

0.667	3.03	1.667	15.28	2.667	3.78	3.67	2.47
0.750	3.58	1.750	9.22	2.750	3.45	3.75	2.35
0.833	3.58	1.833	9.22	2.833	3.45	3.83	2.35
0.917	4.47	1.917	6.88	2.917	3.18	3.92	2.23
1.000	4.47	2.000	6.88	3.000	3.18	4.00	2.23

Max.Eff.Inten.(mm/hr)= 41.67 6.59
over (min) 5.00 10.00
Storage Coeff. (min)= 6.20 (ii) 7.79 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.19 0.13

PEAK FLOW (cms)= 0.97 0.07
TIME TO PEAK (hrs)= 1.50 1.50
RUNOFF VOLUME (mm)= 23.02 3.62
TOTAL RAINFALL (mm)= 25.02 25.02
RUNOFF COEFFICIENT = 0.92 0.14

TOTALS
1.026 (iii)
1.50
14.29
25.02
0.57

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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.

ADD HYD (0048)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1201):	17.89	1.026	1.50	14.29
+ ID2= 2 (1301):	5.08	0.023	2.33	3.63
ID = 3 (0048):	22.97	1.028	1.50	11.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6697	0.5963
0.0130	0.0688	0.8321	0.6991
0.0204	0.1438	0.9671	0.8059
0.0258	0.2249	1.0852	0.9165
0.0313	0.3336	2.1958	0.9732
0.1311	0.4022	4.1789	1.0308
0.3834	0.4973	13.1438	1.2091

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	22.970	1.028	1.50	11.93
OUTFLOW: ID= 1 (0042)	22.970	0.027	4.17	11.88

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.62
TIME SHIFT OF PEAK FLOW (min)=160.00
MAXIMUM STORAGE USED (ha.m.)= 0.2473

CALIB
STANDHYD (1303)
ID= 1 DT= 5.0 min

Area (ha)= 0.66
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.46 0.20
Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 1.00 2.00

Length (m)= 66.33 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	2.17	1.083	6.20	2.083	5.62	3.08	2.95
0.167	2.17	1.167	6.20	2.167	5.62	3.17	2.95
0.250	2.38	1.250	12.18	2.250	4.80	3.25	2.76
0.333	2.38	1.333	12.18	2.333	4.80	3.33	2.76
0.417	2.66	1.417	41.67	2.417	4.21	3.42	2.62
0.500	2.66	1.500	41.67	2.500	4.21	3.50	2.62
0.583	3.03	1.583	15.28	2.583	3.78	3.58	2.47
0.667	3.03	1.667	15.28	2.667	3.78	3.67	2.47
0.750	3.58	1.750	9.22	2.750	3.45	3.75	2.35
0.833	3.58	1.833	9.22	2.833	3.45	3.83	2.35
0.917	4.47	1.917	6.88	2.917	3.18	3.92	2.23
1.000	4.47	2.000	6.88	3.000	3.18	4.00	2.23

Max.Eff.Inten.(mm/hr)= 41.67 1.50
over (min) 5.00 45.00
Storage Coeff. (min)= 2.83 (ii) 40.74 (ii)
Unit Hyd. Tpeak (min)= 5.00 45.00
Unit Hyd. peak (cms)= 0.28 0.03

PEAK FLOW (cms)= 0.05 0.00
TIME TO PEAK (hrs)= 1.50 2.50
RUNOFF VOLUME (mm)= 24.02 2.20
TOTAL RAINFALL (mm)= 25.02 25.02
RUNOFF COEFFICIENT = 0.96 0.09

TOTALS
0.052 (iii)
1.50
17.44
25.02
0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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 (1202)
ID= 1 DT= 5.0 min

Area (ha)= 1.17
Total Imp(%)= 75.00 Dir. Conn.(%)= 60.00

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.88 0.29
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 88.32 20.00
Mannings n = 0.013 0.035

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	2.17	1.083	6.20	2.083	5.62	3.08	2.95
0.167	2.17	1.167	6.20	2.167	5.62	3.17	2.95
0.250	2.38	1.250	12.18	2.250	4.80	3.25	2.76
0.333	2.38	1.333	12.18	2.333	4.80	3.33	2.76
0.417	2.66	1.417	41.67	2.417	4.21	3.42	2.62
0.500	2.66	1.500	41.67	2.500	4.21	3.50	2.62
0.583	3.03	1.583	15.28	2.583	3.78	3.58	2.47
0.667	3.03	1.667	15.28	2.667	3.78	3.67	2.47
0.750	3.58	1.750	9.22	2.750	3.45	3.75	2.35

0.833	3.58	1.833	9.22	2.833	3.45	3.83	2.35
0.917	4.47	1.917	6.88	2.917	3.18	3.92	2.23
1.000	4.47	2.000	6.88	3.000	3.18	4.00	2.23

Max.Eff.Inten.(mm/hr)= 41.67 7.68
 over (min) 5.00 5.00
 Storage Coeff. (min)= 2.73 (ii) 4.16 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.29 0.24

TOTALS
 PEAK FLOW (cms)= 0.08 0.01 0.086 (iii)
 TIME TO PEAK (hrs)= 1.50 1.50 1.50
 RUNOFF VOLUME (mm)= 23.02 3.89 15.37
 TOTAL RAINFALL (mm)= 25.02 25.02 25.02
 RUNOFF COEFFICIENT = 0.92 0.16 0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0043)				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1202):	1.17	0.086	1.50	15.37
+ ID2= 2 (1302):	6.51	0.034	2.17	3.91
ID = 3 (0043):	7.68	0.090	1.50	5.66

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0043):	7.68	0.090	1.50	5.66
+ ID2= 2 (1303):	0.66	0.052	1.50	17.44
ID = 1 (0043):	8.34	0.142	1.50	6.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0043):	8.34	0.142	1.50	6.59
+ ID2= 2 (0042):	22.97	0.027	4.17	11.88
ID = 3 (0043):	31.31	0.155	1.50	10.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

=====

V	V	I	SSSSS	U	U	A	L	(v 6.2.2009)
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		

000	TTTT	TTTT	H	H	Y	Y	M	M	000	TM
0	0	T	T	H	H	Y	Y	MM	MM	0
0	0	T	T	H	H	Y	Y	M	M	0
000	T	T	H	H	Y	Y	M	M	000	

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
 Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\d0616cb9-5003-4901-8698-cfb942d4cf6e\scena
 Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\d0616cb9-5003-4901-8698-cfb942d4cf6e\scena

DATE: 11-10-2022

TIME: 01:44:20

USER:

COMMENTS: _____

 ** SIMULATION : SCS_6H_002Y **

READ STORM	Filename: C:\Users\Valdor\AppData\Local\Temp\908d5600-a56f-49d0-bccb-864caf61b13f\96d71607
Ptotal= 38.70 mm	Comments: 2yr/6hr Peterborough A SCS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	3.87	3.50	8.51	5.25	1.55
0.25	1.55	2.00	3.87	3.75	3.87	5.50	1.55
0.50	1.55	2.25	4.64	4.00	3.87	5.75	1.55
0.75	2.32	2.50	4.64	4.25	3.10	6.00	1.55
1.00	2.32	2.75	23.22	4.50	3.10		
1.25	2.32	3.00	60.37	4.75	2.32		
1.50	2.32	3.25	8.51	5.00	2.32		

CALIB	Area (ha)=	Curve Number (CN)=
NASHYD (2202)	2.59	66.0
ID= 1 DT= 5.0 min	6.20	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=	0.42	

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	1.667	2.32	3.250	60.37	4.83	2.32
0.167	0.00	1.750	2.32	3.333	8.51	4.92	2.32
0.250	0.00	1.833	3.87	3.417	8.51	5.00	2.32
0.333	1.55	1.917	3.87	3.500	8.51	5.08	2.32
0.417	1.55	2.000	3.87	3.583	8.51	5.17	2.32

0.500	1.55	2.083	3.87	3.667	8.51	5.25	2.32
0.583	1.55	2.167	3.87	3.750	8.51	5.33	1.55
0.667	1.55	2.250	3.87	3.833	3.87	5.42	1.55
0.750	1.55	2.333	4.64	3.917	3.87	5.50	1.55
0.833	2.32	2.417	4.64	4.000	3.87	5.58	1.55
0.917	2.32	2.500	4.64	4.083	3.87	5.67	1.55
1.000	2.32	2.583	4.64	4.167	3.87	5.75	1.55
1.083	2.32	2.667	4.64	4.250	3.87	5.83	1.55
1.167	2.32	2.750	4.64	4.333	3.10	5.92	1.55
1.250	2.32	2.833	23.22	4.417	3.10	6.00	1.55
1.333	2.32	2.917	23.22	4.500	3.10	6.08	1.55
1.417	2.32	3.000	23.22	4.583	3.10	6.17	1.55
1.500	2.32	3.083	60.37	4.667	3.10	6.25	1.55
1.583	2.32	3.167	60.37	4.750	3.10		

Unit Hyd Qpeak (cms)= 0.236

PEAK FLOW (cms)= 0.032 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 6.464
 TOTAL RAINFALL (mm)= 38.698
 RUNOFF COEFFICIENT = 0.167

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

CALIB		STANDHYD (2201)		Area (ha)= 11.20	Total Imp(%)= 60.00	Dir. Conn.(%)= 45.00
ID= 1	DT= 5.0 min					
		IMPERVIOUS	PERVIOUS (i)			
Surface Area	(ha)= 6.72	4.48				
Dep. Storage	(mm)= 2.00	5.00				
Average Slope	(%)= 2.00	2.00				
Length	(m)= 273.25	20.00				
Mannings n	= 0.013	0.035				

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	1.667	2.32	3.250	60.37	4.83	2.32
0.167	0.00	1.750	2.32	3.333	8.51	4.92	2.32
0.250	0.00	1.833	3.87	3.417	8.51	5.00	2.32
0.333	1.55	1.917	3.87	3.500	8.51	5.08	2.32
0.417	1.55	2.000	3.87	3.583	8.51	5.17	2.32
0.500	1.55	2.083	3.87	3.667	8.51	5.25	2.32
0.583	1.55	2.167	3.87	3.750	8.51	5.33	1.55
0.667	1.55	2.250	3.87	3.833	3.87	5.42	1.55
0.750	1.55	2.333	4.64	3.917	3.87	5.50	1.55
0.833	2.32	2.417	4.64	4.000	3.87	5.58	1.55
0.917	2.32	2.500	4.64	4.083	3.87	5.67	1.55
1.000	2.32	2.583	4.64	4.167	3.87	5.75	1.55
1.083	2.32	2.667	4.64	4.250	3.87	5.83	1.55
1.167	2.32	2.750	4.64	4.333	3.10	5.92	1.55
1.250	2.32	2.833	23.22	4.417	3.10	6.00	1.55
1.333	2.32	2.917	23.22	4.500	3.10	6.08	1.55
1.417	2.32	3.000	23.22	4.583	3.10	6.17	1.55
1.500	2.32	3.083	60.37	4.667	3.10	6.25	1.55
1.583	2.32	3.167	60.37	4.750	3.10		

Max.Eff.Inten.(mm/hr)= 60.37 21.85
 over (min)= 5.00 10.00
 Storage Coeff. (min)= 4.64 (ii) 6.31 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.22 0.15

TOTALS

PEAK FLOW (cms)= 0.82 0.21 1.036 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 36.70 8.03 20.93
 TOTAL RAINFALL (mm)= 38.70 38.70 38.70
 RUNOFF COEFFICIENT = 0.95 0.21 0.54

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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(0038)		OVERFLOW IS OFF	
IN= 2	OUT= 1	DT= 5.0 min	
OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8454	0.4251
0.0074	0.0469	0.9743	0.4997
0.0112	0.0990	1.0880	0.5770
0.0140	0.1563	1.1909	0.6570
0.1657	0.2182	5.4831	0.7609
0.4409	0.2840	13.2243	0.8692
0.6926	0.3532	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2201)	11.200	1.036	3.25	20.93
OUTFLOW: ID= 1 (0038)	11.200	0.072	4.33	20.78

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.95
 TIME SHIFT OF PEAK FLOW (min)= 65.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1800

ADD HYD (0017)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3					
ID1= 1 (2202):	2.59	0.032	3.58	6.46	
+ ID2= 2 (0038):	11.20	0.072	4.33	20.78	
ID = 3 (0017):	13.79	0.095	3.92	18.09	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		NASHYD (1302)		Area (ha)= 6.51	Curve Number (CN)= 79.0
ID= 1	DT= 5.0 min	Ia (mm)= 6.70	# of Linear Res.(N)= 3.00		
		U.H. Tp(hrs)= 0.42			

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	1.667	2.32	3.250	60.37	4.83	2.32
0.167	0.00	1.750	2.32	3.333	8.51	4.92	2.32
0.250	0.00	1.833	3.87	3.417	8.51	5.00	2.32
0.333	1.55	1.917	3.87	3.500	8.51	5.08	2.32
0.417	1.55	2.000	3.87	3.583	8.51	5.17	2.32
0.500	1.55	2.083	3.87	3.667	8.51	5.25	2.32
0.583	1.55	2.167	3.87	3.750	8.51	5.33	1.55
0.667	1.55	2.250	3.87	3.833	3.87	5.42	1.55

0.750	1.55	2.333	4.64	3.917	3.87	5.50	1.55
0.833	2.32	2.417	4.64	4.000	3.87	5.58	1.55
0.917	2.32	2.500	4.64	4.083	3.87	5.67	1.55
1.000	2.32	2.583	4.64	4.167	3.87	5.75	1.55
1.083	2.32	2.667	4.64	4.250	3.87	5.83	1.55
1.167	2.32	2.750	4.64	4.333	3.10	5.92	1.55
1.250	2.32	2.833	23.22	4.417	3.10	6.00	1.55
1.333	2.32	2.917	23.22	4.500	3.10	6.08	1.55
1.417	2.32	3.000	23.22	4.583	3.10	6.17	1.55
1.500	2.32	3.083	60.37	4.667	3.10	6.25	1.55
1.583	2.32	3.167	60.37	4.750	3.10		

Unit Hyd Qpeak (cms)= 0.592

PEAK FLOW (cms)= 0.131 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 10.287
 TOTAL RAINFALL (mm)= 38.698
 RUNOFF COEFFICIENT = 0.266

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

CALIB			
NASHYD (1301)	Area (ha)=	5.08	Curve Number (CN)= 77.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.50	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=		0.49	

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

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	1.667	2.32	3.250	60.37	4.83	2.32
0.167	0.00	1.750	2.32	3.333	8.51	4.92	2.32
0.250	0.00	1.833	3.87	3.417	8.51	5.00	2.32
0.333	1.55	1.917	3.87	3.500	8.51	5.08	2.32
0.417	1.55	2.000	3.87	3.583	8.51	5.17	2.32
0.500	1.55	2.083	3.87	3.667	8.51	5.25	2.32
0.583	1.55	2.167	3.87	3.750	8.51	5.33	1.55
0.667	1.55	2.250	3.87	3.833	3.87	5.42	1.55
0.750	1.55	2.333	4.64	3.917	3.87	5.50	1.55
0.833	2.32	2.417	4.64	4.000	3.87	5.58	1.55
0.917	2.32	2.500	4.64	4.083	3.87	5.67	1.55
1.000	2.32	2.583	4.64	4.167	3.87	5.75	1.55
1.083	2.32	2.667	4.64	4.250	3.87	5.83	1.55
1.167	2.32	2.750	4.64	4.333	3.10	5.92	1.55
1.250	2.32	2.833	23.22	4.417	3.10	6.00	1.55
1.333	2.32	2.917	23.22	4.500	3.10	6.08	1.55
1.417	2.32	3.000	23.22	4.583	3.10	6.17	1.55
1.500	2.32	3.083	60.37	4.667	3.10	6.25	1.55
1.583	2.32	3.167	60.37	4.750	3.10		

Unit Hyd Qpeak (cms)= 0.396

PEAK FLOW (cms)= 0.085 (i)
 TIME TO PEAK (hrs)= 3.750
 RUNOFF VOLUME (mm)= 9.592
 TOTAL RAINFALL (mm)= 38.698
 RUNOFF COEFFICIENT = 0.248

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

CALIB			
STANDHYD (1201)	Area (ha)=	17.89	
ID= 1 DT= 5.0 min	Total Imp(%)=	70.00	Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	12.52	5.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	345.35	20.00
Mannings n =	0.013	0.035

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

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	1.667	2.32	3.250	60.37	4.83	2.32
0.167	0.00	1.750	2.32	3.333	8.51	4.92	2.32
0.250	0.00	1.833	3.87	3.417	8.51	5.00	2.32
0.333	1.55	1.917	3.87	3.500	8.51	5.08	2.32
0.417	1.55	2.000	3.87	3.583	8.51	5.17	2.32
0.500	1.55	2.083	3.87	3.667	8.51	5.25	2.32
0.583	1.55	2.167	3.87	3.750	8.51	5.33	1.55
0.667	1.55	2.250	3.87	3.833	3.87	5.42	1.55
0.750	1.55	2.333	4.64	3.917	3.87	5.50	1.55
0.833	2.32	2.417	4.64	4.000	3.87	5.58	1.55
0.917	2.32	2.500	4.64	4.083	3.87	5.67	1.55
1.000	2.32	2.583	4.64	4.167	3.87	5.75	1.55
1.083	2.32	2.667	4.64	4.250	3.87	5.83	1.55
1.167	2.32	2.750	4.64	4.333	3.10	5.92	1.55
1.250	2.32	2.833	23.22	4.417	3.10	6.00	1.55
1.333	2.32	2.917	23.22	4.500	3.10	6.08	1.55
1.417	2.32	3.000	23.22	4.583	3.10	6.17	1.55
1.500	2.32	3.083	60.37	4.667	3.10	6.25	1.55
1.583	2.32	3.167	60.37	4.750	3.10		

Max.Eff.Inten.(mm/hr)= 60.37 25.82
 over (min) 5.00 10.00
 Storage Coeff. (min)= 5.34 (ii) 6.72 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.21 0.14

TOTALS

PEAK FLOW (cms)= 1.59 0.29 1.882 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 36.70 8.71 24.10
 TOTAL RAINFALL (mm)= 38.70 38.70 38.70
 RUNOFF COEFFICIENT = 0.95 0.23 0.62

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0048)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (1201):	17.89	1.882	3.25	24.10
+ ID2= 2 (1301):	5.08	0.085	3.75	9.59
ID = 3 (0048):	22.97	1.915	3.25	20.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)			
OVERFLOW IS OFF			
IN= 2--> OUT= 1			
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW STORAGE

```

-----
      (cms)      (ha.m.) |      (cms)      (ha.m.)
      0.0000      0.0000 |      0.6697      0.5963
      0.0130      0.0688 |      0.8321      0.6991
      0.0204      0.1438 |      0.9671      0.8059
      0.0258      0.2249 |      1.0852      0.9165
      0.0313      0.3336 |      2.1958      0.9732
      0.1311      0.4022 |      4.1789      1.0308
      0.3834      0.4973 |      13.1438      1.2091

```

```

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0048) 22.970 1.915 3.25 20.89
OUTFLOW: ID= 1 ( 0042) 22.970 0.109 5.17 20.83

```

```

      PEAK FLOW REDUCTION [Qout/Qin](%)= 5.68
      TIME SHIFT OF PEAK FLOW (min)=115.00
      MAXIMUM STORAGE USED (ha.m.)= 0.3869

```

```

-----
| CALIB |
| STANDHYD ( 1303) |
| ID= 1 DT= 5.0 min |
|-----|
      Area (ha)= 0.66
      Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

```

```

      IMPERVIOUS      PERVIOUS (i)
      (ha)= 0.46      0.20
      Dep. Storage (mm)= 1.00      5.00
      Average Slope (%)= 1.00      2.00
      Length (m)= 66.33      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 | 1.667 2.32 | 3.250 60.37 | 4.83 2.32
0.167 0.00 | 1.750 2.32 | 3.333 8.51 | 4.92 2.32
0.250 0.00 | 1.833 3.87 | 3.417 8.51 | 5.00 2.32
0.333 1.55 | 1.917 3.87 | 3.500 8.51 | 5.08 2.32
0.417 1.55 | 2.000 3.87 | 3.583 8.51 | 5.17 2.32
0.500 1.55 | 2.083 3.87 | 3.667 8.51 | 5.25 2.32
0.583 1.55 | 2.167 3.87 | 3.750 8.51 | 5.33 1.55
0.667 1.55 | 2.250 3.87 | 3.833 3.87 | 5.42 1.55
0.750 1.55 | 2.333 4.64 | 3.917 3.87 | 5.50 1.55
0.833 2.32 | 2.417 4.64 | 4.000 3.87 | 5.58 1.55
0.917 2.32 | 2.500 4.64 | 4.083 3.87 | 5.67 1.55
1.000 2.32 | 2.583 4.64 | 4.167 3.87 | 5.75 1.55
1.083 2.32 | 2.667 4.64 | 4.250 3.87 | 5.83 1.55
1.167 2.32 | 2.750 4.64 | 4.333 3.10 | 5.92 1.55
1.250 2.32 | 2.833 23.22 | 4.417 3.10 | 6.00 1.55
1.333 2.32 | 2.917 23.22 | 4.500 3.10 | 6.08 1.55
1.417 2.32 | 3.000 23.22 | 4.583 3.10 | 6.17 1.55
1.500 2.32 | 3.083 60.37 | 4.667 3.10 | 6.25 1.55
1.583 2.32 | 3.167 60.37 | 4.750 3.10 |

```

```

      Max.Eff.Inten.(mm/hr)= 60.37      8.07
      over (min) = 5.00      25.00
      Storage Coeff. (min)= 2.44 (ii) 21.76 (ii)
      Unit Hyd. Tpeak (min)= 5.00      25.00
      Unit Hyd. peak (cms)= 0.30      0.05

```

```

      *TOTALS*
      PEAK FLOW (cms)= 0.08      0.00      0.079 (iii)
      TIME TO PEAK (hrs)= 3.25      3.58      3.25
      RUNOFF VOLUME (mm)= 37.70      5.79      28.10
      TOTAL RAINFALL (mm)= 38.70      38.70      38.70
      RUNOFF COEFFICIENT = 0.97      0.15      0.73

```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

```

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 61.0 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 ( 1202) |
| ID= 1 DT= 5.0 min |
|-----|
      Area (ha)= 1.17
      Total Imp(%)= 75.00 Dir. Conn.(%)= 60.00

```

```

      IMPERVIOUS      PERVIOUS (i)
      (ha)= 0.88      0.29
      Dep. Storage (mm)= 2.00      5.00
      Average Slope (%)= 2.00      2.00
      Length (m)= 88.32      20.00
      Mannings n = 0.013      0.035

```

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 | 1.667 2.32 | 3.250 60.37 | 4.83 2.32
0.167 0.00 | 1.750 2.32 | 3.333 8.51 | 4.92 2.32
0.250 0.00 | 1.833 3.87 | 3.417 8.51 | 5.00 2.32
0.333 1.55 | 1.917 3.87 | 3.500 8.51 | 5.08 2.32
0.417 1.55 | 2.000 3.87 | 3.583 8.51 | 5.17 2.32
0.500 1.55 | 2.083 3.87 | 3.667 8.51 | 5.25 2.32
0.583 1.55 | 2.167 3.87 | 3.750 8.51 | 5.33 1.55
0.667 1.55 | 2.250 3.87 | 3.833 3.87 | 5.42 1.55
0.750 1.55 | 2.333 4.64 | 3.917 3.87 | 5.50 1.55
0.833 2.32 | 2.417 4.64 | 4.000 3.87 | 5.58 1.55
0.917 2.32 | 2.500 4.64 | 4.083 3.87 | 5.67 1.55
1.000 2.32 | 2.583 4.64 | 4.167 3.87 | 5.75 1.55
1.083 2.32 | 2.667 4.64 | 4.250 3.87 | 5.83 1.55
1.167 2.32 | 2.750 4.64 | 4.333 3.10 | 5.92 1.55
1.250 2.32 | 2.833 23.22 | 4.417 3.10 | 6.00 1.55
1.333 2.32 | 2.917 23.22 | 4.500 3.10 | 6.08 1.55
1.417 2.32 | 3.000 23.22 | 4.583 3.10 | 6.17 1.55
1.500 2.32 | 3.083 60.37 | 4.667 3.10 | 6.25 1.55
1.583 2.32 | 3.167 60.37 | 4.750 3.10 |

```

```

      Max.Eff.Inten.(mm/hr)= 60.37      29.17
      over (min) = 5.00      5.00
      Storage Coeff. (min)= 2.36 (ii) 3.59 (ii)
      Unit Hyd. Tpeak (min)= 5.00      5.00
      Unit Hyd. peak (cms)= 0.30      0.26

```

```

      *TOTALS*
      PEAK FLOW (cms)= 0.12      0.02      0.142 (iii)
      TIME TO PEAK (hrs)= 3.25      3.25      3.25
      RUNOFF VOLUME (mm)= 36.70      9.23      25.71
      TOTAL RAINFALL (mm)= 38.70      38.70      38.70
      RUNOFF COEFFICIENT = 0.95      0.24      0.66

```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

```

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN* = 61.0 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.

```

```

-----
| ADD HYD ( 0043) |

```

```

| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
| (ha) (cms) (hrs) (mm)
ID1= 1 ( 1202): 1.17 0.142 3.25 25.71
+ ID2= 2 ( 1302): 6.51 0.131 3.58 10.29
=====
ID = 3 ( 0043): 7.68 0.203 3.25 12.64

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0043) |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
| (ha) (cms) (hrs) (mm)
ID1= 3 ( 0043): 7.68 0.203 3.25 12.64
+ ID2= 2 ( 1303): 0.66 0.079 3.25 28.10
=====
ID = 1 ( 0043): 8.34 0.282 3.25 13.86

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD ( 0043) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
| (ha) (cms) (hrs) (mm)
ID1= 1 ( 0043): 8.34 0.282 3.25 13.86
+ ID2= 2 ( 0042): 22.97 0.109 5.17 20.83
=====
ID = 3 ( 0043): 31.31 0.307 3.25 18.98

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

=====
V V I SSSS U U A L (v 6.2.2009)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
V V I SSSS UUUU A A LLLL
000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y M M 0 0
0 0 T T H H Y Y M M 0 0
000 T T H H Y Y M M 000

```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat
Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\6f45f1d2-d35a-4a58-a1de-d8c406734d39\scena
Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\6f45f1d2-d35a-4a58-a1de-d8c406734d39\scena

DATE: 11-10-2022 TIME: 01:44:20

USER:

COMMENTS: _____

```

-----
*****
** SIMULATION : SCS_6H_005Y **
*****

```

```

| READ STORM | Filename: C:\Users\Valdor\AppData
| Local\Temp\
| 908d5600-a56f-49d0-bccb-864caf61b13f\3c8faa6e
| Ptotal= 52.40 mm | Comments: 5yr/6hr Peterborough A SCS

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	1.75	5.24	3.50	11.53	5.25	2.10
0.25	2.10	2.00	5.24	3.75	5.24	5.50	2.10
0.50	2.10	2.25	6.29	4.00	5.24	5.75	2.10
0.75	3.14	2.50	6.29	4.25	4.19	6.00	2.10
1.00	3.14	2.75	31.44	4.50	4.19		
1.25	3.14	3.00	81.74	4.75	3.14		
1.50	3.14	3.25	11.53	5.00	3.14		

```

| CALIB |
| NASHYD ( 2202) | Area (ha)= 2.59 Curve Number (CN)= 66.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.20 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.42

```

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 1.667 3.14 3.250 81.74 4.83 3.14
0.167 0.00 1.750 3.14 3.333 11.53 4.92 3.14
0.250 0.00 1.833 5.24 3.417 11.53 5.00 3.14
0.333 2.10 1.917 5.24 3.500 11.53 5.08 3.14
0.417 2.10 2.000 5.24 3.583 11.53 5.17 3.14
0.500 2.10 2.083 5.24 3.667 11.53 5.25 3.14
0.583 2.10 2.167 5.24 3.750 11.53 5.33 2.10
0.667 2.10 2.250 5.24 3.833 5.24 5.42 2.10
0.750 2.10 2.333 6.29 3.917 5.24 5.50 2.10
0.833 3.14 2.417 6.29 4.000 5.24 5.58 2.10
0.917 3.14 2.500 6.29 4.083 5.24 5.67 2.10
1.000 3.14 2.583 6.29 4.167 5.24 5.75 2.10
1.083 3.14 2.667 6.29 4.250 5.24 5.83 2.10
1.167 3.14 2.750 6.29 4.333 4.19 5.92 2.10
1.250 3.14 2.833 31.44 4.417 4.19 6.00 2.10
1.333 3.14 2.917 31.44 4.500 4.19 6.08 2.10
1.417 3.14 3.000 31.44 4.583 4.19 6.17 2.10
1.500 3.14 3.083 81.74 4.667 4.19 6.25 2.10
1.583 3.14 3.167 81.74 4.750 4.19

```

Unit Hyd Qpeak (cms)= 0.236

PEAK FLOW (cms)= 0.061 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 12.054
TOTAL RAINFALL (mm)= 52.400
RUNOFF COEFFICIENT = 0.230

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

| CALIB |

| STANHYD (2201) | Area (ha)= 11.20
| ID= 1 DT= 5.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 6.72 4.48
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 273.25 20.00
Mannings n = 0.013 0.035

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 1.667 3.14 3.250 81.74 4.83 3.14
0.167 0.00 1.750 3.14 3.333 11.53 4.92 3.14
0.250 0.00 1.833 5.24 3.417 11.53 5.00 3.14
0.333 2.10 1.917 5.24 3.500 11.53 5.08 3.14
0.417 2.10 2.000 5.24 3.583 11.53 5.17 3.14
0.500 2.10 2.083 5.24 3.667 11.53 5.25 3.14
0.583 2.10 2.167 5.24 3.750 11.53 5.33 2.10
0.667 2.10 2.250 5.24 3.833 5.24 5.42 2.10
0.750 2.10 2.333 6.29 3.917 5.24 5.50 2.10
0.833 3.14 2.417 6.29 4.000 5.24 5.58 2.10
0.917 3.14 2.500 6.29 4.083 5.24 5.67 2.10
1.000 3.14 2.583 6.29 4.167 5.24 5.75 2.10
1.083 3.14 2.667 6.29 4.250 5.24 5.83 2.10
1.167 3.14 2.750 6.29 4.333 4.19 5.92 2.10
1.250 3.14 2.833 31.44 4.417 4.19 6.00 2.10
1.333 3.14 2.917 31.44 4.500 4.19 6.08 2.10
1.417 3.14 3.000 31.44 4.583 4.19 6.17 2.10
1.500 3.14 3.083 81.74 4.667 4.19 6.25 2.10
1.583 3.14 3.167 81.74 4.750 4.19

Max.Eff.Inten.(mm/hr)= 81.74 38.59
over (min)= 5.00 10.00
Storage Coeff. (min)= 4.11 (ii) 5.59 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.24 0.16

TOTALS
PEAK FLOW (cms)= 1.13 0.39 1.519 (iii)
TIME TO PEAK (hrs)= 3.25 3.25 3.25
RUNOFF VOLUME (mm)= 50.40 14.25 30.52
TOTAL RAINFALL (mm)= 52.40 52.40 52.40
RUNOFF COEFFICIENT = 0.96 0.27 0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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(0038) |
| IN= 2--> OUT= 1 |
| DT= 5.0 min |

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8454	0.4251
0.0074	0.0469	0.9743	0.4997
0.0112	0.0990	1.0880	0.5770
0.0140	0.1563	1.1909	0.6570
0.1657	0.2182	5.4831	0.7609
0.4409	0.2840	13.2243	0.8692
0.6926	0.3532	0.0000	0.0000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 (2201) 11.200 1.519 3.25 30.52
OUTFLOW: ID= 1 (0038) 11.200 0.218 3.75 30.37

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.32
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.2311

| ADD HYD (0017) |
| 1 + 2 = 3 |
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (2202): 2.59 0.061 3.58 12.05
+ ID2= 2 (0038): 11.20 0.218 3.75 30.37
===== ID = 3 (0017): 13.79 0.276 3.75 26.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (1302) | Area (ha)= 6.51 Curve Number (CN)= 79.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.70 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.42

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 1.667 3.14 3.250 81.74 4.83 3.14
0.167 0.00 1.750 3.14 3.333 11.53 4.92 3.14
0.250 0.00 1.833 5.24 3.417 11.53 5.00 3.14
0.333 2.10 1.917 5.24 3.500 11.53 5.08 3.14
0.417 2.10 2.000 5.24 3.583 11.53 5.17 3.14
0.500 2.10 2.083 5.24 3.667 11.53 5.25 3.14
0.583 2.10 2.167 5.24 3.750 11.53 5.33 2.10
0.667 2.10 2.250 5.24 3.833 5.24 5.42 2.10
0.750 2.10 2.333 6.29 3.917 5.24 5.50 2.10
0.833 3.14 2.417 6.29 4.000 5.24 5.58 2.10
0.917 3.14 2.500 6.29 4.083 5.24 5.67 2.10
1.000 3.14 2.583 6.29 4.167 5.24 5.75 2.10
1.083 3.14 2.667 6.29 4.250 5.24 5.83 2.10
1.167 3.14 2.750 6.29 4.333 4.19 5.92 2.10
1.250 3.14 2.833 31.44 4.417 4.19 6.00 2.10
1.333 3.14 2.917 31.44 4.500 4.19 6.08 2.10
1.417 3.14 3.000 31.44 4.583 4.19 6.17 2.10
1.500 3.14 3.083 81.74 4.667 4.19 6.25 2.10
1.583 3.14 3.167 81.74 4.750 4.19

Unit Hyd Qpeak (cms)= 0.592

PEAK FLOW (cms)= 0.244 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 18.444
TOTAL RAINFALL (mm)= 52.400
RUNOFF COEFFICIENT = 0.352

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

| CALIB |
| NASHYD (1301) | Area (ha)= 5.08 Curve Number (CN)= 77.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.50 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.49

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	1.667	3.14	3.250	81.74	4.83	3.14
0.167	0.00	1.750	3.14	3.333	11.53	4.92	3.14
0.250	0.00	1.833	5.24	3.417	11.53	5.00	3.14
0.333	2.10	1.917	5.24	3.500	11.53	5.08	3.14
0.417	2.10	2.000	5.24	3.583	11.53	5.17	3.14
0.500	2.10	2.083	5.24	3.667	11.53	5.25	3.14
0.583	2.10	2.167	5.24	3.750	11.53	5.33	2.10
0.667	2.10	2.250	5.24	3.833	5.24	5.42	2.10
0.750	2.10	2.333	6.29	3.917	5.24	5.50	2.10
0.833	3.14	2.417	6.29	4.000	5.24	5.58	2.10
0.917	3.14	2.500	6.29	4.083	5.24	5.67	2.10
1.000	3.14	2.583	6.29	4.167	5.24	5.75	2.10
1.083	3.14	2.667	6.29	4.250	5.24	5.83	2.10
1.167	3.14	2.750	6.29	4.333	4.19	5.92	2.10
1.250	3.14	2.833	31.44	4.417	4.19	6.00	2.10
1.333	3.14	2.917	31.44	4.500	4.19	6.08	2.10
1.417	3.14	3.000	31.44	4.583	4.19	6.17	2.10
1.500	3.14	3.083	81.74	4.667	4.19	6.25	2.10
1.583	3.14	3.167	81.74	4.750	4.19		

Unit Hyd Qpeak (cms)= 0.396

PEAK FLOW (cms)= 0.159 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 17.300
 TOTAL RAINFALL (mm)= 52.400
 RUNOFF COEFFICIENT = 0.330

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

CALIB			
STANDHYD (1201)			
ID= 1 DT= 5.0 min			
Area (ha)= 17.89			
Total Imp(%)= 70.00 Dir. Conn.(%)= 55.00			
IMPERVIOUS PERVIOUS (i)			
Surface Area	(ha)=	12.52	5.37
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	345.35	20.00
Mannings n	=	0.013	0.035

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	1.667	3.14	3.250	81.74	4.83	3.14
0.167	0.00	1.750	3.14	3.333	11.53	4.92	3.14
0.250	0.00	1.833	5.24	3.417	11.53	5.00	3.14
0.333	2.10	1.917	5.24	3.500	11.53	5.08	3.14
0.417	2.10	2.000	5.24	3.583	11.53	5.17	3.14
0.500	2.10	2.083	5.24	3.667	11.53	5.25	3.14
0.583	2.10	2.167	5.24	3.750	11.53	5.33	2.10
0.667	2.10	2.250	5.24	3.833	5.24	5.42	2.10
0.750	2.10	2.333	6.29	3.917	5.24	5.50	2.10
0.833	3.14	2.417	6.29	4.000	5.24	5.58	2.10
0.917	3.14	2.500	6.29	4.083	5.24	5.67	2.10
1.000	3.14	2.583	6.29	4.167	5.24	5.75	2.10
1.083	3.14	2.667	6.29	4.250	5.24	5.83	2.10
1.167	3.14	2.750	6.29	4.333	4.19	5.92	2.10

1.250	3.14	2.833	31.44	4.417	4.19	6.00	2.10
1.333	3.14	2.917	31.44	4.500	4.19	6.08	2.10
1.417	3.14	3.000	31.44	4.583	4.19	6.17	2.10
1.500	3.14	3.083	81.74	4.667	4.19	6.25	2.10
1.583	3.14	3.167	81.74	4.750	4.19		

Max.Eff.Inten.(mm/hr)= 81.74 45.14
 over (min)= 5.00 10.00
 Storage Coeff. (min)= 4.73 (ii) 5.95 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.22 0.15
 TOTALS
 PEAK FLOW (cms)= 2.18 0.54 2.719 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 50.40 15.30 34.61
 TOTAL RAINFALL (mm)= 52.40 52.40 52.40
 RUNOFF COEFFICIENT = 0.96 0.29 0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0048)				
1 + 2 = 3				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1201):	17.89	2.719	3.25	34.61
+ ID2= 2 (1301):	5.08	0.159	3.67	17.30
=====				
ID = 3 (0048):	22.97	2.788	3.25	30.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)				
IN= 2--> OUT= 1				
DT= 5.0 min				
OVERFLOW IS OFF				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.6697	0.5963
	0.0130	0.0688	0.8321	0.6991
	0.0204	0.1438	0.9671	0.8059
	0.0258	0.2249	1.0852	0.9165
	0.0313	0.3336	2.1958	0.9732
	0.1311	0.4022	4.1789	1.0308
	0.3834	0.4973	13.1438	1.2091

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	22.970	2.788	3.25	30.78
OUTFLOW: ID= 1 (0042)	22.970	0.338	4.08	30.72

PEAK FLOW REDUCTION [Qout/Qin](%)= 12.14
 TIME SHIFT OF PEAK FLOW (min)= 50.00
 MAXIMUM STORAGE USED (ha.m.)= 0.4804

CALIB			
STANDHYD (1303)			
ID= 1 DT= 5.0 min			
Area (ha)= 0.66			
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00			
IMPERVIOUS PERVIOUS (i)			
Surface Area	(ha)=	0.46	0.20
Dep. Storage	(mm)=	1.00	5.00

Average Slope (%)= 1.00 2.00
 Length (m)= 66.33 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	1.667	3.14	3.250	81.74	4.83	3.14
0.167	0.00	1.750	3.14	3.333	11.53	4.92	3.14
0.250	0.00	1.833	5.24	3.417	11.53	5.00	3.14
0.333	2.10	1.917	5.24	3.500	11.53	5.08	3.14
0.417	2.10	2.000	5.24	3.583	11.53	5.17	3.14
0.500	2.10	2.083	5.24	3.667	11.53	5.25	3.14
0.583	2.10	2.167	5.24	3.750	11.53	5.33	2.10
0.667	2.10	2.250	5.24	3.833	5.24	5.42	2.10
0.750	2.10	2.333	6.29	3.917	5.24	5.50	2.10
0.833	3.14	2.417	6.29	4.000	5.24	5.58	2.10
0.917	3.14	2.500	6.29	4.083	5.24	5.67	2.10
1.000	3.14	2.583	6.29	4.167	5.24	5.75	2.10
1.083	3.14	2.667	6.29	4.250	5.24	5.83	2.10
1.167	3.14	2.750	6.29	4.333	4.19	5.92	2.10
1.250	3.14	2.833	31.44	4.417	4.19	6.00	2.10
1.333	3.14	2.917	31.44	4.500	4.19	6.08	2.10
1.417	3.14	3.000	31.44	4.583	4.19	6.17	2.10
1.500	3.14	3.083	81.74	4.667	4.19	6.25	2.10
1.583	3.14	3.167	81.74	4.750	4.19		

Max.Eff.Inten.(mm/hr)= 81.74 18.85
 over (min) 5.00 20.00
 Storage Coeff. (min)= 2.16 (ii) 15.92 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.31 0.07

PEAK FLOW (cms)= 0.10 0.01
 TIME TO PEAK (hrs)= 3.25 3.42
 RUNOFF VOLUME (mm)= 51.40 10.71
 TOTAL RAINFALL (mm)= 52.40 52.40
 RUNOFF COEFFICIENT = 0.98 0.20

TOTALS

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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	Area (ha)= 1.17	Dir. Conn.(%)= 60.00
STANDHYD (1202)	Total Imp(%)= 75.00	
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	0.29
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	88.32	20.00
Mannings n =	0.013	0.035

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	1.667	3.14	3.250	81.74	4.83	3.14

0.167	0.00	1.750	3.14	3.333	11.53	4.92	3.14
0.250	0.00	1.833	5.24	3.417	11.53	5.00	3.14
0.333	2.10	1.917	5.24	3.500	11.53	5.08	3.14
0.417	2.10	2.000	5.24	3.583	11.53	5.17	3.14
0.500	2.10	2.083	5.24	3.667	11.53	5.25	3.14
0.583	2.10	2.167	5.24	3.750	11.53	5.33	2.10
0.667	2.10	2.250	5.24	3.833	5.24	5.42	2.10
0.750	2.10	2.333	6.29	3.917	5.24	5.50	2.10
0.833	3.14	2.417	6.29	4.000	5.24	5.58	2.10
0.917	3.14	2.500	6.29	4.083	5.24	5.67	2.10
1.000	3.14	2.583	6.29	4.167	5.24	5.75	2.10
1.083	3.14	2.667	6.29	4.250	5.24	5.83	2.10
1.167	3.14	2.750	6.29	4.333	4.19	5.92	2.10
1.250	3.14	2.833	31.44	4.417	4.19	6.00	2.10
1.333	3.14	2.917	31.44	4.500	4.19	6.08	2.10
1.417	3.14	3.000	31.44	4.583	4.19	6.17	2.10
1.500	3.14	3.083	81.74	4.667	4.19	6.25	2.10
1.583	3.14	3.167	81.74	4.750	4.19		

Max.Eff.Inten.(mm/hr)= 81.74 50.61
 over (min) 5.00 5.00
 Storage Coeff. (min)= 2.09 (ii) 3.18 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.31 0.27

TOTALS

PEAK FLOW (cms)= 0.16 0.04
 TIME TO PEAK (hrs)= 3.25 3.25
 RUNOFF VOLUME (mm)= 50.40 16.10
 TOTAL RAINFALL (mm)= 52.40 52.40
 RUNOFF COEFFICIENT = 0.96 0.31

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0043)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (1202):	1.17	0.202	3.25	36.68
+ ID2= 2 (1302):	6.51	0.244	3.58	18.44
ID = 3 (0043):	7.68	0.328	3.25	21.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0043):	7.68	0.328	3.25	21.22
+ ID2= 2 (1303):	0.66	0.108	3.25	39.18
ID = 1 (0043):	8.34	0.436	3.25	22.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0043):	8.34	0.436	3.25	22.64

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+ ID2= 2 ( 0042): 22.97 0.338 4.08 30.72
=====
ID = 3 ( 0043): 31.31 0.587 3.75 28.57

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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V V I SSSS U U A L (v 6.2.2009)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
V V I SSSS UUUU A A LLLL

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000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y M M 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voind.dat
Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\3f6a7d6f-36fd-40bb-8afb-a6df443f47d3\scena
Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\3f6a7d6f-36fd-40bb-8afb-a6df443f47d3\scena

DATE: 11-10-2022 TIME: 01:44:20

USER:

COMMENTS: _____

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** SIMULATION : SCS_6H_010Y **
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| READ STORM | Filename: C:\Users\Valdor\AppData\Local\Temp\
|             | 908d5600-a56f-49d0-bccb-864caf61b13f\4d7be5e1
| Ptotal= 61.50 mm | Comments: 10yr/6hr Peterborough A SCS
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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	6.15	3.50	13.53	5.25	2.46
0.25	2.46	2.00	6.15	3.75	6.15	5.50	2.46
0.50	2.46	2.25	7.38	4.00	6.15	5.75	2.46
0.75	3.69	2.50	7.38	4.25	4.92	6.00	2.46
1.00	3.69	2.75	36.90	4.50	4.92		
1.25	3.69	3.00	95.94	4.75	3.69		
1.50	3.69	3.25	13.53	5.00	3.69		

| CALIB |

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| NASHYD ( 2202) | Area (ha)= 2.59 Curve Number (CN)= 66.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.20 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.42

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

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----- 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 1.667 3.69 3.250 95.94 4.83 3.69
0.167 0.00 1.750 3.69 3.333 13.53 4.92 3.69
0.250 0.00 1.833 6.15 3.417 13.53 5.00 3.69
0.333 2.46 1.917 6.15 3.500 13.53 5.08 3.69
0.417 2.46 2.000 6.15 3.583 13.53 5.17 3.69
0.500 2.46 2.083 6.15 3.667 13.53 5.25 3.69
0.583 2.46 2.167 6.15 3.750 13.53 5.33 2.46
0.667 2.46 2.250 6.15 3.833 6.15 5.42 2.46
0.750 2.46 2.333 7.38 3.917 6.15 5.50 2.46
0.833 3.69 2.417 7.38 4.000 6.15 5.58 2.46
0.917 3.69 2.500 7.38 4.083 6.15 5.67 2.46
1.000 3.69 2.583 7.38 4.167 6.15 5.75 2.46
1.083 3.69 2.667 7.38 4.250 6.15 5.83 2.46
1.167 3.69 2.750 7.38 4.333 4.92 5.92 2.46
1.250 3.69 2.833 36.90 4.417 4.92 6.00 2.46
1.333 3.69 2.917 36.90 4.500 4.92 6.08 2.46
1.417 3.69 3.000 36.90 4.583 4.92 6.17 2.46
1.500 3.69 3.083 95.94 4.667 4.92 6.25 2.46
1.583 3.69 3.167 95.94 4.750 4.92

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Unit Hyd Qpeak (cms)= 0.236

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PEAK FLOW (cms)= 0.085 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 16.426
TOTAL RAINFALL (mm)= 61.500
RUNOFF COEFFICIENT = 0.267

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

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| CALIB |
| STANDHYD ( 2201) | Area (ha)= 11.20
| ID= 1 DT= 5.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00
|-----|

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	IMPERVIOUS (ha)	PERVIOUS (i)
Surface Area	6.72	4.48
Dep. Storage	2.00	5.00
Average Slope	2.00	2.00
Length	273.25	20.00
Mannings n	0.013	0.035

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

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----- 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 1.667 3.69 3.250 95.94 4.83 3.69
0.167 0.00 1.750 3.69 3.333 13.53 4.92 3.69
0.250 0.00 1.833 6.15 3.417 13.53 5.00 3.69
0.333 2.46 1.917 6.15 3.500 13.53 5.08 3.69
0.417 2.46 2.000 6.15 3.583 13.53 5.17 3.69
0.500 2.46 2.083 6.15 3.667 13.53 5.25 3.69
0.583 2.46 2.167 6.15 3.750 13.53 5.33 2.46
0.667 2.46 2.250 6.15 3.833 6.15 5.42 2.46
0.750 2.46 2.333 7.38 3.917 6.15 5.50 2.46
0.833 3.69 2.417 7.38 4.000 6.15 5.58 2.46
0.917 3.69 2.500 7.38 4.083 6.15 5.67 2.46

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1.000	3.69	2.583	7.38	4.167	6.15	5.75	2.46
1.083	3.69	2.667	7.38	4.250	6.15	5.83	2.46
1.167	3.69	2.750	7.38	4.333	4.92	5.92	2.46
1.250	3.69	2.833	36.90	4.417	4.92	6.00	2.46
1.333	3.69	2.917	36.90	4.500	4.92	6.08	2.46
1.417	3.69	3.000	36.90	4.583	4.92	6.17	2.46
1.500	3.69	3.083	95.94	4.667	4.92	6.25	2.46
1.583	3.69	3.167	95.94	4.750	4.92		

Max.Eff.Inten.(mm/hr)= 95.94 51.38
 over (min) 5.00 10.00
 Storage Coeff. (min)= 3.86 (ii) 5.24 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.25 0.16

PEAK FLOW (cms)= 1.33 0.54 *TOTALS*
 TIME TO PEAK (hrs)= 3.25 3.25 1.862 (iii)
 RUNOFF VOLUME (mm)= 59.50 19.03 37.24
 TOTAL RAINFALL (mm)= 61.50 61.50 61.50
 RUNOFF COEFFICIENT = 0.97 0.31 0.61

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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(0038) |
 | IN= 2--> OUT= 1 |
DT= 5.0 min
 OVERFLOW IS OFF
 OUTFLOW STORAGE OUTFLOW STORAGE
 (cms) (ha.m.) (cms) (ha.m.)
 0.0000 0.0000 0.8454 0.4251
 0.0074 0.0469 0.9743 0.4997
 0.0112 0.0990 1.0880 0.5770
 0.0140 0.1563 1.1909 0.6570
 0.1657 0.2182 5.4831 0.7609
 0.4409 0.2840 13.2243 0.8692
 0.6926 0.3532 0.0000 0.0000
 AREA QPEAK TPEAK R.V.
 (ha) (cms) (hrs) (mm)
 INFLOW : ID= 2 (2201) 11.200 1.862 3.25 37.24
 OUTFLOW: ID= 1 (0038) 11.200 0.354 3.50 37.10
 PEAK FLOW REDUCTION [Qout/Qin](%)= 19.01
 TIME SHIFT OF PEAK FLOW (min)= 15.00
 MAXIMUM STORAGE USED (ha.m.)= 0.2636

 | ADD HYD (0017) |
1 + 2 = 3
 ID1= 1 (2202): AREA QPEAK TPEAK R.V.
 (ha) (cms) (hrs) (mm)
 + ID2= 2 (0038): 2.59 0.085 3.58 16.43
 + ID2= 2 (0038): 11.20 0.354 3.50 37.10
 =====
 ID = 3 (0017): 13.79 0.438 3.58 33.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | CALIB |
 | NASHYD (1302) |
ID= 1 DT= 5.0 min
 Area (ha)= 6.51 Curve Number (CN)= 79.0
 Ia (mm)= 6.70 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.42

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 1.667 3.69 3.250 95.94 4.83 3.69
 0.167 0.00 1.750 3.69 3.333 13.53 4.92 3.69
 0.250 0.00 1.833 6.15 3.417 13.53 5.00 3.69
 0.333 2.46 1.917 6.15 3.500 13.53 5.08 3.69
 0.417 2.46 2.000 6.15 3.583 13.53 5.17 3.69
 0.500 2.46 2.083 6.15 3.667 13.53 5.25 3.69
 0.583 2.46 2.167 6.15 3.750 13.53 5.33 2.46
 0.667 2.46 2.250 6.15 3.833 6.15 5.42 2.46
 0.750 2.46 2.333 7.38 3.917 6.15 5.50 2.46
 0.833 3.69 2.417 7.38 4.000 6.15 5.58 2.46
 0.917 3.69 2.500 7.38 4.083 6.15 5.67 2.46
 1.000 3.69 2.583 7.38 4.167 6.15 5.75 2.46
 1.083 3.69 2.667 7.38 4.250 6.15 5.83 2.46
 1.167 3.69 2.750 7.38 4.333 4.92 5.92 2.46
 1.250 3.69 2.833 36.90 4.417 4.92 6.00 2.46
 1.333 3.69 2.917 36.90 4.500 4.92 6.08 2.46
 1.417 3.69 3.000 36.90 4.583 4.92 6.17 2.46
 1.500 3.69 3.083 95.94 4.667 4.92 6.25 2.46
 1.583 3.69 3.167 95.94 4.750 4.92

Unit Hyd Qpeak (cms)= 0.592

PEAK FLOW (cms)= 0.329 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 24.548
 TOTAL RAINFALL (mm)= 61.500
 RUNOFF COEFFICIENT = 0.399

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

 | CALIB |
 | NASHYD (1301) |
ID= 1 DT= 5.0 min
 Area (ha)= 5.08 Curve Number (CN)= 77.0
 Ia (mm)= 6.50 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.49

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 1.667 3.69 3.250 95.94 4.83 3.69
 0.167 0.00 1.750 3.69 3.333 13.53 4.92 3.69
 0.250 0.00 1.833 6.15 3.417 13.53 5.00 3.69
 0.333 2.46 1.917 6.15 3.500 13.53 5.08 3.69
 0.417 2.46 2.000 6.15 3.583 13.53 5.17 3.69
 0.500 2.46 2.083 6.15 3.667 13.53 5.25 3.69
 0.583 2.46 2.167 6.15 3.750 13.53 5.33 2.46
 0.667 2.46 2.250 6.15 3.833 6.15 5.42 2.46
 0.750 2.46 2.333 7.38 3.917 6.15 5.50 2.46
 0.833 3.69 2.417 7.38 4.000 6.15 5.58 2.46
 0.917 3.69 2.500 7.38 4.083 6.15 5.67 2.46
 1.000 3.69 2.583 7.38 4.167 6.15 5.75 2.46
 1.083 3.69 2.667 7.38 4.250 6.15 5.83 2.46
 1.167 3.69 2.750 7.38 4.333 4.92 5.92 2.46
 1.250 3.69 2.833 36.90 4.417 4.92 6.00 2.46
 1.333 3.69 2.917 36.90 4.500 4.92 6.08 2.46
 1.417 3.69 3.000 36.90 4.583 4.92 6.17 2.46
 1.500 3.69 3.083 95.94 4.667 4.92 6.25 2.46
 1.583 3.69 3.167 95.94 4.750 4.92

Unit Hyd Qpeak (cms)= 0.396

PEAK FLOW (cms)= 0.215 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 23.113
 TOTAL RAINFALL (mm)= 61.500
 RUNOFF COEFFICIENT = 0.376

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

CALIB		Area (ha)= 17.89		Dir. Conn.(%)= 55.00	
STANDHYD (1201)		Total Imp(%)= 70.00			
ID= 1 DT= 5.0 min					
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	12.52	5.37		
Dep. Storage	(mm)=	2.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	345.35	20.00		
Mannings n	=	0.013	0.035		

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	1.667	3.69	3.250	95.94	4.83	3.69
0.167	0.00	1.750	3.69	3.333	13.53	4.92	3.69
0.250	0.00	1.833	6.15	3.417	13.53	5.00	3.69
0.333	2.46	1.917	6.15	3.500	13.53	5.08	3.69
0.417	2.46	2.000	6.15	3.583	13.53	5.17	3.69
0.500	2.46	2.083	6.15	3.667	13.53	5.25	3.69
0.583	2.46	2.167	6.15	3.750	13.53	5.33	2.46
0.667	2.46	2.250	6.15	3.833	6.15	5.42	2.46
0.750	2.46	2.333	7.38	3.917	6.15	5.50	2.46
0.833	3.69	2.417	7.38	4.000	6.15	5.58	2.46
0.917	3.69	2.500	7.38	4.083	6.15	5.67	2.46
1.000	3.69	2.583	7.38	4.167	6.15	5.75	2.46
1.083	3.69	2.667	7.38	4.250	6.15	5.83	2.46
1.167	3.69	2.750	7.38	4.333	4.92	5.92	2.46
1.250	3.69	2.833	36.90	4.417	4.92	6.00	2.46
1.333	3.69	2.917	36.90	4.500	4.92	6.08	2.46
1.417	3.69	3.000	36.90	4.583	4.92	6.17	2.46
1.500	3.69	3.083	95.94	4.667	4.92	6.25	2.46
1.583	3.69	3.167	95.94	4.750	4.92		

Max.Eff.Inten.(mm/hr)= 95.94 59.79
 over (min) 5.00 10.00
 Storage Coeff. (min)= 4.44 (ii) 5.58 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.23 0.16

TOTALS
 PEAK FLOW (cms)= 2.57 0.74 3.305 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 59.50 20.33 41.87
 TOTAL RAINFALL (mm)= 61.50 61.50 61.50
 RUNOFF COEFFICIENT = 0.97 0.33 0.68

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0048)				
1 + 2 = 3				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1201):	17.89	3.305	3.25	41.87
+ ID2= 2 (1301):	5.08	0.215	3.67	23.11
ID = 3 (0048):	22.97	3.402	3.25	37.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)			
IN= 2--> OUT= 1			
DT= 5.0 min			
OVERFLOW IS OFF			
OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.6697	0.5963
0.0130	0.0688	0.8321	0.6991
0.0204	0.1438	0.9671	0.8059
0.0258	0.2249	1.0852	0.9165
0.0313	0.3336	2.1958	0.9732
0.1311	0.4022	4.1789	1.0308
0.3834	0.4973	13.1438	1.2091

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0048)	22.970	3.402	3.25	37.72
OUTFLOW: ID= 1 (0042)	22.970	0.533	3.83	37.67

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.67
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 0.5497

CALIB		Area (ha)= 0.66		Dir. Conn.(%)= 70.00	
STANDHYD (1303)		Total Imp(%)= 70.00			
ID= 1 DT= 5.0 min					
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	0.46	0.20		
Dep. Storage	(mm)=	1.00	5.00		
Average Slope	(%)=	1.00	2.00		
Length	(m)=	66.33	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	1.667	3.69	3.250	95.94	4.83	3.69
0.167	0.00	1.750	3.69	3.333	13.53	4.92	3.69
0.250	0.00	1.833	6.15	3.417	13.53	5.00	3.69
0.333	2.46	1.917	6.15	3.500	13.53	5.08	3.69
0.417	2.46	2.000	6.15	3.583	13.53	5.17	3.69
0.500	2.46	2.083	6.15	3.667	13.53	5.25	3.69
0.583	2.46	2.167	6.15	3.750	13.53	5.33	2.46
0.667	2.46	2.250	6.15	3.833	6.15	5.42	2.46
0.750	2.46	2.333	7.38	3.917	6.15	5.50	2.46
0.833	3.69	2.417	7.38	4.000	6.15	5.58	2.46
0.917	3.69	2.500	7.38	4.083	6.15	5.67	2.46
1.000	3.69	2.583	7.38	4.167	6.15	5.75	2.46
1.083	3.69	2.667	7.38	4.250	6.15	5.83	2.46
1.167	3.69	2.750	7.38	4.333	4.92	5.92	2.46
1.250	3.69	2.833	36.90	4.417	4.92	6.00	2.46
1.333	3.69	2.917	36.90	4.500	4.92	6.08	2.46
1.417	3.69	3.000	36.90	4.583	4.92	6.17	2.46

1.500	3.69	3.083	95.94	4.667	4.92	6.25	2.46
1.583	3.69	3.167	95.94	4.750	4.92		

Max.Eff.Inten.(mm/hr)= 95.94 25.79
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.03 (ii) 14.17 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.31 0.08

TOTALS

PEAK FLOW (cms)=	0.12	0.01	0.130 (iii)
TIME TO PEAK (hrs)=	3.25	3.42	3.25
RUNOFF VOLUME (mm)=	60.50	14.58	46.71
TOTAL RAINFALL (mm)=	61.50	61.50	61.50
RUNOFF COEFFICIENT =	0.98	0.24	0.76

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
 CN* = 61.0 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	Area (ha)=	1.17
STANDHYD (1202)	Total Imp(%)=	75.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	60.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	0.29
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	88.32	20.00
Mannings n =	0.013	0.035

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	1.667	3.69	3.250	95.94	4.83	3.69
0.167	0.00	1.750	3.69	3.333	13.53	4.92	3.69
0.250	0.00	1.833	6.15	3.417	13.53	5.00	3.69
0.333	2.46	1.917	6.15	3.500	13.53	5.08	3.69
0.417	2.46	2.000	6.15	3.583	13.53	5.17	3.69
0.500	2.46	2.083	6.15	3.667	13.53	5.25	3.69
0.583	2.46	2.167	6.15	3.750	13.53	5.33	2.46
0.667	2.46	2.250	6.15	3.833	6.15	5.42	2.46
0.750	2.46	2.333	7.38	3.917	6.15	5.50	2.46
0.833	3.69	2.417	7.38	4.000	6.15	5.58	2.46
0.917	3.69	2.500	7.38	4.083	6.15	5.67	2.46
1.000	3.69	2.583	7.38	4.167	6.15	5.75	2.46
1.083	3.69	2.667	7.38	4.250	6.15	5.83	2.46
1.167	3.69	2.750	7.38	4.333	4.92	5.92	2.46
1.250	3.69	2.833	36.90	4.417	4.92	6.00	2.46
1.333	3.69	2.917	36.90	4.500	4.92	6.08	2.46
1.417	3.69	3.000	36.90	4.583	4.92	6.17	2.46
1.500	3.69	3.083	95.94	4.667	4.92	6.25	2.46
1.583	3.69	3.167	95.94	4.750	4.92		

Max.Eff.Inten.(mm/hr)= 95.94 66.78
 over (min) 5.00 5.00
 Storage Coeff. (min)= 1.96 (ii) 2.98 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.31 0.28

TOTALS

PEAK FLOW (cms)=	0.19	0.06	0.243 (iii)
TIME TO PEAK (hrs)=	3.25	3.25	3.25

RUNOFF VOLUME (mm)=	59.50	21.31	44.22
TOTAL RAINFALL (mm)=	61.50	61.50	61.50
RUNOFF COEFFICIENT =	0.97	0.35	0.72

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0043)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (1202):	1.17	0.243	3.25	44.22
+ ID2= 2 (1302):	6.51	0.329	3.58	24.55
ID = 3 (0043):	7.68	0.420	3.25	27.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0043):	7.68	0.420	3.25	27.55
+ ID2= 2 (1303):	0.66	0.130	3.25	46.71
ID = 1 (0043):	8.34	0.550	3.25	29.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0043):	8.34	0.550	3.25	29.06
+ ID2= 2 (0042):	22.97	0.533	3.83	37.67
ID = 3 (0043):	31.31	0.884	3.75	35.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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V V I SSSSS U U A L (v 6.2.2009)
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

000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y MM MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000
  
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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
 Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\86f51cd2-5122-4fa5-9a94-173d448cc0ad\scena
 Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\86f51cd2-5122-4fa5-9a94-173d448cc0ad\scena

DATE: 11-10-2022

TIME: 01:44:20

USER:

COMMENTS:

 ** SIMULATION : SCS_6H_025Y **

 READ STORM | Filename: C:\Users\Valdor\AppData\Local\Temp\908d5600-a56f-49d0-bccb-864caf61b13f\fa52cd9
 Ptotal= 72.90 mm | Comments: 25yr/6hr Peterborough A SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	1.75	7.29	3.50	16.04	5.25	2.92
0.25	2.92	2.00	7.29	3.75	7.29	5.50	2.92
0.50	2.92	2.25	8.75	4.00	7.29	5.75	2.92
0.75	4.37	2.50	8.75	4.25	5.83	6.00	2.92
1.00	4.37	2.75	43.74	4.50	5.83		
1.25	4.37	3.00	113.72	4.75	4.37		
1.50	4.37	3.25	16.04	5.00	4.37		

 CALIB | Area (ha)= 2.59 Curve Number (CN)= 66.0
 NASHYD (2202) | Ia (mm)= 6.20 # of Linear Res.(N)= 3.00
 ID= 1 DT= 5.0 min | U.H. Tp(hrs)= 0.42

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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83		

1.500 4.37 | 3.083 113.72 | 4.667 5.83 | 6.25 2.92
 1.583 4.37 | 3.167 113.72 | 4.750 5.83 |

Unit Hyd Qpeak (cms)= 0.236

PEAK FLOW (cms)= 0.117 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 22.518
 TOTAL RAINFALL (mm)= 72.900
 RUNOFF COEFFICIENT = 0.309

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

 CALIB | Area (ha)= 11.20
 STANDHYD (2201) | Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00
 ID= 1 DT= 5.0 min |

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	6.72	4.48
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	273.25	20.00
Mannings n	0.013	0.035

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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83		

Max.Eff.Inten.(mm/hr)= 113.72 68.91
 over (min) 5.00 5.00
 Storage Coeff. (min)= 3.60 (ii) 4.90 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.25 0.22

TOTALS
 PEAK FLOW (cms)= 1.58 0.83 2.411 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 70.90 25.60 45.99
 TOTAL RAINFALL (mm)= 72.90 72.90 72.90
 RUNOFF COEFFICIENT = 0.97 0.35 0.63

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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(0038)				
IN= 2--> OUT= 1				
DT= 5.0 min				

OVERFLOW IS OFF				
OUTFLOW	STORAGE	OUTFLOW	STORAGE	
(cms)	(ha.m.)	(cms)	(ha.m.)	
0.0000	0.0000	0.8454	0.4251	
0.0074	0.0469	0.9743	0.4997	
0.0112	0.0990	1.0880	0.5770	
0.0140	0.1563	1.1909	0.6570	
0.1657	0.2182	5.4831	0.7609	
0.4409	0.2840	13.2243	0.8692	
0.6926	0.3532	0.0000	0.0000	
AREA	QPEAK	TPEAK	R.V.	
(ha)	(cms)	(hrs)	(mm)	
INFLOW : ID= 2 (2201)	11.200	2.411	3.25	45.99
OUTFLOW: ID= 1 (0038)	11.200	0.543	3.42	45.84
PEAK FLOW REDUCTION [Qout/Qin](%)= 22.54				
TIME SHIFT OF PEAK FLOW (min)= 10.00				
MAXIMUM STORAGE USED (ha.m.)= 0.3122				

ADD HYD (0017)				
1 + 2 = 3				

ID1= 1 (2202):	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
	2.59	0.117	3.58	22.52
+ ID2= 2 (0038):	11.20	0.543	3.42	45.84
=====				
ID = 3 (0017):	13.79	0.652	3.50	41.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (1302)				
ID= 1 DT= 5.0 min				

Area	(ha)=	6.51	Curve Number	(CN)= 79.0
Ia	(mm)=	6.70	# of Linear Res.(N)=	3.00
U.H. Tp(hrs)=		0.42		

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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83		

Unit Hyd Qpeak (cms)= 0.592

PEAK FLOW (cms)= 0.443 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 32.770
 TOTAL RAINFALL (mm)= 72.900
 RUNOFF COEFFICIENT = 0.450

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

CALIB			
NASHYD (1301)			
ID= 1 DT= 5.0 min			

Area	(ha)=	5.08	Curve Number (CN)= 77.0
Ia	(mm)=	6.50	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=		0.49	

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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83		

Unit Hyd Qpeak (cms)= 0.396

PEAK FLOW (cms)= 0.291 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 30.988
 TOTAL RAINFALL (mm)= 72.900
 RUNOFF COEFFICIENT = 0.425

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

CALIB			
STANDHYD (1201)			
ID= 1 DT= 5.0 min			

Area	(ha)=	17.89	
Total Imp(%)=		70.00	Dir. Conn.(%)= 55.00

IMPERVIOUS			PERVIOUS (i)	
Surface Area	(ha)=	12.52		5.37
Dep. Storage	(mm)=	2.00		5.00
Average Slope	(%)=	2.00		2.00
Length	(m)=	345.35		20.00
Mannings n	=	0.013		0.035

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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83	6.25	2.92

Max.Eff.Inten.(mm/hr)= 113.72 79.75
over (min) 5.00 10.00
Storage Coeff. (min)= 4.15 (ii) 5.21 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.24 0.16

TOTALS

PEAK FLOW (cms)= 3.06 1.01 4.065 (iii)
TIME TO PEAK (hrs)= 3.25 3.25 3.25
RUNOFF VOLUME (mm)= 70.90 27.21 51.24
TOTAL RAINFALL (mm)= 72.90 72.90 72.90
RUNOFF COEFFICIENT = 0.97 0.37 0.70

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 61.0 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.

ADD HYD (0048)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (1201):	17.89	4.065	3.25	51.24
+ ID2= 2 (1301):	5.08	0.291	3.67	30.99
ID = 3 (0048):	22.97	4.203	3.25	46.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2--> OUT= 1				
DT= 5.0 min				
0.0000	0.0000	0.6697	0.5963	
0.0130	0.0688	0.8321	0.6991	
0.0204	0.1438	0.9671	0.8059	
0.0258	0.2249	1.0852	0.9165	
0.0313	0.3336	2.1958	0.9732	
0.1311	0.4022	4.1789	1.0308	
0.3834	0.4973	13.1438	1.2091	
AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	

INFLOW : ID= 2 (0048) 22.970 4.203 3.25 46.76
OUTFLOW: ID= 1 (0042) 22.970 0.745 3.83 46.70

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.72
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.6440

CALIB
STANDHYD (1303)
ID= 1 DT= 5.0 min

Area (ha)= 0.66
Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00

IMPERVIOUS PVIOUS (i)
Surface Area (ha)= 0.46 0.20
Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 1.00 2.00
Length (m)= 66.33 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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83	6.25	2.92

Max.Eff.Inten.(mm/hr)= 113.72 39.42
over (min) 5.00 10.00
Storage Coeff. (min)= 1.90 (ii) 6.67 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.32 0.14

PEAK FLOW (cms)= 0.15 0.02 0.163 (iii)
TIME TO PEAK (hrs)= 3.25 3.25 3.25
RUNOFF VOLUME (mm)= 71.90 20.02 56.33
TOTAL RAINFALL (mm)= 72.90 72.90 72.90
RUNOFF COEFFICIENT = 0.99 0.27 0.77

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 61.0 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 (1202)
Area (ha)= 1.17

|ID= 1 DT= 5.0 min | Total Imp(%)= 75.00 Dir. Conn.(%)= 60.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.88	0.29
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	88.32	20.00
Mannings n =	0.013	0.035

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	1.667	4.37	3.250	113.72	4.83	4.37
0.167	0.00	1.750	4.37	3.333	16.04	4.92	4.37
0.250	0.00	1.833	7.29	3.417	16.04	5.00	4.37
0.333	2.92	1.917	7.29	3.500	16.04	5.08	4.37
0.417	2.92	2.000	7.29	3.583	16.04	5.17	4.37
0.500	2.92	2.083	7.29	3.667	16.04	5.25	4.37
0.583	2.92	2.167	7.29	3.750	16.04	5.33	2.92
0.667	2.92	2.250	7.29	3.833	7.29	5.42	2.92
0.750	2.92	2.333	8.75	3.917	7.29	5.50	2.92
0.833	4.37	2.417	8.75	4.000	7.29	5.58	2.92
0.917	4.37	2.500	8.75	4.083	7.29	5.67	2.92
1.000	4.37	2.583	8.75	4.167	7.29	5.75	2.92
1.083	4.37	2.667	8.75	4.250	7.29	5.83	2.92
1.167	4.37	2.750	8.75	4.333	5.83	5.92	2.92
1.250	4.37	2.833	43.74	4.417	5.83	6.00	2.92
1.333	4.37	2.917	43.74	4.500	5.83	6.08	2.92
1.417	4.37	3.000	43.74	4.583	5.83	6.17	2.92
1.500	4.37	3.083	113.72	4.667	5.83	6.25	2.92
1.583	4.37	3.167	113.72	4.750	5.83		

Max.Eff.Inten.(mm/hr)=	113.72	88.72
over (min)	5.00	5.00
Storage Coeff. (min)=	1.83 (ii)	2.79 (iii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.32	0.28

	PEAK FLOW (cms)	TIME TO PEAK (hrs)	RUNOFF VOLUME (mm)	TOTAL RAINFALL (mm)	RUNOFF COEFFICIENT
	0.22	0.07	70.90	72.90	0.97
	0.25	3.25	28.43	72.90	0.39
	53.91	32.77			

TOTALS
0.297 (iii)

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1202):	1.17	0.297	3.25	53.91
+ ID2= 2 (1302):	6.51	0.443	3.58	32.77
ID = 3 (0043):	7.68	0.544	3.25	35.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0043):	7.68	0.544	3.25	35.99
+ ID2= 2 (1303):	0.66	0.163	3.25	56.33
ID = 1 (0043):	8.34	0.707	3.25	37.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0043):	8.34	0.707	3.25	37.60
+ ID2= 2 (0042):	22.97	0.745	3.83	46.70
ID = 3 (0043):	31.31	1.231	3.58	44.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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V V I SSSSS U U A L (v 6.2.2009)
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
V V I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y MM MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\ad68ddcc-f445-46f6-aa5d-44e66cbbec44\scena
Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\ad68ddcc-f445-46f6-aa5d-44e66cbbec44\scena

DATE: 11-10-2022 TIME: 01:44:20

USER:

COMMENTS:

** SIMULATION : SCS_6H_050Y **

READ STORM	Filename:
	C:\Users\Valdor\AppData\Local\Temp\908d5600-a56f-49d0-bccb-864caf61b13f\d8695a31

| Ptotal= 81.40 mm | Comments: 50yr/6hr Peterborough A SCS

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	1.75	8.14	3.50	17.91	5.25	3.26
0.25	3.26	2.00	8.14	3.75	8.14	5.50	3.26
0.50	3.26	2.25	9.77	4.00	8.14	5.75	3.26
0.75	4.88	2.50	9.77	4.25	6.51	6.00	3.26
1.00	4.88	2.75	48.84	4.50	6.51		
1.25	4.88	3.00	126.98	4.75	4.88		
1.50	4.88	3.25	17.91	5.00	4.88		

 | CALIB |
 | NASHYD (2202) | Area (ha)= 2.59 Curve Number (CN)= 66.0
 | ID= 1 DT= 5.0 min | Ia (mm)= 6.20 # of Linear Res.(N)= 3.00
 |-----| U.H. Tp(hrs)= 0.42

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	1.667	4.88	3.250	126.98	4.83	4.88
0.167	0.00	1.750	4.88	3.333	17.91	4.92	4.88
0.250	0.00	1.833	8.14	3.417	17.91	5.00	4.88
0.333	3.26	1.917	8.14	3.500	17.91	5.08	4.88
0.417	3.26	2.000	8.14	3.583	17.91	5.17	4.88
0.500	3.26	2.083	8.14	3.667	17.91	5.25	4.88
0.583	3.26	2.167	8.14	3.750	17.91	5.33	3.26
0.667	3.26	2.250	8.14	3.833	8.14	5.42	3.26
0.750	3.26	2.333	9.77	3.917	8.14	5.50	3.26
0.833	4.88	2.417	9.77	4.000	8.14	5.58	3.26
0.917	4.88	2.500	9.77	4.083	8.14	5.67	3.26
1.000	4.88	2.583	9.77	4.167	8.14	5.75	3.26
1.083	4.88	2.667	9.77	4.250	8.14	5.83	3.26
1.167	4.88	2.750	9.77	4.333	6.51	5.92	3.26
1.250	4.88	2.833	48.84	4.417	6.51	6.00	3.26
1.333	4.88	2.917	48.84	4.500	6.51	6.08	3.26
1.417	4.88	3.000	48.84	4.583	6.51	6.17	3.26
1.500	4.88	3.083	126.98	4.667	6.51	6.25	3.26
1.583	4.88	3.167	126.98	4.750	6.51		

Unit Hyd Qpeak (cms)= 0.236

PEAK FLOW (cms)= 0.144 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 27.442
 TOTAL RAINFALL (mm)= 81.400
 RUNOFF COEFFICIENT = 0.337

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

 | CALIB |
 | STANDHYD (2201) | Area (ha)= 11.20
 | ID= 1 DT= 5.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00
 |-----|

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	6.72	4.48
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	273.25	20.00
Mannings n	0.013	0.035

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	1.667	4.88	3.250	126.98	4.83	4.88
0.167	0.00	1.750	4.88	3.333	17.91	4.92	4.88
0.250	0.00	1.833	8.14	3.417	17.91	5.00	4.88
0.333	3.26	1.917	8.14	3.500	17.91	5.08	4.88
0.417	3.26	2.000	8.14	3.583	17.91	5.17	4.88
0.500	3.26	2.083	8.14	3.667	17.91	5.25	4.88
0.583	3.26	2.167	8.14	3.750	17.91	5.33	3.26
0.667	3.26	2.250	8.14	3.833	8.14	5.42	3.26
0.750	3.26	2.333	9.77	3.917	8.14	5.50	3.26
0.833	4.88	2.417	9.77	4.000	8.14	5.58	3.26
0.917	4.88	2.500	9.77	4.083	8.14	5.67	3.26
1.000	4.88	2.583	9.77	4.167	8.14	5.75	3.26
1.083	4.88	2.667	9.77	4.250	8.14	5.83	3.26
1.167	4.88	2.750	9.77	4.333	6.51	5.92	3.26
1.250	4.88	2.833	48.84	4.417	6.51	6.00	3.26
1.333	4.88	2.917	48.84	4.500	6.51	6.08	3.26
1.417	4.88	3.000	48.84	4.583	6.51	6.17	3.26
1.500	4.88	3.083	126.98	4.667	6.51	6.25	3.26
1.583	4.88	3.167	126.98	4.750	6.51		

Max.Eff.Inten.(mm/hr)=	126.98	82.89
over (min)	5.00	5.00
Storage Coeff. (min)=	3.45 (ii)	4.69 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.26	0.22
PEAK FLOW (cms)=	1.76	1.01
TIME TO PEAK (hrs)=	3.25	3.25
RUNOFF VOLUME (mm)=	79.40	30.87
TOTAL RAINFALL (mm)=	81.40	81.40
RUNOFF COEFFICIENT =	0.98	0.38

TOTALS
 2.774 (iii)

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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(0038) OVERFLOW IS OFF			
IN= 2---> OUT= 1	DT= 5.0 min		
OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8454	0.4251
0.0074	0.0469	0.9743	0.4997
0.0112	0.0990	1.0880	0.5770
0.0140	0.1563	1.1909	0.6570
0.1657	0.2182	5.4831	0.7609
0.4409	0.2840	13.2243	0.8692
0.6926	0.3532	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2201)	11.200	2.774	3.25	52.71
OUTFLOW: ID= 1 (0038)	11.200	0.681	3.42	52.57

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.54
 TIME SHIFT OF PEAK FLOW (min)= 10.00
 MAXIMUM STORAGE USED (ha.m.)= 0.3511

```

-----
| ADD HYD ( 0017) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 2202):      AREA   QPEAK   TPEAK   R.V.
+ ID2= 2 ( 0038):      (ha)   (cms)   (hrs)   (mm)
=====
ID = 3 ( 0017):      13.79   0.811   3.42   47.85

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| NASHYD ( 1302) | Area (ha)= 6.51 Curve Number (CN)= 79.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.70 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.42

```

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 | 1.667 4.88 | 3.250 126.98 | 4.83 4.88
0.167 0.00 | 1.750 4.88 | 3.333 17.91 | 4.92 4.88
0.250 0.00 | 1.833 8.14 | 3.417 17.91 | 5.00 4.88
0.333 3.26 | 1.917 8.14 | 3.500 17.91 | 5.08 4.88
0.417 3.26 | 2.000 8.14 | 3.583 17.91 | 5.17 4.88
0.500 3.26 | 2.083 8.14 | 3.667 17.91 | 5.25 4.88
0.583 3.26 | 2.167 8.14 | 3.750 17.91 | 5.33 3.26
0.667 3.26 | 2.250 8.14 | 3.833 8.14 | 5.42 3.26
0.750 3.26 | 2.333 9.77 | 3.917 8.14 | 5.50 3.26
0.833 4.88 | 2.417 9.77 | 4.000 8.14 | 5.58 3.26
0.917 4.88 | 2.500 9.77 | 4.083 8.14 | 5.67 3.26
1.000 4.88 | 2.583 9.77 | 4.167 8.14 | 5.75 3.26
1.083 4.88 | 2.667 9.77 | 4.250 8.14 | 5.83 3.26
1.167 4.88 | 2.750 9.77 | 4.333 6.51 | 5.92 3.26
1.250 4.88 | 2.833 48.84 | 4.417 6.51 | 6.00 3.26
1.333 4.88 | 2.917 48.84 | 4.500 6.51 | 6.08 3.26
1.417 4.88 | 3.000 48.84 | 4.583 6.51 | 6.17 3.26
1.500 4.88 | 3.083 126.98 | 4.667 6.51 | 6.25 3.26
1.583 4.88 | 3.167 126.98 | 4.750 6.51 | 6.25 3.26

```

Unit Hyd Qpeak (cms)= 0.592

```

PEAK FLOW (cms)= 0.533 (i)
TIME TO PEAK (hrs)= 3.583
RUNOFF VOLUME (mm)= 39.232
TOTAL RAINFALL (mm)= 81.400
RUNOFF COEFFICIENT = 0.482

```

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

```

-----
| CALIB
| NASHYD ( 1301) | Area (ha)= 5.08 Curve Number (CN)= 77.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.50 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.49

```

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 | 1.667 4.88 | 3.250 126.98 | 4.83 4.88
0.167 0.00 | 1.750 4.88 | 3.333 17.91 | 4.92 4.88
0.250 0.00 | 1.833 8.14 | 3.417 17.91 | 5.00 4.88
0.333 3.26 | 1.917 8.14 | 3.500 17.91 | 5.08 4.88

```

```

0.417 3.26 | 2.000 8.14 | 3.583 17.91 | 5.17 4.88
0.500 3.26 | 2.083 8.14 | 3.667 17.91 | 5.25 4.88
0.583 3.26 | 2.167 8.14 | 3.750 17.91 | 5.33 3.26
0.667 3.26 | 2.250 8.14 | 3.833 8.14 | 5.42 3.26
0.750 3.26 | 2.333 9.77 | 3.917 8.14 | 5.50 3.26
0.833 4.88 | 2.417 9.77 | 4.000 8.14 | 5.58 3.26
0.917 4.88 | 2.500 9.77 | 4.083 8.14 | 5.67 3.26
1.000 4.88 | 2.583 9.77 | 4.167 8.14 | 5.75 3.26
1.083 4.88 | 2.667 9.77 | 4.250 8.14 | 5.83 3.26
1.167 4.88 | 2.750 9.77 | 4.333 6.51 | 5.92 3.26
1.250 4.88 | 2.833 48.84 | 4.417 6.51 | 6.00 3.26
1.333 4.88 | 2.917 48.84 | 4.500 6.51 | 6.08 3.26
1.417 4.88 | 3.000 48.84 | 4.583 6.51 | 6.17 3.26
1.500 4.88 | 3.083 126.98 | 4.667 6.51 | 6.25 3.26
1.583 4.88 | 3.167 126.98 | 4.750 6.51 | 6.25 3.26

```

Unit Hyd Qpeak (cms)= 0.396

```

PEAK FLOW (cms)= 0.351 (i)
TIME TO PEAK (hrs)= 3.667
RUNOFF VOLUME (mm)= 37.207
TOTAL RAINFALL (mm)= 81.400
RUNOFF COEFFICIENT = 0.457

```

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

```

-----
| CALIB
| STANDHYD ( 1201) | Area (ha)= 17.89
| ID= 1 DT= 5.0 min | Total Imp(%)= 70.00 Dir. Conn.(%)= 55.00
|-----|
| IMPERVIOUS PERVIOUS (i)
| Surface Area (ha)= 12.52 5.37
| Dep. Storage (mm)= 2.00 5.00
| Average Slope (%)= 2.00 2.00
| Length (m)= 345.35 20.00
| Mannings n = 0.013 0.035

```

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 | 1.667 4.88 | 3.250 126.98 | 4.83 4.88
0.167 0.00 | 1.750 4.88 | 3.333 17.91 | 4.92 4.88
0.250 0.00 | 1.833 8.14 | 3.417 17.91 | 5.00 4.88
0.333 3.26 | 1.917 8.14 | 3.500 17.91 | 5.08 4.88
0.417 3.26 | 2.000 8.14 | 3.583 17.91 | 5.17 4.88
0.500 3.26 | 2.083 8.14 | 3.667 17.91 | 5.25 4.88
0.583 3.26 | 2.167 8.14 | 3.750 17.91 | 5.33 3.26
0.667 3.26 | 2.250 8.14 | 3.833 8.14 | 5.42 3.26
0.750 3.26 | 2.333 9.77 | 3.917 8.14 | 5.50 3.26
0.833 4.88 | 2.417 9.77 | 4.000 8.14 | 5.58 3.26
0.917 4.88 | 2.500 9.77 | 4.083 8.14 | 5.67 3.26
1.000 4.88 | 2.583 9.77 | 4.167 8.14 | 5.75 3.26
1.083 4.88 | 2.667 9.77 | 4.250 8.14 | 5.83 3.26
1.167 4.88 | 2.750 9.77 | 4.333 6.51 | 5.92 3.26
1.250 4.88 | 2.833 48.84 | 4.417 6.51 | 6.00 3.26
1.333 4.88 | 2.917 48.84 | 4.500 6.51 | 6.08 3.26
1.417 4.88 | 3.000 48.84 | 4.583 6.51 | 6.17 3.26
1.500 4.88 | 3.083 126.98 | 4.667 6.51 | 6.25 3.26
1.583 4.88 | 3.167 126.98 | 4.750 6.51 | 6.25 3.26

```

```

Max.Eff.Inten.(mm/hr)= 126.98 95.60
over (min)= 5.00 5.00
Storage Coeff. (min)= 3.97 (ii) 4.99 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.24 0.22

```

```

*TOTALS*
PEAK FLOW      (cms)=      3.42      1.38      4.801 (iii)
TIME TO PEAK   (hrs)=      3.25      3.25      3.25
RUNOFF VOLUME  (mm)=     79.40     32.71     58.39
TOTAL RAINFALL (mm)=     81.40     81.40     81.40
RUNOFF COEFFICIENT =      0.98      0.40      0.72

```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

```

-----
| ADD HYD ( 0048) |
| 1 + 2 = 3 |
|-----|
| ID1= 1 ( 1201): 17.89 4.801 3.25 58.39 |
| + ID2= 2 ( 1301): 5.08 0.351 3.67 37.21 |
|-----|
| ID = 3 ( 0048): 22.97 4.972 3.25 53.70 |

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0042) |
| IN= 2--> OUT= 1 |
| DT= 5.0 min |
|-----|
| OUTFLOW STORAGE | OUTFLOW STORAGE |
| (cms) (ha.m.) | (cms) (ha.m.) |
| 0.0000 0.0000 | 0.6697 0.5963 |
| 0.0130 0.0688 | 0.8321 0.6991 |
| 0.0204 0.1438 | 0.9671 0.8059 |
| 0.0258 0.2249 | 1.0852 0.9165 |
| 0.0313 0.3336 | 2.1958 0.9732 |
| 0.1311 0.4022 | 4.1789 1.0308 |
| 0.3834 0.4973 | 13.1438 1.2091 |
|-----|
| AREA QPEAK TPEAK R.V. |
| (ha) (cms) (hrs) (mm) |
| INFLOW : ID= 2 ( 0048) 22.970 4.972 3.25 53.70 |
| OUTFLOW: ID= 1 ( 0042) 22.970 0.866 3.83 53.65 |

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 17.42
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.7271

```

```

-----
| CALIB |
| STANDHYD ( 1303) |
| ID= 1 DT= 5.0 min |
|-----|
| Area (ha)= 0.66 |
| Total Imp(%)= 70.00 Dir. Conn.(%)= 70.00 |
|-----|
| IMPERVIOUS PERVIOUS (i) |
| Surface Area (ha)= 0.46 0.20 |
| Dep. Storage (mm)= 1.00 5.00 |
| Average Slope (%)= 1.00 2.00 |
| Length (m)= 66.33 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 | 1.667 4.88 | 3.250 126.98 | 4.83 4.88

```

```

0.167 0.00 | 1.750 4.88 | 3.333 17.91 | 4.92 4.88
0.250 0.00 | 1.833 8.14 | 3.417 17.91 | 5.00 4.88
0.333 3.26 | 1.917 8.14 | 3.500 17.91 | 5.08 4.88
0.417 3.26 | 2.000 8.14 | 3.583 17.91 | 5.17 4.88
0.500 3.26 | 2.083 8.14 | 3.667 17.91 | 5.25 4.88
0.583 3.26 | 2.167 8.14 | 3.750 17.91 | 5.33 3.26
0.667 3.26 | 2.250 8.14 | 3.833 8.14 | 5.42 3.26
0.750 3.26 | 2.333 9.77 | 3.917 8.14 | 5.50 3.26
0.833 4.88 | 2.417 9.77 | 4.000 8.14 | 5.58 3.26
0.917 4.88 | 2.500 9.77 | 4.083 8.14 | 5.67 3.26
1.000 4.88 | 2.583 9.77 | 4.167 8.14 | 5.75 3.26
1.083 4.88 | 2.667 9.77 | 4.250 8.14 | 5.83 3.26
1.167 4.88 | 2.750 9.77 | 4.333 6.51 | 5.92 3.26
1.250 4.88 | 2.833 48.84 | 4.417 6.51 | 6.00 3.26
1.333 4.88 | 2.917 48.84 | 4.500 6.51 | 6.08 3.26
1.417 4.88 | 3.000 48.84 | 4.583 6.51 | 6.17 3.26
1.500 4.88 | 3.083 126.98 | 4.667 6.51 | 6.25 3.26
1.583 4.88 | 3.167 126.98 | 4.750 6.51 |

```

```

Max.Eff.Inten.(mm/hr)= 126.98 48.04
over (min)= 5.00 10.00
Storage Coeff. (min)= 1.81 (ii) 6.39 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.32 0.15

```

```

*TOTALS*
PEAK FLOW (cms)= 0.16 0.02 0.184 (iii)
TIME TO PEAK (hrs)= 3.25 3.25 3.25
RUNOFF VOLUME (mm)= 80.40 24.44 63.61
TOTAL RAINFALL (mm)= 81.40 81.40 81.40
RUNOFF COEFFICIENT = 0.99 0.30 0.78

```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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 ( 1202) |
| ID= 1 DT= 5.0 min |
|-----|
| Area (ha)= 1.17 |
| Total Imp(%)= 75.00 Dir. Conn.(%)= 60.00 |
|-----|
| IMPERVIOUS PERVIOUS (i) |
| Surface Area (ha)= 0.88 0.29 |
| Dep. Storage (mm)= 2.00 5.00 |
| Average Slope (%)= 2.00 2.00 |
| Length (m)= 88.32 20.00 |
| Mannings n = 0.013 0.035 |

```

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 | 1.667 4.88 | 3.250 126.98 | 4.83 4.88
0.167 0.00 | 1.750 4.88 | 3.333 17.91 | 4.92 4.88
0.250 0.00 | 1.833 8.14 | 3.417 17.91 | 5.00 4.88
0.333 3.26 | 1.917 8.14 | 3.500 17.91 | 5.08 4.88
0.417 3.26 | 2.000 8.14 | 3.583 17.91 | 5.17 4.88
0.500 3.26 | 2.083 8.14 | 3.667 17.91 | 5.25 4.88
0.583 3.26 | 2.167 8.14 | 3.750 17.91 | 5.33 3.26
0.667 3.26 | 2.250 8.14 | 3.833 8.14 | 5.42 3.26
0.750 3.26 | 2.333 9.77 | 3.917 8.14 | 5.50 3.26
0.833 4.88 | 2.417 9.77 | 4.000 8.14 | 5.58 3.26
0.917 4.88 | 2.500 9.77 | 4.083 8.14 | 5.67 3.26
1.000 4.88 | 2.583 9.77 | 4.167 8.14 | 5.75 3.26

```

1.083	4.88	2.667	9.77	4.250	8.14	5.83	3.26
1.167	4.88	2.750	9.77	4.333	6.51	5.92	3.26
1.250	4.88	2.833	48.84	4.417	6.51	6.00	3.26
1.333	4.88	2.917	48.84	4.500	6.51	6.08	3.26
1.417	4.88	3.000	48.84	4.583	6.51	6.17	3.26
1.500	4.88	3.083	126.98	4.667	6.51	6.25	3.26
1.583	4.88	3.167	126.98	4.750	6.51		

Max.Eff.Inten.(mm/hr)= 126.98 106.09
 over (min) 5.00 5.00
 Storage Coeff. (min)= 1.75 (ii) 2.67 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.32 0.29

TOTALS
 PEAK FLOW (cms)= 0.25 0.09 0.337 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 79.40 34.08 61.27
 TOTAL RAINFALL (mm)= 81.40 81.40 81.40
 RUNOFF COEFFICIENT = 0.98 0.42 0.75

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0043)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (1202):	1.17	0.337	3.25	61.27
+ ID2= 2 (1302):	6.51	0.533	3.58	39.23
ID = 3 (0043):	7.68	0.641	3.25	42.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1				
ID1= 3 (0043):	7.68	0.641	3.25	42.59
+ ID2= 2 (1302):	0.66	0.184	3.25	63.61
ID = 1 (0043):	8.34	0.825	3.25	44.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0043)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0043):	8.34	0.825	3.25	44.25
+ ID2= 2 (0042):	22.97	0.866	3.83	53.65
ID = 3 (0043):	31.31	1.457	3.58	51.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSS U U A L (v 6.2.2009)
 V V I SS U U A A L

V V I SS U U A A A A L
 V V I SS U U A A L
 V V I SSSS UUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
 0 0 T T H H Y Y MM MM 0 0
 0 0 T T H H Y M M 0 0
 000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat
 Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\6af9f857-66d9-42c2-b2be-20cbdc4d4020\scena
 Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\6af9f857-66d9-42c2-b2be-20cbdc4d4020\scena

DATE: 11-10-2022

TIME: 01:44:20

USER:

COMMENTS: _____

 ** SIMULATION : SCS_6H_100Y **

READ STORM	Filename: C:\Users\Valdor\AppData\Local\Temp\908d5600-a56f-49d0-bccb-864caf61b13f\d3ed2ac6
Ptotal= 89.90 mm	Comments: 100yr/6hr Peterborough A SCS

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	8.99	3.50	19.78	5.25	3.60
0.25	3.60	2.00	8.99	3.75	8.99	5.50	3.60
0.50	3.60	2.25	10.79	4.00	8.99	5.75	3.60
0.75	5.39	2.50	10.79	4.25	7.19	6.00	3.60
1.00	5.39	2.75	53.94	4.50	7.19		
1.25	5.39	3.00	140.24	4.75	5.39		
1.50	5.39	3.25	19.78	5.00	5.39		

CALIB	Area (ha)	Curve Number (CN)
NASHYD (2202)	2.59	66.0
ID= 1 DT= 5.0 min	6.20	# of Linear Res.(N)= 3.00
U.H. Tp(hrs)=	0.42	

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	5.39	3.250	140.24	4.83	5.39

0.167	0.00	1.750	5.39	3.333	19.78	4.92	5.39
0.250	0.00	1.833	8.99	3.417	19.78	5.00	5.39
0.333	3.60	1.917	8.99	3.500	19.78	5.08	5.39
0.417	3.60	2.000	8.99	3.583	19.78	5.17	5.39
0.500	3.60	2.083	8.99	3.667	19.78	5.25	5.39
0.583	3.60	2.167	8.99	3.750	19.78	5.33	3.60
0.667	3.60	2.250	8.99	3.833	8.99	5.42	3.60
0.750	3.60	2.333	10.79	3.917	8.99	5.50	3.60
0.833	5.39	2.417	10.79	4.000	8.99	5.58	3.60
0.917	5.39	2.500	10.79	4.083	8.99	5.67	3.60
1.000	5.39	2.583	10.79	4.167	8.99	5.75	3.60
1.083	5.39	2.667	10.79	4.250	8.99	5.83	3.60
1.167	5.39	2.750	10.79	4.333	7.19	5.92	3.60
1.250	5.39	2.833	53.94	4.417	7.19	6.00	3.60
1.333	5.39	2.917	53.94	4.500	7.19	6.08	3.60
1.417	5.39	3.000	53.94	4.583	7.19	6.17	3.60
1.500	5.39	3.083	140.24	4.667	7.19	6.25	3.60
1.583	5.39	3.167	140.24	4.750	7.19		

Unit Hyd Qpeak (cms)= 0.236

PEAK FLOW (cms)= 0.172 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 32.650
 TOTAL RAINFALL (mm)= 89.900
 RUNOFF COEFFICIENT = 0.363

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

CALIB					
STANDHYD (2201)	Area (ha)=	11.20			
ID= 1 DT= 5.0 min	Total Imp(%)=	60.00	Dir. Conn.(%)=	45.00	
	IMPERVIOUS		PERVIOUS (i)		
Surface Area (ha)=	6.72		4.48		
Dep. Storage (mm)=	2.00		5.00		
Average Slope (%)=	2.00		2.00		
Length (m)=	273.25		20.00		
Mannings n	=	0.013	0.035		

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	1.667	5.39	3.250	140.24	4.83	5.39
0.167	0.00	1.750	5.39	3.333	19.78	4.92	5.39
0.250	0.00	1.833	8.99	3.417	19.78	5.00	5.39
0.333	3.60	1.917	8.99	3.500	19.78	5.08	5.39
0.417	3.60	2.000	8.99	3.583	19.78	5.17	5.39
0.500	3.60	2.083	8.99	3.667	19.78	5.25	5.39
0.583	3.60	2.167	8.99	3.750	19.78	5.33	3.60
0.667	3.60	2.250	8.99	3.833	8.99	5.42	3.60
0.750	3.60	2.333	10.79	3.917	8.99	5.50	3.60
0.833	5.39	2.417	10.79	4.000	8.99	5.58	3.60
0.917	5.39	2.500	10.79	4.083	8.99	5.67	3.60
1.000	5.39	2.583	10.79	4.167	8.99	5.75	3.60
1.083	5.39	2.667	10.79	4.250	8.99	5.83	3.60
1.167	5.39	2.750	10.79	4.333	7.19	5.92	3.60
1.250	5.39	2.833	53.94	4.417	7.19	6.00	3.60
1.333	5.39	2.917	53.94	4.500	7.19	6.08	3.60
1.417	5.39	3.000	53.94	4.583	7.19	6.17	3.60
1.500	5.39	3.083	140.24	4.667	7.19	6.25	3.60
1.583	5.39	3.167	140.24	4.750	7.19		

Max.Eff.Inten.(mm/hr)= 140.24
 over (min) 5.00

Storage Coeff. (min)= 3.31 (ii) 4.51 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.26 0.23

TOTALS

PEAK FLOW (cms)= 1.95 1.20 3.146 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 87.90 36.41 59.58
 TOTAL RAINFALL (mm)= 89.90 89.90 89.90
 RUNOFF COEFFICIENT = 0.98 0.41 0.66

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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(0038)	OVERFLOW IS OFF				
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.8454	0.4251	
	0.0074	0.0469	0.9743	0.4997	
	0.0112	0.0990	1.0880	0.5770	
	0.0140	0.1563	1.1909	0.6570	
	0.1657	0.2182	5.4831	0.7609	
	0.4409	0.2840	13.2243	0.8692	
	0.6926	0.3532	0.0000	0.0000	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
INFLOW : ID= 2 (2201)	11.200	3.146	3.25	59.58	
OUTFLOW: ID= 1 (0038)	11.200	0.771	3.42	59.44	
	PEAK FLOW REDUCTION [Qout/Qin](%)=	24.52			
	TIME SHIFT OF PEAK FLOW (min)=	10.00			
	MAXIMUM STORAGE USED (ha.m.)=	0.3919			

ADD HYD (0017)					
1 + 2 = 3					
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (2202):	2.59	0.172	3.58	32.65	
+ ID2= 2 (0038):	11.20	0.771	3.42	59.44	
ID = 3 (0017):	13.79	0.930	3.50	54.41	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (1302)	Area (ha)=	6.51	Curve Number (CN)=	79.0	
ID= 1 DT= 5.0 min	Ia (mm)=	6.70	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.42			

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	1.667	5.39	3.250	140.24	4.83	5.39
0.167	0.00	1.750	5.39	3.333	19.78	4.92	5.39
0.250	0.00	1.833	8.99	3.417	19.78	5.00	5.39
0.333	3.60	1.917	8.99	3.500	19.78	5.08	5.39

0.417	3.60	2.000	8.99	3.583	19.78	5.17	5.39
0.500	3.60	2.083	8.99	3.667	19.78	5.25	5.39
0.583	3.60	2.167	8.99	3.750	19.78	5.33	3.60
0.667	3.60	2.250	8.99	3.833	8.99	5.42	3.60
0.750	3.60	2.333	10.79	3.917	8.99	5.50	3.60
0.833	5.39	2.417	10.79	4.000	8.99	5.58	3.60
0.917	5.39	2.500	10.79	4.083	8.99	5.67	3.60
1.000	5.39	2.583	10.79	4.167	8.99	5.75	3.60
1.083	5.39	2.667	10.79	4.250	8.99	5.83	3.60
1.167	5.39	2.750	10.79	4.333	7.19	5.92	3.60
1.250	5.39	2.833	53.94	4.417	7.19	6.00	3.60
1.333	5.39	2.917	53.94	4.500	7.19	6.08	3.60
1.417	5.39	3.000	53.94	4.583	7.19	6.17	3.60
1.500	5.39	3.083	140.24	4.667	7.19	6.25	3.60
1.583	5.39	3.167	140.24	4.750	7.19		

Unit Hyd Qpeak (cms)= 0.592

PEAK FLOW (cms)= 0.626 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 45.923
 TOTAL RAINFALL (mm)= 89.900
 RUNOFF COEFFICIENT = 0.511

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

CALIB			
NASHYD (1301)	Area (ha)=	5.08	Curve Number (CN)= 77.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.49	

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	1.667	5.39	3.250	140.24	4.83	5.39
0.167	0.00	1.750	5.39	3.333	19.78	4.92	5.39
0.250	0.00	1.833	8.99	3.417	19.78	5.00	5.39
0.333	3.60	1.917	8.99	3.500	19.78	5.08	5.39
0.417	3.60	2.000	8.99	3.583	19.78	5.17	5.39
0.500	3.60	2.083	8.99	3.667	19.78	5.25	5.39
0.583	3.60	2.167	8.99	3.750	19.78	5.33	3.60
0.667	3.60	2.250	8.99	3.833	8.99	5.42	3.60
0.750	3.60	2.333	10.79	3.917	8.99	5.50	3.60
0.833	5.39	2.417	10.79	4.000	8.99	5.58	3.60
0.917	5.39	2.500	10.79	4.083	8.99	5.67	3.60
1.000	5.39	2.583	10.79	4.167	8.99	5.75	3.60
1.083	5.39	2.667	10.79	4.250	8.99	5.83	3.60
1.167	5.39	2.750	10.79	4.333	7.19	5.92	3.60
1.250	5.39	2.833	53.94	4.417	7.19	6.00	3.60
1.333	5.39	2.917	53.94	4.500	7.19	6.08	3.60
1.417	5.39	3.000	53.94	4.583	7.19	6.17	3.60
1.500	5.39	3.083	140.24	4.667	7.19	6.25	3.60
1.583	5.39	3.167	140.24	4.750	7.19		

Unit Hyd Qpeak (cms)= 0.396

PEAK FLOW (cms)= 0.414 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 43.669
 TOTAL RAINFALL (mm)= 89.900
 RUNOFF COEFFICIENT = 0.486

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

CALIB			
STANDHYD (1201)	Area (ha)=	17.89	
ID= 1 DT= 5.0 min	Total Imp(%)=	70.00	Dir. Conn.(%)= 55.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	12.52	5.37
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	345.35	20.00
Mannings n =	0.013	0.035

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	1.667	5.39	3.250	140.24	4.83	5.39
0.167	0.00	1.750	5.39	3.333	19.78	4.92	5.39
0.250	0.00	1.833	8.99	3.417	19.78	5.00	5.39
0.333	3.60	1.917	8.99	3.500	19.78	5.08	5.39
0.417	3.60	2.000	8.99	3.583	19.78	5.17	5.39
0.500	3.60	2.083	8.99	3.667	19.78	5.25	5.39
0.583	3.60	2.167	8.99	3.750	19.78	5.33	3.60
0.667	3.60	2.250	8.99	3.833	8.99	5.42	3.60
0.750	3.60	2.333	10.79	3.917	8.99	5.50	3.60
0.833	5.39	2.417	10.79	4.000	8.99	5.58	3.60
0.917	5.39	2.500	10.79	4.083	8.99	5.67	3.60
1.000	5.39	2.583	10.79	4.167	8.99	5.75	3.60
1.083	5.39	2.667	10.79	4.250	8.99	5.83	3.60
1.167	5.39	2.750	10.79	4.333	7.19	5.92	3.60
1.250	5.39	2.833	53.94	4.417	7.19	6.00	3.60
1.333	5.39	2.917	53.94	4.500	7.19	6.08	3.60
1.417	5.39	3.000	53.94	4.583	7.19	6.17	3.60
1.500	5.39	3.083	140.24	4.667	7.19	6.25	3.60
1.583	5.39	3.167	140.24	4.750	7.19		

Max.Eff.Inten.(mm/hr)= 140.24 112.14
 over (min) 5.00 5.00
 Storage Coeff. (min)= 3.81 (ii) 4.79 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.25 0.22

TOTALS
 PEAK FLOW (cms)= 3.79 1.63 5.416 (iii)
 TIME TO PEAK (hrs)= 3.25 3.25 3.25
 RUNOFF VOLUME (mm)= 87.90 38.46 65.65
 TOTAL RAINFALL (mm)= 89.90 89.90 89.90
 RUNOFF COEFFICIENT = 0.98 0.43 0.73

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

ADD HYD (0048)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1201):	17.89	5.416	3.25	65.65
+ ID2= 2 (1301):	5.08	0.414	3.67	43.67
=====				
ID = 3 (0048):	22.97	5.621	3.25	60.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)		OVERFLOW IS OFF			
IN= 2--> OUT= 1					
DT= 5.0 min					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.6697	0.5963
		0.0130	0.0688	0.8321	0.6991
		0.0204	0.1438	0.9671	0.8059
		0.0258	0.2249	1.0852	0.9165
		0.0313	0.3336	2.1958	0.9732
		0.1311	0.4022	4.1789	1.0308
		0.3834	0.4973	13.1438	1.2091
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0048)		22.970	5.621	3.25	60.79
OUTFLOW: ID= 1 (0042)		22.970	0.976	3.83	60.73
		PEAK FLOW REDUCTION [Qout/Qin](%)= 17.37			
		TIME SHIFT OF PEAK FLOW (min)= 35.00			
		MAXIMUM STORAGE USED (ha.m.)= 0.8157			

CALIB					
STANDHYD (1303)					
ID= 1 DT= 5.0 min		Area	(ha)= 0.66		
		Total Imp(%)= 70.00	Dir. Conn.(%)= 70.00		
		IMPERVIOUS		PERVIOUS (i)	
Surface Area		(ha)= 0.46	0.20		
Dep. Storage		(mm)= 1.00	5.00		
Average Slope		(%)= 1.00	2.00		
Length		(m)= 66.33	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
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	1.667	5.39	3.250	140.24
0.167	0.00	1.750	5.39	3.333	19.78
0.250	0.00	1.833	8.99	3.417	19.78
0.333	3.60	1.917	8.99	3.500	19.78
0.417	3.60	2.000	8.99	3.583	19.78
0.500	3.60	2.083	8.99	3.667	19.78
0.583	3.60	2.167	8.99	3.750	19.78
0.667	3.60	2.250	8.99	3.833	8.99
0.750	3.60	2.333	10.79	3.917	8.99
0.833	5.39	2.417	10.79	4.000	8.99
0.917	5.39	2.500	10.79	4.083	8.99
1.000	5.39	2.583	10.79	4.167	8.99
1.083	5.39	2.667	10.79	4.250	8.99
1.167	5.39	2.750	10.79	4.333	7.19
1.250	5.39	2.833	53.94	4.417	7.19
1.333	5.39	2.917	53.94	4.500	7.19
1.417	5.39	3.000	53.94	4.583	7.19
1.500	5.39	3.083	140.24	4.667	7.19
1.583	5.39	3.167	140.24	4.750	7.19
Max.Eff.Inten.(mm/hr)=		140.24		57.18	
over (min)		5.00		10.00	
Storage Coeff. (min)=		1.74 (ii)		6.14 (ii)	
Unit Hyd. Tpeak (min)=		5.00		10.00	
Unit Hyd. peak (cms)=		0.32		0.15	
PEAK FLOW		(cms)= 0.18		0.03	
TIME TO PEAK		(hrs)= 3.25		3.25	
				0.205 (iii)	
				3.25	

RUNOFF VOLUME (mm)= 88.90 29.15 70.97
TOTAL RAINFALL (mm)= 89.90 89.90 89.90
RUNOFF COEFFICIENT = 0.99 0.32 0.79

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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 (1202)
ID= 1 DT= 5.0 min
Area (ha)= 1.17
Total Imp(%)= 75.00 Dir. Conn.(%)= 60.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.88 0.29
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 88.32 20.00
Mannings n = 0.013 0.035

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	1.667	5.39	3.250	140.24	4.83	5.39
0.167	0.00	1.750	5.39	3.333	19.78	4.92	5.39
0.250	0.00	1.833	8.99	3.417	19.78	5.00	5.39
0.333	3.60	1.917	8.99	3.500	19.78	5.08	5.39
0.417	3.60	2.000	8.99	3.583	19.78	5.17	5.39
0.500	3.60	2.083	8.99	3.667	19.78	5.25	5.39
0.583	3.60	2.167	8.99	3.750	19.78	5.33	3.60
0.667	3.60	2.250	8.99	3.833	8.99	5.42	3.60
0.750	3.60	2.333	10.79	3.917	8.99	5.50	3.60
0.833	5.39	2.417	10.79	4.000	8.99	5.58	3.60
0.917	5.39	2.500	10.79	4.083	8.99	5.67	3.60
1.000	5.39	2.583	10.79	4.167	8.99	5.75	3.60
1.083	5.39	2.667	10.79	4.250	8.99	5.83	3.60
1.167	5.39	2.750	10.79	4.333	7.19	5.92	3.60
1.250	5.39	2.833	53.94	4.417	7.19	6.00	3.60
1.333	5.39	2.917	53.94	4.500	7.19	6.08	3.60
1.417	5.39	3.000	53.94	4.583	7.19	6.17	3.60
1.500	5.39	3.083	140.24	4.667	7.19	6.25	3.60
1.583	5.39	3.167	140.24	4.750	7.19		

Max.Eff.Inten.(mm/hr)= 140.24 124.15
over (min) 5.00 5.00
Storage Coeff. (min)= 1.68 (ii) 2.56 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.32 0.29

TOTALS
PEAK FLOW (cms)= 0.27 0.10 0.378 (iii)
TIME TO PEAK (hrs)= 3.25 3.25 3.25
RUNOFF VOLUME (mm)= 87.90 39.99 68.74
TOTAL RAINFALL (mm)= 89.90 89.90 89.90
RUNOFF COEFFICIENT = 0.98 0.44 0.76

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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.

```

-----
| ADD HYD ( 0043) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 1202): 1.17 0.378 3.25 68.74
+ ID2= 2 ( 1302): 6.51 0.626 3.58 45.92
=====
ID = 3 ( 0043): 7.68 0.742 3.25 49.40

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0043) |
| 3 + 2 = 1 |
-----
ID1= 3 ( 0043): 7.68 0.742 3.25 49.40
+ ID2= 2 ( 1303): 0.66 0.205 3.25 70.97
=====
ID = 1 ( 0043): 8.34 0.947 3.25 51.11

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0043) |
| 1 + 2 = 3 |
-----
ID1= 1 ( 0043): 8.34 0.947 3.25 51.11
+ ID2= 2 ( 0042): 22.97 0.976 3.83 60.73
=====
ID = 3 ( 0043): 31.31 1.685 3.25 58.17

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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=====

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V V I SSSS U U A L (v 6.2.2009)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSS UUUU A A LLLL

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000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y MM MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\c73ed2b4-57a0-4a02-97d6-b9299c2649af\scena
Summary filename: C:\Users\Valdor\AppData\Local\Civica\XH5\c7e9b9dc-2878-4b8a-9d26-5e475049aa89\c73ed2b4-57a0-4a02-97d6-b9299c2649af\scena

DATE: 11-10-2022

TIME: 01:44:20

USER:

COMMENTS: _____

```

*****
** SIMULATION : Timmins **
*****

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-----
| READ STORM | Filename: C:\Users\Valdor\AppData\Local\Temp\
|          | 908d5600-a56f-49d0-bccb-864caf61b13f\50758f93
| Ptotal=193.00 mm | Comments: * Timmins Storm
-----

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	15.00	3.00	3.00	6.00	43.00	9.00	13.00
0.25	15.00	3.25	3.00	6.25	43.00	9.25	13.00
0.50	15.00	3.50	3.00	6.50	43.00	9.50	13.00
0.75	15.00	3.75	3.00	6.75	43.00	9.75	13.00
1.00	20.00	4.00	5.00	7.00	20.00	10.00	13.00
1.25	20.00	4.25	5.00	7.25	20.00	10.25	13.00
1.50	20.00	4.50	5.00	7.50	20.00	10.50	13.00
1.75	20.00	4.75	5.00	7.75	20.00	10.75	13.00
2.00	10.00	5.00	20.00	8.00	23.00	11.00	8.00
2.25	10.00	5.25	20.00	8.25	23.00	11.25	8.00
2.50	10.00	5.50	20.00	8.50	23.00	11.50	8.00
2.75	10.00	5.75	20.00	8.75	23.00	11.75	8.00

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-----
| CALIB |
| NASHYD ( 2202) | Area (ha)= 2.59 Curve Number (CN)= 66.0
| ID= 1 DT= 5.0 min | Ia (mm)= 6.20 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.42
-----

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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 15.00 3.083 3.00 6.083 43.00 9.08 13.00
0.167 15.00 3.167 3.00 6.167 43.00 9.17 13.00
0.250 15.00 3.250 3.00 6.250 43.00 9.25 13.00
0.333 15.00 3.333 3.00 6.333 43.00 9.33 13.00
0.417 15.00 3.417 3.00 6.417 43.00 9.42 13.00
0.500 15.00 3.500 3.00 6.500 43.00 9.50 13.00
0.583 15.00 3.583 3.00 6.583 43.00 9.58 13.00
0.667 15.00 3.667 3.00 6.667 43.00 9.67 13.00
0.750 15.00 3.750 3.00 6.750 43.00 9.75 13.00
0.833 15.00 3.833 3.00 6.833 43.00 9.83 13.00
0.917 15.00 3.917 3.00 6.917 43.00 9.92 13.00
1.000 15.00 4.000 3.00 7.000 43.00 10.00 13.00
1.083 20.00 4.083 5.00 7.083 20.00 10.08 13.00
1.167 20.00 4.167 5.00 7.167 20.00 10.17 13.00
1.250 20.00 4.250 5.00 7.250 20.00 10.25 13.00
1.333 20.00 4.333 5.00 7.333 20.00 10.33 13.00
1.417 20.00 4.417 5.00 7.417 20.00 10.42 13.00
1.500 20.00 4.500 5.00 7.500 20.00 10.50 13.00
1.583 20.00 4.583 5.00 7.583 20.00 10.58 13.00
1.667 20.00 4.667 5.00 7.667 20.00 10.67 13.00
1.750 20.00 4.750 5.00 7.750 20.00 10.75 13.00
1.833 20.00 4.833 5.00 7.833 20.00 10.83 13.00
1.917 20.00 4.917 5.00 7.917 20.00 10.92 13.00

```

2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Unit Hyd Qpeak (cms)= 0.236

PEAK FLOW (cms)= 0.187 (i)
 TIME TO PEAK (hrs)= 7.083
 RUNOFF VOLUME (mm)= 109.840
 TOTAL RAINFALL (mm)= 193.000
 RUNOFF COEFFICIENT = 0.569

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

CALIB		STANDHYD (2201)		ID= 1 DT= 5.0 min	
Area (ha)=	11.20	Total Imp(%)=	60.00	Dir. Conn.(%)=	45.00
IMPERVIOUS PVIOUS (i)					
Surface Area (ha)=	6.72	4.48			
Dep. Storage (mm)=	2.00	5.00			
Average Slope (%)=	2.00	2.00			
Length (m)=	273.25	20.00			
Mannings n	=	0.013	0.035		

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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00

2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Max.Eff.Inten.(mm/hr)= 43.00 43.10
 over (min) 5.00 10.00
 Storage Coeff. (min)= 5.32 (ii) 7.23 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.21 0.14

TOTALS
 PEAK FLOW (cms)= 0.60 0.53 1.131 (iii)
 TIME TO PEAK (hrs)= 6.92 7.00 7.00
 RUNOFF VOLUME (mm)= 191.00 116.63 150.09
 TOTAL RAINFALL (mm)= 193.00 193.00 193.00
 RUNOFF COEFFICIENT = 0.99 0.60 0.78

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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(0038)		OVERFLOW IS OFF	
IN= 2--> OUT= 1	DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.8454	0.4251
0.0074	0.0469	0.9743	0.4997
0.0112	0.0990	1.0880	0.5770
0.0140	0.1563	1.1909	0.6570
0.1657	0.2182	5.4831	0.7609
0.4409	0.2840	13.2243	0.8692
0.6926	0.3532	0.0000	0.0000
AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2201)	11.200	1.131	7.00
OUTFLOW: ID= 1 (0038)	11.200	0.819	7.08
PEAK FLOW REDUCTION [Qout/Qin](%)=	72.47		
TIME SHIFT OF PEAK FLOW (min)=	5.00		
MAXIMUM STORAGE USED (ha.m.)=	0.4139		

ADD HYD (0017)		1 + 2 = 3	
ID1= 1 (2202):	ID2= 2 (0038):	AREA (ha)	QPEAK (cms)
2.59	0.187	7.08	109.84
11.20	0.819	7.08	149.95
ID = 3 (0017):	13.79	1.006	7.08
142.42			

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB		NASHYD (1302)		ID= 1 DT= 5.0 min	
Area (ha)=	6.51	Curve Number (CN)=	79.0		
Ia (mm)=	6.70	# of Linear Res.(N)=	3.00		
U.H. Tp(hrs)=	0.42				

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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Unit Hyd Qpeak (cms)= 0.592

PEAK FLOW (cms)= 0.590 (i)
 TIME TO PEAK (hrs)= 7.083
 RUNOFF VOLUME (mm)= 136.728
 TOTAL RAINFALL (mm)= 193.000
 RUNOFF COEFFICIENT = 0.708

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

CALIB			
NASHYD (1301)	Area (ha)=	5.08	Curve Number (CN)= 77.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.49	

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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00

0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Unit Hyd Qpeak (cms)= 0.396

PEAK FLOW (cms)= 0.428 (i)
 TIME TO PEAK (hrs)= 7.167
 RUNOFF VOLUME (mm)= 132.562
 TOTAL RAINFALL (mm)= 193.000
 RUNOFF COEFFICIENT = 0.687

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

CALIB			
STANDHYD (1201)	Area (ha)=	17.89	
ID= 1 DT= 5.0 min	Total Imp(%)=	70.00	Dir. Conn.(%)= 55.00
IMPERVIOUS PERVIOUS (i)			
Surface Area	(ha)=	12.52	5.37
Dep. Storage	(mm)=	2.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	345.35	20.00
Mannings n	=	0.013	0.035

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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00

0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00

Max.Eff.Inten.(mm/hr)= 43.00 48.49
over (min) 5.00 10.00
Storage Coeff. (min)= 6.12 (ii) 7.69 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.19 0.13

TOTALS
PEAK FLOW (cms)= 1.18 0.71 1.888 (iii)
TIME TO PEAK (hrs)= 7.00 7.00 7.00
RUNOFF VOLUME (mm)= 191.00 120.74 159.39
TOTAL RAINFALL (mm)= 193.00 193.00 193.00
RUNOFF COEFFICIENT = 0.99 0.63 0.83

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 61.0 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.

ADD HYD (0048)							
1 + 2 = 3							

ID1= 1 (1201):		17.89	1.888	7.00	159.39		
+ ID2= 2 (1301):		5.08	0.428	7.17	132.56		
=====							
ID = 3 (0048):		22.97	2.303	7.00	153.45		

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0042)							
IN= 2---> OUT= 1							
DT= 5.0 min							

OVERFLOW IS OFF							
OUTFLOW		STORAGE	OUTFLOW	STORAGE			
(cms)		(ha.m.)	(cms)	(ha.m.)			
0.0000		0.0000	0.6697	0.5963			
0.0130		0.0688	0.8321	0.6991			
0.0204		0.1438	0.9671	0.8059			

					0.0258	0.2249	1.0852	0.9165
					0.0313	0.3336	2.1958	0.9732
					0.1311	0.4022	4.1789	1.0308
					0.3834	0.4973	13.1438	1.2091
					AREA	QPEAK	TPEAK	R.V.
					(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0048)					22.970	2.303	7.00	153.45
OUTFLOW: ID= 1 (0042)					22.970	1.945	7.00	153.39

PEAK FLOW REDUCTION [Qout/Qin](%)= 84.46
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.9611

CALIB			
STANDHYD (1303)			
ID= 1 DT= 5.0 min			

Area (ha)=		0.66	
Total Imp(%)=		70.00	Dir. Conn.(%)= 70.00

			IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.46	0.20	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	66.33	40.00	
Mannings n	=	0.013	0.250	

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

TIME RAIN TIME RAIN TIME RAIN TIME RAIN									
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	15.00	3.083	3.00	6.083	43.00	9.08	13.00		
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00		
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00		
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00		
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00		
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00		
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00		
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00		
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00		
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00		
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00		
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00		
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00		
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00		
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00		
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00		
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00		
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00		
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00		
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00		
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00		
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00		
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00		
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00		
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00		
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00		
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00		
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00		
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00		
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00		
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00		
2.667	10.00	5.667	20.00	8.667	23.00	11.67	8.00		
2.750	10.00	5.750	20.00	8.750	23.00	11.75	8.00		
2.833	10.00	5.833	20.00	8.833	23.00	11.83	8.00		
2.917	10.00	5.917	20.00	8.917	23.00	11.92	8.00		
3.000	10.00	6.000	20.00	9.000	23.00	12.00	8.00		

Max.Eff.Inten.(mm/hr)= 43.00 27.21
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.80 (ii) 14.68 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.28 0.08

TOTALS
 PEAK FLOW (cms)= 0.06 0.01 0.069 (iii)
 TIME TO PEAK (hrs)= 6.75 7.00 7.00
 RUNOFF VOLUME (mm)= 192.00 100.87 164.65
 TOTAL RAINFALL (mm)= 193.00 193.00 193.00
 RUNOFF COEFFICIENT = 0.99 0.52 0.85

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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 (1202) |
ID= 1 DT= 5.0 min

Area (ha)= 1.17
 Total Imp(%)= 75.00 Dir. Conn.(%)= 60.00
 IMPERVIOUS PERVIOUS (i)
 (ha)= 0.88 0.29
 Dep. Storage (mm)= 2.00 5.00
 Average Slope (%)= 2.00 2.00
 Length (m)= 88.32 20.00
 Mannings n = 0.013 0.035

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	15.00	3.083	3.00	6.083	43.00	9.08	13.00
0.167	15.00	3.167	3.00	6.167	43.00	9.17	13.00
0.250	15.00	3.250	3.00	6.250	43.00	9.25	13.00
0.333	15.00	3.333	3.00	6.333	43.00	9.33	13.00
0.417	15.00	3.417	3.00	6.417	43.00	9.42	13.00
0.500	15.00	3.500	3.00	6.500	43.00	9.50	13.00
0.583	15.00	3.583	3.00	6.583	43.00	9.58	13.00
0.667	15.00	3.667	3.00	6.667	43.00	9.67	13.00
0.750	15.00	3.750	3.00	6.750	43.00	9.75	13.00
0.833	15.00	3.833	3.00	6.833	43.00	9.83	13.00
0.917	15.00	3.917	3.00	6.917	43.00	9.92	13.00
1.000	15.00	4.000	3.00	7.000	43.00	10.00	13.00
1.083	20.00	4.083	5.00	7.083	20.00	10.08	13.00
1.167	20.00	4.167	5.00	7.167	20.00	10.17	13.00
1.250	20.00	4.250	5.00	7.250	20.00	10.25	13.00
1.333	20.00	4.333	5.00	7.333	20.00	10.33	13.00
1.417	20.00	4.417	5.00	7.417	20.00	10.42	13.00
1.500	20.00	4.500	5.00	7.500	20.00	10.50	13.00
1.583	20.00	4.583	5.00	7.583	20.00	10.58	13.00
1.667	20.00	4.667	5.00	7.667	20.00	10.67	13.00
1.750	20.00	4.750	5.00	7.750	20.00	10.75	13.00
1.833	20.00	4.833	5.00	7.833	20.00	10.83	13.00
1.917	20.00	4.917	5.00	7.917	20.00	10.92	13.00
2.000	20.00	5.000	5.00	8.000	20.00	11.00	13.00
2.083	10.00	5.083	20.00	8.083	23.00	11.08	8.00
2.167	10.00	5.167	20.00	8.167	23.00	11.17	8.00
2.250	10.00	5.250	20.00	8.250	23.00	11.25	8.00
2.333	10.00	5.333	20.00	8.333	23.00	11.33	8.00
2.417	10.00	5.417	20.00	8.417	23.00	11.42	8.00
2.500	10.00	5.500	20.00	8.500	23.00	11.50	8.00
2.583	10.00	5.583	20.00	8.583	23.00	11.58	8.00

2.667 10.00 | 5.667 20.00 | 8.667 23.00 | 11.67 8.00
 2.750 10.00 | 5.750 20.00 | 8.750 23.00 | 11.75 8.00
 2.833 10.00 | 5.833 20.00 | 8.833 23.00 | 11.83 8.00
 2.917 10.00 | 5.917 20.00 | 8.917 23.00 | 11.92 8.00
 3.000 10.00 | 6.000 20.00 | 9.000 23.00 | 12.00 8.00

Max.Eff.Inten.(mm/hr)= 43.00 52.84
 over (min) 5.00 5.00
 Storage Coeff. (min)= 2.70 (ii) 4.11 (ii)
 Unit Hyd. Tpeak (min)= 5.00 5.00
 Unit Hyd. peak (cms)= 0.29 0.24

TOTALS
 PEAK FLOW (cms)= 0.08 0.04 0.127 (iii)
 TIME TO PEAK (hrs)= 6.75 7.00 7.00
 RUNOFF VOLUME (mm)= 191.00 123.73 164.09
 TOTAL RAINFALL (mm)= 193.00 193.00 193.00
 RUNOFF COEFFICIENT = 0.99 0.64 0.85

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 61.0 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.

 | ADD HYD (0043) |
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (1202):	1.17	0.127	7.00	164.09
+ ID2= 2 (1302):	6.51	0.590	7.08	136.73
=====				
ID = 3 (0043):	7.68	0.709	7.00	140.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | ADD HYD (0043) |
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0043):	7.68	0.709	7.00	140.90
+ ID2= 2 (1303):	0.66	0.069	7.00	164.65
=====				
ID = 1 (0043):	8.34	0.778	7.00	142.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | ADD HYD (0043) |
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0043):	8.34	0.778	7.00	142.78
+ ID2= 2 (0042):	22.97	1.945	7.08	153.39
=====				
ID = 3 (0043):	31.31	2.653	7.08	150.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH
 =====
 =====

APPENDIX “F”

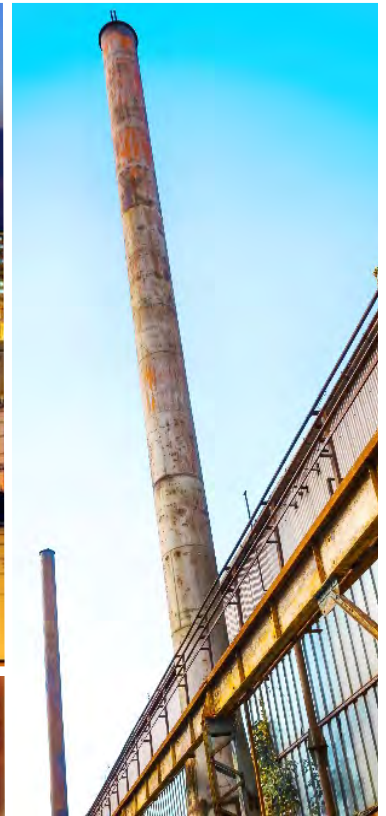
Excerpts from the Hydrogeological Assessment Report



Hydrogeological Assessment Report

Proposed Subdivision Development
787 and 825 Fallis Line
Millbrook, Ontario

Prepared For:
The Bromont Group





6. Conclusions and Recommendations

Supporting data upon which our recommendations are based have been presented in the foregoing sections of this report. Based on the results of our hydrogeologic assessment, it is our professional opinion that the Site is suitable for the proposed house (and garage) and there is low potential for groundwater impact due to the planned construction. It is recommended that good construction and mitigation techniques must be used to minimize the potential for impact. Detailed conclusions and recommendations are presented in the following sections regarding the water balance and impacts.

6.1 Water Balance Evaluation

An evaluation of the water balance was completed to compute the potential impacts that may occur in the recharge/discharge characteristics related to the proposed house construction. The objective of the water balance is to illustrate that post-development infiltration within the developable area can meet or be close to pre-development values. The computations have used detailed parameters such as precipitation (Peterborough A weather station data from 1981 to 2006 was used), regional evapotranspiration, infiltration and runoff. Information from the Peterborough A weather station was selected as it was the closest weather station to the Site (~10 km). The detailed calculations can be reviewed in Appendix F. The calculations are based on a total Site area of 49.22 ha (121.6 acres). A summary of the expected pre-development water balance values for the proposed house construction is described in the following section based on current information.

6.2 Pre-Development Water Balance

The pre-development water balance incorporated the existing soils, slope and agricultural areas. The infiltration factor for the area was calculated from the table of values presented in the “Land Development Guidelines” (MOEE, 1995). It is based on three sub-factors which are:

- Topography sub-factor;
- Soil sub-factor; and
- Cover sub-factor.

The subfactor for topography used a range of representative parameters for the surrounding areas including 0.1 for the forested areas; 0.15 for the agricultural areas and 0.20 for a flatter, naturalized area. The soils are generally comprised of till as per the water balance calculations. The existing vegetation sub-factor was selected to represent both the wooded and agricultural areas of the Site (see Appendix F.2 for breakdown of areas). Table 6.1 summarizes the expected pre-development water balance values for the Site.

Table 6.1 Pre-Development Summary

Total Precipitation (Peterborough A):	- 855 mm/year
Regional Evapotranspiration:	- 556 mm/year
Recharge Available:	- 299 mm/year
Area of Recharge Available (Site):	- 49.22 ha
Total Water Surplus:	- 148,335 m ³ /year
Total Estimated Infiltration:	- 70,356 m ³ /year
Total Estimated Runoff:	- 77,979 m ³ /year



Based upon these values, the overall Sites infiltrate on the order of 70,350 m³ per year or about 145 mm/year.

6.3 Post-Development Water Balance (No Enhancements)

The computation of the water budget was repeated for the proposed house construction assuming no mitigation techniques, that is, runoff from impervious surfaces is unrecoverable and not infiltrated into the ground. The anticipated impact of the proposed construction is related to increased runoff from impervious surfaces such as building roof tops, paved roadways, driveways and parking areas. These are assumed to be impervious surfaces with zero infiltration capacity in this model. A summary of the computations is provided in Table 6.2.

Table 6.2 Post-Development Summary (No Enhancements)

Area of Site:	- 49.22 ha
Impervious Surfaces:	- 20.56 ha
Pervious Surfaces	- 28.66 ha
Total Water Surplus:	- 226,439 m ³ /year
Total Estimated Infiltration:	- 42,674 m ³ /year
Infiltration % Difference (pre- vs. post-):	- (-39%) (decrease)
Total Estimated Runoff:	- 183,765 m ³ /year
Runoff % Difference (pre- vs. post-):	- (136%) (increase)

Information that was provided to GHD in order to compute the post-development water budget in Table 6.2 included evaporation from impervious surfaces (20% of precipitation) and development areas gleaned from the “Draft Concept” prepared by The Biglieri Group Ltd., dated February 20, 2020:

- Single detached lots – 15.86 ha:
 - o Assume rooftops cover 60% of the lots;
 - o Assume paved driveways cover 15% of the lots; and
 - o Assume manicured lawns cover 25% of the lots.
- Townhouse lots – 3.57 ha:
 - o Assume rooftops cover 75% of the lots;
 - o Assume paved driveways cover 5% of the lots; and
 - o Assume manicured lawns cover 20% of the lots.
- Medium density (5-storey building) lot – 0.88 ha:
 - o Assume rooftop covers 60% of the lot;
 - o Assume paved parking area / driveway covers 20 of the lot; and
 - o Assume manicured lawn covers 20% of the lots.
- Parkland and trails – 2.10 ha;
- Right-of-ways – 7.65 ha:
 - o Assume paved asphalt / concrete surfaces cover 50% of the right-of-ways; and
 - o Assume manicured lawn covers 50% of the right-of-ways.
- Natural heritage system – 16.43 ha;
- Easement – 0.01 ha;
- Stormwater facility – 2.57 ha;
 - o Assume pond area – 1.285 ha; and
 - o Grass / open space – 1.285 ha.
- Road widening – 0.16 ha.



Under this scenario, the total infiltration volume decreased by 39% and runoff volume increased by 136%.

Within the areas evaluated, the infiltration has reduced and the runoff increased versus the pre-development values. Groundwater base flow would be expected to decrease over time in this scenario. Based upon this scenario, mitigative strategies are required to minimize infiltration losses and reduce storm water runoff. The following section discusses the water balance after considering the mitigation strategy of conveying rooftop stormwater to the ground for infiltration.

6.4 Post-Development Water Balance (Enhanced Infiltration)

The post-construction water budget computations were repeated considering enhanced infiltration options which are also known as Low Impact Development (LID) technologies. These technologies include and are not restricted to rainwater harvesting, downspout disconnection, infiltration trenches, vegetated filter strips, bioretention, permeable pavement, enhanced grass swales, dry swales and perforated pipe systems. For this Site, downspout disconnection was considered as a LID used to balance the water budget.

Based upon LID documentation, downspout disconnections can reduce rooftop runoff by 25% to 50% (i.e. 25% to 50% of the rooftop runoff can be infiltrated). Our water balance suggests that about 31% of all the available rooftop runoff (after evaporation) is needed to infiltrate the soils to maintain the pre-development infiltration values.

A summary of the post-construction water budget with enhancements for infiltration is presented in Table 6.3.

Table 6.3 Post-Development Summary (With Downspout Disconnection)

Area of Site:	- 49.22 ha
Total Water Surplus:	- 226,439 m ³ /year
% of Rooftop Runoff Required for Infiltration	- 31.8%
Rooftop Runoff Infiltrated	- 27,682 m ³ /year
Total Estimated Infiltration:	- 70,356 m ³ /year
Infiltration % Difference (pre- vs. post-):	- (0%) (meets pre-development)
Total Estimated Runoff:	- 156,083 m ³ /year
Runoff % Difference (pre- vs. post-):	- 100% (increase)

In this scenario and based on the information provided, the post-development infiltration values meet the pre-development values. Runoff has increased as compared with the pre-development conditions and will need to be managed as per a storm water management plan. In general, these water balance calculations indicate development infiltration values can be maintained at pre-development values for the overall development.

Appendix F

Water Balance Calculations

Appendix F.1

Revised Water Budget (Thornthwaite Method) - Average Values*

Weather Station: Peterborough A

Climate Station: 6166418

Elevation: 191 masl

Distance Away: ~ 10.2 km

Month	Mean Temperature (°C)	Heat Index	Unadjusted Potential ET (mm)	Daylight Correction Factor	Adjusted ET (mm)	Total Precipitation (mm)
January	-8.5	0	0	0.78	0	57.4
February	-7.5	0	0	0.88	0	51.5
March	-1.8	0	0	0.99	0	56.1
April	5.9	1.28	28.8	1.12	32.2	68.6
May	12.1	3.81	60.1	1.22	73.3	81.5
June	17	6.38	85.1	1.28	109.0	79.9
July	19.6	7.91	98.5	1.25	123.1	70.6
August	18.3	7.13	91.8	1.15	105.6	77
September	13.9	4.70	69.2	1.04	72.0	85.3
October	7.5	1.85	36.8	0.92	33.8	76.9
November	1.9	0.23	9.0	0.8	7.2	86.4
December	-4.4	0	0	0.76	0	64.2
TOTAL	6.2	33.3	479.3		556.2	855.4
TOTAL WATER SURPLUS: 299.2 mm						

Notes:

*Average values of precipitation were used. Average values of temperature were also used.

Appendix F.2
Water Budget Pre-Development

Catchment Designation	PRE-DEVELOPMENT SITE							TOTAL
	Agricultural Area	Naturalized Areas	Forested Area	787 & 825 Residential Areas				
				Lawn	Rooftops	Pool/Concrete	Gravel Drive	
Area (m ²)	270855	30200	183400	4935	725	185	1900	492200
Pervious Area (m ²)	270855	30200	183400	4935	0	0	1900	491290
% Pervious	55.0%	6.1%	37.3%	1.0%	0%	0%	0.4%	99.8%
Impervious Area (m ²)	0	0	0	0	725	185	0	910
% Impervious	0%	0%	0%	0%	0.1%	0.04%	0%	0.2%
INFILTRATION FACTORS								
Topography Infiltration Factor	0.15	0.2	0.1	0.2	0	0	0.2	
Soil Infiltration Factor	0.2	0.2	0.2	0.2	0	0	0.3	
Land Cover Infiltration Factor	0.1	0.15	0.2	0.15	0	0	0	
MECP Infiltration Factor	0.45	0.55	0.5	0.55	0	0	0.5	
Actual Infiltration Factor	0.45	0.55	0.5	0.55	0	0	0.4	
Runoff Coefficient	0.55	0.45	0.5	0.45	1	1	0.6	
Runoff from Impervious Surfaces*	0	0	0	0	0.8	0.8	0.8	
INPUTS (PER UNIT AREA)								
Precipitation (mm/yr)	855	855	855	855	855	855	855	855
Run On (mm/yr)	0	0	0	0	0	0	0	0
Other Inputs (mm/yr)	0	0	0	0	0	0	0	0
Total Inputs (mm/yr)	855	855	855	855	855	855	855	855
OUTPUTS (PER UNIT AREA)								
Precipitation Surplus (mm/yr)	299	299	299	299	684	684	684	301
Net Surplus (mm/yr)	299	299	299	299	684	684	684	301
Evapotranspiration (mm/yr)	556	556	556	556	171	171	171	554
Infiltration (mm/yr)	135	165	150	165	0	0	274	143
Rooftop Infiltration (mm/yr)	0	0	0	0	171	171	0	0
Total Infiltration (mm/yr)	135	165	150	165	171	171	274	143
Runoff Pervious Areas	165	135	150	135	0	0	411	157
Runoff Impervious Areas	0	0	0	0	513	513	0	1
Total Runoff (mm/yr)	165	135	150	135	513	513	411	158
Total Outputs (mm/yr)	855	855	855	855	855	855	855	855
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
INPUTS (VOLUMES)								
Precipitation (m ³ /yr)	231689	25833	156880	4221	620	158	1625	421028
Run On (m ³ /yr)	0	0	0	0	0	0	0	0
Other Inputs (m ³ /yr)	0	0	0	0	0	0	0	0
Total Inputs (m ³ /yr)	231689	25833	156880	4221	620	158	1625	421028
OUTPUTS (VOLUMES)								
Precipitation Surplus (m ³ /yr)	81032	9035	54868	1476	496	127	1300	148335
Net Surplus (m ³ /yr)	81032	9035	54868	1476	496	127	1300	148335
Evapotranspiration (m ³ /yr)	150657	16798	102012	2745	124	32	325	272693
Infiltration (m ³ /yr)	36465	4969	27434	812	0	0	520	70200
Rooftop Infiltration (m ³ /yr)	0	0	0	0	124	32	0	156
Total Infiltration (m ³ /yr)	36465	4969	27434	812	124	32	520	70356
Runoff Pervious Areas (m ³ /yr)	44568	4066	27434	664	0	0	780	77512
Runoff Impervious Areas (m ³ /yr)	0	0	0	0	372	95	0	467
Total Runoff (m ³ /yr)	44568	4066	27434	664	372	95	780	77979
Total Outputs (m ³ /yr)	231689	25833	156880	4221	620	158	1625	421028
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

Notes:
Forested areas include hedge rows
Naturalized areas are open, vacant areas that are not used for agriculture and are not forested areas

Table 2: Infiltration Factors	
Description of Area/Development Site	Value of Infiltration Factor
TOPOGRAPHY	
■ Flat land, average slope not exceeding 0.6 m per km	0.30
■ Rolling land, average slope of 2.8 m to 3.8 m per km	0.20
■ Hilly land, average slope of 28 m to 47 m per km	0.10
SOIL	
■ Tight impervious clay	0.10
■ Medium combinations of clay and loam	0.20
■ Open sandy loam	0.4
COVER	
■ Cultivated lands	0.1
■ Woodland	0.2

Table 3: Typical Ground Water Recharge Rates		
Soil Texture	Ground Water Recharge Rate	
	(mm/yr)	(L/Day/Hectare)
■ coarse sand and gravel	250+	7000+
■ fine to medium sand	200 - 250	5600 - 7000
■ silty sand to sandy silt	150 - 200	4200 - 5600
■ silt	125 - 150	3500 - 4200
■ clayey silt	100 - 125	2800 - 3500
■ clay	less than 100	less than 2800

Appendix F.3

Water Budget Post-Development - No Mitigation Strategies

Catchment Designation				POST-DEVELOPMENT SITE														TOTAL
	Low Density - Blocks A,B,C - 329 units			Med. Density - Townhouses			Natural	Road	Road ROWs		Parkland	Medium Density - 5-storey bldg			Easement	SWM Pond		
	Lawns	Rooftops	Driveways	Lawns	Rooftops	Driveways	Heritage	Widening	Asphalt	Grass	& Trails	Landscaping	Rooftops	Asphalt		Grass	Pond	
Area (m ²)	39650	95160	23790	7140	26775	1785	164300	1600	38200	38200	21000	1760	5280	1760	100	12850	12850	492200
Pervious Area (m ²)	39650	0	0	7140	0	0	164300	1600	0	38200	21000	1760	0	0	100	12850	0	286600
% Pervious	8.1%	0%	0%	1%	0%	0%	33.4%	0.3%	0%	7.8%	4.3%	0.4%	0%	0%	0.02%	2.6%	0%	58.2%
Impervious Area (m ²)	0	95160	23790	0	26775	1785	0	0	38200	0	0	0	5280	1760	0	0	12850	205600
% Impervious	0%	19.3%	4.8%	0%	5.4%	0.4%	0%	0%	7.8%	0%	0%	0%	1.1%	0.4%	0%	0%	2.6%	41.8%
	INFILTRATION FACTORS																	
Topography Infiltration Factor	0.15	0	0	0.15	0	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0	0	0.2	0.1	0	
Soil Infiltration Factor	0.2	0	0	0.2	0	0	0.2	0.2	0	0.2	0.2	0.2	0	0	0.2	0.2	0	
Land Cover Infiltration Factor	0.15	0	0	0.15	0	0	0.2	0.15	0	0.15	0	0.15	0	0	0.15	0.15	0	
MECP Infiltration Factor	0.5	0	0	0.5	0	0.2	0.5	0.55	0.2	0.55	0.4	0.55	0	0	0.55	0.45	0	
Actual Infiltration Factor	0.5	0	0	0.5	0	0	0.5	0.55	0	0.55	0.4	0.55	0	0	0.55	0.45	0	
Runoff Coefficient	0.5	1	1	0.5	1	1	0.5	0.45	1	0.45	0.6	0.45	1	1	0.45	0.55	1	
Runoff from Impervious Surfaces*	0	0.8	0.8	0	0.8	0.8	0	0	0.8	0	0.8	0	0.8	0.8	0	0	0.8	
	INPUTS (PER UNIT AREA)																	
Precipitation (mm/yr)	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855
Run On (mm/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs (mm/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (mm/yr)	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855
	OUTPUTS (PER UNIT AREA)																	
Precipitation Surplus (mm/yr)	299	684	684	299	684	684	299	299	684	299	299	299	684	684	299	299	684	460
Net Surplus (mm/yr)	299	684	684	299	684	684	299	299	684	299	299	299	684	684	299	299	684	460
Evapotranspiration (mm/yr)	556	171	171	556	171	171	556	556	171	556	556	556	171	171	556	556	171	395
Infiltration (mm/yr)	150	0	0	150	0	0	150	165	0	165	120	165	0	0	165	135	0	87
Rooftop Infiltration (mm/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Infiltration (mm/yr)	150	0	0	150	0	0	150	165	0	165	120	165	0	0	165	135	0	87
Runoff Pervious Areas	150	0	0	150	0	0	150	135	0	135	180	135	0	0	135	165	0	88
Runoff Impervious Areas	0	684	684	0	684	684	0	0	684	0	0	0	684	684	0	0	684	286
Total Runoff (mm/yr)	150	684	684	150	684	684	150	135	684	135	180	135	684	684	135	165	684	373
Total Outputs (mm/yr)	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	INPUTS (VOLUMES)																	
Precipitation (m ³ /yr)	33917	81400	20350	6108	22903	1527	140542	1369	32676	32676	17963	1506	4517	1506	86	10992	10992	421028
Run On (m ³ /yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs (m ³ /yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (m ³ /yr)	33917	81400	20350	6108	22903	1527	140542	1369	32676	32676	17963	1506	4517	1506	86	10992	10992	421028
	OUTPUTS (VOLUMES)																	
Precipitation Surplus (m ³ /yr)	11862	65120	16280	2136	18323	1222	49154	479	26141	11428	6283	527	3613	1204	30	3844	8794	226439
Net Surplus (m ³ /yr)	11862	65120	16280	2136	18323	1222	49154	479	26141	11428	6283	527	3613	1204	30	3844	8794	226439
Evapotranspiration (m ³ /yr)	22054	16280	4070	3971	4581	305	91388	890	6535	21248	11681	979	903	301	56	7148	2198	194589
Infiltration (m ³ /yr)	5931	0	0	1068	0	0	24577	263	0	6286	2513	290	0	0	16	1730	0	42674
Rooftop Infiltration (m ³ /yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Infiltration (m ³ /yr)	5931	0	0	1068	0	0	24577	263	0	6286	2513	290	0	0	16	1730	0	42674
Runoff Pervious Areas (m ³ /yr)	5931	0	0	1068	0	0	24577	215	0	5143	3770	237	0	0	13	2114	0	43069
Runoff Impervious Areas (m ³ /yr)	0	65120	16280	0	18323	1222	0	0	26141	0	0	0	3613	1204	0	0	8794	140696
Total Runoff (m ³ /yr)	5931	65120	16280	1068	18323	1222	24577	215	26141	5143	3770	237	3613	1204	13	2114	8794	183765
Total Outputs (m ³ /yr)	33917	81400	20350	6108	22903	1527	140542	1369	32676	32676	17963	1506	4517	1506	86	10992	10992	421028
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

*Evaporation from impervious areas was assumed to be 20% of precipitation.

Asphalt has 0% infiltration capability

Low Density Single Lots: Assume rooftops cover about 60% of the lot. Driveways cover about 15% of the lot; Grass (lawns) cover about 25% of the lot.

Medium Density 5-storey building lot: Assume rooftops cover about 60% of the lot. Parking areas cover about 20% of the lot; Grass (lawns) cover about 20% of the lot.

Medium Density Townhouse Lots: Assume rooftops cover about 75% of the lot. Driveways cover about 5% of the lot; Grass (lawns) cover about 20% of the lot.

Commercial Lots: Based upon information provided to GHD, assume rooftops covers about 13% of the lot. Asphalt parking covers about 80% of the lot; Landscaping covers about 7% of the lot.

Road ROWs assumed to be 50% asphalt and 50% grass

Appendix F.4

Water Budget Post-Development - With Downspout Disconnection Mitigation Strategies

Catchment Designation				POST-DEVELOPMENT SITE														TOTAL
	Low Density - Blocks A,B,C - 329 units			Med. Density - Townhouses			Natural	Road	Road ROWs		Parkland	Medium Density - 5-storey bldg			Easement	SWM Pond		
	Lawns	Rooftops	Driveways	Lawns	Rooftops	Driveways	Heritage	Widening	Asphalt	Grass	& Trails	Landscaping	Rooftops	Asphalt		Grass	Pond	
Area (m ²)	39650	95160	23790	7140	26775	1785	164300	1600	38200	38200	21000	1760	5280	1760	100	12850	12850	492200
Pervious Area (m ²)	39650	0	0	7140	0	0	164300	1600	0	38200	21000	1760	0	0	100	12850	0	286600
% Pervious	8.1%	0%	0%	1%	0%	0%	33.4%	0.3%	0%	7.8%	4.3%	0.4%	0%	0%	0.02%	2.6%	0%	58.2%
Impervious Area (m ²)	0	95160	23790	0	26775	1785	0	0	38200	0	0	0	5280	1760	0	0	12850	205600
% Impervious	0%	19.3%	4.8%	0%	5.4%	0.4%	0%	0%	7.8%	0%	0%	0%	1.1%	0.4%	0%	0%	2.6%	41.8%
	INFILTRATION FACTORS																	
Topography Infiltration Factor	0.15	0	0	0.15	0	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0	0	0.2	0.1	0	
Soil Infiltration Factor	0.2	0	0	0.2	0	0	0.2	0.2	0	0.2	0.2	0.2	0	0	0.2	0.2	0	
Land Cover Infiltration Factor	0.15	0	0	0.15	0	0	0.2	0.15	0	0.15	0	0.15	0	0	0.15	0.15	0	
MECP Infiltration Factor	0.5	0	0	0.5	0	0.2	0.5	0.55	0.2	0.55	0.4	0.55	0	0	0.55	0.45	0	
Actual Infiltration Factor	0.5	0	0	0.5	0	0	0.5	0.55	0	0.55	0.4	0.55	0	0	0.55	0.45	0	
Runoff Coefficient	0.5	1	1	0.5	1	1	0.5	0.45	1	0.45	0.6	0.45	1	1	0.45	0.55	1	
Runoff from Impervious Surfaces*	0	0.8	0.8	0	0.8	0.8	0	0	0.8	0	0.8	0	0.8	0.8	0	0	0.8	
	INPUTS (PER UNIT AREA)																	
Precipitation (mm/yr)	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855
Run On (mm/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs (mm/yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (mm/yr)	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855
	OUTPUTS (PER UNIT AREA)																	
Precipitation Surplus (mm/yr)	299	684	684	299	684	684	299	299	684	299	299	299	684	684	299	299	684	460
Net Surplus (mm/yr)	299	684	684	299	684	684	299	299	684	299	299	299	684	684	299	299	684	460
Evapotranspiration (mm/yr)	556	171	171	556	171	171	556	556	171	556	556	556	171	171	556	556	171	395
Infiltration (mm/yr)	150	0	0	150	0	0	150	165	0	165	120	165	0	0	165	135	0	87
%Rooftop Required to Meet Pre-Development	--	32%	--	--	32%	--	--	--	--	--	--	--	32%	--	--	--	--	
Rooftop Infiltration (mm/yr)	0	218	0	0	218	0	0	0	0	0	0	0	218	0	0	0	0	56
Total Infiltration (mm/yr)	150	218	0	150	218	0	150	165	0	165	120	165	218	0	165	135	0	143
Runoff Pervious Areas	150	0	0	150	0	0	150	135	0	135	180	135	0	0	135	165	0	88
Runoff Impervious Areas	0	467	684	0	467	684	0	0	684	0	0	0	467	684	0	0	684	230
Total Runoff (mm/yr)	150	467	684	150	467	684	150	135	684	135	180	135	467	684	135	165	684	317
Total Outputs (mm/yr)	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855	855
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	INPUTS (VOLUMES)																	
Precipitation (m ³ /yr)	33917	81400	20350	6108	22903	1527	140542	1369	32676	32676	17963	1506	4517	1506	86	10992	10992	421028
Run On (m ³ /yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Inputs (m ³ /yr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inputs (m ³ /yr)	33917	81400	20350	6108	22903	1527	140542	1369	32676	32676	17963	1506	4517	1506	86	10992	10992	421028
	OUTPUTS (VOLUMES)																	
Precipitation Surplus (m ³ /yr)	11862	65120	16280	2136	18323	1222	49154	479	26141	11428	6283	527	3613	1204	30	3844	8794	226439
Net Surplus (m ³ /yr)	11862	65120	16280	2136	18323	1222	49154	479	26141	11428	6283	527	3613	1204	30	3844	8794	226439
Evapotranspiration (m ³ /yr)	22054	16280	4070	3971	4581	305	91388	890	6535	21248	11681	979	903	301	56	7148	2198	194589
Infiltration (m ³ /yr)	5931	0	0	1068	0	0	24577	263	0	6286	2513	290	0	0	16	1730	0	42674
Rooftop Infiltration (m ³ /yr)	0	20707	0	0	5826	0	0	0	0	0	0	0	1149	0	0	0	0	27682
Total Infiltration (m ³ /yr)	5931	20707	0	1068	5826	0	24577	263	0	6286	2513	290	1149	0	16	1730	0	70356
Runoff Pervious Areas (m ³ /yr)	5931	0	0	1068	0	0	24577	215	0	5143	3770	237	0	0	13	2114	0	43069
Runoff Impervious Areas (m ³ /yr)	0	44413	16280	0	12496	1222	0	0	26141	0	0	0	2464	1204	0	0	8794	113015
Total Runoff (m ³ /yr)	5931	44413	16280	1068	12496	1222	24577	215	26141	5143	3770	237	2464	1204	13	2114	8794	156083
Total Outputs (m ³ /yr)	33917	81400	20350	6108	22903	1527	140542	1369	32676	32676	17963	1506	4517	1506	86	10992	10992	421028
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

*Evaporation from impervious areas was assumed to be 20% of precipitation.

Asphalt has 0% infiltration capability

Low Density Single Lots: Assume rooftops cover about 60% of the lot. Driveways cover about 15% of the lot; Grass (lawns) cover about 25% of the lot.

Medium Density Townhouse Lots: Assume rooftops cover about 75% of the lot. Driveways cover about 5% of the lot; Grass (lawns) cover about 20% of the lot.

Medium Density 5-storey Residential lot: Assume rooftops cover about 60% of the lot. Asphalt covers about 20% of the lot; Grass (lawn) cover about 20% of the lot.

Road ROWs assumed to be 50% asphalt and 50% grass

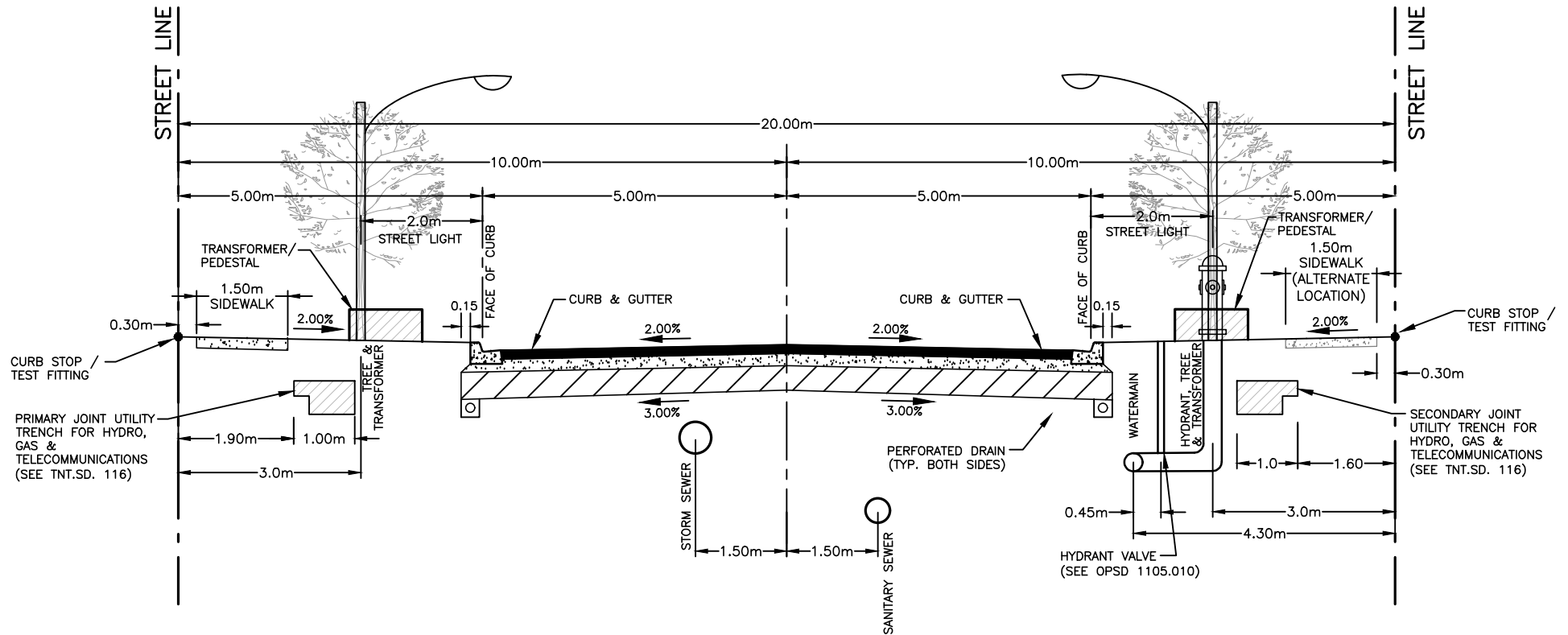
Appendix F.5
Water Budget Summary

PARAMETER	SITE				
	Pre-Development	Post-Development No Mitigation	Difference Pre- vs. Post-	Post-Development With Mitigation	Difference Pre- vs. Post-
INPUTS (VOLUMES)					
Precipitation (m³/yr)	421028	421028	0%	421028	0%
Run On (m³/yr)	0	0	0%	0	0%
Other Inputs (m³/yr)	0	0	0%	0	0%
Total Inputs (m³/yr)	421028	421028	0%	421028	0%
OUTPUTS (VOLUMES)					
Precipitation Surplus (m³/yr)	148335	226439	53%	226439	53%
Net Surplus (m³/yr)	148335	226439	53%	226439	53%
Evapotranspiration (m³/yr)	272693	194589	-29%	194589	-29%
Infiltration (m³/yr)	70200	42674	-39%	42674	-39%
% Rooftop Runoff to balance infiltration	--	--	--	32%	--
Rooftop Infiltration (m³/yr)	156	0	0%	27682	--
Total Infiltration (m³/yr)	70356	42674	-39%	70356	0%
Runoff Pervious Areas (m³/yr)	77512	43069	-44%	43069	-44%
Runoff Impervious Areas (m³/yr)	467	140696	--	113015	--
Total Runoff (m³/yr)	77979	183765	136%	156083	100%
Total Outputs (m³/yr)	421028	421028	0%	421028	0%

To maintain pre-development infiltration values;
32%
of post-development rooftop runoff needs to be infiltrated.

APPENDIX “G”

Standard Road Cross Sections



MILLBROOK SOUTH WEST
SUBDIVISION

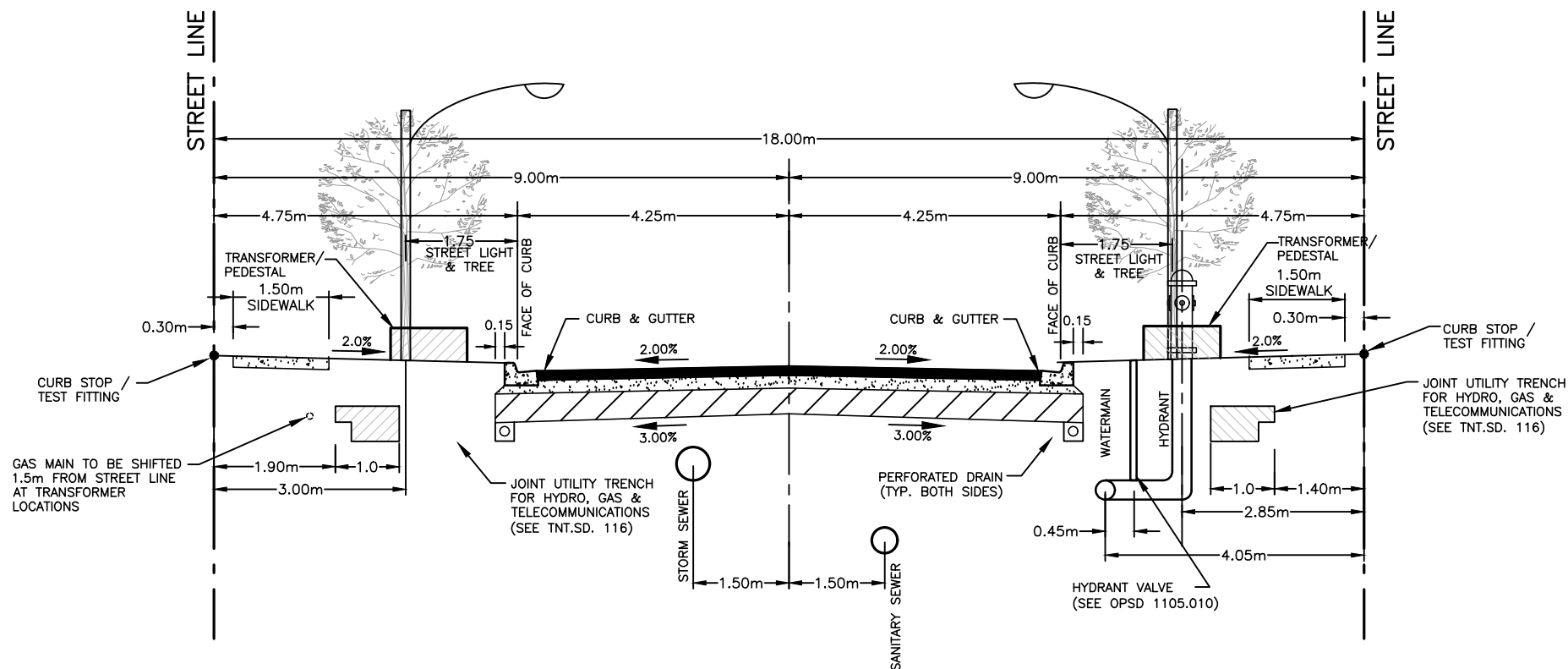
URBAN LOCAL
20.0m RIGHT-OF-WAY (10.0m ROAD)

NO.	REVISIONS	DATE	APR'D

SCALE: N.T.S.

DATE: May 2021

FIGURE G1



MILLBROOK SOUTH WEST
SUBDIVISION

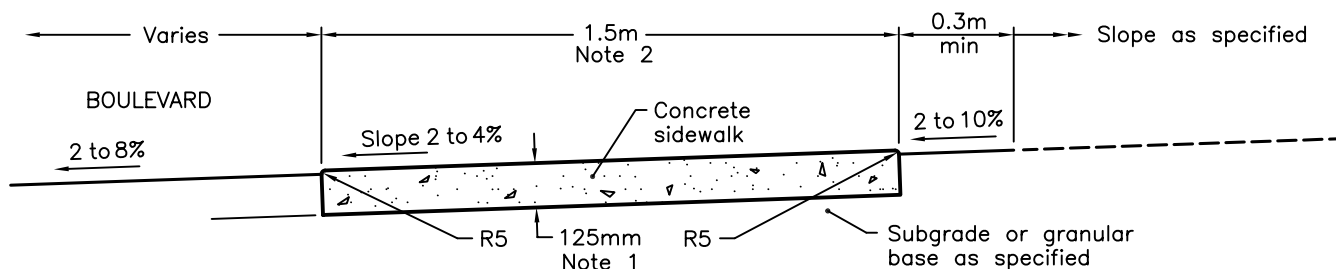
18.0m URBAN MINOR LOCAL
RIGHT-OF-WAY (8.50m ROAD)

NO.	REVISIONS	DATE	APR'D

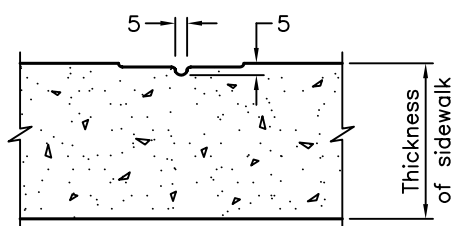
SCALE: N.T.S.

DATE: May 2021

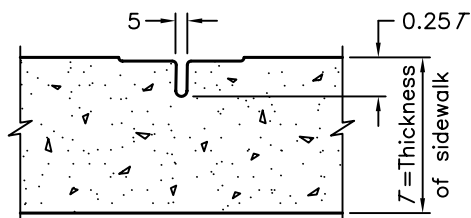
FIGURE G2



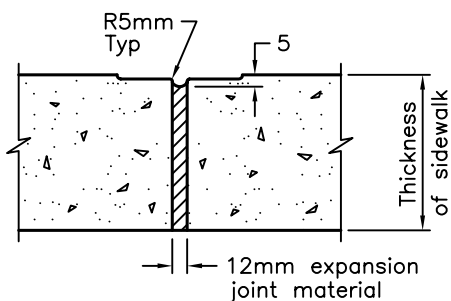
TYPICAL SECTION



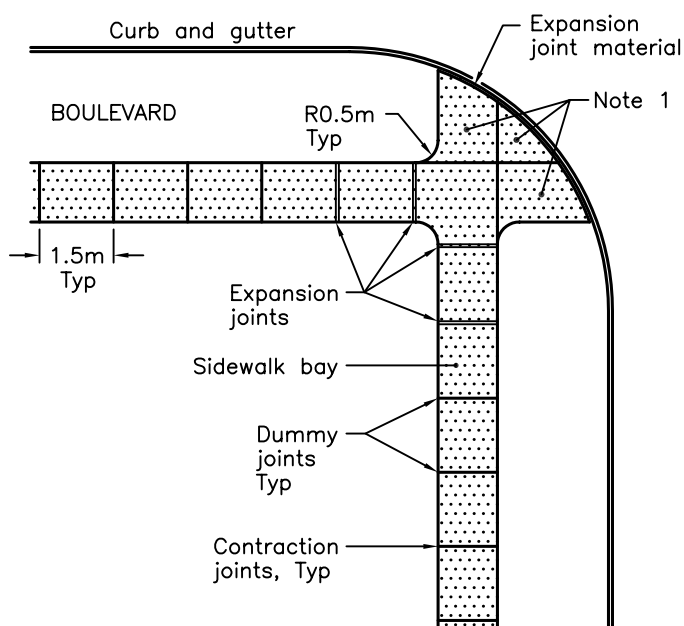
DUMMY JOINT



CONTRACTION JOINT



EXPANSION JOINT



JOINT LAYOUT

NOTES:

- 1 Sidewalk thickness at residential driveways and adjacent to curb shall be 150mm. At commercial and industrial driveways, the thickness shall be 200mm.
- 2 Sidewalk width shall be increased to 2.4m at schools, bus stops, and other high pedestrian areas.

- A This OPSD to be read in conjunction with OPSD-310.030.
- B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2005

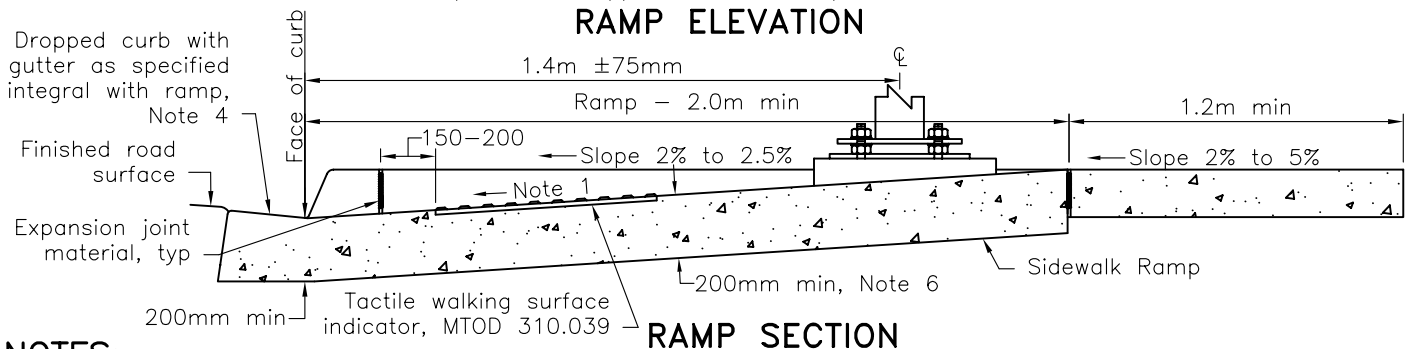
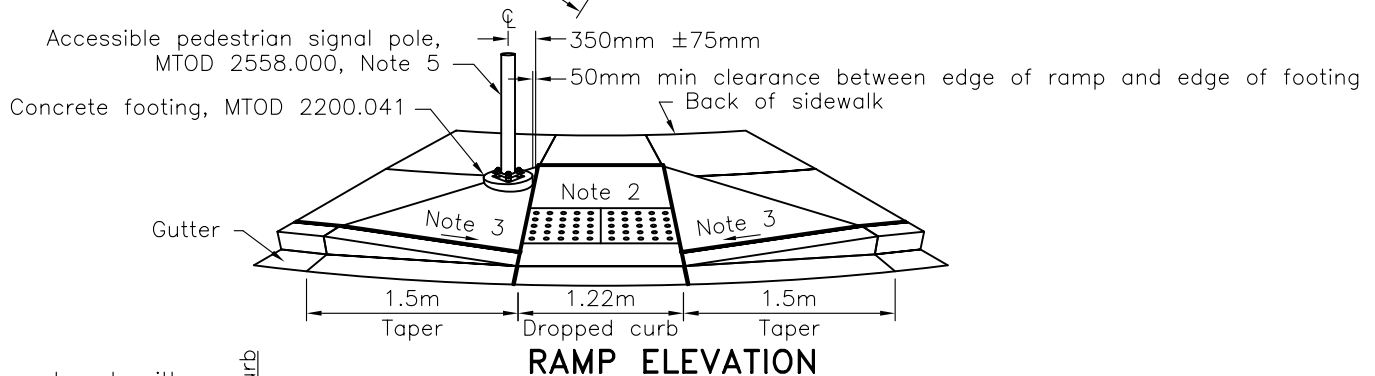
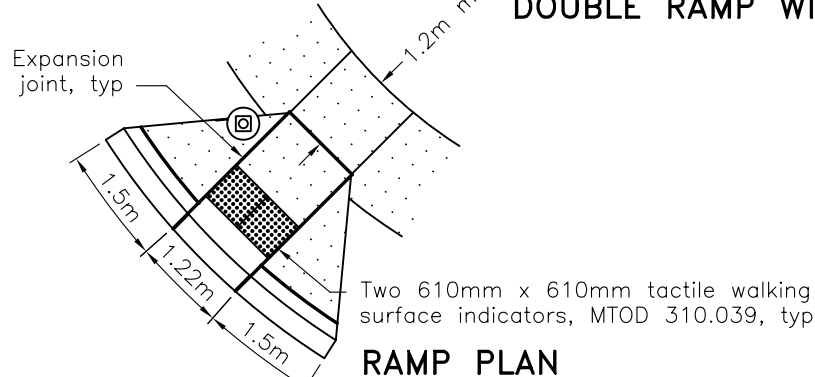
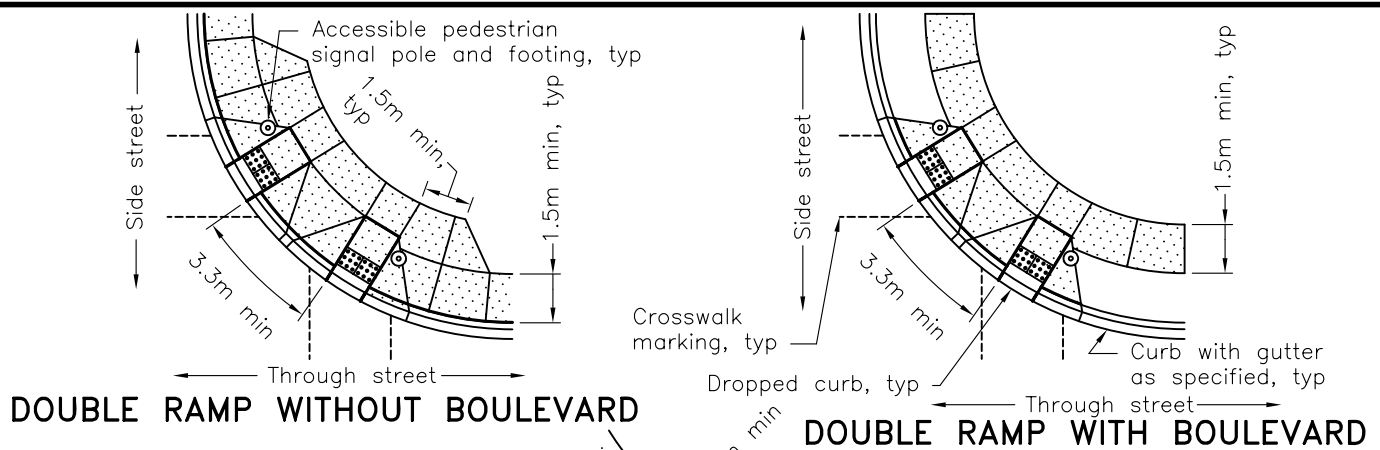
Rev

1

CONCRETE SIDEWALK

OPSD - 310.010





NOTES:

- 1 Slope of ramp shall not exceed 10%.
 - 2 Cross slope of ramp shall not exceed 2% in either direction.
 - 3 Cross slope of flared side of ramp shall not exceed 10%.
 - 4 Dropped curb at ramp shall be modified to eliminate 30 mm step at gutter.
 - 5 Accessible pedestrian signal to have tactile arrow that aligns with direction of crosswalk.
 - 6 Minimum thickness of ramp is 200mm. Minimum thickness of sidewalk and flared sides adjacent to ramp is 150mm.
- A Where only one crosswalk is present at an intersection, only one curb ramp is required.
B All dimensions are in millimetres unless otherwise shown.

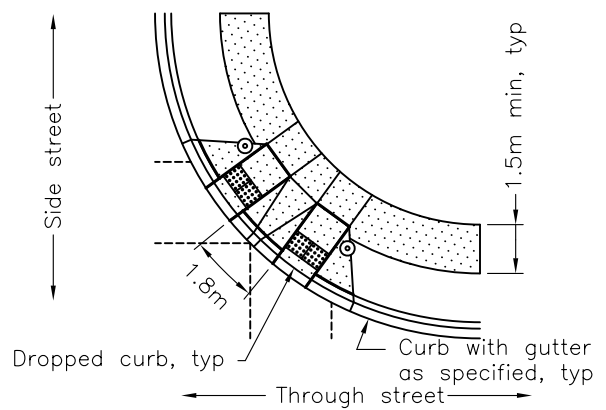
MINISTRY OF TRANSPORTATION ONTARIO DRAWING

Mar 2014

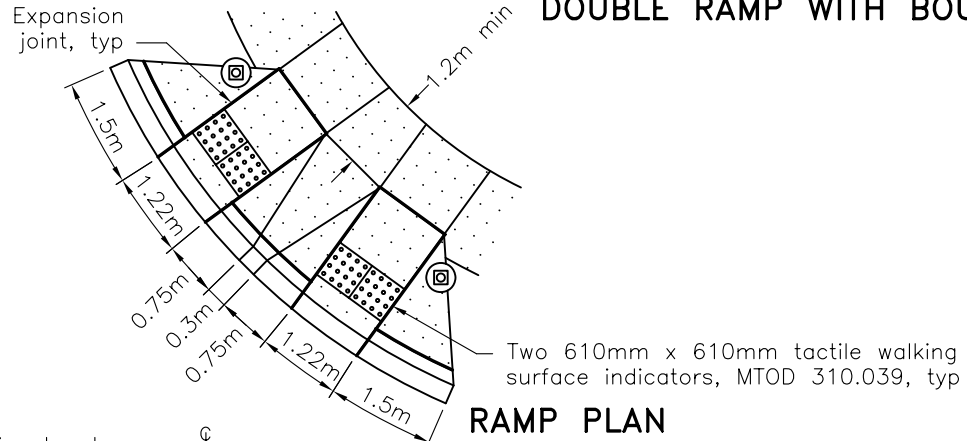
Rev

CONCRETE SIDEWALK RAMPS AT SIGNALIZED INTERSECTIONS

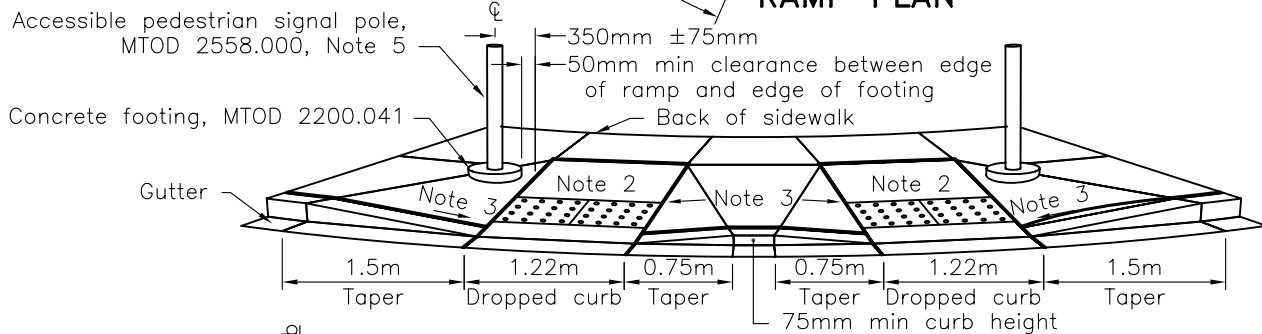
MTOD - 310.030



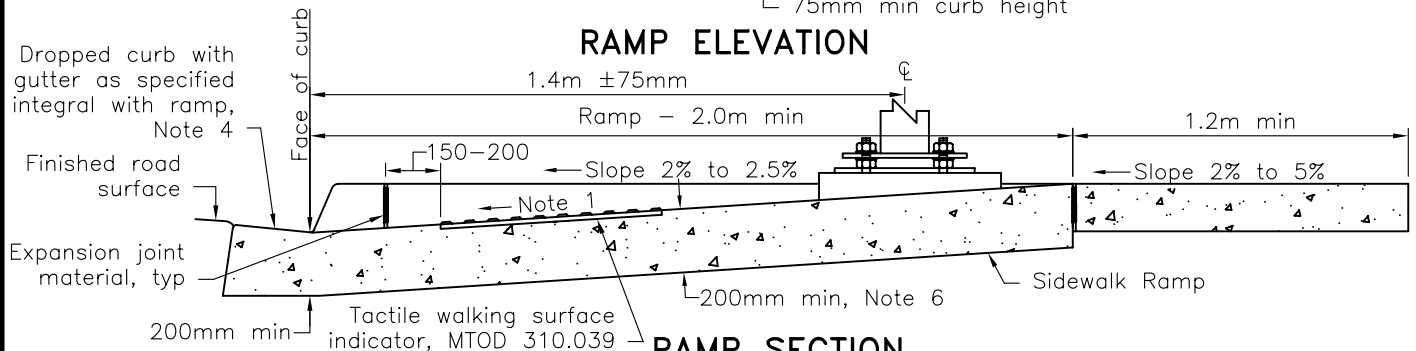
DOUBLE RAMP WITH BOULEVARD



RAMP PLAN



RAMP ELEVATION



RAMP SECTION

1 Slope of ramp shall not exceed 10%.

2 Cross slope of ramp shall not exceed 2% in either direction.

3 Cross slope of flared side of ramp shall not exceed 10%.

4 Dropped curb at ramp shall be modified to eliminate 30 mm step at gutter line.

5 Accessible pedestrian signal to have tactile arrow that aligns with direction of crosswalk.

6 Minimum thickness of ramp is 200mm. Minimum thickness of sidewalk and flared sides adjacent to ramp is 150mm.

A All dimensions are in millimetres unless otherwise shown.

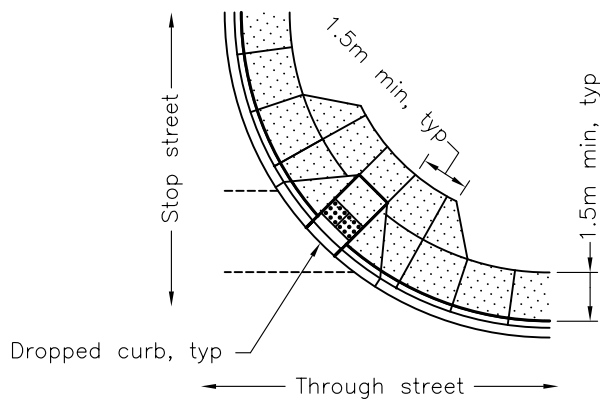
MINISTRY OF TRANSPORTATION ONTARIO DRAWING

Mar 2014

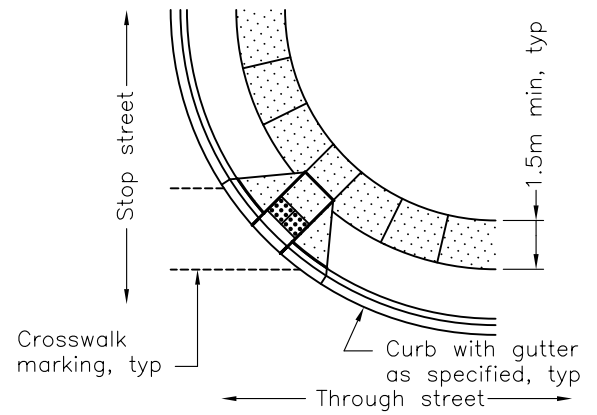
Rev

CONCRETE SIDEWALK RAMPS AT SIGNALIZED INTERSECTIONS WITH INTERSECTING CROSSWALKS

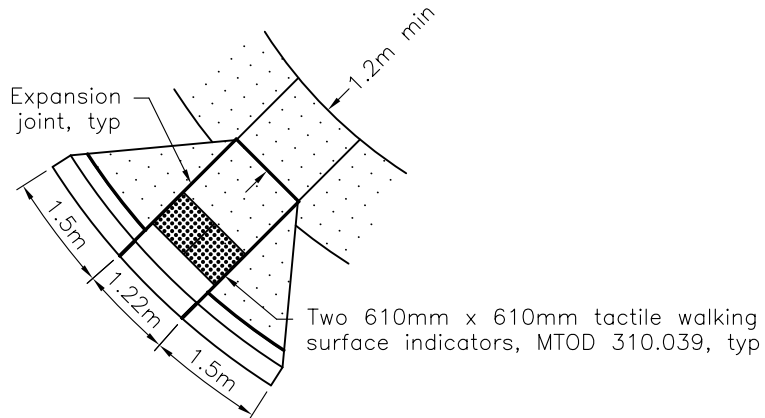
MTOD - 310.031



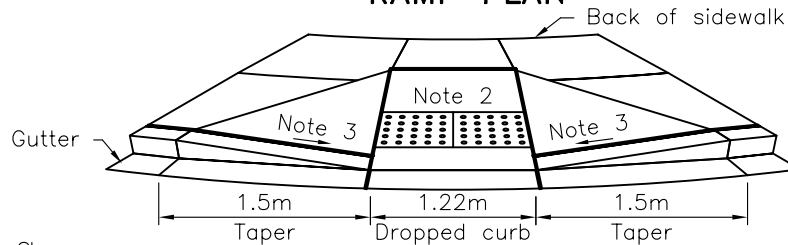
SINGLE RAMP WITHOUT BOULEVARD



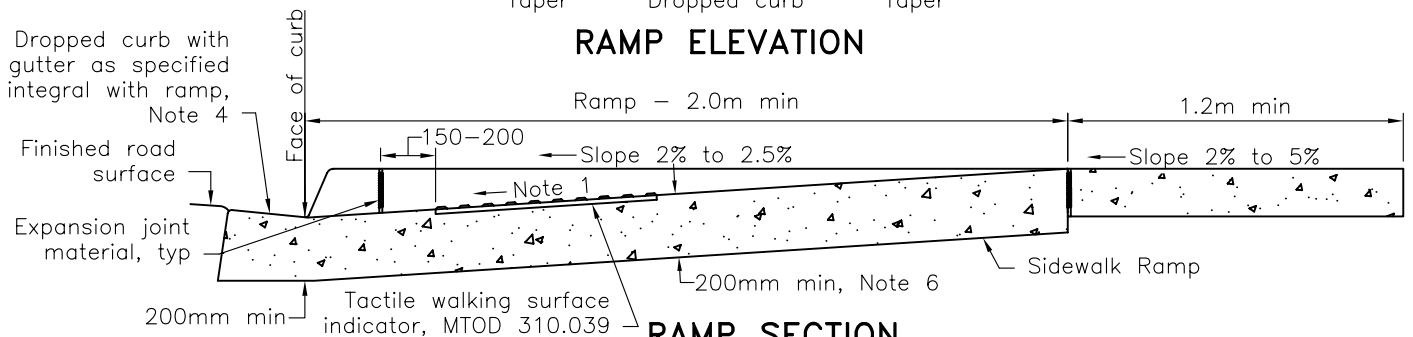
SINGLE RAMP WITH BOULEVARD



RAMP PLAN



RAMP ELEVATION



RAMP SECTION

NOTES:

- 1 Slope of ramp shall not exceed 10%.
- 2 Cross slope of ramp shall not exceed 2% in either direction.
- 3 Cross slope of flared side of ramp shall not exceed 10%.
- 4 Dropped curb at ramp shall be modified to eliminate 30 mm step at gutter line.
- 5 Minimum thickness of ramp is 200mm. Minimum thickness of sidewalk and flared sides adjacent to ramp is 150mm.
- A All dimensions are in millimetres unless otherwise shown.

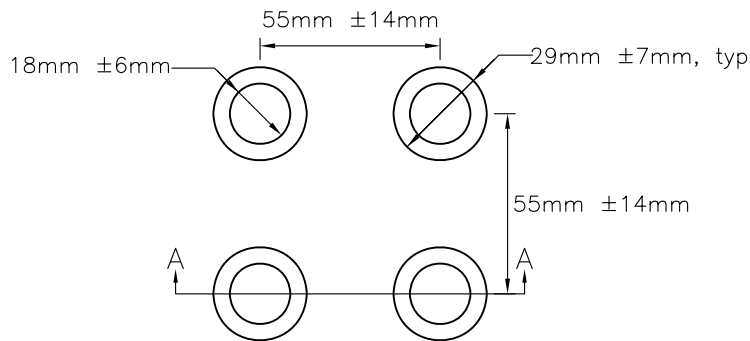
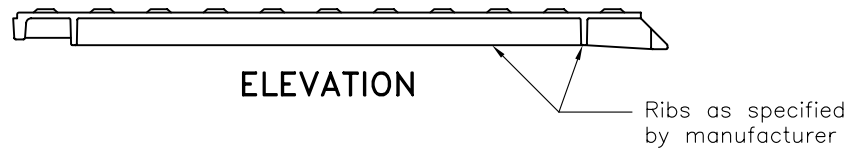
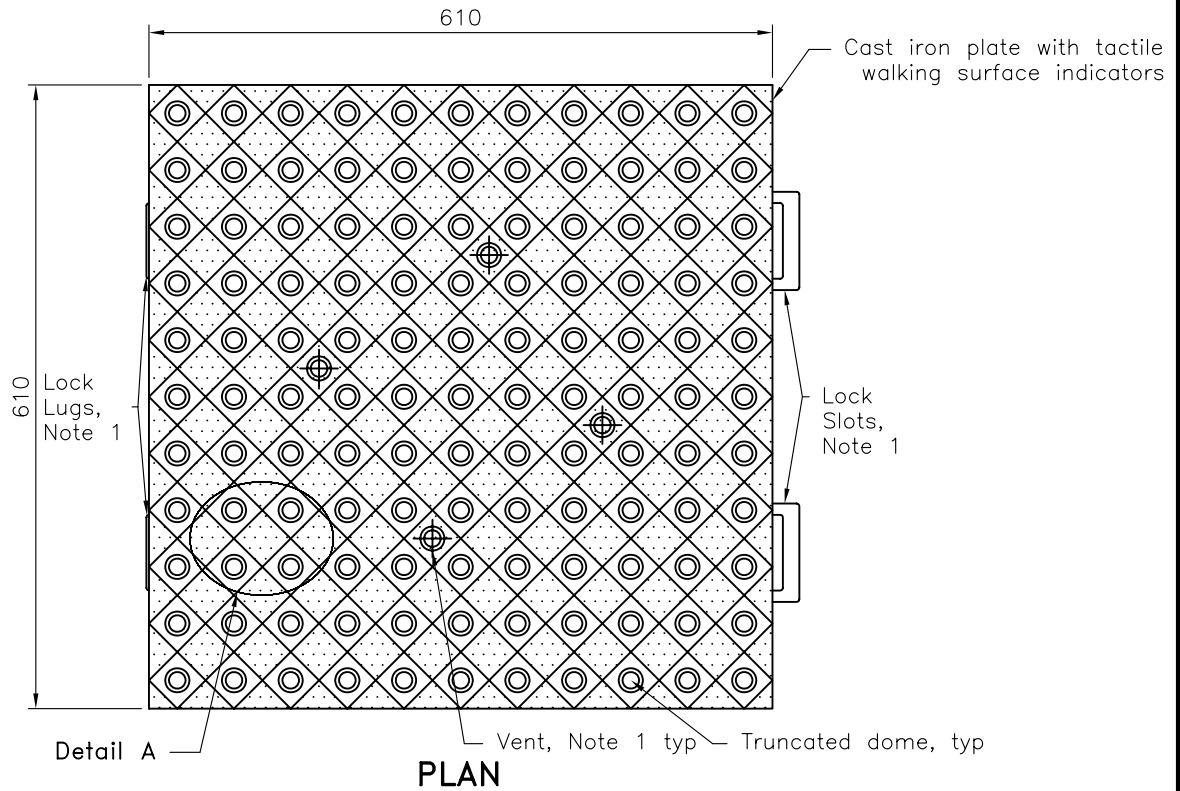
MINISTRY OF TRANSPORTATION ONTARIO DRAWING

Mar 2014

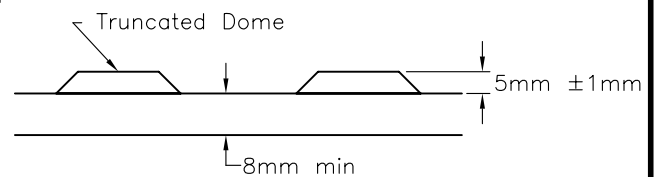
Rev

**CONCRETE SIDEWALK RAMPS AT
UNSIGNALIZED INTERSECTIONS**

MTOD - 310.032



DETAIL A
TRUNCATED DOMES PLAN



SECTION A-A

NOTES:

1 Lock lug and slots to interconnect adjacent cast iron plates, and vents, are proprietary to manufacturer

A The coefficient of friction of the cast iron plate shall not be less than 0.8.

B All dimensions are in millimetres unless otherwise shown.

MINISTRY OF TRANSPORTATION ONTARIO DRAWING

Mar 2014

Rev

CONCRETE SIDEWALK RAMPS
TACTILE WALKING SURFACE
INDICATORS COMPONENT

MTOD – 310.039

APPENDIX “H”

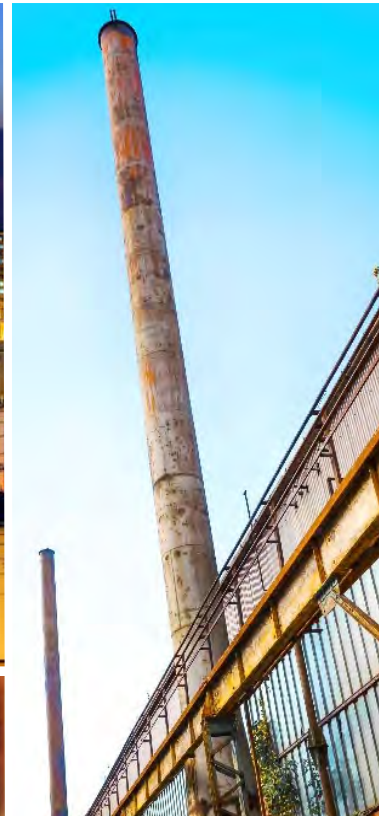
Borehole Logs

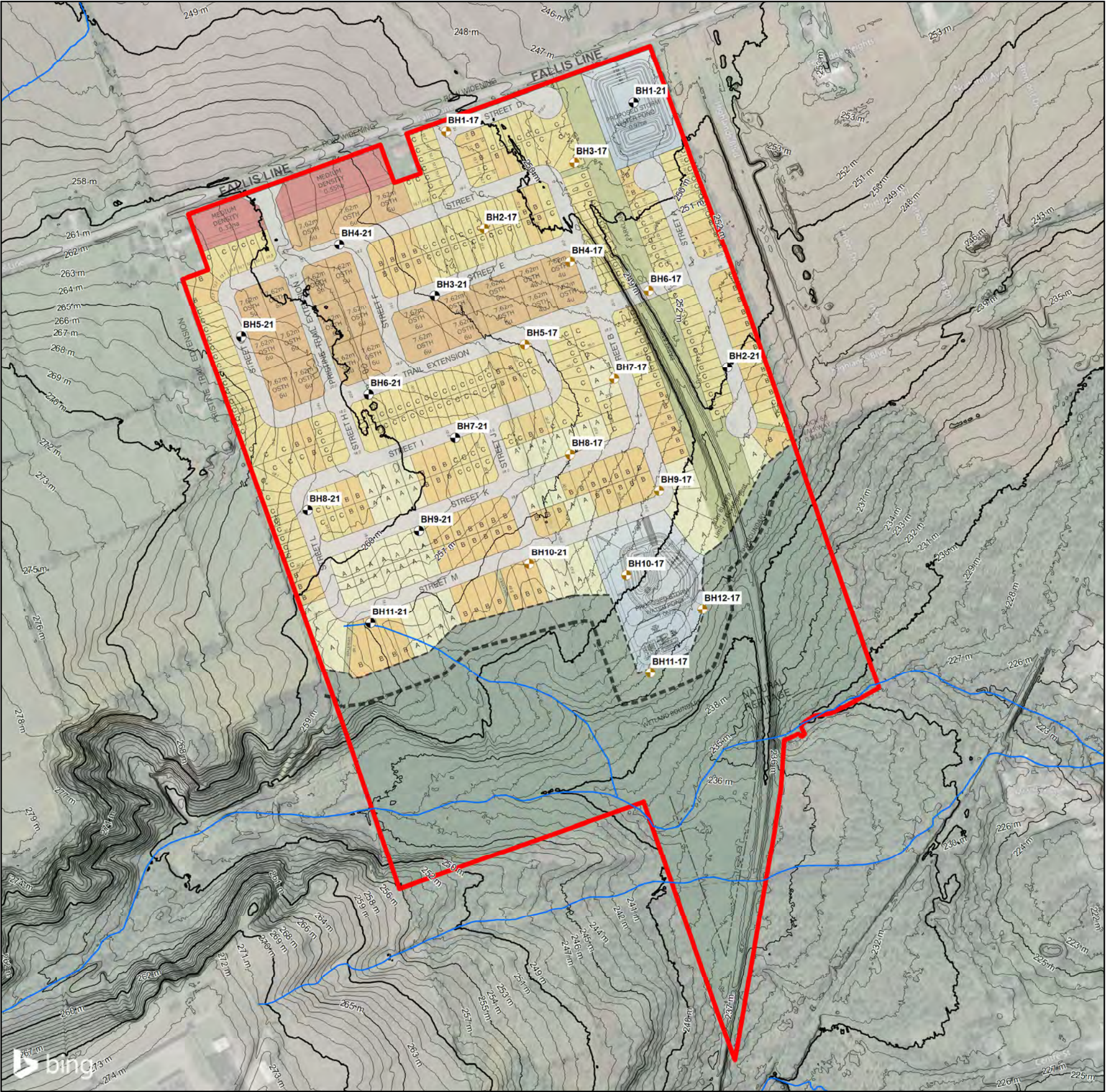


Geotechnical Investigation Report

Proposed Subdivision Development
787 and 825 Fallis Line
Millbrook, Ontario

Report for:
The Bromont Group





TEST HOLES

-  Boreholes Drilled in 2021
-  Boreholes Drilled in 2017

CONTOURS

-  Contour Line, Major
10 m Contour Index
ODTM Lidar Derived
-  Contour Line, Intermediate
5 m Contour Index
ODTM Lidar Derived
-  Contour Line, Minor
1 m Contour Interval
ODTM Lidar Derived

ONTARIO HYDROGRAPHIC NETWORK (OHN)

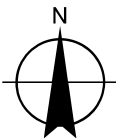
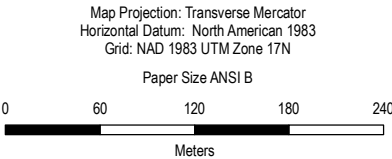
-  Stream

ADMINISTRATIVE BOUNDARIES

-  Property Limit

CITATIONS

Service Layer Credits: © 2021 Microsoft Corporation © 2021 Maxar ©CNES (2021) Distribution Airbus DS © 2021 TomTom
Ontario Digital Terrain Model [Derivative]. OMAFRA. Peterborough, 2016-2017.
Conceptual Draft Plan, Fallis Line West [20697]. The Biglieri Group Ltd. 2021-03-29.



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THE BROMONT GROUP
787 & 825 FALLIS LINE, MILLBROOK, ON
TOWNSHIP OF CAVAN-MONAGHAN
COUNTY OF PETERBOROUGH

GEOTECHNICAL INVESTIGATION
BOREHOLE LOCATION PLAN

Project No. 11224019
Revision No. -
Date Mar 2021

FIGURE 2



BOREHOLE No.: BH1-17

ELEVATION: 251.3 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 22 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 702910E 4892792N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
			TOPSOIL (380 mm)				1				
1	0.4		TILL - Brown Silty Clay, Some Sand, Trace Gravel, Moist, Compact - Occasional Organics to 0.6m	SS-1	79	25	3	8	X		Borehole open and dry upon completion of drilling
2							5				
3	1.0			SS-2	100	18	5	17			
4							6				
5							11				
6	2.0			SS-3	100	20	4	26			SS-3: 4% Gravel 10% Sand 86% Silt and Clay 31% between 5-75 µm
7							10				
8	2.3		Occasional Cobbles, Dense	SS-4	89	14	16	35			
9							21				
10	3.0		Damp to Moist, Very Dense	SS-5	100	7	24	100+			
11							38				
12							50=4"				
13	4.0										
14											
15				SS-6	100	9	21	68			
16	5.0						28				
17							40				
18											
19											
20	6.0		Dense	SS-7	100	13	8	35			
21	6.1						17				
22	6.6		END OF BOREHOLE				18				
23	7.0										
24											

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH2-17

ELEVATION: 252.8 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 22 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 702952E 4892690N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.3	TOPSOIL (300 mm)				2				
1			TILL - Brown Silty Clay, Some Sand, Trace Gravel, Damp, Compact - Occasional Organics to 0.5m	SS-1	83	13	5	11	×		
2							6				
3	1.0			SS-2	100	17	3	11	×	○	
4							3				
5							3				
6	2.0			SS-3	100	24	5	11	×	○	
7							6				
8		2.3	Brown Silty Sand, Some Clay, Trace Gravel, Damp, Compact	SS-4	100	16	5	11	×	○	
9							6				
10	3.0						6				
11				SS-5	100	10	6	15	○	×	
12							9				
13	4.0										
14											
15							6				
16	5.0			SS-6	100	8	6	14	○	×	
17							8				
18											
19											
20	6.0						7				
21				SS-7	100	15	7	16	×		
22		6.6	END OF BOREHOLE				9				
23	7.0										
24											

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH3-17

ELEVATION: 248.3 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 22 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- SS - SPLIT SPOON
 AS - AUGER SAMPLE
 ST - SHELBY TUBE
 CS - CORE SAMPLE
 ▴ - WATER LEVEL

UTM: +/- 17T 703062E 4892759N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.3	TOPSOIL (300 mm)				0				
1			TILL - Brown Silty Clay, Some Sand, Trace Gravel, Moist, Compact - Occasional Organics to 0.6m	SS-1	33	41	0	0	*		
2							2				
3	1.0			SS-2	100	25	3	9	*		
4							6				
5							5				
6	2.0			SS-3	100	20	8	18	*		
7							10				
8							7				
9				SS-4	100	12	10	25	*		
10	3.0						15				
11							7				
12				SS-5	100	12	9	20	*		
13							11				
14	4.0										
15		4.6	Grey Sandy Silt, Some Clay, Trace Gravel, Wet, Very Loose	SS-6	100	34	0	4	*		
16	5.0						1				
17							3				
18											
19											
20	6.0	6.1	Compact Sand Seam at 6.2m	SS-7	100	10	19	24	*		
21							15				
22		6.6	END OF BOREHOLE				9				
23	7.0										
24											

WL - 0.9 m
9/7/2017

Groundwater seepage encountered at 4.6 m during drilling

33 mm inside diameter piezometer installed to 6.6 m

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG, LR.GPJ, GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH4-17

ELEVATION: 251.6 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 22 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- SS - SPLIT SPOON
 AS - AUGER SAMPLE
 ST - SHELBY TUBE
 CS - CORE SAMPLE
 ▴ - WATER LEVEL

UTM: +/- 17T 703055E 4892637N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)											COMMENTS
ft	m									w _p w _L Atterberg limits (%) X "N" Value (blows / 0.3 m) △ Field □ Lab RQD CONE											
		0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90			
				TOPSOIL (300 mm)				1											Borehole open and dry upon completion of drilling WL - Dry 9/7/2017 WL - Dry 10/17/2017		
1		0.3		TILL - Brown Silty Clay, Trace Sand, Moist, Compact - Occasional Organics to 0.6m	SS-1	83	26	3	8	X		○									
2									5												
3	1.0					SS-2	89	30	2	8	X		○								
4								3											WL - Dry 10/17/2017		
5		1.5		Some Gravel, Damp				4													
6					SS-3	100	12	7	18		○	X									
7	2.0							11													
8		2.6			SS-4	100	9	9	57		○			X							
9				SAND - Brown Sand, Some Silt, Damp, Dense to Very Dense				22													
10	3.0							35													
11					SS-5	94	3	40	51		○			X							
12								25													
13	4.0							26											SS-6: 0% Gravel 74% Sand 26% Silt and Clay 20% between 5-75 µm		
14																					
15				Silt Seam at 4.6m				16													
16					SS-6	100	25	22	43			○		X							
17	5.0							21													
18																					
19																					
20	6.0																				
21					SS-7	100	5	21	75		○					X					
22		6.6		END OF BOREHOLE				35											51 mm inside diameter monitoring well installed to 6.1 m		
23	7.0							40													
24																					

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH5-17

ELEVATION: 255.2 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 22 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☐ SS - SPLIT SPOON
☐ AS - AUGER SAMPLE
☐ ST - SHELBY TUBE
☐ CS - CORE SAMPLE
☐ - WATER LEVEL

UTM: +/- 17T 703000E 4892563N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.3	TOPSOIL (300 mm)				0				
1			TILL - Brown Sandy Silty Clay, Trace Gravel, Moist, Compact	SS-1	79	18	3	7	×	○	
2			- Occasional Organics to 0.6m				4				
3	1.0			SS-2	89	14	14	35	○	×	
4							21				
5	1.5		SAND - Brown Sand, Some Silt, Trace Gravel, Damp, Very Dense	SS-3	100	3	25	100+	○		×
6							30				
7	2.0						50=4"				
8				SS-4	100	3	38	100+	○		×
9							50=5"				
10	3.0			SS-5	100	3	46	100+	○		×
11							50=4"				
12											
13	4.0										
14											
15				SS-6	100	6	36	38	○	×	
16	5.0						33				
17							35				
18											
19											
20	6.0			SS-7	100	5	28	100+	○		×
21	6.4		END OF BOREHOLE				50=5"				
22											
23	7.0										
24											



BOREHOLE No.: BH6-17

ELEVATION: 252.4 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 703151E 4892614N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
			TOPSOIL (300 mm)				5				
1	0.3		TILL - Brown Sandy Silty Clay, Some Gravel, Moist, Compact - Occasional Organics to 0.6m	SS-1	79	13	5 5 8 9	13	×		Borehole open and dry upon completion of drilling
2											
3	1.0			SS-2	100	23	5 5 5	10	×	○	
4											
5	1.5		Dense				5				
6				SS-3	83	20	10 25	35	○	×	SS-2: 12% Gravel 20% Sand 68% Silt and Clay 33% between 5-75 µm
7	2.0										
8	2.3		Brown Silty Sand, Some Clay, Trace Gravel, Moist, Dense	SS-4	94	12	31 24 14	38	○	×	
9											
10	3.0		Very Dense				3				
11				SS-5	83	14	24 41	65	○	×	
12											
13	4.0										
14											
15	4.6		SAND - Brown Sand, Some Silt, Trace Gravel, Damp, Very Dense	SS-6	100	4	16 50=5"	100+	○		×
16	5.0										
17											
18											
19											
20	6.0										
21	6.1		Dense	SS-7	100	5	15 15 29	44	○	×	
22	6.6		END OF BOREHOLE								
23	7.0										
24											

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG, LR.GPJ, GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH7-17

ELEVATION: 254.5 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 703108E 4892501N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) △ Field Sensitivity (S) □ Lab ○ Water content (%) w _p w _L Atterberg limits (%) × "N" Value ◆ RQD (blows / 0.3 m) ⊙ CONE										COMMENTS		
ft	m									10	20	30	40	50	60	70	80	90				
		0.0		GROUND SURFACE		%	%		N													
				TOPSOIL (300 mm)				0														Borehole open and dry upon completion of drilling
1		0.3		TILL - Brown Silty Sand, Some Clay, Trace Gravel, Moist, Compact - Occasional Organics to 1.1m	SS-1	83	18	3	6	×	○											
2									5													
3	1.0				SS-2	83	15		4						○	×						
4								3	23													
5		1.5		Very Dense	SS-3	100	3	50=5"	100+	○										×		
6																						
7	2.0																					
8					SS-4	100	6	50=5"	100+	○										×		
9																						
10	3.0				SS-5	100	6	50=4"	100+	○										×		
11																						
12																						
13	4.0																					
14																						
15					SS-6	100	6	46	100+	○										×		
16	5.0							50=4"														
17																						
18																						
19																						
20	6.0																					
21					SS-7	100	7	25	75	○								×				
22		6.6		END OF BOREHOLE				31														
23	7.0							44														
24																						

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH8-17

ELEVATION: 255.4 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
 ▨ AS - AUGER SAMPLE
 ▩ ST - SHELBY TUBE
 ▬ CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 703046E 4892430N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)										COMMENTS	
ft	m									10	20	30	40	50	60	70	80	90			
											w _p w _L Atterberg limits (%)										
											X "N" Value (blows / 0.3 m)										△ Field □ Lab
											RQD CONE										— 1.0 m
ft		m	0.0	GROUND SURFACE		%	%		N												
				TOPSOIL (300 mm)				0													
1		0.3		TILL - Brown Silty Sand, Some Clay, Trace Gravel, Moist, Compact - Occasional Organics to 1.1m	SS-1	88	21	2	5	X	○								Borehole open and dry upon completion of drilling		
2									3												
3	1.0					SS-2	100	19	50=1"	100+		○						X	WL - Dry 9/7/2017		
4																					
5		1.5		Damp, Very Dense	SS-3	100	7	27	100+		○							X	SS-3: 8% Gravel 56% Sand 36% Silt and Clay		
6								50=4"													
7	2.0																				
8					SS-4	100	5	30	74		○						X				
9								34													
10	3.0							40													
11					SS-5	100	6	34	82		○						X				
12								42													
13	4.0																				
14																					
15																					
16	5.0				SS-6	100	4	46	100+		○							X			
17								50=4"													
18																					
19																					
20	6.0	6.1		END OF BOREHOLE	SS-7	100	6	50=2"	100+		○							X	33 mm inside diameter piezometer installed to 6.1 m		
21																					
22																					
23	7.0																				
24																					

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH9-17

ELEVATION: 251.6 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- SS - SPLIT SPOON
 AS - AUGER SAMPLE
 ST - SHELBY TUBE
 CS - CORE SAMPLE
 ▴ - WATER LEVEL

UTM: +/- 17T 703145E 4892381N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)										COMMENTS			
ft	m									10	20	30	40	50	60	70	80	90					
GROUND SURFACE																							
TOPSOIL (300 mm)																						Borehole open and dry upon completion of drilling	
1		0.3	TILL - Brown Silty Sand, Some Clay, Trace Gravel, Moist, Compact - Occasional Organics to 0.6m	SS-1	83	25	2	5	×	○													
2				SS-2	100	7	14	27		○	×												
3	1.0				14	13																	
4																							
5			Brown Silt, Some Clay, Some Sand, Trace Gravel, Moist, Compact	SS-3	89	17	25	18		×									WL - Dry 9/7/2017				
6	2.0	1.7					7	11															
7			Brown Gravelly Silty Sand, Some Clay, Moist, Very Dense	SS-4	100	10	17	54	○		×									WL - Dry 10/17/2017			
8		2.4					22	32															
9																							
10	3.0																						
11				SS-5	100	8	24	38	○		×									SS-5: 31% Gravel 42% Sand 27% Silt and Clay 18% between 5-75 µm			
12							33	25															
13	4.0																						
14																							
15				SS-6	100	7	35	100+	○											51 mm inside diameter monitoring well installed to 5.6 m			
16	5.0						50=5"																
17																							
18																							
19			END OF BOREHOLE	SS-7	100	5	50=2"	100+	○														
20	6.0	6.1																					
21																							
22																							
23	7.0																						
24																							

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG, LR.GPJ, GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH10-17
ELEVATION: 250.7 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- SS - SPLIT SPOON
- AS - AUGER SAMPLE
- ST - SHELBY TUBE
- CS - CORE SAMPLE
- WATER LEVEL

UTM: +/- 17T 703105E 4892285N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.3	TOPSOIL (300 mm)				0				
1			TILL - Brown Silty Sand, Some Clay, Trace Gravel, Moist, Compact - Occasional Organics to 0.9m	SS-1	92	15	2	7	X		Borehole open upon completion of drilling
2							5				
3	1.0			SS-2	100	19	3	10	X		
4							4				
5							6				
6	2.0			SS-3	100	19	6	14	X		
7							8				
8		2.3	Brown Silty Sand, Some Clay, Trace Gravel, Wet, Loose	SS-4	100	14	2	9	X		Slight groundwater seepage encountered at 2.3 m during drilling
9							3				
10	3.0	3.0	SAND - Brown Sand, Some Silt, Trace Gravel, Damp, Very Dense	SS-5	94	6	39	66		X	
11							42				
12							24				
13	4.0						32				
14							38				
15		4.6	Moist	SS-6	100	7	24	70		X	
16	5.0						32				
17							38				
18											
19											
20	6.0										
21		6.2	END OF BOREHOLE	SS-7	100	6	50=5"	100+			
22											
23	7.0										
24											

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH11-17
ELEVATION: 246.5 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
- ▨ AS - AUGER SAMPLE
- ▨ ST - SHELBY TUBE
- ▨ CS - CORE SAMPLE
- ▼ - WATER LEVEL

UTM: +/- 17T 703134E 4892182N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)										COMMENTS
										△ Field □ Lab ○ Water content (%) H Atterberg limits (%) × "N" Value (blows / 0.3 m) ◆ RQD ⊙ CONE										
ft	m	0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90		
				TOPSOIL (300 mm)				0											Borehole open upon completion of drilling	
1		0.3		TILL - Brown Silty Sand, Some Clay, Trace Gravel, Moist, Compact - Occasional Organics to 0.8m	SS-1	83	22	2	5	×	○									
2									3											
3	1.0					SS-2	78	9	11	13	○	×								
4									6											
5								7												
6	2.0				SS-3	100	14	6	13	×										
7								7												
8								9												
9					SS-4	100	12	10	19	○	×									
10	3.0	3.0		Dense				14												
11					SS-5	72	10	17	35	○		×								
12								18											Slight groundwater seepage encountered at 4.6 m during drilling WL - 4.8 m 10/17/2017	
13	4.0																			
14																				
15	4.6	4.6		Wet, Compact				6												
16	5.0				SS-6	100	10	8	15	○	×								WL - 4.7 m 9/7/2017	
17								7												
18																			SS-7: 21% Gravel 48% Sand 31% Silt and Clay 20% between 5-75 µm	
19																				
20	6.0	6.1		Dense, With Gravel				9												
21					SS-7	100	6	20	47	○		×							51 mm inside diameter monitoring well installed to 6.1 m	
22		6.6		END OF BOREHOLE				27												
23	7.0																			
24																				

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG, LR.GPJ, GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH12-17
ELEVATION: 246.1 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group c/o Valdor Engineering

PROJECT: Proposed Residential Development - Fallis Line, Millbrook, Ontario

LOGGED BY: S. Shepherd

DATE: 23 August 2017

DRILLING COMPANY: Landshark Drilling

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from concept plan provided by Valdor Engineering with electronic title "16119_Fallis Line Subdivision_Preliminary Concept.pdf" by email dated July 11, 2017.

LEGEND

- ☒ SS - SPLIT SPOON
- ▨ AS - AUGER SAMPLE
- ▨ ST - SHELBY TUBE
- ▨ CS - CORE SAMPLE
- ▼ - WATER LEVEL

UTM: +/- 17T 703196E 4892253N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) ○ Water content (%) H Atterberg limits (%) X "N" Value (blows / 0.3 m)	△ Field □ Lab ◆ RQD ◎ CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
			TOPSOIL (460 mm)				0				
1		0.5	TILL - Brown Silty Sand, Some Clay, Trace Gravel, Moist, Compact - Occasional Organics to 0.9m	SS-1	75	17	2	4	X	○	
2							1				
3	1.0			SS-2	94	11	4	17		○	X
4							7				
5		1.5	Dense				12				
6		1.8	SAND - Brown Sand, Some Silt, Trace Gravel, Damp, Very Dense	SS-3	100	6	20	44		○	X
7	2.0						24				
8				SS-4	100	4	21	100+		○	X
9							50=5"				
10	3.0						30				
11				SS-5	100	7	40	90		○	X
12							50				
13	4.0										
14											
15				SS-6	100	6	50=5"	100+		○	X
16	5.0										
17		5.2	Wet								
18											
19											
20	6.0	6.1	Damp	SS-7	100	9	50=4"	100+		○	X
21		6.2	END OF BOREHOLE								
22											
23	7.0										
24											

Groundwater seepage encountered at 5.2 m during drilling



WL - 5.2 m
8/23/2017

BOREHOLE LOG GEOTECH 11148475-01, 17-08-22, BOREHOLE LOG_LR.GPJ GEOLOGIC.GDT 24/10/17



BOREHOLE No.: BH1D-21

ELEVATION: 248.0 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 3 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and SplitSpoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- SS - SPLIT SPOON
 AS - AUGER SAMPLE
 ST - SHELBY TUBE
 CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 703105.4E 4892846.0N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)										Field Lab		COMMENTS		
ft	m									w _p w _L										RQD CONE	m - 0.90 m			
		0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90						
				TOPSOIL (460mm)	SS-1	0		0	0	*											WL - 0.2 m 3/17/2021			
1		0.5		TILL - Clayey Silt, Few Sand, Trace Gravel, Very Soft, Brown, Moist Very Stiff	SS-2	100	17	0													- Borehole open upon completion with water level at approximately 3.7m			
2		0.8						9																
3	1.0							10																
4								11	21															
5								12																
6	2.0				SS-3	100	15	9																
7								9																
8								9																
9								15	24															
10	3.0	3.0		Stiff				15																
11								12																
12					SS-4	100	22	7																
13	4.0							8																
14								8	16															
15								8																
16	5.0	4.6		Wet				5																
17								5																
18					SS-5	100	19	5	11															
19								6																
20								6																
21	6.0	6.1		Hard																				
22		6.7		END OF BOREHOLE	SS-6	100	31	0	1															
23	7.0							0																
24								1																
								2																

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21



BOREHOLE No.: BH1S-21

ELEVATION: 248.0 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 3 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 703105.4E 4892846.0N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) X "N" Value (blows / 0.3 m) w _p w _L	Field Lab RQD CONE	COMMENTS
ft	m	0.0		GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.0		TOPSOIL (460mm)								
1		0.5		TILL - Clayey Silt Few Sand Trace Gravel, Very Soft, Brown. Moist								WL - 0.2 m 3/17/2021
2		0.8		Very Stiff								
3	1.0											
4												
5												
6	2.0											- Strata obtained from BH1D-21
7												
8		2.4		END OF BOREHOLE								- 50 mm diameter monitoring well installed to 2.3m
9												
10	3.0											
11												
12												
13	4.0											
14												
15												
16	5.0											
17												
18												
19												
20	6.0											
21												
22												
23	7.0											
24												



BOREHOLE No.: BH2-21

ELEVATION: 249.0 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 3 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and SplitSpoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 703243.9E 4892529.9N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)										COMMENTS	
ft	m									10	20	30	40	50	60	70	80	90			
		0.0		GROUND SURFACE		%	%		N												
		0.2		TOPSOIL (200mm)	SS-1A	67	26	3	6	X											- Borehole open and free of groundwater accumulation upon completion.
1				TILL - Sandy Silt, With Clay, Few Gravel, Loose, Dark Brown to Brown, Moist - Occasional Organics to 0.70m.	SS-1B		25	3													
2		0.7			SS-2A	50	21	3	32												
3	1.0			Dense, Brown	SS-2B		9	10													
4								22													
5		1.5		Very Dense				12													
6					SS-3	79	7	22	100+											X	
7	2.0							50=5"													
8		2.3		Dense	SS-4	67	11	13	33												
9								15													
10	3.0							18													
11					SS-5	100	8	14	32												
12								18													
13	4.0							16													
14																					
15		4.6		Very Dense	SS-6	13	6	50=3"	100+											X	
16	5.0																				
17																					
18																					
19	6.0																				
20		6.2		SAND - Sand, With Silt and Clay, Very Dense, Brown, Moist	SS-7A	46	9	32	100+											X	
21					SS-7B		4	50=5"													
22		6.7		END OF BOREHOLE																	
23	7.0																				
24																					

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21



BOREHOLE No.: BH3-21

ELEVATION: 255.1 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 4 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and SplitSpoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- SS - SPLIT SPOON
 AS - AUGER SAMPLE
 ST - SHELBY TUBE
 CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 702896.8E 4892621.1N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)	Water content (%)	Atterberg limits (%)	"N" Value (blows / 0.3 m)	Field	Lab	COMMENTS
ft	m				%	%		N							
	0.0		GROUND SURFACE												
	0.2		TOPSOIL (230mm)	SS-1A	54	34	2	5	X						
1			TILL - Clayey Silt, Few Sand, Trace Gravel, Firm, Dark Brown to Brown, Moist - Occasional Organics to 0.85m.	SS-1B		35	3								
2							2								
3	1.0			SS-2A	33	36	2	5	X						
4				SS-2B		33	2								
5							3								
6			Very Stiff				5								
7	2.0		Sand Seam at 1.8m	SS-3	100	19	10	16	X						
8							13								
9			Hard				12								
10				SS-4	100	10	20	36							
11	3.0		Very Stiff				16								
12			Sand Seam at 3.2m	SS-5	100	10	10	25							
13							15								
14			Hard				12								
15							50=5"	100+							
16	5.0			SS-6	46	10	12								
17															
18															
19															
20	6.0						18								
21				SS-7	100	21	16	37							
22	6.7		END OF BOREHOLE				21								
23	7.0						24								
24															

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21

- Borehole open upon completion with water level at approximately 6.4m

- SS3:
1% Gravel
11% Sand
45% Silt
43% Clay
($<0.002\text{mm}$)



BOREHOLE No.: BH4-21

ELEVATION: 257.0 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J.Scott

DATE: 3 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
 ☒ AS - AUGER SAMPLE
 ☒ ST - SHELBY TUBE
 ☒ CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 702801.4E 4892676.0N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu)		Sensitivity (S)		Water content (%)		Atterberg limits (%)		"N" Value (blows / 0.3 m)		RQD		COMMENTS
ft	m									w _p	w _L	Field	Lab	Field	Lab	Field	Lab	Field	Lab	Field	Lab	
		0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90				
		0.2		TOPSOIL (205mm)	SS-1A	83	33	2	5	×		○										
1				TILL - Clayey Silt, Few Sand, Trace Gravel, Firm, Dark Brown to Brown, Moist - Occasional Organics to 0.60m.	SS-1B		25	3				○										
2		0.6		Stiff, Brown				4														
3	1.0				SS-2	50	18	5		×	○											
4								5														
5								3														
6	2.0				SS-3	88	19	4		×	○											
7								5														
8		2.3		Very Stiff Sand Seam at 2.4m	SS-4	100	15	12				○	×									
9								10														
10	3.0	3.0		Hard, Occasional Cobbles	SS-5	46	9	14														
11								12														
12								17														
13	4.0							23														
14								50=4"	100+	○												
15																						
16	5.0				SS-6	21	7	50=5"	100+	○												
17																						
18																						
19																						
20	6.0	6.1		SAND - Sand, With Silt and Clay, Very Dense, Brown, Moist	SS-7	46	8	39		○												
21		6.4						50=5"	100+													
22				END OF BOREHOLE																		
23	7.0																					
24																						

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21



BOREHOLE No.: BH5D-21

ELEVATION: 262.4 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J.Scott

DATE: 5 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data. Well Tag Number A301561.

LEGEND

- ☒ SS - SPLIT SPOON
 ☒ AS - AUGER SAMPLE
 ☒ ST - SHELBY TUBE
 ☒ CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 702694.7E 4892571.5N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)										COMMENTS	
										w _p w _L Atterberg limits (%)											
											X "N" Value (blows / 0.3 m) ◆ RQD ⊙ CONE										
ft	m	0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90			
				TOPSOIL (915mm)	SS-1	45	19	9	11	X	○								- Borehole open and free of groundwater accumulation upon completion.		
1								8													
2								3											WL - Dry 3/17/2021		
3	1.0	0.9		FILL - Sand, With Silt and Clay, Very Loose, Brown, Moist	SS-2A	71	29	2	4	X		○									
4					SS-2B		7	2		○											
5		1.5		ORGANIC SILT	SS-3A	79	26	4	9	X		○							- SS4: 0% Gravel 82% Sand 11% Silt 7% Clay (<0.002mm)		
6		1.7		SAND - Sand, With Silt and Clay, Loose, Brown, Moist	SS-3B		5	4		○											
7	2.0							5													
8		2.3		Very Loose	SS-4	42	7	2	2	X	○										
9								1													
10	3.0	3.0		Dense	SS-5	67	7	14	31	○		X									
11								14													
12								17													
13	4.0							18													
14																					
15		4.6		Very Dense	SS-6	54	9	24	100+	○											
16	5.0							50=5"													
17																					
18																					
19																					
20	6.0																				
21		6.2		END OF BOREHOLE	SS-7	29	4	50=5"	100+	○											
22																					
23	7.0																				
24																					

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21



BOREHOLE No.: BH5S-21

ELEVATION: 262.4 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J.Scott

DATE: 5 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☐ SS - SPLIT SPOON
☐ AS - AUGER SAMPLE
☐ ST - SHELBY TUBE
☐ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 702694.7E 4892571.5N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) w _p w _L X "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
1			TOPSOIL (915mm)								WL - Dry 3/17/2021
2											
3	1.0	0.9	FILL - Sand, With Silt and Clay, Very Loose, Brown, Moist								- Strata obtained from BH5D-21
4											
5		1.5	ORGANIC SILT								
6		1.7	SAND - Sand, With Silt and Clay, Loose, Brown, Moist								
7	2.0										- 50 mm diameter monitoring well installed to 2.2m
8		2.2	END OF BOREHOLE								
9											
10	3.0										
11											
12											
13	4.0										
14											
15											
16	5.0										
17											
18											
19											
20	6.0										
21											
22											
23	7.0										
24											



BOREHOLE No.: BH6-21

ELEVATION: 259.1 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J.Scott

DATE: 5 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 702833.9E 4892513.0N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0		GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
				TOPSOIL (915mm)	SS-1	71	38	3	6	X		- Borehole open and free of groundwater accumulation upon completion.
1								2				
2								4				
3	1.0	0.9		FILL - Sand, With Silt and Clay, Dense, Brown, Moist	SS-2A	67	19	2	34			
4					SS-2B		10	5				
5		1.6		ORGANIC SILT	SS-3A	63	11	16	29			
6		1.8		TILL - Sandy Silt, With Clay, Few Gravel, Compact, Brown, Moist	SS-3B		22	14				
7	2.0				SS-3C		7	15				
8		2.3		Dense, Occasional Cobbles				14				
9					SS-4	100	7	14	32			
10	3.0	3.0		Very Dense				18				
11					SS-5	67	8	22	61			
12								25				
13	4.0							36				
14								32				
15					SS-6	13	6	50=3"	100+			
16	5.0											
17												
18												
19												
20	6.0	6.2		END OF BOREHOLE	SS-7	21	6	50=5"	100+			
21												
22												
23	7.0											
24												



BOREHOLE No.: BH7-21

ELEVATION: 259.3 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J.Scott

DATE: 4 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
 ▨ AS - AUGER SAMPLE
 ▩ ST - SHELBY TUBE
 ▬ CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 702936.2E 4892456.8N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%)										COMMENTS
ft	m									△ Field	□ Lab	w _p w _L	"N" Value (blows / 0.3 m)	◆ RQD	⊙ CONE					
		0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90		
				TOPSOIL (300mm)	SS-1A	63	27	4	10										- Borehole open and free of groundwater accumulation upon completion.	
1		0.3		TILL - Sandy Silt, With Clay, Few Gravel, Loose to Compact, Dark Brown to Brown, Moist - Occasional Organics to 0.75m. Compact, Brown	SS-1B		16	5												
2									4											
3	1.0	1.1				SS-2A	58	24	3	7										
4					SS-2B		9	4												
5								4												
6	2.0				SS-3	67	11	9	14											
7								7												
8								7												
9					SS-4	71	16	8	21											
10	3.0							13												
11								14												
12	3.7			Very Dense, Occasional Cobbles	SS-5	100	11	16	25										- SS5: 6% Gravel 34% Sand 46% Silt 14% Clay ($<0.002\text{mm}$)	
13								12												
14	4.0							8												
15																				
16	5.0				SS-6	17	6	50=4"	100+											
17																				
18																				
19																				
20	6.0																			
21	6.2			END OF BOREHOLE	SS-7	21	5	50=5"	100+											
22																				
23	7.0																			
24																				

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21

- Borehole open and free of groundwater accumulation upon completion.

- SS5:
6% Gravel
34% Sand
46% Silt
14% Clay (<0.002mm)



BOREHOLE No.: BH8-21

ELEVATION: 261.8 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 5 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 702771.1E 4892372.6N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%)										COMMENTS
ft	m									w_p w_L × "N" Value (blows / 0.3 m)	△ Field □ Lab	○ Water content (%) ◇ Atterberg limits (%)	× RQD ◎ CONE							
		0.0		GROUND SURFACE		%	%		N	10	20	30	40	50	60	70	80	90		
				TOPSOIL (255mm)	×	SS-1	27	1	5	×		○							- Borehole open and free of groundwater accumulation upon completion.	
1	0.3			TILL - Sandy Silt, With Clay, Few Gravel, Loose, Brown, Moist				2												
2								3												
3	0.8			Very Dense	×	SS-2	13	5	100+		○							×		
4	1.0							11												
5								50=1"												
6					×	SS-3	5	22	74		○					×				
7	2.0	2.0		Occasional Cobbles				37												
8					×	SS-4	5	27	100+		○							×		
9								44												
10								50=5"												
11	3.0				×	SS-5	6	35	91		○						×			
12								42												
13	4.0							49												
14								44												
15					×	SS-6	7	48	100+		○							×		
16	5.0							50=5"												
17																				
18																				
19																				
20	6.0				×	SS-7	7	37	100+		○							×		
21		6.4		END OF BOREHOLE				50=5"												
22																				
23	7.0																			
24																				



BOREHOLE No.: BH9-21

ELEVATION: 259.0 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 4 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
 ☒ AS - AUGER SAMPLE
 ☒ ST - SHELBY TUBE
 ☒ CS - CORE SAMPLE
 ▼ - WATER LEVEL

UTM: +/- 17T 702887.4E 4892348.3N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.3	TOPSOIL (255mm)	SS-1A	12	28	5	12	×	○	
1			TILL - Sandy Silt, With Clay, Few Gravel, Compact, Dark Brown to Brown, Moist - Occasional Organics to 0.75m. Brown	SS-1B		27	5				
2							7				
3		0.8					4				
4	1.0			SS-2	24	19	6	14	×	○	
5							8				
6				SS-3	19	19	7				
7	2.0						9				
8							6				
9				SS-4	24	15	8	14	×		
10	3.0						11				
11				SS-5	24	10	12	25	○	×	
12							13				
13	4.0						10				
14											
15	4.6		Dense	SS-6	24	17	19	41	○	×	
16	5.0						17				
17							24				
18							24				
19											
20	6.0		Very Dense, Occasional Cobbles	SS-7	22	10	10	100+	○		×
21		6.1					18				
22		6.5	END OF BOREHOLE				50=4"				
23	7.0										
24											

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21



BOREHOLE No.: BH10-21

ELEVATION: 253.0 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 4 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

UTM: +/- 17T 703013.4E 4892304.0N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) "N" Value (blows / 0.3 m)										COMMENTS	
ft	m									10	20	30	40	50	60	70	80	90			
		0.0		GROUND SURFACE		%	%		N												
		0.2		TOPSOIL (230mm)	SS-1A	71	24	3	6	X	O										- Borehole open and free of groundwater accumulation upon completion.
1				TILL - Sandy Silt, With Clay Few Gravel, Loose, Dark Brown to Brown, Moist - Occasional Organics to 0.30m	SS-1B		23	3			O										
					SS-1C		23	5			O										
2		0.8		Compact				3													
3	1.0				SS-2	92	22	4	10	X	O										
4								6													
5								7													
6	2.0				SS-3	83	24	12	20		X	O									
7								8													
8								10													
9		2.6		Dense, Occasional Cobbles	SS-4	88		32	28			X									
10	3.0							6													
11								22													
12								19													
13	4.0							16													
14								20													
15								26													
16		4.6		Very Dense, Occasional Cobbles	SS-6	42	16	25	100+		O								X		
17	5.0							50=3"													
18																					
19																					
20	6.0																				
21		6.2		END OF BOREHOLE	SS-7	16	6	50=4"	100+	O									X		
22																					
23	7.0																				
24																					

BOREHOLE LOG GEOTECH 11224019-DSG-21-03-19, GINT BOREHOLE LOGS, JS.GPJ GEOLOGIC.GDT 22/3/21



BOREHOLE No.: BH11D-21

ELEVATION: 254.9 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 4 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- SS - SPLIT SPOON
 AS - AUGER SAMPLE
 ST - SHELBY TUBE
 CS - CORE SAMPLE
 ▴ - WATER LEVEL

UTM: +/- 17T 702829.8E 4892241.8N

Depth		m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S)										COMMENTS	
ft	m									w _p w _L Atterberg limits (%)											
											X "N" Value (blows / 0.3 m) ◆ RQD ◎ CONE										
											△ Field □ Lab										
											— m — 0.85 m										
GROUND SURFACE											10 20 30 40 50 60 70 80 90										
TOPSOIL (275mm)																					
1	0.3			TILL - Clayey Silt, Few Sand, Trace Gravel, Firm, Dark Brown to Brown, Moist - Occasional Organics to 0.90m	SS-1A	75	33	5	5	X											- Borehole open upon completion with water level at approximately 6.5m
2					SS-1B		29	3	3												
3	0.9			Soft, Brown	SS-2A	67	21	3	4	X											- SS2B: 0% Gravel 6% Sand 54% Silt 40% Clay (<0.002mm)
4	1.0				SS-2B		25	2	2												
5	1.5			Stiff				3													
6	2.0				SS-3	100	10	6	7												
7								7	10												
8	2.3			Very Stiff				5													
9					SS-4	71	9	8													WL - 2.5 m 3/17/2021
10	3.0			Wet				8													
11					SS-5	100	16	8													- Groundwater seepage first observed at approximately 3.0 m
12								12													
13	4.0							10													
14																					
15								7													
16	5.0				SS-6	100	18	8													
17								11													
18																					
19																					
20	6.0							10													- 50 mm diameter monitoring well installed to 6.0m
21					SS-7	100	17	12													
22	6.7			END OF BOREHOLE				13													
23	7.0							14													
24																					



BOREHOLE No.: BH11S-21

ELEVATION: 254.9 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: Bromont Group

PROJECT: Geotechnical Investigation - 787 & 825 Fallis Line, Millbrook

LOGGED BY: J. Scott

DATE: 4 March 2021

DRILLING COMPANY: Landshark Group

METHOD: Solid Stem Augers and Split Spoons

NOTES: Ground surface elevation interpolated from ODTM Lidar Derived data.

LEGEND

- ☒ SS - SPLIT SPOON
☒ AS - AUGER SAMPLE
☒ ST - SHELBY TUBE
☒ CS - CORE SAMPLE
 - WATER LEVEL

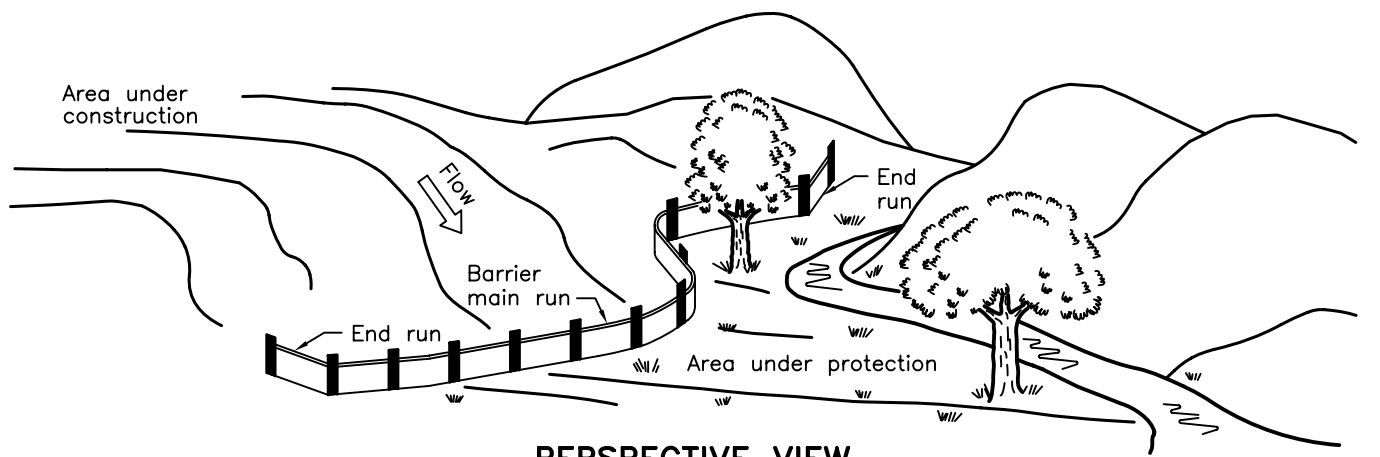
UTM: +/- 17T 702829.8E 4892241.8N

Depth	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Recovery	Moisture Content	Blows per 6 in. / 15 cm	Penetration Index	Shear test (Cu) Sensitivity (S) Water content (%) Atterberg limits (%) X "N" Value (blows / 0.3 m) w _p w _L	Field Lab RQD CONE	COMMENTS
ft	m	0.0	GROUND SURFACE		%	%		N	10 20 30 40 50 60 70 80 90		
		0.3	TOPSOIL (275mm)								
1			TILL - Clayey Silt, Few Sand, Trace Gravel, Firm, Dark Brown to Brown, Moist - Occasional Organics to 0.90m								
2			Soft, Brown								
3	1.0	0.9									
4											
5		1.5	Stiff								
6											
7	2.0										
8		2.3	END OF BOREHOLE								
9											
10	3.0										
11											
12											
13	4.0										
14											
15											
16	5.0										
17											
18											
19											
20	6.0										
21											
22											
23	7.0										
24											

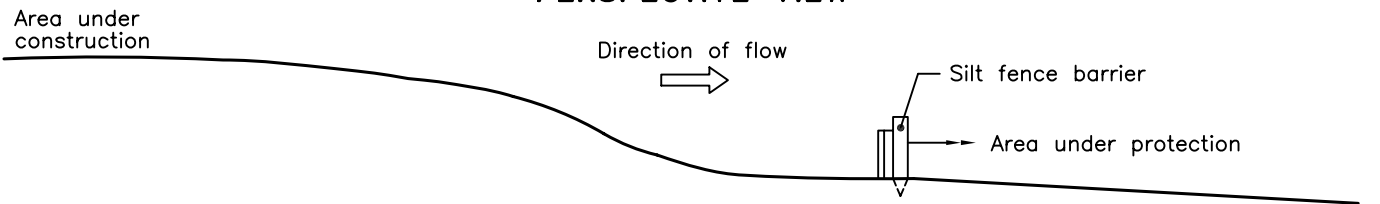
WL - 0.6 m
3/17/2021- Strata obtained
from BH11D-21- 50 mm diameter
monitoring well
installed to 2.3m

APPENDIX “I”

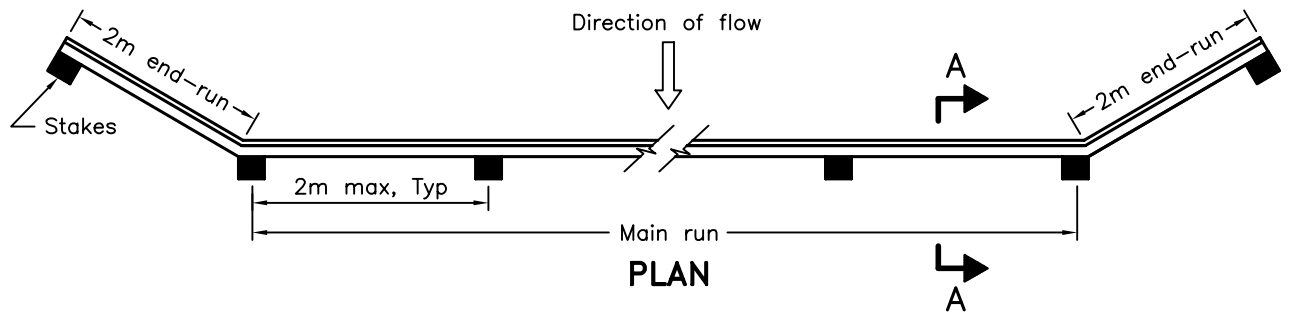
Erosion & Sediment Control Details



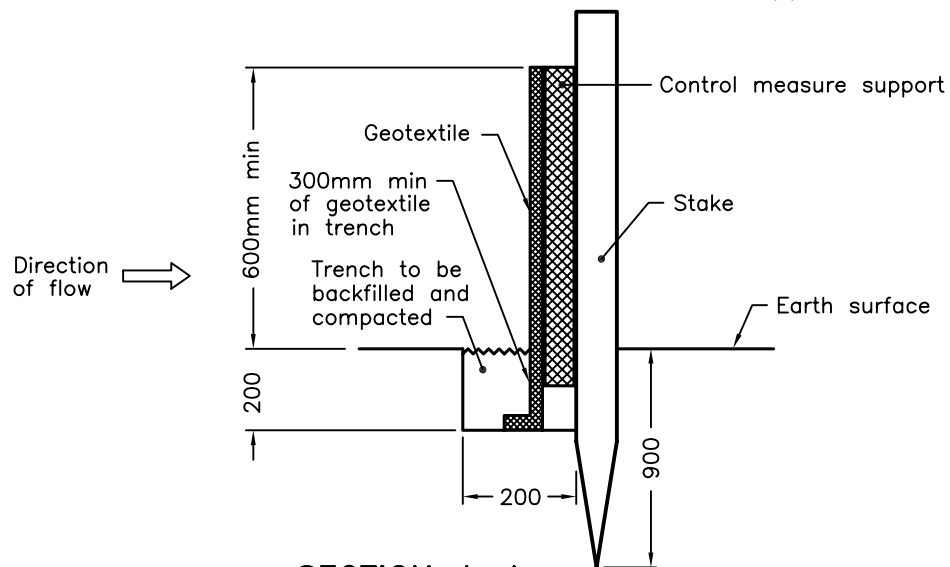
PERSPECTIVE VIEW



SECTION



PLAN



SECTION A-A

NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

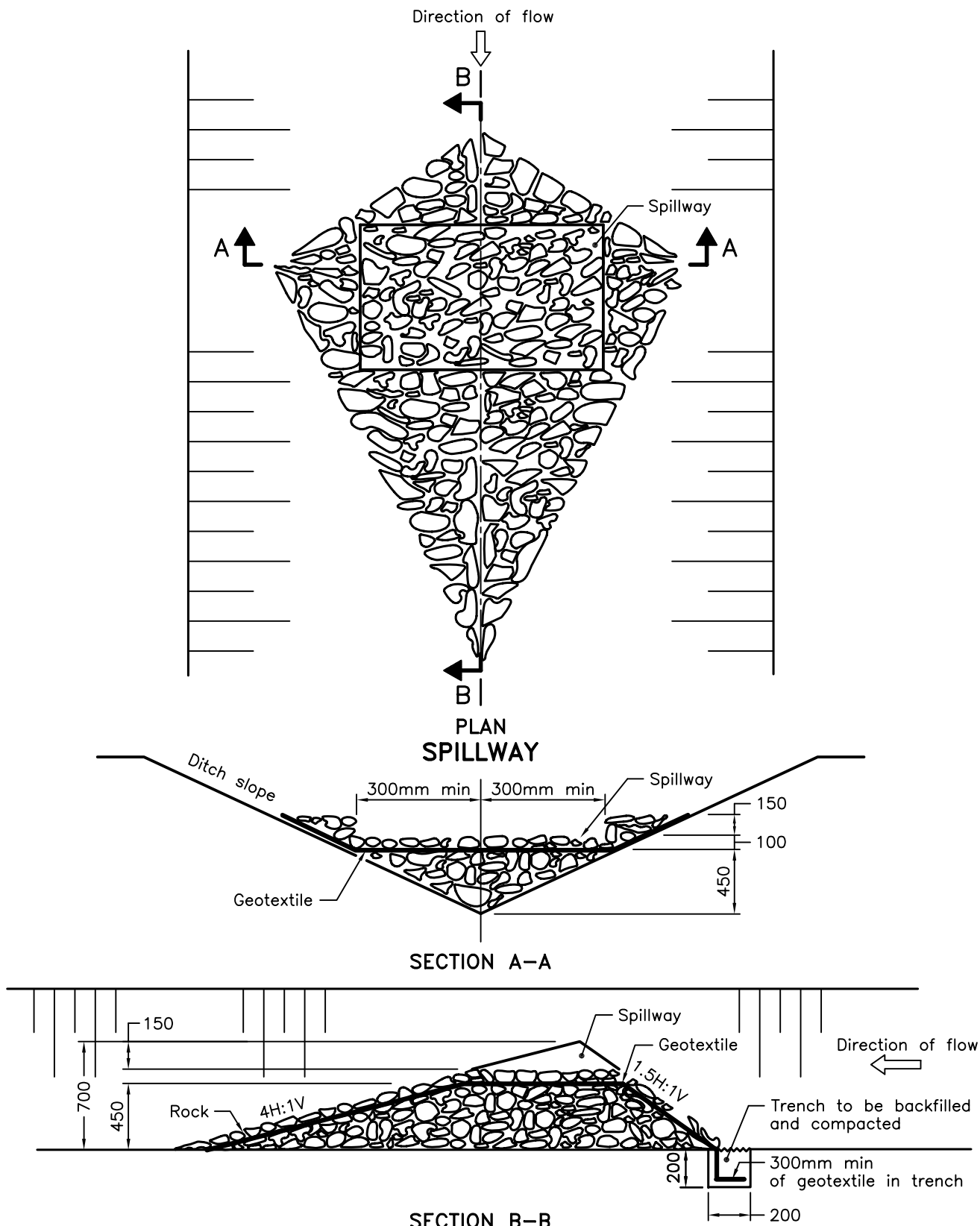
Nov 2006

Rev 1

**HEAVY-DUTY
SILT FENCE BARRIER**



OPSD 219.130



NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2006

Rev 1

ROCK FLOW CHECK DAM

V-DITCH



OPSD 219.210

APPENDIX “J”

Typical Joint Utility Trench Detail

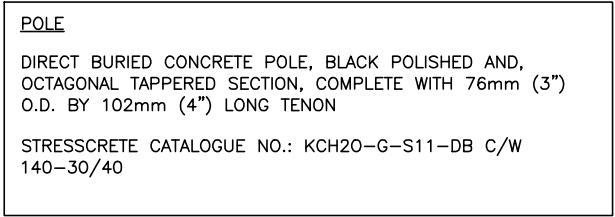
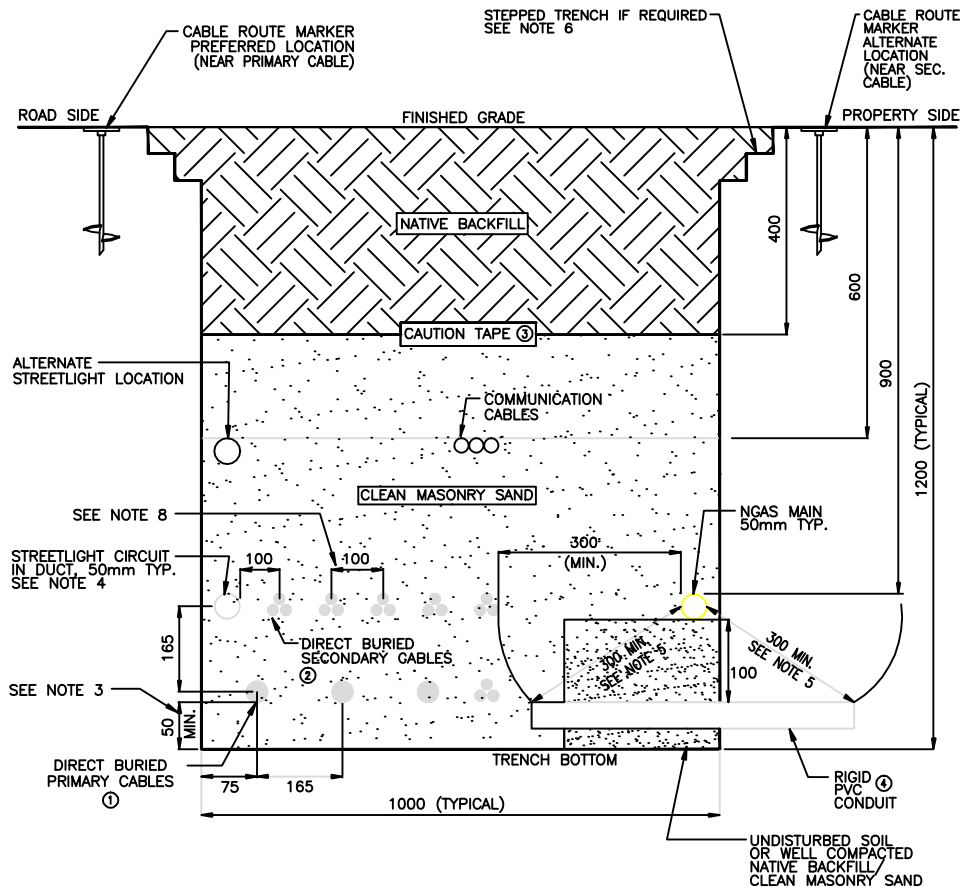


FIGURE J1



NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS STATED OTHERWISE.
2. ALL SEPARATIONS AND DEPTHS OF BURIAL ARE MINIMUM.
3. IN THE PRESENCE OF SHARP ROCK, DEBRIS OR RUBBLE, INCREASE SAND PADDING TO 100mm.
4. STREETLIGHT WIRE DUCT MAY BE INSTALLED AT A REDUCED BURIAL DEPTH, UP TO A MINIMUM DEPTH OF 600mm. SEPARATIONS TO SUPPLY CABLE BASED ON MAXIMUM STREETLIGHT DUCT DIAMETER OF 50mm.
5. MUST MAINTAIN 300mm MINIMUM FROM ALL EXPOSED SUPPLY CABLES TO GAS MAIN. WHEN CROSSING GAS MAIN AND IF 300mm OF CLEAR VERTICAL SEPARATION IS NOT ACHIEVABLE, SECONDARY CABLES SHALL BE INSTALLED IN SHORT LENGTH OF RIGID PVC CONDUIT.
6. CONSTRUCTION, STEPPING AND/OR SUPPORTING OF THE TRENCH WALL TO CONFORM TO THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT.
7. NON-REQUIRED CIRCUITS OR JOINT USE COMPONENTS MAY BE OMITTED PROVIDED THAT CLEARANCES AND SEPARATIONS ARE MAINTAINED. PRIMARY CABLES (IF PRESENT) MUST BE INSTALLED ON THE BOTTOM ROW OF SUPPLY CABLES. SECONDARY CABLE BUNDLES MAY BE SUBSTITUTED IN PLACE OF PRIMARY CABLE(S) WHEN REQUIRED.
8. INTERMITTENT CONTACT IS ALLOWABLE BETWEEN SECONDARY CABLES WHERE REQUIRED.

PART #	MASTER MATERIAL #	DESCRIPTION	QTY.
①	30010134 30008080	CABLE PRIMARY, 28MM, U/GROUND, 2/0 AWG, AL CABLE PRIMARY, 28MM, U/GROUND, 300 KCMIL, CU	
②	30005908 30005915	SERVICE CABLE, U/GROUND, 3/0MM, 3 COND, AL SERVICE CABLE, U/GROUND, 250KCMIL, 3 COND, AL	
③	20002181	CAUTION TAPE	
④	30007542	RIGID PVC CONDUIT	

REFERENCES:

- SECTION 1 - DEFINITIONS
SECTION 3C - CONSTRUCTION GUIDE
SECTION 16 - MATERIALS

02 JULY 2011		GENERAL REVISIONS		PC
Rev. No.	Issue Date	Revision	Drawn By	Approved By
			Chk	Date

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Hydro One Networks Inc.

Drawn: **P. CIARMOLI** Approved: ***** Date: **JULY.20.2011**

JOINT TRENCH - POWER, COMMUNICATION & GAS DISTRIBUTION LINES - TYPICAL

Dwg. No. **DU-03-206.1** Rev. **02**

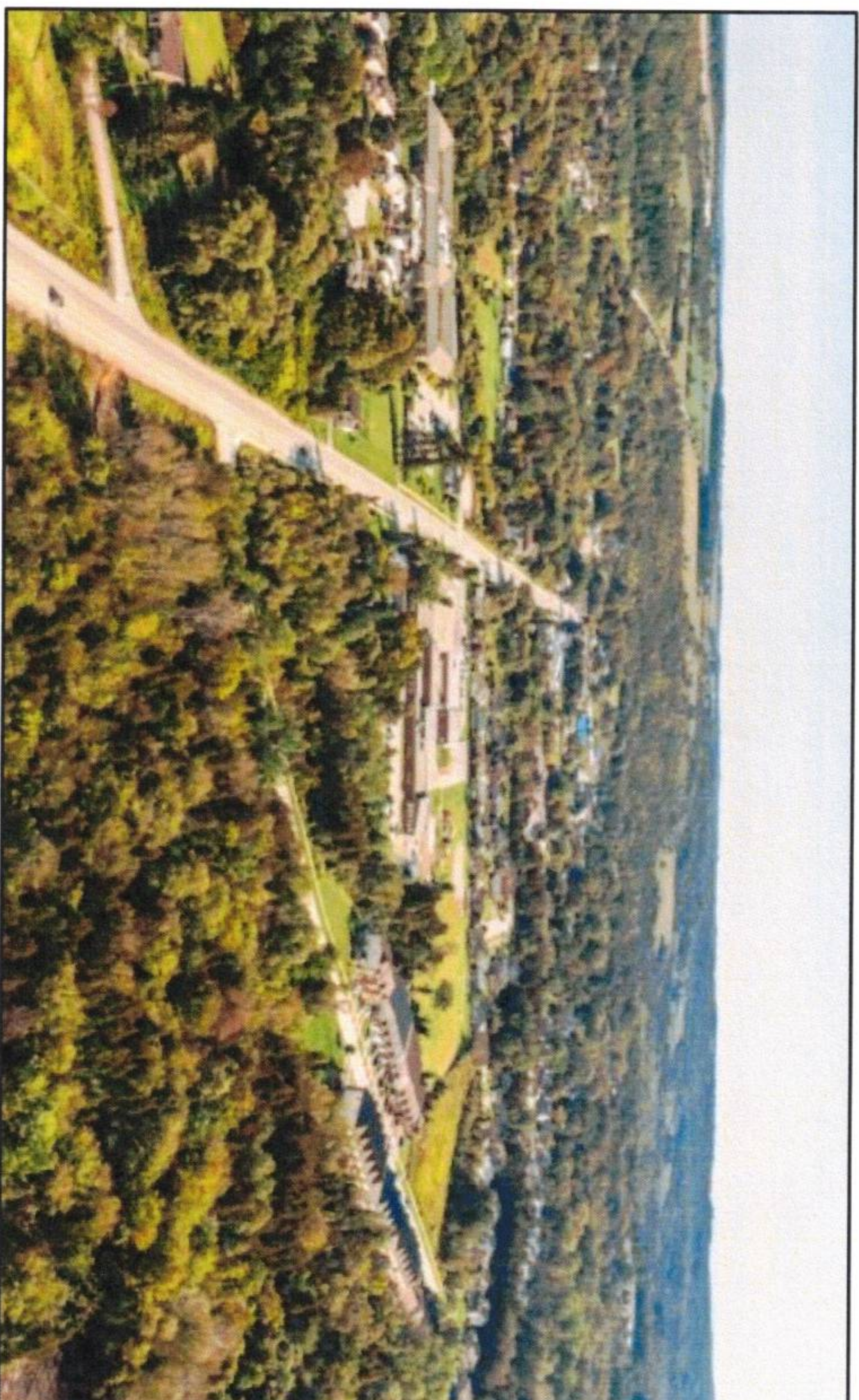
APPENDIX “K”

Growth Management Strategy & Master Servicing Study Update

Council Presentation

Township of Cavan Monaghan

October 18, 2021



Growth Management Strategy & Master Servicing Study Update



R.V. Anderson Associates Limited
engineering • environment • infrastructure



PURPOSE OF GROWTH MANAGEMENT STRATEGY (G.M.S.) UPDATE



- The Growth Plan (2019) now requires upper-tier municipalities to plan for long-term population and employment growth to the year 2051.
- To conform with the Growth Plan, upper-tier municipalities must have new Official Plans approved by July 2022.
- In addition to the above, Council have also requested that the scope of the G.M.S. be expanded to specially review Special Study Area No. 1 (SSA-1) as a potential location for future development in the Township over the long-term.
- As a part of this process, the Township of Cavan Monaghan is updating its population, housing and employment forecasts to include the 2041 to 2051 timeframe.

PETERBOROUGH COUNTY GROWTH FORECAST



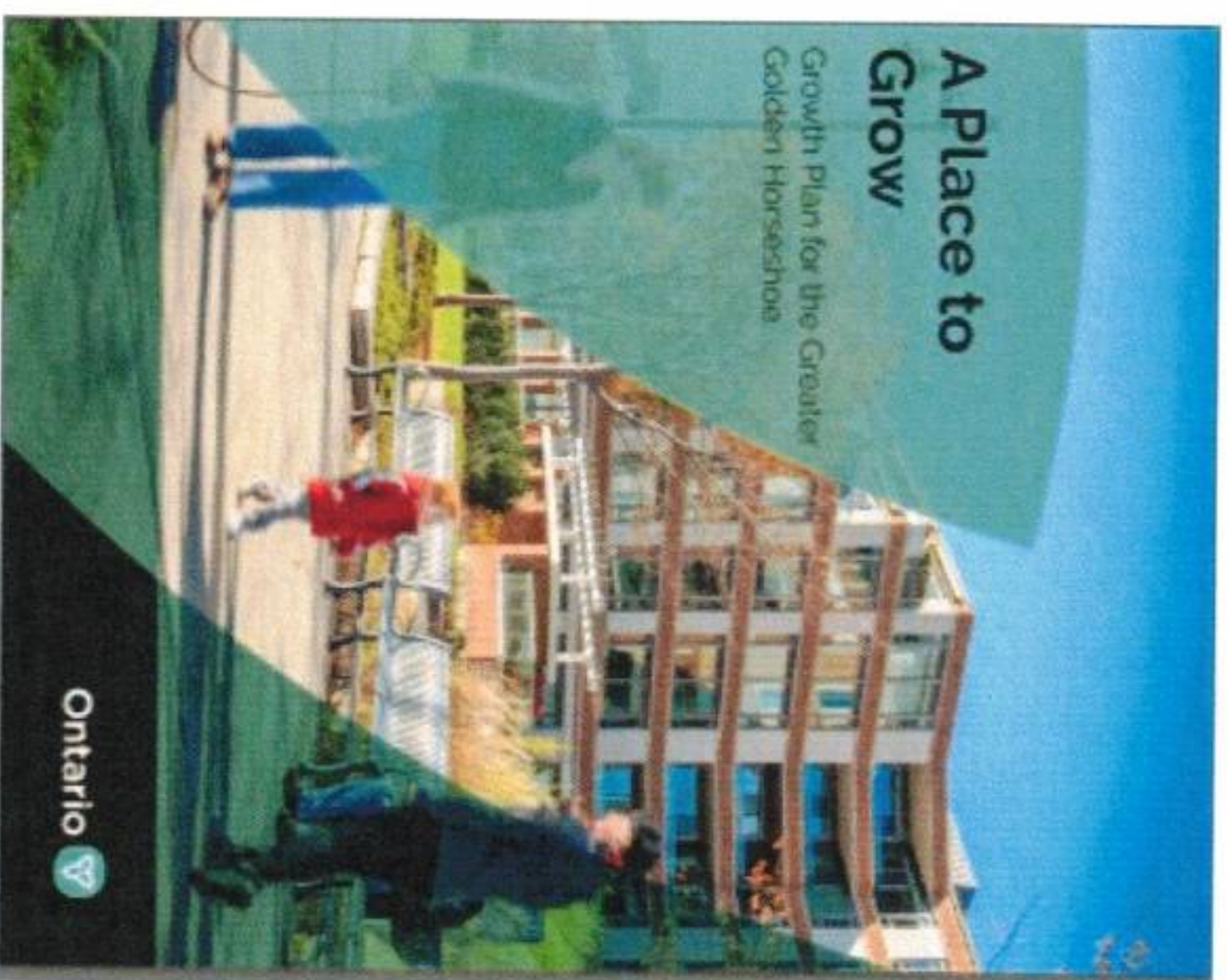
Growth Plan Schedule 3 Growth Forecast for Peterborough County, 2016 to 2051

25,000
population

10,000
jobs

Annual
population
growth rate
of 1% and
employment
growth rate
of 1.4%

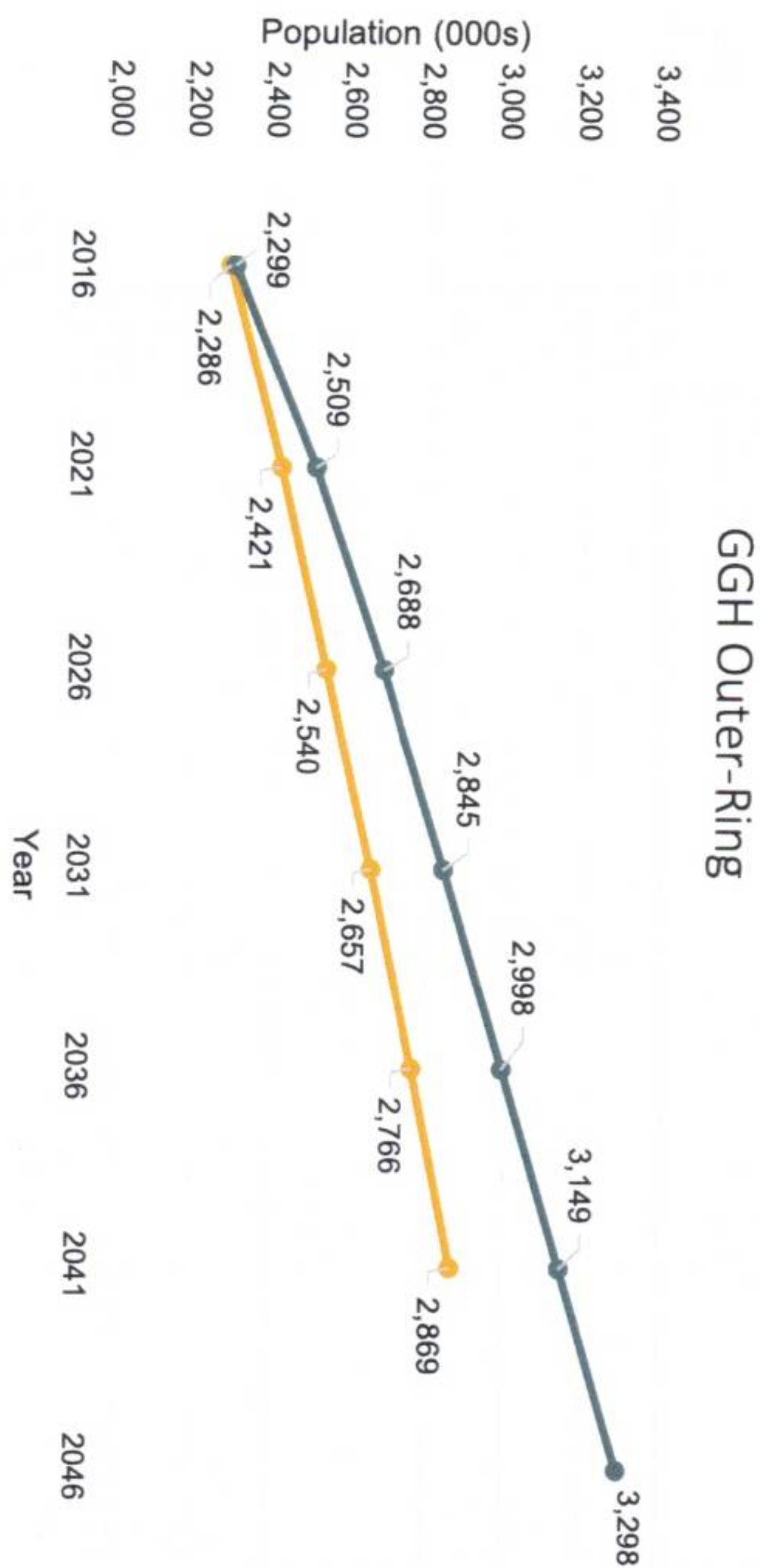
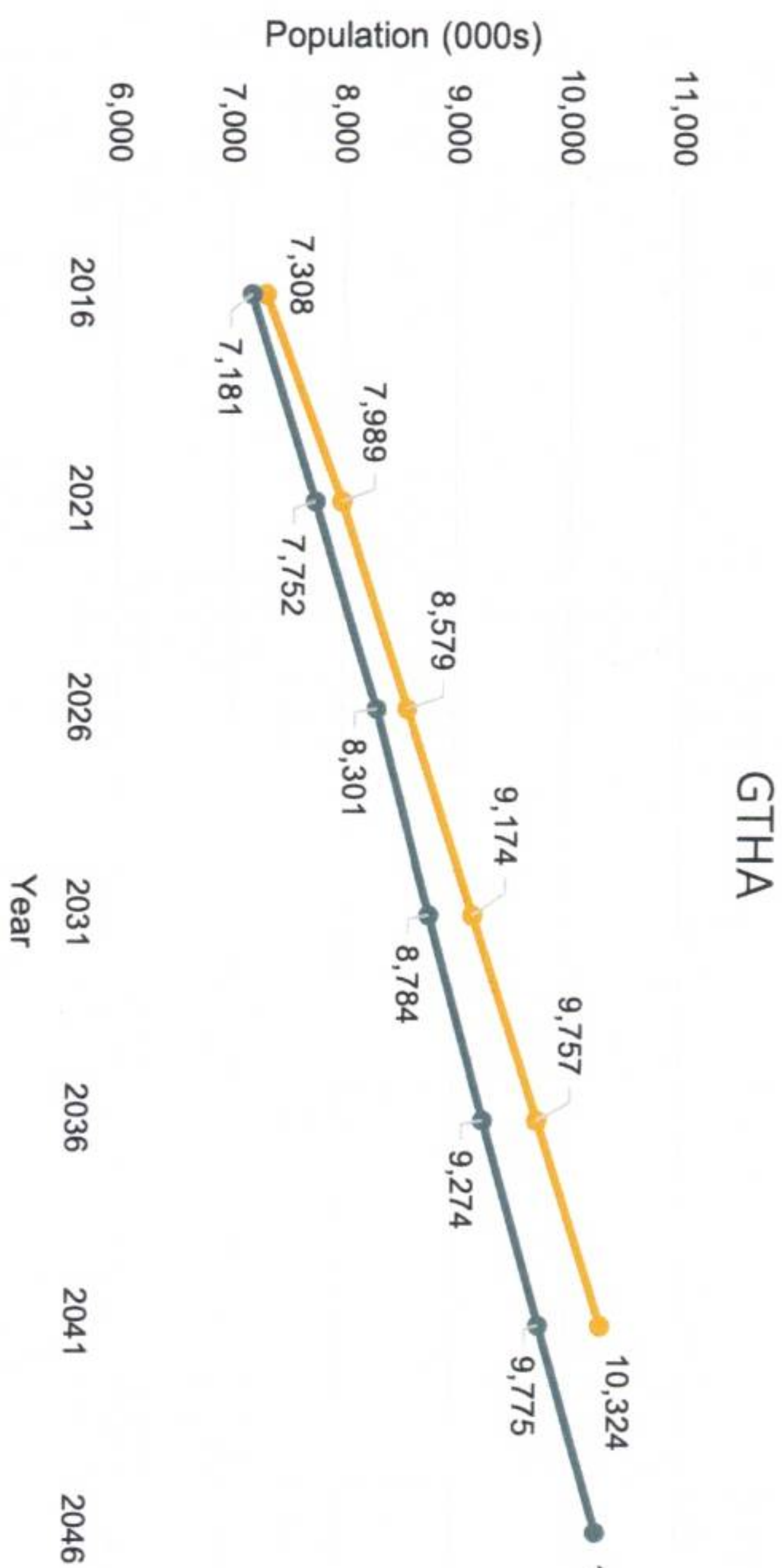
- Schedule 3 Growth Forecasts are to be treated as minimums.
- Higher growth forecast alternatives are permitted, providing that the Municipal Comprehensive Review (M.C.R.) demonstrate that the higher growth scenario meets the Growth Plan, 2020 policy objectives regarding housing choice and labour force supply.





PETERBOROUGH COUNTY GROWTH DRIVERS AND DISRUPTORS

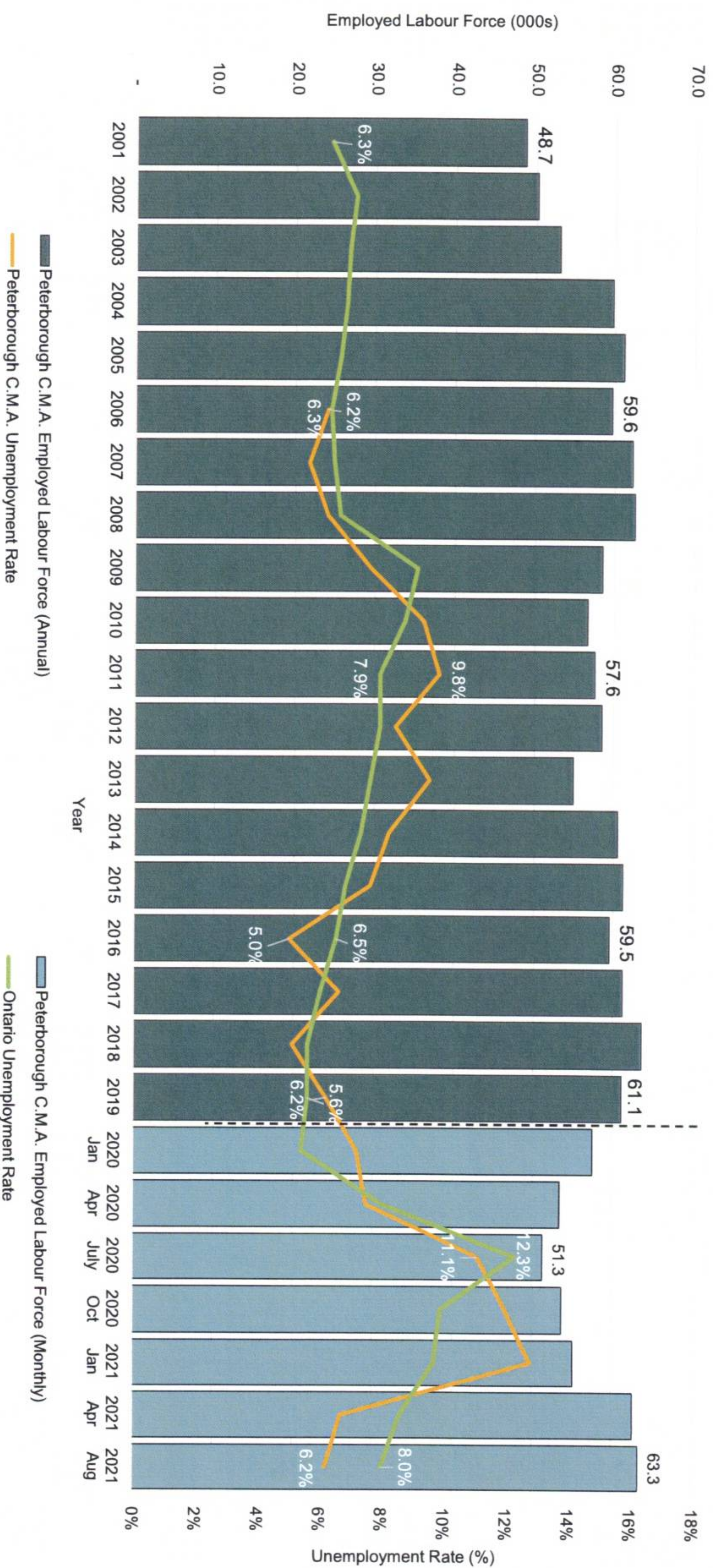
GTHA and GGH Outer Ring Ministry of Finance Population Forecasts



Source: Derived from Ministry of Finance Ontario Population Projections Spring 2017 and Summer 2020 releases, by Watson & Associates Economists Ltd., 2020.

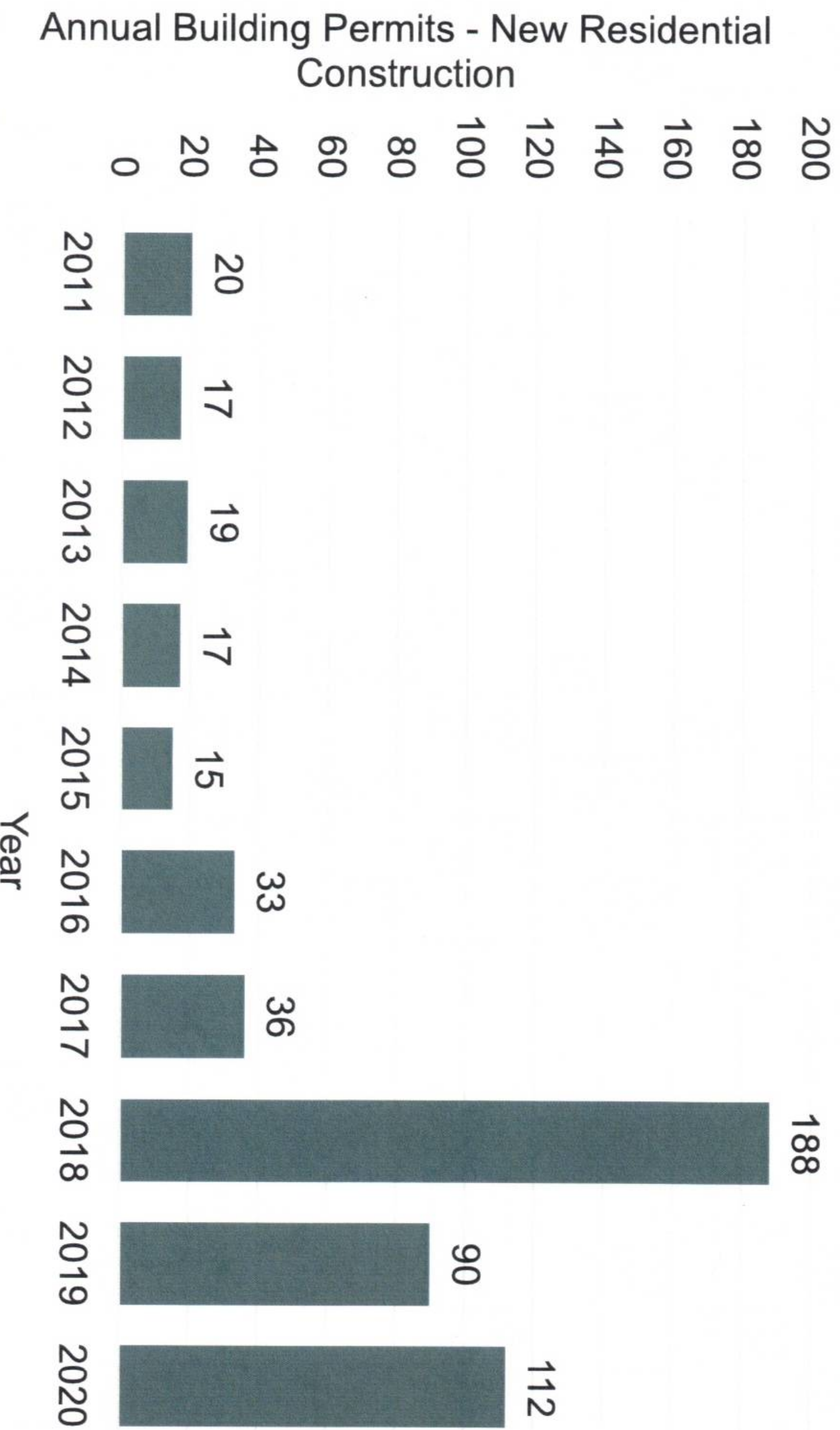
Source: Derived from Ministry of Finance Ontario Population Projections Spring 2017 and Summer 2020 releases by Watson & Associates Economists Ltd., 2020.

5 PETERBOROUGH C.M.A. LABOUR FORCE TRENDS, 2006 TO 2021 YTD



Note: Statistics Canada Labour Force Survey and Census labour force statistics may differ.
Source: Statistics Canada Data Tables 14-10-0098-01 and 14-10-0380-01. By Watson & Associates Economists Ltd., 2021.

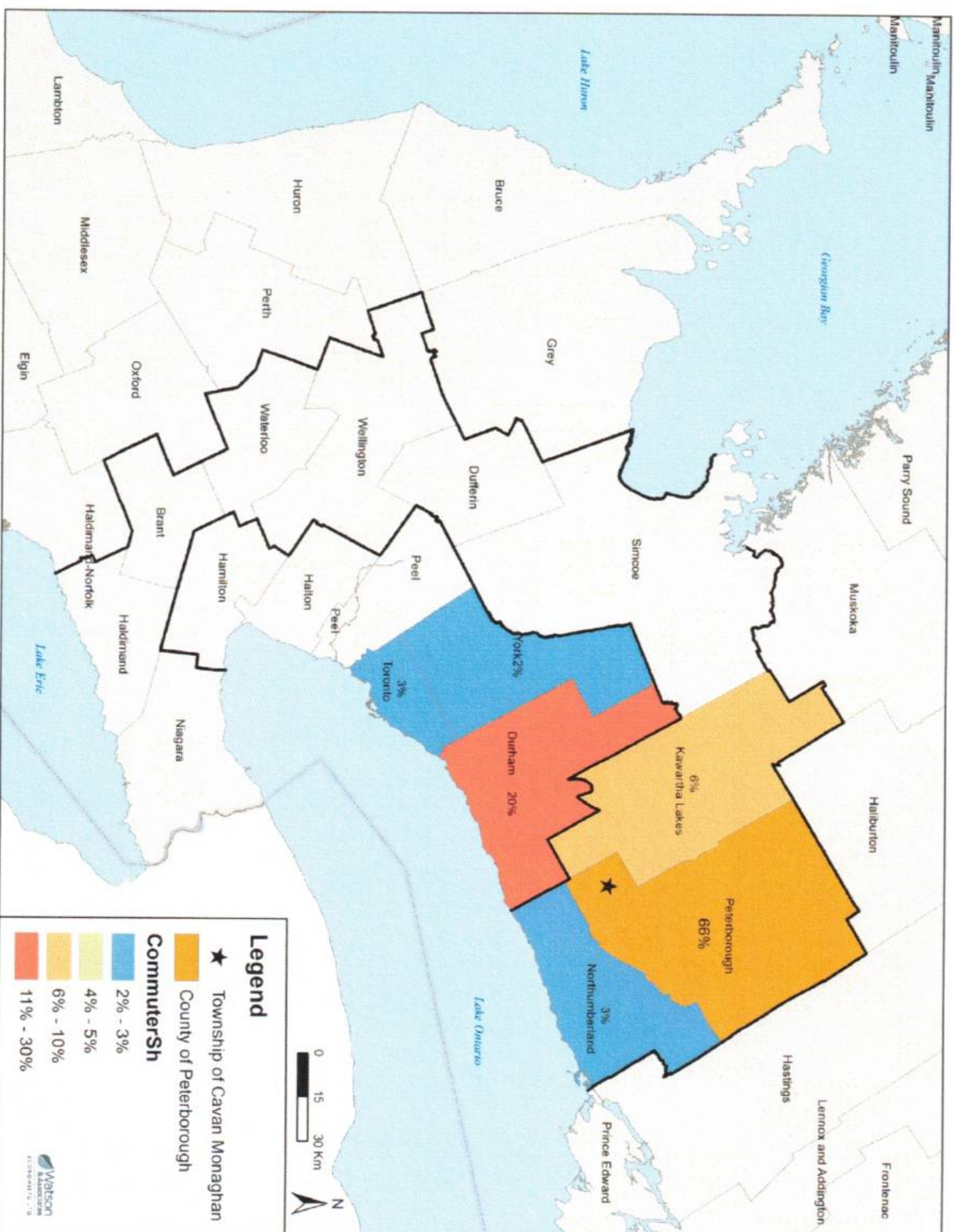
6 CAVAN MONAGHAN HISTORICAL BUILDING PERMIT ACTIVITY, 2011 TO 2020



Source: 2011 to 2014 from Statistics Canada monthly building permit data and 2015 to 2020 from the Township of Cavan Monaghan. Figure by Watson & Associates Economists Ltd., 2021.
Note: Building permit activity does not account for demolitions.

REGIONAL CONTEXT

- Township of Cavan Monaghan Commuter-Shed

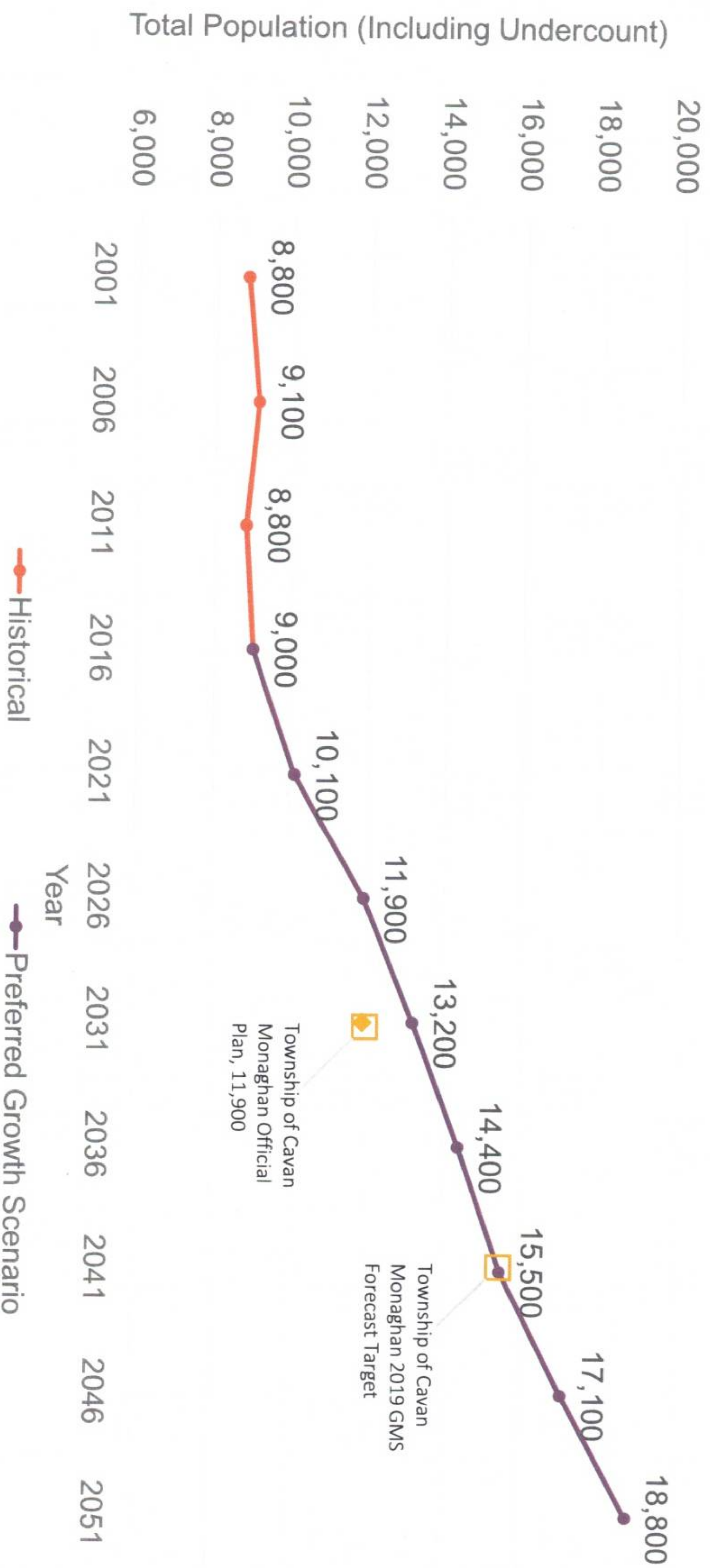


- 1,078,000 increase in Primary Commuter Shed jobs from 2016-2051.
- 1.1% Annual employment growth rate 2016-2051.
- Primary commuter shed is 95% of the Townships' total commuter shed.

Township of Cavan Monaghan Primary Commuter Shed Employment Forecast			
2016	2051	2016-2051	
2,435,000	3,513,000	1,078,000	

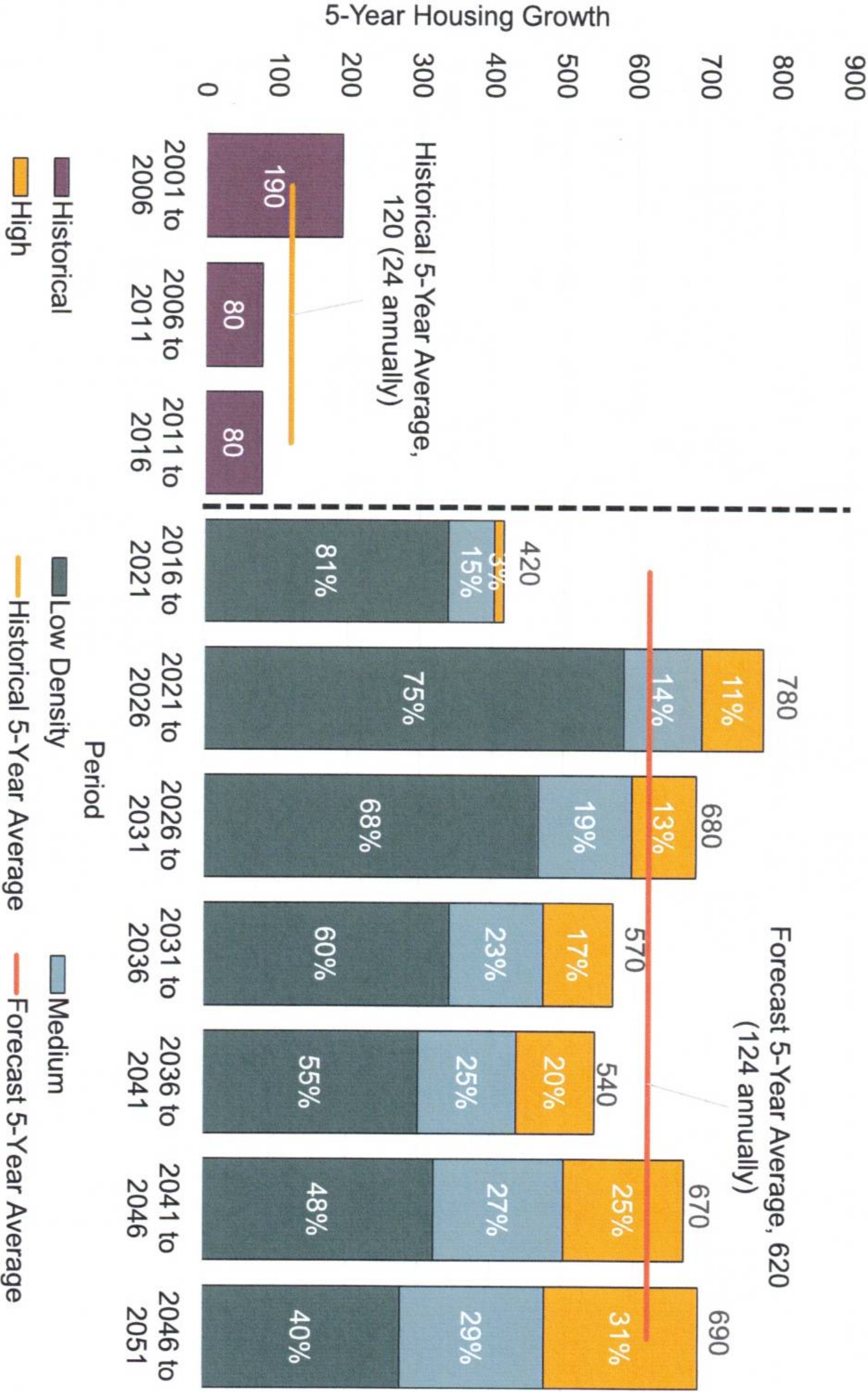
Preliminary Population, Housing, and Employment Forecasts

TOWNSHIP OF CAVAN MONAGHAN POPULATION GROWTH SCENARIOS, 2016 TO 2051



Source: 2001 to 2016 from Statistics Canada Census. Forecast by Watson & Associates Economists Ltd., 2021.
Note: Population includes the net Census undercount estimated at 2.5%.

CAVAN MONAGHAN HOUSING FORECAST BY TYPE, 2016 TO 2051

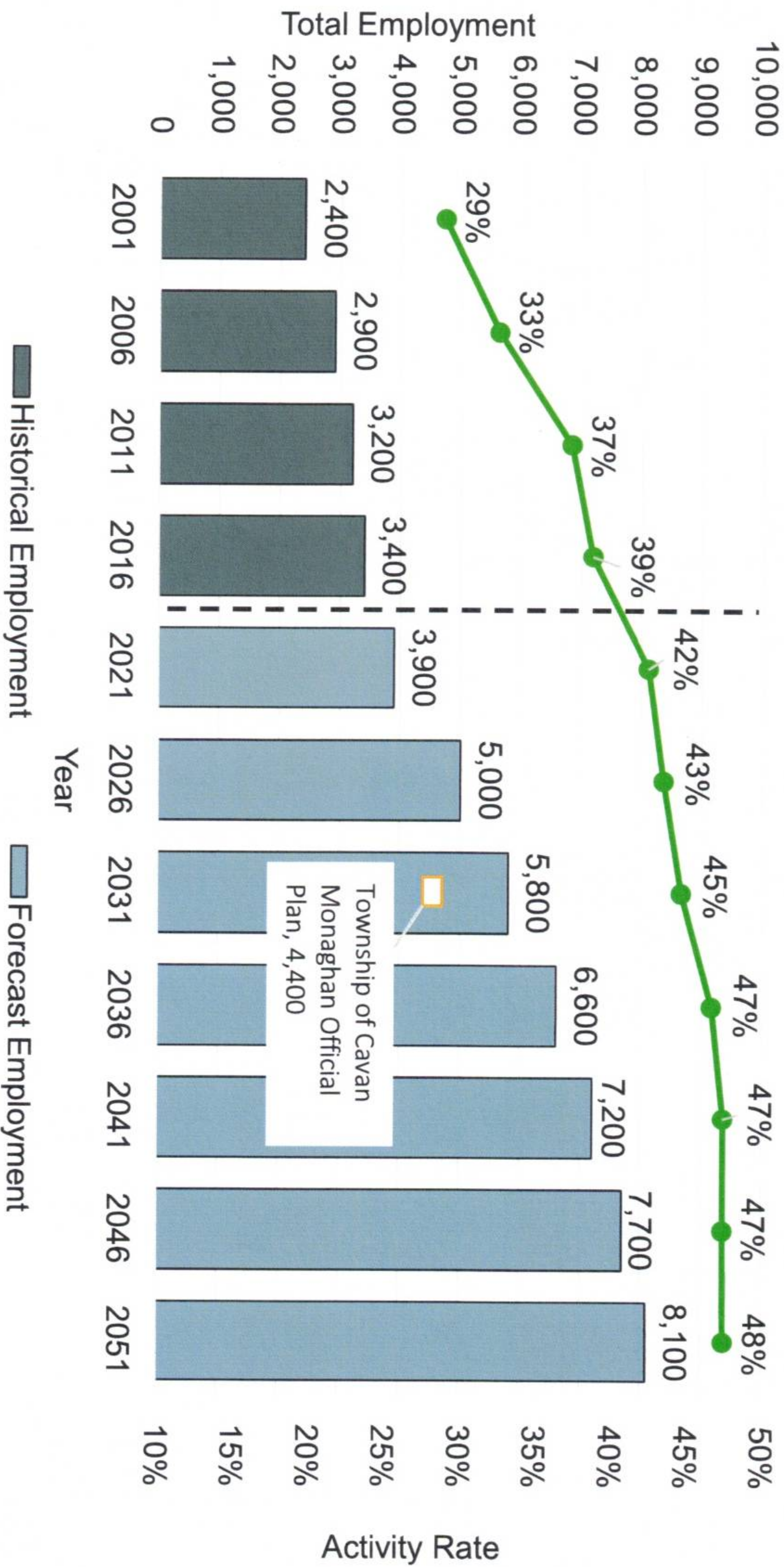


Source: Statistics Canada Census, 2001 to 2016. Forecast by Watson & Associates Economists Ltd., 2021.

TOWNSHIP OF CAVAN MONAGHAN INTENSIFICATION OUTLOOK



TOWNSHIP OF CAVAN MONAGHAN EMPLOYMENT FORECAST, 2016 TO 2051



Source: 2001 to 2016 from Statistics Canada place of work data including work at home and no fixed place of work. Forecast by Watson & Associates Economists Ltd., 2021.
Note: Numbers have been rounded.

TOWNSHIP OF CAVAN MONAGHAN

GROWTH FORECAST, 2016 TO 2051



Total Population (Including Undercount) ¹	Historical		Incremental Growth 2001-2016	Forecast			Incremental Growth 2016-2051	Annual Growth Rate	
	2001	2016		2031	2041	2051		2001-2016	2016-2051
Peterborough County	56,600	57,200	600			82,000	24,800	0.1%	1.0%
Township of Cavan Monaghan	8,800	9,000	200	13,200	15,500	18,800	9,800	0.2%	2.1%
Cavan Monaghan Growth Share of Peterborough County			33%				40%		

¹ Includes the net Census undercount estimated at 2.5%.

Total Employment ¹	Historical		Incremental Growth 2001-2016	Forecast			Incremental Growth 2016-2051	Annual Growth Rate	
	2001	2016		2031	2041	2051		2001-2016	2016-2051
Peterborough County	15,000	15,900	900			26,000	10,100	0.4%	1.4%
Township of Cavan Monaghan	2,400	3,400	1,000	5,800	7,200	8,700	5,300	2.3%	2.7%
Cavan Monaghan Growth Share of Peterborough County			111%				52%		

¹ Includes 'no fixed place of work' employment.

Millbrook Master Servicing to 2041

OUTLINE

- Existing Conditions of Facilities (2019)
- Servicing of Short-Term Growth (~2026)
- Servicing of Long-Term Growth (2041)
- Growth Beyond 2041
- Questions and Comments

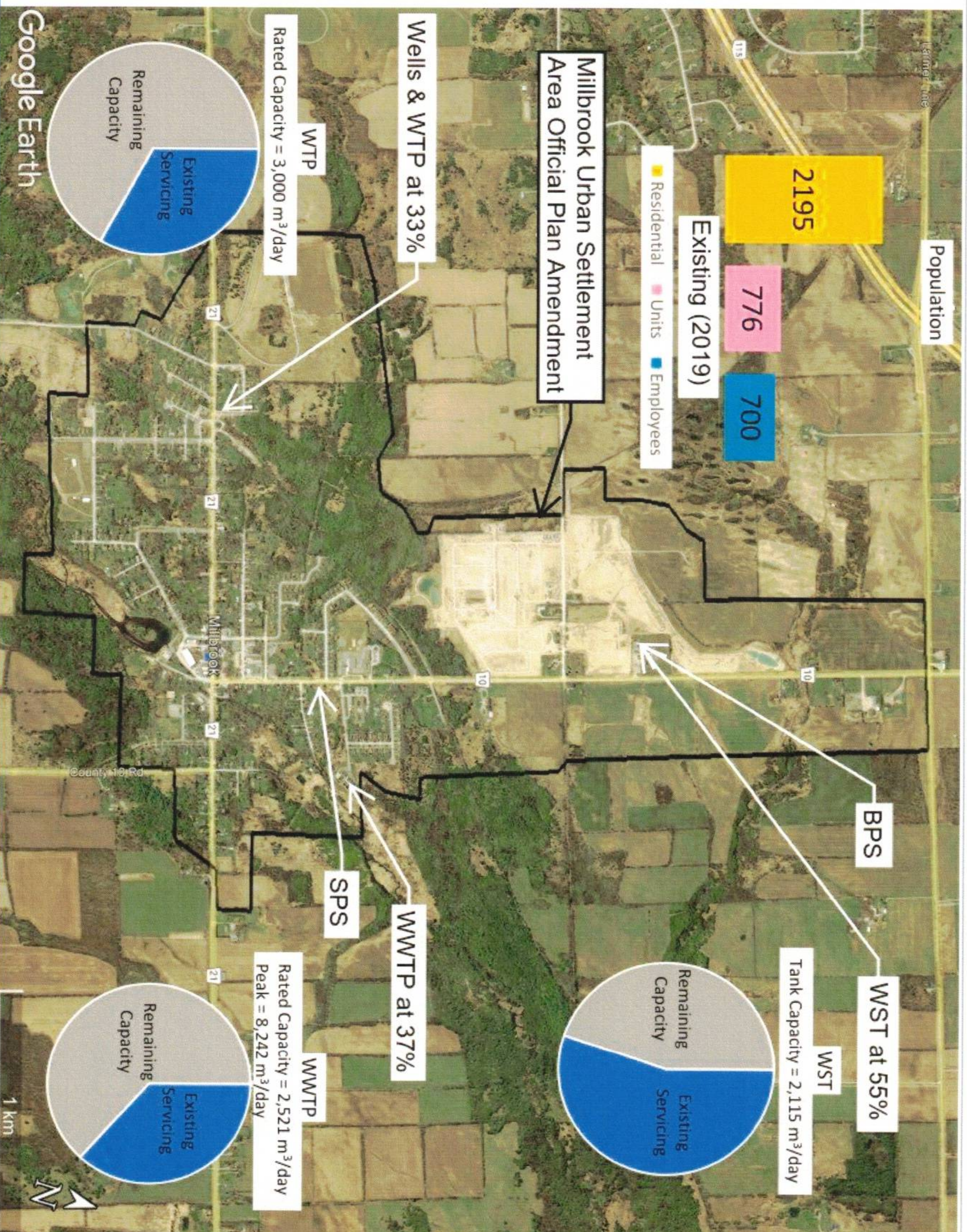
ACRONYMS

- TCM: Township of Cavan Monaghan
- WWTP: Wastewater Treatment Plant
- WTP: Water Treatment Plant
- WST: Water Storage Tank
- SPS: Sewage Pumping Station
- BPS: Booster Pumping Station
- ICI: Institutional, Commercial and Industrial

EXISTING CONDITIONS OF FACILITIES (2019)

- Servicing for:
 - 776 residential units
 - 2,195 residential population
 - 700 employees
- Servicing usage:
 - WWTP operating at 31% of rated capacity 2,521 m³/day and 37% of peak capacity of 8,242 m³/day
 - WTP operating at 33% of 3,000 m³/day rated capacity
 - WST operating at 55% of 2,115 m³ storage volume

EXISTING CONDITIONS OF FACILITIES (2019)



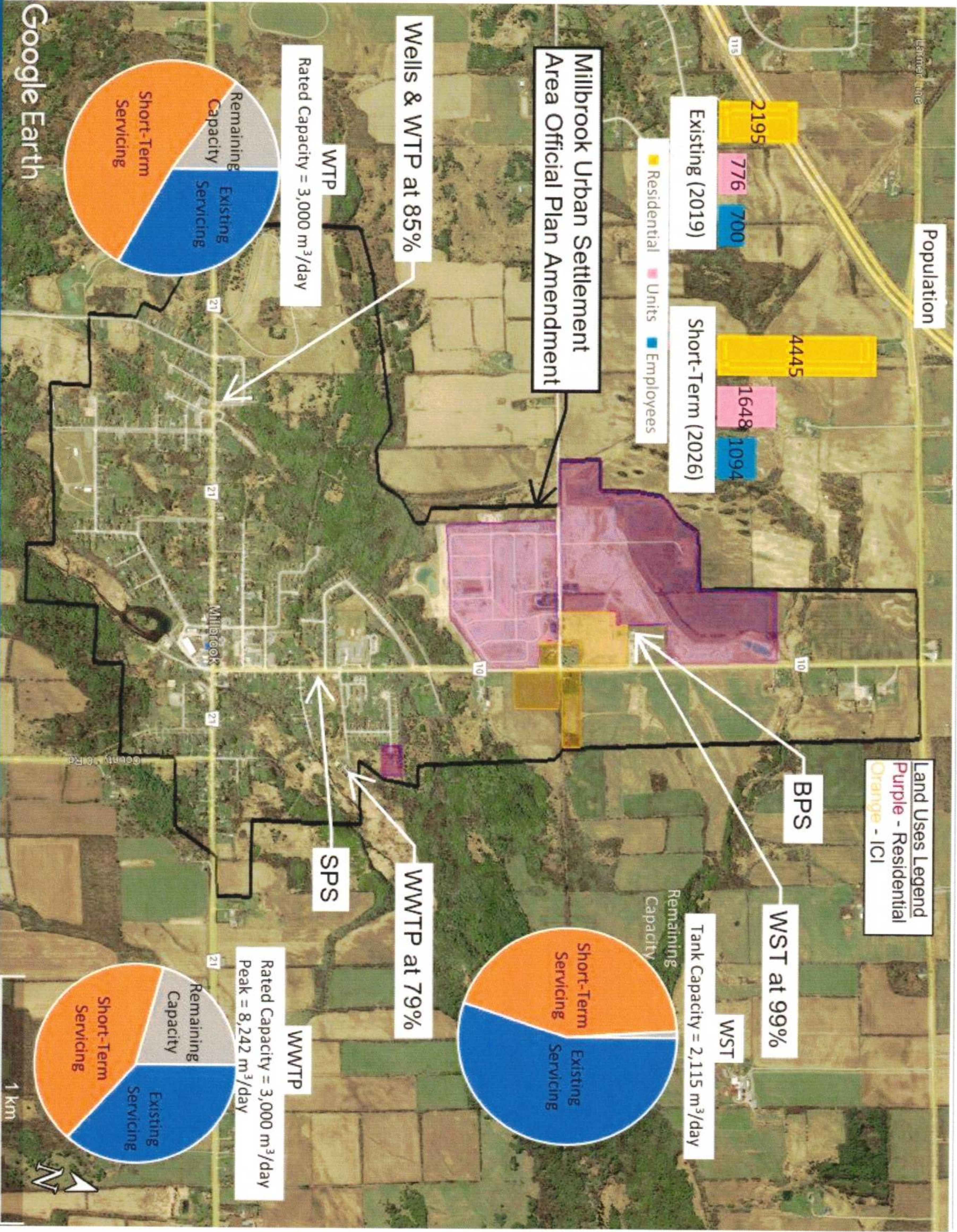
SERVICING OF SHORT-TERM GROWTH (~2026)

- Planned and in progress growth includes:
 - Towerhill South (345 units)
 - Towerhill North (718 units)
 - Coldbrook Drive (former Nina Court) (32 units)
 - Various ICI properties
- Servicing for:
 - 1,648 residential units (872 additional from existing)
 - 4,445 residential population (2,250 additional from existing)
 - 1,094 employees (394 additional from existing)

SERVICING OF SHORT-TERM GROWTH (~2026)

- Required facility upgrades:
 - Stress testing and re-rating the WWTP to 3,000 m³/day (with associated upgrades)
 - Possible upgrades to Tupper St. SPS
 - Booster Pumping Station capacity expansion
 - No further Class EA is required prior to design and construction, unless land acquisition or bldg. expansions are required
 - Total preliminary cost estimate (engineering + capital) of ~\$1.4M (Anticipated to be funded by Development Charges)
- Servicing usage:
 - WWTP operating at 37% of 3,000 m³/day rated capacity and 79% of 8,242 m³/day peak capacity
 - WTP operating at 85% of 3,000 m³/day rated capacity
 - WST operating at 99% of 2,115 m³ storage volume

SERVICING OF SHORT-TERM GROWTH (~2026)



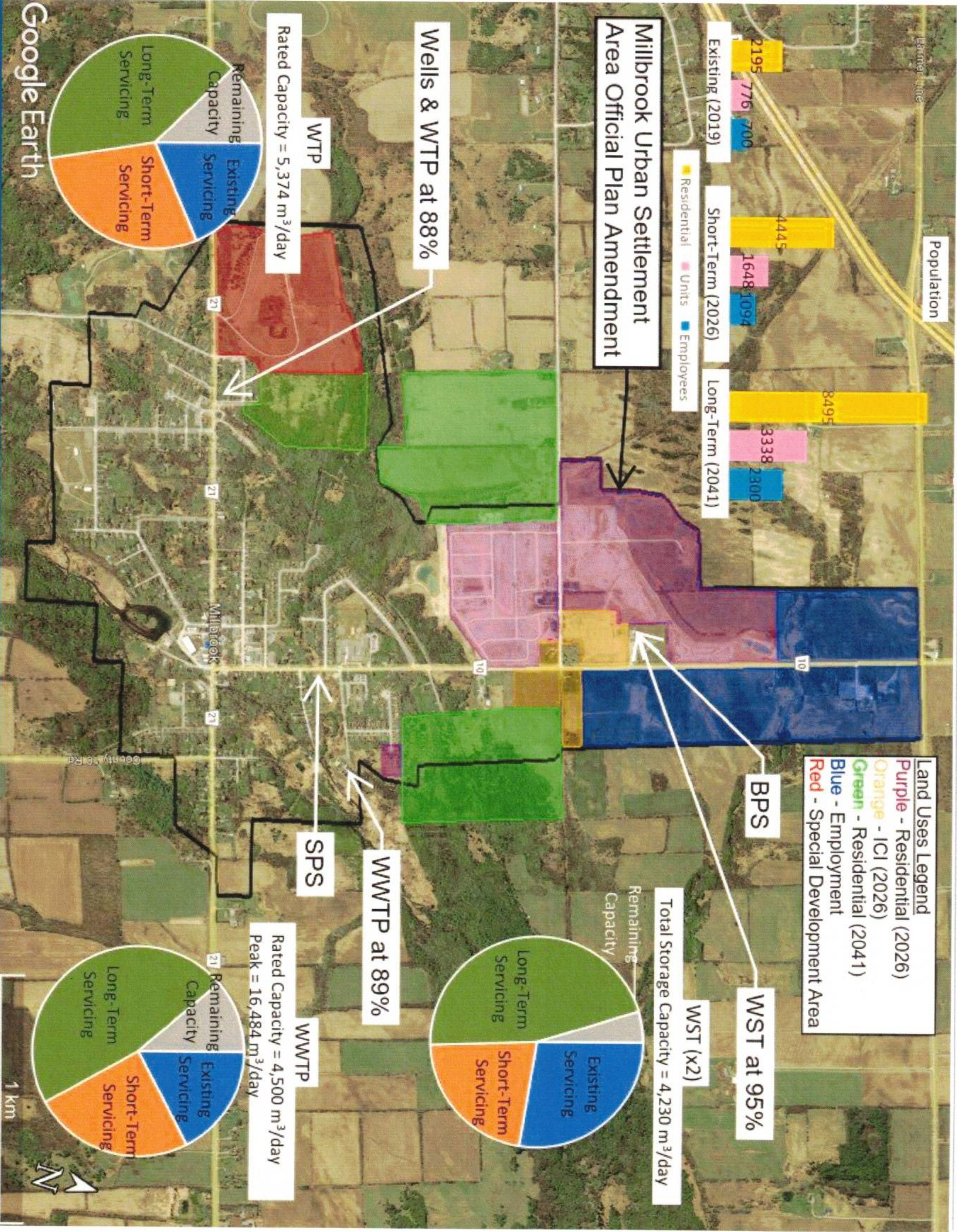
SERVICING OF LONG-TERM GROWTH (2041)

- Active and anticipated applications:
 - Fallis Line East (244 units) - active
 - Fallis Line West (696 units) - active
 - Turner Street (85 units) - active
 - Duke Street (192 units) - anticipated
 - Downtown intensification - ongoing
 - Northern employment areas – anticipated
- Servicing for:
 - 3,338 residential units (1,690 additional from 2026; 2,562 additional from existing)
 - 8,495 residential population (4,050 additional from 2026; 6,300 additional from existing)
 - 2,300 employees (1,206 additional from 2026; 1,600 additional from existing)

SERVICING OF LONG-TERM GROWTH (2041)

- Required facility upgrades:
 - WWTP expansion (addition of 3rd train)
 - Potential new SPS for North employment lands
 - Groundwater exploration, WTP expansion (well supply and treatment)
 - New BPS (depending where growth occurs)
 - Construction of new 2,115 m³ WST (location dependent on where growth occurs)
 - These upgrades will require another Class EA prior to design and construction
 - Total project (engineering + capital) cost estimate of ~\$38M (Anticipated to be funded by Development Charges)
- Servicing usage:
 - WWTP operating at 89% of expanded rated capacity of 4,500 m³/day
 - WTP operating at 88% of expanded rated capacity of 5,374 m³/day
 - WSTs operating at 95% of both tanks, with a total storage volume of 4,230 m³

SERVICING OF LONG-TERM GROWTH (2041)



GROWTH BEYOND 2041

- Baxter creek assimilative capacity cannot support additional wastewater effluent beyond 2041 based on the current regulation requirements and limit of technology
 - Therefore, it will prevent any additional growth in Millbrook
 - However, the design criteria and technology may change over time and can be reassessed in future
- Millbrook groundwater supply source (well field) near its capacity
- Forecasted Township of Cavan Monaghan growth will need to occur outside of Millbrook
- Further investigation and discussions are needed to consider growth beyond 2041 and where that might be located

NEXT STEPS

- Public Works to provide an updated report to Council on next steps.
- Peterborough County will be providing an update on local municipal growth projections on October 29th.
- Watson and Township Staff will work with Peterborough County to discuss the growth and land needs to 2051 in the Township of Cavan Monaghan.
- After these discussions, Watson will finalize the updated GMS that Staff will bring back to Council at a later date.
- Upcoming Water and Wastewater Master Servicing Study Public Information Centre at a later date.
- Public works to provide final Master Servicing recommendations to Council at a later date.

QUESTIONS AND COMMENTS

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