

September 30, 2019

Project Number: P1581

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Attention: Mr. Steve Pichette P.Eng

**Subject: Proposed Redevelopment of Kanata Golf and Country Club:
SWM Pond Sizing**

J.F. Sabourin and Associates (JFSA) were commissioned to complete a Storm Water Management (SWM) pond sizing for the proposed development at the site of the existing Kanata Golf and Country Club at 7000 Campeau Drive, Ottawa. The modelling work outlined in this memo builds on the 2017 Mississippi Valley Conservation Authority (MVCA) Watts Creek hydrologic model. The MVCA 2017 model was updated to reflect the proposed development based on the plan provided in August 2019 by David Schaeffer Engineering Limited (DSEL). Using this plan, SWM ponds were sized to mitigate the proposed development's impacts on the operations of the Beaver Pond or the downstream watercourses (Kizell Drain and Watts Creek). The following memo outlines the impacts of the proposed development on both the operations of the existing Beaver Pond and downstream watercourses.

Note that there have been various 100-year target release rates set for the Beaver Pond over the past few years. The following outlines the various maximum allowable release rates for the pond and their sources:

- Environmental Compliance Approval (2008) - 0.96 m³/s
- AECOM Study (2011-2015) - 1.20 m³/s
- MVCA Floodplain Mapping study (2017) - 1.02 m³/s
- AJ Robinson (quoted in the 2017 MVCA study) - 1.35 m³/s

Using the 2017 MVCA model of record as a starting point, various model parameters were adjusted to produce hydrographs that more accurately reflected those observed at the field monitoring locations within the storm sewer system of Kanata Lakes. Full details of this calibration process are documented in JFSA's September 2019 report titled "Kanata Golf and Country Club 2018-2019 Monitoring and Model Calibration". This calibrated model, for existing conditions, was considered the baseline for the various scenarios assessed in this memo. Note that for any future development scenarios, City of Ottawa default hydrologic parameters were used for those areas.

The following is a brief description of the scenarios assessed in this study:

- **Existing Conditions- (Ex-Calib):**

Reflective of the current conditions (2019) with various model parameters adjusted to more accurately reflect the field-collected data.

- **The Kanata Golf and Country Club Development with SWM controls- (Ex-Calib + KGCC+SWM):**

Reflective of existing conditions with the proposed redevelopment of the Kanata Golf and Country Club in place with Storm Water Management (SWM) ponds conceptually sized to mitigate impacts downstream.

- **KNL Development - (Ex-Calib+KNL):**

Reflective of existing conditions with the inclusion of the KNL Developments Stages 7, 8 & 9 in place as per MVCA's floodplain mapping study.

- **The Kanata Golf and Country Club Development with SWM controls + KNL Development - (Ex-Calib + KGCC+SWM+KNL):**

Reflective of existing conditions with the KNL Development Stages 7, 8 & 9 in place and the proposed redevelopment of the Kanata Golf and Country Club with Storm Water Management (SWM) ponds.

The various scenarios discussed above were assessed using a range of design storms. Table 1 outlines the peak flows into and out of the Beaver Pond as well as at the critical erosion site identified approximately 500 m downstream of the pond outlet. To provide some context to the calibration process, the results from the 2017 MVCA existing conditions model have also been provided. Note that the updated model calibration process, which also removed the two underground storage routing commands that were previously inserted in the model to provide a better fit with measured pond levels, resulted in the peak flows out of the Beaver Pond under existing conditions to increase by anywhere from 0.190 m³/s (for the 100-year flow) to 0.310 m³/s (for the 10-year flow), when compared to the flows computed by the 2017 MVCA's existing conditions model. Consequently, the updated calibrated existing conditions model was considered to set the targets for matching post-development flows for the purposes of this analysis. Accordingly, the SWM ponds within this development were sized to ensure that these targets are met.

Comparing the results of the existing calibrated model to the scenario where the Kanata Golf and Country Club is redeveloped with SWM ponds in place, the peak flows out of the Beaver Pond, as well as further downstream, are not increased from existing conditions. From this analysis, it was found that a total on-site storage volume of 53,600 m³ will need to be provided within the Kanata Golf and Country Club Development to ensure that peak flows out of the Beaver Pond are not increased once the development is in place. Table 2 below provides a break down of the storage volume required at each of the proposed SWM ponds. Note in this analysis, a required storage volume has not been provided for Pond 3 (which will control 9.38 ha of parklands) as the required storage volume and release rates for this pond were substantially smaller than the 4 other proposed SWM ponds.

**Table 1: Peak Flow Summary - Watts Creek / Kizell Drain SWMHYMO Model
September 2019**

Inflow to Beaver Pond

Scenario Name	Peak Flow (m ³ /s)					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
MVCA-EX	0.409	1.132	3.052	6.265	9.474	13.141
EX-Calib	5.454	8.553	11.588	16.374	24.209	30.042
KGCC+SWM	3.040	4.815	6.282	9.368	15.150	19.388
KNL	12.385	21.416	28.036	37.158	43.739	49.953
Ex-Calib + KGCC+SWM +KNL	10.196	17.695	22.735	29.313	34.433	39.292

KNL - Kanata North Lakes

KGCC - Kanata Golf & Country Club

**Outflow from Beaver Pond to Kizell Drain
(Flow Location 9)**

Scenario Name	Peak Flow (m ³ /s)					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
MVCA-EX	0.223	0.318	0.440	0.646	0.730	0.815
EX-Calib	0.484	0.667	0.750	0.876	0.940	1.005
KGCC+SWM	0.475	0.654	0.741	0.866	0.936	1.003
KNL	0.674	0.830	0.932	1.046	1.127	1.207
Ex-Calib + KGCC+SWM +KNL	0.665	0.813	0.923	1.039	1.124	1.206

KNL - Kanata North Lakes

KGCC - Kanata Golf & Country Club

Kizell Drain - Downstream of Station Road

Scenario Name	Peak Flow (m ³ /s)					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
MVCA-EX	0.225	0.323	0.473	0.729	0.835	0.935
EX-Calib	0.553	0.874	1.074	1.351	1.551	1.758
KGCC+SWM	0.498	0.742	0.941	1.244	1.433	1.626
KNL	0.694	0.859	1.064	1.390	1.558	1.725
Ex-Calib + KGCC+SWM +KNL	0.673	0.816	0.973	1.318	1.480	1.647

KNL - Kanata North Lakes

KGCC - Kanata Golf & Country Club

The operation and configuration of the proposed SWM ponds may be further optimized during the detailed design stage, and the analysis provided in this memo should be considered primarily as a proof of concept.

Table 2: Kanata Golf & Country Club Required SWM Pond Volumes

Name	Required SWM Pond Volume (m³)
Pond 1	20,000
Pond 2	12,700
Pond 3	N/A
Pond 4	16,100
Pond 5	4,850
Total	53,650

Based on MVCA’s model, portions of the proposed KNL Development Stages 7, 8 & 9 will also drain to the existing Beaver Pond. Additional scenarios have been generated, where the Kanata Lakes lands are fully developed and where both Kanata Lakes and Kanata Golf and Country Club are developed. For this analysis, it has been assumed that no quantity controls will be implemented on the KNL Development. Based on model simulations of the KNL Development (excluding the Kanata Golf and Country Club Redevelopment) it was found that the peak flows out of the Beaver Pond will increase by anywhere from 0.163 m³/s (for the 5-year event) to 0.202 m³/s (for the 100-year event) above existing conditions. As the Kanata Golf and Country Club Redevelopment should not be required to offset the impacts of the KNL Development, the flows under the condition when KNL is fully developed have been considered the new target, for the scenario when the both KNL and Kanata Golf and Country Club are developed. Applying the SWM ponds outlined above to the Kanata Golf and Country Club lands with the KNL Development in place, it was found that peak flows out of the Beaver Pond will be very similar to when only the KNL Development is in place. All models discussed in this report are provided in Attachment A.

Matrix Solutions identified a critical erosion location on the Kizell Drain approximately 500 m downstream of the Beaver Pond outlet. From their geomorphological analysis, it was determined that this location has a critical shear stress of 20 N/m², which corresponds to a critical flow of 0.500 m³/s. To assess the potential erosive impacts that the proposed developments may have on the creek, various scenarios were simulated using 39 years of hourly historical rainfall data taken from the Ottawa Airport. For each scenario, the total simulated erosive hours, cumulative work index and erosive volumes were calculated. This analysis was completed using both the critical shear stress and the critical flow determined by Matrix solutions for this location. Table 3 provides a full summary of these results using the provided critical shear stress. Table 4 provides a summary using the provided critical flow.

Table 3: Critical Shear Exceedance (20 pa) - Kizell Drain - Downstream of Station Road (Critical Erosion Location) - September 2019
Continuous Simulation (1967-2007)[†]

Scenario Name	Description	Drainage Area (ha)	Average Annual Flow (m ³ /s)	Max Average Annual Flow (m ³ /s)	Total Erosive Hours * (Hrs)	Total Volume Exceedance (m ³)	Total Cumulative Work (pa.m)	Average Annual Erosive Hours (Hrs/Year)	Average Annual Volume Exceedance (m ³ /Year)	Average Annual Cumulative Work (pa.m/Year)
MVCA-EX	MVCA's Official model converted back to existing conditions	444.5	0.030	0.051	240	4,731	228,308	6	121	5,854
EX-Calib	Existing conditions calibrated based on field data.	444.5	0.031	0.053	395	7,130	327,233	10	183	8,391
KGCC	Existing conditions with KGCC developed with SWM controls	444.0	0.034	0.057	498	8,385	389,152	13	215	9,978
KNL	Existing conditions with KNL Developed*	578.4	0.039	0.065	1027	14,289	661,250	26	366	16,955
KNL + KGCC	Existing conditions with KGCC developed with SWM controls and KNL Developed*	578.0	0.042	0.069	1296	17,281	800,302	33	443	20,521

KNL - Kanata Lakes North

KGCC - Kanata Golf & Country Club

Erosive analysis based on a critical flow of 20 pa

*Analysis assumes no SWM controls

[†] Continuous simulation exclude the years 2001 and 2005

* Based on 39 years of continuous simulations

Table 4: Critical Flow Exceedance (500 L/s) - Kizell Drain - Downstream of Station Road (Critical Erosion Location) - September 2019

Scenario Name	Description	Drainage Area (ha)	Average Annual Flow (m ³ /s)	Max Average Annual Flow (m ³ /s)	Total Erosive Hours * (Hrs)	Total Volume Exceedance (m ³)	Average Annual Erosive Hours (Hrs)	Average Annual Volume Exceedance (m ³)
MVCA-EX	MVCA's Official model converted back to existing conditions	444.5	0.030	0.051	300	7,756	8	199
EX-Calib	Existing conditions calibrated based on field data.	444.5	0.031	0.053	650	12,799	17	328
KGCC+SWM	Existing conditions with KGCC developed with SWM controls	444.0	0.034	0.057	906	15,802	23	405
KNL	Existing conditions with KNL Developed*	578.4	0.039	0.065	1964	31,037	50	796
Ex-Calib + KGCC+SWM +KNL	Existing conditions with KGCC developed with SWM controls and KNL Developed*	578.0	0.042	0.069	2534	38,866	65	997

KNL - Kanata Lakes North

KGCC - Kanata Golf & Country Club

Erosive analysis based on a critical flow of 500 L/s

*Analysis assumes no SWM controls

[†] Continuous simulation exclude the years 2001 and 2005

* Based on 39 years of continuous simulations

From these tables, it was found that the redevelopment of the Kanata Golf and Country Club will result in the annual erosive hours on the creek to increase by only 7 hours per year (based on critical flow). This corresponds to an average annual increase in erosive volume of 77 m³/year (based on critical flow) and an increase in average annual cumulative work of 1,588 pa.m/year. To provide some context to these numbers, when only the KNL Development is implemented the average annual erosive hours are increased by 34 hours a year, which corresponds to an annual volume exceedance of 468 m³ and an annual cumulative work increase of 8,565 pa.m above existing conditions.

Considering the KNL Development as the new baseline, and then implementing the Kanata Golf and Country Club Redevelopment with SWM Ponds, this results in the annual average erosive hours to increase by 15 hours, which corresponds to an annual volume exceedance of 201 m³ and an annual cumulative work increase of 3,565 pa.m above the new baseline conditions. This analysis indicates that the increases in potential erosion due to the inclusion of the Kanata Golf and Country club are minimal and manageable.

From this analysis, it was found that the proposed redevelopment of the Kanata Golf and Country Club can be implemented with SWM measures in place to ensure no adverse impacts to peak flows out of the existing Beaver Pond and on the downstream watercourse. It was determined that a total of approximately 53,000 m³ of on-site storage will need to be provided within the Kanata Golf and Country Club Development to ensure that these targets are met. A detailed erosion analysis was completed for each of the scenarios using 39 years of historical data. Increases in erosion due to the Kanata Golf and Country Club Redevelopment have been quantified and were found to be negligible and manageable.

Yours truly,

J.F Sabourin and Associates Inc.



Jonathon Burnett, P.Eng

Water Resources Engineer, JFSA

cc: J.F Sabourin, M.Eng, P.Eng

Director of Water Resources Projects

Table 1: Peak Flow Summary - Watts Creek / Kizell Drain SWMHYMO model

Table 2: Kanata Golf & Country Club Required SWM Pond Volumes

Table 3: Critical Shear Stress Analysis - Kizell Drain

Table 4: Critical Flow Analysis - Kizell Drain

Attachment A: SWMHYMO Model - MVCA Existing Conditions Model

Attachment B: SWMHYMO Model – Existing Conditions Calibrated

Attachment C: SWMHYMO Model – Redeveloped Kanata Golf & Country Club with SWM

Attachment D: SWMHYMO Model – KNL Development

Attachment E: SWMHYMO Model - Redeveloped Kanata Golf and Country Club with SWM & Kanata Lakes Development

Attachment A

SWMHYMO Model:
MVCA 2017 Existing Conditions Model


```

1 2 Metric units
2 *#*****
3 *# Project Name: [Shirley's Brook and Watt's Creek Phase 2 SWM Study] Project
Number: [60264539]
4 *# Future Conditions Model for the Watts Creek/Kizell Drain Flood Plain Mapping Study
5 *# Date : 2014-12-31
6 *# Modeller : [Olivia Chung] John Price MVCA
7 *# Company : AECOM Canada
8 *# License # : 2988504
9 *#*****
10 *
11 *#=====
12 *# WATTS CREEK SUBWATERSHED
13 *# MODEL CONVERTED FROM QUALHYMO MODEL (DILLON, 2009)
14 *# DECEMBER 2014
15 *#=====
16 *# Model updated by JFSA (June 2019)to allow for continuous simulations to complete
17 *# preliminary erosion assessment.
18 *# Model reverted back to existing conditions using parameters as documented in
19 *# MVCA's Watts Creek Final Report November 2017
20 *#=====
21 *# KIZELL DRAIN
22 *#=====
23 * Area Tributary to Beaver Pond and Kizell Cell
24 *#=====
25 *#=====
26 *# Derived from Scenario 20 of Phase 1 SWM Study
27 *# AECOM MODEL + GOLF COURSE DETENTION PONDS
28 *# AMC II Condition
29 *# RAINFALL - BEAVER POND RAIN GAUGE (POINT RAINFALL)
30 *# DESIGN EVENTS
31 *#=====
32 * DESIGN STORMS
33 *#=====
34 *%-----|-----|
35 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0002]
36 2y12hr.stm
37 READ STORM STORM_FILENAME=["storm.001"]
38 *%-----|-----|
39 *#=====
40 * CONTINUOUS SIMULATIONS
41 *#=====
42 *START TZERO=[1967.0719], METOUT=[2], NSTORM=[0], NRUN=[1967]
43 *% [""] <--storm filename, one per line for NSTORM time
44 *%-----|-----|
45 *# Ottawa International Airport - 19 July 1967 to 01 Nov 2007
46 *READ AES DATA AES_FILENAME=["YOW_1967_2007.123"],
47 * IELEM=[123], START_DATE=[0], END_DATE=[-364]
48 *%-----|-----|
49 *%-----|-----|
50 COMPUTE API APII=[40], APIK=[0.8]/day,
51 *%-----|-----|
52 *#=====
53 *# AREA 3A-1 (URBAN PORTION of Area North of Campeau Drive) TO DA 5A
54 *#=====
55 CONTINUOUS STANDHYD ID=[10], NHYD=["000100"], DT=[1](min), AREA=[2.7](ha),
56 XIMP=[0.35], TIMP=[0.47], DWF=[0](cms), LOSS=[2],
57 SCS curve number CN=[61],
58 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
59 LGP=[40](m), MNP=[0.25], SCP=[0](min),
60 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
61 LGI=[242](m), MNI=[0.025], SCI=[0](min),
62 Continuous simulation parameters:
63 IaRECper=[6](hrs), IaRECimp=[4](hrs),
64 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
65 InterEventTime=[12](hrs), END=-1
66 *%-----|-----|

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67 *#=====
68 *# AREA 3A-2 (URBAN PORTION of Area North of Campeau Drive)
69 *#=====
70 CONTINUOUS STANDHYD      ID=[1], NHYD=["000100"], DT=[1](min), AREA=[33.4](ha),
71 XIMP=[0.31], TIMP=[0.41], DWF=[0](cms), LOSS=[2],
72 SCS curve number CN=[64],
73 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
74 LGP=[40](m), MNP=[0.25], SCP=[0](min),
75 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
76 LGI=[1760](m), MNI=[0.025], SCI=[0](min),
77 Continuous simulation parameters:
78 IaRECper=[6](hrs), IaRECimp=[4](hrs),
79 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
80 InterEventTime=[12](hrs), END=-1
81 *%-----|-----
82 *
83 *#=====
84 *# AREA 3B (GOLF PORTION of Area North of Campeau Drive) TO DA 5A
85 *#=====
86 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[6.3](ha),
87 DWF=[0](cms), CN=[62], IA=[7.0](mm),
88 N=[1.1], TP=[0.55]hrs,
89 Continuous simulation parameters:
90 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
91 InterEventTime=[12](hrs),
92 Baseflow simulation parameters:
93 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
94 VHydCond=[0.02](mm/hr), END=-1
95 *%-----|-----
96 *#=====
97 *# ADDED AREA 3A-1 TO 3B
98 *#=====
99 *
100 ADD HYD      IDsum=[3], NHYD=[000321], IDs to add=[10+2]
101 *%-----|-----
102 *#=====
103 *# DA 5A
104 *#=====
105 ROUTE RESERVOIR      IDout=[2], NHYD=[000100], IDin=[3],
106 RDT=[1](min),
107 TABLE of ( OUTFLOW-STORAGE ) values
108 (cms) - (ha-m)
109 [ 0.0 , 0.0 ]
110 [ 0.51 , 0.00005 ]
111 [ 0.65 , 0.0040 ]
112 [ 0.76 , 0.0438 ]
113 [ 0.86 , 0.1887 ]
114 [ 0.95 , 0.5613 ]
115 [ 0.98 , 0.8197 ]
116 [200.00 , 0.9017 ]
117 [ -1 , -1 ] (max twenty pts)
118 IDovf=[ ], NHYDovf=[ ]
119 *%-----|-----
120 *#=====
121 *# ADDED OUTFLOW FROM DA 5A TO 3A-2
122 *#=====
123 *
124 ADD HYD      IDsum=[3], NHYD=[000321], IDs to add=[1+2]
125 *%-----|-----
126 *
127 *#=====
128 *# AREA 12 (GOLF PORTION OF Area East of Knudson Drive - DA 6B)
129 *#=====
130 CONTINUOUS NASHYD      ID=[1], NHYD=["000100"], DT=[1]min, AREA=[2.27](ha),
131 DWF=[0](cms), CN=[67], IA=[7.0](mm),
132 N=[1.1], TP=[0.37]hrs,
133 Continuous simulation parameters:

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134 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
135 InterEventTime=[12](hrs),
136 Baseflow simulation parameters:
137 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
138 VHydCond=[0.02](mm/hr), END=-1
139 *%-----|-----|
140 *
141 *#=====|-----|
142 *# AREA 13 (GOLF PORTION OF Area East of Knudson Drive - DA 6A)
143 *#=====|-----|
144 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[2.9](ha),
145 DWF=[0](cms), CN=[67], IA=[7.0](mm),
146 N=[1.1], TP=[0.64]hrs,
147 Continuous simulation parameters:
148 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
149 InterEventTime=[12](hrs),
150 Baseflow simulation parameters:
151 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
152 VHydCond=[0.02](mm/hr), END=-1
153 *%-----|-----|
154 *#=====|-----|
155 *# ADDED AREA 13 AND AREA 12 TO 3A-2
156 *#=====|-----|
157 *
158 ADD HYD IDsum=[10], NHYD=[000321], IDs to add=[1+2+3]
159 *%-----|-----|
160 *
161 *#=====|-----|
162 *# AREA 2A (URBAN PORTION OF Area North of Campeau Drive)
163 *#=====|-----|
164 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1](min), AREA=[29.3](ha),
165 XIMP=[0.34], TIMP=[0.45], DWF=[0](cms), LOSS=[2],
166 SCS curve number CN=[60],
167 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
168 LGP=[40](m), MNP=[0.25], SCP=[0](min),
169 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
170 LGI=[858](m), MNI=[0.025], SCI=[0](min),
171 Continuous simulation parameters:
172 IaRECper=[6](hrs), IaRECimp=[4](hrs),
173 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
174 InterEventTime=[12](hrs), END=-1
175 *%-----|-----|
176 *
177 *#=====|-----|
178 *# AREA 2B-1 (GOLF PORTION OF Area North of Campeau Drive) TO DA 3
179 *#=====|-----|
180 CONTINUOUS NASHYD ID=[4], NHYD=["000100"], DT=[1]min, AREA=[13](ha),
181 DWF=[0](cms), CN=[66], IA=[7.0](mm),
182 N=[1.1], TP=[0.443]hrs,
183 Continuous simulation parameters:
184 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
185 InterEventTime=[12](hrs),
186 Baseflow simulation parameters:
187 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
188 VHydCond=[0.02](mm/hr), END=-1
189 *%-----|-----|
190 *#=====|-----|
191 *# ADD 2A TO 2B-1
192 *#=====|-----|
193 ADD HYD IDsum=[2], NHYD=[000321], IDs to add=[1+4]
194 *%-----|-----|
195 *
196 *#=====|-----|
197 *# DA 3
198 *#=====|-----|
199 ROUTE RESERVOIR IDout=[4], NHYD=[000100], IDin=[2],
200 RDT=[1](min),

```

```

201          TABLE of ( OUTFLOW-STORAGE ) values
202                      (cms) - (ha-m)
203          [ 0.0 , 0.0 ]
204          [ 0.0 , 0.0240 ]
205          [ 0.9 , 0.4127 ]
206          [ 2.25 , 0.4798 ]
207          [ 4.16 , 0.5507 ]
208          [ 10.00 , 0.6058 ]
209          [ -1 , -1 ] (max twenty pts)
210          IDovf=[ ], NHYDovf=[ ]
211 *%-----|-----|
212 *
213 *#=====|-----|
214 *# AREA 2C (URBAN PORTION OF Area North of Campeau Drive)
215 *#=====|-----|
216 CONTINUOUS STANDHYD      ID=[1], NHYD=["000100"], DT=[1](min), AREA=[13.8](ha),
217          XIMP=[0.39], TIMP=[0.52], DWF=[0](cms), LOSS=[2],
218          SCS curve number CN=[61],
219          Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
220                      LGP=[40](m), MNP=[0.25], SCP=[0](min),
221          Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
222                      LGI=[498](m), MNI=[0.025], SCI=[0](min),
223          Continuous simulation parameters:
224          IaRECper=[6](hrs), IaRECimp=[4](hrs),
225          SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
226          InterEventTime=[12](hrs), END=-1
227 *%-----|-----|
228 ADD HYD                  IDsum=[2], NHYD=[000321], IDs to add=[1+4]
229 *%-----|-----|
230 *
231 *#=====|-----|
232 *# AREA 2B-2 (GOLF PORTION OF Area North of Campeau Drive) TO DA 4
233 *#=====|-----|
234 CONTINUOUS NASHYD      ID=[5], NHYD=["000100"], DT=[1]min, AREA=[15.7](ha),
235          DWF=[0](cms), CN=[63], IA=[7.0](mm),
236          N=[1.1], TP=[0.837]hrs,
237          Continuous simulation parameters:
238          IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
239          InterEventTime=[12](hrs),
240          Baseflow simulation parameters:
241          BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
242          VHydCond=[0.02](mm/hr), END=-1
243 *%-----|-----|
244 ADD HYD                  IDsum=[6], NHYD=[000321], IDs to add=[2+5]
245 *%-----|-----|
246 *#=====|-----|
247 *# DA 4
248 *#=====|-----|
249 ROUTE RESERVOIR      IDout=[2], NHYD=[000100], IDin=[6],
250          RDT=[1](min),
251          TABLE of ( OUTFLOW-STORAGE ) values
252                      (cms) - (ha-m)
253          [ 0.0 , 0.0 ]
254          [ 1.47 , 0.00001 ]
255          [ 2.42 , 0.0080 ]
256          [ 3.09 , 0.0650 ]
257          [ 3.63 , 0.3459 ]
258          [ 3.86 , 0.8899 ]
259          [ 4.09 , 1.6418 ]
260          [ 4.25 , 3.6976 ]
261          [ 200.0 , 4.0674 ]
262          [ -1 , -1 ] (max twenty pts)
263          IDovf=[ ], NHYDovf=[ ]
264 *%-----|-----|
265 *#=====|-----|
266 *# ADD AREA 3A-2 TO OUTFLOW OF DA 4
267 *#=====|-----|

```

```

268 *
269 ADD HYD          IDsum=[5], NHYD=[000321], IDs to add=[2+10]
270 *%-----|-----|
271 *#=====|=====|
272 *# AREA 1C (URBAN PORTION of Area North of Campeau Drive)
273 *#=====|=====|
274 CONTINUOUS STANDHYD      ID=[1], NHYD=["000100"], DT=[1](min), AREA=[17.8](ha),
275 XIMP=[0.38], TIMP=[0.51], DWF=[0](cms), LOSS=[2],
276 SCS curve number CN=[61],
277 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
278 LGP=[40](m), MNP=[0.25], SCP=[0](min),
279 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
280 LGI=[474](m), MNI=[0.025], SCI=[0](min),
281 Continuous simulation parameters:
282 IaRECper=[6](hrs), IaRECimp=[4](hrs),
283 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
284 InterEventTime=[12](hrs), END=-1
285 *%-----|-----|
286 *
287 *#=====|=====|
288 *# AREA 1B (GOLF PORTION OF Area North of Campeau Drive)
289 *#=====|=====|
290 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[9.3](ha),
291 DWF=[0](cms), CN=[61], IA=[7.0](mm),
292 N=[1.1], TP=[0.81]hrs,
293 Continuous simulation parameters:
294 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
295 InterEventTime=[12](hrs),
296 Baseflow simulation parameters:
297 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
298 VHydCond=[0.02](mm/hr), END=-1
299 *%-----|-----|
300 *#=====|=====|
301 *# ADD 1C TO 1B
302 *#=====|=====|
303 ADD HYD          IDsum=[3], NHYD=[000321], IDs to add=[1+2]
304 *%-----|-----|
305 *
306 *#=====|=====|
307 *# AREA 1A (INSTITUTION BLOCK)
308 *#=====|=====|
309 CONTINUOUS NASHYD      ID=[4], NHYD=["000100"], DT=[1]min, AREA=[11.4](ha),
310 DWF=[0](cms), CN=[61], IA=[7.0](mm),
311 N=[1.1], TP=[0.56]hrs,
312 Continuous simulation parameters:
313 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
314 InterEventTime=[12](hrs),
315 Baseflow simulation parameters:
316 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
317 VHydCond=[0.02](mm/hr), END=-1
318 *%-----|-----|
319 *#=====|=====|
320 *# AREA 1D (URBAN PORTION of Area North of Campeau Drive)
321 *#=====|=====|
322 CONTINUOUS STANDHYD      ID=[1], NHYD=["000100"], DT=[1](min), AREA=[15.8](ha),
323 XIMP=[0.41], TIMP=[0.55], DWF=[0](cms), LOSS=[2],
324 SCS curve number CN=[65],
325 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
326 LGP=[40](m), MNP=[0.25], SCP=[0](min),
327 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
328 LGI=[915](m), MNI=[0.025], SCI=[0](min),
329 Continuous simulation parameters:
330 IaRECper=[6](hrs), IaRECimp=[4](hrs),
331 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
332 InterEventTime=[12](hrs), END=-1
333 *%-----|-----|
334 *#=====|=====|

```

```

335  *# MAJOR FLOW TO 5B - MINOR FLOW TO 5C
336  *# 85 L/S/HA * 15.8 HA = 1.343 L/S
337  *#-----|-----|
338  COMPUTE DUALHYD      IDin=[1], CINLET=[1.343](cms), NINLET=[1],
339                        MAJID=[7], MajNHYD=[000100],
340                        MINID=[8], MinNHYD=[000100],
341                        TMJSTO=[0](cu-m)
342  *%-----|-----|
343  *#-----|-----|
344  *# ADD 1A AND 1B TO 1D MINOR
345  *#-----|-----|
346  ADD HYD              IDsum=[6], NHYD=[000321], IDs to add=[4+3+8]
347  *%-----|-----|
348  *
349  *#-----|-----|
350  *# AREA 5A (URBAN PORTION OF Area North of Knudson Drive)
351  *#-----|-----|
352  CONTINUOUS STANDHYD  ID=[1], NHYD=["000100"], DT=[1](min), AREA=[2.5](ha),
353                        XIMP=[0.37], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
354                        SCS curve number CN=[61],
355                        Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
356                                                LGP=[40](m), MNP=[0.25], SCP=[0](min),
357                        Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
358                                                LGI=[146](m), MNI=[0.025], SCI=[0](min),
359                        Continuous simulation parameters:
360                        IaRECper=[6](hrs), IaRECimp=[4](hrs),
361                        SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
362                        InterEventTime=[12](hrs), END=-1
363  *%-----|-----|
364  *
365  *#-----|-----|
366  *# AREA 5B (GOLF PORTION OF Area North of Knudson Drive)
367  *#-----|-----|
368  CONTINUOUS NASHYD    ID=[2], NHYD=["000100"], DT=[1]min, AREA=[9.5](ha),
369                        DWF=[0](cms), CN=[62], IA=[7.0](mm),
370                        N=[1.1], TP=[0.67]hrs,
371                        Continuous simulation parameters:
372                        IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
373                        InterEventTime=[12](hrs),
374                        Baseflow simulation parameters:
375                        BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
376                        VHydCond=[0.02](mm/hr), END=-1
377  *%-----|-----|
378  *#-----|-----|
379  *# ADD 5A AND 1D MAJOR TO 5B
380  *#-----|-----|
381  ADD HYD              IDsum=[4], NHYD=[000321], IDs to add=[1+7+2]
382  *%-----|-----|
383  *
384  *#-----|-----|
385  *# AREA 5C (URBAN PORTION OF Area North of Knudson Drive)
386  *#-----|-----|
387  CONTINUOUS STANDHYD  ID=[1], NHYD=["000100"], DT=[1](min), AREA=[6.2](ha),
388                        XIMP=[0.38], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
389                        SCS curve number CN=[61],
390                        Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
391                                                LGP=[40](m), MNP=[0.25], SCP=[0](min),
392                        Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
393                                                LGI=[309](m), MNI=[0.025], SCI=[0](min),
394                        Continuous simulation parameters:
395                        IaRECper=[6](hrs), IaRECimp=[4](hrs),
396                        SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
397                        InterEventTime=[12](hrs), END=-1
398  *%-----|-----|
399  *#-----|-----|
400  *# MAJOR FLOW TO 5B - MINOR FLOW TO 6A
401  *# 85 L/S/HA * 6.2 HA = 0.527 L/S

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402 *#=====
403 COMPUTE DUALHYD      IDin=[1], CINLET=[0.527](cms), NINLET=[1],
404                      MAJID=[2], MajNHYD=[000100],
405                      MINID=[8], MinNHYD=[000100],
406                      TMJSTO=[0](cu-m)
407 *%-----|-----|
408 *#=====
409 *# ADD 5C MAJOR TO 5B
410 *#=====
411 ADD HYD              IDsum=[7], NHYD=[000321], IDs to add=[2+4]
412 *%-----|-----|
413 *
414 *#=====
415 *# DA 8
416 *# WITH UPDATED DISCHARGE RATING CURVE BASED ON FIELD SURVEY INFORMATION
417 *#=====
418 ROUTE RESERVOIR     IDout=[3], NHYD=[000100], IDin=[7],
419                      RDT=[1](min),
420                      TABLE of ( OUTFLOW-STORAGE ) values
421                      (cms) - (ha-m)
422                      [ 0.0 , 0.0 ]
423                      [ 0.18 ,0.0004 ]
424                      [ 0.22 ,0.0023 ]
425                      [ 0.25 ,0.0092 ]
426                      [ 0.28 ,0.0250 ]
427                      [ 0.30 ,0.0580 ]
428                      [ 0.33 ,0.1272 ]
429                      [ 0.35 ,0.2435 ]
430                      [ 0.37 ,0.4650 ]
431                      [ 200.0 ,0.5115 ]
432                      [ -1 , -1 ] (max twenty pts)
433                      IDovf=[ ], NHYDovf=[ ]
434 *%-----|-----|
435 *#=====
436 *# ADD 1D MINOR AND OUTLET OF DA 8 TO 5C MINOR
437 *#=====
438 ADD HYD              IDsum=[2], NHYD=[000321], IDs to add=[6+3+8]
439 *%-----|-----|
440 *#=====
441 *# ADD 3A TO 5C
442 *#=====
443 ADD HYD              IDsum=[5], NHYD=[000321], IDs to add=[5+2]
444 *%-----|-----|
445 *%SHIFT HYD was removed as it was not being used and was crashing the model
446 *%SHIFT HYD          IDout=[5], NHYD=[000100], IDin=[4], TLAG=[0](min)
447 *%-----|-----|
448 *
449 *#=====
450 *# AREA 6A (URBAN PORTION OF Area North of Knudson Drive)
451 *#=====
452 CONTINUOUS STANDHYD  ID=[1], NHYD=["000100"], DT=[1](min), AREA=[4.1](ha),
453                      XIMP=[0.39], TIMP=[0.52], DWF=[0](cms), LOSS=[2],
454                      SCS curve number CN=[61],
455                      Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
456                      LGP=[40](m), MNP=[0.25], SCP=[0](min),
457                      Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
458                      LGI=[238](m), MNI=[0.025], SCI=[0](min),
459                      Continuous simulation parameters:
460                      IaRECper=[6](hrs), IaRECimp=[4](hrs),
461                      SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
462                      InterEventTime=[12](hrs), END=-1
463 *%-----|-----|
464 *
465 *#=====
466 *# AREA 6B (GOLF PORTION OF Area North of Knudson Drive)
467 *#=====
468 CONTINUOUS NASHYD    ID=[2], NHYD=["000100"], DT=[1]min, AREA=[5.9](ha),

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469      DWF=[0](cms), CN=[61], IA=[7.0](mm),
470      N=[1.1], TP=[0.87]hrs,
471      Continuous simulation parameters:
472      IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
473      InterEventTime=[12](hrs),
474      Baseflow simulation parameters:
475      BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
476      VHydCond=[0.02](mm/hr), END=-1
477  *%-----|-----|
478  *#=====|=====|
479  *# ADD 6A TO 6B
480  *#=====|=====|
481  ADD HYD          IDsum=[3], NHYD=[000321], IDs to add=[1+2]
482  *%-----|-----|
483  *
484  *#=====|=====|
485  *# AREA 6C (URBAN PORTION OF Area North of Knudson Drive)
486  *#=====|=====|
487  CONTINUOUS STANDHYD      ID=[1], NHYD=["000100"], DT=[1](min), AREA=[5.3](ha),
488      XIMP=[0.38], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
489      SCS curve number CN=[61],
490      Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
491      LGP=[40](m), MNP=[0.25], SCP=[0](min),
492      Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
493      LGI=[297](m), MNI=[0.025], SCI=[0](min),
494      Continuous simulation parameters:
495      IaRECper=[6](hrs), IaRECimp=[4](hrs),
496      SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
497      InterEventTime=[12](hrs), END=-1
498  *%-----|-----|
499  *#=====|=====|
500  *# MAJOR FLOW TO 6B - MINOR FLOW TO 7
501  *# 85 L/S/HA * 5.3 HA = 0.4505 L/S
502  *#=====|=====|
503  COMPUTE DUALHYD      IDin=[1], CINLET=[0.451](cms), NINLET=[1],
504      MAJID=[2], MajNHYD=[000100],
505      MINID=[6], MinNHYD=[000100],
506      TMJSTO=[0](cu-m)
507  *%-----|-----|
508  *#=====|=====|
509  *# ADD 6C MAJOR TO 6B
510  *#=====|=====|
511  ADD HYD          IDsum=[4], NHYD=[000321], IDs to add=[2+3]
512  *#=====|=====|
513  *# DA 9
514  *# WITH UPDATED DISCHARGE RATING CURVE BASED ON FIELD SURVEY INFORMATION
515  *#=====|=====|
516  ROUTE RESERVOIR      IDout=[3], NHYD=[000100], IDin=[4],
517      RDT=[1](min),
518      TABLE of ( OUTFLOW-STORAGE ) values
519      (cms) - (ha-m)
520      [ 0.0 , 0.0 ]
521      [ 0.25 ,0.00003 ]
522      [ 0.31 ,0.0039 ]
523      [ 0.36 ,0.0285 ]
524      [ 0.40 ,0.0901 ]
525      [ 0.44 ,0.2499 ]
526      [ 0.47 ,0.6154 ]
527      [ 0.48 ,0.7609 ]
528      [200.00 ,0.8370 ]
529      [ -1 , -1 ] (max twenty pts)
530      IDovf=[ ], NHYDovf=[ ]
531  *%-----|-----|
532  *#=====|=====|
533  *# ADD DA 9 OUTFLOW TO 6C MINOR
534  *#=====|=====|
535  ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[3+6]

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536 *%-----|-----|
537 *#=====|-----|
538 *# ADD 5C TO 6C
539 *#=====|-----|
540 ADD HYD          IDsum=[5], NHYD=[000321], IDs to add=[5+2]
541 *%-----|-----|
542 *SHIFT HYD was removed as it was not being used and was crashing the model
543 *SHIFT HYD      IDout=[5], NHYD=[00100], IDin=[4], TLAG=[0](min)
544 *%-----|-----|
545 *
546 *#=====|-----|
547 *# AREA 14 (GOLF PORTION OF Area East of Knudson Drive - DA 11)
548 *#=====|-----|
549 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[2.38](ha),
550                        DWF=[0](cms), CN=[61], IA=[7.0](mm),
551                        N=[1.1], TP=[0.40]hrs,
552                        Continuous simulation parameters:
553                        IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
554                        InterEventTime=[12](hrs),
555                        Baseflow simulation parameters:
556                        BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
557                        VHydCond=[0.02](mm/hr), END=-1
558 *%-----|-----|
559 *#=====|-----|
560 *# DA 11
561 *# RATING CURVE BASED ON FIELD SURVEY INFORMATION
562 *#=====|-----|
563 ROUTE RESERVOIR      IDout=[4], NHYD=[000100], IDin=[2],
564                        RDT=[1](min),
565                        TABLE of ( OUTFLOW-STORAGE ) values
566                        (cms) - (ha-m)
567                        [ 0.0 , 0.0 ]
568                        [ 0.09 ,0.0019 ]
569                        [ 0.12 ,0.0735 ]
570                        [ 0.145 ,0.2234 ]
571                        [ 0.146 ,0.2349 ]
572                        [200.00 ,0.2584 ]
573                        [ -1 , -1 ] (max twenty pts)
574                        IDovf=[ ], NHYDovf=[ ]
575 *%-----|-----|
576 *#=====|-----|
577 *# ADD OUTFLOW OF DA 11 TO 6C
578 *#=====|-----|
579 ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[5+4]
580 *%-----|-----|
581 *
582 *#=====|-----|
583 *# AREA 15 (GOLF PORTION OF Area South of Walden Drive - DA 10B)
584 *#=====|-----|
585 CONTINUOUS NASHYD      ID=[4], NHYD=["000100"], DT=[1]min, AREA=[2.5](ha),
586                        DWF=[0](cms), CN=[50], IA=[7.0](mm),
587                        N=[1.1], TP=[0.20]hrs,
588                        Continuous simulation parameters:
589                        IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
590                        InterEventTime=[12](hrs),
591                        Baseflow simulation parameters:
592                        BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
593                        VHydCond=[0.02](mm/hr), END=-1
594 *%-----|-----|
595 *#=====|-----|
596 *# DA 10B
597 *# RATING CURVE BASED ON FIELD SURVEY INFORMATION
598 *#=====|-----|
599 ROUTE RESERVOIR      IDout=[5], NHYD=[000100], IDin=[4],
600                        RDT=[1](min),
601                        TABLE of ( OUTFLOW-STORAGE ) values
602                        (cms) - (ha-m)

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```

603 [ 0.0 , 0.0 ]
604 [ 0.32 ,0.0018 ]
605 [ 0.34 ,0.0093 ]
606 [ 0.36 ,0.0309 ]
607 [ 0.38 ,0.1597 ]
608 [ 0.40 ,0.3353 ]
609 [200.00 ,0.3688 ]
610 [ -1 , -1 ] (max twenty pts)
611 IDovf=[ ], NHYDovf=[ ]
612 *%-----|-----|
613 *
614 *#-----|-----|
615 *# AREA 7 (Adjacent to Beaver Pond)
616 *#-----|-----|
617 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1](min), AREA=[19.6](ha),
618 XIMP=[0.33], TIMP=[0.44], DWF=[0](cms), LOSS=[2],
619 SCS curve number CN=[60],
620 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
621 LGP=[40](m), MNP=[0.25], SCP=[0](min),
622 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
623 LGI=[778](m), MNI=[0.025], SCI=[0](min),
624 Continuous simulation parameters:
625 IaRECper=[6](hrs), IaRECimp=[4](hrs),
626 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
627 InterEventTime=[12](hrs), END=-1
628 *%-----|-----|
629 *#-----|-----|
630 *# ADD OUTFLOW OF DA 10B AND 6C TO 7
631 *# TOTAL FLOW - AT EXISTING 2700 MM OUTLET
632 *#-----|-----|
633 ADD HYD IDsum=[10], NHYD=[000321], IDs to add=[5+2+1]
634 *%-----|-----|
635 *
636 *#-----|-----|
637 *# AREA 4C
638 *#-----|-----|
639 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1](min), AREA=[5.8](ha),
640 XIMP=[0.40], TIMP=[0.53], DWF=[0](cms), LOSS=[2],
641 SCS curve number CN=[63],
642 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
643 LGP=[40](m), MNP=[0.25], SCP=[0](min),
644 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
645 LGI=[260](m), MNI=[0.025], SCI=[0](min),
646 Continuous simulation parameters:
647 IaRECper=[6](hrs), IaRECimp=[4](hrs),
648 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
649 InterEventTime=[12](hrs), END=-1
650 *%-----|-----|
651 *#-----|-----|
652 *# MAJOR FLOW TO 4B - MINOR FLOW TO 4A
653 *# 85 L/S/HA * 5.8 HA = 493 L/S
654 *#-----|-----|
655 COMPUTE DUALHYD IDin=[1], CINLET=[0.493](cms), NINLET=[1],
656 MAJID=[5], MajNHYD=[000100],
657 MINID=[6], MinNHYD=[100100],
658 TMJSTO=[0](cu-m)
659 *%-----|-----|
660 *
661 *#-----|-----|
662 *# AREA 4A - FLOW THROUGH AREA 4
663 *#-----|-----|
664 CONTINUOUS STANDHYD ID=[3], NHYD=["000204"], DT=[1](min), AREA=[15.8](ha),
665 XIMP=[0.50], TIMP=[0.66], DWF=[0](cms), LOSS=[2],
666 SCS curve number CN=[58],
667 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
668 LGP=[40](m), MNP=[0.25], SCP=[0](min),
669 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),

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670             LGI=[580](m), MNI=[0.025], SCI=[0](min),
671 Continuous simulation parameters:
672 IaRECper=[6](hrs), IaRECimp=[4](hrs),
673 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
674 InterEventTime=[12](hrs), END=-1
675 *%-----|-----|
676 *
677 *#=====|-----|
678 *# ADDITION OF 4C MINOR TO 4A
679 *#=====|-----|
680 *
681 ADD HYD             IDsum=[4], NHYD=[000231], IDs to add=[3+6]
682 *%-----|-----|
683 *#=====|-----|
684 *# AREA 4B - ROUTE THROUGH ON SITE STORAGE
685 *#=====|-----|
686 CONTINUOUS STANDHYD ID=[3], NHYD=["000204"], DT=[1](min), AREA=[6.2](ha),
687 XIMP=[0.57], TIMP=[0.57], DWF=[0](cms), LOSS=[2],
688 SCS curve number CN=[61],
689 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
690 LGP=[40](m), MNP=[0.25], SCP=[0](min),
691 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
692 LGI=[272](m), MNI=[0.025], SCI=[0](min),
693 Continuous simulation parameters:
694 IaRECper=[6](hrs), IaRECimp=[4](hrs),
695 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
696 InterEventTime=[12](hrs), END=-1
697 *%-----|-----|
698 *#=====|-----|
699 *# ADDITION OF MAJOR FLOW AT 4C TO AREA 4B
700 *#=====|-----|
701 ADD HYD             IDsum=[6], NHYD=[000231], IDs to add=[5+3]
702 *%-----|-----|
703 *#=====|-----|
704 *# ON-SITE STORAGE IN AREA 4B
705 *# 85L/S/HA
706 *#=====|-----|
707 *
708 ROUTE RESERVOIR    IDout=[3], NHYD=[000100], IDin=[6],
709 RDT=[1](min),
710 TABLE of ( OUTFLOW-STORAGE ) values
711 (cms) - (ha-m)
712 [ 0.0 , 0.0 ]
713 [ 0.527, 0.2840 ]
714 [ -1 , -1 ] (max twenty pts)
715 IDovf=[], NHYDovf=[]
716 *%-----|-----|
717 *#=====|-----|
718 *# ADDITION OF ROUTED 4B TO AREA 4A
719 *#=====|-----|
720 ADD HYD             IDsum=[8], NHYD=[000231], IDs to add=[4+3]
721 *%-----|-----|
722 *
723 *#=====|-----|
724 *# AREA 4 (Adjacent to Beaver Pond)
725 *#=====|-----|
726 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1](min), AREA=[21.2](ha),
727 XIMP=[0.29], TIMP=[0.38], DWF=[0](cms), LOSS=[2],
728 SCS curve number CN=[60],
729 Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
730 LGP=[40](m), MNP=[0.25], SCP=[0](min),
731 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
732 LGI=[950](m), MNI=[0.025], SCI=[0](min),
733 Continuous simulation parameters:
734 IaRECper=[6](hrs), IaRECimp=[4](hrs),
735 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
736 InterEventTime=[12](hrs), END=-1

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737 *%-----|-----|
738 *#=====|-----|
739 *# ADDITION OF MINOR FLOW AT 4A TO AREA 4
740 *#=====|-----|
741 ADD HYD          IDsum=[3], NHYD=[000231], IDs to add=[8+1]
742 *%-----|-----|
743 ADD HYD          IDsum=[7], NHYD=[000231], IDs to add=[10+3]
744 *%-----|-----|
745 *#=====|-----|
746 *# AREA 9 (RURAL)
747 *#=====|-----|
748 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[18.9](ha),
749                      DWF=[0](cms), CN=[75], IA=[7.0](mm),
750                      N=[1.1], TP=[0.37]hrs,
751                      Continuous simulation parameters:
752                      IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
753                      InterEventTime=[12](hrs),
754                      Baseflow simulation parameters:
755                      BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
756                      VHydCond=[0.02](mm/hr), END=-1
757 *%-----|-----|
758 ADD HYD          IDsum=[6], NHYD=[000321], IDs to add=[7+2]
759 *%-----|-----|
760 *
761 *#=====|-----|
762 *# GOULDBOURN FORCED ROAD - KANATA AVENUE TO AREA 10 BOUNDARY
763 *# (ARTERIAL ROAD 10 YEAR 10 MN INLET TIME)
764 *#=====|-----|
765 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1](min), AREA=[1.6](ha),
766                      XIMP=[0.71], TIMP=[0.71], DWF=[0](cms), LOSS=[2],
767                      SCS curve number CN=[65],
768                      Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
769                      LGP=[40](m), MNP=[0.25], SCP=[0](min),
770                      Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
771                      LGI=[358](m), MNI=[0.025], SCI=[0](min),
772                      Continuous simulation parameters:
773                      IaRECper=[6](hrs), IaRECimp=[4](hrs),
774                      SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
775                      InterEventTime=[12](hrs), END=-1
776 *%-----|-----|
777 *#=====|-----|
778 *# MAJOR FLOW TO BEAVER POND - MINOR FLOW TO AREA 10 STORM SYSTEM
779 *# 237.69 L/S/HA * 1.66 HA = 394.6 L/S
780 *#=====|-----|
781 COMPUTE DUALHYD      IDin=[1], CINLET=[0.395](cms), NINLET=[1],
782                      MAJID=[2], MajNHYD=[000100],
783                      MINID=[7], MinNHYD=[100100],
784                      TMJSTO=[0](cu-m)
785 *%-----|-----|
786 *#=====|-----|
787 *# BEAVER POND PORTION #1
788 *#=====|-----|
789 *
790 ADD HYD          IDsum=[9], NHYD=[000321], IDs to add=[6+2]
791 *%-----|-----|
792 *
793 *#=====|-----|
794 *# KANATA AVENUE - GOULBOURN FORCED ROAD TO AREA 10 BOUNDARY
795 *# (ARTERIAL ROAD 10 YEAR 10 MIN INLET TIME)
796 *#=====|-----|
797 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1](min), AREA=[2.8](ha),
798                      XIMP=[0.32], TIMP=[0.32], DWF=[0](cms), LOSS=[2],
799                      SCS curve number CN=[61],
800                      Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
801                      LGP=[40](m), MNP=[0.25], SCP=[0](min),
802                      Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
803                      LGI=[370](m), MNI=[0.025], SCI=[0](min),

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804      Continuous simulation parameters:
805      IaRECper=[6](hrs),  IaRECimp=[4](hrs),
806      SMIN=[-1](mm),  SMAX=[-1](mm),  SK=[0.01]/(mm),
807      InterEventTime=[12](hrs),  END=-1
808      *%-----|-----
809      *#=====|=====
810      *# MAJOR FLOW TOWARDS TFD - MINOR FLOW TO AREA 10 STORM SYSTEM
811      *# 237.69 L/S/HA * 1.8 HA = 427.8 L/S
812      * JFSA correction based on above drainage area of 2.8 ha
813      * Capture in DUALHYD below 237.69 L/s/ha * 2.8 ha = 665.5 L/s
814      *#=====|=====
815      COMPUTE DUALHYD      IDin=[1], CINLET=[0.6655](cms), NINLET=[1],
816                          MAJID=[10], MajNHYD=[000100],
817                          MINID=[2], MinNHYD=[100100],
818                          TMJSTO=[0](cu-m)
819      *%-----|-----
820      *
821      *#=====|=====
822      *# DRAINAGE AGREA 10 - TOTAL 43.6 HA - DIVIDED UP FOR HGL ANALYSIS
823      *# (INCLUDES AREA 10-4, 10-1, 10-2 AND 10-3)
824      *#=====|=====
825      *
826      *#=====|=====
827      *# AREA 10-4 - DRAINS INTO S-5 - MAJOR FLOW CASCADES
828      *#=====|=====
829      CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1](min), AREA=[13.9](ha),
830                          XIMP=[0.39], TIMP=[0.51], DWF=[0](cms), LOSS=[2],
831                          SCS curve number CN=[61],
832                          Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
833                                              LGP=[40](m), MNP=[0.25], SCP=[0](min),
834                          Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
835                                              LGI=[285](m), MNI=[0.025], SCI=[0](min),
836                          Continuous simulation parameters:
837                          IaRECper=[6](hrs),  IaRECimp=[4](hrs),
838                          SMIN=[-1](mm),  SMAX=[-1](mm),  SK=[0.01]/(mm),
839                          InterEventTime=[12](hrs),  END=-1
840      *%-----|-----
841      *#=====|=====
842      *# MINOR FLOW INTO SYSTEM
843      *# 85 L/S/HA * 14 = 1190 L/S
844      *JFSA correction based on above drainage area of 13.9 ha
845      * Capture in DUALHYD below 85 L/s/ha * 13.9 ha = 1181 L/s
846      *#=====|=====
847      COMPUTE DUALHYD      IDin=[1], CINLET=[1.181](cms), NINLET=[1],
848                          MAJID=[8], MajNHYD=[000100],
849                          MINID=[6], MinNHYD=[100100],
850                          TMJSTO=[0](cu-m)
851      *%-----|-----
852      *#=====|=====
853      *# ADD KANATA AVENUE AND AREA 10-4 - MH S-5
854      *#=====|=====
855      *
856      ADD HYD      IDsum=[5], NHYD=[000101], IDs to add=[6+2]
857      *%-----|-----
858      *
859      *#=====|=====
860      *# AREA 10-1 - DRAINS INTO S-4 - MAJOR FLOW CASCADES
861      *#=====|=====
862      CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1](min), AREA=[9.8](ha),
863                          XIMP=[0.42], TIMP=[0.51], DWF=[0](cms), LOSS=[2],
864                          SCS curve number CN=[70],
865                          Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
866                                              LGP=[40](m), MNP=[0.25], SCP=[0](min),
867                          Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
868                                              LGI=[256](m), MNI=[0.025], SCI=[0](min),
869                          Continuous simulation parameters:
870                          IaRECper=[6](hrs),  IaRECimp=[4](hrs),

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871             SMIN=[-1](mm),  SMAX=[-1](mm), SK=[0.01]/(mm),
872             InterEventTime=[12](hrs), END=-1
873 *%-----|-----|
874 *#=====|=====|
875 *# MINOR FLOW INTO SYSTEM
876 *# 85 L/S/HA * 9.5 = 807.5 L/S
877 *JFSA correction based on above drainage area of 9.8 ha
878 * Capture in DUALHYD below 85 L/s/ha * 9.8 ha = 833 L/s
879 *#=====|=====|
880 COMPUTE DUALHYD   IDin=[1], CINLET=[0.833](cms), NINLET=[1],
881                   MAJID=[4], MajNHYD=[000100],
882                   MINID=[6], MinNHYD=[100100],
883                   TMJSTO=[0](cu-m)
884 *%-----|-----|
885 *#=====|=====|
886 *# ADD GOULBOURN FORCED ROAD AND AREA 10-1 - MH S-3
887 *#=====|=====|
888 *
889 ADD HYD           IDsum=[3], NHYD=[000101], IDs to add=[6+7]
890 *%-----|-----|
891 ADD HYD           IDsum=[7], NHYD=[000102], IDs to add=[3+5]
892 *%-----|-----|
893 *
894 *#=====|=====|
895 *# AREA 10-3 - DRAINS INTO S-2 - MAJOR FLOW CASCADES
896 *#=====|=====|
897 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1](min), AREA=[4.3](ha),
898                   XIMP=[0.41], TIMP=[0.55], DWF=[0](cms), LOSS=[2],
899                   SCS curve number CN=[78],
900                   Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
901                                           LGP=[40](m), MNP=[0.25], SCP=[0](min),
902                   Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
903                                           LGI=[161](m), MNI=[0.025], SCI=[0](min),
904                   Continuous simulation parameters:
905                   IaRECper=[6](hrs), IaRECimp=[4](hrs),
906                   SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
907                   InterEventTime=[12](hrs), END=-1
908 *%-----|-----|
909 *#=====|=====|
910 *# MINOR FLOW INTO SYSTEM
911 *# 85 L/S/HA * 3.9 = 331.5 L/S
912 *JFSA correction based on above drainage area of 4.3 ha
913 * Capture in DUALHYD below 85 L/s/ha * 4.3 ha = 365 L/s
914 *#=====|=====|
915 COMPUTE DUALHYD   IDin=[1], CINLET=[0.365](cms), NINLET=[1],
916                   MAJID=[5], MajNHYD=[000100],
917                   MINID=[2], MinNHYD=[100100],
918                   TMJSTO=[0](cu-m)
919 *%-----|-----|
920 ADD HYD           IDsum=[10], NHYD=[000103], IDs to add=[2+7]
921 *%-----|-----|
922 *
923 *#=====|=====|
924 *# AREA 10-2 - DRAINS INTO S-6 - MAJOR FLOW CASCADES
925 *#=====|=====|
926 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1](min), AREA=[18.6](ha),
927                   XIMP=[0.38], TIMP=[0.51], DWF=[0](cms), LOSS=[2],
928                   SCS curve number CN=[61],
929                   Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
930                                           LGP=[40](m), MNP=[0.25], SCP=[0](min),
931                   Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
932                                           LGI=[354](m), MNI=[0.025], SCI=[0](min),
933                   Continuous simulation parameters:
934                   IaRECper=[6](hrs), IaRECimp=[4](hrs),
935                   SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
936                   InterEventTime=[12](hrs), END=-1
937 *%-----|-----|

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938 *#=====
939 *# MINOR FLOW INTO SYSTEM
940 *# 85 L/S/HA * 16.2 = 1377 L/S
941 *JFSA correction based on above drainage area of 18.6 ha
942 * Capture in DUALHYD below 85 L/s/ha * 18.6 ha = 1581 L/s
943 *#=====
944 COMPUTE DUALHYD      IDin=[1], CINLET=[1.581](cms), NINLET=[1],
945                     MAJID=[2], MajNHYD=[000100],
946                     MINID=[6], MinNHYD=[100100],
947                     TMJSTO=[0](cu-m)
948 *%-----|-----
949 *
950 *#=====
951 *# AREA 10A - MINOR FLOW TO AREA 10, MAJOR FLOW TO CARP RIVER WATERSHED
952 *#=====
953 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1](min), AREA=[9.9](ha),
954                     XIMP=[0.33], TIMP=[0.44], DWF=[0](cms), LOSS=[2],
955                     SCS curve number CN=[65],
956                     Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
957                                         LGP=[40](m), MNP=[0.25], SCP=[0](min),
958                     Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
959                                         LGI=[246](m), MNI=[0.025], SCI=[0](min),
960                     Continuous simulation parameters:
961                     IaRECper=[6](hrs), IaRECimp=[4](hrs),
962                     SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
963                     InterEventTime=[12](hrs), END=-1
964 *%-----|-----
965 *#=====
966 *# SPLIT OF MAJOR AND MINOR FLOW AT 85 L/S/HA
967 *# 85 * 7.0 = 595 L/S
968 *JFSA correction based on above drainage area of 9.9 ha
969 * Capture in DUALHYD below 85 L/s/ha * 9.9 ha = 841 L/s
970 *#=====
971 COMPUTE DUALHYD      IDin=[1], CINLET=[0.841](cms), NINLET=[1],
972                     MAJID=[3], MajNHYD=[000100],
973                     MINID=[7], MinNHYD=[100100],
974                     TMJSTO=[0](cu-m)
975 *%-----|-----
976 ADD HYD              IDsum=[1], NHYD=[000104], IDs to add=[7+6]
977 *%-----|-----
978 *#=====
979 *# TOTAL MINOR FLOW AT OUTLET
980 *#=====
981 ADD HYD              IDsum=[6], NHYD=[000105], IDs to add=[1+10]
982 *%-----|-----
983 *#=====
984 *# TOTAL MAJOR FLOW FOR DRAINAGE AREA 10 AT OUTLET
985 *#=====
986 ADD HYD              IDsum=[7], NHYD=[000106], IDs to add=[8+4+5+2]
987 *%-----|-----
988 *#=====
989 *# AREA 11 (RURAL) - Increased Area for Existing Conditions
990 *#=====
991 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[46.2](ha),
992                     DWF=[0](cms), CN=[62], IA=[7.0](mm),
993                     N=[1.1], TP=[0.75]hrs,
994                     Continuous simulation parameters:
995                     IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
996                     InterEventTime=[12](hrs),
997                     Baseflow simulation parameters:
998                     BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
999                     VHydCond=[0.02](mm/hr), END=-1
1000 *%-----|-----
1001 ADD HYD              IDsum=[3], NHYD=[000317], IDs to add=[7+2]
1002 *%-----|-----
1003 *#=====
1004 *# TOTAL FLOW TO KIZELL POND (U/S CELL)

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1005 *#=====
1006 ADD HYD          IDsum=[10], NHYD=[000317], IDs to add=[3+6]
1007 *%-----|-----|
1008 *
1009 *#=====
1010 *# SYSTEM STORAGE REPRESENTATION (KIZELL POND)
1011 *# RATING CURVE PROVIDED BY IBI
1012 *#=====
1013 ROUTE RESERVOIR  IDout=[3],  NHYD=["KP-R"],  IDin=[10],
1014                  RDT=[5](min),
1015                  TABLE of ( OUTFLOW-STORAGE ) values
1016                      (cms) - (ha-m)
1017                      [ 0.0 , 0.0 ]
1018                      [ 0.058 , 0.3024]
1019                      [ 0.089 , 0.4604]
1020                      [ 0.179 , 0.9293]
1021                      [ 0.235 , 1.5450]
1022                      [ -1 , -1 ] (max twenty pts)
1023                  IDovf=[4], NHYDovf=["OVF-KP"]
1024 *#=====
1025 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (KIZELL)
1026 *#=====
1027 ADD HYD          IDsum=[10], NHYD=["KP-COM"], IDs to add=[3+4]
1028 *#=====
1029 *
1030 * Kanata Lakes Stage 7 - Catchment removed from Model under existing conditions
1031 *
1032 *#=====
1033 *CONTINUOUS STANDHYD  ID=[1], NHYD=["Stage 7"], DT=[1](min), AREA=[73.1](ha),
1034 *                    XIMP=[0.375], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
1035 *                    SCS curve number CN=[57],
1036 *                    Pervious  surfaces: IAper=[4.67](mm), SLPP=[2](%),
1037 *                    LGP=[40](m), MNP=[0.25], SCP=[0](min),
1038 *                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1039 *                    LGI=[16445](m), MNI=[0.025], SCI=[0](min),
1040 *                    Continuous simulation parameters:
1041 *                    IaRECper=[6](hrs), IaRECimp=[4](hrs),
1042 *                    SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1043 *                    InterEventTime=[12](hrs), END=-1
1044 *#=====
1045 *
1046 * Kanata Lakes Stage 8 - Catchment removed from Model under existing conditions
1047 *
1048 *#=====
1049 *CONTINUOUS STANDHYD  ID=[2], NHYD=["Stage 8"], DT=[1](min), AREA=[65.7](ha),
1050 *                    XIMP=[0.375], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
1051 *                    SCS curve number CN=[57],
1052 *                    Pervious  surfaces: IAper=[4.67](mm), SLPP=[2](%),
1053 *                    LGP=[40](m), MNP=[0.25], SCP=[0](min),
1054 *                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1055 *                    LGI=[14785](m), MNI=[0.025], SCI=[0](min),
1056 *                    Continuous simulation parameters:
1057 *                    IaRECper=[6](hrs), IaRECimp=[4](hrs),
1058 *                    SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1059 *                    InterEventTime=[12](hrs), END=-1
1060 *#=====
1061 *# Only Minor system flow to Kizell Cell - Command removed from Model
1062 *#=====
1063 *COMPUTE DUALHYD  IDin=[2], CINLET=[0.8](cms), NINLET=[1],
1064 *                MAJID=[3], MajNHYD=[000100],
1065 *                MINID=[7], MinNHYD=[100100],
1066 *                TMJSTO=[0](cu-m)
1067 *#=====
1068 * Total flow into Kizell Cell
1069 *#=====
1070 *#ADD HYD          IDsum=[8], NHYD=["KP-COM"], IDs to add=[10+1]
1071 *#=====

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1072 *#=====
1073 * ROUTE THROUGH THE KIZELL CELL
1074 *
1075 ROUTE RESERVOIR      IDout=[5],  NHYD=["Kizell Cell"],  IDin=[10],
1076 RDT=[1](min),
1077         TABLE of ( OUTFLOW-STORAGE ) values
1078                 (cms) - (ha-m)
1079                 [ 0.0 , 0.0 ]
1080                 [ 0.100 , 0.016]
1081                 [ 0.200 , 0.033]
1082                 [ 0.300 , 0.055]
1083                 [ 0.400 , 0.079]
1084                 [ 0.500 , 0.121]
1085                 [ 0.700 , 0.188]
1086                 [ 0.800 , 0.281]
1087                 [ 0.950 , 0.433]
1088                 [ 1.050 , 0.658]
1089                 [ 1.200 , 0.919]
1090                 [ -1 , -1 ] (max twenty pts)
1091 IDovf=[4], NHYDovf=["OVF-Kizell Cell"]
1092 *#=====
1093 *# ADD OUTFLOW AND OVERFLOW
1094 *#=====
1095 ADD HYD              IDsum=[8], NHYD=["KP-COM"], IDs to add=[5+4]
1096 *#=====
1097 *#=====
1098 *# SYSTEM STORAGE REPRESENTATION (BEAVER POND)
1099 *# RATING CURVE PROVIDED BY IBI
1100 *#=====
1101 ROUTE RESERVOIR      IDout=[3],  NHYD=["BP-R"],  IDin=[9],
1102 RDT=[5](min),
1103         TABLE of ( OUTFLOW-STORAGE ) values
1104                 (cms) - (ha-m)
1105                 [ 0.0 , 0.0 ]
1106                 [ 0.091 , 1.3560]
1107                 [ 0.179 , 2.6800]
1108                 [ 0.184 , 2.8250]
1109                 [ 0.264 , 5.3600]
1110                 [ 0.270 , 5.6350]
1111                 [ -1 , -1 ] (max twenty pts)
1112 IDovf=[4], NHYDovf=["OVF-BP"]
1113 *#=====
1114 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (BEAVER)
1115 *#=====
1116 ADD HYD              IDsum=[9], NHYD=["BP-COM"], IDs to add=[3+4]
1117 *#=====
1118 *
1119 * Kanata Lakes Stage 9 - Replaced by subcatchment 8 under existing conditions
1120 *
1121 *#=====
1122 CONTINUOUS NASHYD      ID=[1], NHYD=["8"], DT=[1]min, AREA=[9.2](ha),
1123 DWF=[0](cms),  CN=[56], IA=[7.0](mm),
1124 N=[1.1], TP=[0.21]hrs,
1125 Continuous simulation parameters:
1126 IaRECper=[6](hrs), SMIN=[-1](mm),  SMAX=[-1](mm), SK=[0.01]/(mm),
1127 InterEventTime=[12](hrs),
1128 Baseflow simulation parameters:
1129 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1130 VHydCond=[0.02](mm/hr), END=-1
1131 *#=====
1132 *# TOTAL HYDROGRAPH INTO BEAVER POND
1133 *
1134 ADD HYD              IDsum=[6], NHYD=["BP-TOTAL"], IDs to add=[9+8+1]
1135 *
1136 *#=====
1137 SAVE HYD             ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
1138 HYD_FILENAME=["BP_In"]

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1139             HYD_COMMENT=["Total inflow to the Beaver Pond"]
1140 *#=====
1141 *# TOTAL FLOW FROM BEAVER POND
1142 *#=====
1143 * ROUTE THROUGH BEAVER POND
1144 * Overflow option removed to allow for linear extrapolation of flows out of the
1145 * pond when simulated volumes exceed volumes provided in the curve below.
1146 ROUTE RESERVOIR      IDout=[1],  NHYD=["BP-OUT"],  IDin=[6],
1147                       RDT=[1](min),
1148                       TABLE of ( OUTFLOW-STORAGE ) values
1149                               (cms) - (ha-m)
1150                               [ 0.0 , 0.0 ]
1151                               [ 0.592 , 4.573]
1152                               [ 0.686 , 6.569]
1153                               [ 0.769 , 8.840]
1154                               [ 0.879 , 11.467]
1155                               [ 1.007 , 16.103]
1156                               [ 1.040 , 17.339]
1157                               [ -1 , -1 ] (max twenty pts)
1158                       IDovf=[],  NHYDovf=[""]
1159 *#=====
1160 SAVE HYD             ID=[1],  # OF PCYCLES=[-1],  ICASEsh=[-1]
1161                       HYD_FILENAME=["BP_Out"]
1162                       HYD_COMMENT=["Total Outflow from the Beaver Pond"]
1163 *#=====
1164 *# ROUTE KD-1 THROUGH KD-2A
1165 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 10018.26
1166 *#=====
1167 ROUTE CHANNEL      IDout=[3],  NHYD=["KD-1"],  IDin=[1],
1168                       RDT=[1](min),
1169                       CHLGTH=[277](m),  CHSLOPE=[1.08](%),
1170                                       FPSLOPE=[1.08](%),
1171                       SECNUM=[10018],  NSEG=[4]
1172                       ( SEGROUGH, SEGDIST (m))=[0.08,30.63 -0.03,34.69 0.08,49.66
0.04,70.77] NSEG times
1173                       ( DISTANCE (m), ELEVATION (m))=[ 0, 94.54 ]
1174                                                         [ 7.12, 93.2 ]
1175                                                         [11.07, 92.3 ]
1176                                                         [15.31, 91.8 ]
1177                                                         [17.16, 91.35 ]
1178                                                         [20.56, 90.8 ]
1179                                                         [25.12, 89.58 ]
1180                                                         [28.15, 88.5 ]
1181                                                         [30.63, 87.8 ]
1182                                                         [31.957, 87.854 ]
1183                                                         [ 34.4, 88.5 ]
1184                                                         [34.69, 88.61 ]
1185                                                         [ 36.5, 89.23 ]
1186                                                         [38.48, 90.2 ]
1187                                                         [41.14, 91.1 ]
1188                                                         [ 45.4, 91.66 ]
1189                                                         [49.66, 91.96 ]
1190                                                         [53.06, 92.3 ]
1191                                                         [67.16, 92.43 ]
1192                                                         [70.77, 92.52 ]
1193 *#=====
1194 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9854.606
1195 *#=====
1196 ROUTE CHANNEL      IDout=[2],  NHYD=["KD-1"],  IDin=[3],
1197                       RDT=[1](min),
1198                       CHLGTH=[186](m),  CHSLOPE=[1.97](%),
1199                                       FPSLOPE=[1.97](%),
1200                       SECNUM=[9854],  NSEG=[5]
1201                       ( SEGROUGH, SEGDIST (m))=[0.08,29.81 0.05,34.304 -0.03,38.24
0.05,47.73 0.08,105.39] NSEG times
1202                       ( DISTANCE (m), ELEVATION (m))=[ 0, 90.07 ]
1203                                                         [ 6.86, 89.4 ]

```

```

1204 [13.24, 89.2 ]
1205 [17.79, 88.48 ]
1206 [22.46, 87.2 ]
1207 [29.81, 86.04 ]
1208 [32.17, 85.72 ]
1209 [34.304, 85.612 ]
1210 [36.137, 85.654 ]
1211 [37.46, 85.69 ]
1212 [38.24, 85.72 ]
1213 [44.98, 85.9 ]
1214 [47.73, 86.32 ]
1215 [51.27, 87.3 ]
1216 [55.17, 88 ]
1217 [87.02, 88.79 ]
1218 [90.72, 88.7 ]
1219 [93.96, 89 ]
1220 [99.45, 90.8 ]
1221 [105.39, 91.81 ]
1222 *#=====
1223 *# KD-2A-1 - RURAL - Increased Area for Existing Conditions
1224 *#=====
1225 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2A-1"], DT=[1]min, AREA=[28.6](ha),
1226 DWF=[0](cms), CN=[57], IA=[7](mm),
1227 N=[1.1], TP=[0.91]hrs,
1228 Continuous simulation parameters:
1229 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1230 InterEventTime=[12](hrs),
1231 Baseflow simulation parameters:
1232 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1233 VHydCond=[0.02](mm/hr), END=-1
1234 *#=====
1235 *# ADD KD-2A-1 AND KD-1
1236 *#=====
1237 ADD HYD IDsum=[3], NHYD=["KFP2"], IDs to add=[1+2]
1238 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1239 *#=====
1240 *# ROUTE THROUGH KD-2A-2
1241 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9743.627
1242 *#=====
1243 ROUTE CHANNEL IDout=[1], NHYD=["KD-1"], IDin=[3],
1244 RDT=[1](min),
1245 CHLGTH=[408](m), CHSLOPE=[0.84](%),
1246 FPSLOPE=[0.84](%),
1247 SECNUM=[9743], NSEG=[5]
1248 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
0.05,63.17 0.08,111.15] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
1249 [ 7.01, 86.7 ]
1250 [15.57, 86.2 ]
1251 [21.06, 85.58 ]
1252 [25.69, 84.76 ]
1253 [31.55, 83.42 ]
1254 [40.62, 82.7 ]
1255 [42.45, 82.5 ]
1256 [44.28, 82.561 ]
1257 [ 44.6, 82.59 ]
1258 [46.07, 82.7 ]
1259 [48.58, 82.76 ]
1260 [59.09, 82.59 ]
1261 [63.17, 83.94 ]
1262 [67.14, 85.3 ]
1263 [71.84, 85.8 ]
1264 [82.08, 85.8 ]
1265 [89.16, 86.2 ]
1266 [106.01, 86.6 ]
1267 [111.15, 86.65 ]
1268
1269 *#=====

```

```

1270 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1271 HYD_FILENAME=["KD-1"]
1272 HYD_COMMENT=["KD-1-Channel where Erosion analysis was completed"]
1273 *#=====
1274 *# Erosion Analysis on Kizell Drain (Requires SWMHYMO v5.5)
1275 *#=====
1276 *# Erosion Index/critical shear stress calculated for flows through the critical
1277 *# section of on Kizell Drain as determined by Matrix Solutions (May 2019)
1278 *#=====
1279 EROSION INDEX INDEX_METHOD=[2], SHEARC =[20](Pa), No of Hyds=[1],
1280 NHYDsErosion=[1]
1281 RATING_CURVE_METHOD = [1], user entered channel shape
1282 Channel section parameters
1283 Section No["XS1"]
1284 CHSLOPE=[0.84](%), FPSLOPE=[0.84](%),
1285 NSEG=[5]
1286 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
0.05,63.17 0.08,111.15] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
[ 7.01, 86.7 ]
[15.57, 86.2 ]
[21.06, 85.58 ]
[25.69, 84.76 ]
[31.55, 83.42 ]
[40.62, 82.7 ]
[42.45, 82.5 ]
[44.28, 82.561 ]
[ 44.6, 82.59 ]
[46.07, 82.7 ]
[48.58, 82.76 ]
[59.09, 82.59 ]
[63.17, 83.94 ]
[67.14, 85.3 ]
[71.84, 85.8 ]
[82.08, 85.8 ]
[89.16, 86.2 ]
[106.01, 86.6 ]
[111.15, 86.65 ]
1307 *#=====
1308 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9338.062
1309 *# MINIMUM SLOPE ASSUMED 0.1%
1310 *#=====
1311 ROUTE CHANNEL IDout=[2], NHYD=["KD-1"], IDin=[1],
1312 RDT=[1](min),
1313 CHLGTH=[111](m), CHSLOPE=[0.1](%),
1314 FPSLOPE=[0.1](%),
1315 SECNUM=[9338], NSEG=[5]
1316 ( SEGROUGH, SEGDIST (m))=[0.04,78.47 0.06,82.78 -0.03,87.28
0.06,107.69 0.04,120.16] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 82.8 ]
[ 6.26, 82.86 ]
[ 23, 82.4 ]
[57.46, 82.11 ]
[75.38, 82.1 ]
[78.47, 81.06 ]
[ 81.6, 79.7 ]
[82.78, 79.3 ]
[87.28, 79.28 ]
[ 88.3, 79.7 ]
[91.41, 81.1 ]
[94.81, 81.7 ]
[107.69, 82.1 ]
[120.16, 82.2 ]
1331 *#=====
1332 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9131.887
1333 *#=====
1334 ROUTE CHANNEL IDout=[1], NHYD=["KD-1"], IDin=[2],

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1335 RDT=[1](min),
1336 CHLGTH=[248](m), CHSLOPE=[0.28](%),
1337 FPSLOPE=[0.28](%),
1338 SECNUM=[9131], NSEG=[5]
1339 ( SEGROUGH, SEGDIST (m))=[0.04,70.64 -0.03,72.865 0.04,74.61
0.05,77.65 0.04,191.67] NSEG times
1340 ( DISTANCE (m), ELEVATION (m))=[ 0, 81.6 ]
1341 [ 7.35, 81.6 ]
1342 [ 26.3, 80.9 ]
1343 [48.53, 80.87 ]
1344 [58.55, 80.01 ]
1345 [65.66, 80 ]
1346 [69.22, 79 ]
1347 [70.64, 78.65 ]
1348 [72.865, 78.7 ]
1349 [74.25, 78.96 ]
1350 [74.61, 79.1 ]
1351 [77.65, 79.92 ]
1352 [93.59, 79.9 ]
1353 [103.2, 78.7 ]
1354 [108.05, 79.9 ]
1355 [115.92, 80.2 ]
1356 [132.65, 80.2 ]
1357 [159.72, 80.73 ]
1358 [176.71, 82.61 ]
1359 [191.67, 82.63 ]
1360 *#=====
1361 *# KD-2A-2 - URBAN/RURAL NORTH OF RAILROAD
1362 *#=====
1363 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2A-2"], DT=[1](min), AREA=[44.99](ha),
1364 XIMP=[0.28], TIMP=[0.28], DWF=[0](cms), LOSS=[2],
1365 SCS curve number CN=[70],
1366 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1367 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1368 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1369 LGI=[2232](m), MNI=[0.025], SCI=[0](min),
1370 Continuous simulation parameters:
1371 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1372 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1373 InterEventTime=[12](hrs), END=-1
1374 *#=====
1375 *# ADD KD-2A-1 AND KD-2A-2
1376 *# CREST GAUGE LOCATION KD-2 -KIZELL DRAIN AT MARCH ROAD
1377 *#=====
1378 ADD HYD IDsum=[3], NHYD=["KFP3"], IDs to add=[1+2]
1379 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1380 *#=====
1381 *# KD-2A-3 - URBAN SOUTH OF RAILROAD
1382 *#=====
1383 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2A-3"], DT=[1](min), AREA=[48.56](ha),
1384 XIMP=[0.28], TIMP=[0.31], DWF=[0](cms), LOSS=[2],
1385 SCS curve number CN=[74],
1386 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1387 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1388 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1389 LGI=[2074](m), MNI=[0.025], SCI=[0](min),
1390 Continuous simulation parameters:
1391 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1392 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1393 InterEventTime=[12](hrs), END=-1
1394 *#=====
1395 *# ADD KD-2A-2 AND KD-2A-3 D/S OF MARCH ROAD
1396 *#=====
1397 ADD HYD IDsum=[4], NHYD=["KD-2A-3"], IDs to add=[3+2]
1398 *#=====
1399 *# ROUTE KD-2A THROUGH KD-2B
1400 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8942.456

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1401 *#=====
1402 ROUTE CHANNEL      IDout=[1], NHYD=["KD-2A"], IDin=[4],
1403                   RDT=[1](min),
1404                   CHLGTH=[254](m),  CHSLOPE=[0.55](%),
1405                   FPSLOPE=[0.55](%),
1406                   SECNUM=[8942],    NSEG=[5]
1407                   ( SEGROUGH, SEGDIST (m))=[0.04,17.24 0.05,28.26 -0.03,31.51
0.05,61.08 0.04,68.63] NSEG times
                   ( DISTANCE (m), ELEVATION (m))=[ 0, 80.58 ]
1408                   [ 1.57, 80.5 ]
1409                   [ 8.77, 80.5 ]
1410                   [10.84, 80.23 ]
1411                   [17.24, 80.03 ]
1412                   [20.76, 79 ]
1413                   [23.59, 78.9 ]
1414                   [26.81, 78.17 ]
1415                   [28.26, 77.9 ]
1416                   [30.06, 77.9 ]
1417                   [30.71, 78.01 ]
1418                   [31.51, 78.2 ]
1419                   [32.21, 78.39 ]
1420                   [ 37.7, 78.4 ]
1421                   [44.07, 78.5 ]
1422                   [48.95, 78.7 ]
1423                   [57.53, 79.33 ]
1424                   [61.08, 79.95 ]
1425                   [64.61, 80.71 ]
1426                   [68.63, 81.15 ]
1427
1428 *#=====
1429 *# KD-2B-6 - URBAN
1430 *#=====
1431 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2B-6"], DT=[1](min), AREA=[7.73](ha),
1432 XIMP=[0.61], TIMP=[0.61], DWF=[0](cms), LOSS=[2],
1433 SCS curve number CN=[62],
1434 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1435                   LGP=[40](m), MNP=[0.25], SCP=[0](min),
1436 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1437                   LGI=[1106](m), MNI=[0.025], SCI=[0](min),
1438 Continuous simulation parameters:
1439 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1440 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1441 InterEventTime=[12](hrs), END=-1
1442 *#=====
1443 *# ROUTE KD-2B-6 THROUGH SWM POND SOUTH OF SOLANDT ROAD
1444 *# ASSUME 5-YEAR CONTROL ACCORDING TO CITY GUIDELINES
1445 *#=====
1446 ROUTE RESERVOIR      IDout=[4], NHYD=["KD-2B-6"], IDin=[2],
1447                   RDT=[1](min),
1448                   TABLE of ( OUTFLOW-STORAGE ) values
1449                   (cms) - (ha-m)
1450                   [ 0.0 , 0.0 ]
1451                   [ 0.407 , 0.095 ]
1452                   [ -1 , -1 ] (max twenty pts)
1453                   IDovf=[5], NHYDovf=["OVF-2B6"]
1454 *#=====
1455 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1456 *#=====
1457 ADD HYD              IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5+1]
1458 *#=====
1459 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8329.198
1460 *#=====
1461 ROUTE CHANNEL      IDout=[2], NHYD=["KD-2A"], IDin=[6],
1462                   RDT=[1](min),
1463                   CHLGTH=[747](m),  CHSLOPE=[0.36](%),
1464                   FPSLOPE=[0.36](%),
1465                   SECNUM=[8329],    NSEG=[4]
1466                   ( SEGROUGH, SEGDIST (m))=[0.08,81.34 0.05,88.266 -0.03,97.72

```

```

0.08,109.09] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 78.3 ]
[56.66, 78.2 ]
[67.31, 78.2 ]
[72.25, 78 ]
[79.85, 78 ]
[81.34, 77.66 ]
[87.28, 75.87 ]
[88.266, 75.728 ]
[90.51, 75.759 ]
[90.57, 75.77 ]
[91.47, 75.88 ]
[97.72, 76.64 ]
[109.09, 78.5 ]
    
```

```

1480 *#-----
1481 *# KD-2B-3 - Converted to NASHYD under existing conditions
1482 *#-----
1483 CONTINUOUS NASHYD          ID=[1], NHYD=["KD-2B-3"], DT=[1]min, AREA=[7.40](ha),
1484 DWF=[0](cms), CN=[65], IA=[7.0](mm),
1485 N=[1.1], TP=[0.49]hrs,
1486 Continuous simulation parameters:
1487 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1488 InterEventTime=[12](hrs),
1489 Baseflow simulation parameters:
1490 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1491 VHydCond=[0.02](mm/hr), END=-1
1492 *#-----
1493 *# 5 YEAR CONTROL - 89L/s
1494 *# MAJOR FLOWS TO KIZELL DRAIN
1495 *# MINOR FLOWS TO GOLF COURSE POND #2
1496 *#-----
1497 COMPUTE DUALHYD          IDin=[1], CINLET=[0.089](cms), NINLET=[1],
1498 MAJID=[3], MajNHYD=["2B3MAJ"],
1499 MINID=[4], MinNHYD=["2B3MIN"],
1500 TMJSTO=[0](cu-m)
1501 *#-----
1502 *# KD-2B-4 Converted to NASHYD under existing conditions
1503 *#-----
1504 CONTINUOUS NASHYD          ID=[5], NHYD=["KD-2B-4"], DT=[1]min, AREA=[23.59](ha),
1505 DWF=[0](cms), CN=[63], IA=[7.0](mm),
1506 N=[1.1], TP=[0.62]hrs,
1507 Continuous simulation parameters:
1508 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1509 InterEventTime=[12](hrs),
1510 Baseflow simulation parameters:
1511 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1512 VHydCond=[0.02](mm/hr), END=-1
1513 *#-----
1514 *# ADD KD-2B-3 MINOR AND KD-2B-4
1515 *#-----
1516 ADD HYD                    IDsum=[6], NHYD=["KD-2B-4"], IDs to add=[4+5]
1517 *#-----
1518 *# ROUTE KD-2B-4 THROUGH GOLF COURSE POND #2
1519 *#-----
1520 ROUTE RESERVOIR          IDout=[4], NHYD=["KD-2B-4"], IDin=[6],
1521 RDT=[1](min),
1522 TABLE of ( OUTFLOW-STORAGE ) values
1523 (cms) - (ha-m)
1524 [ 0.0 , 0.0 ]
1525 [ 0.229, 1.5695]
1526 [ 0.251, 1.8191]
1527 [ 0.328, 2.9421]
1528 [ -1 , -1 ] (max twenty pts)
1529 IDovf=[5], NHYDovf=["OVF-2B6"]
1530 *#-----
1531 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1532 *#-----
    
```

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1533 ADD HYD IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5]
1534 *#-----
1535 *# ADD KD-2B-3 MAJOR, KD-2B-4 AND KD-2B-6
1536 *#-----
1537 ADD HYD IDsum=[4], NHYD=["KD-2B-4"], IDs to add=[3+6+2]
1538 *#-----
1539 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7691.759
1540 *#-----
1541 ROUTE CHANNEL IDout=[2], NHYD=["KD-2A"], IDin=[4],
1542 RDT=[1](min),
1543 CHLGTH=[408](m), CHSLOPE=[0.11](%),
1544 FPSLOPE=[0.11](%),
1545 SECNUM=[7691], NSEG=[3]
1546 ( SEGROUGH, SEGDIST (m))=[0.06,16.78 -0.03,19.003 0.06,24.49] NSEG ↵
times
1547 ( DISTANCE (m), ELEVATION (m))=[ 0, 76.75 ]
1548 [ 0.66, 76.6 ]
1549 [ 3.57, 75.74 ]
1550 [ 4.99, 75.24 ]
1551 [ 5.76, 75.1 ]
1552 [ 7.69, 75 ]
1553 [ 8.56, 74.9 ]
1554 [ 9.95, 74.9 ]
1555 [12.21, 74.8 ]
1556 [12.99, 74.69 ]
1557 [ 15.2, 74.3 ]
1558 [16.78, 74.1 ]
1559 [17.38, 73.8 ]
1560 [18.38, 73.8 ]
1561 [19.003, 74.147]
1562 [19.94, 74.21 ]
1563 [20.51, 74.31 ]
1564 [21.52, 74.6 ]
1565 [22.72, 75.04 ]
1566 [24.49, 75.5 ]
1567 *#-----
1568 *# KD-2B-2 - URBAN RESIDENTIAL - Converted to NASHYD under existing conditions
1569 *#-----
1570 CONTINUOUS NASHYD ID=[3], NHYD=["KD-2B-2"], DT=[1]min, AREA=[3.35](ha),
1571 DWF=[0](cms), CN=[63], IA=[7.0](mm),
1572 N=[1.1], TP=[0.32]hrs,
1573 Continuous simulation parameters:
1574 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1575 InterEventTime=[12](hrs),
1576 Baseflow simulation parameters:
1577 BaseFlowOption=[1], InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1578 VHydCond=[0.02](mm/hr), END=-1
1579 *#-----
1580 *# ROUTE KD-2B-2 THROUGH POND #3 NORTH OF FARRAR ROAD
1581 *#-----
1582 ROUTE RESERVOIR IDout=[5], NHYD=["KD-2B-2"], IDin=[3],
1583 RDT=[1](min),
1584 TABLE of ( OUTFLOW-STORAGE ) values
1585 (cms) - (ha-m)
1586 [ 0.0 , 0.0 ]
1587 [ 0.260 , 0.616]
1588 [ 0.282 , 0.7115]
1589 [ 0.374 , 1.2301]
1590 [ -1 , -1 ] (max twenty pts)
1591 IDovf=[6], NHYDovf=["OVF-2B3"]
1592 *#-----
1593 *# ADD OUTFLOW, OVERFLOW AND KD-2B-4
1594 *#-----
1595 ADD HYD IDsum=[1], NHYD=["KD-2B-4"], IDs to add=[5+6+2]
1596 *#-----
1597 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7386.879
1598 *#-----

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1599  ROUTE CHANNEL      IDout=[2], NHYD=["KD-2A-4"], IDin=[1],
1600                      RDT=[1](min),
1601                      CHLGTH=[315](m),  CHSLOPE=[0.11](%),
1602                      FPSLOPE=[0.11](%),
1603                      SECNUM=[7386],      NSEG=[5]
1604                      ( SEGROUGH, SEGDIST (m))=[0.08,21.18 0.05,62.87 -0.06,80.43
                                0.06,90.36 0.05,143.24] NSEG times
1605                      ( DISTANCE (m), ELEVATION (m))=[ 0, 77.07 ]
1606                      [ 5.11, 76.8 ]
1607                      [21.18, 76.7 ]
1608                      [34.27, 76.7 ]
1609                      [43.48, 76.3 ]
1610                      [62.87, 74.8 ]
1611                      [68.48, 74.28 ]
1612                      [70.32, 73.5 ]
1613                      [73.346, 73.437 ]
1614                      [75.588, 73.466 ]
1615                      [75.62, 73.47 ]
1616                      [80.43, 74.3 ]
1617                      [85.13, 75.18 ]
1618                      [90.36, 75.69 ]
1619                      [101.28, 75.4 ]
1620                      [115.17, 75.3 ]
1621                      [121.38, 75.4 ]
1622                      [128.52, 74.95 ]
1623                      [137.68, 75.3 ]
1624                      [143.24, 76.97 ]
1625  *#=====
1626  *# KD-2B-7 - RURAL EAST OF HERZBERG ROAD
1627  *#=====
1628  CONTINUOUS NASHYD      ID=[4], NHYD=["KD-2B-7"], DT=[1]min, AREA=[20.11](ha),
1629                      DWF=[0](cms),  CN=[63], IA=[7](mm),
1630                      N=[1.1], TP=[1.50]hrs,
1631                      Continuous simulation parameters:
1632                      IaRECper=[6](hrs), SMIN=[-1](mm),  SMAX=[-1](mm), SK=[0.01]/(mm),
1633                      InterEventTime=[12](hrs),
1634                      Baseflow simulation parameters:
1635                      BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1636                      VHydCond=[0.02](mm/hr), END=-1
1637  *#=====
1638  *# ADD KD-2B-4 AND KD-2B-7
1639  *#=====
1640  ADD HYD                IDsum=[3], NHYD=["KD-2B-4"], IDs to add=[2+4]
1641  *#=====
1642  *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7058.454
1643  *#=====
1644  ROUTE CHANNEL      IDout=[1], NHYD=["KD-2A-4"], IDin=[3],
1645                      RDT=[1](min),
1646                      CHLGTH=[297](m),  CHSLOPE=[0.38](%),
1647                      FPSLOPE=[0.38](%),
1648                      SECNUM=[7058],      NSEG=[3]
1649                      ( SEGROUGH, SEGDIST (m))=[0.05,206.86 -0.06,216.95 0.04,295.48]
                                NSEG times
1650                      ( DISTANCE (m), ELEVATION (m))=[ 0, 75.7 ]
1651                      [165.24, 75.2 ]
1652                      [198.14, 75.2 ]
1653                      [206.37, 73.8 ]
1654                      [206.86, 73.69 ]
1655                      [209.66, 73 ]
1656                      [211.86, 73 ]
1657                      [213.07, 73.07 ]
1658                      [215.16, 73.8 ]
1659                      [216.95, 74.14 ]
1660                      [247.08, 74.8 ]
1661                      [267.4, 74.8 ]
1662                      [295.48, 76.05 ]
1663  *#=====

```

```

1664 *# KD-2B-5 - URBAN
1665 *#=====
1666 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2B-5"], DT=[1](min), AREA=[4.74](ha),
1667 XIMP=[0.50], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
1668 SCS curve number CN=[79],
1669 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1670                        LGP=[40](m), MNP=[0.25], SCP=[0](min),
1671 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1672                        LGI=[498](m), MNI=[0.025], SCI=[0](min),
1673 Continuous simulation parameters:
1674 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1675 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1676 InterEventTime=[12](hrs), END=-1
1677 *#=====
1678 *# ON-SITE STORAGE
1679 *# RATING CURVE SOURCE - plan2.pdf IN 13616-Richardson Side_Eagleson
1680 *#=====
1681 ROUTE RESERVOIR      IDout=[4], NHYD=["KD-2B-5"], IDin=[2],
1682 RDT=[1](min),
1683 TABLE of ( OUTFLOW-STORAGE ) values
1684 (cms) - (ha-m)
1685 [ 0.0 , 0.0 ]
1686 [0.1458, 0.01283]
1687 [0.1458, 0.03881]
1688 [ -1 , -1 ] (max twenty pts)
1689 IDovf=[5], NHYDovf=["OVF-2B5"]
1690 *#=====
1691 *# KD-2B-1 - URBAN
1692 *#=====
1693 CONTINUOUS STANDHYD      ID=[3], NHYD=["KD-2B-1"], DT=[1](min), AREA=[134.85](ha),
1694 XIMP=[0.40], TIMP=[0.41], DWF=[0](cms), LOSS=[2],
1695 SCS curve number CN=[70],
1696 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1697                        LGP=[40](m), MNP=[0.25], SCP=[0](min),
1698 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1699                        LGI=[3642](m), MNI=[0.025], SCI=[0](min),
1700 Continuous simulation parameters:
1701 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1702 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1703 InterEventTime=[12](hrs), END=-1
1704 *#=====
1705 *# ADD OUTFLOW, OVERFLOW AND KD-2B-1
1706 *#=====
1707 ADD HYD      IDsum=[6], NHYD=["KD-2B-1"], IDs to add=[4+5+3]
1708 *#=====
1709 *# ADD KD-2B-4 AND KD-2B-1
1710 *# CREST GAUGE LOCATION KD-1 -KIZELL DRAIN AT HERTZBERG ROAD
1711 *#=====
1712 ADD HYD      IDsum=[3], NHYD=["KFP4"], IDs to add=[1+6]
1713 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1714 *#=====
1715 *# ROUTE KD-2B THROUGH KD-2C
1716 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6705.311
1717 *# MINIMUM SLOPE ASSUMED 0.1%
1718 *#=====
1719 ROUTE CHANNEL      IDout=[1], NHYD=["KD-2B"], IDin=[3],
1720 RDT=[1](min),
1721 CHLGTH=[600](m), CHSLOPE=[0.1](%),
1722                        FPSLOPE=[0.1](%),
1723 SECNUM=[6705], NSEG=[4]
1724 ( SEGROUGH, SEGDIST (m))=[0.05,162.749 -0.04,168.035 -0.05,168.35  2
0.05,373.63] NSEG times
1725 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.65 ]
1726 [ 24.7, 75.1 ]
1727 [61.29, 73.42 ]
1728 [90.72, 72.7 ]
1729 [119.02, 72.95 ]

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1730 [131.71, 72.8 ]
1731 [160.55, 72.9 ]
1732 [162.46, 72.46 ]
1733 [162.749, 72.403 ]
1734 [168.035, 72.369 ]
1735 [168.35, 72.39 ]
1736 [168.6, 72.43 ]
1737 [171.08, 72.8 ]
1738 [203.12, 72.8 ]
1739 [231.66, 73.3 ]
1740 [255.58, 73.2 ]
1741 [300.16, 73.6 ]
1742 [326.75, 74.3 ]
1743 [347.02, 75.2 ]
1744 [373.63, 76.05 ]
1745 *#=====
1746 *# KD-3A - URBAN WEST OF HERZBERG ROAD
1747 *#=====
1748 CONTINUOUS STANDHYD ID=[3], NHYD=["KD-3A"], DT=[1](min), AREA=[206.16](ha),
1749 XIMP=[0.30], TIMP=[0.34], DWF=[0](cms), LOSS=[2],
1750 SCS curve number CN=[78],
1751 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1752 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1753 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1754 LGI=[3876](m), MNI=[0.025], SCI=[0](min),
1755 Continuous simulation parameters:
1756 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1757 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1758 InterEventTime=[12](hrs), END=-1
1759 *#=====
1760 *# KTC-2B - URBAN - UPSTREAM LIMIT TO HWY 417, NORTH OF CAMPEAU DRIVE
1761 *# LAND USES WITHIN AREA: OFFICE/RECREATIONAL
1762 *#=====
1763 CONTINUOUS STANDHYD ID=[2], NHYD=["KTC-2B"], DT=[1](min), AREA=[20.79](ha),
1764 XIMP=[0.23], TIMP=[0.24], DWF=[0.0](cms), LOSS=[2],
1765 SCS curve number CN=[69],
1766 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1767 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1768 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1769 LGI=[1900](m), MNI=[0.025], SCI=[0](min),
1770 Continuous simulation parameters:
1771 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1772 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1773 InterEventTime=[12](hrs), END=-1
1774 *#=====
1775 *# 5 YEAR CONTROL - 1155L/s
1776 *# MAJOR FLOWS TO KD-3A
1777 *# MINOR FLOWS TO SWF-1205
1778 *#=====
1779 COMPUTE DUALHYD IDin=[2], CINLET=[1.155](cms), NINLET=[1],
1780 MAJID=[7], MajNHYD=["KTC2BMAJ"],
1781 MINID=[10], MinNHYD=["KTC2BMIN"],
1782 TMJSTO=[0](cu-m)
1783 *#=====
1784 *# ADD KTC-2B MAJOR AND KD-3A - TRIBUTARY 1 AT HERTZBERG ROAD
1785 *#=====
1786 ADD HYD IDsum=[5], NHYD=["KD-3A"], IDs to add=[7+3]
1787 *#=====
1788 *# ROUTE KD-3A THROUGH KD-3B
1789 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LiDAR
1790 *#=====
1791 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1792 RDT=[1](min),
1793 CHLGTH=[253](m), CHSLOPE=[0.13](%),
1794 FPSLOPE=[0.13](%),
1795 SECNUM=[1], NSEG=[3]
1796 ( SEGROUGH, SEGDIST (m))=[0.05,27.94 -0.035,38.92 0.08,64.87] NSEG

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times
1797 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.90]
1798 [12.97, 78.12]
1799 [15.97, 77.81]
1800 [19.96, 77.51]
1801 [23.95, 77.36]
1802 [24.95, 77.34]
1803 [25.95, 77.34]
1804 [26.94, 77.36]
1805 [27.94, 77.30]
1806 [30.94, 76.79]
1807 [31.93, 76.73]
1808 [32.93, 76.73]
1809 [33.93, 76.70]
1810 [34.94, 76.76]
1811 [38.92, 77.29]
1812 [42.91, 77.34]
1813 [58.88, 78.52]
1814 [64.87, 78.97]
1815 ROUTE CHANNEL IDout=[5], NHYD=["KD-3A"], IDin=[4],
1816 RDT=[1](min),
1817 CHLGTH=[344](m), CHSLOPE=[0.56](%),
1818 FPSLOPE=[0.56](%),
1819 SECNUM=[2], NSEG=[3]
1820 ( SEGROUGH, SEGDIST (m))=[0.05,20.89 -0.035,76.49 0.08,88.52] NSEG ↗
times
1821 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.38]
1822 [13.92, 77.02]
1823 [20.89, 76.69]
1824 [26.85, 76.09]
1825 [29.84, 76.03]
1826 [44.76, 76.15]
1827 [56.69, 75.91]
1828 [59.68, 76.10]
1829 [61.67, 76.05]
1830 [71.61, 76.31]
1831 [76.49, 76.69]
1832 [82.55, 77.16]
1833 [88.52, 77.40]
1834 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1835 RDT=[1](min),
1836 CHLGTH=[324](m), CHSLOPE=[0.72](%),
1837 FPSLOPE=[0.72](%),
1838 SECNUM=[1], NSEG=[3]
1839 ( SEGROUGH, SEGDIST (m))=[0.05,97.588 -0.035,109.575 0.05,143.405] ↗
NSEG times
1840 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.2777 ]
1841 [39.664, 74.805 ]
1842 [74.612, 74.8767 ]
1843 [79.607, 74.8037 ]
1844 [ 86.6, 74.7914 ]
1845 [90.595, 74.6388 ]
1846 [95.59, 74.6899 ]
1847 [97.588, 74.8802 ]
1848 [101.584, 74.7293 ]
1849 [103.582, 74.4039 ]
1850 [106.578, 74.4818 ]
1851 [109.575, 74.9123 ]
1852 [111.573, 74.8318 ]
1853 [116.568, 74.8294 ]
1854 [120.563, 74.7426 ]
1855 [121.562, 74.7398 ]
1856 [124.559, 74.8464 ]
1857 [130.553, 74.8391 ]
1858 [132.54, 74.777 ]
1859 [143.405, 75.255 ]
1860 *#=====

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1861  *# KD-2C - RURAL
1862  *#=====
1863  CONTINUOUS NASHYD          ID=[2], NHYD=["KD-2C"], DT=[1]min, AREA=[59.10](ha),
1864  DWF=[0](cms), CN=[83], IA=[7](mm),
1865  N=[1.1], TP=[0.60]hrs,
1866  Continuous simulation parameters:
1867  IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1868  InterEventTime=[12](hrs),
1869  Baseflow simulation parameters:
1870  BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1871  VHydCond=[0.02](mm/hr), END=-1
1872  *#=====
1873  *# ADD KD-2B AND KD-2C
1874  *#=====
1875  ADD HYD                    IDsum=[5], NHYD=["KFP5"], IDs to add=[1+2]
1876  *PRINT HYD                 ID=[5], # OF PCYCLES=[1]
1877  *#=====
1878  *# ADD KD-2C AND KD-3A
1879  *#=====
1880  ADD HYD                    IDsum=[3], NHYD=["KD-2C"], IDs to add=[5+4]
1881  *#=====
1882  *# ROUTE KD-1+KD-2 THROUGH KD-3B-1
1883  *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6104.633
1884  *# MINIMUM SLOPE ASSUMED 0.1%
1885  *#=====
1886  ROUTE CHANNEL              IDout=[1], NHYD=["KD-2C"], IDin=[3],
1887  RDT=[1](min),
1888  CHLGTH=[952](m), CHSLOPE=[0.1](%),
1889  FPSLOPE=[0.1](%),
1890  SECNUM=[6104], NSEG=[3]
1891  ( SEGROUGH, SEGDIST (m))=[0.08,175.904 -0.04,179.184 0.08,185.91]
1892  NSEG times
1893  ( DISTANCE (m), ELEVATION (m))=[ 0, 77.06 ]
1894  [ 9.16, 77.1 ]
1895  [23.37, 76.7 ]
1896  [56.09, 76.5 ]
1897  [67.63, 76.2 ]
1898  [80.81, 75.6 ]
1899  [83.87, 75.6 ]
1900  [98.45, 74.5 ]
1901  [103.07, 74.3 ]
1902  [115.78, 74.3 ]
1903  [134.4, 73.6 ]
1904  [149.63, 73.7 ]
1905  [163.83, 73.6 ]
1906  [173.16, 72.7 ]
1907  [175.83, 72 ]
1908  [175.904, 71.992 ]
1909  [179.184, 71.968 ]
1910  [179.27, 72 ]
1911  [183.86, 73.7 ]
1912  [185.91, 74 ]
1913  *#=====
1914  *# KD-3B - RURAL EAST OF HERZBERG ROAD
1915  *#=====
1916  CONTINUOUS NASHYD          ID=[4], NHYD=["KD-23B"], DT=[1]min, AREA=[112.07](ha),
1917  DWF=[0](cms), CN=[66], IA=[7](mm),
1918  N=[1.1], TP=[1.20]hrs,
1919  Continuous simulation parameters:
1920  IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1921  InterEventTime=[12](hrs),
1922  Baseflow simulation parameters:
1923  BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
1924  VHydCond=[0.02](mm/hr), END=-1
1925  *#=====
1926  *# ADD KD-2C,KD-3A AND KD-3B - KIZELL DRAIN AT CONFLUENCE WITH WATTS CREEK
1927  *#=====

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1927 ADD HYD IDsum=[3], NHYD=["KFP6"], IDs to add=[1+4]
1928 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1929 *#-----
1930 *# WATTS CREEK SUBWATERSHED
1931 *#-----
1932 *#-----
1933 *# KANATA TOWN CENTRE-1 - URBAN - UPSTREAM LIMIT TO HWY 417
1934 *# Imperviousness decreased under existing conditions
1935 *#-----
1936 CONTINUOUS STANDHYD ID=[2], NHYD=["KTC-1"], DT=[1](min), AREA=[60.23](ha),
1937 XIMP=[0.34], TIMP=[0.34], DWF=[0](cms), LOSS=[2],
1938 SCS curve number CN=[70],
1939 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1940 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1941 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1942 LGI=[2758](m), MNI=[0.025], SCI=[0](min),
1943 Continuous simulation parameters:
1944 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1945 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1946 InterEventTime=[12](hrs), END=-1
1947 *#-----
1948 *# 5 YEAR CONTROL - 2963L/s
1949 *# MAJOR FLOWS TO WC-1
1950 *# MINOR FLOWS TO SWF-1206
1951 *#-----
1952 COMPUTE DUALHYD IDin=[2], CINLET=[2.963](cms), NINLET=[1],
1953 MAJID=[7], MajNHYD=["KTC1MAJ"],
1954 MINID=[8], MinNHYD=["KTC1MIN"],
1955 TMJSTO=[0](cu-m)
1956 *#-----
1957 *# SWMF-1206
1958 *# STORAGE WAS ESTIMATED FROM AVAILABLE DRAWING
1959 *# DISCHARGE WAS TAKEN FROM R-1564
1960 *#-----
1961 ROUTE RESERVOIR IDout=[4], NHYD=["KTC-1"], IDin=[8],
1962 RDT=[1](min),
1963 TABLE of ( OUTFLOW-STORAGE ) values
1964 (cms) - (ha-m)
1965 [ 0.0 , 0.0 ]
1966 [ 0.955 , 0.2854 ]
1967 [ 1.436 , 3.9725 ]
1968 [ -1 , -1 ] (max twenty pts)
1969 IDovf=[5], NHYDovf=["OVF-KTC1"]
1970 *#-----
1971 *# ADD OUTFLOW, OVERFLOW AND KTC-1 MAJOR
1972 *#-----
1973 ADD HYD IDsum=[2], NHYD=["KTC-1"], IDs to add=[4+5+7]
1974 *#-----
1975 *# WC-1 - RURAL/URBAN EXISTING AREA
1976 *#-----
1977 CONTINUOUS STANDHYD ID=[1], NHYD=["WC-1"], DT=[1](min), AREA=[403.47](ha),
1978 XIMP=[0.30], TIMP=[0.34], DWF=[0](cms), LOSS=[2],
1979 SCS curve number CN=[68],
1980 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1981 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1982 Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
1983 LGI=[5150](m), MNI=[0.025], SCI=[0](min),
1984 Continuous simulation parameters:
1985 IaRECper=[6](hrs), IaRECimp=[4](hrs),
1986 SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
1987 InterEventTime=[12](hrs), END=-1
1988 *#-----
1989 *# ADD WC-1 AND KTC-1 - WATTS CREEK AT HIGHWAY 417
1990 *#-----
1991 ADD HYD IDsum=[5], NHYD=["WC-1"], IDs to add=[1+2]
1992 *#-----
1993 *# KTC-2A - URBAN - UPSTREAM LIMIT TO HWY 417, SOUTH OF CAMPEAU DRIVE

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1994  *# LAND USES WITHIN AREA: TOWN CENTRE/URBAN RES
1995  *#-----
1996  CONTINUOUS STANDHYD      ID=[1], NHYD=["KTC-2A"], DT=[1](min), AREA=[34.34](ha),
1997  XIMP=[0.36], TIMP=[0.42], DWF=[0.0](cms), LOSS=[2],
1998  SCS curve number CN=[75],
1999  Pervious   surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
2000  LGP=[40](m), MNP=[0.25], SCP=[0](min),
2001  Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
2002  LGI=[2152](m), MNI=[0.025], SCI=[0](min),
2003  Continuous simulation parameters:
2004  IaRECper=[6](hrs), IaRECimp=[4](hrs),
2005  SMIN=[-1](mm),  SMAX=[-1](mm), SK=[0.01]/(mm),
2006  InterEventTime=[12](hrs), END=-1
2007  *#-----
2008  *# ADD KTC-2A AND KTC-2B MINOR
2009  *#-----
2010  ADD HYD      IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+10]
2011  *#-----
2012  *# ROUTE KTC-2 THROUGH KANATA TOWN CENTRE PHASE I POND
2013  *# STAGE-STORAGE-DISCHARGE CURVE OBTAINED FROM:
2014  *# KANATA TOWN CENTRE PHASE i - STORMWATER MANAGEMENT REPORT
2015  *# J.L. RICHARDS & ASSOCIATES LTD. 1996
2016  *# SWF-1205
2017  *# STORAGE WAS ESTIMATED WITH AVAILABLE DRAWING
2018  *# DISCHARGE WAS TAKEN FROM R-1563
2019  *#-----
2020  ROUTE RESERVOIR      IDout=[1], NHYD=["KTC-2"], IDin=[4],
2021  RDT=[1](min),
2022  TABLE of ( OUTFLOW-STORAGE ) values
2023  (cms) - (ha-m)
2024  [ 0.0 , 0.0 ]
2025  [ 0.79, 0.6939]
2026  [ 4.70, 1.4350]
2027  [ -1 , -1 ] (max twenty pts)
2028  IDovf=[2], NHYDovf=["OVF-KTC2"]
2029  *#-----
2030  *# ADD OUTFLOW AND OVERFLOW
2031  *#-----
2032  ADD HYD      IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+2]
2033  *#-----
2034  *# ADD WC-1 AND KTC-2
2035  *#-----
2036  ADD HYD      IDsum=[2], NHYD=["KTC-2"], IDs to add=[5+4]
2037  *#-----
2038  *#-----
2039  *# WC-3 - URBAN/RURAL
2040  *#-----
2041  CONTINUOUS NASHYD      ID=[1], NHYD=["WC-3"], DT=[1]min, AREA=[204.06](ha),
2042  DWF=[0](cms), CN=[66], IA=[7](mm),
2043  N=[1.1], TP=[1.28]hrs,
2044  Continuous simulation parameters:
2045  IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
2046  InterEventTime=[12](hrs),
2047  Baseflow simulation parameters:
2048  BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
2049  VHydCond=[0.02](mm/hr), END=-1
2050  *#-----
2051  *# ADD WC-1+KTC AND WC-3
2052  *#-----
2053  ADD HYD      IDsum=[4], NHYD=["WC-3"], IDs to add=[2+1]
2054  *#-----
2055  *# ROUTE WC-1+KTC+WC-3 THROUGH WC-4A
2056  *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2057  *#-----
2058  ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[4],
2059  RDT=[1](min),
2060  CHLGTH=[744](m),  CHSLOPE=[1.29](%),

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2061                FPSLOPE=[1.29](%),
2062                SECNUM=[1],          NSEG=[3]
2063                ( SEGROUGH, SEGDIST (m))=[0.05,25.86 -0.035,40.77 0.05,72.60] NSEG ↵
times
2064                ( DISTANCE (m), ELEVATION (m))=[ 0, 90.87]
2065                [ 1.99, 90.66]
2066                [ 7.96, 90.10]
2067                [16.91, 85.80]
2068                [18.90, 85.49]
2069                [21.88, 85.42]
2070                [25.86, 85.56]
2071                [26.85, 25.50]
2072                [29.83, 84.06]
2073                [31.82, 84.06]
2074                [34.81, 85.10]
2075                [40.77, 85.59]
2076                [48.73, 85.85]
2077                [52.71, 86.80]
2078                [55.59, 87.80]
2079                [60.66, 90.40]
2080                [64.64, 90.77]
2081                [72.60, 90.97]
2082                *#=====
2083                *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2084                *#=====
2085                ROUTE CHANNEL          IDout=[2], NHYD=["WC-3"], IDin=[1],
2086                RDT=[1](min),
2087                CHLGTH=[2295](m),   CHSLOPE=[0.45](%),
2088                FPSLOPE=[0.45](%),
2089                SECNUM=[2],          NSEG=[3]
2090                ( SEGROUGH, SEGDIST (m))=[0.05,12.98 -0.035,20.97 0.05,51.94] NSEG ↵
times
2091                ( DISTANCE (m), ELEVATION (m))=[ 0, 85.79]
2092                [ 1.00, 85.75]
2093                [11.99, 83.71]
2094                [12.98, 83.36]
2095                [14.98, 82.49]
2096                [15.98, 82.44]
2097                [16.98, 82.45]
2098                [20.97, 83.51]
2099                [22.97, 83.46]
2100                [23.97, 83.51]
2101                [26.97, 83.55]
2102                [27.97, 83.55]
2103                [31.96, 83.51]
2104                [32.96, 83.45]
2105                [33.96, 83.45]
2106                [34.96, 83.50]
2107                [51.94, 85.81]
2108                *#=====
2109                *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2110                *#=====
2111                ROUTE CHANNEL          IDout=[1], NHYD=["WC-3"], IDin=[2],
2112                RDT=[1](min),
2113                CHLGTH=[487](m),   CHSLOPE=[0.23](%),
2114                FPSLOPE=[0.23](%),
2115                SECNUM=[3],          NSEG=[3]
2116                ( SEGROUGH, SEGDIST (m))=[0.05,6.97 -0.035,25.87 0.05,29.85] NSEG ↵
times
2117                ( DISTANCE (m), ELEVATION (m))=[ 0, 75.60]
2118                [ 1, 75.54]
2119                [ 1.99, 75.42]
2120                [ 6.97, 73.09]
2121                [11.94, 72.70]
2122                [14.93, 72.66]
2123                [17.91, 72.27]
2124                [23.88, 72.25]

```



```

2125 [25.87, 73.03]
2126 [28.86, 74.06]
2127 [29.85, 74.23]
2128 *#=====
2129 *# WC-4A - RURAL - HIGHWAY 417 TO CNR
2130 *#=====
2131 CONTINUOUS NASHYD ID=[2] NHYD=["WC-4A"], DT=[1]min, AREA=[126.29](ha),
2132 DWF=[0](cms), CN=[82], IA=[7](mm),
2133 N=[1.1], TP=[2.30]hrs,
2134 Continuous simulation parameters:
2135 IaREcper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
2136 InterEventTime=[12](hrs),
2137 Baseflow simulation parameters:
2138 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
2139 VHydCond=[0.02](mm/hr), END=-1
2140 *#=====
2141 *# ADD WC-1+KTC+WC-3 AND WC-4A
2142 *# CREST GAUGE LOCATION WC-1 - WATTS CREEK AT CONFLUENCE WITH KIZELL DRAIN
2143 *#=====
2144 ADD HYD IDsum=[6], NHYD=["WFP1"], IDs to add=[1+2]
2145 *PRINT HYD ID=[6], # OF PCYCLES=[1]
2146 *#=====
2147 *# WC-4B - RURAL - HIGHWAY 417 TO CNR
2148 *#=====
2149 CONTINUOUS NASHYD ID=[4] NHYD=["WC-4B"], DT=[1]min, AREA=[145.27](ha),
2150 DWF=[0](cms), CN=[73], IA=[7](mm),
2151 N=[1.1], TP=[1.22]hrs,
2152 Continuous simulation parameters:
2153 IaREcper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
2154 InterEventTime=[12](hrs),
2155 Baseflow simulation parameters:
2156 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
2157 VHydCond=[0.02](mm/hr), END=-1
2158 *#=====
2159 *# ADD WC-4A AND KIZELL
2160 *#=====
2161 ADD HYD IDsum=[1], NHYD=["WFP2"], IDs to add=[6+3]
2162 *PRINT HYD ID=[1], # OF PCYCLES=[1]
2163 *#=====
2164 *# ADD WC-4A AND WC-4B
2165 *#=====
2166 ADD HYD IDsum=[5], NHYD=["WFP3"], IDs to add=[1+4]
2167 *PRINT HYD ID=[5], # OF PCYCLES=[1]
2168 *#=====
2169 *# ROUTE KIZELL AND WC-1+KTC+WC-3+WC-4 THROUGH WC-5A
2170 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4677.806
2171 *#=====
2172 ROUTE CHANNEL IDout=[2], NHYD=["WC-4"], IDin=[5],
2173 RDT=[1](min),
2174 CHLGTH=[636](m), CHSLOPE=[0.16](%),
2175 FPSLOPE=[0.16](%),
2176 SECNUM=[4677], NSEG=[3]
2177 ( SEGROUGH, SEGDIST (m))=[0.08,95.801 -0.04,102.955 0.08,167.28]
2178 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.4 ]
2179 [ 11.4, 74.3 ]
2180 [ 31.7, 73.6 ]
2181 [51.08, 72.8 ]
2182 [60.69, 72.6 ]
2183 [ 74.1, 71.6 ]
2184 [77.61, 70.8 ]
2185 [84.14, 71 ]
2186 [93.83, 71 ]
2187 [95.801, 70.73 ]
2188 [97.18, 70.5 ]
2189 [ 101, 70.5 ]
2190 [102.955, 70.989 ]

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```

2191 [111.37, 74.5 ]
2192 [121.02, 76.45 ]
2193 [128.96, 77.6 ]
2194 [139.85, 78.3 ]
2195 [151.67, 80.09 ]
2196 [158.82, 80.63 ]
2197 [167.28, 81.57 ]
2198 *#=====
2199 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4446.172
2200 *#=====
2201 ROUTE CHANNEL IDout=[1], NHYD=["WC-4"], IDin=[2],
2202 RDT=[1](min),
2203 CHLGTH=[443](m), CHSLOPE=[0.64](%),
2204 FPSLOPE=[0.64](%),
2205 SECNUM=[4446], NSEG=[4]
2206 ( SEGROUGH, SEGDIST (m))=[0.08,101.82 0.05,155.499 -0.04,160.804 ↵
0.08,360.72] NSEG times
2207 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.11 ]
2208 [15.28, 74.3 ]
2209 [39.39, 73.6 ]
2210 [55.02, 73.7 ]
2211 [70.01, 73.1 ]
2212 [101.82, 72.72 ]
2213 [123.37, 72.37 ]
2214 [137.03, 71.7 ]
2215 [152.53, 68.9 ]
2216 [155.499, 68.552 ]
2217 [160.804, 68.559 ]
2218 [163.78, 68.89 ]
2219 [172.88, 69 ]
2220 [180.76, 72.03 ]
2221 [191.21, 72.8 ]
2222 [208.93, 72.49 ]
2223 [239.54, 72.4 ]
2224 [260.28, 72.6 ]
2225 [291.51, 72.6 ]
2226 [360.72, 73.06 ]
2227 *#=====
2228 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3897.472
2229 *#=====
2230 ROUTE CHANNEL IDout=[2], NHYD=["WC-4"], IDin=[1],
2231 RDT=[1](min),
2232 CHLGTH=[468](m), CHSLOPE=[0.44](%),
2233 FPSLOPE=[0.44](%),
2234 SECNUM=[3897], NSEG=[4]
2235 ( SEGROUGH, SEGDIST (m))=[0.08,161.362 -0.04,164.388 -0.08,164.68 ↵
0.05,242.03] NSEG times
2236 ( DISTANCE (m), ELEVATION (m))=[ 0, 72.01 ]
2237 [14.79, 71.9 ]
2238 [26.32, 71.5 ]
2239 [45.81, 69.5 ]
2240 [ 52.8, 68.5 ]
2241 [67.29, 68.1 ]
2242 [85.91, 68.1 ]
2243 [94.25, 67.9 ]
2244 [116.16, 67.78 ]
2245 [142.44, 67.4 ]
2246 [159.77, 66.1 ]
2247 [161.362, 65.677 ]
2248 [164.388, 65.577 ]
2249 [164.68, 65.61 ]
2250 [166.02, 66.1 ]
2251 [167.47, 66.5 ]
2252 [201.22, 66.8 ]
2253 [208.26, 66.7 ]
2254 [216.93, 67.19 ]
2255 [242.03, 67.3 ]

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```

2256 *#=====
2257 *# WC-5A - RURAL - CNR TO CARLING AVE
2258 *#=====
2259 CONTINUOUS NASHYD          ID=[1] NHYD=["WC-5A"], DT=[1]min, AREA=[59.54](ha),
2260 DWF=[0](cms), CN=[73], IA=[7](mm),
2261 N=[1.1], TP=[0.79]hrs,
2262 Continuous simulation parameters:
2263 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
2264 InterEventTime=[12](hrs),
2265 Baseflow simulation parameters:
2266 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
2267 VHydCond=[0.02](mm/hr), END=-1
2268 *#=====
2269 *# ADD WC-5A AND WC-5A UPSTREAM
2270 *# CALIBRATION LOCATION - WATTS CREEK AT CARLING AVENUE
2271 *#=====
2272 ADD HYD                    IDsum=[3], NHYD=["WFP4"], IDs to add=[1+2]
2273 *PRINT HYD                ID=[3], # OF PCYCLES=[1]
2274 *#=====
2275 *# ROUTE WC-5B UPSTREAM THROUGH WC-5B
2276 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3469.421
2277 *# MINIMUM SLOPE ASSUMED 0.1%
2278 *#=====
2279 ROUTE CHANNEL             IDout=[2], NHYD=["WC-5B"], IDin=[3],
2280 RDT=[1](min),
2281 CHLGTH=[485](m), CHSLOPE=[0.1](%),
2282                                FPSLOPE=[0.1](%),
2283 SECNUM=[3469], NSEG=[4]
2284 ( SEGROUGH, SEGDIST (m))=[0.08,127.46 0.06,131.6 -0.03,141.59
2285                                ( DISTANCE (m), ELEVATION (m))=[ 0, 68.08 ]
2286                                [16.71, 67.1 ]
2287                                [48.15, 66.8 ]
2288                                [75.65, 66.3 ]
2289                                [107.54, 66.2 ]
2290                                [117.33, 66.3 ]
2291                                [127.46, 65.54 ]
2292                                [129.21, 65.3 ]
2293                                [131.6, 64.9 ]
2294                                [136.836, 64.972 ]
2295                                [139.19, 65.3 ]
2296                                [141.59, 65.65 ]
2297                                [161.72, 65.6 ]
2298                                [171.42, 66.1 ]
2299                                [187.05, 66.3 ]
2300                                [224.24, 66.3 ]
2301                                [246.7, 66.1 ]
2302                                [286.52, 66.07 ]
2303                                [304.07, 66.3 ]
2304                                [308.37, 66.7 ]
2305 *#=====
2306 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 2981.379
2307 *#=====
2308 ROUTE CHANNEL             IDout=[1], NHYD=["WC-5B"], IDin=[2],
2309 RDT=[1](min),
2310 CHLGTH=[307](m), CHSLOPE=[0.40](%),
2311                                FPSLOPE=[0.40](%),
2312 SECNUM=[2981], NSEG=[4]
2313 ( SEGROUGH, SEGDIST (m))=[0.08,9.006 -0.03,14.347 -0.06,14.85
2314                                ( DISTANCE (m), ELEVATION (m))=[ 0, 64.35 ]
2315                                [ 2.07, 64.3 ]
2316                                [ 4.58, 64.2 ]
2317                                [ 5.7, 64.1 ]
2318                                [ 6.83, 63.8 ]
2319                                [ 7.91, 63.37 ]
2320                                [9.006, 63.169 ]

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2321 [ 9.64, 62.8 ]
2322 [13.64, 62.8 ]
2323 [14.24, 63.1 ]
2324 [14.347, 63.315 ]
2325 [14.85, 63.35 ]
2326 [15.35, 63.4 ]
2327 [16.49, 63.69 ]
2328 [18.19, 64.21 ]
2329 [21.41, 64.2 ]
2330 [25.06, 64.05 ]
2331 [27.14, 64.06 ]
2332 [28.41, 64.2 ]
2333 [30.25, 64.28 ]
2334 *#=====
2335 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 1585.543
2336 *#=====
2337 ROUTE CHANNEL IDout=[2], NHYD=["WC-5B"], IDin=[1],
2338 RDT=[1](min),
2339 CHLGTH=[2876](m), CHSLOPE=[0.16](%),
2340 FPSLOPE=[0.16](%),
2341 SECNUM=[1585], NSEG=[4]
2342 ( SEGROUGH, SEGDIST (m))=[0.08,56.84 0.05,124.41 -0.035,128.78
0.08,255.15] NSEG times
2343 ( DISTANCE (m), ELEVATION (m))=[ 0, 64.07 ]
2344 [21.74, 63.8 ]
2345 [40.53, 63.5 ]
2346 [56.84, 61.82 ]
2347 [74.07, 61.6 ]
2348 [98.29, 61.7 ]
2349 [104.39, 61.43 ]
2350 [117.32, 61.8 ]
2351 [124.32, 60.8 ]
2352 [124.41, 60.79 ]
2353 [124.519, 60.783 ]
2354 [127.785, 60.75 ]
2355 [ 128, 60.83 ]
2356 [128.78, 61.17 ]
2357 [130.97, 61.8 ]
2358 [149.66, 61.32 ]
2359 [170.74, 61.4 ]
2360 [191.12, 63.6 ]
2361 [219.28, 64.08 ]
2362 [255.15, 64.1 ]
2363 *#=====
2364 *# WC-5B - RURAL - CARLING AVE TO OUTLET
2365 *#=====
2366 CONTINUOUS NASHYD ID=[4] NHYD=["WC-5B"], DT=[1]min, AREA=[379.59](ha),
2367 DWF=[0](cms), CN=[73], IA=[7](mm),
2368 N=[1.1], TP=[3.28]hrs,
2369 Continuous simulation parameters:
2370 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.01]/(mm),
2371 InterEventTime=[12](hrs),
2372 Baseflow simulation parameters:
2373 BaseFlowOption=[1] , InitGWResVol=[10](mm), GWResK=[0.93](mm/day/mm),
2374 VHydCond=[0.02](mm/hr), END=-1
2375 *#=====
2376 *# ADD WC-5B AND WC-5B UPSTREAM
2377 *# WATTS CREEK AT OUTLET TO OTTAWA RIVER
2378 *#=====
2379 ADD HYD IDsum=[1], NHYD=["WFP5"], IDs to add=[4+2]
2380 *PRINT HYD ID=[1], # OF PCYCLES=[1]
2381 *%-----|-----|
2382 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
2383 HYD_FILENAME=["WFP5"]
2384 HYD_COMMENT=["WATTS CREEK AT OUTLET TO OTTAWA RIVER"]
2385 *%-----|-----|
2386 *#=====

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```

2387 *
2388 *#-----
2389 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0005]
2390          5y12hr.stm
2391 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0010]
2392          10y12hr.stm
2393 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0025]
2394          25y12hr.stm
2395 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0050]
2396          50y12hr.stm
2397 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0100]
2398          100y12hr.stm
2399 FINISH
2400 *#-----
2401 *
2402 *#-----
2403 *START          TZERO=[1968.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1968]
2404 *START          TZERO=[1969.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1969]
2405 *START          TZERO=[1970.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1970]
2406 *START          TZERO=[1971.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1971]
2407 *START          TZERO=[1972.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1972]
2408 *START          TZERO=[1973.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1973]
2409 *START          TZERO=[1974.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1974]
2410 *START          TZERO=[1975.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1975]
2411 *START          TZERO=[1976.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1976]
2412 *START          TZERO=[1977.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1977]
2413 *START          TZERO=[1978.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1978]
2414 *START          TZERO=[1979.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1979]
2415 *START          TZERO=[1980.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1980]
2416 *START          TZERO=[1981.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1981]
2417 *START          TZERO=[1982.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1982]
2418 *START          TZERO=[1983.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1983]
2419 *START          TZERO=[1984.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1984]
2420 *START          TZERO=[1985.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1985]
2421 *START          TZERO=[1986.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1986]
2422 *START          TZERO=[1987.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1987]
2423 *START          TZERO=[1988.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1988]
2424 *START          TZERO=[1989.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1989]
2425 *START          TZERO=[1990.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1990]
2426 *START          TZERO=[1991.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1991]
2427 *START          TZERO=[1992.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1992]
2428 *START          TZERO=[1993.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1993]
2429 *START          TZERO=[1994.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1994]
2430 *START          TZERO=[1995.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1995]
2431 *START          TZERO=[1996.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1996]
2432 *START          TZERO=[1997.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1997]
2433 *START          TZERO=[1998.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1998]
2434 *START          TZERO=[1999.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[1999]
2435 *START          TZERO=[2000.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[2000]
2436 *START          TZERO=[2002.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[2002]
2437 *START          TZERO=[2003.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[2003]
2438 *START          TZERO=[2004.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[2004]
2439 *START          TZERO=[2006.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[2006]
2440 *START          TZERO=[2007.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[2007]
2441 *FINISH

```

Attachment B

SWMHYMO Model:
Existing Conditions – Calibrated

```

1  2      Metric units
2  *#*****
3  *# Project Name: [Shirley's Brook and Watt's Creek Phase 2 SWM Study]      Project
   Number: [60264539]
4  *# Future Conditions Model for the Watts Creek/Kizell Drain Flood Plain Mapping Study
5  *# Date          : 2014-12-31
6  *# Modeller     : [Olivia Chung]   John Price MVCA
7  *# Company      : AECOM Canada
8  *# License #    : 2988504
9  *#*****
10 *# September 2019, model parameters further updated by JFSAinc
11 *# with use of rainfall and flow monitoring data collected in 2019
12 *#
13 *# - all N values in NASHYDS changed from N=1.1 to N=2
14 *# - all MNI values in existing conditions STANDHYDs changed from 0.025 to 0.013
15 *# - all SLOPI values in STANDHYDs changed from 0.02 to 1.0
16 *# - change STANDHYD infiltration method from SCS to Horton with
17 *# - Horton: Fo=[125](mm/hr), Fc=[25](mm/hr), DCAY=[2.0](/hr), F=[0](mm)
18 *# - set XIMP to a fix value of 0.25 for all existing residential catchments
19 *# - use COMPUTE API      APII=[40], APIK=[0.8]/day,
20 *# - continuous NASHYDs, use BaseFlowOption=[1] , InitGWResVol=[12], GWResK=[0.85],
   VHydCond=[.001]
21 *# - all golf course NASHYDs, use CN=50
22 *# - XIMP=[0.250], for all existing not draining through the grass areas of the golf
   course
23 *#
24 *# - Areas draining across the golf course:
25 *# - those specific STANDHYD commands converted to NASHYDs so that the infiltrated
   water could come back into the system. This allowed a much better volume comparison
   through the Beaver Pond.
26 *# - The CN and IA values for those NASHYDs were weighted averages of CN=90 for TIMP
   and CN=50 for grass areas, and the IA was based on weighted average of IA=1.5 for TIMP
   and IA=5.0 for grass areas.
27 *# - The Tp value was simply calculated by using the (LGI/0.3 * 2/3) / 3600, where the
   value of 0.3 was my assumed flow velocity. Note, there are 4 catchments to which this
   was done, for a total of 48.3 ha representing just over 11% of the total drainage area
   to the Beaver Pond.
28 *# - removed the two IBI Route Reservoirs that were previously inserted to account
   for some hidden system storage.
29 *#=====
30 *# WATTS CREEK SUBWATERSHED
31 *# MODEL CONVERTED FROM QUALHYMO MODEL (DILLON, 2009)
32 *# DECEMBER 2014
33 *#=====
34 *# Model updated by JFSA (June 2019)to allow for continuous simulations to complete
35 *# preliminary erosion assessment.
36 *# Model reverted back to existing conditions using parameters as documented in
37 *# MVCA's Watts Creek Final Report November 2017
38 *#=====
39 *#
   KIZELL DRAIN
40 *#=====
41 * Area Tributary to Beaver Pond and Kizell Cell
42 *#=====
43 *#=====
44 *# Derived from Scenario 20 of Phase 1 SWM Study
45 *# AECOM MODEL + GOLF COURSE DETENTION PONDS
46 *# AMC II Condition
47 *# RAINFALL - BEAVER POND RAIN GAUGE (POINT RAINFALL)
48 *# DESIGN EVENTS
49 *#=====
50 *
   DESIGN STORMS
51 *#=====
52 *%-----|-----|
53 START          TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0002]
54 *              "2y12hr.stm"
55 READ STORM     STORM_FILENAME=["storm.001"]
56 *%-----|-----|

```

```

57 *#=====
58 *
59 *#=====
60 *%-----|-----|
61 *START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[2019]
62 *              "P4June6-2019.stm"
63 *
64 *READ STORM      STORM_FILENAME=["storm.001"]
65 *%-----|-----|
66 *#=====
67 *
68 *#=====
69 *START          TZERO=[1967.0719], METOUT=[2],  NSTORM=[0],  NRUN=[1967]
70 *%              [""] <--storm filename, one per line for NSTORM time
71 *%-----|-----|
72 *# Ottawa International Airport - 19 July 1967 to 01 Nov 2007
73 *READ AES DATA  AES_FILENAME=["YOW_1967_2007.123"],
74 *              IELEM=[123],  START_DATE=[0],  END_DATE=[-364]
75 *%-----|-----|
76 COMPUTE API      APII=[40],  APIK=[0.8]/day,
77 *%-----|-----|
78 *#=====
79 *# AREA 3A-1 (URBAN PORTION of Area North of Campeau Drive) TO DA 5A
80 *#=====
81 *# XIMP reduced to 0.05 since area drains across the golf course
82 CONTINUOUS STANDHYD  ID=[10],  NHYD=["000100"],  DT=[1] (min),  AREA=[2.7] (ha),
83                    XIMP=[0.05],  TIMP=[0.47],  DWF=[0] (cms),
84                    LOSS=[1]:    Horton: Fo=[125] (mm/hr),  Fc=[25] (mm/hr),
85                    DCAY=[2.0] (/hr),  F=[0] (mm),
86                    Pervious  surfaces: IAper=[4.67] (mm),  SLPP=[2] (%),
87                    LGP=[40] (m),  MNP=[0.25],  SCP=[0] (min),
88                    Impervious surfaces: IAimp=[1.57] (mm),  SLPI=[1.0] (%),
89                    LGI=[2134] (m),  MNI=[0.013],  SCI=[0] (min),
90                    Continuous simulation parameters:
91                    IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
92                    InterEventTime=[12] (hrs),  END=-1
93 *%-----|-----|
94 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
95 *# over golf course and we want to recapture the baseflow
96 CONTINUOUS NASHYD  ID=[10],  NHYD=["000100"],  DT=[1] (min),  AREA=[2.7] (ha)
97                    DWF=[0] (cms),  CN/C=[68.8],  IA=[3.38] (mm),  N=[2],  TP=[1.32] (hrs),
98                    Continuous simulation parameters:
99                    IaRECper=[6] (hrs),  SMIN=[-1] (mm),  SMAX=[-1] (mm),  SK=[0.03]/(mm),
100                   InterEventTime=[12] (hrs),
101                   Baseflow simulation parameters:
102                   BaseFlowOption=[1] ,  InitGWResVol=[12] (mm),  GWResK=[0.85] (mm/day/mm),
103                   VHydCond=[.001] (mm/hr),  END=-1
104 *%-----|-----|
105 *#=====
106 *# AREA 3A-2 (URBAN PORTION of Area North of Campeau Drive)
107 *#=====
108 CONTINUOUS STANDHYD  ID=[1],  NHYD=["000100"],  DT=[1] (min),  AREA=[33.4] (ha),
109                    XIMP=[0.250],  TIMP=[0.41],  DWF=[0] (cms),
110                    LOSS=[1]:    Horton: Fo=[125] (mm/hr),  Fc=[25] (mm/hr),
111                    DCAY=[2.0] (/hr),  F=[0] (mm),
112                    Pervious  surfaces: IAper=[4.67] (mm),  SLPP=[2] (%),
113                    LGP=[40] (m),  MNP=[0.25],  SCP=[0] (min),
114                    Impervious surfaces: IAimp=[1.57] (mm),  SLPI=[1.0] (%),
115                    LGI=[471] (m),  MNI=[0.013],  SCI=[0] (min),
116                    Continuous simulation parameters:
117                    IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
118                    InterEventTime=[12] (hrs),  END=-1
119 *%-----|-----|
120 *#=====
121 *# AREA 3B (GOLF PORTION of Area North of Campeau Drive) TO DA 5A

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121 *#=====
122 * Original CN=62
123 CONTINUOUS NASHYD          ID=[2], NHYD=["000100"], DT=[1]min, AREA=[6.3] (ha),
124 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
125 N=[2.0], TP=[0.55]hrs,
126 Continuous simulation parameters:
127 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
128 InterEventTime=[12] (hrs),
129 Baseflow simulation parameters:
130 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
131 VHydCond=[.001] (mm/hr), END=-1
132 *%-----|-----
133 *#=====
134 *# ADDED AREA 3A-1 TO 3B
135 *#=====
136 *
137 ADD HYD                    IDsum=[3], NHYD=[000321], IDs to add=[10+2]
138 *%-----|-----
139 *#=====
140 *# DA 5A
141 *#=====
142 ROUTE RESERVOIR           IDout=[2], NHYD=[000100], IDin=[3],
143 RDT=[1] (min),
144 TABLE of ( OUTFLOW-STORAGE ) values
145 (cms) - (ha-m)
146 [ 0.0 , 0.0 ]
147 [ 0.51 , 0.00005 ]
148 [ 0.65 , 0.0040 ]
149 [ 0.76 , 0.0438 ]
150 [ 0.86 , 0.1887 ]
151 [ 0.95 , 0.5613 ]
152 [ 0.98 , 0.8197 ]
153 [200.00 , 0.9017 ]
154 [ -1 , -1 ] (max twenty pts)
155 IDovf=[ ], NHYDovf=[ ]
156 *%-----|-----
157 *#=====
158 *# ADDED OUTFLOW FROM DA 5A TO 3A-2
159 *#=====
160 *
161 ADD HYD                    IDsum=[3], NHYD=[000321], IDs to add=[1+2]
162 *%-----|-----
163 *
164 *#=====
165 *# AREA 12 (GOLF PORTION OF Area East of Knudson Drive - DA 6B)
166 *#=====
167 CONTINUOUS NASHYD          ID=[1], NHYD=["000100"], DT=[1]min, AREA=[2.27] (ha),
168 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
169 N=[2.0], TP=[0.37]hrs,
170 Continuous simulation parameters:
171 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
172 InterEventTime=[12] (hrs),
173 Baseflow simulation parameters:
174 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
175 VHydCond=[.001] (mm/hr), END=-1
176 *%-----|-----
177 *
178 *#=====
179 *# AREA 13 (GOLF PORTION OF Area East of Knudson Drive - DA 6A)
180 *#=====
181 CONTINUOUS NASHYD          ID=[2], NHYD=["000100"], DT=[1]min, AREA=[2.9] (ha),
182 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
183 N=[2.0], TP=[0.64]hrs,
184 Continuous simulation parameters:
185 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
186 InterEventTime=[12] (hrs),
187 Baseflow simulation parameters:

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188 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
189 VHydCond=[.001] (mm/hr) , END=-1
190 *%-----|-----|
191 *#=====|
192 *# ADDED AREA 13 AND AREA 12 TO 3A-2
193 *#=====|
194 *
195 ADD HYD IDsum=[10], NHYD=[000321], IDs to add=[1+2+3]
196 *%-----|-----|
197 *
198 *#=====|
199 *# AREA 2A (URBAN PORTION OF Area North of Campeau Drive)
200 *#=====|
201 *# ORIGINAL AREA 2A COMMAND FOLLOWS, WITH REDUCED AREA FOR THE PURPOSE OF GAUGE
202 *# ON CAMPEAU DRIVE, THEN REINSERTED FOR OVERALL MODEL
203 **CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[29.3] (ha),
204 ** XIMP=[0.250], TIMP=[0.45], DWF=[0] (cms), LOSS=[2],
205 ** SCS curve number CN=[60],
206 ** Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
207 ** LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
208 ** Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
209 ** LGI=[858] (m), MNI=[0.013], SCI=[0] (min),
210 ** Continuous simulation parameters:
211 ** IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
212 ** SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
213 ** InterEventTime=[12] (hrs), END=-1
214 *%-----|-----|
215 * Estimated at 22.6 ha to measuring point off GeoOttawa - not exact
216 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[22.6] (ha),
217 XIMP=[0.250], TIMP=[0.45], DWF=[0] (cms),
218 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
219 DCAY=[2.0] (/hr), F=[0] (mm),
220 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
221 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
222 Impervious surfaces: IAimp=[1.5] (mm), SLPI=[1] (%),
223 LGI=[388] (m), MNI=[0.013], SCI=[0] (min),
224 Continuous simulation parameters:
225 IaRECper=[3] (hrs), IaRECimp=[1.5] (hrs),
226 InterEventTime=[12] (hrs), END=-1
227 *%-----|-----|
228 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
229 HYD_FILENAME=["Campeau.hyd"]
230 HYD_COMMENT=["Campeau Drive monitoring site"]
231 *%-----|-----|
232 *# Area re-introduced to model completeness, but XIMP reduced to 0.05 since area drains
233 across golf course
234 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[29.3] (ha),
235 XIMP=[0.05], TIMP=[0.45], DWF=[0] (cms),
236 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
237 DCAY=[2.0] (/hr), F=[0] (mm),
238 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
239 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
240 Impervious surfaces: IAimp=[1.5] (mm), SLPI=[1] (%),
241 LGI=[441] (m), MNI=[0.013], SCI=[0] (min),
242 Continuous simulation parameters:
243 IaRECper=[3] (hrs), IaRECimp=[1.5] (hrs),
244 InterEventTime=[12] (hrs), END=-1
245 *%-----|-----|
246 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
247 *# over golf course and we want to recapture the baseflow
248 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[29.3] (ha)
249 DWF=[0] (cms), CN/C=[68], IA=[3.4] (mm),
250 N=[2], TP=[0.27] (hrs),
251 Continuous simulation parameters:
252 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),

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250 InterEventTime=[12] (hrs),
251 Baseflow simulation parameters:
252 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
253 VHydCond=[.001] (mm/hr) , END=-1
254 *
255 *#=====
256 *# AREA 2B-1 (GOLF PORTION OF Area North of Campeau Drive) TO DA 3
257 *#=====
258 * Original CN=66
259 CONTINUOUS NASHYD ID=[4], NHYD=["000100"], DT=[1]min, AREA=[13] (ha),
260 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
261 N=[2.0], TP=[0.443]hrs,
262 Continuous simulation parameters:
263 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
264 InterEventTime=[12] (hrs),
265 Baseflow simulation parameters:
266 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
267 VHydCond=[.001] (mm/hr) , END=-1
268 *%-----|-----|
269 *#=====
270 *# ADD 2A TO 2B-1
271 *#=====
272 ADD HYD IDsum=[2], NHYD=[000321], IDs to add=[1+4]
273 *%-----|-----|
274 *
275 *#=====
276 *# DA 3
277 *#=====
278 ROUTE RESERVOIR IDout=[4], NHYD=[000100], IDin=[2],
279 RDT=[1] (min),
280 TABLE of ( OUTFLOW-STORAGE ) values
281 (cms) - (ha-m)
282 [ 0.0 , 0.0 ]
283 [ 0.0 , 0.0240 ]
284 [ 0.9 , 0.4127 ]
285 [ 2.25 , 0.4798 ]
286 [ 4.16 , 0.5507 ]
287 [ 10.00 , 0.6058 ]
288 [ -1 , -1 ] (max twenty pts)
289 IDovf=[ ], NHYDovf=[ ]
290 *%-----|-----|
291 *
292 *#=====
293 *# AREA 2C (URBAN PORTION OF Area North of Campeau Drive)
294 *#=====
295 *# XIMP reduced to 0.05 since area drains across the golf course
296 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[13.8] (ha),
297 XIMP=[0.05], TIIMP=[0.52], DWF=[0] (cms),
298 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
299 DCAY=[2.0] (/hr), F=[0] (mm),
300 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
301 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
302 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
303 LGI=[303] (m), MNI=[0.013], SCI=[0] (min),
304 Continuous simulation parameters:
305 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
306 InterEventTime=[12] (hrs), END=-1
307 *%-----|-----|
308 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
309 *# over golf course and we want to recapture the baseflow
310 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[13.8] (ha)
311 DWF=[0] (cms), CN/C=[70.8], IA=[3.18] (mm), N=[2], TP=[0.187] (hrs),
312 Continuous simulation parameters:
313 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
314 InterEventTime=[12] (hrs),
315 Baseflow simulation parameters:
316 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,

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316          VHydCond=[.001] (mm/hr), END=-1
317 *%-----|-----|
318 ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[1+4]
319 *%-----|-----|
320 *
321 *#=====|-----|
322 *# AREA 2B-2 (GOLF PORTION OF Area North of Campeau Drive) TO DA 4
323 *#=====|-----|
324 * Original CN=63
325 CONTINUOUS NASHYD          ID=[5], NHYD=["000100"], DT=[1]min, AREA=[15.7] (ha),
326 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
327 N=[2.0], TP=[0.837]hrs,
328 Continuous simulation parameters:
329 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
330 InterEventTime=[12] (hrs),
331 Baseflow simulation parameters:
332 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
333 VHydCond=[.001] (mm/hr), END=-1
334 *%-----|-----|
335 ADD HYD          IDsum=[6], NHYD=[000321], IDs to add=[2+5]
336 *%-----|-----|
337 *#=====|-----|
338 *# DA 4
339 *#=====|-----|
340 ROUTE RESERVOIR          IDout=[2], NHYD=[000100], IDin=[6],
341 RDT=[1] (min),
342 TABLE of ( OUTFLOW-STORAGE ) values
343 (cms) - (ha-m)
344 [ 0.0 , 0.0 ]
345 [ 1.47 , 0.00001 ]
346 [ 2.42 , 0.0080 ]
347 [ 3.09 , 0.0650 ]
348 [ 3.63 , 0.3459 ]
349 [ 3.86 , 0.8899 ]
350 [ 4.09 , 1.6418 ]
351 [ 4.25 , 3.6976 ]
352 [ 200.0 , 4.0674 ]
353 [ -1 , -1 ] (max twenty pts)
354 IDovf=[ ], NHYDovf=[ ]
355 *%-----|-----|
356 *#=====|-----|
357 *# ADD AREA 3A-2 TO OUTFLOW OF DA 4
358 *#=====|-----|
359 *# (JFS: THIS ADD HYD IS PART OF WHAT FLOWS TO THE WESLOCK GAUGE)
360 ADD HYD          IDsum=[5], NHYD=[000321], IDs to add=[2+10]
361 *%-----|-----|
362 SAVE HYD          ID=[5], # OF PCYCLES=[-1], ICASEsh=[-1]
363 HYD_FILENAME=["WESLOCK-A.HYD"]
364 HYD_COMMENT=["PART A OF WHAT FLOWS THROUGH GAUGE ON WESLOCK"]
365 *%-----|-----|
366 *#=====|-----|
367 *# AREA 1C (URBAN PORTION of Area North of Campeau Drive)
368 *#=====|-----|
369 *# This area is piped through the golf course, so no change in XIMP
370 CONTINUOUS STANDHYD          ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[17.8] (ha),
371 XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
372 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
373 DCAY=[2.0] (/hr), F=[0] (mm),
374 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
375 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
376 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
377 LGI=[344] (m), MNI=[0.013], SCI=[0] (min),
378 Continuous simulation parameters:
379 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
380 InterEventTime=[12] (hrs), END=-1

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380 *%-----|-----|
381 *
382 *#=====|
383 *# AREA 1B (GOLF PORTION OF Area North of Campeau Drive)
384 *#=====|
385 * Original CN=61
386 CONTINUOUS NASHYD          ID=[2], NHYD=["000100"], DT=[1]min, AREA=[9.3] (ha),
387 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
388 N=[2.0], TP=[0.81]hrs,
389 Continuous simulation parameters:
390 IaRECPper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
391 InterEventTime=[12] (hrs),
392 Baseflow simulation parameters:
393 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
394 VHydCond=[.001] (mm/hr), END=-1
395 *%-----|-----|
396 *#=====|
397 *# ADD 1C TO 1B
398 *#=====|
399 ADD HYD                    IDsum=[3], NHYD=[000321], IDs to add=[1+2]
400 *%-----|-----|
401 *
402 *#=====|
403 *# AREA 1A (INSTITUTION BLOCK)
404 *#=====|
405 CONTINUOUS NASHYD          ID=[4], NHYD=["000100"], DT=[1]min, AREA=[11.4] (ha),
406 DWF=[0] (cms), CN=[61], IA=[5.0] (mm),
407 N=[2.0], TP=[0.56]hrs,
408 Continuous simulation parameters:
409 IaRECPper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
410 InterEventTime=[12] (hrs),
411 Baseflow simulation parameters:
412 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
413 VHydCond=[.001] (mm/hr), END=-1
414 *%-----|-----|
415 *#=====|
416 *# AREA 1D (URBAN PORTION of Area North of Campeau Drive)
417 *#=====|
418 CONTINUOUS STANDHYD        ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[15.8] (ha),
419 XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
420 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
421 DCAY=[2.0] (/hr), F=[0] (mm),
422 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
423 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
424 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
425 LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
426 Continuous simulation parameters:
427 IaRECPper=[6] (hrs), IaRECimp=[1.5] (hrs),
428 InterEventTime=[12] (hrs), END=-1
429 *%-----|-----|
430 *#=====|
431 *# FROM AREA 1D, MAJOR FLOW TO 5B - MINOR FLOW TO 5C
432 *# 85 L/S/HA * 15.8 HA = 1.343 L/S
433 *#=====|
434 COMPUTE DUALHYD            IDin=[1], CINLET=[1.343] (cms), NINLET=[1],
435 MAJID=[7], MajNHYD=[000100],
436 MINID=[8], MinNHYD=[000100],
437 TMJSTO=[0] (cu-m)
438 *%-----|-----|
439 *#=====|
440 *# ADD 1A AND 1B TO 1D MINOR
441 *# (JFS: THIS ADD HYD IS PART OF WHAT FLOWS AT THE WESLOCK GAUGE)
442 ADD HYD                    IDsum=[6], NHYD=[000321], IDs to add=[4+3+8]
443 *%-----|-----|
444 SAVE HYD                   ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
445 HYD_FILENAME=["WESLOCK-B.HYD"]

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```

446 HYD_COMMENT=["PART B OF FLOWS AT WESLOCK"]
447 *%-----|-----
-----|
448 *
449 *#=====
450 *# AREA 5A (URBAN PORTION OF Area North of Knudson Drive)
451 *#=====
452 *# XIMP reduced to 0.05 since area drains across the golf course
453 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[2.5] (ha),
454 XIMP=[0.05], TIMP=[0.50], DWF=[0] (cms),
455 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
-----|
DCAY=[2.0] (/hr), F=[0] (mm),
456 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
457 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
458 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
459 LGI=[129] (m), MNI=[0.013], SCI=[0] (min),
460 Continuous simulation parameters:
461 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
462 InterEventTime=[12] (hrs), END=-1
463 *%-----|-----
464 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
465 *# over golf course and we want to recapture the baseflow
466 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[2.5] (ha)
467 DWF=[0] (cms), CN/C=[45.25], IA=[3.25] (mm), N=[2], TP=[0.08] (hrs),
468 Continuous simulation parameters:
469 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
470 InterEventTime=[12] (hrs),
471 Baseflow simulation parameters:
472 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
473 VHydCond=[.001] (mm/hr), END=-1
474 *
475 *#=====
476 *# AREA 5B (GOLF PORTION OF Area North of Knudson Drive)
477 *#=====
478 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[9.5] (ha),
479 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
480 N=[2.0], TP=[0.67]hrs,
481 Continuous simulation parameters:
482 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
483 InterEventTime=[12] (hrs),
484 Baseflow simulation parameters:
485 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
486 VHydCond=[.001] (mm/hr), END=-1
487 *%-----|-----
488 *#=====
489 *# ADD 5A AND 1D MAJOR TO 5B
490 *#=====
491 ADD HYD IDsum=[4], NHYD=[000321], IDs to add=[1+7+2]
492 *%-----|-----
493 *
494 *#=====
495 *# AREA 5C (URBAN PORTION OF Area North of Knudson Drive)
496 *#=====
497 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[6.2] (ha),
498 XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
499 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
-----|
DCAY=[2.0] (/hr), F=[0] (mm),
500 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
501 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
502 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
503 LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
504 Continuous simulation parameters:
505 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
506 InterEventTime=[12] (hrs), END=-1
507 *%-----|-----
508 *#=====
509 *# MAJOR FLOW TO 5B - MINOR FLOW TO 6A

```

```

510 *# 85 L/S/HA * 6.2 HA = 0.527 L/S
511 *#=====
512 COMPUTE DUALHYD      IDin=[1], CINLET=[0.527] (cms), NINLET=[1],
513                      MAJID=[2], MajNHYD=[000100],
514                      MINID=[8], MinNHYD=[000100],
515                      TMJSTO=[0] (cu-m)
516 *%-----|-----
517 *#=====
518 *# ADD 5C MAJOR TO 5B
519 *#=====
520 ADD HYD              IDsum=[7], NHYD=[000321], IDs to add=[2+4]
521 *%-----|-----
522 *
523 *#=====
524 *# DA 8
525 *# WITH UPDATED DISCHARGE RATING CURVE BASED ON FIELD SURVEY INFORMATION
526 *#=====
527 ROUTE RESERVOIR     IDout=[3], NHYD=[000100], IDin=[7],
528                      RDT=[1] (min),
529                      TABLE of ( OUTFLOW-STORAGE ) values
530                      (cms) - (ha-m)
531                      [ 0.0 , 0.0 ]
532                      [ 0.18 ,0.0004 ]
533                      [ 0.22 ,0.0023 ]
534                      [ 0.25 ,0.0092 ]
535                      [ 0.28 ,0.0250 ]
536                      [ 0.30 ,0.0580 ]
537                      [ 0.33 ,0.1272 ]
538                      [ 0.35 ,0.2435 ]
539                      [ 0.37 ,0.4650 ]
540                      [ 200.0 ,0.5115 ]
541                      [ -1 , -1 ] (max twenty pts)
542                      IDovf=[ ], NHYDovf=[ ]
543 *%-----|-----
544 *#=====
545 *# ADD 1D MINOR AND OUTLET OF DA 8 TO 5C MINOR
546 *#=====
547 ADD HYD              IDsum=[2], NHYD=[000321], IDs to add=[6+3+8]
548 *%-----|-----
549 *#=====
550 *# ADD 3A TO 5C
551 *#=====
552 ADD HYD              IDsum=[5], NHYD=[000321], IDs to add=[5+2]
553 *%-----|-----
554 *%SHIFT HYD was removed as it was not being used and was crashing the model
555 *%SHIFT HYD          IDout=[5], NHYD=[000100], IDin=[4], TLAG=[0] (min)
556 *%-----|-----
557 *
558 *#=====
559 *# AREA 6A (URBAN PORTION OF Area North of Knudson Drive)
560 *#=====
561 *# XIMP reduced to 0.05 since area drains across the golf course
562 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[4.1] (ha),
563                      XIMP=[0.050], TIMP=[0.52], DWF=[0] (cms),
564                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
565                      DCAY=[2.0] (/hr), F=[0] (mm),
566                      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
567                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
568                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
569                      LGI=[165] (m), MNI=[0.013], SCI=[0] (min),
570                      Continuous simulation parameters:
571                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
572                      InterEventTime=[12] (hrs), END=-1
573 *%-----|-----
574 *#=====
575 *# AREA 6B (GOLF PORTION OF Area North of Knudson Drive)

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576 *#=====
577 CONTINUOUS NASHYD          ID=[2], NHYD=["000100"], DT=[1]min, AREA=[5.9] (ha),
578 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
579 N=[2.0], TP=[0.87]hrs,
580 Continuous simulation parameters:
581 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
582 InterEventTime=[12] (hrs),
583 Baseflow simulation parameters:
584 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
585 VHydCond=[.001] (mm/hr), END=-1
586 *%-----|-----|
587 *#=====
588 *# ADD 6A TO 6B
589 *#=====
590 ADD HYD                    IDsum=[3], NHYD=[000321], IDs to add=[1+2]
591 *%-----|-----|
592 *
593 *#=====
594 *# AREA 6C (URBAN PORTION OF Area North of Knudson Drive)
595 *#=====
596 CONTINUOUS STANDHYD      ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[5.3] (ha),
597 XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
598 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
599 DCAY=[2.0] (/hr), F=[0] (mm),
600 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
601 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
602 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
603 LGI=[187] (m), MNI=[0.013], SCI=[0] (min),
604 Continuous simulation parameters:
605 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
606 InterEventTime=[12] (hrs), END=-1
607 *%-----|-----|
608 *#=====
609 *# MAJOR FLOW TO 6B - MINOR FLOW TO 7
610 *# 85 L/S/HA * 5.3 HA = 0.4505 L/S
611 *#=====
612 COMPUTE DUALHYD          IDin=[1], CINLET=[0.451] (cms), NINLET=[1],
613 MAJID=[2], MajNHYD=[000100],
614 MINID=[6], MinNHYD=[000100],
615 TMJSTO=[0] (cu-m)
616 *%-----|-----|
617 *#=====
618 *# ADD 6C MAJOR TO 6B
619 *#=====
620 ADD HYD                    IDsum=[4], NHYD=[000321], IDs to add=[2+3]
621 *# DA 9
622 *# WITH UPDATED DISCHARGE RATING CURVE BASED ON FIELD SURVEY INFORMATION
623 *#=====
624 ROUTE RESERVOIR          IDout=[3], NHYD=[000100], IDin=[4],
625 RDT=[1] (min),
626 TABLE of ( OUTFLOW-STORAGE ) values
627 (cms) - (ha-m)
628 [ 0.0 , 0.0 ]
629 [ 0.25 , 0.00003 ]
630 [ 0.31 , 0.0039 ]
631 [ 0.36 , 0.0285 ]
632 [ 0.40 , 0.0901 ]
633 [ 0.44 , 0.2499 ]
634 [ 0.47 , 0.6154 ]
635 [ 0.48 , 0.7609 ]
636 [ 200.00 , 0.8370 ]
637 [ -1 , -1 ] (max twenty pts)
638 IDovf=[ ], NHYDovf=[ ]
639 *%-----|-----|
640 *#=====
641 *# ADD DA 9 OUTFLOW TO 6C MINOR

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```

642 *#=====
643 ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[3+6]
644 *%-----|-----
645 *#=====
646 *# ADD 5C TO 6C
647 *#=====
648 ADD HYD          IDsum=[5], NHYD=[000321], IDs to add=[5+2]
649 *%-----|-----
650 *SHIFT HYD was removed as it was not being used and was crashing the model
651 *SHIFT HYD      IDout=[5], NHYD=[00100], IDin=[4], TLAG=[0] (min)
652 *%-----|-----
653 *
654 *#=====
655 *# AREA 14 (GOLF PORTION OF Area East of Knudson Drive - DA 11)
656 *#=====
657 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[2.38] (ha),
658 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
659 N=[2.0], TP=[0.40]hrs,
660 Continuous simulation parameters:
661 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
662 InterEventTime=[12] (hrs),
663 Baseflow simulation parameters:
664 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
665 VHydCond=[.001] (mm/hr), END=-1
666 *%-----|-----
667 *#=====
668 *# DA 11
669 *# RATING CURVE BASED ON FIELD SURVEY INFORMATION
670 *#=====
671 ROUTE RESERVOIR      IDout=[4], NHYD=[000100], IDin=[2],
672 RDT=[1] (min),
673 TABLE of ( OUTFLOW-STORAGE ) values
674 (cms) - (ha-m)
675 [ 0.0 , 0.0 ]
676 [ 0.09 ,0.0019 ]
677 [ 0.12 ,0.0735 ]
678 [ 0.145 ,0.2234 ]
679 [ 0.146 ,0.2349 ]
680 [200.00 ,0.2584 ]
681 [ -1 , -1 ] (max twenty pts)
682 IDovf=[ ], NHYDovf=[ ]
683 *%-----|-----
684 *#=====
685 *# ADD OUTFLOW OF DA 11 TO 6C
686 *#=====
687 ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[5+4]
688 *%-----|-----
689 *
690 *#=====
691 *# AREA 15 (GOLF PORTION OF Area South of Walden Drive - DA 10B)
692 *#=====
693 CONTINUOUS NASHYD      ID=[4], NHYD=["000100"], DT=[1]min, AREA=[2.5] (ha),
694 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
695 N=[2.0], TP=[0.20]hrs,
696 Continuous simulation parameters:
697 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
698 InterEventTime=[12] (hrs),
699 Baseflow simulation parameters:
700 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
701 VHydCond=[.001] (mm/hr), END=-1
702 *%-----|-----
703 *#=====
704 *# DA 10B
705 *# RATING CURVE BASED ON FIELD SURVEY INFORMATION
706 *#=====
707 ROUTE RESERVOIR      IDout=[5], NHYD=[000100], IDin=[4],
708 RDT=[1] (min),

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709          TABLE of ( OUTFLOW-STORAGE ) values
710                    (cms) - (ha-m)
711                    [ 0.0 , 0.0 ]
712                    [ 0.32 ,0.0018 ]
713                    [ 0.34 ,0.0093 ]
714                    [ 0.36 ,0.0309 ]
715                    [ 0.38 ,0.1597 ]
716                    [ 0.40 ,0.3353 ]
717                    [200.00 ,0.3688 ]
718                    [ -1 , -1 ] (max twenty pts)
719          IDovf=[ ], NHYDovf=[ ]
720 *%-----|-----
721 *
722 *#=====
723 *# AREA 7 (Adjacent to Beaver Pond)
724 *#=====
725 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[19.6] (ha),
726                          XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
727                          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
728                          DCAY=[2.0] (/hr), F=[0] (mm),
729                          Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
730                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
731                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
732                                          LGI=[361] (m), MNI=[0.013], SCI=[0] (min),
733                          Continuous simulation parameters:
734                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
735                          InterEventTime=[12] (hrs), END=-1
736 *%-----|-----
737 *#=====
738 *# ADD OUTFLOW OF DA 10B AND 6C TO 7
739 *# TOTAL FLOW - AT EXISTING 2700 MM OUTLET
740 *#=====
741 ADD HYD                  IDsum=[10], NHYD=[000321], IDs to add=[5+2+1]
742 *%-----|-----
743 *
744 *#=====
745 *# AREA 4C
746 *#=====
747 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[5.8] (ha),
748                          XIMP=[0.250], TIMP=[0.53], DWF=[0] (cms),
749                          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
750                          DCAY=[2.0] (/hr), F=[0] (mm),
751                          Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
752                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
753                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
754                                          LGI=[196] (m), MNI=[0.013], SCI=[0] (min),
755                          Continuous simulation parameters:
756                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
757                          InterEventTime=[12] (hrs), END=-1
758 *%-----|-----
759 *#=====
760 *# MAJOR FLOW TO 4B - MINOR FLOW TO 4A
761 *# 85 L/S/HA * 5.8 HA = 493 L/S
762 *#=====
763 COMPUTE DUALHYD          IDin=[1], CINLET=[0.493] (cms), NINLET=[1],
764                          MAJID=[5], MajNHYD=[000100],
765                          MINID=[6], MinNHYD=[100100],
766                          TMJSTO=[0] (cu-m)
767 *%-----|-----
768 *
769 *#=====
770 *# AREA 4A - FLOW THROUGH AREA 4
771 *#=====
772 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[15.8] (ha),
773                          XIMP=[0.250], TIMP=[0.66], DWF=[0] (cms),
774                          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
775                          DCAY=[2.0] (/hr), F=[0] (mm),

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773          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
774                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
775          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
776                                LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
777          Continuous simulation parameters:
778          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
779          InterEventTime=[12] (hrs), END=-1
780 *%-----|-----|
781 *
782 *#=====|=====|
783 *# ADDITION OF 4C MINOR TO 4A
784 *#=====|=====|
785 *
786 ADD HYD          IDsum=[4], NHYD=[000231], IDs to add=[3+6]
787 *%-----|-----|
788 *#=====|=====|
789 *# AREA 4B - ROUTE THROUGH ON SITE STORAGE
790 *#=====|=====|
791 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[6.2] (ha),
792                          XIMP=[0.250], TIMP=[0.57], DWF=[0] (cms),
793                          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
794                          DCAY=[2.0] (/hr), F=[0] (mm),
795          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
796                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
797          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
798                                LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
799          Continuous simulation parameters:
800          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
801          InterEventTime=[12] (hrs), END=-1
802 *%-----|-----|
803 *#=====|=====|
804 *# ADDITION OF MAJOR FLOW AT 4C TO AREA 4B
805 *#=====|=====|
806 ADD HYD          IDsum=[6], NHYD=[000231], IDs to add=[5+3]
807 *%-----|-----|
808 *#=====|=====|
809 *# ON-SITE STORAGE IN AREA 4B
810 *# 85L/S/HA
811 *#=====|=====|
812 *
813 ROUTE RESERVOIR      IDout=[3], NHYD=[000100], IDin=[6],
814                          RDT=[1] (min),
815                          TABLE of ( OUTFLOW-STORAGE ) values
816                                (cms) - (ha-m)
817                                [ 0.0 , 0.0 ]
818                                [ 0.527, 0.2840 ]
819                                [ -1 , -1 ] (max twenty pts)
820          IDovf=[], NHYDovf=[]
821 *%-----|-----|
822 *#=====|=====|
823 *# ADDITION OF ROUTED 4B TO AREA 4A
824 *#=====|=====|
825 ADD HYD          IDsum=[8], NHYD=[000231], IDs to add=[4+3]
826 *%-----|-----|
827 *
828 *# AREA 4 (Adjacent to Beaver Pond)
829 *#=====|=====|
830 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[21.2] (ha),
831                          XIMP=[0.250], TIMP=[0.38], DWF=[0] (cms),
832                          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
833                          DCAY=[2.0] (/hr), F=[0] (mm),
834          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
835                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
836          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
837                                LGI=[375] (m), MNI=[0.013], SCI=[0] (min),
838          Continuous simulation parameters:

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838          IaRECPper=[6] (hrs),  IaRECImp=[1.5] (hrs),
839          InterEventTime=[12] (hrs), END=-1
840 *%-----|-----|
841 *#=====|=====|
842 *# ADDITION OF MINOR FLOW AT 4A TO AREA 4
843 *#=====|=====|
844 ADD HYD          IDsum=[3], NHYD=[000231], IDs to add=[8+1]
845 *%-----|-----|
846 ADD HYD          IDsum=[7], NHYD=[000231], IDs to add=[10+3]
847 *%-----|-----|
848 *#=====|=====|
849 *# AREA 9 (RURAL - includes Beaver Pond itself)
850 *#=====|=====|
851 CONTINUOUS NASHYD  ID=[2], NHYD=["000100"], DT=[1]min, AREA=[18.9] (ha),
852                   DWF=[0] (cms),  CN=[75], IA=[5.0] (mm),
853                   N=[2.0], TP=[0.37]hrs,
854                   Continuous simulation parameters:
855                   IaRECPper=[6] (hrs), SMIN=[-1] (mm),  SMAX=[-1] (mm), SK=[0.03]/(mm),
856                   InterEventTime=[12] (hrs),
857                   Baseflow simulation parameters:
858                   BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
859                   VHydCond=[.001] (mm/hr), END=-1
860 *%-----|-----|
861 ADD HYD          IDsum=[6], NHYD=[000321], IDs to add=[7+2]
862 *%-----|-----|
863 *
864 *#=====|=====|
865 *# GOULDBOURN FORCED ROAD - KANATA AVENUE TO AREA 10 BOUNDARY
866 *# (ARTERIAL ROAD 10 YEAR 10 MN INLET TIME)
867 *#=====|=====|
868 CONTINUOUS STANDHYD  ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[1.6] (ha),
869                   XIMP=[0.71], TIMP=[0.71], DWF=[0] (cms),
870                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
871                   DCAY=[2.0] (/hr), F=[0] (mm),
872                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
873                   LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
874                   Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
875                   LGI=[103] (m), MNI=[0.013], SCI=[0] (min),
876                   Continuous simulation parameters:
877                   IaRECPper=[6] (hrs),  IaRECImp=[1.5] (hrs),
878                   InterEventTime=[12] (hrs), END=-1
879 *%-----|-----|
880 *# MAJOR FLOW TO BEAVER POND - MINOR FLOW TO AREA 10 STORM SYSTEM
881 *# 237.69 L/S/HA * 1.66 HA = 394.6 L/S
882 *#=====|=====|
883 COMPUTE DUALHYD  IDin=[1], CINLET=[0.395] (cms), NINLET=[1],
884                   MAJID=[2], MajNHYD=[000100],
885                   MINID=[7], MinNHYD=[100100],
886                   TMJSTO=[0] (cu-m)
887 *%-----|-----|
888 *#=====|=====|
889 *# BEAVER POND PORTION #1
890 *#=====|=====|
891 *
892 ADD HYD          IDsum=[9], NHYD=[000321], IDs to add=[6+2]
893 *%-----|-----|
894 *
895 *#=====|=====|
896 *# KANATA AVENUE - GOULDBOURN FORCED ROAD TO AREA 10 BOUNDARY
897 *# (ARTERIAL ROAD 10 YEAR 10 MIN INLET TIME)
898 *#=====|=====|
899 CONTINUOUS STANDHYD  ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[2.8] (ha),
900                   XIMP=[0.32], TIMP=[0.32], DWF=[0] (cms),
901                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
902                   DCAY=[2.0] (/hr), F=[0] (mm),
903                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),

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903             LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
904 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
905             LGI=[136] (m), MNI=[0.013], SCI=[0] (min),
906 Continuous simulation parameters:
907 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
908 InterEventTime=[12] (hrs), END=-1
909 *%-----|-----|
910 *#=====|=====|
911 *# MAJOR FLOW TOWARDS TFD - MINOR FLOW TO AREA 10 STORM SYSTEM
912 *# 237.69 L/S/HA * 1.8 HA = 427.8 L/S
913 * JFSA correction based on above drainage area of 2.8 ha
914 * Capture in DUALHYD below 237.69 L/s/ha * 2.8 ha = 665.5 L/s
915 *#=====|=====|
916 COMPUTE DUALHYD      IDin=[1], CINLET=[0.6655] (cms), NINLET=[1],
917                     MAJID=[10], MajNHYD=[000100],
918                     MINID=[2], MinNHYD=[100100],
919                     TMJSTO=[0] (cu-m)
920 *%-----|-----|
921 *
922 *#=====|=====|
923 *# DRAINAGE AGREA 10 - TOTAL 43.6 HA - DIVIDED UP FOR HGL ANALYSIS
924 *# (INCLUDES AREA 10-4, 10-1, 10-2 AND 10-3)
925 *#=====|=====|
926 *
927 *#=====|=====|
928 *# AREA 10-4 - DRAINS INTO S-5 - MAJOR FLOW CASCADES
929 *#=====|=====|
930 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[13.9] (ha),
931 XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
932 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
933 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
934                 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
935 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
936                 LGI=[304] (m), MNI=[0.013], SCI=[0] (min),
937 Continuous simulation parameters:
938 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
939 InterEventTime=[12] (hrs), END=-1
940 *%-----|-----|
941 *#=====|=====|
942 *# MINOR FLOW INTO SYSTEM
943 *# 85 L/S/HA * 14 = 1190 L/S
944 *JFSA correction based on above drainage area of 13.9 ha
945 * Capture in DUALHYD below 85 L/s/ha * 13.9 ha = 1181 L/s
946 *#=====|=====|
947 COMPUTE DUALHYD      IDin=[1], CINLET=[1.181] (cms), NINLET=[1],
948                     MAJID=[8], MajNHYD=[000100],
949                     MINID=[6], MinNHYD=[100100],
950                     TMJSTO=[0] (cu-m)
951 *%-----|-----|
952 *#=====|=====|
953 *# ADD KANATA AVENUE AND AREA 10-4 - MH S-5
954 *#=====|=====|
955 *
956 ADD HYD              IDsum=[5], NHYD=[000101], IDs to add=[6+2]
957 *%-----|-----|
958 *
959 *#=====|=====|
960 *# AREA 10-1 - DRAINS INTO S-4 - MAJOR FLOW CASCADES
961 *#=====|=====|
962 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.8] (ha),
963 XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
964 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
965 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
966                 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
967 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),

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```

968             LGI=[255] (m), MNI=[0.013], SCI=[0] (min),
969             Continuous simulation parameters:
970             IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
971             InterEventTime=[12] (hrs), END=-1
972 *%-----|-----|
973 *#=====|=====|
974 *# MINOR FLOW INTO SYSTEM
975 *# 85 L/S/HA * 9.5 = 807.5 L/S
976 *JFSA correction based on above drainage area of 9.8 ha
977 * Capture in DUALHYD below 85 L/s/ha * 9.8 ha = 833 L/s
978 *#=====|=====|
979 COMPUTE DUALHYD   IDin=[1], CINLET=[0.833] (cms), NINLET=[1],
980                   MAJID=[4], MajNHYD=[000100],
981                   MINID=[6], MinNHYD=[100100],
982                   TMJSTO=[0] (cu-m)
983 *%-----|-----|
984 *#=====|=====|
985 *# ADD GOULBOURN FORCED ROAD AND AREA 10-1 - MH S-3
986 *#=====|=====|
987 *
988 ADD HYD           IDsum=[3], NHYD=[000101], IDs to add=[6+7]
989 *%-----|-----|
990 ADD HYD           IDsum=[7], NHYD=[000102], IDs to add=[3+5]
991 *%-----|-----|
992 *
993 *#=====|=====|
994 *# AREA 10-3 - DRAINS INTO S-2 - MAJOR FLOW CASCADES
995 *#=====|=====|
996 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[4.3] (ha),
997                   XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
998                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
999                   DCAY=[2.0] (/hr), F=[0] (mm),
1000                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1001                   LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1002                   Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1003                   LGI=[169] (m), MNI=[0.013], SCI=[0] (min),
1004                   Continuous simulation parameters:
1005                   IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1006                   InterEventTime=[12] (hrs), END=-1
1007 *%-----|-----|
1008 *#=====|=====|
1009 *# MINOR FLOW INTO SYSTEM
1010 *# 85 L/S/HA * 3.9 = 331.5 L/S
1011 *JFSA correction based on above drainage area of 4.3 ha
1012 * Capture in DUALHYD below 85 L/s/ha * 4.3 ha = 365 L/s
1013 *#=====|=====|
1014 COMPUTE DUALHYD   IDin=[1], CINLET=[0.365] (cms), NINLET=[1],
1015                   MAJID=[5], MajNHYD=[000100],
1016                   MINID=[2], MinNHYD=[100100],
1017                   TMJSTO=[0] (cu-m)
1018 *%-----|-----|
1019 ADD HYD           IDsum=[10], NHYD=[000103], IDs to add=[2+7]
1020 *%-----|-----|
1021 *
1022 *#=====|=====|
1023 *# AREA 10-2 - DRAINS INTO S-6 - MAJOR FLOW CASCADES
1024 *#=====|=====|
1025 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[18.6] (ha),
1026                   XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
1027                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1028                   DCAY=[2.0] (/hr), F=[0] (mm),
1029                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1030                   LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1031                   Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1032                   LGI=[352] (m), MNI=[0.013], SCI=[0] (min),
1033                   Continuous simulation parameters:
1034                   IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),

```

```

1033             InterEventTime=[12](hrs), END=-1
1034 *%-----|-----|
1035 *#=====|-----|
1036 *# MINOR FLOW INTO SYSTEM
1037 *# 85 L/S/HA * 16.2 = 1377 L/S
1038 *JFSA correction based on above drainage area of 18.6 ha
1039 * Capture in DUALHYD below 85 L/s/ha * 18.6 ha = 1581 L/s
1040 *#=====|-----|
1041 COMPUTE DUALHYD      IDin=[1], CINLET=[1.581](cms), NINLET=[1],
1042                     MAJID=[2], MajNHYD=[000100],
1043                     MINID=[6], MinNHYD=[100100],
1044                     TMJSTO=[0](cu-m)
1045 *%-----|-----|
1046 *
1047 *#=====|-----|
1048 *# AREA 10A - MINOR FLOW TO AREA 10, MAJOR FLOW TO CARP RIVER WATERSHED
1049 *#=====|-----|
1050 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1](min), AREA=[9.9](ha),
1051                     XIMP=[0.250], TIMP=[0.44], DWF=[0](cms),
1052                     LOSS=[1]: Horton: Fo=[125](mm/hr), Fc=[25](mm/hr),
1053                     DCAY=[2.0](/hr), F=[0](mm),
1054                     Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
1055                                         LGP=[40](m), MNP=[0.25], SCP=[0](min),
1056                     Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
1057                                         LGI=[256](m), MNI=[0.013], SCI=[0](min),
1058                     Continuous simulation parameters:
1059                     IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
1060                     InterEventTime=[12](hrs), END=-1
1061 *%-----|-----|
1062 *#=====|-----|
1063 *# SPLIT OF MAJOR AND MINOR FLOW AT 85 L/S/HA
1064 *# 85 * 7.0 = 595 L/S
1065 *JFSA correction based on above drainage area of 9.9 ha
1066 * Capture in DUALHYD below 85 L/s/ha * 9.9 ha = 841 L/s
1067 *#=====|-----|
1068 COMPUTE DUALHYD      IDin=[1], CINLET=[0.841](cms), NINLET=[1],
1069                     MAJID=[3], MajNHYD=[000100],
1070                     MINID=[7], MinNHYD=[100100],
1071                     TMJSTO=[0](cu-m)
1072 *%-----|-----|
1073 ADD HYD              IDsum=[1], NHYD=[000104], IDs to add=[7+6]
1074 *%-----|-----|
1075 *#=====|-----|
1076 *# TOTAL MINOR FLOW AT OUTLET
1077 *#=====|-----|
1078 ADD HYD              IDsum=[6], NHYD=[000105], IDs to add=[1+10]
1079 *%-----|-----|
1080 *#=====|-----|
1081 *# TOTAL MAJOR FLOW FOR DRAINAGE AREA 10 AT OUTLET
1082 *#=====|-----|
1083 ADD HYD              IDsum=[7], NHYD=[000106], IDs to add=[8+4+5+2]
1084 *%-----|-----|
1085 *#=====|-----|
1086 *# AREA 11 (RURAL) - Increased Area for Existing Conditions
1087 *#=====|-----|
1088 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[46.2](ha),
1089                     DWF=[0](cms), CN=[62], IA=[5.0](mm),
1090                     N=[2.0], TP=[0.75]hrs,
1091                     Continuous simulation parameters:
1092                     IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.03]/(mm),
1093                     InterEventTime=[12](hrs),
1094                     Baseflow simulation parameters:
1095                     BaseFlowOption=[1], InitGWResVol=[12](mm), GWResK=[0.85](mm/day/mm),
1096                     VHydCond=[.001](mm/hr), END=-1
1097 *%-----|-----|
1098 ADD HYD              IDsum=[3], NHYD=[000317], IDs to add=[7+2]
1099 *%-----|-----|

```

```

1099 *#=====
1100 *# TOTAL FLOW TO KIZELL POND (U/S CELL)
1101 *#=====
1102 ADD HYD          IDsum=[10], NHYD=[000317], IDs to add=[3+6]
1103 *%-----|-----|
1104 *
1105 *#=====
1106 *# SYSTEM STORAGE REPRESENTATION (KIZELL POND)
1107 *# RATING CURVE PROVIDED BY IBI
1108 *#=====
1109 *# modify the ROUTE RESERVOIR to negate the effect of this underground storage
1110 ROUTE RESERVOIR  IDout=[3], NHYD=["KP-R"], IDin=[10],
1111                  RDT=[1] (min),
1112                  TABLE of ( OUTFLOW-STORAGE ) values
1113                        (cms) - (ha-m)
1114                        [ 0.0 , 0.0 ]
1115                        [ 99.  , 0.09]
1116                        [ -1  , -1  ] (max twenty pts)
1117                  IDovf=[4], NHYDovf=["OVF-KP"]
1118 *#=====
1119 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (KIZELL)
1120 *#=====
1121 ADD HYD          IDsum=[10], NHYD=["KP-COM"], IDs to add=[3+4]
1122 *#=====
1123 *
1124 * Kanata Lakes Stage 7 - Catchment removed from Model under existing conditions
1125 *
1126 *#=====
1127 *CONTINUOUS STANDHYD      ID=[1], NHYD=["Stage 7"], DT=[1] (min), AREA=[73.1] (ha),
1128 *                          XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms), LOSS=[2],
1129 *                          SCS curve number CN=[57],
1130 *                          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1131 *                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1132 *                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1133 *                                          LGI=[698] (m), MNI=[0.013], SCI=[0] (min),
1134 *                          Continuous simulation parameters:
1135 *                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),*
1136 *                          InterEventTime=[12] (hrs), END=-1
1137 *#=====
1138 *
1139 * Kanata Lakes Stage 8 - Catchment removed from Model under existing conditions
1140 *
1141 *#=====
1142 *CONTINUOUS STANDHYD      ID=[2], NHYD=["Stage 8"], DT=[1] (min), AREA=[65.7] (ha),
1143 *                          XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
1144 *                          LOSS=[1]:   Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1145 *                          DCAY=[2.0] (/hr), F=[0] (mm),
1146 *                          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1147 *                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1148 *                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1149 *                                          LGI=[661] (m), MNI=[0.013], SCI=[0] (min),
1150 *                          Continuous simulation parameters:
1151 *                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1152 *                          InterEventTime=[12] (hrs), END=-1
1153 *#=====
1154 *# Only Minor system flow to Kizell Cell - Command removed from Model
1155 *#=====
1156 *COMPUTE DUALHYD      IDin=[2], CINLET=[0.8] (cms), NINLET=[1],
1157 *                     MAJID=[3], MajNHYD=[000100],
1158 *                     MINID=[7], MinNHYD=[100100],
1159 *                     TMJSTO=[0] (cu-m)
1160 *#=====
1161 * Total flow into Kizell Cell
1162 *#=====
1163 *#ADD HYD          IDsum=[8], NHYD=["KP-COM"], IDs to add=[10+1]
1164 *#=====

```



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1165 * ROUTE THROUGH THE KIZELL CELL
1166 *
1167 ROUTE RESERVOIR      IDout=[5],  NHYD=["Kizell Cell"],  IDin=[10],
1168                    RDT=[1] (min),
1169                    TABLE of ( OUTFLOW-STORAGE ) values
1170                    (cms) - (ha-m)
1171                    [ 0.0 , 0.0 ]
1172                    [ 0.100 , 0.016]
1173                    [ 0.200 , 0.033]
1174                    [ 0.300 , 0.055]
1175                    [ 0.400 , 0.079]
1176                    [ 0.500 , 0.121]
1177                    [ 0.700 , 0.188]
1178                    [ 0.800 , 0.281]
1179                    [ 0.950 , 0.433]
1180                    [ 1.050 , 0.658]
1181                    [ 1.200 , 0.919]
1182                    [ -1 , -1 ] (max twenty pts)
1183                    IDovf=[4], NHYDovf=["OVF-Kizell Cell"]
1184 *#=====
1185 *# ADD OUTFLOW AND OVERFLOW
1186 *#=====
1187 ADD HYD              IDsum=[8], NHYD=["KP-COM"], IDs to add=[5+4]
1188 *#=====
1189 *#=====
1190 *# SYSTEM STORAGE REPRESENTATION (BEAVER POND)
1191 *# RATING CURVE PROVIDED BY IBI
1192 *#=====
1193 * modify the ROUTE RESERVOIR to negate the effects of the underground storage
1194 ROUTE RESERVOIR      IDout=[3],  NHYD=["BP-R"],  IDin=[9],
1195                    RDT=[1] (min),
1196                    TABLE of ( OUTFLOW-STORAGE ) values
1197                    (cms) - (ha-m)
1198                    [ 0.0 , 0.0 ]
1199                    [ 99.0 , 0.09]
1200                    [ -1 , -1 ] (max twenty pts)
1201                    IDovf=[4], NHYDovf=["OVF-BP"]
1202 *#=====
1203 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (BEAVER)
1204 *#=====
1205 ADD HYD              IDsum=[9], NHYD=["BP-COM"], IDs to add=[3+4]
1206 *#=====
1207 *
1208 * Kanata Lakes Stage 9 - Replaced by subcatchment 8 under existing conditions
1209 *
1210 *#=====
1211 CONTINUOUS NASHYD      ID=[1], NHYD=["8"], DT=[1]min, AREA=[9.2] (ha),
1212                    DWF=[0] (cms),  CN=[56], IA=[5.0] (mm),
1213                    N=[2.0], TP=[0.21]hrs,
1214                    Continuous simulation parameters:
1215                    IaRECper=[6] (hrs), SMIN=[-1] (mm),  SMAX=[-1] (mm), SK=[0.03]/(mm),
1216                    InterEventTime=[12] (hrs),
1217                    Baseflow simulation parameters:
1218                    BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1219                    VHydCond=[.001] (mm/hr), END=-1
1220 *#=====
1221 *# TOTAL HYDROGRAPH INTO BEAVER POND
1222 *
1223 ADD HYD              IDsum=[6], NHYD=["BP-TOTAL"], IDs to add=[9+8+1]
1224 *
1225 *#=====
1226 SAVE HYD             ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
1227                    HYD_FILENAME=["BP_In"]
1228                    HYD_COMMENT=["Total inflow to the Beaver Pond"]
1229 *#=====
1230 *# TOTAL FLOW FROM BEAVER POND
1231 *#=====

```

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1232 * ROUTE THROUGH BEAVER POND
1233 * Overflow option removed to allow for linear extrapolation of flows out of the
1234 * pond when simulated volumes exceed volumes provided in the curve below.
1235 ROUTE RESERVOIR      IDout=[1],  NHYD=["BP-OUT"],  IDin=[6],
1236                    RDT=[1] (min),
1237                    TABLE of ( OUTFLOW-STORAGE ) values
1238                    (cms) - (ha-m)
1239                    [ 0.0 , 0.0 ]
1240                    [ 0.592 , 4.573]
1241                    [ 0.686 , 6.569]
1242                    [ 0.769 , 8.840]
1243                    [ 0.879 , 11.467]
1244                    [ 1.007 , 16.103]
1245                    [ 1.040 , 17.339]
1246                    [ -1 , -1 ] (max twenty pts)
1247                    IDovf=[],  NHYDovf=[""]
1248 *#=====
1249 SAVE HYD              ID=[1],  # OF PCYCLES=[-1],  ICASEsh=[-1]
1250                    HYD_FILENAME=["BP_Out"]
1251                    HYD_COMMENT=["Total Outflow from the Beaver Pond"]
1252 *#=====
1253 *# ROUTE KD-1 THROUGH KD-2A
1254 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 10018.26
1255 *#=====
1256 ROUTE CHANNEL        IDout=[3],  NHYD=["KD-1"],  IDin=[1],
1257                    RDT=[1] (min),
1258                    CHLGTH=[277] (m),  CHSLOPE=[1.08] (%),
1259                    FPSLOPE=[1.08] (%),
1260                    SECNUM=[10018],  NSEG=[4]
1261                    ( SEGROUGH,  SEGDIST (m))=[0.08,30.63 -0.03,34.69 0.08,49.66
1262                    ( DISTANCE (m),  ELEVATION (m))=[ 0, 94.54 ]
1263                    [ 7.12, 93.2 ]
1264                    [11.07, 92.3 ]
1265                    [15.31, 91.8 ]
1266                    [17.16, 91.35 ]
1267                    [20.56, 90.8 ]
1268                    [25.12, 89.58 ]
1269                    [28.15, 88.5 ]
1270                    [30.63, 87.8 ]
1271                    [31.957, 87.854 ]
1272                    [ 34.4, 88.5 ]
1273                    [34.69, 88.61 ]
1274                    [ 36.5, 89.23 ]
1275                    [38.48, 90.2 ]
1276                    [41.14, 91.1 ]
1277                    [ 45.4, 91.66 ]
1278                    [49.66, 91.96 ]
1279                    [53.06, 92.3 ]
1280                    [67.16, 92.43 ]
1281                    [70.77, 92.52 ]
1282 *#=====
1283 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9854.606
1284 *#=====
1285 ROUTE CHANNEL        IDout=[2],  NHYD=["KD-1"],  IDin=[3],
1286                    RDT=[1] (min),
1287                    CHLGTH=[186] (m),  CHSLOPE=[1.97] (%),
1288                    FPSLOPE=[1.97] (%),
1289                    SECNUM=[9854],  NSEG=[5]
1290                    ( SEGROUGH,  SEGDIST (m))=[0.08,29.81 0.05,34.304 -0.03,38.24
1291                    ( DISTANCE (m),  ELEVATION (m))=[ 0, 90.07 ]
1292                    [ 6.86, 89.4 ]
1293                    [13.24, 89.2 ]
1294                    [17.79, 88.48 ]
1295                    [22.46, 87.2 ]
1296                    [29.81, 86.04 ]

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1297 [32.17, 85.72 ]
1298 [34.304, 85.612 ]
1299 [36.137, 85.654 ]
1300 [37.46, 85.69 ]
1301 [38.24, 85.72 ]
1302 [44.98, 85.9 ]
1303 [47.73, 86.32 ]
1304 [51.27, 87.3 ]
1305 [55.17, 88 ]
1306 [87.02, 88.79 ]
1307 [90.72, 88.7 ]
1308 [93.96, 89 ]
1309 [99.45, 90.8 ]
1310 [105.39, 91.81 ]
1311 *#=====
1312 *# KD-2A-1 - RURAL - Increased Area for Existing Conditions
1313 *#=====
1314 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2A-1"], DT=[1]min, AREA=[28.6] (ha),
1315 DWF=[0] (cms), CN=[57], IA=[7] (mm),
1316 N=[2.0], TP=[0.91]hrs,
1317 Continuous simulation parameters:
1318 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1319 InterEventTime=[12] (hrs),
1320 Baseflow simulation parameters:
1321 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1322 VHydCond=[.001] (mm/hr), END=-1
1323 *#=====
1324 *# ADD KD-2A-1 AND KD-1
1325 *#=====
1326 ADD HYD IDsum=[3], NHYD=["KFP2"], IDs to add=[1+2]
1327 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1328 *#=====
1329 *# ROUTE THROUGH KD-2A-2
1330 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9743.627
1331 *#=====
1332 ROUTE CHANNEL IDout=[1], NHYD=["KD-1"], IDin=[3],
1333 RDT=[1] (min),
1334 CHLGTH=[408] (m), CHSLOPE=[0.84] (%),
1335 FPSLOPE=[0.84] (%),
1336 SECNUM=[9743], NSEG=[5]
1337 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
0.05,63.17 0.08,111.15] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
[ 7.01, 86.7 ]
[15.57, 86.2 ]
[21.06, 85.58 ]
[25.69, 84.76 ]
[31.55, 83.42 ]
[40.62, 82.7 ]
[42.45, 82.5 ]
[44.28, 82.561 ]
[ 44.6, 82.59 ]
[46.07, 82.7 ]
[48.58, 82.76 ]
[59.09, 82.59 ]
[63.17, 83.94 ]
[67.14, 85.3 ]
[71.84, 85.8 ]
[82.08, 85.8 ]
[89.16, 86.2 ]
[106.01, 86.6 ]
[111.15, 86.65 ]
1358 *#=====
1359 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1360 HYD_FILENAME=["KD-1"]
1361 HYD_COMMENT=["KD-1-Channel where Erosion analysis was completed"]
1362 *#=====

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1363 *# Erosion Analysis on Kizell Drain (Requires SWMHYMO v5.5)
1364 *#=====
1365 *# Erosion Index/critical shear stress calculated for flows through the critical
1366 *# section of on Kizell Drain as determined by Matrix Solutions (May 2019)
1367 *#=====
1368 EROSION INDEX      INDEX_METHOD=[1], QCE =[0.50] (cms), NHYDsErosion=[1]
1369 *#=====
1370 EROSION INDEX      INDEX_METHOD=[2], SHEARC =[20] (Pa), No of Hyds=[1],
1371 NHYDsErosion=[1]
1372 RATING_CURVE_METHOD = [1], user entered channel shape
1373 Channel section parameters
1374 Section No["XS1"]
1375 CHSLOPE=[0.84] (%), FPSLOPE=[0.84] (%),
1376 NSEG=[5]
1377 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
0.05,63.17 0.08,111.15] NSEG times
1378 ( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
1379 [ 7.01, 86.7 ]
1380 [15.57, 86.2 ]
1381 [21.06, 85.58 ]
1382 [25.69, 84.76 ]
1383 [31.55, 83.42 ]
1384 [40.62, 82.7 ]
1385 [42.45, 82.5 ]
1386 [44.28, 82.561 ]
1387 [ 44.6, 82.59 ]
1388 [46.07, 82.7 ]
1389 [48.58, 82.76 ]
1390 [59.09, 82.59 ]
1391 [63.17, 83.94 ]
1392 [67.14, 85.3 ]
1393 [71.84, 85.8 ]
1394 [82.08, 85.8 ]
1395 [89.16, 86.2 ]
1396 [106.01, 86.6 ]
1397 [111.15, 86.65 ]
1398 *#=====
1399 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9338.062
1400 *# MINIMUM SLOPE ASSUMED 0.1%
1401 *#=====
1402 ROUTE CHANNEL      IDout=[2], NHYD=["KD-1"], IDin=[1],
1403 RDT=[1] (min),
1404 CHLGTH=[111] (m), CHSLOPE=[0.1] (%),
1405 FPSLOPE=[0.1] (%),
1406 SECNUM=[9338], NSEG=[5]
1407 ( SEGROUGH, SEGDIST (m))=[0.04,78.47 0.06,82.78 -0.03,87.28
0.06,107.69 0.04,120.16] NSEG times
1408 ( DISTANCE (m), ELEVATION (m))=[ 0, 82.8 ]
1409 [ 6.26, 82.86 ]
1410 [ 23, 82.4 ]
1411 [57.46, 82.11 ]
1412 [75.38, 82.1 ]
1413 [78.47, 81.06 ]
1414 [ 81.6, 79.7 ]
1415 [82.78, 79.3 ]
1416 [87.28, 79.28 ]
1417 [ 88.3, 79.7 ]
1418 [91.41, 81.1 ]
1419 [94.81, 81.7 ]
1420 [107.69, 82.1 ]
1421 [120.16, 82.2 ]
1422 *#=====
1423 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9131.887
1424 *#=====
1425 ROUTE CHANNEL      IDout=[1], NHYD=["KD-1"], IDin=[2],
1426 RDT=[1] (min),
1427 CHLGTH=[248] (m), CHSLOPE=[0.28] (%),

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1428                                FPSLOPE=[0.28] (%),
1429                                SECNUM=[9131],      NSEG=[5]
1430                                ( SEGROUGH, SEGDIST (m))=[0.04,70.64 -0.03,72.865 0.04,74.61
                                0.05,77.65 0.04,191.67] NSEG times
1431                                ( DISTANCE (m), ELEVATION (m))=[ 0, 81.6 ]
1432                                [ 7.35, 81.6 ]
1433                                [ 26.3, 80.9 ]
1434                                [48.53, 80.87 ]
1435                                [58.55, 80.01 ]
1436                                [65.66, 80 ]
1437                                [69.22, 79 ]
1438                                [70.64, 78.65 ]
1439                                [72.865, 78.7 ]
1440                                [74.25, 78.96 ]
1441                                [74.61, 79.1 ]
1442                                [77.65, 79.92 ]
1443                                [93.59, 79.9 ]
1444                                [103.2, 78.7 ]
1445                                [108.05, 79.9 ]
1446                                [115.92, 80.2 ]
1447                                [132.65, 80.2 ]
1448                                [159.72, 80.73 ]
1449                                [176.71, 82.61 ]
1450                                [191.67, 82.63 ]
1451                                *#=====
1452                                *# KD-2A-2 - URBAN/RURAL NORTH OF RAILROAD
1453                                *#=====
1454                                CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2A-2"], DT=[1] (min), AREA=[44.99] (ha),
1455                                XIMP=[0.250], TIMP=[0.28], DWF=[0] (cms),
1456                                LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1457                                DCAY=[2.0] (/hr), F=[0] (mm),
1458                                Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1459                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1460                                Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1461                                LGI=[547] (m), MNI=[0.013], SCI=[0] (min),
1462                                Continuous simulation parameters:
1463                                IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1464                                InterEventTime=[12] (hrs), END=-1
1465                                *#=====
1466                                *# ADD KD-2A-1 AND KD-2A-2
1467                                *# CREST GAUGE LOCATION KD-2 -KIZELL DRAIN AT MARCH ROAD
1468                                *#=====
1469                                ADD HYD      IDsum=[3], NHYD=["KFP3"], IDs to add=[1+2]
1470                                *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1471                                *#=====
1472                                *# KD-2A-3 - URBAN SOUTH OF RAILROAD
1473                                *#=====
1474                                CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2A-3"], DT=[1] (min), AREA=[48.56] (ha),
1475                                XIMP=[0.250], TIMP=[0.31], DWF=[0] (cms),
1476                                LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1477                                DCAY=[2.0] (/hr), F=[0] (mm),
1478                                Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1479                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1480                                Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1481                                LGI=[568] (m), MNI=[0.013], SCI=[0] (min),
1482                                Continuous simulation parameters:
1483                                IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1484                                InterEventTime=[12] (hrs), END=-1
1485                                *#=====
1486                                *# ADD KD-2A-2 AND KD-2A-3 D/S OF MARCH ROAD
1487                                *#=====
1488                                ADD HYD      IDsum=[4], NHYD=["KD-2A-3"], IDs to add=[3+2]
1489                                *#=====
1490                                *# ROUTE KD-2A THROUGH KD-2B
1491                                *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8942.456
1492                                *#=====
1493                                ROUTE CHANNEL      IDout=[1], NHYD=["KD-2A"], IDin=[4],

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1492 RDT=[1] (min),
1493 CHLGTH=[254] (m), CHSLOPE=[0.55] (%),
1494 FPSLOPE=[0.55] (%),
1495 SECNUM=[8942], NSEG=[5]
1496 ( SEGROUGH, SEGDIST (m))=[0.04,17.24 0.05,28.26 -0.03,31.51
0.05,61.08 0.04,68.63] NSEG times
1497 ( DISTANCE (m), ELEVATION (m))=[ 0, 80.58 ]
1498 [ 1.57, 80.5 ]
1499 [ 8.77, 80.5 ]
1500 [10.84, 80.23 ]
1501 [17.24, 80.03 ]
1502 [20.76, 79 ]
1503 [23.59, 78.9 ]
1504 [26.81, 78.17 ]
1505 [28.26, 77.9 ]
1506 [30.06, 77.9 ]
1507 [30.71, 78.01 ]
1508 [31.51, 78.2 ]
1509 [32.21, 78.39 ]
1510 [ 37.7, 78.4 ]
1511 [44.07, 78.5 ]
1512 [48.95, 78.7 ]
1513 [57.53, 79.33 ]
1514 [61.08, 79.95 ]
1515 [64.61, 80.71 ]
1516 [68.63, 81.15 ]
1517 *#=====
1518 *# KD-2B-6 - URBAN
1519 *#=====
1520 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2B-6"], DT=[1] (min), AREA=[7.73] (ha),
1521 XIMP=[0.61], TIMP=[0.61], DWF=[0] (cms),
1522 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAV=[2.0] (/hr), F=[0] (mm),
1523 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1524 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1525 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1526 LGI=[227] (m), MNI=[0.013], SCI=[0] (min),
1527 Continuous simulation parameters:
1528 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1529 InterEventTime=[12] (hrs), END=-1
1530 *#=====
1531 *# ROUTE KD-2B-6 THROUGH SWM POND SOUTH OF SOLANDT ROAD
1532 *# ASSUME 5-YEAR CONTROL ACCORDING TO CITY GUIDELINES
1533 *#=====
1534 ROUTE RESERVOIR IDout=[4], NHYD=["KD-2B-6"], IDin=[2],
1535 RDT=[1] (min),
1536 TABLE of ( OUTFLOW-STORAGE ) values
1537 (cms) - (ha-m)
1538 [ 0.0 , 0.0 ]
1539 [ 0.407 , 0.095]
1540 [ -1 , -1 ] (max twenty pts)
1541 IDovf=[5], NHYDovf=["OVF-2B6"]
1542 *#=====
1543 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1544 *#=====
1545 ADD HYD IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5+1]
1546 *#=====
1547 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8329.198
1548 *#=====
1549 ROUTE CHANNEL IDout=[2], NHYD=["KD-2A"], IDin=[6],
1550 RDT=[1] (min),
1551 CHLGTH=[747] (m), CHSLOPE=[0.36] (%),
1552 FPSLOPE=[0.36] (%),
1553 SECNUM=[8329], NSEG=[4]
1554 ( SEGROUGH, SEGDIST (m))=[0.08,81.34 0.05,88.266 -0.03,97.72
0.08,109.09] NSEG times
1555 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.3 ]

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1556 [56.66, 78.2 ]
1557 [67.31, 78.2 ]
1558 [72.25, 78 ]
1559 [79.85, 78 ]
1560 [81.34, 77.66 ]
1561 [87.28, 75.87 ]
1562 [88.266, 75.728 ]
1563 [90.51, 75.759 ]
1564 [90.57, 75.77 ]
1565 [91.47, 75.88 ]
1566 [97.72, 76.64 ]
1567 [109.09, 78.5 ]
1568 *#=====
1569 *# KD-2B-3 - Converted to NASHYD under existing conditions
1570 *#=====
1571 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2B-3"], DT=[1]min, AREA=[7.40] (ha),
1572 DWF=[0] (cms), CN=[65], IA=[5.0] (mm),
1573 N=[2.0], TP=[0.49]hrs,
1574 Continuous simulation parameters:
1575 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1576 InterEventTime=[12] (hrs),
1577 Baseflow simulation parameters:
1578 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1579 VHydCond=[.001] (mm/hr), END=-1
1580 *#=====
1581 *# 5 YEAR CONTROL - 89L/s
1582 *# MAJOR FLOWS TO KIZELL DRAIN
1583 *# MINOR FLOWS TO GOLF COURSE POND #2
1584 *#=====
1585 COMPUTE DUALHYD IDin=[1], CINLET=[0.089] (cms), NINLET=[1],
1586 MAJID=[3], MajNHYD=["2B3MAJ"],
1587 MINID=[4], MinNHYD=["2B3MIN"],
1588 TMJSTO=[0] (cu-m)
1589 *#=====
1590 *# KD-2B-4 Converted to NASHYD under existing conditions
1591 *#=====
1592 CONTINUOUS NASHYD ID=[5], NHYD=["KD-2B-4"], DT=[1]min, AREA=[23.59] (ha),
1593 DWF=[0] (cms), CN=[63], IA=[5.0] (mm),
1594 N=[2.0], TP=[0.62]hrs,
1595 Continuous simulation parameters:
1596 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1597 InterEventTime=[12] (hrs),
1598 Baseflow simulation parameters:
1599 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1600 VHydCond=[.001] (mm/hr), END=-1
1601 *#=====
1602 *# ADD KD-2B-3 MINOR AND KD-2B-4
1603 *#=====
1604 ADD HYD IDsum=[6], NHYD=["KD-2B-4"], IDs to add=[4+5]
1605 *#=====
1606 *# ROUTE KD-2B-4 THROUGH GOLF COURSE POND #2
1607 *#=====
1608 ROUTE RESERVOIR IDout=[4], NHYD=["KD-2B-4"], IDin=[6],
1609 RDT=[1] (min),
1610 TABLE of ( OUTFLOW-STORAGE ) values
1611 (cms) - (ha-m)
1612 [ 0.0 , 0.0 ]
1613 [ 0.229, 1.5695]
1614 [ 0.251, 1.8191]
1615 [ 0.328, 2.9421]
1616 [ -1 , -1 ] (max twenty pts)
1617 IDovf=[5], NHYDovf=["OVF-2B6"]
1618 *#=====
1619 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1620 *#=====
1621 ADD HYD IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5]
1622 *#=====

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1623 *# ADD KD-2B-3 MAJOR, KD-2B-4 AND KD-2B-6
1624 *#=====
1625 ADD HYD          IDsum=[4], NHYD=["KD-2B-4"], IDs to add=[3+6+2]
1626 *#=====
1627 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7691.759
1628 *#=====
1629 ROUTE CHANNEL    IDout=[2], NHYD=["KD-2A"], IDin=[4],
1630                  RDT=[1] (min),
1631                  CHLGTH=[408] (m),  CHSLOPE=[0.11] (%),
1632                  FPSLOPE=[0.11] (%),
1633                  SECNUM=[7691],     NSEG=[3]
1634                  ( SEGROUGH, SEGDIST (m))=[0.06,16.78 -0.03,19.003 0.06,24.49] NSEG  2
                  times
1635                  ( DISTANCE (m), ELEVATION (m))=[  0, 76.75 ]
1636                  [ 0.66, 76.6 ]
1637                  [ 3.57, 75.74 ]
1638                  [ 4.99, 75.24 ]
1639                  [ 5.76, 75.1 ]
1640                  [ 7.69, 75 ]
1641                  [ 8.56, 74.9 ]
1642                  [ 9.95, 74.9 ]
1643                  [12.21, 74.8 ]
1644                  [12.99, 74.69 ]
1645                  [ 15.2, 74.3 ]
1646                  [16.78, 74.1 ]
1647                  [17.38, 73.8 ]
1648                  [18.38, 73.8 ]
1649                  [19.003, 74.147]
1650                  [19.94, 74.21 ]
1651                  [20.51, 74.31 ]
1652                  [21.52, 74.6 ]
1653                  [22.72, 75.04 ]
1654                  [24.49, 75.5 ]
1655 *#=====
1656 *# KD-2B-2 - URBAN RESIDENTIAL - Converted to NASHYD under existing conditions
1657 *#=====
1658 CONTINUOUS NASHYD      ID=[3], NHYD=["KD-2B-2"], DT=[1]min, AREA=[3.35] (ha),
1659                        DWF=[0] (cms),  CN=[63], IA=[5.0] (mm),
1660                        N=[2.0], TP=[0.32]hrs,
1661                        Continuous simulation parameters:
1662                        IaRECper=[6] (hrs), SMIN=[-1] (mm),  SMAX=[-1] (mm), SK=[0.03]/(mm),
1663                        InterEventTime=[12] (hrs),
1664                        Baseflow simulation parameters:
1665                        BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1666                        VHydCond=[.001] (mm/hr), END=-1
1667 *#=====
1668 *# ROUTE KD-2B-2 THROUGH POND #3 NORTH OF FARRAR ROAD
1669 *#=====
1670 ROUTE RESERVOIR      IDout=[5],  NHYD=["KD-2B-2"],  IDin=[3],
1671                        RDT=[1] (min),
1672                        TABLE of ( OUTFLOW-STORAGE ) values
1673                        (cms) - (ha-m)
1674                        [  0.0 ,  0.0 ]
1675                        [ 0.260 , 0.616]
1676                        [ 0.282 ,0.7115]
1677                        [ 0.374 ,1.2301]
1678                        [  -1 ,  -1 ] (max twenty pts)
1679                        IDovf=[6], NHYDovf=["OVF-2B3"]
1680 *#=====
1681 *# ADD OUTFLOW, OVERFLOW AND KD-2B-4
1682 *#=====
1683 ADD HYD          IDsum=[1], NHYD=["KD-2B-4"], IDs to add=[5+6+2]
1684 *#=====
1685 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7386.879
1686 *#=====
1687 ROUTE CHANNEL      IDout=[2], NHYD=["KD-2A-4"], IDin=[1],
1688                    RDT=[1] (min),

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1689          CHLGTH=[315] (m),   CHSLOPE=[0.11] (%),
1690                                FPSLOPE=[0.11] (%),
1691          SECNUM=[7386],         NSEG=[5]
1692          ( SEGROUGH, SEGDIST (m))=[0.08,21.18 0.05,62.87 -0.06,80.43
                                0.06,90.36 0.05,143.24] NSEG times
1693          ( DISTANCE (m), ELEVATION (m))=[ 0, 77.07 ]
1694                                [ 5.11, 76.8 ]
1695                                [21.18, 76.7 ]
1696                                [34.27, 76.7 ]
1697                                [43.48, 76.3 ]
1698                                [62.87, 74.8 ]
1699                                [68.48, 74.28 ]
1700                                [70.32, 73.5 ]
1701                                [73.346, 73.437 ]
1702                                [75.588, 73.466 ]
1703                                [75.62, 73.47 ]
1704                                [80.43, 74.3 ]
1705                                [85.13, 75.18 ]
1706                                [90.36, 75.69 ]
1707                                [101.28, 75.4 ]
1708                                [115.17, 75.3 ]
1709                                [121.38, 75.4 ]
1710                                [128.52, 74.95 ]
1711                                [137.68, 75.3 ]
1712                                [143.24, 76.97 ]
1713          *#=====
1714          *# KD-2B-7 - RURAL EAST OF HERZBERG ROAD
1715          *#=====
1716          CONTINUOUS NASHYD          ID=[4], NHYD=["KD-2B-7"], DT=[1]min, AREA=[20.11] (ha),
1717          DWF=[0] (cms), CN=[63], IA=[7] (mm),
1718          N=[2.0], TP=[1.50]hrs,
1719          Continuous simulation parameters:
1720          IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1721          InterEventTime=[12] (hrs),
1722          Baseflow simulation parameters:
1723          BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1724          VHydCond=[.001] (mm/hr), END=-1
1725          *#=====
1726          *# ADD KD-2B-4 AND KD-2B-7
1727          *#=====
1728          ADD HYD          IDsum=[3], NHYD=["KD-2B-4"], IDs to add=[2+4]
1729          *#=====
1730          *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7058.454
1731          *#=====
1732          ROUTE CHANNEL          IDout=[1], NHYD=["KD-2A-4"], IDin=[3],
1733          RDT=[1] (min),
1734          CHLGTH=[297] (m),   CHSLOPE=[0.38] (%),
1735                                FPSLOPE=[0.38] (%),
1736          SECNUM=[7058],         NSEG=[3]
1737          ( SEGROUGH, SEGDIST (m))=[0.05,206.86 -0.06,216.95 0.04,295.48]
                                NSEG times
1738          ( DISTANCE (m), ELEVATION (m))=[ 0, 75.7 ]
1739                                [165.24, 75.2 ]
1740                                [198.14, 75.2 ]
1741                                [206.37, 73.8 ]
1742                                [206.86, 73.69 ]
1743                                [209.66, 73 ]
1744                                [211.86, 73 ]
1745                                [213.07, 73.07 ]
1746                                [215.16, 73.8 ]
1747                                [216.95, 74.14 ]
1748                                [247.08, 74.8 ]
1749                                [267.4, 74.8 ]
1750                                [295.48, 76.05 ]
1751          *#=====
1752          *# KD-2B-5 - URBAN
1753          *#=====

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1754 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2B-5"], DT=[1] (min), AREA=[4.74] (ha),
1755 XIMP=[0.50], TIMP=[0.50], DWF=[0] (cms),
1756 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1757 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1758 LGI=[177] (m), MNI=[0.013], SCI=[0] (min),
1759 Continuous simulation parameters:
1760 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1761 InterEventTime=[12] (hrs), END=-1
1762
1763 *#=====
1764 *# ON-SITE STORAGE
1765 *# RATING CURVE SOURCE - plan2.pdf IN 13616-Richardson Side_Eagleson
1766 *#=====
1767
1768 ROUTE RESERVOIR      IDout=[4], NHYD=["KD-2B-5"], IDin=[2],
1769 RDT=[1] (min),
1770 TABLE of ( OUTFLOW-STORAGE ) values
1771 (cms) - (ha-m)
1772 [ 0.0 , 0.0 ]
1773 [0.1458, 0.01283]
1774 [0.1458, 0.03881]
1775 [ -1 , -1 ] (max twenty pts)
1776 IDovf=[5], NHYDovf=["OVF-2B5"]
1777 *#=====
1778 *# KD-2B-1 - URBAN
1779 *#=====
1780 CONTINUOUS STANDHYD      ID=[3], NHYD=["KD-2B-1"], DT=[1] (min), AREA=[134.85] (ha),
1781 XIMP=[0.40], TIMP=[0.41], DWF=[0] (cms),
1782 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1783 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1784 LGI=[948] (m), MNI=[0.013], SCI=[0] (min),
1785 Continuous simulation parameters:
1786 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1787 InterEventTime=[12] (hrs), END=-1
1788
1789 *#=====
1790 *# ADD OUTFLOW, OVERFLOW AND KD-2B-1
1791 *#=====
1792
1793 ADD HYD      IDsum=[6], NHYD=["KD-2B-1"], IDs to add=[4+5+3]
1794 *#=====
1795 *# ADD KD-2B-4 AND KD-2B-1
1796 *# CREST GAUGE LOCATION KD-1 - KIZELL DRAIN AT HERTZBERG ROAD
1797 *#=====
1798 ADD HYD      IDsum=[3], NHYD=["KFP4"], IDs to add=[1+6]
1799 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1800 *#=====
1801 *# ROUTE KD-2B THROUGH KD-2C
1802 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6705.311
1803 *# MINIMUM SLOPE ASSUMED 0.1%
1804 *#=====
1805 ROUTE CHANNEL      IDout=[1], NHYD=["KD-2B"], IDin=[3],
1806 RDT=[1] (min),
1807 CHLGTH=[600] (m), CHSLOPE=[0.1] (%),
1808 FPSLOPE=[0.1] (%),
1809 SECNUM=[6705], NSEG=[4]
1810 ( SEGROUGH, SEGDIST (m))=[0.05,162.749 -0.04,168.035 -0.05,168.35
0.05,373.63] NSEG times
1811 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.65 ]
1812 [ 24.7, 75.1 ]
1813 [61.29, 73.42 ]
1814 [90.72, 72.7 ]
1815 [119.02, 72.95 ]
1816 [131.71, 72.8 ]
1817 [160.55, 72.9 ]

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1818 [162.46, 72.46 ]
1819 [162.749, 72.403 ]
1820 [168.035, 72.369 ]
1821 [168.35, 72.39 ]
1822 [168.6, 72.43 ]
1823 [171.08, 72.8 ]
1824 [203.12, 72.8 ]
1825 [231.66, 73.3 ]
1826 [255.58, 73.2 ]
1827 [300.16, 73.6 ]
1828 [326.75, 74.3 ]
1829 [347.02, 75.2 ]
1830 [373.63, 76.05 ]
1831 *#=====
1832 *# KD-3A - URBAN WEST OF HERZBERG ROAD
1833 *#=====
1834 CONTINUOUS STANDHYD ID=[3], NHYD=["KD-3A"], DT=[1] (min), AREA=[206.16] (ha),
1835 XIMP=[0.30], TIMP=[0.34], DWF=[0] (cms),
1836 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1837 DCAY=[2.0] (/hr), F=[0] (mm),
1838 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1839 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1840 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1841 LGI=[1172] (m), MNI=[0.013], SCI=[0] (min),
1842 Continuous simulation parameters:
1843 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1844 InterEventTime=[12] (hrs), END=-1
1845 *#=====
1846 *# KTC-2B - URBAN - UPSTREAM LIMIT TO HWY 417, NORTH OF CAMPEAU DRIVE
1847 *# LAND USES WITHIN AREA: OFFICE/RECREATIONAL
1848 *#=====
1849 CONTINUOUS STANDHYD ID=[2], NHYD=["KTC-2B"], DT=[1] (min), AREA=[20.79] (ha),
1850 XIMP=[0.23], TIMP=[0.24], DWF=[0.0] (cms),
1851 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1852 DCAY=[2.0] (/hr), F=[0] (mm),
1853 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1854 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1855 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1856 LGI=[372] (m), MNI=[0.013], SCI=[0] (min),
1857 Continuous simulation parameters:
1858 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1859 InterEventTime=[12] (hrs), END=-1
1860 *#=====
1861 *# 5 YEAR CONTROL - 1155L/s
1862 *# MAJOR FLOWS TO KD-3A
1863 *# MINOR FLOWS TO SWF-1205
1864 *#=====
1865 COMPUTE DUALHYD IDin=[2], CINLET=[1.155] (cms), NINLET=[1],
1866 MAJID=[7], MajNHYD=["KTC2BMAJ"],
1867 MINID=[10], MinNHYD=["KTC2BMIN"],
1868 TMJSTO=[0] (cu-m)
1869 *#=====
1870 *# ADD KTC-2B MAJOR AND KD-3A - TRIBUTARY 1 AT HERTZBERG ROAD
1871 *#=====
1872 ADD HYD IDsum=[5], NHYD=["KD-3A"], IDs to add=[7+3]
1873 *#=====
1874 *# ROUTE KD-3A THROUGH KD-3B
1875 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LiDAR
1876 *#=====
1877 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1878 RDT=[1] (min),
1879 CHLGTH=[253] (m), CHSLOPE=[0.13] (%),
1880 FPSLOPE=[0.13] (%),
1881 SECNUM=[1], NSEG=[3]
1882 ( SEGROUGH, SEGDIST (m))=[0.05,27.94 -0.035,38.92 0.08,64.87] NSEG
1883 times
1884 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.90]

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1882 [12.97, 78.12]
1883 [15.97, 77.81]
1884 [19.96, 77.51]
1885 [23.95, 77.36]
1886 [24.95, 77.34]
1887 [25.95, 77.34]
1888 [26.94, 77.36]
1889 [27.94, 77.30]
1890 [30.94, 76.79]
1891 [31.93, 76.73]
1892 [32.93, 76.73]
1893 [33.93, 76.70]
1894 [34.94, 76.76]
1895 [38.92, 77.29]
1896 [42.91, 77.34]
1897 [58.88, 78.52]
1898 [64.87, 78.97]
1899 ROUTE CHANNEL IDout=[5], NHYD=["KD-3A"], IDin=[4],
1900 RDT=[1] (min),
1901 CHLGTH=[344] (m), CHSLOPE=[0.56] (%),
1902 FPSLOPE=[0.56] (%),
1903 SECNUM=[2], NSEG=[3]
1904 ( SEGROUGH, SEGDIST (m))=[0.05,20.89 -0.035,76.49 0.08,88.52] NSEG  2
times
1905 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.38]
1906 [13.92, 77.02]
1907 [20.89, 76.69]
1908 [26.85, 76.09]
1909 [29.84, 76.03]
1910 [44.76, 76.15]
1911 [56.69, 75.91]
1912 [59.68, 76.10]
1913 [61.67, 76.05]
1914 [71.61, 76.31]
1915 [76.49, 76.69]
1916 [82.55, 77.16]
1917 [88.52, 77.40]
1918 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1919 RDT=[1] (min),
1920 CHLGTH=[324] (m), CHSLOPE=[0.72] (%),
1921 FPSLOPE=[0.72] (%),
1922 SECNUM=[1], NSEG=[3]
1923 ( SEGROUGH, SEGDIST (m))=[0.05,97.588 -0.035,109.575 0.05,143.405]  2
NSEG times
1924 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.2777 ]
1925 [39.664, 74.805 ]
1926 [74.612, 74.8767 ]
1927 [79.607, 74.8037 ]
1928 [ 86.6, 74.7914 ]
1929 [90.595, 74.6388 ]
1930 [95.59, 74.6899 ]
1931 [97.588, 74.8802 ]
1932 [101.584, 74.7293 ]
1933 [103.582, 74.4039 ]
1934 [106.578, 74.4818 ]
1935 [109.575, 74.9123 ]
1936 [111.573, 74.8318 ]
1937 [116.568, 74.8294 ]
1938 [120.563, 74.7426 ]
1939 [121.562, 74.7398 ]
1940 [124.559, 74.8464 ]
1941 [130.553, 74.8391 ]
1942 [132.54, 74.777 ]
1943 [143.405, 75.255 ]
1944 *#=====
1945 *# KD-2C - RURAL
1946 *#=====

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1947 CONTINUOUS NASHYD          ID=[2], NHYD=["KD-2C"], DT=[1]min, AREA=[59.10] (ha),
1948 DWF=[0] (cms), CN=[83], IA=[7] (mm),
1949 N=[2.0], TP=[0.60]hrs,
1950 Continuous simulation parameters:
1951 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1952 InterEventTime=[12] (hrs),
1953 Baseflow simulation parameters:
1954 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1955 VHydCond=[.001] (mm/hr), END=-1
1956 *#=====
1957 *# ADD KD-2B AND KD-2C
1958 *#=====
1959 ADD HYD                      IDsum=[5], NHYD=["KFP5"], IDs to add=[1+2]
1960 *PRINT HYD                   ID=[5], # OF PCYCLES=[1]
1961 *#=====
1962 *# ADD KD-2C AND KD-3A
1963 *#=====
1964 ADD HYD                      IDsum=[3], NHYD=["KD-2C"], IDs to add=[5+4]
1965 *#=====
1966 *# ROUTE KD-1+KD-2 THROUGH KD-3B-1
1967 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6104.633
1968 *# MINIMUM SLOPE ASSUMED 0.1%
1969 *#=====
1970 ROUTE CHANNEL                IDout=[1], NHYD=["KD-2C"], IDin=[3],
1971 RDT=[1] (min),
1972 CHLGTH=[952] (m), CHSLOPE=[0.1] (%),
1973                                FPSLOPE=[0.1] (%),
1974 SECNUM=[6104], NSEG=[3]
1975 ( SEGROUGH, SEGDIST (m))=[0.08,175.904 -0.04,179.184 0.08,185.91]
NSEG times
1976 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.06 ]
1977 [ 9.16, 77.1 ]
1978 [23.37, 76.7 ]
1979 [56.09, 76.5 ]
1980 [67.63, 76.2 ]
1981 [80.81, 75.6 ]
1982 [83.87, 75.6 ]
1983 [98.45, 74.5 ]
1984 [103.07, 74.3 ]
1985 [115.78, 74.3 ]
1986 [134.4, 73.6 ]
1987 [149.63, 73.7 ]
1988 [163.83, 73.6 ]
1989 [173.16, 72.7 ]
1990 [175.83, 72 ]
1991 [175.904, 71.992 ]
1992 [179.184, 71.968 ]
1993 [179.27, 72 ]
1994 [183.86, 73.7 ]
1995 [185.91, 74 ]
1996 *#=====
1997 *# KD-3B - RURAL EAST OF HERZBERG ROAD
1998 *#=====
1999 CONTINUOUS NASHYD          ID=[4], NHYD=["KD-23B"], DT=[1]min, AREA=[112.07] (ha),
2000 DWF=[0] (cms), CN=[66], IA=[7] (mm),
2001 N=[2.0], TP=[1.20]hrs,
2002 Continuous simulation parameters:
2003 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2004 InterEventTime=[12] (hrs),
2005 Baseflow simulation parameters:
2006 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2007 VHydCond=[.001] (mm/hr), END=-1
2008 *#=====
2009 *# ADD KD-2C,KD-3A AND KD-3B - KIZELL DRAIN AT CONFLUENCE WITH WATTS CREEK
2010 *#=====
2011 ADD HYD                      IDsum=[3], NHYD=["KFP6"], IDs to add=[1+4]
2012 *PRINT HYD                   ID=[3], # OF PCYCLES=[1]

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2013 *#=====
2014 *#
2015 *#
2016 *#
2017 *# KANATA TOWN CENTRE-1 - URBAN - UPSTREAM LIMIT TO HWY 417
2018 *# Imperviousness decreased under existing conditions
2019 *#=====
2020 CONTINUOUS STANDHYD      ID=[2], NHYD=["KTC-1"], DT=[1] (min), AREA=[60.23] (ha),
2021 XIMP=[0.34], TIMP=[0.34], DWF=[0] (cms),
2022 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
2023 DCAY=[2.0] (/hr), F=[0] (mm),
2024 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
2025 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
2026 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
2027 LGI=[633] (m), MNI=[0.013], SCI=[0] (min),
2028 Continuous simulation parameters:
2029 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
2030 InterEventTime=[12] (hrs), END=-1
2031 *#=====
2032 *# 5 YEAR CONTROL - 2963L/s
2033 *# MAJOR FLOWS TO WC-1
2034 *# MINOR FLOWS TO SWF-1206
2035 *#=====
2036 COMPUTE DUALHYD      IDin=[2], CINLET=[2.963] (cms), NINLET=[1],
2037 MAJID=[7], MaJNHYD=["KTC1MAJ"],
2038 MINID=[8], MinNHYD=["KTC1MIN"],
2039 TMJSTO=[0] (cu-m)
2040 *#=====
2041 *# SWMF-1206
2042 *# STORAGE WAS ESTIMATED FROM AVAILABLE DRAWING
2043 *# DISCHARGE WAS TAKEN FROM R-1564
2044 *#=====
2045 ROUTE RESERVOIR      IDout=[4], NHYD=["KTC-1"], IDin=[8],
2046 RDT=[1] (min),
2047 TABLE of ( OUTFLOW-STORAGE ) values
2048 (cms) - (ha-m)
2049 [ 0.0 , 0.0 ]
2050 [ 0.955 , 0.2854 ]
2051 [ 1.436 , 3.9725 ]
2052 [ -1 , -1 ] (max twenty pts)
2053 IDovf=[5], NHYDovf=["OVF-KTC1"]
2054 *#=====
2055 *# ADD OUTFLOW, OVERFLOW AND KTC-1 MAJOR
2056 *#=====
2057 ADD HYD      IDsum=[2], NHYD=["KTC-1"], IDs to add=[4+5+7]
2058 *#=====
2059 *# WC-1 - RURAL/URBAN EXISTING AREA
2060 *#=====
2061 CONTINUOUS STANDHYD      ID=[1], NHYD=["WC-1"], DT=[1] (min), AREA=[403.47] (ha),
2062 XIMP=[0.30], TIMP=[0.34], DWF=[0] (cms),
2063 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
2064 DCAY=[2.0] (/hr), F=[0] (mm),
2065 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
2066 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
2067 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
2068 LGI=[1640] (m), MNI=[0.013], SCI=[0] (min),
2069 Continuous simulation parameters:
2070 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
2071 InterEventTime=[12] (hrs), END=-1
2072 *#=====
2073 *# ADD WC-1 AND KTC-1 - WATTS CREEK AT HIGHWAY 417
2074 *#=====
2075 ADD HYD      IDsum=[5], NHYD=["WC-1"], IDs to add=[1+2]
2076 *#=====
2077 *# KTC-2A - URBAN - UPSTREAM LIMIT TO HWY 417, SOUTH OF CAMPEAU DRIVE
2078 *# LAND USES WITHIN AREA: TOWN CENTRE/URBAN RES
2079 *#=====

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2078 CONTINUOUS STANDHYD      ID=[1], NHYD=["KTC-2A"], DT=[1] (min), AREA=[34.34] (ha),
2079 XIMP=[0.36], TIMP=[0.42], DWF=[0.0] (cms),
2080 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
2081 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
LGI=[478] (m), MNI=[0.013], SCI=[0] (min),
2082
2083 Continuous simulation parameters:
2084 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
2085 InterEventTime=[12] (hrs), END=-1
2086
2087 *#=====
2088 *# ADD KTC-2A AND KTC-2B MINOR
2089 *#=====
2090
2091 ADD HYD      IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+10]
2092 *#=====
2093 *# ROUTE KTC-2 THROUGH KANATA TOWN CENTRE PHASE I POND
2094 *# STAGE-STORAGE-DISCHARGE CURVE OBTAINED FROM:
2095 *# KANATA TOWN CENTRE PHASE i - STORMWATER MANAGEMENT REPORT
2096 *# J.L. RICHARDS & ASSOCIATES LTD. 1996
2097 *# SWF-1205
2098 *# STORAGE WAS ESTIMATED WITH AVAILABLE DRAWING
2099 *# DISCHARGE WAS TAKEN FROM R-1563
2100 *#=====
2101 ROUTE RESERVOIR      IDout=[1], NHYD=["KTC-2"], IDin=[4],
2102 RDT=[1] (min),
2103 TABLE of ( OUTFLOW-STORAGE ) values
2104 (cms) - (ha-m)
2105 [ 0.0 , 0.0 ]
2106 [ 0.79, 0.6939]
2107 [ 4.70, 1.4350]
2108 [ -1 , -1 ] (max twenty pts)
2109 IDovf=[2], NHYDovf=["OVF-KTC2"]
2110 *#=====
2111 *# ADD OUTFLOW AND OVERFLOW
2112 *#=====
2113 ADD HYD      IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+2]
2114 *#=====
2115 *# ADD WC-1 AND KTC-2
2116 *#=====
2117 ADD HYD      IDsum=[2], NHYD=["KTC-2"], IDs to add=[5+4]
2118 *%-----|-----|
2119 *#=====
2120 *# WC-3 - URBAN/RURAL
2121 *#=====
2122 CONTINUOUS NASHYD      ID=[1], NHYD=["WC-3"], DT=[1]min, AREA=[204.06] (ha),
2123 DWF=[0] (cms), CN=[66], IA=[7] (mm),
2124 N=[2.0], TP=[1.28]hrs,
2125 Continuous simulation parameters:
2126 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2127 InterEventTime=[12] (hrs),
2128 Baseflow simulation parameters:
2129 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2130 VHydCond=[.001] (mm/hr), END=-1
2131 *#=====
2132 *# ADD WC-1+KTC AND WC-3
2133 *#=====
2134 ADD HYD      IDsum=[4], NHYD=["WC-3"], IDs to add=[2+1]
2135 *#=====
2136 *# ROUTE WC-1+KTC+WC-3 THROUGH WC-4A
2137 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2138 *#=====
2139 ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[4],
2140 RDT=[1] (min),
2141 CHLGTH=[744] (m), CHSLOPE=[1.29] (%),
2142 FPSLOPE=[1.29] (%),
2143 SECNUM=[1], NSEG=[3]

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2144      ( SEGROUGH, SEGDIST (m))=[0.05,25.86 -0.035,40.77 0.05,72.60] NSEG  2
times
2145      ( DISTANCE (m), ELEVATION (m))=[    0, 90.87]
2146      [ 1.99, 90.66]
2147      [ 7.96, 90.10]
2148      [16.91, 85.80]
2149      [18.90, 85.49]
2150      [21.88, 85.42]
2151      [25.86, 85.56]
2152      [26.85, 25.50]
2153      [29.83, 84.06]
2154      [31.82, 84.06]
2155      [34.81, 85.10]
2156      [40.77, 85.59]
2157      [48.73, 85.85]
2158      [52.71, 86.80]
2159      [55.59, 87.80]
2160      [60.66, 90.40]
2161      [64.64, 90.77]
2162      [72.60, 90.97]
2163      *#-----
2164      *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2165      *#-----
2166      ROUTE CHANNEL      IDout=[2], NHYD=["WC-3"], IDin=[1],
2167      RDT=[1] (min),
2168      CHLGTH=[2295] (m),   CHSLOPE=[0.45] (%),
2169      FPSLOPE=[0.45] (%),
2170      SECNUM=[2],        NSEG=[3]
2171      ( SEGROUGH, SEGDIST (m))=[0.05,12.98 -0.035,20.97 0.05,51.94] NSEG  2
times
2172      ( DISTANCE (m), ELEVATION (m))=[    0, 85.79]
2173      [ 1.00, 85.75]
2174      [11.99, 83.71]
2175      [12.98, 83.36]
2176      [14.98, 82.49]
2177      [15.98, 82.44]
2178      [16.98, 82.45]
2179      [20.97, 83.51]
2180      [22.97, 83.46]
2181      [23.97, 83.51]
2182      [26.97, 83.55]
2183      [27.97, 83.55]
2184      [31.96, 83.51]
2185      [32.96, 83.45]
2186      [33.96, 83.45]
2187      [34.96, 83.50]
2188      [51.94, 85.81]
2189      *#-----
2190      *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2191      *#-----
2192      ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[2],
2193      RDT=[1] (min),
2194      CHLGTH=[487] (m),   CHSLOPE=[0.23] (%),
2195      FPSLOPE=[0.23] (%),
2196      SECNUM=[3],        NSEG=[3]
2197      ( SEGROUGH, SEGDIST (m))=[0.05,6.97 -0.035,25.87 0.05,29.85] NSEG  2
times
2198      ( DISTANCE (m), ELEVATION (m))=[    0, 75.60]
2199      [    1, 75.54]
2200      [ 1.99, 75.42]
2201      [ 6.97, 73.09]
2202      [11.94, 72.70]
2203      [14.93, 72.66]
2204      [17.91, 72.27]
2205      [23.88, 72.25]
2206      [25.87, 73.03]
2207      [28.86, 74.06]

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2208                                     [29.85, 74.23]
2209 *#=====
2210 *# WC-4A - RURAL - HIGHWAY 417 TO CNR
2211 *#=====
2212 CONTINUOUS NASHYD          ID=[2] NHYD=["WC-4A"], DT=[1]min, AREA=[126.29] (ha),
2213 DWF=[0] (cms), CN=[82], IA=[7] (mm),
2214 N=[2.0], TP=[2.30]hrs,
2215 Continuous simulation parameters:
2216 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2217 InterEventTime=[12] (hrs),
2218 Baseflow simulation parameters:
2219 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2220 VHydCond=[.001] (mm/hr), END=-1
2221 *#=====
2222 *# ADD WC-1+KTC+WC-3 AND WC-4A
2223 *# CREST GAUGE LOCATION WC-1 - WATTS CREEK AT CONFLUENCE WITH KIZELL DRAIN
2224 *#=====
2225 ADD HYD                    IDsum=[6], NHYD=["WFP1"], IDs to add=[1+2]
2226 *PRINT HYD                 ID=[6], # OF PCYCLES=[1]
2227 *#=====
2228 *# WC-4B - RURAL - HIGHWAY 417 TO CNR
2229 *#=====
2230 CONTINUOUS NASHYD          ID=[4] NHYD=["WC-4B"], DT=[1]min, AREA=[145.27] (ha),
2231 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2232 N=[2.0], TP=[1.22]hrs,
2233 Continuous simulation parameters:
2234 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2235 InterEventTime=[12] (hrs),
2236 Baseflow simulation parameters:
2237 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2238 VHydCond=[.001] (mm/hr), END=-1
2239 *#=====
2240 *# ADD WC-4A AND KIZELL
2241 *#=====
2242 ADD HYD                    IDsum=[1], NHYD=["WFP2"], IDs to add=[6+3]
2243 *PRINT HYD                 ID=[1], # OF PCYCLES=[1]
2244 *#=====
2245 *# ADD WC-4A AND WC-4B
2246 *#=====
2247 ADD HYD                    IDsum=[5], NHYD=["WFP3"], IDs to add=[1+4]
2248 *PRINT HYD                 ID=[5], # OF PCYCLES=[1]
2249 *#=====
2250 *# ROUTE KIZELL AND WC-1+KTC+WC-3+WC-4 THROUGH WC-5A
2251 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4677.806
2252 *#=====
2253 ROUTE CHANNEL              IDout=[2], NHYD=["WC-4"], IDin=[5],
2254 RDT=[1] (min),
2255 CHLGTH=[636] (m), CHSLOPE=[0.16] (%),
2256 FPSLOPE=[0.16] (%),
2257 SECNUM=[4677], NSEG=[3]
2258 ( SEGROUGH, SEGDIST (m))=[0.08,95.801 -0.04,102.955 0.08,167.28]
2259 NSEG times
2260 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.4 ]
2261 [ 11.4, 74.3 ]
2262 [ 31.7, 73.6 ]
2263 [51.08, 72.8 ]
2264 [60.69, 72.6 ]
2265 [ 74.1, 71.6 ]
2266 [77.61, 70.8 ]
2267 [84.14, 71 ]
2268 [93.83, 71 ]
2269 [95.801, 70.73 ]
2270 [97.18, 70.5 ]
2271 [ 101, 70.5 ]
2272 [102.955, 70.989 ]
2273 [111.37, 74.5 ]
2274 [121.02, 76.45 ]

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2274 [128.96, 77.6 ]
2275 [139.85, 78.3 ]
2276 [151.67, 80.09 ]
2277 [158.82, 80.63 ]
2278 [167.28, 81.57 ]
2279 *#=====
2280 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4446.172
2281 *#=====
2282 ROUTE CHANNEL IDout=[1], NHYD=["WC-4"], IDin=[2],
2283 RDT=[1] (min),
2284 CHLGTH=[443] (m), CHSLOPE=[0.64] (%),
2285 FPSLOPE=[0.64] (%),
2286 SECNUM=[4446], NSEG=[4]
2287 ( SEGROUGH, SEGDIST (m))=[0.08,101.82 0.05,155.499 -0.04,160.804 ↵
0.08,360.72] NSEG times
2288 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.11 ]
2289 [15.28, 74.3 ]
2290 [39.39, 73.6 ]
2291 [55.02, 73.7 ]
2292 [70.01, 73.1 ]
2293 [101.82, 72.72 ]
2294 [123.37, 72.37 ]
2295 [137.03, 71.7 ]
2296 [152.53, 68.9 ]
2297 [155.499, 68.552 ]
2298 [160.804, 68.559 ]
2299 [163.78, 68.89 ]
2300 [172.88, 69 ]
2301 [180.76, 72.03 ]
2302 [191.21, 72.8 ]
2303 [208.93, 72.49 ]
2304 [239.54, 72.4 ]
2305 [260.28, 72.6 ]
2306 [291.51, 72.6 ]
2307 [360.72, 73.06 ]
2308 *#=====
2309 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3897.472
2310 *#=====
2311 ROUTE CHANNEL IDout=[2], NHYD=["WC-4"], IDin=[1],
2312 RDT=[1] (min),
2313 CHLGTH=[468] (m), CHSLOPE=[0.44] (%),
2314 FPSLOPE=[0.44] (%),
2315 SECNUM=[3897], NSEG=[4]
2316 ( SEGROUGH, SEGDIST (m))=[0.08,161.362 -0.04,164.388 -0.08,164.68 ↵
0.05,242.03] NSEG times
2317 ( DISTANCE (m), ELEVATION (m))=[ 0, 72.01 ]
2318 [14.79, 71.9 ]
2319 [26.32, 71.5 ]
2320 [45.81, 69.5 ]
2321 [ 52.8, 68.5 ]
2322 [67.29, 68.1 ]
2323 [85.91, 68.1 ]
2324 [94.25, 67.9 ]
2325 [116.16, 67.78 ]
2326 [142.44, 67.4 ]
2327 [159.77, 66.1 ]
2328 [161.362, 65.677 ]
2329 [164.388, 65.577 ]
2330 [164.68, 65.61 ]
2331 [166.02, 66.1 ]
2332 [167.47, 66.5 ]
2333 [201.22, 66.8 ]
2334 [208.26, 66.7 ]
2335 [216.93, 67.19 ]
2336 [242.03, 67.3 ]
2337 *#=====
2338 *# WC-5A - RURAL - CNR TO CARLING AVE

```

```

2339 *#=====
2340 CONTINUOUS NASHYD          ID=[1] NHYD=["WC-5A"], DT=[1]min, AREA=[59.54] (ha),
2341 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2342 N=[2.0], TP=[0.79]hrs,
2343 Continuous simulation parameters:
2344 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2345 InterEventTime=[12] (hrs),
2346 Baseflow simulation parameters:
2347 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2348 VHydCond=[.001] (mm/hr), END=-1
2349 *#=====
2350 *# ADD WC-5A AND WC-5A UPSTREAM
2351 *# CALIBRATION LOCATION - WATTS CREEK AT CARLING AVENUE
2352 *#=====
2353 ADD HYD                    IDsum=[3], NHYD=["WFP4"], IDs to add=[1+2]
2354 *PRINT HYD                 ID=[3], # OF PCYCLES=[1]
2355 *#=====
2356 *# ROUTE WC-5B UPSTREAM THROUGH WC-5B
2357 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3469.421
2358 *# MINIMUM SLOPE ASSUMED 0.1%
2359 *#=====
2360 ROUTE CHANNEL              IDout=[2], NHYD=["WC-5B"], IDin=[3],
2361 RDT=[1] (min),
2362 CHLGTH=[485] (m), CHSLOPE=[0.1] (%),
2363                                FPSLOPE=[0.1] (%),
2364 SECNUM=[3469], NSEG=[4]
2365 ( SEGROUGH, SEGDIST (m))=[0.08,127.46 0.06,131.6 -0.03,141.59
2366 ( DISTANCE (m), ELEVATION (m))=[ 0, 68.08 ]
2367                                [16.71, 67.1 ]
2368                                [48.15, 66.8 ]
2369                                [75.65, 66.3 ]
2370                                [107.54, 66.2 ]
2371                                [117.33, 66.3 ]
2372                                [127.46, 65.54 ]
2373                                [129.21, 65.3 ]
2374                                [131.6, 64.9 ]
2375                                [136.836, 64.972 ]
2376                                [139.19, 65.3 ]
2377                                [141.59, 65.65 ]
2378                                [161.72, 65.6 ]
2379                                [171.42, 66.1 ]
2380                                [187.05, 66.3 ]
2381                                [224.24, 66.3 ]
2382                                [246.7, 66.1 ]
2383                                [286.52, 66.07 ]
2384                                [304.07, 66.3 ]
2385                                [308.37, 66.7 ]
2386 *#=====
2387 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 2981.379
2388 *#=====
2389 ROUTE CHANNEL              IDout=[1], NHYD=["WC-5B"], IDin=[2],
2390 RDT=[1] (min),
2391 CHLGTH=[307] (m), CHSLOPE=[0.40] (%),
2392                                FPSLOPE=[0.40] (%),
2393 SECNUM=[2981], NSEG=[4]
2394 ( SEGROUGH, SEGDIST (m))=[0.08,9.006 -0.03,14.347 -0.06,14.85
2395 ( DISTANCE (m), ELEVATION (m))=[ 0, 64.35 ]
2396                                [ 2.07, 64.3 ]
2397                                [ 4.58, 64.2 ]
2398                                [ 5.7, 64.1 ]
2399                                [ 6.83, 63.8 ]
2400                                [ 7.91, 63.37 ]
2401                                [9.006, 63.169 ]
2402                                [ 9.64, 62.8 ]
2403                                [13.64, 62.8 ]

```

```

2404 [14.24, 63.1 ]
2405 [14.347, 63.315 ]
2406 [14.85, 63.35 ]
2407 [15.35, 63.4 ]
2408 [16.49, 63.69 ]
2409 [18.19, 64.21 ]
2410 [21.41, 64.2 ]
2411 [25.06, 64.05 ]
2412 [27.14, 64.06 ]
2413 [28.41, 64.2 ]
2414 [30.25, 64.28 ]
2415 *#=====
2416 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 1585.543
2417 *#=====
2418 ROUTE CHANNEL IDout=[2], NHYD=["WC-5B"], IDin=[1],
2419 RDT=[1] (min),
2420 CHLGTH=[2876] (m), CHSLOPE=[0.16] (%),
2421 FPSLOPE=[0.16] (%),
2422 SECNUM=[1585], NSEG=[4]
2423 ( SEGROUGH, SEGDIST (m))=[0.08,56.84 0.05,124.41 -0.035,128.78
0.08,255.15] NSEG times
2424 ( DISTANCE (m), ELEVATION (m))=[ 0, 64.07 ]
2425 [21.74, 63.8 ]
2426 [40.53, 63.5 ]
2427 [56.84, 61.82 ]
2428 [74.07, 61.6 ]
2429 [98.29, 61.7 ]
2430 [104.39, 61.43 ]
2431 [117.32, 61.8 ]
2432 [124.32, 60.8 ]
2433 [124.41, 60.79 ]
2434 [124.519, 60.783 ]
2435 [127.785, 60.75 ]
2436 [ 128, 60.83 ]
2437 [128.78, 61.17 ]
2438 [130.97, 61.8 ]
2439 [149.66, 61.32 ]
2440 [170.74, 61.4 ]
2441 [191.12, 63.6 ]
2442 [219.28, 64.08 ]
2443 [255.15, 64.1 ]
2444 *#=====
2445 *# WC-5B - RURAL - CARLING AVE TO OUTLET
2446 *#=====
2447 CONTINUOUS NASHYD ID=[4] NHYD=["WC-5B"], DT=[1]min, AREA=[379.59] (ha),
2448 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2449 N=[2.0], TP=[3.28]hrs,
2450 Continuous simulation parameters:
2451 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2452 InterEventTime=[12] (hrs),
2453 Baseflow simulation parameters:
2454 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2455 VHydCond=[.001] (mm/hr), END=-1
2456 *#=====
2457 *# ADD WC-5B AND WC-5B UPSTREAM
2458 *# WATTS CREEK AT OUTLET TO OTTAWA RIVER
2459 *#=====
2460 ADD HYD IDsum=[1], NHYD=["WFP5"], IDs to add=[4+2]
2461 *PRINT HYD ID=[1], # OF PCYCLES=[1]
2462 *%-----|-----|
2463 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
2464 HYD_FILENAME=["WFP5"]
2465 HYD_COMMENT=["WATTS CREEK AT OUTLET TO OTTAWA RIVER"]
2466 *%-----|-----|
2467 *#=====
2468 *
2469 *#=====
DESIGN STORMS

```

```
2470 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0005]
2471 * "5y12hr.stm"
2472 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0010]
2473 * "10y12hr.stm"
2474 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0025]
2475 * "25y12hr.stm"
2476 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0050]
2477 * "50y12hr.stm"
2478 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0100]
2479 * "100y12hr.stm"
2480 FINISH
2481 *#-----
2482 * CONTINUOUS SIMULATIONS
2483 *#-----
2484 START TZERO=[1968.0101], METOUT=[2], NSTORM=[0], NRUN=[1968]
2485 START TZERO=[1969.0101], METOUT=[2], NSTORM=[0], NRUN=[1969]
2486 START TZERO=[1970.0101], METOUT=[2], NSTORM=[0], NRUN=[1970]
2487 START TZERO=[1971.0101], METOUT=[2], NSTORM=[0], NRUN=[1971]
2488 START TZERO=[1972.0101], METOUT=[2], NSTORM=[0], NRUN=[1972]
2489 START TZERO=[1973.0101], METOUT=[2], NSTORM=[0], NRUN=[1973]
2490 START TZERO=[1974.0101], METOUT=[2], NSTORM=[0], NRUN=[1974]
2491 START TZERO=[1975.0101], METOUT=[2], NSTORM=[0], NRUN=[1975]
2492 START TZERO=[1976.0101], METOUT=[2], NSTORM=[0], NRUN=[1976]
2493 START TZERO=[1977.0101], METOUT=[2], NSTORM=[0], NRUN=[1977]
2494 START TZERO=[1978.0101], METOUT=[2], NSTORM=[0], NRUN=[1978]
2495 START TZERO=[1979.0101], METOUT=[2], NSTORM=[0], NRUN=[1979]
2496 START TZERO=[1980.0101], METOUT=[2], NSTORM=[0], NRUN=[1980]
2497 START TZERO=[1981.0101], METOUT=[2], NSTORM=[0], NRUN=[1981]
2498 START TZERO=[1982.0101], METOUT=[2], NSTORM=[0], NRUN=[1982]
2499 START TZERO=[1983.0101], METOUT=[2], NSTORM=[0], NRUN=[1983]
2500 START TZERO=[1984.0101], METOUT=[2], NSTORM=[0], NRUN=[1984]
2501 START TZERO=[1985.0101], METOUT=[2], NSTORM=[0], NRUN=[1985]
2502 START TZERO=[1986.0101], METOUT=[2], NSTORM=[0], NRUN=[1986]
2503 START TZERO=[1987.0101], METOUT=[2], NSTORM=[0], NRUN=[1987]
2504 START TZERO=[1988.0101], METOUT=[2], NSTORM=[0], NRUN=[1988]
2505 START TZERO=[1989.0101], METOUT=[2], NSTORM=[0], NRUN=[1989]
2506 START TZERO=[1990.0101], METOUT=[2], NSTORM=[0], NRUN=[1990]
2507 START TZERO=[1991.0101], METOUT=[2], NSTORM=[0], NRUN=[1991]
2508 START TZERO=[1992.0101], METOUT=[2], NSTORM=[0], NRUN=[1992]
2509 START TZERO=[1993.0101], METOUT=[2], NSTORM=[0], NRUN=[1993]
2510 START TZERO=[1994.0101], METOUT=[2], NSTORM=[0], NRUN=[1994]
2511 START TZERO=[1995.0101], METOUT=[2], NSTORM=[0], NRUN=[1995]
2512 START TZERO=[1996.0101], METOUT=[2], NSTORM=[0], NRUN=[1996]
2513 START TZERO=[1997.0101], METOUT=[2], NSTORM=[0], NRUN=[1997]
2514 START TZERO=[1998.0101], METOUT=[2], NSTORM=[0], NRUN=[1998]
2515 START TZERO=[1999.0101], METOUT=[2], NSTORM=[0], NRUN=[1999]
2516 START TZERO=[2000.0101], METOUT=[2], NSTORM=[0], NRUN=[2000]
2517 START TZERO=[2002.0101], METOUT=[2], NSTORM=[0], NRUN=[2002]
2518 START TZERO=[2003.0101], METOUT=[2], NSTORM=[0], NRUN=[2003]
2519 START TZERO=[2004.0101], METOUT=[2], NSTORM=[0], NRUN=[2004]
2520 START TZERO=[2006.0101], METOUT=[2], NSTORM=[0], NRUN=[2006]
2521 START TZERO=[2007.0101], METOUT=[2], NSTORM=[0], NRUN=[2007]
2522 FINISH
2523
```

Attachment C

SWMHYMO Model:
Redeveloped Kanata Golf and Country Club with SWM

```

1 2 Metric units
2 *#*****
3 *# Project Name: [Shirley's Brook and Watt's Creek Phase 2 SWM Study] Project
Number: [60264539]
4 *# Future Conditions Model for the Watts Creek/Kizell Drain Flood Plain Mapping Study
5 *# Date : 2014-12-31
6 *# Modeller : [Olivia Chung] John Price MVCA
7 *# Company : AECOM Canada
8 *# License # : 2988504
9 *#*****
10 *# September 2019, model parameters further updated by JFSAinc
11 *# with use of rainfall and flow monitoring data collected in 2019
12 *#
13 *# - all N values in NASHYDS changed from N=1.1 to N=2
14 *# - all MNI values in existing conditions STANDHYDs changed from 0.025 to 0.013
15 *# - all SLOPI values in STANDHYDs changed from 0.02 to 1.0
16 *# - change STANDHYD infiltration method from SCS to Horton with
17 *# - Horton: Fo=[125](mm/hr), Fc=[25](mm/hr), DCAY=[2.0](/hr), F=[0](mm)
18 *# - set XIMP to a fix value of 0.25 for all existing residential catchments
19 *# - use COMPUTE API APII=[40], APIK=[0.8]/day,
20 *# - continuous NASHYDs, use BaseFlowOption=[1] , InitGWResVol=[12], GWResK=[0.85],
VHydCond=[.001]
21 *# - all golf course NASHYDs, use CN=50
22 *# - XIMP=[0.250], for all existing not draining through the grass areas of the golf
course
23 *#
24 *# - Areas draining across the golf course:
25 *# - those specific STANDHYD commands converted to NASHYDs so that the infiltrated
water could come back into the system. This allowed a much better volume comparison
through the Beaver Pond.
26 *# - The CN and IA values for those NASHYDs were weighted averages of CN=90 for TIMP
and CN=50 for grass areas, and the IA was based on weighted average of IA=1.5 for TIMP
and IA=5.0 for grass areas.
27 *# - The Tp value was simply calculated by using the (LGI/0.3 * 2/3) / 3600, where the
value of 0.3 was my assumed flow velocity. Note, there are 4 catchments to which this
was done, for a total of 48.3 ha representing just over 11% of the total drainage area
to the Beaver Pond.
28 *# - removed the two IBI Route Reservoirs that were previously inserted to account
for some hidden system storage.
29 *#
30 *#=====
31 *# WATTS CREEK SUBWATERSHED
32 *# MODEL CONVERTED FROM QUALHYMO MODEL (DILLON, 2009)
33 *# DECEMBER 2014
34 *#=====
35 *# Model updated by JFSA (June 2019)to allow for continuous simulations to complete
36 *# preliminary erosion assessment.
37 *# Model reverted back to existing conditions using parameters as documented in
38 *# MVCA's Watts Creek Final Report November 2017
39 *# Model updated to assess the impacts of the redevelopment of the Kanata Golf &
40 *# Country Club directly.
41 *# Model updated to reflect the increase in impervious area due to the redevelopment
42 *# of Kanata Golf & Country Club (KGCC) - All developments assume an imperviousness
43 *# of 60% with a directly connected imperviousness of 50%
44 *# All DA's (Detention Areas) have been removed from the model within the Kanata
45 *# Golf & Country Club
46 *# model updated to include SWM ponds for KGCC lands
47 *#=====
48 *# KIZELL DRAIN
49 *#=====
50 * Area Tributary to Beaver Pond and Kizell Cell
51 *#=====
52 *#=====
53 *# Derived from Scenario 20 of Phase 1 SWM Study
54 *# AECOM MODEL + GOLF COURSE DETENTION PONDS
55 *# AMC II Condition
56 *# RAINFALL - BEAVER POND RAIN GAUGE (POINT RAINFALL)

```

```

57 *# DESIGN EVENTS
58 *#=====
59 *                                DESIGN STORMS
60 *#=====
61 *%-----|-----|
62 START                TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0002]
63 *                "2y12hr.stm"
64 READ STORM          STORM_FILENAME=["storm.001"]
65 *%-----|-----|
66 *#=====
67 *                                CONTINUOUS SIMULATIONS
68 *#=====
69 *START                TZERO=[1967.0719], METOUT=[2], NSTORM=[0], NRUN=[1967]
70 *%                [""] <--storm filename, one per line for NSTORM time
71 *%-----|-----|
72 *# Ottawa International Airport - 19 July 1967 to 01 Nov 2007
73 *READ AES DATA      AES_FILENAME=["YOW_1967_2007.123"],
74 *                IELEM=[123], START_DATE=[0], END_DATE=[-364]
75 *%-----|-----|
76 *%-----|-----|
77 COMPUTE API         APII=[40], APIK=[0.8]/day,
78 *%-----|-----|
79 *#=====
80 *                                DRAINAGE TO KGCC POND 1
81 *#=====
82 *#=====
83 *# AREA 3A-1 (URBAN PORTION of Area North of Campeau Drive)
84 *#=====
85 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
86 *# over golf course and we want to recapture the baseflow
87 CONTINUOUS NASHYD   ID=[1], NHYD=["AREA 3A-1"], DT=[1] (min), AREA=[2.7] (ha)
88                   DWF=[0] (cms), CN/C=[68.8], IA=[3.38] (mm), N=[2], TP=[1.32] (hrs),
89                   Continuous simulation parameters:
90                   IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
91                   InterEventTime=[12] (hrs),
92                   Baseflow simulation parameters:
93                   BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
94                   VHydCond=[.001] (mm/hr), END=-1
95 *%-----|-----|
96 *#=====
97 *# AREA 3B (GOLF PORTION of Area North of Campeau Drive) - Developed
98 *#=====
99 CONTINUOUS STANDHYD ID=[2], NHYD=["AREA 3B"], DT=[1] (min), AREA=[6.3] (ha),
100                   XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
101                   LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
102                   DCAY=[4.14] (/hr), F=[0] (mm),
103                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
104                   LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
105                   Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
106                   LGI=[205] (m), MNI=[0.025], SCI=[0] (min),
107                   Continuous simulation parameters:
108                   IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
109                   InterEventTime=[12] (hrs), END=-1
110 *%-----|-----|
111 *# AREA 12 (GOLF PORTION OF Area East of Knudson Drive) - Developed
112 *#=====
113 CONTINUOUS STANDHYD ID=[3], NHYD=["AREA 12"], DT=[1] (min), AREA=[2.27] (ha),
114                   XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
115                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
116                   DCAY=[2.0] (/hr), F=[0] (mm),
117                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
118                   LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
119                   Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
120                   LGI=[123] (m), MNI=[0.025], SCI=[0] (min),
121                   Continuous simulation parameters:
122                   IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),

```



```

122             InterEventTime=[12](hrs), END=-1
123 *%-----|-----|
124 *#=====|=====|
125 *# AREA 2A (URBAN PORTION OF Area North of Campeau Drive)
126 *#=====|=====|
127 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
128 *# over golf course and we want to recapture the baseflow
129 CONTINUOUS NASHYD             ID=[4], NHYD=["AREA 2A"], DT=[1](min), AREA=[29.3](ha),
130                               DWF=[0](cms), CN=[68], IA=[3.4](mm),
131                               N=[2.0], TP=[0.27]hrs,
132                               Continuous simulation parameters:
133                               IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.03]/(mm),
134                               InterEventTime=[12](hrs),
135                               Baseflow simulation parameters:
136                               BaseFlowOption=[1], InitGWResVol=[12](mm), GWResK=[0.85](mm/day/mm),
137                               VHydCond=[.001](mm/hr), END=-1
138 *%-----|-----|
139 *#=====|=====|
140 *# AREA 2B-1 (GOLF PORTION OF Area North of Campeau Drive) TO DA 3 - Developed
141 *#=====|=====|
142 CONTINUOUS STANDHYD             ID=[5], NHYD=["AREA 2B-1"], DT=[1](min), AREA=[13.0](ha),
143                               XIMP=[0.50], TIMP=[0.60], DWF=[0](cms),
144                               LOSS=[1]: Horton: Fo=[76.20](mm/hr), Fc=[13.2](mm/hr),
145                               DCAY=[4.14](/hr), F=[0](mm),
146                               Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
147                                                       LGP=[40](m), MNP=[0.25], SCP=[0](min),
148                               Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
149                                                       LGI=[294](m), MNI=[0.025], SCI=[0](min),
150                               Continuous simulation parameters:
151                               IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
152                               InterEventTime=[12](hrs), END=-1
153 *%-----|-----|
154 *#=====|=====|
155 *# ADD All Catchments that Drain to Pond 1
156 ADD HYD             IDsum=[7], NHYD=["Pond1-IN"], IDs to add=[1+2+3+4+5]
157 *%-----|-----|
158 *#=====|=====|
159 *# KGCC Pond 1 (Drainage 53.57 ha)
160 *#=====|=====|
161 ROUTE RESERVOIR             IDout=[1], NHYD=["Pond-1"], IDin=[7],
162                               RDT=[1](min),
163                               TABLE of ( OUTFLOW-STORAGE ) values
164                               (cms) - (ha-m)
165                               [ 0.0 , 0.0 ]
166                               [ 0.201, 0.643 ]
167                               [ 0.295, 1.045 ]
168                               [ 1.179, 2.0 ]
169                               [ -1 , -1 ] (max twenty pts)
170                               IDovf=[ ], NHYDovf=[ ]
171 *%-----|-----|
172 *#=====|=====|
173 *# DRAINAGE TO KGCC POND 2
174 *#=====|=====|
175 *#=====|=====|
176 *# AREA 2C (URBAN PORTION OF Area North of Campeau Drive)
177 *#=====|=====|
178 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
179 *# over golf course and we want to recapture the baseflow
180 CONTINUOUS NASHYD             ID=[2], NHYD=["AREA 2C"], DT=[1](min), AREA=[13.8](ha)
181                               DWF=[0](cms), CN/C=[70.8], IA=[3.18](mm),
182                               [2], TP=[0.187](hrs),
183                               Continuous simulation parameters:
184                               IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.03]/(mm),
185                               InterEventTime=[12](hrs),
186                               Baseflow simulation parameters:
187                               BaseFlowOption=[1], InitGWResVol=[12](mm), GWResK=[0.85](mm/day/mm),

```

```

188          VHydCond=[.001] (mm/hr), END=-1
189 *%-----|-----|
190 *#-----|-----|
191 *# AREA 2B-2 (GOLF PORTION OF Area North of Campeau Drive) - Developed
192 *#-----|-----|
193 CONTINUOUS STANDHYD      ID=[3], NHYD=["AREA 2B-2"], DT=[1] (min), AREA=[15.7] (ha),
194 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
195 LOSS=[1]:      Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
196 DCAY=[4.14] (/hr), F=[0] (mm),
197 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
198                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
199 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
200                      LGI=[324] (m), MNI=[0.025], SCI=[0] (min),
201 Continuous simulation parameters:
202 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
203 InterEventTime=[12] (hrs), END=-1
204 *#-----|-----|
205 *# ADD All Catchments that Drain to Pond 2
206 *#-----|-----|
207 ADD HYD                  IDsum=[4], NHYD=[Pond2-IN], IDs to add=[2+3]
208 *%-----|-----|
209 *# KGCC Pond 2 (Drainage 29.5 ha)
210 *#-----|-----|
211 ROUTE RESERVOIR         IDout=[2], NHYD=["Pond-2"], IDin=[4],
212 RDT=[1] (min),
213 TABLE of ( OUTFLOW-STORAGE ) values
214                      (cms) - (ha-m)
215                      [ 0.0 , 0.0 ]
216                      [ 0.111 , 0.417 ]
217                      [ 0.162, 0.665 ]
218                      [ 0.649, 1.27 ]
219                      [ -1 , -1 ] (max twenty pts)
220 IDovf=[ ], NHYDovf=[ ]
221 *%-----|-----|
222 *#-----|-----|
223 * DRAINAGE TO KGCC POND 3 (2.90 ha)
224 *#-----|-----|
225 *#-----|-----|
226 *# AREA 13 (GOLF PORTION OF Area East of Knudson Drive - DA 6A) - Developed
227 *#-----|-----|
228 CONTINUOUS STANDHYD      ID=[4], NHYD=["AREA 13"], DT=[1] (min), AREA=[2.9] (ha),
229 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
230 LOSS=[1]:      Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
231 DCAY=[4.14] (/hr), F=[0] (mm),
232 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
233                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
234 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
235                      LGI=[139] (m), MNI=[0.025], SCI=[0] (min),
236 Continuous simulation parameters:
237 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
238 InterEventTime=[12] (hrs), END=-1
239 *%-----|-----|
240 *#-----|-----|
241 *# ADD outflows from Pond 1,2 & 3
242 *#-----|-----|
243 ADD HYD                  IDsum=[10], NHYD=[000321], IDs to add=[1+2+4]
244 *#-----|-----|
245 * DRAINAGE TO KGCC POND 4 (47.68 ha)
246 *#-----|-----|
247 *# AREA 14 (GOLF PORTION OF Area East of Knudson Drive - DA 11) - Developed
248 *#-----|-----|
249 CONTINUOUS STANDHYD      ID=[1], NHYD=["AREA 14"], DT=[1] (min), AREA=[2.38] (ha),
250 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
251 LOSS=[1]:      Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
252 DCAY=[4.14] (/hr), F=[0] (mm),

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252 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
253 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
254 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
255 LGI=[126] (m), MNI=[0.025], SCI=[0] (min),
256 Continuous simulation parameters:
257 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
258 InterEventTime=[12] (hrs), END=-1
259 *%-----|-----|
260 *#=====|=====|
261 *# AREA 1B (GOLF PORTION OF Area North of Campeau Drive) - Developed
262 *#=====|=====|
263 CONTINUOUS STANDHYD ID=[2], NHYD=["AREA 1B"], DT=[1] (min), AREA=[9.3] (ha),
264 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
265 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
266 DCAY=[4.14] (/hr), F=[0] (mm),
267 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
268 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
269 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
270 LGI=[249] (m), MNI=[0.025], SCI=[0] (min),
271 Continuous simulation parameters:
272 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
273 InterEventTime=[12] (hrs), END=-1
274 *%-----|-----|
275 *#=====|=====|
276 *# AREA 1C (URBAN PORTION of Area North of Campeau Drive)
277 *#=====|=====|
278 *# This area is piped through the golf course, so no change in XIMP
279 CONTINUOUS STANDHYD ID=[3], NHYD=["AREA 1C"], DT=[1] (min), AREA=[17.8] (ha),
280 XIMP=[0.225], TIMP=[0.51], DWF=[0] (cms),
281 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
282 DCAY=[2.0] (/hr), F=[0] (mm),
283 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
284 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
285 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
286 LGI=[344] (m), MNI=[0.013], SCI=[0] (min),
287 Continuous simulation parameters:
288 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
289 InterEventTime=[12] (hrs), END=-1
290 *%-----|-----|
291 *#=====|=====|
292 *# AREA 5A (URBAN PORTION OF Area North of Knudson Drive)
293 *#=====|=====|
294 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
295 *# over golf course and we want to recapture the baseflow
296 CONTINUOUS NASHYD ID=[4], NHYD=["AREA 5A"], DT=[1] (min), AREA=[2.5] (ha)
297 DWF=[0] (cms), CN/C=[45.25], IA=[3.25] (mm), N=[2], TP=[0.08] (hrs),
298 Continuous simulation parameters:
299 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
300 InterEventTime=[12] (hrs),
301 Baseflow simulation parameters:
302 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
303 VHydCond=[.001] (mm/hr), END=-1
304 *%-----|-----|
305 *#=====|=====|
306 *# AREA 5B (GOLF PORTION OF Area North of Knudson Drive) - Developed
307 *#=====|=====|
308 CONTINUOUS STANDHYD ID=[5], NHYD=["AREA 5B"], DT=[1] (min), AREA=[9.5] (ha),
309 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
310 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
311 DCAY=[4.14] (/hr), F=[0] (mm),
312 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
313 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
314 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
315 LGI=[252] (m), MNI=[0.025], SCI=[0] (min),
316 Continuous simulation parameters:
317 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
318 InterEventTime=[12] (hrs), END=-1

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316 *%-----|-----|
317 *#=====|-----|
318 *# ADD flows that go directly to Pond 4
319 *#=====|-----|
320 ADD HYD          IDsum=[9], NHYD=[000321], IDs to add=[1+2+3+4+5]
321 *%-----|-----|
322 *#=====|-----|
323 *# AREA 1D (URBAN PORTION of Area North of Campeau Drive)
324 *#=====|-----|
325 CONTINUOUS STANDHYD      ID=[1], NHYD=["AREA 1D"], DT=[1] (min), AREA=[15.8] (ha),
326 XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
327 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
328 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
329                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
330 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
331                      LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
332 Continuous simulation parameters:
333 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
334 InterEventTime=[12] (hrs), END=-1
335 *%-----|-----|
336 *#=====|-----|
337 *# MAJOR FLOW TO Pond 4 - MINOR FLOW TO Beaver Pond
338 *# 85 L/S/HA * 15.8 HA = 1.343 L/S
339 *#=====|-----|
340 COMPUTE DUALHYD      IDin=[1], CINLET=[1.343] (cms), NINLET=[1],
341 MAJID=[2], MajNHYD=[000100],
342 MINID=[3], MinNHYD=[000100],
343 TMJSTO=[0] (cu-m)
344 *%-----|-----|
345 *#=====|-----|
346 *# AREA 5C (URBAN PORTION OF Area North of Knudson Drive)
347 *#=====|-----|
348 CONTINUOUS STANDHYD      ID=[4], NHYD=["000100"], DT=[1] (min), AREA=[6.2] (ha),
349 XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
350 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
351 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
352                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
353 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
354                      LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
355 Continuous simulation parameters:
356 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
357 InterEventTime=[12] (hrs), END=-1
358 *%-----|-----|
359 *#=====|-----|
360 *# MAJOR FLOW TO Pond 4 - MINOR FLOW TO Beaver Pond
361 *# 85 L/S/HA * 6.2 HA = 0.527 L/S
362 *#=====|-----|
363 COMPUTE DUALHYD      IDin=[4], CINLET=[0.527] (cms), NINLET=[1],
364 MAJID=[6], MajNHYD=[000100],
365 MINID=[7], MinNHYD=[000100],
366 TMJSTO=[0] (cu-m)
367 *%-----|-----|
368 *#=====|-----|
369 *# ADD major flows from 1D and 5C that go to Pond 4
370 *#=====|-----|
371 ADD HYD          IDsum=[1], NHYD=[Pond4-IN], IDs to add=[6+2+9]
372 *%-----|-----|
373 *#=====|-----|
374 *# ADD minor flows from 1D and 5C to Beaver Pond
375 *#=====|-----|
376 ADD HYD          IDsum=[2], NHYD=[MIN-Beaver-IN], IDs to add=[7+3]
377 *%-----|-----|
378 *#=====|-----|
379 *#=====|-----|
380 *# KGCC Pond 4 (Drainage 41.48 ha + Major from 1D & 5C)

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381 *#=====
382 ROUTE RESERVOIR      IDout=[4],  NHYD=["Pond-4"],  IDin=[1],
383                    RDT=[1] (min),
384                    TABLE of ( OUTFLOW-STORAGE ) values
385                                (cms) - (ha-m)
386                                [ 0.0 , 0.0 ]
387                                [ 0.156 , 0.480 ]
388                                [ 0.228 , 0.744 ]
389                                [ 0.913 1.61 ]
390                                [ -1 , -1 ] (max twenty pts)
391                    IDovf=[  ], NHYDovf=[  ]
392 *%-----|-----
393 *# ADD outflows from Pond 4 to ponds 1,2 & 3 and minor flows
394 *#=====
395 ADD HYD              IDsum=[1], NHYD=[000321], IDs to add=[10+4+2]
396 *#=====
397 *#=====
398 *                   DRAINAGE TO KGCC POND 5
399 *#=====
400 *#=====
401 *# AREA 6A (URBAN PORTION OF Area North of Knudson Drive)
402 *#=====
403 CONTINUOUS STANDHYD  ID=[2], NHYD=["AREA 6A"], DT=[1] (min), AREA=[4.1] (ha),
404                    XIMP=[0.050], TIMP=[0.52], DWF=[0] (cms),
405                    LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
406                    DCAY=[2.0] (/hr), F=[0] (mm),
407                    Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
408                    LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
409                    Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
410                    LGI=[165] (m), MNI=[0.013], SCI=[0] (min),
411                    Continuous simulation parameters:
412                    IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
413                    InterEventTime=[12] (hrs), END=-1
414 *%-----|-----
415 *# AREA 6B (GOLF PORTION OF Area North of Knudson Drive) - Developed
416 *#=====
417 CONTINUOUS STANDHYD  ID=[3], NHYD=["AREA 6B"], DT=[1] (min), AREA=[5.9] (ha),
418                    XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
419                    LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
420                    DCAY=[4.14] (/hr), F=[0] (mm),
421                    Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
422                    LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
423                    Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
424                    LGI=[198] (m), MNI=[0.025], SCI=[0] (min),
425                    Continuous simulation parameters:
426                    IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
427                    InterEventTime=[12] (hrs), END=-1
428 *%-----|-----
429 *# AREA 15 (GOLF PORTION OF Area South of Walden Drive - DA 10B) - Developed
430 *#=====
431 CONTINUOUS STANDHYD  ID=[4], NHYD=["AREA 15"], DT=[1] (min), AREA=[2.5] (ha),
432                    XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
433                    LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
434                    DCAY=[4.14] (/hr), F=[0] (mm),
435                    Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
436                    LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
437                    Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
438                    LGI=[129] (m), MNI=[0.025], SCI=[0] (min),
439                    Continuous simulation parameters:
440                    IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
441                    InterEventTime=[12] (hrs), END=-1
442 *%-----|-----
443 *# AREA 6C (URBAN PORTION OF Area North of Knudson Drive)
444 *#=====

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445 CONTINUOUS STANDHYD      ID=[5], NHYD=["AREA 6C"], DT=[1] (min), AREA=[5.3] (ha),
446 XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
447 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
448 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
449 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
450 LGI=[187] (m), MNI=[0.013], SCI=[0] (min),
451 Continuous simulation parameters:
452 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
453 InterEventTime=[12] (hrs), END=-1
454
455 *%-----|-----|
456 *#=====|=====|
457 *# MAJOR FLOW TO Pond 5 - MINOR FLOW TO Beaver Pond
458 *# 85 L/S/HA * 5.3 HA = 0.4505 L/S
459 *#=====|=====|
460 COMPUTE DUALHYD          IDin=[5], CINLET=[0.451] (cms), NINLET=[1],
461 MAJID=[6], MajNHYD=[000100],
462 MINID=[7], MinNHYD=[000100],
463 TMJSTO=[0] (cu-m)
464 *%-----|-----|
465 *#=====|=====|
466 *# ADD ALL drainage to Pond 5 (12.5 ha)
467 *#=====|=====|
468 ADD HYD                  IDsum=[8], NHYD=[Pond5-IN], IDs to add=[2+3+4+6]
469 *%-----|-----|
470 *#=====|=====|
471 ROUTE RESERVOIR         IDout=[4], NHYD=["Pond-5"], IDin=[8],
472 RDT=[1] (min),
473 TABLE of ( OUTFLOW-STORAGE ) values
474 (cms) - (ha-m)
475 [ 0.0 , 0.0 ]
476 [ 0.067 , 0.140]
477 [ 0.098 , 0.236]
478 [ 0.392 , 0.485 ]
479 [ -1 , -1 ] (max twenty pts)
480 IDovf=[ ], NHYDovf=[ ]
481 *%-----|-----|
482 *#=====|=====|
483 *# AREA 3A-2 (URBAN PORTION of Area North of Campeau Drive)
484 *#=====|=====|
485 CONTINUOUS STANDHYD      ID=[6], NHYD=["AREA 3A-2"], DT=[1] (min), AREA=[33.4] (ha),
486 XIMP=[0.250], TIMP=[0.41], DWF=[0] (cms),
487 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
488 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
489 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
490 LGI=[471] (m), MNI=[0.013], SCI=[0] (min),
491 Continuous simulation parameters:
492 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
493 InterEventTime=[12] (hrs), END=-1
494
495 *%-----|-----|
496 *#=====|=====|
497 *# AREA 1A (INSTITUTION BLOCK)
498 *#=====|=====|
499 CONTINUOUS NASHYD        ID=[5], NHYD=["AREA 1A"], DT=[1]min, AREA=[11.4] (ha),
500 DWF=[0] (cms), CN=[61], IA=[5.0] (mm),
501 N=[2.0], TP=[0.56]hrs,
502 Continuous simulation parameters:
503 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
504 InterEventTime=[12] (hrs),
505 Baseflow simulation parameters:
506 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
507 VHydCond=[.001] (mm/hr), END=-1
508 *%-----|-----|
509 *# ADD outflows from 3A-2, 1A,Pond 5 and minor from 6C to ponds 1,2,3 & 4

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510 *#=====
511 ADD HYD          IDsum=[11], NHYD=[000321], IDs to add=[1+4+7]
512 *#=====
513 *# AREA 7 (Adjacent to Beaver Pond)
514 *#=====
515 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[19.6] (ha),
516 XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
517 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
518 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
519                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
520 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
521                                LGI=[361] (m), MNI=[0.013], SCI=[0] (min),
522 Continuous simulation parameters:
523 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
524 InterEventTime=[12] (hrs), END=-1
525 *%-----|-----|
526 *#=====
527 *# ADD OUTFLOW OF DA 10B AND 6C TO 7
528 *# TOTAL FLOW - AT EXISTING 2700 MM OUTLET
529 *#=====
530 ADD HYD          IDsum=[9], NHYD=[000321], IDs to add=[5+2+1]
531 *%-----|-----|
532 *
533 *#=====
534 *# AREA 4C
535 *#=====
536 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[5.8] (ha),
537 XIMP=[0.250], TIMP=[0.53], DWF=[0] (cms),
538 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
539 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
540                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
541 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
542                                LGI=[196] (m), MNI=[0.013], SCI=[0] (min),
543 Continuous simulation parameters:
544 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
545 InterEventTime=[12] (hrs), END=-1
546 *%-----|-----|
547 *#=====
548 *# MAJOR FLOW TO 4B - MINOR FLOW TO 4A
549 *# 85 L/S/HA * 5.8 HA = 493 L/S
550 *#=====
551 COMPUTE DUALHYD      IDin=[1], CINLET=[0.493] (cms), NINLET=[1],
552 MAJID=[5], MajNHYD=[000100],
553 MINID=[6], MinNHYD=[100100],
554 TMJSTO=[0] (cu-m)
555 *%-----|-----|
556 *
557 *#=====
558 *# AREA 4A - FLOW THROUGH AREA 4
559 *#=====
560 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[15.8] (ha),
561 XIMP=[0.250], TIMP=[0.66], DWF=[0] (cms),
562 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
563 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
564                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
565 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
566                                LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
567 Continuous simulation parameters:
568 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
569 InterEventTime=[12] (hrs), END=-1
570 *%-----|-----|
571 *
572 *#=====
573 *# ADDITION OF 4C MINOR TO 4A

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574 *#=====
575 *
576 ADD HYD          IDsum=[4], NHYD=[000231], IDs to add=[3+6]
577 *%-----|-----
578 *#=====
579 *# AREA 4B - ROUTE THROUGH ON SITE STORAGE
580 *#=====
581 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[6.2] (ha),
582 XIMP=[0.250], TIMP=[0.57], DWF=[0] (cms),
583 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
584 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
585                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
586 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
587                                LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
588 Continuous simulation parameters:
589 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
590 InterEventTime=[12] (hrs), END=-1
591 *%-----|-----
592 *#=====
593 *# ADDITION OF MAJOR FLOW AT 4C TO AREA 4B
594 *#=====
595 ADD HYD          IDsum=[6], NHYD=[000231], IDs to add=[5+3]
596 *%-----|-----
597 *#=====
598 *# ON-SITE STORAGE IN AREA 4B
599 *# 85L/S/HA
600 *#=====
601 *
602 ROUTE RESERVOIR      IDout=[3], NHYD=[000100], IDin=[6],
603 RDT=[1] (min),
604 TABLE of ( OUTFLOW-STORAGE ) values
605 (cms) - (ha-m)
606 [ 0.0 , 0.0 ]
607 [ 0.527, 0.2840]
608 [ -1 , -1 ] (max twenty pts)
609 IDovf=[], NHYDovf=[]
610 *%-----|-----
611 *#=====
612 *# ADDITION OF ROUTED 4B TO AREA 4A
613 *#=====
614 ADD HYD          IDsum=[8], NHYD=[000231], IDs to add=[4+3]
615 *%-----|-----
616 *
617 *#=====
618 *# AREA 4 (Adjacent to Beaver Pond)
619 *#=====
620 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[21.2] (ha),
621 XIMP=[0.250], TIMP=[0.38], DWF=[0] (cms),
622 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
623 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
624                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
625 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
626                                LGI=[375] (m), MNI=[0.013], SCI=[0] (min),
627 Continuous simulation parameters:
628 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
629 InterEventTime=[12] (hrs), END=-1
630 *%-----|-----
631 *#=====
632 *# ADDITION OF MINOR FLOW AT 4A TO AREA 4
633 *#=====
634 ADD HYD          IDsum=[3], NHYD=[000231], IDs to add=[8+1]
635 *%-----|-----
636 ADD HYD          IDsum=[7], NHYD=[000231], IDs to add=[10+3]
637 *%-----|-----
638 *#=====

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639  *# AREA 9 (RURAL)
640  *#=====
641  CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[18.9] (ha),
642                        DWF=[0] (cms), CN=[75], IA=[5.0] (mm),
643                        N=[2.0], TP=[0.37]hrs,
644                        Continuous simulation parameters:
645                        IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
646                        InterEventTime=[12] (hrs),
647                        Baseflow simulation parameters:
648                        BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
649                        VHydCond=[.001] (mm/hr), END=-1
650  *%-----|-----|
651  ADD HYD                IDsum=[6], NHYD=[000321], IDs to add=[7+2]
652  *%-----|-----|
653  *
654  *#=====
655  *# GOULDBOURN FORCED ROAD - KANATA AVENUE TO AREA 10 BOUNDARY
656  *# (ARTERIAL ROAD 10 YEAR 10 MN INLET TIME)
657  *#=====
658  CONTINUOUS STANDHYD    ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[1.6] (ha),
659                        XIMP=[0.71], TIMP=[0.71], DWF=[0] (cms),
660                        LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
661                        DCAY=[2.0] (/hr), F=[0] (mm),
662                        Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
663                        LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
664                        Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
665                        LGI=[103] (m), MNI=[0.013], SCI=[0] (min),
666                        Continuous simulation parameters:
667                        IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
668                        InterEventTime=[12] (hrs), END=-1
669  *%-----|-----|
670  *#=====
671  *# MAJOR FLOW TO BEAVER POND - MINOR FLOW TO AREA 10 STORM SYSTEM
672  *# 237.69 L/S/HA * 1.66 HA = 394.6 L/S
673  *#=====
674  COMPUTE DUALHYD        IDin=[1], CINLET=[0.395] (cms), NINLET=[1],
675                        MAJID=[2], MajNHYD=[000100],
676                        MINID=[7], MinNHYD=[100100],
677                        TMJSTO=[0] (cu-m)
678  *%-----|-----|
679  *#=====
680  *# BEAVER POND PORTION #1
681  *#=====
682  *
683  ADD HYD                IDsum=[9], NHYD=[000321], IDs to add=[6+2+11]
684  *%-----|-----|
685  *
686  *#=====
687  *# KANATA AVENUE - GOULBOURN FORCED ROAD TO AREA 10 BOUNDARY
688  *# (ARTERIAL ROAD 10 YEAR 10 MIN INLET TIME)
689  *#=====
690  CONTINUOUS STANDHYD    ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[2.8] (ha),
691                        XIMP=[0.32], TIMP=[0.32], DWF=[0] (cms),
692                        LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
693                        DCAY=[2.0] (/hr), F=[0] (mm),
694                        Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
695                        LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
696                        Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
697                        LGI=[136] (m), MNI=[0.013], SCI=[0] (min),
698                        Continuous simulation parameters:
699                        IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
700                        InterEventTime=[12] (hrs), END=-1
701  *%-----|-----|
702  *#=====
703  *# MAJOR FLOW TOWARDS TFD - MINOR FLOW TO AREA 10 STORM SYSTEM
704  *# 237.69 L/S/HA * 1.8 HA = 427.8 L/S
705  * JFSA correction based on above drainage area of 2.8 ha

```

```

704 * Capture in DUALHYD below 237.69 L/s/ha * 2.8 ha = 665.5 L/s
705 *#=====
706 COMPUTE DUALHYD      IDin=[1], CINLET=[0.6655] (cms), NINLET=[1],
707                      MAJID=[10], MajNHYD=[000100],
708                      MINID=[2], MinNHYD=[100100],
709                      TMJSTO=[0] (cu-m)
710 *%-----|-----|
711 *
712 *#=====
713 *# DRAINAGE AGREA 10 - TOTAL 43.6 HA - DIVIDED UP FOR HGL ANALYSIS
714 *# (INCLUDES AREA 10-4, 10-1, 10-2 AND 10-3)
715 *#=====
716 *
717 *#=====
718 *# AREA 10-4 - DRAINS INTO S-5 - MAJOR FLOW CASCADES
719 *#=====
720 CONTINUOUS STANDHYD  ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[13.9] (ha),
721                      XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
722                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
723                      DCAY=[2.0] (/hr), F=[0] (mm),
724                      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
725                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
726                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
727                      LGI=[304] (m), MNI=[0.013], SCI=[0] (min),
728                      Continuous simulation parameters:
729                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
730                      InterEventTime=[12] (hrs), END=-1
731 *%-----|-----|
732 *#=====
733 *# MINOR FLOW INTO SYSTEM
734 *# 85 L/S/HA * 14 = 1190 L/S
735 *JFSA correction based on above drainage area of 13.9 ha
736 * Capture in DUALHYD below 85 L/s/ha * 13.9 ha = 1181 L/s
737 *#=====
738 COMPUTE DUALHYD      IDin=[1], CINLET=[1.181] (cms), NINLET=[1],
739                      MAJID=[8], MajNHYD=[000100],
740                      MINID=[6], MinNHYD=[100100],
741                      TMJSTO=[0] (cu-m)
742 *%-----|-----|
743 *#=====
744 *# ADD KANATA AVENUE AND AREA 10-4 - MH S-5
745 *#=====
746 *
747 ADD HYD              IDsum=[5], NHYD=[000101], IDs to add=[6+2]
748 *%-----|-----|
749 *
750 *#=====
751 *# AREA 10-1 - DRAINS INTO S-4 - MAJOR FLOW CASCADES
752 *#=====
753 CONTINUOUS STANDHYD  ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.8] (ha),
754                      XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
755                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
756                      DCAY=[2.0] (/hr), F=[0] (mm),
757                      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
758                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
759                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
760                      LGI=[255] (m), MNI=[0.013], SCI=[0] (min),
761                      Continuous simulation parameters:
762                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
763                      InterEventTime=[12] (hrs), END=-1
764 *%-----|-----|
765 *#=====
766 *# MINOR FLOW INTO SYSTEM
767 *# 85 L/S/HA * 9.5 = 807.5 L/S
768 *JFSA correction based on above drainage area of 9.8 ha
769 * Capture in DUALHYD below 85 L/s/ha * 9.8 ha = 833 L/s
770 *#=====

```

```

769 COMPUTE DUALHYD      IDin=[1], CINLET=[0.833] (cms), NINLET=[1],
770                      MAJID=[4], MajNHYD=[000100],
771                      MINID=[6], MinNHYD=[100100],
772                      TMJSTO=[0] (cu-m)
773 *%-----|-----|
774 *#=====|=====|
775 *# ADD GOULBOURN FORCED ROAD AND AREA 10-1 - MH S-3
776 *#=====|=====|
777 *
778 ADD HYD                IDsum=[3], NHYD=[000101], IDs to add=[6+7]
779 *%-----|-----|
780 ADD HYD                IDsum=[7], NHYD=[000102], IDs to add=[3+5]
781 *%-----|-----|
782 *
783 *#=====|=====|
784 *# AREA 10-3 - DRAINS INTO S-2 - MAJOR FLOW CASCADES
785 *#=====|=====|
786 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[4.3] (ha),
787                      XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
788                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
789                      DCAY=[2.0] (/hr), F=[0] (mm),
790                      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
791                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
792                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
793                      LGI=[169] (m), MNI=[0.013], SCI=[0] (min),
794                      Continuous simulation parameters:
795                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
796                      InterEventTime=[12] (hrs), END=-1
797 *%-----|-----|
798 *#=====|=====|
799 *# MINOR FLOW INTO SYSTEM
800 *# 85 L/S/HA * 3.9 = 331.5 L/S
801 *JFSA correction based on above drainage area of 4.3 ha
802 * Capture in DUALHYD below 85 L/s/ha * 4.3 ha = 365 L/s
803 *#=====|=====|
804 COMPUTE DUALHYD      IDin=[1], CINLET=[0.365] (cms), NINLET=[1],
805                      MAJID=[5], MajNHYD=[000100],
806                      MINID=[2], MinNHYD=[100100],
807                      TMJSTO=[0] (cu-m)
808 *%-----|-----|
809 ADD HYD                IDsum=[10], NHYD=[000103], IDs to add=[2+7]
810 *%-----|-----|
811 *
812 *#=====|=====|
813 *# AREA 10-2 - DRAINS INTO S-6 - MAJOR FLOW CASCADES
814 *#=====|=====|
815 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[18.6] (ha),
816                      XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
817                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
818                      DCAY=[2.0] (/hr), F=[0] (mm),
819                      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
820                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
821                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
822                      LGI=[352] (m), MNI=[0.013], SCI=[0] (min),
823                      Continuous simulation parameters:
824                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
825                      InterEventTime=[12] (hrs), END=-1
826 *%-----|-----|
827 *#=====|=====|
828 *# MINOR FLOW INTO SYSTEM
829 *# 85 L/S/HA * 16.2 = 1377 L/S
830 *JFSA correction based on above drainage area of 18.6 ha
831 * Capture in DUALHYD below 85 L/s/ha * 18.6 ha = 1581 L/s
832 *#=====|=====|
833 COMPUTE DUALHYD      IDin=[1], CINLET=[1.581] (cms), NINLET=[1],
834                      MAJID=[2], MajNHYD=[000100],
835                      MINID=[6], MinNHYD=[100100],

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834          TMJSTO=[0] (cu-m)
835 *%-----|-----|
836 *
837 *#=====|-----|
838 *# AREA 10A - MINOR FLOW TO AREA 10, MAJOR FLOW TO CARP RIVER WATERSHED
839 *#=====|-----|
840 CONTINUOUS STANDHYD          ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.9] (ha),
841          XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
842          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
843          DCAY=[2.0] (/hr), F=[0] (mm),
844          Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
845          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
846          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
847          LGI=[256] (m), MNI=[0.013], SCI=[0] (min),
848          Continuous simulation parameters:
849          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
850          InterEventTime=[12] (hrs), END=-1
851 *%-----|-----|
852 *#=====|-----|
853 *# SPLIT OF MAJOR AND MINOR FLOW AT 85 L/S/HA
854 *# 85 * 7.0 = 595 L/S
855 *# JFSA correction based on above drainage area of 9.9 ha
856 *# Capture in DUALHYD below 85 L/s/ha * 9.9 ha = 841 L/s
857 *#=====|-----|
858 COMPUTE DUALHYD          IDin=[1], CINLET=[0.841] (cms), NINLET=[1],
859          MAJID=[3], MaJNHYD=[000100],
860          MINID=[7], MinNHYD=[100100],
861          TMJSTO=[0] (cu-m)
862 *%-----|-----|
863 ADD HYD          IDsum=[1], NHYD=[000104], IDs to add=[7+6]
864 *%-----|-----|
865 *#=====|-----|
866 *# TOTAL MINOR FLOW AT OUTLET
867 *#=====|-----|
868 ADD HYD          IDsum=[6], NHYD=[000105], IDs to add=[1+10]
869 *%-----|-----|
870 *#=====|-----|
871 *# TOTAL MAJOR FLOW FOR DRAINAGE AREA 10 AT OUTLET
872 *#=====|-----|
873 ADD HYD          IDsum=[7], NHYD=[000106], IDs to add=[8+4+5+2]
874 *%-----|-----|
875 *#=====|-----|
876 *# AREA 11 (RURAL) - Increased Area for Existing Conditions
877 *#=====|-----|
878 CONTINUOUS NASHYD          ID=[2], NHYD=["000100"], DT=[1]min, AREA=[46.2] (ha),
879          DWF=[0] (cms), CN=[62], IA=[5.0] (mm),
880          N=[2.0], TP=[0.75]hrs,
881          Continuous simulation parameters:
882          IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
883          InterEventTime=[12] (hrs),
884          Baseflow simulation parameters:
885          BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
886          VHydCond=[.001] (mm/hr), END=-1
887 *%-----|-----|
888 ADD HYD          IDsum=[3], NHYD=[000317], IDs to add=[7+2]
889 *%-----|-----|
890 *#=====|-----|
891 *# TOTAL FLOW TO KIZELL POND (U/S CELL)
892 *#=====|-----|
893 ADD HYD          IDsum=[10], NHYD=[000317], IDs to add=[3+6]
894 *%-----|-----|
895 *
896 *#=====|-----|
897 *# SYSTEM STORAGE REPRESENTATION (KIZELL POND)
898 *# RATING CURVE PROVIDED BY IBI
899 *#=====|-----|
900 *# modify the ROUTE RESERVOIR to negate the effect of this underground storage

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900 ROUTE RESERVOIR      IDout=[3],  NHYD=["KP-R"],  IDin=[10],
901                    RDT=[1] (min),
902                    TABLE of ( OUTFLOW-STORAGE ) values
903                        (cms) - (ha-m)
904                        [ 0.0 , 0.0 ]
905                        [ 99.  , 0.09]
906                        [ -1  , -1  ] (max twenty pts)
907                    IDovf=[4], NHYDovf=["OVF-KP"]
908 *#=====
909 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (KIZELL)
910 *#=====
911 ADD HYD                IDsum=[10], NHYD=["KP-COM"], IDs to add=[3+4]
912 *#=====
913 *
914 * Kanata Lakes Stage 7 - Catchment removed from Model under existing conditions
915 *
916 *#=====
917 *CONTINUOUS STANDHYD  ID=[1], NHYD=["Stage 7"], DT=[1] (min), AREA=[73.1] (ha),
918 *                    XIMP=[0.225], TIMP=[0.50], DWF=[0] (cms),
919 *                    LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
920 DCAY=[4.14] (/hr), F=[0] (mm),
921 *                    Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
922 *                    LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
923 *                    Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
924 *                    LGI=[16445] (m), MNI=[0.013], SCI=[0] (min),
925 *                    Continuous simulation parameters:
926 *                    IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
927 *                    InterEventTime=[12] (hrs), END=-1
928 *#=====
929 * Kanata Lakes Stage 8 - Catchment removed from Model under existing conditions
930 *
931 *#=====
932 *CONTINUOUS STANDHYD  ID=[2], NHYD=["Stage 8"], DT=[1] (min), AREA=[65.7] (ha),
933 *                    XIMP=[0.225], TIMP=[0.50], DWF=[0] (cms),
934 *                    LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
935 DCAY=[4.14] (/hr), F=[0] (mm),
936 *                    Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
937 *                    LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
938 *                    Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
939 *                    LGI=[14785] (m), MNI=[0.013], SCI=[0] (min),
940 *                    Continuous simulation parameters:
941 *                    IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
942 *                    InterEventTime=[12] (hrs), END=-1
943 *#=====
944 *# Only Minor system flow to Kizell Cell - Command removed from Model
945 *#=====
946 * COMPUTE DUALHYD     IDin=[2], CINLET=[0.8] (cms), NINLET=[1],
947 *                    MAJID=[3], MajNHYD=[000100],
948 *                    MINID=[7], MinNHYD=[100100],
949 *                    TMJSTO=[0] (cu-m)
950 *#=====
951 * Total flow into Kizell Cell
952 *#=====
953 *#ADD HYD              IDsum=[8], NHYD=["KP-COM"], IDs to add=[10+1]
954 *#=====
955 * ROUTE THROUGH THE KIZELL CELL
956 *
957 ROUTE RESERVOIR      IDout=[5],  NHYD=["Kizell Cell"],  IDin=[10],
958                    RDT=[1] (min),
959                    TABLE of ( OUTFLOW-STORAGE ) values
960                        (cms) - (ha-m)
961                        [ 0.0 , 0.0 ]
962                        [ 0.100 , 0.016]
963                        [ 0.200 , 0.033]
964                        [ 0.300 , 0.055]

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```

965 [ 0.400 , 0.079]
966 [ 0.500 , 0.121]
967 [ 0.700 , 0.188]
968 [ 0.800 , 0.281]
969 [ 0.950 , 0.433]
970 [ 1.050 , 0.658]
971 [ 1.200 , 0.919]
972 [ -1 , -1 ] (max twenty pts)
973 IDovf=[4], NHYDovf=["OVF-Kizell Cell"]
974 *#=====
975 *# ADD OUTFLOW AND OVERFLOW
976 *#=====
977 ADD HYD IDsum=[8], NHYD=["KP-COM"], IDs to add=[5+4]
978 *#=====
979 *#=====
980 *# SYSTEM STORAGE REPRESENTATION (BEAVER POND)
981 *# RATING CURVE PROVIDED BY IBI
982 *#=====
983 * modify the ROUTE RESERVOIR to negate the effects of the underground storage
984 ROUTE RESERVOIR IDout=[3], NHYD=["BP-R"], IDin=[9],
985 RDT=[1] (min),
986 TABLE of ( OUTFLOW-STORAGE ) values
987 (cms) - (ha-m)
988 [ 0.0 , 0.0 ]
989 [ 99.0 , 0.09]
990 [ -1 , -1 ] (max twenty pts)
991 IDovf=[4], NHYDovf=["OVF-BP"]
992 *#=====
993 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (BEAVER)
994 *#=====
995 ADD HYD IDsum=[9], NHYD=["BP-COM"], IDs to add=[3+4]
996 *#=====
997 *
998 * Kanata Lakes Stage 9
999 *
1000 *#=====
1001 * Under the latest proposed development conditions these lands will be broken into
1002 * 3 catchment Beaver Pond (19.31 ha), Kizell Drain (6.89 ha) and Shirley's Brook (4.51
1003 ha).
1004 * As per IBI's "Design Brief KNL Stage 9 Kanata Lakes North" (March 2018).
1005 * No on-site controls have been assumed for this area.
1006 *#=====
1007 *
1008 * Kanata Lakes Stage 9 - Replaced by subcatchment 8 under existing conditions
1009 *#=====
1010 CONTINUOUS NASHYD ID=[1], NHYD=["8"], DT=[1]min, AREA=[9.2] (ha),
1011 DWF=[0] (cms), CN=[56], IA=[5.0] (mm),
1012 N=[2.0], TP=[0.21]hrs,
1013 Continuous simulation parameters:
1014 IaREcper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1015 InterEventTime=[12] (hrs),
1016 Baseflow simulation parameters:
1017 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1018 VHydCond=[.001] (mm/hr), END=-1
1019 *#=====
1020 *# TOTAL HYDROGRAPH INTO BEAVER POND
1021 *
1022 ADD HYD IDsum=[6], NHYD=["BP-TOTAL"], IDs to add=[9+8+1]
1023 *
1024 *#=====
1025 SAVE HYD ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
1026 HYD_FILENAME=["BP_In"]
1027 HYD_COMMENT=["Total inflow to the Beaver Pond"]
1028 *#=====
1029 *# TOTAL FLOW FROM BEAVER POND
1030 *#=====

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1031 * ROUTE THROUGH BEAVER POND
1032 * Overflow option removed to allow for linear extrapolation of flows out of the
1033 * pond when simulated volumes exceed volumes provided in the curve below.
1034 ROUTE RESERVOIR      IDout=[1],  NHYD=["BP-OUT"],  IDin=[6],
1035                    RDT=[1](min),
1036                    TABLE of ( OUTFLOW-STORAGE ) values
1037                    (cms) - (ha-m)
1038                    [ 0.0 , 0.0 ]
1039                    [ 0.592 , 4.573]
1040                    [ 0.686 , 6.569]
1041                    [ 0.769 , 8.840]
1042                    [ 0.879 , 11.467]
1043                    [ 1.007 , 16.103]
1044                    [ 1.040 , 17.339]
1045                    [ -1 , -1 ] (max twenty pts)
1046                    IDovf=[],  NHYDovf=[""]
1047 *#=====
1048 SAVE HYD              ID=[1],  # OF PCYCLES=[-1],  ICASEsh=[-1]
1049                    HYD_FILENAME=["BP_Out"]
1050                    HYD_COMMENT=["Total Outflow from the Beaver Pond"]
1051 *#=====
1052 *# ROUTE KD-1 THROUGH KD-2A
1053 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 10018.26
1054 *#=====
1055 ROUTE CHANNEL        IDout=[3],  NHYD=["KD-1"],  IDin=[1],
1056                    RDT=[1](min),
1057                    CHLGTH=[277](m),  CHSLOPE=[1.08](%),
1058                    FPSLOPE=[1.08](%),
1059                    SECNUM=[10018],  NSEG=[4]
1060                    ( SEGROUGH,  SEGDIST (m))=[0.08,30.63 -0.03,34.69 0.08,49.66
1061                    ( DISTANCE (m),  ELEVATION (m))=[ 0, 94.54 ]
1062                    [ 7.12, 93.2 ]
1063                    [11.07, 92.3 ]
1064                    [15.31, 91.8 ]
1065                    [17.16, 91.35 ]
1066                    [20.56, 90.8 ]
1067                    [25.12, 89.58 ]
1068                    [28.15, 88.5 ]
1069                    [30.63, 87.8 ]
1070                    [31.957, 87.854 ]
1071                    [ 34.4, 88.5 ]
1072                    [34.69, 88.61 ]
1073                    [ 36.5, 89.23 ]
1074                    [38.48, 90.2 ]
1075                    [41.14, 91.1 ]
1076                    [ 45.4, 91.66 ]
1077                    [49.66, 91.96 ]
1078                    [53.06, 92.3 ]
1079                    [67.16, 92.43 ]
1080                    [70.77, 92.52 ]
1081 *#=====
1082 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9854.606
1083 *#=====
1084 ROUTE CHANNEL        IDout=[2],  NHYD=["KD-1"],  IDin=[3],
1085                    RDT=[1](min),
1086                    CHLGTH=[186](m),  CHSLOPE=[1.97](%),
1087                    FPSLOPE=[1.97](%),
1088                    SECNUM=[9854],  NSEG=[5]
1089                    ( SEGROUGH,  SEGDIST (m))=[0.08,29.81 0.05,34.304 -0.03,38.24
1090                    ( DISTANCE (m),  ELEVATION (m))=[ 0, 90.07 ]
1091                    [ 6.86, 89.4 ]
1092                    [13.24, 89.2 ]
1093                    [17.79, 88.48 ]
1094                    [22.46, 87.2 ]
1095                    [29.81, 86.04 ]

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1096 [32.17, 85.72 ]
1097 [34.304, 85.612 ]
1098 [36.137, 85.654 ]
1099 [37.46, 85.69 ]
1100 [38.24, 85.72 ]
1101 [44.98, 85.9 ]
1102 [47.73, 86.32 ]
1103 [51.27, 87.3 ]
1104 [55.17, 88 ]
1105 [87.02, 88.79 ]
1106 [90.72, 88.7 ]
1107 [93.96, 89 ]
1108 [99.45, 90.8 ]
1109 [105.39, 91.81 ]
1110 *#=====
1111 *# KD-2A-1 - RURAL - Increased Area for Existing Conditions
1112 *#=====
1113 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2A-1"], DT=[1]min, AREA=[28.6] (ha),
1114 DWF=[0] (cms), CN=[57], IA=[7] (mm),
1115 N=[2.0], TP=[0.91]hrs,
1116 Continuous simulation parameters:
1117 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1118 InterEventTime=[12] (hrs),
1119 Baseflow simulation parameters:
1120 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1121 VHydCond=[0.001] (mm/hr), END=-1
1122 *#=====
1123 *# ADD KD-2A-1, KD-1 and portion of KNL Stage 9
1124 *#=====
1125 ADD HYD IDsum=[3], NHYD=["KFP2"], IDs to add=[1+2]
1126 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1127 *#=====
1128 *# ROUTE THROUGH KD-2A-2
1129 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9743.627
1130 *#=====
1131 ROUTE CHANNEL IDout=[1], NHYD=["KD-1"], IDin=[3],
1132 RDT=[1] (min),
1133 CHLGTH=[408] (m), CHSLOPE=[0.84] (%),
1134 FPSLOPE=[0.84] (%),
1135 SECNUM=[9743], NSEG=[5]
1136 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
0.05,63.17 0.08,111.15] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
[ 7.01, 86.7 ]
[15.57, 86.2 ]
[21.06, 85.58 ]
[25.69, 84.76 ]
[31.55, 83.42 ]
[40.62, 82.7 ]
[42.45, 82.5 ]
[44.28, 82.561 ]
[ 44.6, 82.59 ]
[46.07, 82.7 ]
[48.58, 82.76 ]
[59.09, 82.59 ]
[63.17, 83.94 ]
[67.14, 85.3 ]
[71.84, 85.8 ]
[82.08, 85.8 ]
[89.16, 86.2 ]
[106.01, 86.6 ]
[111.15, 86.65 ]
1157 *#=====
1158 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1159 HYD_FILENAME=["KD-1"]
1160 HYD_COMMENT=["KD-1-Channel where Erosion analysis was completed"]
1161 *#=====

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1162 *# Erosion Analysis on Kizell Drain (Requires SWMHYMO v5.5)
1163 *#=====
1164 *# Erosion Index/critical shear stress calculated for flows through the critical
1165 *# section of on Kizell Drain as determined by Matrix Solutions (May 2019)
1166 *#=====
1167 EROSION INDEX          INDEX_METHOD=[1], QCE =[0.50] (cms), NHYDsErosion=[1]
1168 *#=====
1169 EROSION INDEX          INDEX_METHOD=[2], SHEARC =[20] (Pa), No of Hyds=[1],
1170                          NHYDsErosion=[1]
1171                          RATING_CURVE_METHOD = [1], user entered channel shape
1172                          Channel section parameters
1173                          Section No["XS1"]
1174                          CHSLOPE=[0.84] (%), FPSLOPE=[0.84] (%),
1175                          NSEG=[5]
1176                          ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
1177                          ( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
1178                          [ 7.01, 86.7 ]
1179                          [15.57, 86.2 ]
1180                          [21.06, 85.58 ]
1181                          [25.69, 84.76 ]
1182                          [31.55, 83.42 ]
1183                          [40.62, 82.7 ]
1184                          [42.45, 82.5 ]
1185                          [44.28, 82.561 ]
1186                          [ 44.6, 82.59 ]
1187                          [46.07, 82.7 ]
1188                          [48.58, 82.76 ]
1189                          [59.09, 82.59 ]
1190                          [63.17, 83.94 ]
1191                          [67.14, 85.3 ]
1192                          [71.84, 85.8 ]
1193                          [82.08, 85.8 ]
1194                          [89.16, 86.2 ]
1195                          [106.01, 86.6 ]
1196                          [111.15, 86.65 ]
1197 *#=====
1198 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9338.062
1199 *# MINIMUM SLOPE ASSUMED 0.1%
1200 *#=====
1201 ROUTE CHANNEL          IDout=[2], NHYD=["KD-1"], IDin=[1],
1202                          RDT=[1] (min),
1203                          CHLGTH=[111] (m), CHSLOPE=[0.1] (%),
1204                          FPSLOPE=[0.1] (%),
1205                          SECNUM=[9338], NSEG=[5]
1206                          ( SEGROUGH, SEGDIST (m))=[0.04,78.47 0.06,82.78 -0.03,87.28
1207                          ( DISTANCE (m), ELEVATION (m))=[ 0, 82.8 ]
1208                          [ 6.26, 82.86 ]
1209                          [ 23, 82.4 ]
1210                          [57.46, 82.11 ]
1211                          [75.38, 82.1 ]
1212                          [78.47, 81.06 ]
1213                          [ 81.6, 79.7 ]
1214                          [82.78, 79.3 ]
1215                          [87.28, 79.28 ]
1216                          [ 88.3, 79.7 ]
1217                          [91.41, 81.1 ]
1218                          [94.81, 81.7 ]
1219                          [107.69, 82.1 ]
1220                          [120.16, 82.2 ]
1221 *#=====
1222 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9131.887
1223 *#=====
1224 ROUTE CHANNEL          IDout=[1], NHYD=["KD-1"], IDin=[2],
1225                          RDT=[1] (min),
1226                          CHLGTH=[248] (m), CHSLOPE=[0.28] (%),

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1227                                FPSLOPE=[0.28] (%),
1228                                SECNUM=[9131],      NSEG=[5]
1229                                ( SEGROUGH, SEGDIST (m))=[0.04,70.64 -0.03,72.865 0.04,74.61
                                0.05,77.65 0.04,191.67] NSEG times
1230                                ( DISTANCE (m), ELEVATION (m))=[ 0, 81.6 ]
1231                                [ 7.35, 81.6 ]
1232                                [ 26.3, 80.9 ]
1233                                [48.53, 80.87 ]
1234                                [58.55, 80.01 ]
1235                                [65.66, 80 ]
1236                                [69.22, 79 ]
1237                                [70.64, 78.65 ]
1238                                [72.865, 78.7 ]
1239                                [74.25, 78.96 ]
1240                                [74.61, 79.1 ]
1241                                [77.65, 79.92 ]
1242                                [93.59, 79.9 ]
1243                                [103.2, 78.7 ]
1244                                [108.05, 79.9 ]
1245                                [115.92, 80.2 ]
1246                                [132.65, 80.2 ]
1247                                [159.72, 80.73 ]
1248                                [176.71, 82.61 ]
1249                                [191.67, 82.63 ]
1250                                *#=====
1251                                *# KD-2A-2 - URBAN/RURAL NORTH OF RAILROAD
1252                                *#=====
1253                                CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2A-2"], DT=[1] (min), AREA=[44.99] (ha),
1254                                XIMP=[0.250], TIMP=[0.28], DWF=[0] (cms),
1255                                LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1256                                DCAY=[2.0] (/hr), F=[0] (mm),
1257                                Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1258                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1259                                Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1260                                LGI=[547] (m), MNI=[0.013], SCI=[0] (min),
1261                                Continuous simulation parameters:
1262                                IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1263                                InterEventTime=[12] (hrs), END=-1
1264                                *#=====
1265                                *# ADD KD-2A-1 AND KD-2A-2
1266                                *# CREST GAUGE LOCATION KD-2 -KIZELL DRAIN AT MARCH ROAD
1267                                *#=====
1268                                ADD HYD      IDsum=[3], NHYD=["KFP3"], IDs to add=[1+2]
1269                                *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1270                                *#=====
1271                                *# KD-2A-3 - URBAN SOUTH OF RAILROAD
1272                                *#=====
1273                                CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2A-3"], DT=[1] (min), AREA=[48.56] (ha),
1274                                XIMP=[0.250], TIMP=[0.31], DWF=[0] (cms),
1275                                LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1276                                DCAY=[2.0] (/hr), F=[0] (mm),
1277                                Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1278                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1279                                Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1280                                LGI=[568] (m), MNI=[0.013], SCI=[0] (min),
1281                                Continuous simulation parameters:
1282                                IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1283                                InterEventTime=[12] (hrs), END=-1
1284                                *#=====
1285                                *# ADD KD-2A-2 AND KD-2A-3 D/S OF MARCH ROAD
1286                                *#=====
1287                                ADD HYD      IDsum=[4], NHYD=["KD-2A-3"], IDs to add=[3+2]
1288                                *#=====
1289                                *# ROUTE KD-2A THROUGH KD-2B
1290                                *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8942.456
1291                                *#=====
1292                                ROUTE CHANNEL      IDout=[1], NHYD=["KD-2A"], IDin=[4],

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1291 RDT=[1] (min),
1292 CHLGTH=[254] (m), CHSLOPE=[0.55] (%),
1293 FPSLOPE=[0.55] (%),
1294 SECNUM=[8942], NSEG=[5]
1295 ( SEGROUGH, SEGDIST (m))=[0.04,17.24 0.05,28.26 -0.03,31.51
0.05,61.08 0.04,68.63] NSEG times
1296 ( DISTANCE (m), ELEVATION (m))=[ 0, 80.58 ]
1297 [ 1.57, 80.5 ]
1298 [ 8.77, 80.5 ]
1299 [10.84, 80.23 ]
1300 [17.24, 80.03 ]
1301 [20.76, 79 ]
1302 [23.59, 78.9 ]
1303 [26.81, 78.17 ]
1304 [28.26, 77.9 ]
1305 [30.06, 77.9 ]
1306 [30.71, 78.01 ]
1307 [31.51, 78.2 ]
1308 [32.21, 78.39 ]
1309 [ 37.7, 78.4 ]
1310 [44.07, 78.5 ]
1311 [48.95, 78.7 ]
1312 [57.53, 79.33 ]
1313 [61.08, 79.95 ]
1314 [64.61, 80.71 ]
1315 [68.63, 81.15 ]
1316 *#=====
1317 *# KD-2B-6 - URBAN
1318 *#=====
1319 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2B-6"], DT=[1] (min), AREA=[7.73] (ha),
1320 XIMP=[0.61], TIMP=[0.61], DWF=[0] (cms),
1321 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1322 DCAY=[2.0] (/hr), F=[0] (mm),
1323 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1324 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1325 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1326 LGI=[227] (m), MNI=[0.013], SCI=[0] (min),
1327 Continuous simulation parameters:
1328 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1329 InterEventTime=[12] (hrs), END=-1
1330 *#=====
1331 *# ROUTE KD-2B-6 THROUGH SWM POND SOUTH OF SOLANDT ROAD
1332 *# ASSUME 5-YEAR CONTROL ACCORDING TO CITY GUIDELINES
1333 *#=====
1334 ROUTE RESERVOIR IDout=[4], NHYD=["KD-2B-6"], IDin=[2],
1335 RDT=[1] (min),
1336 TABLE of ( OUTFLOW-STORAGE ) values
1337 (cms) - (ha-m)
1338 [ 0.0 , 0.0 ]
1339 [ 0.407 , 0.095]
1340 [ -1 , -1 ] (max twenty pts)
1341 IDovf=[5], NHYDovf=["OVF-2B6"]
1342 *#=====
1343 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1344 *#=====
1345 ADD HYD IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5+1]
1346 *#=====
1347 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8329.198
1348 *#=====
1349 ROUTE CHANNEL IDout=[2], NHYD=["KD-2A"], IDin=[6],
1350 RDT=[1] (min),
1351 CHLGTH=[747] (m), CHSLOPE=[0.36] (%),
1352 FPSLOPE=[0.36] (%),
1353 SECNUM=[8329], NSEG=[4]
1354 ( SEGROUGH, SEGDIST (m))=[0.08,81.34 0.05,88.266 -0.03,97.72
0.08,109.09] NSEG times
1355 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.3 ]

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1355 [56.66, 78.2 ]
1356 [67.31, 78.2 ]
1357 [72.25, 78 ]
1358 [79.85, 78 ]
1359 [81.34, 77.66 ]
1360 [87.28, 75.87 ]
1361 [88.266, 75.728 ]
1362 [90.51, 75.759 ]
1363 [90.57, 75.77 ]
1364 [91.47, 75.88 ]
1365 [97.72, 76.64 ]
1366 [109.09, 78.5 ]
1367 *#=====
1368 *# KD-2B-3 - Converted to NASHYD under existing conditions
1369 *#=====
1370 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2B-3"], DT=[1]min, AREA=[7.40] (ha),
1371 DWF=[0] (cms), CN=[65], IA=[5.0] (mm),
1372 N=[2.0], TP=[0.49]hrs,
1373 Continuous simulation parameters:
1374 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1375 InterEventTime=[12] (hrs),
1376 Baseflow simulation parameters:
1377 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1378 VHydCond=[.001] (mm/hr), END=-1
1379 *#=====
1380 *# 5 YEAR CONTROL - 89L/s
1381 *# MAJOR FLOWS TO KIZELL DRAIN
1382 *# MINOR FLOWS TO GOLF COURSE POND #2
1383 *#=====
1384 COMPUTE DUALHYD IDin=[1], CINLET=[0.089] (cms), NINLET=[1],
1385 MAJID=[3], MajNHYD=["2B3MAJ"],
1386 MINID=[4], MinNHYD=["2B3MIN"],
1387 TMJSTO=[0] (cu-m)
1388 *#=====
1389 *# KD-2B-4 Converted to NASHYD under existing conditions
1390 *#=====
1391 CONTINUOUS NASHYD ID=[5], NHYD=["KD-2B-4"], DT=[1]min, AREA=[23.59] (ha),
1392 DWF=[0] (cms), CN=[63], IA=[5.0] (mm),
1393 N=[2.0], TP=[0.62]hrs,
1394 Continuous simulation parameters:
1395 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1396 InterEventTime=[12] (hrs),
1397 Baseflow simulation parameters:
1398 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1399 VHydCond=[.001] (mm/hr), END=-1
1400 *#=====
1401 *# ADD KD-2B-3 MINOR AND KD-2B-4
1402 *#=====
1403 ADD HYD IDsum=[6], NHYD=["KD-2B-4"], IDs to add=[4+5]
1404 *#=====
1405 *# ROUTE KD-2B-4 THROUGH GOLF COURSE POND #2
1406 *#=====
1407 ROUTE RESERVOIR IDout=[4], NHYD=["KD-2B-4"], IDin=[6],
1408 RDT=[1] (min),
1409 TABLE of ( OUTFLOW-STORAGE ) values
1410 (cms) - (ha-m)
1411 [ 0.0 , 0.0 ]
1412 [ 0.229, 1.5695]
1413 [ 0.251, 1.8191]
1414 [ 0.328, 2.9421]
1415 [ -1 , -1 ] (max twenty pts)
1416 IDovf=[5], NHYDovf=["OVF-2B6"]
1417 *#=====
1418 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1419 *#=====
1420 ADD HYD IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5]
1421 *#=====

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1422 *# ADD KD-2B-3 MAJOR, KD-2B-4 AND KD-2B-6
1423 *#=====
1424 ADD HYD          IDsum=[4], NHYD=["KD-2B-4"], IDs to add=[3+6+2]
1425 *#=====
1426 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7691.759
1427 *#=====
1428 ROUTE CHANNEL    IDout=[2], NHYD=["KD-2A"], IDin=[4],
1429                 RDT=[1] (min),
1430                 CHLGTH=[408] (m),  CHSLOPE=[0.11] (%),
1431                 FPSLOPE=[0.11] (%),
1432                 SECNUM=[7691],      NSEG=[3]
1433                 ( SEGROUGH, SEGDIST (m))=[0.06,16.78 -0.03,19.003 0.06,24.49] NSEG  2
                 times
1434                 ( DISTANCE (m), ELEVATION (m))=[  0, 76.75 ]
1435                 [ 0.66, 76.6 ]
1436                 [ 3.57, 75.74 ]
1437                 [ 4.99, 75.24 ]
1438                 [ 5.76, 75.1 ]
1439                 [ 7.69, 75 ]
1440                 [ 8.56, 74.9 ]
1441                 [ 9.95, 74.9 ]
1442                 [12.21, 74.8 ]
1443                 [12.99, 74.69 ]
1444                 [ 15.2, 74.3 ]
1445                 [16.78, 74.1 ]
1446                 [17.38, 73.8 ]
1447                 [18.38, 73.8 ]
1448                 [19.003, 74.147]
1449                 [19.94, 74.21 ]
1450                 [20.51, 74.31 ]
1451                 [21.52, 74.6 ]
1452                 [22.72, 75.04 ]
1453                 [24.49, 75.5 ]
1454 *#=====
1455 *# KD-2B-2 - URBAN RESIDENTIAL - Converted to NASHYD under existing conditions
1456 *#=====
1457 CONTINUOUS NASHYD      ID=[3], NHYD=["KD-2B-2"], DT=[1]min, AREA=[3.35] (ha),
1458                 DWF=[0] (cms),  CN=[63], IA=[5.0] (mm),
1459                 N=[2.0], TP=[0.32]hrs,
1460                 Continuous simulation parameters:
1461                 IaRECper=[6] (hrs), SMIN=[-1] (mm),  SMAX=[-1] (mm), SK=[0.03]/(mm),
1462                 InterEventTime=[12] (hrs),
1463                 Baseflow simulation parameters:
1464                 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1465                 VHydCond=[.001] (mm/hr), END=-1
1466 *#=====
1467 *# ROUTE KD-2B-2 THROUGH POND #3 NORTH OF FARRAR ROAD
1468 *#=====
1469 ROUTE RESERVOIR      IDout=[5],  NHYD=["KD-2B-2"], IDin=[3],
1470                 RDT=[1] (min),
1471                 TABLE of ( OUTFLOW-STORAGE ) values
1472                 (cms) - (ha-m)
1473                 [ 0.0 , 0.0 ]
1474                 [ 0.260 , 0.616]
1475                 [ 0.282 ,0.7115]
1476                 [ 0.374 ,1.2301]
1477                 [ -1 , -1 ] (max twenty pts)
1478                 IDovf=[6], NHYDovf=["OVF-2B3"]
1479 *#=====
1480 *# ADD OUTFLOW, OVERFLOW AND KD-2B-4
1481 *#=====
1482 ADD HYD          IDsum=[1], NHYD=["KD-2B-4"], IDs to add=[5+6+2]
1483 *#=====
1484 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7386.879
1485 *#=====
1486 ROUTE CHANNEL      IDout=[2], NHYD=["KD-2A-4"], IDin=[1],
1487                 RDT=[1] (min),

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1488          CHLGTH=[315] (m),   CHSLOPE=[0.11] (%),
1489                                FPSLOPE=[0.11] (%),
1490          SECNUM=[7386],       NSEG=[5]
1491          ( SEGROUGH, SEGDIST (m))=[0.08,21.18 0.05,62.87 -0.06,80.43
                                0.06,90.36 0.05,143.24] NSEG times
1492          ( DISTANCE (m), ELEVATION (m))=[ 0, 77.07 ]
1493                                [ 5.11, 76.8 ]
1494                                [21.18, 76.7 ]
1495                                [34.27, 76.7 ]
1496                                [43.48, 76.3 ]
1497                                [62.87, 74.8 ]
1498                                [68.48, 74.28 ]
1499                                [70.32, 73.5 ]
1500                                [73.346, 73.437 ]
1501                                [75.588, 73.466 ]
1502                                [75.62, 73.47 ]
1503                                [80.43, 74.3 ]
1504                                [85.13, 75.18 ]
1505                                [90.36, 75.69 ]
1506                                [101.28, 75.4 ]
1507                                [115.17, 75.3 ]
1508                                [121.38, 75.4 ]
1509                                [128.52, 74.95 ]
1510                                [137.68, 75.3 ]
1511                                [143.24, 76.97 ]
1512  *#=====
1513  *# KD-2B-7 - RURAL EAST OF HERZBERG ROAD
1514  *#=====
1515  CONTINUOUS NASHYD          ID=[4], NHYD=["KD-2B-7"], DT=[1]min, AREA=[20.11] (ha),
1516                                DWF=[0] (cms), CN=[63], IA=[7] (mm),
1517                                N=[2.0], TP=[1.50]hrs,
1518                                Continuous simulation parameters:
1519                                IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1520                                InterEventTime=[12] (hrs),
1521                                Baseflow simulation parameters:
1522                                BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1523                                VHydCond=[.001] (mm/hr), END=-1
1524  *#=====
1525  *# ADD KD-2B-4 AND KD-2B-7
1526  *#=====
1527  ADD HYD          IDsum=[3], NHYD=["KD-2B-4"], IDs to add=[2+4]
1528  *#=====
1529  *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7058.454
1530  *#=====
1531  ROUTE CHANNEL          IDout=[1], NHYD=["KD-2A-4"], IDin=[3],
1532                                RDT=[1] (min),
1533                                CHLGTH=[297] (m),   CHSLOPE=[0.38] (%),
1534                                FPSLOPE=[0.38] (%),
1535                                SECNUM=[7058],       NSEG=[3]
1536                                ( SEGROUGH, SEGDIST (m))=[0.05,206.86 -0.06,216.95 0.04,295.48]
                                NSEG times
1537                                ( DISTANCE (m), ELEVATION (m))=[ 0, 75.7 ]
1538                                [165.24, 75.2 ]
1539                                [198.14, 75.2 ]
1540                                [206.37, 73.8 ]
1541                                [206.86, 73.69 ]
1542                                [209.66, 73 ]
1543                                [211.86, 73 ]
1544                                [213.07, 73.07 ]
1545                                [215.16, 73.8 ]
1546                                [216.95, 74.14 ]
1547                                [247.08, 74.8 ]
1548                                [267.4, 74.8 ]
1549                                [295.48, 76.05 ]
1550  *#=====
1551  *# KD-2B-5 - URBAN
1552  *#=====

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1553 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2B-5"], DT=[1] (min), AREA=[4.74] (ha),
1554 XIMP=[0.50], TIMP=[0.50], DWF=[0] (cms),
1555 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
                                DCAY=[2.0] (/hr), F=[0] (mm),
1556 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1557                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1558 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1559                                LGI=[177] (m), MNI=[0.013], SCI=[0] (min),
1560 Continuous simulation parameters:
1561 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1562 InterEventTime=[12] (hrs), END=-1
1563 *#=====
1564 *# ON-SITE STORAGE
1565 *# RATING CURVE SOURCE - plan2.pdf IN 13616-Richardson Side_Eagleson
1566 *#=====
1567 ROUTE RESERVOIR      IDout=[4],  NHYD=["KD-2B-5"],  IDin=[2],
1568 RDT=[1] (min),
1569 TABLE of ( OUTFLOW-STORAGE ) values
1570 (cms) - (ha-m)
1571 [ 0.0 , 0.0 ]
1572 [0.1458, 0.01283]
1573 [0.1458, 0.03881]
1574 [ -1 , -1 ] (max twenty pts)
1575 IDovf=[5], NHYDovf=["OVF-2B5"]
1576 *#=====
1577 *# KD-2B-1 - URBAN
1578 *#=====
1579 CONTINUOUS STANDHYD      ID=[3], NHYD=["KD-2B-1"], DT=[1] (min), AREA=[134.85] (ha),
1580 XIMP=[0.40], TIMP=[0.41], DWF=[0] (cms),
1581 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
                                DCAY=[2.0] (/hr), F=[0] (mm),
1582 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1583                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1584 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1585                                LGI=[948] (m), MNI=[0.013], SCI=[0] (min),
1586 Continuous simulation parameters:
1587 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1588 InterEventTime=[12] (hrs), END=-1
1589 *#=====
1590 *# ADD OUTFLOW, OVERFLOW AND KD-2B-1
1591 *#=====
1592 ADD HYD      IDsum=[6], NHYD=["KD-2B-1"], IDs to add=[4+5+3]
1593 *#=====
1594 *# ADD KD-2B-4 AND KD-2B-1
1595 *# CREST GAUGE LOCATION KD-1 - KIZELL DRAIN AT HERTZBERG ROAD
1596 *#=====
1597 ADD HYD      IDsum=[3], NHYD=["KFP4"], IDs to add=[1+6]
1598 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1599 *#=====
1600 *# ROUTE KD-2B THROUGH KD-2C
1601 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6705.311
1602 *# MINIMUM SLOPE ASSUMED 0.1%
1603 *#=====
1604 ROUTE CHANNEL      IDout=[1], NHYD=["KD-2B"], IDin=[3],
1605 RDT=[1] (min),
1606 CHLGTH=[600] (m),  CHSLOPE=[0.1] (%),
1607                                FPSLOPE=[0.1] (%),
1608 SECNUM=[6705],      NSEG=[4]
1609 ( SEGROUGH, SEGDIST (m))=[0.05,162.749 -0.04,168.035 -0.05,168.35
                                0.05,373.63] NSEG times
1610 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.65 ]
1611                                [ 24.7, 75.1 ]
1612                                [61.29, 73.42 ]
1613                                [90.72, 72.7 ]
1614                                [119.02, 72.95 ]
1615                                [131.71, 72.8 ]
1616                                [160.55, 72.9 ]

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1617 [162.46, 72.46 ]
1618 [162.749, 72.403 ]
1619 [168.035, 72.369 ]
1620 [168.35, 72.39 ]
1621 [168.6, 72.43 ]
1622 [171.08, 72.8 ]
1623 [203.12, 72.8 ]
1624 [231.66, 73.3 ]
1625 [255.58, 73.2 ]
1626 [300.16, 73.6 ]
1627 [326.75, 74.3 ]
1628 [347.02, 75.2 ]
1629 [373.63, 76.05 ]
1630 *#=====
1631 *# KD-3A - URBAN WEST OF HERZBERG ROAD
1632 *#=====
1633 CONTINUOUS STANDHYD ID=[3], NHYD=["KD-3A"], DT=[1] (min), AREA=[206.16] (ha),
1634 XIMP=[0.30], TIMP=[0.34], DWF=[0] (cms),
1635 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1636 DCAY=[2.0] (/hr), F=[0] (mm),
1637 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1638 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1639 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1640 LGI=[1172] (m), MNI=[0.013], SCI=[0] (min),
1641 Continuous simulation parameters:
1642 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1643 InterEventTime=[12] (hrs), END=-1
1644 *#=====
1645 *# KTC-2B - URBAN - UPSTREAM LIMIT TO HWY 417, NORTH OF CAMPEAU DRIVE
1646 *# LAND USES WITHIN AREA: OFFICE/RECREATIONAL
1647 *#=====
1648 CONTINUOUS STANDHYD ID=[2], NHYD=["KTC-2B"], DT=[1] (min), AREA=[20.79] (ha),
1649 XIMP=[0.23], TIMP=[0.24], DWF=[0.0] (cms),
1650 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1651 DCAY=[2.0] (/hr), F=[0] (mm),
1652 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1653 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1654 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1655 LGI=[372] (m), MNI=[0.013], SCI=[0] (min),
1656 Continuous simulation parameters:
1657 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1658 InterEventTime=[12] (hrs), END=-1
1659 *#=====
1660 *# 5 YEAR CONTROL - 1155L/s
1661 *# MAJOR FLOWS TO KD-3A
1662 *# MINOR FLOWS TO SWF-1205
1663 *#=====
1664 COMPUTE DUALHYD IDin=[2], CINLET=[1.155] (cms), NINLET=[1],
1665 MAJID=[7], MajNHYD=["KTC2BMAJ"],
1666 MINID=[10], MinNHYD=["KTC2BMIN"],
1667 TMJSTO=[0] (cu-m)
1668 *#=====
1669 *# ADD KTC-2B MAJOR AND KD-3A - TRIBUTARY 1 AT HERTZBERG ROAD
1670 *#=====
1671 ADD HYD IDsum=[5], NHYD=["KD-3A"], IDs to add=[7+3]
1672 *#=====
1673 *# ROUTE KD-3A THROUGH KD-3B
1674 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LiDAR
1675 *#=====
1676 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1677 RDT=[1] (min),
1678 CHLGTH=[253] (m), CHSLOPE=[0.13] (%),
1679 FPSLOPE=[0.13] (%),
1680 SECNUM=[1], NSEG=[3]
1681 ( SEGROUGH, SEGDIST (m))=[0.05,27.94 -0.035,38.92 0.08,64.87] NSEG
1682 times
1683 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.90]

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1681 [12.97, 78.12]
1682 [15.97, 77.81]
1683 [19.96, 77.51]
1684 [23.95, 77.36]
1685 [24.95, 77.34]
1686 [25.95, 77.34]
1687 [26.94, 77.36]
1688 [27.94, 77.30]
1689 [30.94, 76.79]
1690 [31.93, 76.73]
1691 [32.93, 76.73]
1692 [33.93, 76.70]
1693 [34.94, 76.76]
1694 [38.92, 77.29]
1695 [42.91, 77.34]
1696 [58.88, 78.52]
1697 [64.87, 78.97]
1698 ROUTE CHANNEL IDout=[5], NHYD=["KD-3A"], IDin=[4],
1699 RDT=[1] (min),
1700 CHLGTH=[344] (m), CHSLOPE=[0.56] (%),
1701 FPSLOPE=[0.56] (%),
1702 SECNUM=[2], NSEG=[3]
1703 ( SEGROUGH, SEGDIST (m))=[0.05,20.89 -0.035,76.49 0.08,88.52] NSEG times
1704 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.38]
1705 [13.92, 77.02]
1706 [20.89, 76.69]
1707 [26.85, 76.09]
1708 [29.84, 76.03]
1709 [44.76, 76.15]
1710 [56.69, 75.91]
1711 [59.68, 76.10]
1712 [61.67, 76.05]
1713 [71.61, 76.31]
1714 [76.49, 76.69]
1715 [82.55, 77.16]
1716 [88.52, 77.40]
1717 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1718 RDT=[1] (min),
1719 CHLGTH=[324] (m), CHSLOPE=[0.72] (%),
1720 FPSLOPE=[0.72] (%),
1721 SECNUM=[1], NSEG=[3]
1722 ( SEGROUGH, SEGDIST (m))=[0.05,97.588 -0.035,109.575 0.05,143.405] NSEG times
1723 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.2777 ]
1724 [39.664, 74.805 ]
1725 [74.612, 74.8767 ]
1726 [79.607, 74.8037 ]
1727 [ 86.6, 74.7914 ]
1728 [90.595, 74.6388 ]
1729 [95.59, 74.6899 ]
1730 [97.588, 74.8802 ]
1731 [101.584, 74.7293 ]
1732 [103.582, 74.4039 ]
1733 [106.578, 74.4818 ]
1734 [109.575, 74.9123 ]
1735 [111.573, 74.8318 ]
1736 [116.568, 74.8294 ]
1737 [120.563, 74.7426 ]
1738 [121.562, 74.7398 ]
1739 [124.559, 74.8464 ]
1740 [130.553, 74.8391 ]
1741 [132.54, 74.777 ]
1742 [143.405, 75.255 ]
1743 *#=====
1744 *# KD-2C - RURAL
1745 *#=====

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1746 CONTINUOUS NASHYD          ID=[2], NHYD=["KD-2C"], DT=[1]min, AREA=[59.10] (ha),
1747 DWF=[0] (cms), CN=[83], IA=[7] (mm),
1748 N=[2.0], TP=[0.60]hrs,
1749 Continuous simulation parameters:
1750 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1751 InterEventTime=[12] (hrs),
1752 Baseflow simulation parameters:
1753 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1754 VHydCond=[.001] (mm/hr), END=-1
1755 *#=====
1756 *# ADD KD-2B AND KD-2C
1757 *#=====
1758 ADD HYD                      IDsum=[5], NHYD=["KFP5"], IDs to add=[1+2]
1759 *PRINT HYD                   ID=[5], # OF PCYCLES=[1]
1760 *#=====
1761 *# ADD KD-2C AND KD-3A
1762 *#=====
1763 ADD HYD                      IDsum=[3], NHYD=["KD-2C"], IDs to add=[5+4]
1764 *#=====
1765 *# ROUTE KD-1+KD-2 THROUGH KD-3B-1
1766 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6104.633
1767 *# MINIMUM SLOPE ASSUMED 0.1%
1768 *#=====
1769 ROUTE CHANNEL                IDout=[1], NHYD=["KD-2C"], IDin=[3],
1770 RDT=[1] (min),
1771 CHLGTH=[952] (m), CHSLOPE=[0.1] (%),
1772                                FPSLOPE=[0.1] (%),
1773 SECNUM=[6104], NSEG=[3]
1774 ( SEGROUGH, SEGDIST (m))=[0.08,175.904 -0.04,179.184 0.08,185.91]
1775 NSEG times
1776 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.06 ]
1777 [ 9.16, 77.1 ]
1778 [23.37, 76.7 ]
1779 [56.09, 76.5 ]
1780 [67.63, 76.2 ]
1781 [80.81, 75.6 ]
1782 [83.87, 75.6 ]
1783 [98.45, 74.5 ]
1784 [103.07, 74.3 ]
1785 [115.78, 74.3 ]
1786 [134.4, 73.6 ]
1787 [149.63, 73.7 ]
1788 [163.83, 73.6 ]
1789 [173.16, 72.7 ]
1790 [175.83, 72 ]
1791 [175.904, 71.992 ]
1792 [179.184, 71.968 ]
1793 [179.27, 72 ]
1794 [183.86, 73.7 ]
1795 [185.91, 74 ]
1796 *#=====
1797 *# KD-3B - RURAL EAST OF HERZBERG ROAD
1798 *#=====
1799 CONTINUOUS NASHYD          ID=[4], NHYD=["KD-23B"], DT=[1]min, AREA=[112.07] (ha),
1800 DWF=[0] (cms), CN=[66], IA=[7] (mm),
1801 N=[2.0], TP=[1.20]hrs,
1802 Continuous simulation parameters:
1803 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1804 InterEventTime=[12] (hrs),
1805 Baseflow simulation parameters:
1806 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1807 VHydCond=[.001] (mm/hr), END=-1
1808 *#=====
1809 *# ADD KD-2C,KD-3A AND KD-3B - KIZELL DRAIN AT CONFLUENCE WITH WATTS CREEK
1810 *#=====
1811 ADD HYD                      IDsum=[3], NHYD=["KFP6"], IDs to add=[1+4]
1812 *PRINT HYD                   ID=[3], # OF PCYCLES=[1]

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1812 *#=====
1813 *#                               WATTS CREEK SUBWATERSHED
1814 *#=====
1815 *#=====
1816 *# KANATA TOWN CENTRE-1 - URBAN - UPSTREAM LIMIT TO HWY 417
1817 *# Imperviousness decreased under existing conditions
1818 *#=====
1819 CONTINUOUS STANDHYD      ID=[2], NHYD=["KTC-1"], DT=[1] (min), AREA=[60.23] (ha),
1820 XIMP=[0.34], TIMP=[0.34], DWF=[0] (cms),
1821 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1822 DCAY=[2.0] (/hr), F=[0] (mm),
1823 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1824 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1825 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1826 LGI=[633] (m), MNI=[0.013], SCI=[0] (min),
1827 Continuous simulation parameters:
1828 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1829 InterEventTime=[12] (hrs), END=-1
1830 *#=====
1831 *# 5 YEAR CONTROL - 2963L/s
1832 *# MAJOR FLOWS TO WC-1
1833 *# MINOR FLOWS TO SWF-1206
1834 *#=====
1835 COMPUTE DUALHYD      IDin=[2], CINLET=[2.963] (cms), NINLET=[1],
1836 MAJID=[7], MaJNHYD=["KTC1MAJ"],
1837 MINID=[8], MinNHYD=["KTC1MIN"],
1838 TMJSTO=[0] (cu-m)
1839 *#=====
1840 *# SWMF-1206
1841 *# STORAGE WAS ESTIMATED FROM AVAILABLE DRAWING
1842 *# DISCHARGE WAS TAKEN FROM R-1564
1843 *#=====
1844 ROUTE RESERVOIR      IDout=[4], NHYD=["KTC-1"], IDin=[8],
1845 RDT=[1] (min),
1846 TABLE of ( OUTFLOW-STORAGE ) values
1847 (cms) - (ha-m)
1848 [ 0.0 , 0.0 ]
1849 [ 0.955 , 0.2854 ]
1850 [ 1.436 , 3.9725 ]
1851 [ -1 , -1 ] (max twenty pts)
1852 IDovf=[5], NHYDovf=["OVF-KTC1"]
1853 *#=====
1854 *# ADD OUTFLOW, OVERFLOW AND KTC-1 MAJOR
1855 *#=====
1856 ADD HYD      IDsum=[2], NHYD=["KTC-1"], IDs to add=[4+5+7]
1857 *#=====
1858 *# WC-1 - RURAL/URBAN EXISTING AREA
1859 *#=====
1860 CONTINUOUS STANDHYD      ID=[1], NHYD=["WC-1"], DT=[1] (min), AREA=[403.47] (ha),
1861 XIMP=[0.30], TIMP=[0.34], DWF=[0] (cms),
1862 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1863 DCAY=[2.0] (/hr), F=[0] (mm),
1864 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1865 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1866 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1867 LGI=[1640] (m), MNI=[0.013], SCI=[0] (min),
1868 Continuous simulation parameters:
1869 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1870 InterEventTime=[12] (hrs), END=-1
1871 *#=====
1872 *# ADD WC-1 AND KTC-1 - WATTS CREEK AT HIGHWAY 417
1873 *#=====
1874 ADD HYD      IDsum=[5], NHYD=["WC-1"], IDs to add=[1+2]
1875 *#=====
1876 *# KTC-2A - URBAN - UPSTREAM LIMIT TO HWY 417, SOUTH OF CAMPEAU DRIVE
1877 *# LAND USES WITHIN AREA: TOWN CENTRE/URBAN RES
1878 *#=====

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1877 CONTINUOUS STANDHYD      ID=[1], NHYD=["KTC-2A"], DT=[1] (min), AREA=[34.34] (ha),
1878 XIMP=[0.36], TIMP=[0.42], DWF=[0.0] (cms),
1879 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
                                DCAY=[2.0] (/hr), F=[0] (mm),
1880 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1881                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1882 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1883                                LGI=[478] (m), MNI=[0.013], SCI=[0] (min),
1884 Continuous simulation parameters:
1885 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1886 InterEventTime=[12] (hrs), END=-1
1887 *#=====
1888 *# ADD KTC-2A AND KTC-2B MINOR
1889 *#=====
1890 ADD HYD          IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+10]
1891 *#=====
1892 *# ROUTE KTC-2 THROUGH KANATA TOWN CENTRE PHASE I POND
1893 *# STAGE-STORAGE-DISCHARGE CURVE OBTAINED FROM:
1894 *# KANATA TOWN CENTRE PHASE i - STORMWATER MANAGEMENT REPORT
1895 *# J.L. RICHARDS & ASSOCIATES LTD. 1996
1896 *# SWF-1205
1897 *# STORAGE WAS ESTIMATED WITH AVAILABLE DRAWING
1898 *# DISCHARGE WAS TAKEN FROM R-1563
1899 *#=====
1900 ROUTE RESERVOIR  IDout=[1], NHYD=["KTC-2"], IDin=[4],
1901 RDT=[1] (min),
1902 TABLE of ( OUTFLOW-STORAGE ) values
1903 (cms) - (ha-m)
1904 [ 0.0 , 0.0 ]
1905 [ 0.79, 0.6939]
1906 [ 4.70, 1.4350]
1907 [ -1 , -1 ] (max twenty pts)
1908 IDovf=[2], NHYDovf=["OVF-KTC2"]
1909 *#=====
1910 *# ADD OUTFLOW AND OVERFLOW
1911 *#=====
1912 ADD HYD          IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+2]
1913 *#=====
1914 *# ADD WC-1 AND KTC-2
1915 *#=====
1916 ADD HYD          IDsum=[2], NHYD=["KTC-2"], IDs to add=[5+4]
1917 *%-----|-----
1918 *#=====
1919 *# WC-3 - URBAN/RURAL
1920 *#=====
1921 CONTINUOUS NASHYD      ID=[1], NHYD=["WC-3"], DT=[1]min, AREA=[204.06] (ha),
1922 DWF=[0] (cms), CN=[66], IA=[7] (mm),
1923 N=[2.0], TP=[1.28]hrs,
1924 Continuous simulation parameters:
1925 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
1926 InterEventTime=[12] (hrs),
1927 Baseflow simulation parameters:
1928 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1929 VHydCond=[.001] (mm/hr), END=-1
1930 *#=====
1931 *# ADD WC-1+KTC AND WC-3
1932 *#=====
1933 ADD HYD          IDsum=[4], NHYD=["WC-3"], IDs to add=[2+1]
1934 *#=====
1935 *# ROUTE WC-1+KTC+WC-3 THROUGH WC-4A
1936 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
1937 *#=====
1938 ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[4],
1939 RDT=[1] (min),
1940 CHLGTH=[744] (m), CHSLOPE=[1.29] (%),
1941                                FPSLOPE=[1.29] (%),
1942 SECNUM=[1], NSEG=[3]

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```

1943      ( SEGROUGH, SEGDIST (m))=[0.05,25.86 -0.035,40.77 0.05,72.60] NSEG ↵
times
1944      ( DISTANCE (m), ELEVATION (m))=[ 0, 90.87]
1945      [ 1.99, 90.66]
1946      [ 7.96, 90.10]
1947      [16.91, 85.80]
1948      [18.90, 85.49]
1949      [21.88, 85.42]
1950      [25.86, 85.56]
1951      [26.85, 25.50]
1952      [29.83, 84.06]
1953      [31.82, 84.06]
1954      [34.81, 85.10]
1955      [40.77, 85.59]
1956      [48.73, 85.85]
1957      [52.71, 86.80]
1958      [55.59, 87.80]
1959      [60.66, 90.40]
1960      [64.64, 90.77]
1961      [72.60, 90.97]
1962      *#-----
1963      *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
1964      *#-----
1965      ROUTE CHANNEL      IDout=[2], NHYD=["WC-3"], IDin=[1],
1966      RDT=[1] (min),
1967      CHLGTH=[2295] (m),   CHSLOPE=[0.45] (%),
1968      FPSLOPE=[0.45] (%),
1969      SECNUM=[2],        NSEG=[3]
1970      ( SEGROUGH, SEGDIST (m))=[0.05,12.98 -0.035,20.97 0.05,51.94] NSEG ↵
times
1971      ( DISTANCE (m), ELEVATION (m))=[ 0, 85.79]
1972      [ 1.00, 85.75]
1973      [11.99, 83.71]
1974      [12.98, 83.36]
1975      [14.98, 82.49]
1976      [15.98, 82.44]
1977      [16.98, 82.45]
1978      [20.97, 83.51]
1979      [22.97, 83.46]
1980      [23.97, 83.51]
1981      [26.97, 83.55]
1982      [27.97, 83.55]
1983      [31.96, 83.51]
1984      [32.96, 83.45]
1985      [33.96, 83.45]
1986      [34.96, 83.50]
1987      [51.94, 85.81]
1988      *#-----
1989      *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
1990      *#-----
1991      ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[2],
1992      RDT=[1] (min),
1993      CHLGTH=[487] (m),   CHSLOPE=[0.23] (%),
1994      FPSLOPE=[0.23] (%),
1995      SECNUM=[3],        NSEG=[3]
1996      ( SEGROUGH, SEGDIST (m))=[0.05,6.97 -0.035,25.87 0.05,29.85] NSEG ↵
times
1997      ( DISTANCE (m), ELEVATION (m))=[ 0, 75.60]
1998      [ 1, 75.54]
1999      [ 1.99, 75.42]
2000      [ 6.97, 73.09]
2001      [11.94, 72.70]
2002      [14.93, 72.66]
2003      [17.91, 72.27]
2004      [23.88, 72.25]
2005      [25.87, 73.03]
2006      [28.86, 74.06]

```

```

2007                                     [29.85, 74.23]
2008 *#=====
2009 *# WC-4A - RURAL - HIGHWAY 417 TO CNR
2010 *#=====
2011 CONTINUOUS NASHYD          ID=[2] NHYD=["WC-4A"], DT=[1]min, AREA=[126.29] (ha),
2012 DWF=[0] (cms), CN=[82], IA=[7] (mm),
2013 N=[2.0], TP=[2.30]hrs,
2014 Continuous simulation parameters:
2015 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2016 InterEventTime=[12] (hrs),
2017 Baseflow simulation parameters:
2018 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2019 VHydCond=[.001] (mm/hr), END=-1
2020 *#=====
2021 *# ADD WC-1+KTC+WC-3 AND WC-4A
2022 *# CREST GAUGE LOCATION WC-1 - WATTS CREEK AT CONFLUENCE WITH KIZELL DRAIN
2023 *#=====
2024 ADD HYD          IDsum=[6], NHYD=["WFP1"], IDs to add=[1+2]
2025 *PRINT HYD          ID=[6], # OF PCYCLES=[1]
2026 *#=====
2027 *# WC-4B - RURAL - HIGHWAY 417 TO CNR
2028 *#=====
2029 CONTINUOUS NASHYD          ID=[4] NHYD=["WC-4B"], DT=[1]min, AREA=[145.27] (ha),
2030 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2031 N=[2.0], TP=[1.22]hrs,
2032 Continuous simulation parameters:
2033 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2034 InterEventTime=[12] (hrs),
2035 Baseflow simulation parameters:
2036 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2037 VHydCond=[.001] (mm/hr), END=-1
2038 *#=====
2039 *# ADD WC-4A AND KIZELL
2040 *#=====
2041 ADD HYD          IDsum=[1], NHYD=["WFP2"], IDs to add=[6+3]
2042 *PRINT HYD          ID=[1], # OF PCYCLES=[1]
2043 *#=====
2044 *# ADD WC-4A AND WC-4B
2045 *#=====
2046 ADD HYD          IDsum=[5], NHYD=["WFP3"], IDs to add=[1+4]
2047 *PRINT HYD          ID=[5], # OF PCYCLES=[1]
2048 *#=====
2049 *# ROUTE KIZELL AND WC-1+KTC+WC-3+WC-4 THROUGH WC-5A
2050 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4677.806
2051 *#=====
2052 ROUTE CHANNEL          IDout=[2], NHYD=["WC-4"], IDin=[5],
2053 RDT=[1] (min),
2054 CHLGTH=[636] (m), CHSLOPE=[0.16] (%),
2055 FPSLOPE=[0.16] (%),
2056 SECNUM=[4677], NSEG=[3]
2057 ( SEGROUGH, SEGDIST (m))=[0.08,95.801 -0.04,102.955 0.08,167.28]
2058 NSEG times
2059 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.4 ]
2060 [ 11.4, 74.3 ]
2061 [ 31.7, 73.6 ]
2062 [51.08, 72.8 ]
2063 [60.69, 72.6 ]
2064 [ 74.1, 71.6 ]
2065 [77.61, 70.8 ]
2066 [84.14, 71 ]
2067 [93.83, 71 ]
2068 [95.801, 70.73 ]
2069 [97.18, 70.5 ]
2070 [ 101, 70.5 ]
2071 [102.955, 70.989 ]
2072 [111.37, 74.5 ]
2073 [121.02, 76.45 ]

```

```

2073 [128.96, 77.6 ]
2074 [139.85, 78.3 ]
2075 [151.67, 80.09 ]
2076 [158.82, 80.63 ]
2077 [167.28, 81.57 ]
2078 *#=====
2079 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4446.172
2080 *#=====
2081 ROUTE CHANNEL IDout=[1], NHYD=["WC-4"], IDin=[2],
2082 RDT=[1] (min),
2083 CHLGTH=[443] (m), CHSLOPE=[0.64] (%),
2084 FPSLOPE=[0.64] (%),
2085 SECNUM=[4446], NSEG=[4]
2086 ( SEGROUGH, SEGDIST (m))=[0.08,101.82 0.05,155.499 -0.04,160.804 ↵
0.08,360.72] NSEG times
2087 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.11 ]
2088 [15.28, 74.3 ]
2089 [39.39, 73.6 ]
2090 [55.02, 73.7 ]
2091 [70.01, 73.1 ]
2092 [101.82, 72.72 ]
2093 [123.37, 72.37 ]
2094 [137.03, 71.7 ]
2095 [152.53, 68.9 ]
2096 [155.499, 68.552 ]
2097 [160.804, 68.559 ]
2098 [163.78, 68.89 ]
2099 [172.88, 69 ]
2100 [180.76, 72.03 ]
2101 [191.21, 72.8 ]
2102 [208.93, 72.49 ]
2103 [239.54, 72.4 ]
2104 [260.28, 72.6 ]
2105 [291.51, 72.6 ]
2106 [360.72, 73.06 ]
2107 *#=====
2108 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3897.472
2109 *#=====
2110 ROUTE CHANNEL IDout=[2], NHYD=["WC-4"], IDin=[1],
2111 RDT=[1] (min),
2112 CHLGTH=[468] (m), CHSLOPE=[0.44] (%),
2113 FPSLOPE=[0.44] (%),
2114 SECNUM=[3897], NSEG=[4]
2115 ( SEGROUGH, SEGDIST (m))=[0.08,161.362 -0.04,164.388 -0.08,164.68 ↵
0.05,242.03] NSEG times
2116 ( DISTANCE (m), ELEVATION (m))=[ 0, 72.01 ]
2117 [14.79, 71.9 ]
2118 [26.32, 71.5 ]
2119 [45.81, 69.5 ]
2120 [ 52.8, 68.5 ]
2121 [67.29, 68.1 ]
2122 [85.91, 68.1 ]
2123 [94.25, 67.9 ]
2124 [116.16, 67.78 ]
2125 [142.44, 67.4 ]
2126 [159.77, 66.1 ]
2127 [161.362, 65.677 ]
2128 [164.388, 65.577 ]
2129 [164.68, 65.61 ]
2130 [166.02, 66.1 ]
2131 [167.47, 66.5 ]
2132 [201.22, 66.8 ]
2133 [208.26, 66.7 ]
2134 [216.93, 67.19 ]
2135 [242.03, 67.3 ]
2136 *#=====
2137 *# WC-5A - RURAL - CNR TO CARLING AVE

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```

2138 *#=====
2139 CONTINUOUS NASHYD          ID=[1] NHYD=["WC-5A"], DT=[1]min, AREA=[59.54] (ha),
2140 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2141 N=[2.0], TP=[0.79]hrs,
2142 Continuous simulation parameters:
2143 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2144 InterEventTime=[12] (hrs),
2145 Baseflow simulation parameters:
2146 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2147 VHydCond=[.001] (mm/hr), END=-1
2148 *#=====
2149 *# ADD WC-5A AND WC-5A UPSTREAM
2150 *# CALIBRATION LOCATION - WATTS CREEK AT CARLING AVENUE
2151 *#=====
2152 ADD HYD                    IDsum=[3], NHYD=["WFP4"], IDs to add=[1+2]
2153 *PRINT HYD                ID=[3], # OF PCYCLES=[1]
2154 *#=====
2155 *# ROUTE WC-5B UPSTREAM THROUGH WC-5B
2156 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3469.421
2157 *# MINIMUM SLOPE ASSUMED 0.1%
2158 *#=====
2159 ROUTE CHANNEL             IDout=[2], NHYD=["WC-5B"], IDin=[3],
2160 RDT=[1] (min),
2161 CHLGTH=[485] (m), CHSLOPE=[0.1] (%),
2162                                FPSLOPE=[0.1] (%),
2163 SECNUM=[3469], NSEG=[4]
2164 ( SEGROUGH, SEGDIST (m))=[0.08,127.46 0.06,131.6 -0.03,141.59
2165                                ( DISTANCE (m), ELEVATION (m))=[ 0, 68.08 ]
2166                                [16.71, 67.1 ]
2167                                [48.15, 66.8 ]
2168                                [75.65, 66.3 ]
2169                                [107.54, 66.2 ]
2170                                [117.33, 66.3 ]
2171                                [127.46, 65.54 ]
2172                                [129.21, 65.3 ]
2173                                [131.6, 64.9 ]
2174                                [136.836, 64.972 ]
2175                                [139.19, 65.3 ]
2176                                [141.59, 65.65 ]
2177                                [161.72, 65.6 ]
2178                                [171.42, 66.1 ]
2179                                [187.05, 66.3 ]
2180                                [224.24, 66.3 ]
2181                                [246.7, 66.1 ]
2182                                [286.52, 66.07 ]
2183                                [304.07, 66.3 ]
2184                                [308.37, 66.7 ]
2185 *#=====
2186 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 2981.379
2187 *#=====
2188 ROUTE CHANNEL             IDout=[1], NHYD=["WC-5B"], IDin=[2],
2189 RDT=[1] (min),
2190 CHLGTH=[307] (m), CHSLOPE=[0.40] (%),
2191                                FPSLOPE=[0.40] (%),
2192 SECNUM=[2981], NSEG=[4]
2193 ( SEGROUGH, SEGDIST (m))=[0.08,9.006 -0.03,14.347 -0.06,14.85
2194                                ( DISTANCE (m), ELEVATION (m))=[ 0, 64.35 ]
2195                                [ 2.07, 64.3 ]
2196                                [ 4.58, 64.2 ]
2197                                [ 5.7, 64.1 ]
2198                                [ 6.83, 63.8 ]
2199                                [ 7.91, 63.37 ]
2200                                [9.006, 63.169 ]
2201                                [ 9.64, 62.8 ]
2202                                [13.64, 62.8 ]

```



```

2203 [14.24, 63.1 ]
2204 [14.347, 63.315 ]
2205 [14.85, 63.35 ]
2206 [15.35, 63.4 ]
2207 [16.49, 63.69 ]
2208 [18.19, 64.21 ]
2209 [21.41, 64.2 ]
2210 [25.06, 64.05 ]
2211 [27.14, 64.06 ]
2212 [28.41, 64.2 ]
2213 [30.25, 64.28 ]
2214 *#=====
2215 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 1585.543
2216 *#=====
2217 ROUTE CHANNEL IDout=[2], NHYD=["WC-5B"], IDin=[1],
2218 RDT=[1] (min),
2219 CHLGTH=[2876] (m), CHSLOPE=[0.16] (%),
2220 FPSLOPE=[0.16] (%),
2221 SECNUM=[1585], NSEG=[4]
2222 ( SEGROUGH, SEGDIST (m))=[0.08,56.84 0.05,124.41 -0.035,128.78
0.08,255.15] NSEG times
2223 ( DISTANCE (m), ELEVATION (m))=[ 0, 64.07 ]
2224 [21.74, 63.8 ]
2225 [40.53, 63.5 ]
2226 [56.84, 61.82 ]
2227 [74.07, 61.6 ]
2228 [98.29, 61.7 ]
2229 [104.39, 61.43 ]
2230 [117.32, 61.8 ]
2231 [124.32, 60.8 ]
2232 [124.41, 60.79 ]
2233 [124.519, 60.783 ]
2234 [127.785, 60.75 ]
2235 [ 128, 60.83 ]
2236 [128.78, 61.17 ]
2237 [130.97, 61.8 ]
2238 [149.66, 61.32 ]
2239 [170.74, 61.4 ]
2240 [191.12, 63.6 ]
2241 [219.28, 64.08 ]
2242 [255.15, 64.1 ]
2243 *#=====
2244 *# WC-5B - RURAL - CARLING AVE TO OUTLET
2245 *#=====
2246 CONTINUOUS NASHYD ID=[4] NHYD=["WC-5B"], DT=[1]min, AREA=[379.59] (ha),
2247 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2248 N=[2.0], TP=[3.28]hrs,
2249 Continuous simulation parameters:
2250 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2251 InterEventTime=[12] (hrs),
2252 Baseflow simulation parameters:
2253 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2254 VHydCond=[.001] (mm/hr), END=-1
2255 *#=====
2256 *# ADD WC-5B AND WC-5B UPSTREAM
2257 *# WATTS CREEK AT OUTLET TO OTTAWA RIVER
2258 *#=====
2259 ADD HYD IDsum=[1], NHYD=["WFP5"], IDs to add=[4+2]
2260 *PRINT HYD ID=[1], # OF PCYCLES=[1]
2261 *%-----|-----|
2262 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
2263 HYD_FILENAME=["WFP5"]
2264 HYD_COMMENT=["WATTS CREEK AT OUTLET TO OTTAWA RIVER"]
2265 *%-----|-----|
2266 *#=====
2267 *
DESIGN STORMS
2268 *#=====

```

```

2269 *FINISH
2270 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0005]
2271 *              "5y12hr.stm"
2272 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0010]
2273 *              "10y12hr.stm"
2274 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0025]
2275 *              "25y12hr.stm"
2276 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0050]
2277 *              "50y12hr.stm"
2278 START          TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[0100]
2279 *              "100y12hr.stm"
2280 FINISH
2281 *#-----
2282 *              CONTINUOUS SIMULATIONS
2283 *#-----
2284 START          TZERO=[1968.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1968]
2285 START          TZERO=[1969.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1969]
2286 START          TZERO=[1970.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1970]
2287 START          TZERO=[1971.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1971]
2288 START          TZERO=[1972.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1972]
2289 START          TZERO=[1973.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1973]
2290 START          TZERO=[1974.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1974]
2291 START          TZERO=[1975.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1975]
2292 START          TZERO=[1976.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1976]
2293 START          TZERO=[1977.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1977]
2294 START          TZERO=[1978.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1978]
2295 START          TZERO=[1979.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1979]
2296 START          TZERO=[1980.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1980]
2297 START          TZERO=[1981.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1981]
2298 START          TZERO=[1982.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1982]
2299 START          TZERO=[1983.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1983]
2300 START          TZERO=[1984.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1984]
2301 START          TZERO=[1985.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1985]
2302 START          TZERO=[1986.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1986]
2303 START          TZERO=[1987.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1987]
2304 START          TZERO=[1988.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1988]
2305 START          TZERO=[1989.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1989]
2306 START          TZERO=[1990.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1990]
2307 START          TZERO=[1991.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1991]
2308 START          TZERO=[1992.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1992]
2309 START          TZERO=[1993.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1993]
2310 START          TZERO=[1994.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1994]
2311 START          TZERO=[1995.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1995]
2312 START          TZERO=[1996.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1996]
2313 START          TZERO=[1997.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1997]
2314 START          TZERO=[1998.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1998]
2315 START          TZERO=[1999.0101], METOUT=[2],  NSTORM=[0],  NRUN=[1999]
2316 START          TZERO=[2000.0101], METOUT=[2],  NSTORM=[0],  NRUN=[2000]
2317 START          TZERO=[2002.0101], METOUT=[2],  NSTORM=[0],  NRUN=[2002]
2318 START          TZERO=[2003.0101], METOUT=[2],  NSTORM=[0],  NRUN=[2003]
2319 START          TZERO=[2004.0101], METOUT=[2],  NSTORM=[0],  NRUN=[2004]
2320 START          TZERO=[2006.0101], METOUT=[2],  NSTORM=[0],  NRUN=[2006]
2321 START          TZERO=[2007.0101], METOUT=[2],  NSTORM=[0],  NRUN=[2007]
2322 FINISH

```

Attachment D

SWMHYMO Model:
Kanata Lakes Development

```

1  2      Metric units
2  *#*****
3  *# Project Name: [Shirley's Brook and Watt's Creek Phase 2 SWM Study]      Project
   Number: [60264539]
4  *# Future Conditions Model for the Watts Creek/Kizell Drain Flood Plain Mapping Study
5  *# Date          : 2014-12-31
6  *# Modeller     : [Olivia Chung]  John Price MVCA
7  *# Company      : AECOM Canada
8  *# License #    : 2988504
9  *#*****
10 *# September 2019, model parameters further updated by JFSAinc
11 *# with use of rainfall and flow monitoring data collected in 2019
12 *#
13 *# - all N values in NASHYDS changed from N=1.1 to N=2
14 *# - all MNI values in existing conditions STANDHYDs changed from 0.025 to 0.013
15 *# - all SLOPI values in STANDHYDs changed from 0.02 to 1.0
16 *# - change STANDHYD infiltration method from SCS to Horton with
17 *# - Horton: Fo=[125](mm/hr), Fc=[25](mm/hr), DCAY=[2.0](/hr), F=[0](mm)
18 *# - set XIMP to a fix value of 0.25 for all existing residential catchments
19 *# - use COMPUTE API          APII=[40], APIK=[0.8]/day,
20 *# - continuous NASHYDs, use BaseFlowOption=[1] , InitGWResVol=[12], GWResK=[0.85],
   VHydCond=[.001]
21 *# - all golf course NASHYDs, use CN=50
22 *# - XIMP=[0.250], for all existing not draining through the grass areas of the golf
   course
23 *#
24 *# - Areas draining across the golf course:
25 *# - those specific STANDHYD commands converted to NASHYDs so that the infiltrated
   water could come back into the system. This allowed a much better volume comparison
   through the Beaver Pond.
26 *# - The CN and IA values for those NASHYDs were weighted averages of CN=90 for TIMP
   and CN=50 for grass areas, and the IA was based on weighted average of IA=1.5 for TIMP
   and IA=5.0 for grass areas.
27 *# - The Tp value was simply calculated by using the (LGI/0.3 * 2/3) / 3600, where the
   value of 0.3 was my assumed flow velocity. Note, there are 4 catchments to which this
   was done, for a total of 48.3 ha representing just over 11% of the total drainage area
   to the Beaver Pond.
28 *# - removed the two IBI Route Reservoirs that were previously inserted to account
   for some hidden system storage.
29 *#
30 *#=====
31 *# WATTS CREEK SUBWATERSHED
32 *# MODEL CONVERTED FROM QUALHYMO MODEL (DILLON, 2009)
33 *# DECEMBER 2014
34 *#=====
35 *# Model updated by JFSA (June 2019)to allow for continuous simulations to complete
36 *# preliminary erosion assessment.
37 *# Model reverted back to existing conditions using parameters as documented in
38 *# MVCA's Watts Creek Final Report November 2017
39 *# Model updated to reflect the current design for Kanata Lakes Stage 9 as per IBI's
40 *# March 2018 Design Brief
41 *# Kanata Lakes Stages 7 & 8 as per MVCA model
42 *#=====
43 *#
44 *#                               KIZELL DRAIN
45 *#=====
46 *# Area Tributary to Beaver Pond and Kizell Cell
47 *#=====
48 *# Derived from Scenario 20 of Phase 1 SWM Study
49 *# AECOM MODEL + GOLF COURSE DETENTION PONDS
50 *# AMC II Condition
51 *# RAINFALL - BEAVER POND RAIN GAUGE (POINT RAINFALL)
52 *# DESIGN EVENTS
53 *#=====
54 *#                               DESIGN STORMS
55 *#=====
56 *%-----|-----|

```

```

57  START          TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0002]
58  *              "2y12hr.stm"
59  READ STORM     STORM_FILENAME=["storm.001"]
60  *%-----|-----|
61  *#=====|-----|
62  *              CALIBRATION EVENT
63  *#=====|-----|
64  *%-----|-----|
65  *START          TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[2019]
66  *              "P4June6-2019.stm"
67  *
68  *READ STORM     STORM_FILENAME=["storm.001"]
69  *%-----|-----|
70  *#=====|-----|
71  *              CONTINUOUS SIMULATIONS
72  *#=====|-----|
73  *START          TZERO=[1967.0719], METOUT=[2], NSTORM=[0], NRUN=[1967]
74  *%              [""] <--storm filename, one per line for NSTORM time
75  *%-----|-----|
76  *# Ottawa International Airport - 19 July 1967 to 01 Nov 2007
77  *READ AES DATA AES_FILENAME=["YOW_1967_2007.123"],
78  *              IELEM=[123], START_DATE=[0], END_DATE=[-364]
79  *%-----|-----|
80  *%-----|-----|
81  COMPUTE API     APII=[40], APIK=[0.8]/day,
82  *%-----|-----|
83  *#=====|-----|
84  *# AREA 3A-1 (URBAN PORTION of Area North of Campeau Drive) TO DA 5A
85  *#=====|-----|
86  *# XIMP reduced to 0.05 since area drains across the golf course
87  CONTINUOUS STANDHYD ID=[10], NHYD=["000100"], DT=[1] (min), AREA=[2.7] (ha),
88  XIMP=[0.05], TIMP=[0.47], DWF=[0] (cms),
89  LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
90  DCAY=[2.0] (/hr), F=[0] (mm),
91  Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
92  LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
93  Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
94  LGI=[2134] (m), MNI=[0.013], SCI=[0] (min),
95  Continuous simulation parameters:
96  IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
97  InterEventTime=[12] (hrs), END=-1
98  *%-----|-----|
99  *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
100 *# over golf course and we want to recapture the baseflow
101 CONTINUOUS NASHYD ID=[10], NHYD=["000100"], DT=[1] (min), AREA=[2.7] (ha)
102 DWF=[0] (cms), CN/C=[68.8], IA=[3.38] (mm), N=[2], TP=[1.32] (hrs),
103 Continuous simulation parameters:
104 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
105 InterEventTime=[12] (hrs),
106 Baseflow simulation parameters:
107 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
108 VHydCond=[.001] (mm/hr), END=-1
109 *%-----|-----|
110 *#=====|-----|
111 *# AREA 3A-2 (URBAN PORTION of Area North of Campeau Drive)
112 *#=====|-----|
113 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[33.4] (ha),
114 XIMP=[0.250], TIMP=[0.41], DWF=[0] (cms),
115 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
116 DCAY=[2.0] (/hr), F=[0] (mm),
117 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
118 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
119 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
120 LGI=[471] (m), MNI=[0.013], SCI=[0] (min),
Continuous simulation parameters:
IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),

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121 InterEventTime=[12](hrs), END=-1
122 *%-----|-----|
123 *
124 *#=====|-----|
125 *# AREA 3B (GOLF PORTION of Area North of Campeau Drive) TO DA 5A
126 *#=====|-----|
127 * Original CN=62
128 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[6.3](ha),
129 DWF=[0](cms), CN=[50], IA=[5.0](mm),
130 N=[2.0], TP=[0.55]hrs,
131 Continuous simulation parameters:
132 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.03]/(mm),
133 InterEventTime=[12](hrs),
134 Baseflow simulation parameters:
135 BaseFlowOption=[1], InitGWResVol=[12](mm), GWResK=[0.85](mm/day/mm),
136 VHydCond=[.001](mm/hr), END=-1
137 *%-----|-----|
138 *#=====|-----|
139 *# ADDED AREA 3A-1 TO 3B
140 *#=====|-----|
141 *
142 ADD HYD IDsum=[3], NHYD=[000321], IDs to add=[10+2]
143 *%-----|-----|
144 *#=====|-----|
145 *# DA 5A
146 *#=====|-----|
147 ROUTE RESERVOIR IDout=[2], NHYD=[000100], IDin=[3],
148 RDT=[1](min),
149 TABLE of ( OUTFLOW-STORAGE ) values
150 (cms) - (ha-m)
151 [ 0.0 , 0.0 ]
152 [ 0.51 , 0.00005 ]
153 [ 0.65 , 0.0040 ]
154 [ 0.76 , 0.0438 ]
155 [ 0.86 , 0.1887 ]
156 [ 0.95 , 0.5613 ]
157 [ 0.98 , 0.8197 ]
158 [200.00 , 0.9017 ]
159 [ -1 , -1 ] (max twenty pts)
160 IDovf=[ ], NHYDovf=[ ]
161 *%-----|-----|
162 *#=====|-----|
163 *# ADDED OUTFLOW FROM DA 5A TO 3A-2
164 *#=====|-----|
165 *
166 ADD HYD IDsum=[3], NHYD=[000321], IDs to add=[1+2]
167 *%-----|-----|
168 *
169 *#=====|-----|
170 *# AREA 12 (GOLF PORTION OF Area East of Knudson Drive - DA 6B)
171 *#=====|-----|
172 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1]min, AREA=[2.27](ha),
173 DWF=[0](cms), CN=[50], IA=[5.0](mm),
174 N=[2.0], TP=[0.37]hrs,
175 Continuous simulation parameters:
176 IaRECper=[6](hrs), SMIN=[-1](mm), SMAX=[-1](mm), SK=[0.03]/(mm),
177 InterEventTime=[12](hrs),
178 Baseflow simulation parameters:
179 BaseFlowOption=[1], InitGWResVol=[12](mm), GWResK=[0.85](mm/day/mm),
180 VHydCond=[.001](mm/hr), END=-1
181 *%-----|-----|
182 *
183 *#=====|-----|
184 *# AREA 13 (GOLF PORTION OF Area East of Knudson Drive - DA 6A)
185 *#=====|-----|
186 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[2.9](ha),
187 DWF=[0](cms), CN=[50], IA=[5.0](mm),

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188 N=[2.0], TP=[0.64]hrs,
189 Continuous simulation parameters:
190 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
191 InterEventTime=[12] (hrs),
192 Baseflow simulation parameters:
193 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
194 VHydCond=[.001] (mm/hr), END=-1
195 *%-----|-----|
196 *#=====|=====|
197 *# ADDED AREA 13 AND AREA 12 TO 3A-2
198 *#=====|=====|
199 *
200 ADD HYD IDsum=[10], NHYD=[000321], IDs to add=[1+2+3]
201 *%-----|-----|
202 *
203 *#=====|=====|
204 *# AREA 2A (URBAN PORTION OF Area North of Campeau Drive)
205 *#=====|=====|
206 *# ORIGINAL AREA 2A COMMAND FOLLOWS, WITH REDUCED AREA FOR THE PURPOSE OF GAUGE
207 *# ON CAMPEAU DRIVE, THEN REINSERTED FOR OVERALL MODEL
208 **CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[29.3] (ha),
209 ** XIMP=[0.250], TIMP=[0.45], DWF=[0] (cms),
210 * LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
** Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
** LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
** Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
** LGI=[858] (m), MNI=[0.013], SCI=[0] (min),
** Continuous simulation parameters:
** IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
** SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
** InterEventTime=[12] (hrs), END=-1
219 *%-----|-----|
220 * Estimated at 22.6 ha to measuring point off GeoOttawa - not exact
221 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[22.6] (ha),
222 XIMP=[0.250], TIMP=[0.45], DWF=[0] (cms),
223 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
** Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
** LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
** Impervious surfaces: IAimp=[1.5] (mm), SLPI=[1] (%),
** LGI=[388] (m), MNI=[0.013], SCI=[0] (min),
** Continuous simulation parameters:
** IaRECper=[3] (hrs), IaRECimp=[1.5] (hrs),
** InterEventTime=[12] (hrs), END=-1
231 *%-----|-----|
232 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
233 HYD_FILENAME=["Campeau.hyd"]
234 HYD_COMMENT=["Campeau Drive monitoring site"]
235 *%-----|-----|
236 *#READ HYD ID=[2], NHYD=["Measured"],
237 *# HYD_FILENAME=["Q_CampeauAt5min.hyd"]
238 *%-----|-----|
239 *# Area re-introduced to model completeness, but XIMP reduced to 0.05 since area drains
across golf course
240 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[29.3] (ha),
241 XIMP=[0.05], TIMP=[0.45], DWF=[0] (cms),
242 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
** Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
** LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
** Impervious surfaces: IAimp=[1.5] (mm), SLPI=[1] (%),
** LGI=[441] (m), MNI=[0.013], SCI=[0] (min),
** Continuous simulation parameters:
** IaRECper=[3] (hrs), IaRECimp=[1.5] (hrs),

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249 InterEventTime=[12] (hrs), END=-1
250 *%-----|----- ↵
-----|
251 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
252 *# over golf course and we want to recapture the baseflow
253 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[29.3] (ha)
254 DWF=[0] (cms), CN/C=[68], IA=[3.4] (mm),
255 N=[2], TP=[0.27] (hrs),
256 Continuous simulation parameters:
257 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
258 InterEventTime=[12] (hrs),
259 Baseflow simulation parameters:
260 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
261 VHydCond=[.001] (mm/hr), END=-1
262 *
263 *#=====
264 *# AREA 2B-1 (GOLF PORTION OF Area North of Campeau Drive) TO DA 3
265 *#=====
266 * Original CN=66
267 CONTINUOUS NASHYD ID=[4], NHYD=["000100"], DT=[1]min, AREA=[13] (ha),
268 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
269 N=[2.0], TP=[0.443]hrs,
270 Continuous simulation parameters:
271 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
272 InterEventTime=[12] (hrs),
273 Baseflow simulation parameters:
274 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
275 VHydCond=[.001] (mm/hr), END=-1
276 *%-----|-----|
277 *#=====
278 *# ADD 2A TO 2B-1
279 *#=====
280 ADD HYD IDsum=[2], NHYD=[000321], IDs to add=[1+4]
281 *%-----|-----|
282 *
283 *#=====
284 *# DA 3
285 *#=====
286 ROUTE RESERVOIR IDout=[4], NHYD=[000100], IDin=[2],
287 RDT=[1] (min),
288 TABLE of ( OUTFLOW-STORAGE ) values
289 (cms) - (ha-m)
290 [ 0.0 , 0.0 ]
291 [ 0.0 , 0.0240 ]
292 [ 0.9 , 0.4127 ]
293 [ 2.25 , 0.4798 ]
294 [ 4.16 , 0.5507 ]
295 [ 10.00 , 0.6058 ]
296 [ -1 , -1 ] (max twenty pts)
297 IDovf=[ ], NHYDovf=[ ]
298 *%-----|-----|
299 *
300 *#=====
301 *# AREA 2C (URBAN PORTION OF Area North of Campeau Drive)
302 *#=====
303 *# XIMP reduced to 0.05 since area drains across the golf course
304 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[13.8] (ha),
305 XIMP=[0.05], TIMP=[0.52], DWF=[0] (cms),
306 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr), ↵
DCAY=[2.0] (/hr), F=[0] (mm),
307 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
308 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
309 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
310 LGI=[303] (m), MNI=[0.013], SCI=[0] (min),
311 Continuous simulation parameters:
312 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
313 InterEventTime=[12] (hrs), END=-1

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314 *%-----|-----|
315 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
316 *# over golf course and we want to recapture the baseflow
317 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[13.8] (ha)
318 DWF=[0] (cms), CN/C=[70.8], IA=[3.18] (mm), N=[2], TP=[0.187] (hrs),
319 Continuous simulation parameters:
320 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
321 InterEventTime=[12] (hrs),
322 Baseflow simulation parameters:
323 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
324 VHydCond=[.001] (mm/hr), END=-1
325 *%-----|-----|
326 ADD HYD IDsum=[2], NHYD=[000321], IDs to add=[1+4]
327 *%-----|-----|
328 *
329 *#=====
330 *# AREA 2B-2 (GOLF PORTION OF Area North of Campeau Drive) TO DA 4
331 *#=====
332 * Original CN=63
333 CONTINUOUS NASHYD ID=[5], NHYD=["000100"], DT=[1]min, AREA=[15.7] (ha),
334 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
335 N=[2.0], TP=[0.837]hrs,
336 Continuous simulation parameters:
337 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
338 InterEventTime=[12] (hrs),
339 Baseflow simulation parameters:
340 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
341 VHydCond=[.001] (mm/hr), END=-1
342 *%-----|-----|
343 ADD HYD IDsum=[6], NHYD=[000321], IDs to add=[2+5]
344 *%-----|-----|
345 *#=====
346 *# DA 4
347 *#=====
348 ROUTE RESERVOIR IDout=[2], NHYD=[000100], IDin=[6],
349 RDT=[1] (min),
350 TABLE of ( OUTFLOW-STORAGE ) values
351 (cms) - (ha-m)
352 [ 0.0 , 0.0 ]
353 [ 1.47 , 0.00001 ]
354 [ 2.42 , 0.0080 ]
355 [ 3.09 , 0.0650 ]
356 [ 3.63 , 0.3459 ]
357 [ 3.86 , 0.8899 ]
358 [ 4.09 , 1.6418 ]
359 [ 4.25 , 3.6976 ]
360 [ 200.0 , 4.0674 ]
361 [ -1 , -1 ] (max twenty pts)
362 IDovf=[ ], NHYDovf=[ ]
363 *%-----|-----|
364 *#=====
365 *# ADD AREA 3A-2 TO OUTFLOW OF DA 4
366 *#=====
367 *# (JFS: THIS ADD HYD IS PART OF WHAT FLOWS TO THE WESLOCK GAUGE)
368 ADD HYD IDsum=[5], NHYD=[000321], IDs to add=[2+10]
369 *%-----|-----|
370 SAVE HYD ID=[5], # OF PCYCLES=[-1], ICASEsh=[-1]
371 HYD_FILENAME=["WESLOCK-A.HYD"]
372 HYD_COMMENT=["PART A OF WHAT FLOWS THROUGH GAUGE ON WESLOCK"]
373 *%-----|-----|
374 *#=====
375 *# AREA 1C (URBAN PORTION of Area North of Campeau Drive)
376 *#=====
377 *# This area is piped through the golf course, so no change in XIMP
378 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[17.8] (ha),

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379 XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
380 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
381 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
382 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
383 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
384 LGI=[344] (m), MNI=[0.013], SCI=[0] (min),
385 Continuous simulation parameters:
386 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
387 InterEventTime=[12] (hrs), END=-1
388 *%-----|-----|
389 *
390 *#=====
391 *# AREA 1B (GOLF PORTION OF Area North of Campeau Drive)
392 *#=====
393 * Original CN=61
394 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[9.3] (ha),
395 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
396 N=[2.0], TP=[0.81]hrs,
397 Continuous simulation parameters:
398 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
399 InterEventTime=[12] (hrs),
400 Baseflow simulation parameters:
401 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
402 VHydCond=[.001] (mm/hr), END=-1
403 *%-----|-----|
404 *#=====
405 *# ADD 1C TO 1B
406 *#=====
407 ADD HYD IDsum=[3], NHYD=[000321], IDs to add=[1+2]
408 *%-----|-----|
409 *
410 *#=====
411 *# AREA 1A (INSTITUTION BLOCK)
412 *#=====
413 CONTINUOUS NASHYD ID=[4], NHYD=["000100"], DT=[1]min, AREA=[11.4] (ha),
414 DWF=[0] (cms), CN=[61], IA=[5.0] (mm),
415 N=[2.0], TP=[0.56]hrs,
416 Continuous simulation parameters:
417 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
418 InterEventTime=[12] (hrs),
419 Baseflow simulation parameters:
420 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
421 VHydCond=[.001] (mm/hr), END=-1
422 *%-----|-----|
423 *#=====
424 *# AREA 1D (URBAN PORTION of Area North of Campeau Drive)
425 *#=====
426 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[15.8] (ha),
427 XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
428 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
429 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
430 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
431 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
432 LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
433 Continuous simulation parameters:
434 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
435 InterEventTime=[12] (hrs), END=-1
436 *%-----|-----|
437 *#=====
438 *# FROM AREA 1D, MAJOR FLOW TO 5B - MINOR FLOW TO 5C
439 *# 85 L/S/HA * 15.8 HA = 1.343 L/S
440 *#=====
441 COMPUTE DUALHYD IDin=[1], CINLET=[1.343] (cms), NINLET=[1],
442 MAJID=[7], MajNHYD=[000100],
443 MINID=[8], MinNHYD=[000100],

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444             TMJSTO=[0] (cu-m)
445 *%-----|-----|
446 *#-----|-----|
447 *# ADD 1A AND 1B TO 1D MINOR
448 *#-----|-----|
449 *# (JFS: THIS ADD HYD IS PART OF WHAT FLOWS AT THE WESLOCK GAUGE)
450 ADD HYD             IDsum=[6], NHYD=[000321], IDs to add=[4+3+8]
451 *%-----|-----|
452 SAVE HYD           ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
453                   HYD_FILENAME=["WESLOCK-B.HYD"]
454                   HYD_COMMENT=["PART B OF FLOWS AT WESLOCK"]
455 *%-----|-----|
456 *
457 *#-----|-----|
458 *# AREA 5A (URBAN PORTION OF Area North of Knudson Drive)
459 *#-----|-----|
460 *# XIMP reduced to 0.05 since area drains across the golf course
461 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[2.5] (ha),
462                   XIMP=[0.05], TIMP=[0.50], DWF=[0] (cms),
463                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
464                   DCAY=[2.0] (/hr), F=[0] (mm),
465                   Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
466                   LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
467                   Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
468                   LGI=[129] (m), MNI=[0.013], SCI=[0] (min),
469                   Continuous simulation parameters:
470                   IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
471                   InterEventTime=[12] (hrs), END=-1
472 *%-----|-----|
473 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
474 *# over golf course and we want to recapture the baseflow
475 CONTINUOUS NASHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[2.5] (ha)
476                   DWF=[0] (cms), CN/C=[45.25], IA=[3.25] (mm), N=[2], TP=[0.08] (hrs),
477                   Continuous simulation parameters:
478                   IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
479                   InterEventTime=[12] (hrs),
480                   Baseflow simulation parameters:
481                   BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
482                   VHydCond=[.001] (mm/hr), END=-1
483 *
484 *#-----|-----|
485 *# AREA 5B (GOLF PORTION OF Area North of Knudson Drive)
486 *#-----|-----|
487 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[9.5] (ha),
488                   DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
489                   N=[2.0], TP=[0.67]hrs,
490                   Continuous simulation parameters:
491                   IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
492                   InterEventTime=[12] (hrs),
493                   Baseflow simulation parameters:
494                   BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
495                   VHydCond=[.001] (mm/hr), END=-1
496 *%-----|-----|
497 *#-----|-----|
498 *# ADD 5A AND 1D MAJOR TO 5B
499 *#-----|-----|
500 ADD HYD             IDsum=[4], NHYD=[000321], IDs to add=[1+7+2]
501 *%-----|-----|
502 *
503 *#-----|-----|
504 *# AREA 5C (URBAN PORTION OF Area North of Knudson Drive)
505 *#-----|-----|
506 CONTINUOUS STANDHYD ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[6.2] (ha),
507                   XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
508                   LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
509                   DCAY=[2.0] (/hr), F=[0] (mm),

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508          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
509                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
510          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
511                                LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
512          Continuous simulation parameters:
513          IaREcper=[6] (hrs), IaREcimp=[1.5] (hrs),
514          InterEventTime=[12] (hrs), END=-1
515  *%-----|-----|
516  *#=====|=====|
517  *# MAJOR FLOW TO 5B - MINOR FLOW TO 6A
518  *# 85 L/S/HA * 6.2 HA = 0.527 L/S
519  *#=====|=====|
520  COMPUTE DUALHYD      IDin=[1], CINLET=[0.527] (cms), NINLET=[1],
521                        MAJID=[2], MajNHYD=[000100],
522                        MINID=[8], MinNHYD=[000100],
523                        TMJSTO=[0] (cu-m)
524  *%-----|-----|
525  *#=====|=====|
526  *# ADD 5C MAJOR TO 5B
527  *#=====|=====|
528  ADD HYD              IDsum=[7], NHYD=[000321], IDs to add=[2+4]
529  *%-----|-----|
530  *
531  *#=====|=====|
532  *# DA 8
533  *# WITH UPDATED DISCHARGE RATING CURVE BASED ON FIELD SURVEY INFORMATION
534  *#=====|=====|
535  ROUTE RESERVOIR      IDout=[3], NHYD=[000100], IDin=[7],
536                        RDT=[1] (min),
537                        TABLE of ( OUTFLOW-STORAGE ) values
538                                (cms) - (ha-m)
539                                [ 0.0 , 0.0 ]
540                                [ 0.18 , 0.0004 ]
541                                [ 0.22 , 0.0023 ]
542                                [ 0.25 , 0.0092 ]
543                                [ 0.28 , 0.0250 ]
544                                [ 0.30 , 0.0580 ]
545                                [ 0.33 , 0.1272 ]
546                                [ 0.35 , 0.2435 ]
547                                [ 0.37 , 0.4650 ]
548                                [ 200.0 , 0.5115 ]
549                                [ -1 , -1 ] (max twenty pts)
550                        IDovf=[ ], NHYDovf=[ ]
551  *%-----|-----|
552  *#=====|=====|
553  *# ADD 1D MINOR AND OUTLET OF DA 8 TO 5C MINOR
554  *#=====|=====|
555  ADD HYD              IDsum=[2], NHYD=[000321], IDs to add=[6+3+8]
556  *%-----|-----|
557  *#=====|=====|
558  *# ADD 3A TO 5C
559  *#=====|=====|
560  ADD HYD              IDsum=[5], NHYD=[000321], IDs to add=[5+2]
561  *%-----|-----|
562  *%SHIFT HYD was removed as it was not being used and was crashing the model
563  *%SHIFT HYD          IDout=[5], NHYD=[000100], IDin=[4], TLAG=[0] (min)
564  *%-----|-----|
565  *
566  *#=====|=====|
567  *# AREA 6A (URBAN PORTION OF Area North of Knudson Drive)
568  *#=====|=====|
569  *# XIMP reduced to 0.05 since area drains across the golf course
570  CONTINUOUS STANDHYD  ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[4.1] (ha),
571                        XIMP=[0.050], TIMP=[0.52], DWF=[0] (cms),
572                        LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
573                        DCAY=[2.0] (/hr), F=[0] (mm),
          Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2] (%),

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574             LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
575 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
576             LGI=[165] (m), MNI=[0.013], SCI=[0] (min),
577 Continuous simulation parameters:
578 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
579 InterEventTime=[12] (hrs), END=-1
580 *%-----|-----|
581 *
582 *#-----|-----|
583 *# AREA 6B (GOLF PORTION OF Area North of Knudson Drive)
584 *#-----|-----|
585 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[5.9] (ha),
586 DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
587 N=[2.0], TP=[0.87]hrs,
588 Continuous simulation parameters:
589 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
590 InterEventTime=[12] (hrs),
591 Baseflow simulation parameters:
592 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
593 VHydCond=[.001] (mm/hr), END=-1
594 *%-----|-----|
595 *#-----|-----|
596 *# ADD 6A TO 6B
597 *#-----|-----|
598 ADD HYD                IDsum=[3], NHYD=[000321], IDs to add=[1+2]
599 *%-----|-----|
600 *
601 *#-----|-----|
602 *# AREA 6C (URBAN PORTION OF Area North of Knudson Drive)
603 *#-----|-----|
604 CONTINUOUS STANDHYD   ID=[1], NHYD=["000100"], DT=[1] (min), AREA=[5.3] (ha),
605 XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
606 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
607 DCAY=[2.0] (/hr), F=[0] (mm),
608 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
609             LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
610 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
611             LGI=[187] (m), MNI=[0.013], SCI=[0] (min),
612 Continuous simulation parameters:
613 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
614 InterEventTime=[12] (hrs), END=-1
615 *%-----|-----|
616 *#-----|-----|
617 *# MAJOR FLOW TO 6B - MINOR FLOW TO 7
618 *# 85 L/S/HA * 5.3 HA = 0.4505 L/S
619 *#-----|-----|
620 COMPUTE DUALHYD      IDin=[1], CINLET=[0.451] (cms), NINLET=[1],
621 MAJID=[2], MajNHYD=[000100],
622 MINID=[6], MinNHYD=[000100],
623 TMJSTO=[0] (cu-m)
624 *%-----|-----|
625 *#-----|-----|
626 *# ADD 6C MAJOR TO 6B
627 *#-----|-----|
628 ADD HYD                IDsum=[4], NHYD=[000321], IDs to add=[2+3]
629 *#-----|-----|
630 *# DA 9
631 *# WITH UPDATED DISCHARGE RATING CURVE BASED ON FIELD SURVEY INFORMATION
632 *#-----|-----|
633 ROUTE RESERVOIR      IDout=[3], NHYD=[000100], IDin=[4],
634 RDT=[1] (min),
635             TABLE of ( OUTFLOW-STORAGE ) values
636             (cms) - (ha-m)
637             [ 0.0 , 0.0 ]
638             [ 0.25 ,0.00003 ]
639             [ 0.31 ,0.0039 ]
640             [ 0.36 ,0.0285 ]

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640         [ 0.40 ,0.0901 ]
641         [ 0.44 ,0.2499 ]
642         [ 0.47 ,0.6154 ]
643         [ 0.48 ,0.7609 ]
644         [200.00 ,0.8370 ]
645         [ -1 , -1 ] (max twenty pts)
646         IDovf=[ ], NHYDovf=[ ]
647 *%-----|-----|
648 *#=====|=====|
649 *# ADD DA 9 OUTFLOW TO 6C MINOR
650 *#=====|=====|
651 ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[3+6]
652 *%-----|-----|
653 *#=====|=====|
654 *# ADD 5C TO 6C
655 *#=====|=====|
656 ADD HYD          IDsum=[5], NHYD=[000321], IDs to add=[5+2]
657 *%-----|-----|
658 *SHIFT HYD was removed as it was not being used and was crashing the model
659 *SHIFT HYD      IDout=[5], NHYD=[00100], IDin=[4], TLAG=[0] (min)
660 *%-----|-----|
661 *
662 *#=====|=====|
663 *# AREA 14 (GOLF PORTION OF Area East of Knudson Drive - DA 11)
664 *#=====|=====|
665 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[2.38] (ha),
666                       DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
667                       N=[2.0], TP=[0.40]hrs,
668                       Continuous simulation parameters:
669                       IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
670                       InterEventTime=[12] (hrs),
671                       Baseflow simulation parameters:
672                       BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
673                       VHydCond=[.001] (mm/hr), END=-1
674 *%-----|-----|
675 *#=====|=====|
676 *# DA 11
677 *# RATING CURVE BASED ON FIELD SURVEY INFORMATION
678 *#=====|=====|
679 ROUTE RESERVOIR      IDout=[4], NHYD=[000100], IDin=[2],
680                       RDT=[1] (min),
681                       TABLE of ( OUTFLOW-STORAGE ) values
682                               (cms) - (ha-m)
683                               [ 0.0 , 0.0 ]
684                               [ 0.09 ,0.0019 ]
685                               [ 0.12 ,0.0735 ]
686                               [ 0.145 ,0.2234 ]
687                               [ 0.146 ,0.2349 ]
688                               [200.00 ,0.2584 ]
689                               [ -1 , -1 ] (max twenty pts)
690                               IDovf=[ ], NHYDovf=[ ]
691 *%-----|-----|
692 *#=====|=====|
693 *# ADD OUTFLOW OF DA 11 TO 6C
694 *#=====|=====|
695 ADD HYD          IDsum=[2], NHYD=[000321], IDs to add=[5+4]
696 *%-----|-----|
697 *
698 *#=====|=====|
699 *# AREA 15 (GOLF PORTION OF Area South of Walden Drive - DA 10B)
700 *#=====|=====|
701 CONTINUOUS NASHYD      ID=[4], NHYD=["000100"], DT=[1]min, AREA=[2.5] (ha),
702                       DWF=[0] (cms), CN=[50], IA=[5.0] (mm),
703                       N=[2.0], TP=[0.20]hrs,
704                       Continuous simulation parameters:
705                       IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
706                       InterEventTime=[12] (hrs),

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707 Baseflow simulation parameters:
708 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
709 VHydCond=[.001] (mm/hr) , END=-1
710 *%-----|-----|
711 *#=====|=====|
712 *# DA 10B
713 *# RATING CURVE BASED ON FIELD SURVEY INFORMATION
714 *#=====|=====|
715 ROUTE RESERVOIR IDout=[5], NHYD=[000100], IDin=[4],
716 RDT=[1] (min),
717 TABLE of ( OUTFLOW-STORAGE ) values
718 (cms) - (ha-m)
719 [ 0.0 , 0.0 ]
720 [ 0.32 , 0.0018 ]
721 [ 0.34 , 0.0093 ]
722 [ 0.36 , 0.0309 ]
723 [ 0.38 , 0.1597 ]
724 [ 0.40 , 0.3353 ]
725 [200.00 , 0.3688 ]
726 [ -1 , -1 ] (max twenty pts)
727 IDovf=[ ], NHYDovf=[ ]
728 *%-----|-----|
729 *
730 *#=====|=====|
731 *# AREA 7 (Adjacent to Beaver Pond)
732 *#=====|=====|
733 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[19.6] (ha),
734 XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
735 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
736 DCAY=[2.0] (/hr), F=[0] (mm),
737 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
738 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
739 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
740 LGI=[361] (m), MNI=[0.013], SCI=[0] (min),
741 Continuous simulation parameters:
742 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
743 InterEventTime=[12] (hrs), END=-1
744 *%-----|-----|
745 *# ADD OUTFLOW OF DA 10B AND 6C TO 7
746 *# TOTAL FLOW - AT EXISTING 2700 MM OUTLET
747 *#=====|=====|
748 ADD HYD IDsum=[10], NHYD=[000321], IDs to add=[5+2+1]
749 *%-----|-----|
750 *
751 *#=====|=====|
752 *# AREA 4C
753 *#=====|=====|
754 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[5.8] (ha),
755 XIMP=[0.250], TIMP=[0.53], DWF=[0] (cms),
756 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
757 DCAY=[2.0] (/hr), F=[0] (mm),
758 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
759 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
760 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
761 LGI=[196] (m), MNI=[0.013], SCI=[0] (min),
762 Continuous simulation parameters:
763 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
764 InterEventTime=[12] (hrs), END=-1
765 *%-----|-----|
766 *# MAJOR FLOW TO 4B - MINOR FLOW TO 4A
767 *# 85 L/S/HA * 5.8 HA = 493 L/S
768 *#=====|=====|
769 COMPUTE DUALHYD IDin=[1], CINLET=[0.493] (cms), NINLET=[1],
770 MAJID=[5], MajNHYD=[000100],
771 MINID=[6], MinNHYD=[100100],

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772             TMJSTO=[0] (cu-m)
773 *%-----|-----|
774 *
775 *#=====|-----|
776 *# AREA 4A - FLOW THROUGH AREA 4
777 *#=====|-----|
778 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[15.8] (ha),
779                        XIMP=[0.250], TIMP=[0.66], DWF=[0] (cms),
780                        LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
781                        DCAY=[2.0] (/hr), F=[0] (mm),
782                        Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
783                        LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
784                        Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
785                        LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
786                        Continuous simulation parameters:
787                        IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
788                        InterEventTime=[12] (hrs), END=-1
789 *%-----|-----|
790 *
791 *#=====|-----|
792 *# ADDITION OF 4C MINOR TO 4A
793 *#=====|-----|
794 *
795 ADD HYD                  IDsum=[4], NHYD=[000231], IDs to add=[3+6]
796 *%-----|-----|
797 *# AREA 4B - ROUTE THROUGH ON SITE STORAGE
798 *#=====|-----|
799 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[6.2] (ha),
800                        XIMP=[0.250], TIMP=[0.57], DWF=[0] (cms),
801                        LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
802                        DCAY=[2.0] (/hr), F=[0] (mm),
803                        Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
804                        LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
805                        Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
806                        LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
807                        Continuous simulation parameters:
808                        IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
809                        InterEventTime=[12] (hrs), END=-1
810 *%-----|-----|
811 *#=====|-----|
812 *# ADDITION OF MAJOR FLOW AT 4C TO AREA 4B
813 *#=====|-----|
814 *
815 ADD HYD                  IDsum=[6], NHYD=[000231], IDs to add=[5+3]
816 *%-----|-----|
817 *# ON-SITE STORAGE IN AREA 4B
818 *# 85L/S/HA
819 *#=====|-----|
820 *
821 ROUTE RESERVOIR          IDout=[3], NHYD=[000100], IDin=[6],
822                        RDT=[1] (min),
823                        TABLE of ( OUTFLOW-STORAGE ) values
824                        (cms) - (ha-m)
825                        [ 0.0 , 0.0 ]
826                        [ 0.527, 0.2840 ]
827                        [ -1 , -1 ] (max twenty pts)
828                        IDovf=[], NHYDovf=[]
829 *%-----|-----|
830 *#=====|-----|
831 *# ADDITION OF ROUTED 4B TO AREA 4A
832 *#=====|-----|
833 *
834 ADD HYD                  IDsum=[8], NHYD=[000231], IDs to add=[4+3]
835 *%-----|-----|
836 *# AREA 4 (Adjacent to Beaver Pond)

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837 *#=====
838 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[21.2] (ha),
839 XIMP=[0.250], TIMP=[0.38], DWF=[0] (cms),
840 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
841 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
842                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
843 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
844                                LGI=[375] (m), MNI=[0.013], SCI=[0] (min),
845 Continuous simulation parameters:
846 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
847 InterEventTime=[12] (hrs), END=-1
848 *%-----|-----
849 *#=====
850 *# ADDITION OF MINOR FLOW AT 4A TO AREA 4
851 *#=====
852 ADD HYD                  IDsum=[3], NHYD=[000231], IDs to add=[8+1]
853 *%-----|-----
854 ADD HYD                  IDsum=[7], NHYD=[000231], IDs to add=[10+3]
855 *%-----|-----
856 *#=====
857 *# AREA 9 (RURAL - includes Beaver Pond itself)
858 *#=====
859 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[18.9] (ha),
860 DWF=[0] (cms), CN=[75], IA=[5.0] (mm),
861 N=[2.0], TP=[0.37]hrs,
862 Continuous simulation parameters:
863 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
864 InterEventTime=[12] (hrs),
865 Baseflow simulation parameters:
866 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
867 VHydCond=[.001] (mm/hr), END=-1
868 *%-----|-----
869 ADD HYD                  IDsum=[6], NHYD=[000321], IDs to add=[7+2]
870 *%-----|-----
871 *
872 *#=====
873 *# GOULDBOURN FORCED ROAD - KANATA AVENUE TO AREA 10 BOUNDARY
874 *# (ARTERIAL ROAD 10 YEAR 10 MN INLET TIME)
875 *#=====
876 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[1.6] (ha),
877 XIMP=[0.71], TIMP=[0.71], DWF=[0] (cms),
878 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
879 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
880                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
881 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
882                                LGI=[103] (m), MNI=[0.013], SCI=[0] (min),
883 Continuous simulation parameters:
884 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
885 InterEventTime=[12] (hrs), END=-1
886 *%-----|-----
887 *#=====
888 *# MAJOR FLOW TO BEAVER POND - MINOR FLOW TO AREA 10 STORM SYSTEM
889 *# 237.69 L/S/HA * 1.66 HA = 394.6 L/S
890 *#=====
891 COMPUTE DUALHYD        IDin=[1], CINLET=[0.395] (cms), NINLET=[1],
892 MAJID=[2], MajNHYD=[000100],
893 MINID=[7], MinNHYD=[100100],
894 TMJSTO=[0] (cu-m)
895 *%-----|-----
896 *#=====
897 *# BEAVER POND PORTION #1
898 *#=====
899 *
900 ADD HYD                  IDsum=[9], NHYD=[000321], IDs to add=[6+2]
901 *%-----|-----

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902 *
903 *#=====
904 *# KANATA AVENUE - GOULBOURN FORCED ROAD TO AREA 10 BOUNDARY
905 *# (ARTERIAL ROAD 10 YEAR 10 MIN INLET TIME)
906 *#=====
907 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[2.8] (ha),
908                          XIMP=[0.32], TIMP=[0.32], DWF=[0] (cms),
909                          LOSS=[1]:   Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
910                          DCAY=[2.0] (/hr), F=[0] (mm),
911                          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
912                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
913                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
914                                          LGI=[136] (m), MNI=[0.013], SCI=[0] (min),
915                          Continuous simulation parameters:
916                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
917                          InterEventTime=[12] (hrs), END=-1
918 *%-----|-----|
919 *#=====
920 *# MAJOR FLOW TOWARDS TFD - MINOR FLOW TO AREA 10 STORM SYSTEM
921 *# 237.69 L/S/HA * 1.8 HA = 427.8 L/S
922 * JFSA correction based on above drainage area of 2.8 ha
923 * Capture in DUALHYD below 237.69 L/s/ha * 2.8 ha = 665.5 L/s
924 *#=====
925 COMPUTE DUALHYD          IDin=[1], CINLET=[0.6655] (cms), NINLET=[1],
926                          MAJID=[10], MajNHYD=[000100],
927                          MINID=[2], MinNHYD=[100100],
928                          TMJSTO=[0] (cu-m)
929 *%-----|-----|
930 *
931 *#=====
932 *# DRAINAGE AGREA 10 - TOTAL 43.6 HA - DIVIDED UP FOR HGL ANALYSIS
933 *# (INCLUDES AREA 10-4, 10-1, 10-2 AND 10-3)
934 *#=====
935 *
936 *# AREA 10-4 - DRAINS INTO S-5 - MAJOR FLOW CASCADES
937 *#=====
938 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[13.9] (ha),
939                          XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
940                          LOSS=[1]:   Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
941                          DCAY=[2.0] (/hr), F=[0] (mm),
942                          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
943                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
944                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
945                                          LGI=[304] (m), MNI=[0.013], SCI=[0] (min),
946                          Continuous simulation parameters:
947                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
948                          InterEventTime=[12] (hrs), END=-1
949 *%-----|-----|
950 *#=====
951 *# MINOR FLOW INTO SYSTEM
952 *# 85 L/S/HA * 14 = 1190 L/S
953 * JFSA correction based on above drainage area of 13.9 ha
954 * Capture in DUALHYD below 85 L/s/ha * 13.9 ha = 1181 L/s
955 *#=====
956 COMPUTE DUALHYD          IDin=[1], CINLET=[1.181] (cms), NINLET=[1],
957                          MAJID=[8], MajNHYD=[000100],
958                          MINID=[6], MinNHYD=[100100],
959                          TMJSTO=[0] (cu-m)
960 *%-----|-----|
961 *#=====
962 *# ADD KANATA AVENUE AND AREA 10-4 - MH S-5
963 *#=====
964 *
965 ADD HYD                   IDsum=[5], NHYD=[000101], IDs to add=[6+2]
966 *%-----|-----|
967 *

```

```

967 *#=====
968 *# AREA 10-1 - DRAINS INTO S-4 - MAJOR FLOW CASCADES
969 *#=====
970 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.8] (ha),
971                          XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
972                          LOSS=[1]:   Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
973                          DCAY=[2.0] (/hr), F=[0] (mm),
974                          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
975                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
976                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
977                          LGI=[255] (m), MNI=[0.013], SCI=[0] (min),
978                          Continuous simulation parameters:
979                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
980                          InterEventTime=[12] (hrs), END=-1
981 *%-----|-----
982 *#=====
983 *# MINOR FLOW INTO SYSTEM
984 *# 85 L/S/HA * 9.5 = 807.5 L/S
985 *JFSA correction based on above drainage area of 9.8 ha
986 * Capture in DUALHYD below 85 L/s/ha * 9.8 ha = 833 L/s
987 *#=====
988 COMPUTE DUALHYD          IDin=[1], CINLET=[0.833] (cms), NINLET=[1],
989                          MAJID=[4], MajNHYD=[000100],
990                          MINID=[6], MinNHYD=[100100],
991                          TMJSTO=[0] (cu-m)
992 *%-----|-----
993 *#=====
994 *# ADD GOULBOURN FORCED ROAD AND AREA 10-1 - MH S-3
995 *#=====
996 *
997 ADD HYD                  IDsum=[3], NHYD=[000101], IDs to add=[6+7]
998 *%-----|-----
999 ADD HYD                  IDsum=[7], NHYD=[000102], IDs to add=[3+5]
1000 *%-----|-----
1001 *
1002 *#=====
1003 *# AREA 10-3 - DRAINS INTO S-2 - MAJOR FLOW CASCADES
1004 *#=====
1005 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[4.3] (ha),
1006                          XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
1007                          LOSS=[1]:   Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1008                          DCAY=[2.0] (/hr), F=[0] (mm),
1009                          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1010                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1011                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1012                          LGI=[169] (m), MNI=[0.013], SCI=[0] (min),
1013                          Continuous simulation parameters:
1014                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1015                          InterEventTime=[12] (hrs), END=-1
1016 *%-----|-----
1017 *#=====
1018 *# MINOR FLOW INTO SYSTEM
1019 *# 85 L/S/HA * 3.9 = 331.5 L/S
1020 *JFSA correction based on above drainage area of 4.3 ha
1021 * Capture in DUALHYD below 85 L/s/ha * 4.3 ha = 365 L/s
1022 *#=====
1023 COMPUTE DUALHYD          IDin=[1], CINLET=[0.365] (cms), NINLET=[1],
1024                          MAJID=[5], MajNHYD=[000100],
1025                          MINID=[2], MinNHYD=[100100],
1026                          TMJSTO=[0] (cu-m)
1027 *%-----|-----
1028 ADD HYD                  IDsum=[10], NHYD=[000103], IDs to add=[2+7]
1029 *%-----|-----
1030 *
1031 *#=====
1032 *# AREA 10-2 - DRAINS INTO S-6 - MAJOR FLOW CASCADES
1033 *#=====

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```

1032 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[18.6] (ha),
1033 XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
1034 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
LGI=[352] (m), MNI=[0.013], SCI=[0] (min),
Continuous simulation parameters:
IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
InterEventTime=[12] (hrs), END=-1
*%-----|-----
*#=====
1044 *# MINOR FLOW INTO SYSTEM
1045 *# 85 L/S/HA * 16.2 = 1377 L/S
1046 *JFSA correction based on above drainage area of 18.6 ha
1047 * Capture in DUALHYD below 85 L/s/ha * 18.6 ha = 1581 L/s
1048 *#=====
1049 COMPUTE DUALHYD      IDin=[1], CINLET=[1.581] (cms), NINLET=[1],
1050 MAJID=[2], MajNHYD=[000100],
1051 MINID=[6], MinNHYD=[100100],
1052 TMJSTO=[0] (cu-m)
1053 *%-----|-----
1054 *
1055 *#=====
1056 *# AREA 10A - MINOR FLOW TO AREA 10, MAJOR FLOW TO CARP RIVER WATERSHED
1057 *#=====
1058 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.9] (ha),
1059 XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
1060 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
LGI=[256] (m), MNI=[0.013], SCI=[0] (min),
Continuous simulation parameters:
IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
InterEventTime=[12] (hrs), END=-1
1068 *%-----|-----
1069 *#=====
1070 *# SPLIT OF MAJOR AND MINOR FLOW AT 85 L/S/HA
1071 *# 85 * 7.0 = 595 L/S
1072 *JFSA correction based on above drainage area of 9.9 ha
1073 * Capture in DUALHYD below 85 L/s/ha * 9.9 ha = 841 L/s
1074 *#=====
1075 COMPUTE DUALHYD      IDin=[1], CINLET=[0.841] (cms), NINLET=[1],
1076 MAJID=[3], MajNHYD=[000100],
1077 MINID=[7], MinNHYD=[100100],
1078 TMJSTO=[0] (cu-m)
1079 *%-----|-----
1080 ADD HYD      IDsum=[1], NHYD=[000104], IDs to add=[7+6]
1081 *%-----|-----
1082 *#=====
1083 *# TOTAL MINOR FLOW AT OUTLET
1084 *#=====
1085 ADD HYD      IDsum=[6], NHYD=[000105], IDs to add=[1+10]
1086 *%-----|-----
1087 *#=====
1088 *# TOTAL MAJOR FLOW FOR DRAINAGE AREA 10 AT OUTLET
1089 *#=====
1090 ADD HYD      IDsum=[7], NHYD=[000106], IDs to add=[8+4+5+2]
1091 *%-----|-----
1092 *#=====
1093 *# AREA 11 (RURAL) - Increased Area for Existing Conditions
1094 *#=====
1095 CONTINUOUS NASHYD      ID=[2], NHYD=["000100"], DT=[1]min, AREA=[46.2] (ha),
1096 DWF=[0] (cms), CN=[62], IA=[5.0] (mm),

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1097 N=[2.0], TP=[0.75]hrs,
1098 Continuous simulation parameters:
1099 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1100 InterEventTime=[12] (hrs),
1101 Baseflow simulation parameters:
1102 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1103 VHydCond=[.001] (mm/hr), END=-1
1104 *%-----|
1105 ADD HYD IDsum=[3], NHYD=[000317], IDs to add=[7+2]
1106 *%-----|
1107 *#=====|
1108 *# TOTAL FLOW TO KIZELL POND (U/S CELL)
1109 *#=====|
1110 ADD HYD IDsum=[10], NHYD=[000317], IDs to add=[3+6]
1111 *%-----|
1112 *
1113 *#=====|
1114 *# SYSTEM STORAGE REPRESENTATION (KIZELL POND)
1115 *# RATING CURVE PROVIDED BY IBI
1116 *#=====|
1117 *# modify the ROUTE RESERVOIR to negate the effect of this underground storage
1118 ROUTE RESERVOIR IDout=[3], NHYD=["KP-R"], IDin=[10],
1119 RDT=[1] (min),
1120 TABLE of ( OUTFLOW-STORAGE ) values
1121 (cms) - (ha-m)
1122 [ 0.0 , 0.0 ]
1123 [ 99. , 0.09 ]
1124 [ -1 , -1 ] (max twenty pts)
1125 IDovf=[4], NHYDovf=["OVF-KP"]
1126 *#=====|
1127 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (KIZELL)
1128 *#=====|
1129 ADD HYD IDsum=[10], NHYD=["KP-COM"], IDs to add=[3+4]
1130 *#=====|
1131 *
1132 * Kanata Lakes Stage 7
1133 *
1134 *#=====|
1135 CONTINUOUS STANDHYD ID=[1], NHYD=["Stage 7"], DT=[1] (min), AREA=[73.1] (ha),
1136 XIMP=[0.40], TIMP=[0.50], DWF=[0] (cms),
1137 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1138 DDCAY=[4.14] (/hr), F=[0] (mm),
1139 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1140 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1141 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1142 LGI=[256] (m), MNI=[0.013], SCI=[0] (min),
1143 Continuous simulation parameters:
1144 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1145 InterEventTime=[12] (hrs), END=-1
1146 *#=====|
1147 *
1148 * Kanata Lakes Stage 8
1149 *#=====|
1150 CONTINUOUS STANDHYD ID=[2], NHYD=["Stage 8"], DT=[1] (min), AREA=[65.7] (ha),
1151 XIMP=[0.40], TIMP=[0.50], DWF=[0] (cms),
1152 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1153 DCAY=[4.14] (/hr), F=[0] (mm),
1154 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1155 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1156 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1157 LGI=[661] (m), MNI=[0.013], SCI=[0] (min),
1158 Continuous simulation parameters:
1159 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1160 InterEventTime=[12] (hrs), END=-1
1161 *#=====|
1162 *# Only Minor system flow to Kizell Cell

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1162 * JFSA: fFlow split adjusted to reflect new 5-Year runoff rate with corrected LGI
1163 *#=====
1164 COMPUTE DUALHYD      IDin=[2], CINLET=[4.321] (cms), NINLET=[1],
1165                     MAJID=[3], MajNHYD=[000100],
1166                     MINID=[7], MinNHYD=[100100],
1167                     TMJSTO=[0] (cu-m)
1168 *#=====
1169 * Total flow into Kizell Cell
1170 *#=====
1171 ADD HYD              IDsum=[8], NHYD=["KP-COM"], IDs to add=[10+1+7]
1172 *#=====
1173 *#=====
1174 * ROUTE THROUGH THE KIZELL CELL
1175 *
1176 ROUTE RESERVOIR     IDout=[5], NHYD=["Kizell Cell"], IDin=[8],
1177                     RDT=[1] (min),
1178                     TABLE of ( OUTFLOW-STORAGE ) values
1179                               (cms) - (ha-m)
1180                               [ 0.0 , 0.0 ]
1181                               [ 0.100 , 0.016]
1182                               [ 0.200 , 0.033]
1183                               [ 0.300 , 0.055]
1184                               [ 0.400 , 0.079]
1185                               [ 0.500 , 0.121]
1186                               [ 0.700 , 0.188]
1187                               [ 0.800 , 0.281]
1188                               [ 0.950 , 0.433]
1189                               [ 1.050 , 0.658]
1190                               [ 1.200 , 0.919]
1191                               [ -1 , -1 ] (max twenty pts)
1192                               IDovf=[4], NHYDovf=["OVF-Kizell Cell"]
1193 *#=====
1194 *# ADD OUTFLOW AND OVERFLOW
1195 *#=====
1196 ADD HYD              IDsum=[8], NHYD=["KP-COM"], IDs to add=[5+4]
1197 *#=====
1198 *#=====
1199 *# SYSTEM STORAGE REPRESENTATION (BEAVER POND)
1200 *# RATING CURVE PROVIDED BY IBI
1201 *#=====
1202 * modify the ROUTE RESERVOIR to negate the effects of the underground storage
1203 ROUTE RESERVOIR     IDout=[3], NHYD=["BP-R"], IDin=[9],
1204                     RDT=[1] (min),
1205                     TABLE of ( OUTFLOW-STORAGE ) values
1206                               (cms) - (ha-m)
1207                               [ 0.0 , 0.0 ]
1208                               [ 99.0 , 0.09]
1209                               [ -1 , -1 ] (max twenty pts)
1210                               IDovf=[4], NHYDovf=["OVF-BP"]
1211 *#=====
1212 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (BEAVER)
1213 *#=====
1214 ADD HYD              IDsum=[9], NHYD=["BP-COM"], IDs to add=[3+4]
1215 *#=====
1216 *
1217 * Kanata Lakes Stage 9
1218 *
1219 *#=====
1220 * Under the latest proposed development conditions these lands will be broken into
1221 * 3 catchment Beaver Pond (19.31 ha), Kizell Drain (6.89 ha) and Shirley's Brook (4.51
1222 ha).
1223 * As per IBI's "Design Brief KNL Stage 9 Kanata Lakes North" (March 2018).
1224 * No on-site controls have been assumed for this area.
1225 *#=====
1226 * Kanata Lakes Stage 9 - Beaver Pond
1227 *

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1228 *#=====
1229 CONTINUOUS STANDHYD      ID=[1], NHYD=["Stage 9-Beaver"], DT=[1] (min), AREA=[19.31] (ha),
1230 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
1231 LOSS=[1]:      Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1232 DCAY=[4.14] (/hr), F=[0] (mm),
1233 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1234                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1235 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1236                                LGI=[359] (m), MNI=[0.013], SCI=[0] (min),
1237 Continuous simulation parameters:
1238 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1239 InterEventTime=[12] (hrs), END=-1
1240 *#=====
1241 *
1242 * Kanata Lakes Stage 9 - Shirley's Brook - Under developed conditions these lands
1243 * discharge to Shirley's Brook and do not drain to the Kizell drain, but this catchment
1244 * has been left in the model as a area closure check.
1245 *#=====
1246 CONTINUOUS STANDHYD      ID=[6], NHYD=["Stage 9-Shirley"], DT=[1] (min), AREA=[4.51] (ha),
1247 XIMP=[0.53], TIMP=[0.63], DWF=[0] (cms),
1248 LOSS=[1]:      Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1249 DCAY=[4.14] (/hr), F=[0] (mm),
1250 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1251                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1252 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1253                                LGI=[173] (m), MNI=[0.013], SCI=[0] (min),
1254 Continuous simulation parameters:
1255 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1256 InterEventTime=[12] (hrs), END=-1
1257 *#=====
1258 *# TOTAL HYDROGRAPH INTO BEAVER POND
1259 *
1260 ADD HYD                  IDsum=[6], NHYD=["BP-TOTAL"], IDs to add=[9+8+1]
1261 *#=====
1262 SAVE HYD                 ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
1263 HYD_FILENAME=["BP_In"]
1264 HYD_COMMENT=["Total inflow to the Beaver Pond"]
1265 *#=====
1266 *# TOTAL FLOW FROM BEAVER POND
1267 *#=====
1268 * ROUTE THROUGH BEAVER POND
1269 * Overflow option removed to allow for linear extrapolation of flows out of the
1270 * pond when simulated volumes exceed volumes provided in the curve below.
1271 ROUTE RESERVOIR         IDout=[1], NHYD=["BP-OUT"], IDin=[6],
1272 RDT=[1] (min),
1273 TABLE of ( OUTFLOW-STORAGE ) values
1274                                (cms) - (ha-m)
1275                                [ 0.0 , 0.0 ]
1276                                [ 0.592 , 4.573]
1277                                [ 0.686 , 6.569]
1278                                [ 0.769 , 8.840]
1279                                [ 0.879 , 11.467]
1280                                [ 1.007 , 16.103]
1281                                [ 1.040 , 17.339]
1282                                [ -1 , -1 ] (max twenty pts)
1283 IDovf=[], NHYDovf=[""]
1284 *#=====
1285 SAVE HYD                 ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1286 HYD_FILENAME=["BP_Out"]
1287 HYD_COMMENT=["Total Outflow from the Beaver Pond"]
1288 *#=====
1289 *# ROUTE KD-1 THROUGH KD-2A
1290 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 10018.26
1291 *#=====
1292 ROUTE CHANNEL           IDout=[3], NHYD=["KD-1"], IDin=[1],

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1293 RDT=[1] (min),
1294 CHLGTH=[277] (m), CHSLOPE=[1.08] (%),
1295 FPSLOPE=[1.08] (%),
1296 SECNUM=[10018], NSEG=[4]
1297 ( SEGROUGH, SEGDIST (m))=[0.08,30.63 -0.03,34.69 0.08,49.66
0.04,70.77] NSEG times
1298 ( DISTANCE (m), ELEVATION (m))=[ 0, 94.54 ]
1299 [ 7.12, 93.2 ]
1300 [11.07, 92.3 ]
1301 [15.31, 91.8 ]
1302 [17.16, 91.35 ]
1303 [20.56, 90.8 ]
1304 [25.12, 89.58 ]
1305 [28.15, 88.5 ]
1306 [30.63, 87.8 ]
1307 [31.957, 87.854 ]
1308 [ 34.4, 88.5 ]
1309 [34.69, 88.61 ]
1310 [ 36.5, 89.23 ]
1311 [38.48, 90.2 ]
1312 [41.14, 91.1 ]
1313 [ 45.4, 91.66 ]
1314 [49.66, 91.96 ]
1315 [53.06, 92.3 ]
1316 [67.16, 92.43 ]
1317 [70.77, 92.52 ]
1318 *#=====
1319 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9854.606
1320 *#=====
1321 ROUTE CHANNEL IDout=[2], NHYD=["KD-1"], IDin=[3],
1322 RDT=[1] (min),
1323 CHLGTH=[186] (m), CHSLOPE=[1.97] (%),
1324 FPSLOPE=[1.97] (%),
1325 SECNUM=[9854], NSEG=[5]
1326 ( SEGROUGH, SEGDIST (m))=[0.08,29.81 0.05,34.304 -0.03,38.24
0.05,47.73 0.08,105.39] NSEG times
1327 ( DISTANCE (m), ELEVATION (m))=[ 0, 90.07 ]
1328 [ 6.86, 89.4 ]
1329 [13.24, 89.2 ]
1330 [17.79, 88.48 ]
1331 [22.46, 87.2 ]
1332 [29.81, 86.04 ]
1333 [32.17, 85.72 ]
1334 [34.304, 85.612 ]
1335 [36.137, 85.654 ]
1336 [37.46, 85.69 ]
1337 [38.24, 85.72 ]
1338 [44.98, 85.9 ]
1339 [47.73, 86.32 ]
1340 [51.27, 87.3 ]
1341 [55.17, 88 ]
1342 [87.02, 88.79 ]
1343 [90.72, 88.7 ]
1344 [93.96, 89 ]
1345 [99.45, 90.8 ]
1346 [105.39, 91.81 ]
1347 *#=====
1348 *# KD-2A-1 - RURAL - Reduced Area for Future Conditions
1349 *#=====
1350 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2A-1"], DT=[1]min, AREA=[6.79] (ha),
1351 DWF=[0] (cms), CN=[57], IA=[7] (mm),
1352 N=[2.0], TP=[0.91]hrs,
1353 Continuous simulation parameters:
1354 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1355 InterEventTime=[12] (hrs),
1356 Baseflow simulation parameters:
1357 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),

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1358          VHydCond=[.001] (mm/hr), END=-1
1359 *#=====
1360 *
1361 * Kanata Lakes Stage 9 - Kizell Drain
1362 *
1363 *#=====
1364 CONTINUOUS STANDHYD      ID=[4], NHYD=["Stage 9-Kizell"], DT=[1] (min), AREA=[6.89] (ha),
1365 XIMP=[0.48], TIMP=[0.58], DWF=[0] (cms),
1366 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1367 DCAY=[4.14] (/hr), F=[0] (mm),
1368 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1369 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1370 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1371 LGI=[215] (m), MNI=[0.013], SCI=[0] (min),
1372 Continuous simulation parameters:
1373 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1374 InterEventTime=[12] (hrs), END=-1
1375 *#=====
1376 *# ADD KD-2A-1, KD-1 and portion of KNL Stage 9
1377 *#=====
1378 ADD HYD                  IDsum=[3], NHYD=["KFP2"], IDs to add=[1+2+4]
1379 *#=====
1380 *# ROUTE THROUGH KD-2A-2
1381 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9743.627
1382 *#=====
1383 ROUTE CHANNEL           IDout=[1], NHYD=["KD-1"], IDin=[3],
1384 RDT=[1] (min),
1385 CHLGTH=[408] (m), CHSLOPE=[0.84] (%),
1386 FPSLOPE=[0.84] (%),
1387 SECNUM=[9743], NSEG=[5]
1388 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
1389 0.05,63.17 0.08,111.15] NSEG times
1390 ( DISTANCE (m), ELEVATION (m))=[
1391 0, 86.7 ]
1392 [ 7.01, 86.7 ]
1393 [15.57, 86.2 ]
1394 [21.06, 85.58 ]
1395 [25.69, 84.76 ]
1396 [31.55, 83.42 ]
1397 [40.62, 82.7 ]
1398 [42.45, 82.5 ]
1399 [44.28, 82.561 ]
1400 [ 44.6, 82.59 ]
1401 [46.07, 82.7 ]
1402 [48.58, 82.76 ]
1403 [59.09, 82.59 ]
1404 [63.17, 83.94 ]
1405 [67.14, 85.3 ]
1406 [71.84, 85.8 ]
1407 [82.08, 85.8 ]
1408 [89.16, 86.2 ]
1409 [106.01, 86.6 ]
1410 [111.15, 86.65 ]
1411 *#=====
1412 SAVE HYD                ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1413 HYD_FILENAME=["KD-1"]
1414 HYD_COMMENT=["KD-1-Channel where Erosion analysis was completed"]
1415 *#=====
1416 *# Erosion Analysis on Kizell Drain (Requires SWMHYMO v5.5)
1417 *#=====
1418 *# Erosion Index/critical shear stress calculated for flows through the critical
1419 *# section of on Kizell Drain as determined by Matrix Solutions (May 2019)
1420 *#=====
1421 EROSION INDEX          INDEX_METHOD=[1], QCE =[0.50] (cms), NHYDsErosion=[1]
1422 *#=====
1423 EROSION INDEX          INDEX_METHOD=[2], SHEARC =[20] (Pa), No of Hyds=[1],
1424 NHYDsErosion=[1]
1425 RATING_CURVE_METHOD = [1], user entered channel shape

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1423 Channel section parameters
1424 Section No["XS1"]
1425 CHSLOPE=[0.84] (%), FPSLOPE=[0.84] (%),
1426 NSEG=[5]
1427 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
0.05,63.17 0.08,111.15] NSEG times
1428 ( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
1429 [ 7.01, 86.7 ]
1430 [15.57, 86.2 ]
1431 [21.06, 85.58 ]
1432 [25.69, 84.76 ]
1433 [31.55, 83.42 ]
1434 [40.62, 82.7 ]
1435 [42.45, 82.5 ]
1436 [44.28, 82.561 ]
1437 [ 44.6, 82.59 ]
1438 [46.07, 82.7 ]
1439 [48.58, 82.76 ]
1440 [59.09, 82.59 ]
1441 [63.17, 83.94 ]
1442 [67.14, 85.3 ]
1443 [71.84, 85.8 ]
1444 [82.08, 85.8 ]
1445 [89.16, 86.2 ]
1446 [106.01, 86.6 ]
1447 [111.15, 86.65 ]
1448 *#=====
1449 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9338.062
1450 *# MINIMUM SLOPE ASSUMED 0.1%
1451 *#=====
1452 ROUTE CHANNEL IDout=[2], NHYD=["KD-1"], IDin=[1],
1453 RDT=[1] (min),
1454 CHLGTH=[111] (m), CHSLOPE=[0.1] (%),
1455 FPSLOPE=[0.1] (%),
1456 SECNUM=[9338], NSEG=[5]
1457 ( SEGROUGH, SEGDIST (m))=[0.04,78.47 0.06,82.78 -0.03,87.28
0.06,107.69 0.04,120.16] NSEG times
1458 ( DISTANCE (m), ELEVATION (m))=[ 0, 82.8 ]
1459 [ 6.26, 82.86 ]
1460 [ 23, 82.4 ]
1461 [57.46, 82.11 ]
1462 [75.38, 82.1 ]
1463 [78.47, 81.06 ]
1464 [ 81.6, 79.7 ]
1465 [82.78, 79.3 ]
1466 [87.28, 79.28 ]
1467 [ 88.3, 79.7 ]
1468 [91.41, 81.1 ]
1469 [94.81, 81.7 ]
1470 [107.69, 82.1 ]
1471 [120.16, 82.2 ]
1472 *#=====
1473 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9131.887
1474 *#=====
1475 ROUTE CHANNEL IDout=[1], NHYD=["KD-1"], IDin=[2],
1476 RDT=[1] (min),
1477 CHLGTH=[248] (m), CHSLOPE=[0.28] (%),
1478 FPSLOPE=[0.28] (%),
1479 SECNUM=[9131], NSEG=[5]
1480 ( SEGROUGH, SEGDIST (m))=[0.04,70.64 -0.03,72.865 0.04,74.61
0.05,77.65 0.04,191.67] NSEG times
1481 ( DISTANCE (m), ELEVATION (m))=[ 0, 81.6 ]
1482 [ 7.35, 81.6 ]
1483 [ 26.3, 80.9 ]
1484 [48.53, 80.87 ]
1485 [58.55, 80.01 ]
1486 [65.66, 80 ]

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1487 [69.22, 79 ]
1488 [70.64, 78.65 ]
1489 [72.865, 78.7 ]
1490 [74.25, 78.96 ]
1491 [74.61, 79.1 ]
1492 [77.65, 79.92 ]
1493 [93.59, 79.9 ]
1494 [103.2, 78.7 ]
1495 [108.05, 79.9 ]
1496 [115.92, 80.2 ]
1497 [132.65, 80.2 ]
1498 [159.72, 80.73 ]
1499 [176.71, 82.61 ]
1500 [191.67, 82.63 ]
1501 *#=====
1502 *# KD-2A-2 - URBAN/RURAL NORTH OF RAILRAOD
1503 *#=====
1504 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2A-2"], DT=[1] (min), AREA=[44.99] (ha),
1505 XIMP=[0.250], TIMP=[0.28], DWF=[0] (cms),
1506 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
LGI=[547] (m), MNI=[0.013], SCI=[0] (min),
Continuous simulation parameters:
IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
InterEventTime=[12] (hrs), END=-1
1514 *#=====
1515 *# ADD KD-2A-1 AND KD-2A-2
1516 *# CREST GAUGE LOCATION KD-2 -KIZELL DRAIN AT MARCH ROAD
1517 *#=====
1518 ADD HYD IDsum=[3], NHYD=["KFP3"], IDs to add=[1+2]
1519 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1520 *#=====
1521 *# KD-2A-3 - URBAN SOUTH OF RAILROAD
1522 *#=====
1523 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2A-3"], DT=[1] (min), AREA=[48.56] (ha),
1524 XIMP=[0.250], TIMP=[0.31], DWF=[0] (cms),
1525 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
LGI=[568] (m), MNI=[0.013], SCI=[0] (min),
Continuous simulation parameters:
IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
InterEventTime=[12] (hrs), END=-1
1533 *#=====
1534 *# ADD KD-2A-2 AND KD-2A-3 D/S OF MARCH ROAD
1535 *#=====
1536 ADD HYD IDsum=[4], NHYD=["KD-2A-3"], IDs to add=[3+2]
1537 *#=====
1538 *# ROUTE KD-2A THROUGH KD-2B
1539 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8942.456
1540 *#=====
1541 ROUTE CHANNEL IDout=[1], NHYD=["KD-2A"], IDin=[4],
1542 RDT=[1] (min),
1543 CHLGTH=[254] (m), CHSLOPE=[0.55] (%),
1544 FPSLOPE=[0.55] (%),
1545 SECNUM=[8942], NSEG=[5]
1546 ( SEGROUGH, SEGDIST (m))=[0.04,17.24 0.05,28.26 -0.03,31.51
0.05,61.08 0.04,68.63] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0, 80.58 ]
[ 1.57, 80.5 ]
[ 8.77, 80.5 ]
[10.84, 80.23 ]

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1551 [17.24, 80.03 ]
1552 [20.76, 79 ]
1553 [23.59, 78.9 ]
1554 [26.81, 78.17 ]
1555 [28.26, 77.9 ]
1556 [30.06, 77.9 ]
1557 [30.71, 78.01 ]
1558 [31.51, 78.2 ]
1559 [32.21, 78.39 ]
1560 [ 37.7, 78.4 ]
1561 [44.07, 78.5 ]
1562 [48.95, 78.7 ]
1563 [57.53, 79.33 ]
1564 [61.08, 79.95 ]
1565 [64.61, 80.71 ]
1566 [68.63, 81.15 ]
1567 *#=====
1568 *# KD-2B-6 - URBAN
1569 *#=====
1570 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2B-6"], DT=[1] (min), AREA=[7.73] (ha),
1571 XIMP=[0.61], TIMP=[0.61], DWF=[0] (cms),
1572 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1573 DCAY=[2.0] (/hr), F=[0] (mm),
1574 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1575 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1576 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1577 LGI=[227] (m), MNI=[0.013], SCI=[0] (min),
1578 Continuous simulation parameters:
1579 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1580 InterEventTime=[12] (hrs), END=-1
1581 *#=====
1582 *# ROUTE KD-2B-6 THROUGH SWM POND SOUTH OF SOLANDT ROAD
1583 *# ASSUME 5-YEAR CONTROL ACCORDING TO CITY GUIDELINES
1584 *#=====
1585 ROUTE RESERVOIR IDout=[4], NHYD=["KD-2B-6"], IDin=[2],
1586 RDT=[1] (min),
1587 TABLE of ( OUTFLOW-STORAGE ) values
1588 (cms) - (ha-m)
1589 [ 0.0 , 0.0 ]
1590 [ 0.407 , 0.095 ]
1591 [ -1 , -1 ] (max twenty pts)
1592 IDovf=[5], NHYDovf=["OVF-2B6"]
1593 *#=====
1594 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1595 *#=====
1596 ADD HYD IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5+1]
1597 *#=====
1598 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8329.198
1599 *#=====
1600 ROUTE CHANNEL IDout=[2], NHYD=["KD-2A"], IDin=[6],
1601 RDT=[1] (min),
1602 CHLGTH=[747] (m), CHSLOPE=[0.36] (%),
1603 FPSLOPE=[0.36] (%),
1604 SECNUM=[8329], NSEG=[4]
1605 ( SEGROUGH, SEGDIST (m))=[0.08,81.34 0.05,88.266 -0.03,97.72
1606 0.08,109.09] NSEG times
1607 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.3 ]
1608 [56.66, 78.2 ]
1609 [67.31, 78.2 ]
1610 [72.25, 78 ]
1611 [79.85, 78 ]
1612 [81.34, 77.66 ]
1613 [87.28, 75.87 ]
1614 [88.266, 75.728 ]
1615 [90.51, 75.759 ]
1616 [90.57, 75.77 ]
1617 [91.47, 75.88 ]

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1616                                     [97.72, 76.64 ]
1617                                     [109.09, 78.5 ]
1618 *#=====
1619 *# KD-2B-3 - Converted to NASHYD under existing conditions
1620 *#=====
1621 CONTINUOUS NASHYD          ID=[1], NHYD=["KD-2B-3"], DT=[1]min, AREA=[7.40] (ha),
1622                           DWF=[0] (cms), CN=[65], IA=[5.0] (mm),
1623                           N=[2.0], TP=[0.49]hrs,
1624                           Continuous simulation parameters:
1625                           IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1626                           InterEventTime=[12] (hrs),
1627                           Baseflow simulation parameters:
1628                           BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1629                           VHydCond=[.001] (mm/hr), END=-1
1630 *#=====
1631 *# 5 YEAR CONTROL - 89L/s
1632 *# MAJOR FLOWS TO KIZELL DRAIN
1633 *# MINOR FLOWS TO GOLF COURSE POND #2
1634 *#=====
1635 COMPUTE DUALHYD          IDin=[1], CINLET=[0.089] (cms), NINLET=[1],
1636                           MAJID=[3], MajNHYD=["2B3MAJ"],
1637                           MINID=[4], MinNHYD=["2B3MIN"],
1638                           TMJSTO=[0] (cu-m)
1639 *#=====
1640 *# KD-2B-4 Converted to NASHYD under existing conditions
1641 *#=====
1642 CONTINUOUS NASHYD          ID=[5], NHYD=["KD-2B-4"], DT=[1]min, AREA=[23.59] (ha),
1643                           DWF=[0] (cms), CN=[63], IA=[5.0] (mm),
1644                           N=[2.0], TP=[0.62]hrs,
1645                           Continuous simulation parameters:
1646                           IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1647                           InterEventTime=[12] (hrs),
1648                           Baseflow simulation parameters:
1649                           BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1650                           VHydCond=[.001] (mm/hr), END=-1
1651 *#=====
1652 *# ADD KD-2B-3 MINOR AND KD-2B-4
1653 *#=====
1654 ADD HYD                    IDsum=[6], NHYD=["KD-2B-4"], IDs to add=[4+5]
1655 *#=====
1656 *# ROUTE KD-2B-4 THROUGH GOLF COURSE POND #2
1657 *#=====
1658 ROUTE RESERVOIR          IDout=[4], NHYD=["KD-2B-4"], IDin=[6],
1659                           RDT=[1] (min),
1660                           TABLE of ( OUTFLOW-STORAGE ) values
1661                           (cms) - (ha-m)
1662                           [ 0.0 , 0.0 ]
1663                           [ 0.229, 1.5695]
1664                           [ 0.251, 1.8191]
1665                           [ 0.328, 2.9421]
1666                           [ -1 , -1 ] (max twenty pts)
1667                           IDovf=[5], NHYDovf=["OVF-2B6"]
1668 *#=====
1669 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1670 *#=====
1671 ADD HYD                    IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5]
1672 *#=====
1673 *# ADD KD-2B-3 MAJOR, KD-2B-4 AND KD-2B-6
1674 *#=====
1675 ADD HYD                    IDsum=[4], NHYD=["KD-2B-4"], IDs to add=[3+6+2]
1676 *#=====
1677 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7691.759
1678 *#=====
1679 ROUTE CHANNEL            IDout=[2], NHYD=["KD-2A"], IDin=[4],
1680                           RDT=[1] (min),
1681                           CHLGTH=[408] (m), CHSLOPE=[0.11] (%),
1682                           FPSLOPE=[0.11] (%),

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1683 SECNUM=[7691], NSEG=[3]
1684 ( SEGROUGH, SEGDIST (m))=[0.06,16.78 -0.03,19.003 0.06,24.49] NSEG ↵
times
1685 ( DISTANCE (m), ELEVATION (m))=[ 0, 76.75 ]
1686 [ 0.66, 76.6 ]
1687 [ 3.57, 75.74 ]
1688 [ 4.99, 75.24 ]
1689 [ 5.76, 75.1 ]
1690 [ 7.69, 75 ]
1691 [ 8.56, 74.9 ]
1692 [ 9.95, 74.9 ]
1693 [12.21, 74.8 ]
1694 [12.99, 74.69 ]
1695 [ 15.2, 74.3 ]
1696 [16.78, 74.1 ]
1697 [17.38, 73.8 ]
1698 [18.38, 73.8 ]
1699 [19.003, 74.147]
1700 [19.94, 74.21 ]
1701 [20.51, 74.31 ]
1702 [21.52, 74.6 ]
1703 [22.72, 75.04 ]
1704 [24.49, 75.5 ]
1705 *#=====
1706 *# KD-2B-2 - URBAN RESIDENTIAL - Converted to NASHYD under existing conditions
1707 *#=====
1708 CONTINUOUS NASHYD ID=[3], NHYD=["KD-2B-2"], DT=[1]min, AREA=[3.35] (ha),
1709 DWF=[0] (cms), CN=[63], IA=[5.0] (mm),
1710 N=[2.0], TP=[0.32]hrs,
1711 Continuous simulation parameters:
1712 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1713 InterEventTime=[12] (hrs),
1714 Baseflow simulation parameters:
1715 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1716 VHydCond=[.001] (mm/hr), END=-1
1717 *#=====
1718 *# ROUTE KD-2B-2 THROUGH POND #3 NORTH OF FARRAR ROAD
1719 *#=====
1720 ROUTE RESERVOIR IDout=[5], NHYD=["KD-2B-2"], IDin=[3],
1721 RDT=[1] (min),
1722 TABLE of ( OUTFLOW-STORAGE ) values
1723 (cms) - (ha-m)
1724 [ 0.0 , 0.0 ]
1725 [ 0.260 , 0.616]
1726 [ 0.282 , 0.7115]
1727 [ 0.374 , 1.2301]
1728 [ -1 , -1 ] (max twenty pts)
1729 IDovf=[6], NHYDovf=["OVF-2B3"]
1730 *#=====
1731 *# ADD OUTFLOW, OVERFLOW AND KD-2B-4
1732 *#=====
1733 ADD HYD IDsum=[1], NHYD=["KD-2B-4"], IDs to add=[5+6+2]
1734 *#=====
1735 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7386.879
1736 *#=====
1737 ROUTE CHANNEL IDout=[2], NHYD=["KD-2A-4"], IDin=[1],
1738 RDT=[1] (min),
1739 CHLGTH=[315] (m), CHSLOPE=[0.11] (%),
1740 FPSLOPE=[0.11] (%),
1741 SECNUM=[7386], NSEG=[5]
1742 ( SEGROUGH, SEGDIST (m))=[0.08,21.18 0.05,62.87 -0.06,80.43 ↵
0.06,90.36 0.05,143.24] NSEG times
1743 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.07 ]
1744 [ 5.11, 76.8 ]
1745 [21.18, 76.7 ]
1746 [34.27, 76.7 ]
1747 [43.48, 76.3 ]

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1748 [62.87, 74.8 ]
1749 [68.48, 74.28 ]
1750 [70.32, 73.5 ]
1751 [73.346, 73.437 ]
1752 [75.588, 73.466 ]
1753 [75.62, 73.47 ]
1754 [80.43, 74.3 ]
1755 [85.13, 75.18 ]
1756 [90.36, 75.69 ]
1757 [101.28, 75.4 ]
1758 [115.17, 75.3 ]
1759 [121.38, 75.4 ]
1760 [128.52, 74.95 ]
1761 [137.68, 75.3 ]
1762 [143.24, 76.97 ]
1763 *#=====
1764 *# KD-2B-7 - RURAL EAST OF HERZBERG ROAD
1765 *#=====
1766 CONTINUOUS NASHYD ID=[4], NHYD=["KD-2B-7"], DT=[1]min, AREA=[20.11] (ha),
1767 DWF=[0] (cms), CN=[63], IA=[7] (mm),
1768 N=[2.0], TP=[1.50]hrs,
1769 Continuous simulation parameters:
1770 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1771 InterEventTime=[12] (hrs),
1772 Baseflow simulation parameters:
1773 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1774 VHydCond=[.001] (mm/hr), END=-1
1775 *#=====
1776 *# ADD KD-2B-4 AND KD-2B-7
1777 *#=====
1778 ADD HYD IDsum=[3], NHYD=["KD-2B-4"], IDs to add=[2+4]
1779 *#=====
1780 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7058.454
1781 *#=====
1782 ROUTE CHANNEL IDout=[1], NHYD=["KD-2A-4"], IDin=[3],
1783 RDT=[1] (min),
1784 CHLGTH=[297] (m), CHSLOPE=[0.38] (%),
1785 FPSLOPE=[0.38] (%),
1786 SECNUM=[7058], NSEG=[3]
1787 ( SEGROUGH, SEGDIST (m))=[0.05,206.86 -0.06,216.95 0.04,295.48] ↵
NSEG times
1788 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.7 ]
1789 [165.24, 75.2 ]
1790 [198.14, 75.2 ]
1791 [206.37, 73.8 ]
1792 [206.86, 73.69 ]
1793 [209.66, 73 ]
1794 [211.86, 73 ]
1795 [213.07, 73.07 ]
1796 [215.16, 73.8 ]
1797 [216.95, 74.14 ]
1798 [247.08, 74.8 ]
1799 [267.4, 74.8 ]
1800 [295.48, 76.05 ]
1801 *#=====
1802 *# KD-2B-5 - URBAN
1803 *#=====
1804 CONTINUOUS STANDHYD ID=[2], NHYD=["KD-2B-5"], DT=[1] (min), AREA=[4.74] (ha),
1805 XIMP=[0.50], TIMP=[0.50], DWF=[0] (cms),
1806 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr), ↵
DCAY=[2.0] (/hr), F=[0] (mm),
1807 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1808 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1809 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1810 LGI=[177] (m), MNI=[0.013], SCI=[0] (min),
1811 Continuous simulation parameters:
1812 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),

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1813 InterEventTime=[12] (hrs), END=-1
1814 *#=====
1815 *# ON-SITE STORAGE
1816 *# RATING CURVE SOURCE - plan2.pdf IN 13616-Richardson Side_Eagleson
1817 *#=====
1818 ROUTE RESERVOIR IDout=[4], NHYD=["KD-2B-5"], IDin=[2],
1819 RDT=[1] (min),
1820 TABLE of ( OUTFLOW-STORAGE ) values
1821 (cms) - (ha-m)
1822 [ 0.0 , 0.0 ]
1823 [0.1458, 0.01283]
1824 [0.1458, 0.03881]
1825 [ -1 , -1 ] (max twenty pts)
1826 IDovf=[5], NHYDovf=["OVF-2B5"]
1827 *#=====
1828 *# KD-2B-1 - URBAN
1829 *#=====
1830 CONTINUOUS STANDHYD ID=[3], NHYD=["KD-2B-1"], DT=[1] (min), AREA=[134.85] (ha),
1831 XIMP=[0.40], TIMP=[0.41], DWF=[0] (cms),
1832 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1833 DCAY=[2.0] (/hr), F=[0] (mm),
1834 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1835 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1836 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1837 LGI=[948] (m), MNI=[0.013], SCI=[0] (min),
1838 Continuous simulation parameters:
1839 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1840 InterEventTime=[12] (hrs), END=-1
1841 *#=====
1842 *# ADD OUTFLOW, OVERFLOW AND KD-2B-1
1843 *#=====
1844 ADD HYD IDsum=[6], NHYD=["KD-2B-1"], IDs to add=[4+5+3]
1845 *#=====
1846 *# ADD KD-2B-4 AND KD-2B-1
1847 *# CREST GAUGE LOCATION KD-1 - KIZELL DRAIN AT HERTZBERG ROAD
1848 *#=====
1849 ADD HYD IDsum=[3], NHYD=["KFP4"], IDs to add=[1+6]
1850 *PRINT HYD ID=[3], # OF PCYCLES=[1]
1851 *#=====
1852 *# ROUTE KD-2B THROUGH KD-2C
1853 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6705.311
1854 *# MINIMUM SLOPE ASSUMED 0.1%
1855 *#=====
1856 ROUTE CHANNEL IDout=[1], NHYD=["KD-2B"], IDin=[3],
1857 RDT=[1] (min),
1858 CHLGTH=[600] (m), CHSLOPE=[0.1] (%),
1859 FPSLOPE=[0.1] (%),
1860 NSEG=[4]
1861 ( SEGROUGH, SEGDIST (m))=[0.05,162.749 -0.04,168.035 -0.05,168.35
1862 0.05,373.63] NSEG times
1863 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.65 ]
1864 [ 24.7, 75.1 ]
1865 [61.29, 73.42 ]
1866 [90.72, 72.7 ]
1867 [119.02, 72.95 ]
1868 [131.71, 72.8 ]
1869 [160.55, 72.9 ]
1870 [162.46, 72.46 ]
1871 [162.749, 72.403 ]
1872 [168.035, 72.369 ]
1873 [168.35, 72.39 ]
1874 [168.6, 72.43 ]
1875 [171.08, 72.8 ]
1876 [203.12, 72.8 ]
1877 [231.66, 73.3 ]
1878 [255.58, 73.2 ]
1879 [300.16, 73.6 ]

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1878                                     [326.75, 74.3 ]
1879                                     [347.02, 75.2 ]
1880                                     [373.63, 76.05 ]
1881 *#=====
1882 *# KD-3A - URBAN WEST OF HERZBERG ROAD
1883 *#=====
1884 CONTINUOUS STANDHYD      ID=[3], NHYD=["KD-3A"], DT=[1](min), AREA=[206.16](ha),
1885 XIMP=[0.30], TIMP=[0.34], DWF=[0](cms),
1886 LOSS=[1]: Horton: Fo=[125](mm/hr), Fc=[25](mm/hr),
1887 DCAY=[2.0](/hr), F=[0](mm),
1888 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1889 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1889 Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
1890 LGI=[1172](m), MNI=[0.013], SCI=[0](min),
1891 Continuous simulation parameters:
1892 IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
1893 InterEventTime=[12](hrs), END=-1
1894 *#=====
1895 *# KTC-2B - URBAN - UPSTREAM LIMIT TO HWY 417, NORTH OF CAMPEAU DRIVE
1896 *# LAND USES WITHIN AREA: OFFICE/RECREATIONAL
1897 *#=====
1898 CONTINUOUS STANDHYD      ID=[2], NHYD=["KTC-2B"], DT=[1](min), AREA=[20.79](ha),
1899 XIMP=[0.23], TIMP=[0.24], DWF=[0.0](cms),
1900 LOSS=[1]: Horton: Fo=[125](mm/hr), Fc=[25](mm/hr),
1901 DCAY=[2.0](/hr), F=[0](mm),
1902 Pervious surfaces: IAper=[4.67](mm), SLPP=[2.0](%),
1903 LGP=[40](m), MNP=[0.25], SCP=[0](min),
1904 Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
1905 LGI=[372](m), MNI=[0.013], SCI=[0](min),
1906 Continuous simulation parameters:
1907 IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
1908 InterEventTime=[12](hrs), END=-1
1909 *#=====
1910 *# 5 YEAR CONTROL - 1155L/s
1911 *# MAJOR FLOWS TO KD-3A
1912 *# MINOR FLOWS TO SWF-1205
1913 *#=====
1914 COMPUTE DUALHYD      IDin=[2], CINLET=[1.155](cms), NINLET=[1],
1915 MAJID=[7], MajNHYD=["KTC2BMAJ"],
1916 MINID=[10], MinNHYD=["KTC2BMIN"],
1917 TMJSTO=[0](cu-m)
1918 *#=====
1919 *# ADD KTC-2B MAJOR AND KD-3A - TRIBUTARY 1 AT HERTZBERG ROAD
1920 *#=====
1921 ADD HYD      IDsum=[5], NHYD=["KD-3A"], IDs to add=[7+3]
1922 *#=====
1923 *# ROUTE KD-3A THROUGH KD-3B
1924 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LiDAR
1925 *#=====
1926 ROUTE CHANNEL      IDout=[4], NHYD=["KD-3A"], IDin=[5],
1927 RDT=[1](min),
1928 CHLGTH=[253](m), CHSLOPE=[0.13](%),
1929 FPSLOPE=[0.13](%),
1930 SECNUM=[1], NSEG=[3]
1931 ( SEGROUGH, SEGDIST (m))=[0.05,27.94 -0.035,38.92 0.08,64.87] NSEG
1932 times
1933 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.90]
1934 [12.97, 78.12]
1935 [15.97, 77.81]
1936 [19.96, 77.51]
1937 [23.95, 77.36]
1938 [24.95, 77.34]
1939 [25.95, 77.34]
1940 [26.94, 77.36]
1941 [27.94, 77.30]
1942 [30.94, 76.79]
1943 [31.93, 76.73]

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1942 [32.93, 76.73]
1943 [33.93, 76.70]
1944 [34.94, 76.76]
1945 [38.92, 77.29]
1946 [42.91, 77.34]
1947 [58.88, 78.52]
1948 [64.87, 78.97]
1949 ROUTE CHANNEL IDout=[5], NHYD=["KD-3A"], IDin=[4],
1950 RDT=[1] (min),
1951 CHLGTH=[344] (m), CHSLOPE=[0.56] (%),
1952 FPSLOPE=[0.56] (%),
1953 SECNUM=[2], NSEG=[3]
1954 ( SEGROUGH, SEGDIST (m))=[0.05,20.89 -0.035,76.49 0.08,88.52] NSEG times
1955 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.38]
1956 [13.92, 77.02]
1957 [20.89, 76.69]
1958 [26.85, 76.09]
1959 [29.84, 76.03]
1960 [44.76, 76.15]
1961 [56.69, 75.91]
1962 [59.68, 76.10]
1963 [61.67, 76.05]
1964 [71.61, 76.31]
1965 [76.49, 76.69]
1966 [82.55, 77.16]
1967 [88.52, 77.40]
1968 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1969 RDT=[1] (min),
1970 CHLGTH=[324] (m), CHSLOPE=[0.72] (%),
1971 FPSLOPE=[0.72] (%),
1972 SECNUM=[1], NSEG=[3]
1973 ( SEGROUGH, SEGDIST (m))=[0.05,97.588 -0.035,109.575 0.05,143.405] NSEG times
1974 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.2777 ]
1975 [39.664, 74.805 ]
1976 [74.612, 74.8767 ]
1977 [79.607, 74.8037 ]
1978 [ 86.6, 74.7914 ]
1979 [90.595, 74.6388 ]
1980 [95.59, 74.6899 ]
1981 [97.588, 74.8802 ]
1982 [101.584, 74.7293 ]
1983 [103.582, 74.4039 ]
1984 [106.578, 74.4818 ]
1985 [109.575, 74.9123 ]
1986 [111.573, 74.8318 ]
1987 [116.568, 74.8294 ]
1988 [120.563, 74.7426 ]
1989 [121.562, 74.7398 ]
1990 [124.559, 74.8464 ]
1991 [130.553, 74.8391 ]
1992 [132.54, 74.777 ]
1993 [143.405, 75.255 ]
1994 *#=====
1995 *# KD-2C - RURAL
1996 *#=====
1997 CONTINUOUS NASHYD ID=[2], NHYD=["KD-2C"], DT=[1]min, AREA=[59.10] (ha),
1998 DWF=[0] (cms), CN=[83], IA=[7] (mm),
1999 N=[2.0], TP=[0.60]hrs,
2000 Continuous simulation parameters:
2001 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2002 InterEventTime=[12] (hrs),
2003 Baseflow simulation parameters:
2004 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2005 VHydCond=[.001] (mm/hr), END=-1
2006 *#=====

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2007 *# ADD KD-2B AND KD-2C
2008 *#=====
2009 ADD HYD          IDsum=[5], NHYD=["KFP5"], IDs to add=[1+2]
2010 *PRINT HYD      ID=[5], # OF PCYCLES=[1]
2011 *#=====
2012 *# ADD KD-2C AND KD-3A
2013 *#=====
2014 ADD HYD          IDsum=[3], NHYD=["KD-2C"], IDs to add=[5+4]
2015 *#=====
2016 *# ROUTE KD-1+KD-2 THROUGH KD-3B-1
2017 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6104.633
2018 *# MINIMUM SLOPE ASSUMED 0.1%
2019 *#=====
2020 ROUTE CHANNEL    IDout=[1], NHYD=["KD-2C"], IDin=[3],
2021                  RDT=[1] (min),
2022                  CHLGTH=[952] (m), CHSLOPE=[0.1] (%),
2023                  FPSLOPE=[0.1] (%),
2024                  SECNUM=[6104], NSEG=[3]
2025                  ( SEGROUGH, SEGDIST (m))=[0.08,175.904 -0.04,179.184 0.08,185.91]
2026                  NSEG times
2027                  ( DISTANCE (m), ELEVATION (m))=[ 0, 77.06 ]
2028                  [ 9.16, 77.1 ]
2029                  [23.37, 76.7 ]
2030                  [56.09, 76.5 ]
2031                  [67.63, 76.2 ]
2032                  [80.81, 75.6 ]
2033                  [83.87, 75.6 ]
2034                  [98.45, 74.5 ]
2035                  [103.07, 74.3 ]
2036                  [115.78, 74.3 ]
2037                  [134.4, 73.6 ]
2038                  [149.63, 73.7 ]
2039                  [163.83, 73.6 ]
2040                  [173.16, 72.7 ]
2041                  [175.83, 72 ]
2042                  [175.904, 71.992 ]
2043                  [179.184, 71.968 ]
2044                  [179.27, 72 ]
2045                  [183.86, 73.7 ]
2046                  [185.91, 74 ]
2047 *#=====
2048 *# KD-3B - RURAL EAST OF HERZBERG ROAD
2049 *#=====
2050 CONTINUOUS NASHYD ID=[4], NHYD=["KD-23B"], DT=[1]min, AREA=[112.07] (ha),
2051 DWF=[0] (cms), CN=[66], IA=[7] (mm),
2052 N=[2.0], TP=[1.20]hrs,
2053 Continuous simulation parameters:
2054 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2055 InterEventTime=[12] (hrs),
2056 Baseflow simulation parameters:
2057 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2058 VHydCond=[.001] (mm/hr), END=-1
2059 *#=====
2060 *# ADD KD-2C,KD-3A AND KD-3B - KIZELL DRAIN AT CONFLUENCE WITH WATTS CREEK
2061 *#=====
2062 ADD HYD          IDsum=[3], NHYD=["KFP6"], IDs to add=[1+4]
2063 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
2064 *#=====
2065 *# WATTS CREEK SUBWATERSHED
2066 *#=====
2067 *# KANATA TOWN CENTRE-1 - URBAN - UPSTREAM LIMIT TO HWY 417
2068 *# Imperviousness decreased under existing conditions
2069 *#=====
2070 CONTINUOUS STANDHYD ID=[2], NHYD=["KTC-1"], DT=[1] (min), AREA=[60.23] (ha),
2071 XIMP=[0.34], TIMP=[0.34], DWF=[0] (cms),
2072 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),

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2073          DCAY=[2.0] (/hr), F=[0] (mm),
Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
2074                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
2075          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
2076                      LGI=[633] (m), MNI=[0.013], SCI=[0] (min),
2077          Continuous simulation parameters:
2078          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
2079          InterEventTime=[12] (hrs), END=-1
2080 *#-----
2081 *# 5 YEAR CONTROL - 2963L/s
2082 *# MAJOR FLOWS TO WC-1
2083 *# MINOR FLOWS TO SWF-1206
2084 *#-----
2085 COMPUTE DUALHYD      IDin=[2], CINLET=[2.963] (cms), NINLET=[1],
2086                      MAJID=[7], MajNHYD=["KTC1MAJ"],
2087                      MINID=[8], MinNHYD=["KTC1MIN"],
2088                      TMJSTO=[0] (cu-m)
2089 *#-----
2090 *# SWMF-1206
2091 *# STORAGE WAS ESTIMATED FROM AVAILABLE DRAWING
2092 *# DISCHARGE WAS TAKEN FROM R-1564
2093 *#-----
2094 ROUTE RESERVOIR      IDout=[4], NHYD=["KTC-1"], IDin=[8],
2095                      RDT=[1] (min),
2096                      TABLE of ( OUTFLOW-STORAGE ) values
2097                      (cms) - (ha-m)
2098                      [ 0.0 , 0.0 ]
2099                      [ 0.955 , 0.2854 ]
2100                      [ 1.436 , 3.9725 ]
2101                      [ -1 , -1 ] (max twenty pts)
2102                      IDovf=[5], NHYDovf=["OVF-KTC1"]
2103 *#-----
2104 *# ADD OUTFLOW, OVERFLOW AND KTC-1 MAJOR
2105 *#-----
2106 ADD HYD              IDsum=[2], NHYD=["KTC-1"], IDs to add=[4+5+7]
2107 *#-----
2108 *# WC-1 - RURAL/URBAN EXISTING AREA
2109 *#-----
2110 CONTINUOUS STANDHYD ID=[1], NHYD=["WC-1"], DT=[1] (min), AREA=[403.47] (ha),
2111                      XIMP=[0.30], TIMP=[0.34], DWF=[0] (cms),
2112                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
2113                      DCAY=[2.0] (/hr), F=[0] (mm),
2114                      Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
2115                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
2116                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
2117                      LGI=[1640] (m), MNI=[0.013], SCI=[0] (min),
2118                      Continuous simulation parameters:
2119                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
2120                      InterEventTime=[12] (hrs), END=-1
2121 *#-----
2122 *# ADD WC-1 AND KTC-1 - WATTS CREEK AT HIGHWAY 417
2123 *#-----
2124 ADD HYD              IDsum=[5], NHYD=["WC-1"], IDs to add=[1+2]
2125 *#-----
2126 *# KTC-2A - URBAN - UPSTREAM LIMIT TO HWY 417, SOUTH OF CAMPEAU DRIVE
2127 *# LAND USES WITHIN AREA: TOWN CENTRE/URBAN RES
2128 *#-----
2129 CONTINUOUS STANDHYD ID=[1], NHYD=["KTC-2A"], DT=[1] (min), AREA=[34.34] (ha),
2130                      XIMP=[0.36], TIMP=[0.42], DWF=[0.0] (cms),
2131                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
2132                      DCAY=[2.0] (/hr), F=[0] (mm),
2133                      Pervious   surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
2134                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
2135                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
2136                      LGI=[478] (m), MNI=[0.013], SCI=[0] (min),
2137                      Continuous simulation parameters:
2138                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),

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2137             InterEventTime=[12] (hrs), END=-1
2138 *#=====
2139 *# ADD KTC-2A AND KTC-2B MINOR
2140 *#=====
2141 ADD HYD             IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+10]
2142 *#=====
2143 *# ROUTE KTC-2 THROUGH KANATA TOWN CENTRE PHASE I POND
2144 *# STAGE-STORAGE-DISCHARGE CURVE OBTAINED FROM:
2145 *# KANATA TOWN CENTRE PHASE i - STORMWATER MANAGEMENT REPORT
2146 *# J.L. RICHARDS & ASSOCIATES LTD. 1996
2147 *# SWF-1205
2148 *# STORAGE WAS ESTIMATED WITH AVAILABLE DRAWING
2149 *# DISCHARGE WAS TAKEN FROM R-1563
2150 *#=====
2151 ROUTE RESERVOIR    IDout=[1], NHYD=["KTC-2"], IDin=[4],
2152                   RDT=[1] (min),
2153                   TABLE of ( OUTFLOW-STORAGE ) values
2154                   (cms) - (ha-m)
2155                   [ 0.0 , 0.0 ]
2156                   [ 0.79, 0.6939]
2157                   [ 4.70, 1.4350]
2158                   [ -1 , -1 ] (max twenty pts)
2159                   IDovf=[2], NHYDovf=["OVF-KTC2"]
2160 *#=====
2161 *# ADD OUTFLOW AND OVERFLOW
2162 *#=====
2163 ADD HYD             IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+2]
2164 *#=====
2165 *# ADD WC-1 AND KTC-2
2166 *#=====
2167 ADD HYD             IDsum=[2], NHYD=["KTC-2"], IDs to add=[5+4]
2168 *%-----|-----|
2169 *#=====
2170 *# WC-3 - URBAN/RURAL
2171 *#=====
2172 CONTINUOUS NASHYD  ID=[1], NHYD=["WC-3"], DT=[1]min, AREA=[204.06] (ha),
2173                   DWF=[0] (cms), CN=[66], IA=[7] (mm),
2174                   N=[2.0], TP=[1.28]hrs,
2175                   Continuous simulation parameters:
2176                   IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2177                   InterEventTime=[12] (hrs),
2178                   Baseflow simulation parameters:
2179                   BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2180                   VHydCond=[.001] (mm/hr), END=-1
2181 *#=====
2182 *# ADD WC-1+KTC AND WC-3
2183 *#=====
2184 ADD HYD             IDsum=[4], NHYD=["WC-3"], IDs to add=[2+1]
2185 *#=====
2186 *# ROUTE WC-1+KTC+WC-3 THROUGH WC-4A
2187 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2188 *#=====
2189 ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[4],
2190                   RDT=[1] (min),
2191                   CHLGTH=[744] (m), CHSLOPE=[1.29] (%),
2192                   FPSLOPE=[1.29] (%),
2193                   SECNUM=[1], NSEG=[3]
2194                   ( SEGROUGH, SEGDIST (m))=[0.05,25.86 -0.035,40.77 0.05,72.60] NSEG  ↵
2195                   times
2196                   ( DISTANCE (m), ELEVATION (m))=[ 0, 90.87]
2197                   [ 1.99, 90.66]
2198                   [ 7.96, 90.10]
2199                   [16.91, 85.80]
2200                   [18.90, 85.49]
2201                   [21.88, 85.42]
2202                   [25.86, 85.56]
2203                   [26.85, 25.50]

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2203 [29.83, 84.06]
2204 [31.82, 84.06]
2205 [34.81, 85.10]
2206 [40.77, 85.59]
2207 [48.73, 85.85]
2208 [52.71, 86.80]
2209 [55.59, 87.80]
2210 [60.66, 90.40]
2211 [64.64, 90.77]
2212 [72.60, 90.97]
2213 *#=====
2214 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2215 *#=====
2216 ROUTE CHANNEL      IDout=[2], NHYD=["WC-3"], IDin=[1],
2217                   RDT=[1] (min),
2218                   CHLGTH=[2295] (m),   CHSLOPE=[0.45] (%),
2219                   FPSLOPE=[0.45] (%),
2220                   SECNUM=[2],         NSEG=[3]
2221                   ( SEGROUGH, SEGDIST (m))=[0.05,12.98 -0.035,20.97 0.05,51.94] NSEG  ↵
                times
2222                   ( DISTANCE (m), ELEVATION (m))=[ 0, 85.79]
2223                   [ 1.00, 85.75]
2224                   [11.99, 83.71]
2225                   [12.98, 83.36]
2226                   [14.98, 82.49]
2227                   [15.98, 82.44]
2228                   [16.98, 82.45]
2229                   [20.97, 83.51]
2230                   [22.97, 83.46]
2231                   [23.97, 83.51]
2232                   [26.97, 83.55]
2233                   [27.97, 83.55]
2234                   [31.96, 83.51]
2235                   [32.96, 83.45]
2236                   [33.96, 83.45]
2237                   [34.96, 83.50]
2238                   [51.94, 85.81]
2239 *#=====
2240 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2241 *#=====
2242 ROUTE CHANNEL      IDout=[1], NHYD=["WC-3"], IDin=[2],
2243                   RDT=[1] (min),
2244                   CHLGTH=[487] (m),   CHSLOPE=[0.23] (%),
2245                   FPSLOPE=[0.23] (%),
2246                   SECNUM=[3],         NSEG=[3]
2247                   ( SEGROUGH, SEGDIST (m))=[0.05,6.97 -0.035,25.87 0.05,29.85] NSEG  ↵
                times
2248                   ( DISTANCE (m), ELEVATION (m))=[ 0, 75.60]
2249                   [ 1, 75.54]
2250                   [ 1.99, 75.42]
2251                   [ 6.97, 73.09]
2252                   [11.94, 72.70]
2253                   [14.93, 72.66]
2254                   [17.91, 72.27]
2255                   [23.88, 72.25]
2256                   [25.87, 73.03]
2257                   [28.86, 74.06]
2258                   [29.85, 74.23]
2259 *#=====
2260 *# WC-4A - RURAL - HIGHWAY 417 TO CNR
2261 *#=====
2262 CONTINUOUS NASHYD      ID=[2] NHYD=["WC-4A"], DT=[1]min, AREA=[126.29] (ha),
2263                   DWF=[0] (cms),   CN=[82], IA=[7] (mm),
2264                   N=[2.0], TP=[2.30]hrs,
2265                   Continuous simulation parameters:
2266                   IaRECper=[6] (hrs), SMIN=[-1] (mm),   SMAX=[-1] (mm), SK=[0.03] / (mm),
2267                   InterEventTime=[12] (hrs),

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2268 Baseflow simulation parameters:
2269 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
2270 VHydCond=[.001] (mm/hr) , END=-1
2271 *#=====
2272 *# ADD WC-1+KTC+WC-3 AND WC-4A
2273 *# CREST GAUGE LOCATION WC-1 - WATTS CREEK AT CONFLUENCE WITH KIZELL DRAIN
2274 *#=====
2275 ADD HYD IDsum=[6] , NHYD=["WFP1"] , IDs to add=[1+2]
2276 *PRINT HYD ID=[6] , # OF PCYCLES=[1]
2277 *#=====
2278 *# WC-4B - RURAL - HIGHWAY 417 TO CNR
2279 *#=====
2280 CONTINUOUS NASHYD ID=[4] NHYD=["WC-4B"] , DT=[1]min , AREA=[145.27] (ha) ,
2281 DWF=[0] (cms) , CN=[73] , IA=[7] (mm) ,
2282 N=[2.0] , TP=[1.22]hrs ,
2283 Continuous simulation parameters:
2284 IaRECper=[6] (hrs) , SMIN=[-1] (mm) , SMAX=[-1] (mm) , SK=[0.03] / (mm) ,
2285 InterEventTime=[12] (hrs) ,
2286 Baseflow simulation parameters:
2287 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
2288 VHydCond=[.001] (mm/hr) , END=-1
2289 *#=====
2290 *# ADD WC-4A AND KIZELL
2291 *#=====
2292 ADD HYD IDsum=[1] , NHYD=["WFP2"] , IDs to add=[6+3]
2293 *PRINT HYD ID=[1] , # OF PCYCLES=[1]
2294 *#=====
2295 *# ADD WC-4A AND WC-4B
2296 *#=====
2297 ADD HYD IDsum=[5] , NHYD=["WFP3"] , IDs to add=[1+4]
2298 *PRINT HYD ID=[5] , # OF PCYCLES=[1]
2299 *#=====
2300 *# ROUTE KIZELL AND WC-1+KTC+WC-3+WC-4 THROUGH WC-5A
2301 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4677.806
2302 *#=====
2303 ROUTE CHANNEL IDout=[2] , NHYD=["WC-4"] , IDin=[5] ,
2304 RDT=[1] (min) ,
2305 CHLGTH=[636] (m) , CHSLOPE=[0.16] (%) ,
2306 FPSLOPE=[0.16] (%) ,
2307 SECNUM=[4677] , NSEG=[3]
2308 ( SEGROUGH , SEGDIST (m))=[0.08,95.801 -0.04,102.955 0.08,167.28] ↗
2309 NSEG times
2310 ( DISTANCE (m) , ELEVATION (m))=[ 0 , 75.4 ]
2311 [ 11.4 , 74.3 ]
2312 [ 31.7 , 73.6 ]
2313 [ 51.08 , 72.8 ]
2314 [ 60.69 , 72.6 ]
2315 [ 74.1 , 71.6 ]
2316 [ 77.61 , 70.8 ]
2317 [ 84.14 , 71 ]
2318 [ 93.83 , 71 ]
2319 [ 95.801 , 70.73 ]
2320 [ 97.18 , 70.5 ]
2321 [ 101 , 70.5 ]
2322 [ 102.955 , 70.989 ]
2323 [ 111.37 , 74.5 ]
2324 [ 121.02 , 76.45 ]
2325 [ 128.96 , 77.6 ]
2326 [ 139.85 , 78.3 ]
2327 [ 151.67 , 80.09 ]
2328 [ 158.82 , 80.63 ]
2329 [ 167.28 , 81.57 ]
2330 *#=====
2331 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4446.172
2332 *#=====
2333 ROUTE CHANNEL IDout=[1] , NHYD=["WC-4"] , IDin=[2] ,
2334 RDT=[1] (min) ,

```

```

2334          CHLGTH=[443] (m),   CHSLOPE=[0.64] (%),
2335                      FPSLOPE=[0.64] (%),
2336          SECNUM=[4446],       NSEG=[4]
2337          ( SEGROUGH, SEGDIST (m))=[0.08,101.82 0.05,155.499 -0.04,160.804
          0.08,360.72] NSEG times
2338          ( DISTANCE (m), ELEVATION (m))=[ 0, 75.11 ]
2339                      [15.28, 74.3 ]
2340                      [39.39, 73.6 ]
2341                      [55.02, 73.7 ]
2342                      [70.01, 73.1 ]
2343                      [101.82, 72.72 ]
2344                      [123.37, 72.37 ]
2345                      [137.03, 71.7 ]
2346                      [152.53, 68.9 ]
2347                      [155.499, 68.552 ]
2348                      [160.804, 68.559 ]
2349                      [163.78, 68.89 ]
2350                      [172.88, 69 ]
2351                      [180.76, 72.03 ]
2352                      [191.21, 72.8 ]
2353                      [208.93, 72.49 ]
2354                      [239.54, 72.4 ]
2355                      [260.28, 72.6 ]
2356                      [291.51, 72.6 ]
2357                      [360.72, 73.06 ]
2358 *#=====
2359 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3897.472
2360 *#=====
2361 ROUTE CHANNEL          IDout=[2], NHYD=["WC-4"], IDin=[1],
2362                      RDT=[1] (min),
2363                      CHLGTH=[468] (m),   CHSLOPE=[0.44] (%),
2364                      FPSLOPE=[0.44] (%),
2365                      SECNUM=[3897],       NSEG=[4]
2366          ( SEGROUGH, SEGDIST (m))=[0.08,161.362 -0.04,164.388 -0.08,164.68
          0.05,242.03] NSEG times
2367          ( DISTANCE (m), ELEVATION (m))=[ 0, 72.01 ]
2368                      [14.79, 71.9 ]
2369                      [26.32, 71.5 ]
2370                      [45.81, 69.5 ]
2371                      [ 52.8, 68.5 ]
2372                      [67.29, 68.1 ]
2373                      [85.91, 68.1 ]
2374                      [94.25, 67.9 ]
2375                      [116.16, 67.78 ]
2376                      [142.44, 67.4 ]
2377                      [159.77, 66.1 ]
2378                      [161.362, 65.677 ]
2379                      [164.388, 65.577 ]
2380                      [164.68, 65.61 ]
2381                      [166.02, 66.1 ]
2382                      [167.47, 66.5 ]
2383                      [201.22, 66.8 ]
2384                      [208.26, 66.7 ]
2385                      [216.93, 67.19 ]
2386                      [242.03, 67.3 ]
2387 *#=====
2388 *# WC-5A - RURAL - CNR TO CARLING AVE
2389 *#=====
2390 CONTINUOUS NASHYD          ID=[1] NHYD=["WC-5A"], DT=[1]min, AREA=[59.54] (ha),
2391                      DWF=[0] (cms),   CN=[73], IA=[7] (mm),
2392                      N=[2.0], TP=[0.79]hrs,
2393                      Continuous simulation parameters:
2394                      IaRECper=[6] (hrs), SMIN=[-1] (mm),   SMAX=[-1] (mm), SK=[0.03]/(mm),
2395                      InterEventTime=[12] (hrs),
2396                      Baseflow simulation parameters:
2397                      BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2398                      VHydCond=[.001] (mm/hr), END=-1

```



```

2399 *#=====
2400 *# ADD WC-5A AND WC-5A UPSTREAM
2401 *# CALIBRATION LOCATION - WATTS CREEK AT CARLING AVENUE
2402 *#=====
2403 ADD HYD          IDsum=[3], NHYD=["WFP4"], IDs to add=[1+2]
2404 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
2405 *#=====
2406 *# ROUTE WC-5B UPSTREAM THROUGH WC-5B
2407 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3469.421
2408 *# MINIMUM SLOPE ASSUMED 0.1%
2409 *#=====
2410 ROUTE CHANNEL   IDout=[2], NHYD=["WC-5B"], IDin=[3],
2411                RDT=[1] (min),
2412                CHLGTH=[485] (m), CHSLOPE=[0.1] (%),
2413                FPSLOPE=[0.1] (%),
2414                SECNUM=[3469], NSEG=[4]
2415                ( SEGROUGH, SEGDIST (m))=[0.08,127.46 0.06,131.6 -0.03,141.59
                0.08,308.37] NSEG times
2416                ( DISTANCE (m), ELEVATION (m))=[ 0, 68.08 ]
2417                [16.71, 67.1 ]
2418                [48.15, 66.8 ]
2419                [75.65, 66.3 ]
2420                [107.54, 66.2 ]
2421                [117.33, 66.3 ]
2422                [127.46, 65.54 ]
2423                [129.21, 65.3 ]
2424                [131.6, 64.9 ]
2425                [136.836, 64.972 ]
2426                [139.19, 65.3 ]
2427                [141.59, 65.65 ]
2428                [161.72, 65.6 ]
2429                [171.42, 66.1 ]
2430                [187.05, 66.3 ]
2431                [224.24, 66.3 ]
2432                [246.7, 66.1 ]
2433                [286.52, 66.07 ]
2434                [304.07, 66.3 ]
2435                [308.37, 66.7 ]
2436 *#=====
2437 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 2981.379
2438 *#=====
2439 ROUTE CHANNEL   IDout=[1], NHYD=["WC-5B"], IDin=[2],
2440                RDT=[1] (min),
2441                CHLGTH=[307] (m), CHSLOPE=[0.40] (%),
2442                FPSLOPE=[0.40] (%),
2443                SECNUM=[2981], NSEG=[4]
2444                ( SEGROUGH, SEGDIST (m))=[0.08,9.006 -0.03,14.347 -0.06,14.85
                0.08,30.25] NSEG times
2445                ( DISTANCE (m), ELEVATION (m))=[ 0, 64.35 ]
2446                [ 2.07, 64.3 ]
2447                [ 4.58, 64.2 ]
2448                [ 5.7, 64.1 ]
2449                [ 6.83, 63.8 ]
2450                [ 7.91, 63.37 ]
2451                [9.006, 63.169 ]
2452                [ 9.64, 62.8 ]
2453                [13.64, 62.8 ]
2454                [14.24, 63.1 ]
2455                [14.347, 63.315 ]
2456                [14.85, 63.35 ]
2457                [15.35, 63.4 ]
2458                [16.49, 63.69 ]
2459                [18.19, 64.21 ]
2460                [21.41, 64.2 ]
2461                [25.06, 64.05 ]
2462                [27.14, 64.06 ]
2463                [28.41, 64.2 ]

```

```

2464                                     [30.25, 64.28 ]
2465 *#=====
2466 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 1585.543
2467 *#=====
2468 ROUTE CHANNEL      IDout=[2], NHYD=["WC-5B"], IDin=[1],
2469                   RDT=[1] (min),
2470                   CHLGTH=[2876] (m),   CHSLOPE=[0.16] (%),
2471                   FPSLOPE=[0.16] (%),
2472                   SECNUM=[1585],       NSEG=[4]
2473                   ( SEGROUGH, SEGDIST (m))=[0.08,56.84 0.05,124.41 -0.035,128.78
0.08,255.15] NSEG times
2474                   ( DISTANCE (m), ELEVATION (m))=[  0, 64.07 ]
2475                                     [21.74, 63.8 ]
2476                                     [40.53, 63.5 ]
2477                                     [56.84, 61.82 ]
2478                                     [74.07, 61.6 ]
2479                                     [98.29, 61.7 ]
2480                                     [104.39, 61.43 ]
2481                                     [117.32, 61.8 ]
2482                                     [124.32, 60.8 ]
2483                                     [124.41, 60.79 ]
2484                                     [124.519, 60.783 ]
2485                                     [127.785, 60.75 ]
2486                                     [ 128, 60.83 ]
2487                                     [128.78, 61.17 ]
2488                                     [130.97, 61.8 ]
2489                                     [149.66, 61.32 ]
2490                                     [170.74, 61.4 ]
2491                                     [191.12, 63.6 ]
2492                                     [219.28, 64.08 ]
2493                                     [255.15, 64.1 ]
2494 *#=====
2495 *# WC-5B - RURAL - CARLING AVE TO OUTLET
2496 *#=====
2497 CONTINUOUS NASHYD      ID=[4] NHYD=["WC-5B"], DT=[1]min, AREA=[379.59] (ha),
2498                   DWF=[0] (cms),   CN=[73], IA=[7] (mm),
2499                   N=[2.0], TP=[3.28]hrs,
2500                   Continuous simulation parameters:
2501                   IaRECper=[6] (hrs), SMIN=[-1] (mm),   SMAX=[-1] (mm), SK=[0.03]/(mm),
2502                   InterEventTime=[12] (hrs),
2503                   Baseflow simulation parameters:
2504                   BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2505                   VHydCond=[.001] (mm/hr), END=-1
2506 *#=====
2507 *# ADD WC-5B AND WC-5B UPSTREAM
2508 *# WATTS CREEK AT OUTLET TO OTTAWA RIVER
2509 *#=====
2510 ADD HYD                IDsum=[1], NHYD=["WFP5"], IDs to add=[4+2]
2511 *PRINT HYD            ID=[1],   # OF PCYCLES=[1]
2512 *%-----|-----|
2513 SAVE HYD              ID=[1],   # OF PCYCLES=[-1], ICASEsh=[-1]
2514                   HYD_FILENAME=["WFP5"]
2515                   HYD_COMMENT=["WATTS CREEK AT OUTLET TO OTTAWA RIVER"]
2516 *#=====
2517 *
2518 *                       DESIGN STORMS
2519 *#=====
2519 START                TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0005]
2520 *                    "5y12hr.stm"
2521 START                TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0010]
2522 *                    "10y12hr.stm"
2523 START                TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0025]
2524 *                    "25y12hr.stm"
2525 START                TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0050]
2526 *                    "50y12hr.stm"
2527 START                TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0100]
2528 *                    "100y12hr.stm"
2529 FINISH

```

```
2530 *#-----  
2531 * CONTINUOUS SIMULATIONS  
2532 *#-----  
2533 START TZERO=[1968.0101], METOUT=[2], NSTORM=[0], NRUN=[1968]  
2534 START TZERO=[1969.0101], METOUT=[2], NSTORM=[0], NRUN=[1969]  
2535 START TZERO=[1970.0101], METOUT=[2], NSTORM=[0], NRUN=[1970]  
2536 START TZERO=[1971.0101], METOUT=[2], NSTORM=[0], NRUN=[1971]  
2537 START TZERO=[1972.0101], METOUT=[2], NSTORM=[0], NRUN=[1972]  
2538 START TZERO=[1973.0101], METOUT=[2], NSTORM=[0], NRUN=[1973]  
2539 START TZERO=[1974.0101], METOUT=[2], NSTORM=[0], NRUN=[1974]  
2540 START TZERO=[1975.0101], METOUT=[2], NSTORM=[0], NRUN=[1975]  
2541 START TZERO=[1976.0101], METOUT=[2], NSTORM=[0], NRUN=[1976]  
2542 START TZERO=[1977.0101], METOUT=[2], NSTORM=[0], NRUN=[1977]  
2543 START TZERO=[1978.0101], METOUT=[2], NSTORM=[0], NRUN=[1978]  
2544 START TZERO=[1979.0101], METOUT=[2], NSTORM=[0], NRUN=[1979]  
2545 START TZERO=[1980.0101], METOUT=[2], NSTORM=[0], NRUN=[1980]  
2546 START TZERO=[1981.0101], METOUT=[2], NSTORM=[0], NRUN=[1981]  
2547 START TZERO=[1982.0101], METOUT=[2], NSTORM=[0], NRUN=[1982]  
2548 START TZERO=[1983.0101], METOUT=[2], NSTORM=[0], NRUN=[1983]  
2549 START TZERO=[1984.0101], METOUT=[2], NSTORM=[0], NRUN=[1984]  
2550 START TZERO=[1985.0101], METOUT=[2], NSTORM=[0], NRUN=[1985]  
2551 START TZERO=[1986.0101], METOUT=[2], NSTORM=[0], NRUN=[1986]  
2552 START TZERO=[1987.0101], METOUT=[2], NSTORM=[0], NRUN=[1987]  
2553 START TZERO=[1988.0101], METOUT=[2], NSTORM=[0], NRUN=[1988]  
2554 START TZERO=[1989.0101], METOUT=[2], NSTORM=[0], NRUN=[1989]  
2555 START TZERO=[1990.0101], METOUT=[2], NSTORM=[0], NRUN=[1990]  
2556 START TZERO=[1991.0101], METOUT=[2], NSTORM=[0], NRUN=[1991]  
2557 START TZERO=[1992.0101], METOUT=[2], NSTORM=[0], NRUN=[1992]  
2558 START TZERO=[1993.0101], METOUT=[2], NSTORM=[0], NRUN=[1993]  
2559 START TZERO=[1994.0101], METOUT=[2], NSTORM=[0], NRUN=[1994]  
2560 START TZERO=[1995.0101], METOUT=[2], NSTORM=[0], NRUN=[1995]  
2561 START TZERO=[1996.0101], METOUT=[2], NSTORM=[0], NRUN=[1996]  
2562 START TZERO=[1997.0101], METOUT=[2], NSTORM=[0], NRUN=[1997]  
2563 START TZERO=[1998.0101], METOUT=[2], NSTORM=[0], NRUN=[1998]  
2564 START TZERO=[1999.0101], METOUT=[2], NSTORM=[0], NRUN=[1999]  
2565 START TZERO=[2000.0101], METOUT=[2], NSTORM=[0], NRUN=[2000]  
2566 START TZERO=[2002.0101], METOUT=[2], NSTORM=[0], NRUN=[2002]  
2567 START TZERO=[2003.0101], METOUT=[2], NSTORM=[0], NRUN=[2003]  
2568 START TZERO=[2004.0101], METOUT=[2], NSTORM=[0], NRUN=[2004]  
2569 START TZERO=[2006.0101], METOUT=[2], NSTORM=[0], NRUN=[2006]  
2570 START TZERO=[2007.0101], METOUT=[2], NSTORM=[0], NRUN=[2007]  
2571 FINISH  
2572
```

Attachment E

SWMHYMO Model:
The Kanata Golf and Country Club with SWM
+
Kanata Lakes Development

```

1 2 Metric units
2 *#*****
3 *# Project Name: [Shirley's Brook and Watt's Creek Phase 2 SWM Study] Project
Number: [60264539]
4 *# Future Conditions Model for the Watts Creek/Kizell Drain Flood Plain Mapping Study
5 *# Date : 2014-12-31
6 *# Modeller : [Olivia Chung] John Price MVCA
7 *# Company : AECOM Canada
8 *# License # : 2988504
9 *#*****
10 *# September 2019, model parameters further updated by JFSAinc
11 *# with use of rainfall and flow monitoring data collected in 2019
12 *#
13 *# - all N values in NASHYDS changed from N=1.1 to N=2
14 *# - all MNI values in existing conditions STANDHYDs changed from 0.025 to 0.013
15 *# - all SLOPI values in STANDHYDs changed from 0.02 to 1.0
16 *# - change STANDHYD infiltration method from SCS to Horton with
17 *# - Horton: Fo=[125](mm/hr), Fc=[25](mm/hr), DCAY=[2.0](/hr), F=[0](mm)
18 *# - set XIMP to a fix value of 0.25 for all existing residential catchments
19 *# - use COMPUTE API APII=[40], APIK=[0.8]/day,
20 *# - continuous NASHYDs, use BaseFlowOption=[1] , InitGWResVol=[12], GWResK=[0.85],
VHydCond=[.001]
21 *# - all golf course NASHYDs, use CN=50
22 *# - XIMP=[0.250], for all existing not draining through the grass areas of the golf
course
23 *#
24 *# - Areas draining across the golf course:
25 *# - those specific STANDHYD commands converted to NASHYDs so that the infiltrated
water could come back into the system. This allowed a much better volume comparison
through the Beaver Pond.
26 *# - The CN and IA values for those NASHYDs were weighted averages of CN=90 for TIMP
and CN=50 for grass areas, and the IA was based on weighted average of IA=1.5 for TIMP
and IA=5.0 for grass areas.
27 *# - The Tp value was simply calculated by using the (LGI/0.3 * 2/3) / 3600, where the
value of 0.3 was my assumed flow velocity. Note, there are 4 catchments to which this
was done, for a total of 48.3 ha representing just over 11% of the total drainage area
to the Beaver Pond.
28 *# - removed the two IBI Route Reservoirs that were previously inserted to account
for some hidden system storage.
29 *#
30 *#=====
31 *# WATTS CREEK SUBWATERSHED
32 *# MODEL CONVERTED FROM QUALHYMO MODEL (DILLON, 2009)
33 *# DECEMBER 2014
34 *#=====
35 *# Model updated by JFSA (June 2019)to allow for continuous simulations to complete
36 *# preliminary erosion assessment.
37 *# Model reverted back to existing conditions using parameters as documented in
38 *# MVCA's Watts Creek Final Report November 2017
39 *# Model updated to assess the impacts of the redevelopment of the Kanata Golf &
40 *# Country Club directly.
41 *# Model updated to reflect the increase in impervious area due to the redevelopment
42 *# of Kanata Golf & Country Club (KGCC) - All developments assume an imperviousness
43 *# of 60% with a directly connected imperviousness of 50%
44 *# All DA's (Detention Areas) have been removed from the model within the Kanata
45 *# Golf & Country Club
46 *# model updated to include SWM ponds for KGCC lands
47 *# Model updated to reflect the current design for Kanata Lakes Stage 9 as per IBI's
48 *# March 2018 Design Brief
49 *# Kanata Lakes Stages 7 & 8 as per MVCA model
50 *#=====
51 *# KIZELL DRAIN
52 *#=====
53 * Area Tributary to Beaver Pond and Kizell Cell
54 *#=====
55 *#=====
56 *# Derived from Scenario 20 of Phase 1 SWM Study

```

```

57  *# AECOM MODEL + GOLF COURSE DETENTION PONDS
58  *# AMC II Condition
59  *# RAINFALL - BEAVER POND RAIN GAUGE (POINT RAINFALL)
60  *# DESIGN EVENTS
61  *#=====
62  *
63  *#=====
64  *%-----|-----
65  START          TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0002]
66  *              "2y12hr.stm"
67  READ STORM     STORM_FILENAME=["storm.001"]
68  *%-----|-----
69  *#=====
70  *
71  *#=====
72  *START          TZERO=[1967.0719], METOUT=[2], NSTORM=[0], NRUN=[1967]
73  *%              [""] <--storm filename, one per line for NSTORM time
74  *%-----|-----
75  *# Ottawa International Airport - 19 July 1967 to 01 Nov 2007
76  *READ AES DATA AES_FILENAME=["YOW_1967_2007.123"],
77  *              IELEM=[123], START_DATE=[0], END_DATE=[-364]
78  *%-----|-----
79  *%-----|-----
80  COMPUTE API    APII=[40], APIK=[0.8]/day,
81  *%-----|-----
82  *#=====
83  *
84  *#=====
85  *#=====
86  *# AREA 3A-1 (URBAN PORTION of Area North of Campeau Drive)
87  *#=====
88  *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
89  *# over golf course and we want to recapture the baseflow
90  CONTINUOUS NASHYD ID=[1], NHYD=["AREA 3A-1"], DT=[1] (min), AREA=[2.7] (ha)
91  DWF=[0] (cms), CN/C=[68.8], IA=[3.38] (mm), N=[2], TP=[1.32] (hrs),
92  Continuous simulation parameters:
93  IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
94  InterEventTime=[12] (hrs),
95  Baseflow simulation parameters:
96  BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
97  VHydCond=[.001] (mm/hr), END=-1
98  *%-----|-----
99  *#=====
100 *# AREA 3B (GOLF PORTION of Area North of Campeau Drive) - Developed
101 *#=====
102 CONTINUOUS STANDHYD ID=[2], NHYD=["AREA 3B"], DT=[1] (min), AREA=[6.3] (ha),
103 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
104 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
105 DCAY=[4.14] (/hr), F=[0] (mm),
106 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
107 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
108 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
109 LGI=[205] (m), MNI=[0.025], SCI=[0] (min),
110 Continuous simulation parameters:
111 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
112 InterEventTime=[12] (hrs), END=-1
113 *%-----|-----
114 *#=====
115 *# AREA 12 (GOLF PORTION OF Area East of Knudson Drive) - Developed
116 *#=====
117 CONTINUOUS STANDHYD ID=[3], NHYD=["AREA 12"], DT=[1] (min), AREA=[2.27] (ha),
118 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
119 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
120 DCAY=[4.14] (/hr), F=[0] (mm),
121 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
122 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
123 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),

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```

122             LGI=[123] (m), MNI=[0.025], SCI=[0] (min),
123     Continuous simulation parameters:
124     IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
125     InterEventTime=[12] (hrs), END=-1
126 *%-----|-----|
127 *#=====|=====|
128 *# AREA 2A (URBAN PORTION OF Area North of Campeau Drive)
129 *#=====|=====|
130 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
131 *# over golf course and we want to recapture the baseflow
132 CONTINUOUS NASHYD      ID=[4], NHYD=["AREA 2A"], DT=[1] (min), AREA=[29.3] (ha),
133     DWF=[0] (cms), CN=[68], IA=[3.4] (mm),
134     N=[2.0], TP=[0.27]hrs,
135     Continuous simulation parameters:
136     IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
137     InterEventTime=[12] (hrs),
138     Baseflow simulation parameters:
139     BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
140     VHydCond=[.001] (mm/hr), END=-1
141 *%-----|-----|
142 *#=====|=====|
143 *# AREA 2B-1 (GOLF PORTION OF Area North of Campeau Drive) TO DA 3 - Developed
144 *#=====|=====|
145 CONTINUOUS STANDHYD   ID=[5], NHYD=["AREA 2B-1"], DT=[1] (min), AREA=[13.0] (ha),
146     XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
147     LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
148     DCAY=[4.14] (/hr), F=[0] (mm),
149     Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
150     LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
151     Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
152     LGI=[294] (m), MNI=[0.025], SCI=[0] (min),
153     Continuous simulation parameters:
154     IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
155     InterEventTime=[12] (hrs), END=-1
156 *%-----|-----|
157 *#=====|=====|
158 *# ADD All Catchments that Drain to Pond 1
159 *#=====|=====|
160 ADD HYD                IDsum=[7], NHYD=["Pond1-IN"], IDs to add=[1+2+3+4+5]
161 *%-----|-----|
162 *#=====|=====|
163 *# KGCC Pond 1 (Drainage 53.57 ha)
164 *#=====|=====|
165 ROUTE RESERVOIR       IDout=[1], NHYD=["Pond-1"], IDin=[7],
166     RDT=[1] (min),
167     TABLE of ( OUTFLOW-STORAGE ) values
168     (cms) - (ha-m)
169     [ 0.0 , 0.0 ]
170     [ 0.201, 0.643 ]
171     [ 0.295, 1.045 ]
172     [ 1.179, 2.0 ]
173     [ -1 , -1 ] (max twenty pts)
174     IDovf=[ ], NHYDovf=[ ]
175 *%-----|-----|
176 *#=====|=====|
177 *# DRAINAGE TO KGCC POND 2
178 *#=====|=====|
179 *# AREA 2C (URBAN PORTION OF Area North of Campeau Drive)
180 *#=====|=====|
181 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
182 *# over golf course and we want to recapture the baseflow
183 CONTINUOUS NASHYD     ID=[2], NHYD=["AREA 2C"], DT=[1] (min), AREA=[13.8] (ha)
184     DWF=[0] (cms), CN/C=[70.8], IA=[3.18] (mm),
185     [2], TP=[0.187] (hrs),
186     Continuous simulation parameters:
187     IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),

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188 InterEventTime=[12] (hrs),
189 Baseflow simulation parameters:
190 BaseFlowOption=[1] , InitGWResVol=[12] (mm) , GWResK=[0.85] (mm/day/mm) ,
191 VHydCond=[.001] (mm/hr) , END=-1
192 *%-----|-----|
193 *#=====|=====|
194 *# AREA 2B-2 (GOLF PORTION OF Area North of Campeau Drive) - Developed
195 *#=====|=====|
196 CONTINUOUS STANDHYD ID=[3], NHYD=["AREA 2B-2"], DT=[1] (min), AREA=[15.7] (ha),
197 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
198 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
199 DCAY=[4.14] (/hr), F=[0] (mm),
200 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
201 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
202 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
203 LGI=[324] (m), MNI=[0.025], SCI=[0] (min),
204 Continuous simulation parameters:
205 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
206 InterEventTime=[12] (hrs), END=-1
207 *#=====|=====|
208 *# ADD All Catchments that Drain to Pond 2
209 *#=====|=====|
210 ADD HYD IDsum=[4], NHYD=[Pond2-IN], IDs to add=[2+3]
211 *%-----|-----|
212 *#=====|=====|
213 *# KGCC Pond 2 (Drainage 29.5 ha)
214 *#=====|=====|
215 ROUTE RESERVOIR IDout=[2], NHYD=["Pond-2"], IDin=[4],
216 RDT=[1] (min),
217 TABLE of ( OUTFLOW-STORAGE ) values
218 (cms) - (ha-m)
219 [ 0.0 , 0.0 ]
220 [ 0.111 , 0.417 ]
221 [ 0.162, 0.665 ]
222 [ 0.649, 1.27 ]
223 [ -1 , -1 ] (max twenty pts)
224 IDovf=[ ], NHYDovf=[ ]
225 *%-----|-----|
226 *#=====|=====|
227 * DRAINAGE TO KGCC POND 3 (2.90 ha)
228 *#=====|=====|
229 *# AREA 13 (GOLF PORTION OF Area East of Knudson Drive - DA 6A) - Developed
230 *#=====|=====|
231 CONTINUOUS STANDHYD ID=[4], NHYD=["AREA 13"], DT=[1] (min), AREA=[2.9] (ha),
232 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
233 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
234 DCAY=[4.14] (/hr), F=[0] (mm),
235 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
236 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
237 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
238 LGI=[139] (m), MNI=[0.025], SCI=[0] (min),
239 Continuous simulation parameters:
240 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
241 InterEventTime=[12] (hrs), END=-1
242 *%-----|-----|
243 *#=====|=====|
244 *# ADD outflows from Pond 1,2 & 3
245 *#=====|=====|
246 ADD HYD IDsum=[10], NHYD=[000321], IDs to add=[1+2+4]
247 *#=====|=====|
248 * DRAINAGE TO KGCC POND 4 (47.68 ha)
249 *#=====|=====|
250 *# AREA 14 (GOLF PORTION OF Area East of Knudson Drive - DA 11) - Developed
251 *#=====|=====|
252 CONTINUOUS STANDHYD ID=[1], NHYD=["AREA 14"], DT=[1] (min), AREA=[2.38] (ha),

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253 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
254 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
DCAY=[4.14] (/hr), F=[0] (mm),
255 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
256 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
257 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
258 LGI=[126] (m), MNI=[0.025], SCI=[0] (min),
259 Continuous simulation parameters:
260 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
261 InterEventTime=[12] (hrs), END=-1
262 *%-----|-----|
263 *#=====|=====|
264 *# AREA 1B (GOLF PORTION OF Area North of Campeau Drive) - Developed
265 *#=====|=====|
266 CONTINUOUS STANDHYD ID=[2], NHYD=["AREA 1B"], DT=[1] (min), AREA=[9.3] (ha),
267 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
268 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
DCAY=[4.14] (/hr), F=[0] (mm),
269 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
270 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
271 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
272 LGI=[249] (m), MNI=[0.025], SCI=[0] (min),
273 Continuous simulation parameters:
274 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
275 InterEventTime=[12] (hrs), END=-1
276 *%-----|-----|
277 *#=====|=====|
278 *# AREA 1C (URBAN PORTION of Area North of Campeau Drive)
279 *#=====|=====|
280 *# This area is piped through the golf course, so no change in XIMP
281 CONTINUOUS STANDHYD ID=[3], NHYD=["AREA 1C"], DT=[1] (min), AREA=[17.8] (ha),
282 XIMP=[0.225], TIMP=[0.51], DWF=[0] (cms),
283 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
DCAY=[2.0] (/hr), F=[0] (mm),
284 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
285 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
286 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
287 LGI=[344] (m), MNI=[0.013], SCI=[0] (min),
288 Continuous simulation parameters:
289 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
290 InterEventTime=[12] (hrs), END=-1
291 *%-----|-----|
292 *#=====|=====|
293 *# AREA 5A (URBAN PORTION OF Area North of Knudson Drive)
294 *#=====|=====|
295 *# Previous command replaced by a NASHYD to account for the fact that the drainage goes
296 *# over golf course and we want to recapture the baseflow
297 CONTINUOUS NASHYD ID=[4], NHYD=["AREA 5A"], DT=[1] (min), AREA=[2.5] (ha)
298 DWF=[0] (cms), CN/C=[45.25], IA=[3.25] (mm), N=[2], TP=[0.08] (hrs),
299 Continuous simulation parameters:
300 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
301 InterEventTime=[12] (hrs),
302 Baseflow simulation parameters:
303 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
304 VHydCond=[.001] (mm/hr), END=-1
305 *%-----|-----|
306 *#=====|=====|
307 *# AREA 5B (GOLF PORTION OF Area North of Knudson Drive) - Developed
308 *#=====|=====|
309 CONTINUOUS STANDHYD ID=[5], NHYD=["AREA 5B"], DT=[1] (min), AREA=[9.5] (ha),
310 XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
311 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
DCAY=[4.14] (/hr), F=[0] (mm),
312 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
313 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
314 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
315 LGI=[252] (m), MNI=[0.025], SCI=[0] (min),

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316          Continuous simulation parameters:
317          IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
318          InterEventTime=[12] (hrs), END=-1
319  *%-----|-----|
320  *#=====|=====|
321  *# ADD flows that go directly to Pond 4
322  *#=====|=====|
323  ADD HYD          IDsum=[9], NHYD=[000321], IDs to add=[1+2+3+4+5]
324  *%-----|-----|
325  *#=====|=====|
326  *# AREA 1D (URBAN PORTION of Area North of Campeau Drive)
327  *#=====|=====|
328  CONTINUOUS STANDHYD      ID=[1], NHYD=["AREA 1D"], DT=[1] (min), AREA=[15.8] (ha),
329          XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
330          LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
331          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
332          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
333          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
334          LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
335          Continuous simulation parameters:
336          IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
337          InterEventTime=[12] (hrs), END=-1
338  *%-----|-----|
339  *#=====|=====|
340  *# MAJOR FLOW TO Pond 4 - MINOR FLOW TO Beaver Pond
341  *# 85 L/S/HA * 15.8 HA = 1.343 L/S
342  *#=====|=====|
343  COMPUTE DUALHYD      IDin=[1], CINLET=[1.343] (cms), NINLET=[1],
344          MAJID=[2], MajNHYD=[000100],
345          MINID=[3], MinNHYD=[000100],
346          TMJSTO=[0] (cu-m)
347  *%-----|-----|
348  *#=====|=====|
349  *# AREA 5C (URBAN PORTION OF Area North of Knudson Drive)
350  *#=====|=====|
351  CONTINUOUS STANDHYD      ID=[4], NHYD=["000100"], DT=[1] (min), AREA=[6.2] (ha),
352          XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
353          LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
354          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
355          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
356          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
357          LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
358          Continuous simulation parameters:
359          IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
360          InterEventTime=[12] (hrs), END=-1
361  *%-----|-----|
362  *#=====|=====|
363  *# MAJOR FLOW TO Pond 4 - MINOR FLOW TO Beaver Pond
364  *# 85 L/S/HA * 6.2 HA = 0.527 L/S
365  *#=====|=====|
366  COMPUTE DUALHYD      IDin=[4], CINLET=[0.527] (cms), NINLET=[1],
367          MAJID=[6], MajNHYD=[000100],
368          MINID=[7], MinNHYD=[000100],
369          TMJSTO=[0] (cu-m)
370  *%-----|-----|
371  *#=====|=====|
372  *# ADD major flows from 1D and 5C that go to Pond 4
373  *#=====|=====|
374  ADD HYD          IDsum=[1], NHYD=[Pond4-IN], IDs to add=[6+2+9]
375  *%-----|-----|
376  *#=====|=====|
377  *# ADD minor flows from 1D and 5C to Beaver Pond
378  *#=====|=====|
379  ADD HYD          IDsum=[2], NHYD=[MIN-Beaver-IN], IDs to add=[7+3]
380  *%-----|-----|

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381
382 *#=====
383 *# KGCC Pond 4 (Drainage 41.48 ha + Major from 1D & 5C)
384 *#=====
385 ROUTE RESERVOIR      IDout=[4],  NHYD=["Pond-4"],  IDin=[1],
386                    RDT=[1](min),
387                    TABLE of ( OUTFLOW-STORAGE ) values
388                    (cms) - (ha-m)
389                    [ 0.0 , 0.0 ]
390                    [ 0.156 , 0.480 ]
391                    [ 0.228 , 0.744 ]
392                    [ 0.913 1.61 ]
393                    [ -1 , -1 ] (max twenty pts)
394                    IDovf=[ ], NHYDovf=[ ]
395 *%-----|-----
396 *# ADD outflows from Pond 4 to ponds 1,2 & 3 and minor flows
397 *#=====
398 ADD HYD              IDsum=[1], NHYD=[000321], IDs to add=[10+4+2]
399 *#=====
400 *#=====
401 *                    DRAINAGE TO KGCC POND 5
402 *#=====
403 *#=====
404 *# AREA 6A (URBAN PORTION OF Area North of Knudson Drive)
405 *#=====
406 CONTINUOUS STANDHYD ID=[2], NHYD=["AREA 6A"], DT=[1](min), AREA=[4.1](ha),
407                    XIMP=[0.050], TIMP=[0.52], DWF=[0](cms),
408                    LOSS=[1]: Horton: Fo=[125](mm/hr), Fc=[25](mm/hr),
409                    DCAY=[2.0](/hr), F=[0](mm),
410                    Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
411                    LGP=[40](m), MNP=[0.25], SCP=[0](min),
412                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
413                    LGI=[165](m), MNI=[0.013], SCI=[0](min),
414                    Continuous simulation parameters:
415                    IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
416                    InterEventTime=[12](hrs), END=-1
417 *%-----|-----
418 *# AREA 6B (GOLF PORTION OF Area North of Knudson Drive) - Developed
419 *#=====
420 CONTINUOUS STANDHYD ID=[3], NHYD=["AREA 6B"], DT=[1](min), AREA=[5.9](ha),
421                    XIMP=[0.50], TIMP=[0.60], DWF=[0](cms),
422                    LOSS=[1]: Horton: Fo=[76.20](mm/hr), Fc=[13.2](mm/hr),
423                    DCAY=[4.14](/hr), F=[0](mm),
424                    Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
425                    LGP=[40](m), MNP=[0.25], SCP=[0](min),
426                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
427                    LGI=[198](m), MNI=[0.025], SCI=[0](min),
428                    Continuous simulation parameters:
429                    IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
430                    InterEventTime=[12](hrs), END=-1
431 *%-----|-----
432 *# AREA 15 (GOLF PORTION OF Area South of Walden Drive - DA 10B) - Developed
433 *#=====
434 CONTINUOUS STANDHYD ID=[4], NHYD=["AREA 15"], DT=[1](min), AREA=[2.5](ha),
435                    XIMP=[0.50], TIMP=[0.60], DWF=[0](cms),
436                    LOSS=[1]: Horton: Fo=[76.20](mm/hr), Fc=[13.2](mm/hr),
437                    DCAY=[4.14](/hr), F=[0](mm),
438                    Pervious surfaces: IAper=[4.67](mm), SLPP=[2](%),
439                    LGP=[40](m), MNP=[0.25], SCP=[0](min),
440                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.2](%),
441                    LGI=[129](m), MNI=[0.025], SCI=[0](min),
442                    Continuous simulation parameters:
443                    IaRECper=[6](hrs), IaRECimp=[1.5](hrs),
444                    InterEventTime=[12](hrs), END=-1
445 *%-----|-----

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445 *#=====
446 *# AREA 6C (URBAN PORTION OF Area North of Knudson Drive)
447 *#=====
448 CONTINUOUS STANDHYD      ID=[5], NHYD=["AREA 6C"], DT=[1] (min), AREA=[5.3] (ha),
449                          XIMP=[0.250], TIMP=[0.50], DWF=[0] (cms),
450 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
451                          DCAY=[2.0] (/hr), F=[0] (mm),
452 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
453                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
454 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
455                          LGI=[187] (m), MNI=[0.013], SCI=[0] (min),
456 Continuous simulation parameters:
457                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
458                          InterEventTime=[12] (hrs), END=-1
459 *%-----|-----
460 *#=====
461 *# MAJOR FLOW TO Pond 5 - MINOR FLOW TO Beaver Pond
462 *# 85 L/S/HA * 5.3 HA = 0.4505 L/S
463 *#=====
464 COMPUTE DUALHYD          IDin=[5], CINLET=[0.451] (cms), NINLET=[1],
465                          MAJID=[6], MajNHYD=[000100],
466                          MINID=[7], MinNHYD=[000100],
467                          TMJSTO=[0] (cu-m)
468 *%-----|-----
469 *# ADD ALL drainage to Pond 5 (12.5 ha)
470 *#=====
471 ADD HYD                  IDsum=[8], NHYD=[Pond5-IN], IDs to add=[2+3+4+6]
472 *%-----|-----
473 *#=====
474 ROUTE RESERVOIR         IDout=[4], NHYD=["Pond-5"], IDin=[8],
475                          RDT=[1] (min),
476                          TABLE of ( OUTFLOW-STORAGE ) values
477                              (cms) - (ha-m)
478                              [ 0.0 , 0.0 ]
479                              [ 0.067 , 0.140 ]
480                              [ 0.098 , 0.236 ]
481                              [ 0.392 , 0.485 ]
482                              [ -1 , -1 ] (max twenty pts)
483 IDovf=[ ], NHYDovf=[ ]
484 *%-----|-----
485 *#=====
486 *# AREA 3A-2 (URBAN PORTION of Area North of Campeau Drive)
487 *#=====
488 CONTINUOUS STANDHYD      ID=[6], NHYD=["AREA 3A-2"], DT=[1] (min), AREA=[33.4] (ha),
489                          XIMP=[0.250], TIMP=[0.41], DWF=[0] (cms),
490 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
491                          DCAY=[2.0] (/hr), F=[0] (mm),
492 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
493                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
494 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
495                          LGI=[471] (m), MNI=[0.013], SCI=[0] (min),
496 Continuous simulation parameters:
497                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
498                          InterEventTime=[12] (hrs), END=-1
499 *%-----|-----
500 *# AREA 1A (INSTITUTION BLOCK)
501 *#=====
502 CONTINUOUS NASHYD        ID=[5], NHYD=["AREA 1A"], DT=[1]min, AREA=[11.4] (ha),
503                          DWF=[0] (cms), CN=[61], IA=[5.0] (mm),
504                          N=[2.0], TP=[0.56]hrs,
505                          Continuous simulation parameters:
506                          IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
507                          InterEventTime=[12] (hrs),
508                          Baseflow simulation parameters:
509                          BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),

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510          VHydCond=[.001] (mm/hr), END=-1
511 *%-----|-----|
512 *# ADD outflows from 3A-2, 1A,Pond 5 and minor from 6C to ponds 1,2,3 & 4
513 *#-----|-----|
514 ADD HYD          IDsum=[11], NHYD=[000321], IDs to add=[1+4+7]
515 *#-----|-----|
516 *# AREA 7 (Adjacent to Beaver Pond)
517 *#-----|-----|
518 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[19.6] (ha),
519      XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
520      LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
521      DCAY=[2.0] (/hr), F=[0] (mm),
522      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
523      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
524      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
525      LGI=[361] (m), MNI=[0.013], SCI=[0] (min),
526      Continuous simulation parameters:
527      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
528      InterEventTime=[12] (hrs), END=-1
529 *%-----|-----|
530 *#-----|-----|
531 *# ADD OUTFLOW OF DA 10B AND 6C TO 7
532 *#-----|-----|
533 ADD HYD          IDsum=[9], NHYD=[000321], IDs to add=[5+2+1]
534 *%-----|-----|
535 *
536 *#-----|-----|
537 *# AREA 4C
538 *#-----|-----|
539 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[5.8] (ha),
540      XIMP=[0.250], TIMP=[0.53], DWF=[0] (cms),
541      LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
542      DCAY=[2.0] (/hr), F=[0] (mm),
543      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
544      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
545      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
546      LGI=[196] (m), MNI=[0.013], SCI=[0] (min),
547      Continuous simulation parameters:
548      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
549      InterEventTime=[12] (hrs), END=-1
550 *%-----|-----|
551 *#-----|-----|
552 *# MAJOR FLOW TO 4B - MINOR FLOW TO 4A
553 *# 85 L/S/HA * 5.8 HA = 493 L/S
554 *#-----|-----|
555 COMPUTE DUALHYD      IDin=[1], CINLET=[0.493] (cms), NINLET=[1],
556      MAJID=[5], MajNHYD=[000100],
557      MINID=[6], MinNHYD=[100100],
558      TMJSTO=[0] (cu-m)
559 *%-----|-----|
560 *
561 *#-----|-----|
562 *# AREA 4A - FLOW THROUGH AREA 4
563 *#-----|-----|
564 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[15.8] (ha),
565      XIMP=[0.250], TIMP=[0.66], DWF=[0] (cms),
566      LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
567      DCAY=[2.0] (/hr), F=[0] (mm),
568      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
569      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
570      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
571      LGI=[324] (m), MNI=[0.013], SCI=[0] (min),
572      Continuous simulation parameters:
573      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
574      InterEventTime=[12] (hrs), END=-1
575 *%-----|-----|

```

```

574 *
575 *#=====
576 *# ADDITION OF 4C MINOR TO 4A
577 *#=====
578 *
579 ADD HYD          IDsum=[4], NHYD=[000231], IDs to add=[3+6]
580 *%-----|-----
581 *#=====
582 *# AREA 4B - ROUTE THROUGH ON SITE STORAGE
583 *#=====
584 CONTINUOUS STANDHYD      ID=[3], NHYD=["000204"], DT=[1] (min), AREA=[6.2] (ha),
585 XIMP=[0.250], TIMP=[0.57], DWF=[0] (cms),
586 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
587 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
588 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
589 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
590 LGI=[203] (m), MNI=[0.013], SCI=[0] (min),
591 Continuous simulation parameters:
592 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
593 InterEventTime=[12] (hrs), END=-1
594 *%-----|-----
595 *#=====
596 *# ADDITION OF MAJOR FLOW AT 4C TO AREA 4B
597 *#=====
598 ADD HYD          IDsum=[6], NHYD=[000231], IDs to add=[5+3]
599 *%-----|-----
600 *#=====
601 *# ON-SITE STORAGE IN AREA 4B
602 *# 85L/S/HA
603 *#=====
604 *
605 ROUTE RESERVOIR      IDout=[3], NHYD=[000100], IDin=[6],
606 RDT=[1] (min),
607 TABLE of ( OUTFLOW-STORAGE ) values
608 (cms) - (ha-m)
609 [ 0.0 , 0.0 ]
610 [ 0.527, 0.2840]
611 [ -1 , -1 ] (max twenty pts)
612 IDovf=[], NHYDovf=[]
613 *%-----|-----
614 *#=====
615 *# ADDITION OF ROUTED 4B TO AREA 4A
616 *#=====
617 ADD HYD          IDsum=[8], NHYD=[000231], IDs to add=[4+3]
618 *%-----|-----
619 *
620 *#=====
621 *# AREA 4 (Adjacent to Beaver Pond)
622 *#=====
623 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[21.2] (ha),
624 XIMP=[0.250], TIMP=[0.38], DWF=[0] (cms),
625 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
626 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
627 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
628 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
629 LGI=[375] (m), MNI=[0.013], SCI=[0] (min),
630 Continuous simulation parameters:
631 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
632 InterEventTime=[12] (hrs), END=-1
633 *%-----|-----
634 *#=====
635 *# ADDITION OF MINOR FLOW AT 4A TO AREA 4
636 *#=====
637 ADD HYD          IDsum=[3], NHYD=[000231], IDs to add=[8+1]
638 *%-----|-----

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639 ADD HYD IDsum=[7], NHYD=[000231], IDs to add=[10+3]
640 *%-----|-----|
641 *#-----|-----|
642 *# AREA 9 (RURAL)
643 *#-----|-----|
644 CONTINUOUS NASHYD ID=[2], NHYD=["000100"], DT=[1]min, AREA=[18.9] (ha),
645 DWF=[0] (cms), CN=[75], IA=[5.0] (mm),
646 N=[2.0], TP=[0.37]hrs,
647 Continuous simulation parameters:
648 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
649 InterEventTime=[12] (hrs),
650 Baseflow simulation parameters:
651 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
652 VHydCond=[.001] (mm/hr), END=-1
653 *%-----|-----|
654 ADD HYD IDsum=[6], NHYD=[000321], IDs to add=[7+2]
655 *%-----|-----|
656 *
657 *#-----|-----|
658 *# GOULDBOURN FORCED ROAD - KANATA AVENUE TO AREA 10 BOUNDARY
659 *# (ARTERIAL ROAD 10 YEAR 10 MN INLET TIME)
660 *#-----|-----|
661 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[1.6] (ha),
662 XIMP=[0.71], TIMP=[0.71], DWF=[0] (cms),
663 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
664 DCAY=[2.0] (/hr), F=[0] (mm),
665 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
666 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
667 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
668 LGI=[103] (m), MNI=[0.013], SCI=[0] (min),
669 Continuous simulation parameters:
670 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
671 InterEventTime=[12] (hrs), END=-1
672 *%-----|-----|
673 *#-----|-----|
674 *# MAJOR FLOW TO BEAVER POND - MINOR FLOW TO AREA 10 STORM SYSTEM
675 *# 237.69 L/S/HA * 1.66 HA = 394.6 L/S
676 *#-----|-----|
677 COMPUTE DUALHYD IDin=[1], CINLET=[0.395] (cms), NINLET=[1],
678 MAJID=[2], MajNHYD=[000100],
679 MINID=[7], MinNHYD=[100100],
680 TMJSTO=[0] (cu-m)
681 *%-----|-----|
682 *#-----|-----|
683 *# BEAVER POND PORTION #1
684 *#-----|-----|
685 *
686 ADD HYD IDsum=[9], NHYD=[000321], IDs to add=[6+2+11]
687 *%-----|-----|
688 *
689 *#-----|-----|
690 *# KANATA AVENUE - GOULDBOURN FORCED ROAD TO AREA 10 BOUNDARY
691 *# (ARTERIAL ROAD 10 YEAR 10 MIN INLET TIME)
692 *#-----|-----|
693 CONTINUOUS STANDHYD ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[2.8] (ha),
694 XIMP=[0.32], TIMP=[0.32], DWF=[0] (cms),
695 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
696 DCAY=[2.0] (/hr), F=[0] (mm),
697 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
698 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
699 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
700 LGI=[136] (m), MNI=[0.013], SCI=[0] (min),
701 Continuous simulation parameters:
702 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
703 InterEventTime=[12] (hrs), END=-1
704 *%-----|-----|
705 *#-----|-----|

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```

704 *# MAJOR FLOW TOWARDS TFD - MINOR FLOW TO AREA 10 STORM SYSTEM
705 *# 237.69 L/S/HA * 1.8 HA = 427.8 L/S
706 * JFSA correction based on above drainage area of 2.8 ha
707 * Capture in DUALHYD below 237.69 L/s/ha * 2.8 ha = 665.5 L/s
708 *#=====
709 COMPUTE DUALHYD      IDin=[1], CINLET=[0.6655] (cms), NINLET=[1],
710                     MAJID=[10], MajNHYD=[000100],
711                     MINID=[2], MinNHYD=[100100],
712                     TMJSTO=[0] (cu-m)
713 *%-----|-----|
714 *
715 *#=====
716 *# DRAINAGE AGREA 10 - TOTAL 43.6 HA - DIVIDED UP FOR HGL ANALYSIS
717 *# (INCLUDES AREA 10-4, 10-1, 10-2 AND 10-3)
718 *#=====
719 *
720 *#=====
721 *# AREA 10-4 - DRAINS INTO S-5 - MAJOR FLOW CASCADES
722 *#=====
723 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[13.9] (ha),
724                         XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
725                         LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
726                         DCAY=[2.0] (/hr), F=[0] (mm),
727                         Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
728                                             LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
729                         Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
730                                             LGI=[304] (m), MNI=[0.013], SCI=[0] (min),
731                         Continuous simulation parameters:
732                         IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
733                         InterEventTime=[12] (hrs), END=-1
734 *%-----|-----|
735 *#=====
736 *# MINOR FLOW INTO SYSTEM
737 *# 85 L/S/HA * 14 = 1190 L/S
738 *JFSA correction based on above drainage area of 13.9 ha
739 * Capture in DUALHYD below 85 L/s/ha * 13.9 ha = 1181 L/s
740 *#=====
741 COMPUTE DUALHYD      IDin=[1], CINLET=[1.181] (cms), NINLET=[1],
742                     MAJID=[8], MajNHYD=[000100],
743                     MINID=[6], MinNHYD=[100100],
744                     TMJSTO=[0] (cu-m)
745 *%-----|-----|
746 *#=====
747 *# ADD KANATA AVENUE AND AREA 10-4 - MH S-5
748 *#=====
749 ADD HYD              IDsum=[5], NHYD=[000101], IDs to add=[6+2]
750 *%-----|-----|
751 *
752 *#=====
753 *# AREA 10-1 - DRAINS INTO S-4 - MAJOR FLOW CASCADES
754 *#=====
755 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.8] (ha),
756                         XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
757                         LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
758                         DCAY=[2.0] (/hr), F=[0] (mm),
759                         Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
760                                             LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
761                         Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
762                                             LGI=[255] (m), MNI=[0.013], SCI=[0] (min),
763                         Continuous simulation parameters:
764                         IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
765                         InterEventTime=[12] (hrs), END=-1
766 *%-----|-----|
767 *#=====
768 *# MINOR FLOW INTO SYSTEM
769 *# 85 L/S/HA * 9.5 = 807.5 L/S

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769 *JFSA correction based on above drainage area of 9.8 ha
770 * Capture in DUALHYD below 85 L/s/ha * 9.8 ha = 833 L/s
771 *#=====
772 COMPUTE DUALHYD      IDin=[1], CINLET=[0.833] (cms), NINLET=[1],
773                      MAJID=[4], MajNHYD=[000100],
774                      MINID=[6], MinNHYD=[100100],
775                      TMJSTO=[0] (cu-m)
776 *%-----|-----
777 *#=====
778 *# ADD GOULBOURN FORCED ROAD AND AREA 10-1 - MH S-3
779 *#=====
780 *
781 ADD HYD              IDsum=[3], NHYD=[000101], IDs to add=[6+7]
782 *%-----|-----
783 ADD HYD              IDsum=[7], NHYD=[000102], IDs to add=[3+5]
784 *%-----|-----
785 *
786 *#=====
787 *# AREA 10-3 - DRAINS INTO S-2 - MAJOR FLOW CASCADES
788 *#=====
789 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[4.3] (ha),
790                          XIMP=[0.250], TIMP=[0.55], DWF=[0] (cms),
791                          LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
792                          DCAY=[2.0] (/hr), F=[0] (mm),
793                          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
794                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
795                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
796                                          LGI=[169] (m), MNI=[0.013], SCI=[0] (min),
797                          Continuous simulation parameters:
798                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
799                          InterEventTime=[12] (hrs), END=-1
800 *%-----|-----
801 *#=====
802 *# MINOR FLOW INTO SYSTEM
803 *# 85 L/S/HA * 3.9 = 331.5 L/S
804 *JFSA correction based on above drainage area of 4.3 ha
805 * Capture in DUALHYD below 85 L/s/ha * 4.3 ha = 365 L/s
806 *#=====
807 COMPUTE DUALHYD      IDin=[1], CINLET=[0.365] (cms), NINLET=[1],
808                      MAJID=[5], MajNHYD=[000100],
809                      MINID=[2], MinNHYD=[100100],
810                      TMJSTO=[0] (cu-m)
811 *%-----|-----
812 ADD HYD              IDsum=[10], NHYD=[000103], IDs to add=[2+7]
813 *%-----|-----
814 *
815 *#=====
816 *# AREA 10-2 - DRAINS INTO S-6 - MAJOR FLOW CASCADES
817 *#=====
818 CONTINUOUS STANDHYD      ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[18.6] (ha),
819                          XIMP=[0.250], TIMP=[0.51], DWF=[0] (cms),
820                          LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
821                          DCAY=[2.0] (/hr), F=[0] (mm),
822                          Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
823                                          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
824                          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
825                                          LGI=[352] (m), MNI=[0.013], SCI=[0] (min),
826                          Continuous simulation parameters:
827                          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
828                          InterEventTime=[12] (hrs), END=-1
829 *%-----|-----
830 *#=====
831 *# MINOR FLOW INTO SYSTEM
832 *# 85 L/S/HA * 16.2 = 1377 L/S
833 *JFSA correction based on above drainage area of 18.6 ha
834 * Capture in DUALHYD below 85 L/s/ha * 18.6 ha = 1581 L/s
835 *#=====

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```

834 COMPUTE DUALHYD      IDin=[1], CINLET=[1.581] (cms), NINLET=[1],
835                      MAJID=[2], MajNHYD=[000100],
836                      MINID=[6], MinNHYD=[100100],
837                      TMJSTO=[0] (cu-m)
838 *%-----|-----|
839 *
840 *#=====|-----|
841 *# AREA 10A - MINOR FLOW TO AREA 10, MAJOR FLOW TO CARP RIVER WATERSHED
842 *#=====|-----|
843 CONTINUOUS STANDHYD   ID=[1], NHYD=["000204"], DT=[1] (min), AREA=[9.9] (ha),
844                      XIMP=[0.250], TIMP=[0.44], DWF=[0] (cms),
845                      LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
846                      DCAY=[2.0] (/hr), F=[0] (mm),
847                      Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
848                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
849                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
850                      LGI=[256] (m), MNI=[0.013], SCI=[0] (min),
851                      Continuous simulation parameters:
852                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
853                      InterEventTime=[12] (hrs), END=-1
854 *%-----|-----|
855 *#=====|-----|
856 *# SPLIT OF MAJOR AND MINOR FLOW AT 85 L/S/HA
857 *# 85 * 7.0 = 595 L/S
858 *# JFSA correction based on above drainage area of 9.9 ha
859 *# Capture in DUALHYD below 85 L/s/ha * 9.9 ha = 841 L/s
860 *#=====|-----|
861 COMPUTE DUALHYD      IDin=[1], CINLET=[0.841] (cms), NINLET=[1],
862                      MAJID=[3], MajNHYD=[000100],
863                      MINID=[7], MinNHYD=[100100],
864                      TMJSTO=[0] (cu-m)
865 *%-----|-----|
866 ADD HYD              IDsum=[1], NHYD=[000104], IDs to add=[7+6]
867 *%-----|-----|
868 *#=====|-----|
869 *# TOTAL MINOR FLOW AT OUTLET
870 *#=====|-----|
871 ADD HYD              IDsum=[6], NHYD=[000105], IDs to add=[1+10]
872 *%-----|-----|
873 *#=====|-----|
874 *# TOTAL MAJOR FLOW FOR DRAINAGE AREA 10 AT OUTLET
875 *#=====|-----|
876 ADD HYD              IDsum=[7], NHYD=[000106], IDs to add=[8+4+5+2]
877 *%-----|-----|
878 *#=====|-----|
879 *# AREA 11 (RURAL) - Increased Area for Existing Conditions
880 *#=====|-----|
881 CONTINUOUS NASHYD     ID=[2], NHYD=["000100"], DT=[1]min, AREA=[46.2] (ha),
882                      DWF=[0] (cms), CN=[62], IA=[5.0] (mm),
883                      N=[2.0], TP=[0.75]hrs,
884                      Continuous simulation parameters:
885                      IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
886                      InterEventTime=[12] (hrs),
887                      Baseflow simulation parameters:
888                      BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
889                      VHydCond=[.001] (mm/hr), END=-1
890 *%-----|-----|
891 ADD HYD              IDsum=[3], NHYD=[000317], IDs to add=[7+2]
892 *%-----|-----|
893 *#=====|-----|
894 *# TOTAL FLOW TO KIZELL POND (U/S CELL)
895 *#=====|-----|
896 ADD HYD              IDsum=[10], NHYD=[000317], IDs to add=[3+6]
897 *%-----|-----|
898 *
899 *#=====|-----|
900 *# SYSTEM STORAGE REPRESENTATION (KIZELL POND)

```

```

900  *# RATING CURVE PROVIDED BY IBI
901  *#=====
902  *# modify the ROUTE RESERVOIR to negate the effect of this underground storage
903  ROUTE RESERVOIR      IDout=[3],  NHYD=["KP-R"],  IDin=[10],
904                      RDT=[1] (min),
905                      TABLE of ( OUTFLOW-STORAGE ) values
906                      (cms) - (ha-m)
907                      [ 0.0 , 0.0 ]
908                      [ 99.  , 0.09]
909                      [ -1   , -1 ] (max twenty pts)
910                      IDovf=[4], NHYDovf=["OVF-KP"]
911  *#=====
912  *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (KIZELL)
913  *#=====
914  ADD HYD              IDsum=[10], NHYD=["KP-COM"], IDs to add=[3+4]
915  *#=====
916  *
917  * Kanata Lakes Stage 7
918  *
919  *#=====
920  CONTINUOUS STANDHYD  ID=[1], NHYD=["Stage 7"], DT=[1] (min), AREA=[73.1] (ha),
921                      XIMP=[0.40], TIMP=[0.50], DWF=[0] (cms),
922                      LOSS=[1]:  Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
923                      DDCAAY=[4.14] (/hr), F=[0] (mm),
924                      Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
925                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
926                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
927                      LGI=[256] (m), MNI=[0.013], SCI=[0] (min),
928                      Continuous simulation parameters:
929                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
930                      InterEventTime=[12] (hrs), END=-1
931  *#=====
932  *
933  * Kanata Lakes Stage 8
934  *
935  CONTINUOUS STANDHYD  ID=[2], NHYD=["Stage 8"], DT=[1] (min), AREA=[65.7] (ha),
936                      XIMP=[0.40], TIMP=[0.50], DWF=[0] (cms),
937                      LOSS=[1]:  Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
938                      DCAY=[4.14] (/hr), F=[0] (mm),
939                      Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
940                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
941                      Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
942                      LGI=[661] (m), MNI=[0.013], SCI=[0] (min),
943                      Continuous simulation parameters:
944                      IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
945                      InterEventTime=[12] (hrs), END=-1
946  *#=====
947  *# Only Minor system flow to Kizell Cell
948  * JFSA: fFlow split adjusted to reflect new 5-Year runoff rate with corrected LGI
949  *#=====
950  COMPUTE DUALHYD      IDin=[2], CINLET=[4.321] (cms), NINLET=[1],
951                      MAJID=[3], MajNHYD=[000100],
952                      MINID=[7], MinNHYD=[100100],
953                      TMJSTO=[0] (cu-m)
954  *#=====
955  * Total flow into Kizell Cell
956  *#=====
957  ADD HYD              IDsum=[8], NHYD=["KP-COM"], IDs to add=[10+1+7]
958  *#=====
959  * ROUTE THROUGH THE KIZELL CELL
960  *
961  ROUTE RESERVOIR      IDout=[5],  NHYD=["KizellCell"],  IDin=[8],
962                      RDT=[1] (min),
963                      TABLE of ( OUTFLOW-STORAGE ) values

```

```

964                (cms) - (ha-m)
965                [ 0.0 , 0.0 ]
966                [ 0.100 , 0.016]
967                [ 0.200 , 0.033]
968                [ 0.300 , 0.055]
969                [ 0.400 , 0.079]
970                [ 0.500 , 0.121]
971                [ 0.700 , 0.188]
972                [ 0.800 , 0.281]
973                [ 0.950 , 0.433]
974                [ 1.050 , 0.658]
975                [ 1.200 , 0.919]
976                [ -1 , -1 ] (max twenty pts)
977                IDovf=[4], NHYDovf=["OVF-Kizell Cell"]
978 *#=====
979 *# ADD OUTFLOW AND OVERFLOW
980 *#=====
981 ADD HYD                IDsum=[8], NHYD=["KP-COM"], IDs to add=[5+4]
982 *#=====
983 *#=====
984 *# SYSTEM STORAGE REPRESENTATION (BEAVER POND)
985 *# RATING CURVE PROVIDED BY IBI
986 *#=====
987 * modify the ROUTE RESERVOIR to negate the effects of the underground storage
988 ROUTE RESERVOIR        IDout=[3], NHYD=["BP-R"], IDin=[9],
989                        RDT=[1] (min),
990                        TABLE of ( OUTFLOW-STORAGE ) values
991                        (cms) - (ha-m)
992                        [ 0.0 , 0.0 ]
993                        [ 99.0 , 0.09]
994                        [ -1 , -1 ] (max twenty pts)
995                        IDovf=[4], NHYDovf=["OVF-BP"]
996 *#=====
997 *# ADD SYSTEM STORAGE OUTFLOW, OVERFLOW AND BYPASS (BEAVER)
998 *#=====
999 ADD HYD                IDsum=[9], NHYD=["BP-COM"], IDs to add=[3+4]
1000 *#=====
1001 *
1002 * Kanata Lakes Stage 9
1003 *
1004 *#=====
1005 * Under the latest proposed development conditions these lands will be broken into
1006 * 3 catchment Beaver Pond (19.31 ha), Kizell Drain (6.89 ha) and Shirley's Brook (4.51 ha).
1007 * As per IBI's "Design Brief KNL Stage 9 Kanata Lakes North" (March 2018).
1008 * No on-site controls have been assumed for this area.
1009 *#=====
1010 *
1011 * Kanata Lakes Stage 9 - Beaver Pond
1012 *
1013 *#=====
1014 CONTINUOUS STANDHYD        ID=[1], NHYD=["Stage 9-Beaver"], DT=[1] (min), AREA=[19.31] (ha),
1015                        XIMP=[0.50], TIMP=[0.60], DWF=[0] (cms),
1016                        LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1017                        DCAY=[4.14] (/hr), F=[0] (mm),
1018                        Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1019                        LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1020                        Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1021                        LGI=[359] (m), MNI=[0.013], SCI=[0] (min),
1022                        Continuous simulation parameters:
1023                        IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1024                        InterEventTime=[12] (hrs), END=-1
1025 *#=====
1026 *
1027 * Kanata Lakes Stage 9 - Shirley's Brook - Under developed conditions these lands
1028 * discharge to Shirley's Brook and do not drain to the Kizell drain, but this catchment
1029 * has been left in the model as a area closure check.

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1029 *
1030 *#=====
1031 CONTINUOUS STANDHYD      ID=[6], NHYD=["Stage 9-Shirley"], DT=[1] (min), AREA=[4.51] (ha),
1032 XIMP=[0.53], TIMP=[0.63], DWF=[0] (cms),
1033 LOSS=[1]:      Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
1034 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1035                      LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1036 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1037                      LGI=[173] (m), MNI=[0.013], SCI=[0] (min),
1038 Continuous simulation parameters:
1039 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1040 InterEventTime=[12] (hrs), END=-1
1041 *#=====
1042 *# TOTAL HYDROGRAPH INTO BEAVER POND
1043 *
1044 ADD HYD                  IDsum=[6], NHYD=["BP-TOTAL"], IDs to add=[9+8+1]
1045 *
1046 *#=====
1047 SAVE HYD                 ID=[6], # OF PCYCLES=[-1], ICASEsh=[-1]
1048 HYD_FILENAME=["BP_In"]
1049 HYD_COMMENT=["Total inflow to the Beaver Pond"]
1050 *#=====
1051 *# TOTAL FLOW FROM BEAVER POND
1052 *#=====
1053 * ROUTE THROUGH BEAVER POND
1054 * Overflow option removed to allow for linear extrapolation of flows out of the
1055 * pond when simulated volumes exceed volumes provided in the curve below.
1056 ROUTE RESERVOIR        IDout=[1], NHYD=["BP-OUT"], IDin=[6],
1057 RDT=[1] (min),
1058 TABLE of ( OUTFLOW-STORAGE ) values
1059 (cms) - (ha-m)
1060 [ 0.0 , 0.0 ]
1061 [ 0.592 , 4.573 ]
1062 [ 0.686 , 6.569 ]
1063 [ 0.769 , 8.840 ]
1064 [ 0.879 , 11.467 ]
1065 [ 1.007 , 16.103 ]
1066 [ 1.040 , 17.339 ]
1067 [ -1 , -1 ] (max twenty pts)
1068 IDovf=[], NHYDovf=""
1069 *#=====
1070 SAVE HYD                 ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1071 HYD_FILENAME=["BP_Out"]
1072 HYD_COMMENT=["Total Outflow from the Beaver Pond"]
1073 *#=====
1074 *# ROUTE KD-1 THROUGH KD-2A
1075 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 10018.26
1076 *#=====
1077 ROUTE CHANNEL           IDout=[3], NHYD=["KD-1"], IDin=[1],
1078 RDT=[1] (min),
1079 CHLGTH=[277] (m), CHSLOPE=[1.08] (%),
1080                      FPSLOPE=[1.08] (%),
1081 SECNUM=[10018], NSEG=[4]
1082 ( SEGROUGH, SEGDIST (m))=[0.08,30.63 -0.03,34.69 0.08,49.66
1083 ( DISTANCE (m), ELEVATION (m))=[ 0, 94.54 ]
1084 [ 7.12, 93.2 ]
1085 [11.07, 92.3 ]
1086 [15.31, 91.8 ]
1087 [17.16, 91.35 ]
1088 [20.56, 90.8 ]
1089 [25.12, 89.58 ]
1090 [28.15, 88.5 ]
1091 [30.63, 87.8 ]
1092 [31.957, 87.854 ]
1093 [ 34.4, 88.5 ]

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1094 [34.69, 88.61 ]
1095 [ 36.5, 89.23 ]
1096 [38.48, 90.2 ]
1097 [41.14, 91.1 ]
1098 [ 45.4, 91.66 ]
1099 [49.66, 91.96 ]
1100 [53.06, 92.3 ]
1101 [67.16, 92.43 ]
1102 [70.77, 92.52 ]
1103 *#=====
1104 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9854.606
1105 *#=====
1106 ROUTE CHANNEL IDout=[2], NHYD=["KD-1"], IDin=[3],
1107 RDT=[1] (min),
1108 CHLGTH=[186] (m), CHSLOPE=[1.97] (%),
1109 FPSLOPE=[1.97] (%),
1110 SECNUM=[9854], NSEG=[5]
1111 ( SEGROUGH, SEGDIST (m))=[0.08,29.81 0.05,34.304 -0.03,38.24
0.05,47.73 0.08,105.39] NSEG times
1112 ( DISTANCE (m), ELEVATION (m))=[ 0, 90.07 ]
1113 [ 6.86, 89.4 ]
1114 [13.24, 89.2 ]
1115 [17.79, 88.48 ]
1116 [22.46, 87.2 ]
1117 [29.81, 86.04 ]
1118 [32.17, 85.72 ]
1119 [34.304, 85.612 ]
1120 [36.137, 85.654 ]
1121 [37.46, 85.69 ]
1122 [38.24, 85.72 ]
1123 [44.98, 85.9 ]
1124 [47.73, 86.32 ]
1125 [51.27, 87.3 ]
1126 [55.17, 88 ]
1127 [87.02, 88.79 ]
1128 [90.72, 88.7 ]
1129 [93.96, 89 ]
1130 [99.45, 90.8 ]
1131 [105.39, 91.81 ]
1132 *#=====
1133 *# KD-2A-1 - RURAL - Reduced Area for Future Conditions
1134 *#=====
1135 CONTINUOUS NASHYD ID=[1], NHYD=["KD-2A-1"], DT=[1]min, AREA=[6.79] (ha),
1136 DWF=[0] (cms), CN=[57], IA=[7] (mm),
1137 N=[2.0], TP=[0.91]hrs,
1138 Continuous simulation parameters:
1139 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1140 InterEventTime=[12] (hrs),
1141 Baseflow simulation parameters:
1142 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1143 VHydCond=[.001] (mm/hr), END=-1
1144 *#=====
1145 *
1146 * Kanata Lakes Stage 9 - Kizell Drain
1147 *
1148 *#=====
1149 CONTINUOUS STANDHYD ID=[4], NHYD=["Stage 9-Kizell"], DT=[1] (min), AREA=[6.89] (ha),
1150 XIMP=[0.48], TIMP=[0.58], DWF=[0] (cms),
1151 LOSS=[1]: Horton: Fo=[76.20] (mm/hr), Fc=[13.2] (mm/hr),
DCAY=[4.14] (/hr), F=[0] (mm),
1152 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2] (%),
1153 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1154 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[0.2] (%),
1155 LGI=[215] (m), MNI=[0.013], SCI=[0] (min),
1156 Continuous simulation parameters:
1157 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1158 InterEventTime=[12] (hrs), END=-1

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1159 *#=====
1160 *# ADD KD-2A-1, KD-1 and portion of KNL Stage 9
1161 *#=====
1162 ADD HYD          IDsum=[3], NHYD=["KFP2"], IDs to add=[1+2+4]
1163 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1164 *#=====
1165 *# ROUTE THROUGH KD-2A-2
1166 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9743.627
1167 *#=====
1168 ROUTE CHANNEL    IDout=[1], NHYD=["KD-1"], IDin=[3],
1169                 RDT=[1] (min),
1170                 CHLGTH=[408] (m), CHSLOPE=[0.84] (%),
1171                 FPSLOPE=[0.84] (%),
1172                 SECNUM=[9743], NSEG=[5]
1173                 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
1174                 0.05,63.17 0.08,111.15] NSEG times
1175                 ( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
1176                 [ 7.01, 86.7 ]
1177                 [15.57, 86.2 ]
1178                 [21.06, 85.58 ]
1179                 [25.69, 84.76 ]
1180                 [31.55, 83.42 ]
1181                 [40.62, 82.7 ]
1182                 [42.45, 82.5 ]
1183                 [44.28, 82.561 ]
1184                 [ 44.6, 82.59 ]
1185                 [46.07, 82.7 ]
1186                 [48.58, 82.76 ]
1187                 [59.09, 82.59 ]
1188                 [63.17, 83.94 ]
1189                 [67.14, 85.3 ]
1190                 [71.84, 85.8 ]
1191                 [82.08, 85.8 ]
1192                 [89.16, 86.2 ]
1193                 [106.01, 86.6 ]
1194                 [111.15, 86.65 ]
1195 *#=====
1196 SAVE HYD         ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
1197                 HYD_FILENAME=["KD-1"]
1198                 HYD_COMMENT=["KD-1-Channel where Erosion analysis was completed"]
1199 *#=====
1200 *# Erosion Analysis on Kizell Drain (Requires SWMHYMO v5.5)
1201 *#=====
1202 *# Erosion Index/critical shear stress calculated for flows through the critical
1203 *# section of on Kizell Drain as determined by Matrix Solutions (May 2019)
1204 *#=====
1205 *#=====
1206 EROSION INDEX    INDEX_METHOD=[1], QCE =[0.50] (cms), NHYDsErosion=[1]
1207 *#=====
1208 EROSION INDEX    INDEX_METHOD=[2], SHEARC =[20] (Pa), No of Hyds=[1],
1209                 NHYDsErosion=[1]
1210                 RATING_CURVE_METHOD = [1], user entered channel shape
1211                 Channel section parameters
1212                 Section No["XS1"]
1213                 CHSLOPE=[0.84] (%), FPSLOPE=[0.84] (%),
1214                 NSEG=[5]
1215                 ( SEGROUGH, SEGDIST (m))=[0.05,42.45 -0.03,44.28 -0.05,46.07
1216                 0.05,63.17 0.08,111.15] NSEG times
1217                 ( DISTANCE (m), ELEVATION (m))=[ 0, 86.7 ]
1218                 [ 7.01, 86.7 ]
1219                 [15.57, 86.2 ]
1220                 [21.06, 85.58 ]
1221                 [25.69, 84.76 ]
1222                 [31.55, 83.42 ]
1223                 [40.62, 82.7 ]
1224                 [42.45, 82.5 ]
1225                 [44.28, 82.561 ]
1226                 [ 44.6, 82.59 ]

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1224 [46.07, 82.7 ]
1225 [48.58, 82.76 ]
1226 [59.09, 82.59 ]
1227 [63.17, 83.94 ]
1228 [67.14, 85.3 ]
1229 [71.84, 85.8 ]
1230 [82.08, 85.8 ]
1231 [89.16, 86.2 ]
1232 [106.01, 86.6 ]
1233 [111.15, 86.65 ]
1234 *#=====
1235 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9338.062
1236 *# MINIMUM SLOPE ASSUMED 0.1%
1237 *#=====
1238 ROUTE CHANNEL IDout=[2], NHYD=["KD-1"], IDin=[1],
1239 RDT=[1] (min),
1240 CHLGTH=[111] (m), CHSLOPE=[0.1] (%),
1241 FPSLOPE=[0.1] (%),
1242 SECNUM=[9338], NSEG=[5]
1243 ( SEGROUGH, SEGDIST (m))=[0.04,78.47 0.06,82.78 -0.03,87.28
0.06,107.69 0.04,120.16] NSEG times
1244 ( DISTANCE (m), ELEVATION (m))=[ 0, 82.8 ]
1245 [ 6.26, 82.86 ]
1246 [ 23, 82.4 ]
1247 [57.46, 82.11 ]
1248 [75.38, 82.1 ]
1249 [78.47, 81.06 ]
1250 [ 81.6, 79.7 ]
1251 [82.78, 79.3 ]
1252 [87.28, 79.28 ]
1253 [ 88.3, 79.7 ]
1254 [91.41, 81.1 ]
1255 [94.81, 81.7 ]
1256 [107.69, 82.1 ]
1257 [120.16, 82.2 ]
1258 *#=====
1259 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 9131.887
1260 *#=====
1261 ROUTE CHANNEL IDout=[1], NHYD=["KD-1"], IDin=[2],
1262 RDT=[1] (min),
1263 CHLGTH=[248] (m), CHSLOPE=[0.28] (%),
1264 FPSLOPE=[0.28] (%),
1265 SECNUM=[9131], NSEG=[5]
1266 ( SEGROUGH, SEGDIST (m))=[0.04,70.64 -0.03,72.865 0.04,74.61
0.05,77.65 0.04,191.67] NSEG times
1267 ( DISTANCE (m), ELEVATION (m))=[ 0, 81.6 ]
1268 [ 7.35, 81.6 ]
1269 [ 26.3, 80.9 ]
1270 [48.53, 80.87 ]
1271 [58.55, 80.01 ]
1272 [65.66, 80 ]
1273 [69.22, 79 ]
1274 [70.64, 78.65 ]
1275 [72.865, 78.7 ]
1276 [74.25, 78.96 ]
1277 [74.61, 79.1 ]
1278 [77.65, 79.92 ]
1279 [93.59, 79.9 ]
1280 [103.2, 78.7 ]
1281 [108.05, 79.9 ]
1282 [115.92, 80.2 ]
1283 [132.65, 80.2 ]
1284 [159.72, 80.73 ]
1285 [176.71, 82.61 ]
1286 [191.67, 82.63 ]
1287 *#=====
1288 *# KD-2A-2 - URBAN/RURAL NORTH OF RAILROAD

```



```

1289 *#=====
1290 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2A-2"], DT=[1] (min), AREA=[44.99] (ha),
1291 XIMP=[0.250], TIMP=[0.28], DWF=[0] (cms),
1292 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1293 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1294                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1295 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1296                                LGI=[547] (m), MNI=[0.013], SCI=[0] (min),
1297 Continuous simulation parameters:
1298 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1299 InterEventTime=[12] (hrs), END=-1
1300 *#=====
1301 *# ADD KD-2A-1 AND KD-2A-2
1302 *# CREST GAUGE LOCATION KD-2 -KIZELL DRAIN AT MARCH ROAD
1303 *#=====
1304 ADD HYD      IDsum=[3], NHYD=["KFP3"], IDs to add=[1+2]
1305 *PRINT HYD      ID=[3],  # OF PCYCLES=[1]
1306 *#=====
1307 *# KD-2A-3 - URBAN SOUTH OF RAILROAD
1308 *#=====
1309 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2A-3"], DT=[1] (min), AREA=[48.56] (ha),
1310 XIMP=[0.250], TIMP=[0.31], DWF=[0] (cms),
1311 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1312 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1313                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1314 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1315                                LGI=[568] (m), MNI=[0.013], SCI=[0] (min),
1316 Continuous simulation parameters:
1317 IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1318 InterEventTime=[12] (hrs), END=-1
1319 *#=====
1320 *# ADD KD-2A-2 AND KD-2A-3 D/S OF MARCH ROAD
1321 *#=====
1322 ADD HYD      IDsum=[4], NHYD=["KD-2A-3"], IDs to add=[3+2]
1323 *#=====
1324 *# ROUTE KD-2A THROUGH KD-2B
1325 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8942.456
1326 *#=====
1327 ROUTE CHANNEL      IDout=[1], NHYD=["KD-2A"], IDin=[4],
1328 RDT=[1] (min),
1329 CHLGTH=[254] (m),  CHSLOPE=[0.55] (%),
1330                                FPSLOPE=[0.55] (%),
1331 SECNUM=[8942],      NSEG=[5]
1332 ( SEGROUGH, SEGDIST (m))=[0.04,17.24 0.05,28.26 -0.03,31.51
1333 ( DISTANCE (m), ELEVATION (m))=[ 0, 80.58 ]
1334                                [ 1.57, 80.5 ]
1335                                [ 8.77, 80.5 ]
1336                                [10.84, 80.23 ]
1337                                [17.24, 80.03 ]
1338                                [20.76, 79 ]
1339                                [23.59, 78.9 ]
1340                                [26.81, 78.17 ]
1341                                [28.26, 77.9 ]
1342                                [30.06, 77.9 ]
1343                                [30.71, 78.01 ]
1344                                [31.51, 78.2 ]
1345                                [32.21, 78.39 ]
1346                                [ 37.7, 78.4 ]
1347                                [44.07, 78.5 ]
1348                                [48.95, 78.7 ]
1349                                [57.53, 79.33 ]
1350                                [61.08, 79.95 ]
1351                                [64.61, 80.71 ]
1352                                [68.63, 81.15 ]

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1353 *#=====
1354 *# KD-2B-6 - URBAN
1355 *#=====
1356 CONTINUOUS STANDHYD      ID=[2], NHYD=["KD-2B-6"], DT=[1] (min), AREA=[7.73] (ha),
1357 XIMP=[0.61], TIMP=[0.61], DWF=[0] (cms),
1358 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1359 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1360 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1361 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1362 LGI=[227] (m), MNI=[0.013], SCI=[0] (min),
1363 Continuous simulation parameters:
1364 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1365 InterEventTime=[12] (hrs), END=-1
1366 *#=====
1367 *# ROUTE KD-2B-6 THROUGH SWM POND SOUTH OF SOLANDT ROAD
1368 *# ASSUME 5-YEAR CONTROL ACCORDING TO CITY GUIDELINES
1369 *#=====
1370 ROUTE RESERVOIR      IDout=[4], NHYD=["KD-2B-6"], IDin=[2],
1371 RDT=[1] (min),
1372 TABLE of ( OUTFLOW-STORAGE ) values
1373 (cms) - (ha-m)
1374 [ 0.0 , 0.0 ]
1375 [ 0.407 , 0.095 ]
1376 [ -1 , -1 ] (max twenty pts)
1377 IDovf=[5], NHYDovf=["OVF-2B6"]
1378 *#=====
1379 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1380 *#=====
1381 ADD HYD      IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5+1]
1382 *#=====
1383 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 8329.198
1384 *#=====
1385 ROUTE CHANNEL      IDout=[2], NHYD=["KD-2A"], IDin=[6],
1386 RDT=[1] (min),
1387 CHLGTH=[747] (m), CHSLOPE=[0.36] (%),
1388 FPSLOPE=[0.36] (%),
1389 SECNUM=[8329], NSEG=[4]
1390 ( SEGROUGH, SEGDIST (m))=[0.08,81.34 0.05,88.266 -0.03,97.72
1391 0.08,109.09] NSEG times
1392 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.3 ]
1393 [56.66, 78.2 ]
1394 [67.31, 78.2 ]
1395 [72.25, 78 ]
1396 [79.85, 78 ]
1397 [81.34, 77.66 ]
1398 [87.28, 75.87 ]
1399 [88.266, 75.728 ]
1400 [90.51, 75.759 ]
1401 [90.57, 75.77 ]
1402 [91.47, 75.88 ]
1403 [97.72, 76.64 ]
1404 [109.09, 78.5 ]
1405 *#=====
1406 *# KD-2B-3 - Converted to NASHYD under existing conditions
1407 *#=====
1408 CONTINUOUS NASHYD      ID=[1], NHYD=["KD-2B-3"], DT=[1]min, AREA=[7.40] (ha),
1409 DWF=[0] (cms), CN=[65], IA=[5.0] (mm),
1410 N=[2.0], TP=[0.49]hrs,
1411 Continuous simulation parameters:
1412 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1413 InterEventTime=[12] (hrs),
1414 Baseflow simulation parameters:
1415 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1416 VHydCond=[.001] (mm/hr), END=-1
1417 *#=====
1418 *# 5 YEAR CONTROL - 89L/s

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1418 *# MAJOR FLOWS TO KIZELL DRAIN
1419 *# MINOR FLOWS TO GOLF COURSE POND #2
1420 *#=====
1421 COMPUTE DUALHYD      IDin=[1], CINLET=[0.089] (cms), NINLET=[1],
1422                      MAJID=[3], MajNHYD=["2B3MAJ"],
1423                      MINID=[4], MinNHYD=["2B3MIN"],
1424                      TMJSTO=[0] (cu-m)
1425 *#=====
1426 *# KD-2B-4 Converted to NASHYD under existing conditions
1427 *#=====
1428 CONTINUOUS NASHYD      ID=[5], NHYD=["KD-2B-4"], DT=[1]min, AREA=[23.59] (ha),
1429                      DWF=[0] (cms), CN=[63], IA=[5.0] (mm),
1430                      N=[2.0], TP=[0.62]hrs,
1431                      Continuous simulation parameters:
1432                      IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
1433                      InterEventTime=[12] (hrs),
1434                      Baseflow simulation parameters:
1435                      BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1436                      VHydCond=[.001] (mm/hr), END=-1
1437 *#=====
1438 *# ADD KD-2B-3 MINOR AND KD-2B-4
1439 *#=====
1440 ADD HYD                IDsum=[6], NHYD=["KD-2B-4"], IDs to add=[4+5]
1441 *#=====
1442 *# ROUTE KD-2B-4 THROUGH GOLF COURSE POND #2
1443 *#=====
1444 ROUTE RESERVOIR      IDout=[4], NHYD=["KD-2B-4"], IDin=[6],
1445                      RDT=[1] (min),
1446                      TABLE of ( OUTFLOW-STORAGE ) values
1447                      (cms) - (ha-m)
1448                      [ 0.0 , 0.0 ]
1449                      [ 0.229, 1.5695]
1450                      [ 0.251, 1.8191]
1451                      [ 0.328, 2.9421]
1452                      [ -1 , -1 ] (max twenty pts)
1453                      IDovf=[5], NHYDovf=["OVF-2B6"]
1454 *#=====
1455 *# ADD OUTFLOW, OVERFLOW AND KD-2A
1456 *#=====
1457 ADD HYD                IDsum=[6], NHYD=["KD-2B-6"], IDs to add=[4+5]
1458 *#=====
1459 *# ADD KD-2B-3 MAJOR, KD-2B-4 AND KD-2B-6
1460 *#=====
1461 ADD HYD                IDsum=[4], NHYD=["KD-2B-4"], IDs to add=[3+6+2]
1462 *#=====
1463 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7691.759
1464 *#=====
1465 ROUTE CHANNEL          IDout=[2], NHYD=["KD-2A"], IDin=[4],
1466                      RDT=[1] (min),
1467                      CHLGTH=[408] (m), CHSLOPE=[0.11] (%),
1468                      FPSLOPE=[0.11] (%),
1469                      SECNUM=[7691], NSEG=[3]
1470                      ( SEGROUGH, SEGDIST (m))=[0.06,16.78 -0.03,19.003 0.06,24.49] NSEG  ↗
1471                      times
1472                      ( DISTANCE (m), ELEVATION (m))=[ 0, 76.75 ]
1473                      [ 0.66, 76.6 ]
1474                      [ 3.57, 75.74 ]
1475                      [ 4.99, 75.24 ]
1476                      [ 5.76, 75.1 ]
1477                      [ 7.69, 75 ]
1478                      [ 8.56, 74.9 ]
1479                      [ 9.95, 74.9 ]
1480                      [12.21, 74.8 ]
1481                      [12.99, 74.69 ]
1482                      [ 15.2, 74.3 ]
1483                      [16.78, 74.1 ]
1484                      [17.38, 73.8 ]

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1484                                     [18.38, 73.8 ]
1485                                     [19.003, 74.147]
1486                                     [19.94, 74.21 ]
1487                                     [20.51, 74.31 ]
1488                                     [21.52, 74.6 ]
1489                                     [22.72, 75.04 ]
1490                                     [24.49, 75.5 ]
1491 *#=====
1492 *# KD-2B-2 - URBAN RESIDENTIAL - Converted to NASHYD under existing conditions
1493 *#=====
1494 CONTINUOUS NASHYD          ID=[3], NHYD=["KD-2B-2"], DT=[1]min, AREA=[3.35] (ha),
1495 DWF=[0] (cms), CN=[63], IA=[5.0] (mm),
1496 N=[2.0], TP=[0.32]hrs,
1497 Continuous simulation parameters:
1498 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1499 InterEventTime=[12] (hrs),
1500 Baseflow simulation parameters:
1501 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1502 VHydCond=[.001] (mm/hr), END=-1
1503 *#=====
1504 *# ROUTE KD-2B-2 THROUGH POND #3 NORTH OF FARRAR ROAD
1505 *#=====
1506 ROUTE RESERVOIR          IDout=[5], NHYD=["KD-2B-2"], IDin=[3],
1507 RDT=[1] (min),
1508 TABLE of ( OUTFLOW-STORAGE ) values
1509 (cms) - (ha-m)
1510 [ 0.0 , 0.0 ]
1511 [ 0.260 , 0.616]
1512 [ 0.282 , 0.7115]
1513 [ 0.374 , 1.2301]
1514 [ -1 , -1 ] (max twenty pts)
1515 IDovf=[6], NHYDovf=["OVF-2B3"]
1516 *#=====
1517 *# ADD OUTFLOW, OVERFLOW AND KD-2B-4
1518 *#=====
1519 ADD HYD          IDsum=[1], NHYD=["KD-2B-4"], IDs to add=[5+6+2]
1520 *#=====
1521 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7386.879
1522 *#=====
1523 ROUTE CHANNEL          IDout=[2], NHYD=["KD-2A-4"], IDin=[1],
1524 RDT=[1] (min),
1525 CHLGTH=[315] (m), CHSLOPE=[0.11] (%),
1526 FPSLOPE=[0.11] (%),
1527 SECNUM=[7386], NSEG=[5]
1528 ( SEGROUGH, SEGDIST (m))=[0.08,21.18 0.05,62.87 -0.06,80.43
0.06,90.36 0.05,143.24] NSEG times
1529 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.07 ]
1530 [ 5.11, 76.8 ]
1531 [21.18, 76.7 ]
1532 [34.27, 76.7 ]
1533 [43.48, 76.3 ]
1534 [62.87, 74.8 ]
1535 [68.48, 74.28 ]
1536 [70.32, 73.5 ]
1537 [73.346, 73.437 ]
1538 [75.588, 73.466 ]
1539 [75.62, 73.47 ]
1540 [80.43, 74.3 ]
1541 [85.13, 75.18 ]
1542 [90.36, 75.69 ]
1543 [101.28, 75.4 ]
1544 [115.17, 75.3 ]
1545 [121.38, 75.4 ]
1546 [128.52, 74.95 ]
1547 [137.68, 75.3 ]
1548 [143.24, 76.97 ]
1549 *#=====

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1550 *# KD-2B-7 - RURAL EAST OF HERZBERG ROAD
1551 *#=====
1552 CONTINUOUS NASHYD          ID=[4], NHYD=["KD-2B-7"], DT=[1]min, AREA=[20.11] (ha),
1553 DWF=[0] (cms), CN=[63], IA=[7] (mm),
1554 N=[2.0], TP=[1.50]hrs,
1555 Continuous simulation parameters:
1556 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1557 InterEventTime=[12] (hrs),
1558 Baseflow simulation parameters:
1559 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1560 VHydCond=[.001] (mm/hr), END=-1
1561 *#=====
1562 *# ADD KD-2B-4 AND KD-2B-7
1563 *#=====
1564 ADD HYD                    IDsum=[3], NHYD=["KD-2B-4"], IDs to add=[2+4]
1565 *#=====
1566 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 7058.454
1567 *#=====
1568 ROUTE CHANNEL             IDout=[1], NHYD=["KD-2A-4"], IDin=[3],
1569 RDT=[1] (min),
1570 CHLGTH=[297] (m), CHSLOPE=[0.38] (%),
1571                                FPSLOPE=[0.38] (%),
1572 SECNUM=[7058], NSEG=[3]
1573 ( SEGROUGH, SEGDIST (m))=[0.05,206.86 -0.06,216.95 0.04,295.48]
1574                                NSEG times
1575                                ( DISTANCE (m), ELEVATION (m))=[ 0, 75.7 ]
1576                                [165.24, 75.2 ]
1577                                [198.14, 75.2 ]
1578                                [206.37, 73.8 ]
1579                                [206.86, 73.69 ]
1580                                [209.66, 73 ]
1581                                [211.86, 73 ]
1582                                [213.07, 73.07 ]
1583                                [215.16, 73.8 ]
1584                                [216.95, 74.14 ]
1585                                [247.08, 74.8 ]
1586                                [267.4, 74.8 ]
1587                                [295.48, 76.05 ]
1588 *#=====
1589 *# KD-2B-5 - URBAN
1590 *#=====
1591 CONTINUOUS STANDHYD       ID=[2], NHYD=["KD-2B-5"], DT=[1] (min), AREA=[4.74] (ha),
1592 XIMP=[0.50], TIMP=[0.50], DWF=[0] (cms),
1593 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1594 DCAY=[2.0] (/hr), F=[0] (mm),
1595 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1596                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1597 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1598                                LGI=[177] (m), MNI=[0.013], SCI=[0] (min),
1599 Continuous simulation parameters:
1600 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1601 InterEventTime=[12] (hrs), END=-1
1602 *#=====
1603 *# ON-SITE STORAGE
1604 *# RATING CURVE SOURCE - plan2.pdf IN 13616-Richardson Side_Eagleson
1605 *#=====
1606 ROUTE RESERVOIR          IDout=[4], NHYD=["KD-2B-5"], IDin=[2],
1607 RDT=[1] (min),
1608 TABLE of ( OUTFLOW-STORAGE ) values
1609                                (cms) - (ha-m)
1610                                [ 0.0 , 0.0 ]
1611                                [0.1458, 0.01283]
1612                                [0.1458, 0.03881]
1613                                [ -1 , -1 ] (max twenty pts)
1614 IDovf=[5], NHYDovf=["OVF-2B5"]
1615 *#=====
1616 *# KD-2B-1 - URBAN

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1615 *#=====
1616 CONTINUOUS STANDHYD      ID=[3], NHYD=["KD-2B-1"], DT=[1] (min), AREA=[134.85] (ha),
1617 XIMP=[0.40], TIMP=[0.41], DWF=[0] (cms),
1618 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1619 DCAY=[2.0] (/hr), F=[0] (mm),
1620 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1621                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1622 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1623                                LGI=[948] (m), MNI=[0.013], SCI=[0] (min),
1624 Continuous simulation parameters:
1625 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1626 InterEventTime=[12] (hrs), END=-1
1627 *#=====
1628 *# ADD OUTFLOW, OVERFLOW AND KD-2B-1
1629 *#=====
1630 ADD HYD      IDsum=[6], NHYD=["KD-2B-1"], IDs to add=[4+5+3]
1631 *#=====
1632 *# ADD KD-2B-4 AND KD-2B-1
1633 *# CREST GAUGE LOCATION KD-1 - KIZELL DRAIN AT HERTZBERG ROAD
1634 *#=====
1635 ADD HYD      IDsum=[3], NHYD=["KFP4"], IDs to add=[1+6]
1636 *PRINT HYD      ID=[3], # OF PCYCLES=[1]
1637 *#=====
1638 *# ROUTE KD-2B THROUGH KD-2C
1639 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6705.311
1640 *# MINIMUM SLOPE ASSUMED 0.1%
1641 *#=====
1642 ROUTE CHANNEL      IDout=[1], NHYD=["KD-2B"], IDin=[3],
1643 RDT=[1] (min),
1644 CHLGTH=[600] (m),  CHSLOPE=[0.1] (%),
1645                                FPSLOPE=[0.1] (%),
1646 SECNUM=[6705],      NSEG=[4]
1647 ( SEGROUGH, SEGDIST (m))=[0.05,162.749 -0.04,168.035 -0.05,168.35
1648 0.05,373.63] NSEG times
1649 ( DISTANCE (m), ELEVATION (m))=[  0, 75.65 ]
1650 [ 24.7, 75.1 ]
1651 [61.29, 73.42 ]
1652 [90.72, 72.7 ]
1653 [119.02, 72.95 ]
1654 [131.71, 72.8 ]
1655 [160.55, 72.9 ]
1656 [162.46, 72.46 ]
1657 [162.749, 72.403 ]
1658 [168.035, 72.369 ]
1659 [168.35, 72.39 ]
1660 [168.6, 72.43 ]
1661 [171.08, 72.8 ]
1662 [203.12, 72.8 ]
1663 [231.66, 73.3 ]
1664 [255.58, 73.2 ]
1665 [300.16, 73.6 ]
1666 [326.75, 74.3 ]
1667 [347.02, 75.2 ]
1668 [373.63, 76.05 ]
1669 *#=====
1670 *# KD-3A - URBAN WEST OF HERZBERG ROAD
1671 *#=====
1672 CONTINUOUS STANDHYD      ID=[3], NHYD=["KD-3A"], DT=[1] (min), AREA=[206.16] (ha),
1673 XIMP=[0.30], TIMP=[0.34], DWF=[0] (cms),
1674 LOSS=[1]:      Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1675 DCAY=[2.0] (/hr), F=[0] (mm),
1676 Pervious  surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1677                                LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1678 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1679                                LGI=[1172] (m), MNI=[0.013], SCI=[0] (min),
1680 Continuous simulation parameters:
1681 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),

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1679 InterEventTime=[12] (hrs), END=-1
1680 *#=====
1681 *# KTC-2B - URBAN - UPSTREAM LIMIT TO HWY 417, NORTH OF CAMPEAU DRIVE
1682 *# LAND USES WITHIN AREA: OFFICE/RECREATIONAL
1683 *#=====
1684 CONTINUOUS STANDHYD ID=[2], NHYD=["KTC-2B"], DT=[1] (min), AREA=[20.79] (ha),
1685 XIMP=[0.23], TIMP=[0.24], DWF=[0.0] (cms),
1686 LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
1687 DCAY=[2.0] (/hr), F=[0] (mm),
1688 Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1689 LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1690 Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1691 LGI=[372] (m), MNI=[0.013], SCI=[0] (min),
1692 Continuous simulation parameters:
1693 IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1694 InterEventTime=[12] (hrs), END=-1
1695 *#=====
1696 *# 5 YEAR CONTROL - 1155L/s
1697 *# MAJOR FLOWS TO KD-3A
1698 *# MINOR FLOWS TO SWF-1205
1699 *#=====
1700 COMPUTE DUALHYD IDin=[2], CINLET=[1.155] (cms), NINLET=[1],
1701 MAJID=[7], MajNHYD=["KTC2BMAJ"],
1702 MINID=[10], MinNHYD=["KTC2BMIN"],
1703 TMJSTO=[0] (cu-m)
1704 *#=====
1705 *# ADD KTC-2B MAJOR AND KD-3A - TRIBUTARY 1 AT HERTZBERG ROAD
1706 *#=====
1707 ADD HYD IDsum=[5], NHYD=["KD-3A"], IDs to add=[7+3]
1708 *#=====
1709 *# ROUTE KD-3A THROUGH KD-3B
1710 *# CHANNEL CROSS-SECTION DATA TAKEN FROM LiDAR
1711 *#=====
1712 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1713 RDT=[1] (min),
1714 CHLGTH=[253] (m), CHSLOPE=[0.13] (%),
1715 FPSLOPE=[0.13] (%),
1716 SECNUM=[1], NSEG=[3]
1717 ( SEGROUGH, SEGDIST (m))=[0.05,27.94 -0.035,38.92 0.08,64.87] NSEG
1718 times
1719 ( DISTANCE (m), ELEVATION (m))=[ 0, 78.90]
1720 [12.97, 78.12]
1721 [15.97, 77.81]
1722 [19.96, 77.51]
1723 [23.95, 77.36]
1724 [24.95, 77.34]
1725 [25.95, 77.34]
1726 [26.94, 77.36]
1727 [27.94, 77.30]
1728 [30.94, 76.79]
1729 [31.93, 76.73]
1730 [32.93, 76.73]
1731 [33.93, 76.70]
1732 [34.94, 76.76]
1733 [38.92, 77.29]
1734 [42.91, 77.34]
1735 [58.88, 78.52]
1736 [64.87, 78.97]
1737 ROUTE CHANNEL IDout=[5], NHYD=["KD-3A"], IDin=[4],
1738 RDT=[1] (min),
1739 CHLGTH=[344] (m), CHSLOPE=[0.56] (%),
1740 FPSLOPE=[0.56] (%),
1741 SECNUM=[2], NSEG=[3]
1742 ( SEGROUGH, SEGDIST (m))=[0.05,20.89 -0.035,76.49 0.08,88.52] NSEG
1743 times
1744 ( DISTANCE (m), ELEVATION (m))=[ 0, 77.38]
1745 [13.92, 77.02]

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1743 [20.89, 76.69]
1744 [26.85, 76.09]
1745 [29.84, 76.03]
1746 [44.76, 76.15]
1747 [56.69, 75.91]
1748 [59.68, 76.10]
1749 [61.67, 76.05]
1750 [71.61, 76.31]
1751 [76.49, 76.69]
1752 [82.55, 77.16]
1753 [88.52, 77.40]
1754 ROUTE CHANNEL IDout=[4], NHYD=["KD-3A"], IDin=[5],
1755 RDT=[1] (min),
1756 CHLGTH=[324] (m), CHSLOPE=[0.72] (%),
1757 FPSLOPE=[0.72] (%),
1758 SECNUM=[1], NSEG=[3]
1759 ( SEGROUGH, SEGDIST (m))=[0.05,97.588 -0.035,109.575 0.05,143.405]
NSEG times
1760 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.2777 ]
1761 [39.664, 74.805 ]
1762 [74.612, 74.8767 ]
1763 [79.607, 74.8037 ]
1764 [ 86.6, 74.7914 ]
1765 [90.595, 74.6388 ]
1766 [95.59, 74.6899 ]
1767 [97.588, 74.8802 ]
1768 [101.584, 74.7293 ]
1769 [103.582, 74.4039 ]
1770 [106.578, 74.4818 ]
1771 [109.575, 74.9123 ]
1772 [111.573, 74.8318 ]
1773 [116.568, 74.8294 ]
1774 [120.563, 74.7426 ]
1775 [121.562, 74.7398 ]
1776 [124.559, 74.8464 ]
1777 [130.553, 74.8391 ]
1778 [132.54, 74.777 ]
1779 [143.405, 75.255 ]
1780 *#=====
1781 *# KD-2C - RURAL
1782 *#=====
1783 CONTINUOUS NASHYD ID=[2], NHYD=["KD-2C"], DT=[1]min, AREA=[59.10] (ha),
1784 DWF=[0] (cms), CN=[83], IA=[7] (mm),
1785 N=[2.0], TP=[0.60]hrs,
1786 Continuous simulation parameters:
1787 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1788 InterEventTime=[12] (hrs),
1789 Baseflow simulation parameters:
1790 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1791 VHydCond=[.001] (mm/hr), END=-1
1792 *#=====
1793 *# ADD KD-2B AND KD-2C
1794 *#=====
1795 ADD HYD IDsum=[5], NHYD=["KFP5"], IDs to add=[1+2]
1796 *PRINT HYD ID=[5], # OF PCYCLES=[1]
1797 *#=====
1798 *# ADD KD-2C AND KD-3A
1799 *#=====
1800 ADD HYD IDsum=[3], NHYD=["KD-2C"], IDs to add=[5+4]
1801 *#=====
1802 *# ROUTE KD-1+KD-2 THROUGH KD-3B-1
1803 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 6104.633
1804 *# MINIMUM SLOPE ASSUMED 0.1%
1805 *#=====
1806 ROUTE CHANNEL IDout=[1], NHYD=["KD-2C"], IDin=[3],
1807 RDT=[1] (min),
1808 CHLGTH=[952] (m), CHSLOPE=[0.1] (%),

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1809                      FPSLOPE=[0.1] (%),
1810          SECNUM=[6104],          NSEG=[3]
1811          ( SEGROUGH, SEGDIST (m))=[0.08,175.904 -0.04,179.184 0.08,185.91]
          NSEG times
1812          ( DISTANCE (m), ELEVATION (m))=[ 0, 77.06 ]
1813                      [ 9.16, 77.1 ]
1814                      [23.37, 76.7 ]
1815                      [56.09, 76.5 ]
1816                      [67.63, 76.2 ]
1817                      [80.81, 75.6 ]
1818                      [83.87, 75.6 ]
1819                      [98.45, 74.5 ]
1820                      [103.07, 74.3 ]
1821                      [115.78, 74.3 ]
1822                      [134.4, 73.6 ]
1823                      [149.63, 73.7 ]
1824                      [163.83, 73.6 ]
1825                      [173.16, 72.7 ]
1826                      [175.83, 72 ]
1827                      [175.904, 71.992 ]
1828                      [179.184, 71.968 ]
1829                      [179.27, 72 ]
1830                      [183.86, 73.7 ]
1831                      [185.91, 74 ]
1832  *#=====
1833  *# KD-3B - RURAL EAST OF HERZBERG ROAD
1834  *#=====
1835  CONTINUOUS NASHYD          ID=[4], NHYD=["KD-23B"], DT=[1]min, AREA=[112.07] (ha),
1836          DWF=[0] (cms), CN=[66], IA=[7] (mm),
1837          N=[2.0], TP=[1.20]hrs,
1838          Continuous simulation parameters:
1839          IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1840          InterEventTime=[12] (hrs),
1841          Baseflow simulation parameters:
1842          BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1843          VHydCond=[.001] (mm/hr), END=-1
1844  *#=====
1845  *# ADD KD-2C,KD-3A AND KD-3B - KIZELL DRAIN AT CONFLUENCE WITH WATTS CREEK
1846  *#=====
1847  ADD HYD          IDsum=[3], NHYD=["KFP6"], IDs to add=[1+4]
1848  *PRINT HYD          ID=[3], # OF PCYCLES=[1]
1849  *#=====
1850  *#          WATTS CREEK SUBWATERSHED
1851  *#=====
1852  *#=====
1853  *# KANATA TOWN CENTRE-1 - URBAN - UPSTREAM LIMIT TO HWY 417
1854  *# Imperviousness decreased under existing conditions
1855  *#=====
1856  CONTINUOUS STANDHYD          ID=[2], NHYD=["KTC-1"], DT=[1] (min), AREA=[60.23] (ha),
1857          XIMP=[0.34], TIMP=[0.34], DWF=[0] (cms),
1858          LOSS=[1]: Horton: Fo=[125] (mm/hr), Fc=[25] (mm/hr),
          DCAY=[2.0] (/hr), F=[0] (mm),
1859          Pervious surfaces: IAper=[4.67] (mm), SLPP=[2.0] (%),
1860          LGP=[40] (m), MNP=[0.25], SCP=[0] (min),
1861          Impervious surfaces: IAimp=[1.57] (mm), SLPI=[1.0] (%),
1862          LGI=[633] (m), MNI=[0.013], SCI=[0] (min),
1863          Continuous simulation parameters:
1864          IaRECper=[6] (hrs), IaRECimp=[1.5] (hrs),
1865          InterEventTime=[12] (hrs), END=-1
1866  *#=====
1867  *# 5 YEAR CONTROL - 2963L/s
1868  *# MAJOR FLOWS TO WC-1
1869  *# MINOR FLOWS TO SWF-1206
1870  *#=====
1871  COMPUTE DUALHYD          IDin=[2], CINLET=[2.963] (cms), NINLET=[1],
1872          MAJID=[7], MajNHYD=["KTC1MAJ"],
1873          MINID=[8], MinNHYD=["KTC1MIN"],

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1874             TMJSTO=[0] (cu-m)
1875 *#=====
1876 *# SWMF-1206
1877 *# STORAGE WAS ESTIMATED FROM AVAILABLE DRAWING
1878 *# DISCHARGE WAS TAKEN FROM R-1564
1879 *#=====
1880 ROUTE RESERVOIR      IDout=[4],  NHYD=["KTC-1"],  IDin=[8],
1881                      RDT=[1] (min),
1882                      TABLE of ( OUTFLOW-STORAGE ) values
1883                                (cms) - (ha-m)
1884                                [ 0.0 , 0.0 ]
1885                                [ 0.955 , 0.2854]
1886                                [ 1.436 , 3.9725]
1887                                [ -1 , -1 ] (max twenty pts)
1888                      IDovf=[5],  NHYDovf=["OVF-KTC1"]
1889 *#=====
1890 *# ADD OUTFLOW, OVERFLOW AND KTC-1 MAJOR
1891 *#=====
1892 ADD HYD              IDsum=[2],  NHYD=["KTC-1"],  IDs to add=[4+5+7]
1893 *#=====
1894 *# WC-1 - RURAL/URBAN EXISTING AREA
1895 *#=====
1896 CONTINUOUS STANDHYD      ID=[1],  NHYD=["WC-1"],  DT=[1] (min),  AREA=[403.47] (ha),
1897                      XIMP=[0.30],  TIMP=[0.34],  DWF=[0] (cms),
1898                      LOSS=[1]:    Horton: Fo=[125] (mm/hr),  Fc=[25] (mm/hr),
1899                      DCAY=[2.0] (/hr),  F=[0] (mm),
1900                      Pervious  surfaces: IAper=[4.67] (mm),  SLPP=[2.0] (%),
1901                      LGP=[40] (m),  MNP=[0.25],  SCP=[0] (min),
1902                      Impervious surfaces: IAimp=[1.57] (mm),  SLPI=[1.0] (%),
1903                      LGI=[1640] (m),  MNI=[0.013],  SCI=[0] (min),
1904                      Continuous simulation parameters:
1905                      IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1906                      InterEventTime=[12] (hrs),  END=-1
1907 *#=====
1908 *# ADD WC-1 AND KTC-1 - WATTS CREEK AT HIGHWAY 417
1909 *#=====
1910 ADD HYD              IDsum=[5],  NHYD=["WC-1"],  IDs to add=[1+2]
1911 *#=====
1912 *# KTC-2A - URBAN - UPSTREAM LIMIT TO HWY 417, SOUTH OF CAMPEAU DRIVE
1913 *# LAND USES WITHIN AREA: TOWN CENTRE/URBAN RES
1914 *#=====
1915 CONTINUOUS STANDHYD      ID=[1],  NHYD=["KTC-2A"],  DT=[1] (min),  AREA=[34.34] (ha),
1916                      XIMP=[0.36],  TIMP=[0.42],  DWF=[0.0] (cms),
1917                      LOSS=[1]:    Horton: Fo=[125] (mm/hr),  Fc=[25] (mm/hr),
1918                      DCAY=[2.0] (/hr),  F=[0] (mm),
1919                      Pervious  surfaces: IAper=[4.67] (mm),  SLPP=[2.0] (%),
1920                      LGP=[40] (m),  MNP=[0.25],  SCP=[0] (min),
1921                      Impervious surfaces: IAimp=[1.57] (mm),  SLPI=[1.0] (%),
1922                      LGI=[478] (m),  MNI=[0.013],  SCI=[0] (min),
1923                      Continuous simulation parameters:
1924                      IaRECper=[6] (hrs),  IaRECimp=[1.5] (hrs),
1925                      InterEventTime=[12] (hrs),  END=-1
1926 *#=====
1927 *# ADD KTC-2A AND KTC-2B MINOR
1928 *#=====
1929 ADD HYD              IDsum=[4],  NHYD=["KTC-2"],  IDs to add=[1+10]
1930 *#=====
1931 *# ROUTE KTC-2 THROUGH KANATA TOWN CENTRE PHASE I POND
1932 *# STAGE-STORAGE-DISCHARGE CURVE OBTAINED FROM:
1933 *# KANATA TOWN CENTRE PHASE i - STORMWATER MANAGEMENT REPORT
1934 *# J.L. RICHARDS & ASSOCIATES LTD. 1996
1935 *# SWF-1205
1936 *# STORAGE WAS ESTIMATED WITH AVAILABLE DRAWING
1937 *# DISCHARGE WAS TAKEN FROM R-1563
1938 *#=====
1939 ROUTE RESERVOIR      IDout=[1],  NHYD=["KTC-2"],  IDin=[4],
1940                      RDT=[1] (min),

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1939          TABLE of ( OUTFLOW-STORAGE ) values
1940                      (cms) - (ha-m)
1941                      [ 0.0 , 0.0 ]
1942                      [ 0.79, 0.6939]
1943                      [ 4.70, 1.4350]
1944                      [ -1 , -1 ] (max twenty pts)
1945          IDovf=[2], NHYDovf=["OVF-KTC2"]
1946          *#=====
1947          *# ADD OUTFLOW AND OVERFLOW
1948          *#=====
1949          ADD HYD          IDsum=[4], NHYD=["KTC-2"], IDs to add=[1+2]
1950          *#=====
1951          *# ADD WC-1 AND KTC-2
1952          *#=====
1953          ADD HYD          IDsum=[2], NHYD=["KTC-2"], IDs to add=[5+4]
1954          *%-----|-----|
1955          *#=====
1956          *# WC-3 - URBAN/RURAL
1957          *#=====
1958          CONTINUOUS NASHYD          ID=[1], NHYD=["WC-3"], DT=[1]min, AREA=[204.06] (ha),
1959          DWF=[0] (cms), CN=[66], IA=[7] (mm),
1960          N=[2.0], TP=[1.28]hrs,
1961          Continuous simulation parameters:
1962          IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
1963          InterEventTime=[12] (hrs),
1964          Baseflow simulation parameters:
1965          BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
1966          VHydCond=[.001] (mm/hr), END=-1
1967          *#=====
1968          *# ADD WC-1+KTC AND WC-3
1969          *#=====
1970          ADD HYD          IDsum=[4], NHYD=["WC-3"], IDs to add=[2+1]
1971          *#=====
1972          *# ROUTE WC-1+KTC+WC-3 THROUGH WC-4A
1973          *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
1974          *#=====
1975          ROUTE CHANNEL          IDout=[1], NHYD=["WC-3"], IDin=[4],
1976          RDT=[1] (min),
1977          CHLGTH=[744] (m), CHSLOPE=[1.29] (%),
1978          FPSLOPE=[1.29] (%),
1979          SECNUM=[1], NSEG=[3]
1980          ( SEGROUGH, SEGDIST (m))=[0.05,25.86 -0.035,40.77 0.05,72.60] NSEG 2
          times
1981          ( DISTANCE (m), ELEVATION (m))=[ 0, 90.87]
1982          [ 1.99, 90.66]
1983          [ 7.96, 90.10]
1984          [16.91, 85.80]
1985          [18.90, 85.49]
1986          [21.88, 85.42]
1987          [25.86, 85.56]
1988          [26.85, 25.50]
1989          [29.83, 84.06]
1990          [31.82, 84.06]
1991          [34.81, 85.10]
1992          [40.77, 85.59]
1993          [48.73, 85.85]
1994          [52.71, 86.80]
1995          [55.59, 87.80]
1996          [60.66, 90.40]
1997          [64.64, 90.77]
1998          [72.60, 90.97]
1999          *#=====
2000          *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2001          *#=====
2002          ROUTE CHANNEL          IDout=[2], NHYD=["WC-3"], IDin=[1],
2003          RDT=[1] (min),
2004          CHLGTH=[2295] (m), CHSLOPE=[0.45] (%),

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2005                      FPSLOPE=[0.45] (%),
2006          SECNUM=[2],          NSEG=[3]
2007          ( SEGROUGH, SEGDIST (m))=[0.05,12.98 -0.035,20.97 0.05,51.94] NSEG  ↵
times
2008          ( DISTANCE (m), ELEVATION (m))=[ 0, 85.79]
2009                      [ 1.00, 85.75]
2010                      [11.99, 83.71]
2011                      [12.98, 83.36]
2012                      [14.98, 82.49]
2013                      [15.98, 82.44]
2014                      [16.98, 82.45]
2015                      [20.97, 83.51]
2016                      [22.97, 83.46]
2017                      [23.97, 83.51]
2018                      [26.97, 83.55]
2019                      [27.97, 83.55]
2020                      [31.96, 83.51]
2021                      [32.96, 83.45]
2022                      [33.96, 83.45]
2023                      [34.96, 83.50]
2024                      [51.94, 85.81]
2025  *#=====
2026  *# CHANNEL CROSS-SECTION DATA TAKEN FROM LIDAR
2027  *#=====
2028  ROUTE CHANNEL          IDout=[1], NHYD=["WC-3"], IDin=[2],
2029                      RDT=[1] (min),
2030                      CHLGTH=[487] (m),  CHSLOPE=[0.23] (%),
2031                      FPSLOPE=[0.23] (%),
2032          SECNUM=[3],          NSEG=[3]
2033          ( SEGROUGH, SEGDIST (m))=[0.05,6.97 -0.035,25.87 0.05,29.85] NSEG  ↵
times
2034          ( DISTANCE (m), ELEVATION (m))=[ 0, 75.60]
2035                      [ 1, 75.54]
2036                      [ 1.99, 75.42]
2037                      [ 6.97, 73.09]
2038                      [11.94, 72.70]
2039                      [14.93, 72.66]
2040                      [17.91, 72.27]
2041                      [23.88, 72.25]
2042                      [25.87, 73.03]
2043                      [28.86, 74.06]
2044                      [29.85, 74.23]
2045  *#=====
2046  *# WC-4A - RURAL - HIGHWAY 417 TO CNR
2047  *#=====
2048  CONTINUOUS NASHYD          ID=[2] NHYD=["WC-4A"], DT=[1]min, AREA=[126.29] (ha),
2049                      DWF=[0] (cms),  CN=[82], IA=[7] (mm),
2050                      N=[2.0], TP=[2.30]hrs,
2051          Continuous simulation parameters:
2052                      IaREcper=[6] (hrs), SMIN=[-1] (mm),  SMAX=[-1] (mm), SK=[0.03]/(mm),
2053                      InterEventTime=[12] (hrs),
2054          Baseflow simulation parameters:
2055                      BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2056                      VHydCond=[.001] (mm/hr), END=-1
2057  *#=====
2058  *# ADD WC-1+KTC+WC-3 AND WC-4A
2059  *# CREST GAUGE LOCATION WC-1 - WATTS CREEK AT CONFLUENCE WITH KIZELL DRAIN
2060  *#=====
2061  ADD HYD          IDsum=[6], NHYD=["WFP1"], IDs to add=[1+2]
2062  *PRINT HYD          ID=[6],  # OF PCYCLES=[1]
2063  *#=====
2064  *# WC-4B - RURAL - HIGHWAY 417 TO CNR
2065  *#=====
2066  CONTINUOUS NASHYD          ID=[4] NHYD=["WC-4B"], DT=[1]min, AREA=[145.27] (ha),
2067                      DWF=[0] (cms),  CN=[73], IA=[7] (mm),
2068                      N=[2.0], TP=[1.22]hrs,
2069          Continuous simulation parameters:

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2070 IaREcper=[6] (hrs), SMIN=[-1] (mm), SMAx=[-1] (mm), SK=[0.03]/(mm),
2071 InterEventTime=[12] (hrs),
2072 Baseflow simulation parameters:
2073 BaseFlowOption=[1], InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2074 VHydCond=[.001] (mm/hr), END=-1
2075 *#=====
2076 *# ADD WC-4A AND KIZELL
2077 *#=====
2078 ADD HYD IDsum=[1], NHYD=["WFP2"], IDs to add=[6+3]
2079 *PRINT HYD ID=[1], # OF PCYCLES=[1]
2080 *#=====
2081 *# ADD WC-4A AND WC-4B
2082 *#=====
2083 ADD HYD IDsum=[5], NHYD=["WFP3"], IDs to add=[1+4]
2084 *PRINT HYD ID=[5], # OF PCYCLES=[1]
2085 *#=====
2086 *# ROUTE KIZELL AND WC-1+KTC+WC-3+WC-4 THROUGH WC-5A
2087 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4677.806
2088 *#=====
2089 ROUTE CHANNEL IDout=[2], NHYD=["WC-4"], IDin=[5],
2090 RDT=[1] (min),
2091 CHLGTH=[636] (m), CHSLOPE=[0.16] (%),
2092 FPSLOPE=[0.16] (%),
2093 SECNUM=[4677], NSEG=[3]
2094 ( SEGROUGH, SEGDIST (m))=[0.08,95.801 -0.04,102.955 0.08,167.28]
2095 NSEG times
2096 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.4 ]
2097 [ 11.4, 74.3 ]
2098 [ 31.7, 73.6 ]
2099 [51.08, 72.8 ]
2100 [60.69, 72.6 ]
2101 [ 74.1, 71.6 ]
2102 [77.61, 70.8 ]
2103 [84.14, 71 ]
2104 [93.83, 71 ]
2105 [95.801, 70.73 ]
2106 [ 97.18, 70.5 ]
2107 [ 101, 70.5 ]
2108 [102.955, 70.989 ]
2109 [111.37, 74.5 ]
2110 [121.02, 76.45 ]
2111 [128.96, 77.6 ]
2112 [139.85, 78.3 ]
2113 [151.67, 80.09 ]
2114 [158.82, 80.63 ]
2115 [167.28, 81.57 ]
2116 *#=====
2117 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 4446.172
2118 *#=====
2119 ROUTE CHANNEL IDout=[1], NHYD=["WC-4"], IDin=[2],
2120 RDT=[1] (min),
2121 CHLGTH=[443] (m), CHSLOPE=[0.64] (%),
2122 FPSLOPE=[0.64] (%),
2123 SECNUM=[4446], NSEG=[4]
2124 ( SEGROUGH, SEGDIST (m))=[0.08,101.82 0.05,155.499 -0.04,160.804
2125 0.08,360.72] NSEG times
2126 ( DISTANCE (m), ELEVATION (m))=[ 0, 75.11 ]
2127 [15.28, 74.3 ]
2128 [39.39, 73.6 ]
2129 [55.02, 73.7 ]
2130 [70.01, 73.1 ]
2131 [101.82, 72.72 ]
2132 [123.37, 72.37 ]
2133 [137.03, 71.7 ]
2134 [152.53, 68.9 ]
2135 [155.499, 68.552 ]
2136 [160.804, 68.559 ]

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2135 [163.78, 68.89 ]
2136 [172.88, 69 ]
2137 [180.76, 72.03 ]
2138 [191.21, 72.8 ]
2139 [208.93, 72.49 ]
2140 [239.54, 72.4 ]
2141 [260.28, 72.6 ]
2142 [291.51, 72.6 ]
2143 [360.72, 73.06 ]
2144 *#=====
2145 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3897.472
2146 *#=====
2147 ROUTE CHANNEL IDout=[2], NHYD=["WC-4"], IDin=[1],
2148 RDT=[1] (min),
2149 CHLGTH=[468] (m), CHSLOPE=[0.44] (%),
2150 FPSLOPE=[0.44] (%),
2151 SECNUM=[3897], NSEG=[4]
2152 ( SEGROUGH, SEGDIST (m))=[0.08,161.362 -0.04,164.388 -0.08,164.68 2
0.05,242.03] NSEG times
2153 ( DISTANCE (m), ELEVATION (m))=[ 0, 72.01 ]
2154 [14.79, 71.9 ]
2155 [26.32, 71.5 ]
2156 [45.81, 69.5 ]
2157 [ 52.8, 68.5 ]
2158 [67.29, 68.1 ]
2159 [85.91, 68.1 ]
2160 [94.25, 67.9 ]
2161 [116.16, 67.78 ]
2162 [142.44, 67.4 ]
2163 [159.77, 66.1 ]
2164 [161.362, 65.677 ]
2165 [164.388, 65.577 ]
2166 [164.68, 65.61 ]
2167 [166.02, 66.1 ]
2168 [167.47, 66.5 ]
2169 [201.22, 66.8 ]
2170 [208.26, 66.7 ]
2171 [216.93, 67.19 ]
2172 [242.03, 67.3 ]
2173 *#=====
2174 *# WC-5A - RURAL - CNR TO CARLING AVE
2175 *#=====
2176 CONTINUOUS NASHYD ID=[1] NHYD=["WC-5A"], DT=[1]min, AREA=[59.54] (ha),
2177 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2178 N=[2.0], TP=[0.79]hrs,
2179 Continuous simulation parameters:
2180 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03] / (mm),
2181 InterEventTime=[12] (hrs),
2182 Baseflow simulation parameters:
2183 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2184 VHydCond=[.001] (mm/hr), END=-1
2185 *#=====
2186 *# ADD WC-5A AND WC-5A UPSTREAM
2187 *# CALIBRATION LOCATION - WATTS CREEK AT CARLING AVENUE
2188 *#=====
2189 ADD HYD IDsum=[3], NHYD=["WFP4"], IDs to add=[1+2]
2190 *PRINT HYD ID=[3], # OF PCYCLES=[1]
2191 *#=====
2192 *# ROUTE WC-5B UPSTREAM THROUGH WC-5B
2193 *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 3469.421
2194 *# MINIMUM SLOPE ASSUMED 0.1%
2195 *#=====
2196 ROUTE CHANNEL IDout=[2], NHYD=["WC-5B"], IDin=[3],
2197 RDT=[1] (min),
2198 CHLGTH=[485] (m), CHSLOPE=[0.1] (%),
2199 FPSLOPE=[0.1] (%),
2200 SECNUM=[3469], NSEG=[4]

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2201      ( SEGROUGH, SEGDIST (m))=[0.08,127.46 0.06,131.6 -0.03,141.59      ↵
0.08,308.37] NSEG times
2202      ( DISTANCE (m), ELEVATION (m))=[ 0, 68.08 ]
2203      [16.71, 67.1 ]
2204      [48.15, 66.8 ]
2205      [75.65, 66.3 ]
2206      [107.54, 66.2 ]
2207      [117.33, 66.3 ]
2208      [127.46, 65.54 ]
2209      [129.21, 65.3 ]
2210      [131.6, 64.9 ]
2211      [136.836, 64.972 ]
2212      [139.19, 65.3 ]
2213      [141.59, 65.65 ]
2214      [161.72, 65.6 ]
2215      [171.42, 66.1 ]
2216      [187.05, 66.3 ]
2217      [224.24, 66.3 ]
2218      [246.7, 66.1 ]
2219      [286.52, 66.07 ]
2220      [304.07, 66.3 ]
2221      [308.37, 66.7 ]
2222      *#=====
2223      *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 2981.379
2224      *#=====
2225      ROUTE CHANNEL      IDout=[1], NHYD=["WC-5B"], IDin=[2],
2226      RDT=[1] (min),
2227      CHLGTH=[307] (m),   CHSLOPE=[0.40] (%),
2228      FPSLOPE=[0.40] (%),
2229      SECNUM=[2981],      NSEG=[4]
2230      ( SEGROUGH, SEGDIST (m))=[0.08,9.006 -0.03,14.347 -0.06,14.85      ↵
0.08,30.25] NSEG times
2231      ( DISTANCE (m), ELEVATION (m))=[ 0, 64.35 ]
2232      [ 2.07, 64.3 ]
2233      [ 4.58, 64.2 ]
2234      [ 5.7, 64.1 ]
2235      [ 6.83, 63.8 ]
2236      [ 7.91, 63.37 ]
2237      [9.006, 63.169 ]
2238      [ 9.64, 62.8 ]
2239      [13.64, 62.8 ]
2240      [14.24, 63.1 ]
2241      [14.347, 63.315 ]
2242      [14.85, 63.35 ]
2243      [15.35, 63.4 ]
2244      [16.49, 63.69 ]
2245      [18.19, 64.21 ]
2246      [21.41, 64.2 ]
2247      [25.06, 64.05 ]
2248      [27.14, 64.06 ]
2249      [28.41, 64.2 ]
2250      [30.25, 64.28 ]
2251      *#=====
2252      *# CHANNEL CROSS-SECTION DATA TAKEN FROM HEC-RAS MODEL STATION 1585.543
2253      *#=====
2254      ROUTE CHANNEL      IDout=[2], NHYD=["WC-5B"], IDin=[1],
2255      RDT=[1] (min),
2256      CHLGTH=[2876] (m),   CHSLOPE=[0.16] (%),
2257      FPSLOPE=[0.16] (%),
2258      SECNUM=[1585],      NSEG=[4]
2259      ( SEGROUGH, SEGDIST (m))=[0.08,56.84 0.05,124.41 -0.035,128.78      ↵
0.08,255.15] NSEG times
2260      ( DISTANCE (m), ELEVATION (m))=[ 0, 64.07 ]
2261      [21.74, 63.8 ]
2262      [40.53, 63.5 ]
2263      [56.84, 61.82 ]
2264      [74.07, 61.6 ]

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2265 [98.29, 61.7 ]
2266 [104.39, 61.43 ]
2267 [117.32, 61.8 ]
2268 [124.32, 60.8 ]
2269 [124.41, 60.79 ]
2270 [124.519, 60.783 ]
2271 [127.785, 60.75 ]
2272 [ 128, 60.83 ]
2273 [128.78, 61.17 ]
2274 [130.97, 61.8 ]
2275 [149.66, 61.32 ]
2276 [170.74, 61.4 ]
2277 [191.12, 63.6 ]
2278 [219.28, 64.08 ]
2279 [255.15, 64.1 ]
2280 *#=====
2281 *# WC-5B - RURAL - CARLING AVE TO OUTLET
2282 *#=====
2283 CONTINUOUS NASHYD ID=[4] NHYD=["WC-5B"], DT=[1]min, AREA=[379.59] (ha),
2284 DWF=[0] (cms), CN=[73], IA=[7] (mm),
2285 N=[2.0], TP=[3.28]hrs,
2286 Continuous simulation parameters:
2287 IaRECper=[6] (hrs), SMIN=[-1] (mm), SMAX=[-1] (mm), SK=[0.03]/(mm),
2288 InterEventTime=[12] (hrs),
2289 Baseflow simulation parameters:
2290 BaseFlowOption=[1] , InitGWResVol=[12] (mm), GWResK=[0.85] (mm/day/mm),
2291 VHydCond=[.001] (mm/hr), END=-1
2292 *#=====
2293 *# ADD WC-5B AND WC-5B UPSTREAM
2294 *# WATTS CREEK AT OUTLET TO OTTAWA RIVER
2295 *#=====
2296 ADD HYD IDsum=[1], NHYD=["WFP5"], IDs to add=[4+2]
2297 *PRINT HYD ID=[1], # OF PCYCLES=[1]
2298 *%-----|-----|
2299 SAVE HYD ID=[1], # OF PCYCLES=[-1], ICASEsh=[-1]
2300 HYD_FILENAME=["WFP5"]
2301 HYD_COMMENT=["WATTS CREEK AT OUTLET TO OTTAWA RIVER"]
2302 *%-----|-----|
2303 *#=====
2304 *
2305 *#=====
2306 *FINISH
2307 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0005]
2308 * "5y12hr.stm"
2309 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0010]
2310 * "10y12hr.stm"
2311 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0025]
2312 * "25y12hr.stm"
2313 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0050]
2314 * "50y12hr.stm"
2315 START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[0100]
2316 * "100y12hr.stm"
2317 FINISH
2318 *#=====
2319 *
2320 *#=====
2321 START TZERO=[1968.0101], METOUT=[2], NSTORM=[0], NRUN=[1968]
2322 START TZERO=[1969.0101], METOUT=[2], NSTORM=[0], NRUN=[1969]
2323 START TZERO=[1970.0101], METOUT=[2], NSTORM=[0], NRUN=[1970]
2324 START TZERO=[1971.0101], METOUT=[2], NSTORM=[0], NRUN=[1971]
2325 START TZERO=[1972.0101], METOUT=[2], NSTORM=[0], NRUN=[1972]
2326 START TZERO=[1973.0101], METOUT=[2], NSTORM=[0], NRUN=[1973]
2327 START TZERO=[1974.0101], METOUT=[2], NSTORM=[0], NRUN=[1974]
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2330 START TZERO=[1977.0101], METOUT=[2], NSTORM=[0], NRUN=[1977]
2331 START TZERO=[1978.0101], METOUT=[2], NSTORM=[0], NRUN=[1978]

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2332	START	TZERO=[1979.0101],	METOUT=[2],	NSTORM=[0],	NRUN=[1979]
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2341	START	TZERO=[1988.0101],	METOUT=[2],	NSTORM=[0],	NRUN=[1988]
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2352	START	TZERO=[1999.0101],	METOUT=[2],	NSTORM=[0],	NRUN=[1999]
2353	START	TZERO=[2000.0101],	METOUT=[2],	NSTORM=[0],	NRUN=[2000]
2354	START	TZERO=[2002.0101],	METOUT=[2],	NSTORM=[0],	NRUN=[2002]
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2356	START	TZERO=[2004.0101],	METOUT=[2],	NSTORM=[0],	NRUN=[2004]
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2359	FINISH				