Caledon 410 Developments

Stormwater Management Report

VERSION 1 ▪ NOVEMBER 2017

REPORT PREPARED FOR

Caledon 410 Developments Ltd.
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TORONTO, ONTARIO
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TMIG PROJECT NUMBER 16109

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1 INTRODUCTION

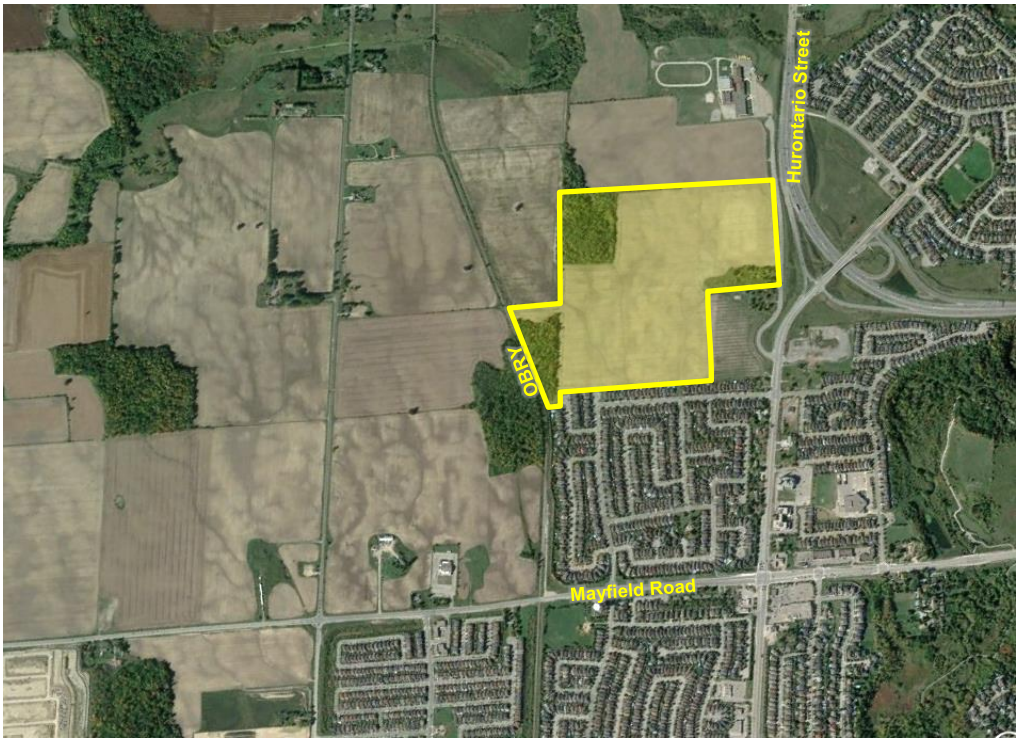
The Municipal Infrastructure Group (TMIG) has been retained by Caledon 410 Developments to prepare a Stormwater Management (SWM) Report in support of their Draft Plan of Subdivision application. The Caledon 410 site is a proposed 38.14 ha residential development is within the Mayfield West Phase 2 Secondary Plan Area, in the Town of Caledon. The proposed development is located west of Hurontario Street, east of the Orangeville-Brampton Railway (OBRY) and north of the existing subdivision as shown on **Figure 1-1**.

This report will:

- Provide background information,
- Summarize the existing site conditions,
- Provide information regarding the existing and proposed drainage catchment areas,
- Provide information regarding the proposed development,
- Provide an analysis of the proposed stormwater management facility, and
- Provide an analysis of the stormwater management strategy for the subject site.

The recommended stormwater management strategy has been developed in accordance with applicable design criteria and requirements of the Town of Caledon (Town), the Region of Peel (Region), Ontario Ministry of Environment and Climate Change (MOECC), and the Toronto and Region Conservation Authority (TRCA). The Stormwater Management Report presents information at a functional level and is intended to demonstrate feasibility. The functional servicing report (FSR) completed by TMIG for the same development should also be read in conjunction with this report. It should be noted that the detailed design will be supported by the Environmental Impact Study (EIS), hydrogeology and geotechnical studies in order to further refine the proposed Stormwater Management (SWM) strategy and pond design.

Figure 1-1: Location Plan



1.1 Background Information

The information contained within this report is based on the Functional Servicing Report for Mayfield West Phase 2 Secondary Plan Area (MW2 FSR), dated August 2017 prepared by Urbantech.

The MW2 FSR outlined the stormwater, sanitary and water servicing, a grading strategy, environmental constraints and mitigation measures, hydrogeology and the geotechnical guidelines for future developments for the overall secondary plan area. This SWM Report is consistent with the strategies outlined in the MW2 FSR and the standards of the regulatory agencies (Town, TRCA and MOECC).

This report is to be read in conjunction with other related reports supporting the proposed draft plan including:

- Environmental Impact Statement (EIS) prepared by Hensel,
- Geotechnical Report prepared by Terraprobe,
- Feature Based Water Budget Assessment prepared by PECG, and
- Caledon 410 Functional Servicing Report prepared by TMIG

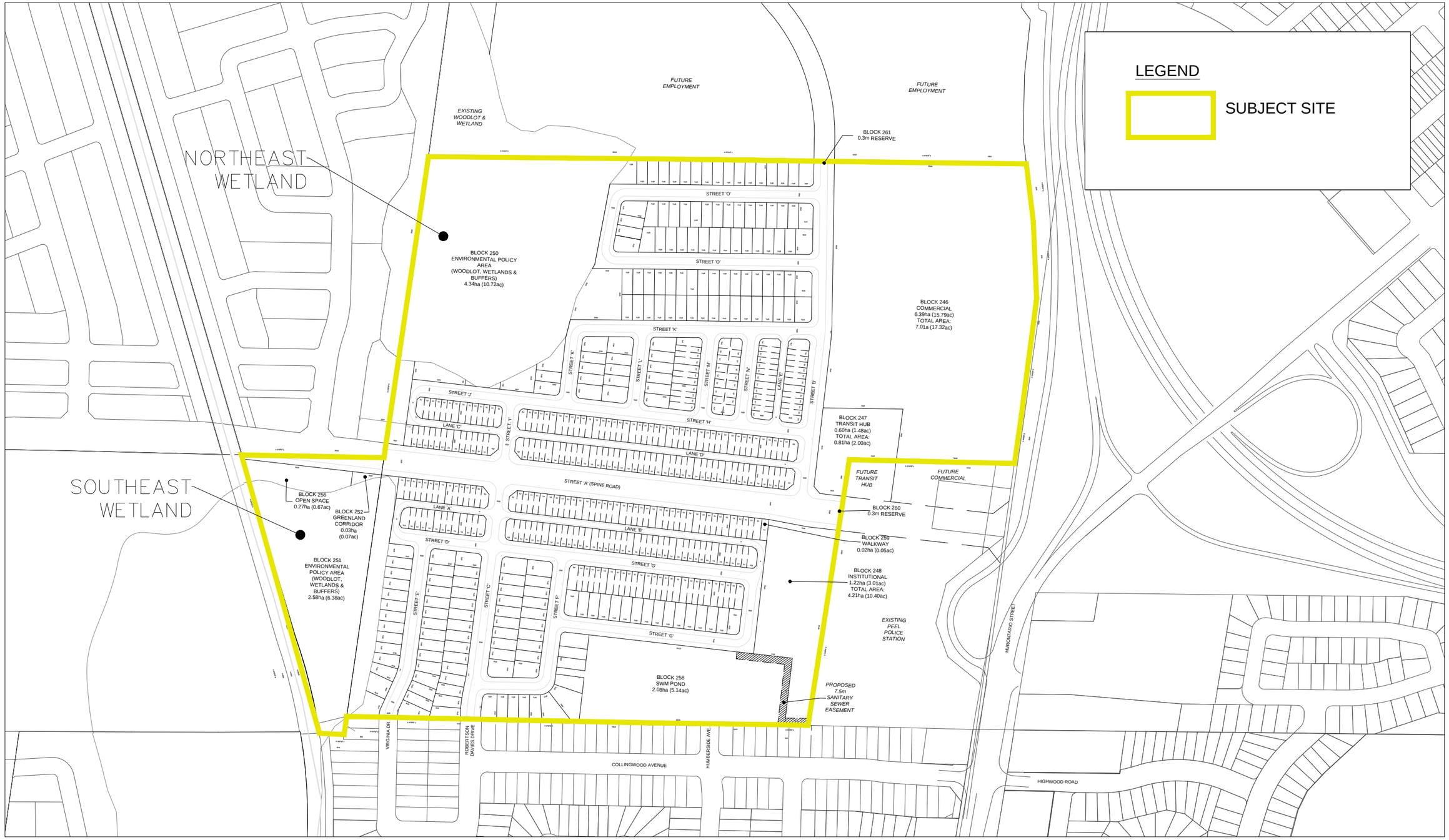
1.2 Proposed Development

The proposed development land uses include low density residential, medium density residential, an institutional block, roads, a stormwater management facility, park, open space, and Natural Heritage System (NHS). External drainage areas varying from 11.86ha to 10.76ha during the interim and ultimate condition will also flow onto the proposed development to the stormwater management (SWM) facility. The SWM facility on the subject site is identified as SWM Pond 9 in the MW2 FSR.

Table 1-1 summarizes the proposed land uses and corresponding development areas. The proposed road network and lot layout is based on the Draft Plan of Subdivision prepared by Glen Schnarr & Associates Inc., dated November 14, 2017.

Table 1-1 Proposed Land Use Areas

Land Use	Area (ha)
Residential (Detached)	6.95
Residential (Townhouses)	4.84
Commercial	6.39
Transit	0.6
Institutional	1.22
Park	0.25
Environmental Policy Area	6.92
Greenway Corridor	0.2
Open Space	0.29
SWM Pond	1.84
Walkway	0.02
Roads	8.62



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PROPOSED DRAFT PLAN

FUNCTIONAL SERVICING REPORT
CALEDON 410 DEVELOPMENT - MAYFIELD WEST PHASE 2, TOWN OF CALEDON

SCALE: 1:4,000		PROJECT No.	16109
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DESIGNED BY:	DRAWN BY:	FIGURE No.	1-2
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File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\SWM Report Figures\FIGURE 1-2 - PROPOSED DEVELOPMENT PLAN.dwg, Layout : Layout1 Date :Nov 30, 2017 - 4:45pm, Edit By : rchung

1.3 Existing Conditions

1.3.1 Existing Topography and Natural Heritage System

The existing topography within the proposed development ranges in elevation from 263.64m to 256.82m. Existing topography falls generally from northwest to southeast from a ridge north of the subject site. The topography ranges in slope from 1% to 3%.

The existing land use is predominantly agricultural and rural in nature.

There are two natural heritage systems (NHS) located within the subject site. Two wetlands referred to as northeast wetland and southeast (TRCA wetland) in the Urbantech MW2 FSR are located along the western and southwestern boundary of the site.

The draft plan of subdivision as shown on **Figure 1-2** illustrates the proposed development in the context of the site's Natural Heritage System. For information on the detailed NHS and the width of the applied buffer, the corresponding Environmental Impact Statement (EIS) report should be reviewed.

1.3.2 Existing Drainage

As part of the Mayfield West Phase 2 FSR, existing drainage catchments were delineated for the entire Secondary Plan area.

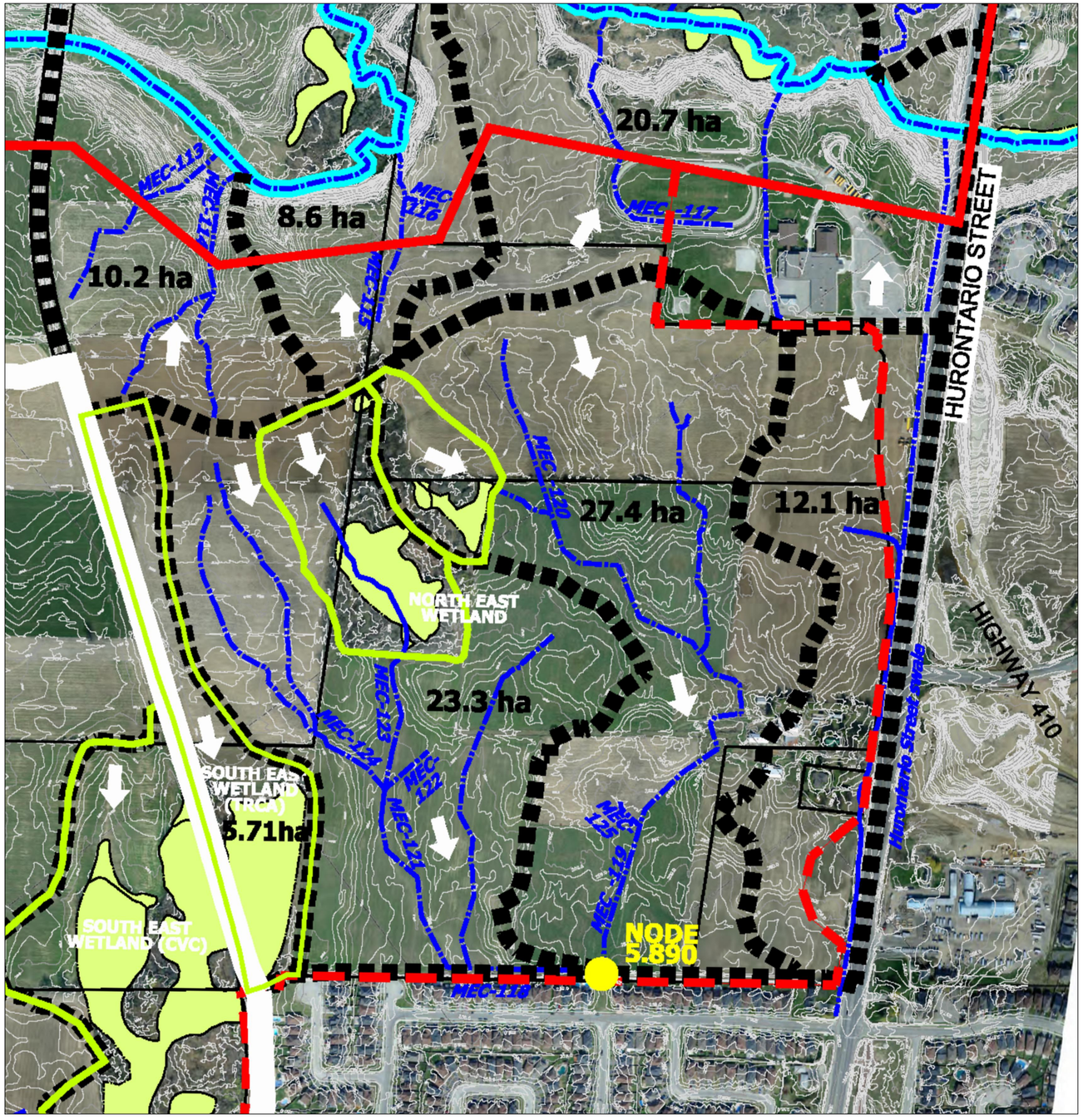
As can be seen on **Figure 1-3** the subject site falls within three existing drainage areas, two of which contributes to minor tributaries that converges at Node 5.890 and the other drains to the ditch along Hurontario Street. Node 5.890 from the southern boundary of the subject site is captured through an existing storm sewer on Humberside Drive. All of these catchment areas ultimately join downstream with the main Etobicoke Creek.

1.3.3 Physiography and Geology

The site is located within the South Slope physiographic region, which lies between the Oak Ridges Moraine and the Peel Plain (Chapman and Putnam, 1984). This area is characterized by a flat to gently rolling drumlinized till plain.

Overburden soils are dominated by clayey silt to sily clay Halton Till and range in thickness from 10 – 40 m near the site. The Halton Till may contain isolated lenses of lacustrine laminated sand, silt, and clay (Sharp et al., 1999). Fine grained glaciolacustrine sediments (silt and clay) were identified along the northern site boundary, immediately south of Etobicoke Creek. Bedrock consists of red shale interbedded with grey to green limestone, known as the Queenston Formation.

For further information on the Hydrogeological and Geotechnical conditions of the subject site, please refer to the report prepared by PECG for the overall Mayfield West Phase 2 Secondary Plan Area.



LEGEND:

- EXISTING ETOBICOKE CREEK
- MEC-121 EXISTING REACH AND REACH NUMBER
- EXISTING FLETCHERS/ETOBICOKE CREEK WATERSHED BOUNDARY
- EXISTING SUBWATERSHED DRAINAGE AREA BOUNDARY
- 20.7 ha EXISTING DRAINAGE AREA IN HECTARES
- EXISTING CULVERT
- EXISTING FLOW DRAINAGE PATH
- NODE 5.890 EXISTING FLOW NODE
- EXISTING WETLAND
- EXISTING WETLAND CONTRIBUTING DRAINAGE AREA BOUNDARY
- MAYFIELD WEST 2 DEVELOPMENT LIMIT
- GREENBELT AREA LIMIT

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PRE DEVELOPMENT DRAINAGE AREA

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File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\SWM Report Figures\FIGURE 1-3 - Exisiting Drainage Area.dwg, Layout : Layout1 Date : Nov 29, 2017 - 11:30am, Edit By : rchung

2 STORMWATER MANAGEMENT

Based on the MW2 FSR, there are two drainage scenarios to SWM Pond 9. The two scenarios have been identified as the ultimate and interim condition. During the ultimate condition all surrounding lands are assumed to be developed and existing drainage north of the subject site will be diverted northwards to a separate SWM facilities. During the interim condition, approximately 15.78ha of external drainage will be drain through the subject site to SWM Pond 9 following existing flow direction. The drainage area for the ultimate condition is 48.12ha and for the interim condition is 49.24ha. The proposed drainage areas are illustrated on **Figure 2-1** and **Figure 2-2** for the interim and ultimate condition respectively.

2.1 Stormwater Management Criteria

2.1.1 Erosion Control Criteria

Based on AMEC's approved erosion threshold analysis and post-development land use modelling, the following target volume and release rate were established:

- Etobicoke Creek 325m^3/impervious ha, released at 0.00031 m^3/s/ha

The erosion control criteria for the subject site is summarized in **Table 2-1** and has been determined in the MW2 FSR. Detail calculations are provided in **Appendix A**.

Table 2-1: Erosion Control Criteria

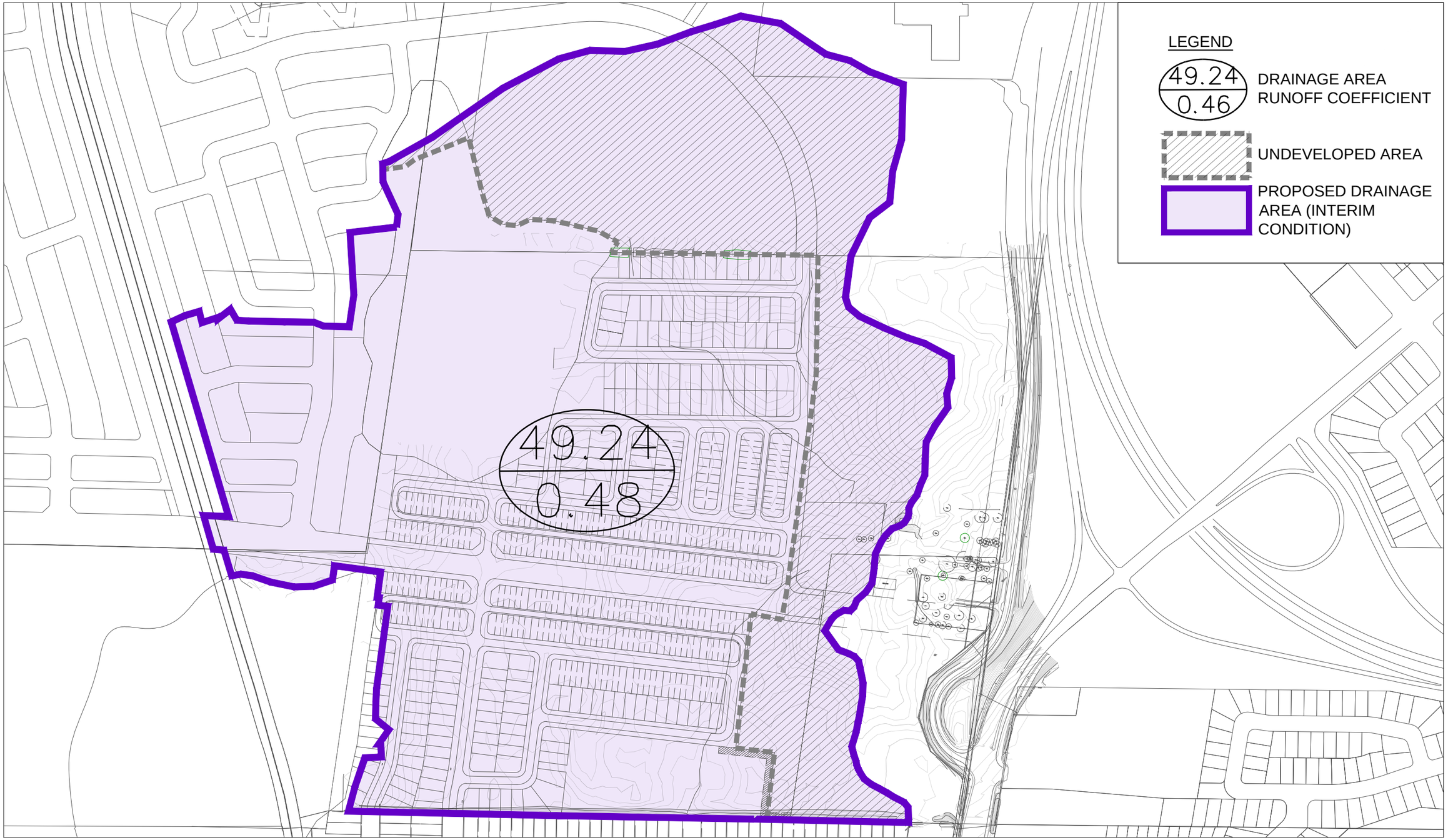
Scenario	Drainage Area	Imperviousness	Required Volume	Required Release Rate
Ultimate	48.12ha	68%	10,571 m^3	0.015m^3/s
Interim	49.24ha	39%	6,290 m^3	0.015m^3/s

2.1.2 Water Quality Control Criteria

All ponds within the Etobicoke Creek Watershed must meet the Enhanced (Level 1) criteria as per the MOE SWM Planning and Design Manual (March 2003) Table 3.2, as shown below.

Table 3.2 Water Quality Storage Requirements based on Receiving Waters[1, 2]

Protection Level	SWMP Type	Storage Volume (m³/ha) for Impervious Level			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240



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PROPOSED DRAINAGE AREA - INTERIM CONDITION

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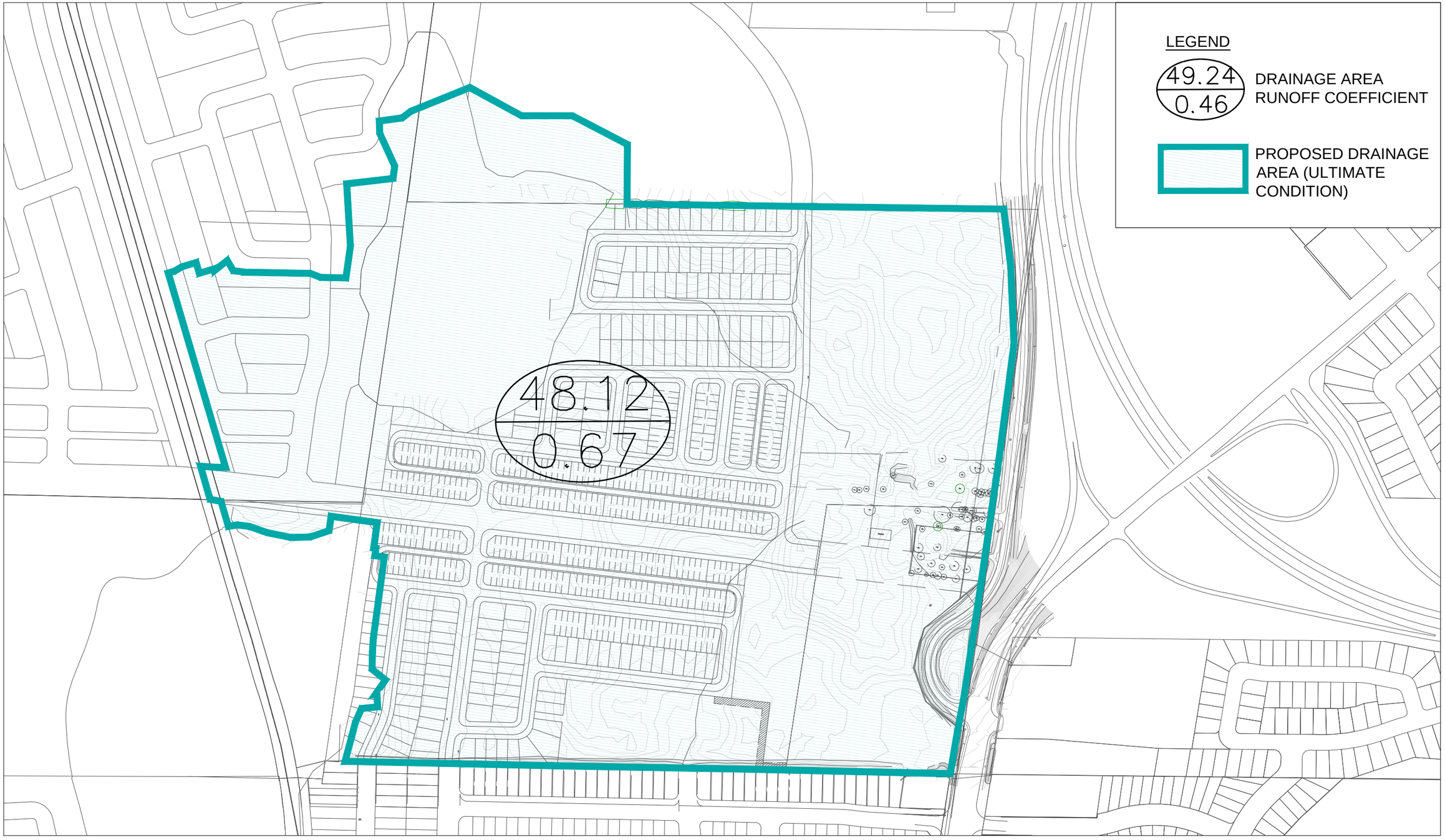
File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\SWM Report Figures\FIGURE 2-1 - PROPOSED Drainage area Interim.dwg, Layout : Layout1 Date :Nov 30, 2017 - 1:44pm, Edit By : rchung



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PROPOSED DRAINAGE AREA - ULTIMATE CONDITION

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The water quality control criteria for the subject site for wet pond is summarized in **Table 2-2**. Detail calculations are provided in in **Appendix A**.

Table 2-2: Water Quality Control Criteria

Scenario	Drainage Area	Imperviousness	Required Volume
Ultimate	48.12ha	68%	8,438m^3
Interim	49.24ha	39%	5,537m^3

2.1.3 Water Quantity Control Criteria

Pond 9 Release rates are governed by capacity of the downstream storm sewer on Humberside Drive (approximately 2.22m^3/s). Regional controls are not required for facilities discharging to Etobicoke Creek in accordance with the TRCA SWM criteria.

2.2 Preliminary SWM Pond Design

The proposed SWM Pond has been designed as an enhanced water quality wet pond servicing post-development flows from the subject site. The SWM pond has been designed to satisfy the required stormwater management criteria described in **Section 2.1**.Since the requirements for the ultimate condition is greater, the SWM pond has been sized based on the ultimate condition. Flows will inlet to the SWM Ponds through storm sewers and overland flow routes, with attenuated discharge draining to an existing storm sewer on Humberside Drive. Preliminary SWM Pond layout is shown on **Figure 2-3**.

Water quantity control will be provided to reduce the post-development release rates to the capacity of the downstream sewer on Humberside Drive (2.22m^3/s). To determine the required attenuation storage volumes for the SWM ponds post-development storm runoff from the proposed development was modelled using the Visual OTTHYMO (VO) hydrologic model. The 2-year through 100-year return period events were simulated using the 12-hour AES design storms. Summaries of the expected storage volumes and release rates are presented in **Table 2-3.** The VO hydrologic model output files are provided in **Appendix A**.

The provided storage is based on the new SWM pond block which differs from the draft plan in the MW2 FSR. Detail calculations of the provided storage is provided in **Appendix A**.

Table 2-3: Summary of Expected Storage Volumes and Release Rates (12hr AES Storm)

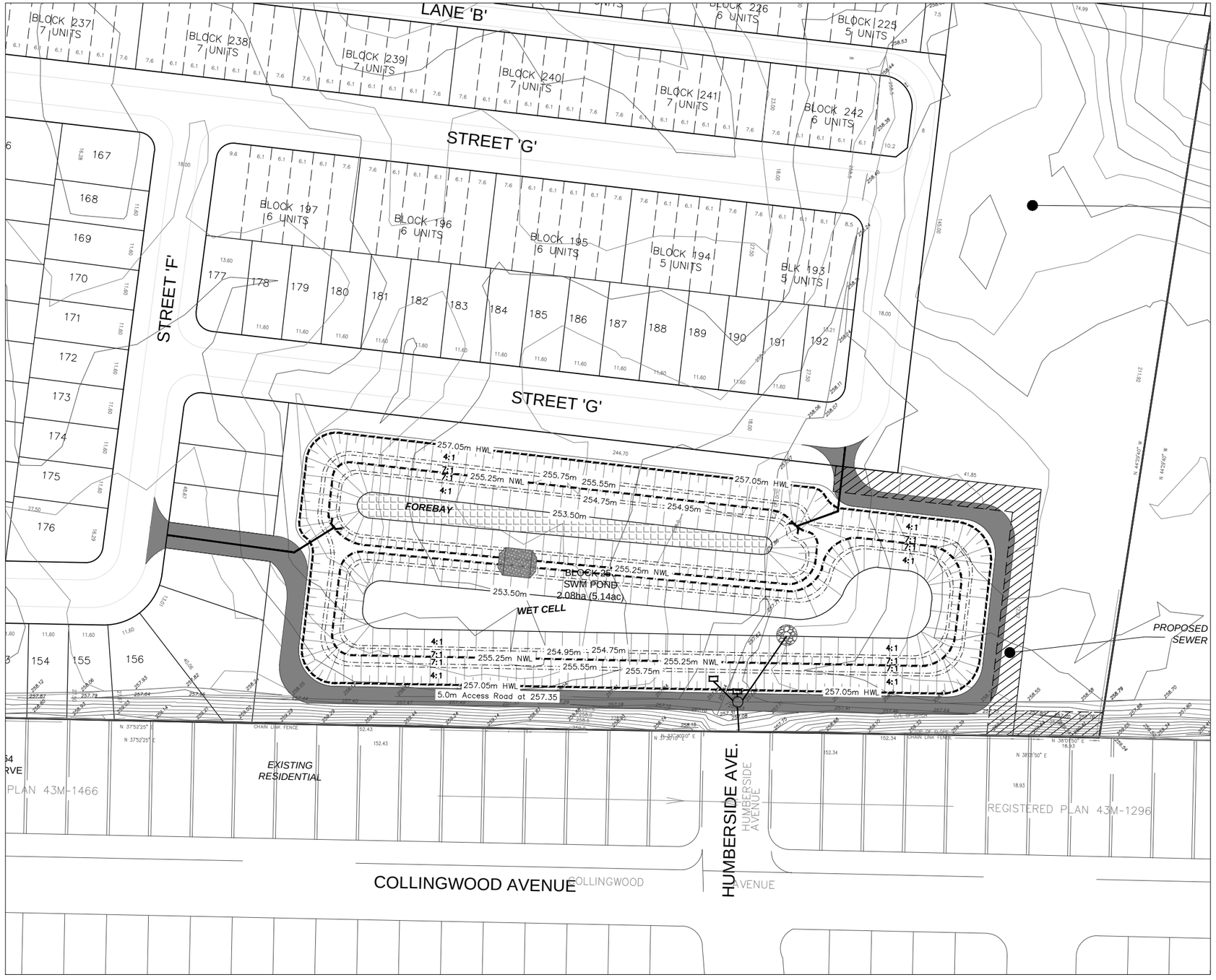
Component	Ultimate Condition		Interim Condition		Provide Storage (m^3)
	Peak Flow (m^3/s)	Required Storage (m^3)	Peak Flow (m^3/s)	Required Storage (m^3)	
Permanent Pool		8,438		5,537	8,643
Erosion Control	0.015	10,571	0.015	6,290	10,808
2-year	0.522	11,895	0.254	11,323	-
5-year	1.110	13,154	0.782	12,452	-
10-year	1.588	14,178	1.164	13,268	-
25-year	1.965	15,700	1.728	14,482	-
50-year	2.085	17,159	1.959	15,637	-
100-year	2.208	18,727	2.083	17,117	18,826

*Represents results from VO model output.

As shown on **Table 2-3**, the sufficient capacity is provided for both the ultimate and interim condition.

2.2.1 On-Site Control

The commercial property at the northeast corner of the Caledon 410 development is proposed to provide 42L/s/ha of on-site control prior to discharging into the SWM pond. On-site control may include but not limited to rooftop controls, surface storage over the parking area to a maximum of 0.3m, and underground storage. The entire 7.01ha of the commercial block is assumed to be controlled to a rate of 0.29m^3/s.



DESCRIPTION	REQUIRED STORAGE	AVAILABLE STORAGE
PERMANENT POOL EL.253.50 – EL.255.25	8,438m³(ULTIMATE) 5,537m³(INTERIM)	8,631m³
EXTENDED DETENTION EL.255.25 – EL.256.30	10,571m³(ULTIMATE) 6,290m³(INTERIM)	10,808m³
100–YEAR FLOOD EL.255.25 – EL.257.05	18,727m³(ULTIMATE) 17,117m³(INTERIM)	18,826m³

POND DATA	
DRAINAGE AREA	48.12 HA (ULTIMATE) 49.24 HA (INTERIM)
POND BLOCK AREA	1.84 HA
PERMANENT POOL ELEV.	255.25m
BOTTOM OF POND ELEV.	253.50m
HW (100yr)	257.05m
FREE BOARD ELEV	257.35m
POND SLOPES	VARIES
POND INLET INV.	255.25
POND OUTLET INV.	254.35

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PROPOSED SWM POND 9

FUNCTIONAL SERVICING REPORT
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File : G:\Projects\2016\16109 - Caledon 410 - Fieldgate\DRAWINGS\SWM Report Figures\FIGURE 2-3 - SWM Pond - SMALLER POND.dwg, Layout : Layout1 Date :Nov 29, 2017 - 11:08am, Edit By : rchung

2.3 Site Specific Water Balance

The water balance / recharge targets were established in the AMEC SWS modelling by examining the average annual infiltration volumes that occur under existing conditions. Due to varying soil types / land cover and flow characteristics, recharge targets were established by AMEC for each of the major catchment areas in the MW2 lands. The required infiltration volume for the associated drainage node 5.890 is 26,395m^3 per year.

2.3.1 LID Measures

The lot level controls recommended in the MW2 FSR consisted of: rainwater harvesting, increased topsoil depth, roof downspout disconnections, rain gardens and dry swales. Additional geotechnical / hydrogeological studies are required prior to finalizing the selection of LID techniques in order to establish a realistic infiltration rate for potential LID locations. Given the low overall site infiltration rate, the expectation is that best efforts will be made to meet the targets established through the site specific studies.

2.4 Feature Based Water Balance

There are two environmental features that have been identified on the subject site which has been referred to as northeast and southeast (TRCA wetland) wetlands in the Urbantech MW2 FSR. The location of these wetlands are identified on **Figure 2-4**. The pre and post development drainage area identified in the MW2 FSR is summarized in **Table 2-4**.

Figure 2-4: Wetland Locations

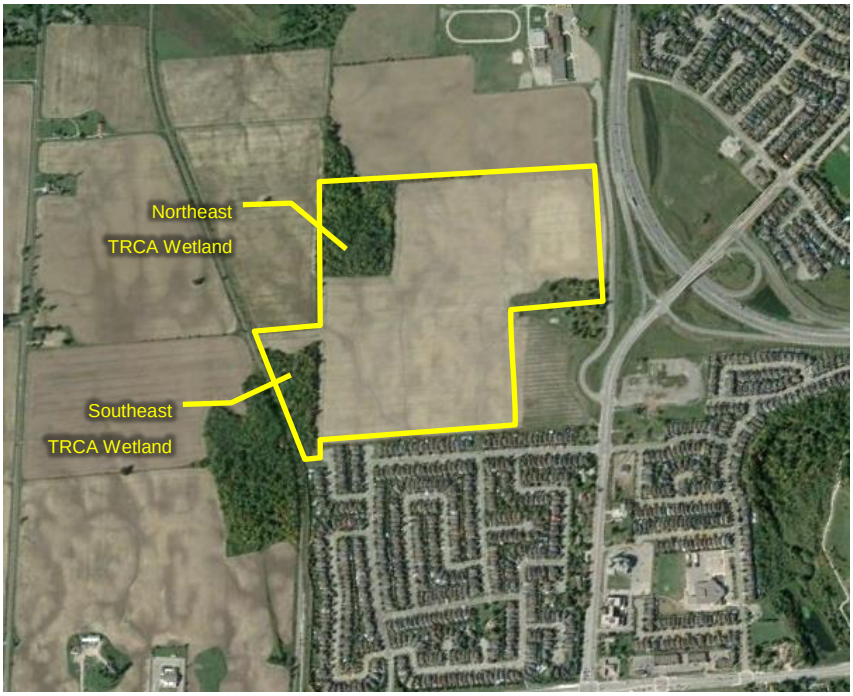


Table 2-4: Pre and Post Development Feature Drainage Area

Wetland	Existing Drainage Area	Post Development Drainage Area
Northeast TRCA Wetland	6.82ha	7.35ha
Southeast TRCA Wetland	5.7ha	4.31ha

Groundwater and surface water monitoring for these wetlands were conducted by Terraprobe between 2011 and 2014. Based on the results of Terraprobe's analysis, PECG concluded that both TRCA wetlands are surface water fed wetlands since the results indicate a seasonal trend of wet and dry periods.

3 PROPOSED STORM SERVICING

3.1 Minor System

Internally within the development, drainage will be collected within a dual major/minor drainage network. The storm sewers within the proposed development will be designed to convey the runoff from a 5-year storm event and are designed as per the Town Standards. All storm sewer slopes, pipe cover depths and manholes meet the minimum design requirements of the Town. Runoff within this development will be conveyed to the Stormwater Management Pond within the proposed development area. The breakdown of drainage areas from these lands for to the pond is as noted in the following table.

Table 3-1 SWM Pond Tributary Areas- Ultimate Condition

Tributary Area (ha)	Comment
41.22	From this draft plan
6.90	External Area

Table 3-2 SWM Pond Tributary Areas- Interim Condition

Tributary Area (ha)	Comment
27.63	From this draft plan
21.61	External Area

The storm sewers have been designed such that a minimum ground cover of 1.50m is maintained above the sewers. The Caledon 410 FSR should be referenced for the proposed storm sewer layout and the storm design sheet.

3.2 Major System

Runoff from events greater than the 5-year event will be directed overland along the internal road network to the established low points adjacent to the proposed stormwater management pond. Overland flows will be directed via appropriately sized inlet conveyances into the pond.

The major system overland flow routes shall be designed to safely convey the 100 year peak overland flow into the facility and will be designed as per the Town Standards. The site has been graded to ensure positive drainage to the intended major system outlet such that the depth of ponding under 100 year event does not exceed 0.3m.

4 CONCLUSION

This Stormwater Management Report presents the stormwater management plan for the Caledon 410 Development within the Mayfield West Phase 2 Secondary Plan Area, Town of Caledon.

A summary of our findings are as follows;

- Appropriate stormwater management measures will be provided to satisfy the applicable water quality treatment and quantity attenuation criteria.
- The storm sewer network within the proposed development will be designed to convey runoff from a 5-year storm event.

The SWM report is a functional level of design and it is noted that the detailed design will be supported by the Environmental Impact Study (EIS), hydrogeology and geotechnical studies in order to further refine the proposed Stormwater Management (SWM) pond design.

We trust you will find the contents of this report satisfactory. Should you have any questions or comments please do not hesitate to contact the undersigned.

Prepared By:

Laura Koyanagi, B.Sc
Water Resources Analyst and Project Manager

Reviewed By:

David Ashfield, P.Eng.
Partner

APPENDIX A

Stormwater Management Calculations

Caledon 410

Town of Caledon
Project No: 16109
Date: November 2017

Drainage Areas and Imperviousness Calculation
Ultimate Condition

SWM Pond 9

Area Breakdown / Proposed landuse	Drainage Area	Runoff Coefficient	Imperviousness
	(ha)		*(%)*
Commercial and Transit Hub	7.82	0.90	100%
Residential Lots (Single)	8.82	0.50	43%
Residential Lots (Townhouse/Apartment)	4.84	0.75	79%
Institutional	4.21	0.75	79%
Parks	0.25	0.25	7%
EPA/Open Space / Buffers	4.80	0.25	7%
Walkway	0.02	0.90	90%
SWM Pond and Access Road	1.84	0.55	50%
Right of Way / Roads	8.62	0.90	100%
External Residential	2.45	0.75	79%
External EPA and Park	2.67	0.25	7%
External Road	0.70	0.90	100%
External Employment	1.08	0.90	100%

Total Drainage Area (ha)	**48.12**
Weighted Runoff Coefficient	**0.67**
Weighted Imperviousness (%)	**68%**

Caledon 410

Town of Caledon
Project No: 16109
Date: November 2017

Drainage Areas and Imperviousness Calculation
Interim Condition

SWM Pond 9

Area Breakdown / Proposed landuse	Drainage Area	Runoff Coefficient	Imperviousness
	(ha)		*(%)*
Residential Lots (Single)	8.82	0.50	43%
Residential Lots (Townhouse/Apartment)	4.84	0.75	79%
Institutional	2.51	0.75	79%
Parks	0.25	0.25	7%
EPA/Open Space / Buffers	4.80	0.25	7%
Walkway	0.02	0.90	90%
SWM Pond and Access Road	1.84	0.55	50%
Right of Way / Roads	4.56	0.90	100%
External Residential	2.45	0.75	79%
External EPA and Park	2.67	0.25	7%
External Road	0.70	0.90	100%
External Undeveloped	15.78	0.25	7%

Total Drainage Area (ha)	**49.24**
Weighted Runoff Coefficient	**0.48**
Weighted Imperviousness (%)	**39%**

Caledon 410

Town of Caledon
Project No: 16109
Date: November 2017

Permanent Pool/Extended Detention Volume

Table A.1 – MOE Water Quality Storage Requirements (SWMP 2003)*

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

* Values in table for Wet Ponds and Wetlands include 40m^3/ha of extended detention storage.

SWM Facility Type = Wet Pond
Level of Protection = Enhanced

Ultimate Condition

Drainage Area = 48.12 ha
Area-Weighted Imperviousness = 68%

Water Quality Control Unit Volume Requirement =	215	m^3/ha
Permanent Pool Unit Volume Requirement =	175	m^3/ha
Total Permanent Pool Storage Volume Required =	**8,438**	m^3
Extended Detention Storage Unit Volume Requirement =	40	m^3/ha
Total Extended Detention Storage Volume Required =	**1,925**	m^3

Interim Condition

Drainage Area = 49.24 ha
Area-Weighted Imperviousness = 39%

Water Quality Control Unit Volume Requirement =	152	m^3/ha
Permanent Pool Unit Volume Requirement =	112	m^3/ha
Total Permanent Pool Storage Volume Required =	**5,537**	m^3
Extended Detention Storage Unit Volume Requirement =	40	m^3/ha
Total Extended Detention Storage Volume Required =	**1,970**	m^3

Caledon 410

Town of Caledon
Project No: 16109
Date: November 2017

Erosion Control Reqiurement

Criteria

As per AMEC's approved erosion threshold anlaysis, the following target volume and release rate were established.
(Based on Urbantech FSR)

	Required Storage (m^3/impervious ha)	Required Release Rate (m^3/s/ha)
Etobicoke Creek	325	0.00031

Target Release Rates

Scenario	Drainage area (ha)	Imperviousness (%)	Required Storage (m^3/impervious ha)	Required Release Rate (m^3/s/ha)
Ultimate	48.12	68%	10571	0.015
Interim	49.24	39%	6290	0.015

SWM Pond Storage Calculations
new site plan

Project#: **16109**

November 2017

A3 POND CHARACTERISTICS

Base of Pond:	253.50	
N.W.L.:	255.25	masl
Increment for Volume:	0.1	m
Required Permanent Pool Volume:	**8438**	m^3
Permanent Pool Volume Provided:	**8631**	m^3

VOLUME

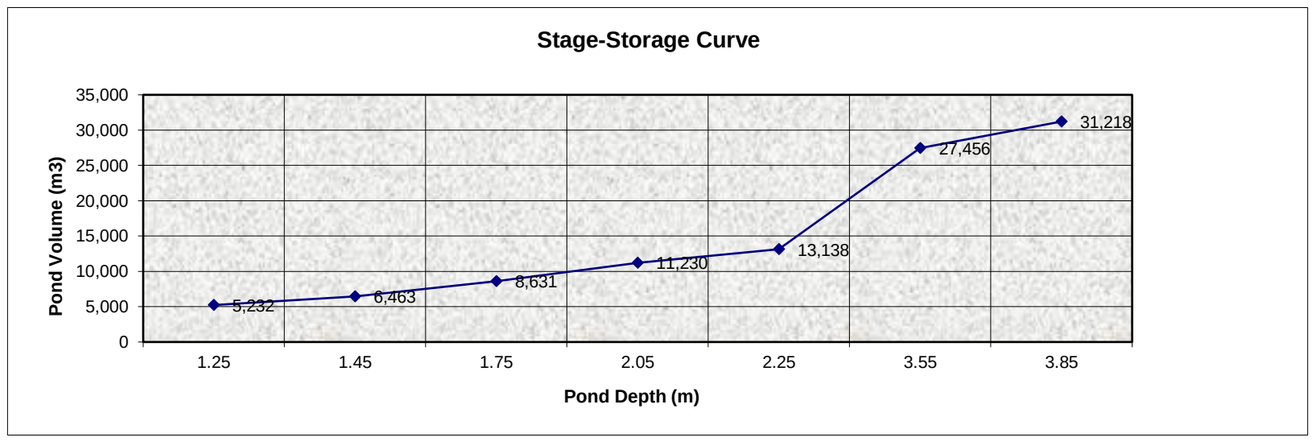
Known Water Level:	256.85	
	INCL. P.P.	ACTIVE ONLY
Lower Known Elevation:	255.75	
Lower Known Volume:	13138.29513	
Upper Known Elevation:	257.05	
Upper Known Volume:	27456.08823	
Volume of Known W.L. Elevation:	**25253**	**16623**

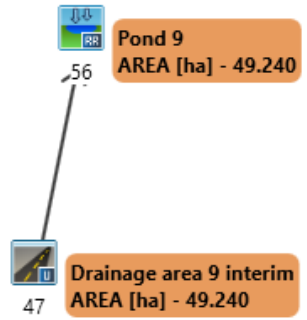
Water Level of Known Volume

Known Volume:		10575
	INCL. P.P.	ACTIVE ONLY
Lower Known Elevation:	#N/A	255.75
Lower Known Volume:	#N/A	4507.73
Upper Known Elevation:	#N/A	257.05
Upper Known Volume:	#N/A	18825.53
W.L. Elevation of Known Volume:	**#N/A**	**256.30**

STAGE / STORAGE INFORMATION

	Elevation (m)	Stage (m)	Area (m^2)	Area 2 (m^2)	Total Area (m^2)	Avg. Area (m^2)	Incremental Storage (m^3)	Cumulative Storage (m^3)	Cumulative Storage above Permanent Pool (m^3)
Pond Base:	253.50	0.00	758	1753	2511		0		
	254.75	1.25	2157	3703	5860	*4186*	*5232*	**5,232**	**0**
	254.95	1.45	2401	4044	6446	*6153*	*1231*	**6,463**	**0**
NWL	255.25	1.75	3058	4947	8005	*7226*	*2168*	**8,631**	**0**
	255.55	2.05	9326		9326	*8666*	*2600*	**11,230**	**2,600**
	255.75	2.25	9754		9754	*9540*	*1908*	**13,138**	**4,508**
100yr-WL	257.05	3.55	12273		12273	*11014*	*14318*	**27,456**	**18,826**
Freeboard	257.35	3.85	12807		12807	*12540*	*3762*	**31,218**	**22,588**





Run	NHYD	DT [hr]	AREA [ha]	PKFW [m³/s]	TP [hr]	RV [mm]	DWF [m³/s]
Run 01	56	0.083	49.240	0.009	5.417	7.648	0.000
Run 02	56	0.083	49.240	0.254	7.833	16.951	0.000
Run 03	56	0.083	49.240	0.782	6.500	27.506	0.000
Run 04	56	0.083	49.240	1.164	6.167	34.848	0.000
Run 05	56	0.083	49.240	1.728	5.833	44.205	0.000
Run 06	56	0.083	49.240	1.959	5.833	51.268	0.000
Run 07	56	0.083	49.240	2.083	5.833	58.408	0.000

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================================================================================
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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****

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82ba-587931b98dfc\70f03a18-d07f-48d0-b90c-ce9ce784cef3\scena

DATE: 11/30/2017                          TIME: 09:37:33

USER:


COMMENTS: ____________________________________________________________

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  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\rchung\AppD
|                  |              ata\Local\Temp\
|                  |              a13eca12-f58c-4768-8916-2ad8b41bda6a\521418bc
| Ptotal= 42.00 mm |    Comments:
--------------------
                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
                0.25     0.00 |  3.50     7.14 |  6.75     2.94 | 10.00     0.42
                0.50     0.42 |  3.75     7.14 |  7.00     2.94 | 10.25     0.42
                0.75     0.42 |  4.00     7.14 |  7.25     2.94 | 10.50     0.42
                1.00     0.42 |  4.25     7.14 |  7.50     1.68 | 10.75     0.42
                1.25     0.42 |  4.50    19.32 |  7.75     1.68 | 11.00     0.42
                1.50     0.42 |  4.75    19.32 |  8.00     1.68 | 11.25     0.42
                1.75     0.42 |  5.00    19.32 |  8.25     1.68 | 11.50     0.42
                2.00     0.42 |  5.25    19.32 |  8.50     0.84 | 11.75     0.42
                2.25     0.42 |  5.50     5.46 |  8.75     0.84 | 12.00     0.42
                2.50     2.52 |  5.75     5.46 |  9.00     0.84 | 12.25     0.42
                2.75     2.52 |  6.00     5.46 |  9.25     0.84 |
                3.00     2.52 |  6.25     5.46 |  9.50     0.42 |
                3.25     2.52 |  6.50     2.94 |  9.75     0.42 |

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0047)|   Area     (ha)=  49.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  39.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       19.20         30.04
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        1.00          2.00
     Length            (m)=      572.95         40.00
     Mannings n             =      0.013         0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

			TOTALS
Max.Eff.Inten.(mm/hr)=	19.32	11.36	
over (min)	15.00	35.00	
Storage Coeff. (min)=	14.05 (ii)	30.90 (ii)	
Unit Hyd. Tpeak (min)=	15.00	35.00	
Unit Hyd. peak (cms)=	0.08	0.04	
PEAK FLOW (cms)=	1.02	0.67	1.618 (iii)
TIME TO PEAK (hrs)=	5.25	5.50	5.25
RUNOFF VOLUME (mm)=	41.00	19.22	27.72
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.98	0.46	0.66

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0056)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	2.0350	1.6534
0.0140	1.0810	2.0820	1.7107
1.8880	1.4816	2.1280	1.7680
1.9390	1.5389	2.2160	1.8825
1.9870	1.5961	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0047)	49.240	1.618	5.25	27.72
OUTFLOW: ID= 1 (0056)	49.240	0.254	7.83	16.95

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.70
TIME SHIFT OF PEAK FLOW (min)=155.00
MAXIMUM STORAGE USED (ha.m.)= 1.1323

****
** SIMULATION NUMBER: 2 **
****

READ STORM	Filename: C:\Users\rchung\AppData\Local\Temp\a13eca12-f58c-4768-8916-2ad8b41bda6a\5da00888
Ptotal= 54.38 mm	Comments:

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	9.25	6.75	3.81	10.00	0.54
0.50	0.54	3.75	9.25	7.00	3.81	10.25	0.54
0.75	0.54	4.00	9.25	7.25	3.81	10.50	0.54
1.00	0.54	4.25	9.25	7.50	2.18	10.75	0.54
1.25	0.54	4.50	25.02	7.75	2.18	11.00	0.54
1.50	0.54	4.75	25.02	8.00	2.18	11.25	0.54
1.75	0.54	5.00	25.02	8.25	2.18	11.50	0.54
2.00	0.54	5.25	25.02	8.50	1.09	11.75	0.54
2.25	0.54	5.50	7.07	8.75	1.09	12.00	0.54
2.50	3.26	5.75	7.07	9.00	1.09	12.25	0.54
2.75	3.26	6.00	7.07	9.25	1.09		
3.00	3.26	6.25	7.07	9.50	0.54		
3.25	3.26	6.50	3.81	9.75	0.54		

CALIB
STANDHYD (0047)
ID= 1 DT= 5.0 min

Area (ha)= 49.24
Total Imp(%)= 39.00 Dir. Conn.(%)= 39.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	19.20	30.04
Dep. Storage	(mm)=	1.00	1.50

Average Slope	(%)=	1.00	2.00
Length	(m)=	572.95	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)=		25.02	16.91	
over (min)		15.00	30.00	
Storage Coeff. (min)=		12.67 (ii)	27.04 (ii)	
Unit Hyd. Tpeak (min)=		15.00	30.00	
Unit Hyd. peak (cms)=		0.08	0.04	
				TOTALS
PEAK FLOW	(cms)=	1.32	1.06	2.326 (iii)
TIME TO PEAK	(hrs)=	5.25	5.42	5.25
RUNOFF VOLUME	(mm)=	53.38	28.62	38.28
TOTAL RAINFALL	(mm)=	54.38	54.38	54.38
RUNOFF COEFFICIENT	=	0.98	0.53	0.70

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0056)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	2.0350	1.6534
	0.0140	1.0810	2.0820	1.7107
	1.8880	1.4816	2.1280	1.7680
	1.9390	1.5389	2.2160	1.8825
	1.9870	1.5961	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0047)	49.240	2.326	5.25	38.28
OUTFLOW: ID= 1 (0056)	49.240	0.782	6.50	27.51

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.61
TIME SHIFT OF PEAK FLOW (min)= 75.00
MAXIMUM STORAGE USED (ha.m.)= 1.2452

****
** SIMULATION NUMBER: 3 **
****

READ STORM	Filename: C:\Users\rchung\AppData\Local\Temp\a13eca12-f58c-4768-8916-2ad8b41bda6a\cefd0acd
Ptotal= 62.71 mm	Comments:

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	10.66	6.75	4.39	10.00	0.63
0.50	0.63	3.75	10.66	7.00	4.39	10.25	0.63
0.75	0.63	4.00	10.66	7.25	4.39	10.50	0.63
1.00	0.63	4.25	10.66	7.50	2.51	10.75	0.63
1.25	0.63	4.50	28.84	7.75	2.51	11.00	0.63
1.50	0.63	4.75	28.84	8.00	2.51	11.25	0.63
1.75	0.63	5.00	28.84	8.25	2.51	11.50	0.63
2.00	0.63	5.25	28.84	8.50	1.25	11.75	0.63
2.25	0.63	5.50	8.15	8.75	1.25	12.00	0.63
2.50	3.76	5.75	8.15	9.00	1.25	12.25	0.63
2.75	3.76	6.00	8.15	9.25	1.25		
3.00	3.76	6.25	8.15	9.50	0.63		
3.25	3.76	6.50	4.39	9.75	0.63		

CALIB			
STANDHYD (0047)	Area (ha)= 49.24		
ID= 1 DT= 5.0 min	Total Imp(%)= 39.00	Dir. Conn.(%)= 39.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	19.20	30.04
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	572.95	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.	(mm/hr)=	28.84	20.66	
over	(min)	10.00	30.00	
Storage Coeff.	(min)=	11.97 (ii)	25.24 (ii)	
Unit Hyd. Tpeak	(min)=	10.00	30.00	
Unit Hyd. peak	(cms)=	0.10	0.04	
				TOTALS
PEAK FLOW	(cms)=	1.53	1.34	2.807 (iii)
TIME TO PEAK	(hrs)=	5.25	5.42	5.25
RUNOFF VOLUME	(mm)=	61.71	35.33	45.62
TOTAL RAINFALL	(mm)=	62.71	62.71	62.71
RUNOFF COEFFICIENT	=	0.98	0.56	0.73

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0056)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	2.0350	1.6534
	0.0140	1.0810	2.0820	1.7107
	1.8880	1.4816	2.1280	1.7680
	1.9390	1.5389	2.2160	1.8825
	1.9870	1.5961	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0047)	49.240	2.807	5.25	45.62
OUTFLOW: ID= 1 (0056)	49.240	1.164	6.17	34.85

PEAK FLOW REDUCTION [Qout/Qin](%)= 41.46
TIME SHIFT OF PEAK FLOW (min)= 55.00
MAXIMUM STORAGE USED (ha.m.)= 1.3268

****
** SIMULATION NUMBER: 4 **
****

READ STORM	Filename: C:\Users\rchung\AppData\Local\Temp\a13eca12-f58c-4768-8916-2ad8b41bda6a\0ffb8cf0
Ptotal= 73.10 mm	Comments:

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	12.43	6.75	5.12	10.00	0.73
0.50	0.73	3.75	12.43	7.00	5.12	10.25	0.73
0.75	0.73	4.00	12.43	7.25	5.12	10.50	0.73
1.00	0.73	4.25	12.43	7.50	2.92	10.75	0.73
1.25	0.73	4.50	33.63	7.75	2.92	11.00	0.73
1.50	0.73	4.75	33.63	8.00	2.92	11.25	0.73
1.75	0.73	5.00	33.63	8.25	2.92	11.50	0.73
2.00	0.73	5.25	33.63	8.50	1.46	11.75	0.73
2.25	0.73	5.50	9.50	8.75	1.46	12.00	0.73
2.50	4.39	5.75	9.50	9.00	1.46	12.25	0.73
2.75	4.39	6.00	9.50	9.25	1.46		
3.00	4.39	6.25	9.50	9.50	0.73		
3.25	4.39	6.50	5.12	9.75	0.73		

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| CALIB            |
| STANDHYD (  0047)|   Area    (ha)=  49.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  39.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      19.20         30.04
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     572.95         40.00
     Mannings n           =      0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

```
     Max.Eff.Inten.(mm/hr)=      33.63        25.46
               over (min)        10.00        25.00
     Storage Coeff.  (min)=     11.26 (ii)   23.46 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.10         0.05
```

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                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.79         1.73         3.480 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.33          5.25
     RUNOFF VOLUME    (mm)=      72.10        44.03         54.98
     TOTAL RAINFALL   (mm)=      73.10        73.10         73.10
     RUNOFF COEFFICIENT   =       0.99         0.60          0.75


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0056)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   2.0350      1.6534
                          0.0140     1.0810   |   2.0820      1.7107
                          1.8880     1.4816   |   2.1280      1.7680
                          1.9390     1.5389   |   2.2160      1.8825
                          1.9870     1.5961   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0047)     49.240     3.480      5.25      54.98
   OUTFLOW: ID= 1 (  0056)     49.240     1.728      5.83      44.20

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.66
                  TIME SHIFT OF PEAK FLOW          (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.4482

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  ** SIMULATION NUMBER:   5 **
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|    READ STORM    |    Filename: C:\Users\rchung\AppD
|                  |              ata\Local\Temp\
|                  |              a13eca12-f58c-4768-8916-2ad8b41bda6a\2982cd96
| Ptotal= 80.82 mm |    Comments:
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```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	13.74	6.75	5.66	10.00	0.81
0.50	0.81	3.75	13.74	7.00	5.66	10.25	0.81
0.75	0.81	4.00	13.74	7.25	5.66	10.50	0.81
1.00	0.81	4.25	13.74	7.50	3.23	10.75	0.81
1.25	0.81	4.50	37.17	7.75	3.23	11.00	0.81
1.50	0.81	4.75	37.17	8.00	3.23	11.25	0.81
1.75	0.81	5.00	37.17	8.25	3.23	11.50	0.81
2.00	0.81	5.25	37.17	8.50	1.62	11.75	0.81
2.25	0.81	5.50	10.50	8.75	1.62	12.00	0.81
2.50	4.85	5.75	10.50	9.00	1.62	12.25	0.81
2.75	4.85	6.00	10.50	9.25	1.62		
3.00	4.85	6.25	10.50	9.50	0.81		

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                3.25    4.85 |  6.50    5.66 |  9.75    0.81 |

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| CALIB            |
| STANDHYD (  0047)|   Area    (ha)=  49.24
|ID= 1 DT= 5.0 min |   Total Imp(%)=  39.00   Dir. Conn.(%)=  39.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      19.20        30.04
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     572.95        40.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

```
     Max.Eff.Inten.(mm/hr)=      37.17        29.06
                 over (min)      10.00        25.00
     Storage Coeff.  (min)=      10.82 (ii)   22.39 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.11         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.98         2.01      3.953 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.33       5.25
     RUNOFF VOLUME    (mm)=      79.82        50.68      62.04
     TOTAL RAINFALL   (mm)=      80.82        80.82      80.82
     RUNOFF COEFFICIENT   =       0.99         0.63       0.77

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR(  0056)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   2.0350      1.6534
                          0.0140     1.0810   |   2.0820      1.7107
                          1.8880     1.4816   |   2.1280      1.7680
                          1.9390     1.5389   |   2.2160      1.8825
                          1.9870     1.5961   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0047)     49.240     3.953      5.25      62.04
   OUTFLOW: ID= 1 (  0056)     49.240     1.959      5.83      51.27

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.55
                TIME SHIFT OF PEAK FLOW         (min)= 35.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.5637

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  ***************************
  ** SIMULATION NUMBER:   6 **
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|    READ STORM    |    Filename: C:\Users\rchung\AppD
|                  |              ata\Local\Temp\
|                  |              a13eca12-f58c-4768-8916-2ad8b41bda6a\0ec66e16
| Ptotal= 88.54 mm |    Comments:
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```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	15.05	6.75	6.20	10.00	0.89
0.50	0.89	3.75	15.05	7.00	6.20	10.25	0.89
0.75	0.89	4.00	15.05	7.25	6.20	10.50	0.89
1.00	0.89	4.25	15.05	7.50	3.54	10.75	0.89
1.25	0.89	4.50	40.71	7.75	3.54	11.00	0.89
1.50	0.89	4.75	40.71	8.00	3.54	11.25	0.89
1.75	0.89	5.00	40.71	8.25	3.54	11.50	0.89
2.00	0.89	5.25	40.71	8.50	1.77	11.75	0.89

	2.25	0.89	5.50	11.51	8.75	1.77	12.00	0.89
	2.50	5.31	5.75	11.51	9.00	1.77	12.25	0.89
	2.75	5.31	6.00	11.51	9.25	1.77		
	3.00	5.31	6.25	11.51	9.50	0.89		
	3.25	5.31	6.50	6.20	9.75	0.89		

CALIB	
STANDHYD (0047)	Area (ha)= 49.24
ID= 1 DT= 5.0 min	Total Imp(%)= 39.00 Dir. Conn.(%)= 39.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	19.20	30.04
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	572.95	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

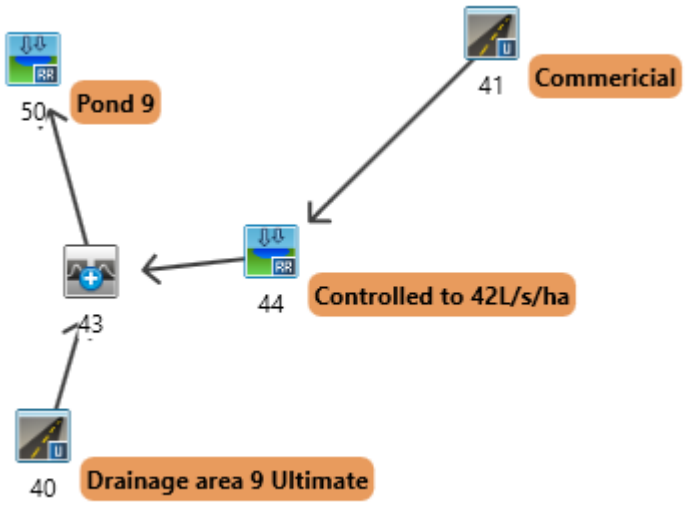
Max.Eff.Inten.(mm/hr)=		40.71	32.69	
over (min)		10.00	25.00	
Storage Coeff. (min)=		10.43 (ii)	21.47 (ii)	
Unit Hyd. Tpeak (min)=		10.00	25.00	
Unit Hyd. peak (cms)=		0.11	0.05	
				TOTALS
PEAK FLOW	(cms)=	2.17	2.30	4.432 (iii)
TIME TO PEAK	(hrs)=	5.25	5.33	5.25
RUNOFF VOLUME	(mm)=	87.54	57.45	69.19
TOTAL RAINFALL	(mm)=	88.54	88.54	88.54
RUNOFF COEFFICIENT	=	0.99	0.65	0.78

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0056)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	2.0350	1.6534
	0.0140	1.0810	2.0820	1.7107
	1.8880	1.4816	2.1280	1.7680
	1.9390	1.5389	2.2160	1.8825
	1.9870	1.5961	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0047)	49.240	4.432	5.25	69.19
OUTFLOW: ID= 1 (0056)	49.240	2.083	5.83	58.41

PEAK FLOW REDUCTION [Qout/Qin](%)= 47.00
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 1.7117



Run	NHYD	DT [hr]	AREA [ha]	PKFW [m³/s]	TP [hr]	RV [mm]	DWF [m³/s]
Run 02	50	0.083	48.120	0.522	6.667	22.890	0.000
Run 03	50	0.083	48.120	1.110	6.000	34.292	0.000
Run 04	50	0.083	48.120	1.588	5.750	42.092	0.000
Run 05	50	0.083	48.120	1.965	5.667	51.927	0.000
Run 06	50	0.083	48.120	2.085	5.750	59.294	0.000
Run 07	50	0.083	48.120	2.208	5.750	66.703	0.000

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       V     V   I    SSSSS  U   U    A    L
       V     V   I    SS     U   U   A A   L
        V   V    I      SS   U   U  AAAAA  L
        V   V    I       SS  U   U  A   A  L
         VV      I    SSSSS  UUUUU  A   A  LLLLL

        OOO    TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O     T      T    H   H   Y Y   MM MM  O   O
       O   O     T      T    H   H    Y    M   M  O   O
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       OOO     T      T    H   H    Y    M   M   OOO
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                *****  D E T A I L E D   O U T P U T *****


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DATE: 11/30/2017                          TIME: 09:46:37

USER:


COMMENTS: _____________________________________________________________


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  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************


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| Ptotal= 42.00 mm |    Comments:
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                TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                 hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
                0.25     0.00 |  3.50     7.14 |  6.75     2.94 | 10.00     0.42
                0.50     0.42 |  3.75     7.14 |  7.00     2.94 | 10.25     0.42
                0.75     0.42 |  4.00     7.14 |  7.25     2.94 | 10.50     0.42
                1.00     0.42 |  4.25     7.14 |  7.50     1.68 | 10.75     0.42
                1.25     0.42 |  4.50    19.32 |  7.75     1.68 | 11.00     0.42
                1.50     0.42 |  4.75    19.32 |  8.00     1.68 | 11.25     0.42
                1.75     0.42 |  5.00    19.32 |  8.25     1.68 | 11.50     0.42
                2.00     0.42 |  5.25    19.32 |  8.50     0.84 | 11.75     0.42
                2.25     0.42 |  5.50     5.46 |  8.75     0.84 | 12.00     0.42
                2.50     2.52 |  5.75     5.46 |  9.00     0.84 | 12.25     0.42
                2.75     2.52 |  6.00     5.46 |  9.25     0.84 |
                3.00     2.52 |  6.25     5.46 |  9.50     0.42 |
                3.25     2.52 |  6.50     2.94 |  9.75     0.42 |

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| CALIB            |
| STANDHYD (  0040)|   Area     (ha)=  41.11
|ID= 1 DT= 5.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  62.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	25.49	15.62
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	523.51	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.	(mm/hr)=	19.32	11.36	
over	(min)	15.00	35.00	
Storage Coeff.	(min)=	13.31 (ii)	30.16 (ii)	
Unit Hyd. Tpeak	(min)=	15.00	35.00	
Unit Hyd. peak	(cms)=	0.08	0.04	
				TOTALS
PEAK FLOW	(cms)=	1.35	0.35	1.668 (iii)
TIME TO PEAK	(hrs)=	5.25	5.50	5.25
RUNOFF VOLUME	(mm)=	41.00	19.22	32.72
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.46	0.78

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0041)	Area (ha)= 7.01
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	6.94	0.07	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	216.18	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	19.32	11.73	
over	(min)	10.00	10.00	
Storage Coeff.	(min)=	7.83 (ii)	10.00 (ii)	
Unit Hyd. Tpeak	(min)=	10.00	10.00	
Unit Hyd. peak	(cms)=	0.13	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.37	0.00	0.374 (iii)
TIME TO PEAK	(hrs)=	5.25	5.25	5.25
RUNOFF VOLUME	(mm)=	41.00	19.22	40.78
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	0.46	0.97

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0044)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.7000	0.1400

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0041)		7.010	0.374	5.25	40.78
OUTFLOW: ID= 1 (0044)		7.010	0.319	5.33	40.78
PEAK FLOW REDUCTION [Qout/Qin](%)=		85.17			
TIME SHIFT OF PEAK FLOW	(min)=	5.00			
MAXIMUM STORAGE USED	(ha.m.)=	0.0639			

```
| ADD HYD  (  0043)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):    41.11   1.668     5.25    32.72
     + ID2= 2 (  0044):     7.01   0.319     5.33    40.78
       ================================================
       ID = 3 (  0043):    48.12   1.982     5.25    33.90

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-------------------
| RESERVOIR(  0050)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   2.0350      1.6534
                         0.0140     1.0807   |   2.0820      1.7107
                         1.8880     1.4816   |   2.1280      1.7680
                         1.9390     1.5389   |   2.2160      1.8825
                         1.9870     1.5961   |   0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0043)    48.120     1.982      5.25      33.90
   OUTFLOW: ID= 1 (  0050)    48.120     0.522      6.67      22.89

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.31
                 TIME SHIFT OF PEAK FLOW         (min)= 85.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  1.1895

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  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************


-------------------
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|                  |              ata\Local\Temp\
|                  |              1ecac1ca-9d75-4d0f-9ee6-3d58c0963f95\5da00888
| Ptotal= 54.38 mm |    Comments:
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.00 |  3.50    9.25 |  6.75    3.81 | 10.00    0.54
                0.50    0.54 |  3.75    9.25 |  7.00    3.81 | 10.25    0.54
                0.75    0.54 |  4.00    9.25 |  7.25    3.81 | 10.50    0.54
                1.00    0.54 |  4.25    9.25 |  7.50    2.18 | 10.75    0.54
                1.25    0.54 |  4.50   25.02 |  7.75    2.18 | 11.00    0.54
                1.50    0.54 |  4.75   25.02 |  8.00    2.18 | 11.25    0.54
                1.75    0.54 |  5.00   25.02 |  8.25    2.18 | 11.50    0.54
                2.00    0.54 |  5.25   25.02 |  8.50    1.09 | 11.75    0.54
                2.25    0.54 |  5.50    7.07 |  8.75    1.09 | 12.00    0.54
                2.50    3.26 |  5.75    7.07 |  9.00    1.09 | 12.25    0.54
                2.75    3.26 |  6.00    7.07 |  9.25    1.09 |
                3.00    3.26 |  6.25    7.07 |  9.50    0.54 |
                3.25    3.26 |  6.50    3.81 |  9.75    0.54 |

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--------------------
| CALIB            |
| STANDHYD (  0040)|   Area     (ha)=  41.11
|ID= 1 DT= 5.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  62.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       25.49         15.62
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        1.00          2.00
     Length            (m)=      523.51         40.00
     Mannings n           =       0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    0.00 | 3.167    3.26 | 6.250    7.07 |  9.33    0.54
             0.167    0.00 | 3.250    3.26 | 6.333    3.81 |  9.42    0.54
             0.250    0.00 | 3.333    9.25 | 6.417    3.81 |  9.50    0.54
             0.333    0.54 | 3.417    9.25 | 6.500    3.81 |  9.58    0.54
             0.417    0.54 | 3.500    9.25 | 6.583    3.81 |  9.67    0.54
             0.500    0.54 | 3.583    9.25 | 6.667    3.81 |  9.75    0.54
             0.583    0.54 | 3.667    9.25 | 6.750    3.81 |  9.83    0.54
             0.667    0.54 | 3.750    9.25 | 6.833    3.81 |  9.92    0.54
             0.750    0.54 | 3.833    9.25 | 6.917    3.81 | 10.00    0.54
             0.833    0.54 | 3.917    9.25 | 7.000    3.81 | 10.08    0.54
             0.917    0.54 | 4.000    9.25 | 7.083    3.81 | 10.17    0.54
             1.000    0.54 | 4.083    9.25 | 7.167    3.81 | 10.25    0.54
             1.083    0.54 | 4.167    9.25 | 7.250    3.81 | 10.33    0.54
             1.167    0.54 | 4.250    9.25 | 7.333    2.18 | 10.42    0.54
             1.250    0.54 | 4.333   25.02 | 7.417    2.18 | 10.50    0.54
             1.333    0.54 | 4.417   25.02 | 7.500    2.18 | 10.58    0.54
             1.417    0.54 | 4.500   25.02 | 7.583    2.18 | 10.67    0.54
             1.500    0.54 | 4.583   25.02 | 7.667    2.18 | 10.75    0.54
             1.583    0.54 | 4.667   25.02 | 7.750    2.18 | 10.83    0.54
             1.667    0.54 | 4.750   25.02 | 7.833    2.18 | 10.92    0.54
             1.750    0.54 | 4.833   25.02 | 7.917    2.18 | 11.00    0.54
             1.833    0.54 | 4.917   25.02 | 8.000    2.18 | 11.08    0.54
             1.917    0.54 | 5.000   25.02 | 8.083    2.18 | 11.17    0.54
             2.000    0.54 | 5.083   25.02 | 8.167    2.18 | 11.25    0.54
             2.083    0.54 | 5.167   25.02 | 8.250    2.18 | 11.33    0.54
             2.167    0.54 | 5.250   25.02 | 8.333    1.09 | 11.42    0.54
             2.250    0.54 | 5.333    7.07 | 8.417    1.09 | 11.50    0.54
             2.333    3.26 | 5.417    7.07 | 8.500    1.09 | 11.58    0.54
             2.417    3.26 | 5.500    7.07 | 8.583    1.09 | 11.67    0.54
             2.500    3.26 | 5.583    7.07 | 8.667    1.09 | 11.75    0.54
             2.583    3.26 | 5.667    7.07 | 8.750    1.09 | 11.83    0.54
             2.667    3.26 | 5.750    7.07 | 8.833    1.09 | 11.92    0.54
             2.750    3.26 | 5.833    7.07 | 8.917    1.09 | 12.00    0.54
             2.833    3.26 | 5.917    7.07 | 9.000    1.09 | 12.08    0.54
             2.917    3.26 | 6.000    7.07 | 9.083    1.09 | 12.17    0.54
             3.000    3.26 | 6.083    7.07 | 9.167    1.09 | 12.25    0.54
             3.083    3.26 | 6.167    7.07 | 9.250    1.09 |

     Max.Eff.Inten.(mm/hr)=      25.02         16.91
               over (min)        10.00         30.00
     Storage Coeff.  (min)=      12.01 (ii)    26.37 (ii)
     Unit Hyd. Tpeak (min)=      10.00         30.00
     Unit Hyd. peak  (cms)=       0.10          0.04
```

				TOTALS	
PEAK FLOW	(cms)=	1.76	0.56	2.288	(iii)
TIME TO PEAK	(hrs)=	5.25	5.42	5.25	
RUNOFF VOLUME	(mm)=	53.38	28.62	43.97	
TOTAL RAINFALL	(mm)=	54.38	54.38	54.38	
RUNOFF COEFFICIENT	=	0.98	0.53	0.81	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0041)
ID= 1 DT= 5.0 min

Area (ha)= 7.01
Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	6.94	0.07		
Dep. Storage	(mm)=	1.00	1.50		
Average Slope	(%)=	1.00	2.00		
Length	(m)=	216.18	40.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(mm/hr)	=	25.02	17.13		
over (min)		5.00	10.00		
Storage Coeff.	(min)=	7.06 (ii)	9.02 (ii)		
Unit Hyd. Tpeak	(min)=	5.00	10.00		
Unit Hyd. peak	(cms)=	0.17	0.12		
				TOTALS	
PEAK FLOW	(cms)=	0.48	0.00	0.485	(iii)
TIME TO PEAK	(hrs)=	5.25	5.25	5.25	
RUNOFF VOLUME	(mm)=	53.38	28.62	53.13	
TOTAL RAINFALL	(mm)=	54.38	54.38	54.38	
RUNOFF COEFFICIENT	=	0.98	0.53	0.98	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0044)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.7000	0.1400

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (	0041)	7.010	0.485	5.25	53.13
OUTFLOW: ID= 1 (	0044)	7.010	0.416	5.25	53.13

PEAK FLOW REDUCTION [Qout/Qin](%)= 85.68
TIME SHIFT OF PEAK FLOW (min)= 0.00
MAXIMUM STORAGE USED (ha.m.)= 0.0842

ADD HYD (0043)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0040):	41.11	2.288	5.25	43.97
+ ID2= 2 (0044):	7.01	0.416	5.25	53.13
ID = 3 (0043):	48.12	2.704	5.25	45.30

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0050)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	2.0350	1.6534
0.0140	1.0807	2.0820	1.7107
1.8880	1.4816	2.1280	1.7680
1.9390	1.5389	2.2160	1.8825
1.9870	1.5961	0.0000	0.0000

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (	0043)	48.120	2.704	5.25	45.30
OUTFLOW: ID= 1 (	0050)	48.120	1.110	6.00	34.29

PEAK FLOW REDUCTION [Qout/Qin](%)= 41.06
TIME SHIFT OF PEAK FLOW (min)= 45.00
MAXIMUM STORAGE USED (ha.m.)= 1.3154

****
** SIMULATION NUMBER: 3 **
****

READ STORM	Filename: C:\Users\rchung\AppData\Local\Temp\1ecac1ca-9d75-4d0f-9ee6-3d58c0963f95\cefd0acd
Ptotal= 62.71 mm	Comments:

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	3.50	10.66	6.75	4.39	10.00	0.63
0.50	0.63	3.75	10.66	7.00	4.39	10.25	0.63
0.75	0.63	4.00	10.66	7.25	4.39	10.50	0.63
1.00	0.63	4.25	10.66	7.50	2.51	10.75	0.63
1.25	0.63	4.50	28.84	7.75	2.51	11.00	0.63
1.50	0.63	4.75	28.84	8.00	2.51	11.25	0.63
1.75	0.63	5.00	28.84	8.25	2.51	11.50	0.63
2.00	0.63	5.25	28.84	8.50	1.25	11.75	0.63
2.25	0.63	5.50	8.15	8.75	1.25	12.00	0.63
2.50	3.76	5.75	8.15	9.00	1.25	12.25	0.63
2.75	3.76	6.00	8.15	9.25	1.25		

3.00	3.76	6.25	8.15	9.50	0.63
3.25	3.76	6.50	4.39	9.75	0.63

CALIB			
STANDHYD (0040)	Area (ha)= 41.11		
ID= 1 DT= 5.0 min	Total Imp(%)= 62.00	Dir. Conn.(%)= 62.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	25.49	15.62
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	523.51	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)=	28.84	20.66		
over (min)	10.00	25.00		
Storage Coeff. (min)=	11.34 (ii)	24.60 (ii)		
Unit Hyd. Tpeak (min)=	10.00	25.00		
Unit Hyd. peak (cms)=	0.10	0.05		
				TOTALS
PEAK FLOW (cms)=	2.03	0.71		2.727 (iii)
TIME TO PEAK (hrs)=	5.25	5.33		5.25
RUNOFF VOLUME (mm)=	61.71	35.33		51.69
TOTAL RAINFALL (mm)=	62.71	62.71		62.71
RUNOFF COEFFICIENT =	0.98	0.56		0.82

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0041)	Area (ha)= 7.01		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	6.94	0.07
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	216.18	40.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	28.84	20.90		
over (min)	5.00	10.00		
Storage Coeff. (min)=	6.67 (ii)	8.52 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.18	0.12		
				TOTALS
PEAK FLOW (cms)=	0.56	0.00		0.560 (iii)
TIME TO PEAK (hrs)=	5.25	5.25		5.25
RUNOFF VOLUME (mm)=	61.71	35.33		61.45
TOTAL RAINFALL (mm)=	62.71	62.71		62.71
RUNOFF COEFFICIENT =	0.98	0.56		0.98

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0044)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.7000	0.1400

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
   INFLOW : ID= 2 (  0041)      7.010      0.560      5.25      61.45
   OUTFLOW: ID= 1 (  0044)      7.010      0.481      5.25      61.44

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 85.88
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0973

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| ADD HYD  (  0043)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0040):    41.11   2.727     5.25    51.69
      + ID2= 2 (  0044):     7.01   0.481     5.25    61.44
        ================================================
        ID = 3 (  0043):    48.12   3.208     5.25    53.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR(  0050)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   2.0350      1.6534
                         0.0140     1.0807    |   2.0820      1.7107
                         1.8880     1.4816    |   2.1280      1.7680
                         1.9390     1.5389    |   2.2160      1.8825
                         1.9870     1.5961    |   0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0043)    48.120     3.208     5.25      53.11
   OUTFLOW: ID= 1 (  0050)    48.120     1.588     5.75      42.09

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.49
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.4178

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  ****************************
  ** SIMULATION NUMBER:   4 **
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|    READ STORM    |    Filename: C:\Users\rchung\AppD
|                  |              ata\Local\Temp\
|                  |              1ecac1ca-9d75-4d0f-9ee6-3d58c0963f95\0ffb8cf0
| Ptotal= 73.10 mm |    Comments:
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.00 |  3.50   12.43 |  6.75    5.12 | 10.00    0.73
                0.50    0.73 |  3.75   12.43 |  7.00    5.12 | 10.25    0.73
                0.75    0.73 |  4.00   12.43 |  7.25    5.12 | 10.50    0.73
                1.00    0.73 |  4.25   12.43 |  7.50    2.92 | 10.75    0.73
                1.25    0.73 |  4.50   33.63 |  7.75    2.92 | 11.00    0.73
                1.50    0.73 |  4.75   33.63 |  8.00    2.92 | 11.25    0.73
                1.75    0.73 |  5.00   33.63 |  8.25    2.92 | 11.50    0.73
                2.00    0.73 |  5.25   33.63 |  8.50    1.46 | 11.75    0.73
                2.25    0.73 |  5.50    9.50 |  8.75    1.46 | 12.00    0.73
                2.50    4.39 |  5.75    9.50 |  9.00    1.46 | 12.25    0.73
                2.75    4.39 |  6.00    9.50 |  9.25    1.46 |
                3.00    4.39 |  6.25    9.50 |  9.50    0.73 |
                3.25    4.39 |  6.50    5.12 |  9.75    0.73 |

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| CALIB            |
| STANDHYD (  0040)|   Area     (ha)=  41.11
|ID= 1 DT= 5.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  62.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       25.49         15.62
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        1.00          2.00
     Length            (m)=      523.51         40.00
     Mannings n           =       0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.083    0.00 | 3.167    4.39 | 6.250    9.50 |  9.33    0.73
     0.167    0.00 | 3.250    4.39 | 6.333    5.12 |  9.42    0.73
     0.250    0.00 | 3.333   12.43 | 6.417    5.12 |  9.50    0.73
     0.333    0.73 | 3.417   12.43 | 6.500    5.12 |  9.58    0.73
     0.417    0.73 | 3.500   12.43 | 6.583    5.12 |  9.67    0.73
     0.500    0.73 | 3.583   12.43 | 6.667    5.12 |  9.75    0.73
     0.583    0.73 | 3.667   12.43 | 6.750    5.12 |  9.83    0.73
     0.667    0.73 | 3.750   12.43 | 6.833    5.12 |  9.92    0.73
     0.750    0.73 | 3.833   12.43 | 6.917    5.12 | 10.00    0.73
     0.833    0.73 | 3.917   12.43 | 7.000    5.12 | 10.08    0.73
     0.917    0.73 | 4.000   12.43 | 7.083    5.12 | 10.17    0.73
     1.000    0.73 | 4.083   12.43 | 7.167    5.12 | 10.25    0.73
     1.083    0.73 | 4.167   12.43 | 7.250    5.12 | 10.33    0.73
     1.167    0.73 | 4.250   12.43 | 7.333    2.92 | 10.42    0.73
     1.250    0.73 | 4.333   33.63 | 7.417    2.92 | 10.50    0.73
     1.333    0.73 | 4.417   33.63 | 7.500    2.92 | 10.58    0.73
     1.417    0.73 | 4.500   33.63 | 7.583    2.92 | 10.67    0.73
     1.500    0.73 | 4.583   33.63 | 7.667    2.92 | 10.75    0.73
     1.583    0.73 | 4.667   33.63 | 7.750    2.92 | 10.83    0.73
     1.667    0.73 | 4.750   33.63 | 7.833    2.92 | 10.92    0.73
     1.750    0.73 | 4.833   33.63 | 7.917    2.92 | 11.00    0.73
     1.833    0.73 | 4.917   33.63 | 8.000    2.92 | 11.08    0.73
     1.917    0.73 | 5.000   33.63 | 8.083    2.92 | 11.17    0.73
     2.000    0.73 | 5.083   33.63 | 8.167    2.92 | 11.25    0.73
     2.083    0.73 | 5.167   33.63 | 8.250    2.92 | 11.33    0.73
     2.167    0.73 | 5.250   33.63 | 8.333    1.46 | 11.42    0.73
     2.250    0.73 | 5.333    9.50 | 8.417    1.46 | 11.50    0.73
     2.333    4.39 | 5.417    9.50 | 8.500    1.46 | 11.58    0.73
     2.417    4.39 | 5.500    9.50 | 8.583    1.46 | 11.67    0.73
     2.500    4.39 | 5.583    9.50 | 8.667    1.46 | 11.75    0.73
     2.583    4.39 | 5.667    9.50 | 8.750    1.46 | 11.83    0.73
     2.667    4.39 | 5.750    9.50 | 8.833    1.46 | 11.92    0.73
     2.750    4.39 | 5.833    9.50 | 8.917    1.46 | 12.00    0.73
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              2.833    4.39 | 5.917    9.50 | 9.000    1.46 | 12.08    0.73
              2.917    4.39 | 6.000    9.50 | 9.083    1.46 | 12.17    0.73
              3.000    4.39 | 6.083    9.50 | 9.167    1.46 | 12.25    0.73
              3.083    4.39 | 6.167    9.50 | 9.250    1.46 |

     Max.Eff.Inten.(mm/hr)=      33.63        25.46
               over (min)        10.00        25.00
     Storage Coeff.  (min)=      10.67 (ii)   22.87 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.11         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.37         0.91      3.261 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.33       5.25
     RUNOFF VOLUME    (mm)=      72.10        44.03      61.43
     TOTAL RAINFALL   (mm)=      73.10        73.10      73.10
     RUNOFF COEFFICIENT   =       0.99         0.60       0.84


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0041)|   Area    (ha)=   7.01
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.94         0.07
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     216.18        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      33.63        25.71
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       6.27 (ii)    8.01 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.19         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.65         0.00      0.653 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.25       5.25
     RUNOFF VOLUME    (mm)=      72.10        44.03      71.82
     TOTAL RAINFALL   (mm)=      73.10        73.10      73.10
     RUNOFF COEFFICIENT   =       0.99         0.60       0.98


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0044)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)      (ha.m.)   |   (cms)      (ha.m.)
                         0.0000     0.0000    |   0.7000      0.1400

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0041)       7.010     0.653      5.25      71.82
   OUTFLOW: ID= 1 (  0044)       7.010     0.562      5.25      71.81

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 86.07
                TIME SHIFT OF PEAK FLOW         (min)=  0.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.1138

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--------------------
| ADD HYD  (  0043)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0040):     41.11    3.261     5.25    61.43
      + ID2= 2 (  0044):      7.01    0.562     5.25    71.81
        ================================================
        ID = 3 (  0043):     48.12    3.823     5.25    62.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0050)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)      (ha.m.)   |   (cms)      (ha.m.)
                         0.0000     0.0000    |   2.0350      1.6534
                         0.0140     1.0807    |   2.0820      1.7107
                         1.8880     1.4816    |   2.1280      1.7680
                         1.9390     1.5389    |   2.2160      1.8825
                         1.9870     1.5961    |   0.0000      0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0043)      48.120     3.823      5.25      62.95
   OUTFLOW: ID= 1 (  0050)      48.120     1.965      5.67      51.93

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 51.39
                TIME SHIFT OF PEAK FLOW         (min)= 25.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.5700

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  ***************************
  ** SIMULATION NUMBER:   5 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\rchung\AppD
|                  |              ata\Local\Temp\
|                  |              1ecac1ca-9d75-4d0f-9ee6-3d58c0963f95\2982cd96
| Ptotal= 80.82 mm |    Comments:
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.00 |  3.50   13.74 |  6.75    5.66 | 10.00    0.81
```

0.50	0.81	3.75	13.74	7.00	5.66	10.25	0.81
0.75	0.81	4.00	13.74	7.25	5.66	10.50	0.81
1.00	0.81	4.25	13.74	7.50	3.23	10.75	0.81
1.25	0.81	4.50	37.17	7.75	3.23	11.00	0.81
1.50	0.81	4.75	37.17	8.00	3.23	11.25	0.81
1.75	0.81	5.00	37.17	8.25	3.23	11.50	0.81
2.00	0.81	5.25	37.17	8.50	1.62	11.75	0.81
2.25	0.81	5.50	10.50	8.75	1.62	12.00	0.81
2.50	4.85	5.75	10.50	9.00	1.62	12.25	0.81
2.75	4.85	6.00	10.50	9.25	1.62		
3.00	4.85	6.25	10.50	9.50	0.81		
3.25	4.85	6.50	5.66	9.75	0.81		

CALIB	STANDHYD (0040)	ID= 1 DT= 5.0 min

Area (ha)= 41.11
Total Imp(%)= 62.00 Dir. Conn.(%)= 62.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	25.49	15.62
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	523.51	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)=	37.17	29.06	
over (min)	10.00	25.00	
Storage Coeff. (min)=	10.25 (ii)	21.82 (ii)	
Unit Hyd. Tpeak (min)=	10.00	25.00	
Unit Hyd. peak (cms)=	0.11	0.05	
			TOTALS
PEAK FLOW (cms)=	2.63	1.05	3.660 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	79.82	50.68	68.75
TOTAL RAINFALL (mm)=	80.82	80.82	80.82
RUNOFF COEFFICIENT =	0.99	0.63	0.85

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	STANDHYD (0041)	ID= 1 DT= 5.0 min

Area (ha)= 7.01
Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	6.94	0.07
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	216.18	40.00
Mannings n	=	0.013	0.250

Max.Eff.Inten.(mm/hr)=	37.17	29.32	
over (min)	5.00	10.00	
Storage Coeff. (min)=	6.03 (ii)	7.70 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.19	0.13	
			TOTALS
PEAK FLOW (cms)=	0.72	0.01	0.722 (iii)
TIME TO PEAK (hrs)=	5.25	5.25	5.25
RUNOFF VOLUME (mm)=	79.82	50.68	79.53
TOTAL RAINFALL (mm)=	80.82	80.82	80.82
RUNOFF COEFFICIENT =	0.99	0.63	0.98

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0044)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.7000      0.1400

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0041)     7.010     0.722      5.25      79.53
   OUTFLOW: ID= 1 (  0044)     7.010     0.622      5.25      79.52

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 86.20
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1260

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--------------------
| ADD HYD  (  0043)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):    41.11    3.660     5.25    68.75
     + ID2= 2 (  0044):     7.01    0.622     5.25    79.52
       ================================================
       ID = 3 (  0043):    48.12    4.282     5.25    70.32

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR(  0050)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   2.0350      1.6534
                         0.0140     1.0807   |   2.0820      1.7107
                         1.8880     1.4816   |   2.1280      1.7680
                         1.9390     1.5389   |   2.2160      1.8825
                         1.9870     1.5961   |   0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0043)     48.120     4.282      5.25      70.32
   OUTFLOW: ID= 1 (  0050)     48.120     2.085      5.75      59.29

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 48.69
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.7159

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  ** SIMULATION NUMBER:   6 **
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--------------------
|    READ STORM    |    Filename: C:\Users\rchung\AppD
|                  |              ata\Local\Temp\
|                  |              1ecac1ca-9d75-4d0f-9ee6-3d58c0963f95\0ec66e16
| Ptotal= 88.54 mm |    Comments:
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.00 |  3.50   15.05 |  6.75    6.20 | 10.00    0.89
                0.50    0.89 |  3.75   15.05 |  7.00    6.20 | 10.25    0.89
                0.75    0.89 |  4.00   15.05 |  7.25    6.20 | 10.50    0.89
                1.00    0.89 |  4.25   15.05 |  7.50    3.54 | 10.75    0.89
                1.25    0.89 |  4.50   40.71 |  7.75    3.54 | 11.00    0.89
                1.50    0.89 |  4.75   40.71 |  8.00    3.54 | 11.25    0.89
                1.75    0.89 |  5.00   40.71 |  8.25    3.54 | 11.50    0.89
                2.00    0.89 |  5.25   40.71 |  8.50    1.77 | 11.75    0.89
                2.25    0.89 |  5.50   11.51 |  8.75    1.77 | 12.00    0.89
                2.50    5.31 |  5.75   11.51 |  9.00    1.77 | 12.25    0.89
                2.75    5.31 |  6.00   11.51 |  9.25    1.77 |
                3.00    5.31 |  6.25   11.51 |  9.50    0.89 |
                3.25    5.31 |  6.50    6.20 |  9.75    0.89 |

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--------------------
| CALIB            |
| STANDHYD (  0040)|   Area     (ha)=  41.11
|ID= 1 DT= 5.0 min |   Total Imp(%)=  62.00   Dir. Conn.(%)=  62.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       25.49         15.62
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        1.00          2.00
     Length            (m)=      523.51         40.00
     Mannings n             =     0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    0.00 | 3.167    5.31 | 6.250   11.51 |  9.33    0.89
               0.167    0.00 | 3.250    5.31 | 6.333    6.20 |  9.42    0.89
               0.250    0.00 | 3.333   15.05 | 6.417    6.20 |  9.50    0.89
               0.333    0.89 | 3.417   15.05 | 6.500    6.20 |  9.58    0.89
               0.417    0.89 | 3.500   15.05 | 6.583    6.20 |  9.67    0.89
               0.500    0.89 | 3.583   15.05 | 6.667    6.20 |  9.75    0.89
               0.583    0.89 | 3.667   15.05 | 6.750    6.20 |  9.83    0.89
               0.667    0.89 | 3.750   15.05 | 6.833    6.20 |  9.92    0.89
               0.750    0.89 | 3.833   15.05 | 6.917    6.20 | 10.00    0.89
               0.833    0.89 | 3.917   15.05 | 7.000    6.20 | 10.08    0.89
               0.917    0.89 | 4.000   15.05 | 7.083    6.20 | 10.17    0.89
               1.000    0.89 | 4.083   15.05 | 7.167    6.20 | 10.25    0.89
               1.083    0.89 | 4.167   15.05 | 7.250    6.20 | 10.33    0.89
               1.167    0.89 | 4.250   15.05 | 7.333    3.54 | 10.42    0.89
               1.250    0.89 | 4.333   40.71 | 7.417    3.54 | 10.50    0.89
               1.333    0.89 | 4.417   40.71 | 7.500    3.54 | 10.58    0.89
               1.417    0.89 | 4.500   40.71 | 7.583    3.54 | 10.67    0.89
               1.500    0.89 | 4.583   40.71 | 7.667    3.54 | 10.75    0.89
               1.583    0.89 | 4.667   40.71 | 7.750    3.54 | 10.83    0.89
               1.667    0.89 | 4.750   40.71 | 7.833    3.54 | 10.92    0.89
               1.750    0.89 | 4.833   40.71 | 7.917    3.54 | 11.00    0.89
               1.833    0.89 | 4.917   40.71 | 8.000    3.54 | 11.08    0.89
               1.917    0.89 | 5.000   40.71 | 8.083    3.54 | 11.17    0.89
```

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              2.000    0.89 | 5.083   40.71 | 8.167    3.54 | 11.25    0.89
              2.083    0.89 | 5.167   40.71 | 8.250    3.54 | 11.33    0.89
              2.167    0.89 | 5.250   40.71 | 8.333    1.77 | 11.42    0.89
              2.250    0.89 | 5.333   11.51 | 8.417    1.77 | 11.50    0.89
              2.333    5.31 | 5.417   11.51 | 8.500    1.77 | 11.58    0.89
              2.417    5.31 | 5.500   11.51 | 8.583    1.77 | 11.67    0.89
              2.500    5.31 | 5.583   11.51 | 8.667    1.77 | 11.75    0.89
              2.583    5.31 | 5.667   11.51 | 8.750    1.77 | 11.83    0.89
              2.667    5.31 | 5.750   11.51 | 8.833    1.77 | 11.92    0.89
              2.750    5.31 | 5.833   11.51 | 8.917    1.77 | 12.00    0.89
              2.833    5.31 | 5.917   11.51 | 9.000    1.77 | 12.08    0.89
              2.917    5.31 | 6.000   11.51 | 9.083    1.77 | 12.17    0.89
              3.000    5.31 | 6.083   11.51 | 9.167    1.77 | 12.25    0.89
              3.083    5.31 | 6.167   11.51 | 9.250    1.77 |

     Max.Eff.Inten.(mm/hr)=      40.71        32.69
               over (min)        10.00        25.00
     Storage Coeff.  (min)=      9.88 (ii)    20.92 (ii)
     Unit Hyd. Tpeak (min)=      10.00        25.00
     Unit Hyd. peak  (cms)=       0.11         0.05
                                                        *TOTALS*
     PEAK FLOW       (cms)=       2.88         1.20       4.062 (iii)
     TIME TO PEAK    (hrs)=       5.25         5.33        5.25
     RUNOFF VOLUME    (mm)=      87.54        57.45       76.11
     TOTAL RAINFALL   (mm)=      88.54        88.54       88.54
     RUNOFF COEFFICIENT   =       0.99         0.65        0.86


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0041)|   Area    (ha)=   7.01
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       6.94         0.07
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     216.18        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      40.71        32.96
               over (min)         5.00        10.00
     Storage Coeff.  (min)=      5.81 (ii)    7.42 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.20         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.78         0.01       0.791 (iii)
     TIME TO PEAK    (hrs)=      5.25         5.25        5.25
     RUNOFF VOLUME    (mm)=     87.54        57.45       87.24
     TOTAL RAINFALL   (mm)=     88.54        88.54       88.54
     RUNOFF COEFFICIENT   =      0.99         0.65        0.99


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR(  0044)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.7000      0.1400

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0041)      7.010      0.791      5.25      87.24
   OUTFLOW: ID= 1 (  0044)      7.010      0.683      5.25      87.23

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 86.30
                TIME SHIFT OF PEAK FLOW         (min)=  0.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.1382

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--------------------
| ADD HYD  (  0043)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0040):    41.11    4.062     5.25    76.11
     + ID2= 2 (  0044):     7.01    0.683     5.25    87.23
       ==========================================================
       ID = 3 (  0043):    48.12    4.745     5.25    77.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR(  0050)|
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   2.0350      1.6534
                         0.0140     1.0807   |   2.0820      1.7107
                         1.8880     1.4816   |   2.1280      1.7680
                         1.9390     1.5389   |   2.2160      1.8825
                         1.9870     1.5961   |   0.0000      0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0043)     48.120      4.745      5.25      77.73
   OUTFLOW: ID= 1 (  0050)     48.120      2.208      5.75      66.70

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.54
                TIME SHIFT OF PEAK FLOW         (min)= 30.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.8727

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