20	0.00	2.55	0.136	54.389	0.136	0.000	0.000	0.000	0.000	0.000	0.000	4.436	4.572
1.8	10.80	0.00	2.70	0.140	75.670	0.140	0.000	0.000	0.000	0.000	0.000	0.000	8.150	8.290
1.9	11.40	0.00	2.85	0.144	103.061	0.144	0.000	0.000	0.000	0.000	0.000	0.000	12.548	12.692
2.0	12.00	0.00	3.00	0.148	137.773	0.148	0.000	0.000	0.000	0.000	0.000	0.000	17.536	17.684
2.1	12.60	0.00	3.15	0.152	181.166	0.152	0.000	0.000	0.000	0.000	0.000	0.000	23.052	23.204
2.2	13.20	0.00	3.30	0.155	234.757	0.155	0.000	0.000	0.000	0.000	0.000	0.000	29.049	29.204
2.3	13.80	0.00	3.45	0.159	300.229	0.159	0.000	0.000	0.000	0.000	0.000	0.000	35.491	35.650
2.4	14.40	0.00	3.60	0.163	379.439	0.163	0.000	0.000	0.000	0.000	0.000	0.000	42.349	42.512
2.5	15.00	0.00	3.75	0.166	474.424	0.166	0.000	0.000	0.000	0.000	0.000	0.000	49.600	49.766
2.6	15.60	0.00	3.90	0.169	587.416	0.169	0.000	0.000	0.000	0.000	0.000	0.000	57.223	57.392
2.7	16.20	0.00	4.05	0.173	720.842	0.173	0.000	0.000	0.000	0.000	0.000	0.000	65.201	65.374
2.8	16.80	0.00	4.20	0.176	877.340	0.176	0.000	0.000	0.000	0.000	0.000	0.000	73.519	73.695
2.9	17.40	0.00	4.35	0.179	1059.762	0.179	0.000	0.000	0.000	0.000	0.000	0.000	82.163	82.342
3.0	18.00	0.00	4.50	0.182	1271.187	0.182	0.000	0.000	0.000	0.000	0.000	0.000	91.121	91.303
3.1	18.60	0.00	4.65	0.185	1514.925	0.185	0.000	0.000	0.000	0.000	0.000	0.000	99.072	99.258
3.2	19.20	0.00	4.80	0.189	1794.529	0.189	0.000	0.000	0.000	0.000	0.000	0.000	102.122	102.310
3.3	19.80	0.00	4.95	0.192	2113.801	0.192	0.000	0.000	0.000	0.000	0.000	0.000	105.082	105.274
3.4	20.40	0.00	5.10	0.194	2476.804	0.194	0.000	0.000	0.000	0.000	0.000	0.000	107.962	108.156
3.5	21.00	0.00	5.25	0.197	2887.865	0.197	0.000	0.000	0.000	0.000	0.000	0.000	110.766	110.964
3.6	21.60	0.40	5.40	0.200	3351.588	0.200	0.000	0.000	0.000	0.000	0.000	0.000	113.502	113.702
3.7	22.20	0.80	5.55	0.203	3872.861	0.203	0.000	0.000	0.000	0.000	0.000	0.000	116.173	116.376
3.8	22.80	1.20	5.70	0.206	4456.865	0.206	0.000	0.000	0.000	0.000	0.000	0.000	118.784	118.990
3.9	23.40	1.60	5.85	0.209	5109.082	0.209	0.000	0.000	0.000	0.000	0.000	0.000	121.338	121.547
4.0	24.00	2.00	6.00	0.211	5835.302	0.211	0.000	0.000	0.000	0.000	0.000	0.000	123.841	124.052
4.1	24.60	2.40	6.15	0.214	6641.633	0.214	0.000	0.000	0.000	0.000	0.000	0.000	126.293	126.507
4.2	25.20	2.80	6.30	0.217	7534.513	0.217	0.000	0.000	0.000	0.000	0.000	0.000	128.699	128.916
4.3	25.80	3.20	6.45	0.219	8520.709	0.219	0.000	0.000	0.000	0.000	0.000	0.000	131.060	131.280
4.4	26.40	3.60	6.60	0.222	9607.337	0.222	0.000	0.000	0.000	0.000	0.000	0.000	133.380	133.602
4.5	27.00	4.00	6.75	0.224	10801.861	0.224	0.000	0.000	0.000	0.000	0.000	0.000	135.660	135.885
4.6	27.60	4.40	6.90	0.227	12112.107	0.227	0.000	0.000	0.000	0.000	0.000	0.000	137.903	138.130
4.7	28.20	4.80	7.05	0.229	13546.268	0.229	0.000	0.000	0.000	0.000	0.000	0.000	140.110	140.339
4.8	28.80	5.20	7.20	0.232	15112.917	0.232	0.000	0.000	0.000	0.000	0.000	0.000	142.282	142.514
4.9	29.40	5.60	7.35	0.234	16821.011	0.234	0.000	0.000	0.000	0.000	0.000	0.000	144.422	144.656
5.0	30.00	6.00	7.50	0.237	18679.901	0.237	0.000	0.000	0.000	0.000	0.000	0.000	146.530	146.767
5.1	30.60	6.40	7.65	0.239	20699.342	0.239	0.000	0.000	0.000	0.000	0.000	0.000	148.609	148.848
5.2	31.20	6.80	7.80	0.242	22889.497	0.242	0.000	0.000	0.000	0.000	0.000	0.000	150.658	150.900
5.3	31.80	7.20	7.95	0.244	25260.953	0.244	0.000	0.000	0.000	0.000	0.000	0.000	152.681	152.925
5.4	32.40	7.60	8.10	0.246	27824.722	0.246	0.000	0.000	0.000	0.000	0.000	0.000	154.677	154.923
5.5	33.00	8.00	8.25	0.249	30592.253	0.249	0.000	0.000	0.000	0.000	0.000	0.000	156.647	156.896
5.6	33.60	8.40	8.40	0.251	33575.441	0.251	0.000	0.000	0.000	0.000	0.000	0.000	158.593	158.844
5.7	34.20	8.80	8.55	0.253	36786.633	0.253	0.000	0.000	0.000	0.000	0.000	0.000	160.516	160.769
5.8	34.80	9.20	8.70	0.255	40238.640	0.255	0.000	0.000	0.000	0.000	0.000	0.000	162.415	162.671
5.9	35.40	9.60	8.85	0.258	43944.741	0.258	0.000	0.000	0.000	0.000	0.000	0.000	164.293	164.551
6.0	36.00	10.00	9.00	0.260	47918.696	0.260	0.000	0.000	0.000	0.000	0.000	0.000	166.149	166.409
6.1	36.60	10.40	9.15	0.262	52174.751	0.262	0.000	0.000	0.000	0.000	0.000	0.000	167.985	168.247
6.2	37.20	10.80	9.30	0.264	56727.648	0.264	0.000	0.000	0.000	0.000	0.000	0.000	169.802	170.066
6.3	37.80	11.20	9.45	0.266	61592.635	0.266	0.000	0.000	0.000	0.000	0.000	0.000	171.598	171.865
6.4	38.40	11.60	9.60	0.268	66785.470	0.268	0.000	0.000	0.000	0.000	0.000	0.000	173.377	173.645
6.5	39.00	12.00	9.75	0.271	72322.434	0.271	0.000	0.000	0.000	0.000	0.000	0.000	175.137	175.407

6.6	39.60	12.40	9.90	0.273	78220.338	0.273	0.000	0.000	0.000	0.000	0.000	0.000	176.880	177.152
6.7	40.20	12.80	10.05	0.275	84496.530	0.275	0.000	0.000	0.000	0.000	0.000	0.000	178.605	178.880
6.8	40.80	13.20	10.20	0.277	91168.906	0.277	0.000	0.000	0.000	0.000	0.000	0.000	180.315	180.591
6.9	41.40	13.60	10.35	0.279	98255.916	0.279	0.000	0.000	0.000	0.000	0.000	0.000	182.008	182.286
7.0	42.00	14.00	10.50	0.281	105776.574	0.281	0.000	0.000	0.000	0.000	0.000	0.000	183.685	183.966

Basin #7 Discharge

Discharge vs Elevation Table

Low orifice:	1 "	Top orifice:	8 "		
Number:	1	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	4.00 ft		
Cg-middle:	0.61	Area (SF=2)	1.00 sq ft	<---	1.5 x 1.0
invert elev:	3.50 ft	Circumference	4.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	1.20	0.00	0.15	0.006	0.007	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
0.2	2.40	0.00	0.30	0.011	0.014	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
0.3	3.60	0.00	0.45	0.014	0.017	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
0.4	4.80	0.00	0.60	0.016	0.072	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
0.5	6.00	0.00	0.75	0.018	0.344	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018
0.6	7.20	0.00	0.90	0.020	1.154	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
0.7	8.40	0.00	1.05	0.022	3.028	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022
0.8	9.60	0.00	1.20	0.023	6.743	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
0.9	10.80	0.00	1.35	0.025	13.377	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025
1.0	12.00	0.00	1.50	0.026	24.355	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026
1.1	13.20	0.00	1.65	0.027	41.500	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027
1.2	14.40	0.00	1.80	0.029	67.076	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
1.3	15.60	0.00	1.95	0.030	103.841	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030
1.4	16.80	0.00	2.10	0.031	155.093	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
1.5	18.00	0.00	2.25	0.032	224.716	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
1.6	19.20	0.00	2.40	0.033	317.231	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033
1.7	20.40	0.00	2.55	0.034	437.841	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034
1.8	21.60	0.00	2.70	0.035	592.483	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035
1.9	22.80	0.00	2.85	0.036	787.870	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
2.0	24.00	0.00	3.00	0.037	1031.545	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037
2.1	25.20	0.00	3.15	0.038	1331.926	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038
2.2	26.40	0.00	3.30	0.039	1698.353	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
2.3	27.60	0.00	3.45	0.040	2141.138	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
2.4	28.80	0.00	3.60	0.041	2671.612	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
2.5	30.00	0.00	3.75	0.042	3302.171	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042
2.6	31.20	0.00	3.90	0.043	4046.330	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043
2.7	32.40	0.00	4.05	0.044	4918.762	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
2.8	33.60	0.00	4.20	0.044	5935.356	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
2.9	34.80	0.00	4.35	0.045	7113.254	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
3.0	36.00	0.00	4.50	0.046	8470.909	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046
3.1	37.20	0.00	4.65	0.047	10028.126	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
3.2	38.40	0.00	4.80	0.047	11806.115	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
3.3	39.60	0.00	4.95	0.048	13827.533	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048
3.4	40.80	0.00	5.10	0.049	16116.538	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049
3.5	42.00	0.00	5.25	0.050	18698.833	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050
3.6	43.20	0.40	5.40	0.050	21601.716	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050
3.7	44.40	0.80	5.55	0.051	24854.127	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051
3.8	45.60	1.20	5.70	0.052	28486.694	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052
3.9	46.80	1.60	5.85	0.052	32531.786	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052
4.0	48.00	2.00	6.00	0.053	37023.556	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053
4.1	49.20	2.40	6.15	0.054	41997.992	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.392	0.446
4.2	50.40	2.80	6.30	0.054	47492.961	0.054	0.000	0.000	0.000	0.000	0.000	0.000	1.109	1.164
4.3	51.60	3.20	6.45	0.055	53548.264	0.055	0.000	0.000	0.000	0.000	0.000	0.000	2.038	2.093
4.4	52.80	3.60	6.60	0.056	60205.676	0.056	0.000	0.000	0.000	0.000	0.000	0.000	3.096	3.152
4.5	54.00	4.00	6.75	0.056	67509.000	0.056	0.000	0.000	0.000	0.000	0.000	0.000	3.461	3.518
4.6	55.20	4.40	6.90	0.057	75504.110	0.057	0.000	0.000	0.000	0.000	0.000	0.000	3.792	3.849
4.7	56.40	4.80	7.05	0.058	84239.002	0.058	0.000	0.000	0.000	0.000	0.000	0.000	4.096	4.153
4.8	57.60	5.20	7.20	0.058	93763.844	0.058	0.000	0.000	0.000	0.000	0.000	0.000	4.378	4.437
4.9	58.80	5.60	7.35	0.059	104131.018	0.059	0.000	0.000	0.000	0.000	0.000	0.000	4.644	4.703
5.0	60.00	6.00	7.50	0.059	115395.172	0.059	0.000	0.000	0.000	0.000	0.000	0.000	4.895	4.955
5.1	61.20	6.40	7.65	0.060	127613.268	0.060	0.000	0.000	0.000	0.000	0.000	0.000	5.134	5.194
5.2	62.40	6.80	7.80	0.061	140844.628	0.061	0.000	0.000	0.000	0.000	0.000	0.000	5.362	5.423
5.3	63.60	7.20	7.95	0.061	155150.985	0.061	0.000	0.000	0.000	0.000	0.000	0.000	5.581	5.643
5.4	64.80	7.60	8.10	0.062	170596.525	0.062	0.000	0.000	0.000	0.000	0.000	0.000	5.792	5.854
5.5	66.00	8.00	8.25	0.062	187247.942	0.062	0.000	0.000	0.000	0.000	0.000	0.000	5.995	6.058

MWS Vault Discharge

Discharge vs Elevation Table

Low orifice:	1.25 "	Top orifice:	8 "		
Number:	1	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	9.00 ft		
Cg-middle:	0.61	Area (SF=2)	0.50 sq ft	<---	0.5 x 1.0
invert elev:	3.50 ft	Circumference	3.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.96	0.00	0.15	0.009	0.009	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
0.2	1.92	0.00	0.30	0.016	0.021	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
0.3	2.88	0.00	0.45	0.021	0.025	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021
0.4	3.84	0.00	0.60	0.025	0.035	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025
0.5	4.80	0.00	0.75	0.028	0.125	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028
0.6	5.76	0.00	0.90	0.031	0.453	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031
0.7	6.72	0.00	1.05	0.034	1.287	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034
0.8	7.68	0.00	1.20	0.036	3.037	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
0.9	8.64	0.00	1.35	0.038	6.278	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038
1.0	9.60	0.00	1.50	0.041	11.779	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
1.1	10.56	0.00	1.65	0.043	20.532	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043
1.2	11.52	0.00	1.80	0.045	33.777	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
1.3	12.48	0.00	1.95	0.047	53.031	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.047
1.4	13.44	0.00	2.10	0.048	80.113	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048
1.5	14.40	0.00	2.25	0.050	117.177	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050
1.6	15.36	0.00	2.40	0.052	166.732	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052
1.7	16.32	0.00	2.55	0.054	231.676	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054
1.8	17.28	0.00	2.70	0.055	315.320	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055
1.9	18.24	0.00	2.85	0.057	421.414	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057
2.0	19.20	0.00	3.00	0.058	554.180	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.058
2.1	20.16	0.00	3.15	0.060	718.332	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
2.2	21.12	0.00	3.30	0.061	919.112	0.061	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.061
2.3	22.08	0.00	3.45	0.063	1162.309	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063
2.4	23.04	0.00	3.60	0.064	1454.292	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.064
2.5	24.00	0.00	3.75	0.065	1802.036	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.065
2.6	24.96	0.00	3.90	0.067	2213.146	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.067
2.7	25.92	0.00	4.05	0.068	2695.893	0.068	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.068
2.8	26.88	0.00	4.20	0.069	3259.232	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069
2.9	27.84	0.00	4.35	0.070	3912.834	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.070
3.0	28.80	0.00	4.50	0.072	4667.113	0.072	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
3.1	29.76	0.00	4.65	0.073	5533.255	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
3.2	30.72	0.00	4.80	0.074	6523.242	0.074	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074
3.3	31.68	0.00	4.95	0.075	7649.882	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075
3.4	32.64	0.00	5.10	0.076	8926.834	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.076
3.5	33.60	0.00	5.25	0.077	10368.639	0.077	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.077
3.6	34.56	0.40	5.40	0.079	11990.746	0.079	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079
3.7	35.52	0.80	5.55	0.080	13809.535	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080
3.8	36.48	1.20	5.70	0.081	15842.354	0.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081
3.9	37.44	1.60	5.85	0.082	18107.536	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082
4.0	38.40	2.00	6.00	0.083	20624.433	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083
4.1	39.36	2.40	6.15	0.084	23413.444	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.084
4.2	40.32	2.80	6.30	0.085	26496.035	0.085	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.085
4.3	41.28	3.20	6.45	0.086	29894.777	0.086	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.086
4.4	42.24	3.60	6.60	0.087	33633.364	0.087	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.087
4.5	43.20	4.00	6.75	0.088	37736.645	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.088
4.6	44.16	4.40	6.90	0.089	42230.654	0.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.089
4.7	45.12	4.80	7.05	0.090	47142.630	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090
4.8	46.08	5.20	7.20	0.091	52501.052	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091
4.9	47.04	5.60	7.35	0.092	58335.661	0.092	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.092
5.0	48.00	6.00	7.50	0.093	64677.491	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093
5.1	48.96	6.40	7.65	0.094	71558.894	0.094	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.094
5.2	49.92	6.80	7.80	0.095	79013.569	0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.095
5.3	50.88	7.20	7.95	0.096	87076.589	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096
5.4	51.84	7.60	8.10	0.096	95784.428	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096
5.5	52.80	8.00	8.25	0.097	105174.989	0.097	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.097
5.6	53.76	8.40	8.40	0.098	115287.630	0.098	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.098
5.7	54.72	8.80	8.55	0.099	126163.196	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099
5.8	55.68	9.20	8.70	0.100	137844.039	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100
5.9	56.64	9.60	8.85	0.101	150374.053	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.101
6.0	57.60	10.00	9.00	0.102	163798.694	0.102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.102
6.1	58.56	10.40	9.15	0.103	178165.016	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103
6.2	59.52	10.80	9.30	0.103	193521.690	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103
6.3	60.48	11.20	9.45	0.104	209919.037	0.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.104
6.4	61.44	11.60	9.60	0.105	227409.054	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.105
6.5	62.40	12.00	9.75	0.106	246045.440	0.106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.106
6.6	63.36	12.40	9.90	0.107	265883.626	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.107
6.7	64.32	12.80	10.05	0.108	286980.798	0.108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.108

6.8	65.28	13.20	10.20	0.108	309395.932	0.108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.108
6.9	66.24	13.60	10.35	0.109	333189.813	0.109	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.109
7.0	67.20	14.00	10.50	0.110	358425.068	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110
7.1	68.16	14.40	10.65	0.111	385166.192	0.111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.111
7.2	69.12	14.80	10.80	0.112	413479.574	0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.112
7.3	70.08	15.20	10.95	0.112	443433.526	0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.112
7.4	71.04	15.60	11.10	0.113	475098.311	0.113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.113
7.5	72.00	16.00	11.25	0.114	508546.168	0.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.114
7.6	72.96	16.40	11.40	0.115	543851.342	0.115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115
7.7	73.92	16.80	11.55	0.115	581090.111	0.115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115
7.8	74.88	17.20	11.70	0.116	620340.810	0.116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.116
7.9	75.84	17.60	11.85	0.117	661683.864	0.117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.117
8.0	76.80	18.00	12.00	0.118	705201.812	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.118
8.1	77.76	18.40	12.15	0.118	750979.334	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.118
8.2	78.72	18.80	12.30	0.119	799103.281	0.119	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.119
8.3	79.68	19.20	12.45	0.120	849662.700	0.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120
8.4	80.64	19.60	12.60	0.121	902748.863	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121
8.5	81.60	20.00	12.75	0.121	958455.293	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121
8.6	82.56	20.40	12.90	0.122	1016877.793	0.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.122
8.7	83.52	20.80	13.05	0.123	1078114.472	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.123
8.8	84.48	21.20	13.20	0.123	1142265.775	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.123
8.9	85.44	21.60	13.35	0.124	1209434.506	0.124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.124
9.0	86.40	22.00	13.50	0.125	1279725.859	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125
9.1	87.36	22.40	13.65	0.125	1353247.446	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.294	0.420
9.2	88.32	22.80	13.80	0.126	1430109.320	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.958
9.3	89.28	23.20	13.95	0.127	1510424.008	0.127	0.000	0.000	0.000	0.000	0.000	0.000	1.341	1.467
9.4	90.24	23.60	14.10	0.128	1594306.535	0.128	0.000	0.000	0.000	0.000	0.000	0.000	1.548	1.676
9.5	91.20	24.00	14.25	0.128	1681874.450	0.128	0.000	0.000	0.000	0.000	0.000	0.000	1.731	1.859
9.6	92.16	24.40	14.40	0.129	1773247.860	0.129	0.000	0.000	0.000	0.000	0.000	0.000	1.896	2.025
9.7	93.12	24.80	14.55	0.130	1868549.448	0.130	0.000	0.000	0.000	0.000	0.000	0.000	2.048	2.177
9.8	94.08	25.20	14.70	0.130	1967904.510	0.130	0.000	0.000	0.000	0.000	0.000	0.000	2.189	2.319
9.9	95.04	25.60	14.85	0.131	2071440.974	0.131	0.000	0.000	0.000	0.000	0.000	0.000	2.322	2.453
10.0	96.00	26.00	15.00	0.132	2179289.435	0.132	0.000	0.000	0.000	0.000	0.000	0.000	2.448	2.579
10.1	96.96	26.40	15.15	0.132	2291583.177	0.132	0.000	0.000	0.000	0.000	0.000	0.000	2.567	2.699
10.2	97.92	26.80	15.30	0.133	2408458.202	0.133	0.000	0.000	0.000	0.000	0.000	0.000	2.681	2.814
10.3	98.88	27.20	15.45	0.134	2530053.257	0.134	0.000	0.000	0.000	0.000	0.000	0.000	2.791	2.924
10.4	99.84	27.60	15.60	0.134	2656509.865	0.134	0.000	0.000	0.000	0.000	0.000	0.000	2.896	3.030
10.5	100.80	28.00	15.75	0.135	2787972.347	0.135	0.000	0.000	0.000	0.000	0.000	0.000	2.998	3.133
10.6	101.76	28.40	15.90	0.135	2924587.852	0.135	0.000	0.000	0.000	0.000	0.000	0.000	3.096	3.232
10.7	102.72	28.80	16.05	0.136	3066506.386	0.136	0.000	0.000	0.000	0.000	0.000	0.000	3.191	3.327
10.8	103.68	29.20	16.20	0.137	3213880.837	0.137	0.000	0.000	0.000	0.000	0.000	0.000	3.284	3.421
10.9	104.64	29.60	16.35	0.137	3366867.002	0.137	0.000	0.000	0.000	0.000	0.000	0.000	3.374	3.511
11.0	105.60	30.00	16.50	0.138	3525623.618	0.138	0.000	0.000	0.000	0.000	0.000	0.000	3.461	3.599

LID Outlet #7			
ABMP=	2300	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	0.5	in	(diameter in inches of the bottom orifice)
Aorifice=	0.00136	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0362		C coefficient to be inserted into SWMM
H-gravel=	4.25	ft	Depth of the gravel layer where water is ponding
	51	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	50.5	in	
H-design=	4.208	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.01369	cfs	
$Q_{orif\text{-}SWMM}$=	0.01369	cfs	
$Q_{diversion}$=	0.01383	cfs	1% additional to the Qorifice.

Basin #8 and #9 Discharge

Discharge vs Elevation Table

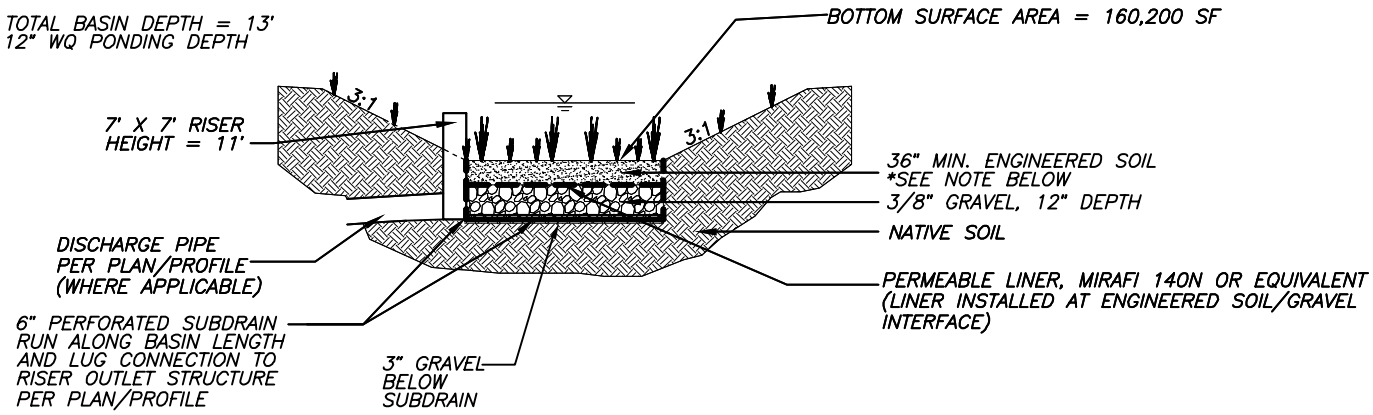
Low orifice:	1 "	Top orifice:	8 "		
Number:	0	Number:	0		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.00 ft	invert elev:	0.00 ft		
Middle orifice:	3 "	Emergency inlet:			
number of orif:	0	Rim height:	0.50 ft		
Cg-middle:	0.61	Area (SF=2)	1.00 sq ft	<---	1.0 x 1.0
invert elev:	3.50 ft	Circumference	4.00 ft		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qemerg (cfs)	Qtot (cfs)
0.0	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	1.20	0.00	0.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.2	2.40	0.00	0.30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.3	3.60	0.00	0.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.4	4.80	0.00	0.60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.5	6.00	0.00	0.75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.6	7.20	0.00	0.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392	0.392
0.7	8.40	0.00	1.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.109	1.109
0.8	9.60	0.00	1.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.038	2.038
0.9	10.80	0.00	1.35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.096	3.096
1.0	12.00	0.00	1.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.461	3.461
1.1	13.20	0.00	1.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.792	3.792
1.2	14.40	0.00	1.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.096	4.096
1.3	15.60	0.00	1.95	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.378	4.378
1.4	16.80	0.00	2.10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.644	4.644
1.5	18.00	0.00	2.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.895	4.895

LID Outlets #8 and #9			
ABMP=	160	sq-ft	(Area above engineered fill/bio-retention section)
			(It can also be area of infiltration at the bottom)
Cg=	0.61		(coefficient of discharge of the bottom orifice)
Dorif=	0.15	in	(diameter in inches of the bottom orifice)
Aorifice=	0.00012	sq-ft	(area of orifice in sq-ft)
$C_{SWMM=}$	0.0468		C coefficient to be inserted into SWMM
H-gravel=	4	ft	Depth of the gravel layer where water is ponding
	48	in	(In this case: superior bottom - mulch - ammended soil - invert of French drain)
	47.85	in	
H-design=	3.988	ft	H-gravel minus radius of the discharge
$Q_{orif\text{-}classic}$=	0.00120	cfs	
$Q_{orif\text{-}SWMM}$=	0.00120	cfs	
$Q_{diversion}$=	0.00121	cfs	1% additional to the Qorifice.

SECTION 5 - Biofiltration Details

Basin#1(BF-1-1)



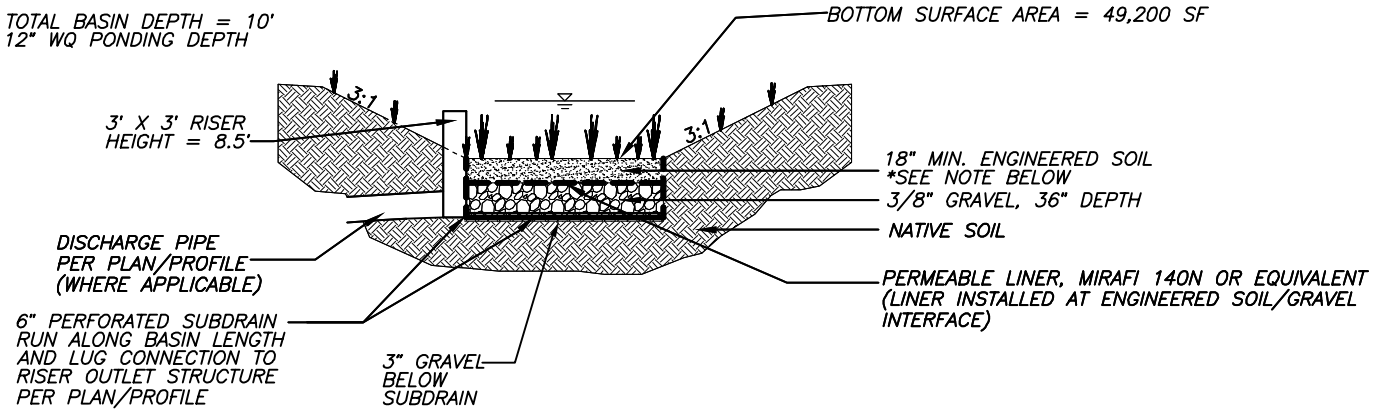
*"ENGINEERED SOIL" LAYER SHALL BE 36" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#1

Basin#2(BF-1-2)



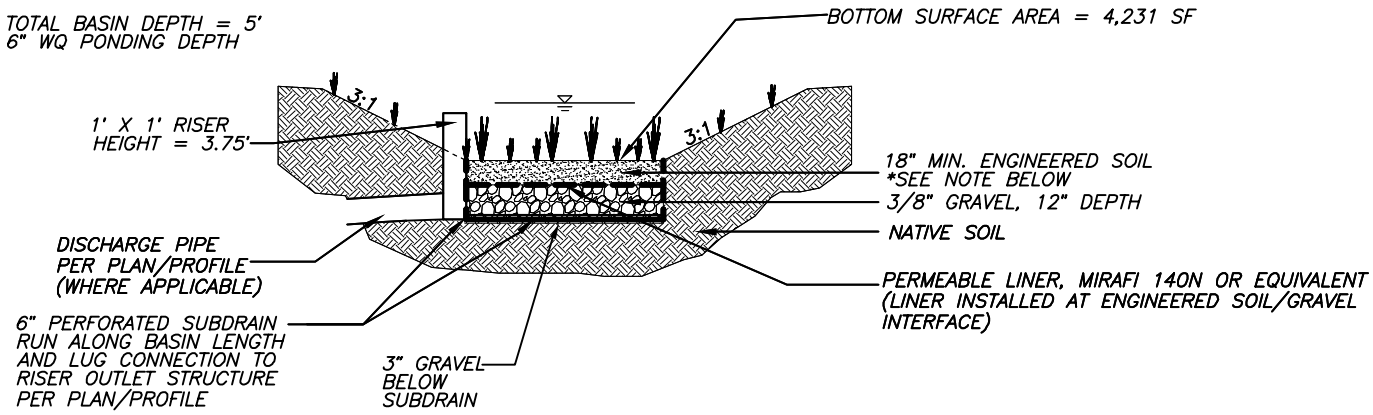
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#2

Basin#3(BF-1-3)



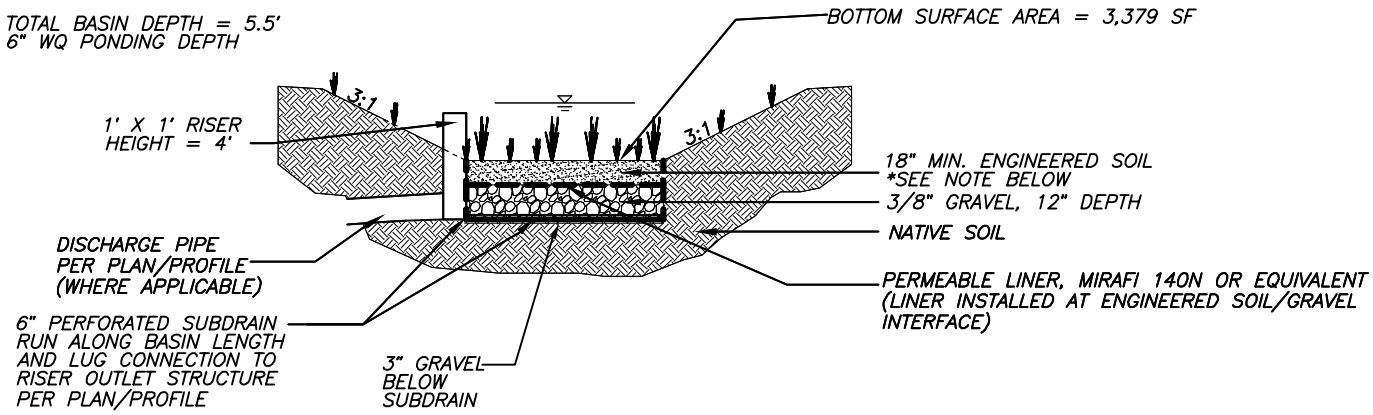
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#3

Basin#4(BF-1-4)



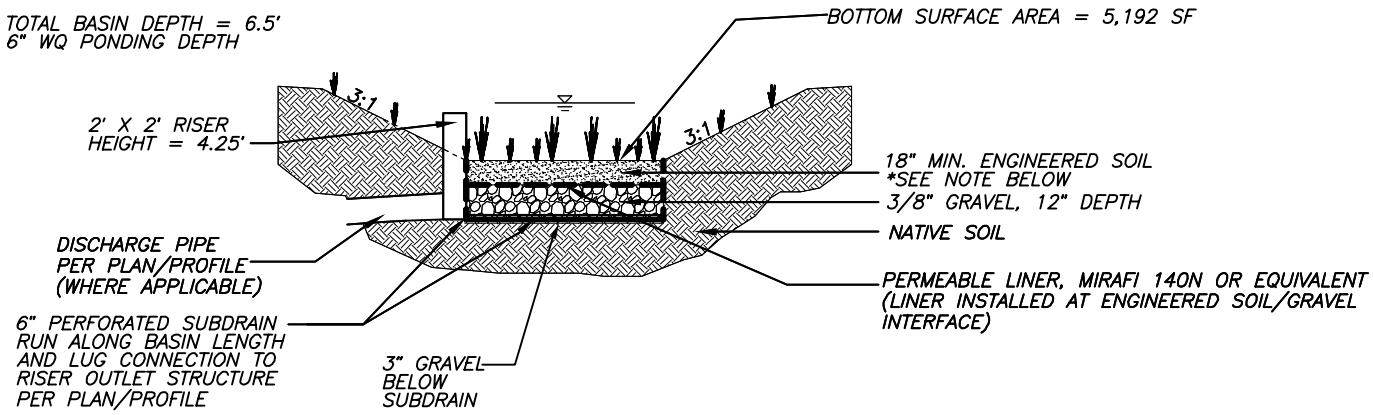
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#4

Basin#5(BF-1-5)



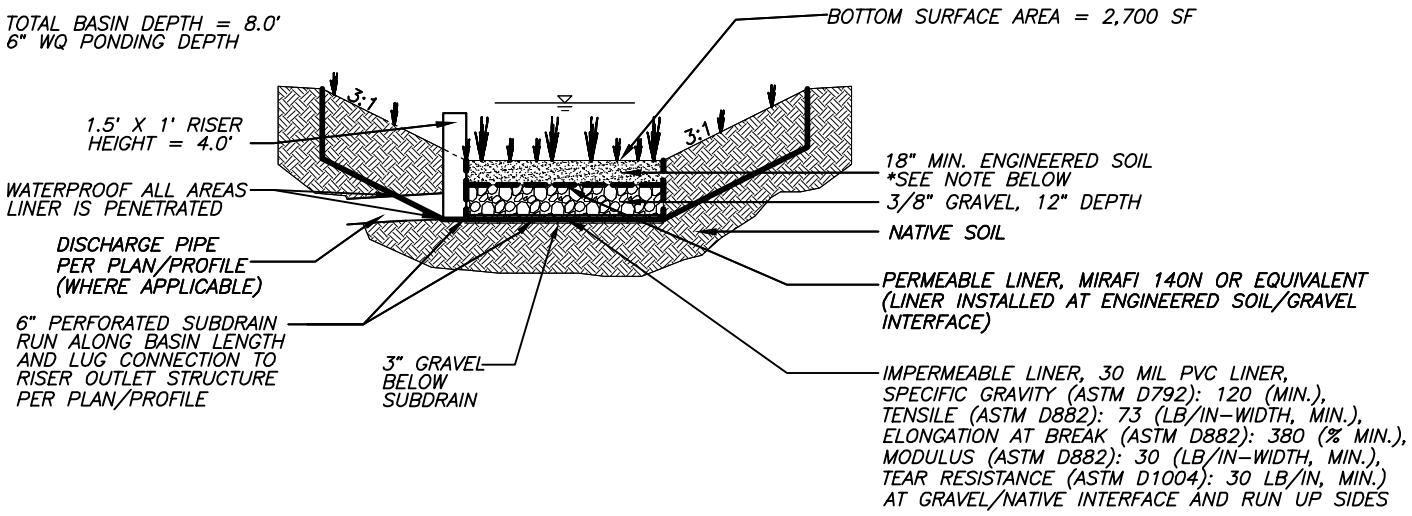
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50–60% SAND, 20–30% COMPOST, AND 20–30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#5

Basin#6 (BF-1-6)



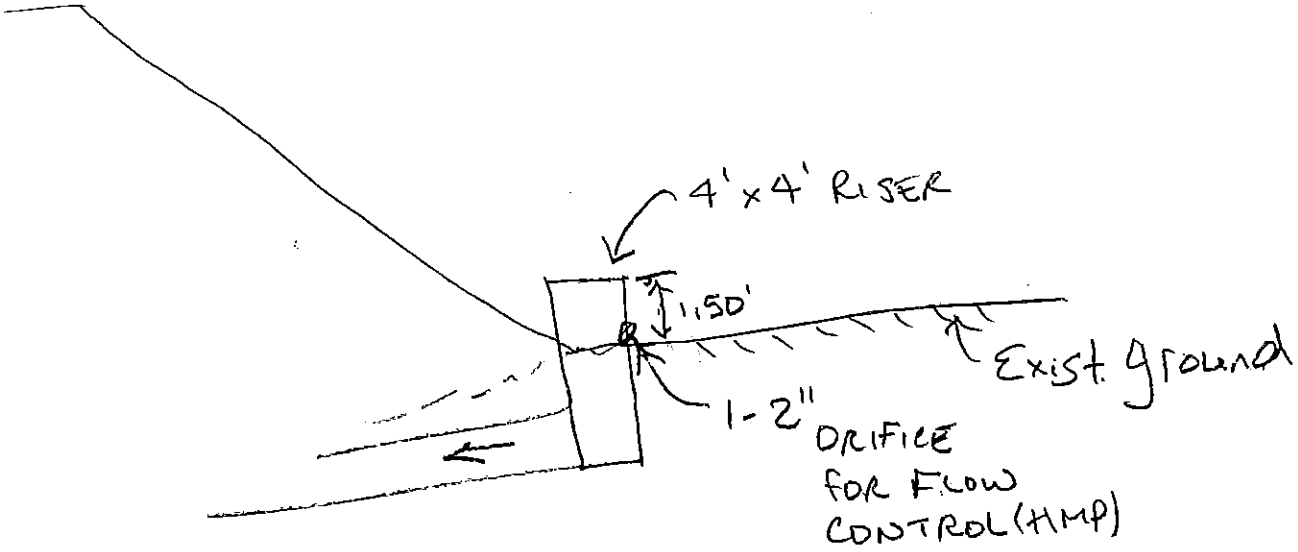
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST, AND 20-30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

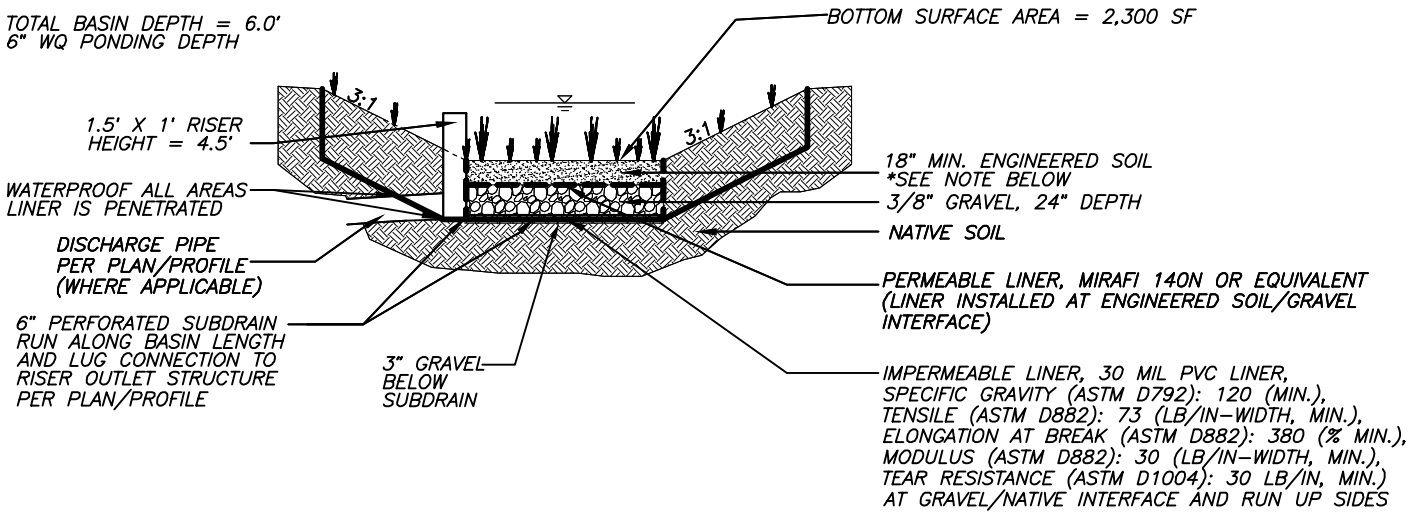
NOT TO SCALE

POC#6

HMP-2 (RISER)



Basin#7 (BF-1-7)



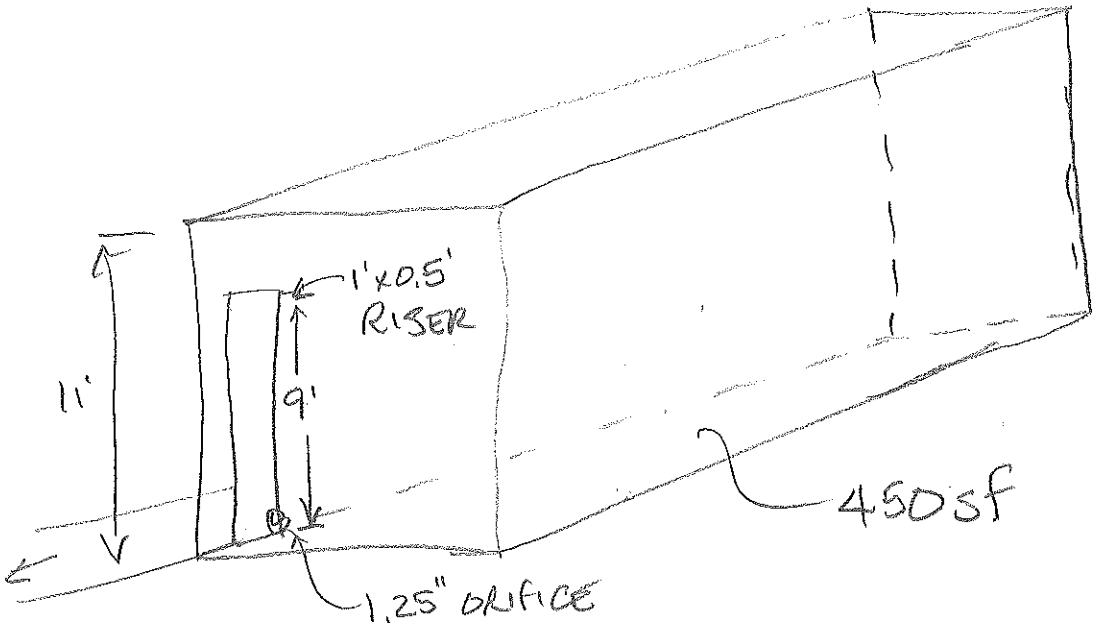
*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST, AND 20-30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

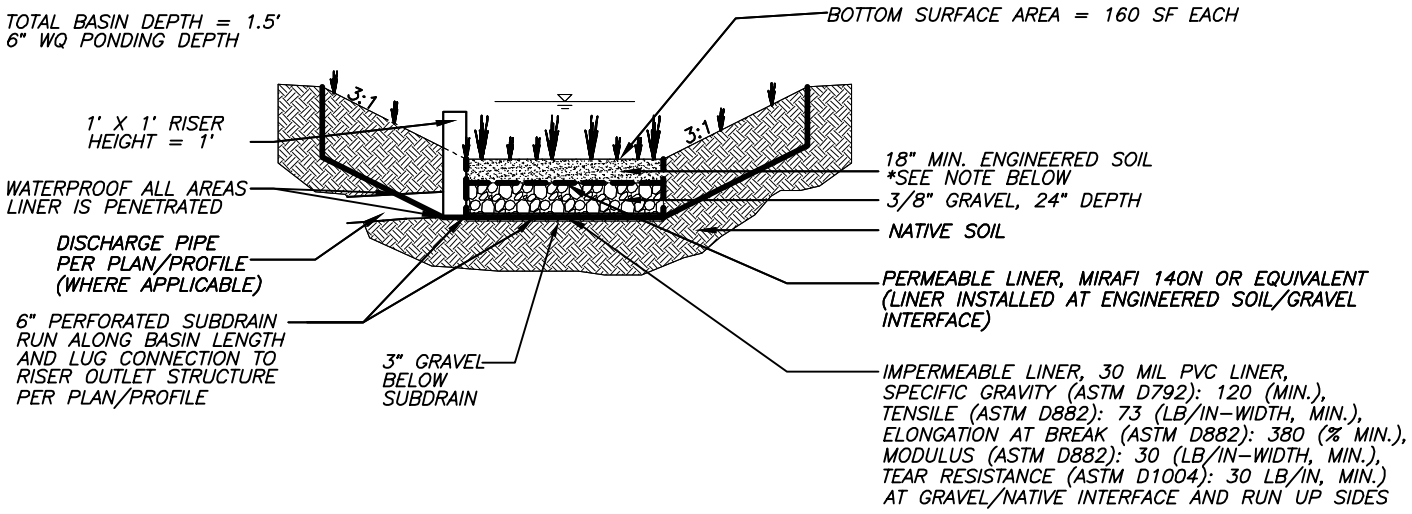
NOT TO SCALE

POC#7

HMP-1 (VAULT)



Basin#8 & 9
(BF-1-8)
(BF-1-9)



*"ENGINEERED SOIL" LAYER SHALL BE 18" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST, AND 20-30% TOPSOIL.

SOIL SECTION FOR WATER QUALITY/HYDROMODIFICATION BIOFILTRATION BASIN

NOT TO SCALE

POC#8

SECTION 6 - SWMM Input Data (Existing and Proposed Models)

Village 14 POC 1 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
1	Natural	0%	591.62	591.62	0.00
1	Residential	40%	0.00	0.00	0.00
1	Roadway/road slope	65%	0.00	0.00	0.00
1	Total	0%	591.62	591.62	0.00

Village 14 POC 1 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
1-Direct	Natural	0%	306.58	306.58	0.00
1-Direct	Residential-Roadway	40%	0.00	0.00	0.00
1-Direct	Roadway/road slope	60%	0.00	0.00	0.00
1-Direct	1-Direct-Total	0%	306.58	306.58	0.00
1-via Basin	Tank Access Road	18.42%	7.11	5.80	1.31
1-via Basin	Basin	0%	7.42	7.42	0.00
1-via Basin	Roof/ Street/Sdwk/landscape	64.47%	371.32	131.93	239.39
1-via Basin	1-Basin-Total	62%	385.85	145.15	240.70
1-Total	1-Total-Total	N/A	692.43	451.73	240.70

Village 14 POC1 Watershed Parameters		
POC1EXArea		
L=	11510	ft
A=	591.62	ac
% Impervious	0%	
W=	2239	ft
US Elev=	1910	ft
DS Elev=	620	ft
S=	11.2%	
POC1PRDevArea		
L=	9523	ft
A=	378.43	ac
% Impervious	63.6%	
W=	1731	ft
US Elev=	1420	ft
DS Elev=	690	ft
S=	7.7%	
POC1PRBasin		
L=	590	ft
A=	7.42	ac
W=	548	
US Elev=	648.00	ft
DS Elev=	647.50	ft
S=	0.1%	
POC1PRBypass		
L=	11387	ft
A=	306.58	ac
% Impervious	0%	
W=	1173	ft
US Elev=	1910	ft
DS Elev=	620	ft
S=	11.3%	

Village 14 POC 2 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
2	Natural	0%	432.14	432.14	0.00
2	Residential	40%	0.00	0.00	0.00
2	Roadway/road slope	65%	0.00	0.00	0.00
2	Total	0%	432.14	432.14	0.00
Village 14 POC 2 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
2-Direct	Natural	0%	314.16	314.16	0.00
2-Direct	Residential-Roadway	40%	0.00	0.00	0.00
2-Direct	Roadway/road slope	80%	0.00	0.00	0.00
2-Direct	1-Direct-Total	N/A	314.16	314.16	0.00
2-via Basin	Slope - Developed	0%	0.00	0.00	0.00
2-via Basin	Basin	0%	1.99	1.99	0.00
2-via Basin	Roof/ Street/Sdwk/landscape	60%	138.99	55.80	83.19
2-via Basin	1-Basin-Total	N/A	140.98	57.79	83.19
2-Total	1-Total-Total	N/A	455.14	371.95	83.19

Village 14 POC2 Watershed Parameters		
POC2ExArea		
L=	9105	ft
A=	432.14	ac
% Impervious	0%	
W=	2067	ft
US Elev=	1870	ft
DS Elev=	570	ft
S=	14.3%	
POC2PRDevArea		
L=	4792	ft
A=	138.99	ac
% Impervious	59.9%	
W=	1263	ft
US Elev=	719	ft
DS Elev=	598	ft
S=	2.5%	
POC2PRBasin		
L=	263	ft
A=	1.99	ac
W=	330	
US Elev=	584.20	ft
DS Elev=	584.00	ft
S=	0.1%	
POC2PrBypass		
L=	7529	ft
A=	314.16	ac
% Impervious	0%	
W=	1818	ft
US Elev=	1870	ft
DS Elev=	570	ft
S=	17.3%	

Village 14 POC 3 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
3	Natural	0%	10.62	10.62	0.00
3	Residential	40%	0.00	0.00	0.00
3	Roadway/road slope	100%	0.00	0.00	0.00
3	Total	0%	10.62	10.62	0.00

Village 14 POC 3 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
3-Direct	Natural	0%	6.45	6.45	0.00
3-Direct	Residential-Roadway	40.0%	0.00	0.00	0.00
3-Direct	Roadway/road slope	60.0%	0.00	0.00	0.00
3-Direct	3-Direct-Total	N/A	6.45	6.45	0.00
3-via Basin	Pervious areas	0%	0.42	0.42	0.00
3-via Basin	Basin	0%	0.21	0.21	0.00
3-via Basin	Roof/ Street/Sdwk/landscape	85.00%	4.00	0.60	3.40
3-via Basin	3-Basin-Total	73%	4.63	1.23	3.40
3-Total	3-Total-Total	N/A	11.08	7.68	3.40

Village 14 POC3 Watershed Parameters		
POC3ExArea		
L=	1795	ft
A=	10.62	ac
% Impervious	0%	
W=	258	ft
US Elev=	605	ft
DS Elev=	565	ft
S=	2.23%	
POC3PRDevArea		
L=	1805	ft
A=	4.42	ac
% Impervious	76.9%	
W=	107	ft
US Elev=	595	ft
DS Elev=	577	ft
S=	0.99%	
POC3PRBasin		
L=	50	ft
A=	0.21	ac
W=	183	
US Elev=	570.00	ft
DS Elev=	569.95	ft
S=	0.1%	
POC3PRBypass		
L=	1835	ft
A=	6.45	ac
% Impervious	0.00%	
W=	153	ft
US Elev=	595	ft
DS Elev=	565	ft
S=	1.63%	

Village 14 POC 4 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
4	Natural	0%	18.32	18.32	0.00
4	Residential	40%	0.00	0.00	0.00
4	Roadway/road slope	100%	0.00	0.00	0.00
4	Total	0%	18.32	18.32	0.00

Village 14 POC 4 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
4-Direct	Natural	0%	16.03	16.03	0.00
4-Direct	Residential-Roadway	40.0%	0.00	0.00	0.00
4-Direct	Roadway/road slope	60.0%	0.00	0.00	0.00
4-Direct	1-Direct-Total	N/A	16.03	16.03	0.00
4-via Basin	Pervious areas	0%	1.27	1.27	0.00
4-via Basin	Basin	0%	0.08	0.08	0.00
4-via Basin	Roof/ Street/Sdwk/landscape	100.00%	2.05	0.00	2.05
4-via Basin	1-Basin-Total	60%	3.40	1.35	2.05
4-Total	1-Total-Total	N/A	19.43	17.38	2.05

Village 14 POC4 Watershed Parameters		
POC4ExArea		
L=	1515	ft
A=	18.32	ac
% Impervious	0%	
W=	527	ft
US Elev=	715	ft
DS Elev=	545	ft
S=	11.22%	
POC4PrDevArea		
L=	1546	ft
A=	3.32	ac
% Impervious	61.7%	
W=	94	ft
US Elev=	585	ft
DS Elev=	570	ft
S=	1.00%	
POC4PRBasin		
L=	45	ft
A=	0.08	ac
W=	77	
US Elev=	562.50	ft
DS Elev=	562.45	ft
S=	0.1%	
POC4PRBypass		
L=	1515	ft
A=	16.03	ac
% Impervious	0.00%	
W=	461	ft
US Elev=	715	ft
DS Elev=	545	ft
S=	11.22%	

Village 14 POC 5 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
5	Natural	0%	179.14	179.14	0.00
5	Residential -Rolling Hills	10%	915.59	824.03	91.56
5	Roadway/road slope	85%	0.00	0.00	0.00
5	Total	8%	1094.73	1003.17	91.56
Village 14 POC 5 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
5-Direct	Natural	0%	175.16	175.16	0.00
5-Direct	Residential-Rolling Hills	10.0%	915.59	824.03	91.56
5-Direct	Roadway/road slope	60.0%	0.00	0.00	0.00
5-Direct	1-Direct-Total	N/A	1090.75	999.19	91.56
5-via Basin	Pervious areas	0%	1.69	1.69	0.00
5-via Basin	Basin	0%	0.12	0.12	0.00
5-via Basin	Roof/ Street/Sdwk/landscape	80.00%	4.83	0.97	3.86
5-via Basin	1-Basin-Total	58%	6.64	2.78	3.86
5-Total	1-Total-Total	N/A	1097.39	1001.97	95.42

Village 14 POC5 Watershed Parameters		
POC5EXArea		
L=	15353	ft
A=	1094.73	ac
% Impervious	8%	
W=	3106	ft
US Elev=	2560	ft
DS Elev=	544	ft
S=	13.13%	
POC5DevArea		
L=	1938	ft
A=	6.52	ac
% Impervious	59.3%	
W=	147	ft
US Elev=	625	ft
DS Elev=	563	ft
S=	3.20%	
POC5PRBasin		
L=	73	ft
A=	0.12	ac
W=	72	
US Elev=	555.00	ft
DS Elev=	554.95	ft
S=	0.1%	
POC5PRBypass		
L=	15353	ft
A=	1090.75	ac
% Impervious	8%	
W=	3095	ft
US Elev=	2560	ft
DS Elev=	544	ft
S=	13.13%	

Village 14 POC 6 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
6	Natural	0%	146.19	146.19	0.00
6	Residential	40%	0.00	0.00	0.00
6	Roadway/road slope	100%	0.00	0.00	0.00
6	Total	0%	146.19	146.19	0.00
Village 14 POC 6 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
6-Direct	Natural	0%	144.61	144.61	0.00
6-Direct	PVR Roadway	90.0%	1.03	0.10	0.93
6-Direct	Roadway/road slope	60.0%	0.00	0.00	0.00
6-Direct	Direct-Total	N/A	145.64	144.71	0.93
6-via Basin	Natural	0%	0.00	0.00	0.00
6-via Basin	Basin	0%	0.35	0.35	0.00
6-via Basin	Roof/ Street/Sdwk/landscape	90.00%	0.94	0.09	0.85
6- via Basin	Basin-Total	66%	1.29	0.44	0.85
6-Total	Total-Total	N/A	146.93	145.16	1.77

Village 14 POC6 Watershed Parameters		
POC6EXArea		
L=	5230	ft
A=	146.19	ac
% Impervious	0%	
W=	1218	ft
US Elev=	940	ft
DS Elev=	880	ft
S=	1.15%	
POC6DevArea		
L=	1575	ft
A=	0.94	ac
% Impervious	90.0%	
W=	26	ft
US Elev=	900	ft
DS Elev=	875	ft
S=	1.59%	
POC6PRBasin		
L=	94	ft
A=	0.35	ac
W=	162	
US Elev=	890.00	ft
DS Elev=	889.95	ft
S=	0.1%	
POC6PRBypass		
L=	812	ft
A=	1.03	ac
% Impervious	90.0%	
W=	55	ft
US Elev=	914	ft
DS Elev=	891	ft
S=	2.87%	
POC6Offsite		
L=	5230	ft
A=	144.61	ac
% Impervious	0.0%	
W=	1204	ft
US Elev=	940	ft
DS Elev=	880	ft
S=	1.15%	

Village 14 POC 7 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
7	Natural	0%	148.33	148.33	0.00
7	Residential	40%	0.00	0.00	0.00
7	Roadway/road slope	100%	0.00	0.00	0.00
7	Total	0%	148.33	148.33	0.00

Village 14 POC 7 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
7-Direct	Natural	0%	147.61	147.61	0.00
7-Direct	Residential-Roadway	40.0%	0.00	0.00	0.00
7-Direct	Roadway/road slope	60.0%	0.00	0.00	0.00
7-Direct	Direct-Total	N/A	147.61	147.61	0.00
7-Basin	Pervious areas	0%	0.00	0.00	0.00
7-Basin	Basin	0%	0.20	0.20	0.00
7-Basin	Roof/ Street/Sdwk/landscape	90.00%	1.86	0.19	1.67
7-Basin	Basin-Total	81%	2.06	0.39	1.67
7-Total	Total-Total	N/A	149.67	148.00	1.67

Village 14 POC7 Watershed Parameters		
POC7EXArea		
L=	2900	ft
A=	148.33	ac
% Impervious	0%	
W=	2228	ft
US Elev=	950	ft
DS Elev=	880	ft
S=	2.41%	
POC7DevArea		
L=	1575	ft
A=	1.86	ac
% Impervious	90.0%	
W=	51	ft
US Elev=	920	ft
DS Elev=	880	ft
S=	2.54%	
POC7PRBasin		
L=	90	ft
A=	0.20	ac
W=	97	
US Elev=	880.00	ft
DS Elev=	879.90	ft
S=	0.1%	
POC7PRBypass		
L=	2900	ft
A=	147.61	ac
% Impervious	0.00%	
W=	2217	ft
US Elev=	950	ft
DS Elev=	880	ft
S=	2.41%	

Village 14 POC 8 DMA Calculations					
Pre-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
8	Natural	0%	0.29	0.29	0.00
8	Residential	40%	0.00	0.00	0.00
8	Roadway/road slope	90%	0.00	0.00	0.00
8	Total	0%	0.29	0.29	0.00
Village 14 POC 7 DMA Calculations					
Post-Developed Condition					
POC	Neighborhood	% Imperviousness	Total Area	Pervious Area	Impervious Area
8-Direct	Natural	0%	0.00	0.00	0.00
8-Direct	Residential-Roadway	40.0%	0.00	0.00	0.00
8-Direct	Roadway/road slope	60.0%	0.00	0.00	0.00
8-Direct	Direct-Total	N/A	0.00	0.00	0.00
8-via Basin 8	Pervious areas	0%	0.00	0.00	0.00
8-via Basin 8	Basin	0%	0.04	0.04	0.00
8-via Basin 8	Roof/ Street/Sdwk/landscape	90.00%	0.11	0.01	0.10
8-via Basin 8	Basin-Total	66%	0.15	0.05	0.10
8-via Basin 9	Pervious areas	0%	0.00	0.00	0.00
8-via Basin 9	Basin	0%	0.04	0.04	0.00
8-via Basin 9	Roof/ Street/Sdwk/landscape	90.00%	0.11	0.01	0.10
8-via Basin 9	Basin-Total	66%	0.15	0.05	0.10
8-Total	Total-Total	N/A	0.29	0.10	0.19

Village 14 POC8 Watershed Parameters		
POC8EXArea		
L=	350	ft
A=	0.29	ac
% Impervious	0%	
W=	36	ft
US Elev=	905	ft
DS Elev=	901	ft
S=	1.29%	
POC8DevArea8		
L=	335	ft
A=	0.11	ac
% Impervious	90.0%	
W=	14	ft
US Elev=	905	ft
DS Elev=	901	ft
S=	1.19%	
POC8PRBasin8		
L=	335	ft
A=	0.04	ac
W=	5	
US Elev=	905.00	ft
DS Elev=	901.00	ft
S=	1.19%	
POC8DevArea9		
L=	335	ft
A=	0.11	ac
% Impervious	90.0%	
W=	14	ft
US Elev=	905	ft
DS Elev=	901	ft
S=	1.19%	
POC8PRBasin9		
L=	335	ft
A=	0.04	ac
W=	5	
US Elev=	905.00	ft
DS Elev=	901.00	ft
S=	1.19%	

SECTION 7 - SWMM Screens and Explanation of Significant Variables

Attached, the reader can see the screenshots associated with the EPA-SWMM Model in both pre-development and post-development conditions for each POC. Similar model setup was employed for the models for the remaining POC locations using the input data found in the previous section. Each portion, i.e., sub-catchments, outfalls, storage units, LID controls for the biofiltration cells, ponding on top of the biofiltration (modeled as a storage unit), weir as a discharge, and outfalls (point of compliance), are also shown as applicable.

Variables for modeling are associated with typical recommended values by the EPA-SWMM model, typical values found in technical literature (such as Maidment's Handbook of Hydrology). Recommended values for the SWMM model have been obtained from the interim Orange County criteria established for their SWMM calibration. Currently, no recommended values have been established by the San Diego County HMP Permit for the SWMM Model.

Soil characteristics of the existing soils were determined from the USGS sources.

Some values incorporated within the SWMM model have been determined from the professional experience of H&A using conservative assumption that have a tendency to increase the size of the needed BMP and also generate a long-term runoff as a percentage of rainfall similar to those measured in gage stations in Southern California by the USGS.

Description of model parameters and assumptions:

N-Imperv – Manning's N for impervious surfaces

0.012 (typical)

N-Perv – Manning's N for pervious surfaces

0.10 (typical)

Dstore-Imperv – Depth of depression storage on impervious area (in)

0.05 (typical)

Dstore-Perv – Depth of depression storage on pervious area (in)

0.1 (typical)

%Zero-Imperv – Percentage of impervious area with no depression storage (%)

25 (typical)

Suction Head – Soil capillary suction head (in)

Conductivity – Soil saturated hydraulic conductivity (in/hr)

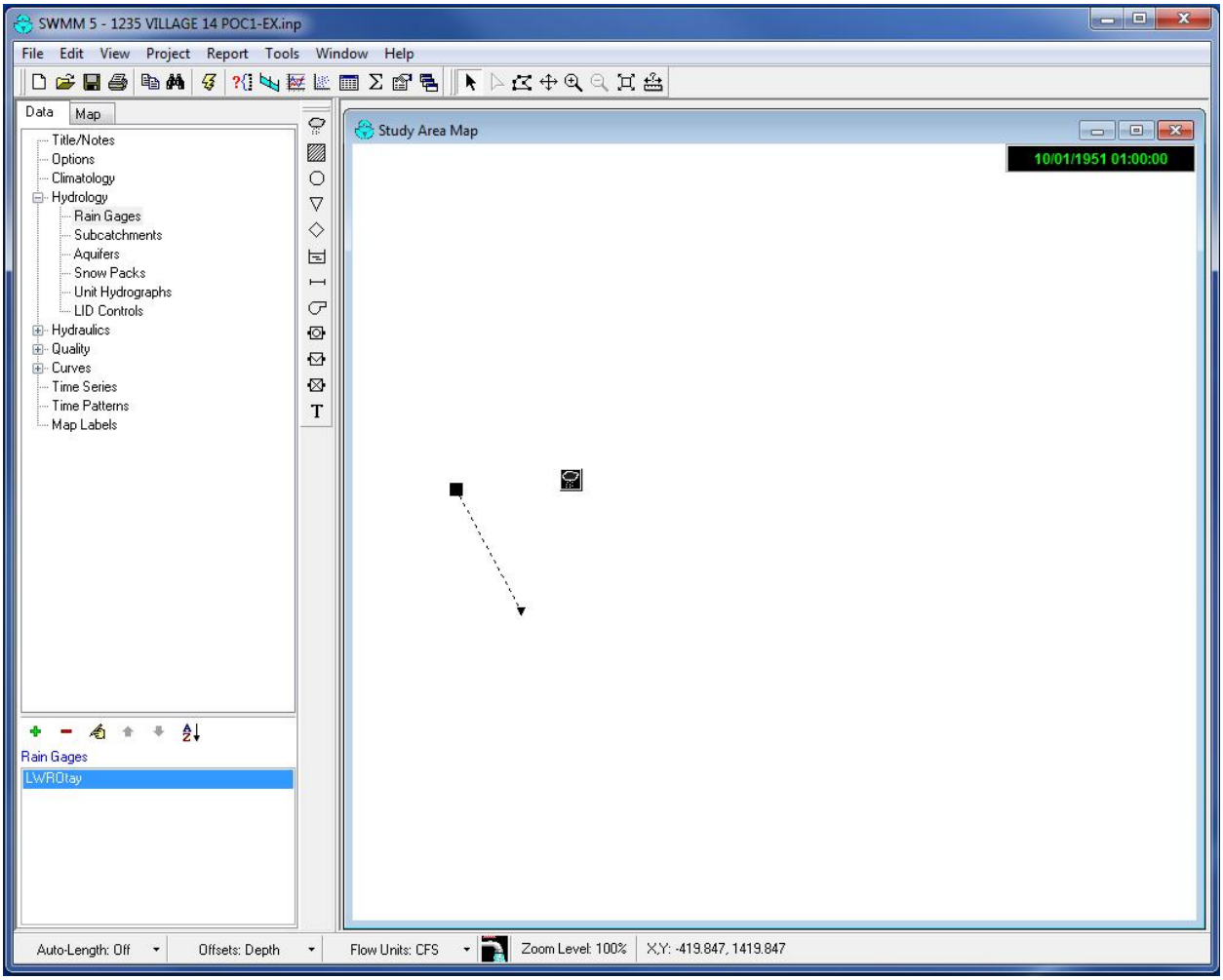
-75% of these values if subcatchment is graded/compacted

Initial Deficit – Initial moisture deficit (fraction)

Soil Type	Suction Head	Conductivity	Initial Deficit
A	1.5	0.3	0.30
B	3	0.2	0.31
C	6	0.1	0.32
D	9	0.025	0.33

NOTE : These values are based on Maidment's Handbook of Hydrology, Orange County calibrations for SWMM and recommended values form the EPA SWMM program.

POC 1 – Pre-Developed Condition



Subcatchment POC1EXArea

Property	Value
Name	POC1EXArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Existing Area
Tag	
Rain Gage	LWROtay
Outlet	POC1Ex
Area	591.62
Width	2239
% Slope	11.2
% Imperv	0
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

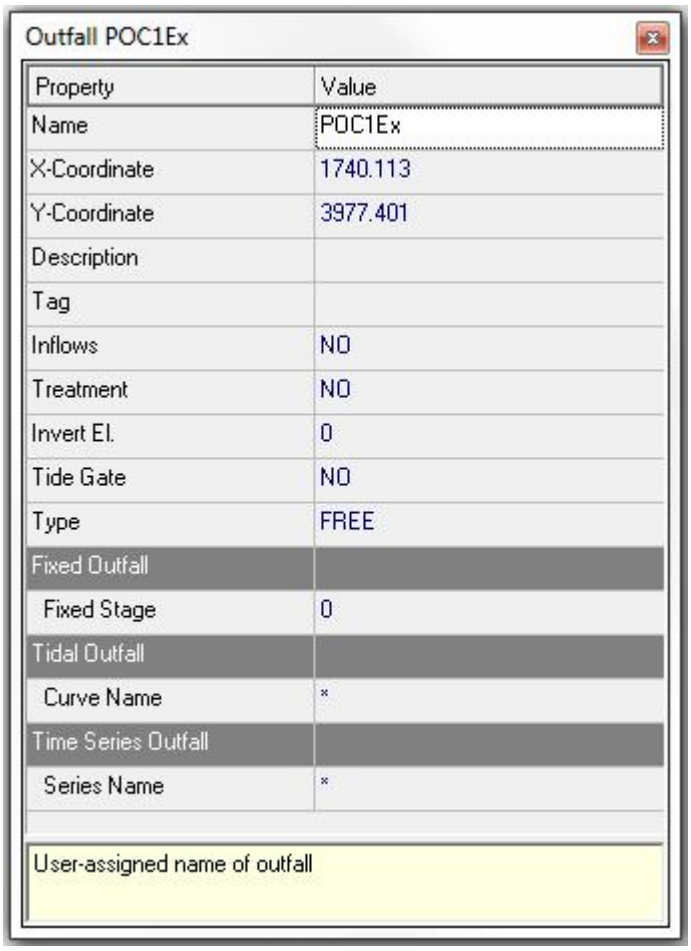
Infiltration Editor

Infiltration Method: GREEN_AMPT

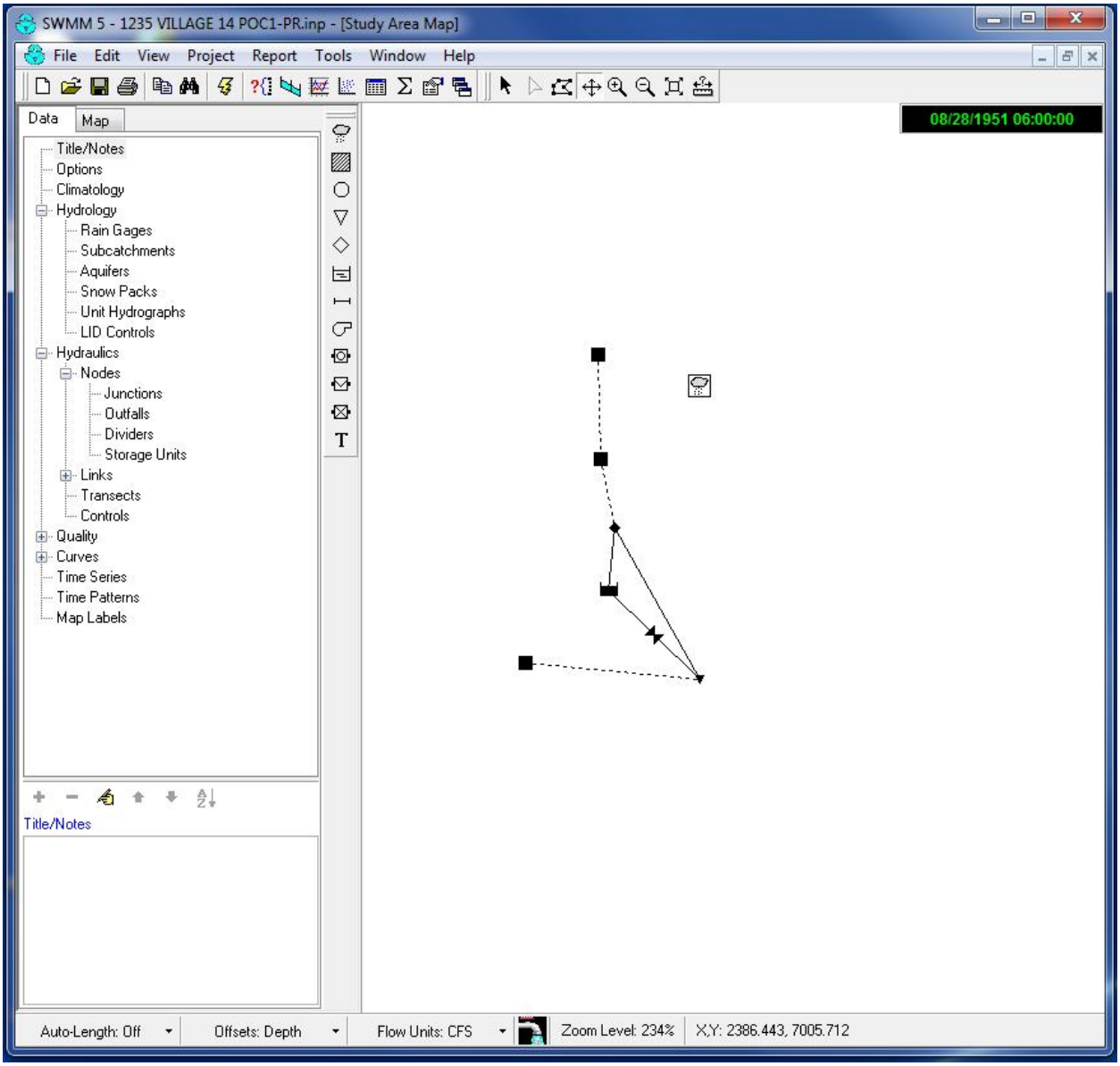
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

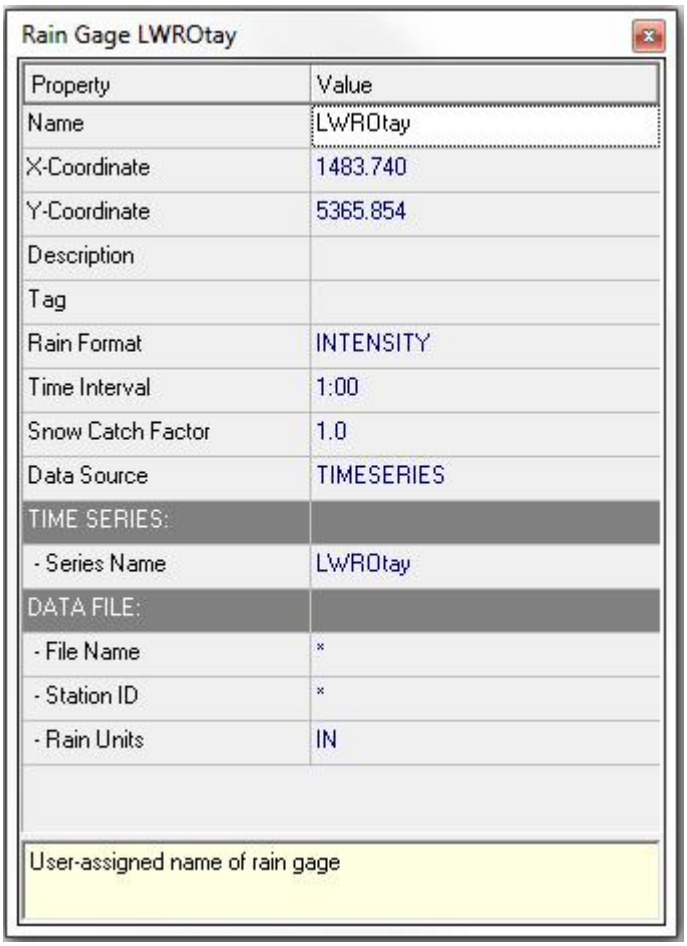
Soil capillary suction head (inches or mm)

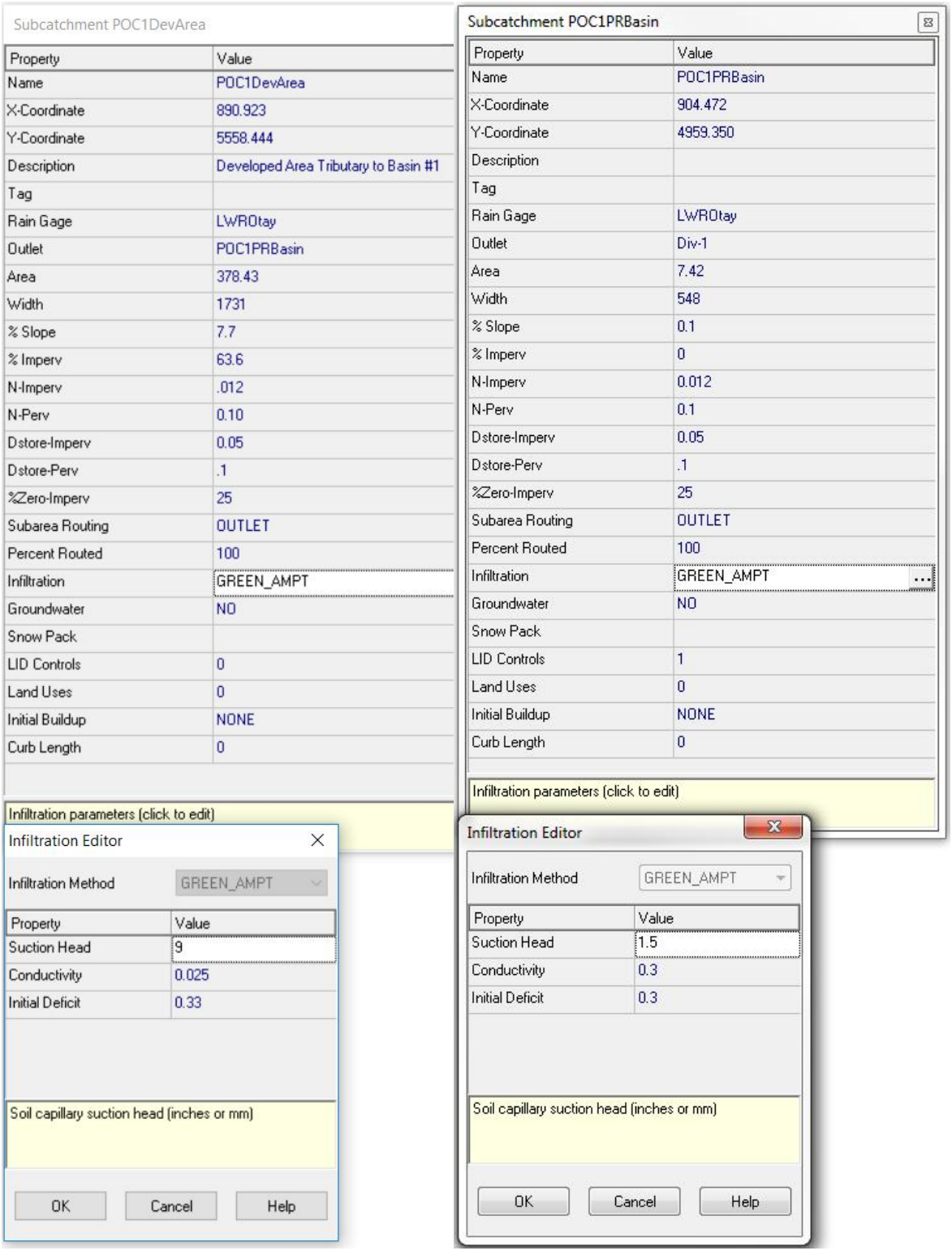
OK Cancel Help


Outfall POC1Ex
Property
Value
Name
POC1Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 1 – Developed Condition




Rain Gage LWROtay
Property
Value
Name
LWROtay
X-Coordinate
1483.740
Y-Coordinate
5365.854
Description
Tag
Rain Format
INTENSITY
Time Interval
1:00
Snow Catch Factor
1.0
Data Source
TIMESERIES
TIME SERIES:
- Series Name
LWROtay
DATA FILE:
- File Name
*
- Station ID
*
- Rain Units
IN
User-assigned name of rain gage


Subcatchment POC1DevArea
Property
Value
Name
POC1DevArea
X-Coordinate
890.923
Y-Coordinate
5558.444
Description
Developed Area Tributary to Basin #1
Tag
Rain Gage
LWROtay
Outlet
POC1PRBasin
Area
378.43
Width
1731
% Slope
7.7
% Imperv
63.6
N-Imperv
.012
N-Perv
0.10
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
0
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration parameters (click to edit)
Subcatchment POC1PRBasin
Property
Value
Name
POC1PRBasin
X-Coordinate
904.472
Y-Coordinate
4959.350
Description
Tag
Rain Gage
LWROtay
Outlet
Div-1
Area
7.42
Width
548
% Slope
0.1
% Imperv
0
N-Imperv
0.012
N-Perv
0.1
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
1
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration parameters (click to edit)
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
9
Conductivity
0.025
Initial Deficit
0.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
1.5
Conductivity
0.3
Initial Deficit
0.3
Soil capillary suction head (inches or mm)
OK
Cancel
Help

Subcatchment POC1PRBypass

Property	Value
Name	POC1PRBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to basin
Tag	
Rain Gage	LWROtay
Outlet	POC-1
Area	306.58
Width	1173
% Slope	11.3
% Imperv	0
N-Imperv	0.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

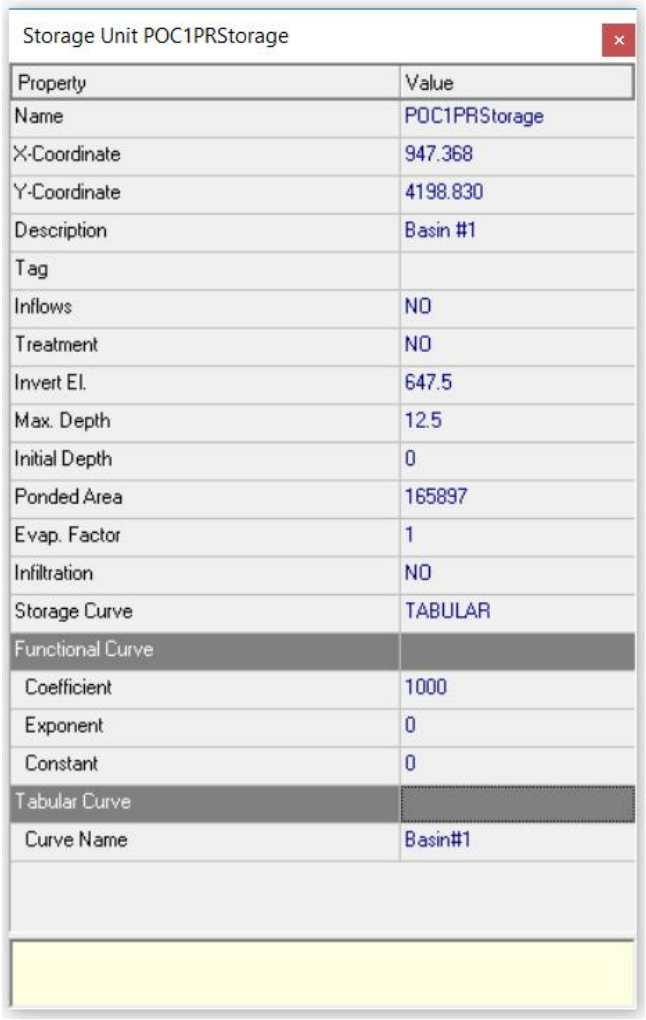
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

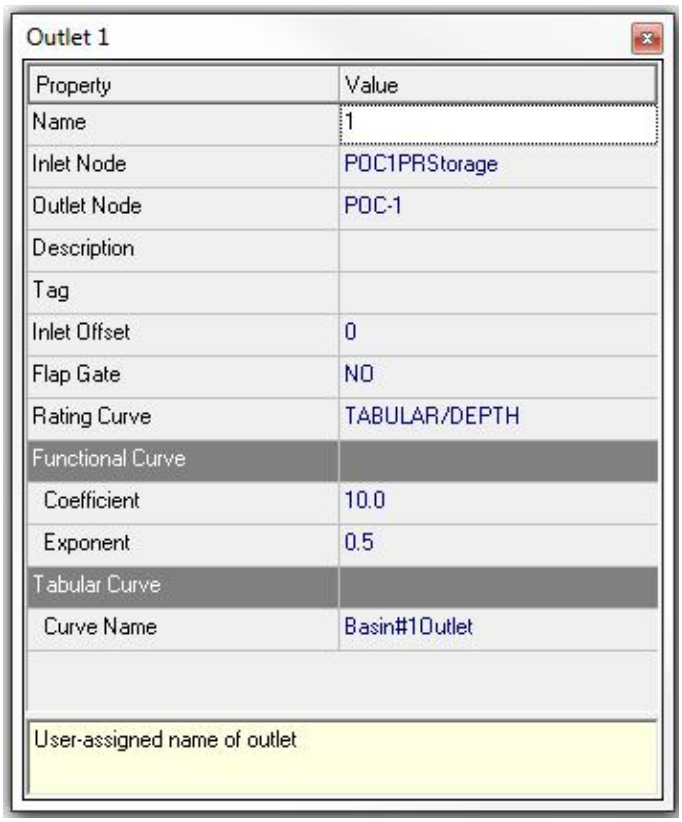
Soil capillary suction head (inches or mm)

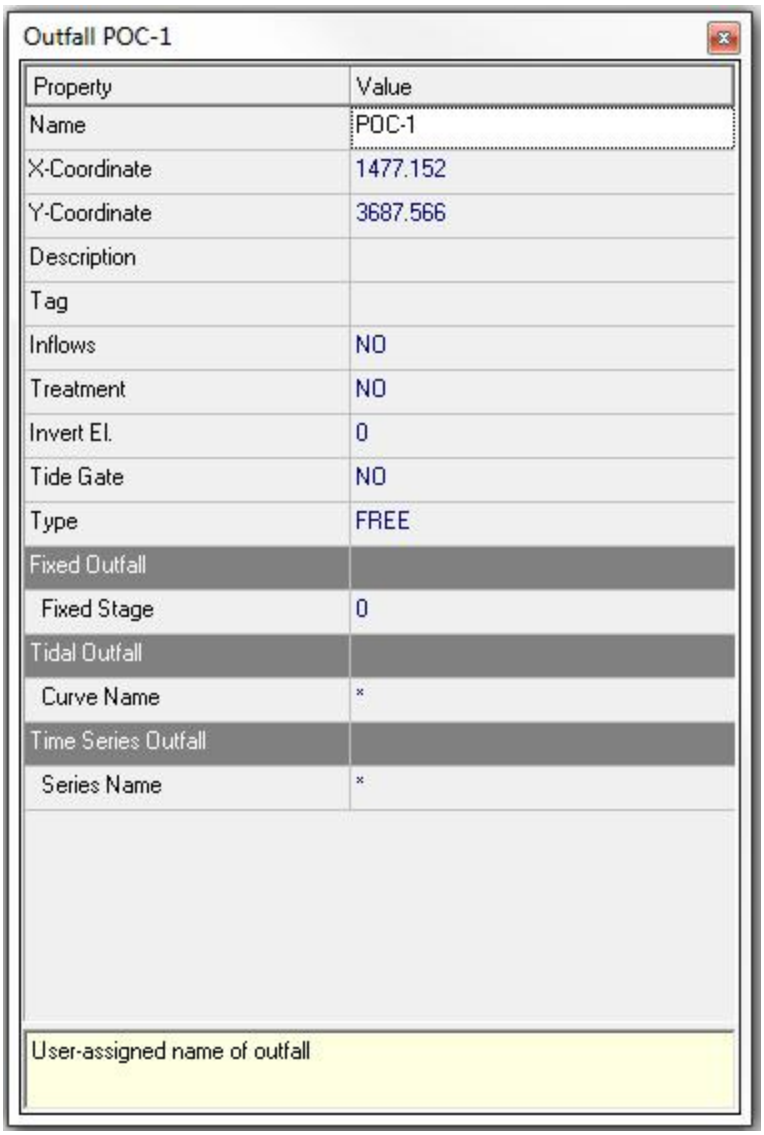
OK | Cancel | Help

Divider Div-1

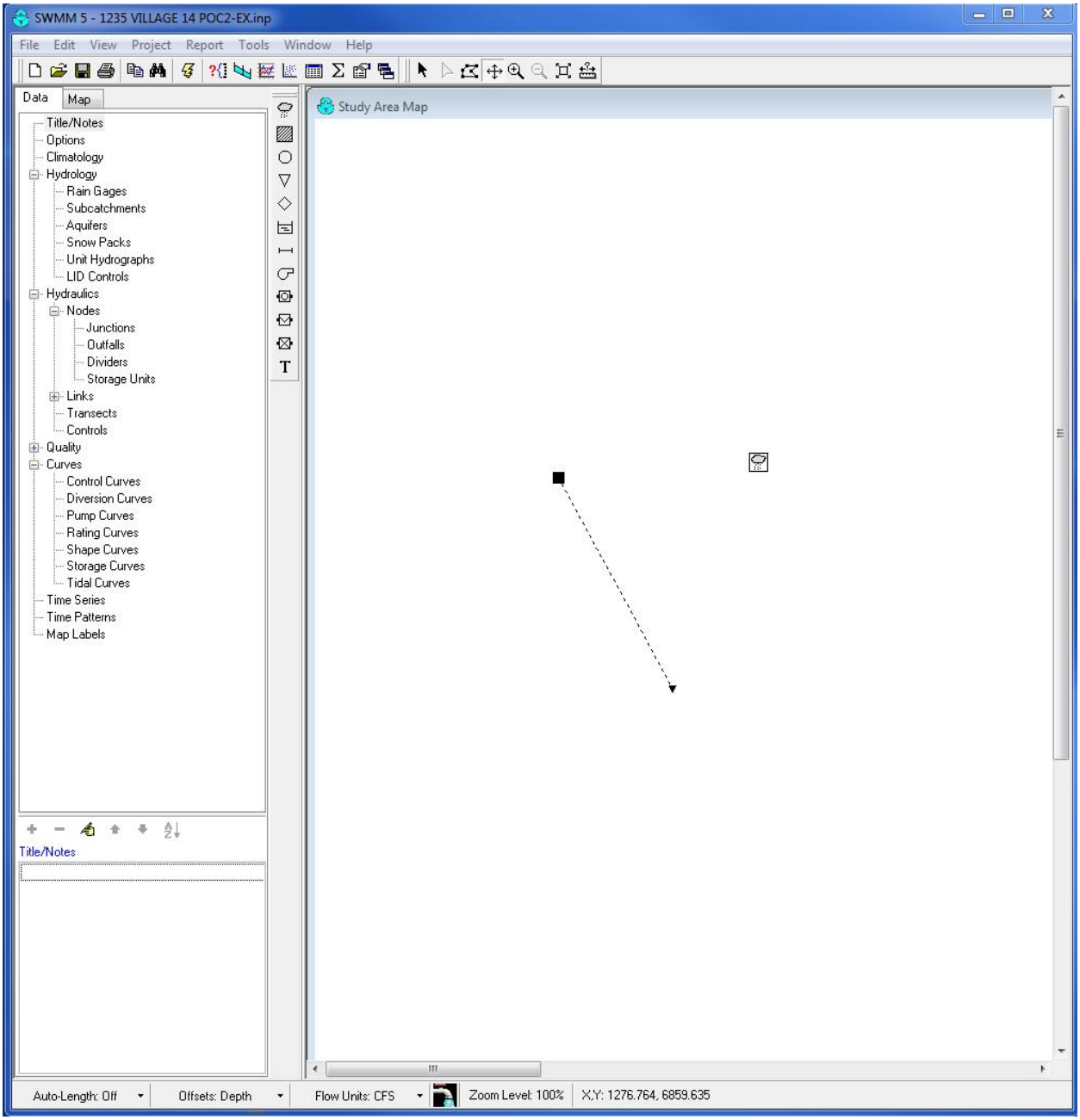
Property	Value
Name	Div-1
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	1.0796
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

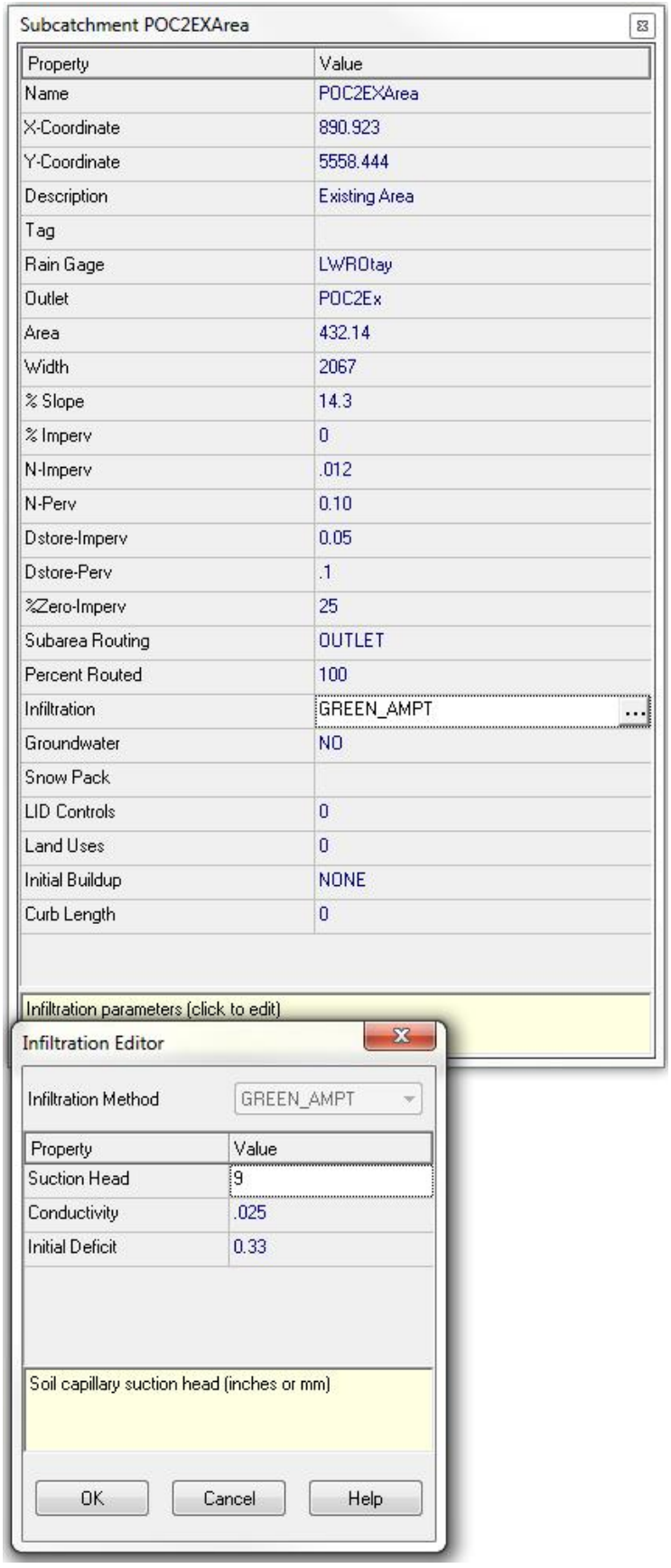

Storage Unit POC1PRStorage
Property
Value
Name
POC1PRStorage
X-Coordinate
947.368
Y-Coordinate
4198.830
Description
Basin #1
Tag
Inflows
NO
Treatment
NO
Invert El.
647.5
Max. Depth
12.5
Initial Depth
0
Ponded Area
165897
Evap. Factor
1
Infiltration
NO
Storage Curve
TABULAR
Functional Curve
Coefficient
1000
Exponent
0
Constant
0
Tabular Curve
Curve Name
Basin#1

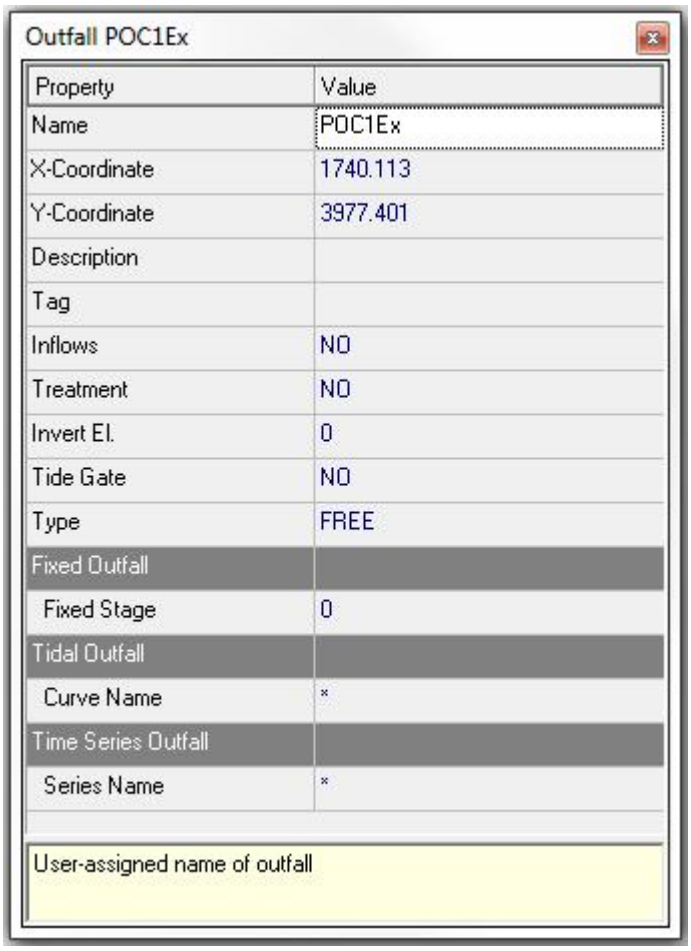

Outlet 1
Property
Value
Name
1
Inlet Node
POC1PRStorage
Outlet Node
POC-1
Description
Tag
Inlet Offset
0
Flap Gate
NO
Rating Curve
TABULAR/DEPTH
Functional Curve
Coefficient
10.0
Exponent
0.5
Tabular Curve
Curve Name
Basin#1Outlet
User-assigned name of outlet


Outfall POC-1
Property
Value
Name
POC-1
X-Coordinate
1477.152
Y-Coordinate
3687.566
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

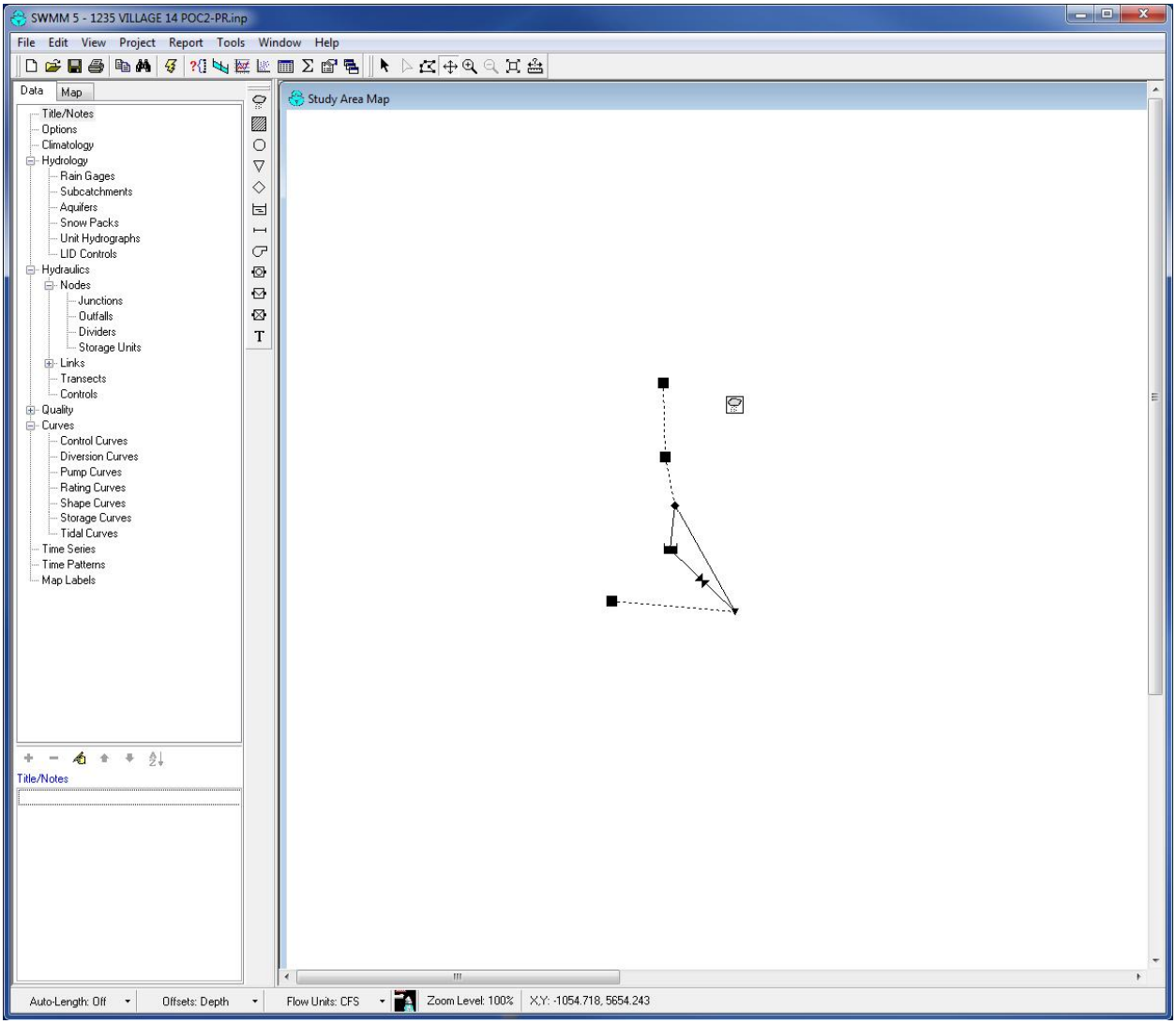
POC 2 – Pre-Developed Condition

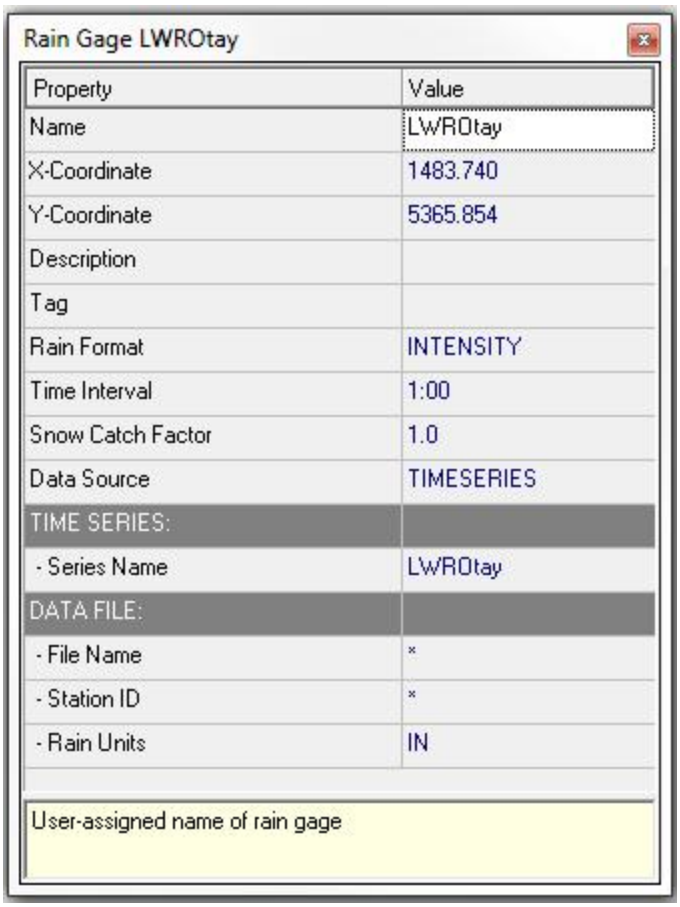


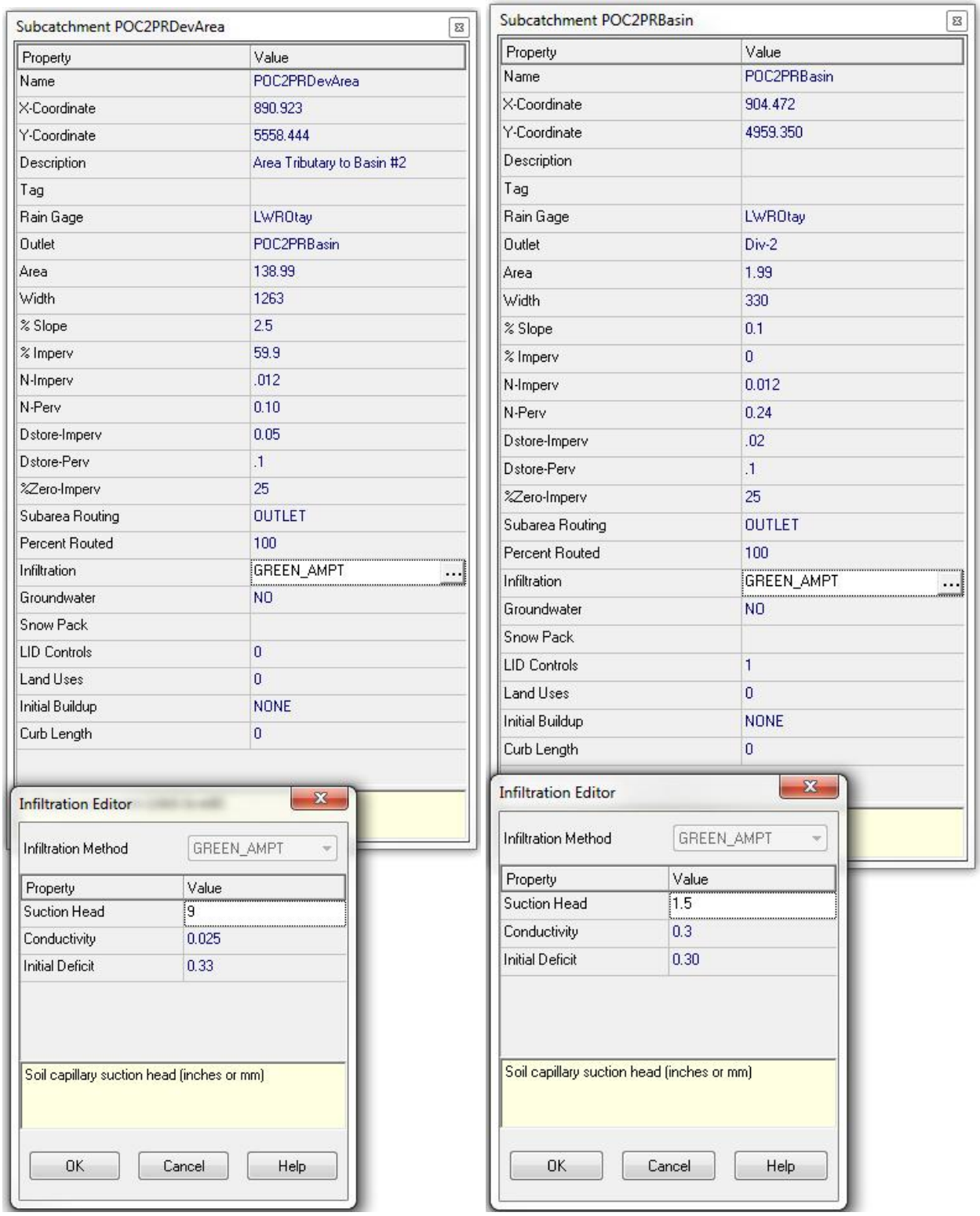

Subcatchment POC2EXArea
Property
Value
Name
POC2EXArea
X-Coordinate
890.923
Y-Coordinate
5558.444
Description
Existing Area
Tag
Rain Gage
LWROtay
Outlet
POC2Ex
Area
432.14
Width
2067
% Slope
14.3
% Imperv
0
N-Imperv
.012
N-Perv
0.10
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
0
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration parameters (click to edit)
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
9
Conductivity
.025
Initial Deficit
0.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help


Outfall POC1Ex
Property
Value
Name
POC1Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 2 – Developed Condition




Rain Gage LWROtay
Property
Value
Name
LWROtay
X-Coordinate
1483.740
Y-Coordinate
5365.854
Description
Tag
Rain Format
INTENSITY
Time Interval
1:00
Snow Catch Factor
1.0
Data Source
TIMESERIES
TIME SERIES:
- Series Name
LWROtay
DATA FILE:
- File Name
*
- Station ID
*
- Rain Units
IN
User-assigned name of rain gage


Subcatchment POC2PRDevArea
Property
Value
Name
POC2PRDevArea
X-Coordinate
890.923
Y-Coordinate
5558.444
Description
Area Tributary to Basin #2
Tag
Rain Gage
LWROtay
Outlet
POC2PRBasin
Area
138.99
Width
1263
% Slope
2.5
% Imperv
59.9
N-Imperv
.012
N-Perv
0.10
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
0
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
9
Conductivity
0.025
Initial Deficit
0.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help
Subcatchment POC2PRBasin
Property
Value
Name
POC2PRBasin
X-Coordinate
904.472
Y-Coordinate
4959.350
Description
Tag
Rain Gage
LWROtay
Outlet
Div-2
Area
1.99
Width
330
% Slope
0.1
% Imperv
0
N-Imperv
0.012
N-Perv
0.24
Dstore-Imperv
.02
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
1
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
1.5
Conductivity
0.3
Initial Deficit
0.30
Soil capillary suction head (inches or mm)
OK
Cancel
Help

Subcatchment POC2PRBypass

Property	Value
Name	POC2PRBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to basin
Tag	
Rain Gage	LWROtay
Outlet	POC-2
Area	314.16
Width	1818
% Slope	17.3
% Imperv	0
N-Imperv	0.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

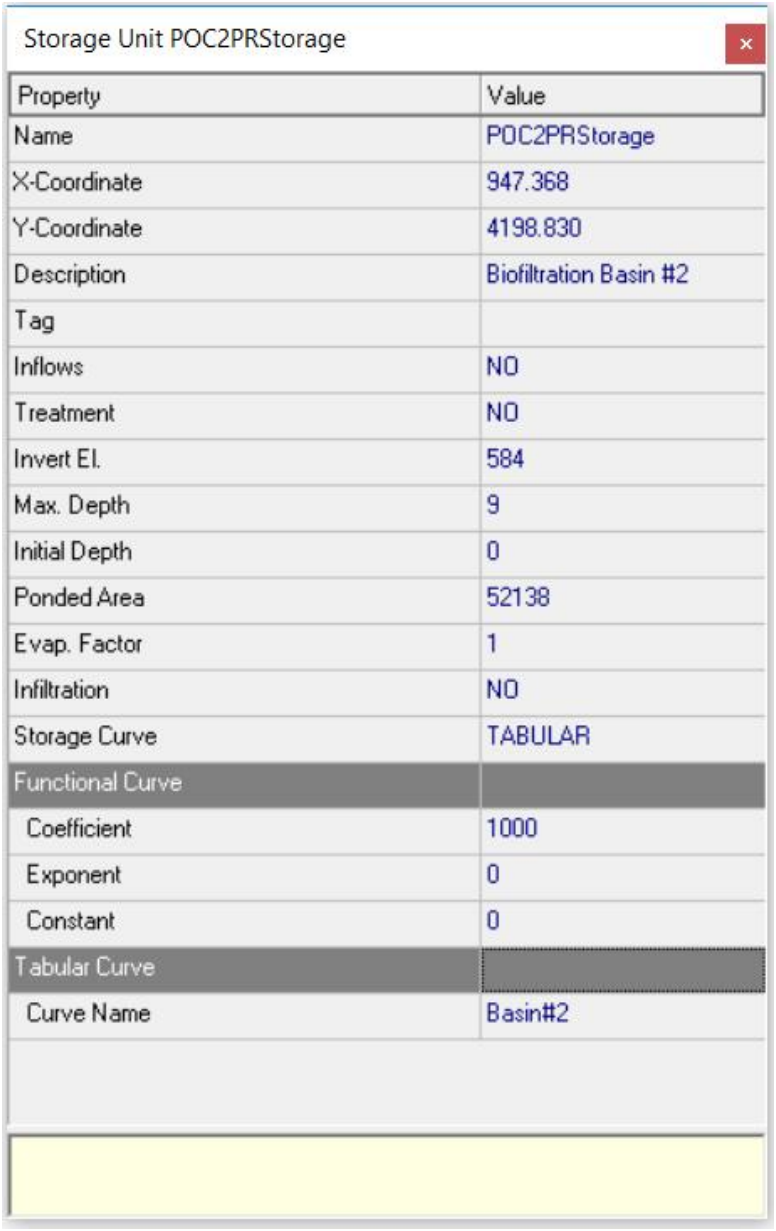
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Divider Div-2

Property	Value
Name	Div-2
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-2
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.77177
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

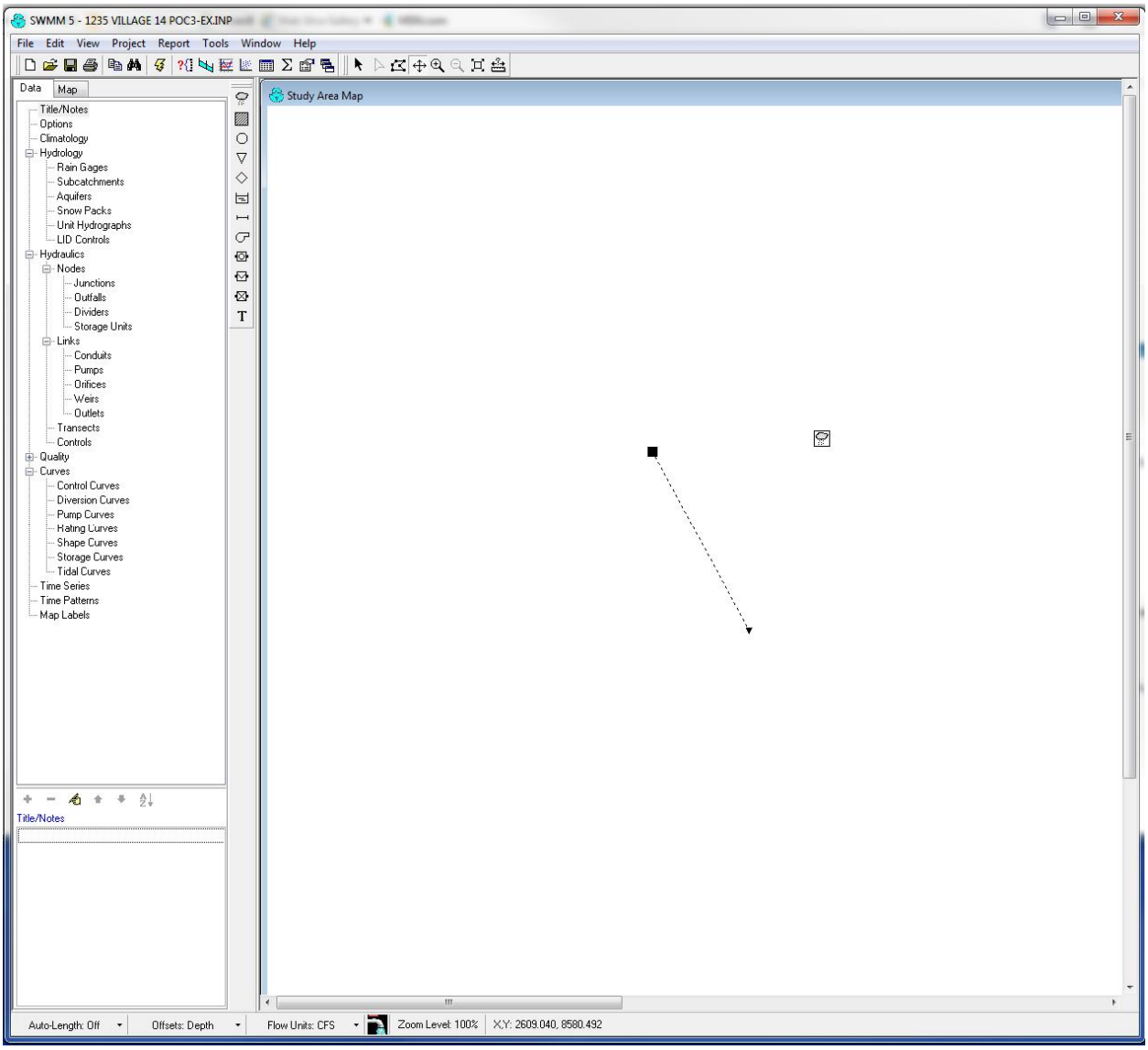

Storage Unit POC2PRStorage
Property
Value
Name
POC2PRStorage
X-Coordinate
947.368
Y-Coordinate
4198.830
Description
Biofiltration Basin #2
Tag
Inflows
NO
Treatment
NO
Invert El.
584
Max. Depth
9
Initial Depth
0
Ponded Area
52138
Evap. Factor
1
Infiltration
NO
Storage Curve
TABULAR
Functional Curve
Coefficient
1000
Exponent
0
Constant
0
Tabular Curve
Curve Name
Basin#2

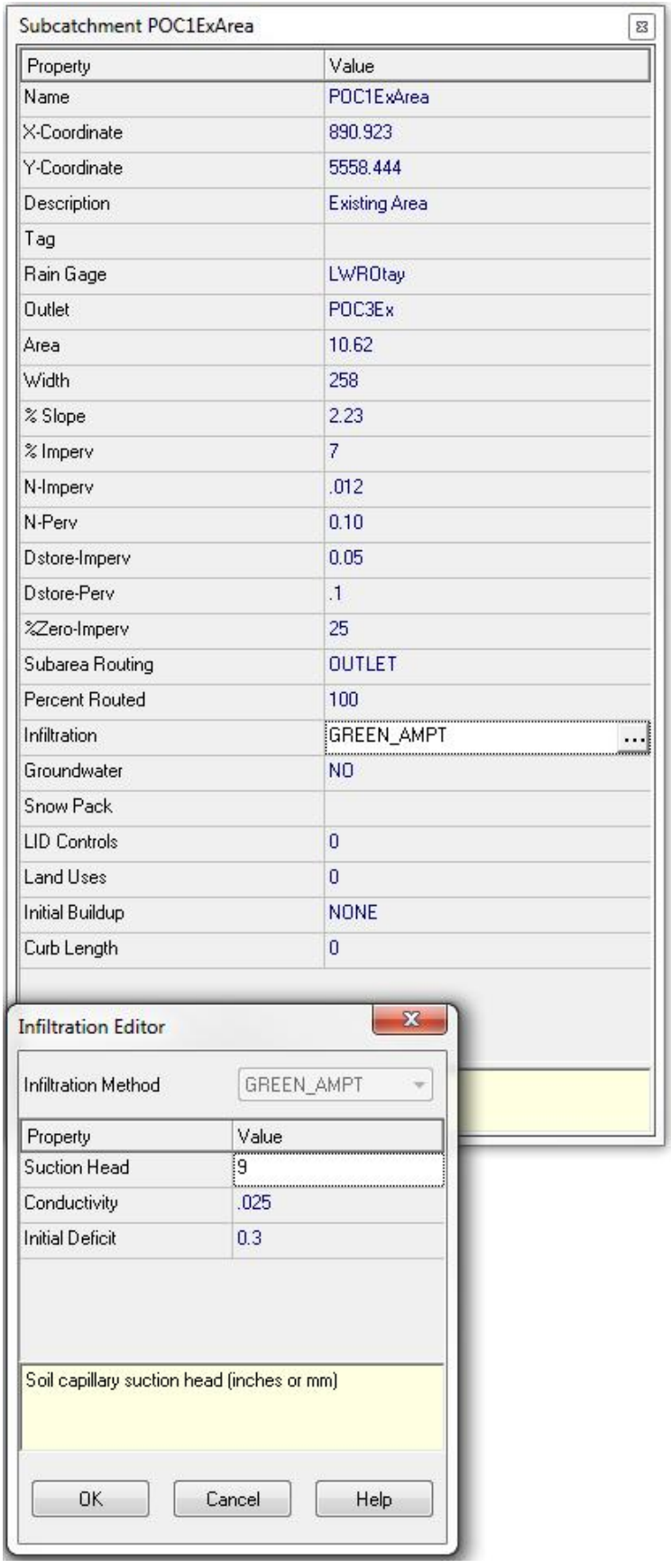
Outfall POC-2

Property	Value
Name	POC-2
X-Coordinate	1477.152
Y-Coordinate	3687.566
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

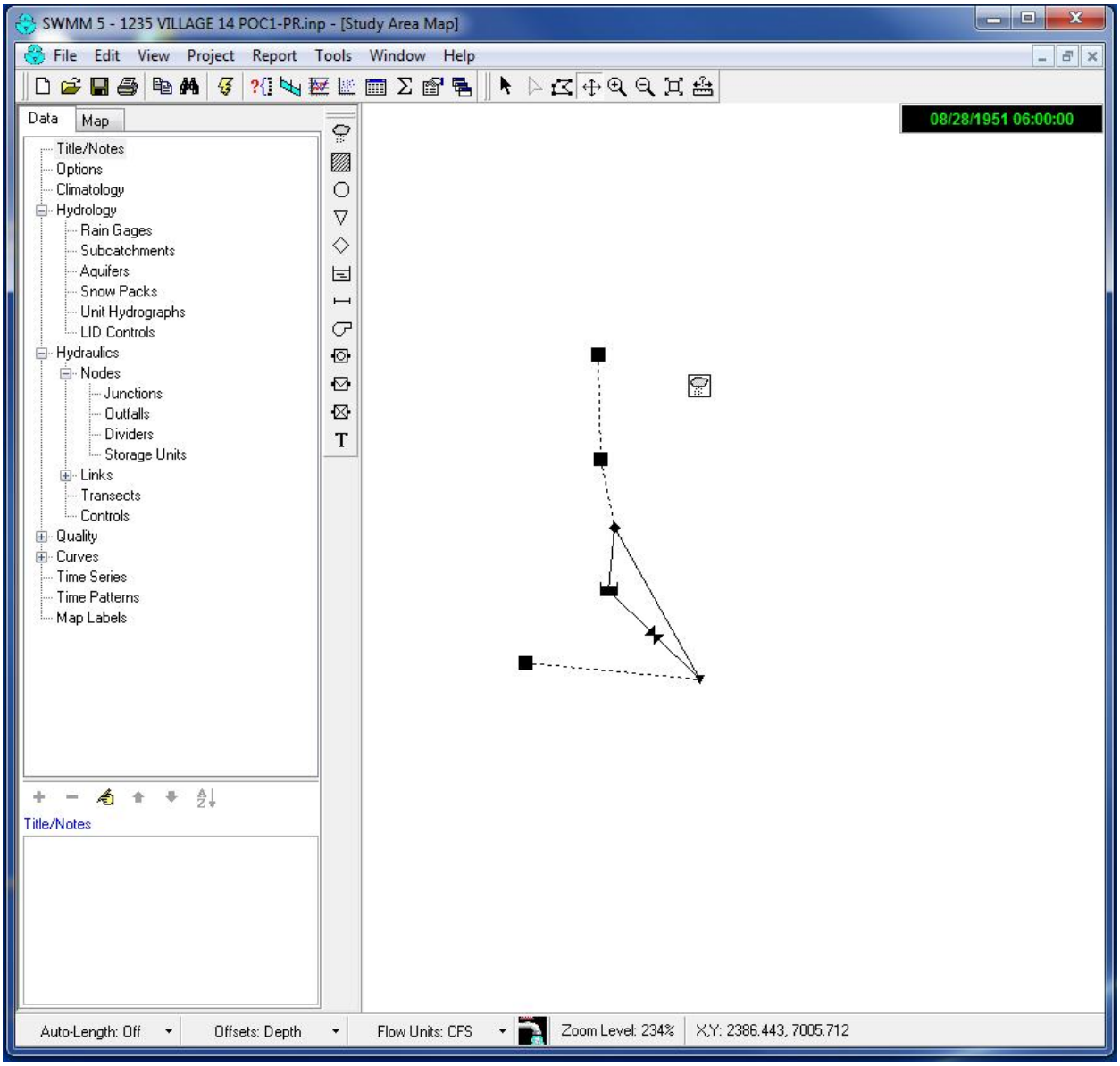
POC 3 – Pre-Developed Condition

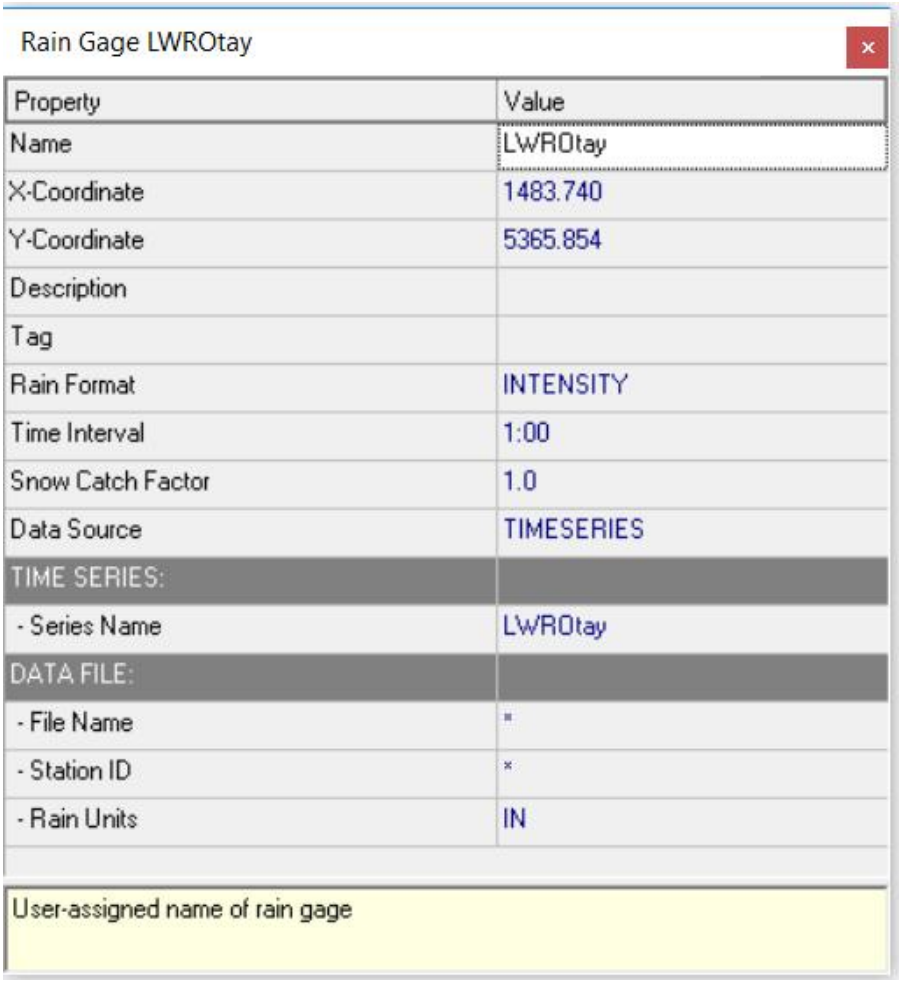



Subcatchment POC1ExArea
Property
Value
Name
POC1ExArea
X-Coordinate
890.923
Y-Coordinate
5558.444
Description
Existing Area
Tag
Rain Gage
LWROtay
Outlet
POC3Ex
Area
10.62
Width
258
% Slope
2.23
% Imperv
7
N-Imperv
.012
N-Perv
0.10
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
0
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
9
Conductivity
.025
Initial Deficit
0.3
Soil capillary suction head (inches or mm)
OK
Cancel
Help


Outfall POC3Ex
Property
Value
Name
POC3Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 3 – Developed Condition




Rain Gage LWROtay
Property
Value
Name
LWROtay
X-Coordinate
1483.740
Y-Coordinate
5365.854
Description
Tag
Rain Format
INTENSITY
Time Interval
1:00
Snow Catch Factor
1.0
Data Source
TIMESERIES
TIME SERIES:
- Series Name
LWROtay
DATA FILE:
- File Name
*
- Station ID
*
- Rain Units
IN
User-assigned name of rain gage

Subcatchment POC3PRDevArea

Property	Value
Name	POC3PRDevArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Area Tributary to Basin #3
Tag	
Rain Gage	LWROtay
Outlet	POC3PRBasin
Area	4.42
Width	107
% Slope	0.99
% Imperv	76.9
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC3PRBasin

Property	Value
Name	POC3PRBasin
X-Coordinate	904.472
Y-Coordinate	4959.350
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-3
Area	.21
Width	183
% Slope	0.1
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC3PRBypass

Property	Value
Name	POC3PRBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to basin
Tag	
Rain Gage	LWROtay
Outlet	POC-3
Area	6.45
Width	153
% Slope	1.63
% Imperv	0
N-Imperv	0.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

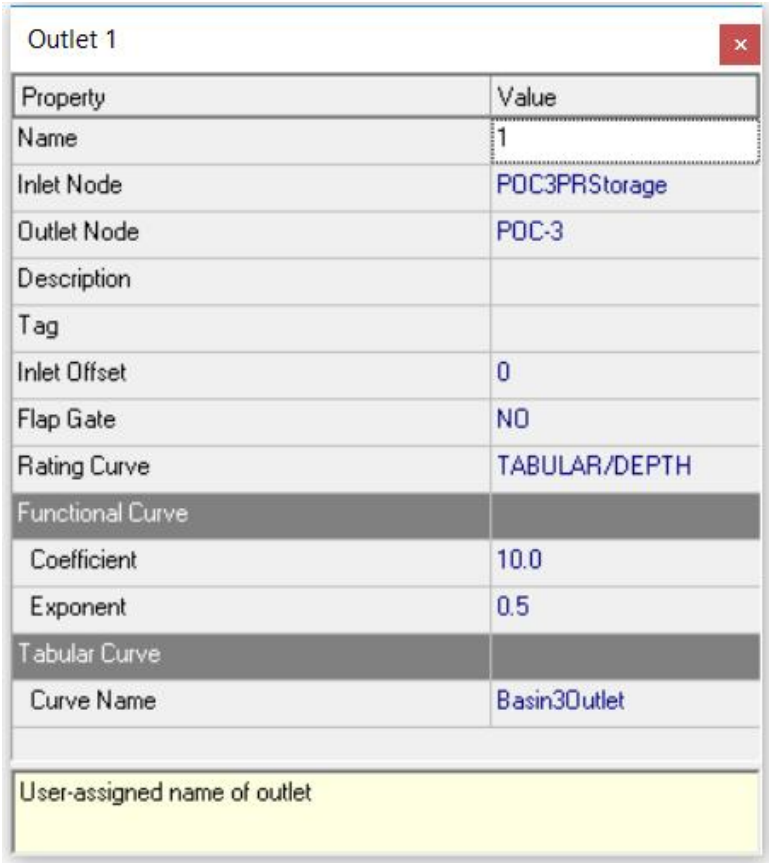
OK Cancel Help

Divider Div-3

Property	Value
Name	Div-3
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.03079
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

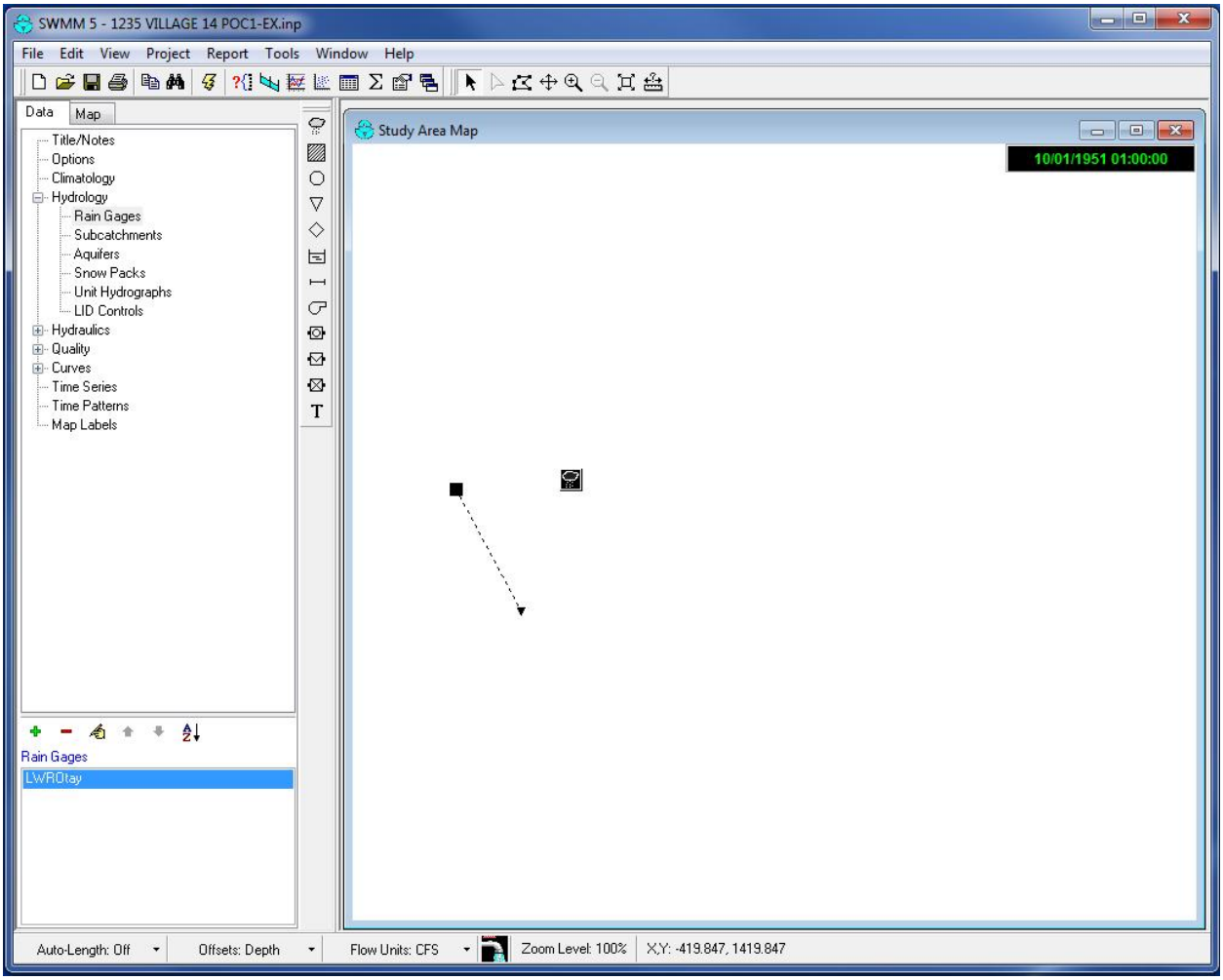
Storage Unit POC3PRStorage

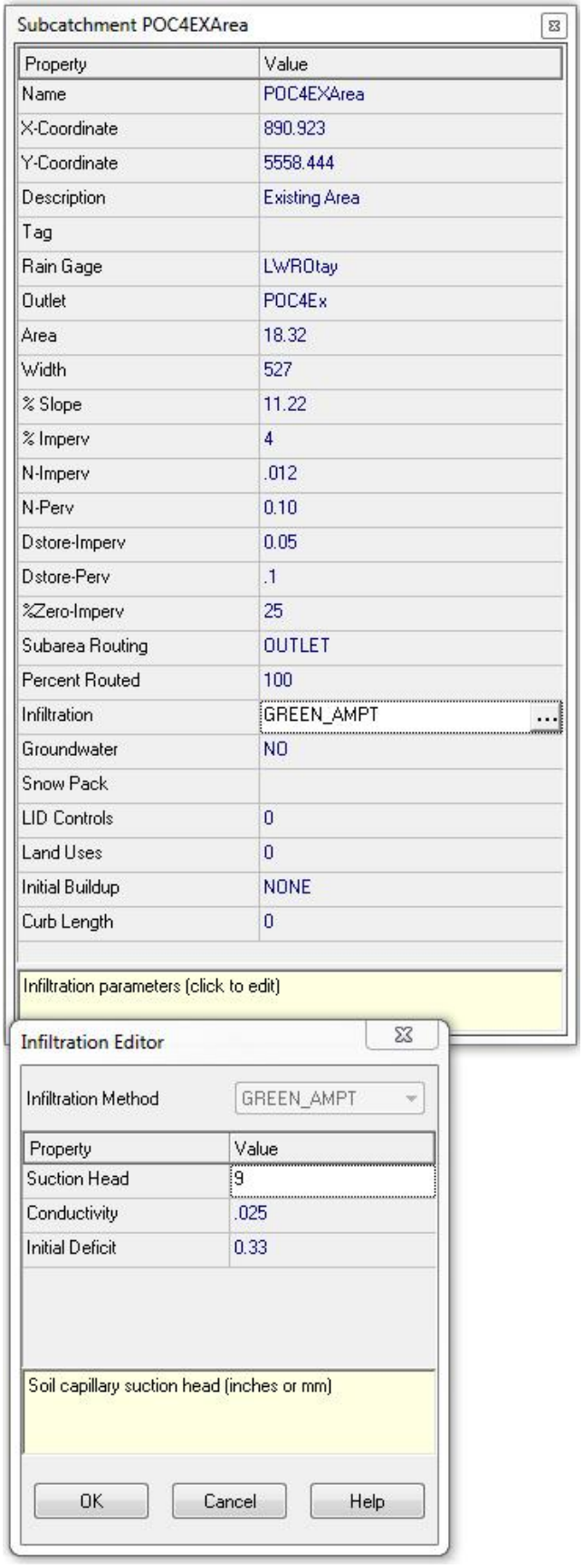
Property	Value
Name	POC3PRStorage
X-Coordinate	947.368
Y-Coordinate	4198.830
Description	Basin #3
Tag	
Inflows	NO
Treatment	NO
Invert El.	570
Max. Depth	5
Initial Depth	0
Ponded Area	4643
Evap. Factor	1
Infiltration	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin#3

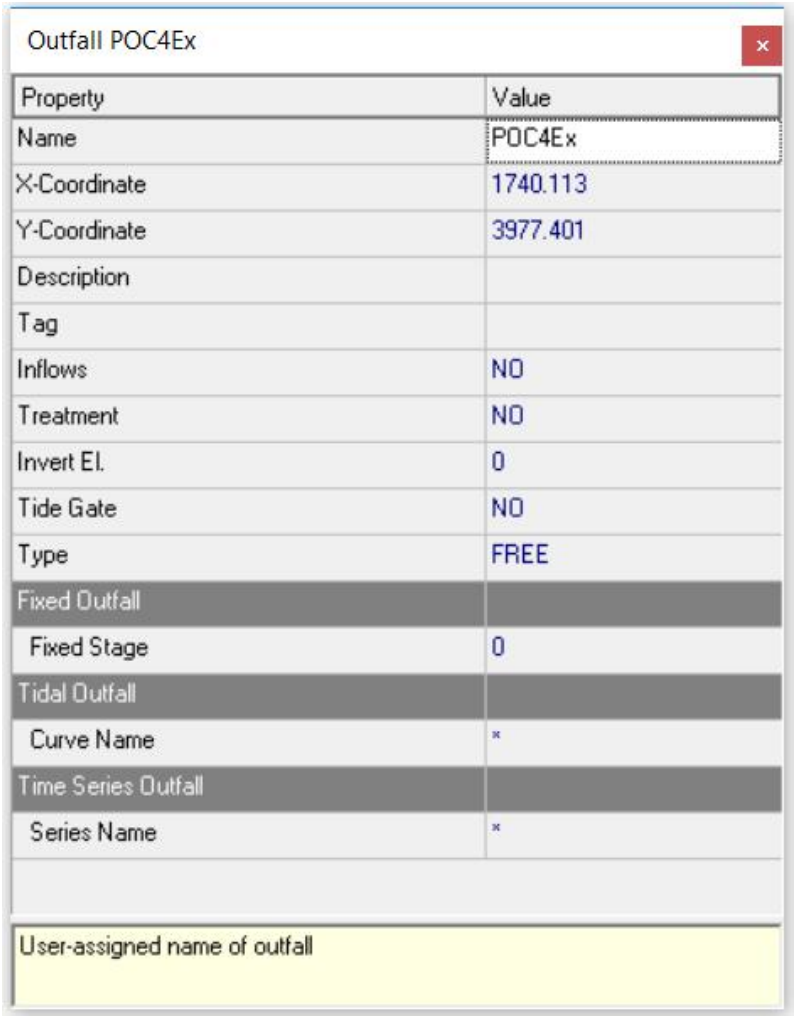

Outlet 1
Property
Value
Name
1
Inlet Node
POC3PRStorage
Outlet Node
POC-3
Description
Tag
Inlet Offset
0
Flap Gate
NO
Rating Curve
TABULAR/DEPTH
Functional Curve
Coefficient
10.0
Exponent
0.5
Tabular Curve
Curve Name
Basin3Outlet
User-assigned name of outlet


Outfall POC-3
Property
Value
Name
POC-3
X-Coordinate
1477.152
Y-Coordinate
3687.566
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

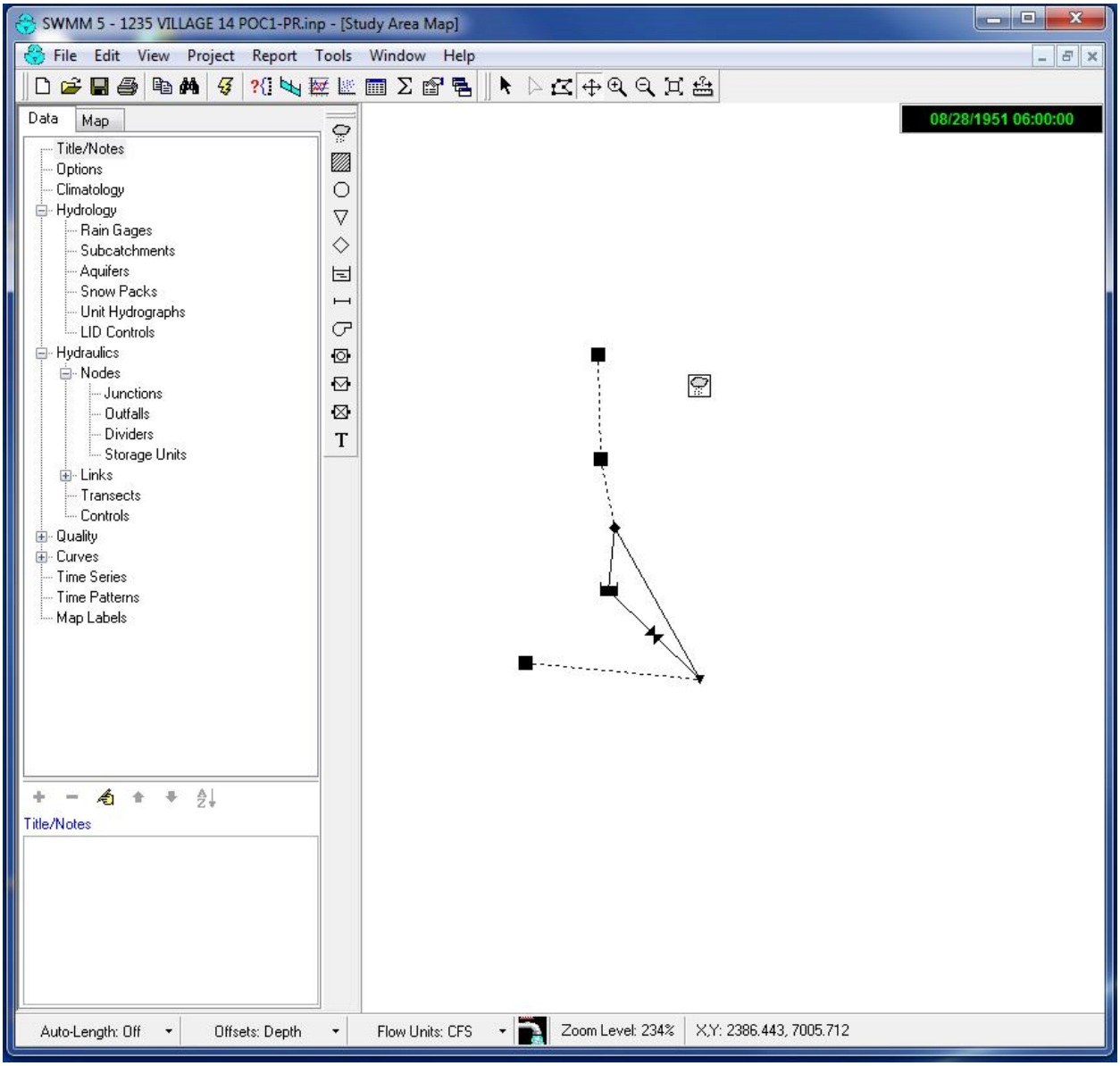
POC 4 – Pre-Developed Condition




Subcatchment POC4EXArea
Property
Value
Name
POC4EXArea
X-Coordinate
890.923
Y-Coordinate
5558.444
Description
Existing Area
Tag
Rain Gage
LWROtay
Outlet
POC4Ex
Area
18.32
Width
527
% Slope
11.22
% Imperv
4
N-Imperv
.012
N-Perv
0.10
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
0
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration parameters (click to edit)
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
9
Conductivity
.025
Initial Deficit
0.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help


Outfall POC4Ex
Property
Value
Name
POC4Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 4 – Developed Condition



Subcatchment POC4PRDevArea

Property	Value
Name	POC4PRDevArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Area Tributary to Basin #4
Tag	
Rain Gage	LWROtay
Outlet	POC4PRBasin
Area	3.32
Width	94
% Slope	1.0
% Imperv	61.7
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC4PRBasin

Property	Value
Name	POC4PRBasin
X-Coordinate	904.472
Y-Coordinate	4959.350
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-4
Area	0.08
Width	77
% Slope	0.1
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC4PrBypass

Property	Value
Name	POC4PrBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to bas
Tag	
Rain Gage	LWROtay
Outlet	POC-4
Area	16.03
Width	461
% Slope	11.22
% Imperv	0
N-Imperv	0.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

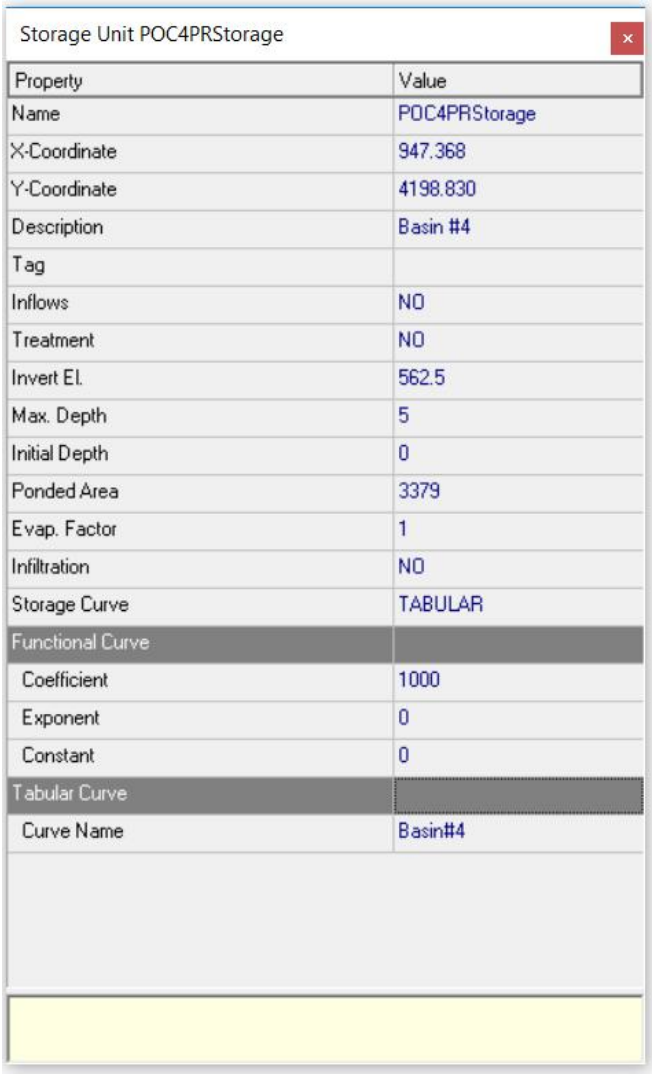
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

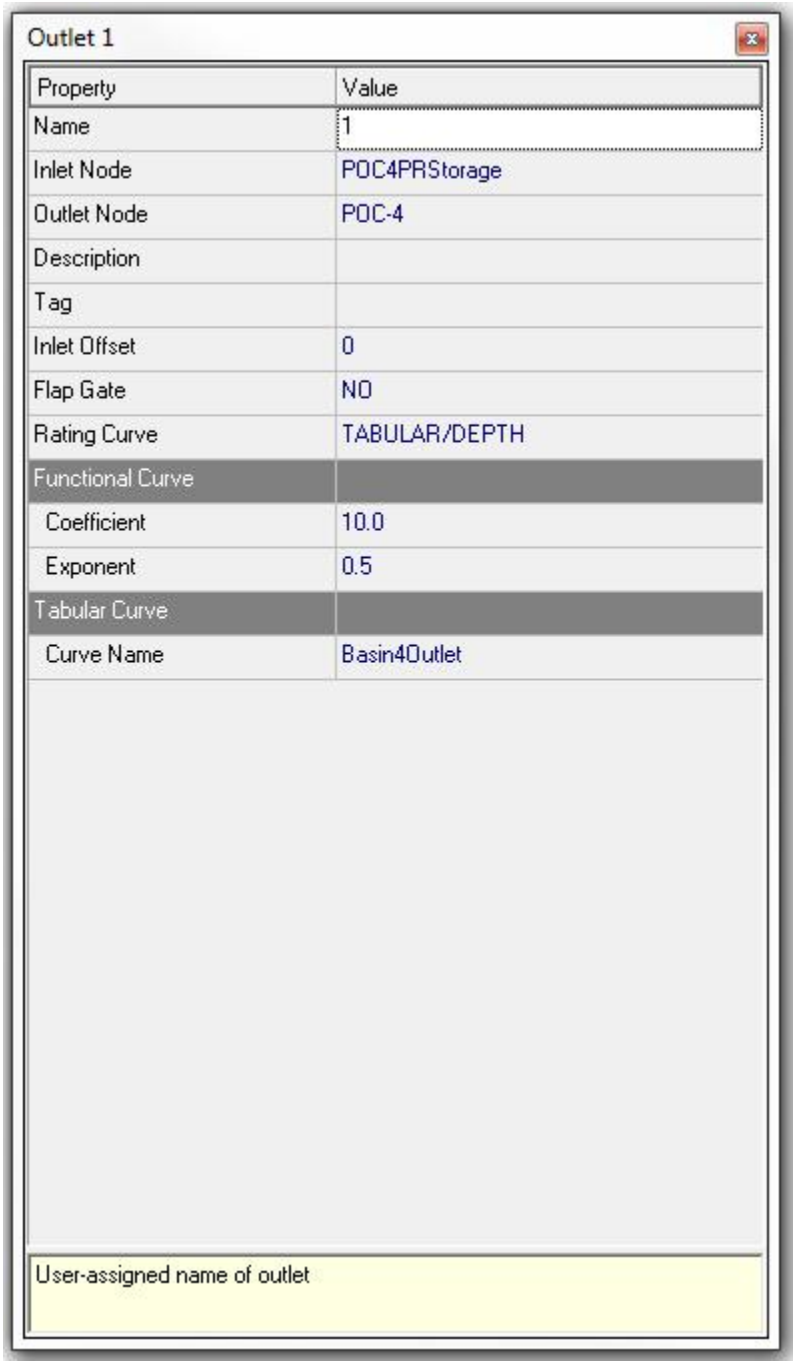
Soil capillary suction head (inches or mm)

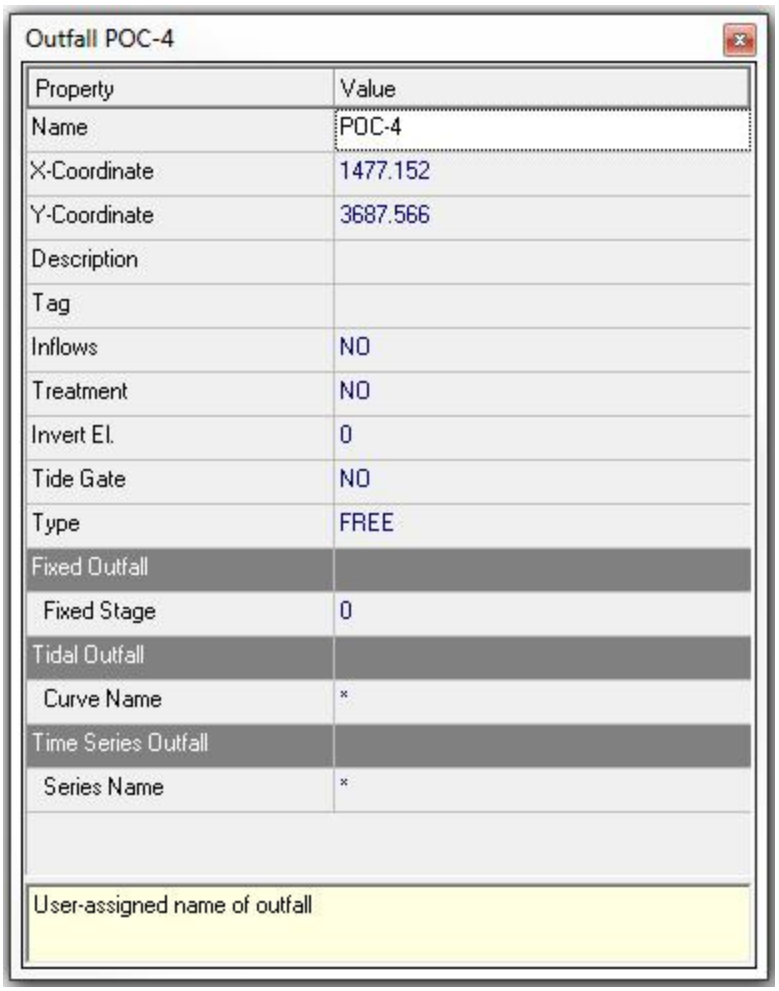
OK Cancel Help

Divider Div-4

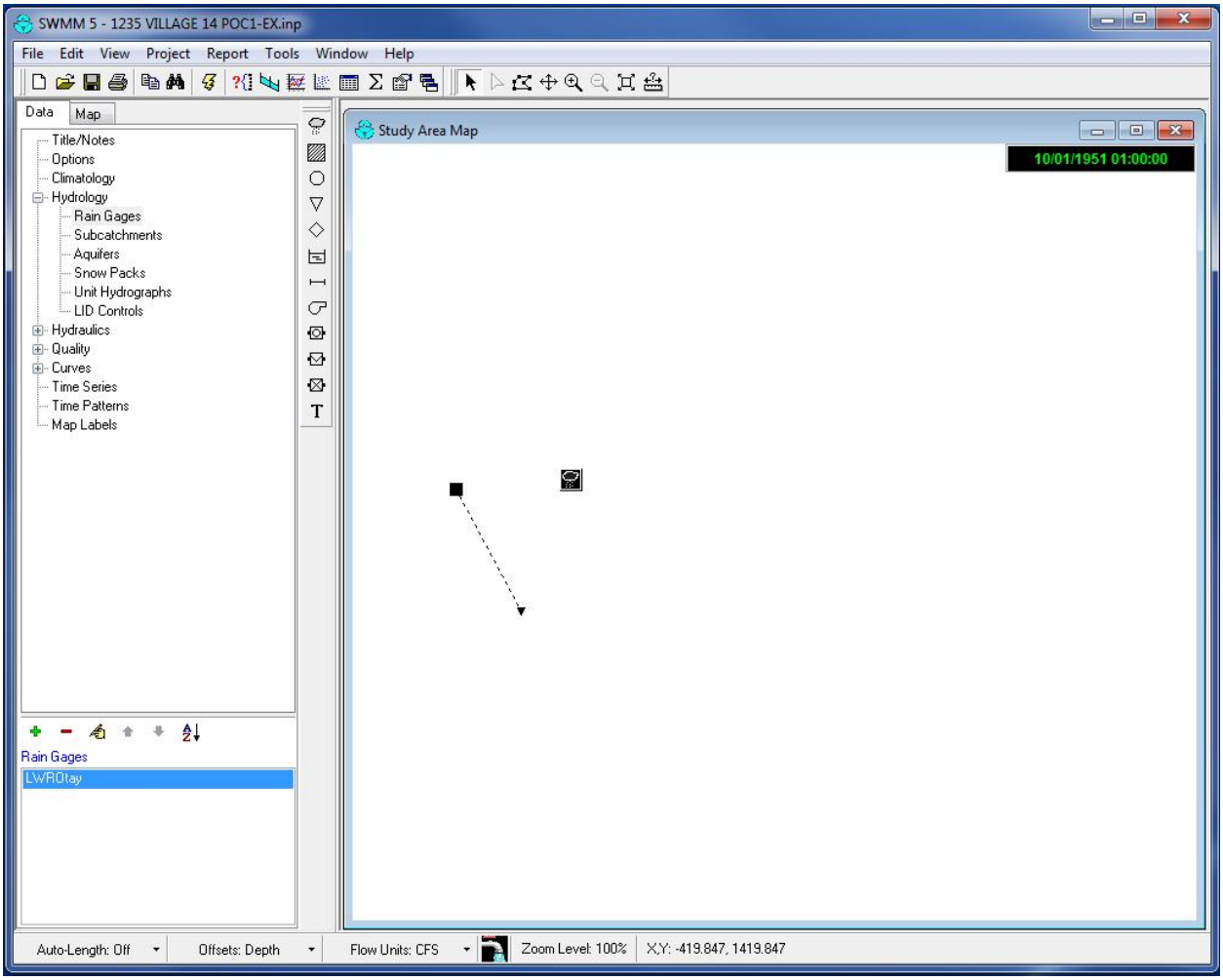
Property	Value
Name	Div-4
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.02361
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0


Storage Unit POC4PRStorage
Property
Value
Name
POC4PRStorage
X-Coordinate
947.368
Y-Coordinate
4198.830
Description
Basin #4
Tag
Inflows
NO
Treatment
NO
Invert El.
562.5
Max. Depth
5
Initial Depth
0
Ponded Area
3379
Evap. Factor
1
Infiltration
NO
Storage Curve
TABULAR
Functional Curve
Coefficient
1000
Exponent
0
Constant
0
Tabular Curve
Curve Name
Basin#4


Outlet 1
Property
Value
Name
1
Inlet Node
POC4PRStorage
Outlet Node
POC-4
Description
Tag
Inlet Offset
0
Flap Gate
NO
Rating Curve
TABULAR/DEPTH
Functional Curve
Coefficient
10.0
Exponent
0.5
Tabular Curve
Curve Name
Basin4Outlet
User-assigned name of outlet


Outfall POC-4
Property
Value
Name
POC-4
X-Coordinate
1477.152
Y-Coordinate
3687.566
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 5 – Pre-Developed Condition



Subcatchment POC5EXArea

Property	Value
Name	POC5EXArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Existing Area
Tag	
Rain Gage	LWROtay
Outlet	POC5Ex
Area	1094.73
Width	3106
% Slope	13.13
% Imperv	8
N-Imperv	.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

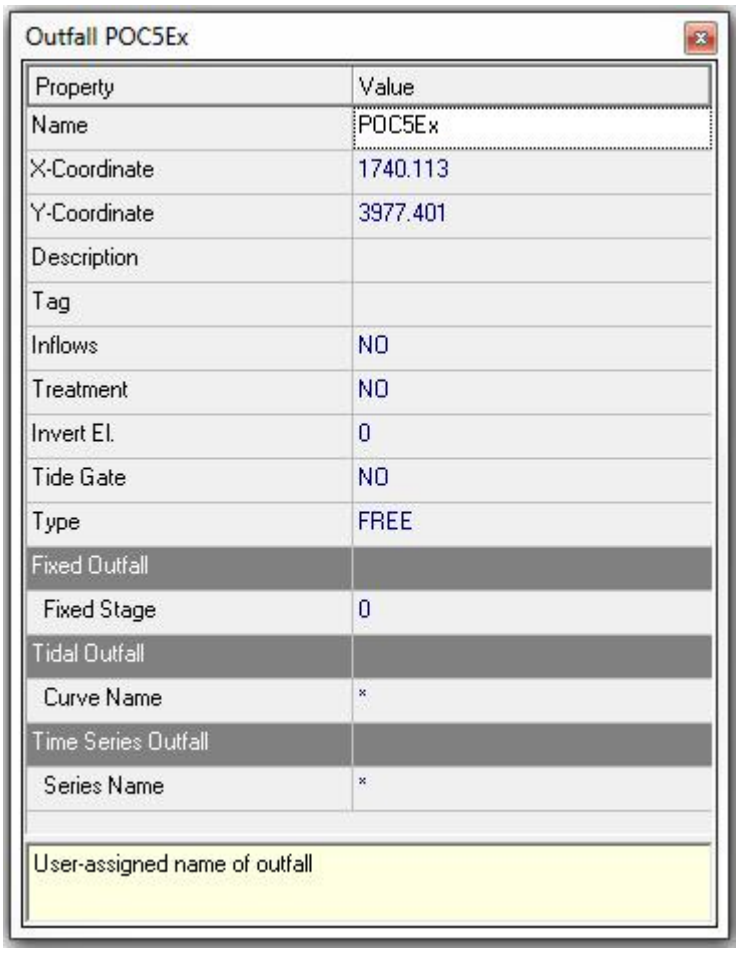
Infiltration Editor

Infiltration Method: GREEN_AMPT

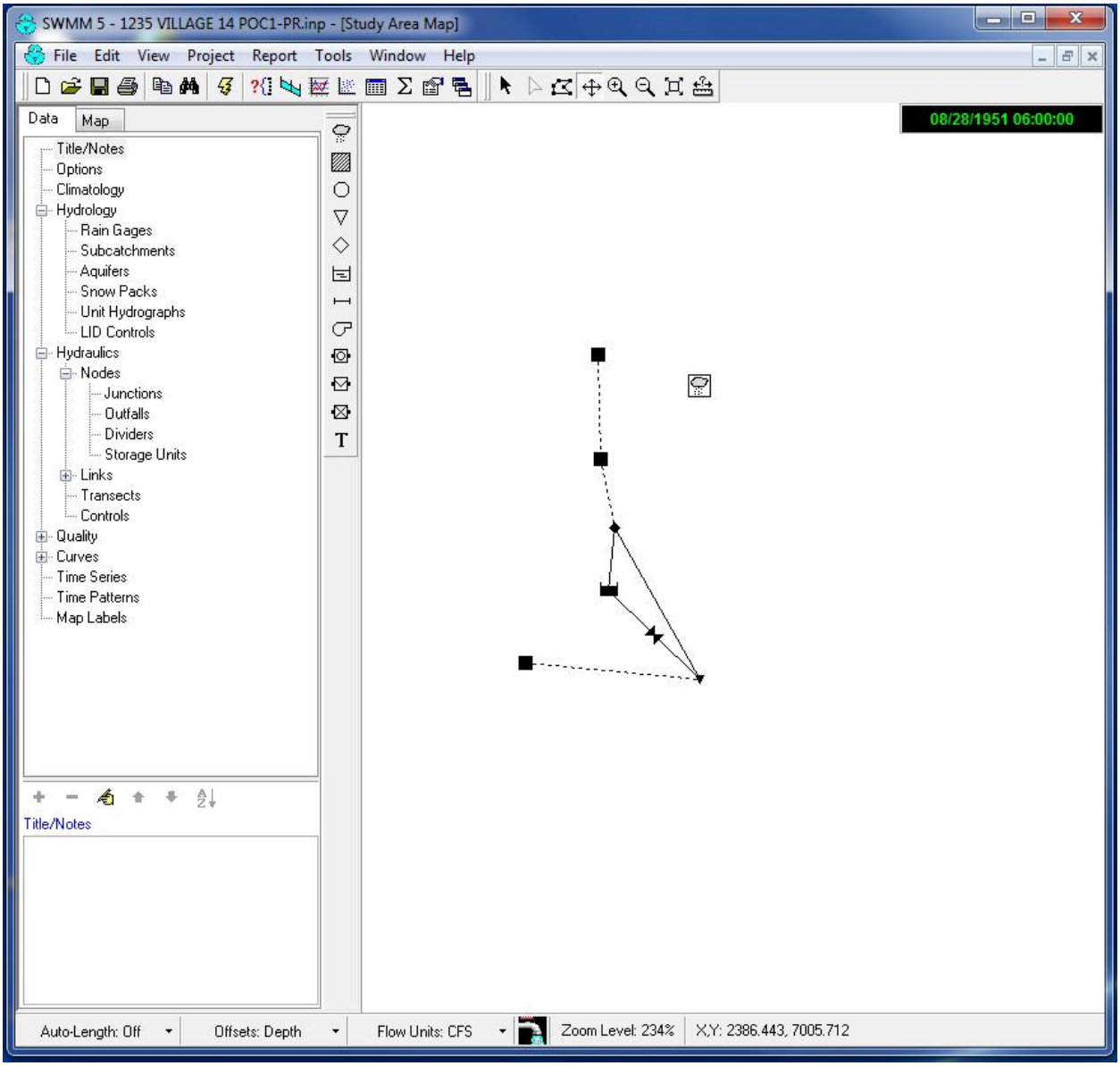
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

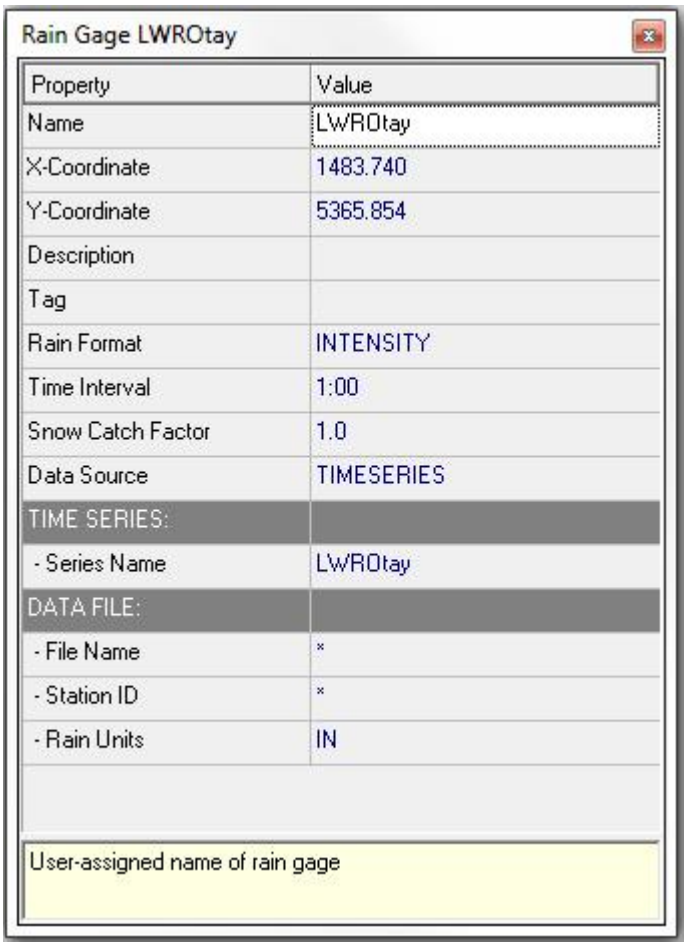
Soil capillary suction head (inches or mm)

OK Cancel Help


Outfall POC5Ex
Property
Value
Name
POC5Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 5 – Developed Condition




Rain Gage LWROtay
Property
Value
Name
LWROtay
X-Coordinate
1483.740
Y-Coordinate
5365.854
Description
Tag
Rain Format
INTENSITY
Time Interval
1:00
Snow Catch Factor
1.0
Data Source
TIMESERIES
TIME SERIES:
- Series Name
LWROtay
DATA FILE:
- File Name
*
- Station ID
*
- Rain Units
IN
User-assigned name of rain gage

Subcatchment POC5PrDevArea

Property	Value
Name	POC5PrDevArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Area Tributary to Basin #1
Tag	
Rain Gage	LWROtay
Outlet	POC5PRBasin
Area	6.52
Width	147
% Slope	3.20
% Imperv	59.3
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC5PRBasin

Property	Value
Name	POC5PRBasin
X-Coordinate	904.472
Y-Coordinate	4959.350
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-5
Area	0.12
Width	72
% Slope	0.1
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC5PRBypass

Property	Value
Name	POC5PRBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to basin
Tag	
Rain Gage	LWROtay
Outlet	POC-5
Area	1090.75
Width	3095
% Slope	13.13
% Imperv	8
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Divider Div-5

Property	Value
Name	Div-5
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.03079
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Storage Unit POC5PRStorage

Property	Value
Name	POC5PRStorage
X-Coordinate	947.368
Y-Coordinate	4198.830
Description	Basin #5
Tag	
Inflows	NO
Treatment	NO
Invert El.	555
Max. Depth	5
Initial Depth	0
Ponded Area	5192
Evap. Factor	1
Infiltration	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin#5

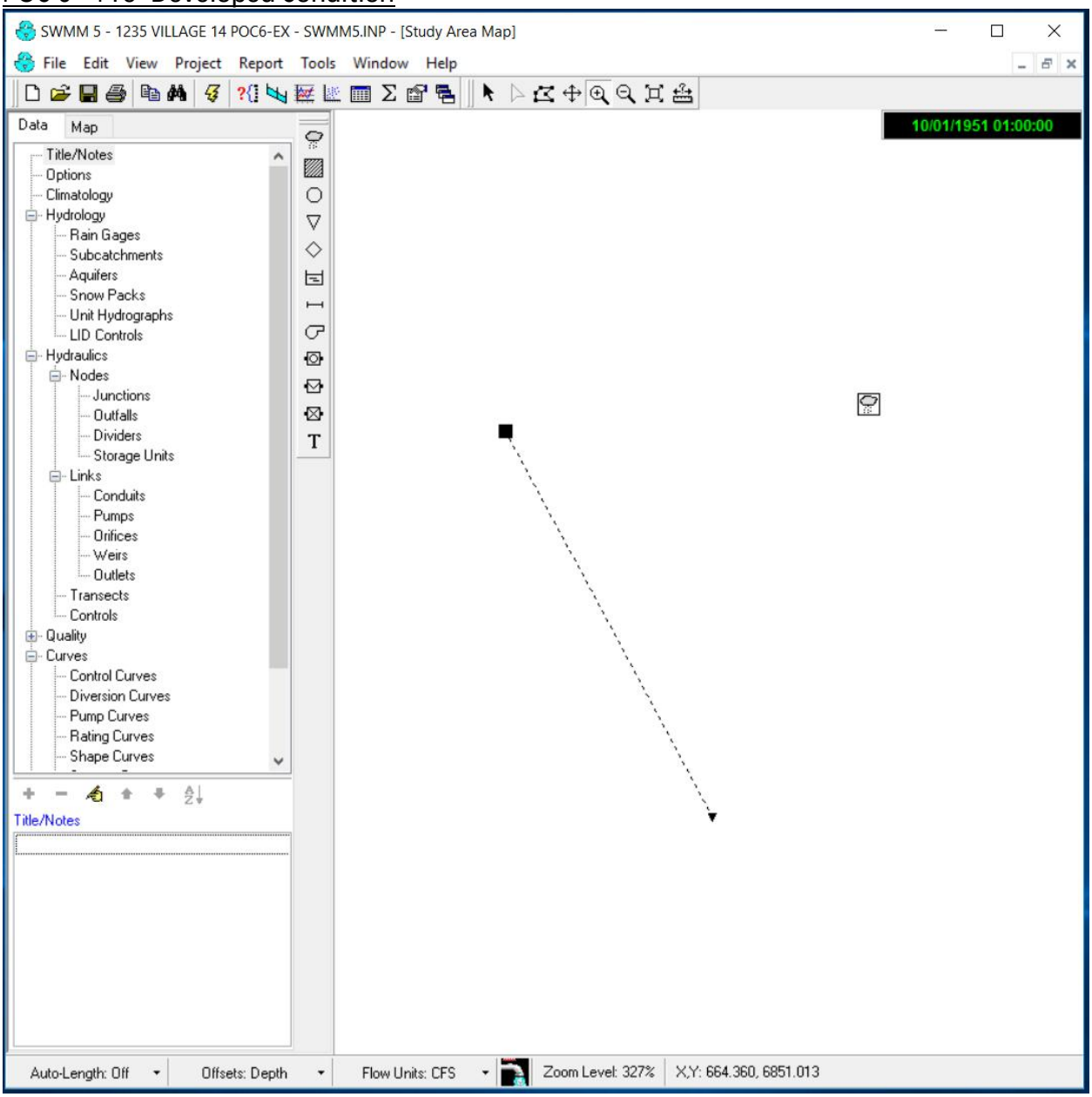
Outlet 1

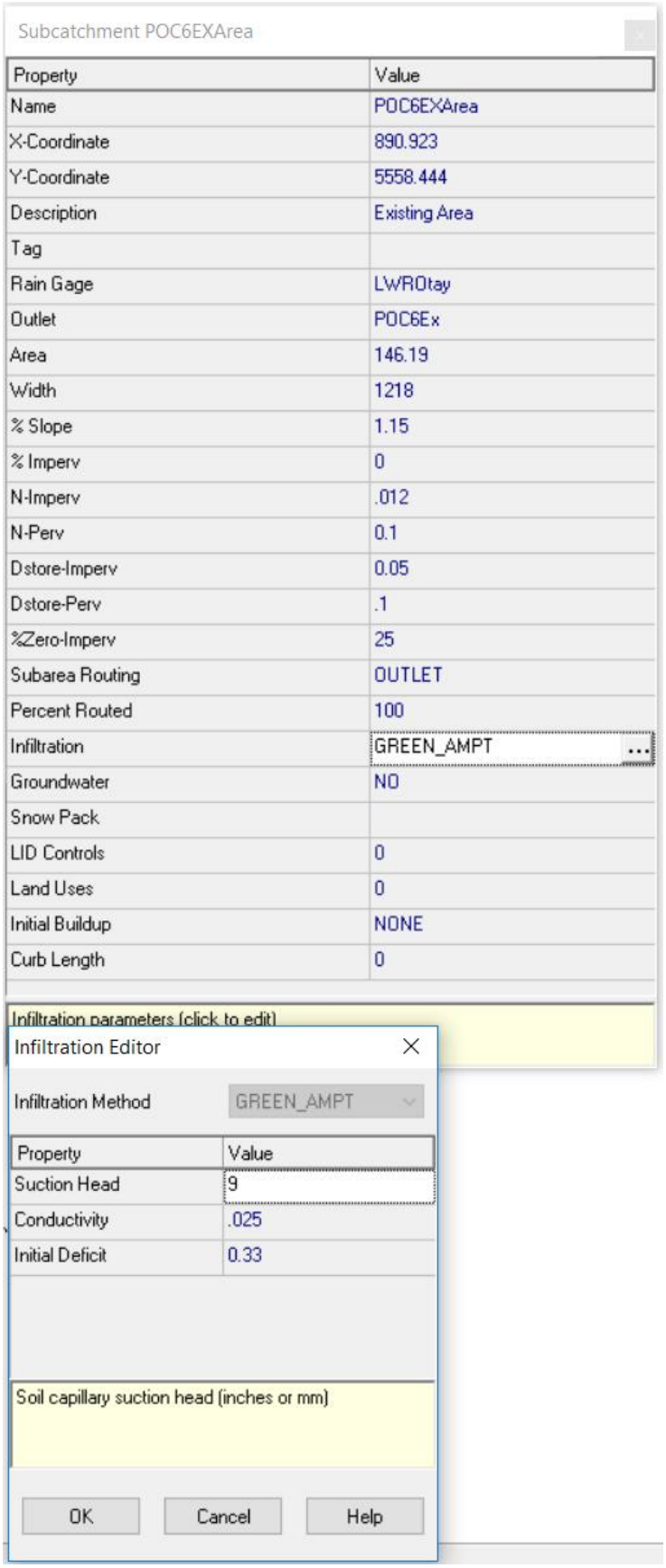
Property	Value
Name	1
Inlet Node	POC5PRStorage
Outlet Node	POC-5
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Basin5Outlet

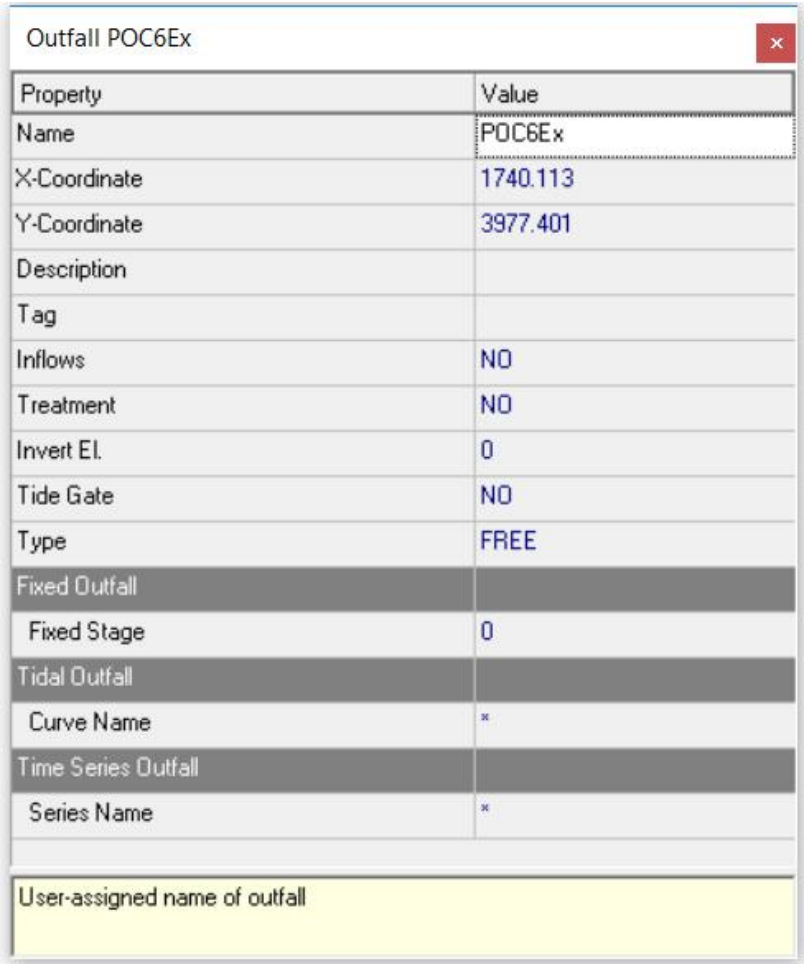
User-assigned name of outlet


Outfall POC-5
Property
Value
Name
POC-5
X-Coordinate
1477.152
Y-Coordinate
3687.566
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

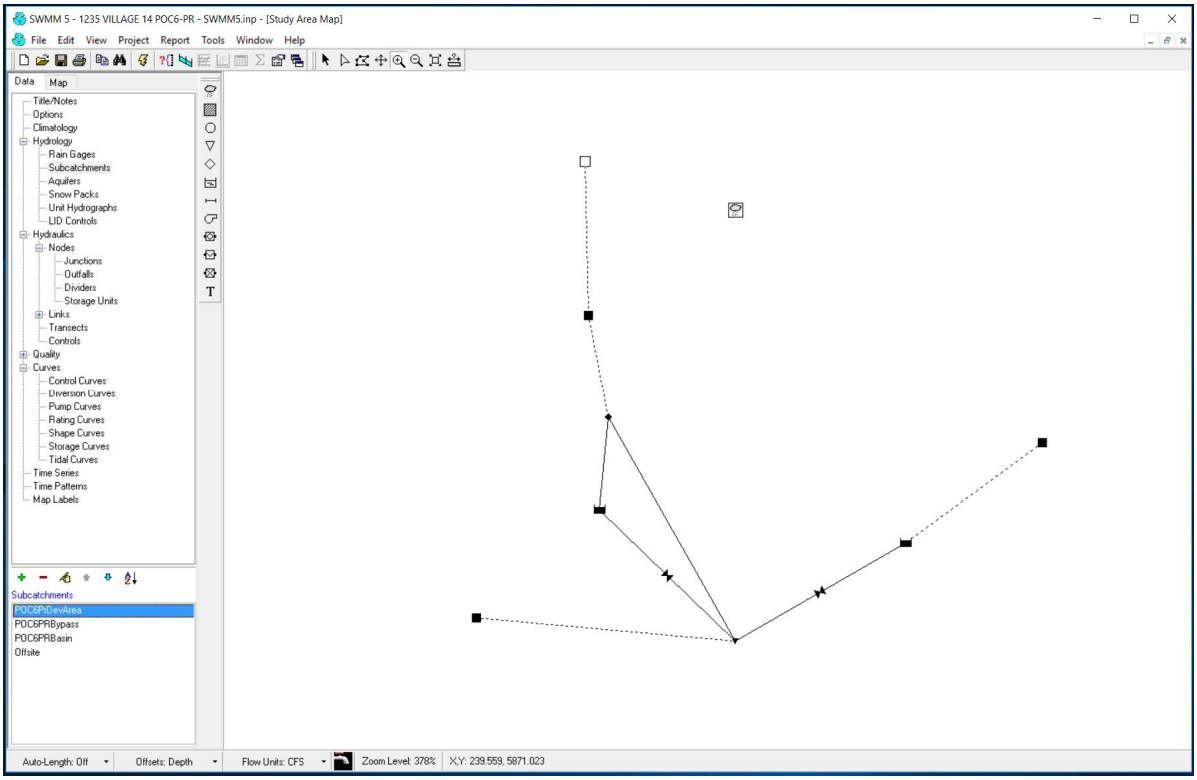
POC 6 – Pre- Developed Condition




Subcatchment POC6EXArea
Property
Value
Name
POC6EXArea
X-Coordinate
890.923
Y-Coordinate
5558.444
Description
Existing Area
Tag
Rain Gage
LWROtay
Outlet
POC6Ex
Area
146.19
Width
1218
% Slope
1.15
% Imperv
0
N-Imperv
.012
N-Perv
0.1
Dstore-Imperv
0.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
0
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration parameters (click to edit)
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
9
Conductivity
.025
Initial Deficit
0.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help


Outfall POC6Ex
Property
Value
Name
POC6Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 6 – Developed Condition



Subcatchment POC6PrDevArea

Property	Value
Name	POC6PrDevArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Area Tributary to Basin #6
Tag	
Rain Gage	LWROtay
Outlet	POC6PRBasin
Area	0.94
Width	26
% Slope	1.59
% Imperv	90
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC6PRBasin

Property	Value
Name	POC6PRBasin
X-Coordinate	904.472
Y-Coordinate	4959.350
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-6
Area	.35
Width	162
% Slope	0.1
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment Offsite

Property	Value
Name	Offsite
X-Coordinate	2677.652
Y-Coordinate	4459.320
Description	
Tag	
Rain Gage	LWROtay
Outlet	OffBasin
Area	144.61
Width	1204
% Slope	1.15
% Imperv	0
N-Imperv	0.012
N-Perv	.1
Dstore-Imperv	.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC6PRBypass

Property	Value
Name	POC6PRBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to basin
Tag	
Rain Gage	LWROtay
Outlet	POC-6
Area	1.03
Width	55
% Slope	2.87
% Imperv	90
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Divider Div-6

Property	Value
Name	Div-6
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.01737
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Storage Unit POC5PRStorage

Property	Value
Name	POC5PRStorage
X-Coordinate	947.368
Y-Coordinate	4198.830
Description	Basin #5
Tag	
Inflows	NO
Treatment	NO
Invert El.	890
Max. Depth	6
Initial Depth	0
Ponded Area	3065
Evap. Factor	1
Infiltration	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin#6

Storage Unit OFFBasin

Property	Value
Name	OFFBasin
X-Coordinate	2142.122
Y-Coordinate	4067.971
Description	Offiste ponding east of PVR.
Tag	
Inflows	NO
Treatment	NO
Invert El.	881
Max. Depth	7
Initial Depth	0
Ponded Area	3601
Evap. Factor	1
Infiltration	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	OffisteBasin

Outlet 1

Property	Value
Name	1
Inlet Node	POC5PRStorage
Outlet Node	POC-6
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Basin6Outlet

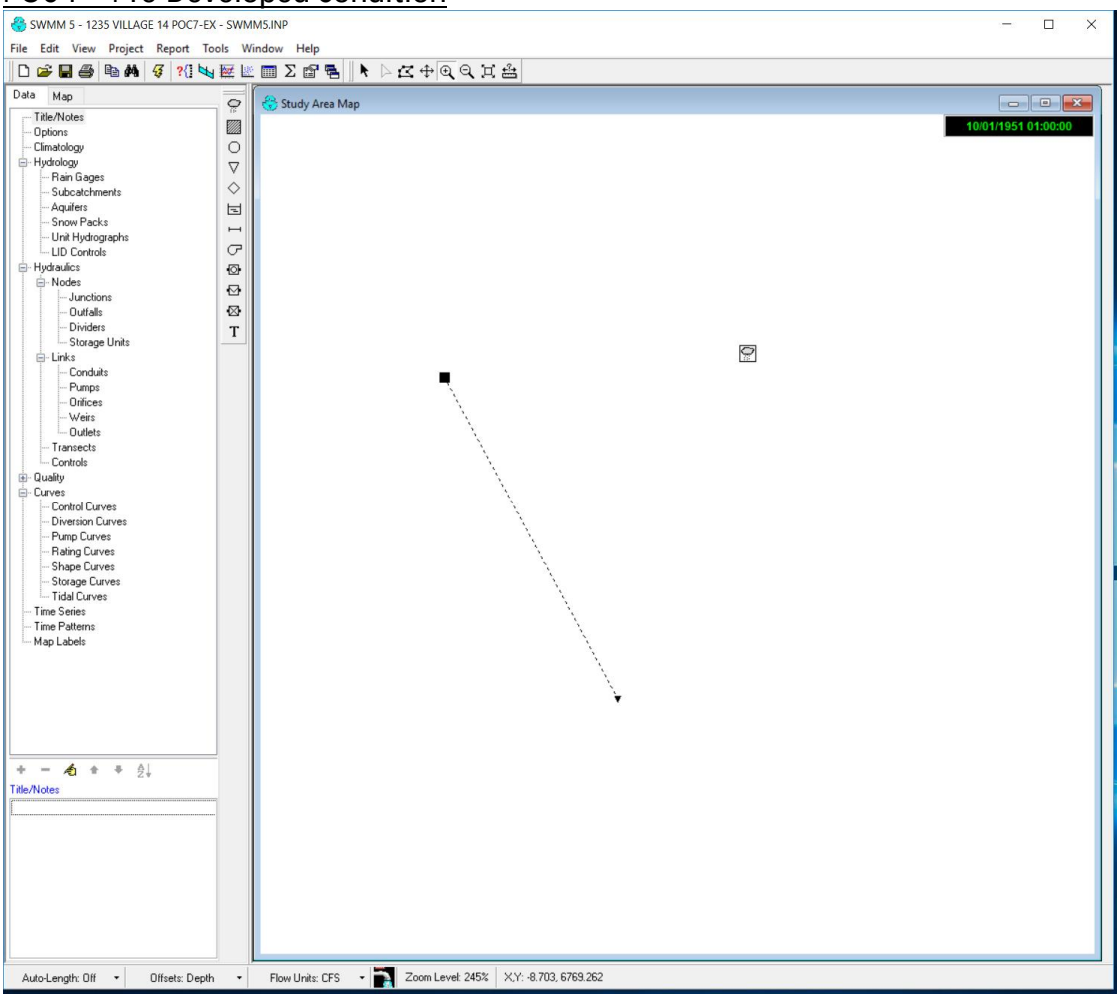
User-assigned name of outlet

Outfall POC-6

Property	Value
Name	POC-6
X-Coordinate	1477.152
Y-Coordinate	3687.566
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

POC 7 – Pre-Developed Condition



Subcatchment POC7EXArea

Property	Value
Name	POC7EXArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Existing Area
Tag	
Rain Gage	LWROtay
Outlet	POC7Ex
Area	148.33
Width	2228
% Slope	2.41
% Imperv	0
N-Imperv	.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

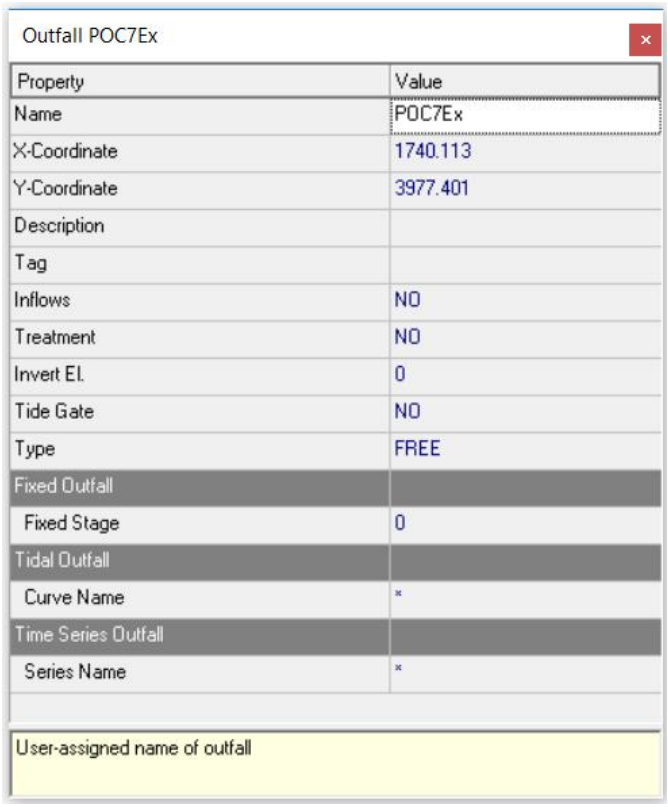
Infiltration Editor

Infiltration Method: GREEN_AMPT

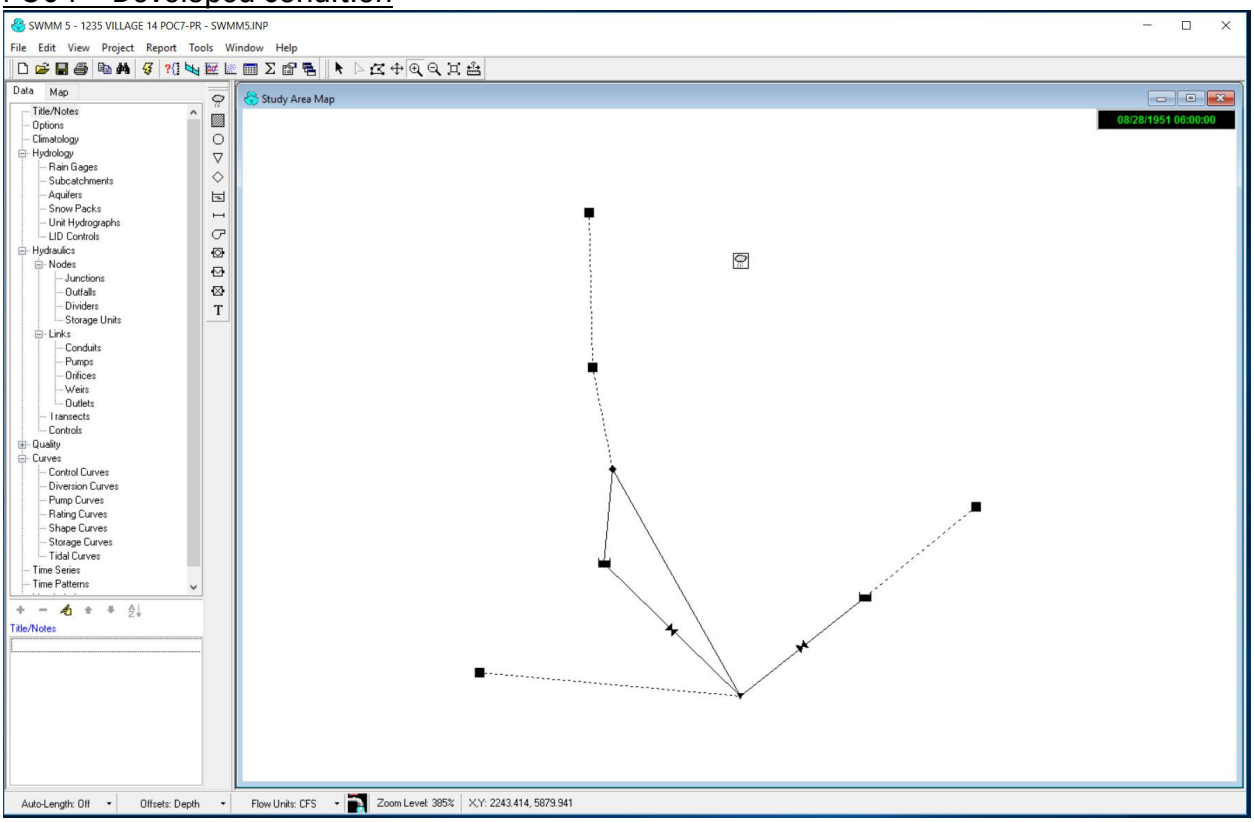
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help


Outfall POC7Ex
Property
Value
Name
POC7Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 7 – Developed Condition



Subcatchment POC7PrDevArea

Property	Value
Name	POC7PrDevArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Area Tributary to Basin #7
Tag	
Rain Gage	LWROtay
Outlet	POC7PRBasin
Area	.92
Width	59
% Slope	1.26
% Imperv	90
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC7PRBasin

Property	Value
Name	POC7PRBasin
X-Coordinate	904.472
Y-Coordinate	4959.350
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-7
Area	.24
Width	116
% Slope	0.1
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC7PRBypass

Property	Value
Name	POC7PRBypass
X-Coordinate	467.751
Y-Coordinate	3777.964
Description	Additional area not tributary to bas
Tag	
Rain Gage	LWROtay
Outlet	POC-7
Area	147.61
Width	2217
% Slope	2.41
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC7MWS

Property	Value
Name	POC7MWS
X-Coordinate	2389.289
Y-Coordinate	4418.126
Description	
Tag	
Rain Gage	LWROtay
Outlet	MWSstorage
Area	0.94
Width	69
% Slope	1.95
% Imperv	90
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

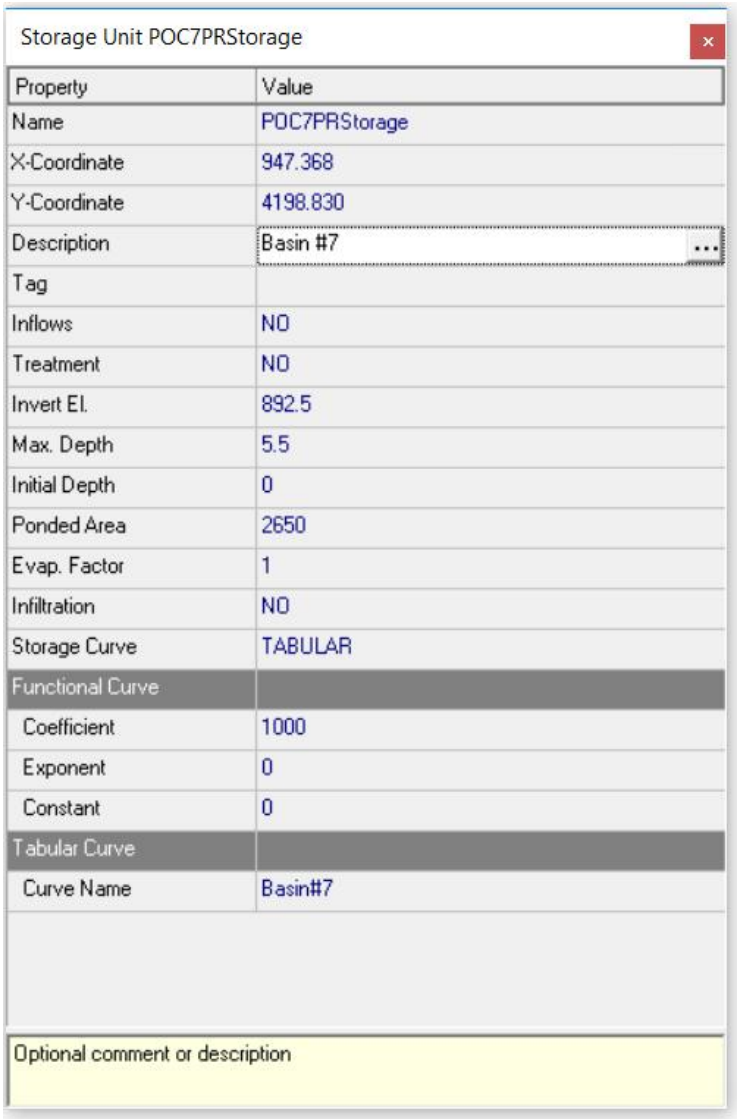
Soil capillary suction head (inches or mm)

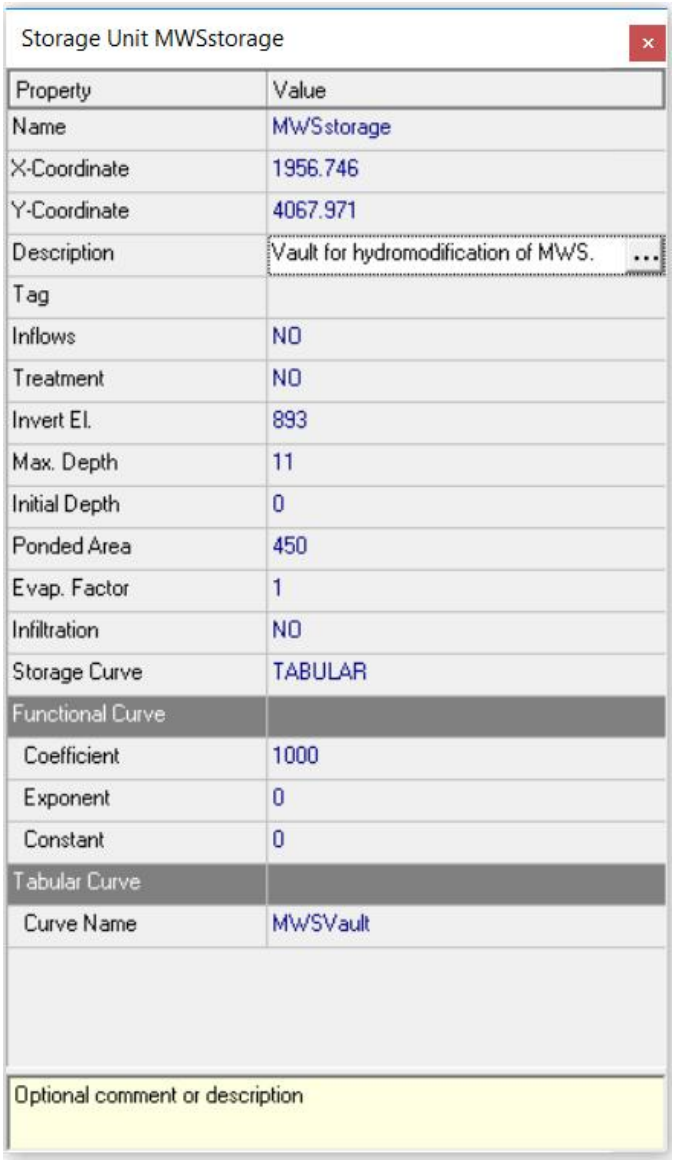
OK Cancel Help

Divider Div-7

Property	Value
Name	Div-7
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.01383
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Depth in excess of maximum depth before flooding occurs (ft)


Storage Unit POC7PRStorage
Property
Value
Name
POC7PRStorage
X-Coordinate
947.368
Y-Coordinate
4198.830
Description
Basin #7
Tag
Inflows
NO
Treatment
NO
Invert El.
892.5
Max. Depth
5.5
Initial Depth
0
Ponded Area
2650
Evap. Factor
1
Infiltration
NO
Storage Curve
TABULAR
Functional Curve
Coefficient
1000
Exponent
0
Constant
0
Tabular Curve
Curve Name
Basin#7
Optional comment or description


Storage Unit MWSstorage
Property
Value
Name
MWSstorage
X-Coordinate
1956.746
Y-Coordinate
4067.971
Description
Vault for hydromodification of MWS.
Tag
Inflows
NO
Treatment
NO
Invert El.
893
Max. Depth
11
Initial Depth
0
Ponded Area
450
Evap. Factor
1
Infiltration
NO
Storage Curve
TABULAR
Functional Curve
Coefficient
1000
Exponent
0
Constant
0
Tabular Curve
Curve Name
MWSVault
Optional comment or description

Outlet 1

Property	Value
Name	1
Inlet Node	POC6PRStorage
Outlet Node	POC-7
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Basin7Outlet

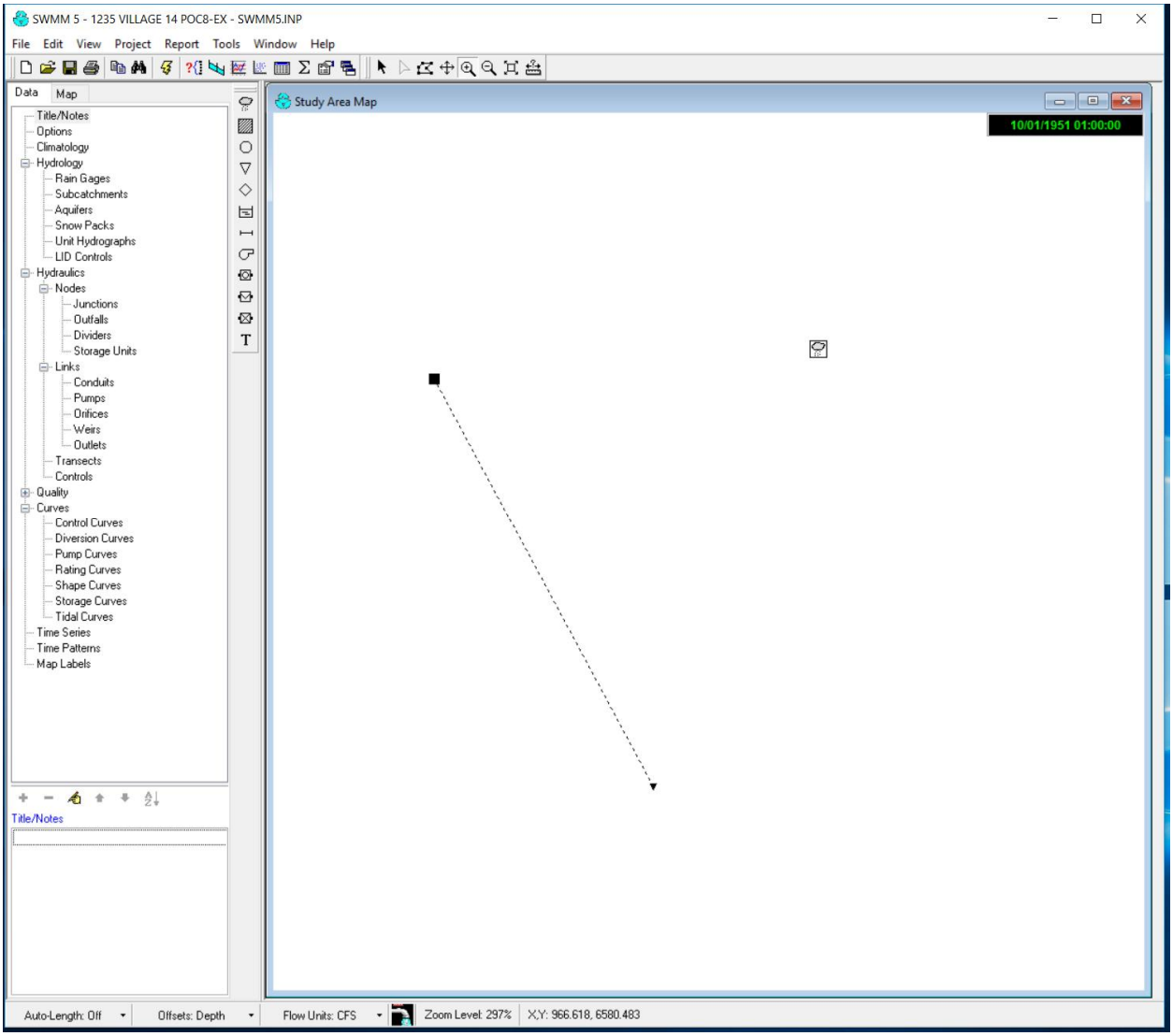
User-assigned name of outlet

Outfall POC-7

Property	Value
Name	POC-7
X-Coordinate	1477.152
Y-Coordinate	3687.566
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

POC 8 – Pre-Developed Condition



Subcatchment POC8EXArea

Property	Value
Name	POC8EXArea
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Existing Area
Tag	
Rain Gage	LWROtay
Outlet	POC8Ex
Area	0.29
Width	36
% Slope	1.29
% Imperv	0
N-Imperv	.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

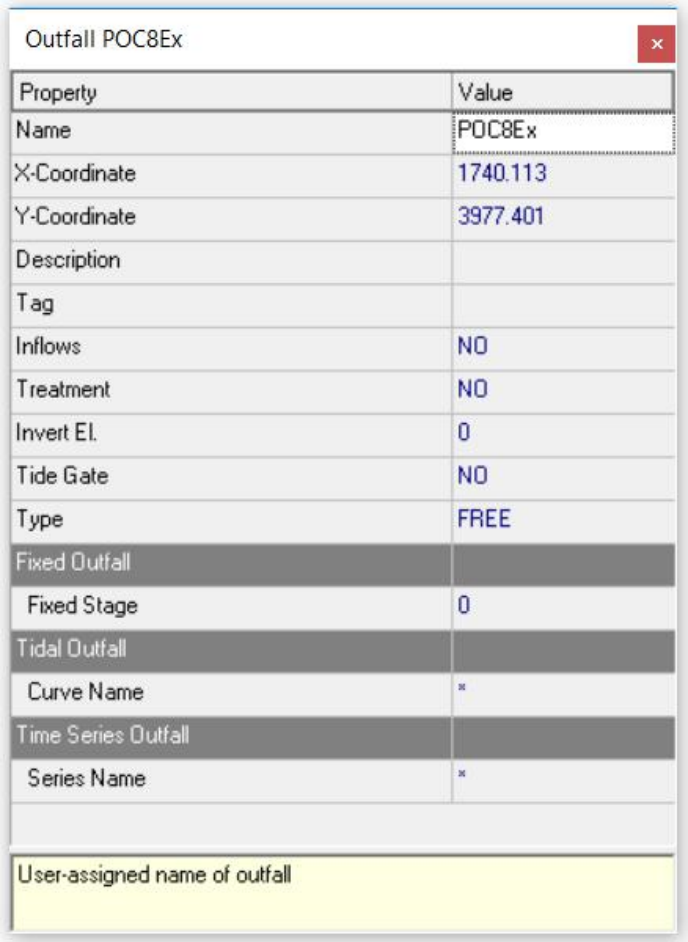
Infiltration Editor

Infiltration Method: GREEN_AMPT

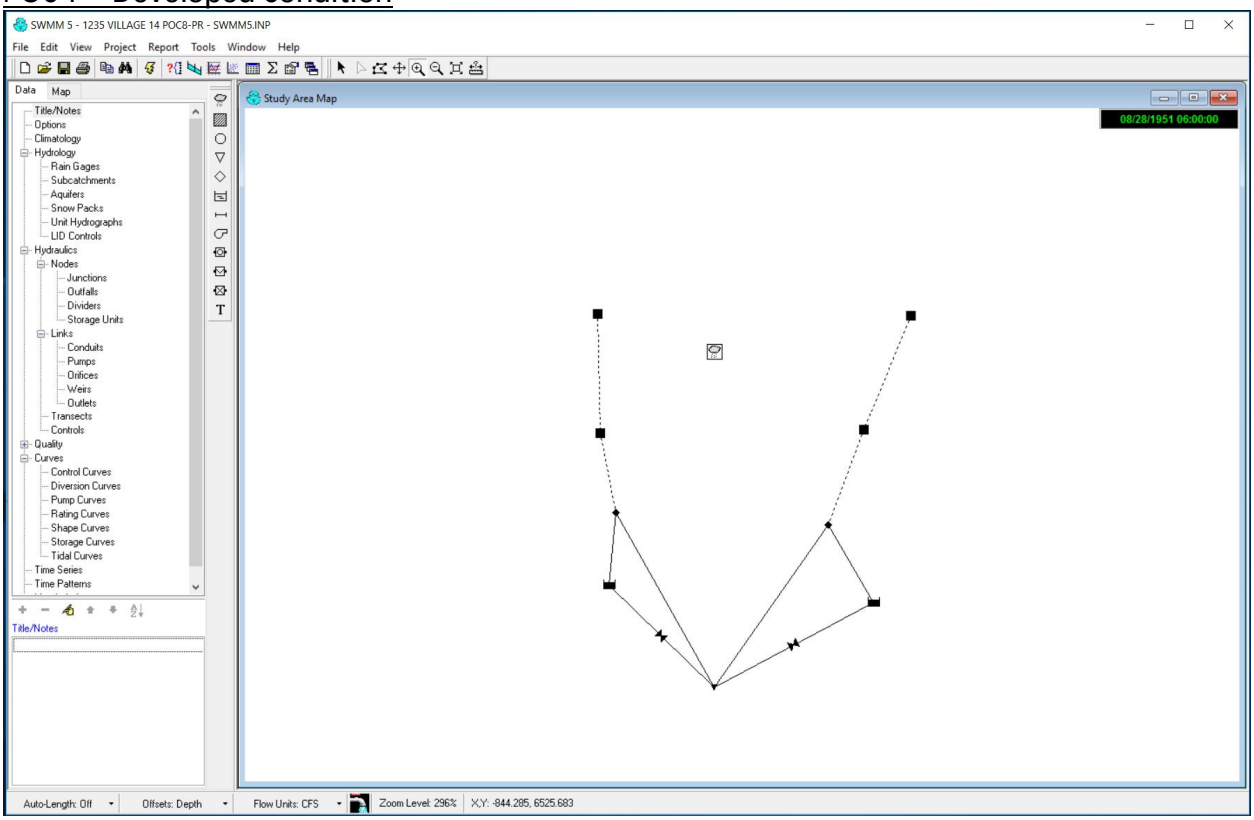
Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help


Outfall POC8Ex
Property
Value
Name
POC8Ex
X-Coordinate
1740.113
Y-Coordinate
3977.401
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

POC 7 – Developed Condition



Subcatchment POC8PrDevArea8

Property	Value
Name	POC8PrDevArea8
X-Coordinate	890.923
Y-Coordinate	5558.444
Description	Area Tributary to Basin #8
Tag	
Rain Gage	LWROtay
Outlet	POC8PRBasin8
Area	.11
Width	14
% Slope	1.19
% Imperv	90
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC8PRBasin8

Property	Value
Name	POC8PRBasin8
X-Coordinate	904.472
Y-Coordinate	4959.350
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-8
Area	0.04
Width	5
% Slope	1.19
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC8PrDevArea9

Property	Value
Name	POC8PrDevArea9
X-Coordinate	2461.380
Y-Coordinate	5550.978
Description	
Tag	
Rain Gage	LWROtay
Outlet	POC8PrBasin9
Area	.11
Width	14
% Slope	1.19
% Imperv	90
N-Imperv	.012
N-Perv	0.10
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment POC8PRBasin9

Property	Value
Name	POC8PRBasin9
X-Coordinate	2224.511
Y-Coordinate	4974.253
Description	
Tag	
Rain Gage	LWROtay
Outlet	Div-9
Area	.04
Width	5
% Slope	1.19
% Imperv	0
N-Imperv	0.012
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Divider Div-8

Property	Value
Name	Div-8
X-Coordinate	981.151
Y-Coordinate	4560.296
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	1
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-1
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.0121
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Divider Div-9

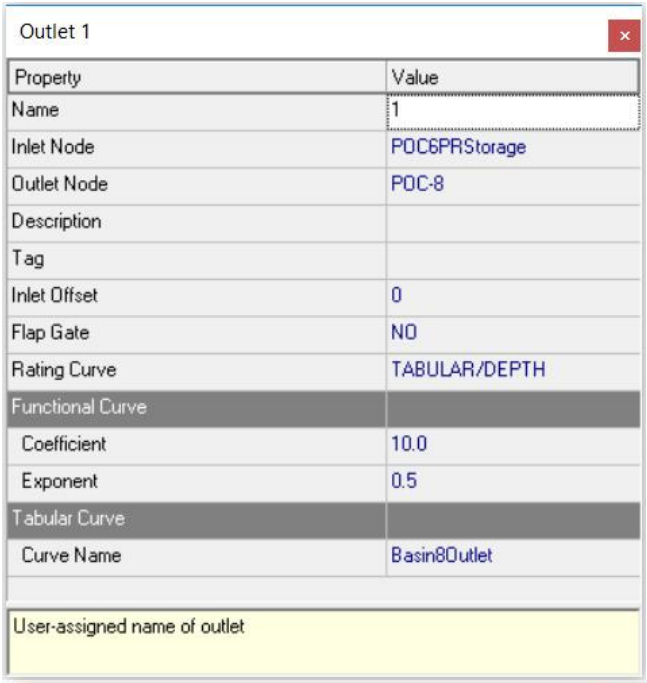
Property	Value
Name	Div-9
X-Coordinate	2049.434
Y-Coordinate	4500.515
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	1
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	Bypass-2
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.0121
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

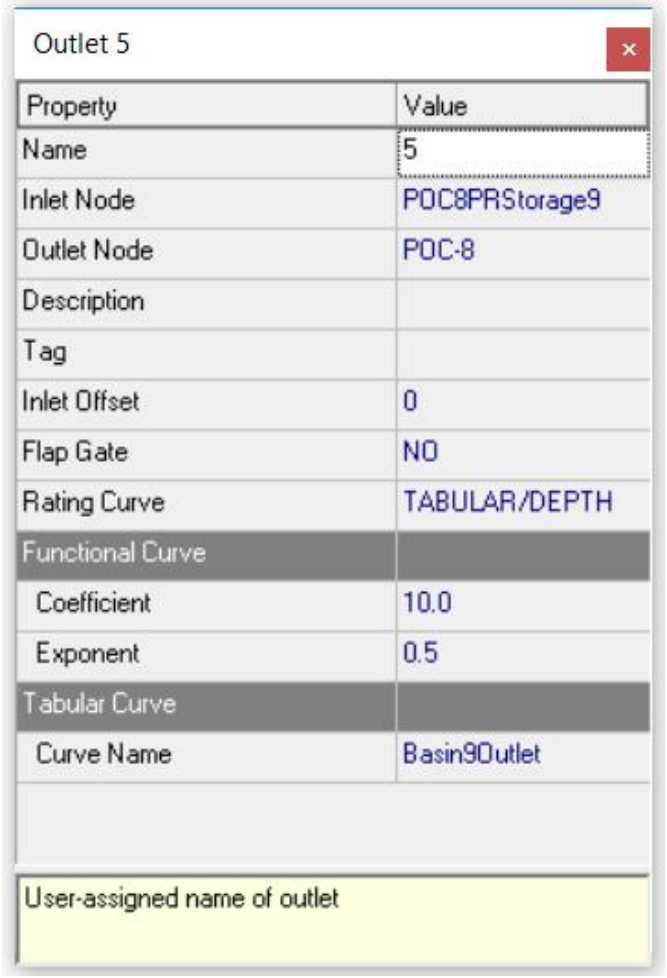
Storage Unit POC8PRStorage8

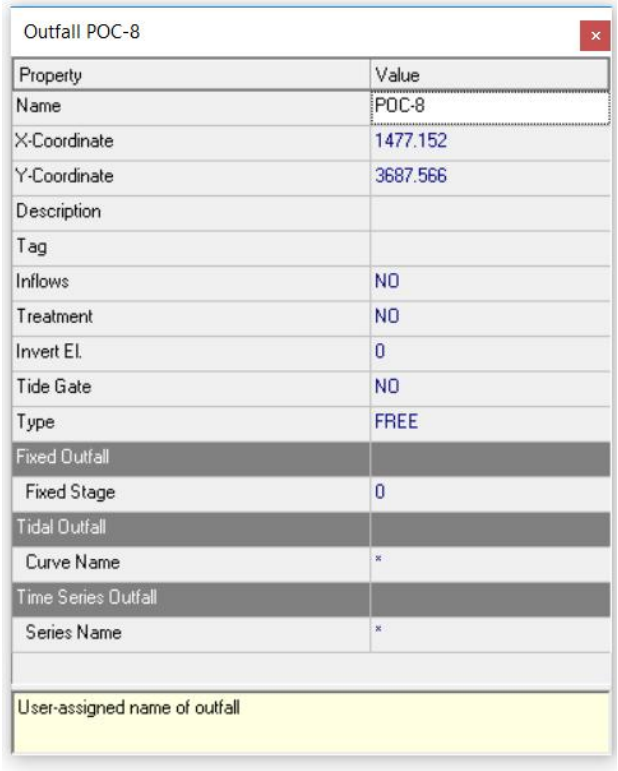
Property	Value
Name	POC8PRStorage8
X-Coordinate	947.368
Y-Coordinate	4198.830
Description	Basin #8
Tag	
Inflows	NO
Treatment	NO
Invert El.	899.5
Max. Depth	1.5
Initial Depth	0
Ponded Area	160
Evap. Factor	1
Infiltration	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin#8

Storage Unit POC8PRStorage9

Property	Value
Name	POC8PRStorage9
X-Coordinate	2276.004
Y-Coordinate	4109.166
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	899.5
Max. Depth	1.5
Initial Depth	0
Ponded Area	160
Evap. Factor	1
Infiltration	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin#9


Outlet 1
Property
Value
Name
1
Inlet Node
POC6PRStorage
Outlet Node
POC-8
Description
Tag
Inlet Offset
0
Flap Gate
NO
Rating Curve
TABULAR/DEPTH
Functional Curve
Coefficient
10.0
Exponent
0.5
Tabular Curve
Curve Name
Basin8Outlet
User-assigned name of outlet


Outlet 5
Property
Value
Name
5
Inlet Node
POC8PRStorage9
Outlet Node
POC-8
Description
Tag
Inlet Offset
0
Flap Gate
NO
Rating Curve
TABULAR/DEPTH
Functional Curve
Coefficient
10.0
Exponent
0.5
Tabular Curve
Curve Name
Basin9Outlet
User-assigned name of outlet


Outfall POC-8
Property
Value
Name
POC-8
X-Coordinate
1477.152
Y-Coordinate
3687.566
Description
Tag
Inflows
NO
Treatment
NO
Invert El.
0
Tide Gate
NO
Type
FREE
Fixed Outfall
Fixed Stage
0
Tidal Outfall
Curve Name
*
Time Series Outfall
Series Name
*
User-assigned name of outfall

EXPLANATION OF SELECTED VARIABLES

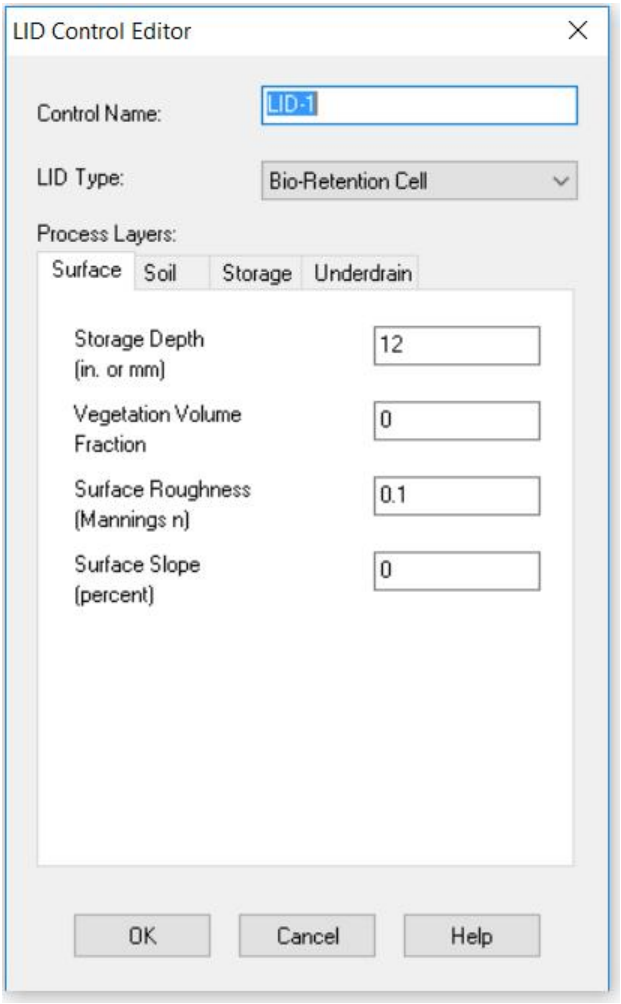
Parameters for the pre- and post-developed models include soil types C & D in accordance with the San Diego County Hydrology Manual and the USGS Soil Survey Map (attached at the end of this appendix). Suction head, conductivity and initial deficit corresponds to average values expected for the soil types, according to sources consulted, professional experience, and approximate values obtained by the interim Orange County modeling approach.

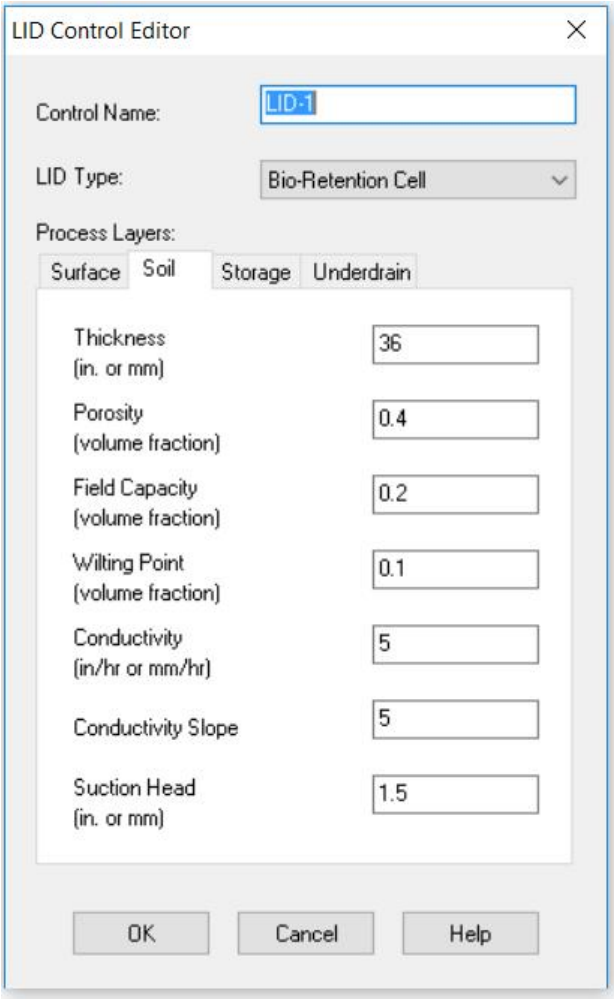
H&A selected infiltration values, such that the percentage of total precipitation that becomes runoff, is realistic for soil type D and slightly smaller than measured values for Southern California watersheds.

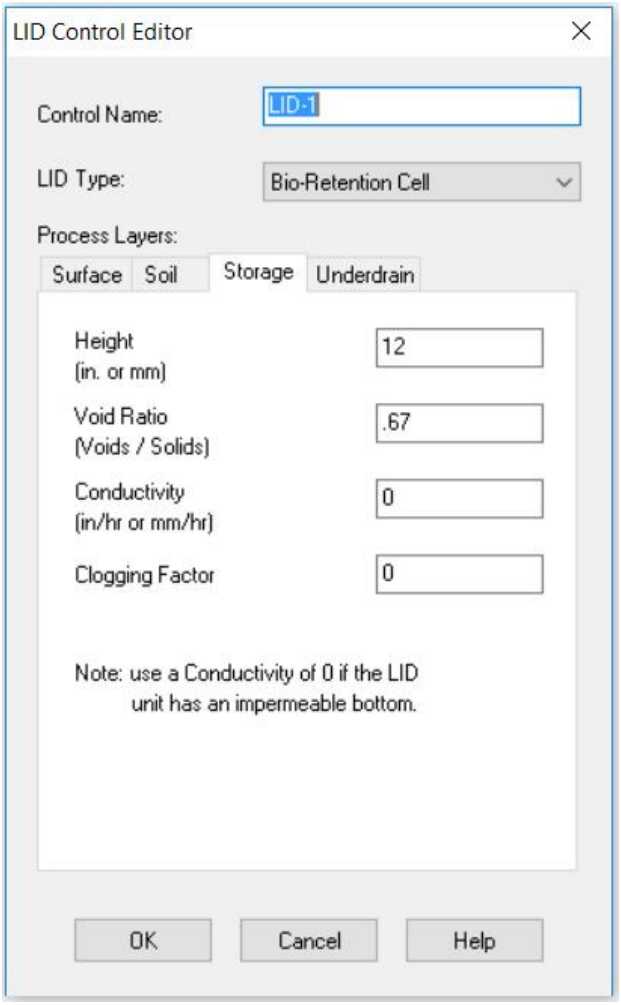
Selection of a Kinematic Approach: As the continuous model is based on hourly rainfall, and the time of concentration for the pre-development and post-development conditions is significantly smaller than 60 minutes, precise routing of the flows through the impervious surfaces, the underdrain pipe system, and the discharge pipe was considered unnecessary. The truncation error of the precipitation into hourly steps is much more significant than the precise routing in a system where the time of concentration is much smaller than 1 hour.

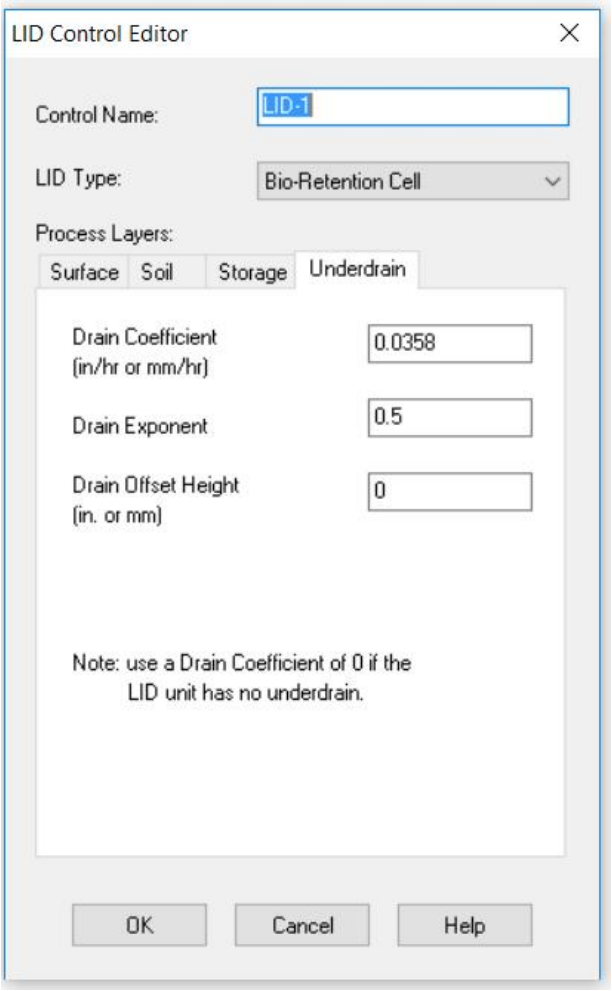
The area of 'POC1PRDevArea' + POC1PRBasin must be equal to the area of the development tributary to that particular biofiltration facility. Five (5) decimal places were given regarding the areas of the bio-retention to insure that the area used by the program for the LID subroutine corresponds exactly with these tributaries.

BIOFILTRATION POC1: LID EDITOR

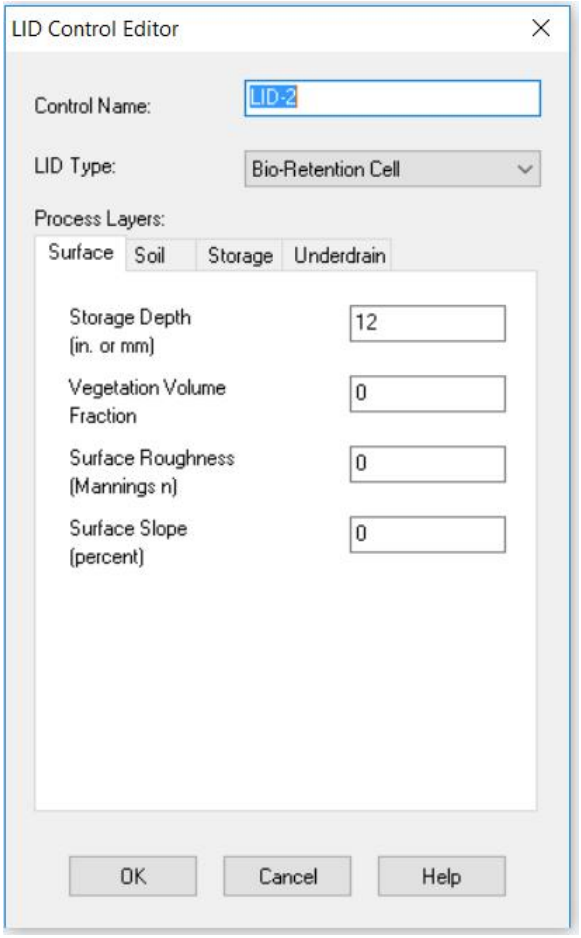


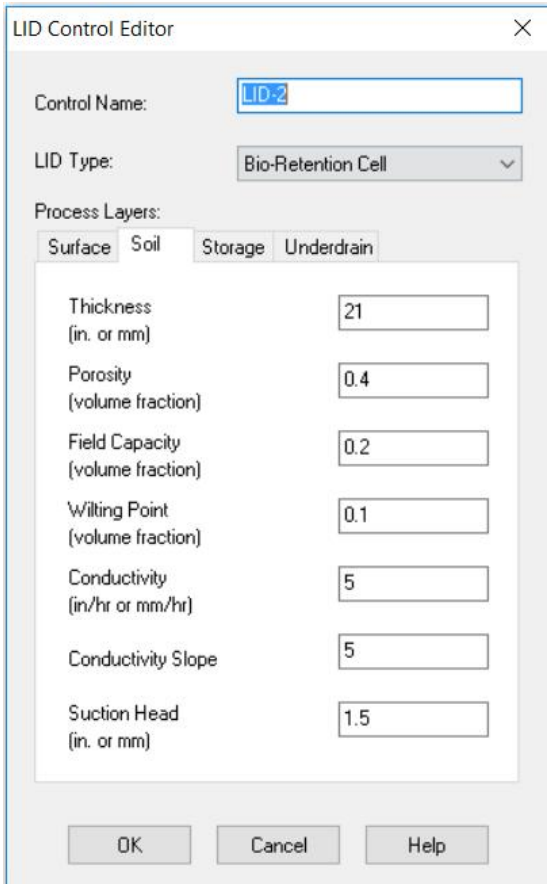


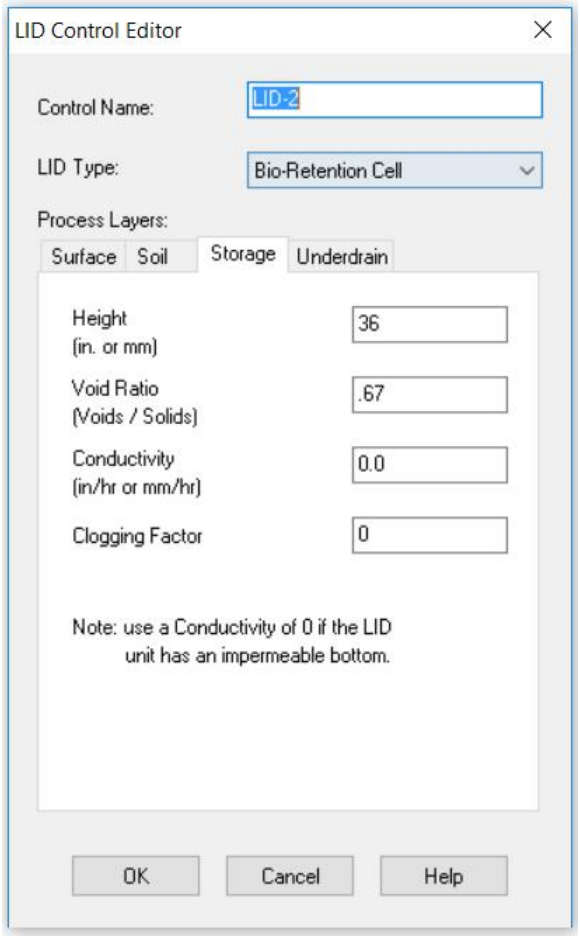

LID Control Editor
Control Name:
LID-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
12
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help

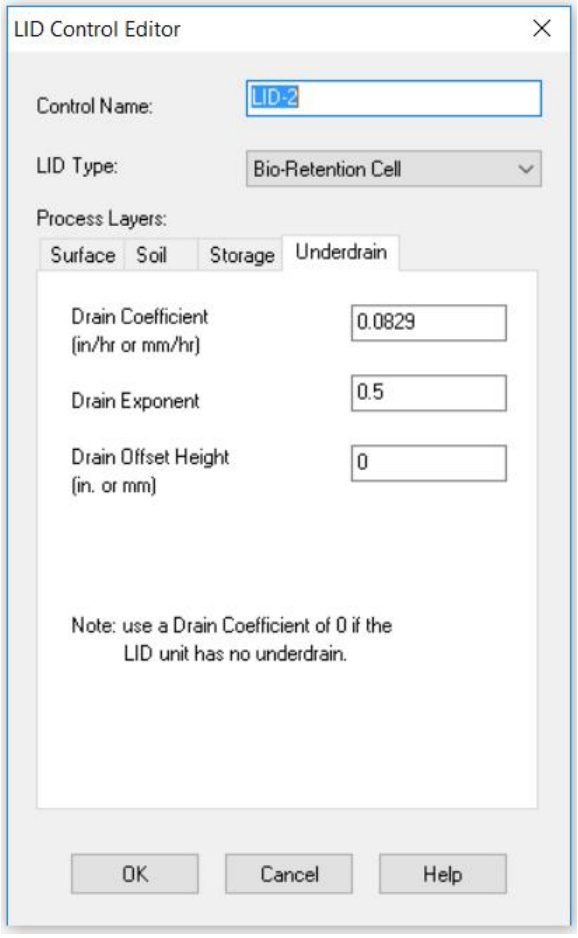

LID Control Editor
Control Name:
LID-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0358
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

BIOFILTRATION POC2: LID EDITOR

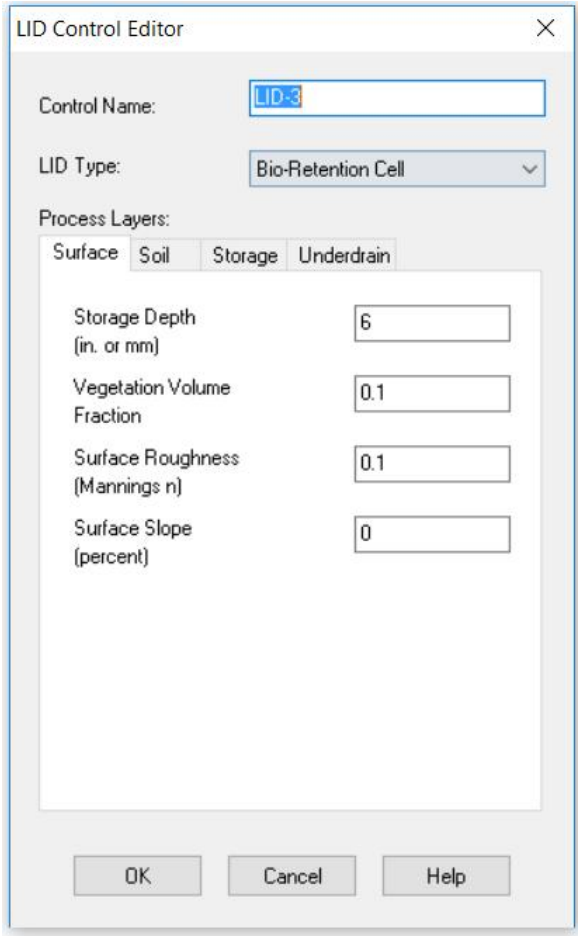


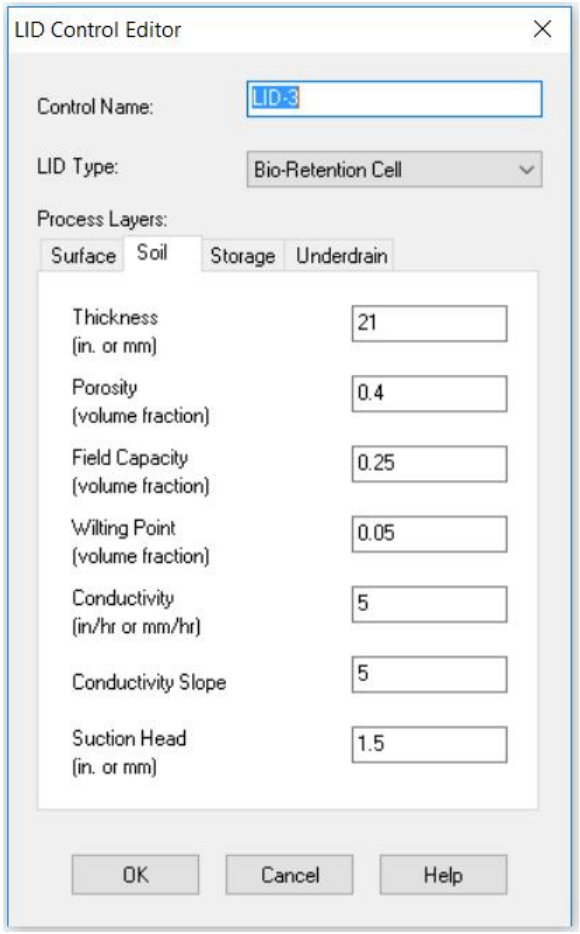


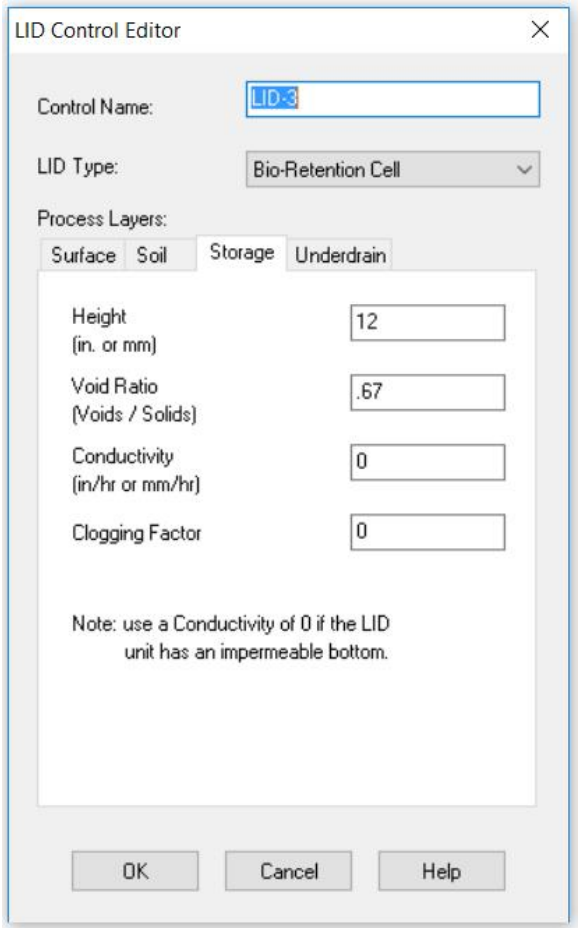

LID Control Editor
Control Name:
LID-2
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
36
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0.0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help

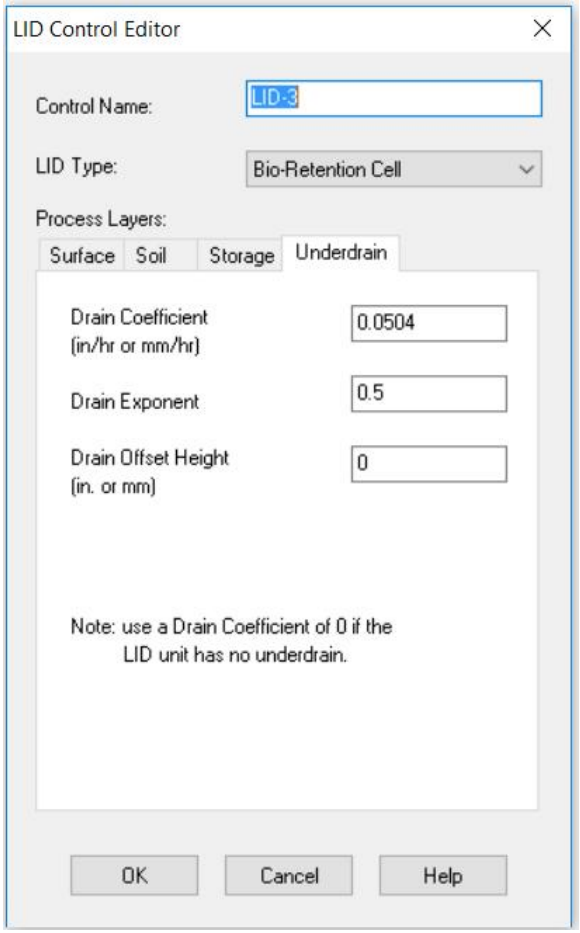

LID Control Editor
Control Name:
LID-2
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0829
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

BIOFILTRATION POC3: LID EDITOR

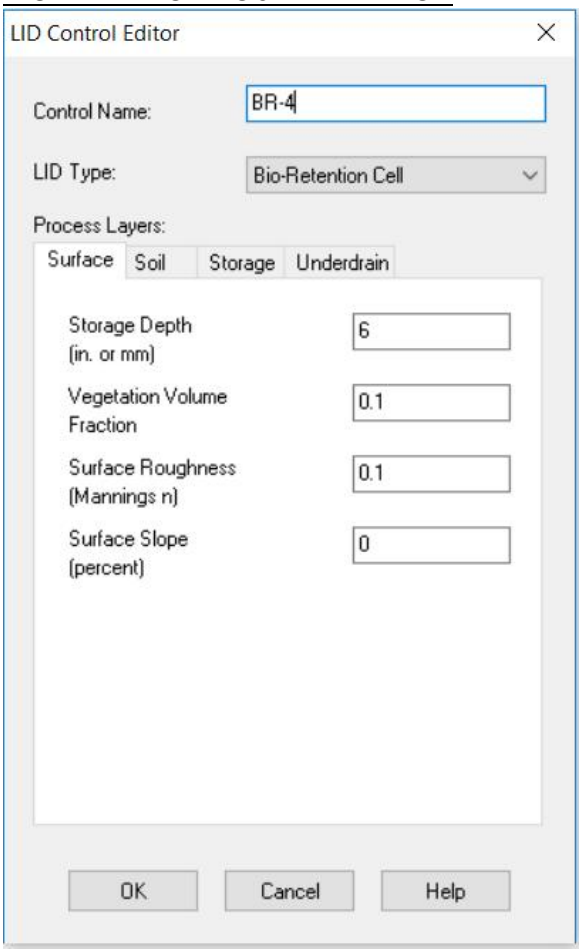


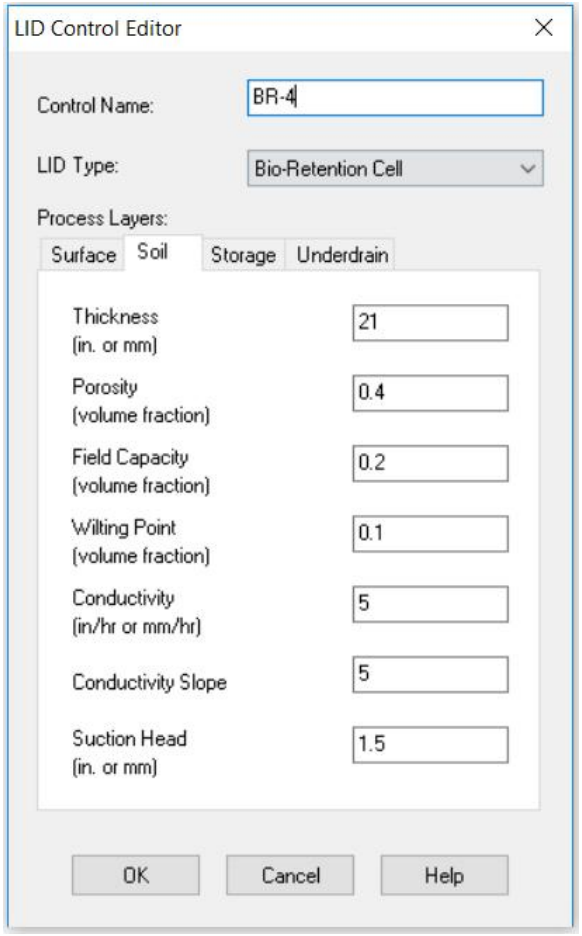


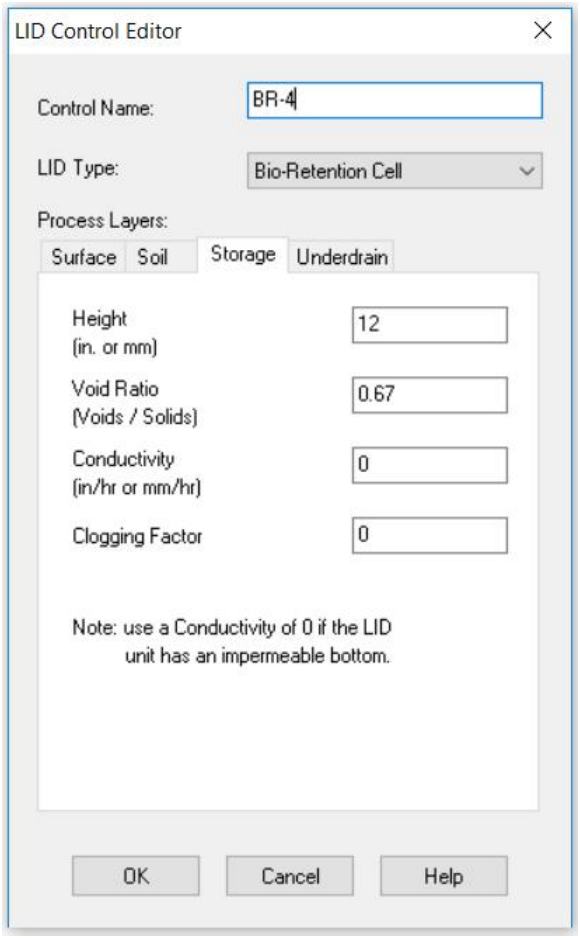

LID Control Editor
Control Name:
LID-3
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
12
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help

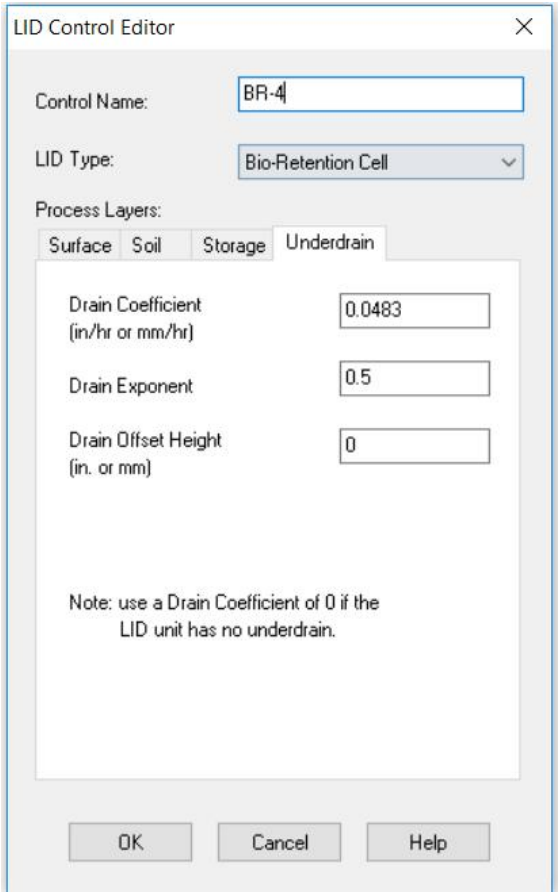

LID Control Editor
Control Name:
LID-3
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0504
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

BIOFILTRATION POC4: LID EDITOR

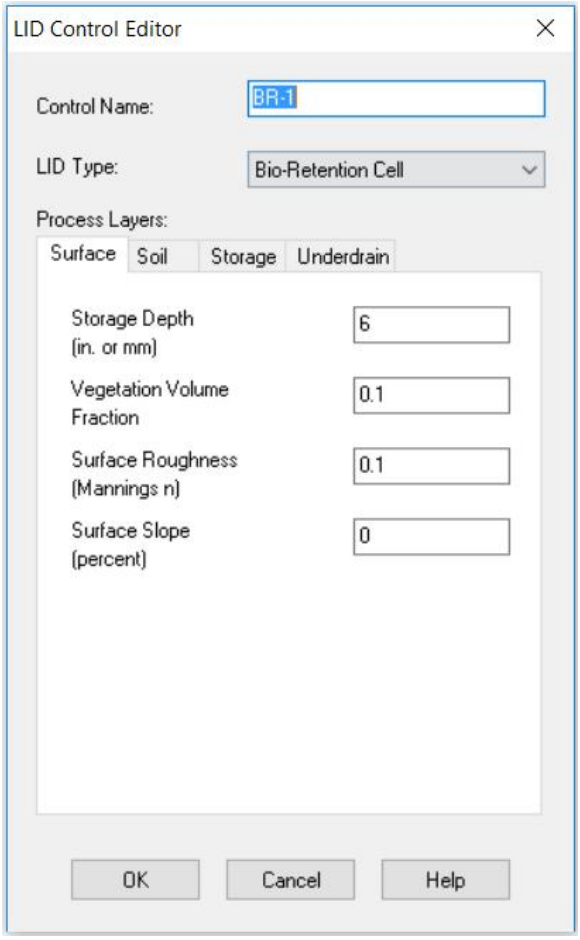


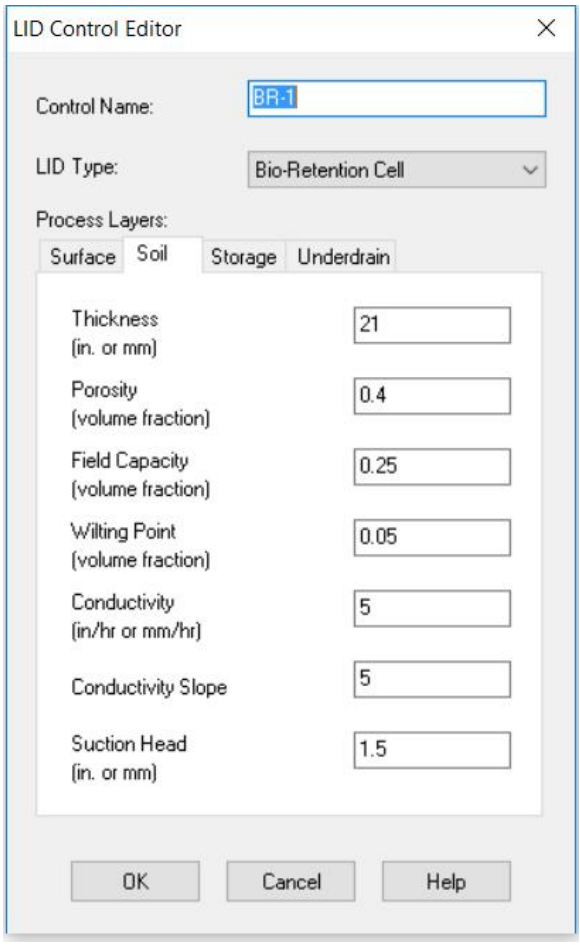


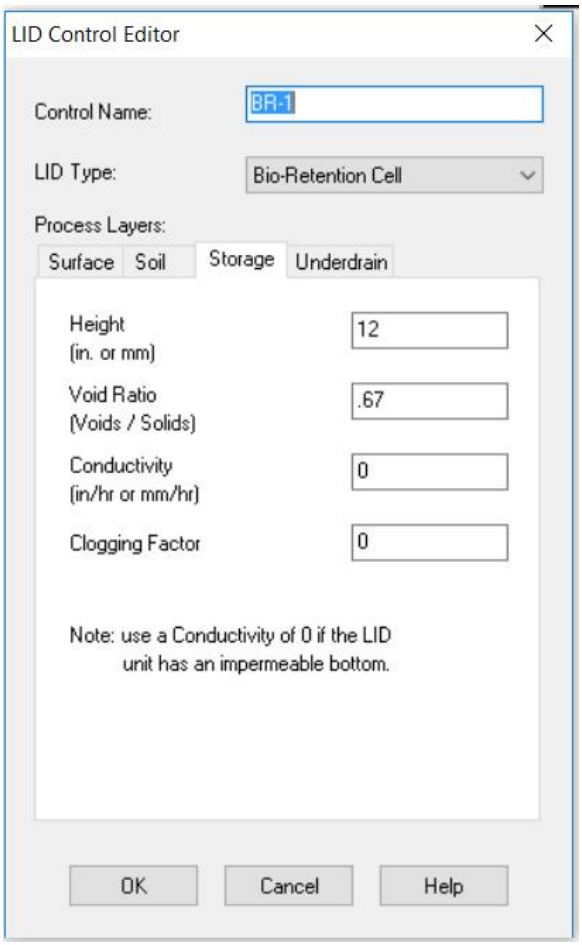

LID Control Editor
Control Name:
BR-4
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
12
Void Ratio
(Voids / Solids)
0.67
Conductivity
(in/hr or mm/hr)
0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help


LID Control Editor
Control Name:
BR-4
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0483
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

BIOFILTRATION POC5: LID EDITOR

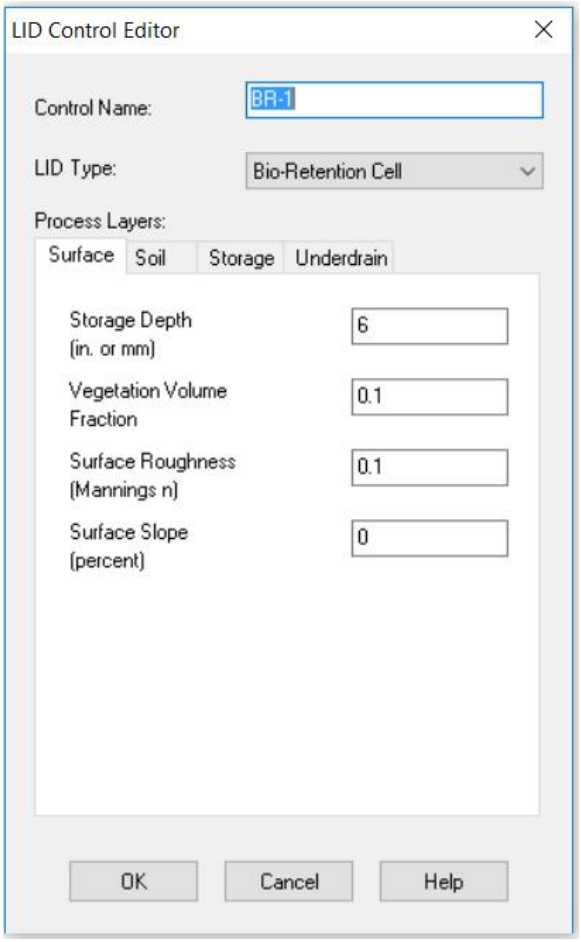


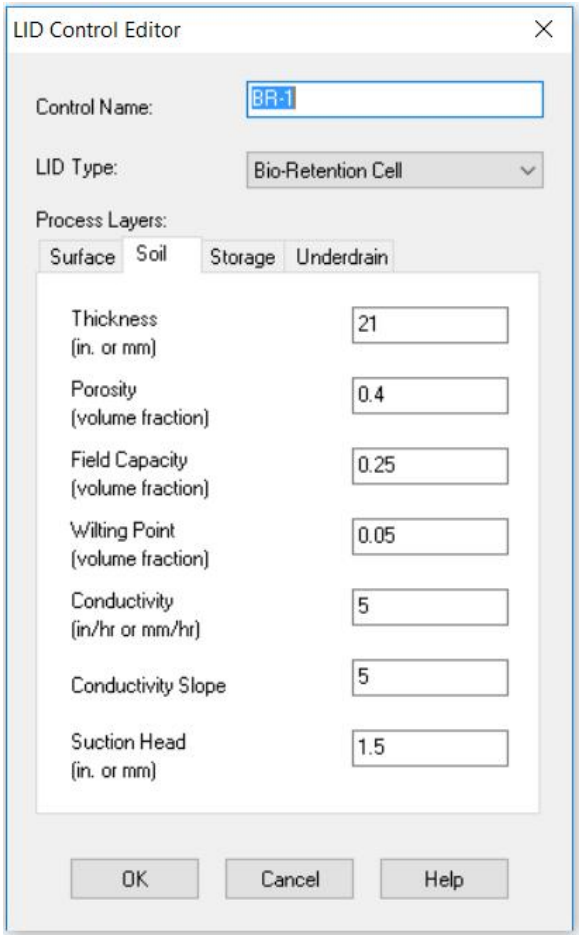


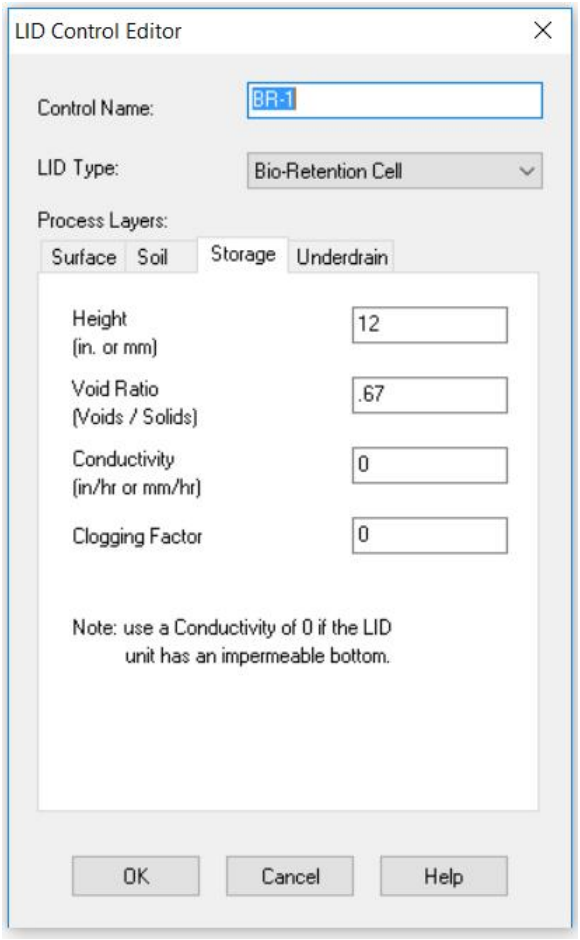

LID Control Editor
Control Name:
BR-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
12
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help

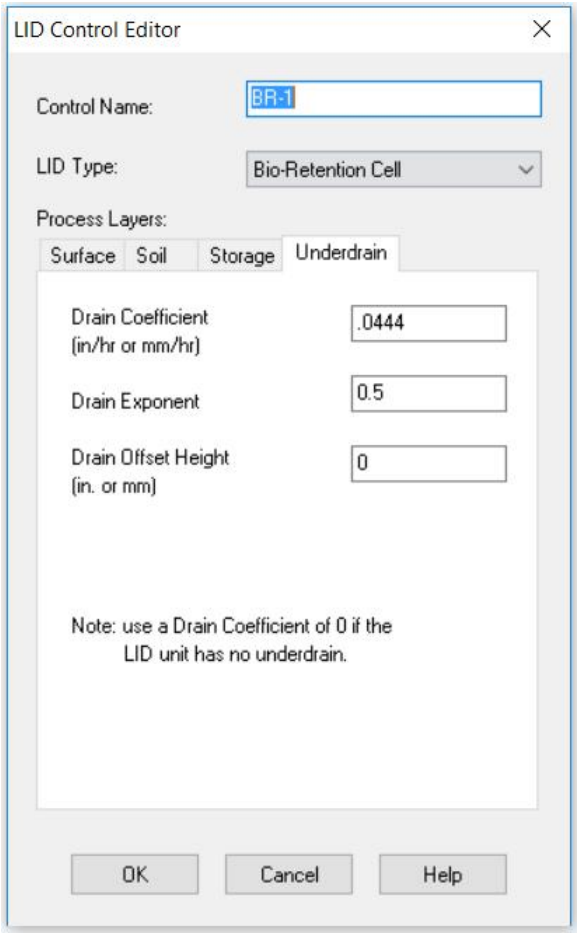

LID Control Editor
Control Name:
BR-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.041
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

BIOFILTRATION POC6: LID EDITOR

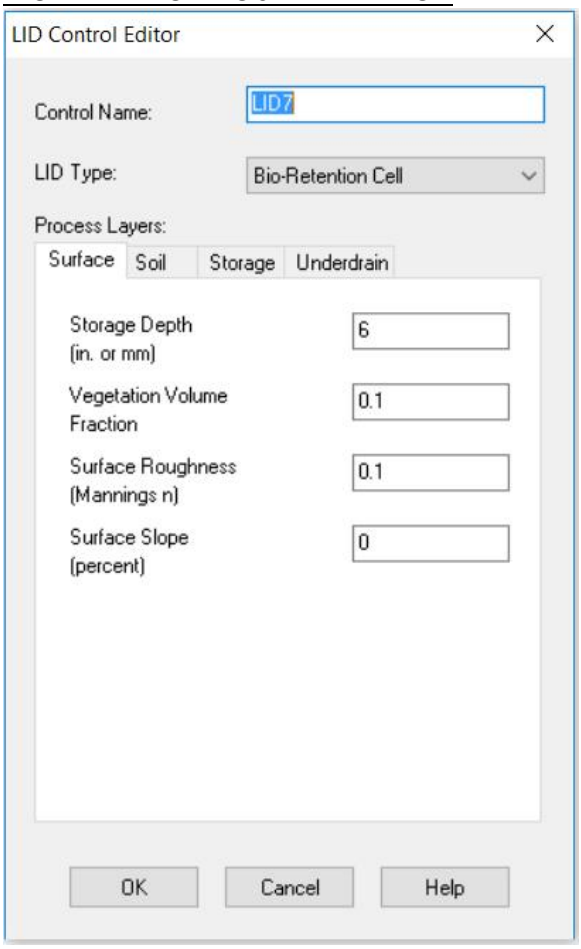


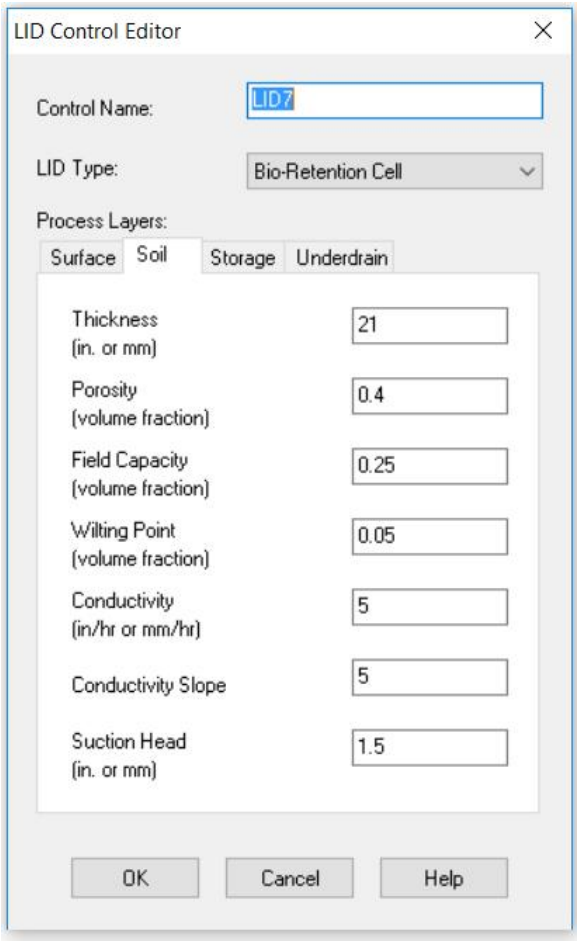


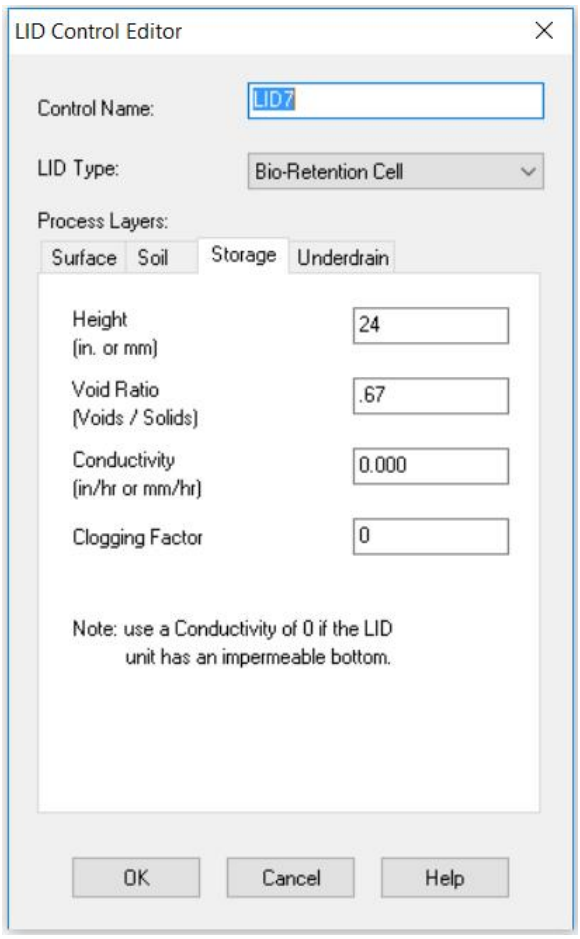

LID Control Editor
Control Name:
BR-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
12
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help

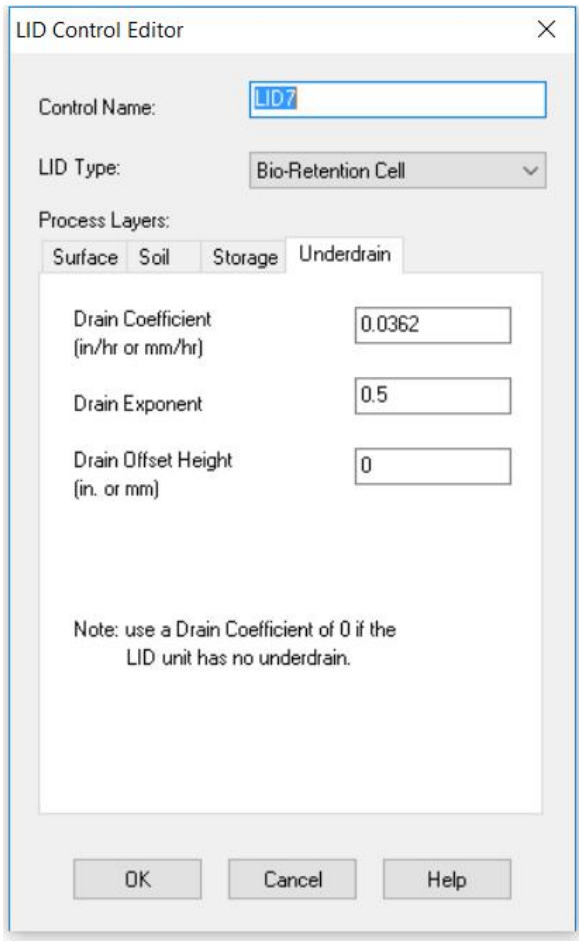

LID Control Editor
Control Name:
BR-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
.0444
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

BIOFILTRATION POC7: LID EDITOR

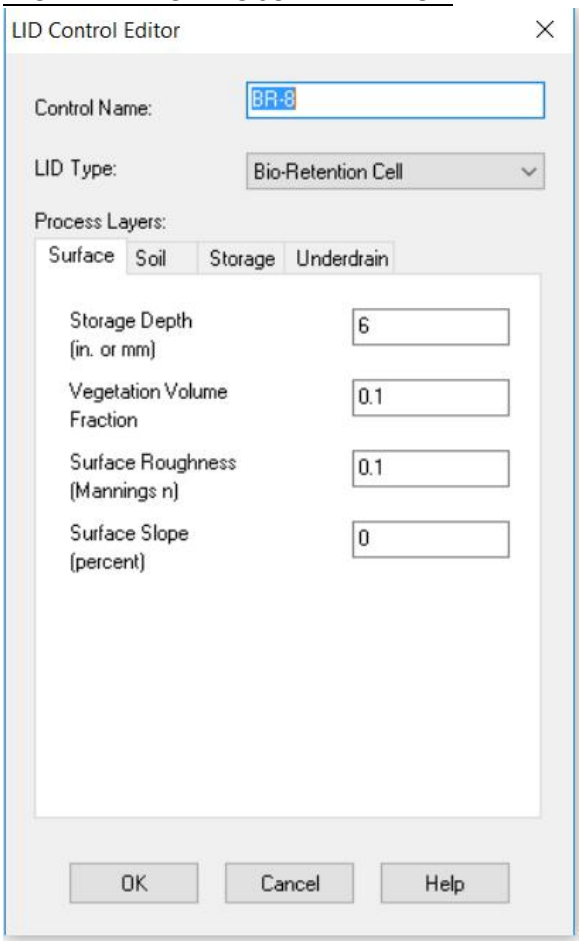


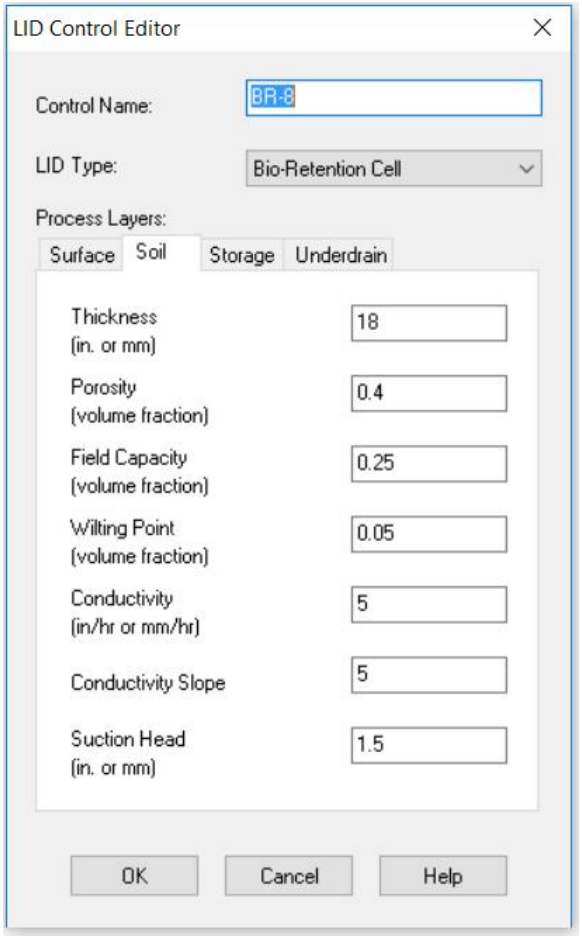


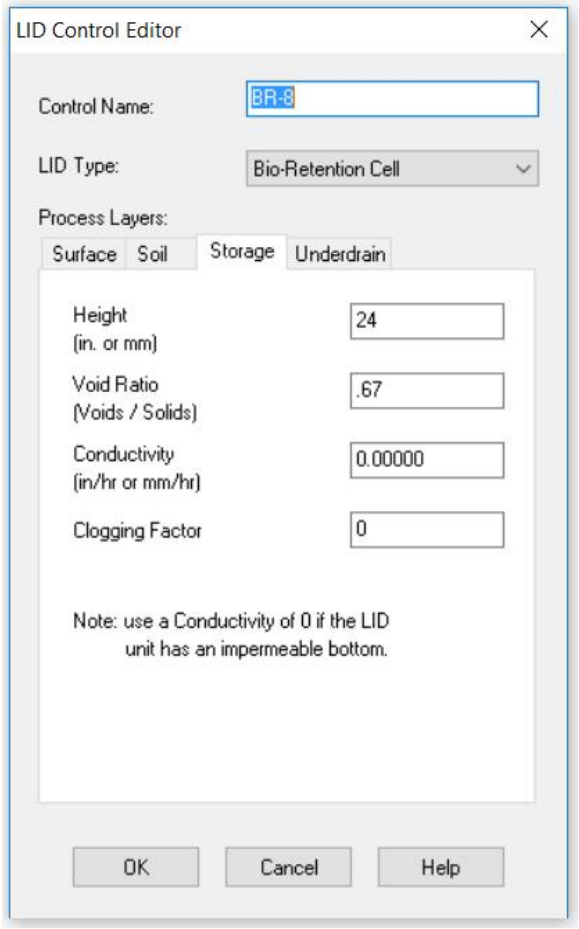

LID Control Editor
Control Name:
LID7
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
24
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0.000
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help


LID Control Editor
Control Name:
LID7
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0362
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help

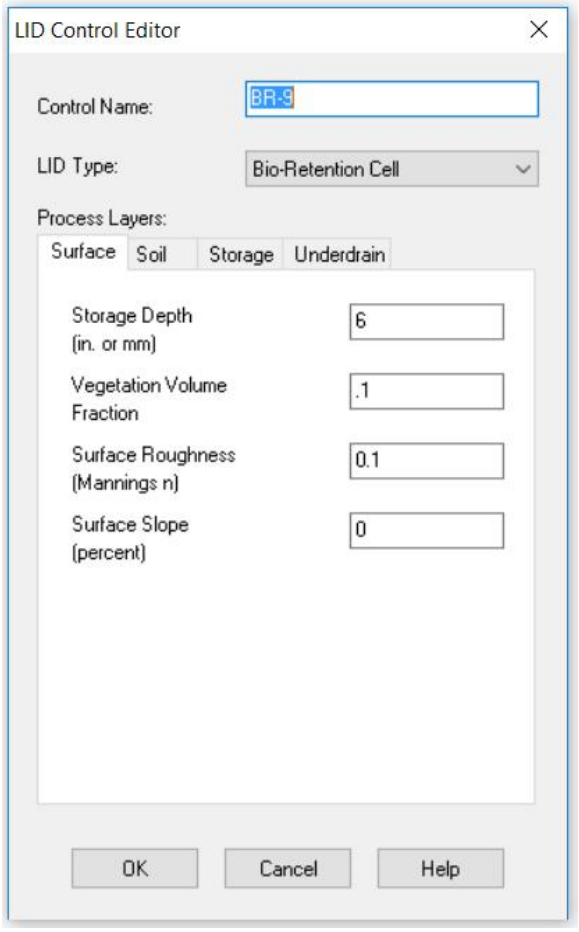
BIOFILTRATION POC8: LID EDITOR

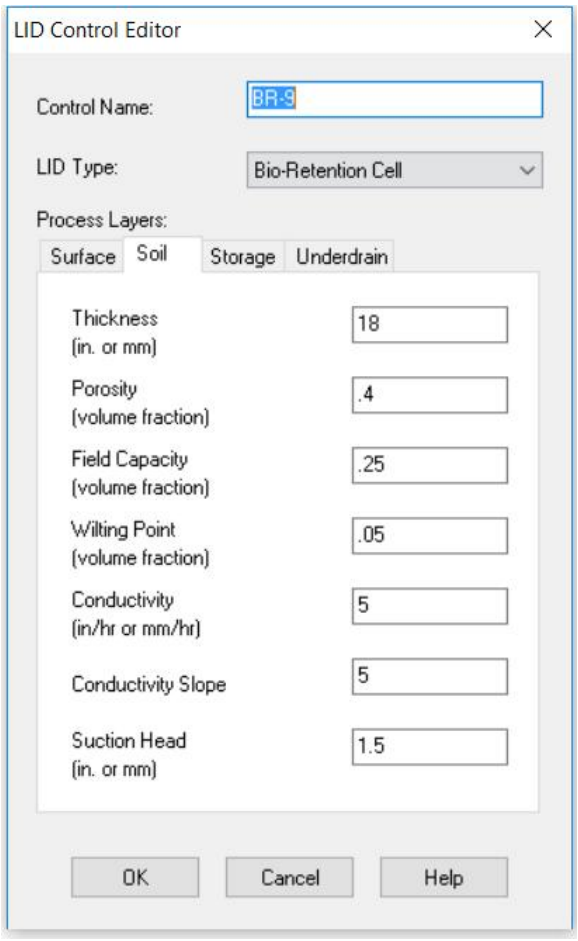


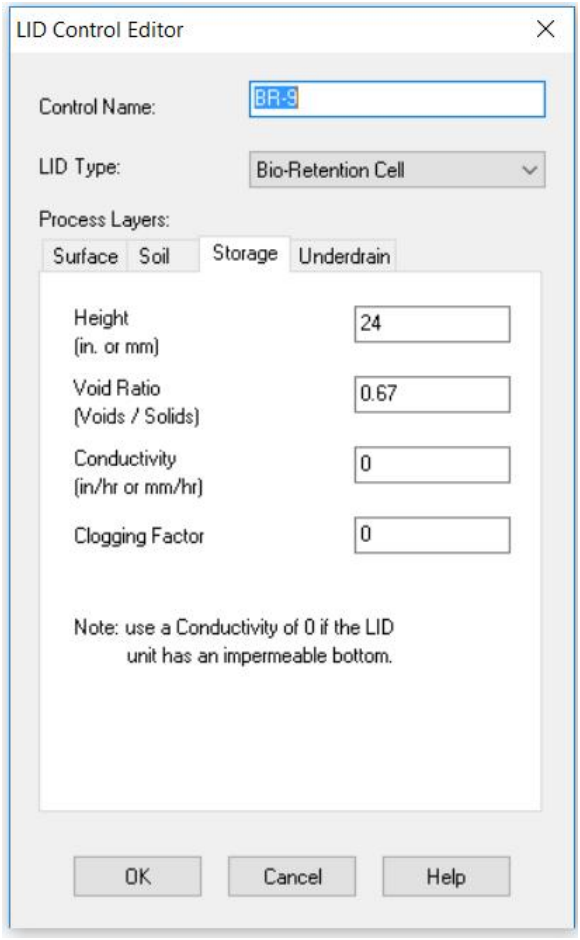



LID Control Editor
Control Name:
BR-8
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
24
Void Ratio
(Voids / Solids)
.67
Conductivity
(in/hr or mm/hr)
0.00000
Clogging Factor
0
Note: use a Conductivity of 0 if the LID unit has an impermeable bottom.
OK
Cancel
Help


LID Control Editor
Control Name:
BR-8
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0468
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the LID unit has no underdrain.
OK
Cancel
Help


LID Control Editor
Control Name:
BR-9
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Storage Depth
(in. or mm)
6
Vegetation Volume
Fraction
.1
Surface Roughness
(Mannings n)
0.1
Surface Slope
(percent)
0
OK
Cancel
Help


LID Control Editor
Control Name:
BR-9
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Thickness
(in. or mm)
18
Porosity
(volume fraction)
.4
Field Capacity
(volume fraction)
.25
Wilting Point
(volume fraction)
.05
Conductivity
(in/hr or mm/hr)
5
Conductivity Slope
5
Suction Head
(in. or mm)
1.5
OK
Cancel
Help


LID Control Editor
Control Name:
BR-9
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
24
Void Ratio
(Voids / Solids)
0.67
Conductivity
(in/hr or mm/hr)
0
Clogging Factor
0
Note: use a Conductivity of 0 if the LID
unit has an impermeable bottom.
OK
Cancel
Help


LID Control Editor
Control Name:
BR-9
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.0468
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
0
Note: use a Drain Coefficient of 0 if the
LID unit has no underdrain.
OK
Cancel
Help

LID Control Editor: Explanation of Significant Variables

Storage Depth:
The storage depth variable within the SWMM model is representative of the storage volume provided beneath the engineered soil and mulch components of the biofiltration facility. This storage volume is comprised of a gravel located bed beneath a layer of engineered soil and a 0.25 foot (3-inch) layer of landscaping mulch.

Porosity:
A porosity value of 0.4 has been selected for the model. The amended soil is to be highly sandy in content in order to have a saturated hydraulic conductivity of approximately 5 in/hr.

H&A considers such a value to be slightly high; however, in order to comply with the HMP Permit, the value recommended by the Copermittees for the porosity of amended soil is 0.4, per Appendix A of the Final Hydromodification Management Plan by Brown & Caldwell, dated March 2011.

Void Ratio:
The ratio of the void volume divided by the soil volume is directly related to porosity as n/(1-n). As the underdrain layer is composed of gravel, a porosity value of 0.4 has been selected, which results in a void ratio of 0.4/(1-0.4) = 0.67 for the gravel detention layer.

Clogging factor:
A clogging factor was not used (0 indicates that there is not clogging assumed within the model). The reason for this is related to the fairness of a comparison with the SDHM model and the HMP sizing tables: a clogging factor was not considered, and instead, a conservative value of infiltration was recommended.

Drain (Flow) coefficient:
The flow coefficient in the SWMM Model is the coefficient needed to transform the orifice equation into a general power law equation of the form:

$$q = C(H - H_D)^n \qquad (1)$$

where q is the peak flow in in/hr, n is the exponent (typically 0.5 for orifice equation), H D is the elevation of the centroid of the orifice in inches (assumed equal to the invert of the orifice for small orifices and in our design equal to 0) and H is the depth of the water in inches.

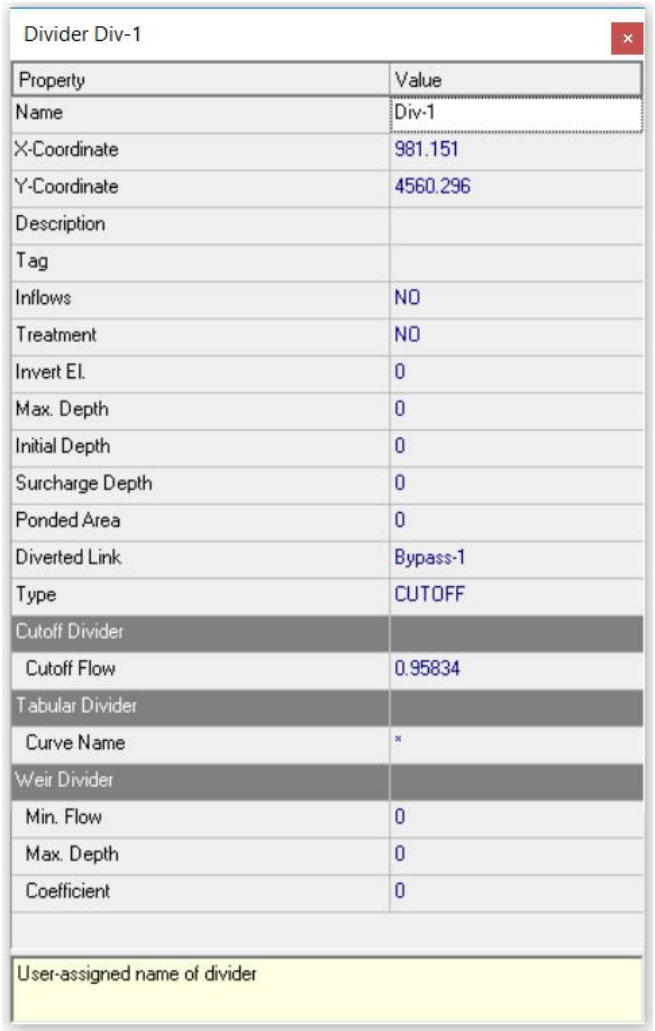
The general orifice equation can be expressed as:

$$Q = \frac{\pi}{4} c_g \frac{D^2}{144} \sqrt{2g \frac{(H - H_D)}{12}} \qquad (2)$$

where Q is the peak flow in cfs, D is the diameter in inches, c_g is the typical discharge coefficient for orifices (0.61-0.63 for thin walls and around 0.75-0.8 for thick walls), g is the acceleration of gravity in ft/s^2, and H and H D are defined above and are also used in inches in Equation (2).

Cutoff Flow:

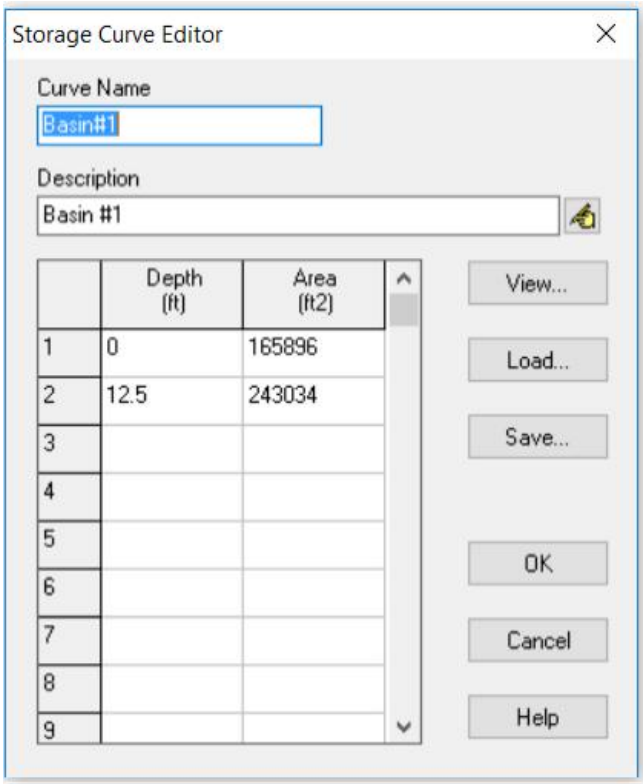
This is the only significant variable in the diversion, as the type of diversion is defined by this value. Any excess of flow over this value will be diverted into a pond subroutine (the surface stage of the bio-retention basin) and routed there. The determination of this value equates to the value obtained with equation (2) above, plus 1%, when H = depth of gravel layer and H_D=0 (orifice situated at the datum). Thus, once flows exceed the maximum discharge the LID orifice experiences a head of the storage depth, ponding occurs within the biofiltration basin, routing these additional flows via the pond riser.

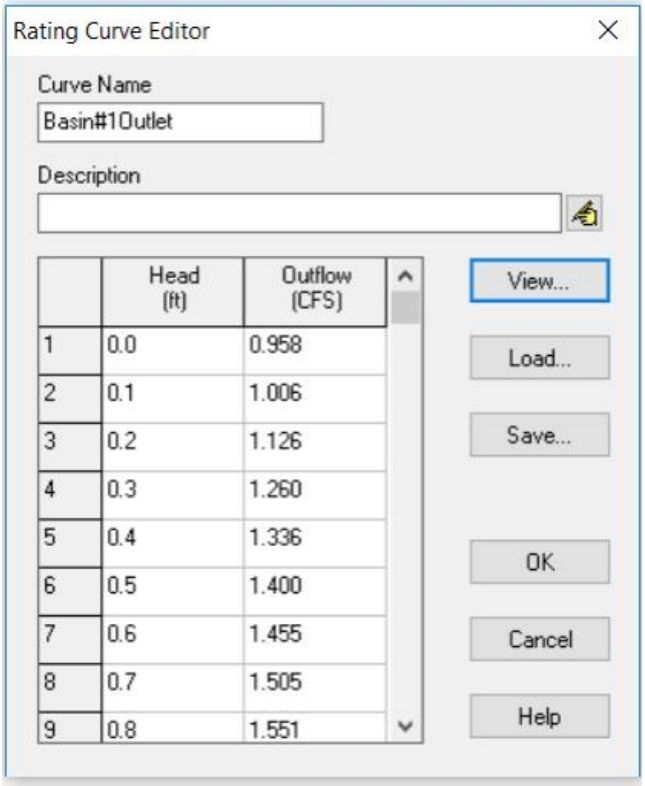


Note:

The complete storage and rating curves and the respective explanation is shown at the end of this appendix. A variable area vs. elevation storage curve was used for the final model, and a discharge that is a function of the outlet structure in the surface was used also.

BASIN: POC1


Storage Curve Editor
Curve Name
Basin#1
Description
Basin #1
Depth (ft)
Area (ft2)
1 0 165896
2 12.5 243034
3
4
5
6
7
8
9
View...
Load...
Save...
OK
Cancel
Help


Rating Curve Editor
Curve Name
Basin#1Outlet
Description
Head (ft)
Outflow (CFS)
1 0.0 0.958
2 0.1 1.006
3 0.2 1.126
4 0.3 1.260
5 0.4 1.336
6 0.5 1.400
7 0.6 1.455
8 0.7 1.505
9 0.8 1.551
View...
Load...
Save...
OK
Cancel
Help

Otay Ranch Village 13
Water Quality Basin- Dewatering Calculations

M E M O R A N D U M

Date: January 29, 2018

To: Greg Mattson, AICP, Project Manager
Planning and Development Services, County of San Diego

From: Alisa Vialpando, P.E.

Subject: **Otay Ranch- Village 14 and Planning Areas 16/19: Water Quality Basin- dewatering calculations**

This memo has been prepared to address the County of San Diego plan review comment 6-49 regarding the *SWQMP for Otay Ranch Village 14 and Planning Areas 16/19* which had a submittal date of August 30, 2017. The comment is provided below for quick reference:

The drawdown calculations were not included as part of this submittal. Either include a drawdown calculation on the next submittal OR provide a certified letter from the EOW stating that in their professional opinion deferring this requirement to final engineering will not cause significant design changes on this project.

This letter is provided in response to the comment and is also applicable to the *SWQMP for Otay Ranch Village 14 and Planning Areas 16/19- Land Exchange Alternative* since both projects will utilize similar treatment control BMPs. In particular, both projects propose regional biofiltration basins for most of the developed areas. These basins will concurrently serve as flow control basins to address hydromodification. Due to the nature of these basins being low-flow basins which receive a maximum of the Q10 flowrate, deference of providing dewatering calculations at this phase of the project is acceptable. Although no significant design changes are anticipated, options such as re-allocation of drainage areas, optimization of outlet structures, or preparation of a vector control plans are all alternatives which could be explored to meet or address dewatering concerns and requirements.

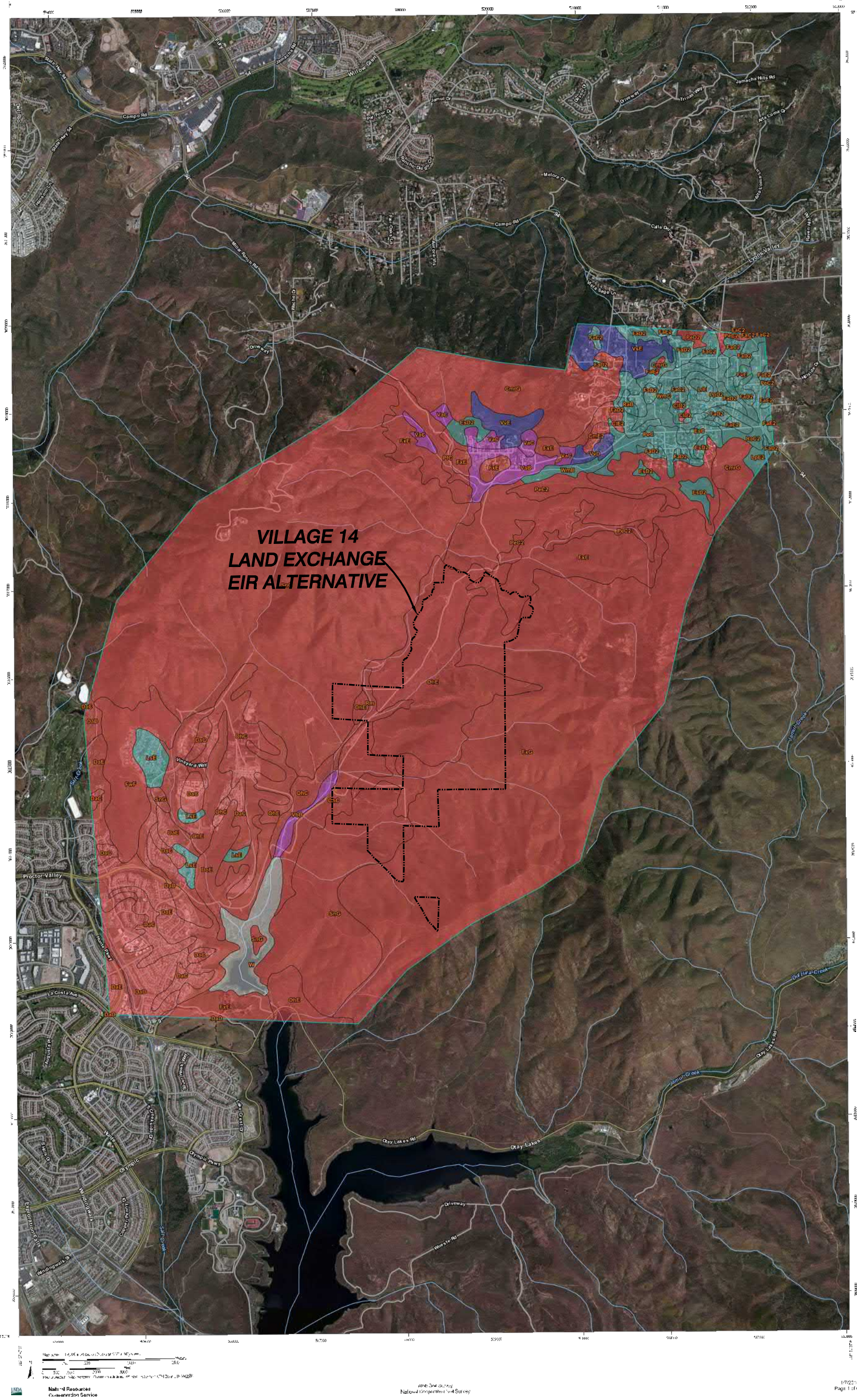
Should you have any questions regarding the information contained within this memo, please contact me at (858) 558-4500.

Alisa S. Vialpando

Sincerely,
Alisa S. Vialpando, R.C.E. 47945
Vice President/Principal

SECTION 8 – NRCS Soil Map of Project Site

Hydrologic Soil Group—San Diego County Area, California
(Mt. Atse 14 HYDROLOGIC SOIL GROUPS)



Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

1/7/2015
Page 1 of 6

MAP LEGEND

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

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 8, Sep 17, 2014

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

Date(s) aerial images were photographed: May 2, 2010—May 6, 2010

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ClD2	Cieneba coarse sandy loam, 5 to 15 percent slopes, erod ed	D	4.6	0.0%
ClE2	Cieneba coarse sandy loam, 15 to 30 percent slopes, ero ded	D	25.9	0.3%
CmE2	Cieneba rocky coarse sandy loam, 9 to 30 percent slopes , eroded	D	12.5	0.1%
CmrG	Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes	D	454.1	4.4%
DaC	Diablo clay, 2 to 9 percent slopes	D	196.6	1.9%
DaD	Diablo clay, 9 to 15 percent slopes	D	216.6	2.1%
DaE	Diablo clay, 15 to 30 percent slopes	D	326.3	3.2%
DoE	Diablo-Olivenhain complex, 9 to 30 percent slopes	D	137.8	1.3%
EsC	Escondido very fine sandy loam, 5 to 9 percent slopes	C	24.1	0.2%
EsD2	Escondido very fine sandy loam, 9 to 15 percent slopes, eroded	C	56.6	0.5%
FaC2	Fallbrook sandy loam, 5 to 9 percent slopes, eroded	C	55.0	0.5%
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded	C	139.0	1.3%
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes, eroded	C	52.1	0.5%
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent slopes	C	6.7	0.1%
FwF	Friant fine sandy loam, 30 to 50 percent slopes	D	215.6	2.1%

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
FxE	Friant rocky fine sandy loam, 9 to 30 percent slopes	D	878.1	8.5%
FxG	Friant rocky fine sandy loam, 30 to 70 percent slopes	D	2,296.1	22.2%
LpD2	Las Posas fine sandy loam, 9 to 15 percent slopes, erod ed	C	28.8	0.3%
LpE2	Las Posas fine sandy loam, 15 to 30 percent slopes, ero ded	C	16.0	0.2%
LrE	Las Posas stony fine sandy loam, 9 to 30 percent slopes	C	11.4	0.1%
LsE	Linne clay loam, 9 to 30 percent slopes	C	77.6	0.8%
OhC	Olivenhain cobbly loam, 2 to 9 percent slopes	D	393.7	3.8%
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes	D	855.7	8.3%
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	61.5	0.6%
PeC2	Placentia sandy loam, 5 to 9 percent slopes, eroded	D	134.5	1.3%
PeD2	Placentia sandy loam, 9 to 15 percent slopes, eroded	D	10.5	0.1%
PfC	Placentia sandy loam, thick surface, 2 to 9 percent slo pes	D	19.0	0.2%
RaB	Ramona sandy loam, 2 to 5 percent slopes	C	8.5	0.1%
RaC2	Ramona sandy loam, 5 to 9 percent slopes, eroded	C	62.9	0.6%
Rm	Riverwash	D	31.8	0.3%
SnG	San Miguel-Exchequer rocky silt loams, 9 to 70 percent slopes	D	2,987.2	28.9%
VaB	Visalia sandy loam, 2 to 5 percent slopes	A	67.6	0.7%
VaC	Visalia sandy loam, 5 to 9 percent slopes	A	60.3	0.6%
VbB	Visalia gravelly sandy loam, 2 to 5 percent slopes	A	27.8	0.3%

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
VsE	Vista coarse sandy loam, 15 to 30 percent slopes	B	88.6	0.9%
VvD	Vista rocky coarse sandy loam, 5 to 15 percent slopes	B	20.4	0.2%
VvE	Vista rocky coarse sandy loam, 15 to 30 percent slopes	B	51.3	0.5%
W	Water		134.4	1.3%
WmB	Wyman loam, 2 to 5 percent slopes	C	28.1	0.3%
WmC	Wyman loam, 5 to 9 percent slopes	C	76.8	0.7%
Totals for Area of Interest			**10,351.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher